

OCEAN CONTROLS - Introduction

August 2009

Dear Customers

New things that we have added to our catalog this month include

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Latching Emergency Stop Switch page 90
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3onedata RS232 to RS485 Converters page 17
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Not all our products are shown in the catalog. To see the full range and to view more details about our products please visit our website at www.oceancontrols.com.au

Please note all prices are in Australian dollars and are ex GST. Australian customers should add 10% to the price when purchasing goods

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OCEAN CONTROLS - DATA ACQUISITION

LabJack U12

USB-based multifunction data acquisition and control device

Features:

- 8 Single-Ended, 4 Differential 12-Bit Analog Inputs
- ± 10 Volt Analog Input Range
- PGA with Gains of 1, 2, 4, 5, 8, 10, 16, or 20 V/V
- Up to 8 kSamples/Sec (Burst) or 1.2 kSamples/Second (Stream)
- Supports Software or Hardware Timed Acquisition
- Supports Triggered Acquisition
- 2 Analog Outputs
- 20 Digital I/O (Up to 50 Hz per I/O)
- 32-Bit Counter.
- Software is included including activex component



Price Each	1	5+
LAJ-001	\$215.00	POA

LabJack U3 USB Data Acquisition Module LV

Features:

- 16 Flexible I/O (Digital Input, Digital Output, or Analog Input)
- Up to 2 Timers (Pulse Counting/Timing, PWM Output, Quadrature Input)
- Up to 2 Counters (32-Bits Each)
- 4 Additional Digital I/O
- Up to 16 12-bit Analog Inputs (0-2.4 V or 0-3.6 V, SE or Diff.)
- 2 Analog Outputs (10-Bit, 0-5 volts)
- Supports SPI, I2C, and Asynchronous Serial Protocols (Master Only)
- Built-In Screw Terminals for Some Signals
- USB 2.0/1.1 Full Speed Interface
- Powered by USB Cable
- Drivers Available for Windows, Linux, Mac and Pocket PC
- Examples Available for C/C++, VB, LabVIEW, Java, and More
- Includes Licensed Copy of DAQFactory Express Software (Win2000/XP)
- Includes USB Cable and Screwdriver
- Free Firmware Upgrades
- Money Back Guarantee
- Enclosure Size Approximately 3" x 4.5" x 1.2" (75mm x 115mm x 30mm)
- Rated for Industrial Temperature Range (-40 to +85 Degrees C)



LabJack U3 USB Data Acquisition Module HV

Differences with the HV (High-Voltage) Version:

- First 4 Flexible I/O are Changed to Dedicated HV Analog Inputs.
- 4 HV Inputs have ± 10 Volt or -10/+20 Volt Range.
- 12 LV Inputs (Flexible I/O) Still Available, for 16 Total Analog Inputs.-

Price Each	1	5+
LAJ-021 Labjack U3 USB Data Acquisition Module LV	\$179.00	POA
LAJ-022 Labjack U3 USB Data Acquisition Module HV	\$189.00	POA
LAJ-023 LABJACK U3 Data Acquisition OEM Module	\$129.00	POA

LabJack UE9 and UE9-Pro

USB/Ethernet data acquisition module

A high speed and accurate data acquisition module. The UE9-Pro has all the features of the normal UE9 with the addition of an auxiliary low-speed hi-resolution (24-bit) sigma-delta ADC.

Features:

- 14 Analog Inputs (12-16 bits depending on speed)
- ± 5 or 0-5 Volt Maximum Analog Input Range
- Analog Input Streaming upto 50KHz (Ethernet)
- 2 Analog Outputs
- 2 Counters (32 Bits)
- 23 Digital I/O
- Supports Software or Hardware Timed Acquisition
- Copy of DaqFactory Express, Labview Drivers and ActiveX component



Price Each	1	5+
LAJ-011 Labjack UE9	\$689.00	POA
LAJ-015 Labjack UE9-Pro	\$839.00	POA

LABJACK U6 USB DATA ACQUISITION MODULE

Features

The U6-Pro has all the features of the normal U6 with the addition of an auxiliary low-speed hi-resolution (24-bit) sigma-delta ADC. This converter takes about 125 ms per sample and provides an effective resolution of about 22-bits over the 0-5 or +/-5 volt ranges. Linearity and accuracy are also improved compared to the normal converter.

- 14 Analog Inputs (16-18+ Bits Depending on Speed)
- U6-Pro Adds 24-bit Low-Speed ADC for 22-Bit Effective Resolution
- Single-Ended Inputs (14) or Differential Inputs (7)
- Instrumentation Amplifier Inputs
- Software Programmable Gains of x1, x10, and x100
- Analog Input Ranges of ± 10 , ± 1 , and ± 0.1 Volts
- Built-In CJC Temperature Sensor
- 2 Fixed Current Outputs (200/10 uA)
- 2 Analog Outputs (12-Bit, ~0-5 Volts)
- 20 Digital I/O
- Up to 2 Counters (32 Bits Each)
- Up to 4 Timers (Pulse Timing, PWM Output, Quadrature Input, ...)
- Supports SPI, I2C, and Asynchronous Serial Protocols (Master Only)
- Supports Software or Hardware Timed Acquisition
- Maximum Input Stream Rate of 50 kHz (Depending on Resolution)
- Capable of Command/Response Times Less Than 1 Millisecond
- Built-In Screw Terminals for Some Signals
- USB 2.0/1.1 Full Speed Interface
- Powered by USB Cable
- Drivers Available for Windows, Linux, Mac and Pocket PC
- Examples Available for C/C++, VB, LabVIEW, Python, and More
- Includes Licensed Copy of DAQFactory Express Software (Win2000+)
- Includes USB Cable and Screwdriver
- Free Firmware Upgrades
- Money Back Guarantee
- Enclosure Size Approximately 3" x 7" x 1" (75mm x 185mm x 30mm)
- Rated for Industrial Temperature Range (-40 to +85 Degrees C)



Price Each	1	5+
LAJ-041 LABJACK U6 Data Acquisition Module	\$475.00	POA
LAJ-042 LABJACK U6-Pro Data Acquisition Module	\$575.00	POA

OCEAN CONTROLS - DATA ACQUISITION

CB-15 Labjack U3 Terminal Board

Provides convenient screw terminals for the DB15 connector on the LabJack U3 and UE9. The CB15 can connect directly to the U3 and UE9 on the LabJack UE9.



Price Each	1	5+
LAJ-014 CB-15 Terminal Board	\$70.00	POA

CB-25 Labjack Terminal Board

Most of the connections on the LabJack U12 have built-in screw terminals, but 16 of the digital I/O are accessed with a DB-25 connector. To ease the use of these digital ports the CB25 provides screw terminal connections. It also provides short-circuit/overvoltage protection for the 16 I/O which are accessed through the DB25 connector.



Price Each	1	5+
LAJ-002	\$85.00	POA

CB-37 Labjack UE9 Terminal Board EB-37 Experiment Board

The CB37 Provides convenient screw terminals for the DB37 connector on the LabJack UE9. The CB37 can connect directly to the UE9.



The EB37 experiment board connects to the LabJack UE9's DB37 connector and provides convenient screw terminal access. Also provided is a solderless breadboard and useful power supplies (+/-10 volts, 3.3 volts, and 1.25 volts). Includes a screwdriver, power supply, and jumper wires. For the LabJack UE9 only.



Price Each	1	5+
LAJ-012 CB-37 Terminal Board	\$84.00	POA
LAJ-013 EB-37 Development Board	\$165.00	POA

Labjack LJTick—Divider

The LJTick-Divider (LJTD) is a signal-conditioning module designed to divide 2 single-ended channels of 0-10 volt analog signals down to 0-2.5 volt signals. It is suitable for use with the Labjack U3 and UE9. The 4-pin design plugs into the standard AIN/AIN/GND/VS screw terminal block found on newer LabJacks such as the U3 and UE9. The use of large resistors and a precision op-amp buffer provide an input impedance of 1 MW. By adding or replacing resistors, many other configurations are possible, such as a level shifter that converts ± 10 volts to 0-2.5 volts.



Price Each	1	5+
LAJ-030 LJTick-Divider	\$49.00	POA

Labjack LJTick—InAmp

Signal-conditioning module provides two instrumentation amplifiers ideal for low-level signals such as bridge circuits (e.g. strain gauges) and thermocouples. The LJTI has switches to choose from 5 gain settings (x1, x11, x51, x201, or custom) and two output voltage offsets. The 4-pin design plugs into the standard AIN/AIN/GND/VS screw terminal block found on newer LabJacks such as the U3 and UE9. (RoHS=YES).



Price Each	1	5+
LAJ-031 LJTick-InAmp	\$89.00	POA

Labjack LJTick—RelayDriver

The LJTick-RelayDriver (LJTRD) allows 2 digital I/O lines on a Labjack U3 or UE9 to control a relay or other moderate load up to 50V/200mA.



Price Each	1	5+
LAJ-032 LJTick-InAmp	\$27.50	POA

Labjack LJTick—Proto

The LJTick-Proto (LJTP) consists of an 8x8 grid of holes for prototyping custom signal-conditioning ticks for the LabJack U3 or UE9.



Price Each	1	5+
LAJ-033 LJTick-Proto	\$25.00	POA

Labjack LJTick—Current Shunt

The LJTick-CurrentShunt (LJTCS) is a signal-conditioning module designed to convert a 4-20 mA current loop input signal into a 0.47-2.36 volt signal compatible with the LabJack U3 or UE9. The 4-pin design plugs into the standard AIN/AIN/GND/VS screw terminal block found on newer LabJacks such as the U3 and UE9.



Price Each	1	5+
LAJ-034 LJTick-Current Shunt	\$69.00	POA

LJTick-DAC

Provides a pair of 14-bit analog outputs with a range of +/- 10 volts. Plugs into any digital I/O block, and thus up to 10 of these can be used per U3/UE9 to add 20 analog outputs. Provides a pair of 14-bit analog outputs with a range of +/- 10 volts. Plugs into any digital I/O block, and thus up to 10 of these can be used per U3/UE9 to add 20 analog outputs.



Price Each	1	5+
LAJ-035 LJDAC- Digital to Analog Converter	\$135.00	POA

OCEAN CONTROLS - DATA ACQUISITION

Dual Instrument Amplifier

A dual instrumentation amplifier from Electronic Innovations Corp provides 2 high-impedance differential inputs. Operates from a single 5 volt supply and provides a +/- 15 volt supply and a 4.096 volt reference. Analog input range is +/- 10 volts. The gain of each channel is set to 1, 10, 100, or 1000 via digital I/O or jumper wires. Typical current requirement is about 80 mA @ 5 volts, allowing the EI-1040 to be powered from a +5V terminal on the LabJack U12. Can be used with the Labjack U12, U3 or UE9



Price Each	1	5+
LAIJ-004 Dual Instrumentation Amp	\$185.00	POA

Dual DC Amplifier

Our dual amplifier or voltage divider module allows you to amplify signals by a factor of 1.5 to x10 or reduce signals by a factor 0.667 to 0.1 You can easily convert 4 to 20mA signals to a voltage.

The dual DC amplifier circuit consists of two non inverting amplifiers (OP1 and OP2) with a voltage divider at the input.

Each amplifier is identical in design and is issued with one 50K potentiometer. Whether the circuit amplifies or reduces the amplitude of the signal depends on where the 50K potentiometer is placed on the circuit. A simple jumper allows the circuit to operate off a 9 to 24V supply for amplification of unipolar signals or it can be powered by a +/-9 to 15V supply for amplification of bipolar signals.

You can purchase the dual amplifier module as a kit or fully assembled and tested. If you are purchasing it assembled and tested it comes in 3 forms

- Dual Amplifier
- Dual Voltage Divider
- Amplifier and Voltage Divider

If you require 4-20mA conversion to voltage contact us with your required voltage output.

The card also has optional DIN rail mounts



Price Each	1	5+
KIT-200 Dual Amplifier as a kit	\$25.00	less 10%
KTA-201 Dual Amplifier Assembled	\$39.00	less 10%
KTA-202 Dual Volt Divider Assembled	\$39.00	less 10%
KTA-203 Dual Amp & Volt Divider Assembled	\$39.00	less 10%
KIT-204 DIN Rail Mount	\$13.50	less 10%

Thermocouple amplifier

Often you want to connect a J or K Type Thermocouple signal to a data acquisition system.

A lot of data acquisition modules have analog inputs which only accept 0-5V or 0-10V signals. Our TC Amplifier card allows you to connect a J or K thermocouple to it and convert the signal to a 10mV/DegC output



Our TCAMP board comes in a number of different models
 KTA254 - J Thermocouple amplifier with 10mV/degC output
 KTB254 - J Thermocouple amplifier with 4-20mA output over 0-200 or 0-1000degC
 KTC-254 - K Thermocouple amplifier with 10mV/degC output
 KTD-254 - K Thermocouple amplifier with 4-20mA output over 0-200 or 0-1000degC
 KTE-254 - 0-2V/0-10V to 0-20/4-20mA converter
 KTF-254 - LM35 to 4-20mA

Circuit

Our Thermocouple amplifier card uses the AD594 (J Thermocouple) or AD595 (K Thermocouple) integrated circuits. Each of these feature in-built cold junction compensation. The AD594/5 will output 10mV/degC which is available on one of the screw terminals.

The card can also be fitted with a AD694 which will convert the output of the AD594/5 to a 0-20mA or 4-20mA signal. Links on the board allow the 4-20mA to be over a 0-200degC or 0-1000degC range

If you wish to use the card as a voltage to current converter we can sell it without the AD594/5 integrated circuit providing a cheap 0-2V/0-10V to 0-20mA/4-20mA converter.

Price Each	1	5+
KTA-254 J Thermocouple Amplifier 10mV/Deg Out	\$45.00	less 10%
KTB-254 J Thermocouple Amplifier 4-20mA Out	\$65.00	less 10%
KTC-254 K Thermocouple Amplifier 10mV/Deg Out	\$45.00	less 10%
KTD-254 K Thermocouple Amplifier 4-20mA Out	\$65.00	less 10%
KTE-254 0-10V to 4-20mA Converter	\$45.00	less 10%
KTF-254 LM35 to 4-20mA	\$45.00	less 10%

OCEAN CONTROLS - DATA ACQUISITION

Temperature Probe -40 to 100 degC

An inexpensive and easy to use temperature probe. Designed to work with a Lab-Jack, but can also be used with any voltage measuring device. Outputs 10 mV per degree C, and has a range of -40 to +100 degrees C.



Price Each	1	5+
LAJ-003	\$65.00	POA

Stainless Steel Temperature Probe

An easy to use, very accurate, and waterproof temperature probe from Electronic Innovations Corp. The sensor is mounted in a stainless steel sheath and features a high-level linear output of 10 mV per degree F, typical accuracy of +/-0.25 degrees C (+/- 0.4 degrees F) at room temperature, and a range of 0 to +300 degrees F (-17 to +150 degrees C, with U3/UE9). Can be used with all labjacks but can also be used with any other voltage measuring device



Price Each	1	5+
LAJ-006	\$99.00	POA

Digital Temperature/Humidity Probe

EI-1050 Digital Temperature/Humidity Probe. The EI-1050 uses two digital lines on the Lab-Jack U12 (IO0 and IO1) to retrieve temperature and relative humidity measurements. Can also be used with Labjack U3 and UE9 Featuring the Sensirion SHT11 sensor it provides 14-bit temperature readings and 12-bit humidity readings. An enable line is provided allowing up to 20 EI-1050 probes to be connected to a single LabJack U12. Measurement range is -40 to 120 degrees C for temperature and 0 to 100% for humidity. Accuracy is +/-0.5 degrees C (@ 25 deg C) and +/-3.5%.



Price Each	1	5+
LAJ-005	\$125.00	POA

iUSBDAQ Module

The iUSBDAQ - U120816 is the lowest cost USB data acquisition module. It is USB 2/1.1 compliant. It features eight 12-bit analog inputs, 16 digital I/O lines, two programmable pulse-width output channels, and one 16-bit counter channel. Analog sampling rate is up to 32 ksamples/s for all 8 channels, with single channel up to 13 ksamples/s. All I/O is connected via screw connectors.

Dimensions 90 x 85 x 30mm

The package comes with all free usb cable, screw driver, device driver, DLL, LabVIEW driver, dot net wrapper class, rich examples and free ready-to-run iDAQTest&Log testing and data logging software.



Price Each	1	4+
HYT-001 iUSBDAQ Data Acquisition Module	\$155.00	less 10%

iUSBDAQ Data Acquisition and Logger Module

The iUSBDAQ - U1208LOG is the only multifunction three in one (3-in-1) USB data acquisition module that provides PC control mode for fast speed data acquisition and transfer (up to 64KSamples/s) as well as **standalone data logging mode for direct data logging into USB flash drive** without computer, the storage capacity is virtually unlimited, it's up to your USB flash disk space. Another unique feature that iUSBDAQ - U1208LOG brings, is the **build-in video functions** in programming APIs as well as in the FREE ready-to-run iDAQTest&Log software for easy integration and synchronization of data and video. A dedicated video trigger output line is also provided in the hardware for external synchronization with other devices. Works with USB Flash Drives up to 2GB.



Price Each	1	5+
HYT-010 iUSBDAQ Data acquisition and Logger module	\$325.00	less 10%
USB-010 5VDC USB Power Supply 100-240VAC	\$18.14	less 10%
USB-011 5VDC USB Power Supply 12VDC Car Powered	\$8.32	less 10%

NET-Link Ethernet Board

Netiom-Link works as a pair of devices communicating over an ethernet network. Each Netiom-Link transmits a packet of data to its opposite end containing information about its input status. Upon receipt of this data the receiving device changes its outputs to be the same as the inputs on the transmitting unit.

In this way all 16 inputs on one Netiom-Link are reflected on the outputs of the second Netiom-Link. Hence a switch on one can operate a relay on the other. In a similar way serial data coming into one port will be transmitted out of the serial port of the second Netiom-Link.



Price Each	1
NET-005 NET-Link Ethernet Board	\$49.00

OCEAN CONTROLS - DATA ACQUISITION

myPCLab Data Acquisition Module

is a very compact Data Acquisition tool which connects to a PC via a USB port. It has two universal analog inputs (Thermocouples type J, K, T, E, N, R, S and B, Pt100 RTD (3-wire), 4-20 mA, 0-50 mVdc or 0-10 Vdc) and one digital input. From hobbyists to scientists, from simple technical tasks to complex engineering activities, myPCLab can be an invaluable tool for on-line monitoring and data logging in school, laboratory research, machine data recording and industrial understanding. It comes with an intuitive and easy-to-use Windows software which plots and records data, shows gauges, bargraphs and digital readouts. The USB port is accessed as a virtual serial port which makes myPCLab compatible with SCADA softwares with Modbus RTU driver or with any program with ASCII serial communication. Multiple units of myPCLab can be connected to the same computer.



Price Each	1	5+
NOV-010 myPCLab Data acquisition module	\$129.00	less 10%

myPCProbe temperature or temperature and humidity sensor

myPCProbe is a temperature or temperature and humidity sensor which connects to a PC via a USB port. From hobbyists to scientists, from simple technical tasks to complex engineering activities, myPCProbe can be an invaluable tool for on-line monitoring and data logging in school, laboratory research, machine data recording and industrial understanding.



Features:

- myPCProbe-RHT: For temperature and humidity measurements from -20 to +100°C and 0 to 100 %RH (also available as dew point)
- Sampling rate: one sample every 1 or 3 seconds, depending on the programmed resolution
- Response time: 4 s (RH) or 30 s (T) in fairly still air
- myPCProbe-TEMP: For temperature measurements in different ranges, according to the specified sensor. Available for thermocouple types J, K, T, E, N, R, S and B and Pt100 RTD
- Internal temperature sensor for cold junction compensation or handle temperature monitoring
- Accuracy: 0.2% of full scale for Pt100; 0.25% of FS $\pm 3^{\circ}\text{C}$ for thermocouples type R, S and B; 0.25% $\pm 1^{\circ}\text{C}$ for all other thermocouples; $\pm 1.5^{\circ}\text{C}$ for internal temperature sensor
- Sampling rate: 8 to 128 samples per second, depending on the A/D resolution
- A/D resolution: programmable from 15 to 11 bits, depending on the sampling rate
- Automatic cold junction compensation for thermocouples
- Cable resistance compensation for Pt100
- Computer interface: USB V1.1 Plug and Play, Virtual Serial Port driver
- USB connection: 1.5 m cable with Type-A USB plug
- Double communication protocol: ASCII & Modbus RTU
- Powered by the USB bus
- Consumption: <100 mA
- Free Windows software provides configuration, visualization, recording and data export. Provides simultaneous communication with multiple myPCProbe and myPCLab devices
- Data export formats: txt, xls, rtf, pdf, html, xml, dbf, csv
- Compatible with Windows 2000, XP (up to SP2) and Vista

Price Each	1	5+
NOV-020 myPCProbe Humidity and Temperature Probe	\$159.00	less 10%
NOV-021 myPCProbe 6x300mm temperature probe	\$149.00	less 10%
NOV-022 myPCProbe 6/3x150mm sharp temp. probe	\$149.00	less 10%

4 Probe Temperature Logger

This kit is a 4 channel temperature meter and logger. The temperature data, in degrees C or F, is output as a continuous data stream over an RS232 serial port. The kit uses 4 x DS18S20 digital thermometers (only 1 is supplied - more are available on request). A data logger windows program is supplied on CD featuring trends, min-max



The DS18S20 has an operating temperature range of -55°C to +125°C and is accurate to $\pm 0.5^{\circ}\text{C}$ over the range of -10°C to +85°C. The sensors can be mounted up to 200metres away from the logger. Windows datalogging Software included

Price Each	1	5+
KIT-145 Kit	\$36.00	less 10%
KTA-145 Assembled and Tested	\$49.95	less 10%
PTP-003 DS18S20 Temperature Sensor	\$12.00	less 10%

K145 Server

The Ocean Controls K145 Server Software is a budget priced Windows based HTTP, Email and Modbus TCP Server for the K145 4 Channel Temperature Logger.



Main Features:

- Monitor Temperatures in Real Time from anywhere in the world over the Internet, using only a web browser
- Easily see if Temperatures are within Alarm Limits
- Monitor Maximum and Minimum Temperatures
- Sends Emails to three different email addresses when Temperature enters Alarm State and returns to Normal
- View real time and Logged Data using Modbus TCP connection

Price Each	1
OCS-145 K145 Server Pack	\$99.00
OCS-146 K145 Server Software	\$59.00
PTP-003 DS18S20 Temperature Transducer	\$12.00

OCEAN CONTROLS - DATA ACQUISITION

DAS005 - 12 Bit Data Acquisition Module

The DAS005 is a 12 bit data acquisition module which features

- a 12 bit ADC with 8 single ended inputs reading 0 to 4 Volts. The inputs can withstand up to +/-20V.
- ADC conversion time of less than 10 usecs.
- Note using windows software reduces this speed
- 4 Digital Inputs that are TTL and CMOS compatible
- 4 Digital Outputs that are TTL and CMOS compatible that are capable of sourcing and sinking 6mA.
- Requires 9-12VDC power



Price Each	1	5+
KIT-005 DAS005 As Kit	\$89.00	less 10%
KTA-005 DAS005 Assembled and Tested	\$125.00	less 10%

D25 Terminal Board

The D25 male connector to terminal card allows you to easily connect to screw terminals

Can be used to add terminal connections to the DAS005 and Labjack U12

Available in DIN Rail Mounting



Price Each	1	5+
DTC-001 D25 Terminal Card	\$45.00	less 10%
DTD-001 Card DIN Rail Mounted	\$65.00	less 10%

D15 Terminal Board

The D15 female connector to terminal card allows you to easily connect to screw terminals

Available in DIN Rail Mounting



Price Each	1	5+
DTC-009 D9 Terminal Card	\$39.00	less 10%
DTD-009 D9 Card DIN Rail Mounted	\$45.00	less 10%

Webserver WS10 Module

The WebServer WS10 is a device for data acquisition, logging and transmission. It is capable of integrating instruments and sensors to the Internet, ethernet and wireless. The inputs for data acquisition can be either the 4 built-in analog and digital inputs or any inputs from the external equipments connected to the WS10 through the RS485 interface (Modbus protocol). Data transfer can be accomplished through the ethernet interface or modem (mobile or conventional) using ordinary Internet resources, such as the internet browser, e-mail and TCP connection. Internal memory for off-line data logging (16 bit CPU, with 512KB RAM) 2 Serial Interfaces (RS232, RS485 or Modem) Ethernet 10BaseT Interface. It supports TCP/IP, PPP (client and server), HTTP, FTP, SMTP, DHCP, Modbus TCP, Modbus RTU protocols Mobile wireless networks (GSM GPRS or CDMA 1XRTT) email in case of alarm



Price Each	1
NWS-001 Webserver WS10 Module	\$1499.00

Digirail 2 Channel Universal Analog Input Module

This module can be used to monitor 2 analog inputs.

Features of the module include -

- 2 Analogue inputs: programmable for thermocouples (J, K, T, E, N, R, S, B), Pt100, mV, V, mA. Cold junction compensation for thermocouples and compensation for Pt100 3-wire cables.
- Open loop detection for thermocouples, Pt100 and mV.

Sampling rate for 1 analogue input: 10Hz for mV, V and mA. 5Hz for thermocouples and Pt100.

Analogue input resolution: 17 bits.

User defined linearization for the analogue inputs.

Power: 10 to 35Vdc, 50mA maximum current.

2-wire RS485 communication with Modbus RTU protocol. Configurable address and baud rate (1,200 to 115,200bps).

LED indicators for communication and status.



Price Each	1	5+
SIG-100	\$149.00	less 10%

Digirail 4 Channel Digital Input/Counter Module

This module can be used to monitor the status of digital inputs or count pulses.

Features of the module include -

- Digital inputs: in voltage, 4 to 35V to activate. Internally limited current to 5mA.

Maximum count frequency: 1000 Hz for signals with square wave and working cycle of 50%.

Input 1 can be configured for counting signals of up to 100 kHz.

Counting capacity (per input): 32 bits (0 to 4294967295)

Power: 10 to 35Vdc, 50mA maximum current.

2-wire RS485 communication with Modbus RTU protocol. Configurable address and baud rate (1,200 to 115,200bps).

LED indicators for communication and status.



Price Each	1	5+
SIG-101	\$149.00	less 10%

Digirail 2 Relay Output Module

This module can be used to control 2 relay outputs.

Features of the module include -

- 2 Relay outputs: 3A / 250Vac SPDT relay, resistive load.

Power: 10 to 35Vdc, 50mA maximum current.

2-wire RS485 communication with Modbus RTU protocol. Configurable address and baud rate (1,200 to 115,200bps).

LED indicators for communication and status.

Windows based configuration software.

Dimensions: 72 x 78 x 19mm.

Mounting: 35mm DIN rail.

Working temperature: 0 to 70°C.



Price Each	1	5+
SIG-102 Digirail 2 Relay Output Module	\$149.00	less 10%

OCEAN CONTROLS - DATA ACQUISITION



MA-8X8YR MA 8 channels digital input 8 channels

Descriptions:

- *8 points input
- *8 points relay output
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Price Each 1 5+
PLC-500 MA-8X8YR MA 8 channels digital input 8 channels digital output \$144.00 less 10%



MA-6PT-P 6 channels PT100 temperature input, PID control inside

Descriptions:

- *6 channels Platinum temperature sensor input, resolution degree is PT100
- *6 channels have individual PID function and can self study PID parameters
- *1mA constant current output, will not be interfered by outside environment
- *Resolution is 0.1°C
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Specifications:

Analog input signal: Pt100 Pt hot resistance
Measure temperature range: -100°C ~ 350°C
Digital output range: Full-scale 4095, 12 bits with sign, binary
Control precision: $\pm 0.1^\circ\text{C}$
Resolution: 0.1°C
Integrated precision: 0.8% (related maximum)
Conversion speed: 20ms/1 channel
Power supply for analog: DC24V $\pm 10\%$, 50mA
Installation: Use M3 screw or fix on DIN46277 rail (width 35mm)
Profile dimension: 63mm \times 102mm \times 73.3mm

Price Each 1 5+
PLC-501 MA-6PT-P 6 channels PT100 temperature input, PID control inside \$349.00 less 10%



MA-4DA MA 4 channels analog output

Descriptions:

- *4 channels analog output
- *current/voltage mode selectable
- *voltage mode output range: DC 0~5V, 0~10V
- *current mode output range: DC 0~20mA, 4~20mA
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Specifications:

Voltage output: DC0 ~ 5V, 0 ~ 10V(exterior load resistor 2K Ω ~1M Ω)
Current output: DC0 ~ 20mA, 4 ~ 20mA (exterior load resistor less than 500 Ω)
Digital input range: 10 bits binary numbers
Resolution ratio: 1/1023 (10Bit)
Integrated precision: 0.8%
Conversion speed: 3ms/1 channel
Power of analog quantity: DC24V $\pm 10\%$, 100mA
Installation: Use M3 screw or fix on DIN46277 rail (width 35mm)
Profile dimension: 63mm \times 102mm \times 73.3mm

Price Each 1 5+
PLC-502 MA-4DA MA 4 channels analog output \$329.00 less 10%



MA-8AD MA 8 channels analog input

Descriptions:

- *8 channels analog input
- *12 bits high precision input
- *current/voltage mode selectable
- *voltage mode output range: DC 0~5V, 0~10V
- *current mode output range: DC 0~20mA, 4~20mA
- *PID control function
- *self-study PID parameters
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Specifications:

Analog input range: Voltage: DC0 ~ 5V, 0 ~ 10V(exterior load resistor 2K Ω ~1M Ω); Current: DC0 ~ 20mA, 4 ~ 20mA(exterior load resistor less than 500 Ω)
Maximum input range: Voltage: $\pm 18\text{V}$; Current: 0 ~ 40mA
Digital output range: 12 bits binary numbers
Resolution: 1/4095 (12Bit)
Integrated precision: 0.8%
Conversion speed: 20ms per channel
Power supply for analog: DC24V $\pm 10\%$, 100mA
Installation: Use M3 screw or fix on DIN46277 rail (width 35mm)

Price Each 1 5+
PLC-503 MA-8AD MA 8 channels analog input \$329.00 less 10%



MA-4AD2DA 4 channels analog input and 2 channels analog output

Descriptions:

- *4 channels analog input
- *2 channels analog output
- *12 bits high precision input
- *current/voltage mode selectable
- *voltage mode output/input range: DC 0~5V, 0~10V
- *current mode output/input range: DC 0~20mA, 4~20mA
- *PID control function for analog input
- *self-study PID parameters
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most 4 channels analog output



Specifications:

Item	Analog input (4AD)		Analog output (2DA)	
	Voltage input	Current input	Voltage output	Current output
Analog input range	0~5V,0~10V	0~20mA,4~20mA	-	
Max input range	DC±18V	0~40mA	-	
Analog output range	-		0~5V、0~10V, (exterior load resistor 2KΩ~1MΩ)	0~20mA、 4~20mA (exterior load resistor less than 500Ω)
Digital input range	-		10 bits binary number (0~1023)	
Digital output range	12 bits binary number (0~4095)		-	
Resolution	1/4095(12Bit)		1/1023(10Bit)	
PID output value	0~K4095			
Integrated precision	0.8%			
Conversion speed	20ms/1 channel		3ms/1 channel	
Power supply for analog quantity	DC24V±10% , 100mA			
Installation	Use M3 screw or fix on the DIN46277 (width 35mm) rail			
Profile dimension	63mm×102mm×73.3mm			

Price Each 1 5+
PLC-504 MA-4AD2DA 4 channels analog input and 2 channels analog output \$349.00 less 10%

OCEAN CONTROLS - DATA ACQUISITION



MA-6TC-P 6 channels type K thermocouple temperature input, PID control inside

Descriptions:

- *6 channels temperature signal input
- *6 channels PID control output
- *Support K type thermocouple temperature sensor
- *Precision is 1 °C
- *PID control function
- *self-study PID parameters
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Specifications:

Using environment: 0°C ~ 60°C

Measure temperature range: 0°C ~ 1000°C

Digital output range: 0 ~ 4095, 12 bits with sign, binary

Precision: 1°C

Integrated precision: 1°C

Conversion speed: 20ms/1 channel

Power supply for analog: DC24V±10%, 50mA

Installation: Use M3 screw or fix on DIN46277 (width 35mm) rail

Profile dimension: 63mm×102mm×73.3mm

Price Each	1	5+
PLC-505 MA-6TC-P 6 channels type K thermocouple temperature input, PID control inside	\$349.00	less 10%



MA-16Y MA 16 channels digital output

Descriptions:

- *Include two types: MA-16YR and MA-16YT
- *I/O extension for PLC
- *16 points relay or transistor output
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Price Each	1	5+
PLC-507 MA-16Y MA 16 channels digital output	\$144.00	less 10%



MA-16X MA 16 channels digital input

Descriptions:

- *16 points digital input
- *I/O extension for PLC
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Price Each	1	5+
PLC-508 MA-16X MA 16 channels digital input	\$135.00	less 10%



MA-4AD MA 4 channels analog input

Descriptions:

- *4 channels analog input
- *12 bits high precision input
- *current/voltage mode selectable
- *voltage mode output range: DC 0~5V, 0~10V
- *current mode output range: DC 0~20mA, 4~20mA
- *PID control function
- *self-study PID parameters
- *DC 24V power supply
- *Support Modbus-RTU protocol
- *RS485 port, can connect with PLC, HMI and other devices
- *Can extend 16 this kind of modules at most



Specifications:

Analog input type: Voltage input; Current input

Analog input range: 0~5V, 0~10V; 0~20mA, 4~20mA

Maximum input range: DC±18V; 0~40mA

Digital output range: 12 bits binary value (0~4095)

Resolution: 1/4095(12Bit)

PID output range: 0~K4095

Integrated precision: 0.8%

Converting speed: 20ms per channel

Power for analog: DC24V±10% , 100mA

Installation: Fix up the module with M3 screw or put on DIN46277 rail (width 35mm)

Profile dimension: 63mm×102mm×73.3mm

Price Each	1	5+
PLC-506 MA-4AD MA 4 channels analog input	\$292.00	less 10%

OCEAN CONTROLS - DATA ACQUISITION

16 Digital Output Modbus Module

The TRP-C24, an isolated output open collector RS-485 module, provides 16 digital outputs (100mA). All channels feature screw terminals for convenient connection of field signals as well as LED's to indicate channel working status. All outputs are equipped with photo-couplers to protect the module against high voltage spikes, as well as ground potential differences. The module can be remote controlled by PC in ASCII or Modbus RTU protocol over a RS485 network. Can be DIN Rail mounted with fitting



Specifications

- Output channel: 16 digital output channels (open collector).
- Digital output isolation: 3750Vrms.
- Communication interface: RS-485 differential 2 half/duplex wires.
- Communication speed form 1.2Kbps to 115.2Kbps auto-switching.
- Data format: Data bit: 8, Parity Check: None, Stop Bit: 1.
- Distance: up to 4000ft (1200M).

Price Each	1	5+
TRY-024 16 Digital Output Modbus Module	\$130.00	less 10%

4 Digital Input and 4 Relay Output Modbus Module

TRP-C28 provides with 4 optical isolate digital input channels and 4 power relays output. All channel features screw terminals for convenient connection of field signals as well as LED's to indicate channel status. Input channels are equipped with 3750Vrms DC isolation, and surge protection on RS-485 data lines that protect the module and device against high power voltage input and ground potential differences. The module can be remote controlled by PC in ASCII or Modbus RTU protocol over a RS485 network. Can be DIN Rail mounted with fitting



Specifications

- Input logical level 0 +1V (max).
- Input logical level 1 +4.0V ~ +30V.
- Digital Input can be used as counter channel: 4
- Counter frequency: 100Hz.
- Output channel: 4 channel power reply outputs.
- Relay type: 2 Form A (RL1,RL2) , 2 Form C (RL3,RL4).
- Contact rating: 5A /30V DC , 5A /120V AC , 5A /250V AC.

Price Each	1	5+
TRY-028 4 Digital In and 4 relay output Modbus Module	\$199.00	less 10%

16 Digital Input Modbus Module

TRP-C26 provides 16 optical isolated digital input channels that allow you to input the logic signal from 0 to 30V DC. All inputs are equipped with photo-couplers to protect the module against high voltage spikes, as well as ground potential differences. The module can be remote controlled by PC in ASCII or Modbus RTU protocol over a RS485 network. Can be DIN Rail mounted with fitting

Specifications

- Power Input Voltage: DC +10V to +30V.
- Input channel: 16 digital input channels with counter.
- Input digital input counter: 0~65535.
- Input optical isolation: 3750 Vrms.
- Input logical level 0 +1V (max).
- Input logical level 1 +4.0V ~ +30V
- Leds to indicate status of digital inputs



Price Each	1	5+
TRY-026 16 Digital Input Modbus Module	\$127.50	less 10%

8 Analog Input Modbus Module

TRP-C68 ,is an 8-channel Analog input module. It accepts either a voltage or a current signal and supports the sample rate in " Normal " or "Fast" mode. All channels feature screw terminals for convenient connection, and LED's to indicate channel status. All inputs are provided with isolation and surge protection to protect the module against high voltage spikes, as well as ground potential differences. TRP-C68 support both ASCII and Modbus protocol over a RS485 network.

Specifications

- Resolution :16 bit
- Sample rate: Normal mode: 10 Fast Mode: 60 sample / sec.
- Zero drift: 0.03uV/C .
- Span drift:25 ppm/C .
- Accuracy: Normal 0.1 or better. Fast: 0.5 or better.
- Analog Input range:
Voltage:±10V,±5V,±2.5V,±1.25V,±650mV. Current: +/-20mA.
- CMRR:92 db min/50/60Hz
- Analog input over voltage protection:+/- 35V .



Price Each	1	5+
TRY-068 8 Analog Input Modbus Module	\$215.00	less 10%

OCEAN CONTROLS - COMPUTER PARTS

4 PORT USB HUB

The UH284 is ATEN's compact and highly functional 4 port USB 2.0 hub series for the desktop or the laptop. It features built-in Magnet Pads and can be placed almost anywhere. UH284 provides 4 additional USB 2.0 ports for existing USB Systems, including an easy access port which is ideal for connecting a flash drive.



- * Provides 4 additional USB 2.0 ports to existing USB Systems
- * Four independent, fully functional, 480 Mbps, downstream ports
- * Fully compliant with the USB 2.0 specification
- * Per port overcurrent protection

Price Each	1	5+
UHB-001 4 Port USB Hub	\$22.50	less 10%

Sunix Dual Parallel Port Card

Sunix's 4018T offers 2 ports of parallel for your connection need. The port provides data transfer rate up to 2.7 MB/sec. The card support 32-bit or 64-bit PCI bus with 3.3V or 5V and is ready for 64-bit system as well. It is plug-n-play capable makes installation a breeze. The card also support Re-Map to ISA address function.



Features include

- Support 32 bit / 64 bit PCI bus
- Universal PCI interface
- Data transfer speed up to 2.7MB/sec
- IEEE1284 standard compatible
- Re-map to ISA Address 278, 378
- Plug and Play
- Friendly Graphic User Interface
- Ready for 64 bit system

Price Each	1	5+
COV-301 Sunix Dual Parallel Port Card	\$43.95	less 10%

Sunix IEEE1284/Parallel PCMCIA Card 2 Port

Sunix's parallel PCMCIA-2P offers you two ports of Parallel port for all your connection needs. The ports have a data transfer rate up to 2.7 MB/sec. The card is plug-n-play and installation is a breeze with the included driver CD.



FEATURES

Compatible with 32 bit CardBus slot
Easy to Plug-n-Play installation
Simple and easy way to connect devices to your notebooks
Speed up to 2.7 MB/sec
Friendly Graphic User Interface

Price Each	1	5+
COV-310 Sunix Parallel PCMCIA Card 2 Port	\$104.50	less 10%

Box Of Connectors - RS232 Gender Pack

Our plastic pack contains all the gender changers you need to sort out an RS232 connection.

- A D9 Female to Female
- A D9 Male to Male
- A D25 Female to Female
- A D25 Male to Male
- A D25 Male to D9Female changer
- A D25 Female to D9Male changer
- A Null Modem Cable

All in a long lasting plastic box for the technician to put in their tool box



Price Each	1	5+
BOX-001 RS232 Gender Pack	\$35.00	less 10%

7 PORT USB HUB

High speed 7 port USB hub conforms to USB 2.0 specification and will operate at speeds up to 480Mbps. Power and 7 port LED indication. Simple, flexible and highly scalable connectivity solution between you PC and USB compliant device, including cameras, scanners, printers and ultra fast storage devices.



- * Measures only 100mm Lx 58mm W x 15mm H
- * Supports up to 127 Hi-Speed Devices
- * 1.8mt USB lead and mains plugpack included.
- * Supports Win 98SE, Me, 2k, XP and Vista
- * Individual Port Over Current Protection
- * Full compliance with USB Specs 2.0/1.1/1.0

Price Each	1	5+
UHB-002 7 Port USB Hub	\$54.50	less 10%

Sunix Multi I/O PCI Controller Card

Sunix's 4079T is a serial and parallel combo expansion card. It offers you two ports of DB9M connection plus one port of parallel for all your project needs. The serial ports have a data transfer rate up to 921.6 Kbps and the parallel ports offers speed up to 2.7 MB/sec. The card is ideal for project like the POS system, automation assembly, ISDN terminal, and more. The serial card is plug-n-play capable and installation is a breeze. Bundle with the card is Sunix's unique software which can increase the FIFO memory up to 128Kbyte.



- * Support 32 bit / 64 bit PCI bus
- * Universal PCI interface
- * 3.3V & 5V Universal PCI
- * Supports Windows, Linux, DOS

Price Each	1	5+
COV-305 Sunix Multi I/O PCI controller card	\$69.00	less 10%

USB-Parallel Port Converter

This converter allows you to connect standard (IEEE-1284) parallel printers. It includes

- True PnP & Bi-Directional printing
- An 'A' Type USB connector to 36 Pin Centronics
- Length: 1.7m cable
- USB Port powered
- Drivers included



Price Each	1
COV-004 USB to Parallel Port Converter	\$45.41

Box Of Connectors - BNC Pack

Our plastic pack contains all the BNC connectors a technician needs for connecting to and analyzing problems

- 2 - BNC T Adaptor 1 Male to 2 Female
- 2 - BNC Female to Female Adaptor
- 2 - BNC Terminator Plugs
- 2 - BNC Male to Double Binding Posts/ Banana Sockets

All in a long lasting plastic box for the technician to put in their tool box.



Price Each	1	5+
BOX-002 BNC Connector Pack	\$34.50	less 10%

OCEAN CONTROLS - COMPUTER LEADS

RS232 Serial Leads

DB9 Male to DB9 Female 1.8m



Price Each	1	4+
CAB-002 DB9 male to DB9 Female 1.8m	\$9.05	less 10%

DB9 Male to DB9 Male 1.8m



Price Each	1	4+
CAB-008 DB9 Male to DB9 Male 1.8m	\$7.59	less 10%

DB9 Female to DB9 Female Null Modem 1.8m



Price Each	1	4+
CAB-003 DB9 Female to DB9 Female Null 1.8m	\$8.32	less 10%

DB25 Male to DB25 Female 1.8m



Price Each	1	4+
CAB-001 DB25 Male to DB25 Female 1.8m	\$8.77	less 10%

DB25 Male to DB25 Male 1.8m



Price Each	1	4+
CAB-006 DB25 Male to DB25 Male 1.8m	\$7.59	less 10%

DB25 Male to DB9 Female Modem Cable 1.8m



Price Each	1	4+
CAB-007 DB25 Male to DB9 Female Modem 1.8m	\$8.45	less 10%

Extra Long RS232 Serial Leads



Price Each	1	4+
CAB-010 DB9 Male to DB9 Female Modem 5m	\$11.45	less 10%
CAB-012 DB9 Male to DB9 Female Modem 10m	\$22.00	less 10%

RS232 Gender Changers



Price Each	1	4+
CAB-101 D9 Female to D9 Female Gender Changer	\$4.32	less 10%
CAB-102 D9 Male to D9 Male Gender Changer	\$4.32	less 10%
CAB-103 D25 Female to D9 Female Gender Changer	\$5.27	less 10%
CAB-104 D25 Male to D9 Male Gender Changer	\$5.27	less 10%
CAB-110 D25 Female to D9 Male Gender Changer	\$4.32	less 10%
CAB-111 D25 Male to D9 Female Gender Changer	\$4.32	less 10%

Configurable RJ45 Adaptors

Price Each	1	4+
CON-001 DB9 Female to RJ45 Female	\$4.14	less 10%
CON-002 DB9 Male to RJ45 Female	\$4.14	less 10%



Price Each	1	4+
CON-003 DB25 Female to RJ45 Female	\$5.64	less 10%
CON-004 DB25 Male to RJ45 Female	\$6.50	less 10%



USB Leads

USB2.0 Type A Male to Type A Male



Price Each	1	4+
USB-001 USB2.0 Type A Male To Type A Male	\$9.05	less 10%

USB2.0 Type A Male to Type A Male



Price Each	1	4+
USB-002 USB2.0 Type A Male To Type B Male	\$9.05	less 10%

USB2.0 Type A Male to 5 Pin Mini B

Use this to connect to a digital camera or camcorder
Length 1.8 metres



Price Each	1	4+
USB-003 USB2.0 Type A Male To 5 Pin Mini Male	\$9.05	less 10%

USB Extension Lead

USB1.1 Extend the length of your USB device by an additional 5-metres (16-feet) using this Active USB Repeater Cable.



Price Each	1	4+
COV-005 USB1.1 USB Data Extension Lead	\$22.68	less 10%

RJ45 Modular Patch Leads

RJ45 Modular Patch Leads



Price Each	1	4+
CAB-030 Modular Patch Leads 0.5m	\$3.36	less 10%
CAB-033 Modular Patch Leads 1m	\$4.21	less 10%
CAB-036 Modular Patch Leads 2m	\$4.14	less 10%
CAB-039 Modular Patch Leads 3m	\$5.45	less 10%
CAB-042 Modular Patch Leads 5m	\$9.36	less 10%
CAB-045 Modular Patch Leads 10m	\$13.55	less 10%
CAB-048 Crossover Cat 5e cables 2m	\$6.23	less 10%
CAB-051 Crossover Cat 5e cables 5m	\$7.96	less 10%

OCEAN CONTROLS - COMPONENTS

Thumb Joystick

Description: This is a joystick very similar to the 'analog' joysticks on PS2 (PlayStation 2) controllers. Directional movements are simply two potentiometers - one for each axis. Pots are ~10k each. This joystick also has a select button that is actuated when the joystick is pressed down.



Price Each	1	5+
SFJ-001 Thumb Joystick	\$6.00	less 10%

Breakout Board for Thumb Joystick

Description: This is the breakout board for the thumb joystick. Pins are broken out to a 0.1" header and includes 4 mounting holes in the corners. The picture shows the joystick mounted on the Breakout board



Dimensions: 1" x 1.25"

Price Each	1	5+
SFJ-002 Breakout Board for Thumb Joystick	\$4.25	less 10%

Arcade Joystick - Short Stick

Description: 4-way Pacman type arcade joystick. Heavy duty design gives this joystick a great feel!

Features:

- * ABS plastic and solid alloy construction
- * Uses 4 microswitches to detect on/off position
- * Unique handle design
- * Spring return to center
- * Very rugged construction



Dimensions:

- * Overall height: 101mm
- * Base: 97x65mm
- * Joystick height: 60mm

Price Each	1	5+
SFJ-003 Arcade Joystick- Short Handle	\$22.95	less 10%

Arcade Joystick - Long Handle

Description: This is a heavy-duty joystick very similar to the ones in claw arcade games. Directional movements are momentary limit switches - one for each direction. This joystick also has a select button that is actuated when the red button is pressed down.



This joystick is pretty beefy and very tall because of it. We built up an enclosure just to see what it would look like. Ideally, this joystick would be panel mounted, but actually reading the movement of the joystick is as simple as setting up the microcontroller to read five switches.

Dimensions:

- * Joystick height: 79mm
- * Overall height: 190mm
- * Base: 61.5mm square

Price Each	1	5+
SFJ-004 Arcade Joystick - Long Handle	\$27.50	less 10%

Big Dome Push Button

Description: It's the end of the world, and you need a button to press. This is it. A 60mm diameter dome illuminated push button comes with a 12VDC@1.2 watt lamp, securing nut and a pre-installed long life horizontal microswitch. Button can also be adjusted to a low profile button by removing the middle ring.



Note: Some basic assembly required.

Features:

- * Bulb and Bulb holder included
- * Wedge base, T-3.75 12VDC@1.2watts incandescent bulb standard
- * Bulb holder is easy to install or remove
- * 3 Terminals Button Actuator microswitch included
- * Microswitch reliability tested to 10,000,000 cycles
- * Microswitch can be replaced
- * Polycarbonate lens cap for optical clarity

Dimensions:

- * 60 mm Diameter x 72 mm Height
- * Net weight: 100grams
- * Mounting hole diameter: 24 mm

Price Each	1	5+
SFJ-011 Big Dome Push Button	\$14.95	less 10%

Push Button

Description: This is a 33mm round momentary push button similar to the ones you find on arcade games. Simple screw in design. Perfect for mashing. Available in the colors Blue, Green, Pink and Yellow



Features:

- * Convex Button
- * 35.75 mm Diameter x 46 mm Height
- * M28 thread
- * Mounting Hole Diameter: 27.3 mm
- * Net weight: 0.015kg

Price Each	1	5+
SFJ-015 Push Button 33mm-Blue	\$2.95	less 10%
SFJ-016 Push Button 33mm-Green	\$2.95	less 10%
SFJ-017 Push Button 33mm-Pink	\$2.95	less 10%
SFJ-018 Push Button 33mm-Yellow	\$2.95	less 10%

OCEAN CONTROLS - COMPONENTS



Concave Button

Description: This is a 35mm concave momentary push button similar to the ones you find on arcade games. Simple screw in design. Perfect for mashing. This button has a great tactile, 'clicky' feel.

Features:

- * Concave plunger design
- * Durable nylon material
- * Microswitch: max 3A @ 120 VAC
- * Microswitch reliability tested to 10,000,000 cycles
- * Includes 3 terminal microswitch
- * Net weight: 25g

Dimensions:

- * Cap diameter: 35mm
- * Overall height: 65mm
- * Mounting hole: 1 1/8th inch paddle bit (1.125" / 28mm)

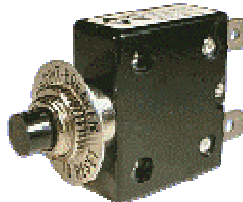


Price Each	1	5+
SFJ-020 Concave Button – Red	\$4.95	less 10%
SFJ-021 Concave Button – Blue	\$4.95	less 10%
SFJ-022 Concave Button – Yellow	\$4.95	less 10%
SFJ-023 Concave Button – Black	\$4.95	less 10%
SFJ-024 Concave Button – White	\$4.95	less 10%
SFJ-025 Concave Button – Green	\$4.95	less 10%

Circuit Breakers

Specifications:

All specifications at 25°C
 Hold Current: 100% load indefinitely
 Trip Current: Within 1 hr @ 145% load
 Within 1 minute @ 200% load
 Max. Voltage: 250V AC or 50V DC
 Panel Cutout: Single hole mount 12mm Ø
 Dimensions: 36H x 31L x 15W mm



Price Each	1	5+
CIR-001 Circuit Breaker 3A Panel Mount	\$7.18	less 10%
CIR-002 Circuit Breaker 5A Panel Mount	\$7.18	less 10%
CIR-003 Circuit Breaker 10A Panel Mount	\$7.18	less 10%
CIR-004 Circuit Breaker 15A Panel Mount	\$7.18	less 10%
CIR-005 Circuit Breaker 20A Panel Mount	\$7.18	less 10%
CIR-006 Circuit Breaker 25A Panel Mount	\$7.18	less 10%
CIR-007 Circuit Breaker 30A Panel Mount	\$7.18	less 10%
CIR-008 Circuit Breaker 35A Panel Mount	\$7.18	less 10%

10 Turn Potentiometers

Description:

Rotary - Linear
 Series 3590
 Resistance In Ohms 10K
 Power (Watts) 2W
 Number of Turns 10
 Adjustment Type Side Adjustment
 Tolerance ±5%
 Package / Case Round - 0.875" Dia x 0.732" H
 (22.23mm x 18.60mm)
 Termination Style Solder Lug
 Actuator Diameter 6.30mm
 Actuator Length 20.62mm
 Actuator Type Slotted Shaft



Price Each	1	5+
DIP-001 10 Turn 5K Potentiometer	\$27.50	less 10%
DIP-010 15 Turn Dial Scale	\$22.95	less 10%



Blackberry Trackballer

Description:

This is a breakout board for our Blackberry Trackball. The four spindles on the trackball have a tiny circular magnet the end; each of these are paired with an SMD hall effect sensor, which are used to measure up, down, left and right movements of the trackball. An SMD momentary switch is placed under the trackball to give you a select switch. The BTN line will be pulled low when the switch is pressed. Also included on the Trackballer are 4 LEDs: red, blue, green and white. These can be powered to light the clear trackball up any color you can imagine.

All features are broken out to a 0.1" pitch header. Regulated, 2.5-5.25VDC power must be provided to power the Hall sensors. The trackball is attached with strong CA glue. Board comes as shown, with all components populated.

The hall-effect sensors and trackball combo are surprisingly sensitive. A slight roll of the trackball creates multiple high/low transitions on the four axis pins, easily picked up by any microcontroller. A 360° rotation of the trackball, along a single axis, will result in about 9 high/low transitions.

Features:

- * Center select button
 - * 360° direction
 - * Hall effect sensors measure up/down/left/right movements of trackball
 - * Red, blue, green, white LEDs to light up the trackball
 - * All pins broken out to 0.1" pitch header
- Dimensions: 1.1x0.85"



Price Each	1	5+
SFJ-030 Blackberry Trackballer	\$17.93	less 10%

Illuminated Panel Mount Circuit Breaker

Combination illuminated switch and circuit breaker all in one compact package.

Specifications:

All specifications at 25°C
 Hold Current: 100% load indefinitely
 Trip Current: Within 1 hr @ 135% load
 Within 1 minute @ 200% load
 Neon Voltage: 250V AC
 Max. Voltage: 250V AC or 50V DC
 Panel Cutout: 13.35mm x 28.5mm
 Dimensions: 33H x 32L x 15.5W mm



Price Each	1	5+
CIR-021 Circuit Breaker Switch 3A 250V	\$7.23	less 10%
CIR-022 Circuit Breaker Switch 5A 250V	\$7.23	less 10%
CIR-023 Circuit Breaker Switch 8A 250V	\$7.23	less 10%
CIR-024 Circuit Breaker Switch 10A 250V	\$7.23	less 10%
CIR-025 Circuit Breaker Switch 15A 250V	\$7.23	less 10%



Headerless ShiftBrite

Description:

The ShiftBrite is a module by macetech that integrates the Allegro A6281 3-channel constant current LED driver with a large, high-brightness RGB LED. Using just three digital output pins and a simple protocol, your microcontroller can control a long chain of ShiftBrites. Each ShiftBrite in the chain can be independently changed to any of the 1,073,741,824 possible colors to create dynamic displays and decorations. Adjustable current for each color channel lets you correct for slight differences in brightness. Overtemperature shutdown protects the LED driver from overheating. The pins of the ShiftBrite are spaced 0.1" apart, making them compatible with breadboards and perfboards.



Price Each	1	5+
POL-1241 Headerless ShiftBrite	\$8.65	less 10%

OCEAN CONTROLS - COMPONENTS

Low Profile Crystals



Price Each	1	5+
CRY-001 32.768kHz QSC38	\$3.50	less 10%
CRY-004 8.0000MHz HC49S	\$3.50	less 10%
CRY-006 16.0000MHz HC49S	\$3.50	less 10%
CRY-008 20.0000MHz HC49S	\$3.50	less 10%

Atmel AVR Microcontrollers



Price Each	1	5+
ATL-001 AT89C2051-24-PC	\$5.41	less 10%
ATL-002 ATTiny2313-10-PC 20MHz 2kb 8-bit	\$13.95	less 10%
ATL-003 ATmega168-20PC 20MHz 16kb 8-bit Micro	\$15.00	less 10%
ATL-004 ATmega162-16PU 16MHz 16kb 8-bit Micro	\$19.00	less 10%
ATL-005 ATmega32-16PI 16MHz 32kb 8-bit Micro	\$24.00	less 10%
ATL-006 ATmega328-20PC 20MHz 32kb 8-bit Microcontroller	\$7.95	less 10%

Peripheral IC's



Price Each	1	5+
ICS-001 MAX232 RS232 Transceiver	\$5.60	less 10%
ICS-002 LTC485 RS485 Transceiver IC	\$4.25	less 10%
ICS-010 L297 Motor Controller IC	\$7.95	less 10%
ICS-011 L298 Stepper Motor Controller IC	\$8.25	less 10%
ICS-020 LM7805 5Volt Regulator	\$1.10	less 10%
ICS-021 LM7812 12Volt Regulator	\$1.10	less 10%
ICS-022 LM7833 3.3Volt 500mA Regulator	\$1.50	less 10%
ICS-031 ULN2003 7 Darlington Array	\$3.20	less 10%
ICS-032 ULN2803 8 Darlington Array	\$4.05	less 10%

Programmer Cables and ZIF Sockets

Price Each	1
ZIF-020 20 pin ZIF Socket	\$20.00
ZIF-040 40 pin ZIF Socket	\$25.00
USB-001 USB A Male to A Male Cable	\$9.05
USB-002 USB A Male to B Male Cable	\$9.05
CAB-002 DB9 Male to Female Cable	\$8.77
PLP-003 12VDC Unregulated Plug Pack	\$14.55

PIC Microcontrollers



Price Each	1	5+
PIC-001 PIC12C508A-04	\$5.41	less 10%
PIC-002 PIC12C509A-04	\$5.41	less 10%
PIC-005 PIC16F84A-20P	\$11.77	less 10%
PIC-006 PIC16F88	\$13.59	less 10%
PIC-007 PIC16F628A-20/P	\$11.77	less 10%
PIC-008 PIC16F877A	\$13.59	less 10%
PIC-010 PIC18F2550 USB 28pin microcontroller	\$13.59	less 10%

DIN Rail PCB Mounting Sections

Easily mount 72mm or 107mm wide PCBs on DIN rail, the total PCB length that can be accommodated can be calculated by totalling up the total length of the base sections and adding 10mm for each end cap. Two mounting clips will be required to attach the section to the DIN rail.

For example: 2 x 44.8mm bases and 1x 11.2mm section + 2 end-caps = 44.8 + 44.8 + 11.2 + 10 + 10 = 120.8mm.



DIN Rail Mounting Sections 72mm

Price Each	1	10+
DRM-001 Base Mounting Clip	\$1.77	less 10%
DRM-002 End Cap	\$2.14	less 10%
DRM-003 Base Sections 11.2mm length	\$2.86	less 10%
DRM-004 Base Sections 22.4mm length	\$3.59	less 10%
DRM-005 Base Sections 44.8mm length	\$4.32	less 10%

DIN Rail Mounting Sections 107mm

Price Each	1	10+
DRM-011 Base Mounting Clip	\$2.14	less 10%
DRM-012 End cap	\$2.50	less 10%
DRM-013 Base Sections 11.2mm length	\$3.18	less 10%
DRM-014 Base Sections 22.4mm length	\$3.91	less 10%
DRM-015 Base Sections 44.8mm length	\$4.91	less 10%

OCEAN CONTROLS - COMMUNICATIONS

ATEN USB to 2 Port and 4 Port RS232 Converter

The UC232A from ATEN is a USB to 2 Port or 4 Port serial RS232 converter. It provides PCs, notebook PCs and handheld computing devices using USB an external PnP RS232 port

Features

Easy way to add 4 RS-232 serial ports
Fully compliant with USB 1.1; USB 2.0 compatible
Supports RS-232 serial interface
Supports automatic handshake mode
Up to 115.2 Kbps data transfer rate for each serial port
Supports remote wake up and power management
Dual data buffers for each upstream and downstream data transfer



Price Each	1
COV-014 USB to 2 Port Serial RS232 Converter	\$79.00
COV-015 USB to 4 Port Serial RS232 Converter	\$109.00

Non-Isolated USB to RS485/422 Converter

The USB485C is a USB to RS-485/422 industrial intelligent converter. It is a good economical solution for the communication between USB and RS-485/422. Compared with RS-232 to RS-485/422 converter, USB to RS-485/422 converter has many advantages

Features

- 1.Small volume, easy installation
- 2.No power supply needed, plug and play
- 3.Adopt DIP switch setup, random switch RS-485/RS-422 interface
- 4.Transmit distance reach up to 1800M at the rate of 115200bps.
- 5Automatic send data control, auto distinguish and sense direction adopt data transfer
- 6.Auto sense serial signal rate, zero delay automatic transmit



Comes with a D9Female to Screw Terminal Interface
Suitable for Windows 98/ME/2000/XP/Linux OS/Vista (32bit)

Price Each	1
TOD-100 USB485C USB to RS485 converter	\$69.95

Non-Isolated RS232 to RS485/RS422 Converter

The IC-485S converter can operate in:

RS422 mode: Point to point on 2 twisted pairs.
RS485 mode: Multidrop on one twisted pair
Simplex: when any device transmits, the others receive only

Features

- In RS485 mode, data transmission direction must be controlled by the RTS Signal (i.e. it is not automatic).
- For Automatic direction control see the units from Trycom.
- DCE/DTE Selectable
- Point to Point, Multidrop, and Simplex/Duplex Link Selectable
- Four Wire Full Duplex / Two Wire Half Duplex, D25 Female connector
- Supports baud rates up to 115.2kbps.



Data transfer can take place at up to 1200 metres over four or two wire cable for full or half duplex, respectively.

In RS485 (2-wire) mode up to 32 receivers can be set up in a multidrop installation, making for a cost effective network configuration.

The IC-485S can obtain power from the RS232 port.
For better line driving capability a mains Adaptor is included

Price Each	1
COV-002 Non-Isolated RS232 to RS422/RS485 Converter	\$69.00

Price Each	1
COV-020 ATEN IC-150 Short Haul Modem	\$69.00

ATEN USB-RS232 Converter

The UC232A from ATEN is a USB to serial port converter. It provides PCs, notebook PCs and handheld computing devices using USB an external PnP RS232 port

Features

Support the RS232 Serial interface.
Support full handshake mode
Full compliance with the USB Specification 1.1.
Up to 230Kbps data transfer rate.
Works with cellular phones, PDAs, digital cameras, modems or ISDN terminal adapter.
OS Compatibility: WIN98, WIN ME, WIN 2K, WIN 2003, WIN XP, Windows Vista 32 & 64 Bit, LINUX and Mac OS 8.6/9/10.

Package Content

1x UC-232A, 1x Driver Disk, 1x User Manual



Price Each	1
COV-013 USB to Serial Converter	\$29.00

Non Isolated RS232 to RS485 Converter

This simple RS232 to RS485 non isolated converter features an auto baud rate up to 115200 bps

Features include

LED Indication:
Transmission Distance:9600 bps: 200M, 19200 bps: 200M, 38400 bps: 200M 57600 bps: 150M, 115200 bps:120M
Baud Rate: Up to 115200 bps
Operating Temperature: 0~55C, Storage Temperature: -10~70C
Operating Humidity: 20~95% RH (non-condensing)
Power Supply: Powerless or DV 5V
Serial Port: Screw Terminals RS-485x1, D9 Female RS-232x1



Price Each	1
ALT-010 Non Isolated RS232 to RS485 Converter	

Isolated USB-RS422/RS485 converter

The USB-i485 module is a cost-effective way to convert RS485 or RS422 industrial buses to a USB interface. When connected to a PC USB port the USB-i485 module is automatically detected and is installed as a native COM port.
1500 Vdc isolation between the USB port and RS485/RS422 protects the PC from spikes or possible misconnections in the communication bus. The USB-i485 converter can be configured for four-wire (Full Duplex) RS422 and RS485 or two-wire (Half Duplex) networks. When operating in two-wire RS485 the data transfer control is automatically done by the converter.

- Supports Windows 98/ME/2000/CE/XP/Vista, MAC & Linux 2.4.20 or superior.
- Transmission rate: from 300 bps to 1Mbps.



Price Each	1	5+
COV-001 Isolated USB to RS422/RS485 Converter	\$129.00	less 10%

ATEN IC-150 Short Haul Modem

The IC-150 Short Haul Modem allows you to connect the RS-232 ports of remote devices for fast and easy file transfers and data sharing.

The unit drives your data at various speeds up to 19,200 bps over distances up to 800m using 24-gauge wire (transmitting at 110 bps over distances up to 10km).

It provides 1,500VAC lightning surge protection and excellent noise rejection through the use of differential circuitry. The unit is switch-selectable for DCE/DTE. The Line Driver provides asynchronous transmission and operates full duplex over four wires.

Features

No external power supply required
DCE/DTE selection

Long distance transfer via economical cable
Analog loop back
Dimensions 74.5 x 54 x 18.5 (mm).



OCEAN CONTROLS - COMMUNICATIONS

USB to 2 RS232 and 2 RS485/RS422 ports Converter

The TRP-C08H allows you to simultaneously connect 2 RS232 and 2 RS422/485 serial devices to system by using a USB interface. The RS232 interface support all common PC DTE connection type. For RS422/485 data lines TRP-C08H provides auto-detecting function in data format, baud rate and data direction flow control, it may automatically configure RS422/485 signals and baud rate without external switch setting.



- Full compliance with the USB V1.0, 1.1 and 2.0 specification.
- Expand to 2 standard RS232 ports and 2 RS422/485 ports.
- 256 bytes buffer for upstream and downstream data flow.
- Auto direction flow control on RS485.
- Automatically switch signal RS422 and RS485.
- Support 3000V DC isolation and surge protection on RS422/485 data lines.
- Power/TXA/RXA/TXB/RXB mode LED indicator.
- Direct power from USB port and external power.
- Driver support: Windows 98/ME/2000/XP/CE3.0, Linux, and Mac OS.

Price Each 1 5+
TRY-005 USB-2 RS232 and 2 RS422/RS485 Converter \$173.75 less 10%

RS232/485/422 to Ethernet converter(10/100M)

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly. Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity. 3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,

Features

1. Auto-detecting 10/100Mbps Ethernet interface
2. 3-in-1 RS-232/422/485 serial interfaces
3. Cigarette pack size for easy integration
4. Supports Windows Native COM drivers with automatic network connection recovery
5. Built-in Ethernet and TCP/IP protocol supports Driver Mode, TCP Server, TCP Client, UDP
6. RS-485 supports ADDC (Automatic Data Direction Control intelligence)
7. Built-in 15 KV ESD protection for all serial signals



Price Each 1
TOD-011 NP312 RS232/422/RS485 to Ethernet Converter (10/100M) \$165.00

2 ports RS485/422 to Ethernet converter

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly. Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity. 3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,



Features

1. Auto-detecting 10/100Mbps Ethernet interface
2. Supports Windows Native COM drivers with automatic network connection recovery
3. Built-in Ethernet and TCP/IP protocol supports Driver Mode, TCP Server, TCP Client, UDP
4. Built-in 15 KV ESD protection for all serial signals

Price Each 1
TOD-013 NP302-2M 2 Port RS485/422 to Ethernet Serial Server \$310.00

USB2.0 to 1 RS232 and 1 RS485/RS422 Converter

The TRP-C08S is one standard USB 2.0 to Serials Bridge that has one DB-9 RS232 male connectors and 4 PIN screw terminal for RS422/485. The RS422/485 with auto configuration in data format, baud rate and RS485 data flow direction control.



RS422/485 equips with 3000VDC of isolation and internal surge-protection on each data line, it gives the host computer and module itself entirely protection from destructive voltage spikes and danger of unregulated voltages input.

- Input: 2.0 protocol.
- Output: RS232 signal: Standard 9 pin DTE full-duplex.
- RS422 signal: Differential 4 full-duplex wires, RS485 signal: Differential 2 half-duplex wires (D+, D-).
- Driver support: Windows 98/ME/2000/XP/CE3.0, Linux, and Mac OS.

Price Each 1
TRY-014 USB-1 RS232 and 1 RS422/RS485

RS232/485/RS422 to Ethernet

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly.



Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity. 3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,

Features

1. 3-in-1 RS-232/422/485 serial interfaces
2. Cigarette pack size for easy integration
3. Supports Windows Native COM drivers with automatic network connection recovery
4. Built-in Ethernet and TCP/IP 10M protocol supports Driver Mode, TCP Server, TCP Client, UDP
5. RS-485 supports Automatic Data Direction Control intelligence
6. Built-in 15 KV ESD protection for all serial signals

Price Each 1
TOD-010 NP311 RS232/422/RS485 to Ethernet Converter (10M) \$115.00

2 ports RS232 to Ethernet converter

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly. Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity.



3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,

Features

1. Auto-detecting 10/100Mbps Ethernet interface
2. Supports Windows Native COM drivers with automatic network connection recovery
3. Built-in Ethernet and TCP/IP protocol supports Driver Mode, TCP Server, TCP Client, UDP
4. Built-in 15 KV ESD protection for all serial signals

Price Each 1
TOD-012 NP302 2 Port RS232 to Ethernet Converter (10/100M) \$260.00

OCEAN CONTROLS - COMMUNICATIONS

RS232 To TTL Module

The smallest and easiest to use serial conversion circuit on the market! This board has one purpose in life - to convert RS232 to TTL and vice versa (TX and RX). This will allow a micro-controller to communicate with a computer. Shifter SMD is powered from the target application and can run at any voltage! That's right - power the board at 5V and the unit will convert RS232 to 5V TTL. Power the board at 2.8V and the Shifter board will convert RS232 to 2.8V CMOS TTL. Includes two indicator LEDs for TX and RX. Runs from 300bps up to 115200bps.



Unit comes fully assembled and tested as shown. You can either solder a 4-pin header or individual wires. Dimensions: 1.25x1.15"

Price Each	1	5+
COV-201 RS232 To TTL Module	\$14.95	less 10%

Dual RS232 to RS422/RS485 Isolated Converter

The TRP-C06H allows 2 RS232 line signal to be bi-directionally converted to RS-422 or RS-485 standard and transmit data up to 1.2KM . Featuring automatic data format and baud rate detect function users just need to plug the unit and go without extra configuration efforts. TRP-C06H is equipped with 3000V DC of isolation and internal surge protection to protect the host computer and converter against high voltage spikes, as well as ground potential differences. DIN Rail Mount Option

Features Include

- 10-30VDC power supply.
- Automatic data format configuration.
- Auto direction flow control on RS-485.
- Auto baud rate switching from 300bps to 115.2Kbps.
- 3000V DC isolated protection.
- Surge protection on RS-422/485 data lines.
- Power/TX/RX mode LED indicator.
- Support screw terminal and external DC adaptor.



Price Each	1	5+
TRY-002 Dual Isolated RS232 to RS422/RS485 Converter	\$119.00	less 10%

RS485/RS422 Repeater

TRP-C07 is designed to extend the RS-422 and RS-485 signals to another 4000ft (1200m) distance and increase the maximum number of connected nodes up to 32 sets. Aside from extension function TRP-C07 provides with auto configuration features in data format detecting, baud rate setting and RS-485 data direction flow control. TRP-C07 is equipped with photo-couplers and internal surge protection to protect the module and all data lines against high voltage spikes, as well as ground potential differences. DIN Rail mount option available.



- 10-30VDC power supply.
- Automatic data format configuration.
- Auto direction flow control on RS-485.
- Auto baud rate switching from 300bps to 115.2Kbps.
- RS485 bi-directionally communication.
- 3000 VDC isolated protection.
- Surge protection on RS-422/485 data lines.
- Power/TX/RX mode LED indicator.
- Support screw terminal and external DC adapter.
- DIN rail or panel mount support.

Price Each	1	5+
TRY-003 RS422/RS485 Isolated Repeater	\$84.00	less 10%

RS232 to RS422/RS485 Isolated Converter

Model485P has both isolation and surge protection, enclosed terminal blocks for tamper resistance and DIP switches for configuration. Isolated power and ground generated internally. LEDs indicate data traffic.



Features

1. Powered from double side, 2500V isolation, 1500W surge protection
2. Transmit distance can reach up to 1800M at the rate of 115.2kbps
3. Adopt interface auto-adapt technology, no DIP switch setup, random switch RS-485/RS-422 interface
4. Automatic send data control, auto distinguish and sense direction about data transfer
5. Auto sense serial signal rate, zero delay automatic transmit

Point to point or multi-point, 2 line half duplex, 4 line full duplex
Band rate 300-115200bps, automatic test signal rate
Powered by 9-15VDC plug pack.

Price Each	1	5+
TOD-001 RS232 to RS422/RS485 Isolated Converter	\$75.00	less 10%

RS232 to RS422/RS485 Isolated Converter

SW485SGI/C is our top-of-the-line RS232 to RS485/422 converter with both isolation and surge protection, enclosed terminal blocks for tamper resistance and dip switches for configuration. Isolated power and ground generated internally. LEDs indicate data traffic.

Features

1. DIN-rail mount, terminal block, 9-36VDC external power, 3000V isolation
2. Transmit distance reach up to 1800M at the rate of 9.6kbps
3. random switch RS-485/RS-422 interface
4. Automatic send data control, auto distinguish and sense direction about data transfer
5. Auto sense serial signal rate, zero delay automatic transmit



Point to point or multi-point, 2 line half duplex, 4 line full duplex
Band rate 300-115200bps, automatic test signal rate
Working temperature -40 to 80degC

Price Each	1	5+
TOD-002 RS232 to RS422/RS485 Isolated Converter	\$139.00	less 10%

USB to RS232/RS485/RS422 Converter

The TRP-C08 allows you to connect your serial devices to systems by using a USB interface. With auto configuration in data format, baud rate and RS485 data flow direction control. TRP-C08 is equipped with 3000V DC of isolation and internal surge-protection on each data lines to protect the host computer and converter against high voltage spikes, as well as ground potential difference.

Features include

- Full compliance with the USB V1.0 and 2.0 specification.
- System gets 1 COM port when the converter is connected.
- Auto data format detecting.
- Auto direction flow control on RS485.
- Auto baud rate switching from 300bps to 115.2 Kbps.
- Driver support: Windows 98/ME/2000/XP/CE3.0, Linux and Mac OS.



Price Each	1
TRY-004 USB-RS232/RS422/RS485 Isolated Converter	\$88.75

OCEAN CONTROLS - COMMUNICATIONS

4 ports RS232 to Ethernet converter

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly. Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity. 3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,

Features

1. Auto-detecting 10/100Mbps Ethernet interface
2. Supports Windows Native COM drivers with automatic network connection recovery
3. Built-in Ethernet and TCP/IP protocol supports TCP Server, TCP Client, UDP Server/Client.
4. Built-in 15 KV ESD protection for all serial signals



Price Each	1
TOD-014 NP304 4 RS232 to Ethernet Serial Server	\$515.00

Embedded Serial Server Module

Everything is networked is rapidly becoming the norm for enterprises the world over, and to keep pace with the trend of networked-based automation, devices must be networked in order to form an automatic data collection system for quality control, production monitoring, or even real-time cost management. But that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express, devices such as CNCs, milling machines, card readers, PLCs, switching machines, sensors, and UPS systems will become powerful tools with network connectivity.

Features

1. Adopt TTL
2. 3-in-1 RS-232/422/485 serial interfaces
3. Supports Windows Native COM drivers with automatic network connection recovery
4. Built-in Ethernet and TCP/IP protocol supports Driver Mode, TCP Server, TCP Client, UDP
5. RS-485 supports ADDC (Automatic Data Direction Control intelligence)
6. Built-in 15 KV ESD protection for all serial signals



Price Each	1
TOD-030 M4000T Serial Server Module	\$55.00
TOD-031 M4000T Test Motherboard	\$45.00

Model FL45 RJ45 Ethernet Surge Protector

IEC6 1000-4-5 and ITU-TK20&K21 are the recognized standards for top quality surge protectors. The FL45 complies with these standards. The FL45 is constructed with high response surge arresters, this allows clamping of high voltage transients and low loss against high speed signal, because it has a low capacitance. Designed to protect data communication lines in local and wide area networks up to 100Base-T transmission speeds.

Features

1. IEC6 1000-4-5 and ITU-TK20&K21
2. The high response surge arresters
3. Clamping voltage and low loss against high speed signal
4. Designed by the theory of current limited and voltage clamped, discharged to ground
5. Standard: 10Base-T/100Base-T standard



Price Each	1
TOD-022 FL45 RJ45 Ethernet Surge Protection	\$45.00

Price Each	1
TOD-021 FL-BNC BNC Surge Protection	\$45.00

4 ports RS485/422to Ethernet converter

Everything is being networked today but that doesn't mean your existing equipment and software investment is out of date due to a lack of Ethernet or TCP/IP connectivity. With 3onedata Express you can turn any serial device into a network device instantly. Devices such as CNCs, card readers, PLCs, switching machines, sensors, and UPS systems can all have network connectivity. 3onedata Express supports Windows 95/98/Me, Windows NT, and Windows 2000/XP/2003 native COM drivers,

Features

1. Auto-detecting 10/100Mbps Ethernet interface
2. Supports Windows Native COM drivers with automatic network connection recovery
3. Built-in Ethernet and TCP/IP protocol supports TCP Server, TCP Client, UDP Server/Client.
5. Built-in 15 KV ESD protection for all serial signal



Price Each	1
TOD-015 NP304-4M RS485/422 to Ethernet Serial Server	\$580.00

Model 232I RS232 Isolator

Model232I is a RS232 system communication serial port optic isolation product. This product supports transmission rate as high as 57,600bps, no external power needed, optic electric isolation 5KV and is applicable in tough environments. According to different customer needs, there are 4 lines, 6 lines and 8 lines three types, separately corresponds to three line serial port application, five lines serial port application and 7 lines serial port application with RTS/CTS (or DTR/CTS). Transmission distance at 9,600bps is 10m, stable performance.

Features

1. Plug and play
2. Port-powered, lowest consumption
3. Auto sense serial signal rate
4. Isolation serial device



Price Each	1
TOD-003 Model232I RS232 to RS422/RS485 Isolated Converter	\$35.00

Model FL485 RS485 Isolator

IEEE 1000-4-5 and ITU-TK20 & K21 are the recognized standards for top quality surge protectors. The FL485 unit meet these specifications with three stage protection on all data lines. The FL485 has high response speed and high transfer performance. All have #10 ground screws which must be connected to a solid ground.

Features

1. Three stages of protection on every data line
2. Protected signal ground connection
3. RS-422, RS-485 versions
4. Easy to install



Price Each	1
TOD-020 Model FL485 lighting protection	\$35.00

Model FLBNC - BNC Ethernet Surge Protector

IEC6 1000-4-5 and ITU-TK20&K21 are the recognized standards for top quality surge protectors. The FLBNC complies with these standards. The FLBNC is constructed with high response surge arresters, this allows clamping of high voltage transients and low loss against high speed signal, because it has a low capacitance. Designed to protect the equipment and coaxial line, connect in series. Interface accord with BNC standard.

Features

1. IEC6 1000-4-5 and ITU-TK20&K21
2. Allowed clamping voltage and low loss against high speed signal
3. low capacitance. Designed to protect the equipment and coaxial line, connect in series
4. Interface accord with BNC standard



OCEAN CONTROLS - COMMUNICATIONS

Ethernet to RS232/RS422/RS485 Isolated Converter

TRP-C36 is designed to instantly convert data from RS-232/422/485 interfaces to an Ethernet network running at the TCP/IP, UDP protocol. By using a standard COM port and existing network infrastructure the device allow you to link together a distant RS-232/422/485 serial device. You can reach TRP-C36 from Windows and Linux without the need to modify existing software. TRP-C36 supports 10/100Mbps auto-detecting, and auto RS-485 data direction flow control, it also provides with 3000V DC isolation and internal surge protection to protect the converter against high input voltage spikes and ground potential differences, and ensure a save data transmission on network. DIN Rail mount option available.



Features include

- 10-30VDC power supply.
- Fully compatible with Ethernet TCP/IP protocol.
- Support 3000V DC isolation protection.
- Auto direction flow control on RS-485.
- Surge protection on RS-422/485 data lines.
- Support baud rate up to 230Kbps.
- Power/Link/TX /RX mode LED indicator.
- Support intranet and internet system setting function.
- Support screw terminal and standard external DC power adaptor.
- Operating System: Windows98/Me/2000/NT/XP.

Price Each	1
TRY-010 Ethernet to RS-232/422/485 Isolated Converter	\$151.25

Fiber to RS232/RS422/RS485 Isolated Converter ST Multi Mode

The TRP-C39 fiber converter allows RS-232/422/485 signals to be bi-directionally converted to fiber optic and extend the distance up to 2KM over multi-mode. By using fiber optic transmission technology TRP-C39 secures a stable and error free data transmission over the industrial environments present electrical noise and ground differential challenges, especially over long distances. TRP-C39 support data format, baud rate and data direction auto configuration, it also provides with 3000V DC isolation and internal surge protection. The industry DIN rail and panel mounting design enable user a fast and professional installation. DIN Rail Mount Option



Features Include

- 10-30VDC power supply.
- Wide range power input voltage.
- ST Multi-mode fiber port.
- Auto direction flow control on RS-485.
- Automatically switch signal RS-232, RS-422 and RS-485.
- Support 3000V DC isolation protection.
- All RS-422/485 signals provide surge and over current protection.
- Power/TX/RX mode LED indicator.
- Fiber transmission distance up to 2KM .
- Auto baud rate switching from 300bps to 115.2Kbps.

Price Each	1
TRY-012 Fiber to RS-232/422/485 ST Multi-mode	\$132.50

DIN RAIL OPTION FOR TRYCOM COMMUNICATION MODULES



Price Each	1	5+
TRY-900 DIN Rail Mount	\$15.00	\$13.50

Modbus TCP/IP to ASCII /RTU Gateway

The TRP-C 31M , MODBUS gateway allows MODBUS RTU/ASCII devices to operate on a MODBUS TCP network. It allows either MODBUS serial master or slave to communicate with MODBUS TCP's slave or master.

When TRP-C 31M function as "MODBUS TCP masters to RTU/ASCII slaves": It allows multiple MODBUS TCP masters to communicate with a MODBUS serial network. the queries from different masters are pipelined and processed one by one. When TRP-C 31M functions as MODBUS RTU/ASCII master to MODBUS TCP slaves: it can connect up to 8 MODBUS TCP slaves.

User can specify a UID range for each MODBUS TCP slave. TRP-C 31M provides inactive timeout that allows user to specify a time period to disconnect TCP/IP connection to prevent one connection slot was occupied if there is no activity in the network., or prevent any another connection again. A friendly management software provides user an easy way of configuration over Ethernet. TRP-C 31M can work at Loop back Mode, all data is sent back immediately. This feature makes the connection testing easy. DIN Rail mount option available.

Features include

- 10-30VDC power supply.
- Supports 10/100 Mbps Ethernet.
- Supports RS232, RS422, and RS485 serial interface.
- High speed up to 230.4Kbps
- Supports 8 MODBUS TCP master to MODBUS RTU/ASCII slave (up to 31) .
- Supports MODBUS RTU/ASCII master to MODBUS/TCP slave devices (up to 8).
- Provide inactive timeout for connection auto-recovery when power failures.
- Automatically generate exception when RTU/ASCII slave device does not response.
- Remote IP address filtering function to reject unwanted incoming connection source.



Price Each	1
TRY-007 Modbus TCP To RTU/ASCII Gateway	\$233.75

Ethernet to Fiber Media Converter

TRP-C41 is a device for Ethernet extension over fiber, it supports point-to-point and networked systems. The high fiber bandwidth connections solve problems with electrical noise and different ground potentials over long transmission lines. TRP-C41 supports 10/100Base-TX transmissions up to 100 meters and 100Base-FX transmissions up to 20KM . It is the perfect solution for wide distance connections with high immunity to electrical noise.

Features include

- Cable: Fiber cable (9/125um).
- One 10/100Base-TX auto-negotiation Ethernet RJ-45 port.
- One 100Mbps fiber port with Single-mode SC connector.
- Built in 128Kb RAM for data buffer.
- Wavelength: 1310 nM.
- Fiber Power:-15 ~ -8 dBm.
- LED indicator: Power and power and TX and fiber link/activity, full/half, 10/100MB.
- Distance : 20KM can be up to 60KM (option).
- Speed : Auto 10/100MB.
- Power Consumption: 12V/160mA.
- Power requirement: USB port power or DC input or screw terminal from +10 to 30V.
- Operating temperature: 0 to 55degC.



Price Each	1
TRY-041 Ethernet to Fibre Converter	\$166.25

OCEAN CONTROLS - COMMUNICATIONS

Fiber to RS232/RS422/RS485 Isolated

The TRP-C39S fiber converter allows RS-232/422/485 signals to be bi-directionally converted to fiber optic and extended the line signal distance up to 40KM over single mode. By using fiber optic transmission technology TRP-C39S secures a stable and error free data transmission over the industrial environments. The high bandwidth fiber connections solve problems with electrical noise and different ground potentials over long transmission. TRP-C39S support auto configuration in data format, baud rate and RS-485 data direction flow control, it also provides with 3000V DC isolation and internal surge protection. DIN Rail mount option available.

Features include

- 10-30VDC power supply.
- SC single mode fiber port.
- Auto direction flow control on RS-485.
- Auto RS-232/422/485 signals switching.
- Auto data format detecting.
- Auto baud rate switching from 300bps to 115.2Kbps.
- Support 3000V DC isolation protection.
- Support surge protection on RS-422/485 data lines.
- Power/TX/RX mode LED indicator.



Price Each	1	5+
TRY-013 Fiber to RS-232/422/485 SC Single-mode	\$222.50	

Bluetooth Modem

The BlueSMiRF is the latest Bluetooth wireless serial cable replacement. These modems work as a serial (RX/TX) pipe. Any serial stream from 9600 to 115200bps can be passed seamlessly from your computer to your target. We've even tested these units successfully over open air at 350ft (106m)!



The remote unit can be powered from 3.3V up to 6V for easy battery attachment. All signal pins on the remote unit are 3V-6V tolerant. No level shifting is required.

The BlueSMiRF includes hardware flow control (CTS and RTS) and uses a compact ceramic antenna.

Specifications:

- * FCC Approved Class 1 Bluetooth Radio Modem
- * Extremely small radio - 0.15x0.6x1.9"
- * Very robust link both in integrity and transmission distance (100m) - no more buffer overruns!
- * Low power consumption : 25mA avg
- * Hardy frequency hopping scheme - operates in harsh RF environments like WiFi, 802.11g, and Zigbee
- * Encrypted connection
- * Frequency: 2.4~2.524 GHz
- * Operating Voltage: 3.3V-6V
- * Serial communications: 2400-115200bps
- * Operating Temperature: -40 ~ +70C
- * Built-in antenna



Use a Bluetooth USB Dongle to communicate between a PC and the modem

Price Each	1	5+
WIR-010 Bluetooth Modem	\$89.95	less 10%
TRY-901 USB-Bluetooth Dongle	\$22.68	less 10%

Modem Long Range 433MHz: UM96 - Includes Antenna and Cable

433MHz Long Range Radio from HAC. These small modems use a seamless serial interface - whatever enters the TX pin at 9600bps shows up on the other unit's RX pin. All buffering and error detection is handled internally. And the best part - with 10mW output, it reaches over 500m!

This unit can be attached to TTL level serial (for microcontrollers) or directly to RS232 for incredibly simple serial cable replacement!

Specifications:

- * Operating Voltage: 3.3V-5.5V
- * 9600bps over 500m
- * Modulation type: GFSK
- * 8 Channels jumper selectable
- * Low power : 30mA RX, 40mA TX, 20uA Sleep
- * Small footprint size: 26x47mm



Supported Antennae: Kit comes with 1/4 wave 50Ohm antenna and communications cable!

Price Each	1	5+
WIR-001 Modem Long Range 433MHz: UM96	\$69.95	less 10%

UM96 and UM12 Modem Adapter

The KT-5232 is an easy to use adapter for the UM96 and UM12 wireless modems.

Just attach the modem, a power supply (8-30VDC) and a serial cable and you will be up and running in no time.

Use a Male to Female 9-pin serial



Specifications:

- * Operating Voltage: 8-30V
- * Accepts UM12 and UM96 modems
- * D9F Connector

Price Each	1	5+
KTA-232 Wireless Modem Adapter for UM96 and UM12	\$20.00	

Modem Long Range 433MHz: UM12 - Includes Antenna and Cable

433MHz Long Range Radio from HAC. These small modems use a seamless serial interface - whatever serial character enters the TX pin at 1200bps shows up on the other unit's RX pin. All buffering and error detection is handled internally. And the best part - with 10mW output, it reaches over 1000m!



This unit can be attached to TTL level serial (for microcontrollers) or directly to RS232 for incredibly simple serial cable replacement!

Specifications:

- * Operating Voltage: 3.3V-5.5V
- * 1200bps over 1000m
- * Modulation type: GFSK
- * 8 Channels jumper selectable (4 can be used in Australia 433MHz and above)
- * Low power : 30mA RX, 40mA TX, 20uA Sleep
- * Small footprint size: 26x47mm

Documents: HAC-UM96 Datasheet (Serves both UM96 and UM12)
Supported Antennae: Kit comes with 1/4 wave 50Ohm antenna and communications cable!

Price Each	1	5+
WIR-002 Modem Long Range 433MHz: UM12	\$79.00	less 10%

OCEAN CONTROLS - COMMUNICATIONS

Transceiver - 2.4GHz with Duck Antenna

The MiRF v2 is the latest in RF modules. This module uses the newest 2.4GHz transceiver from Nordic Semiconductor, the nRF24L01. This transceiver IC operates in the 2.4GHz band and has many new features! Take all the coolness of the nRF2401A and add some extra pipelines, buffers, and an auto-retransmit feature - very nice! This also board features a reverse polarized SMA connector for maximum RF range. Please remember, you will need a mating RP-SMA 2.4GHz antenna (listed below).



Comes with 2.4GHz Duck Antenna 2.2dBi with Reverse Polarized - SMA RF connector. Perfect for prototyping with our RF ICs. 50 ohm impedance. 4" long.

Features:

- * On-board 3.3V LDO Regulator (3.3 to 7V supply allowed)
- * 80m Range at 1000kbps
- * 2Mbit Data Rate
- * Auto Acknowledge
- * Auto Re-Transmit
- * Multiceiver - 6 Data Pipes
- * 32 Byte separate TX and RX FIFOs
- * 5V tolerant input pins
- * Software selectable channel from 2400MHz to 2525MHz (125 Selectable channels)
- * Minimum number of external components
- * Pins broken out : VCC, CE, CSN, SCK, MOSI, MISO, IRQ, GND
- * Lots of application notes and support on Nordic Semiconductor Web-site
- * Operating Voltage: 3V
- * Output Power: +4dBm
- * Data Rate: 1Mbps; 250Kbps
- * Small footprint size: 20.0 x 36.7 x 2.4mm
- * Operating Temperature: -40 ~ +85 C
- * Long range: 280mts @250Kbps ; 150mts @1Mbps
- * Built-in antenna

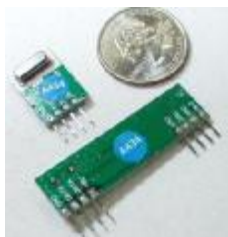
Price Each	1	5+
WIR-006 Transceiver - 2.4GHz with Duck Antenna	\$36.95	less 10%

Serial UHF Transmitter and Receiver Pair

This transmitter and receiver pair is good for data rates up to 4800bps and distance up to 160metres

The receiver is operated at 5V and the transmitter operates from 2-12V. The higher the Voltage, the greater the range

This is an ASK transmitter module with an output of up to 8mW depending on power supply voltage. The transmitter is based on SAW resonator and accepts digital inputs, can operate from 2 to 12 Volts-DC, and makes building RF enabled products very easy.



This receiver has a sensitivity of 3uV. It operates from 4.5 to 5.5 volts-DC and has digital output. The typical sensitivity is -103dbm and the typical current consumption is 3.5mA for 5V operation voltage. Modulate Mode ASK
Frequency range—433.92MHz

Price Each	1	5+
WIR-030 Serial UHF Transmitter Receiver pair	\$11.50	less 10%

Bluetooth® Modem - Roving Networks RS232

Description: FireFly is a Roving Networks' RN-41 Bluetooth® module with RS232 circuitry on the front end. This allows the user to access the RN-41 AT command set over a common COM port. FireFly enables wireless connections to any legacy serial port and supports bi-directional RS-232 (or 422 !) signaling at a rate of up to 464Kbps. Just attach FireFly to your device's RS232/EIA232/422 port, power it, and you're connected. The transmit range can be up to 330' (100m), depending upon environmental considerations.

Please note: The power jack on the side of the unit is a small 3.5x1.2mm jack. The center pin is positive and requires 5-11VDC.

Features:

- * Wireless cable replacement: use to replace cables or where cabling is not possible or practical
- * Very low power consumption (<5ma idle, 10-40ma connect)
- * Bluetooth® Technology v2.0 compliant
- * FCC, IC, CE certified, and RoHS compliant
- * Class 1 high powered radio for long range operation
- * Easy to use settings via on board DIP switches
- * RS232 driver built in



FireFly uses the standard Bluetooth Serial Port profile and is compatible with all clients running under Windows™, PalmOS™, PocketPC™, Apple™, and other Bluetooth® enabled platforms.

Price Each	1	5+
WIR-011 Bluetooth Modem - Roving Networks RS232	\$149.00	less 10%

Serial UHF Transmitter and Receiver

This transmitter and receiver pair have a usable range up to 30m

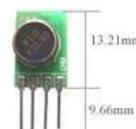
Supply Voltage 5VDC

Transmission Data rate 8KB/sec

Receiver Data rate 4.8KB/Sec

Modulate Mode ASK

Frequency range—433.92MHz



Price Each	1	5+
WIR-020 Serial UHF Transmitter	\$9.05	less 10%
WIR-021 Serial UHF Receiver	\$9.05	less 10%

RS485 Distribution Board

This card allows you to connect several RS485 devices. These have been primarily designed to connect the **Moscad Ace** RTU RS485 port via an RJ45 connector. It allows multiple devices such as VSD drives, PID controllers etc to be connected together. Up to 4 devices can be connected via terminals. The RJ45 cable can be provided to allow connection to a Moscad RTU. Can be purchased with a DIN Rail Mount.



Price Each	1
OCH-012 RS485 Distribution Card in DIN Rail Mount	\$45.00

OCEAN CONTROLS - COMMUNICATIONS

XBee 2mW Series 2.5 Wire Antenna

New 2.4GHz XBee XB24-BWIT-004 module from Digi (formerly Maxstream). Series 2.5 improves on the power output and data protocol. These modules take the 802.15.4 stack (the basis for Zigbee) and wrap it into a simple to use serial command set. They allow a very reliable and simple communication between microcontrollers, computers, systems, really anything with a serial port! Point to point and multi-point networks are supported.

Series 1 and Series 2.5 XBee modules have the same pin-out. However, Series 1 modules cannot communicate with new Series 2.5 modules.

Features:

- * 3.3V @ 40mA.
- * 2mW output (+3dBm)
- * Built-in antenna
- * 6 10-bit ADC input pins
- * 128-bit encryption
- * AT or API command set
- * 250kbps Max data rate
- * 400ft (120m) range
- * Fully FCC certified
- * 8 digital IO pins
- * Local or over-air configuration



Price Each	1	5+
WIR-041 XBEE 2mW Wire Antenna	\$46.95	less 10%

2mm 10-pin Sockets for XBee Breakout

These 2mm 10-pin Sockets accept the XBee Modules and solder into the breakout board (above) so you don't have to permanently solder the XBee module to the breakout board.



Price Each	1
WIR-043 XBEE 2mm 10pin Socket	\$1.59

1mW Series 1 Wire Antenna

XB24-AWI-001 module from Digi. Please Note: Series 1 and Series 2.5 XBee modules have the same pin-out. Series 1 modules cannot communicate with Series 2.5 modules.



Price Each	1
WIR-046 XBee 1mW Series 1 Wire Antenna	\$39.95

XBee Pro 50mW Series 2.5 Wire Antenna

XB24-BWIT-004 module from Digi. Please Note: Series 1 and Series 2.5 XBee modules have the same pin-out. Series 1 modules cannot communicate with Series 2.5 modules.



Price Each	1	5+
WIR-047 XBee Pro 50mW Series 2.5 Wire Antenna	\$79.95	less 10%

XBee Pro 50mW Series 2.5 RPSMA Connector

XB24-BSIT-004 module from Digi. Please Note: Series 1 and Series 2.5 XBee modules have the same pin-out. Series 1 modules cannot communicate with Series 2.5 modules.



Price Each	1
WIR-048 XBee Pro 50mW Series 2.5 RPSMA Connector	\$84.95

XBee Pro 60mW Wire Antenna

The very popular 2.4GHz XBee XBP24-AWI-001 module from Digi (formerly Maxstream). The Pro series have the same pinout and command set of the basic series with an increase output power of 60mW! These modules take the 802.15.4 stack (the basis for Zigbee) and wrap it into a simple to use serial command set. They allow a very reliable and simple communication between microcontrollers, computers, systems, really anything with a serial port! Point to point and multi-point networks are supported.

Features:

- * 3.3V @ 215mA
- * 60mW output (+18dBm)
- * Built-in antenna
- * 6 10-bit ADC input pins
- * 128-bit encryption
- * 250kbps Max data rate
- * 1 mile (1500m) range
- * Fully FCC certified
- * 8 digital IO pins
- * Local or over-air configuration



Price Each	1	5+
WIR-042 XBEE Pro 60mW Wire Antenna	\$79.95	less 10%

XBee Explorer USB Board

This is a simple to use, USB to serial base unit for the XBee line. This unit works with all XBee modules including the Series 1 and Series 2.5, standard and Pro version. Plug the unit into the XBee Explorer, attach a mini USB cable, and you will have direct access to the serial and programming pins on the XBee unit.



Price Each	1
WIR-045 XBEE Explorer USB Board	\$37.50

XBee Breakout Board

This is a simple breakout board for the popular XBee product from Maxstream. This board breaks out all 20 pins of the XBee to a 0.1" standard spacing dual row header. The spacing between 0.1" headers is 0.5" making it breadboard DIP friendly. We highly recommend using the female sockets to avoid having to solder the XBee permanently to the breakout board. This is the PCB only. Please order the accompanying 2mm sockets (you'll need 2!) and 0.1" headers below.



Price Each	1	5+
WIR-040 XBEE Breakout board	\$3.95	less 10%



XBee Explorer Serial

Description: This is a simple to use, RS232 to serial base unit for the XBee line. This unit works with all XBee modules including the Series 1 and Series 2.5, standard and Pro version. Plug the unit into the XBee Explorer, attach a RS232 cable, and you will have direct access to the serial and programming pins on the XBee unit. The board also supports DTR communication so you can reprogram and configure the XBee unit.



Price Each	1	5+
WIR-049 Xbee Explorer Serial	\$39.00	less 10%

OCEAN CONTROLS - DATA LOGGERS

New

TagTemp Temperature Logger

TagTemp is a compact water proof temperature data logger. Housed in an IP67 enclosure, TagTemp can be installed in harsh environments in different applications.

It can be easily programmed and set via a handy infrared IR-LINK 3 interface connected to a USB port under Windows LogChart II software or with a Palm compatible PDA IrDA interface under PalmOS. Features

- Enclosure: IP67, flame retardant, ABS+PC
- Dimensions: 47 x 30 x 12 mm;
- Temperature measurement accuracy: $\pm 0.5^{\circ}\text{C}$;
- Reading resolution: 14 bits or 16,384 levels;
- Memory capacity: 16,000 loggings;
- Reading intervals: from 1 second to 18 hours;
- Loggings can be programmed to start immediately, outset by the device's button, by date/hour or by a programmed setpoint or through a PDA;
- Loggings can be programmed to stop: at full memory; at some specified date and hour, number of samples or never (circular memory);
- Internal button to command start/stop logging;



Price Each	1	5+
LOG-010 TagTemp 16K Readings	\$99.00	less 10%
LOG-002 IR-Link & Windows LogChart II	\$120.00	less 10%

New

Logbox-RHT and LogBox-RHT-LCD Data Logger

Are dual channel data loggers with built-in temperature and relative humidity sensors. They use a high quality industrial grade humidity sensor for accurate and reliable operation in applications such as transportation, food and goods storage, process auditing, pharmaceutical, HVAC and others.

They can be easily programmed and set via a handy infrared IR-LINK 3 interface connected to a USB port under Windows® software or with a PalmOS compatible PDA IrDA interface. LogChart II software allows for logger configuration, recorded data retrieval, plotting, historical analysis and it exports data to spread sheets.

In the LogBox-RHT-LCD the temperature and humidity values are shown in the digital display. You can also check on the display the Minimum and maximum recorded values.



Price Each	1	5+
LOG-005 LogBox RHT 32K Readings	\$289.00	less 10%
LOG-006 Logbox RHT 32K Readings with LCD	\$309.00	less 10%
LOG-002 IR-Link & Windows LogChart II	\$120.00	less 10%

LogBox AA Data Logger

Is a 2-channel data logger which can accept 0-20mA and 4-20mA, 0-50mV and 0-10V voltage, thermocouple, Pt-100 RTD signals inputs all in a small weatherproof IP65 enclosure.

Setup and data retrieval is done in a PC via an infrared wand through the use of LOG CHART, a Windows compatible software which plots and prints graphs, lists loggings and exports data to spreadsheets.

Memory capacity: 32k readings

The LogBox-AA also provides a signal for commanding an external power supply (battery) of a device connected to the logger. **This feature allows that external devices, such as a transmitter, be powered only during the measurement sample time, thus extending the life of these external batteries.**



Price Each	1	5+
LOG-001 LogBox AA 32K Readings	\$269.00	less 10%
LOG-002 IR-Link & Windows LogChart II	\$120.00	less 10%

TagTemp Temperature Logger Starter Pack

Contains 2 Tagtemp Data-loggers, a USB-IRLink and Logchart software. All you need to get you started for \$199.00



Price Each	1
LOG-011 TagTemp Starter Pack	\$239.00

LogBox DA Logger

Is a 2 channel data logger

Channel 1: NPN, PNP, Pulse or Dry Contact Max. frequency: 4000 Hz or 20 Hz Maximum counting: 65,535 per period.

Channel 2: 0-20mA, 4-20mA, 0-50mV and 0-10Vdc

Memory capacity: 32k readings

The LogBox-DA also provides a signal for commanding an external power supply (battery) of a device connected to the logger. **This feature allows that external devices, such as a transmitter, be powered only during the measurement sample time, thus extending the autonomy of these external batteries.**



This logger has been designed for monitoring water and irrigation flows but is suitable for many other applications

Price Each	1	5+
LOG-003 LogBox DA 32K Readings	\$249.00	less 10%
LOG-002 IR-Link & Windows LogChart II	\$120.00	less 10%

Field Logger

A stand-alone data logger which features 8 universal analogue inputs and will operate as a datalogger or as an RTU (Remote Telemetry Unit using Modbus Protocol) linked to a PC for on line recording and supervision. Able to be mounted on a DIN rail, its 8 universal channels accept t/c J, K, T, E, N, R, S, B; 4-20mA, Pt100, 0-50mV without hardware change. Connection to the input channels are via screw terminals. The Fieldlogger also features 2 alarm relay channels.

The Fieldlogger is setup by the Configurator software. The Fieldlogger has a RS485 interface which allows communication to 1Km. A connection from the PC's RS232 port is made via a RS232/ RS485 converter.

Features include

Internal memory (optional) for 128,000 recordings and real time clock. Input resolution: 12,000 levels. Accuracy: 0.1% of full scale.



Price Each	1
LOG-102 FieldLogger Datalogger 128k memory 24VDC	\$750.00
LOG-104 FieldChart Data Acquisition Software - 8 Channels	\$275.00

OCEAN CONTROLS - DATA LOGGERS

New

Venus GPS with SMA Connector

Description: This is a development board that uses the smallest, most powerful, and most versatile GPS receiver we carry, the Venus. The module can be configured to an amazingly powerful 10Hz update rate, with 14 channel tracking! With two serial ports, UART and SPI interfaces (please see the datasheets on how to implement the SPI interface), 28mA operating current, and high sensitivity, this receiver seriously opens new doors for tracking. Module outputs the standard NMEA-0183 or SkyTraQ Binary sentences at a default rate of 4800bps (adjustable to 115200bps).



The Venus634LPx has improved sensitivity, an integrated LNA (with multipath detection and suppression), built-in RTC, and integrated single power supply making it very simple to use. In addition, the module supports data logging with an external SPI Flash!

You can easily connect to the UART using our USB to Serial FT232 Breakout Board.

Check out our GPS buying guide!

Features:

- * 51 channel acquisition and 14 channel tracking
- * SkyTraQ based chipset
- * 10Hz max update rate (1Hz default)
- * Integrated LNA
- * Single 2.7-3.3V supply
- * 3.3V TTL UART
- * Power: 28mA tracking
- * Sensitivity: -161dBm
- * Accuracy: <2.5m
- * Hot start: 1 Seconds
- * Cold Start: 29 Seconds
- * Supports active or passive antennas
- * Supports SBAS (WAAS, EGNOS, MSAS)

Price Each	1	5+
GPS-002 Venus GPS with SMA Connector	\$69.95	less 10%

Antenna GPS 3V Magnetic Mount SMA

Description: Magnet mount antenna for GPS modules operating at 3V. Designed for used with automobiles - the magnet will hold the antenna in place at speeds greater than 100mph. 5meter cable terminated with standard male SMA connector.



Check out our GPS buying guide!

Features:

- * Gain 26dB
- * VSWR <2.0
- * Voltage 3.3V +/- 0.5V
- * Current 12mA
- * Weight 50g

Price Each	1	5+
GPS-020 Antenna GPS 3V Magnetic Mount SMA	\$19.95	less 10%

Logomatic V2 Serial Data Logger

The Logomatic Version 2 incorporates the LPC2148 controller with USB, battery charging, and microSD support.

This allows us to use the SparkFun LPC2148 USB bootloader for even easier and faster modification of the firmware. No programmer required!

The Logomatic v2 uses a USB mass storage stack to appear under any operating system as a flash drive. Logs are created in FAT16 format on the microSD media and can be downloaded quickly over a USB connection by dragging and dropping the text files from the device. The microSD card can also be removed and inserted into a card reader to download the logs.

Board comes with a JST connector to be powered from our line-up of LiPo batteries or other power sources up to 7.5VDC. If you choose to use LiPo batteries, the Logomatic v2 has a built-in charger to charge batteries off USB.

The Logomatic v2 ships with basic serial text and analog logging. Users can easily start with this firmware but are encouraged to modify the firmware for their specific requirements.



Price Each	1	5+
GPS-101 Logomatic V2 Serial Datalogger	\$93.25	less 10%

1GB and 2GB microSD card and Adapter

We have 1 and 2 gig microSD media cards which are perfect for massive datalogging in a minute amount of space. These microSD cards have a simple to use SPI interface allowing any micro to read and write data in a very large 1 gigabyte storage array.

Card may come with different brandings but does include the small microSD card and a SD card converter. Insert the microSD into the SD converter and then stick the larger SD card into any standard card reader.

This product is guaranteed to work in any of our SD sockets, MMC sockets, microSD sockets, or products that use a SD or MMC card. Great for the Logomatic V2



Price Each	1	5+
MSD-001 1GB microSD Card and Adapter	\$19.95	less 10%
MSD-002 2GB microSD Card and Adapter	\$17.00	less 10%

uLog - The Lil'est Logger

Description: The uLog is a tiny analog logging device. Central to the logger is an ATtiny24 mated with an AT45DB161D 16Mbit flash IC. Sampling at 50Hz, it'll log 3 channels of 10-bit ADC for about 2 hours before the memory fills up.

Very stripped down and simple to use: at power up it determines if a UART line is attached. If there is, it spits out a "?" and waits for user input. There are only 2 commands: "r" for read and "e" for erase. Erasing the flash sets all addresses to 0xFFFF, and reading dumps all the data up to the first 0xFFFF. If there's no UART line attached it starts sampling. If connecting with one of our FT232 breakout boards, all you need is TX, RX and ground. If using an RS232 shifter board you will also need to connect 3.3V.

The power input is a 2-pin JST connector, which works well with our LiPo batteries, especially the small 100mAh LiPo, and it draws just 4mA with an ADXL320 attached. An ON/OFF switch is also included. There are so many uses for this device! We strapped it to a rocket while it logged the analog output of an ADXL321 accelerometer.

Features:

- * AT45DB161D provides 16 Mbits of flash
- * Up to 3-channel ADC logging
- * Access to ATtiny24 SPI pins
- * Simple-to-use UART (38400 baud) interface for reading and erasing flash

Dimensions: * Size: 0.9x0.7"; * Weight: 8.07g



Price Each	1	5+
LOG-020 Ulog - The Lil'est Logger	\$23.93	less 10%

OCEAN CONTROLS - RELAY CONTROLLERS

New

USB I/O Controller

The KT-5220 is a USB Controlled I/O module for interfacing PC's to real world applications such as controlling lights, pumps and sprinkler systems, reading sensors and monitoring switches and other digital signals. The list is endless.

The controller provides eight relay outputs each capable of switching 5 amps @240VAC and four opto-isolated digital inputs. Other features of the controller are

- 8 Relay Outputs
- 4 Opto Isolated inputs
- 2 Analog Inputs (0-5V or 0-20mA)
- 1 PWM Output

All connections to the I/O are via screw connectors.

A DLL and an example VB programs are provided

Power Indicator LE

Requires 12VDC plug pack and D25 Male-Female Cable



Price Each	1	5+
KTA-220 USB I/O Controller	\$135.00	less 10%

GOIC Modbus I/O Controller

The GOIC Modbus I/O Card acts as a Modbus RTU slave. It features

- Modbus Slave Address can be set.
- Baudrate and parity selectable
- Two 10bit analog inputs can be 4-20mA, 0-20mA or 0-5V inputs.
- Optional 12 bit Analog output. 4-20mA or 0-5VDC output
- Six digital inputs can sense NPN, relay contacts or 0-5V TTL signals
- Two relay outputs with Normally open and closed contacts. Relays can switch 3A @240VAC.
- Two of the digital inputs can be used to communicate with DS18S20 temperature sensors to monitor temperature over the range -55 to 125 degC
- Two of the digital counters also function as pulse counters
- 12 to 15VDC powered.

Communication via RS232 or RS485.

DIN Rail Mount Option

All external connections are via screw terminals



Price Each	1	5+
KTA-211 Modbus Card with 4-20mA Analog Output	\$124.50	less 10%

Serial I/O Controller

The controller provides eight relay outputs each capable of switching 5 amps @240VAC and four opto-isolated digital inputs. All connections to the I/O are via screw connectors.

It is controlled via a computers RS232 serial port via ASCII commands. Serial cables can be much longer (up to 35 metres) allowing 'remote' control. Use our RS232/RS485 converters and distance of over a 1000 metres can be obtained.

Requires 12VDC plug pack and D9 Male-Female Cable



Price Each	1	5+
KIT-108 As Kit	\$99.00	less 10%
KTA-108 Assembled and Tested	\$115.00	less 10%

Multi Drop Serial I/O Controller

The multi drop controller provides eight relay outputs each capable of switching 5 amps @240VAC and four opto-isolated digital inputs. All connections to the I/O are via screw connectors.

It has been programmed so that each controller has its own programmable address. Up to 10 controllers can be multi dropped on a RS232 serial line or RS485 serial line.

It also has been programmed so that the 4 digital inputs can be used as 24 bit counters

Requires 12VDC plug pack and D9 Male-Female Cable

A multi drop kit is available to convert the standard serial I/O controller into a Multi Drop Serial I/O controller



Price Each	1	5+
KTU-108 Upgrade Kit	\$29.95	less 10%
KTM-108 Multi Drop Controller Assembled	\$135.00	less 10%

Pixel Programmable Controller Board

This controller is based around the PICAXE 28X1 microcontroller. The PICAXE controllers have been featured in Silicon Chip magazine. The controller features 4 Ten bit Analog Inputs (0-5V), 8 digital inputs and 8 relay outputs. Each of the digital inputs has pull up resistors to allow easy interfacing to relay contacts, switches and 0 to 5V inputs etc. Each relay output has a LED to indicate its state and is capable of switching 5 amps @240VAC.

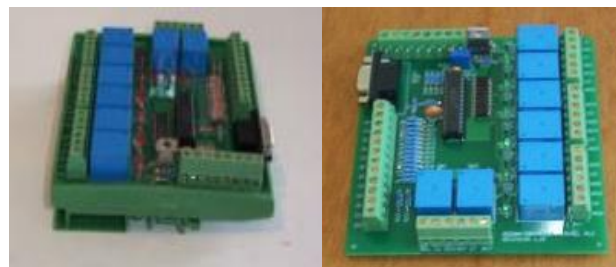
All connections to the I/O are via screw connectors. The Pixel Controller measures 122x111x25mm.

The software provides a complete programming environment for generating BASIC programs for the PICAXE. Programs can be edited, compiled and downloaded.

The Pixel Controller is fitted with a Picaxe 28X microcontroller. Extra features include - 4 Ten bit analog inputs (0-5V)

- Program memory approx. 1000 lines with intelligent download
- Data memory 260 bytes

Requires 12VDC power and D9 Male-Female Cable



Price Each	1	5+
PIX-002 Pixel Controller Board	\$129.50	less 10%
PIX-003 Pixel Controller Board In Din Rail	\$159.50	less 10%

OCEAN CONTROLS - RELAY CONTROLLERS & ARDUINO CONTROLLERS

SOM96 Relay Card

The SOM96 Serial Output Module is designed to be used with PCs. Each module has 4 independent single pole changeover relays which can be independently addressed from the PC. The standard RS232 serial output is converted to RS485 by the first module and this is used to drive subsequent modules. Each module may be allocated one of 256 addresses, thus allowing for control of 1024 relays. Addresses are selected using an 8 way DIL switch and more than one module can have the same address. This will allow several relays to be controlled simultaneously. Modules can be physically placed in positions remote from the PC. The link from the PC Serial Port to the first module is restricted to approximately 50 metres. After that modules can be located as much as 200 metres apart.



Price Each	1
NET-030 SOM-96 Relay Card	\$49.00

Level Monitor

The KTA-251 is a level meter and relay controller card. It can easily interfaced with sensors having a 0-5V / 0-20mA / 4-20mA outputs. Two relays can be programmed to activate when an input crosses a level (with optional hysteresis) or is within or outside a range. The unit is equipped with a small LCD and buttons, allowing an easy-to-configure interface. By using the pushbuttons and screen you are able to select ranges and set relay ON-OFF levels. Configuration is stored to non-volatile memory. The meter can also be easily interface to the DS18S20 temperature sensors and Maxbotix MaxSonar-LV-EZ0 and EZ1 ultrasonic range finders. The unit can be mounted on a panel using screws and supports. A DIN Rail mount can also be purchased.

SPECIFICATIONS

- *Power Supply Vs and COM:
 - KTA-251 / KTC-251: 9-16V DC (12V Nominal) ~200mA + External 5V drain
 - KTB-251 / KTD-251: 18-32V DC (24V Nominal) ~200mA + External 5V drain
- *Voltage Input Vin: 0-5V
- *Current Input Iin: 0-20mA
- *Digital Input Din: 0-5V, Compatible with Maxim DS18S20 temperature sensors, which have an operating range of -55°C to 125°C and are accurate to ±0.5°C over the range -10°C to 85°C.
- *Relay Outputs R1 and R2: Single-pole, single-throw relays rated to 5A (resistive). 240VAC / 30VDC
- 5V Auxiliary Supply 5V: 200mA
- *Dimensions: 76L x 72W x 24H mm



APPLICATIONS

1. A user may wish to monitor the pressure in a vessel and sound an alarm if the pressure drops too low or rises too high. The sensor is a 4-20mA, 0-100Bar pressure sensor.
2. A test oven needs to be maintained at 80degC. Using a DS1820 temperature sensor connected to the KTA-251 and a heater to the relay, the controller can be programmed to switch on the relay at 79degC and switch off at 81degC.
3. An interactive display must be switched on when a person comes within a meter of the display. Using a Maxbotix MaxSonar-LV-EZ0 ultrasonic sensor connected to the KTA-251 it can be programmed to switch the relay ON (turns on display) when the sensor detects an object within 1 meter.

Price Each	1
KTA-251 Level Monitor 12VDC Powered	\$89.00
KTB-251 Level Monitor 24VDC Powered	\$89.00
KTC-251 Level Monitor 12VDC Powered DIN Rail Mount	\$109.00
KTD-251 Level Monitor 24VDC Powered DIN Rail Mount	\$109.00

PC Parallel Port Relay Controller

This PC Parallel Port Relay board allows you to convert your PC into a dedicated controller. Simply connect a printer cable from your computer to the D25 connector on the relay board. There are 8 relays each capable of switching 12VDC/120VAC @ 10A and 240VAC @ 5A. All connections to the relay contacts are via screw terminals. Each relay has an LED to indicate when it is operated. Requires 12VDC plug pack and D25 Male-Female Cable



Price Each	1	5+
KIT-074 As Kit	\$57.00	less 10%
KTA-074 Assembled and Tested	\$69.95	less 10%

PC Parallel Port Relay Card In Box

Essentially exactly the same as our PC Parallel Port Relay Board but supplied fully assembled in a high quality plastic case. The software provided for the board works with this unit

All components provided including a plastic case with pre-punched and silk screened front and rear panels to give the product a professional and attractive finish as shown in the photos. Finished Dimensions (mm): 140Wx110Dx35H.

Requires 12VDC plug pack and D25 Male-Female Cable



Price Each	1	5+
KTA-165 Assembled in Box	\$89.00	less 10%

ARDUINO Card

Description: Arduino is an open-source physical computing platform based on a simple i/o board and a development environment that implements the [Processing/Wiring](#) language. Arduino can be used to develop stand-alone interactive objects or can be connected to software on your computer (e.g. Flash, Processing, MaxMSP). The open-source IDE can be [downloaded](#) for free (currently for Mac OS X, Windows, and Linux). We now ship the new Arduino Duemilanove. The Duemilanove automatically selects the appropriate power supply (USB or external power). A great description of the new functionality can be found [here](#) (USB fuse protection, software reset, and much more!). Board comes fully assembled and tested with ATmega168 pre-loaded with bootloader. Please see the Arduino support forum for more information about this new board revision and bootloader.

Summary

- Microcontroller ATmega328
- Input Voltage (recommended) 7-12 V
- Input Voltage (limits) 6-20 V
- DC Current per I/O Pin 40 mA
- Flash Memory 32 KB (of which 2 KB used by bootloader)
- SRAM 1 KB
- EEPROM 512 bytes
- Clock Speed 16 MHz



Price Each	1	5+
ARD-001 Arduino Card	\$54.95	less 10%

Description: This is a motor shield for Arduino that will control two DC motors. Based on the L298 H-bridge, the Ardumoto can drive up to 2 amps per channel. The board takes its power from the same Vin line as the Arduino board, includes blue and yellow LEDs to indicate active direction, and all driver lines are diode protected from back EMF.

Control for motor attached to OUT1/2 is connected to digital line 12 (direction A) and digital line 10 (PWM A). Control for motor attached to OUT3/4 is connected to digital line 13 (direction B) and digital line 11 (PWM B). Compatible screw terminals and connectors are listed below.



Price Each	1	5+
ARD-030 Ardumoto - Motor Driver Shield	\$34.95	less 10%

OCEAN CONTROLS - ARDUINO CONTROLLERS

Arduino Pro 328 - 5V/16MHz

Description: It's blue! It's skinny! It's the Arduino Pro! SparkFun's minimal design approach to Arduino. This is a 5V Arduino running the 16MHz bootloader (select 'Arduino Duemilanove w/ 328' within the Arduino software). The power switch was moved to the side of the board (good idea Limor!) to allow control when a shield is attached.



Please note: The right-angle power switch is fragile. We're working on making the switch stronger. For now, please be gentle.

Arduino Pro does not come with connectors populated so that you can solder in any connector or wire with any orientation you need. We recommend first time Arduino users start with the Duemilanove. It's a great board that will get you up and running quickly. The Arduino Pro series is meant for advanced users that understand the limitations of system voltage (5V), lack of connectors, and USB off board.

We wanted Arduino Pro to be low profile. The DC power jack footprint is available, but not populated. We recommend running the board with a LiPo battery for better portability.

We really wanted to minimize the cost of an Arduino. The Arduino Pro is like the Arduino Duemilanove (same pin out) but to keep the cost low, we used all SMD components, made it two layer, etc. This board connects directly to the FTDI Basic Breakout board and supports auto-reset. The Arduino Pro also works with the FTDI cable but the FTDI cable does not bring out the DTR pin so the auto-reset feature will not work.

Features:

- * ATmega328 running at 16MHz external resonator. Select 'Arduino Duemilanove w/ 328' to get the delay functions to work correctly.
- * USB connection off board
- * 5V regulator
- * Max 150mA output
- * Over current protected
- * Reverse polarity protected
- * DC input 5V up to 12V
- * Resettable fuse prevents damage to board in case of short
- * Power select switch acts as on/off switch

Price Each	1	5+
ARD-040 Arduino Pro 328 - 5V/16MHz	\$27.50	less 10%



Making Things Talk

Description: Tom Igoe is one of the prolific actors on the Arduino scene. One of the core of 5 Arduino developers, Tom has amassed a huge volume of knowledge working with a multitude of technologies and a large number of students over the past decade. Making Things Talk is a small section of what he has learned. This book (in color!) covers a wide range: flex sensors, Bluetooth wireless, XBee wireless, USB, networks, IR remote control, RFID, force sensitive resistors, protocols, and of course, lots of LEDs. It's pretty awesome - and it's not just how to work with these neat technologies, but how to apply them in innovative projects. This is a great book to build upon a basic knowledge of Arduino. Tom does a great way of describing and teaching on a very easy to understand level, while getting complex concepts



Price Each	1	5+
BOK-001 Making Things Talk	\$38.00	less 10%



Getting Started with Arduino

Description: If you've heard about this Arduino thing, but are unsure about where to begin, Getting Started with Arduino is a great place to begin. 110 pages of easy to read, well written, Make/O'Reilly goodness. Massimo Banzi (author and one of the 5 Arduino developers) describes the basic hardware, writes some simple programs, and explains how to use the free Arduino development environment.



Price Each	1	5+
BOK-002 Getting Started with Arduino	\$23.33	less 10%

Price Each	1	5+
ARD-050 TellyMate	\$37.27	less 10%

Arduino Pro Mini - 3.3V/8MHz

It's blue! It's thin (0.8mm)! It's the Arduino Pro Mini! SparkFun's minimal design approach to Arduino. This is a 3.3V Arduino running the 8MHz bootloader (select 'LilyPad' within the Arduino software). The Pro Mini is very much like the Wee, but we added a handful of features to become a fully certified Arduino board.

Arduino Pro Mini does not come with connectors populated so that you can solder in any connector or wire with any orientation you need. We recommend first time Arduino users start with the Diecimila. It's a great board that will get you up and running quickly. The Arduino Pro series is meant for users that understand the limitations of system voltage (3.3V), lack of connectors, and USB off board.

We really wanted to minimize the cost of an Arduino. The Arduino Pro Mini is like the Arduino Mini (same pin out) but to keep the cost low, we used all SMD components, made it two layer, etc. This board connects directly to the FTDI Basic Breakout board and supports auto-reset. The Arduino Pro Mini also works with the FTDI cable but the FTDI cable does not bring out the DTR pin so the auto-reset feature will not work.

Features:

- ATmega168V running at 8MHz with external resonator (0.5% tolerance)
- Low-voltage board needs no interfacing circuitry to popular 3.3V devices and modules (GPS, accelerometers, sensors, etc)
- USB connection off board
- Supports auto-reset
- 3.3V regulator
- Reverse polarity protected
- DC input 3.3V up to 12V
- On board Power and Status LEDs



Dimensions:

0.7x1.3" (18x33mm)
Less than 2 grams

Price Each	1	5+
ARD-008 Arduino Pro Mini - 3.3V/8MHz		

ARDUINO Ethernet Shield

Description: The Arduino Ethernet Shield allows an Arduino board to connect to the internet. It is based on the Wiznet W5100 ethernet chip providing a network (IP) stack capable of both TCP and UDP. The Arduino Ethernet Shield supports up to four simultaneous socket connections. Use the Ethernet library to write sketches which connect to the internet using the shield.



The ethernet shield connects to an Arduino board using long wire-wrap headers which extend through the shield. This keeps the pin layout intact and allows another shield to be stacked on top.

Arduino uses digital pins 10, 11, 12, and 13 (SPI) to communicate with the W5100 on the ethernet shield. While using the Ethernet Shield, these pins cannot be used for general i/o.

The shield provides a standard RJ45 ethernet jack.

The reset button on the shield resets both the W5100 and the Arduino board.

Price Each	1	5+
ARD-020 Arduino Ethernet Shield	\$85.00	less 10%



TellyMate

Description: The TellyMate Shield equips an Arduino with the ability to send simple text and graphics to a TV. The TellyMate Shield connects to an Arduino board using long headers which extend through the shield. This keeps the pin layout intact and allows another shield to be stacked on top.

Arduino uses digital pin1 (TX) to communicate with the TellyMate. Just plug it into your Arduino and use Serial.println() commands to output text onto your TV!

The shield provides a 3.5mm jack and the necessary cable to convert to a composite video connection. The baud rate is selected by jumpers, which are also included.

Features:

- * TV output from your Arduino
- * PAL or NTSC Composite Video
- * Stackable Shield
- * works with Serial.println() etc.



OCEAN CONTROLS - ARDUINO CONTROLLERS

New

Arduino ProtoShield Kit

Description: Riding on the waves of the very popular Arduino USB board is this small prototyping shield. Originally spawned with collaboration between the folks at SFE and ITP @ NYU, the Protoshield mates with the Arduino USB board and gives the user a small soldering area, two general LEDs, access to a BlueSMiRF socket, a general pushbutton switch, and most important of all - the Arduino reset switch is brought to the top level.



This comes in kit form and must be soldered together by the end user. Please note - we do not ship assembly instructions! There are a few tutorials on assembly listed below. All soldering is through-hole (relatively easy) but always check your component orientation before soldering!

The kit is pictured with the bread-board option. We highly recommend this bread-board! The bread board can be purchased separately as a related item shown below.

Kit Includes:

- * 1 - Protoshield bare PCB
- * 1 - 40pin break-away male header
- * 3 - 6-pin female connector
- * 2 - 8-pin female connector
- * 1 - 4-pin female connector
- * 2 - Bright 5mm LEDs
- * 2 - 330 Ohm resistors
- * 2 - Momentary push buttons
- * 1 - 10k resistor
- * 2 - 0.1uF Capacitors

Features:

- * All Arduino pins are brought to the top level
- * 5V, GND, and Raw pins are exposed as well
- * BlueSMiRF socket for wireless communication between Arduinos
- * 2 general use LEDs
- * 1 general use button
- * Reset Button brought to top level

Price Each	1	5+
ARD-060 Arduino ProtoShield Kit	\$22.60	less 10%

New

Breadboard Mini Self-Adhesive Red

Description: This is a very small breadboard with 170 tie points. This bread board is compatible with the Arduino Proto Shield shown above. Strong, self-adhesive backing. Measures 1.8"x1.4"



Price Each	1	5+
ARD-070 Breadboard Mini Self-Adhesive Red	\$5.27	less 10%

New

Arduino Mega

Description: Arduino is an open-source physical computing platform based on a simple i/o board and a development environment that implements the Processing/Wiring language. Arduino can be used to develop stand-alone interactive objects or can be connected to software on your computer (e.g. Flash, Processing, MaxMSP). The open-source IDE can be downloaded for free (currently for Mac OS X, Windows, and Linux).



The Arduino Mega is a microcontroller board based on the ATmega1280. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.

Price Each	1	5+
ARD-080 Arduino Mega	\$77.89	less 10%

New

Arduino MegaShield Kit

Description: The Arduino Mega now has its very own prototyping shield! The MegaShield mates with the Arduino Mega board and gives the user a prototyping area, two general LEDs, and, most important of all, the Arduino Mega reset switch is brought to the top level. The shield also works with our small breadboards if you don't want to solder to the prototyping area.



This comes in kit form and must be soldered together by the end user. Please note - we do not ship assembly instructions! All soldering is through-hole (relatively easy) but always check your component orientation before soldering!

Kit Includes:

- * 1 - MegaShield PCB
- * 1 - 6-pin stackable female connector
- * 11 - 8-pin stackable female connector
- * 1 - Bright 5mm Green LED
- * 1 - Bright 5mm Red LED
- * 2 - 330 Ohm resistors
- * 1 - Momentary push button
- * 1 - 10k resistor

Features:

- * All Arduino Mega pins are brought to the top level
- * 5V and GND power busses
- * Power and stat (connected to D13) LEDs
- * Reset Button brought to top level

Price Each	1	5+
ARD-081 Arduino MegaShield Kit	\$21.53	less 10%

OCEAN CONTROLS - SECURITY

Weatherproof Door / Alarm Control Keypad

This door access controller keypad is designed for door strike and other access control applications in home or business security installations. It features 3 outputs; 5A NC/NO for door strike and 2 x 1A outputs for alarm triggering or auxiliary security functions. It can be installed so that each user can enter their own 4 digit pin number (up to 9999 users) or alternatively user groups can be assigned allowing up to 100 million possible entry codes.

Features:

- Tamper switch
- 5A 30VDC output for doorstrike
- 2 x 1A 30VDC outputs for alarm triggering
- Single or multi user 4 digit entry codes
- Panic/duress output
- Operation voltage 12VAC/DC
- Dimensions 129H x 84W x 41Dmm



Price Each	1	5+
SEC-001 Weatherproof Door / Alarm Control Keypad	\$57.23	less 10%

RFID Keypad Access Controller

Description: This door access controller keypad is designed for door strike and other access control applications in home or business security installations. The use of RFID tags allows easy movement for authorised users in and out of the building or secure area. It allows 3 methods of entry, by use of keypad only, proximity card only or keypad PLUS proximity card combined. The three inbuilt relays allow control of a door strike at the entry point in addition to 2 independent relays for security system triggering and duress alarm.

Features:

- 12-15VDC operation
- 125KHz frequency.
- Maximum read range 14cm
- Dimensions: 123 x 107 x 21mm
- Entry modes: keypad, proximity card, keypad PLUS proximity card
- 3 relay outputs (door strike, alarm and duress)
- Entry delay



Price Each	1	5+
SEC-003 RFID Keypad Access Controller	\$117.27	less 10%

RFID Weatherproof Door / Alarm Control Keypad

This RFID door access controller is designed for controlling a door strike in home or business security installations. Each user can be assigned an RFID key card which is used to activate the door locking mechanism. For additional security it may also be configured to require a 4 digit code to be entered on the keypad. Up to 500 users can be added to a system. It features 2 x 3A NC/NO relay contacts for door strike connection, plus alarm triggering. An auxiliary 1A relay output is provided for doorbells. Operates with fail-safe or failsecure door strikes.

Features

- Weatherproof design & construction
- Tamper switch
- 2 x 3A relays for doorstrike
- 500 users
- Keypad lock after multiple false entries
- 1A relay for doorbell
- Single or multi user 4 digit entry codes
- Door forced/left open alarm output
- 12V DC operation
- Dimensions 129H x 84W x 41Dmm



Price Each	1	5+
SEC-002 RFID Weatherproof Door / Alarm Control Keypad	\$82.59	less 10%

Weather Proof 100db Siren / Strobe

Description: Combined siren and strobe in a single weather resistant housing. Separate input for siren and strobe.

Black wire - common
White wire - siren
Blue wire - strobe

Specifications:

Supply Voltage: 10- 14V DC
SPL Output: 100dB @ 50cm
Current: 280mA
Flash Rate: 75 per minute
Dimensions (mm): 75W x 120H



Price Each	1	5+
SEC-004 Weather Proof 100db Siren / Strobe	\$29.23	less 10%

OCEAN CONTROLS - REMOTE CONTROLLERS

2 Channel UHF Relay Controller Module

Features 2 Relays rated to 2A at 24V DC and an NPN Transistor Output.

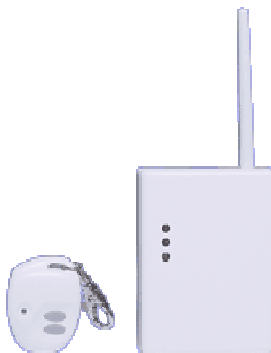
Each Relay can be set to operate in 2 second momentary mode or ON-OFF latching mode.

Pushing both buttons together operates the Transistor Output.

Alternatively the Module can be put into 'Gate Opening' or 'Garage Door' mode. In this mode each relay operates for 2 minutes when the corresponding button is pushed. Pushing any button on the remote while either of the relays are on when in this mode will switch the relays off.

Operates on 12-24V DC or 15V AC.
30m Outdoor Range.

Supplied with one remote and is housed in an attractive case with a Microswitch Tamper Output for Alarm Systems if the cover is removed.
Dimensions 73 x 100 x 25mm, Antenna Protrudes 86mm.



Price Each	1	5+
UHF-001 2 Channel UHF Relay Controller 24VDC	\$141.77	less 10%
UHF-003 Spare Key Remote	\$54.50	less 10%

1 Channel UHF Relay Controller Module

This mains powered unit can switch 240V AC at 6 Amps via its inbuilt relay. Up to 10 remotes can be taught to control the unit. The receiver can operate in 4 modes, On/Off, Latched, Momentary and 2 minute Timed operation. On/Off: The contacts are switched alternately. Latched: The contacts are switched. Momentary: The button must be held down for 1 seconds to operate the relay for 1 second. 2 Minute Timed Output: The button must be held down for 2 seconds to operate the relay for 2 minutes.

Operates on 240VAC

30m Outdoor Range.

Supplied with one remote

Dimensions 73 x 100 x 25mm, Antenna Protrudes 86mm.



Price Each	1	5+
UHF-002 1 Channel UHF Relay Controller 240VAC	\$141.09	less 10%
UHF-003 Spare Key Remote	\$54.50	less 10%

Remote Controlled Mains Outlets

Allows remote control of just about any appliance in the home! This 8 channel mains switching package is suitable for switching up to 1000W. This makes it perfect for automating devices around the home at the touch of a button. Extra mains switches are available allowing up to 8 mains outlets to be controlled remotely. The RF signal used means you don't even need to be in line-of-sight to the outlet unlike some infra-red models available on the market. Please check power consumption of your appliances before making your purchase



Price Each	1	5+
UHF-010 1 UHF Remote Control Mains Outlet	\$27.23	less 10%

Additional UHF Mains Outlets

These are an Additional Mains Outlet for the UHF-010 Remote control as shown above

Maximum switching power: 1000W
Transmission frequency: 433.92MHz
Operating range: 20m



Price Each	1	5+
UHF-011 1 Additional UHF Mains Outlet	\$20.86	less 10%

Rolling Code 2 Channel Relay Board

A 'state of the art' UHF remote control almost impossible to 'crack'. Uses a pre-built 'keyfob' style transmitter (as used in many car lock systems) with 2 pushbuttons, one for each relay on the matching receiver board. Each relay can be either latching or momentary in operation. An LED for each relay indicates when it is operated. The receiver board uses a pre-built UHF receiver module to decode the transmitter signal.

Up to 15 transmitter units can be learnt by one receiver unit.



12VDC plug pack required

Price Each	1	5+
KIT-157 As Kit with transmitter	\$69.95	less 10%
KTA-157 Assembled and Tested	\$89.95	less 10%
KTT-157 Additional Transmitter	\$28.00	less 10%

Rolling Code 4 Channel UHF Relay Board

A 'state of the art' UHF remote control almost impossible to 'crack'. Uses a pre-built 'keyfob' style transmitter (as used in many car lock systems) with 4 pushbuttons, one for each relay on the matching receiver board. Each relay can be either latching or momentary in operation. An LED for each relay indicates when it is operated. The receiver board uses a pre-built UHF receiver module to decode the transmitter signal.

12VDC Plug Pack Required



Price Each	1	5+
KIT-180 As Kit	\$75.00	less 10%
KTA-180 Assembled and Tested	\$95.00	less 10%
KTT-180 Additional Transmitter	\$29.50	less 10%

OCEAN CONTROLS - REMOTE CONTROLLERS

Rolling Code 10 Channel UHF Relay Board

This kit uses the same Tx/RX pair as 4Channel Controller but it uses all 10 defined keypress combinations out of the 4 buttons to activate relays. Buttons 1, 2, 3, and 4 (of course) and the buttons 1&2, 1&3, 1&4, 2&3, 2&4, and 3&4 pressed together. A PIC16F628 does ALL the work Toggle or momentary mode is determined by keeping the one or two buttons depressed for more than 2 seconds and then that relay will stay in that mode until another >2 sec keypress. Small relays are used to save weight and board area. 12VDC plug pack required



Price Each	1	5+
KIT-181 As Kit	\$99.00	less 10%
KTA-181 Assembled and Tested	\$129.00	less 10%
KTT-181 Additional Transmitter	\$29.50	less 10%

Infra Red 12 Channel Relay Board Controller

This kit comprises a commercial 14-button IR remote controller PLUS a 12 channel relay board. All 12 relays are provided on the receiver board - nothing more to add. Makes it very simple to add infrared remote control to any project or existing equipment. Indicator LEDs show which relay is operated. Operating range up to 18 metres/60 feet (length of the factory!). 12VDC Plug Pack Required



Price Each	1	5+
KIT-142 As Kit	\$84.00	less 10%
KTA-142 Assembled and Tested	\$114.00	less 10%
RIR-101 12 Button Remote	\$20.00	less 10%

UHF Sequence Logic Controller

Our UHF Sequence Logic Controller allows you to program the operation of 6 relays based on the condition of the UHF transmitter buttons and digital inputs. You develop the program on your PC, test it on the PC and then download it.

Some control examples are

- On pushing a single button you could automatically open a gate wait a few seconds and then close it.
- Push button 'x' closes relay 'x' and switches off the other relays.
- Security system button 1 opens a gate and turns on the lights, button 2 just turns on the lights for a defined length of time.
- In photography pushing button 1 turns on relay 1 to wind on film then relay 2 is turned on to take the photograph, waits a second then repeats the process 60 more times.

The applications are endless

The logic controller features

- 4 button key FOB UHF 433MHz Transmitter
- 6 Relays with changeover contacts can switch 5 amps @240VAC
- 4 Isolated Digital Inputs
- 2 0-5V Digital Inputs
- screw terminal connections for all inputs and outputs
- 12VDC powered

The controller can handle up to 15 transmitters so if you can have a number of people with their own transmitters operating the controller. The transmitters use rolling code technology so it's close-to-impossible to electronically "crack"

The 4 button transmitter will operate the controller from a distance of up to 50m clear line of site

Tx and Rx Modules Used in KTA-157

These are the same 2 button transmitters and receivers used in our rolling code 2 channel 434MHz UHF relay board Battery is already fitted into the transmitter



Price Each	1	5+
KTT-157 A17-Tx 2 Channel UHF Transmitter	\$28.00	less 10%
KTR-157 A17-Rx 2 Channel UHF Receiver	\$25.00	less 10%

Tx and Rx Modules Used in KTA-180

These are the same 4 button transmitters and 4 channel receivers used in our rolling code 4 channel 434MHz UHF relay board. Battery is already fitted into the transmitter



Price Each	1	5+
KTT-180 A16-Tx 4 Channel UHF Transmitter	\$29.50	less 10%
KTR-180 A16-Rx 4 Channel UHF Receiver	\$24.50	less 10%

Infra Red Relay Controller Board

This kit allows you to turn on and off a variety of electrical devices using almost any household infrared remote control unit (e.g. TV, video, satellite, hi-fi, etc). Relay output rated at 12VDC 5A or 240VAC 3A. If you wish to switch heavier loads use our DIN mounted relays

Push any button of the remote control and the PCB mounted relay will turn on. Push any button a few seconds or hours later and the relay will toggle off. Supply: 8 - 15V DC required PCB measures: 28x74mm.



Price Each	1	5+
KIT-058 As Kit	\$21.95	less 10%
KTA-058 Assembled and Tested	\$35.50	less 10%



Price Each	1	5+
KTA-230 Wireless Sequence Logic Controller.	\$159.00	less 10%
KTA-231 Wireless Sequence Logic Controller no transmitter	\$129.00	less 10%
KTT-180 A16-Tx 4 Channel UHF Transmitter	\$29.50	less 10%

OCEAN CONTROLS - REMOTE CONTROLLERS

Remote Telemetry Unit

The KTA-235, KTA-236 and KTA-237 are an ASCII based easy to use Remote Telemetry Unit or RTU. It is designed to be used with a PC or PLC, where the PC or PLC can remotely control and monitor the status of 6 Relays, 4 optically isolated inputs and 2 Analog inputs. The Analog inputs can also be set to behave as dry contact or open collector digital inputs in cases where analog inputs are not required. **Each unit is individually addressable, which means that multiple controllers can be used on the serial link**, and the option of a serial modem means that units can be wirelessly controlled up to 1000m from the host.



The RTU comes in 3 forms

KTA-235 communicates via an RS232 serial connection. This connection can be multidropped using a combination of diodes and resistors

KTA-236 using a UM96 (9600 baud) wireless modem card. A distance of 500m can be achieved via direct line of sight.

KTA-237 using a UM12 (1200 baud) wireless modem card. A distance of 1000m can be achieved via direct line of sight.

The wireless modems operate in the licence free 433MHz band.

Measures 135(L) x 140(W) x 35(H)mm

Price Each	1	5+
KTA-235 Serial Remote Telemetry Unit	\$129.00	less 10%
KTA-236 Wireless Remote Telemetry Unit 9600Baud.	\$179.00	less 10%
KTA-237 Wireless Remote Telemetry Unit 1200Baud.	\$179.00	less 10%

Wireless Back To Back Controller

We have now reprogrammed our KTA-235 Remote Telemetry Unit or RTU to operate as a back to back controller.

What is a Back to Back Controller?

The KTA-238 has 4 isolated digital inputs, 2 non isolated 0-5V digital inputs and 6 relay outputs. Two KTA-238's are connected by a communications link. The link can be RS232, RS485 or wireless. The status of the inputs for each controller are automatically transmitted to the other controller where they are written to the relay outputs. In the diagram below you will see the switch S1 at Site 2 turns on Motor 1 at Site 1

the switch S2 at Site 2 turns on Lamp 2 at Site 1

the switch S3 at Site 2 turns on Horn 3 at Site 1

the switch S5 at Site 1 turns on Lamp 5 at Site 2



As you can imagine the applications are endless

Turn on a pump from your house. Security if a perimeter contact is broken a horn or lamp is activated at the central location. Alarm if a level in a tank gets low or high an alarm is activated.

Price Each	1	5+
KTA-238 Wireless Back to Back Controller.	\$179.00	less 10%
KTA-239 Serial Back to Back Controller	\$129.00	less 10%

Each KTA-238 controller provides 6 changeover relay outputs each capable of switching 5 amps @240VAC and four opto-isolated digital inputs. All connections to the I/O are via screw connectors.

Measures 135(L) x 140(W) x 35(H)mm.

OCEAN CONTROLS - TEMPERATURE CONTROLLERS

N322 Temperature Thermostats

The Novus N322 Thermostats can be used with NTC Thermistors, PT100 and J Type Thermocouples. The NTC Thermistor model is provided with a NTC Thermistor and 2m long cable to get you up and running immediately. The N322 Thermostats have two relay outputs which can be configured for heating or cooling or a number of different alarm modes and are easily configured by the front panel buttons and display. The Temperature and status of Relays are shown on the LED Display. Great for Aquariums, Home Brewing and many other applications.

- Sensor input: Pt100 (-50 to 300°C), Pt1000 (-200 to 530°C), Thermocouple J,K and T (0 to 600°C) or thermistor (-50 to 120°C).

- IP65 enclosure frontal protection

- Output: 2 relays SPST

- Resolution: 0,1°C from -19,9 to 99,9°C

- Accuracy: $\pm 0,5^{\circ}\text{C}/^{\circ}\text{F} \pm 1$ digit (Pt100/Pt1000/Thermistor) and $\pm 2^{\circ}\text{C}$ for Thermocouple.

- Adjustable hysteresis

- Sampling: 1,5 per second

- Working temperature: 0 to 50°C

- Power supply: 85-250Vac (internal) 12VDC optional



Price Each	1	5+
CET-001 N322 NTC Thermistor Electronic Thermostat	\$89.00	less 10%
CET-002 N322 Pt100 Electronic Thermostat	\$99.00	less 10%
CET-003 N322 Thermocouple Electronic Thermostat	\$99.00	less 10%
CET-004 N322 NTC Electronic Thermostat 12VDC	\$89.00	less 10%

OCEAN CONTROLS - TEMPERATURE CONTROLLERS

N322T Temperature Thermostats with Timer

Temperature controller for heating and refrigeration purposes with timer support. It has PT100 RTD, thermistor NTC or J thermocouples inputs available. Allows energy time delay and minimum on/off time settings. The NTC Thermistor model is provided with a NTC Thermistor and 2m long cable to get you up and running immediately.

The timer output is typically used for the system defrost. The t1 and t2 parameters define, respectively, the interval and duration of the defrost cycles.

Sensor input: Thermistor (-50 to 120 °C), Pt100 (-50 to 300 °C), Thermocouple J (0 to 600 °C).

IP65 enclosure frontal protection

Output: 10 A control relay and 3 A alarm relay

Resolution: 0,1 °C from -19,9 to 199,9 °C

Operating temperature: 0 to 40 °C

Power supply: 100~240 Vac/dc (± 10 %) or 24 Vdc/ac (12~30 Vdc/ac)

RS-485 digital communication; RTU MODBUS protocol (optional)

Dimensions: 75 x 33 x 75 mm



Price Each	1	5+
CET-006 N322T NTC Timer 240VAC	\$109.00	less 10%
CET-008 N322T NTC Timer with RS485 240VAC	\$114.00	less 10%

N323R Temperature Thermostats

N323R Model: This model of temperature controller controls the end of defrosting by temperature. It features three output relays: compressor, defrosting and fan. It operates with two sensors (NTC), one for room temperature and other to be attached to the evaporator for control of defrost end. Employed in cooling and defrosting.

Example: Frozen chambers and displays.

Sensor input: Thermistor (-50 to 120 °C), Pt100 (-50 to 300 °C), Thermocouple J (0 to 600 °C).

IP65 enclosure frontal protection

OUTPUT1: Relay SPDT; 1 HP 250 Vac / 1/3 HP 125 Vac (10 A Resistive)

OUTPUT2: Relay: 3A / 250 Vac, SPST

OUTPUT3: Relay: 3A / 250 Vac, SPST Resolution: 0,1 °C from -19,9 to 199,9 °C

Operating temperature: 5 to 50 °C

Power supply: 100~240 Vac/dc (± 10 %) or 24 Vdc/ac (12~30 Vdc/ac)

RS-485 digital communication; RTU MODBUS protocol (optional)

Dimensions: 75 x 33 x 75 mm



Price Each	1	5+
CET-030 N322R NTC Defrost 240VAC	\$109.00	less 10%

N322 Relative Humidity and Temperature Controller

The N322RHT is a digital controller for relative humidity and temperature. Its 2 relay outputs can be configured independently as control or alarm, either for temperature or relative humidity. A Relative Humidity and Temperature or RHT probe (3 m length) is provided along with the instrument. Both the Temperature, Humidity and status of Relays are shown on the LED Display. Applications include fruit storage and air conditioning.

INPUT SENSOR:

Humidity measurement: Accuracy: Refer to Figure 01;

Stability: < 1 %RH / year;

Range: 0 and 100 % RH

Linearity error: << 1 % RH; Long term Stability: < 1 % RH

Response time: 4 seconds in the range from 10 to 90 %, with slow moving air. Outside this range, up to 48 hours.

Temperature measurement: Accuracy: Refer to Figure 1;

Repeatability: ±0.1 °C;

Range: -40 and 120 °C (-3.8 to 211.8 °F)

Response time: up to 30 seconds in slow moving air.

WARM-UP: 15 minutes

MEASUREMENT RESOLUTION:

Temperature: 0.1° for indications between -19.9° and 119.9° 1° elsewhere

RH: 1%

OUTPUT1:Relay SPDT; 1 HP 250 Vac / 1/3 HP 125 Vac (10 A Resistive)

OUTPUT2:Relay: 3A / 250 Vac, SPST

POWER SUPPLY: 100~240 Vac (± 10 %) or optional 24 Vdc/ac (12~30 Vdc/ac)

DIMENSIONS: Width x Height x Depth: 74 x 32 x 75 mm PANEL CUT-OUT: 70 x 29 mm WEIGHT: 100 g

ENVIRONMENT: Operating temperature: 0 to 40 °C (32 to 122 °F) Storage temperature: -20 to 60 °C (-4 to 140 °F) Relative humidity: 20 to 85 % non condensing

CASE: Polycarbonate UL94 V-2; Protection: Front panel: IP65, Box:

IP42

RS-485 digital communication; RTU MODBUS protocol (optional)



Price Each	1	5+
CET-007 N322RHT Temperature and RH Controller 240VAC	\$195.00	less 10%

OCEAN CONTROLS - PROCESS CONTROLLERS

N440 Process Controller

The N440 is an ON/OFF action digital temperature controller which provides maximum versatility at an economic price and can be a great substitute for the obsolete analog controllers.

It accepts thermocouples type J, K or Pt100 RTD and features one relay and one voltage pulse output for Solid State Relays.

Keypad programming is simple and intuitive and parameters setting can be selectively locked.

The N440 is aimed at simple temperature heating or cooling processes applications that require low cost and yet demand good display accuracy with simple operation.

Features include

- Temperature ranges:
Thermocouple J: 0 to 600 °C, 1 °C resolution.
Thermocouple K: 0 to 1370 °C, 1 °C resolution.
Pt100: -50 to 530 °C; 0.1 °C resolution from -19.9 °C and 199.9 °C
- Thermocouples according to NBR 12771/99, Pt100 NBR 13773/97.
- Pt100 three-wire connection with automatic cable resistance compensation.
- Pt100 excitation current: 170 uA.
- Internal cold junction compensation for thermocouples.
- Accuracy: Thermocouple: 3 °C maximum error, Pt100: 1 °C maximum error.
- A/D converter resolution: 13 bits. Sampling rate: 5 measurements per second.
- Display: 3½ digit LED with 13 mm height.
- Indication and control time response: < 2 s.
- Output 1: SPDT relay, 5 A / 250 Vac. Output 2: 5 Vdc / 20 mA pulse. Optional: 3 A / 250 Vac relay.
- Operating ambient: 0 to 50 °C, 20 to 85 % Relative Humidity, non-condensing.
- Dimensions: 48 x 48 x 110 mm (1.89" x 1.89" x 4.33"). Panel cutout: 45.5 x 45.5 mm.
- Power: 100 to 240 Vac/dc.

Price Each	1	5+
CET-010 N440-CPR In: RTD Out: 1 relay+pulse Pwr: 240VAC	\$109.00	less 10%
CET-015 N440-JPR In: J T/C Out: 1 relay+pulse Pwr: 240VAC	\$114.00	less 10%
CET-020 N440-KPR In: K T/C Out: 1 relay+pulse Pwr: 240VAC	\$109.00	less 10%



N480 Process Controller

The N480D series of PID temperature controllers was designed for non-experienced novice users for combining extreme simplicity in operation with high performance only found in expensive high end controllers.

It is a low-cost instrument which can be easily installed and operated. It accepts J,K and S thermocouples and Pt100 RTD, features a relay and pulse output for driving solid state relays and optionally can be supplied with a linear 4 to 20 mA output.

Autotuning PID function, dual display, full range universal power supply and ramps soak function are standard.

It greatly surpasses the old and obsolete analog controllers in performance with ease of operation.

Features include

- Accepts thermocouples type
J range -50 °C to 760 °C, K range -90 °C to 1370 °C, T range -100 °C to 400 °C
R range 0 to 1760 °C, S from 0 to 1760 °C, E range -30 a 720 °C
N range -90 a 1300 °C
- cold junction compensation.
- Accepts 2 or 3-wire Pt100 RTD, range -200 °C to 530 °C, with cable resistance compensation.
- Pt100 excitation current: 0.170 uA.
- Internal A/D resolution: 15,000 levels
- Displayed resolution: 7,500 levels.
- Four-digit 10 mm red display for measured variable and four-digit 7 mm green display for setpoint.
- Sampling rate: 5 measurements per second.
- Control output update: 200 ms.
- 5 Vdc 20 mA logic control output.
- 1 SPDT relay and 2 SPST 3A @ 250 Vac relays.
- Power: 100 to 240 Vac/dc, 50/60 Hz; optional 24 Vdc/ac.
- Power consumption: less than 9 VA.
- Operating environment: 0 to 55 °C, 20 to 95 % RH.
- Front panel: IP65, Polycarbonate UL94 V-2, Back panel: IP30, ABS+PC UL94 V-0.
- Weight: 140 g with 1 relay, 160 g with 3 relays.
- Dimensions: 48 x 48 x 110 mm (1.89" x 1.89" x 4.33").

Price Each	1	5+
CET-050 N480D T/C, RTD 2 Relays+Pulse Pwr: 240VAC	\$139.00	less 10%
CET-051 N480D T/C, RTD 2 Relays+Pulse Pwr: 24VDC	\$139.00	less 10%
CET-052 N480D T/C, RTD 3 Relays Pwr: 240VAC	\$139.00	less 10%
CET-053 N480D T/C, RAR 2 Relays+Pulse Pwr: 240VAC	\$152.50	less 10%
CET-054 N480D T/C, RAR 2 Relays+Pulse Pwr: 24VDC	\$152.50	less 10%



OCEAN CONTROLS - PROCESS CONTROLLERS

N1100 Process Controller

The N1100 series of Universal Process Controllers is a real breakthrough in versatility for holding in one single instrument all the major features that are needed for the vast majority of industrial processes.

The sophisticated and consistent software and its advanced truly universal SMT circuitry make the N1100 the only 1/16 DIN PID instrument in the world to accept configuration of both input signal and control output through the front keyboard without any hardware change.

From the very simple applications as a temperature controller to the most complex systems of distributed control with PLC's or SCADA networks, the N1100 is the right answer to your needs for industrial, building or laboratory automation

Features include

- Universal Input accepts: Thermocouples J, K, T, S, Pt100, 4-20mA, 50mV, 0-5Vdc
- Double LED display: red for PV and green for SV.
- Outputs: 3A/250Vac Relay, linear 4-20mA and logic pulse for solid state relays available.
- 2 alarms (Relays SPST) more Out linear 4-20mA or logic pulse (standard).
- Up to 2 time relays, 0 to 6500 seconds.
- Input resolution: 12,000 levels.
- PV or SP retransmission in 4 to 20mA.
- RS485 comm with Modbus RTU protocol (optional).
- Auto tuning PID control.
- Auto/Manual mode, bumpless transfer.
- Remote setpoint input (4 to 20mA).
- Programmable Soft start up to 9999 seconds.
- Ramp and Soak: 7 programs of up to 7 segments each. Can be linked to create longer programs of up to 49 segments.
- Power: 85 to 264 Vac, 50/60 Hz. Dimensions: 48 x 48 x 106 mm.



Price Each	1	5+
PID-001 N1100 Process Controller	\$175.00	less 10%
PID-002 N1100 Process Controller with RS485	\$199.00	less 10%
PID-003 N1100 Process Controller 24V	\$175.00	less 10%
PID-004 N1100 Process Controller 24V with RS485	\$199.00	less 10%

N2000 Process Controller

The N2000 Universal Process Controller is a real breakthrough in versatility for holding in one single instrument all the major features required in the vast majority of industrial processes.

With a sophisticated and consistent software and its advanced truly universal circuitry, the N2000 accepts configuration of both input signal and control output through the front keyboard without any internal hardware change.

Power supply for remote loop powered transmitters is standard and is a must for high-end applications.

From the very simple applications as a temperature controller to the most complex systems of distributed control with PLC's or SCADA networks, the N2000 is the right answer to your needs for industrial or laboratory automation.

The **N2000S** is specific for applications in controlling **servo motorized valves, servo actuators and dampers by means of two time proportional relays.**

Features include

- Universal Input accepts thermocouples type J, K, T, N, R, S; Pt100 RTD, linear 4-20 mA, 0-50 mV, 0-5 Vdc.
- Double LED display: red for PV and green for SV.
- Dual SPST 3A/250 Vac relays and dual SPDT 5A/250 Vac relays can be individually programmed for control or alarm.
- Isolated 4-20mA output with 1500-level resolution, maximum 550 ohm load for control or PV/SV retransmission. It can also be configured for digital input or output (10 Vdc/20 mA).
- Sampling rate: 4 measurements per second.
- One digital input for dry contact with 5 programmable functions.
- Remote setpoint input for 4-20 mAdc signal (N2000).
- 24 Vdc/30 mA supply output for remote transmitter excitation.
- RS485 comm with Modbus RTU protocol.
- Auto tuning PID control.
- Auto/Manual mode, bumpless transfer.
- Programmable Soft start up to 9999 seconds.
- Ramp and Soak: 7 programs of up to 7 segments each. Can be linked to create longer programs of up to 49 segments.
- Measured value resolution: 12,000 levels.
- Control output update: 250 ms.
- Up to four configurable relays, two timer alarms.
- Alarm functions: LO, HI, differential, differential LO, differential HI, sensor break and event.
- Alarm initial blocking function.
- Power: 85 to 250 Vac, 50/60 Hz; optional 24 Vdc/ac.
- Dimensions: 48 x 96 x 92 mm.



Price Each	1	5+
PID-010 N2000 Process Controller with RS485	\$239.00	less 10%
PID-020 N2000S Servo Positioning Process Controller with RS485	\$259.00	less 10%



OCEAN CONTROLS - PROCESS CONTROLLERS

N1200 PID Controller

The N1200 is an advanced self-adaptive PID controller with an algorithm that constantly monitors the process performance and adjusts PID settings in order to always obtain the best possible control response.

A single model is able to accept most industrial sensors and signals and provides all output types required to control different processes.

All controller parameters can be accessed from the front panel without performing any hardware change.

The multi-purpose inputs and outputs can be combined to provide tremendous versatility with extremely high accuracy in the most demanding applications.

A Modbus RTU RS485 is an optional extra. You can use the Superview software or ISEE-Modbus Software to monitor and set parameters in the controller



Features include

- Accepts thermocouples J, K, N, R, T, S, B, E, Pt100 RTD, 0-20 mA, 4-20 mA, 50 mV, 0-5 Vdc and 0-10 Vdc.
- Internal resolution: 32,767 levels (15 bits).
- Displayed resolution: 12,000 levels.
- Dual LED display: red upper display for PV, 10 mm high; green lower display for SV, 8 mm high.
- Sampling: up to 55 measurements/second.
- Control output update: up to 20 ms.
- Isolated 4-20 mA output with up to 32,000 resolution levels (15 bits), 550 ohms maximum load.
- 2 SPST relays 1,5 A / 240 Vac/dc and 1 SPDT relay (optional)
- 3 A/250 Vac/dc.
- Power supply: 100 to 240 Vac/dc, 50/60 Hz; optional 24 Vac/dc.
- Maximum consumption: 9 VA.
- Operating environment: 5 to 50 °C, 30 to 80% RH.
- Protection: NEMA 4 front bezel (IP65), PC UL94 V-2 case IP20, ABS + PC UL94 V-0.
- Rated CE and UL.
- Dimensions: 48 x 48 x 110 mm.
- Panel cutout: 45.5 x 45.5 mm (1.79 x 1.79 in)
- Approximate weight: 150 g

Price Each	1	5+
PID-040 N1200 24V Self Adaptive PID Controller	\$259.00	less 10%
PID-041 N1200 Self Adaptive PID Controller	\$259.00	less 10%
PID-042 N1200 Self Adaptive PID Controller w/ 3 relays +RS485	\$329.00	less 10%
PID-043 N1200 24V Self Adaptive PID Controller w/ 3 relays +RS485	\$333.00	less 10%

N3000 Process Controller

The N3000 Big Digit Universal Process Controller is a real breakthrough in versatility for holding in one single instrument all the major features required in the vast majority of industrial processes.

With a sophisticated and consistent software and its advanced truly universal circuitry, the N3000 accepts configuration of both input signal and control output through the front keyboard without any internal hardware change.

Power supply for remote loop powered transmitters is standard and is a must for high-end applications.

From the very simple applications as a temperature controller to the most complex systems of distributed control with PLC's or SCADA networks, the N3000 is the right answer to your needs for industrial or laboratory automation. A Modbus RTU RS485 connection is fitted. You can use the [Superview](#) software or [ISEE-Modbus](#) Software to monitor and set parameters in the controller



Features include

- Double LED display: red for PV (18 mm) and green for SV (13 mm).
- Accepts thermocouples type J, K, T, N, R, S; Pt100 RTD, linear 4-20 mA, 0-50 mV, 0-5 Vdc.
- Sampling rate: 4 measurements per second. - Measured value resolution: 12,000 levels.
- One digital input for dry contact with 5 programmable functions.
- Remote setpoint input for 4-20 mAdc signal.
- Dual SPST 3 A / 250 Vac relays and dual SPDT 5 A / 250 Vac relays can be individually programmed for control or alarm.
- Isolated 4-20 mA output with 1500-level resolution, maximum 550 ohm load for control or PV/SV retransmission. It can also be configured for digital input or output (10 Vdc / 20 mA).
- Auto tuning PID control. Auto/Manual mode, bumpless transfer. - Programmable Soft start up to 9999 seconds.
- Ramp and Soak: 7 programs of up to 7 segments each. Can be linked to create longer programs of up to 49 segments.
- Control output update: 250 ms.
- Up to four configurable relays, two timer alarms.
- Alarm functions: LO, HI, differential, differential LO, differential HI, sensor break and event.
- Alarm initial blocking function.
- Power: 100 to 240 Vac, 50/60 Hz; optional 24 Vdc/ac.
- Maximum consumption: 3 VA.
- 24 Vdc / 30 mA supply output for remote transmitter excitation.
- RS485 comm with Modbus RTU protocol (optional).
- Front panel: IP65, Polycarbonate UL94 V-2.
- Back panel: IP30, ABS + PC UL94 V-0.
- Operating environment: 0 to 55 °C, 20 to 85 % RH.
- Dimensions: 96 x 96 x 92 mm. Panel cutout: 93 x 93 mm Weight: 330 g.

Price Each	1	5+
PID-030 N3000 Process Controller 240VAC with RS485	\$259.00	less 10%
PID-031 N3000 Process Controller 24VDC with RS485	\$259.00	less 10%

OCEAN CONTROLS - PROCESS CONTROLLERS

KTA-389 4 Channel Temperature Monitor & Controller!

This kit is an 'extension' of the KTA145 Temperature Logger kit. Like the KTA145 it features four (4) temperature inputs using the DS1820 digital sensor. In addition four (4) relays have been added to provide output control. Supplied with plastic case and front/rear panels for a professional looking finish.

Commands for reading temperatures or controlling relays are sent via the RS232 interface using simple text strings. The kit can be controlled using a simple terminal or communications program (such as Hyperterminal) or via a freeware Windows application (see below) **Connected to a PC you will be able to carry out ON/OFF temperature control.**

Temperature range: -55 to +125 degrees C

Please note: The kit does not include any DS18S20 temperature sensors. They have to be purchased separately.

Typical applications include
Computer server monitoring
Home temperature monitoring
Home automation tasks (start fan if warmer outside during Summer)
Refrigerator monitoring and testing
Brewing temperature regulation
Fish tank heater verification



Price Each	1	5+
KIT-389 Serial Temperature Monitor Kit	\$95.00	less 10%
KTA-389 Serial Temperature Monitor Assembled	\$115.00	less 10%
PTP-003 DS18S20 Temperature Transducer	\$12.00	less 10%
CAB-002 D9 RS232 Male-Female Cable 1.8 metres	\$8.77	less 10%
PLP-003 12VDC, 500mA Plug Pack	\$14.55	less 10%

Anemometer Interface Card

The KTA-250 is an anemometer monitoring and alarming card. It allows the wind speed and direction to be measured with a Davis Instruments DS7911 Anemometer, without the need for the entire weather station. Monitoring of the wind speed and direction can be done via the analog retransmission channels with 0-5V, 1-5V, 0-20mA or 4-20mA outputs. As well as monitoring the speed and direction, 2 alarm relays can be programmed to activate at a certain speed or wind direction range, or combination of the two. Wind speed and direction can also be monitored using the Modbus protocol with either an RS232 or 2-wire RS485 connection. All settings are set using the Modbus protocol and the provided software.

Features

- *Connects to Davis Instruments DS7911 Anemometer
- 8Monitor both the wind speed and direction
- *Interface to PLC's using the Modbus protocol
- *Communicate via RS232 or 2-wire RS485
- *Interface to PLC's/Instruments or other controllers using 4-20mA or 0-5V signals
- *Generate relay alarms depending on the wind speed and direction
- *Alarms can be monitored by the on board relays or via the Modbus protocol
- *DIN Rail mounting available



Price Each	1	5+
KTA-250 Anemometer Interface Card	\$159.00	less 10%
KTD-250 Anemometer Interface Card DIN Rail	\$179.00	less 10%
ANM-001 Davis Instruments 7911 Anemometer	\$215.00	less 10%

Price Each	1	5+
ECS-001 Wireless Vantage Pro 2	\$980.00	less 10%
ECS-002 Wireless Vantage Pro 2 Plug	\$1560.00	less 10%
ECS-003 WeatherLink for Vantage Pro Serial	\$260.00	less 10%

KTA-390 4 Channel Temperature Controller!

We have reprogrammed the microcontroller in the KTA-389 to become a standalone 4 channel temperature ON-OFF Controller. The controller can do both heating and cooling. So you can control the temperature in 4 fish tanks or 4 heaters for brewing. Supplied with plastic case and front/rear panels for a professional looking finish.

Commands for reading temperatures, controlling relays, setting ON-OFF temperatures are sent via the RS232 interface using simple text strings. A simple to use Windows program allows you to easily program the controller. Once programmed you can separate the controller from the PC and it will operate on its own. All parameters are saved in EEPROM so they are not lost if power is removed from the controller

Please note: The kit does not include any DS18S20 temperature sensors. They have to be purchased separately.



Price Each	1	5+
KTA-390 Serial Temperature Controller Assembled	\$145.00	less 10%
PTP-003 DS18S20 Temperature Transducer	\$12.00	less 10%
CAB-002 D9 RS232 Male-Female Cable 1.8 metres	\$8.77	less 10%
PLP-003 12VDC, 500mA Plug Pack	\$14.55	less 10%

Modbus-VantagePro2 Gateway

Our Modbus to Davis VantagePro2 Weather Station Gateway allows you to easily connect your PLC (Programmable Logic Controller), RTU (remote telemetry unit) or SCADA System to a Davis Vantage Pro2 Weather Station. Using the Modbus RTU protocol it enables your programmable controller to monitor and carry out actions based on wind speed, wind direction, temperature etc.

Features

- *Connect weather station to Gateway
- RS232 Com Port 1 Baud rate 19200
- *Connect the PLC to Gateway Com port 2.
- *PLC Connection can be RS232 or RS485.
- *PLC Connection selectable Modbus address 1 to 16.
- selectable baud rate 2400, 4800,9600 or 19200
- selectable parity none, odd, even
- *Transfer readings
- Outdoor Temperature, Humidity
- Wind Speed, Wind Direction
- Rainfall (Precipitation)
- Barometric Pressure
- Indoor Temperature and Humidity (console)
- Solar Radiation
- Evaporative Transfer
- Daily, Monthly, Yearly Rainfall
- * Communications OK status between the weather station and gateway



Price Each	1	5+
GWY-140 Modbus to Davis VantagePro Weather Station Card	\$139.00	less 10%
GWY-141 Modbus to Davis VantagePro Card DIN Rail	\$159.00	less 10%

Modbus-VantagePro2 Weather Stations

The first and only weather station in its class to use frequency hopping spread spectrum radio technology to transmit weather data wirelessly up to 1000' (300 m).

Includes Vantage Pro2 console/receiver, integrated sensor suite, and mounting hardware. Integrated sensor suite includes rain collector, temperature and humidity sensors, anemometer, 40' (12 m) anemometer cable, and solar panel. Electronic components are housed in a weather-resistant shelter.

Sensor suite is solar powered. Electronic components are housed in a weather-resistant shelter. Console may be powered using the included AC-power adapter or with three C batteries (not included).

Wireless range is up to 1000' (300 m) outdoors, line of sight. Typical range through walls under most conditions is 200' to 400' (60 to 120 m). Add wireless repeaters for distances up to 1.7 miles (2.7 km).



OCEAN CONTROLS - CONTROLLERS

TRIP Amplifier or Analog Monitor Card

The Dual Trip Alarm or Alarm Monitor allows you to monitor 0-20mA, 4-20mA and 0-5V analog signals. Alarm 1 has 10 different modes of operation. Alarm 2 has 9 different modes of operation.

The Dual Alarm monitor is easily configured by a PC program via its serial port. All alarm parameters are stored into the non volatile EEPROM memory. Configurations can be saved to your PC's hard drive

Modes include

- High Level Alarm. A relay is switched on when the analog input level remains above a specified High Level. Relay is switched off on returning to Low Level
- Low Level Alarm. A relay is switched on when the analog input level remains below a specified Low Level. Relay is switched off on returning to High Level
- High Low Level Alarm. A relay is switched on when the analog input level remains above a specified High Level or below a specified Low Level.

Can be used to on-off control of pumps, compressors, ovens etc



Price Each	1	5+
ALM-001 Trip Alarm/Alarm Monitor	\$79.50	less 10%
ALD-001 Trip Alarm/Alarm Monitor DIN Rail Mount	\$109.50	less 10%

OCEAN CONTROLS - COUNTERS & TIMERS

7 Digit LCD Counter

This self powered counter (internal battery) can count up to 9999999 and retains data at least 10 years. It comes in two forms the CH-7N (accepts NPN signals) and the CH-7P (accepts PNP signals). The maximum input signal frequency is 20Hz.

It also features a reset switch on the front panel



Ambient Operating Temperature 0 to 50degC
Ambient Operating Humidity 35 to 85%RH
Measure 45(W)x22(H)x48(D)mm

Price Each	1	5+
CH-07N 7 Digit LCD Counter NPN Input	\$42.50	less 10%
CH-07P 7 Digit LCD Counter PNP Input	\$42.50	less 10%

7 Digit LCD Timer

This self powered timer (internal battery) comes in two forms TH-7NM and the TH-7NH.

The TH-7NM accepts a NPN signal or relay contact to common and counts up to 999999.9 minutes.

The TH-7NH accepts a NPN signal or relay contact to common and counts up to 999999.9 hours.

Both types retain data for at least 10 years.

They also feature a reset switch on the front panel

Ambient Operating Temperature 0 to 50degC

Ambient Operating Humidity 35 to 85%RH

Measure 45(W)x22(H)x48(D)mm



Price Each	1	5+
TH-7NM 7 Digit LCD Minute Timer	\$42.50	less 10%
TH-7NH 7 Digit LCD Hour Timer	\$42.50	less 10%

Multi Function Programmable Timer

This timer from Crouzet would have to be the most flexible timer in the market. Features include

7 timing ranges - 1s - 10s - 1min - 1hr - 10hr - 100hr

10 different functions

Supply Voltage 12 - 240V AC/DC

Output - 1 Change over relay

DIN rail mountable

Price Each	1	5+
TIM-001 Crouzet Mur3 Multi Function Timer	\$84.00	less 10%



OCEAN CONTROLS - COUNTERS & TIMERS

Multi Function Programmable Timer Kit

This timer supports up to 7 different modes of operation. It can be programmed with a delay time of 1 second to 2550 minutes. Can switch up 240VAC @ 5A. Perfect for Watch-dog Timer applications.



Price Each	1	5+
KIT-141 As Kit	\$33.50	less 10%
KTA-141 Assembled Timer	\$48.50	less 10%

Square Wave Oscillator

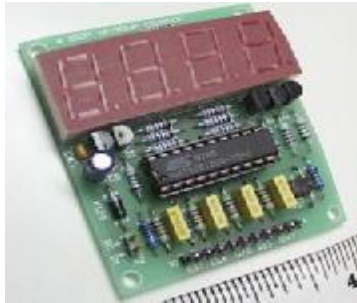
This simple kit, based on the popular 555 timer IC. It generates six preset frequencies - 1Hz, 10Hz, 100Hz, 1KHz, 10KHz and 100KHz. The output is selected by setting a jumper position (J1 to J6). It has a wide operating voltage (5-18V) and even provides visual indication (LED) of the output. A 9V battery snap is provided and a suitable mounting box sup-



Price Each	1	5+
KIT-111 As Kit	\$20.00	less 10%
KTA-111 Assembled and Tested	\$35.00	less 10%

4 Digit Up Down Counter

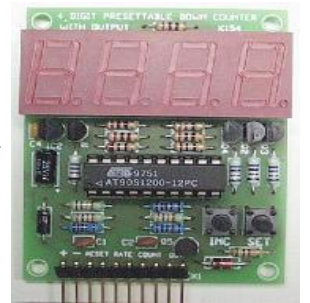
This is a low cost 4 Digit Up Down. As a count up counter its range is from 0000,1,2.. to 9999. It can also count down. Inputs include "Reset", "Count", "Count Direction" and "Disable". It also has an "Overflow" output for connecting to another counter which allows an 8 Digit counter to be made.



Price Each	1	5+
KIT-129 As Kit	\$33.00	less 10%

4 Digit Presettable Down Counter

A low cost 4 digit presettable down counter with output and reset. The starting count value can be set using 2 pushbuttons. The counter can be used for both high and low speed counting applications. The counter has 4 operating modes that control how the output behaves when the count reaches zero.



Price Each	1	5+
KIT-154 As Kit	\$33.00	less 10%

Clear Top Bulkhead Case

The 4 Digit timers and Up Down Counters can be mounted in our clear Bulkhead Plastic case to give a budget priced sealed timer. The case has a clear top that allows you to view the contents of the box. Measures 120x70x30mm.



Price Each	1	10+
CAS-001 Clear Top Bulkhead Case	\$10.86	less 10%

Dual Cyclic Timer or Pulse Generator

For each cyclic timer you can configure the width of the high and low portion of the pulse (0 to 9999999.9 secs) and the number of pulses (1 to 9999999). A 0 for the number of pulses indicates endless pulses. A led indicates when the cyclic timer is finished. Two digital inputs control the operation of the timer. An enable pin starts the timer. A reset pin causes the cyclic timer pulses to restart again . The Dual Cyclic Timer is easily configured by a PC program via its serial port. All parameters are stored into EEPROM memory.



Price Each	1	5+
CYC-001 Cyclic Timer / Pulse Generator Card	\$79.50	less 10%
CYC-002 Cyclic Timer / Pulse Generator on DIN Rail	\$109.50	less 10%

OCEAN CONTROLS - COUNTERS & TIMERS

Programmable Timer

With a 4 digit display, this timer offers a relay output to be switched at pre-programmed intervals according to eleven different timing functions. The LED display shows the running time and the digital inputs execute start, hold and reset functions. Dimensions: 48x48mm x 100mm (1/16 DIN).

Features Include

Input types: NPN/PNP, dry contact and voltage pulse.

Output type: 3A @ 250Vac relay or 5vdc voltage pulse.

Display: high efficiency 10mm LED.

Switching power supply: 12-24Vdc/ac or 85-264Vac.

Dimensions: 48x48mm x 100mm.

Up and down counting.

Eleven different timer modes. One mode is user defined.

Three digital inputs for special functions.

Frontal key to execute one pre-programmed special function.

Programmable time range from 0.01 second to 9999 hours.



Programmable 6 Digit Counter

This programmable 6-digit counter is also a batch counter and totalizer, performs quadrature counting and accepts remote reset.

Its 2 outputs with built-in timers can be activated at any of the 3 counter presets: unit, batch or totalizer.

It features a special function key, full scale adjustment and several other advanced configuration options.

- Input types: (2 for counting, 1 reset) type

NPN/PNP, dry contact (relay, switch, etc) or voltage pulse.

- Max. count frequency: 50 Hz or 10 kHz.

- Counter scale factor: 0.00001 to 9.99999.

- Counting: UP or DOWN.

- F key: counter hold, counter reset, outputs reset.

- Outputs: 1 SPST relay and 1 pulse 5 V/25 mA output.

- Output timer: 10 ms to 9999 s.

- Power: 100~240 Vac/dc $\pm 10\%$ or 24 Vdc/ac.

- Internal battery for data hold.

- Sensor supply output: 12 Vdc/50 mA.

- IP65 UL94 V-2 front panel; IP20 UL94 V-0 enclosure; silicone rubber keypad.

- Size: 48 x 48 x 110 mm.



Price Each	1	5+
TIM-010 Programmable Timer 240VAC	\$119.00	less 10%
TIM-011 Programmable Timer 24VDC	\$119.00	less 10%

7 Day Digital Timer

This 7 Day Digital Timer can switch on and off up to 10 times per day. Has a 'random' function which turns appliances on and off at non-specified times between the hours 6pm and 6am (great for when you are on holiday). Also features a countdown timer which may be used to turn appliances on or off after a specified time interval.



Price Each	1	5+
NOV-400 6 Digit Counter Relay+Pulse Out 240VAC	\$129.00	less 10%
NOV-401 6 Digit Counter Relay+Pulse Out 24VDC	\$129.00	less 10%
NOV-405 6 Digit Counter Relay+Pulse RS485 240VAC	\$129.00	less 10%
NOV-405 6 Digit Counter Relay+Pulse RS485 24VDC	\$129.00	less 10%

Price Each	1
TIM-021 7 Day Digital timer	\$22.68

OCEAN CONTROLS - ELECTRICAL PARTS

Universal DIN Rail Terminals

Our new line of DIN-Rail terminals will impress both on quality and price. If you would like a **free sample pack** to inspect then [email us](#)



Type(IEC ROHS)	SKJ-2.5	SKJ-4	SKJ-6	SKJ-10	SKJ-16	SKJ-35
W/T/H(mm)	42.5/5.2/46.5	42.5/6.2/46.5	42.5/8.2/46.5	42.5/10.2/46.5	42.5/12.2/50.5	50.5/15.2/61
Voltage(V)	800	800	800	800	800	1000
Current(A)	32	41	57	76	101	150
Rigid cable (mm2)	1.0-4/AWG24-12	0.2-6/AWG24-10	0.2-10/AWG24-8	0.5-16/AWG20-6	2.5-25/AWG12-4	0.75-50/AWG18-00
Soft cable (mm2)	1.0-2.5/AWG24-12	0.2-4/AWG24-10	0.2-6/AWG24-8	0.5-10/AWG20-6	4-16/AWG12-4	0.75-35/AWG18-00

Price Each	1+	10+
TRM-007 SKJ-2.5 Universal 2.5mm Terminal	\$0.99	less 10%
TRM-010 SKJ-4 Universal 4mm Terminal	\$0.99	less 10%
TRM-013 SKJ-6 Universal 6mm Terminal	\$1.39	less 10%
TRM-016 SKJ-10 Universal 10mm Terminal	\$1.89	less 10%
TRM-019 SKJ-16 Universal 16mm Terminal	\$2.39	less 10%
TRM-022 SKJ-35 Universal 35mm Terminal	\$4.10	less 10%

Fuse and Switch DIN Rail Terminals



Type(IEC ROHS)	SKJ-2.5RD	SKJ-4RD	SKJ-4RDX	SKJ-10RD	SKJ-10RD	SKJ-2.5SK
W/T/H(mm)	58.5/8.0/43.5	72.5/8.2/56	72.5/8.2/56	62.4/12.2/56	62.4/12.2/56	52/6.2/46
Voltage(V)	660	660	660	660	660	400
Current(A)	6.3	6.3	6.3	10	10	16
Rigid cable (mm2)	0.2-4/AWG24-12	0.2-4/AWG24-12	0.2-4/AWG24-12	0.5-16/AWG12-4	0.5-16/AWG12-4	0.2-4/AWG24-12
Soft cable (mm2)	0.2-2.5/AWG24-12	0.2-4/AWG24-12	0.2-4/AWG24-12	0.5-16/AWG12-4	0.5-16/AWG12-4	0.2-4/AWG24-12
Fuse or Switch	Fuse	Fuse	Fuse	Fuse	Fuse	Switch
LED Indication	No	No	Yes	No	Yes	No

Price Each	1+	10+
TRM-041 SKJ-2.5RD Fuse Terminal	\$2.19	less 10%
TRM-044 SKJ-4RD Fuse Terminal	\$2.39	less 10%
TRM-047 SKJ-4RD/X Fuse Terminal	\$3.12	less 10%
TRM-050 SKJ-10RD Fuse Terminal	\$3.45	less 10%
TRM-053 SKJ-10RD/X Fuse Terminal	\$4.50	less 10%
TRM-056 SKJ-2.5SK Test Switch	\$2.45	less 10%

Earth DIN Rail Terminals



Type(IEC ROHS)	SKJ-2.5JD	SKJ-4JD	SKJ-6JD	SKJ-10JD
W/T/H(mm)	42.5/5.2/46	64/6.2/46.4	42.5/8.2/46	42.5/8.2/46
Torque(Nm)	0.5-0.7	0.5-0.7	1.5-1.8	1.5-1.8
Current(A)				
Rigid cable(mm2)	0.2-6/AWG24-12	0.2-6/AWG24-12	0.2-10/AWG24-8	0.5-16/AWG20-6
Soft cable (mm2)	0.2-2.5/AWG24-12	0.2-4/AWG24-12	0.2-6/AWG24-8	1.5-10/AWG20-6

Price Each	1+	10+
TRM-071 SKJ-2.5JD Earth Terminal 2.5mm	\$2.25	less 10%
TRM-074 SKJ-4JD Earth Terminal 4mm	\$2.29	less 10%
TRM-077 SKJ-6JD Earth Terminal 6mm	\$2.69	less 10%
TRM-091 SKJ-6JD Earth Terminal 10mm	\$1.99	less 10%

OCEAN CONTROLS - ELECTRICAL PARTS

Jumpers For Terminals



Type(IEC ROHS)	10 Way Internal Jumper	10 Way External Jumper
SJK-2.5	SFB1-10-5	SEB2-10-5
SJK-4	SFB1-10-6	SEB2-10-6
SJK-6	SFB1-10-8	SEB2-10-8
SJK-10	SFB1-10-10	SEB2-10-10
SJK-16	SFB1-10-12	SEB2-10-12

Price Each	1+	10+
TRM-092 SFB1 10-6 INTERNAL JUMPER for SJK4	\$1.99	less 10%
TRM-093 SFB1 10-8 INTERNAL JUMPER for SKJ6	\$2.29	less 10%
TRM-094 SFB1 10-10 INTERNAL JUMPER for SJK-10	\$2.79	less 10%
TRM-095 SFB1 10-12 INTERNAL JUMPER for SJK-16	\$3.25	less 10%
TRM-101 SEB 10-5 EXTERNAL JUMPER for SKJ2.5	\$1.50	less 10%
TRM-102 SEB 10-6 EXTERNAL JUMPER for SKJ4	\$1.99	less 10%
TRM-103 SEB 10-8 EXTERNAL JUMPER for SJK6	\$2.29	less 10%
TRM-104 SEB 10-10 EXTERNAL JUMPER for SJK10	\$2.99	less 10%

Accessories for Terminals



Type IEC ROHS	SKJ2G/2	SKJ-B1	SKJ-G(ATP-UK)	SKJ-G(DUK)
Description	End Clamp	Label	Grouping Clap Board	End Plate
Suitable for	All SKJ Terminals	All SJK Terminals	SJK 2.5 to 16 Terminals	SJK 2.5 to 16 Terminals

Price Each	1+	10+
TRM-111 SKJ-2.5XG END PLATE	\$0.59	less 10%
TRM-112 SKJ-2G2 END CLAMP	\$0.69	less 10%
TRM-113 SKJ-B1 MARK SEAT	\$0.69	less 10%
TRM-114 SKJ-G(ATP-UK) GROUPING STOP	\$0.79	less 10%
TRM-115 SKJ-G(DUK) END PLATE	\$0.59	less 10%

Plastic Cable Glands

IP68 CE RoHS

PG TYPE

Material: nylon plastic

Hermetic seal: nitrile rubber

Ambient temperature:

quiescent state -40degC to 100degC,

short time to 120degC

dynamic

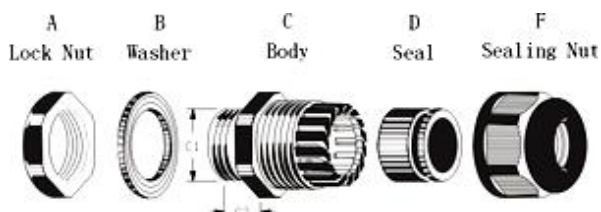
-20degC to 80degC,

short time to 100degC.

Supply color: Grey,Black, Other color please inquire



Price Each	1+	10+
CGL-001 PG7 Grey Cable Gland	\$1.50	less 10%
CGL-004 PG9 Grey Cable Gland	\$1.60	less 10%
CGL-007 PG11 Grey Cable Gland	\$1.70	less 10%
CGL-010 PG13.5 Grey Cable Gland	\$1.80	less 10%
CGL-013 PG16 Grey Cable Gland	\$1.90	less 10%
CGL-016 PG19 Grey Cable Gland	\$2.00	less 10%
CGL-019 PG21 Grey Cable Gland	\$2.10	less 10%
CGL-022 PG25 Grey Cable Gland	\$2.30	less 10%
CGL-025 PG29 Grey Cable Gland	\$2.75	less 10%



ITEM. NO.	D1	D2	L1	L2	L3	B1	Cable range
PG-07	10.9	8.1	10.4	14.5	10.5	6.4	3.5-6
PG-09	15.3	12.2	9.9	15.8	17.2	8.6	4-8
PG-11	17.9	14.6	10.6	15.5	17.5	10.7	5-10
PG-13.5	20.2	16.2	10.3	17.8	17.9	13.3	6-12
PG-16	21.3	18.3	11.2	18.5	20.5	14.3	10-14
PG-19	24.7	20.5	11.4	18.6	21.8	15.5	12-15
PG-21	26.9	21.8	11.6	18.7	23.1	16.7	13-18
PG-24	29.8	25.0	12.1	28.3	24.1	19.2	15-22
PG-29	35.1	29.8	12.4	22.6	24.8	24.8	18-25
PG-36	44.7	37.1	12.6	25.1	26.1	30.7	22-32
PG-42	50.4	43.3	17.3	25.9	30.5	35.6	30-38
PG-48	56.1	48.2	20.9	28.1	31.5	41.4	34-44
PG-63	71	63.5	27.5	31.5	43.5	55	42-54

OCEAN CONTROLS - ELECTRICAL PARTS & ENCLOSURE

Heatshrink Tubing

Temperature Rating 125degC
Voltage Rating 600V
Flammability VW-1
Certificated by UL, CSA.
Sizes range from 1.5 to 50mm dia
Supply color: Black, Red and Blue



Sold in 1 metre lengths

ITEM. NO.	BEFORE SHRINKAGE		AFTER SHRINKAGE		PACKING (M/ROLL)
	I. D (mm)	THICKNESS	I. D (mm)	THICKNESS	
SMS-1	1.0	0.2±0.05	0.5	0.4±0.05	400m
SMS-1.5	1.5	0.2±0.05	0.75	0.4±0.05	300m
SMS-2	2.0	0.25±0.05	1.0	0.45±0.1	200m
SMS-100	100.0	0.7±0.1	50.0	1.30±0.2	25m

Price Each	1+	10+
HSH-001 Black 1metre 1.5/0.75	\$0.75	less 10%
HSH-002 Black 1metre 2.5/1.25	\$0.90	less 10%
HSH-003 Black 1metre 3.5/1.75	\$1.10	less 10%
HSH-004 Black 1metre 5.0/2.5	\$1.30	less 10%
HSH-005 Black 1metre 7.0/3.5	\$1.60	less 10%
HSH-006 Black 1metre 10/5.0	\$2.00	less 10%
HSH-007 Black 1metre 15/7.5	\$2.80	less 10%
HSH-008 Black 1metre 20/10	\$3.10	less 10%
HSH-009 Black 1metre 25/12.5	\$3.90	less 10%
HSH-010 Black 1metre 30/15	\$4.80	less 10%
HSH-011 Black 1metre 40/20	\$6.10	less 10%
HSH-012 Black 1metre 50/25	\$7.50	less 10%
HSH-021 Red 1metre 1.5/0.75	\$0.75	less 10%
HSH-022 Red 1metre 2.5/1.25	\$0.90	less 10%
HSH-023 Red 1metre 3.5/1.75	\$1.10	less 10%
HSH-024 Red 1metre 5.0/2.5	\$1.30	less 10%
HSH-025 Red 1metre 7.0/3.5	\$1.60	less 10%
HSH-026 Red 1metre 10/5.0	\$2.00	less 10%
HSH-027 Red 1metre 15/7.5	\$2.80	less 10%
HSH-028 Red 1metre 20/10	\$3.10	less 10%
HSH-029 Red 1metre 25/12.5	\$3.90	less 10%
HSH-030 Red 1metre 30/15	\$4.80	less 10%
HSH-031 Red 1metre 40/20	\$6.10	less 10%
HSH-032 Red 1metre 50/25	\$7.50	less 10%
HSH-041 Blue 1metre 1.5/0.75	\$0.75	less 10%
HSH-042 Blue 1metre 2.5/1.25	\$0.90	less 10%
HSH-043 Blue 1metre 3.5/1.75	\$1.10	less 10%
HSH-044 Blue 1metre 5.0/2.5	\$1.30	less 10%
HSH-045 Blue 1metre 7.0/3.5	\$1.60	less 10%
HSH-046 Blue 1metre 10/5.0	\$2.00	less 10%
HSH-047 Blue 1metre 15/7.5	\$2.80	less 10%
HSH-048 Blue 1metre 20/10	\$3.10	less 10%
HSH-049 Blue 1metre 25/12.5	\$3.90	less 10%
HSH-050 Blue 1metre 30/15	\$4.80	less 10%
HSH-051 Blue 1metre 40/20	\$6.10	less 10%
HSH-052 Blue 1metre 50/25	\$7.50	less 10%

22-23 Industrial Control Enclosure 115x90x40 mm

Size: 115x90x40 mm
Material—ABS Plastic
IP Protection Class: no
Battery: no



Price Each	1
ENC-006 22-23 Industrial Control Enclosure 115x90x40 mm	\$15.95

23-16 Standard Din-rail Enclosure 101x115x45 mm

Size: 101x115x45 mm
Material—Aluminium Cover and Bottom
IP Protection Class: no
Battery: no



Price Each	1
ENC-001 23-16 Standard Din-rail Enclosure 101x115x45 mm	\$17.50

23-16A Standard Din-rail Enclosure 101x115x45 mm

Size: 101x115x45 mm
Material—Aluminium Cover and Bottom
IP Protection Class: no
Battery: no



Price Each	1
ENC-002 23-16A Standard Din-rail Enclosure 101x115x45 mm	\$23.50

23-14 Standard Din-rail Enclosure 101x115x55 mm

Size: 101x115x55 mm
Material—Aluminium Cover and Bottom
IP Protection Class: no
Battery: no



Price Each	1
NC-003 23-14 Standard Din-rail Enclosure 101x115x55 mm	\$17.50

23-14A Standard Din-rail Enclosure 101x115x55 mm

Size: 101x115x55 mm
Material—Aluminium Cover and Bottom
IP Protection Class: no
Battery: no



Price Each	1
ENC-004 23-14A Standard Din-rail Enclosure 101x115x55 mm	\$23.50

22-62 Industrial Control Enclosure 115x90x41 mm

Size: 115x90x41 mm
Material—ABS Plastic
IP Protection Class: no
Battery: no



Price Each	1
ENC-005 22-62 Industrial Control Enclosure 115x90x41 mm	\$15.95

OCEAN CONTROLS - MICROCONTROLLER PROGRAMMERS

AVRISP-MKII In-System Programmer

The Atmel® AVRISP MK2 (AVRISP MKII Communication Protocol) is an In-System Programmer for Atmel's AVR® Flash microcontrollers. The AVRISP MK2 gives the designer a compact and reliable programming tool to program all In-System Programmable AVR microcontrollers through a 6 pin ISP connector. The AVRISP MK2 uses AVR Studio®, Atmel's Integrated Development Environment (IDE) for code writing and debugging. The programming software can be controlled from both a Windows® environment and a DOS command-line interface.

- o AVR Studio Operated
- o USB Serial In-System Programming
- o USB Interface to PC
- o Upgrades are done from AVR Studio
- o Target Voltage 2.7 - 6.0V
- o Powered from Target. No Need for Additional Power Supply



Price Each	1
PRG-001 AVRISP-MKII In-System Programmer	\$75.00

AVR Programming Adapter

This is a simple, but extremely handy board to adapt the common 10-pin ISP programmers to the smaller 6-pin ISP connections and vice-versa. Also designed in is a 6-pin inline connector so that you can insert this board directly into a breadboard! Good for the AVRISP-MKII. Pin 1 indicators indicate how the AVR-PG1 and PG2 should be oriented. Board comes bare.



Price Each	1
PRG-002 AVR Programming Adapter	\$2.50

AVR - ICSP Adapter

This is an adapter assembly that converts 2x5 pin connector to 2x3 pin mini-ICSP. Comes with a mini-ICSP cable terminated female at both ends. The adapter board comes terminated as male 2x3 pin to female 2x5 pin.



Price Each	1
PRG-003 AVR to ICSP Adapter	\$9.95



MPLAB Compatible ICD2 with USB

Description:

PIC-ICD2-POCKET is the world's smallest PIC ICD2 debugger and programmer, with only 55 x 55 mm (2.16 x 2.16") dimensions and only 30gr weight (without ICSP cable and packing) this little device fits in your pocket and is very convenient to carry with you when you work in field. PIC-ICD2-POCKET is completely replacement of Microchip's original MPLAB-ICD2 and with it you can do everything you can do with the original MPLAB-ICD2, the only difference is that MPLAB-ICD2 have also RS232 while PIC-ICD2-POCKET operates only from USB. PIC-ICD2-POCKET is a low cost, real-time debugger and programmer for selected PIC® MCUs and dsPIC® DSCs.

Programs can be downloaded, executed in real time and examined in detail with the debug functions of MPLAB. Set watch variables and breakpoints from symbolic labels in C or assembly source code, and single step through C source lines or into assembly code. PIC-ICD2-POCKET can also be used as a development programmer for supported MCUs. The secret behind In Circuit Debugging is two dedicated hardware lines (microcontroller pins used only during debugging mode) that control In Circuit Serial Programming™ (ICSP™) of the device and, afterwards, debugging through proprietary, on-chip firmware. The ICD 2 debug features are built into the microcontroller and activated by programming the debug code into the target processor. There is some shared overhead expense that includes one stack level, some general purpose file registers and a small area of program memory.

Features:

- * USB (Full Speed 2 M bits/s) interface to host PC
- * Real time background debugging
- * MPLAB IDE GUI (latest release available for free download from Microchip's web site)
- * Built in over-voltage/short circuit monitor
- * Firmware upgradeable from PC
- * Light plastic enclosure
- * Supports low voltage to 2.0 volts. (2.0 to 6.0 range)
- * Diagnostic bi-color LED (Busy, Error)
- * USB power status green LED
- * Reading/Writing memory space and EEDATA areas of target microcontroller
- * Programs configuration bits
- * Erase of program memory space with verification
- * Peripheral freeze-on-halt stops timers at breakpoints



Price Each	1
PRG-010 MPLAB Compatible ICD2 with USB	\$155.30

AVR Programmer

This is a simple to use USB AVR programmer. It is low cost, easy to use, works great with AVRdude, and is tested under Windows, Linux, and MacOS X. Based on Dick Steefland's USBtiny and Limor Fried's USBtinyISP.



This programmer works really well for ATmega168 and ATmega328 and should work with all the AVR micros supported by AVRDUDE. We've played a bit with the ATtinys but we cannot guarantee that this board will be compatible with anything but ATmega168/328.

This board is buffered and power protected so that you can do some really evil things to the programmer without killing it. It is fast! Comparable speed to the AVR ISP2 USB programmer from Digikey. One of the greatest features of this board is the ability to power the target (up to 500mA) from the programmer.

To use this programmer, attach to a windows machine and install the drivers listed below. Open a command prompt. Assuming WinAVR (and therefore AVRDUDE) have been installed, type:
avrdude -c usbtiny -B 1 -patmega328 -U flash:w:main.hex

Be sure to include the "-B 1" flag as this will significantly increase the programming speed! You may need to change -p flag to your appropriate microcontroller. You can setup a tool and hotkey in Programmers Notepad to do this automatically.

Cable is about 200mm long.

Price Each	1
PRG-004 Pocket AVR Programmer	\$21.50



MPLAB Compatible ICD2 with USB and RS232

Description:

The popular ICD2 by Olimex. This is complete drop in replacement for the Microchip ICD2 at a fraction of the cost. A low cost development tool providing real time emulation for all PICs with the built-in ICD feature. Operates through RS232 or USB. More information about the ICD2 can be found on Microchip's web site.



Uses standard DB9 serial cable or USB cable. USB cable should be 'B' Male (ICD2) to 'A' Male (Computer).

The large PIC on the ICD2 is a 16F877 that stays on the board. It is what does all the magic. The ICD2 can only be used through the ICSP port - there is no 'programming' socket on the unit itself.
Note: MPLab 8.xx has a bug that affects the RS232 interface on the ICD2. If using version 8.xx of Microchip's MPLab, you will need to use the USB interface or any of the version 7.xx IDEs. This bug affects not only Olimex ICD2s, but the original MPLab ICD2 from Microchip as well.

Dimensions: 3.8x3.3"

Price Each	1
PRG-011 MPLAB Compatible ICD2 with USB and RS232	\$139.01



MPLAB Compatible Tiny-ICD2

Description:

The new, lower cost Tiny-ICD2 has all the functionality of the much higher priced ICD2 from Microchip! Compact, low cost development tool providing real time emulation for all PICs with built-in ICD feature. Operates through RS232 only. A complete replacement of Microchip's MPLAB-ICD2. More information can be found on the Microchip web site.



Unit requires a 15VDC 2.1x5.5mm center positive external power supply. We do not currently carry an adapter of this size but you might try Jameco or Digikey.

Note: MPLab 8.xx has a bug that affects the RS232 interface on the ICD2. If using version 8.xx of Microchip's MPLab, you will need to use an ICD2 with a USB interface (available in the related items below) or any of the version 7.xx IDEs. This bug affects not only Olimex ICD2s, but the original MPLab ICD2 from Microchip as well.

Price Each	1
PRG-012 MPLAB Compatible Tiny-ICD2 with RS232	\$76.36

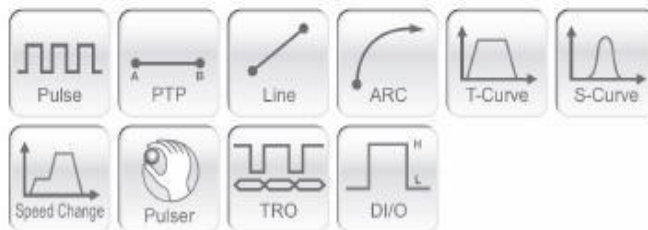
OCEAN CONTROLS - ROBOTICS & MOTOR CONTROLLERS

SMC-200 DMC5400 Advanced 4-axis Stepping & Servo Motion Control Card

The DMC5400 is an advanced 4-axis motion control card for stepping and digital servo control application. Compared with the DMC1000 and DMC3400 series, DMC5400 offers better linear and circular interpolation capability and continuous contouring performance for advanced pulse output motion control solutions.

Features

- 32-bit PCI bus, Rev. 2.2, 33MHz
- Pulse output rate up to 5MHz
- 6 Pulse/dir output modes: Pulse /DIR, CW/CCW etc
- 2~4 axes linear interpolation
- 2 axes circular interpolation
- Multi-axis continuous interpolation
- Position/speed change on-the-fly
- 13 home return modes and auto home search
- 4 axes incremental encoders input with 28-bit up/down counter
- Hardware position compare and trigger with auto-loading FIFO
- High speed position latch function
- 32 General-Purposed I/O
- Manual pulser input interface
- Programmable acceleration and deceleration time
- Trapezoidal and S-curve velocity profiles
- Multi-axis, simultaneous start/stop
- Programmable interrupt sources
- Supports up to 5 cards in one system (20 axes)
- Hardware backlash compensator
- Software limit function
- Easy interface to any stepping and digital servo



Price Each	1
SMC-200 DMC5400 Multi Axis Controller	\$1049.00
SMC-201 TB60 Cable and Terminal Board	\$149.00
SMC-202 TB50 Cable and Terminal Board	\$149.00

Pololu Low Voltage Dual Serial Motor Controller

This low-voltage dual serial motor controller (DSMC) is designed specifically for high-performance, low-voltage toy motors that run on 1.5 - 6 V. Serially controlled it uses PWM to control the motor speed

Specifications:

- PCB size: 25 x 22.5mm, Motor ports: 2
- Speeds: 127 forward and backward, brake
- Max current: two motors 5 A each, one motor 10 A
- Motor voltage: 0 - 7 V
- Logic voltage: 3 - 5.5 V
- PWM frequency: two motors 600 Hz, one motor 750 Hz
- Serial baud rate: 1200 - 192000 (automatically detected)



Price Each	1	5+
POL-120 Low Voltage Dual Serial Motor Controller	\$53.50	less 10%

Pololu's Micro Dual Serial Motor Controller

Pololu's popular micro motor controller will get your robot running in a snap. The tiny module can individually control two motors, and you can daisy-chain multiple units to control up to 62 motors with one serial line. The new version provides up to 2 A to a single motor, or 1 A each to two motors. The motor supply can be as low as 2 V, making the unit a perfect match for small DC motors. Using one serial output from your microcontroller, you can independently set each motor to go forward or backward at any of 127 speeds, coast, and with the new version, brake.



Price Each	1	5+
POL-411 Micro Dual Serial Motor Controller	\$43.14	less 10%

Pololu 3-Amp motor Controller

The 3-Amp motor controller with multiple interface and feedback options simplifies servo control of commonly available DC motors. The module features three independent interfaces: a serial protocol for microcontroller-based applications, a pulse-width interface for connection to hobby radio control equipment or serial servo controllers, and an analog voltage interface for simple tests and demonstrations. Two feedback alternatives allows for closed-loop control of position or speed. The motor controller measures 36 x 36mm and has an operating voltage of 6-18 volts. The serial protocol is compatible with other Pololu motion control devices, allowing multiple units to be connected to a single serial line to control a mixture of motors sizes and hobby RC servos.



Price Each	1	5+
POL-392 3 Amp Motor Controller	\$64.30	less 10%

OCEAN CONTROLS - ROBOTICS & MOTOR CONTROLLERS

Pololu TRex Dual High Power Motor Driver

The TRex can control two bidirectional and one unidirectional motor via three independent control interfaces: radio control (RC) servo pulses, analog voltage, and asynchronous serial (RS-232 or TTL). It uses five input channels to receive the RC or analog control signals. When operating in RC or analog mode, the five channels function as follows:



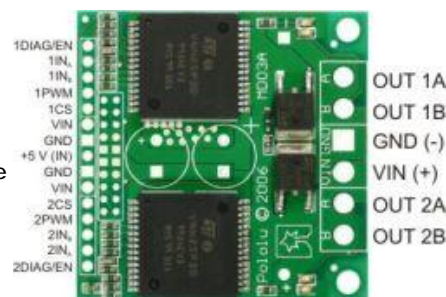
- * **Channel 1:** motor 1 speed and direction or, if in mix mode, turn left/right
- * **Channel 2:** motor 2 speed and direction or, if in mix mode, go forward/reverse
- * **Channel 3:** auxiliary (unidirectional) motor speed
- * **Channel 4:** can be used to enable "flipped mode", which allows invertible robots to be controlled as normal when they are inverted
- * **Channel 5:** determines whether the motors are controlled by the channel inputs or the serial interface; this channel allows you to switch between autonomous and human control at will.

Price Each	1	5+
POL-777 TRex Dual Motor Controller	\$124.50	less 10%

Pololu Dual Hi Current Motor Controller

The Pololu dual high-power motor drivers are compact carriers for the VN13SP30 and VN12SP30 motor driver IC's. The board incorporates most of the components of the typical VN12SP30 application including pull-up and current-limiting resistors and a FET for reverse battery protection. (The current sense circuit is populated on both versions of the board, but only the VN12SP30 supports current sense.) To keep the number of I/O lines down, the two enable/diagnostic lines on each chip are tied together. All you need to add is a microcontroller or other control circuit to turn the H-Bridges on and off.

In a typical application, the power connections are made on one end of the board, and the control connections are made on the other end. +5 volts must be supplied to the board; the input voltage is available at those pins as well, but the connection is not intended for currents exceeding a few amps. The diagnostic pins can be left disconnected if you do not want to monitor the fault conditions of the motor drivers. INA and INB control the direction of each motor, and the PWM pins turn the motors on or off. For the VN12SP30 version, the current sense (CS) pins will output approximately 0.13 volts per amp of output current.



Price Each	1	5+
POL-705 30 Amp Motor Driver with VN13SP30	\$39.65	less 10%
POL-706 30 Amp Motor Driver with VN12SP30	\$47.60	less 10%

Pololu High Power Motor Controller with Feedback

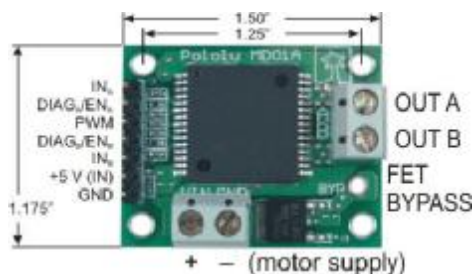
The SMC04 high-power motor controller with feedback has multiple interface and feedback options that simplify servo control of commonly available DC motors. The module features three independent interfaces: a serial protocol for microcontroller-based applications, a pulse-width interface for connection to hobby radio control equipment or serial servo controllers, and an analog voltage interface for simple tests and demonstrations. Two feedback alternatives allows for closed-loop control of position or speed. The SMC04 is higher-current version of our 3-A motor controller with feedback that can handle larger motors with its VN13SP30 motor driver chip.



Price Each	1	5+
POL-425 Hi Power Motor Controller with Feedback	\$123.80	less 10%

Pololu Hi Current Motor Controller

The Pololu high-power motor drivers are compact carriers for the VN13SP30 and VN12SP30 motor driver integrated circuits from ST. All you need to add is a microcontroller or other control circuit to turn the H-Bridge on and off. The motor drivers have a maximum current rating of 30 A continuous. The actual current you can deliver depends on how well you can keep the motor driver cool. In our tests, we were able to deliver short durations (on the order of milliseconds) of 30 A and a few seconds of 20 A without overheating. At 6 A, the chip gets just barely noticeably warm.



Price Each	1	5+
POL-705 30 Amp Motor Driver with VN13SP30	\$39.65	less 10%
POL-706 30 Amp Motor Driver with VN12SP30	\$47.60	less 10%

Micro Serial Servo Controller

The Pololu micro serial servo controller is a very compact solution for controlling up to eight radio control (RC) servos from a computer or microcontroller. The controller measures just 23 x 23mm, yet it is one of the most full-featured servo controllers available. Each servo speed and range can be controlled independently, the baud rate is detected automatically over a 1200-38400 bps range, and multiple units can be daisy-chained on one serial line to control up to 128 servos. Three status LEDs and an integrated level converter for RS-232 applications get you up and running quickly. The micro serial servo controller is dwarfed by even a standard servo, but it can control any standard RC servos, including giant 1/4-scale servos.



Price Each	1	5+
POL-207 Micro Serial Servo Controller	\$34.5	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

Pololu's Serial 8 Servo Motor Controller

The Pololu serial 8-servo controller allows you to control up to eight RC servos with almost any robot controller or computer. The interface to the servo controller is a standard RS-232 serial port or a TTL-level serial line, using any baud rate between 1200 and 38400 baud. Multiple 8-servo controllers can be connected to a single serial line to control up to 128 servos independently. The servo controller is compatible with all of our serial motor controllers and servo controllers. The servo controller is also compatible with the Scott Edwards MiniSSC II servo controller and any software written for it.



Price Each	1	5+
POL-727 Serial 8 Servo Motor Controller	\$38.10	less 10%

Pololu's USB 16 Servo Controller

The Pololu USB 16-servo controller is the latest addition to our line of R/C hobby servo controllers. The compact module measures just 1.9"x1.0" including the USB connector, making it smaller than most 8-channel controllers, and it offers both USB and asynchronous serial (UART) connectivity. No features are compromised for the small size, as our USB controller supports independent speed and range settings for each servo while delivering 0.5-microsecond resolution for smooth output across its broad output pulse range of 250 through 2750 microseconds. .

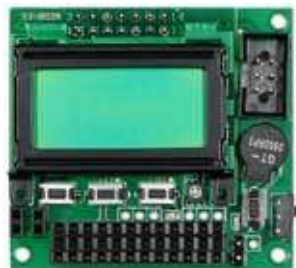


Price Each	1	5+
POL-390 USB 16 Servo Controller	\$103.25	less 10%
USB-003 USB 2.0 Plug A to 5 Pin Mini B Cable	\$9.05	less 10%

Pololu's Orangutan Controller

The Orangutan robot controller is a complete control solution for small robots. Orangutan includes an 8-character x 2-line liquid crystal display, two bi-directional motor ports, a buzzer, three pushbuttons, and up to 12 user I/O lines, yet the compact module measures only 2.00" x 1.85" and weighs less than 1 ounce. Because of the complete feature set, very few additional components (such as sensors or motors) need to be added to complete the electronic portion of a small robot.

Orangutan is based on the Atmel MEGA168 microcontroller, which features 16 Kbytes of flash program memory, 1024 bytes of SRAM, and 512 bytes of EEPROM. Up to 8 channels of 10-bit analog-to-digital conversion is also available. Because the user has direct access to the microcontroller, any development software for Atmel's AVR microcontrollers, including Atmel's free AVR Studio and the GCC C compiler, is compatible with Orangutan. An in-circuit programmer such as Atmel's affordable AVR ISP is required for programming



Price Each	1	5+
POL-225 Orangutan Controller	\$75.45	less 10%

DC Servo Motor Controller

This PIC Servo Motor Driver can simultaneously drive up to four servo motors using potentiometers as positioning controllers. Each motor is positioned by rotating a potentiometer which is connected to the input of the micro-controller.

You need one potentiometer per motor. The PIC Servo Motor Driver uses a PIC16C71. All the work is done in the micro-controller. Full source code supplied. Servo-motors & potentiometers not supplied. Power Supply Required: 5V DC/1A. PCB: 75 x 50mm.



Price Each	1	5+
KIT-102 As Kit	\$32.50	less 10%
KTA-102 Assembled and Tested	\$42.50	less 10%

8 Servo Motor Controller

Our 8 RC Servo Motor Controller can be configured to control 4 RC servo motors by switches (motor moves to two different positions based on a switch) and 4 servos via RS232 ASCII serial commands. Being able to control the position of the servos by a switch allows a servo motor to be used easily in open - closed situations such as road or door barriers. It is perfect for use with model trains, hobby models, robotics and industrial production.

The card can easily be configured to have all 8 servos controlled serially. Up to 4 boards can be operated off the one PC serial port allowing up to 32 motors to be controlled.



Price Each	1	5+
KTA-199 8 Servo Motor Controller assembled	\$55.00	less 10%

Pololu's Round Robot Chassis

This circular laser-cut plastic robot chassis makes a great base for small mobile robots. With a diameter of only five inches (slightly bigger than a CD), this acrylic chassis is ideal for building sturdy robots capable of navigating tight spaces. As shown below, the circular chassis has many holes and slots for mounting sensors, motors, and other hardware.

To complete the round robot chassis, the kit includes a Tamiya twin-motor gearbox, ball caster, and truck tires; .



Price Each	1	5+
POL-250 Robot Chassis with gearbox motor and tyres	\$55.00	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

DC Motor PID Speed Controller

Our new kit provides feedback control of DC Motors. It can operate in Closed Loop PID mode allowing accurate speed control over different loads or in Open Loop PWM mode.

Target Speed and PID settings can be set via the 3 Pushbuttons and LCD, the Serial Port or Analog Input (potentiometer). Serial Port control allows you to control a number of controllers from the one serial port on your PC.

With this kit you can control the speed of a common DC motor rated up to 55V (20A) without sacrificing motor torque. Operates on a supply voltage of 8V to 26V. It uses a microcontroller to pulse-width modulate two high current power IRFZ44 MOSFETs to provide high torque DC Motor Speed Control. Feedback is achieved with a Photo-Interrupter Pulse (Provided). Finished Dimensions (mm): 100Wx100Lx40H.



Price Each	1	5+
KTA-194 DC Motor PID Speed Controller	\$105.00	less 10%

Hi Current DC Motor Speed Controller

This DC motor controller uses PWM Pulse Width Modulation to control the speed of a DC motor. A potentiometer can be used to set the speed or a 0 to 5VDC signal can be supplied.

With this kit you can control the speed of a common DC motor rated up to 55V (20A) without sacrificing motor torque. Operates on a supply voltage of 8V to 26V.

Uses a microcontroller to pulse-width modulate two high current power IRFZ44 MOSFETs to provide high torque DC Motor Speed Control.

This controller is suitable for controlling **Golf Buggy DC Motors**. A customer recently said this was the best controller he had used with his Golf Buggy Motor.



Finished Dimensions (mm): 100Wx100Lx40H. .

Price Each	1	5+
KTA-195 Hi Current DC Motor Controller	\$79.00	less 10%

Mini DC Motor Speed Controller in

With this kit control the speed of any common DC motor rated up to 35V and 8A without sacrificing motor torque. Operates on a supply voltage of 8V to 35V.

Uses a microcontroller to accurately pulse-width modulate a high current power MOSFET, IRFZ44. Also features adjustable acceleration time, potentiometer, 0-5V or 4-20mA input signal control. Die Cast Box mounted.

Finished Dimensions (mm): 35Wx89Lx30H.



Price Each	1	5+
KTA-246 Mini DC Motor Speed Controller	\$69.00	less 10%

DC Motor Speed Controller

With this kit control the speed of any common DC motor rated up to 100V (5A) without sacrificing motor torque. Operates on a supply voltage of 5V to 15V.

Uses NE555 to pulse-width modulate a high current power MOSFET, IRFZ44.

In this way motor torque is maintained. Adjustable speed control. Box mounted. Finished Dimensions (mm): 60Wx100Lx30H.



Price Each	1	5+
KIT-067 As Kit	\$26.50	less 10%
KTA-067 Assembled and Tested	\$44.00	less 10%

Serial Hi Current DC Motor Speed Con-

The operation of this 20A DC Motor Speed Controller is configured using a serial port of a PC. It has 4 different modes of operation.

Mode 1 - Speed is set by ASCII commands received from a serial RS232 connection. Up to 4 Speed Controllers can be addressed and controlled from a single PC or microcontroller serial port.

Mode 2 - 4 selectable speeds can be chosen using a 4 position rotary switch

Mode 3 - Motor speed is controlled by a 1-2mS RC Pulse.

Mode 4 - Motor speed is controlled by a PWM pulse stream received from a PLC or microcontroller



With this kit you can control the speed of a common DC motor rated up to 55V (20A) without sacrificing motor torque. The controller logic operates on a supply voltage of 8V to 26V. It uses a microcontroller to pulse-width modulate two high current power IRFZ44 MOSFETs to provide high torque DC Motor Speed Control. PWM Frequencies of 9.7KHz, 1.2KHz, 152Hz and 38Hz can be selected using a serial command.

A straight through D9 Male to Female serial cable is required to configure and communicate with the controller via a PC. The PC software supplied is a Visual Basic program with source code provided for you to be able to write your own programs to control the motor from your PC.

Price Each	1	5+
KTA-207 Serial Hi Current DC Motor Controller	\$89.00	less 10%

TB6612FNG Dual Motor Driver Carrier

This tiny board is an easy way to use Toshiba's TB6612FNG dual motor driver, which can independently control two bidirectional DC motors. An operating range of 4.5 – 13.5 V and peak current output of 3 A per channel (1 A continuous) make this a great motor driver for low-power motors.

In a typical application, power connections are made on one side of the board and control connections are made on the other. All of the control inputs are internally pulled low. Each of the two motor channels has two direction control pins and a speed control pin that accepts a PWM input with a frequency of up to 100 kHz. The STBY pin must be driven high to take the driver out of standby mode.

Specifications

- * Motor voltage (VMOT): 4.5 – 13.5 V
- * Logic voltage (VCC): 2.7 – 5.5 V
- * Output current maximum: 3 A per channel
- * Output current continuous: 1 A per channel (can be paralleled to deliver 2 A continuous)
- * Maximum PWM frequency: 100 kHz



Price Each	1	5+
POL-713 TB6612FNG Dual Motor Driver Carrier	\$21.21	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

Dual Bidirectional DC Motor Speed Controller

This DC motor controller allows you to control the speed of two DC motors independently. Each motor can be operated in unidirectional mode with a 0-5V input giving 0-100% PWM and a digital input for direction selection, or in bidirectional mode where the analog input is responsible for direction and speed selection.

A link allows you to control the speed from a 0-20mA or 4-20mA signal. A serial command allows you to set the PWM frequency to 10KHz, 1.25KHz or 156Hz to suit your application.

Finished Dimensions 75x105x20mm .



Price Each	1	5+
KTA-198 Dual Bidirectional DC Motor Controller	\$79.00	less 10%

Bidirectional DC Motor Speed Controller

This kit controls the speed of a DC motor in both the forward and reverse direction using pulse width modulation PWM. The range of control is from fully OFF to fully ON in both directions. The maximum voltage available to run the motor is 32VDC.



Price Each	1	5+
KIT-166 As Kit	\$34.50	less 10%
KTA-166 Assembled and Tested	\$49.50	less 10%

Modbus Programmable Stepper Motor Controller

The introduction of a more powerful microcontroller has allowed us to produce a standalone 4 axis stepper motor controller which can be programmed via a PC using supplied software or alternatively controlled via a PLC to free the PLC from complex stepper motor control routines. Up to 4 cards can be controlled from a PLC using the Modbus protocol.

Up to 120 instructions can be programmed into the controller (1 motor, 50 instructions for 4 motors) and retained through power loss. Just program once and then let it go.

Ideal for repetitive process tasks involving stepper motors, the unit can also be configured with up to 6 simple digital outputs (when the outputs are not being used for motor control) and 4 digital inputs which can be used for limit switches or program control.



Price Each	1	5+
KTA-193 Modbus Programmable Stepper Controller	\$119.00	less 10%

DC Motor Actuator

New The KTA-264 DC Motor Actuator allows a user to drive and control the position of a DC gearhead motors. The motor drives a load and is also physically coupled to a quadrature encoder, photo-interrupter or potentiometer. The position to move the motor is given by a serial command from a PC, PLC or other type of controller or a by an externally mounted ON-OFF switch connected to the card. The position of the DC motor is determined by the wiper of a potentiometer or the quadrature encoder A and B signals connected to the card. For a quadrature encoder or photo interrupter the position is restricted to the range -2000000000 to +2000000000. For a potentiometer the position of the motor is restricted to the range of 0-1023.

At the end of each movement the position is saved to EEPROM. When the end of movement is reached the power will be removed from the motor. The inertia of the gearhead motor will be expected to hold the load in position. Please note control of a gearhead motor is not as precise as a stepper or servo motors with expected errors of movement of +/- 5-10 degrees. Please note potentiometers have a typical life of 100,000 movements. Hence this actuator using a potentiometer feedback is not suited to quick repetitive movements. Also because of the limited range of 0 to 1023 it is only suited to short movements.

To prevent damage to the potentiometer the range for the MOVA instruction is limited to between 20 to 1000 when using the KTA-264 with a potentiometer.



Price Each	1	5+
KTA-264 DC Motor Actuator	\$139.00	less 10%

KTA-261 / KTA-262 / KTA-263 Microstepping Bipolar Stepper Motor Drivers

Small 1, 2 or 3 axis stepper motor drivers with full, 1/2, 1/4 and 1/16 micro-step modes.

Features

- Control motors up to 2.5A
- Supply voltage up to 30VDC
- Works with 4, 6 and 8 wire motors
- Current adjusted by on board trim pot
- Step and Direction inputs
- Plug in Connectors
- Small size 58x47x31mm (KTA-261)



The KTA-261, 262 and 263 are Bipolar Stepper Motor Drivers capable of controlling 4, 6 and 8 wire stepper motors at up to 2.5A. As well as full stepping, half, quarter and sixteenth micro-step modes are available, giving 200, 400, 800 or 3200 steps per revolution for standard 1.8° degree motors.

KTA-261 is capable of controlling 1 motor, KTA-262 up to 2 motors and KTA-263 up to 3 motors.

Price Each	1	5+
KTA-261 1 Axis Microstepping Stepper Motor Controller	\$79.00	less 10%
KTA-262 2 Axis Microstepping Stepper Motor Controller	\$149.00	less 10%
KTA-263 3 Axis Microstepping Stepper Motor Controller	\$214.00	less 10%

KTA-190 Serial Stepper Motor Controller

Connects to the PC serial port and provides an easy to use interface for connecting and controlling stepper motors by your PC. You can connect up to four KT5158 Bipolar Stepper Motor Drivers (See Below) or KT5179 Unipolar Stepper Motor Drivers to the card using their step and direction signals. You can multidrop up to 4 interface cards off the 1 RS232 serial line so you can control up to a total of 16 stepper motors.



Simple ACSII commands are sent to the card to control each of the stepper motors

@01 AMOV 2000 move stepper motor 1 to position 2000

Allows acceleration and deceleration of the motors and limit switches can be connected to the card

Price Each	1	5+
KTA-190 Serial Stepper Motor Controller	\$65.00	less 10%

KTA-208 Dual Pulse Generator

Features

- 2 Pulse Generators
- 0 to 5V Square wave pulses
- RS-232 9600, 8N1 ASCII Serial Controlled
- Add more units to control up to 16 Motors
- Up to 100KHz for each pulse output.
- Ramp up and down adjustable
- Parameters can be stored in Non-Volatile EEPROM
- 5V Pulse and Direction Signal Levels
- 5V Output for Opto-Coupler Drive
- 2 SPST 5A Relays for Control
- 12V or 24VDC Powered
- up to 4 cards off the 1 serial port.

Summary

The KTA-256 Pulse Generator features 2 Pulse Generators. It has been primarily been designed to interface to stepper and servo motor drives. Each pulse generator has a direction output associated with it. A negative frequency will result in the direction output having a 0V output while a positive frequency results in a 5V output. The outputs cannot be connected directly to our stepper drives



Price Each	1	5+
KTA-208 Dual Pulse Generator	\$65.00	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

12.5kHz Relay Card

Features

- Senses 12.5kHz "Charge Pump" or "Heartbeat" from CNC control systems for safety shut-off if the controller fails
- Microcontroller-based for high reliability
- 3.3V and 5V input signal compatible
- On-board 5A SPDT
- Auxiliary coil output for larger relay
- 12V and 24V versions
- DIN rail mount option
- 72mm X 42mm

Summary

The KTA-253 Relay Card is designed to sense a 12.5kHz "Charge Pump" or "Heartbeat" signal from a CNC controller and activate the relay when the signal is present. Mach 3 and other CNC controllers can provide this signal as a safety feature. Should the controller fail or the computer hang, crash or lose power, the signal disappears. The KTA-253 is designed as a safety system to shut down CNC equipment in the event of controller failure, but also has other uses like preventing erratic movement as Windows starts up and polls the parallel port.

The card is equipped with a 5A (resistive) relay. A larger relay can be wired to the card's COIL connections. 12V and 24V versions are available both as a PCB or in DIN-rail mount.



Specifications:

Power Supply Vs and COM:

*KTA-253 / KTC-253: 9V – 16V DC (12V Nominal) ~100mA *KTB-253 / KTD-253: 18V – 30V DC (24V Nominal) ~100mA

12.5kHz Input IN: *-0.5V – 5.5V.

Relay activation range: 3kHz – 15kHz.

*Signal must drop below 0.3V and rise above 0.7V to be sensed. (3.3V TTL and 5V TTL compatible)

Auxiliary Relay Connection COIL: Up to 450mA

Relay Output NO C NC: Single-pole, double-throw relay rated to 5A (resistive). 240VAC / 30VDC

Price Each	1	5+
KTA-253 12.5kHz Relay Card 12V Card	\$35.00	less 10%
KTB-253 12.5kHz Relay Card 24V Card	\$35.00	less 10%
KTC-253 12.5kHz Relay Card 12V Card DIN Rail Mount	\$48.50	less 10%
KTD-253 12.5kHz Relay Card 24V Card DIN Rail Mount	\$48.50	less 10%

M325 Microstepping Bipolar Stepper Driver

The M325 is a high performance microstepping driver. It is suitable for driving any 2-phase and 4-phase hybrid stepping motors. By using advanced bipolar constant-current chopping technique, it can output more speed and power from the same motor, compared with traditional technologies such as L/R drivers. Features

- Supply voltage 12 to +24VDC
- Adjustable peak current 0.39 to 2.5A
- The current reduction switches in on absence of clock pulses
- Suitable for 2-phase and 4-phase stepping motors
- Optically isolated input signals
- Pulse frequency up to 100 KHz
- Selectable microstep resolutions 1,2,4 and 8
- Small size (86x55x20.5mm)



Price Each	1	5+
SMC-002 M325 Microstepping Stepper Motor Controller	\$99.00	less 10%

KTA-205 Parallel Port Interface Card with Relays

Our Parallel Port Relay card allows you to control stepper motor operations from your parallel port. It uses a 74HC245 buffer IC to provide protection for your PC's parallel port and enough current drive for turning on and off opto-isolator inputs. Can be connected to our stepper motor driver cards and Microstepping drives. The card provides 8 motor control output signals (4 Step signals, 4 Direction signals) to control up to 4 Stepper Motor Drivers, 4 digital inputs designed for use as limit switch inputs, 2 Relay Outputs to control spindles, coolant or vacuums, and 3 general IO which are connected directly to the port. The card is available with 12V or 24V relays and requires power at the relay voltage. . Perfect for a 3 axis or 4 axis CNC machine. Pin outs are suitable for most desk top CNC packages.



Price Each	1	5+
KTA-205 Parallel Port Interface with 12V Relays	\$45.00	less 10%
KTA-206 Parallel Port Interface with 24V Relays	\$45.00	less 10%

M542 Microstepping Bipolar Stepper Driver

The M542 is a high performance microstepping driver. It is suitable for driving any 2-phase and 4-phase hybrid stepping motors. By using advanced bipolar constant-current chopping technique, it can output more speed and power from the same motor, compared with traditional technologies such as L/R drivers. Features

- Supply voltage +20 to +45VDC,
- Adjustable peak current 0.54 to 4.2A
- The current reduction switches in on absence of clock pulses
- Suitable for 2-phase and 4-phase stepping motors
- Optically isolated input signals
- Pulse frequency up to 400 KHz
- 15 selectable resolutions up to 25000 steps/rev
- Short-circuit, over-voltage, short-voltage protection
- Small size (118x75.5x33mm)



Price Each	1	5+
SMC-003 M542 Microstepping Stepper Motor Controller	\$149.00	less 10%

M415 Microstepping Bipolar Stepper Driver

The M415B is a very small size high performance microstepping driver. It is suitable for driving any 2-phase and 4-phase hybrid stepping motors. By using advanced bipolar constant-current chopping technique, it can output more speed and power from the same motor, compared with traditional technologies such as L/R drivers. Features

- High Performance Low Cost
- Supply voltage 18 to +36VDC
- output current adjustable from 0.1A to 1.5A
- Inaudible 20kHz chopping frequency
- TTL compatible and optically isolated input signals
- Automatic idle-current reduction
- Mixed-decay current control for less motor heating
- 7 selectable resolutions (1,2, 4, 8, 16, 32, 64)
- Microstep resolution can be changed on the fly (optional)
- Suitable for 2-phase and 4-phase stepping motors
- Reverse polarity protection



Price Each	1	5+
SMC-006 M415 Microstepping Stepper Motor Controller	\$109.00	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

ND556 Microstepping Bipolar Stepper Driver

The ND556 is a high performance microstepping driver using pure-sinusoidal wave current control technology, it is particularly suitable for applications which require extremely low noise and low heating. The ND556 is suitable for a wide range of stepping motors of NEMA 17, 23 and 34 size

Features include

- Patented technology
- Pure-sinusoidal precise current control technology
- Extreme low motor noise
- Both driver and motor low heating
- High performance, low cost
- Supply voltage +20 to +45VDC, Adjustable peak current 1.4 to 5.6A
- The current semi-reduction automatically switches in on absence of clock pulses
- Suitable for 4,6,8 lead motors
- Optically isolated input signals
- Pulse frequency up to 400 KHz



Price Each	1	5+
SMC-004 ND556 Microstepping Stepper Motor Controller	\$179.00	less 10%

DM856 Fully Digital Microstepping Bipolar Stepper Motor Driver

The DM856 is a versatility fully digital stepping driver based on a DSP with advanced control algorithm. The DM856 is the next generation of digital stepping motor controls. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor auto-identification and parameter auto-configuration technology offers optimum responses with different motors and easy-to-use. The driven motors can run with much smaller noise, lower heating, smoother movement than most of the drivers in the markets. Its unique features make the DM856 an ideal solution for applications that require low-speed smoothness.



Compared to the DM432, broader input voltage and output current ranges make the DM856 can drive more motors than the DM432. What's more, owing to its higher performance DSP, driven motors can achieve much higher speed (above 3000RPM) than that of the DM432, offering servo-like performances. It can be regarded as an improved model origin from DM556, while supports broader input voltage range.

Features

- Anti-Resonance, provides optimum torque and nulls mid-range instability
- Motor self-test and parameter auto-setup technology, offers optimum responses with different motors
- Multi-Stepping allows a low resolution step input to produce a higher microstep output for smooth system performance
- Microstep resolutions programmable, from full-step to 102,400 steps/rev
- Supply voltage up to +80VDC
- Output current programmable, from 0.5A to 5.6A
- Pulse input frequency up to 200 KHz
- TTL compatible and optically isolated input
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase motors
- Support PUL/DIR and CW/CCW modes
- Over-voltage, over-current, phase-error protections

Price Each	1	5+
SMC-009 DM856 Microstepping Stepper Motor Controller	\$225.00	less 10%

DM556 Fully Digital Microstepping Bipolar Stepper Motor Driver

The DM556 is a versatile fully digital stepping driver based on a DSP with advanced control algorithm. The DM556 is the next generation of digital stepping motor controls. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor self-test and parameter auto-setup technology offers optimum responses with different motors and easy-to-use. Tuning software is freely available which allows your PC to serially connect to the drive and tune the performance of your motor. The driven motors can then run with much smaller noise, lower heating, smoother movement than most of the drivers in the markets. Its unique features make the DM556 an ideal solution for applications that require low-speed smoothness.



What's more, owing to its higher performance DSP, driven motors can achieve much higher speed (above 3000RPM), offering servo-like performances.

Features

- Anti-Resonance, provides optimum torque and nulls mid-range instability
- Motor self-test and parameter auto-setup technology, offers optimum responses with different motors
- Multi-Stepping allows a low resolution step input to produce a higher microstep output for smooth system performance
- Microstep resolutions programmable, from full-step to 102,400 steps/rev
- Supply voltage up to +50VDC
- Output current programmable, from 0.5A to 5.6A
- Pulse input frequency up to 200 KHz
- TTL compatible and optically isolated input
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase motors
- Support PUL/DIR and CW/CCW modes
- Over-voltage, over-current, phase-error protections

Price Each	1	5+
SMC-007 DM556 Microstepping Stepper Motor Controller	\$189.00	less 10%

DM432 Fully Digital Microstepping Bipolar Stepper Motor Drivers

The DM432 is a versatility fully digital stepping driver based on a DSP with advanced control algorithm. The DM432 is the next generation of digital stepping motor controls. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor auto-identification and parameter auto-configuration technology offers optimum responses with different motors and easy-to-use. The driven motors can run with much smaller noise, lower heating, smoother movement than most of the drivers in the markets. Its unique features make the DM432 an ideal solution for applications that require low-speed smoothness.

Features

- Anti-Resonance, provides optimum torque and nulls mid-range instability
- Motor auto-identification and parameter auto-configuration technology, offers optimum responses with different motors
- Multi-Stepping allows a low resolution step input to produce a higher microstep output for smooth system performance
- Microstep resolutions programmable, from full-step to 102,400 steps/rev
- Supply voltage up to +40 VDC
- Output current programmable, from 0.3A to 3.2A
- Pulse input frequency up to 200 KHz
- TTL compatible and optically isolated input
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase motors
- Support PUL/DIR and CW/CCW modes
- Over-voltage, over-current, phase-error protections



Price Each	1	5+
SMC-008 DM432 Microstepping Stepper Motor Controller	\$99.00	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

MD882 Microstepping Bipolar Stepper Driver

The MD882 is a high performance microstepping driver using pure-sinusoidal wave current control technology. It is particularly suitable for applications desired with extremely low noise and low heating. The pure-sinusoidal precise current control technology (domestic patented technology) ensures long motor life and high torque and the operating effect of the stepping motor is somehow inclined to that of servo motor.

Features

- Pure-sinusoidal precise current control technology
- Supply voltage up to +75VDC
- Peak current to 8.2A (RMS5.86A)
- Optically isolated differential input pulse frequency up to 300 KHz
- Automatic idle-current reduction
- Suitable for 2-phase and 4-phase stepper motors
- 16 selectable resolutions up to 10000 steps/rev
- DIP switch current setting with 8 different values



Price Each	1	5+
SMC-005 MD882 Microstepping Stepper Motor Controller	\$225.00	less 10%

KTA-196 Bipolar Stepper Motor driver

Simple circuit to drive 4 wire (and 6 or 8 wire) bipolar stepper motors at up to 8 amps. The card features

- a double sided PCB - screw Terminals for all inputs, power and motor connections.
- Full and Half Step (less resonance problems) and microstepping of 4,8,16,32,64 and 128 operation
- Step and Direction Inputs.
- an enable input which will remove all power to the motor

Supply Required: 8-30V DC

We tested the KT5196 against a K158 and found an increase of 33% in stepping rate performance.

Dimensions 75x105x20mm .



Price Each	1	5+
KTA-196 Assembled and Tested	\$65.00	less 10%

KTA-206 Serial Unipolar Stepper Motor

The KT-5206 is a combination of our popular KT5190 Serial Stepper Controller and a Unipolar Stepper Motor Driver.

The new card features

- accepts the same serial ASCII commands as the KT-5190 to drive the motor eg @01 RMOV 10000
- accelerate and decelerate motors
- control up to 4 KT-5206's from the one RS232 serial port
- accepts a 0-5V signal to control the speed of the stepper motor.
- a double sided PCB (more reliable and no links to solder).
- screw terminals for all inputs, power and motor connections.
- Full and Half Step (less resonance problems) operation
- Step and Direction Input.
- an enable input which will remove all power to the motor .

Dimensions 75x105x20mm .



Price Each	1	5+
KTA-206 Assembled and Tested	\$95.00	less 10%

KTA-191 Bipolar Chopper Stepper Motor Driver Kit

Our new bipolar chopper drive allows you to get better performance from your stepper motor.

It uses a dual full bridge motor driver based on the L297 & L298. Motor current for each phase is set using an on-board potentiometer and the controller is capable of handling motor winding currents up to 2 Amps per phase.

It operates from a DC supply voltage of 9-36V. The drive provides all basic motor controls, including full or half stepping of bipolar steppers and direction control.

Works with our range of large bipolar stepper motors

Signals (Step, Direction, Enable) can be interfaced to external logic or a microcontroller. Can easily control the motor from your computer's parallel port or our serial stepper controller card!

Finished Dimensions (mm): 88Wx105Lx35H



Price Each	1	5+
KTA-191 Bipolar Motor Chopper Drive Assembled	\$85.00	less 10%

KTA-197 Serial Bipolar Stepper Motor Controller

The KT-5197 is a combination of our popular KT5190 Serial Stepper Controller and the KT-5196 Bipolar Stepper Motor Driver.

It has all the features of the KT-5196 including full and half stepping and enable input.

You simply write ASCII commands through the PC's serial port to the card to control the stepper motor

@01 AMOV 2000 move stepper motor 1 to position 2000

Up to 4 of these cards can be controlled from a serial port.

Dimensions 75x105x20mm .



Price Each	1	5+
KTA-197 Assembled and Tested	\$95.00	less 10%

EasyDrive Bipolar Stepper

EasyDriver v3 is a simple to use bipolar stepper motor driver, compatible with anything that can output a digital 0 to 5V pulse.

The EasyDriver requires a 7V to 30V supply to power the motor, and has an on board voltage

regulator for the digital interface. Connect a 4-wire stepper motor and a microcontroller and you've got precision motor control!

Caution: Do not connect or disconnect a motor while the driver is energized. This will cause permanent damage to the A3967 IC.

Features:

- * A3967 driver configured for 8-microstep mode
- * Compatible with 4, 6, and 8 wire stepper motors
- * Adjustable current control from 150mA/phase to 750mA/phase
- * Power supply range from 7V to 30V. The higher the voltage, the higher the torque

Dimensions 43 x 21 x 8mm

Note at higher currents the A3967 gets hot and may need cooling



Price Each	1	5+
SMC-020 EasyDriver Bipolar Stepper Drive	\$19.95	less 10%

OCEAN CONTROLS - MOTOR CONTROLLERS

KIT-179 Unipolar Stepper Motor

Standard circuit to drive 5, 6 or 8 wire unipolar stepper motors. Can be operated in free-standing (internal oscillator) or PC-controlled (direction, step) mode. Uses IRFZ44 power MOSFETs to drive the motors. These MOSFETs have a low on resistance and can and can carry 6A each with needing a heatsink. Separate supply voltage for kit and motors if required. Up to six driver boards (for controlling 6 motors) can be connected to a single PC parallel port.



Price Each	1	5+
KIT-179 As Kit	\$25.00	less 10%
KTA-179 Assembled and Tested	\$39.00	less 10%

Dual Unipolar Stepper Motor Controller

Connects to the PC printer port & will drive two unipolar stepper motors up to max. 3A each. All contained in an extended D-shell case. Will also accept 4 inputs from external switches. A DOS based software program (also runs under Windows) written specifically to drive stepper motors is included, complete with C source code. Software provides three run modes and will half-step, single-step or manual-step motors. Software will run interactively or process a text file of commands.



Price Each	1	5+
KIT-113 As Kit	\$34.50	less 10%
KTA-113 Assembled and Tested		

DC Servo Motor Controller

The DB810A is a digital DC servo driver developed with CPLD and high efficient MOSFET technologies. In position control, it's easy for end users to change stepping drivers to the DB810A without changing control systems, because its input command is PUL/DIR signal, which is compatible with that of stepping drivers. In low power motion control applications, performances of DC servo systems using the DB810A are better than those of digital AC servo systems in velocity, precision, noise, stability, or at least as good as those of digital AC servo systems. However, the cost of the DB810A stays at the price line of stepping driver, namely far lower than those of AC servo drivers..



Features

- 18-80VDC, 0-20A, 20-400W
- PID feedback servo drive
- Feedback resolution x4 encoder line count
- Lock range +/- 128 count following error
- Opto-isolated pulse and direction inputs (differential)
- Over-current and short-circuit protection

Small size 110 x 69 x 27mm - Weight - 0.45Kg

Price Each	1	5+
SMC-240 DB810A Servo Motor Drive	\$229.00	less 10%

Stepper Motor Power Supply

SPS series power supplies are switchable DC power supplies specifically designed for stepping & servo driver. Normal regulated switchable power supplies usually work with bad variability and low efficiency when used in stepping or servo driving. This is because conventional switching power supplies are designed for the constant, unvarying loads of circuit boards. With stepping or servo systems inductive loads are being switched so the driving current vary quickly. This supply is capable of delivering current to motor drivers without affecting the reliability due to its unregulated specialty and bulky capacitance. By selecting the correct model, one supply can supply 1 to 3 motors and so the average cost per shaft is saved.



Features

- Compact size, lightweight 112x102x55mm Weight - 0.45Kg
- Output power 300W (continuous work)
- Short circuit, over-current & over-voltage
- Input Supply 240VAC

Models

- SPS-407 output 7A continuous at 40V (9A Peak current).
- SPS-487 output 7A continuous at 48V (9A Peak current).
- SPS-705 output 5A continuous at 70V (7A Peak current).

Price Each	1	5+
SMC-100 40V Power Supply	\$129.00	less 10%
SMC-105 48V Power Supply	\$129.00	less 10%
SMC-110 70V Power Supply	\$149.00	less 10%

OCEAN CONTROLS - CNC PACKAGES

50 oz-in Frame 17 Mini 3 Axis CNC Pack

The **CNC-001** 3 Axis Package includes
 3 x Hi-Speed MOT-120 Stepper Motors
 3 x M325 Stepper Motor Drivers (1,2,4 and 8 Microstepping)
 1 x 150W 24VDC Power Supply
 1 x Parallel Port Interface KTA-192
 1 x Wiring Diagram



The **CNC-101** Additional Axis Package includes
 1 x High Speed MOT-120 Stepper Motors
 (see Specs)
 1 x M325 Stepper Motor Driver (1,2,4 and 8 Microstepping)
 1 x PSM-002 24VDC 40W Power Supply

Price Each	1
CNC-001 50 Oz-In Frame 17 Mini CNC Pack	\$499.00
CNC-101 50 Oz-In Frame 17 Additional Axis	\$179.00

125 oz-in High Speed CNC Pack

The **CNC-002** 3 Axis Package includes
 3 x High Speed MOT-124 Stepper Motors
 (see Specs)

- 1 x 3 Axis Driver KTA-263
- 1 x 150W 24VDC Power Supply
- 1 x Parallel Port Interface KTA-205



The **CNC-102** Additional Axis Package includes
 1 x High Speed MOT-124 Stepper Motors (see Specs)
 1 x 1 Axis Driver KTA-261
 1 x PSM-002 24VDC 40W Power Supply

Price Each	1
CNC-002 125 oz-in High Speed CNC Pack	\$499.00
CNC-102 125 oz-in High Speed Additional Axis Pack	\$179.00

OCEAN CONTROLS - MOTOR CONTROLLERS

175 oz-in High Speed 3 Axis CNC Pack

The **CNC-004** 3 Axis Package includes
 3 x Hi-Speed Frame 23 MOT-122 Stepper Motors
 3 x M542 Microstepping Drivers (up to 25000 steps per rev)
 2 x SPS407 40VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram



The **CNC-104** Additional Axis Package includes
 1 x High Speed Frame 23 MOT-122 Stepper Motor
 1 x M542 Microstepping Driver (up to 25000 steps per rev)

Price Each	1
CNC-004 175 oz-in High Speed CNC Pack	\$799.00
CNC-104 175 oz-in High Speed Additional Axis Pack	\$189.00

262 oz-in High Speed & Torque CNC Pack

The **CNC-005** 3 Axis Package includes
 3 x Hi-Speed Frame 23 MOT-125 Motors
 3 x M542 Microstepping Drivers (up to 25000 steps per rev)
 2 x SPS407 40VDC Stepper Supplies
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram
\$1012 Value for \$859



The **CNC-105** Additional Axis Package includes
 1 x High Speed Frame 23 MOT-125 Stepper Motor
 1 x M542 Microstepping Driver (up to 25000 steps per rev)
\$248 Value for \$209

Price Each	1
CNC-005 262 oz-in High Speed CNC Pack	\$859.00
CNC-105 262 oz-in High Speed Additional Axis Pack	\$209.00

262 oz-in Hi-Speed & Torque CNC Pack

The **CNC-006** 3 Axis Package includes
 3 x High Speed Frame 23 MOT-125 Motors
 3 x ND556 Low Noise Sinusoidal Drivers
 2 x SPS407 40VDC Stepper Supplies
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram



\$1102 Value for \$929

The **CNC-106** Additional Axis Package
 1 x High Speed Frame 23 MOT-125 Stepper Motor
 1 x ND556 Low Noise Sinusoidal Driver

\$278 Value for \$229

Price Each	1
CNC-006 262 oz-in High Speed CNC Pack	\$929.00
CNC-106 262 oz-in High Speed Additional Axis Pack	\$229.00

310 oz-in High Speed & Torque CNC Pack

The **CNC-007** 3 Axis Package includes
 3 x Hi-Speed Frame 23 MOT-105 Stepper Motors
 3 x ND556 Low Noise Sinusoidal Drivers
 3 x SPS407 40VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram



\$1211 Value for \$1029

The **CNC-107** Additional Axis Package
 1 x High Speed Frame 23 MOT-105 Stepper Motor
 1 x ND556 Low Noise Sinusoidal Driver
 1 x SPS407 40VDC Stepper Supply

\$387 Value for \$329

Price Each	1
CNC-007 310 oz-in High Speed CNC Pack	\$1029.00
CNC-107 310 oz-in High Speed Additional Axis Pack	\$329.00

430 oz-in High Torque CNC Pack

The **CNC-011** 3 Axis Package includes
 3 x Frame 24 MOT-128 Stepper Motors
 3 x ND556 Low Noise Sinusoidal Drivers
 2 x SPS407 40VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x 12VDC Plug Pack
 1 x Wiring Diagram



\$1162 Value for \$979

The **CNC-111** Additional Axis Package includes
 1 x Frame 24 MOT-128 Stepper Motor
 1 x ND556 Low Noise Sinusoidal Driver

\$298 Value for \$249

Price Each	1
CNC-011 430 oz-in High Torque CNC Pack	\$979.00
CNC-111 430 oz-in Additional Axis Pack	\$249.00

630 oz-in High Torque CNC Pack

The **CNC-020** 3 Axis Package includes
 3 x MOT-130 Stepper Motors
 3 x ND556 Low Noise Sinusoidal Drivers
 3 x SPS407 40VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x 12VDC Plug Pack
 1 x Wiring Diagram



\$1439 Value for \$1219

The **CNC-120** Additional Axis Package includes
 1 x MOT-130 Stepper Motor
 1 x ND556 Low Noise Sinusoidal Driver
 1 x SPS407 40VDC Stepper Supply

\$463 Value for \$389

Price Each	1
CNC-020 630 oz-in High Torque CNC Pack	\$1219.00
CNC-120 630 oz-in Additional Axis Pack	\$389.00

OCEAN CONTROLS - MOTOR CONTROLLERS

1200 oz-in High Torque CNC Pack

The **CNC-022** 3 Axis Package includes
 3 x MOT-132 Stepper Motors
 3 x MD882 Microstepping Drivers
 3 x SPS407 40VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x 12VDC Plug Pack
 1 x Wiring Diagram

\$1697 Value for \$1439



The **CNC-122** Additional Axis Package includes
 1 x MOT-132 Stepper Motor
 1 x MD882 Microstepping Drivers
 1 x SPS407 40VDC Stepper Supply

\$549 Value for \$459

Price Each	1
CNC-022 1207 oz-in High Torque CNC Pack	\$1439.00
CNC-122 1207 oz-in Additional Axis Pack	\$459.00

630 oz-in High Torque CNC Pack

1700 oz-in High Speed & Torque CNC Pack

The **CNC-024** 3 Axis Package includes
 3 x MOT-135 Stepper Motors
 3 x MD882 Microstepping Drivers
 3 x SPS487 48VDC Stepper Supply
 1 x Parallel Port Interface KTA-205
 1 x 12VDC Plug Pack
 1 x Wiring Diagram

\$1697 Value for \$1475



The **CNC-124** Additional Axis Package includes
 1 x MOT-135 Stepper Motor
 1 x MD882 Microstepping Drivers
 1 x SPS487 48VDC Stepper Supply

\$549 Value for \$495

Price Each	1
CNC-024 1700 oz-in High Torque CNC Pack	\$1475.00
CNC-124 1700 oz-in Additional Axis Pack	\$495.00

3 Axis DC Servo CNC Pack

The **CNC-015** 3 Axis Package includes

3 x MOT-280 DC Servo Motors with 1000 line Encoders
 3 x DB810A Servo Drives
 1 x PSM-201 500W Power Supply
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram

\$1786 Value for \$1499



The **CNC-115** Additional Axis Package includes
 1 x MOT-280 Servo Motor with 1000 line Encoder
 3 x DB810A Servo Drive

\$468 Value for \$394

Price Each	1
CNC-015 Servo CNC Pack	\$1499.00
CNC-115 Servo Additional Axis Pack	\$394.00

3 Axis DC Servo CNC Pack

The **CNC-014** 3 Axis Package includes

3 x MOT-270 DC Servo Motors with 500 line Encoders
 3 x DB810A Servo Drives
 2 x PSM-008 Power Supply
 1 x Parallel Port Interface KTA-205
 1 x Wiring Diagram

\$1565 Value for \$1329



The **CNC-114** Additional Axis Package includes
 1 x MOT-270 Servo Motor with 500 line Encoder
 3 x DB810A Servo Drive

\$454 Value for \$379

Price Each	1
CNC-014 Servo CNC Pack	\$1329.00
CNC-114 Servo Additional Axis Pack	\$379.00

OCEAN CONTROLS - MOTORS

MOT-301 Mini Servo 4.8V-6V

Mini sized servo perfect for R/C or robotics applications where size is at a premium.

Dimensions: 35 x 16.9 x 32mm (L x W x H)

Weight: 26g

Torque 4.8V: 3.4kg / cm

Transit Time 4.8V: 0.19 sec / 60 deg

Torque 6V: 4.2kg / cm

Transit Time 6V: 0.15 sec / 60 deg



Price Each	1	5+
MOT-301 Mini Servo 4.8-6V	\$27.23	less 10%

MOT-302 Standard Size Power Servo 4.8V-6V

Standard sized servo suitable for 1/10th scale R/C cars and robotics applications. Strong torque for power applications.

Dimensions: 39.5 x 20 x 39.6mm (L x W x H)

Weight: 46g

Torque 4.8V: 7.2kg / cm

Transit Time 4.8V: 0.33 sec / 60 deg

Torque 6V: 8kg / cm

Transit Time 6V: 0.27 sec / 60 deg



Price Each	1	5+
MOT-302 Standard Size Servo 4.8-6V	\$36.32	less 10%

MOT-303 Heavy Duty Servo 4.8V-6V

A heavy duty servo which won't make a heavy duty dent in your wallet. Features include ball bearing, high torque and quick transit time.

Dimensions: 54.4 x 26.5 x 51.5mm (L x W x H)

Weight: 110g

Torque 4.8V: 10kg/cm

Transit Time 4.8V: 0.25 sec / 60deg

Torque 6V: 13kg / cm

Transit Time 6V: 0.20 sec / 60deg



Price Each	1	5+
MOT-303 Heavy Duty Servo 4.8-6V	\$40.91	less 10%

MOT-310 Giant Servo 4.8V-6V

For projects that require brute strength, look no further than this giant-scale servo. This servo will deliver eight times the torque of a standard servo, has two ball bearings, and has metal gears to handle those extra-tough loads. Includes Servo Horns

Dimensions: 63.0 x 32.0 x

61.6mm Weight: 160g

Torque 4.8V: 24kg/cm

Transit Time 4.8V: 0.24 sec / 60deg

Torque 6V: 28.8kg / cm

Transit Time 6V: 0.20 sec / 60deg



Price Each	1	5+
MOT-310 Giant Servo 4.8-6V	\$75.00	less 10%

MOT-312 Jumbo Servo 4.8V-6V

This is our largest servo and feature huge torque and speed Features include ball bearing, high torque and quick transit time.

Dimensions: 65.0 x 32.0 x 70.4mm (L x W x H)

Weight: 190g

Torque 4.8V: 35kg/cm

Transit Time 4.8V: 0.15 sec / 60deg

Torque 6V: 42kg / cm

Transit Time 6V: 0.12 sec / 60deg



Price Each	1	5+
MOT-312 Jumbo Servo 4.8-6V	\$115.00	less 10%

MOT-108 Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for small CNC projects and robots. Has a holding torque of 0.18Kg.cm (0.018Nm or 2.5oz-in). Shaft at one end

Features

- Step Angle 1.8deg
- Voltage 3.9V
- Current 0.6A
- Resistance per coil 6.5 Ohm
- Inductance per coil 1.7
- Dimensions: 20mm x 20mm square face, 30mm long, 16mm between mounting holes
- 4 Leads
- Weight: 0.06Kg



Price Each	1	5+
MOT-108 Bipolar Stepper Motor	\$22.00	less 10%

Horns for R/C Servo Motors

MOT-304 Packet of 6 mixed servo horns to suit our Mini Servo and Standard Sized Servo



MOT-305 Packet of 2 servo horns to suit our heavy duty servo



Price Each	1	5+
MOT-304 Packet of Mixed Servo Horns	\$6.32	less 10%
MOT-305 Packet of Heavy Servo Horns	\$6.32	less 10%

PM55L-048 Stepper Motor

Precision Stepper Motor, ideal for small projects and robots, good output characteristics and small size.

Does not come with connector cable but the pins are accessible for soldering.

Features

- 55mm Outer Diameter
- High Torque for size
- Step Angle: 7.5deg
- Shaft protrudes through both ends with pinion gear on top
- Dimensions: 55mm Wide, 25mm High, 65mm between mounting holes, Shaft protrudes ~10mm through each end



Price Each	1	5+
MOT-004 PM55L-048 Stepper Motor	\$18.00	less 10%

OCEAN CONTROLS - MOTORS

GEARBOX WITH MOTOR REVERSIBLE 12V 70RPM

This compact unit will give a massive 2.1 kg/cm of torque at 70 RPM. Current draw rises to a modest 390 MA.

SPECS:

Torque	2.1kg/cm
Rated Voltage	12.0V
Operating max	4.5 - 18V
Current - No load	30mA
Current - Full load	390mA
Gear Ratio	82:1
Shaft Speed	70RPM



Price Each	1
MOT-201 Reversible Gearbox Motor 12V 70RPM	\$13.59

GEARBOX WITH MOTOR REVERSIBLE 12V 36RPM

Only slightly larger than the MO-101, it has a much larger torque (12.0Kg/CM) at 36RPM. It is ideal for driving wheels or other traction devices.

SPECS:

Torque	12.0kg/cm
Rated Voltage	12.0V
Operating	4.5 - 18V max
Current - No load	70mA
Current - Full load	1380mA
Gear Ratio	244:1
Shaft Speed	36RPM



Price Each	1
MOT-202 Reversible Gearbox Motor 12V 36RPM	\$22.68

GEARHEAD MOTOR REVERSIBLE 12VDC - 140RPM

Featuring a torque of 50Kg/cm this motor is for heavy duty applications.

SPECS:

Torque	50kg/cm
Rated Voltage	12.0V
Operating	-
Current - No load	270mA
Current - Full load	11.7A
Gear Ratio	1000:1
Shaft Speed	140RPM
Weight	300g



Price Each	1
MOT-203 Reversible Gearbox Motor 12V 14RPM	\$40.91

MO-210 DC MOTOR 12VDC - 11800RPM

A compact ferrite magnet type DC Motor featuring hard steel drive shaft, long life design and are built in an ISO 9002 quality environment.

No load

Speed (RPM)	11800
Current (AMP)	0.8
Operating Range (V)	6-12

At Stall

Torque (kg/cm)	2.7
Current (AMP)	26

At Max Efficiency

Efficiency (%)	76
Power (W)	43
Speed (RPM)	9800
Torque (kg/cm)	0.42
Current (A)	4.7



Price Each	1
MOT-210 High Power DC Motor 11800 RPM	\$16.32

MO-211 DC MOTOR 12VDC - 9700RPM

A compact ferrite magnet type DC Motor featuring hard steel drive shaft, long life design and are built in an ISO 9002 quality environment.

No load

Speed (RPM)	9700
Current (AMP)	1.3
Operating Range (V)	6-18

At Stall

Torque (kg/cm)	6.0
Current (AMP)	57

At Max Efficiency

Efficiency (%)	73
Power (W)	52
Speed (RPM)	8490
Torque (kg/cm)	.60
Current (A)	6.0



Price Each	1
MOT-211 High Power DC Motor 9700 RPM	\$22.68

MO-212 DC MOTOR 12VDC - 18800RPM

A compact ferrite magnet type DC Motor featuring hard steel drive shaft, long life design and are built in an ISO 9002 quality environment.

No load

Speed (RPM)	18800
Current (AMP)	2.6
Operating Range (V)	6-12

At Stall

Torque (kg/cm)	4.9
Current (AMP)	92

At Max Efficiency

Efficiency (%)	71
Power (W)	107
Speed (RPM)	15520
Torque (kg/cm)	.67
Current (A)	12.8



Price Each	1
MOT-212 High Power DC Motor 18800 RPM	\$20.86

OCEAN CONTROLS - HI PERFORMANCE STEPPER MOTORS

MOT-110 Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for small CNC projects and robots. Has a holding torque of 1.0Kg.cm (0.098Nm or 14oz-in). Shaft at one end



- Features
- Voltage 10V
 - Current 0.5A
 - Resistance per coil 20Ohm
 - Inductance per coil 18mH
 - Dimensions: 35mm x 35mm square face, 36mm long, 26mm between mounting holes
 - 4 Leads
 - Weight: 0.18Kg

Price Each	1	5+
MOT-110 Bipolar Stepper Motor	\$22.00	less 10%

MOT-120 (Frame 17) Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for small CNC projects and robots. Has a holding torque of 3.6Kg.cm (0.35Nm or 50oz-in). Shaft at both ends



- Features
- Step Angle 1.8deg
 - Voltage 2.8V, Current 1.68A
 - Resistance per coil 1.65Ohm
 - Inductance per coil 3.2mH
 - Dimensions: 42mm x 42mm square face, 40mm long, 26mm between mounting holes
 - 4 Leads
 - Weight: 0.3Kg
 - Weight: 0.15Kg

Price Each	1	5+
MOT-120 Bipolar Stepper Motor	\$59.00	less 10%

MOT-124 Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for CNC projects and robots. Has a holding torque of 9.0Kg.cm (0.88Nm or 125oz-in). Shaft at both ends



- Features
- Step Angle 1.8deg
 - Voltage 7.4V
 - Current 1A
 - Resistance per coil 7.4 ohm
 - Inductance per coil 10
 - Dimensions: 56mm x 56mm square face, 56mm long, 47mm between mounting holes
 - 6 Leads
 - Weight: 0.7Kg

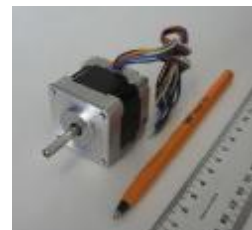
Price Each	1	5+
MOT-124 Bipolar Stepper Motor	\$79.00	less 10%

Price Each	1	5+
MOT-125 Bipolar Stepper Motor	\$99.00	less 10%

New

MOT-115 Bipolar Stepper Motor MOT-116 Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for small CNC projects and robots. Has a holding torque of 2.0Kg.cm (0.196Nm or 28oz-in). MOT-115: Shaft at one end; MOT-116: Shaft at two end.



- Features
- Step Angle 1.8deg
 - Voltage 6V
 - Current 0.8A
 - Resistance per coil 7.5Ohm
 - Inductance per coil 6
 - Holding Torque 2.0Kg.cm
 - Step Angle Accuracy $\pm 5\%$ (full step, no load)
 - Resistance Accuracy $\pm 10\%$
 - Inductance Accuracy $\pm 20\%$
 - Temperature Rise 80degC Max. (rated current, 2 phase on)
 - Ambient Temperature -20 to +50degC
 - Insulation Resistance 100MOhm Min. ,500VDC
 - Dielectric Strength 500VAC for one minute
 - Shaft Radial Play 0.02Max. (450 g-load)
 - Shaft Axial Play 0.08Max. (450 g-load)
 - Max. radial force 28N (20mm from the flange)
 - Max. axial force 10N
 - Dimensions: 39mm x 39mm square face, 38mm long, 31mm between mounting holes
 - 6 Leads
 - Weight: 0.2Kg
 - Shaft Dia 5mm.
 - MOT-115: Extends 20mm from 1 end of the motor;
 - MOT-116: Extends 20mm from front and 10mm from rear of the motor.

Price Each	1	5+
MOT-115 Bipolar Stepper Motor	\$27.50	less 10%
MOT-116 Bipolar Stepper Motor	\$27.50	less 10%

MOT-122 (Frame 23) Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for CNC projects and robots. Has a holding torque of 12.6Kg.cm (1.24Nm or 175oz-in). Shaft at both ends



- Features
- Step Angle 1.8deg
 - Voltage 2.5V
 - Current 2.8A
 - Resistance per coil 0.9ohm
 - Inductance per coil 2.5mH
 - Dimensions: 56mm x 56mm square face, 56mm long, 47mm between mounting holes
 - 4 Leads
 - Weight: 0.7Kg

Price Each	1	5+
MOT-122 Bipolar Stepper Motor	\$79.00	less 10%

MOT-125 (Frame 23) Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for CNC projects and robots. Has a holding torque of 18.9Kg.cm (1.85Nm or 262oz-in). Shaft at both ends



- Features
- Step Angle 1.8deg
 - Voltage 3.2V
 - Current 2.8A
 - Resistance per coil 1.13ohm
 - Inductance per coil 3.6mH
 - Holding Torque 18.9Kg.cm
 - Dimensions: 56mm x 56mm square face, 76mm long, 47mm between mounting holes
 - 4 Leads
 - Weight: 1Kg
 - Shaft extends 20mm and 15mm from ends of the motor

OCEAN CONTROLS - HI PERFORMANCE STEPPER MOTORS

MOT-128 (Frame 24) Bipolar Stepper Motor

Industrial grade small Stepper Motor, ideal for CNC projects and robots. Has a holding torque of 31Kg.cm (3.04Nm or 430oz-in). Shaft at both ends



Features

- Step Angle 1.8deg
- Voltage 4.2V
- Current 2.8A
- Resistance per coil 1.5ohm
- Inductance per coil 6.8mH
- Holding Torque 31Kg.cm

Dimensions: 60mm x 60mm square face, 88mm long, 47mm between mounting holes

- 8 Leads
- Weight: 1.4Kg
- Shaft extends 20mm and 15mm from ends of the motor

Price Each	1	5+
MOT-128 Bipolar Stepper Motor	\$119.00	less 10%

MOT-130 Bipolar Stepper Motor

Industrial grade Stepper Motor, ideal for driving heavier loads. Has a holding torque of 46Kg.cm (4.51Nm or 638oz-in). Shaft at both ends



Features

- Step Angle 1.8deg
- Voltage 2.5V
- Current 5.5A
- Resistance per coil 0.46ohm
- Inductance per coil 4mH
- Holding Torque 46Kg.cm

Dimensions: 86mm x 86mm square face, 80mm long, 69mm between mounting holes

- 4 Leads
- Weight: 2.3Kg
- Shaft extends 30mm from both ends of the motor

Price Each	1	5+
MOT-130 Bipolar Stepper Motor	\$175.00	less 10%

MOT-132 Bipolar Stepper Motor

Industrial grade Stepper Motor, ideal for driving heavier loads. Has a holding torque of 87Kg.cm (8.53Nm or 1207oz-in). Shaft at both ends



Features

- Step Angle 1.8deg
- Voltage 3.6V
- Current 6A
- Resistance per coil 0.6ohm
- Inductance per coil 6.5 mH
- Holding Torque 87Kg.cm

Dimensions: 86mm x 86mm square face, 118mm long, 69mm between mounting holes

- 4 Leads
- Weight: 3.8Kg
- Shaft extends 30mm from both ends of the motor

Price Each	1	5+
MOT-132 Bipolar Stepper Motor	\$215.00	less 10%

Bipolar Stepper Motor-- Torque 2.2Nm

This motor is a 23 Frame motor with 4 phases which you can wire in parallel or serial provides. It has a holding torque of 2.2 N.m (311oz-in) and is suitable for very heavy operation



Features

- Rated Current: 2.8A (Series), 5.7A(Parallel)
- Phase Resistance 1.6ohm
- Phase Inductance 7.2mH
- Step angle: 1.8deg
- Ambient Temp -10 to 50degC
- Temp Rise 80degC
- Dimensions: 56mm x 56mm square face, 80mm long, 47mm between mounting holes
- Weight: 1.2Kg
- Shaft extends 20mm from both ends of the motor

Price Each	1	5+
MOT-105 Bipolar Stepper Motor 57HS22	\$99.00	less 10%

MOT-135 Bipolar Stepper Motor

Industrial grade Stepper Motor, ideal for driving heavier loads. Has a holding torque of 122Kg.cm (11.96Nm or 1694oz-in). Shaft at one end



Features

- Step Angle 1.8deg
- Voltage 4.65V
- Current 6.2A
- Resistance per coil 0.75ohm
- Inductance per coil 9 mH
- Holding Torque 122Kg.cm

Dimensions: 86mm x 86mm square face, 156mm long, 69mm between mounting holes

- 4 Leads
- Weight: 5.4Kg
- Shaft extends 30mm from **one end** of the motor

Price Each	1	5+
MOT-135 Bipolar Stepper Motor	\$259.00	less 10%

OCEAN CONTROLS - DC SERVO MOTORS

DC Servo Motor

DCM5xxx series motors are permanent magnet DC brush servo motors. The motors are ideal for cost sensitive applications. They include an attached encoder which provides position feedback to controllers. Suitable for a wide range of equipments and instruments such as engraving machines, cutting machines, jet-ink machines, experimental installations, instructional machines, imager, analytic instruments, electronic packaging equipments and loading and unloading devices, medical instruments, etc. It performs better in equipments which expected to be low noise, high precision and high velocity.

Features Include

- High performance (Smooth operation, High precision and Low noise)
- Low cost
- Small disturbance
- Model DCM50205 comes with a 500 line encoder
- Model DCM50207 comes with a 1000 line encoder
- Positional error can be eliminated to one pulse
- Mounting dimensions of DCM57xxx brush servo motors are the same as those of NEMA 23 size motors



Price Each	1	5+
MOT-270 DCM50205 DC Servo Motor with encoder	\$225.00	less 10%
MOT-280 DCM50207 DC Servo Motor with encoder	\$239.00	less 10%

ISC3004 SERIES-ROTARY ENCODER

Shaft diameter $\Phi 4$ mm, clamping flange, housing diameter $\Phi 30$ mm. 500 Pulses/rev Quadrature
Low price at high performance, small volume, light weight, easy for installing.

Applications:

Measure the speed, and measure the distance, shoe making machines, molding machines.



Price Each	1	5+
IBE-001 Rotary Encoder ISC3004-701E500B-12-24C	\$135.00	less 10%

ISC4006 SERIES-Rotary encoder

Shaft diameter $\Phi 6$ mm, clamping flange, housing diameter $\Phi 40$ mm. 1000 Pulses/rev Quadrature
Low price at high performance, small volume, light weight, easy for installing.

Applications:

Measure the distance, stop dog positioning, curtained door, textile machines.



Price Each	1	5+
IBE-002 Rotary Encoder ISC4006-H03G1000BZ3-5-24C	\$135.00	less 10%

ISM8060-Rotary encoder

The metal raster, the design is modularization, and the material have plastic and metal. 100 Pulses/rev Quadrature

The unit is $\phi 72 \times 21$, the type is thin, and it is very light, fastness 3M3.

Adapt to the printing and so on.



Price Each	1	5+
IBE-003 Rotary Encoder ISC8060-401G100BZ1-12C	\$135.00	less 10%

OCEAN CONTROLS - HI PERFORMANCE STEPPER MOTORS

Spider Coupler

Connects motors or shafts which are slightly mis-aligned and absorbs torsional shock. The hubs are connected by a synthetic rubber spider.

20mm dia
30mm long
6.35mm (1/4") bore



Price Each	1	5+
MOA-001 Spider Coupler	\$18.14	less 10%

6.35mm (1/4") Shaft Coupler

Solid steel Shaft Coupler connects two axially aligned shafts by hex drive set screws.

12.7mm dia
19mm long
6.35mm (1/4") bore



Price Each	1	5+
MOA-002 Shaft Coupler	\$11.77	less 10%

Aluminium Hub with Set Screws

Securely connect a gear or plate to a shaft using this Aluminium Hub.

22.5mm dia
Connects to gear using 4 set screws
6.35mm (1/4") bore



Price Each	1	5+
MOA-003 Aluminium Hub	\$11.77	less 10%

Universal Aluminum Mounting Hub for 3mm Shaft Pair

These universal mounting hubs are designed to work with most 3 mm shafts, including round shafts, "D" shafts, and Tamiya's 3 mm hexagonal shafts. Each hub has four mounting holes for 2-56 screws, letting you mount custom wheels or mechanisms to your motors. 4-40 hex set screws (one included for each hub) allow secure coupling of shaft to hub. The included set screws require a 0.05" hex wrench (often the smallest size in SAE Allen wrench sets).



Price Each	1	5+
MOA-010 Universal Mounting Hub for 3mm Shaft Pair	\$11.95	less 10%

Universal Aluminum Mounting Hub for 4mm Shaft Pair

These universal mounting hubs are designed to work with most 4 mm shafts, including round shafts, and "D" shafts. Each hub has four mounting holes for 4-40 screws, letting you mount custom wheels or mechanisms to your motors. 4-40 hex set screws (one included for each hub) allow secure coupling of shaft to hub. The included set screws require a 0.05" hex wrench (often the smallest size in SAE Allen wrench sets).



Price Each	1	5+
MOA-011 Universal Mounting Hub for 4mm Shaft Pair	\$11.95	less 10%

Pololu 37D mm Metal Gearmotor Bracket

These aluminum gearmotor brackets let you securely mount Pololu 37D mm metal gearmotors to your project. The brackets are sold in pairs, and each bracket includes six M3 screws for securing the motor to the bracket.

These light-weight brackets (under 15 g each) are specifically designed for the Pololu 37D mm metal gearmotors, such as the 19:1 metal gearmotor 37Dx52L mm. Each bracket features seven mounting holes for M3 or #4-size screws along each edge, giving you a variety of mounting options. A total of twelve M3 screws (six for each bracket) are included for securing the motor to the bracket.



Price Each	1	5+
MOA-014 Pololu 37D mm Metal Gearmotor Bracket Pair	\$13.10	less 10%

IBEST DR series (Flexible Coupling)

D: External diameter of the connector; L: the long of the connector.

M: The hole dia. of the encoder end. N: the hole dia. of the user end.

Torque $\leq 1\text{Nm}$, the axial degree $\leq 0.2\text{mm}$, the corner setover $\leq 1.5^\circ$

Adapt to the encoder and user with the spring connect.



Model	Internal Dia 1	Internal Dia 2	External Dia	Length
DR4X6-D18L25	4	6	18	25
DR6.35X6.35-D18L25	6.35	6.35	18	25
DR8X8-D18L25	8	8	18	25

Price Each	1	5+
IBE-004 Flexible Coupling DR4X6-D18L25	\$13.85	less 10%
IBE-005 Flexible Coupling DR6.35X6.35-D18L25	\$13.85	less 10%

IBEST BR series (Flexible Coupling)

D: External diameter of the connector; L: the long of the connector.

M: The hole dia. of the encoder end. N: the hole dia. of the user end.

Torque $\leq 1\text{Nm}$, the axial degree $\leq 0.2\text{mm}$, the corner setover $\leq 1.5^\circ$

Adapt to the encoder and user with the spring connect.



Model	Internal Dia 1	Internal Dia 2	External Dia	Length
BR6.35X6.35-D24L25	6.35	6.35	24	25
BR8X8-D24L25	8	8	24	25
BR10X10-D30L30	10	10	30	30

Price Each	1	5+
IBE-007 Flexible Coupling BR6.35X6.35-D24L25	\$16.00	less 10%

Universal Aluminum Mounting Hub for 6mm

The universal aluminum mounting hub allows you to mount custom wheels and mechanisms to 6 mm motor shafts. The hubs are sold in pairs, and each hub includes two 4-40 set screws for securing a motor shaft to the hub. These universal mounting hubs are designed to work with most 6 mm shafts, including round shafts and "D" shafts. Each hub has six mounting holes for 4-40 screws, letting you mount custom wheels or mechanisms to your motors. 4-40 hex set screws (two included for each hub) allow secure coupling of shaft to hub. The included set screws require a 0.05" hex wrench (often the smallest size in SAE Allen wrench sets).



Price Each	1	5+
MOA-012 Universal Mounting Hub for 6mm Shaft Pair	\$12.95	less 10%

New Pololu 20D mm Metal Gearmotor Bracket

These aluminum gearmotor brackets let you securely mount Pololu's 20D mm metal gearmotors to your project. The brackets are sold in pairs, and each bracket includes two M3 screws for securing the motor to the bracket.

These light-weight brackets (under 5 g each) are specifically designed for the Pololu 20D mm metal gearmotors, such as the 25:1 metal gearmotor 20Dx44L mm. Each bracket features three mounting holes and ten mounting slots for M3 or #4-size screws, giving you a variety of mounting options. A total of four M3 screws (two for each bracket) are included for securing the motor to the bracket.



Price Each	1	5+
MOA-013 Pololu 20D mm Metal Gearmotor Bracket Pair	\$11.77	less 10%

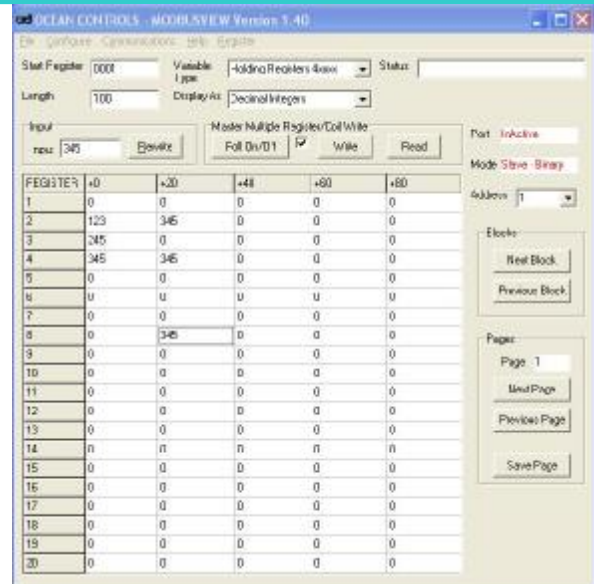
OCEAN CONTROLS - SOFTWARE

ModbusView Version 1.43

ModbusView is an easy to use program that monitors and simulates Modbus communications on your PC. It enables your PC to act as both a modbus master and a slave device making it easy for you to simulate the action of your HMI machine, instruments, PLCs etc. ModbusView can operate on a PC under Windows 95/98, ME, NT, 2000, XP and Vista. It can communicate both in the RTU form and the ASCII form and it can also be set to a range of baud rates, data bits, parity and stop bits.

The user can monitor and set the status of coils, input status, holding registers and input registers. The values of the input and holding registers can be viewed in decimal, hexadecimal, long integer, long hexadecimals and floating point (forward and reverse)

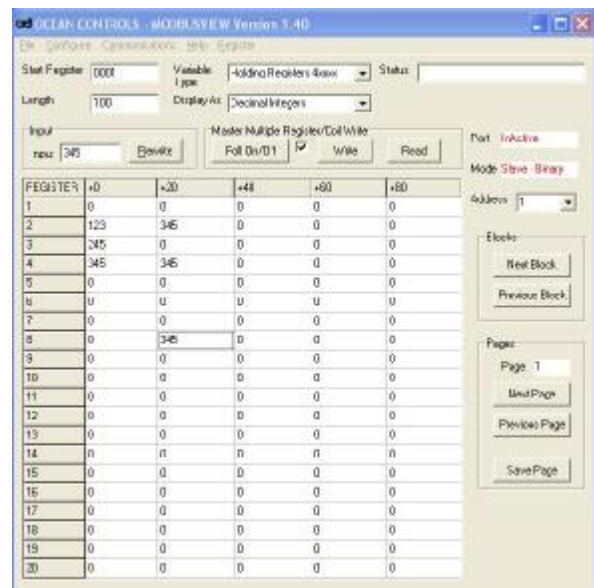
Price Each 1
ModbusView \$59.00



ModbusView TCP Version 1.43

ModbusView TCP is an easy to use program that monitors and simulates Modbus TCP/IP communications on your PC. The Master (or Client in Modbus TCP) establishes a connection with the Slave (or Server). The Server waits for an incoming connection from the Client. Once a connection is established, the Server then responds to the queries from the Client until the client closes the connection. It enables your PC to act as both a modbus master and a slave device making it easy for you to simulate the action of your HMI machine, instruments, PLCs etc. ModbusView can operate on a PC under Windows 95/98, ME, NT, 2000, XP and Vista (must have administrative rights). It communicates in the RTU. The user can monitor and set the status of coils, input status, holding registers and input registers. The values of the input and holding registers can be viewed in decimal, hexadecimal, long integer, long hexadecimals and floating point (forward and reverse)

Price Each 1
ModbusView \$59.00

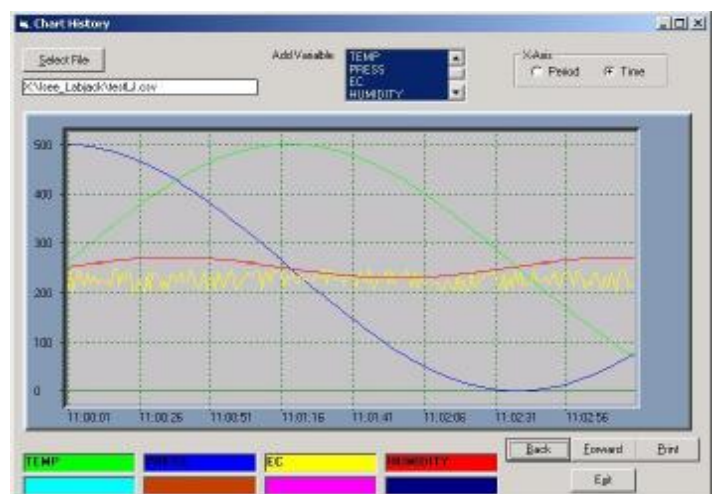


ISEE Modbus

The ISEE-MODBUS data acquisition program is a fully featured minimum cost HMI program for controlling and monitoring controllers, PLCs and instrumentation that use the modbus protocol. Running under Windows XP/2000/NT/ME/98 it allows the user to

- Interrogate multiple controllers, PLCs and instruments
- Supports RTU and ASCII modes of Modbus
- View the holding and input registers. They can be viewed as raw readings or in engineering units.
- Holding and Input registers can contain integers, long integers and floating point numbers
- View the status of the coils and input status
- Write to the coils and holding registers
- Supports up to 1024 tags
- No graphics to draw. Simply display the readings on the screens. Readings can be grouped as you like.
- Display registers, coils, statuses and calculated variables on graphs or trends

Price Each 1
ISEE-modbus Software \$125.00

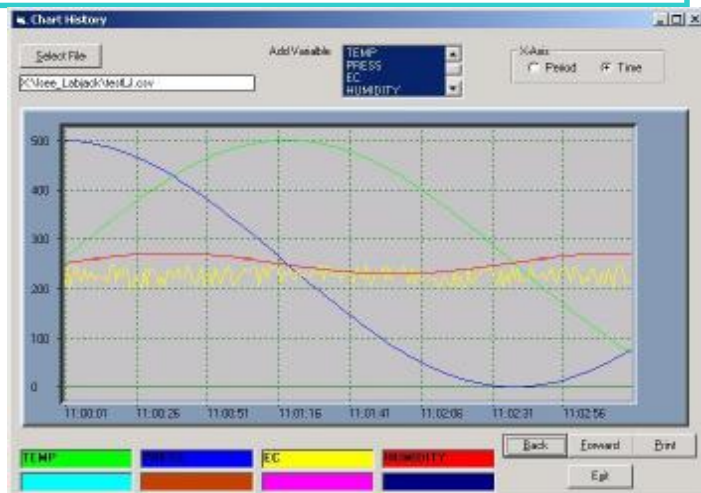


OCEAN CONTROLS - SOFTWARE

VIEW INTEGRA

The VIEW-INTEGRA data acquisition program is a fully featured minimum cost HMI program for controlling and monitoring Crompton Instruments Integra 1500 series of Digital Meters. Running under Windows XP/2000/NT/ME/98 it allows the user to

- Interrogate up to 30 Digital Meters
- All Parameters are already defined ready to use
- View the value of parameters and units.
- Can reset Energy consumption values such as Total KWs
- Can define your own internal variables or tags for control and alarm purposes
- No graphics to draw. Simply display the readings on the screens. Readings can be grouped as you like.
- Display values of parameters and internal variables on graphs or trends
- View the maximum and minimum values for each tag
- Log parameters and internal variables to a csv type file
- Display and analyse Historical logged files on graphs
- Define and display alarms



Price Each

1

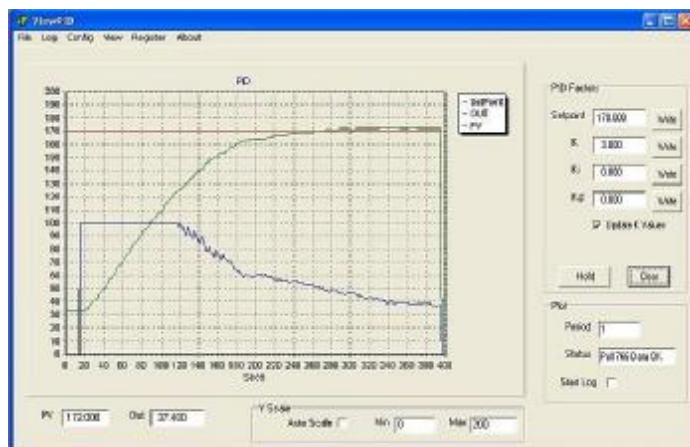
ViewPID Software

ViewPID is our new easy to use Windows PC program that monitors and records the performance of your PID controller (such as our Novus 1100, 1200, 2000 and 3000 controllers) The PC is simply connected to the PID controller with a RS232 or RS485 connection. The software then communicates with the Process controller using Modbus Protocol. By connecting your PC to your PID controller using a RS232 or RS485 serial connection, ViewPID software interrogates your controller for the following values using Modbus protocol

Process Variable, Setpoint, Output
Gain K, Integral Ki and Differential Kd

Features of ViewPID program

- A trend showing the process variable, setpoint and %output.
- Auto or fixed scaling on the trend
- Able to hold the trend.
- Able to change the period of polling from 1 to 1000 seconds
- A display of the setpoint, gain, integral and differential parameters
- Alter the setpoint, gain, integral and differential parameters from the display
- Log the the process variable, setpoint and %output to a csv file on your PC.
- Logged file can be opened later in Excel for analysis
- Display a graph of your logged data.



Price Each

ViewPID Software

\$50.00

Audio Wave Software V2

With AudioWave 2.0 your soundcard becomes a comfortable LF-signal-generator, which produces signals from 1Hz to 20 kHz with a resolution of 1 Hz. Phase shift between left and right channel is adjustable from -180° to +180° and an attenuator can be used for steps of 0dB, -3dB, -6dB, -10 dB, -20 dB, -30dB. Frequency, level and attenuation can be adjusted independently for left and right channel and optionally left and right channel can be chained. AudioWave produces sine and noise signals, as well as modulated signals. Automatic frequency and level progress is programmable. Complex adjustment can be stored as presets with clear names.

Improvements with Version 2

Frequency adjustment 1Hz...20 kHz; 1 Hz resolution

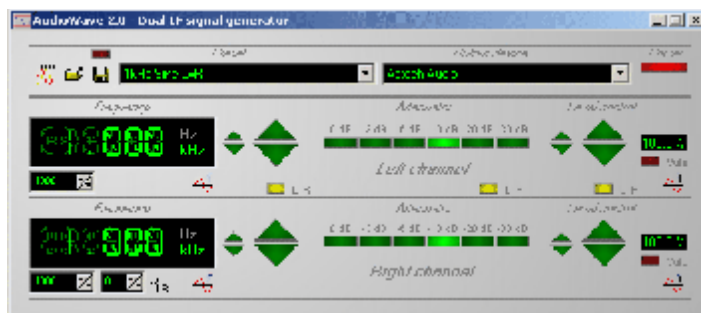
Direct frequency input via keyboard

Soft frequency change

Independent or chained control of frequency, level and attenuation for left and right channel

Channel mute function

Duration up to 60 seconds for modulated signals



Price Each

AudioWave Software

\$25.00

OCEAN CONTROLS - RELAYS

12VDC or 24VDC PCB Relays

These SPDT relays from Goodsky are type RWH-SH-112D 12V and RWH-SH-124D 24V Can switch 10A at 240VAC and 24VDC.

Coil Resistance 400ohm 12VDC, 1600ohm 24VDC
Life expectancy
mechanical 10,000,000 operations at no load
electrical 100,000 at rated resistive load



Price Each	1	5+
RLY-001 12V PCB Relay	\$2.50	less 10%
RLY-002 24V PCB Relay	\$2.50	less 10%

10A DPDT DIN Mount Relays

12VDC or 24VDC or 240VAC coil relay with two changeover contacts (DPDT) rated at 10A 240VAC. Features LED Indicator. Coil at 12VDC 160ohms. Coil at 24VDC 650ohms. It is mounted on a DIN Rail Mount base with screw Terminals. Can be mounted by screws or on a Din Rail Features built in LED Indicator



Price Each	1	5+
RLY-003 12VDC Relay and DIN Base	\$11.91	less 10%
RLY-004 24VDC Relay and DIN Base	\$11.91	less 10%
RLY-010 240VAC Relay and DIN Base	\$11.91	less 10%

10A 4PDT DIN Mount Relays

These relays feature both an LED and Press to Test button

Specifications
Max Voltage 250VAC, 110VDC
Max Current 10A (total)
Coil Resistance (24VDC) 350Ohm
Life expectancy
mechanical 10,000,000 operations no load
electrical 100,000 at rated resistive load

Available also in 24VAC coils



Price Each	1	5+
RLY-005 4PDT DIN Mount Relay 24VDC	\$18.00	less 10%
RLY-006 4PDT DIN Mount Relay 24VAC	\$18.00	less 10%

Relay SPDT 30A 12VDC Tag Connection

Specifications:

- Max voltage: 250V AC
- Max current: 30A
- Max VA (Watts): 7200VA (1100W)
- Contact material: Silver Nickel Alloy
- Coil resistance: 160Ω
- Max coil power: 2.5W
- Insulation resistance: >1000MΩ @ 500V DC
- Dielectric strength (for 1 min):
1500V AC between open contact
2500V AC between coil & contact
- Electrical life: 100,000 operations
- Mechanical life: 1 million operations
- Dimensions: ~50W x 27L x 20H mm (excluding terminals)



SDK4 12 VDC relay terminals coupled emission SDK4 24 VDC relay terminals coupled emission

Features:

Enter the input voltage: 12VDC±10%; 24 VDC±10%
Input current: About 13mA
Pull-in voltage: 75%Un max
Release voltage 5%Un min
Pull-in time: About 10ms
Release time: About 5ms
Additional input circuit: Red LED working status indication
Maximum switching voltage output: 250VAC, 30VDC
Maximum switching current: 3A
Maximum switching power of the load resistor (cosφ = 1): 750VA/90W
The maximum movement frequency (negative rating): 1200 times / hour
Contact Material: Silver alloy
Contact Type: A regular open
Life (resistive load) Mechanical life: 2 × 10⁷ switching action
Electrical life: 1 × 10⁵ switching action
Test voltage winding / contact: 2kV, 50Hz, 1 minutes
Contact / Contact: 1kV, 50Hz, 1 minutes
Ambient temperature: -25°C...+40°C
Pollution level II
Connection: Screw connection
Conductor cross-sectional area: 0.5...2.5mm²
Dimensions: Width / thickness / height mm 66 / 6 (66/70)



Price Each	1	5+
RLY-100 SDK4 12VDC relay terminals	\$14.50	less 10%
RLY-110 SDK4 24VDC relay terminals	\$14.50	less 10%

OCEAN CONTROLS - RELAYS

40A 240VAC Solid State Relay

The SS-240DA solid state relay that offers 4-32VDC input control, with the output rated at 40Amps @ 240VAC. It provides 4000Vms opto-isolation between input and output. Comes with cover to minimize contact with live voltages (see picture)

Input Circuit

- Control Voltage Range: 4- 32VDC
- Control Current: 6 to 10mA
- Pick Up voltage: 4V DC, Drop Out Voltage: 2VDC

Output Circuit

- Nominal Line Voltage: 240V AC
- Load Voltage Range: 24- 280V AC
- Min. Blocking Voltage: 600V AC
- Max one- cycle surge current: 400A
- Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
- Dimensions:57(L) x 45(W) x30(H)mm



Price Each 1+
SSR-100 SS-240DA 4-32VDC Input 40A@240v AC Switch \$35.00

40A 240VAC Solid State Relay

The SS-240AA Solid State Relay offers 80-280VAC input control, with the output rated at 40Amps @ 240VAC. It provides 4000Vms opto-isolation between input and output. Comes with cover to minimize contact with live voltages (see picture)

Input Circuit

- Control Voltage Range: 80-280Vac
- Control Current: 10mA/110Vac
- Pick Up voltage: 60V AC, Drop Out Voltage: 40VAC

Output Circuit

- Nominal Line Voltage: 240V AC
- Load Voltage Range: 24- 280V AC
- Min. Blocking Voltage: 600V AC
- Max one- cycle surge current: 400A
- Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
- Dimensions:57(L) x 45(W) x30(H)mm



Price Each 1+
SSR-110 SS-240AA 80-280VAC Input 40A@240v AC Switch \$35.00

40A 440VAC Solid State Relay

The SS-440DA solid state relay that offers 4-32VDC input control, with the output rated at 40Amps @ 440VAC. It provides 4000Vms opto-isolation between input and output. Comes with cover to minimize contact with live voltages (see picture)

Input Circuit

- Control Voltage Range: 4- 32VDC
- Control Current: 6 to 10mA
- Pick Up voltage: 4V DC, Drop Out Voltage: 2VDC

Output Circuit

- Nominal Line Voltage: 440V AC
- Load Voltage Range: 48- 440V AC
- Min. Blocking Voltage: 600V AC
- Max one- cycle surge current: 400A
- Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
- Dimensions:57(L) x 45(W) x30(H)mm



Price Each 1+
SSR-200 SS-440DA 4-32VDC Input 40A@240v AC Switch \$42.50

40A 440VAC Solid State Relay

The SS-440AA Solid State Relay from Conch offers 80-280VAC input control, with the output rated at 40Amps @ 480VAC. It provides 4000Vms opto-isolation between input and output. Comes with cover to minimize contact with live voltages (see picture)

Input Circuit

- Control Voltage Range: 80-280Vac
- Control Current: 10mA/110Vac
- Pick Up voltage: 60V AC, Drop Out Voltage: 40VAC

Output Circuit

- Nominal Line Voltage: 415V AC
- Load Voltage Range: 48-480V AC
- Min. Blocking Voltage: 600V AC
- Max one- cycle surge current: 400A
- Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
- Dimensions:57(L) x 45(W) x30(H)mm



Price Each 1+
SSR-205 SS-440AA 80-280VAC Input 40A@240v AC Switch \$47.50

10A 60VDC Solid State Relay

The SS-110DD Solid State Relay from Conch is a panel mounting solid state relay that offers 4-32VDC input control, with the output rated at 10Amps @ 60VDC. It provides 4000Vms opto-isolation between input and output. Comes with cover to minimize contact with live voltages (see picture)

Input Circuit

- Control Voltage Range: 4-32Vdc
- Control Current: 6-10mA
- Pick Up voltage: 4V dc
- Drop Out Voltage: 2 V dc

Output Circuit

- Load Voltage Range: 5-60V DC
- Non rep. peak voltage: 150Vp
- Leakage current <1mA
- Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
- Dimensions:57(L) x 45(W) x30(H)mm



Price Each 1+
SSR-120 SS-240DD 4-32VDC Input 10A@60V DC Switch \$35.00

OCEAN CONTROLS - RELAY CARDS

40A 240VAC Solid State Relay Potentiometer Input

The SS-240VA is a panel mounting solid state relay that allows a 500KOhm pot to be connected across the input. The position of the potentiometer results in Phase Trigger Control of the Load. If the potentiometer is set at 10% then 10% of each half cycle is passed. **(Warning there is no isolation between the input and output. There is 240VAC across the potentiometer inputs. The potentiometer must be rated to 240VAC)** The breakdown voltage is rated at 2500Vrms. Comes with cover to minimize contact with live voltages



Specifications:

- Input Circuit
- Potentiometer Resistor 500KOhm for 240VAC
- Output Circuit
- Load Voltage Range: 80-280V AC
 - rated at 40Amps @ 240VAC.
 - Non rep. peak voltage: 600Vp
 - Leakage current 8mA
 - 1 Cycle Surge Current 400A

Price Each	1+
SSR-125 SS-240VA 500K Pot Input 40A@240V AC Switch	\$35.00

PCB Solid State Relays

This PCB mounting, single in line package relay capable of switching up to 240V AC at 3 amps.

- Input Circuit
- Control Voltage Range: 3- 32VDC
 - Control Current: 15mA Max-
 - Min. turn off voltage: 1V DC
 - Input Resistance: 2.2kohm min.
- Output Circuit
- Max load current: 3A
 - Nominal Line Voltage: 240V AC
 - Load Voltage Range: 24- 280V AC
 - Min. Blocking Voltage: 600V AC
 - Max one- cycle surge current: 80A
 - Min. Load current: 50mA
 - Dimensions:10(D) x 42(W) x25(H)mm



Price Each	1+
SSR-011 32V DC Solid State Relay	\$16.32

100A DC Solid State Relay

Solid State Relay 3-32VDC Input 100A@30VDC Switching

This solid state relay uses MOSFET technology to provide an economical and reliable method of switching medium to high power DC loads. By electrical switching with a

- Output Circuit
- Load Voltage: 0-30VDC
 - Load Current: 0.02-100A
 - Max On-State Resistance: 0.007Ohms
 - Max On-State Voltage Drop: 0.35V
 - Max Turn On Time: 0.5ms
 - Max Turn Off Time: 0.5ms
 - Max Surge Current: 240A (10ms)

- Input Circuit
- Control Voltage: 3-32VDC
 - Control Current: 28mA max.
 - Min Turn Off Voltage: 1.0VDC
 - Input Resistance: 1.2kOhm .
- Dimensions: 58.4(L) x 45.7(W) x 22.9(D)mm



Price Each	1+
SSR-013 Solid State Relay 100A@30v DC Switching	\$43.59

40A 240VAC Solid State Relay with 4-20mA Input

The SS-240CA is a panel mounting solid state relay that allows a 4-20mA signal to be connected across the input. The level of the 4-20mA signal results in Phase Trigger Control of the Load. A curve is provided on the datasheet showing the relationship between the input current and the Output Percentage load. The load output is rated at 40Amps @ 240VAC. It provides 4000Vrms opto-isolation between input and output. A cover to minimize contact with live voltages is included

Specifications:

- Input Circuit
- Input Control Range 4-20mA

- Output Circuit
- Load Voltage Range: 90-260V AC
 - Non rep. peak voltage: 600Vp
 - Leakage current 8mA
 - 1 Cycle Surge Current 400A
 - Operating/Storage Temperature: -20 to 80degC/-40 to 100degC
 - Dimensions:57(L) x 45(W) x30(H)mm
 - **DIN Rail Mount Heat Sink included.**

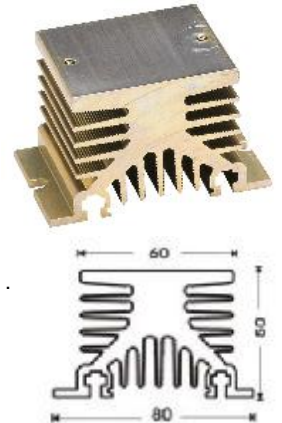


Price Each	1+
SSR-130 SS-240CA 4-20mA Input 40A@240V AC Switch	\$75.00

Solid State Relay Heatsink

These heatsinks are designed for mounting the 40A 240VAC and SSR-013 solid state relays on them. They are manufactured from solid black aluminium and come in lengths of 50mm (fits 1 relay) and 100mm (fits 2 Solid State Relays). The screw holes for the solid state relays are 4mm.

The heatsinks are suitable to be used with an 80mm fan mounted at the heatsink end. .



Price Each	1	5+
SSR-020 Black Aluminium Heatsink 50mm for SSR	\$15.00	less 10%
SSR-021 Black Aluminium Heatsink 100mm for SSR	\$22.00	less 10%

OCEAN CONTROLS - RELAY CARDS

NIO - Relay Interface

The NIO series of DIN rail relays are interfaces used extensively in switching applications in industrial automation. They are built with high quality components for beyond normal performance and comply with the highly demanding automation standards.

Electrical connections are quickly performed through the quick-on spring loaded terminals without turning screws which help speed up the installation procedure and guarantee highly efficient contacts under high amperage.

Specifications:

- * Mechanical life: 10,000,000 cycles
- * Electrical life with resistive load: 60,000 cycles
- * Switching time: 5 ms
- * Electrical insulation between input and output: 1000 Vac
- * Operating temperature: -40 to 70 °C (-40 to 158 °F)
- * Enclosure protection: IP20
- * Wiring gauge: 0.2 ~ 1.5 mm²
- * Input

Switching rated voltage (UN): 12/24/220 Vac/dc
Consumption: 0.2/0.3/0.9 VA (W)
Holding voltage: 0.8 ... 1.1 UN
Must drop-out voltage: 0.6 UN

* Output

Output type: SPDT relay
Rated current: 6 A
Maximum instantaneous current: 10 A
Working voltage: 250 Vac/dc
Maximum working voltage: 400 Vac/dc
Resistive load capacity: 1500 VA
Inductive load capacity: 300 VA
Capacity with monophase motor (220 Vac): 185 VA (1/4 HP)
Maximum resistive current DC (30V / 220 V): 6 A / 0,15 A
Contact material: AgNi

* OPTIONS

Identification and interconnecting accessories



Price Each	1	5+
SSR-040 NIO - Relay Interface		



AC Zero Crossing Solid State Relays Card

These would have to be the most versatile relay cards on the market. Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V. Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay.



Specifications:

Operating Voltage 12VDC
Input low voltage (LO) 0 - 0.8V
Input high voltage (HI) 2.4 - 12V
We have operated these relays from an old style TTL 7404 Hex Inverter which have less drive capacity than the newer HC and HCT types. The inverter could operate the relay with both a low and a high output signal. But what is more important was that the High voltage dropped from 4V to 3.5V showing the output still had capacity to drive other TTL devices
Low profile PCB mounting solid state relays with LED input status indication. Suitable for applications such as I/O interfaces and programmable logic controllers.

SY-4096

Type: Zero crossing turn on, solid state relay. The relay will only turn on when the line (output) voltage is near zero. Suitable for resistive loads.

Control voltage range: 9.6 - 14.4VDC

Load voltage: 75 - 400VAC

Load current: 0.1 - 3A

A LED shows the state of each relay.

The Relay Cards are available in 12VDC

Four 3.5mm holes in each corner allow easy mounting on a panel

Dimensions of card

2 relay card - 42(L) x 71(W) x 20(H)mm

4 relay card - 86(L) x 71(W) x 20(H)mm

6 relay card - 130(L) x 71(W) x 20(H)mm

8 relay card - 174(L) x 71(W) x 20(H)mm

Price Each	1	5+
POC-122 Two 12 V AC Zero Crossing Solid State Relays Card	\$37.50	less 10%
POC-124 Four 12 V AC Zero Crossing Solid State Relays Card	\$74.50	less 10%
POC-128 Eight 12 V AC Zero Crossing Solid State Relays Card	\$149.00	less 10%
POD-122 Two 12 V AC Zero Crossing Solid State Relays Card on DIN Rail	\$56.00	less 10%
POD-124 Four 12 V AC Zero Crossing Solid State Relays Card on DIN Rail	\$107.00	less 10%
POD-128 Eight 12 V AC Zero Crossing Solid State Relays Card on DIN Rail	\$214.00	less 10%

DIN Rail Mounted Heatsink

These heatsinks are designed for mounting the 40A 250VAC and SSR-013 solid state relays on them. They are manufactured from solid aluminium and come in height of 40mm and 60mm and a length of 100mm (fits 1 relay). The screw holes for the solid state relays are 4mm.

The heatsinks are suitable to be used with an 80mm fan mounted at the heatsink end.



Price Each	1	5+
SSR-030 DIN Rail Aluminium Heatsink 40mm High	\$27.50	less 10%
SSR-031 DIN Rail Aluminium Heatsink 60mm High	\$29.50	less 10%



ALT-301 1 PHASE SCR POWER REGULATOR

Features:

*Down-Opened panel, easy for fuse replacement

*Automatic power frequency detection for 50-60 Hz

*Adjustment VR for 0-100% output

*DIN rail type, easy installation



Specifications:

* Input Voltage: AC 220-380V / AC 480V +- 15%

* Load Current: 50A

* Input Signal: 4-20 mAdc

* Adjustment VR: 0-100%

* LED Indication: Green: Power Indicator;

Green: Input Indicator;

Red: Output Indicator;

Yellow: Error Indicator

* Temperature Coefficient: 100ppm / °C (0-60 °C)

* Operating Temperature: 0-50 °C

* Operating Humidity: 20-90% RH (non-condensing)

* Storage Temperature: 0-60 °C

* Storage Humidity: 20-90% RH (non-condensing)

* Power Supply: AC 220V +-15%

Price Each	1	5+
ALT-301 1 PHASE SCR POWER REGULATOR	\$191.44	less 10%

Multiple Relay Cards

These would have to be the most versatile relay cards on the market. The cards come in a 12V or 24V powered form.

Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V (0 to 24V if using 24VDC relays). Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay. They also feature LEDs to indicate the state of the relay.

Specifications:

Operating Voltage 12VDC (or 24VDC)

Input low voltage (LO) 0 - 0.8V

Input high voltage (HI) 2.4 - 12V

(or 24VDC)

They are available in 2, 4, 6 and 8 Relays cards



Price Each	1	5+
RLC-122 Two 12V Relay Card	\$21.50	less 10%
RLC-124 Four 12V Relay Card	\$42.50	less 10%
RLC-128 Eight 12V Relay Card	\$85.00	less 10%
RLC-242 Two 24V Relay Card	\$21.50	less 10%
RLC-244 Four 24V Relay Card	\$42.50	less 10%
RLC-248 Eight 24V Relay Card	\$85.00	less 10%

OCEAN CONTROLS - RELAY CARDS

Multiple Relay Cards DIN Rail Mounted

These would have to be the most versatile relay cards on the market. The cards come in a 12V or 24V powered form.

Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V (0 to 24V if using 24VDC relays). Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay. They also feature LEDs to indicate the state of the relay.

Specifications:

Operating Voltage 12VDC (or 24VDC)
Input low voltage (LO) 0 - 0.8V
Input high voltage (HI) 2.4 - 12V (or 24VDC)

They are available in 2, 4, 6 and 8 Relays configurations mounted in a DIN rail carrier



Price Each	1	5+
RLD-122 Two 12V Relay Card on DIN Rail	\$40.00	less 10%
RLD-124 Four 12V Relay Card on DIN Rail	\$75.00	less 10%
RLD-128 Eight 12V Relay Card on DIN Rail	\$150.00	less 10%
RLD-242 Two 24V Relay Card on DIN Rail	\$40.00	less 10%
RLD-244 Four 24V Relay Card on DIN Rail	\$75.00	less 10%
RLD-248 Eight 24V Relay Card on DIN Rail	\$150.00	less 10%



Plug-In Relays Card

These would have to be the most versatile relay cards on the market. Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V(0 to 24V if using 24VDC relays). Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay.

Specifications:

Operating Voltage 12VDC (or 24VDC)
Input low voltage (LO) 0 - 0.8V
Input high voltage (HI) 2.4 - 12V (or 24VDC)

We have operated these relays from an old style TTL 7404 Hex Inverter which have less drive capacity than the newer HC and HCT types. The inverter could operate the relay with both a low and a high output signal. But what is more important was that the High voltage dropped from 4V to 3.5V showing the output still had capacity to drive other TTL devices
Fully sealed construction (immersion cleanable).

Specifications

Max voltage: 250V AC, 110V DC
Max current: 16A
Max VA (Watts): 1800VA (450W)
Contact material: Silver Selenium Dioxide
Coil resistance: 200Ω
Max coil power: 720mw
Insulation resistance: >100MΩ @ 500V DC
Dielectric strength (for 1 min):
1000V AC between open contacts
5000V AC between coil & contact
Electrical life: 100,000 operations
Mechanical life: 10 million operations
Dimensions: 13W x 29L x 21H mm



A LED shows the state of each relay.

The Relay Cards are available in

12VDC or 24VDC

Four 3.5mm holes in each corner allow easy mounting on a panel

Dimensions of card

2 relay card - 42(L) x 71(W) x 20(H)mm

4 relay card - 86(L) x 71(W) x 20(H)mm

6 relay card - 130(L) x 71(W) x 20(H)mm

8 relay card - 174(L) x 71(W) x 20(H)mm

Price Each	1	5+
PPC-122 Two 12 V Plug-In Relays Card	\$22.90	less 10%
PPC-124 Four 12 V Plug-In Relays Card	\$45.30	less 10%
PPC-128 Eight 12 V Plug-In Relays Card	\$90.60	less 10%
PPD-122 Two 12 V Plug-In Relays Card on DIN Rail	\$41.40	less 10%
PPD-124 Four 12 V Plug-In Relays Card on DIN Rail	\$77.80	less 10%
PPD-128 Eight 12 V Plug-In Relays Card on DIN Rail	\$155.60	less 10%
PPC-242 Two 24 V Plug-In Relays Card	\$22.90	less 10%
PPC-244 Four 24 V Plug-In Relays Card	\$45.30	less 10%
PPC-248 Eight 24 V Plug-In Relays Card	\$90.60	less 10%
PPD-242 Two 24 V Plug-In Relays Card on DIN Rail	\$41.40	less 10%
PPD-244 Four 24 V Plug-In Relays Card on DIN Rail	\$77.80	less 10%
PPD-248 Eight 24 V Plug-In Relays Card on DIN Rail	\$155.60	less 10%



Telecoms Relays Card

These would have to be the most versatile relay cards on the market. Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V. Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay.

Specifications:

Operating Voltage 12VDC
Input low voltage (LO) 0 - 0.8V
Input high voltage (HI) 2.4 - 12V

We have operated these relays from an old style TTL 7404 Hex Inverter which have less drive capacity than the newer HC and HCT types. The inverter could operate the relay with both a low and a high output signal. But what is more important was that the High voltage dropped from 4V to 3.5V showing the output still had capacity to drive other TTL devices
Elegant relays. PCB mounting featuring silver alloy contacts SPDT - 12V DC. - Coil 285 ohms. - 10A @ 30V DC or 10A @ 240V AC contact rating.



A LED shows the state of each relay.

The Relay Cards are available in 12VDC

Four 3.5mm holes in each corner allow easy mounting on a panel

Dimensions of card

2 relay card - 42(L) x 71(W) x 20(H)mm

4 relay card - 86(L) x 71(W) x 20(H)mm

6 relay card - 130(L) x 71(W) x 20(H)mm

8 relay card - 174(L) x 71(W) x 20(H)mm

Price Each	1	5+
PMC-122 Two 12 V Telecoms Relays Card	\$26.40	less 10%
PMC-124 Four 12 V Telecoms Relays Card	\$52.30	less 10%
PMC-128 Eight 12 V Telecoms Relays Card	\$104.60	less 10%
PMD-122 Two 12 V Telecoms Relays Card on DIN Rail	\$44.90	less 10%
PMD-124 Four 12 V Telecoms Relays Card on DIN Rail	\$84.80	less 10%
PMD-128 Eight 12 V Telecoms Relays Card on DIN Rail	\$169.60	less 10%

DC Solid State Relays Card



These would have to be the most versatile relay cards on the market. Each relay can be operated by TTL levels, NPN and PNP open collector or 0 to 12V. Each relay has two inputs, marked LO and HI. As the names suggest a low on the LO input will operate the relay. Similarly a high on the HI input will also operate the relay.

Specifications:

Operating Voltage 12VDC
Input low voltage (LO) 0 - 0.8V
Input high voltage (HI) 2.4 - 12V

We have operated these relays from an old style TTL 7404 Hex Inverter which have less drive capacity than the newer HC and HCT types. The inverter could operate the relay with both a low and a high output signal. But what is more important was that the High voltage dropped from 4V to 3.5V showing the output still had capacity to drive other TTL devices

Low profile PCB mounting solid state relays with LED input status indication. Suitable for applications such as I/O interfaces and programmable logic controllers.

SY-4093

Control voltage range:9.6 -

14.4VDC

Max. input current: 20mA

Load voltage: 3 - 125VDC

Load current: 0.01 - 2A

A LED shows the state of each relay.

The Relay Cards are available in 12VDC

Four 3.5mm holes in each corner allow easy mounting on a panel

Dimensions of card

2 relay card - 42(L) x 71(W) x 20(H)mm

4 relay card - 86(L) x 71(W) x 20(H)mm

6 relay card - 130(L) x 71(W) x 20(H)mm

Price Each	1	5+
PNC-122 Two 12 V DC Solid State Relays Card	\$35.10	less10%
PNC-124 Four 12 V DC Solid State Relays Card	\$69.70	less10%
PNC-128 Eight 12 V DC Solid State Relays Card	\$139.40	less10%
PND-122 Two 12 V DC Solid State Relays Card on DIN Rail	\$53.60	less10%
PND-124 Four 12 V DC Solid State Relays Card on DIN Rail	\$102.20	less10%
PND-128 Eight 12 V DC Solid State Relays Card on DIN Rail	\$204.40	less10%



OCEAN CONTROLS - FANS

60mm 12v DC - 2 Wire Sleeve Bearing

- Air Volume 0.57 (M3/min), 20 (CFM)
- Bearing System Sleeve
- Noise 30dB (A)
- Speed 4,000 rpm
- Input 1.6 watts
- Current 130mA
- Size 60 x 60 x 25.4mm
- Flylead connection
- Impeller Plastic, fibreglass filled
- Housing Plastic, fibreglass filled.



FAN-002 80mm 12VDC FAN Sleeve Bearing

- Air Volume 0.97 (M3/min), 34 (CFM)
- Bearing System Sleeve
- Noise 32dB (A)
- Speed 3,000 rpm
- Input 2.4 watts
- Current 200mA
- Size 80 x 80 x 25.4mm
- Flylead connection
- Impeller Plastic, fibreglass filled
- Housing Plastic, fibreglass filled



Price Each	1	5+
FAN-001 60mm 12VDC - 2 Wire Sleeve Bearing	\$17.55	less 10%

Price Each	1	5+
FAN-002 80mm 12v DC - 2 Wire Sleeve Bearing	\$17.55	less 10%

FAN-003 80mm 12VDC Ball Bearing Fan

- Life expectancy 100,000 hours @ 25°C.
- Air Volume 0.97 (M3/min), 34 (CFM)
 - Noise 32dB (A)
 - Speed 3,000 rpm
 - Input 2.4 watts
 - Current 200mA
 - Size 80 x 80 x 25.4mm
 - Flylead connection
 - Impeller Plastic, fibreglass filled
 - Housing Plastic, fibreglass filled.



FAN-004 120mm 12VDC Ball Bearing Fan

- Air volume 2.3 (m3/min) 80(CFM)
- Flylead connection.
- Noise 42 dB (A)
- Speed 3,000 rpm
- Input 4.56 Watts
- Current 380 mA
- Size 120 x 120 x 25.4mm
- Voltage 12VDC
- Impeller Plastic, fibreglass filled
- Housing Plastic, fibreglass filled
- Bearing system Ball race.



Price Each	1	5+
FAN-003 80mm 12v DC - 2 Wire Ball Bearing	\$19.77	less 10%

Price Each	1	5+
FAN-004 120mm 12v DC - 2 Wire Thin Ball Bearing	\$30.23	less 10%

FAN-005 80mm 24VDC Sleeve Bearing Fan

- Air volume: 1.13 (m3/min) 40(CFM)
- Noise: 35 dBA-
- Input: 3.12 Watts
- Size: 80 x 80 x 25.4mm
- Impeller: Plastic, fibreglass filled
- Housing: Plastic, fibreglass filled
- Bearing system: Sleeve
- Speed: 3,200 rpm
- Current: 130 mA
- Flylead connection



FAN-006 80mm 24VDC Ball Bearing Fan

- Life expectancy 100,000 hours @ 25°C.
- Air volume: 1.13 (m3/min) 40(cfm)
- Noise: 35 dBA-
- Input: 3.12 Watts
- Size: 80 x 80 x 25.4mm-
- Impeller: Plastic, fibre glass filled
- Housing: Plastic, fibre glass filled
- Bearing system : Ball Bearing
- Speed: 3,200 rpm
- Current: 130 mA
- Flylead connection



Price Each	1	5+
FAN-005 80mm 24v DC - 2 Wire Thin	\$17.55	less 10%

Price Each	1	5+
FAN-006 80mm 24v DC - Ball Bearing Fan	\$21.95	less 10%

OCEAN CONTROLS - PLC'S

XC3 Series of PLC

The XC3 series from Rockhood Automation features a large number of functions, large memory capacity, small size and fast scan times

Although economically priced, these PLC's have been built and designed with motion control in mind. Basic features in the XC series programmable logic controller are

- Max 1024 I/O points using expansion modules.
- Program's capacity is 30K
- Two high speed counter inputs, the highest frequency is 200K.
- 2 pulse outputs for stepper or servo motor control the max pulse output is 400K
- PWM Control
- support for CAN bus, Modbus and TCP/IP Ethernet.

Other features include

- Free Software
- Programmable in Ladder Logic and Instruction List

Can be used with our HMI Displays (OP-320A, MY-330, TP-562T etc)on the next page



The software is fast and easy to use. It allows for commenting of the variables so the rungs are easy to understand.

It has an online monitor which allows the user to monitor the program on the ladder or open the data window to modify or monitor the data variables

The XCP software also features a rich instruction list which allow calculations in integer, long integer or floating point. Other instructions include ordinal control, data manipulation, interrupts, communications and motion control.

Copy, cut and paste of instruction and ladder programming allows easy editing of programs

Model	Digital Inputs	Transistor Outputs	Relay Outputs	Power	Notes
XC3-14RT-C	8	2	4	20-30VDC	
XC3-14RT-E	8	2	4	90-260VAC	
XC3-32T-C	18	14	0	20-30VDC	2 High Speed Pulse Outputs
XC3-32T-E	18	14	0	90-260VAC	2 High Speed Pulse Outputs
XC5-48T-C	28	20	0	20-30VDC	4 High Speed Pulse Outputs

Price Each

PLC-001 XC3-14RT-E	\$215.00
PLC-002 XC3-14RT-C	\$215.00
PLC-021 XC3-32T-C	\$349.00
PLC-022 XC3-32T-C	\$349.00
PLC-060 XC5-48T-C	\$525.00

XC3-19AR PLC

The XC3-19AR from Rockhood is a PLC with the following features all in one unit

Basic Performance

- Integrates logic Control, analog input/output in one unit
- Digital Input - 9 points (NPN type optical coupling insulation)
- Digital Output - 10 points (Relay Type)
- Analog Input - 8 points (0 to 10 voltage)
- Analog Output - 2 points (0 to 10 voltage or 4 to 20mA)
- Supports 3 channels AB phase input
- Supports 4 channels high speed count (20KHz)
- All connections via screw terminals
- High performance-price ratio, major space saving



Price Each

PLC-100 XMP3-18R-C	\$425.00
PLC-301 OP-XP-CAB Programming Cable	\$26.00

Other features include

- Free Software
- Programmable in Ladder Logic and Instruction List

The software is fast and easy to use. It allows for commenting of the variables so the rungs are easy to understand.

It has an online monitor which allows the user to monitor the program on the ladder or open the data window to modify or monitor the data variables

The XCP software also features a rich instruction list which allow calculations in integer, long integer or floating point. Other instructions include ordinal control, data manipulation, interrupts, communications and motion control.

Copy, cut and paste of instruction and ladder programming allows easy editing of programs

XMP3 DUAL PUMP CONTROLLER

We have programmed our XMP3 PLC to be a Dual Pump Controller. It is suitable for both water and wastewater applications. It can be used to control the pumps for filling a tank or emptying a wet well. The units comes with the usual features found with pump controllers and more. The controller features

- 1 or 2 pump control.
- pumps can operate in duty/standby or cyclic.
- Can control pumps to fill a tank or empty a well
- Operates with conductive probe, pressure, ultrasonic or any 4-20mA device
- Start pumps by Level sensor, high or low floats or both
- With level sensor operation each pump can have its own start and stop levels
- Switch over to standby pump on overload, runtime fail or no flow fault.
- Times to recognize faults are configurable.
- Can operate a wet well washer
- Start a pump once a day to take advantage of Off Peak Electricity tariffs
- Start a pump after a period of no activity. Useful to prevent wet wells going septic
- Easily configured with the touch screen.
- Modbus connection to connect to another PLC or RTU.



Price Each

PLC-400 XMP3 Pump Controller	\$575.00
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OCEAN CONTROLS - PLC'S

XC3 Series Expansion Modules

The XC3 Programmable Logic Controllers can be expanded with these Analog modules and I/O modules.

Analog Modules	Description
XC-4AD2DA	4 Analog In 2 Analog Out Module
XC-4AD	4 Analog In Module
XC-8AD	8 Analog In Module
XC-2DA	2 Analog Out Module
XC-4DA	4 Analog Out Module
XC-4PT4AD	4 Analog In Module 4 PT100 temperature sampling
XC-6PT	6 PT100 temperature sampling Module, 0-300 C, precision: 0.2 degree
XC-6PT-P	6 PT100 temperature sampling PID Out Module, 0-300 C, precision: 0.2 degree, PID output
XC-6TC	6 K, E temperature sampling Module, 0-1200 C, precision: 0.5 degree,
XC-6TC-P	6 K, E temperature sampling PID Control Module, 0-1200 C, precision: 0.5 degree, PID control
XC-2AD2PT-BD	2 CHANNELS 12Bits analog input, 2 channels Pt100 temperature sampling card (XC3-14 models don't support)
XC3-COM-BD	RS232, RS485 communication expand board (XC3-14 models don't support)

I/O Modules	Description
XC3-E8X	8 points DC input
XC3-E8YR	8 points relay output
XC3-E8YT	8 points transistor output
XC3-E16X	16 points DC input
XC3-E16YR	16 points relay output
XC3-E16YT	16 points transistor output
XC3-E32X	32 points DC input
XC3-E32YR	32 points relay output
XC3-E32YT	32 points transistor output
XC3-E8X8YR	8 points DC input / 8 points relay output
XC3-E8X8YT	8 points DC input / 8 points transistor output

XC5 Series of PLC

The XC5 series from Rockhood Automation features a large number of functions, large memory capacity, small size and fast scan times. Although economically priced, these PLC's have been built and designed with motion control in mind.

Basic features in the XC series programmable logic controller are

- Max 1024 I/O points using expansion modules.
- Program's capacity is 30K
- Two high speed counter inputs, the highest frequency is 200K.
- 4 pulse outputs for stepper or servo motor control the max pulse output is 400K
- PWM Control
- support for CAN bus, Modbus and TCP/IP Ethernet.

Other features include

- Free Software
- Programmable in Ladder Logic and Instruction List

Can be used with our HMI Displays (OP-320A, MY-330, TP-562T etc)on the next page

The software is fast and easy to use. It allows for commenting of the variables so the rungs are easy to understand.

It has an online monitor which allows the user to monitor the program on the ladder or open the data window to modify or monitor the data variables

The XCP software also features a rich instruction list which allow calculations in integer, long integer or floating point. Other instructions include ordinal control, data manipulation, interrupts, communications and motion control.

Copy, cut and paste of instruction and ladder programming allows easy editing of programs

Model	Digital Inputs	Transistor Outputs	Relay Outputs	Power	Notes
XC5-48T-C	28	20	0	20-30VDC	4 High Speed Pulse Outputs



Price Each	1
PLC-200 XC-4AD2DA 4 Analog In 2 Analog Out Module	\$349.00
PLC-201 XC-4AD 4 Analog In Module	\$289.00
PLC-202 XC-8AD 8 Analog In Module	\$330.00
PLC-203 XC-2DA 2 Analog Out Module	\$269.00
PLC-204 XC-4DA 4 Analog Out Module	\$289.00
PLC-205 XC-4PT4AD 4 Analog In / PT100 temperature	\$359.00
PLC-206 XC-6PT 6 PT100 temperature Module	\$330.00
PLC-207 XC-6PT-P 6 PT100 temperature & PID Out Module	\$369.00
PLC-208 XC-6TC 6 K, E temperature Module	\$330.00
PLC-209 XC-6TC-P 6 K, E temperature & PID Control Module	\$369.00
PLC-210 XC-2AD2PT-BD 2 Analog In & PT100 temperature Module	\$180.00
PLC-211 XC3-COM-BD RS232, RS485 communication expand board	\$141.00
PLC- 232 XC3-E8X 8 I/O Expansion module	\$117.00
PLC- 233 XC3-E8YR 8 I/O Expansion module	\$122.00
PLC- 234 XC3-E8YT 8 I/O Expansion module	\$139.00
PLC- 235 XC3-E16X 16 I/O Expansion module	\$141.00
PLC- 236 XC3-E16YR 16 I/O Expansion module	\$151.00
PLC- 237 XC3-E16YT 16 I/O Expansion module	\$151.00
PLC- 238 XC3-E32X 32 I/O Expansion module	\$245.00
PLC- 239 XC3-E32YR 32 I/O Expansion module	\$269.00
PLC- 240 XC3-E32YT 32 I/O Expansion module	\$269.00
PLC- 241 XC3-E8X8YR 8 I/O Expansion module	\$151.00
PLC- 242 XC3-E8X8YT 8 I/O Expansion module	\$151.00



Price Each	1
PLC-060 XC5-48T-C	\$595.00

OCEAN CONTROLS - PLC OPERATOR PANELS

OP-320A

This low cost display features

- 3.7 inch monochrome LCD screen
- 192 x 64 Pixels
- easily connects to our XC3 and XC5

PLC's

The 20 keys can be defined to be function keys (In which 12 keys can be defined to be number keys and other usage), STN LCD display with back light, can display 24 letters*4 lines



General Specifications:

- Screen Pixel: 192 x 64
- Display Size: 3.7" LCD
- User Memory: 1MB Flash, 1KB SRAM
- Expected Bulb Life: 20,000 Hours
- Function Keys: 10 Numeric Keys: 10
- Color: STN LCD with Backlight
- Screen Saver: Set by Software, Display Brightness: 60 nits
- Communication Port: RS 232 / RS 485
- Real Time Clock: Yes
- Power Input: 24VDC 4W
- Operation Temperature: 0°C ~ 50°C
- Storage Temperature: -10°C ~ 60°C
- Weight: 0.45Kg
- Relative Humidity: 20 ~ 85% non-condensing
- IP 65F

Other features include

- Free Software

Price Each

HMI-001 OP320-A Text Display

\$249.00

TP562-T Touch Screen Display

5.7 inch 256 color TFT 320*240 pixels

4MB FlashROM 4KB SRAM

With data display, data monitor, alarm, scheme and relevant functions

Support for various popular PLC's and has

double separated communication ports

Easily connects to our XC3 and XC5 PLC's

Its own screen edit software supports simulate offline and simulate online as well as configuration function.



General Specifications:

- Screen Pixels: 320 x 240
- Display Size: 5.7" diagonal TFT color LCD
- Touch Type: Resistive Touch Screen
- User Memory: 4MB Flash, 2KB SRAM
- Expected Bulb Life: 50,000 Hours
- Touch Cells: 192 (16 X 12)
- Color: 256 True TFT Color
- Screen Saver: Set by software
- Display Brightness: 300 nits
- Communication Ports: RS-232, RS 422 / 485
- Protocols: ASCII and Modbus RTU
- Real Time Clock: Yes
- Power Input: 24 VDC
- Power Consumption: 7.5 W
- Operation Temperature: 0°C ~ 50°C
- Storage Temperature: -10°C ~ 60°C
- Relative Humidity: 20 ~ 85% non-condensing
- IP 65F

Other features include

- Free Software

Price Each

HMI-020 TP562-T 5.7 inch Touchscreen

\$799.00

MP330

A low cost versatile display. Its features include

- 3.7-inch, Monochrome Display area 320*240
- 26 function keys, support area
- Numerical Keypad for data entry
- Suitable for various PLC's including our XC3 and XC5 series
- Password protection and internal clock(Optional)
- Key-press can be defined as function keys, partly replace the mechanical keys in your control cabinet.
- With backlight STN LCD
- Using life Up to 20000hrs Ambient temperature 25degC 24 hours operation
- Supply Voltage Range DC22V~DC26V
- Supply Current <260mA
- Brightness Can not be adjusted
- Character Size English 8*16 16*32
- Memory Screen 4MB FlashROM
- Memory Data 2KB SRAM
- Interface Download Port RS232
- COM Port RS232 /RS422

Other features include

- Free Software



Price Each

HMI-010 MP330 Text Display

\$299.00

TPA61-T Touch Screen Display

A 10.4 Inch 800x600pixel touchscreen which features:

- General specifications:
- Screen pixels: 800 x 600
- Display size: 10.4in, true TFT color LCD
- Touch type: resistive touch screen
- User memory: 8MB flash, 4KB SRAM
- Expected bulb life: up to 50,000 hours
- Touch cells: 768 (32 X 24)
- Color: 256 true TFT color
- Screen saver: set by Software
- Display brightness: 400nits
- Communication ports: RS-232, RS-422/485, two USB ports
- Protocols: Include ASCII and Modbus RTU
- Real time clock: yes
- Power input: 24 VDC
- Power consumption: 10W
- Operation temperature: 0-50 degree Celsius
- Storage temperature: -10-60 Degree Celsius
- Withstand voltages: AC1000V-20mA within one minute
- Noise resistance: 1,000Vp-p noise voltage
- Weight: 4lbs
- Relative Humidity: 2-85% non-condensing
- IP: 65F

Other features include

- Free Software



Price Each

HMI-030 TPA61-T 10 inch Touchscreen

\$1699.00

OCEAN CONTROLS - PLC'S

SL100 Controller

SL100 is a single board programmable logic controller that includes a number of innovative features. Key features are:

- 8 digital inputs. The inputs can accept relay contacts or NPN open collector.
- 8 digital outputs. The 8 digital outputs are 500mA Darlington transistors capable of driving small DC solenoid valves or relay coils.
- 1 analog Input can be configured to operate on 0-10V, 0-20mA or as a temperature measuring input (using an external thermistor sensor)
- All external connections are on plug-in connectors for fast final product assembly.
- 1 analog outputs which can generate a 0-10V signal, with a maximum load current of 5mA. The outputs have internal current limiting
- Provision for modem communications
- An extremely flexible range of expansion possibilities



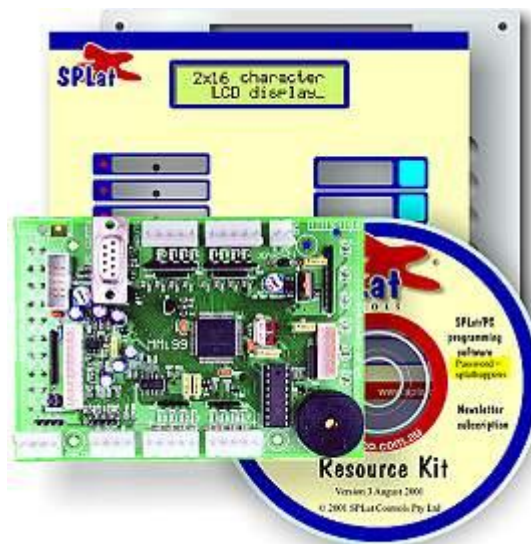
The SL99 programmer is programmed using a basic type language featuring subroutines which has been tailored for control applications. For program development all you need is our free software, a simple wall cube power supply and a standard RS232 cable. The SL99 is available one-off as a Developer's Kit, which includes our resources CD and printed materials.

Price Each	1	5+
SPL-010 SL100 Development Kit	\$189.00	less 10%
SPL-011 SL100 Controller Board	\$179.00	less 10%

MMI 202 Controller

The MMi202 is a single board programmable logic controller that includes a number of innovative features. Key features are:

- 8 digital inputs. The inputs can accept relay contacts or NPN open collector. Input 7 can act as a high speed counter. All other inputs have debouncing
- 8 digital outputs with LED indicators. The digital outputs are open collector type implemented using the ULN2803, chip.
- 2 versatile analog inputs. Each single ended input can be configured to operate on 0-10V, 0-20mA or as a temperature measuring input (using an external thermistor sensor)
- 2 analog outputs which can generate a 0-10V signal, with a maximum load current of 5mA. The outputs have internal current limiting
- Onboard Operator Interface, with support for a liquid crystal display (LCD)
- Provision for modem communications, RS232 connection with Modbus Communications
- PID control
- An extremely flexible range of expansion possibilities.



The MMi202 has its own inbuilt operator interface. This gives you push buttons, indicators and a beeper to allow interaction with an operator. It also gives you the ability to tailor the appearance of your end product via a plastic graphical membrane overlay. The LCD port supports display sizes from 1x16 to 4x20 (our standard offering is 2x16).

The MMi202 is supplied a several different packages. The packages with "DK" in the name are Developer's Kits.

- MMi202DK. This is the board already mounted onto an aluminium front panel and supplied with a universal graphical overlay. It also includes a set of matching connectors and software on CD;
- MMi202DK216. Like the MMi201DK but with the addition of a 2 line by 16 character Liquid Crystal Display and Real Time Clock;

The MMi202 programmer is programmed using a basic type language featuring subroutines, LCD display control, floating point maths and PID

Price Each	1	5+
SPL-001 MMi202DK Development Kit	\$249.00	less 10%
SPL-002 MMi202DK216 Development Kit	\$336.00	less 10%

OCEAN CONTROLS - PLC OPERATOR PANELS

Prizm 10

The Prizm 10 is an economical Keypad Based Operator Interface which when connected to a PLC can display values of PLC registers and messages and allow data entry into PLC registers.

Features include

- 16 X 2 back lit LCD
- 6 function keys with macro functions. 2 LEDs
- Floating point
- Serial port for printing screens / alarms
- Free Windows configuration software
- Over 50 PLC's supported

The user can define actions for 3 events: when the key is pressed, while the key is pressed and when the key is released.

Multiple tasks can be assigned to a single keystroke making it a powerful tool in the machine control environment. It is also possible to assign actions for a combination of two keys pressed simultaneously.



Price Each	1
PZM-010 PZM-10-24-B	\$329.00

Prizm 50

The Prizm 50 is an economical Keypad Based Operator Interface which when connected to a PLC can display values of PLC registers and messages and allow data entry into PLC registers.

Features include

- 20 X 4 back lit LCD
- Numeric keys for easy data entry
- 8 function keys with macro functions and LEDs
- Serial port for printing screens, alarms and floating points
- Optional Data Logging function
- Free Windows configuration software
- Over 50 PLC's supported

The user can define actions for 3 events: when the key is pressed, while the key is pressed and when the key is released.

Multiple tasks can be assigned to a single keystroke making it a powerful tool in the machine control environment. It is also possible to assign actions for a combination of two keys pressed simultaneously.



Price Each	1
PZM-050 PZM-50-24-B	\$499.00

Prizm 140

The Prizm 140 is an economical monochrome Touch Screen Operator Panel that is designed for applications where display of PLC operations and Data entry into PLC registers is needed in a Graphical Display.

Features include

- 128x64 Pixels Monochrome Graphical Display
- Two universal serial ports (Dual Port Support) to connect PLC / Printer / Programming Port
- Direct connection to most controller families including Modbus RTU
- Up to 65535 user definable screens (full size) or pop-up windows (partial size)
- Real Time clock
- Wizards for rapid application development of standard bitmapped objects
- Real Time and Historical alarms
- Real time and Historical trending
- Data logging
- Recipes support
- Backlight screen saver
- Windows® based programming softwareFREE!!
- IP65 design, CE / CSA / UL certification



Price Each	1
PZM-140 PZM-140-24-B	\$549.00

OCEAN CONTROLS - PLC'S AND PERIPHERALS

PROTOCOL GATEWAY

GWY-00 is a Protocol Converter / Data sharer for devices like PLCs, Inverters, Controllers etc. The gateway has two serial ports that connect with two different devices. The gateway communicates with a device to get the information required by the other device.

Our Windows® based Gateway setup software makes it easy to configure the protocol converter. After choosing which protocol to use for each port, you program the Gateway to transfer the data blocks. Using a simple spreadsheet format, you simply program the Gateway to fetch a specified number of registers or bits from one device and transfer them to the other. Powerful software allows you to have all of the information transfers done continuously or allows the PLC to control which block of data is to be transferred.

Features include

- DIN Rail or Panel Mounted compact Protocol Converter
- DB9 Serial ports in any combination of RS232 / RS422 / 2 or 4 wire RS485 / CMOS
- Connects PLC to PLC or PLC to a Modbus Network (as a Master or Slave)
- Allows data sharing between PLC, Invertors, Controllers and other network devices
- Common model for connecting different devices. Several PLC an Invertors supported
- Direct connection to the Programming terminal saves additional hardware
- Low power consumption of only 2.5 Watts
- Common Programming software for the entire Gateway family.....FREE!!
- CE / CSA with UL certification



Price Each	1
GWY-000 Serial Gateway	\$336.00

LONWORKS GATEWAY

The LonWorks Gateway communicates between LonWorks network interface on one sde and various serial protocols on the other side (e.g. Modbus ASCII / RTU etc.). It allows LonWorks devices to make available their LonWorks variables for PLC's or SCADA. It also makes possible for serial device to act as a LonWorks node.

Microsoft Windows® based configuration software, Gateway Setup, helps user to configure Gateway unit. 'Configuration' means making the Gateway unit work as per the system requirements. The complete configuration for a unit is termed as 'Project'. Project comprises of device names, Register addresses, Conditions for block execution etc.

Features Include

- DIN Rail or Panel Mounted compact Protocol Converter
- Hardware with two communication ports COM1: RS232 / RS422 / 2 or 4 wire RS485 / CMOS
- COM2: LonWorks TP FT10 (78 Kbps, free topology)
- Connect your LonWorks device to serial device or vice versa
- Connect your LonWorks device on Modbus Network (as a Master / Slave)
- Same model can be re-configured for connecting different devices
- Supports up to 62 network variables
- Free software for Gateway and SNVT variables configuration!!
- CE with UL certification



Price Each	1
GWY-100 LonWorks Gateway	\$385.00

OCEAN CONTROLS - PLC'S AND PERIPHERALS

DigiGate Profibus-Modbus Gateway



The DigiGate Profibus is ideal for connecting a Profibus DP network with a Modbus RTU network. It works as a gateway, operating as a master station in the Modbus network and as a slave station in the Profibus network. The DigiGate will read the data of the slaves on the Modbus network and send the values to the Profibus master. In the same way, it will write at the output of the Modbus slaves according to the Profibus master requests, providing a complete control of the Modbus network devices through the Profibus network. The device is totally configurable through the application DigiConfig for Windows®, which comes with the product, making access and changing of its parameters easy.



Features include

Profibus:

- Protocol: Profibus DP
- Operates at the entire range of communication rates, from 9600 bps to 12 Mbps
- Addressing range: 0 to 125
- Automatic detection of supported baud rate
- "GSD" file included
- Termination and polarization resistors included (activated by jumper)
- Profibus connection: Terminals for wires, comes with an adapter for DB9

Modbus:

- Operates from 1200 bps to 115200 bps
- Termination and polarization resistors included (activated by jumper)
- Commands available for data reading: "01 Read Coil Status", "02 Read Input - Status", "03 Read - Holding Register" and "04 Read Input Register"
- Commands available for data writing: "05 Force Single Coil", "06 Preset Single Register", "15 Force - Multiple Coils" and "16 Preset Multiple Registers"
- Protection at the bus: ± 60 Vdc, 15 kV ESD

General:

- Operating environment: 0 to 50 °C, 30 to 80% of relative humidity, without condensation
- Mounting: DIN 35 mm rail
- Electrical insulation between the Profibus interface and the rest of the device: 1000 Vac
- Power supply: 10 a 35 Vdc. Internal protection against inverse polarity
- Frontal lit indicators for communication and status

Price Each

SIG-300 Profibus DP / Modbus RTU Gateway

\$495.00

OCEAN CONTROLS - PANEL METERS

N1500 Universal Indicator

The N1500 would have to be the best featured budget priced programmable process indicator on the market. Hundreds have been sold. The **standard version** comes with key panel programmable range, selectable decimal point, universal switching power supply, 24Vdc output for field transmitters excitation, ultra bright five digit LED display and 2 relay alarms with 6 function options.

Features are

- Accepts type J, K, T, E, N, R, S and B thermocouples; Pt100, 4-20 mA, 0-50 mV and 0-10 Vdc
- Programmable range from -31000 to +31000 with adjustable filter.
- front panel input of **custom created non-linear curve with up to 20 segments. Use this feature to display volumes in spherical tanks or bullets**
- 5 Digit LED display
- Input sampling: up to 20 per second
- Maximum and Minimum Memory
- Peak and Hold Functions
- 2 SPST 3Amp Alarm Relays
- Alarm Relays can be configured for LO, HI, differential, diff. LO, diff. HI and sensor break
- Power required 24VDC/AC or 240VAC
- Dimensions: 48x96x92mm .
- Work temperature: 0°C to +55°C, 35 to 85% humidity.
- Protection rate Front panel: IP65, Rear panel: IP30



Because it has 2 relay contacts you can program it to operate as an ON-OFF Controller and Display unit

Options include 4 to 20mA output for retransmission of measured variable to a recorder or PLC, two extra alarm relays, 1 digital

Price Each	1	5+
IPI-100 N1500 Universal Process Indicator 24VDC	\$265.00	less10%
IPI-101 N1500 Universal Process Indicator 240VAC	\$235.00	less10%
IPI-105 N1500 Process Indicator 24VDC, Analog Out, RS485, 4 Relays	\$299.00	less10%
IPI-102 N1500 Process Indicator 240VAC, Analog Out, RS485, 4 Relays	\$299.00	less10%
IPI-103 N1500G Process Indicator 240VAC, Analog Out, RS485, Large Digits 60mm High Display	\$575.00	less10%

N1500 Load Cell Indicator

N1500 LC is a universal indicator for use with load cells. It accepts a wide variety of electric signals and is suitable for Load Cells with 1mV/V, 2mV/V and 3mV/V output. A six-digit LED display shows measured value and all programming parameters of the instrument.

Configuration can be entirely made through the keyboard, no circuit changes are required. Selection of input and output types, alarms configuration, and other special functions are accessed and programmed through the front keypad.

Features include

- Input: 4-20mA, 0-20mA, 0-50mV, 0-20mV and -20 to 20mV;
- 10Vcc power supply for load cells;
- Memory for **maximum** and **minimum** values;
- **Hold, peak hold, tare, zero tare and automatic zero** functions;
- 2 SPST 3Amp Alarm Relays (4 Alarm Relays is optional)
- Alarm Relays can be configured for LO, HI, differential, diff. LO, diff. HI and sensor break
- A Process Variable (PV) retransmission in 0-20mA or 4-20mA comes as standard
- Internal resolution: 128000 levels.
- Display resolution: 62000 levels (-31000 to 31000);
- Sampling rate: 15 samples per second;
- Maximum error: 0.15 of the maximum range;
- PV retransmission resolution: 4000 levels, max. 550W
- Working temperature: 0 to 55°C, humidity 35 to 85%;
- Protection rate Frontal panel: IP65 Rear panel: IP30
- Dimensions: 48x96x92mm

Standard unit is fitted with 2 alarm relays (4 Relays optional), 4-20mA analog retransmission, RS485 Modbus connection
A Process Variable (PV) retransmission in 0-20mA or 4-20mA comes as standard



Price Each	1	5+
IPI-110 N1500LC Load Cell Indicator 24VDC	\$399.00	less10%
IPI-111 N1500 LC Load Cell Indicator 240VAC	\$399.00	less10%

N480i Process Indicator

This low cost and easy-to-use universal indicator can be programmed by non-experienced users. Full rangeability and a 24 Vdc output for remote transmitters are standard.

Features Include

- Input: thermocouples J, K, T, N, R, S; Pt100, 50 mV, 10V and 4-20mA
- Programmable range from -1999 to +9999
- 2 relay alarms
- Alarm functions: LO, HI, differential, diff. HI, differential LO and broken sensor.
- Power: 100-240 Vac/dc or 24 Vdc/ac
- option 1 relay alarm can be replaced with 24 Vdc output excitation for transmitters (only on 240VAC model)
- Detects any sensor failure.
- Easy to use programming menu makes operator interface a snap.
- Front panel: IP65, Polycarbonate UL94 V-2.
- Back panel: IP30, ABS + PC UL94 V-0.
- Dimensions: 48 x 48 x 106 mm



Price Each	1
IPI-120 N480i Process Indicator 24VDC Power 2 Relays	\$159.00
IPI-121 N480i Process Indicator 240VAC Power 2 Relays	\$159.00
IPI-122 N480i Process Indicator 240VAC Power 1 Relay 24VDC out	\$159.00

IBEST DS8 Digital Universal Indicator

Features include

- Multi-function sensor indicator, size:48*96*100mm
- Universal input: TC, RTD, mA, mV, A(AA/DA), V (AV/DV), Rt, 20 segments of customized linear input. (Configurable by software)
- Up to 3 alarm relays, contact capacity: AC 250V/3A or DC 30V/3A (resistance load)
- Isolated analog output: 0~10mA or 4~20mA, configurable by software.
- Transmitter power supply: DC 24V or DC12V / 30mA max.
- RS485 or RS232 interface
- Product power supply: AC 90~260V 50/60HZ, power consumption<5VA



Price Each	1
IBI-001 DS8-Digital Universal Indicator	\$179.00

OCEAN CONTROLS - PANEL METERS

4 Digit Mini Programmable 0-20mA Display

This microprocessor controlled meter can be used to display a 4-20mA or 0-20mA signal in engineering units. The user can set the input value, display value, zero adjustment and the position of the decimal point. All settings all done by switches under the front panel cover. All settings are saved to non-volatile memory

Features include

- 4 Digit LED display range -1999 to 9999
- Accepts a 0-20mA or 4-20mA signal
- adjustable Sampling Time 0.1 to 9.9secs.
- Programmable decimal point position
- Programmable scaling.
- Signal out of range indication
- Programmable scaling. Range 0.1 to 999.9
- Power required 12VDC +/-5% 0.5W or 24VDC +/-5% 0.5W
- Dimensions: 48x24x70mm.



Price Each

CPM-001 Mini-Type 4-20mA Panel Meter 12VDC Powered	\$99.00
CPM-002 Mini-Type 4-20mA Panel Meter 24VDC Powered	\$99.00

4 Digit Mini Display Tachometer

This meter can be used to display the RPM of an engine. It has a programmable scaling factor which you can divide the pulse source by to correct the reading to engineering units.

Features include

- 4 Digit LED display 0-9999
- Accepts NPN input signals up to approx 1KHz
- adjustable Sampling Time 0.1 to 9.9secs
- Programmable decimal point position
- Programmable scaling. Range 0.1 to 999.9
- Power required 12VDC +/-5% 0.5W or 24VDC +/-5% 0.5W
- Dimensions: 48x24x70mm.



Price Each

CPM-003 Mini-Type Tachometer/Line Speed Meter 12V powered	\$119.00
CPM-004 Mini-Type Tachometer/Line Speed Meter 24V powered	\$119.00

Flow Totaliser Indicator

The KFM-TA is a budget priced programmable totaliser indicator. It accepts a 4-20mA signal as a rate or flow.

Features Include

- 10 DIGIT MICROPROCESSOR TOTALIZER METER
- 5 DIGIT MICROPROCESSOR RATE METER
- Rate of display range: 0-99999
- Rate/Total decimal point selectable
- Time unit selectable: sec / min/hour
- Total scale programmable(0.0001-9.9999)
- 2 Alarm Relays
- (15bit resolution) optional
- Roof square function available for analog input
- Reset for Total by external control input
- CE approval
- High stability, non-flammable case(PC), high safety
- Pulse Output



Specifications

- Accuracy: Analog input: +/-0.1% F.S. +/-1digit
- Pulse Input +/-0.03%FS
- Display Screen: High brightness red LED; 10.2mm(0.4")
- Analog Sampling Time: 16 cycles/sec
- Pulse Sampling Time: 10 cycles/sec (>10Hz); f cycles/sec (<10Hz)
- Max. Input Frequency: 100KHz (50% duty cycle)
- Display Range: Rate: 0-99999; Total: 0-9999999999
- Parameters Setting: Push buttons
- Back Up Memory: EEPROM
- Over Range Indication: doFL/loFL
- Temperature Coefficient: 100ppm/degC(0-60degC)
- Operating Temperature: 0 to 60degC
- Operating Humidity: 20 to 90% RH(non condensing)
- Storage Temperature -10-70degC
- Operating Humidity: 20 to 90% RH(non condensing)
- Power Supply 24VDC
- Power Consumption: 8.5VA (all functions output)
- Dimensions: 96x48x112mm.

Price Each

ALT-090 Analog 4-20mA Rate Totaliser Meter	\$450.00
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RPM/Line Speed Indicator

The AM5H is a budget priced 5 digit Panel Meter which is available in 2 models. The first is a RPM indicator. The other is a line speed indicator. Both models feature a 4-20mA analog retransmission signal and a RS485 modbus connection.

Features Include

- 5 DIGIT MICROPROCESSOR RATE METER
- Highbrightness 0.8" LEDdisplay:0-99999;
- decimalpoint selectable
- Line-Speed/RPM/Frequency selectable; Lineunit:M/min
- RPM pulse input programmable:1-99999
- RS-485 communications
- Analog output (15bit resolution)
- CE approval
- Highstability , non-flammablecase(PC),highsafety
- Accuracy: 0.03%F .S
- Measuring NPN DC Pulse Input frequency:0.001Hz~100KHz
- Dimensions: 96x48x112mm.

Models available

Line Speed Meter AM5H-R-N2M-C-NAY

RPM Meter AM5H-R-N2R-C-NAY



Price Each

ALT-079 LineSpeedMeterAM5H-R-N2M-C-R2NN 24VDC Powered	\$229.00
ALT-080 LineSpeedMeterAM5H-R-N2M-C-NAY 240VAC Powered	\$229.00
ALT-081 RPM Meter AM5H-R-N2R-C-NAY 240VAC Powered	\$229.00

Digital Panel Meter with 2 Alarms, Pulse Output, RS485

Features:

- *Measuring power parameters: V, A, W, Q (Var), S (VA), PF, Hz, KWH, KQH, DM (Demand)
- *1P2W/1P3W/3P3W/3P4Wsystemprogrammable
- *Display range:-9999 to 9999; decimal point selectable
- *2Alarms output or 2 Digital input / 2 Pulses output for forward KWH & reverse KWH RS-485communicationoptional (The above option can be exist together)
- 8DIN case: 96x96mm
- *High stability, non-flammable case (PC), high safety

Specification:

- *Accuracy: $\pm 0.25\%$ for VL-N: V1, V2, V3, VE; $\pm 0.25\%$ for VL-L: V12, V23, V13, VE; $\pm 0.25\%$ for A: A1, A2, A3, AE; $\pm 0.5\%$ for W (Watt): W1, W2, W3, ΣW ; $\pm 0.5\%$ for Q (Var): Q1, Q2, Q3, ΣQ ; $\pm 0.5\%$ for S(VA): S1, S2, S3, ΣS ; $\pm 0.5\%$ for PF: PF1, PF2, PF3, ΣPF ; $\pm 0.1\%$ for Hz; $\pm 0.5\%$ for KWH; $\pm 0.5\%$ for KQH; $\pm 0.5\%$ for DM (Demand)
- *Measuring Range: 1P2W, 1P3W, 3P3W, 3P4Wsystems; Voltage: 0 to 600Vac; Current: 0 to 5Aac; Frequency: 50/60 Hz
- *Display Screen: High brightness LED; 14.22mm (0.56"); High brightness LED; 10.2mm (0.4")
- *Sampling Time: 1 cycle / sec
- *Display Range: - 9999 to 9999; 0 to 9999999999 for KWH & KQH
- *Parameters Setting: Push buttons
- *Back up Memory: EEPROM
- *Alarm Action: "≥ (Hi) on" or "< (Lo) on"
- *Alarm Run Delay Time: 0 to 99 sec
- *Relay Contact: AC277V/7A; DC 30V/7A
- *Communication: RS-485 Modbus RTU mode
- *Baud Rate: 19200/9600/4800/2400 bps
- *Temperature Coefficient: 100ppm/°C (0 to 60°C)
- *Operating Temperature: 0 to 60°C
- *Operating Humidity: 20-90 % RH (non-condensing)
- *Storage Temperature: -10 to 70°C
- *Storage Humidity: 20-90 % RH (non-condensing)
- *Power Supply: AC100 to 240V; DC 24/30 to 90V
- *Power Consumption: 10VA (all functions output)
- *Surge Test: 1KVac/1MIN (Input/Power); 3KVac/1min (Terminals/Case)
- *Insulation Resistance: >100MΩ with 500Vdc
- *Input Impedance: Voltage: >2V for 20K / V; 2V for >200MΩ; Current: $\geq 0.2A$ at 100mV; <0.2A at 1V
- *Safety: IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11



Price Each

ALT-022 Digital Panel Meter with 2 Alarms, Pulse Output, RS485	\$449.00
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OCEAN CONTROLS - PANEL METERS

Basic 16x2 Character LCD FSTN - White on

This is a basic 16 character by 2 line display with a snazzy black background with white characters. Utilizes the extremely common HD44780 parallel interface chipset (datasheet). Interface code is freely available. You will need ~11 general I/O pins to interface to this LCD screen. Includes white LED backlight. Works with our LCD Serial Module.



Price Each	1	5+
LCD-011 16x2 Basic LCD White on Black	\$19.95	less 10%
LCD-012 16x2 Basic LCD Yellow on Blue	\$19.95	less 10%
LCD-013 16x2 Basic LCD Red on Black	\$19.95	less 10%

Basic 16x2 Character LCD STN - Black on Green

This is a basic 16 character by 2 line display. Black text on Green background. Utilizes the extremely common HD44780 parallel interface chipset (datasheet). Interface code is freely available. You will need ~11 general I/O pins to interface to this LCD screen. Includes LED backlight. Works with our LCD Serial Module.



Price Each	1	5+
LCD-002 16x2 Basic LCD Black on Green	\$17.50	less 10%

Serial LCD Module

The SerLCD v2.5 module is the latest serial LCD module from Spark Fun Electronics that incorporates many new features. The SerLCD backpack takes care of all the HD44780 commands allowing seamless integration with any micro that can communicate over a wide range of TTL serial baud rates. The SerLCD v2.5 has the ability to drive up to 1A directly for backlight control or as a general purpose high-power control pin. SerLCD v2.5 currently supports 16 and 20 character wide screens with 2 or 4 lines of display. Contrast control is implemented through a trim pot on the module. Comes with 3-pin screw terminal shown on right.

Features:

- * Adjustable baud rates of 2400, 4800, 9600 (default), 14400, 19200 and 38400
- * Operational Backspace
- * Greater processing speed at 8MHz
- * Incoming buffer stores up to 80 characters
- * Backlight transistor can handle up to 1A
- * Pulse width modulation of backlight allows direct control of backlight brightness and current consumption
- * All surface mount design allows a backpack that is half the size of the original
- * Faster boot-up time
- * Boot-up display can be turned on/off via firmware
- * User definable splash screen



Price Each	1	5+
LCD-001 Serial LCD Module	\$21.95	less 10%



Basic 8x2 Character LCD FSTN - White on Blue

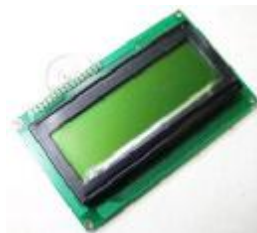
This is a basic 8 character by 2 line display with a snazzy blue background with white characters. Utilizes the extremely common HD44780 parallel interface chipset (datasheet). Interface code is freely available. You will need ~11 general I/O pins to interface to this LCD screen. Includes white LED backlight.



Price Each	1	5+
LCD-003 8x2 Basic LCD White on Blue	\$9.50	less 10%

Basic 20x4 Character LCD Black on Green

This is a basic 20 character by 4 line display. Utilizes the extremely common HD44780 parallel interface chipset (datasheet). Interface code is freely available. You will need ~11 general I/O pins to interface to this LCD screen. Includes LED backlight. Works with our LCD Serial Module



Price Each	1	5+
LCD-032 20x4 Basic LCD Black on Green	\$29.95	less 10%

Color LCD 128x128 with carrier board

Description: Stop trying to solder the 0.5mm pitch Color LCD connector and start playing! This breakout board comes fully tested and assembled with it's own Nokia LCD. The Color LCD Carrier Board requires only 3.3V and boosts this voltage to drive the LED backlight at 6.5V. The multiple solder jumpers allow the end user to get complete access to the LCD connector if needed. Only 6 connections are need for basic operation:

- * +Vin (3.3V)
- * CS (Chip Select)
- * SCLK (Serial Clock)
- * SDATA (Serial Data)
- * RST (Reset)
- * GND (Ground)

Carrier board comes fully assembled and tested and includes a Nokia Color LCD.



Special Note:

The Nokia LCDs are sensitive to electrical noise on the Vdsp supply line (Pin 6 on LCD). This line provides power for the LCD itself while Vdig supplies power to the screens controller and interface logic. This breakout board allows several different power configurations using jumpers. By default the board takes a single 3.3 volt input to power the booster circuit and both Vdsp and Vdig. This configuration causes large amounts of noise on Vdsp that can cause the screen to flicker randomly. For best results use a separate 3.3 volt supply for Vdsp. If a separate regulated 3.3 volt supply is not available for Vdsp, try a 100uF capacitor between Vdsp and GND which might provide acceptable performance.

Price Each	1	5+
LCD-050 Color LCD and Carrier Board	\$49.50	less 10%

Color LCD 128x128 without carrier board

Description: Finally! Color LCDs you can afford and play with! What SFE found over in China is a 'copy' of the Nokia LCD found in models 6100, 6610, 7210, 7250, and 5100? We don't know what phones it fits, and we don't really care. This inexpensive LCD comes with a powerful white LED backlight and a relatively simple serial interface. It's a 9-bit interface, so beware. But we were able to get the LCD up and running on a LPC2138 with a few hours worth of work.

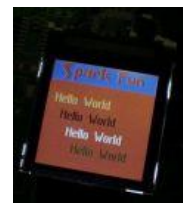
Please note: Comes with a carrier board so you can easily interface to the LCD

Frame Dimensions: 1.35x1.58"

Active Display Dimensions: 1.2"x1.2"

Features:

- * LCD Logic - 3.3V @ 2-3mA
- * LED Backlight - 7V @ 40-50mA (very bright)
- * Full 4,096 Color Display
- * Uses the Epson S1D15G10 Compatible Controller



Price Each	1	5+
LCD-051 Color LCD without Carrier Board	\$25.00	less 10%

OCEAN CONTROLS - PANEL METERS

New

EL Sequencer

Description: The EL Sequencer is a ATmega based control board that allows the user to program any sequence of blink, on/off, even PWM pulsing of EL wire.
Electroluminescent wire is this really neat, flexible cord that emits a florescent light. Some times referred to as 'cool neon' because the cord does not heat up. The kicker is that EL wire runs on high voltage AC - about 125V at 425Hz. While EL wire requires very little power, you can't use normal transistors to turn on/off a string of it. So we created the EL Sequencer that uses TRIACs to control up to 8 channels.

Features:

- * ATmega168V
- * Board can be powered from USB or LiPo
- * Switch chooses source and acts as on/off
- * Compatible with Arduino (8MHz LilyPad)
- * TRIAC part #: Z0103MN
- * 8 TRIACs can handle up to 600V
- * Control 8 channels of EL
- * Runs on 3.7V LiPo
- * Footprint for connection to FTDI Basic for downloading code
- * Footprint for connection to Nordic nRF24L01 2.4GHz wireless module



Price Each	1	5+
LIG-001 EL Sequencer	\$38.27	less 10%

New

Serial Graphic LCD 160x128

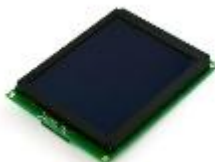
Description: This is a very large serial graphic LCD. The Serial Graphic LCD backpack is soldered to the 160x128 pixel "Huge" Graphic LCD and provides the user a simple serial interface to a full range of controls.

Besides writing text, this serial graphic LCD allows the user to draw lines, circles and boxes, set or reset individual pixels, erase specific blocks of the display, control the backlight and adjust the baud rate. There's also a reverse mode that allows the screen to operate blue on white instead of white on blue. Additionally, all source code for the ATmega168 processor is compiled using the free WinAVR compiler and is free for downloading.

Features:

- * Voltage: 6V – 7V DC
- * Current: 220mA (backlight at 100%)
- * Input: 0-5V, 115,200bps (adjustable), 8 data bits, 1 stop bit, no parity

Dimensions: 4x5x0.65" (102x129x17mm)



Price Each	1	5+
LCD-060 Serial Graphic LCD	\$109.95	less 10%

New

Serial Graphic LCD 128x64

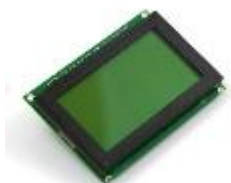
Description: This is a smaller version of our serial graphic LCD. The Serial Graphic LCD backpack is soldered to the 128x64 pixel Graphic LCD and provides the user a simple serial interface to a full range of controls.

Besides writing text, this serial graphic LCD allows the user to draw lines, circles and boxes, set or reset individual pixels, erase specific blocks of the display, control the backlight and adjust the baud rate. Additionally, all source code for the ATmega168 processor is compiled using the free WinAVR compiler and is free for downloading.

Features:

- * Voltage: 6V – 7V DC
- * Current: 220mA (backlight at 100%)
- * Input: 0-5V, 115,200bps (adjustable), 8 data bits, 1 stop bit, no parity

Dimensions: 2x2.45"



Price Each	1	5+
LCD-061 Serial Graphic LCD 128x64	\$41.92	less 10%

New

7-Segment Red 6.5" Display

7-Segment Red 6.5" Display

Description: No really - it's 6 inches (153mm) tall! This very large 7-segment display can be seen from a hundred feet away. So many projects to try, so little time...



Price Each	1	5+
LCD-100 7-Segment Red 6.5" Display	\$23.95	less 10%

New

7-Segment Serial Display

Description: The 7-Segment Serial Display turns the thirteen pins necessary to control a 4-digit 7-segment display into just one or three. The display will give you full control of all digits, decimal points, the colon and the apostrophe. At the heart of the display is an ATmega168 which controls all the serial communications and the 4-digit 7-segment display through an easy to use API.



The Serial 7-Segment Display can be controlled in one of two ways: (1) serial TTL communication or (2) SPI serial communication. Regardless of which method you use to communicate with the display, the display is controlled with 4-byte packets and special 2-byte commands.

Features:

- * 4 digit alpha-numeric display with serial (1 pin) or SPI interface (3 pins)
- * Display numbers (0-9) and letters (A-F)
- * Control multiple decimal points, apostrophe, and colon
- * Selectable baud rate (4800 to 57600 bps)
- * Selectable brightness (255 different levels)

Price Each	1	5+
LCD-110 7-Segment Serial Display	\$21.50	less 10%

New

7-Segment Panel Meter Display

Features:

- Large 6" 7-Segment Display
- Easily add digits to display higher values
- 2 x opto-isolated inputs
- 1 x 10-bit 0-5V input
- 1 x 10-bit 0-20mA input
- RS485 Serial, TTL Serial
- RS232 Serial or USB Serial with additional converters
- 12-17VDC Powered



Have you ever had the need for a display that can be read from across the room? How about across the factory? How about 50m away? This display uses Large 6" (15cm), 7-Segment displays and can be expanded to use up to 10 digits, without costing upwards of a thousand of dollars. But what does it display? The display has been designed to accept multiple input signals, for maximum flexibility. Parameters are set using a computer and saved to memory.

Input signal types:

- 0-5V Scaled
- 0-20mA or 4-20mA Scaled
- Up/Down Counter with Reset and Preset
- Quadrature Up/Down Counter
- Tachometer RPM
- Frequency
- Up/Down Second Timers
- ASCII or Modbus Serial over RS485 or TTL
- (or RS232 using COV-201)
- (or USB using ARD-011)

Price includes Red Acrylic

Price Each	1	5+
KTA-255 Main Controller Digit	\$119.00	less 10%
KTA-256 Slave Digit	\$69.00	less 10%
KT5-255 5 Digit Panel Meter	\$349.00	less 10%
COV-201 RS232 to TTL Converter	\$14.95	less 10%
ARD-011 FTDI Basic Breakout	\$21.50	less 10%

OCEAN CONTROLS - SIGNAL CONDITIONERS

Programmable Non Isolated TxBlock

The TxBlock is a programmable head mount 4-20mA temperature transmitters. One single model can be configured to accept several thermocouple types and Pt100 RTD. output.

Specifications

Programmable input: thermocouples type J,K,T,N,E,R,S,B, and Pt100 RTD
2-wire loop powered 4-20mA output
Power supply: 12 to 30 Vdc.
Linearized output and cold junction compensation for thermocouples.
2 or 3-wire Pt100 with linearization
Accuracy: $\pm 0.2\%$ full scale for Pt100 and 0.3% max. of FS for thermocouples.
Programmable working range. We can program it for you at no charge



Price Each	1
SIG-001 TxBlock Non Isolated Head Mount Transmitter	\$89.00
SIG-007 TxConfig PC Interface and Configurator Software	\$89.00

Programmable Isolated TxBlock

The TxBlock is a programmable head mount 4-20mA temperature transmitters. One single model can be configured to accept several thermocouple types and Pt100 RTD. output.

Specifications

Programmable input: thermocouples type J,K,T,N,E,R,S,B, and Pt100 RTD
2-wire loop powered 4-20mA output
Power supply: 12 to 30 Vdc.
Linearized output and cold junction compensation for thermocouples.
2 or 3-wire Pt100 with linearization
Accuracy: $\pm 0.15\%$ full scale for Pt100 and 0-50mV and 0.25% max. of full scale $\pm 1^\circ\text{C}$ for thermocouples.
Isolation: 1500Vac between sensor input and 4-20mA output loop.
Programmable working range. We can program it for you at no charge



Price Each	1
SIG-004 TxBlock Isolated Head Mount Transmitter	\$139.00
SIG-007 TxConfig PC Interface and Configurator Software	\$89.00

Programmable Non Isolated TxRail

The TxRail is a programmable DIN rail mount 4-20mA temperature transmitters. One single model can be configured to accept several thermocouple types and Pt100 RTD. output.

Specifications

Programmable input: thermocouples type J,K,T,N,E,R,S,B, and Pt100 RTD
2-wire loop powered 4-20mA output (Option 0-10V output)
Power supply: 12 to 30 Vdc.
Linearized output and cold junction compensation for thermocouples.
2 or 3-wire Pt100 with linearization
Accuracy: $\pm 0.2\%$ full scale for Pt100 and 0.3% max. of FS for thermocouples.



Price Each	1
SIG-002 TxRail Non Isolated DIN Mount 4-20mA	\$99.00
SIG-003 TxRail Non Isolated DIN Mount 0-10V	\$99.00
SIG-007 TxConfig PC Interface and Configurator Software	\$89.00

Programmable Isolated TxRail

The TxRail is a programmable DIN rail 4-20mA temperature transmitters. One single model can be configured to accept several thermocouple types and Pt100 RTD. output.

Specifications

Programmable input: thermocouples type J,K,T,N,E,R,S,B, and Pt100 RTD
2-wire loop powered 4-20mA output (Option 0-10V output)
Power supply: 12 to 30 Vdc.
Linearized output and cold junction compensation for thermocouples.
2 or 3-wire Pt100 with linearization
Accuracy: $\pm 0.15\%$ full scale for Pt100 and 0-50mV and 0.25% max. of full scale $\pm 1^\circ\text{C}$ for thermocouples.
Isolation: 1500Vac between sensor input and 4-20mA output loop.
Programmable working range. We can program it for you at no charge



Price Each	1
SIG-005 TxRail Isolated DIN Mount 4-20mA	\$139.00
SIG-006 TxRail Isolated DIN Mount 0-10V	\$139.00
SIG-007 TxConfig PC Interface and Configurator Software	\$89.00

New

4-20mA Loop Isolation Modules

Loop isolators provide signal protection by electrically isolating the input signal from the output. TxIsoLoop-1 and TxIsoLoop-2 simplify your application and avoid the undesirable ground loops by providing single and dual loop galvanic isolation. The 0/4-20 mA input is measured and an identical isolated signal is reproduced at the output. Power is drawn from the 0(4)-20 mA input loop, thus no external power supply is needed.

Specifications

- Input Signal (INPUT): 0 to 20 mA; 4 to 20 mA (check minimum current - for proper operation)
- Maximum Input voltage (Vin max.): 32 Vdc
- Voltage Drop (Vdrop): < 3 Vdc
- Output Signal (OUTPUT): 0(4) to 20 mA
- Max. Load (RL): 1450 R
- Accuracy: 0.2 % FS @ 0 a 60 °C / RL= 250 R; 0.3 % FS @ -20 a 75 °C / RL= 250 R
- Operating current: > 0.1 mA
- Overload: < 40 mA; < 32 Vdc
- Response time: 2 ms @ RL= 250 R
- Isolation: 3000 Vac / 10 s; 240 Vac continuous
- EMC: EN 61326-1
- Ambient temperature range: -20 to + 75 °C
- Humidity: 20 to 90 % RH
- Protection: IP40
- Wire gauge for connections: 0.14 to 1.5 mm²
- Recommended torque: 0.8 Nm
- Terminal blocks injected in Polyamide



Price Each	1
SIG-201 TxIsoLoop-1 Single Loop Isolator	\$129.00
SIG-202 TxIsoLoop-2 Dual Loop Isolator	\$219.00

OCEAN CONTROLS - SIGNAL CONDITIONERS

Frequency to Analog Converter with 2 Alarms

Our frequency to analog converter allows you to convert the frequency of a pulse stream to an analog voltage 0 to 10V or 4-20mA.

The converter has a RS232 serial port 9600 baud which allows you to configure the card and read the frequency using the popular Modbus protocol. The configuration is automatically saved to EEPROM so your configuration will be retained in the event of power loss

Two on board relays can be used as alarm contacts if the frequency rises above or falls below set limits.

Frequency range is 5 to 10KHz or 5 to 65000RPM.

The pulse stream can be 0 to 5V signal or a NPN signal.

12 to 15VDC powered.

The converter can be DIN rail mounted.

Measures 107(L) x 87(W) x 24(H)mm



Price Each	1	5+
KTA-215 Frequency to Analog Converter Assembled	\$114.50	less 10%

Dual Frequency to Analog Converter

Our Dual frequency to analog converter allows you to easily convert up to two frequency signal streams to an analog voltage signal



The KTA-245 is not designed for unlimited frequencies but for most applications it is suitable. 60KHz is combined maximum frequency of the two frequency inputs. ie. If channel 1 is 60KHz you cannot use channel 2, but if channel 1 is 40KHz the maximum for channel 2 is 20KHz. Realistically, most

signals will be in the 10KHz or below range.

To set up the two ranges of the analog outputs there are four switch blocks on the PCB. A rotary switch sets the base frequency and a dual DIP switch sets the multiplier

For ease of installation, the KTA-245 unit can be supplied with DIN rail

Price Each	1	5+
KTA-245 Dual Freq to Volt Converter	\$99.00	less 10%
KTD-245 Dual Freq to Volt Converter	\$129.00	less 10%

OCEAN CONTROLS - SENSORS

QL-1805 DC Square Proximity Switch

Proximity switch inductive NPN or PNP rectangular shape
 Dimensions 36 x 18 x 18mm
 Secure Sensing Range 0-4mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Voltage Drop $\leq 1.5V$
 Degree of Protection IP67
 Maximum Output Current 150mA
 Power Absorbed $< 10mA$
 Operating Frequency 600Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-001 DC Proximity Switch QL-1805NA NPN	\$22.50	less 10%
PXS-002 DC Proximity Switch QL-1805PA PNP	\$22.50	less 10%

TS-0802 Tubular Proximity Switch

Proximity switch inductive tubular shape
 Dimensions 8mm Dia x 40mm Long
 Secure Sensing Range 0-1.6mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Degree of Protection IP67
 Maximum Output Current 150mA
 Power Absorbed $< 10mA$
 Voltage Drop $\leq 1.5V$
 Operating Frequency 1KHz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-100 Tube Proximity Switch TS-0802NA NPN	\$44.50	less 10%
PXS-101 Tube Proximity Switch TS-0802PA PNP	\$44.50	less 10%

TS-1805 Tubular Proximity Switch

Proximity switch inductive NPN or PNP tubular shape
 Dimensions 18mm Dia x 40mm Long
 Secure Sensing Range 0-4mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Voltage Drop $\leq 1.5V$
 Power Absorbed $< 10mA$
 Degree of Protection IP67
 Maximum Output Current 150mA
 Operating Frequency 600Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-110 Tube Proximity Switch TS-1805NA NPN	\$39.00	less 10%
PXS-111 Tube Proximity Switch TS-1805PA PNP	\$39.00	less 10%

TS-3015 Tubular Proximity Switch

Proximity switch inductive NPN or PNP tubular shape
 Dimensions 30mm Dia x 40mm Long
 Secure Sensing Range 0-12mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Degree of Protection IP67
 Maximum Output Current 150mA
 Power Absorbed $< 10mA$
 Voltage Drop $\leq 1.5V$
 Operating Frequency 100Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-112 Tube Proximity Switch TS-3015NA NPN	\$49.00	less 10%
PXS-113 Tube Proximity Switch TS-3015PA PNP	\$49.00	less 10%

QL-1808 DC Square Proximity Switch

Proximity switch inductive NPN or PNP rectangular shape
 Dimensions 36 x 18 x 18mm
 Secure Sensing Range 0-8mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Voltage Drop $\leq 1.5V$
 Degree of Protection IP67
 Maximum Output Current 150mA
 Power Absorbed $< 10mA$
 Operating Frequency 200Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-003 DC Proximity Switch QL-1808NA NPN	\$25.00	less 10%
PXS-004 DC Proximity Switch QL-1808NA PNP	\$25.00	less 10%

TS-1204 Tubular Proximity Switch

Proximity switch inductive tubular shape
 Dimensions 12mm Dia x 40mm Long
 Secure Sensing Range 0-3.2mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Degree of Protection IP67
 Maximum Output Current 150mA
 Power Absorbed $< 10mA$
 Voltage Drop $\leq 1.5V$
 Operating Frequency 600Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-104 Tube Proximity Switch TS-1204NA NPN	\$39.00	less 10%
PXS-105 Tube Proximity Switch TS-1204PA PNP	\$39.00	less 10%

TS-1808 Tubular Proximity Switch

Proximity switch inductive NPN or PNP tubular shape
 Dimensions 18mm Dia x 40mm Long
 Secure Sensing Range 0-6.4mm
 Suitable for Limit/Speed Switches
 Supply Voltage 10-30VDC
 Voltage Drop $\leq 1.5V$
 Power Absorbed $< 10mA$
 Degree of Protection IP67
 Maximum Output Current 150mA
 Operating Frequency 200Hz
 Temperature/Humidity -20 to +70degC/ 35 to 95%RH



Price Each	1	5+
PXS-116 Tube Proximity Switch TS-1808NA NPN	\$39.00	less 10%
PXS-117 Tube Proximity Switch TS-1808PA PNP	\$39.00	less 10%

OCEAN CONTROLS - SENSORS

IPS-18N010B IBEST M18 Proximity Sensor Inductive

Rated operational voltage (DC/AC): 24VDC
 Supply voltage (DC/AC): 10-30VDC
 Voltage drop: $\leq 2.0V$
 Rated insulation voltage: $\geq 20M\Omega$
 Load current capacity (DC/AC): 200mA
 Off-state current (NPN/PNP): $\leq 15mA$
 Leak current: $\leq 20\mu A$
 Against polarity reversal: YES
 Short circuit protected: YES
 Load capacity: $\leq 1\mu F$
 Repeated accuracy: $\leq 5\%$
 Ambient temperature range: $-25...+70degC$
 Frequency (DC 3/2 wires 800Hz
 Function indication: Red LED Indicator
 IP ratings: IP67
 Housing material: Nickle plated brass
 Material of sensing face: ABS
 Standard length of cable: 2m
 Detection distance: 10mm
 Approvals: CE



Price Each	1	5+
IBP-001 Proximity Sensor Inductive NPN	\$17.85	less 10%

IPS-F54NOC36B IBEST F54 Inductive Proximity Sensor

Dim: $54 \times 35 \times 76.8$, protruding.
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC)
 Mounting distance: 25mm Detection distance: 36mm
 With LED operation indicate lamp, easily identifiable
 Standard sensing object: ferrous metals;
 Protection rate: IP67, water resistant
 Over-current and short circuit protection; Against polarity reversal.
 Widely applied in measuring, Counting, Rpm measuring in mechanism, chemical, paper manufacture light industry, etc



Price Each	1	5+
IBP-004 Proximity Sensor Inductive IPS-F54NOC36B	\$45.00	less 10%

CPS-18PO5B IBES M18 Proximity Sensor Capacitive

Capacitive sensor, style: cylinder shape , diameter: 18mm
 Shielded or unshielded type;
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC),
 Connection mode: 3/4 wire
 Mounting distance: shielded: 2mm / un-shielded: 4mm Detection distance: 5mm
 With LED operation indicate lamp, easily identifiable
 Brass chrome plated, proof of oil, water acid, alkaline
 Standard sensing object: metal or non-metal objects.
 Protection rate: IP67, water resistant
 Over-current protection
 Widely applied in measuring, Counting, Rpm measuring in mechanism, chemical, paper manufacture light industry, etc



Price Each	1	5+
IBC-001 Proximity Sensor Capacitive CPS-18PO5B	\$49.00	less 10%
IBC-002 Proximity Sensor Capacitive CPS-18NOC8B	\$49.00	less 10%

IPS-S30NOC15B IBEST S30 Inductive Proximity Sensor

Dim: $30 \times 30 \times 53mm$, rectangular.
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC),
 Mounting distance: 15mm Detection distance: 15mm
 With LED operation indicate lamp, easily identifiable
 Standard sensing object: ferrous metals;
 Protection rate: IP67, water resistant
 Over-current and short circuit protection; Against polarity reversal.
 Widely applied in measuring, Counting, Rpm measuring in mechanism, chemical, paper manufacture light industry, etc



Price Each	1	5+
IBP-002 Proximity Sensor Inductive IPS-S30NOC15B	\$39.00	less 10%

IPS-F36NOC15B IBEST S36 Inductive Proximity Sensor

Dim: $36 \times 17.5 \times 51.5mm$, protruding.
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC)
 Mounting distance: 15mm Detection distance: 15mm
 With LED operation indicate lamp, easily identifiable
 Standard sensing object: ferrous metals;
 Protection rate: IP67, water resistant
 Over-current and short circuit protection; Against polarity reversal.



Price Each	1	5+
IBP-003 Proximity Sensor Inductive IPS-F36NOC15B	\$39.00	less 10%

IPS-F100NOC50B IBEST F100 Inductive Proximity Sensor

Dim: $100 \times 100 \times 50$, protruding.
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC),
 Mounting distance: 50mm Detection distance: 50mm
 With LED operation indicate lamp, easily identifiable
 Standard sensing object: ferrous metals;
 Protection rate: IP67, water resistant
 Over-current and short circuit protection; Against polarity reversal.
 Widely applied in measuring, Counting, Rpm measuring in mechanism, chemical, paper manufacture light industry, etc



Price Each	1	5+
IBP-005 Proximity Sensor Inductive IPS-F100NOC50B	\$55.00	less 10%

CPS-30NOC15B IBES M30 Proximity Sensor Capacitive

Capacitive sensor, style: cylinder shape , diameter: 30mm
 Shielded or unshielded type;
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC),
 Connection mode: 3/4 wire
 Mounting distance: shielded: 2mm / un-shielded: 4mm Detection distance: 15mm
 With LED operation indicate lamp, easily identifiable
 Brass chrome plated, proof of oil, water acid, alkaline
 Standard sensing object: metal or non-metal objects.
 Protection rate: IP67, water resistant
 Over-current protection



Price Each	1	5+
IBC-003 Proximity Sensor Capacitive CPS-30NOC15B	\$59.00	less 10%

OCEAN CONTROLS - SENSORS

CPS-S41NOC20B IBES S41 Proximity Sensor Capacitive

Capacitive sensor, style: rectangular
 Shielded or unshielded type;
 DC 2-wire (10-30V DC), DC 3-wire(10-30V DC), DC 4-wire(10-30V DC),
 Connection mode: 3/4 wire
 Mounting distance: shielded: 2mm / unshielded: 4mm Detection distance:20mm
 With LED operation indicate lamp, easily identifiable
 Brass chrome plated, proof of oil, water acid, alkaline
 Standard sensing object: metal or non-metal objects.
 Protection rate: IP67, water resistant
 Over-current protection
 Widely applied in measuring, Counting, Rpm measuring in mechanism, chemical, paper manufacture light industry, etc



Price Each	<u>1</u>	<u>5+</u>
IBC-004 Proximity Sensor Capacitive CPS-S41NOC20B \$59.00 less 10%		

LS18R-300P Tubular IR Photo Electric Switch

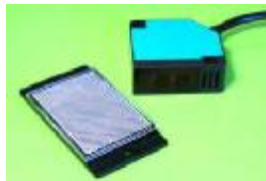
Transistor Output PNP
 Output Mode switchable "Light On" or "Dark On"
 Reflection Type with Reflector
 Dimensions 18mmDia x 68mm Long
 Detecting Distance 0.1-3m
 Supply Voltage 10-30VDC
 Power Consumption 15mA max
 Maximum Output Current 100mA at 24VDC
 Voltage Drop <=1.5V
 Detecting Delay Time 2ms
 Degree of Protection IP66
 Temperature/Humidity -25 to +50degC/ 35 to 85%RH



Price Each	<u>1</u>	<u>5+</u>
PES-003 Photo Electric Switch LS18R-300P \$52.50 less 10%		

LS3-3MR IR Photo Electric Switch

Retro-Reflection Switch with Relay Output
 Dimensions 50mm x 55mm x 21mm
 Detecting Distance 0.1-3m
 Detects Opaque Objects (4.5cm min.)
 Supply Voltage 12-240VDC 24-240VAC
 Degree of Protection IP54
 Relay Output 250V/5A
 Power Absorbed <2W
 Temperature/Humidity -25 to +50degC/ 35 to 85%RH



Price Each	<u>1</u>	<u>5+</u>
PES-005 Photo Electric Switch LS3-3MR \$72.50 less 10%		

CPS-F36NOC15B IBES F36 Proximity Sensor Capacitive

Output: NPN, NO(NC)
 Install: Unshielded
 Mount D: 15mm
 Detect D: 15mm
 IP rating: IP67



Price Each	<u>1</u>	<u>5+</u>
IBC-005 Proximity Sensor Capacitive CPS-F36NOC15B \$65.00 less 10%		

LS18D-40P Tubular IR Photo Electric Switch

Transistor Output PNP
 Output Mode switchable "Light On" or "Dark On"
 Diffuse Reflection Type
 Dimensions 18mmDia x 68mm Long
 Detecting Distance 0-40cm(10x10cm white paper with no reflection)
 Supply Voltage 10-30VDC
 Power Consumption 15mA max
 Maximum Output Current 100mA at 24VDC
 Voltage Drop <=1.5V
 Detecting Delay Time 2ms
 Degree of Protection IP66
 Temperature/Humidity -25 to +50degC/ 35 to 85%RH



Price Each	<u>1</u>	<u>5+</u>
PES-001 Photo Electric Switch LS18D-40P \$44.50 less 10%		

LS3-1MD IR Photo Electric Switch

Diffused Reflection Switch with Relay Output
 Dimensions 50mm x 55mm x 21mm
 Detecting Distance 0-100cm
 Detects Transparent/Opaque Objects
 Supply Voltage 12-240VDC 24-240VAC
 Degree of Protection IP54
 Relay Output 250V/5A
 Power Absorbed <2W
 Temperature/Humidity -25 to +50degC/ 35 to 85%RH



Price Each	<u>1</u>	<u>5+</u>
PES-004 Photo Electric Switch LS3-1MD \$67.50 less 10%		

LS18-15MT IR Photo Electric Switch

Through Beam - Consist of transmitter LS18T-1500X and detector LS18T-1500N with NPN Output
 Dimensions 18mmDia x 68mm Long
 Detecting Distance 0.1-15m
 Detects Opaque Objects (1cm min.)
 Supply Voltage 12-24VDC
 Power Consumption 40mA Max
 Degree of Protection IP54
 NPN Output 100mA
 Temperature/Humidity -25 to +55degC/ 35 to 85%RH



Price Each	<u>1</u>	<u>5+</u>
PES-006 Photo Electric Switch LS18-15MT \$95.00 less 10%		

OCEAN CONTROLS - SENSORS

Laser Photo Electric Switch

Model: LAS-T18NO20MD

Specification:

- Type of reflection: T: THROUGH BEAM
- Mounting distance Sn: 10cm-20m
- Out type: NPN (NO+NC)
- Supply voltage (DC): 10-30 V DC
- Voltage drop: $\leq 0.8V$
- Rated insulation voltage: $\geq 20M\Omega$
- Load current (DC/AC): 100mA
- Max. Off-state current (NPN/PNP): $\leq 5mA$
- Leak current: $\leq 20\mu A$
- Response time: THROUGH BEAM: $< 1ms$
- Working angle (T/R): $< 3^\circ$
- Difference distance: $< 0.1\%$
- Function indication: Red LED Display
- Detect mode: Red laser (640-655nm)
- Ambient light: Incandescence lamp: 3000Lx / Sun light 10000Lx
- IP rating (IEC60529): IP67
- Housing material: Nickel plated brass
- Connection mode: Wire cable
- Cable length (Standard): 2m
- Ambient temperature: $-25...+55^\circ C$



Price Each	1	5+
IBL-001 IBEST Laser Photo Sensor LAS-T18NO20MD	\$75.00	less 10%

PCB or Chassis Mount Photo Interrupter

This device enables you to turn off a circuit on and off optically. It consists of an IR LED facing a phototransistor across and air gap. Any object in the gap will interrupt the IR beam and consequently switch the phototransistor on and off. The device is very fast and ideal for counting, timing or sensing.



Block Measures 25Lx5Wx13H
Gap measure 3mm,
Mounting Holes 3.2mm Dia

Price Each	1	5+
PES-010 Photo Interrupter Component Switch	\$5.50	less 10%

M30*1.5 Analog Proximity Sensor

Features

- Dimension: M30*1.5
- Installation: Non-Flush (unshielded)
- Mounting distance Sn: 15mm
- Detect distance Sa: 1.5...15mm
- Detect Object (Q235 steel) mm: 18*18*1t
- Supply Voltage: DC15-30V
- Current Consumption: $\leq 20mA$
- Output Current (I): 4-20mA
- Output Voltage (V): 0-5V OR 0-10V
- Load Resistance (Current/Voltage): 300Ω/1K
- Max. Fluctuant Voltage: $\leq 5\%$
- Ambient Temperature: $-25...+70^\circ C$
- Detect Status: Red LED Indicator
- IP Rating (IEC60529): IP67
- Housing Material: Nickel plated brass



Price Each	1	5+
IBP-020 M30 analog proximity sensor, 4-20mA output	\$39.00	less 10%
IBP-021 M30 analog proximity sensor, 0-10mA output	\$39.00	less 10%

Industrial Grade Photo Interrupter

This Photo Interrupter is suited for Industrial Use. Fully sealed it is easily mounted with 2 supplied screws. Features are
Supply Voltage 12-24VDC
Current Consumption 18mA Max
Frequency of Response 2KHz
Output NPN Transistor 100mA MAX
Degree of Protection IP66
Temperature/Humidity -25 to $+55^\circ C$ / 35 to 85%RH
Measures 55mm x 30mm x 14mm



Price Each	1	5+
PES-011 Photo Interrupter Switch PU-08	\$29.00	less 10%

Hall Effect Sensors

Features:

- Standard sensing object: magnetic objects.
- Fast response, long operation life.
- Mini volume, easy to be installed, in particular installed closely inside metal objects in line, can detect magnetic objects through metal objects.
- IP ratings: IP67, water and oil resistant.
- Widely used in pneumatic, liquid, plunger pump, bicycle pump...etc for detecting and positioning purpose.
- Can detect magnetic objects through metal objects
- Flush Mounting



It is available in the size of M12 and M18.

Price Each	1	5+
IBP-006 Hall Sensor M12 NPN Output	\$27.50	less 10%
IBP-007 Hall Sensor M18 NPN Output	\$29.50	less 10%

S40 Analog Proximity Sensor

Features

- Dimension: S40
- Installation: Flush (shielded)
- Mounting distance Sn: 20mm
- Detect distance Sa: 0.1...20mm
- Detect Object (Q235 steel) mm: 18*18*1t
- Supply Voltage: DC15-30V
- Current Consumption: $\leq 20mA$
- Output Current (I): 4-20mA
- Output Voltage (V): 0-5V OR 0-10V
- Load Resistance (Current/Voltage): 300Ω/1K
- Max. Fluctuant Voltage: $\leq 5\%$
- Ambient Temperature: $-25...+70^\circ C$
- Detect Status: Red LED Indicator
- IP Rating (IEC60529): IP67
- Housing Material: ABS



Price Each	1	5+
IBP-022 S40 analog proximity sensor, 4-20mA output	\$49.00	less 10%
IBP-023 S40 analog proximity sensor, 0-10mA output	\$49.00	less 10%

OCEAN CONTROLS - SENSORS

Industrial Grade Photo Interrupter

This Photo Interrupter is suited for Industrial Use. Fully sealed it is easily mounted with 2 supplied screws. Features are

Supply Voltage 12-24VDC
Current Consumption 18mA Max
Frequency of Response 2KHz
Output NPN Transistor 100mA MAX
Degree of Protection IP66
Temperature/Humidity -25 to +55degC/ 35 to 85%RH
Measures 55mm x 30mm x 14mm



Price Each	1	5+
PES-011 Photo Interrupter Switch PU-08	\$29.00	less 10%

Ultrasonic Range Finder

The MaxSonar-EZ0 and EZ1 are sonar range finders that offer very short- to long-range detection and ranging in an incredibly small package with ultra-low power consumption. The MaxSonar detects objects from 0 inches to 254 inches (6.45 meters) and provides sonar range information from 6 inches out to 254 inches with 1-inch resolution. Objects between 0 inches and 6 inches range as 6 inches. The interface output formats included are pulse width output, analog voltage output, and asynchronous serial digital output. The **LV-MaxSonar-EZ0 differs from the LV-MaxSonar-EZ1** in beam shape and sensitivity; the EZ0 has the most sensitivity of the MaxSonar product line, yielding a controlled wide beam with high sensitivity.



Specifications and Features

- Small and light: 0.870" x 0.785" x 0.645", 4.3 grams
- Long range detection: 0 - 254 inches (6.45 meters)
- No deadband (detections from 0 to 6 inches are output as 6 inches)
- 1-inch resolution
- Low typical current consumption: 2 mA
- Runs on 5 V +/- 0.5 V
- 42 kHz ultrasonic sensor, 20 Hz reading rate
- Free-run or triggered operation

Price Each	1	5+
POL-723 Ultrasonic Range Finder -EZ0	\$47.50	less 10%
POL-725 Ultrasonic Range Finder -EZ1	\$47.50	less 10%

Infrared Range Finder

New

Infrared proximity sensor made by Sharp. Part # GP2Y0A02YK0F has an analog output that varies from 2.8V

at 15cm to 0.4V at 150cm with a supply voltage between 4.5 and 5.5VDC. The sensor has a Japanese Solderless Terminal (JST) Connector. We recommend using a JST pigtail or soldering wires directly to the back of the module. This sensor is great for sensing objects up to 5 feet away!



Price Each	1	5+
IRP-001 Infrared Proximity Sensor Long Range	\$29.95	less 10%

PCB or Chassis Mount Photo Interrupter

This device enables you to turn off a circuit on and off optically. It consists of an IR LED facing a phototransistor across and air gap. Any object in the gap will interrupt the IR beam and consequently switch the phototransistor on and off. The device is very fast and ideal for counting, timing or sensing.



Block Measures 25Lx5Wx13H
Gap measure 3mm,
Mounting Holes 3.2mm Dia

Price Each	1	5+
PES-010 Photo Interrupter Component Switch	\$5.50	less 10%

Ultrasonic Range Finder - Maxbotix LV-WR1

Description: This is the new, weather resistant, field-hardened WR1 from Maxbotix. The WR1 uses a robust PVC housing, is designed to meet IP67 water intrusion, and matches standard electrical 3/4" PVC pipe fittings. We are extremely pleased with the size, quality, and ease of use of this low voltage weather-resistant range finder. The serial interface is a bit odd (it's RS232 instead of standard TTL), but the PWM and Analog interfaces will allow any micro to listen easily enough. The sensor provides very accurate readings of 0 to 254 inches (0 to 6.45m) in 1 inch increments with little or no dead zone!



Features:

- * 42kHz Ultrasonic sensor
- * Operates from 3-5.5V
- * Low 2.1mA supply current
- * 20Hz reading rate
- * RS232 Serial Output - 9600bps
- * Analog Output - (Vcc/512)/inch
- * PWM Output - 147uS/inch
- * Designed for outdoor application

Price Each	1
SFG-002 Ultrasonic Range Finder - Maxbotix LV-WR1	\$179.95

Lever Actuated Microswitch

Specifications:

Switch Type: SPDT Momentary
Contact Rating: 6A @ 250V AC
Contact Resistance: <15mR
Actuator Length: 27mm



Long Lever Length: 51mm

Price Each	1	5+
LSW-001 Lever Actuated Microswitch	\$3.27	less 10%
LSW-002 Long Lever Actuated Microswitch	\$3.27	less 10%

OCEAN CONTROLS - SENSORS

PIR Motion Sensor

This is a simple to use motion sensor. Power it up and wait 1-2 seconds for the sensor to get a snapshot of the still room. If anything moves after that period, the 'alarm' pin will go low.

Red wire is power (5 to 12V). Brown wire is GND. Black wire is open collector Alarm.

This unit works great from 5 to 12V (datasheet shows 12V). You can also install a jumper wire past the 5V regulator on board to make this unit work at 3.3V. Sensor uses 1.6mA@3.3V.

The alarm pin is an open collector meaning you will need a pull up resistor on the alarm pin. The open drain setup allows multiple motion sensors to be connected on a single input pin. If any of the motion sensors go off, the input pin will be pulled low.



Price Each		1	+5
PIR-001	PIR Motion Detector	\$14.95	less 10%

PIR Motion Sensor

Easy to install PIR with dual look down detection. Features excellent temperature compensation and selectable pulse count. Its stylish countoured shape virtually disappears once installed into the corner of any room.

Vertical range is adjustable and a high quality noise reduction circuit ensures reliable detection. Superior RFI/EMI immunity.



Specifications:

Power supply: 9-16V
Current drain: NO 8mA @ 12V DC
Alarm period: 1.5-2.5 sec
Alarm output: NC/NO, 30VDC, 0.2A
Pulse4 count: 2/3 selectable
RFI immunity: 25V/m average
Tamper: NC, open trigger
Temperature range: -20 degree's C to 60 degrees C
Dimensions: 100 x 60 x 42mm

Price Each		1
PIR-005	PIR Motion Detector	\$31.32

Float Switch

Fully immersible. Ideal for water tank systems such as rain or waste water management, activating boat bilge pumps etc. Can be used to control pumps or electric valves when liquid levels change. Features a waterproof membrane which mounts on the inside of the tank.

Specifications:

Switch type: SPST
Switching current: 0.5A DC
Contact rating 1.5A @ 200VDC (Max)
Contact resistance: 100m?
Insulation resistance: >10¹⁰ ?
Magnetic sensitivity: 20 - 50 AT
Operate time: 0.8ms
Flying lead length: 300mm
Temperature Rating: -30 to 147 degrees C



Price Each		1
LSW-010	Horizontal Mount Float Switch	\$29.23
LSW-011	Vertical Mount Float Switch	\$20.86

Latching Emergency Stop Switch

Essential for installations of industrial or lab equipment. Latching actuator with rotating release and normally closed contacts. When the actuator is pushed in, the contacts open and the switch is latched, ensuring the equipment can't be operated until the switch is intentionally disengaged by rotating the actuator and releasing. It has two independent sets of contacts so the neutral and active may be both isolated.

Specifications:

- Configuration: 2 contact sets, normally closed (RED) & normally open (GREEN)
- Actuation: Push off, rotate on
- Contact rating: 125VAC 6A, 300VAC 3A
- Mounting hole: 22mm



Price Each		1
LSW-020	Latching Emergency Stop Switch	\$9.95

Beambar Security Sensor

The Beambar 4 is a multiple infrared Beam device for short range internal use. Four time multiplexed beams are arranged with a separation of 75mm, an alarm being generated if two adjacent beams are broken. Its unique expansion capability allows a complete barrier of almost limitless height to be formed by stacking units together. Such a barrier provides a tightly controlled detection area with a very high probability of detection. The Beambar 4 is housed in a white ABS box 300mm long x 44mm wide x 254mm deep, allowing a very compact and attractive installation. Additional fixings are provided which permit a wide range of installation options. Installation is facilitated by the provision of several features such as test LEDs for each beam, automatic gain reduction during installation, and environmental outputs are provided which will warn of impending problems.



Price Each		1
NET-040	Beam Bar 4	\$59.00

OCEAN CONTROLS - SENSORS

Temperature and Humidity Transmitter Wall Mount

The Relative Humidity and Temperature Transmitters RHT-DM are microprocessed based instruments that incorporate high accurate and stable sensors whose information is converted to linear 4-20 mA. The transmitter parameters can be configured to tailor a particular application.

Specifications

Loop powered 4-20 mA outputs.

Power supply: 12 to 30 Vdc

Channel isolation: the 4-20 mA outputs are isolated from each other.

Reverse polarity protection: YES.

Cable entrance: compress fitting PG7.

Operating limits:

Sensor and probe (RHT-DM): -20 to 80 °C, 0 to 100 %RH.

Electronic circuit: -10 to +65 °C, 0 to 95 %RH.

RH channel:

Accuracy: $\pm 1,5$ %RH @ 25 °C, from 20 to 80 %RH.

Repeatability: ± 1 % RH.

Hysteresis: ± 1 % RH.

Span: any value between 0 and 100% RH or -40 to 100°C for dew point.

Temperature channel:

Accuracy: $\pm 0,5$ °C @ 25 °C.

Maximum ± 2 °C from -40 to 80 °C.

Repeatability: ± 0.1 °C.

Span: between -40 and 120°C.



Price Each

RHT-003 Temperature and Humidity Sensor 4-20mA output	\$209.00
RHT-006 Temperature and Humidity Sensor 0-10V output	\$209.00

Temperature Transmitter Wall Mount

The Relative Humidity and Temperature Transmitters Temp-DM are microprocessed based instruments that incorporate high accurate and stable sensors whose information is converted to linear 4-20 mA. The transmitter parameters can be configured to tailor a particular application.

Specifications

Temperature:

Accuracy: 0,5 °C @ 25 °C.

Repeatability: $\pm 0,1$ °C.

Range: programmable between -50 and 120 °C (please check operational limits).

Response Time: up to 30 s in fairly still air.

- Operational limits:

Electronic module(WM-DM): -20 to +65 °C, 0 to 95% RH;

Sensor and Probe (DM): -40 to +100 °C.

Note: When measuring temperatures higher than +65 °C or lower than -20 °C, only 50% of the probe total length must be inserted into the measured environment.

Power:

- 12 to 30 Vdc (model 4-20 mA);

- 18 to 30 Vdc (model 0-10 V). Cable input: PG7 cable gland.

Output:

- Two-wire loop powered 4-20 mA or 20-4 mA.

- Voltage output: 0-10 Vdc or 10-0 Vdc (optional).



Price Each

RHT-020 TEMP-WM TemperatureSensor 4-20mA output	\$135.00
RHT-021 TEMP-WM TemperatureSensor 0-10V output	\$135.00
RHT-022 TEMP-DM Duct Temp Sensor 4-20mA 150mm	\$155.00
RHT-024 TEMP-DM Duct Temp Sensor 4-20mA 250mm	\$159.00
RHT-030 Dust Covers for RHT-WM Probes	\$10.00

Price Each

LAJ-003 Temperature Probe	\$65.00	less 10%
LAJ-006 Stainless Steel Temperature Probe	\$99.00	less 10%

Temperature and Humidity Transmitter Duct Mount

The Relative Humidity and Temperature Transmitters RHT-DM are microprocessed based instruments that incorporate high accurate and stable sensors whose information is converted to linear 4-20 mA. They are suitable for mounting in air conditioning ducts. Using the digital communication interface, the transmitter parameters can be configured to tailor a particular application.

Specifications

Loop powered 4-20 mA outputs.

Power supply: 12 to 30 Vdc

Operating limits:

Sensor and probe (RHT-DM): -20 to 80 °C, 0 to 100 %RH.

Electronic circuit: -10 to +65 °C, 0 to 95 %RH.

RH channel:

Accuracy: $\pm 1,5$ %RH @ 25 °C, from 20 to 80 %RH.

Repeatability: ± 1 % RH.

Hysteresis: ± 1 % RH.

Span: any value between 0 and 100% RH or -40 to 100°C



Price Each

RHT-004 Duct Temp and Humidity Sensor 4-20mA 150mm Probe	\$225.00
RHT-005 Duct Temp and Humidity Sensor 4-20mA 250mm Probe	\$225.00

Temperature and Humidity Transmitter - RHT MODBUS

The RHT-WM-485-LCD and RHT-DM-485-LCD transmitters include high precision and stability sensors for measuring temperature and relative humidity. They are microprocessed devices and, therefore, allow being entirely configured through a RS485 interface, using the Modbus RTU commands. The DigiConfig allows the configuration of all transmitter features as well as its diagnostic procedure.

Specifications

* Operating temperature of the transmitter: From 0 °C to 70 °C

*Electromagnetic compatibility: EM 61326:2000

*Sensor measuring range

Temperature: -40.0 °C to 100.0 °C

Relative Humidity (RH): 0.0 to 100.0 % RH (No Condensing)

Dew Point: -40.0 °C and 100.0 °C

* Measuring resolution

Temperature: 0.1 °C. 14 bits (16383 levels)

Relative Humidity (RH): 0.1 %. 12 bits (4095 levels)

* Response time

Temperature: up to 30s in slow air movement

Humidity: up to 8s in smooth air movement (20 to 80 % RH)

* Sampling interval: 3 seconds

* Power supply: 12 Vdc to 30 Vdc

* Case: Polycarbonate

* Protection class: Product appropriate for applications which require protection class up to IP65

* Electronic module case: IP65; Sensor capsule: IP40



Price Each

RHT-010 RHT MODBUS	\$225.00
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Temperature Probes

An inexpensive and easy to use temperature probe. Designed to work with a LabJack, but can also be used with any voltage measuring device. Outputs 10 mV per degree C, and has a range of -40 to +100 degrees C.

A stainless steel easy to use, very accurate, and waterproof temperature probe. The sensor is mounted in a stainless steel sheath and features a high-level linear output of 10 mV per degree F, typical accuracy of ± 0.25 degrees C (± 0.4 degrees F) at room temperature, and a range of 0 to +300 degrees F (-17 to +150 degrees C).



OCEAN CONTROLS - SENSORS

GS-4200 Pressure Sensors

The Ellison Sensors GS4200 series pressure transmitter is designed for demanding applications where reliable pressure measurement is required and where good quality, fast delivery and low cost are high priority.



The GS4200 is the latest addition to the Ellison Sensors range, offering outstanding performance due to a unique "Silicon On Sapphire" diaphragm construction giving excellent stability over a wide temperature range. Accuracy of $\pm 0.25\%$ with an over pressure limit of twice nominal pressure, together with an output of 4-20mA, wide operating temp range -40 to $+80\text{degC}$ and adjustable zero & span for ease of calibration. All models are supplied with $\frac{1}{4}$ " BSP thread process connection and a large DIN43650 Plug for electrical connection. The titanium pressure ports and stainless steel body offer high level of corrosion resistance with the overall transducer having an IP65 environmental rating.

PR-3850 Pressure Sensors with Flush Diaphragm

The Ellison Sensors PR3850 series flush diaphragm pressure transmitter is designed for demanding applications where the process media is unsuitable for direct contact with the transducer diaphragm (slurries etc).



The series features high accuracy together with an output of 4-20mA and adjustable zero & span for ease of calibration. All models are supplied with $\frac{1}{2}$ " BSP thread process connection (optional 1" BSP) and a large DIN43650 Plug for electrical connection. The fully 316 stainless steel body offer high level of corrosion resistance with the overall transducer having an IP65 environmental rating. Other features include can operate in ambient temperature of -40 to $+90\text{degC}$ and media temperature of -20 to $+85\text{degC}$

Applications for the PR3850 series include the continuous monitoring of

PM1000 Plug In Transducer Display

The PM1000 Series is universal plug-on LED display suitable for use with various transmitters having a 4-20mA output and fitted with DIN43650 connector. The Plug in display simply fits between the plug and socket on any DIN43650 connector, it is supplied from the 4-20mA current loop signal of the transmitter. No additional power is required. The unit is user programmable from two buttons behind the front panel enabling scaling, decimal point position and adjustment of the set point position. All are easily set through the menu steps outputted to the LED display and stored in an EEPROM, the programme is not lost in the event of power failure. The display can be rotated through 90 degree steps for use in different installation positions. The integral open-collector output on the PM1001 model allows the transmitter to be retrofitted easily with a limit contact set point, for use as an alarm or controller. Intrinsically safe models available certified to EEx ib IIC T4



Price Each

	1
PRT-001 Ellison GS4200 -1 to 0 Bar Vacuum	\$459.00
PRT-002 Ellison GS4200 0 to 500 mBar (50KPa, 7.3PSI)	\$399.00
PRT-003 Ellison GS4200 0 to 1 Bar (100KPa, 14.7PSI)	\$399.00
PRT-004 Ellison GS4200 0 to 1.6 Bar (160KPa, 23PSI)	\$399.00
PRT-005 Ellison GS4200 0 to 2.5 Bar (250KPa, 36PSI)	\$399.00
PRT-006 Ellison GS4200 0 to 4 Bar (400KPa, 58PSI)	\$399.00
PRT-007 Ellison GS4200 0 to 6 Bar (600KPa, 86PSI)	\$399.00
PRT-008 Ellison GS4200 0 to 10 Bar (1MPa, 147PSI)	\$399.00
PRT-009 Ellison GS4200 0 to 16 Bar (1.6MPa, 230PSI)	\$399.00
PRT-010 Ellison GS4200 0 to 25 Bar (2.5MPa, 360PSI)	\$399.00
PRT-011 Ellison GS4200 0 to 40 Bar (4.0MPa, 580PSI)	\$399.00
PRT-012 Ellison GS4200 0 to 60 Bar (6.0MPa, 860PSI)	\$399.00
PRT-013 Ellison GS4200 0 to 100 Bar (10MPa, 1470PSI)	\$399.00
PRT-014 Ellison GS4200 0 to 160 Bar (16MPa, 2300PSI)	\$399.00
PRT-015 Ellison GS4200 0 to 250 Bar (25MPa, 3600PSI)	\$399.00
PRT-016 Ellison GS4200 0 to 400 Bar (40MPa, 5800PSI)	\$399.00
PRT-017 Ellison GS4200 0 to 600 Bar (60MPa, 8600PSI)	\$399.00
PRT-018 Ellison GS4200 0 to 1000 Bar (100MPa)	\$399.00
PRT-019 Ellison GS4200 0 to 1500 Bar (150MPa)	\$399.00

Price Each

	1
PRT-035 Ellison PR3850 0 to 2.5 Bar (250KPa, 36PSI)	\$485.00
PRT-036 Ellison PR3850 0 to 4 Bar (400KPa, 58PSI)	\$485.00
PRT-037 Ellison PR3850 0 to 6 Bar (600KPa, 86PSI)	\$485.00
PRT-038 Ellison PR3850 0 to 10 Bar (1MPa, 147PSI)	\$485.00
PRT-039 Ellison PR3850 0 to 16 Bar (1.6MPa, 230PSI)	\$485.00
PRT-040 Ellison PR3850 0 to 25 Bar (2.5MPa, 360PSI)	\$485.00
PRT-041 Ellison PR3850 0 to 40 Bar (4.0MPa, 580PSI)	\$485.00
PRT-042 Ellison PR3850 0 to 60 Bar (6.0MPa, 860PSI)	\$485.00
PRT-043 Ellison PR3850 0 to 100 Bar (10MPa, 1470PSI)	\$485.00
PRT-044 Ellison PR3850 0 to 160 Bar (16MPa, 2300PSI)	\$485.00
PRT-045 Ellison PR3850 0 to 250 Bar (25MPa, 3600PSI)	\$485.00
PRT-046 Ellison PR3850 0 to 400 Bar (40MPa, 5800PSI)	\$485.00
PRT-047 Ellison PR3850 0 to 600 Bar (60MPa, 8600PSI)	\$485.00
PRT-048 Ellison PR3850 0 to 1000 Bar (100MPa)	\$485.00
PRT-049 Ellison PR3850 0 to 1500 Bar (150MPa)	\$485.00

SCP1000 Barometric Pressure Board

Please note: This is the ASIC rev B (IC label 'P01'). The SCP1000 is the very first absolute pressure sensor on the market to use MEMs technology to grant 17-bit resolution. Under ideal conditions, this sensor can detect the pressure difference within a 9cm column of air.



VTI's SCP1000-D01 digital absolute pressure sensors are intended for barometric pressure measurement and altimeter applications for 30kPa...120kPa and -20°C ... 70°C measuring ranges. The pressure and temperature output data is calibrated and compensated internally and the communication between the SCP1000 and its host micro-controller is realized using an SPI interface.

Four user selectable measuring modes combine 17-bit resolution (9cm of air column) with low or ultra-low power consumption, or alternatively 15-bit resolution (18cm of air column) with high speed data read (9Hz) or less than $5\mu\text{A}$ and power consumption. For example, at Low Power mode, the SCP1000 has an overall resolution of 2 Pa (15cm of air column) and a power consumption of $3.5\mu\text{A}$. This unit comes in a newly developed RoHS compliant plastic housing. Normal hot-air rework will destroy this sensor so we highly recommend this breakout board for prototyping.

- 3V single supply operation

Price Each

	1	5+
BPS-001 SCP-1000 Barometric Pressure Sensor	\$69.95	less 10%

Price Each

	1
PRT-050 3.5 Digit LED Plug-On Display	\$299.00
PRT-051 3.5 Digit LED Plug-On Display with alarm point	\$399.00

OCEAN CONTROLS - SENSORS

New

Pressure Transmitters NP-430A Series

NP-430A Pressure Transmitter

A great economical pressure sensor! The NP-430A series of pressure transmitters have been developed for general industrial applications including refrigeration technology. It can be used with most general purpose gases and liquids but is NOT compatible with ammonia.

Features include

- Pressure Ranges: 0 to 2 bar and 0 to 120 bar
- Signal output: two-wire 4-20 mA
- Power supply (V): 12 to 28 Vdc
- Load (RL): $RL_{max} = (V - 12 V) / 20 \text{ mA}$
- Accuracy: better than 1% FS (including linearity, hysteresis and repeatability)
- Long-term stability: 0.4 % / FS / year
- Over load: 150 % FS
- Rupture pressure: 300% FS
- Electrical connection: Packard Type
- Protection: IP67
- Weight: 90 g
- Ambient Temperature: -40 to 80 °C
- Process fluid temperature: -40 to 100 °C
- Response time: < 10 ms (0 to 99%)
- Process connection: External thread 1/4" - 18 NPT (basic model)
- Wetted parts: Stainless Steel 1Cr18Ni9Ti, Ceramic Diaphragm (Al2O3 96%)
- Sealing material: Nitrile NBR O'ring



Price Each	1
NPT-002 NP430A Relative Pressure Sensor 0-2 bar	\$149.00
NPT-005 NP430A Relative Pressure Sensor 0-5 bar	\$149.00
NPT-010 NP430A Relative Pressure Sensor 0-10 bar	\$149.00
NPT-020 NP430A Relative Pressure Sensor 0-20 bar	\$149.00
NPT-030 NP430A Relative Pressure Sensor 0-30 bar	\$149.00
NPT-060 NP430A Relative Pressure Sensor 0-60 bar	\$149.00
NPT-120 NP430A Relative Pressure Sensor 0-120 bar	\$149.00

New

ECONOMIC TYPE VACUUM / PRESSURE SENSOR - BPS Series

Features:

- *Accuracy: $\pm 0.5\%$ F.S.
- *Measuring range: 10, 100, 250 bar
- *Measuring absolute or gauge pressure
- *Standard and custom options available for OEM design
- *Robust package, all laser-welded stainless steel design
- *Power supply: DC8~30V; Output: 4~20mA
- *Proof pressure range: 3 x Full Scale
- *Compact size and excellent

Specification:

- *Accuracy: $\pm 0.5\%$ F.S.
- *Thermal Error: <0.5% F.S.
- *Total Error: <0.5% F.S.
- *Stability: <0.25% F.S. / Year
- *Zero Pressure Offset: 4 mA
- *Full Scale Output: 20 mA
- *Proof Pressure: 3 x F.S.
- *Burst Pressure: Absolute Pressure: 10 x F.S. or 15000 psi; Gauge Pressure: 5 x F.S.
- *Pressure Cycles: 8Hz
- *Response Time: <1 msec
- *Vibration: 10 to 2050Hz, 20 sinusoidal, 3 axes
- *Thermal Shock: -40 to 105°C, 0.5hr soaks at Temp.
- *Temperature Coefficient: 100ppm/°C (0 to 60 °C)
- *Operating Temperature: -40 to 105°C
- *Operating Humidity: <95% RH (non-condensing)
- *Storage Temperature: -40 to 105°C
- *Storage Humidity: <95% RH (non-condensing)
- *Power Supply: DC 18 to 30V (2 wire loop)
- *EMC Compatibility: 80 MHz to 1 GHz
- *Wetted materials: 304L & 316L stainless steel
- *Pressure Connection: 1/4" NPT
- *Electrical Connection: DIN 43650



Price Each	1
ALT-106 Pressure Sensor Input:0-6 Bar	\$229.00
ALT-110 Pressure Sensor Input:0-10 Bar	\$229.00
ALT-125 Pressure Sensor Input:0-25 Bar	\$229.00
ALT-140 Pressure Sensor Input:0-40 Bar	\$229.00
ALT-200 Pressure Sensor Input:0-100Bar	\$229.00

OCEAN CONTROLS - SENSORS

Barometric Pressure Board - HP03D

The HP03D is a high accuracy, low-cost pressure sensor, ideal for use with weather stations, altimeters and pressure measurement. The unit comprises a piezo resistive pressure sensor and a 16 bit ADC with 15-Bit accuracy together with a measurement accuracy of 0.5hpa. Easy to interface to any microcontroller with a standard I²C interface. The unit requires only 3V and full installation instructions are available in the datasheet link below.



Features

- Pressure Range 300-1100hpa
- 16 Bit ADC
- I²C Serial Interface
- Accurate to 0.5hpa
- Supply Voltage: 2.2 - 3.6V

Price Each	1	5+
BPS-010 Barometric Pressure Sensor HP03D	\$27.50	less 10%

Accelerometer Breakout Board -

Breakout board for the Analog Devices accelerometers in the E8 package. The ADXL is a solid state MEMS accelerometer with digital PWM or Analog output. The ADXL can measure both static and dynamic acceleration. This means the ADXL is suited well for sensing tilt (used in many Glove / Air Mouse applications) and for sensing brute acceleration (rocketry and general motion sensing applications).



Board comes fully assembled and tested with selected sensor, 0.1uF filtering capacitors, and 1MOhm pulse width resistor (where required).

Installed Sensor: ADXL210 +/-10g (PWM and Analog)

Price Each	1	5+
ACC-002 Accelerometer Board - ADXL210AE +/-10g	\$59.00	less 10%

Accelerometer Breakout Board - ADXL320 +/-5g

Breakout board for the dual axis ADXL320 accelerometers. Brings out the analog voltage levels from the X and Y axis to a standard .1" header. The ADXL320 can be powered from 2.4V-5.25V. The Self-Test pin can be used to verify sensor operation.



Board comes fully assembled and tested with selected sensor and 0.1uF filtering capacitors.

Installed Sensor: ADXL320 (+/- 5g)

Dimensions: 18x18 mm (0.70x0.70")

Price Each	1	5+
ACC-006 Accelerometer Board - ADXL320 +/-5g	\$35.95	less 10%
ACC-007 Accelerometer Board - ADXL321 +/-18g 5g	\$35.95	less 10%

Accelerometer Breakout Board - ADXL202JE +/-2g

Breakout board for the Analog Devices accelerometers in the E8 package. The ADXL is a solid state MEMS accelerometer with digital PWM or Analog output. The ADXL can measure both static and dynamic acceleration. This means the ADXL is suited well for sensing tilt (used in many Glove / Air Mouse applications) and for sensing brute acceleration (rocketry and general motion sensing applications).



Board comes fully assembled and tested with selected sensor, 0.1uF filtering capacitors, and 1MOhm pulse width resistor (where required).

Installed Sensor: ADXL202 +/-2g (PWM and Analog)

Price Each	1	5+
ACC-001 Accelerometer Board - ADXL202JE +/-2g	\$59.00	less 10%

Accelerometer Breakout Board - ADXL322 +/-2g

Breakout board for the dual axis ADXL320 accelerometers. Brings out the analog voltage levels from the X and Y axis to a standard .1" header. The ADXL320 can be powered from 2.4V-5.25V. The Self-Test pin can be used to verify sensor operation.



Board comes fully assembled and tested with selected sensor and 0.1uF filtering capacitors.

Installed Sensor: ADXL322 (+/- 2g)

Dimensions: 18x18 mm (0.70x0.70")

Price Each	1	5+
ACC-005 Accelerometer Board - ADXL322 +/-2g	\$35.95	less 10%

Tri Axis Accelerometer - MMA7260Q

Breakout board for the 3 axis MMA7260Q accelerometer from Freescale. Please view the datasheet for this impressive sensor! With a **low power shut-down mode, high sensitivity output with selectable ranges (+/- 1.5, 2, 4, and 6g)**, this sensor is one of the very first to market with three accelerometers sensors built onto a single IC! Board comes fully assembled and tested with external filters installed.)



Dimensions: 25x25 mm (1x1")

Price Each	1	5+
ACC-020 Accelerometer Board - MMA7260Q	\$24.95	less 10%

OCEAN CONTROLS - SENSORS

Tri Axis Accelerometer - LIS3LV02DQ

Breakout board for the 3 axis LIS3LV02DQ accelerometer from ST Micro. With a digital interface (SPI or I2C), the user only has to initiate commands to get 1mg resolution! Independent channels can be shut off, the sensor can be powered down, even an interrupt threshold can be set and used to awaken the sensor from power down! Selectable ranges are available for +/-2g and 6g.



This sensor is one of the first with triple axis and an easy to use digital interface. Board comes fully assembled and tested with external decoupling caps.

We were thoroughly impressed with the flexibility and precision of this sensor. This is a great sensor to play with if you need triple axis accelerations in digital form and you don't want to deal with analog conversions or filtering.

Dimensions: 21x23mm (0.8x0.9")

Price Each	1	5+
ACC-021 Accelerometer Board - MMA7260Q	\$52.50	less 10%



Triple Axis Accelerometer Breakout - ADXL335

Description: Breakout board for the 3 axis ADXL335 from Analog Devices. This is the latest in a long, proven line of Accelerometers from Analog - and now the holy grail has finally arrived. The ADXL335 is a triple axis accelerometer with extremely low noise and power consumption - only 320uA! Sensor ranges from +/-3g. Board comes fully assembled and tested with external components installed.



Note: The silkscreen indicators for the axes are incorrect. Please refer to the datasheet for the correct orientation.

Dimensions: 0.7x0.7"

Price Each	1	5+
ACC-024 Triple Axis Accelerometer Breakout - ADXL335		\$33.27



Triple Axis Accelerometer Breakout - ADXL345

Breakout board for the Analog Device ADXL345. The ADXL345 is a small, thin, low power, 3-axis accelerometer with high resolution (13-bit) measurement at up to ± 16 g. Digital output data is formatted as 16-bit twos complement and is accessible through either a SPI (3- or 4-wire) or I2C digital interface.



The ADXL345 is well suited to measure the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration resulting from motion or shock. Its high resolution (4 mg/LSB) enables measurement of inclination changes less than 1.0° .

Several special sensing functions are provided. Activity and inactivity sensing detect the presence or lack of motion and if the acceleration on any axis exceeds a user-set level. Tap sensing detects single and double taps. Free-fall sensing detects if the device is falling. These functions can be mapped to one of two interrupt output pins. An integrated, patent pending 32-level first in, first out (FIFO) buffer can be used to store data to minimize host processor intervention. Low power modes enable intelligent motion-based power management with threshold sensing and active acceleration measurement at extremely low power dissipation.

Features:

- * 2.0-3.6VDC Supply Voltage
- * Ultra Low Power: 40uA in measurement mode, 0.1uA in standby @ 2.5V
- * Tap/Double Tap Detection
- * Free-Fall Detection
- * SPI and I2C interfaces

Price Each	1	5+
ACC-023 Triple Axis Accelerometer Breakout - ADXL345	\$37.27	less 10%

OCEAN CONTROLS - SENSORS

Triple Axis Accelerometer Breakout - LIS302DL

This is a compact breakout board for the LIS302DL. The LIS302DL is a really impressive little IC. Low cost, digital interface, small footprint, easy to use, and it has some great features built in. If all you need is 8-bit resolution, this is the digital triple axis accelerometer to use.



Price Each	1	5+
ACC-022 Triple Axis Accelerometer Breakout - LIS302DL	\$29.95	less 10%

Serial Accelerometer Tri-Axis v5 - Dongle Serial Accelerometer Tri-Axis v5 - Enclosed

The SerAccel v5 is a 3 axis accelerometer up to $\pm 6g$ with a simple serial interface. The latest SerAccel development, version 5 has many new improvements including variable baud rate, a factory reset command, and a complete triple axis measurement system based on the newly released MMA7260Q sensor from Freescale. Power is gained from any RS232 port (including USB-to-RS232 converters) so no external power supply is needed. The onboard PIC (16LF88) runs at 10MHz and outputs three different types of outputs including calculated, binary, and raw outputs. The SerAccel v5 has software configurable settings to select between 4 sensing ranges (± 1.5 , 2, 4, and 6g), as well as a software selectable measurement frequency (0-590Hz).



The SerAccel outputs real-time accelerations from 9600 to 57600bps using visible ASCII characters. The SerAccel is compatible with any RS232 Comm port in conjunction with any terminal program (Hyperterminal, VB Programs, or anything else that can read the comm port). Works with USB-RS232 converters.

Price Each	1	5+
ACC-010 Serial Accelerometer Tri-Axis v5 - Dongle	\$63.95	less 10%
ACC-011 Serial Accelerometer Tri-Axis v5 - Enclosed	\$77.95	less 10%

3 Axis Accelerometer Breakout Board - ADXL330 $\pm 3g$

Breakout board for the 3 axis ADXL330 from Analog Devices. This is the latest is a long, proven line of Accelerometers from Analog - and now the holy grail has finally arrived. The ADXL330 is a triple axis accelerometer with extremely low noise and power consumption - only 320uA! Sensor ranges from $\pm 3g$.



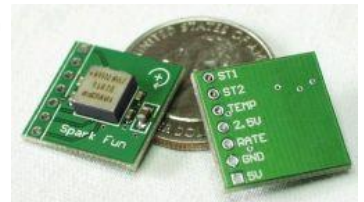
Board comes fully assembled and tested with external components installed. The ADXL330 is a 3V part and outputs an analog voltage for each of the three outputs. This voltage is in ratio to the measured acceleration and to the supply voltage (ratiometric). You will need some extra hardware to convert this analog signal to a usable digital one. Luckily, many uCs have a built in Analog to Digital converter.

Installed Sensor: ADXL330 ($\pm 3g$)
Dimensions: 18x18 mm (0.70x0.70")

Price Each	1	5+
ACC-008 Triple Axis Accelerometer Board - ADXL330	\$35.95	less 10%

Gyro Breakout Board - ADXRS150 and ADXRS300

The ADXRS MEMs gyroscope from Analog Devices come in 2 forms. The ADXRS150 150deg/sec and the ADXRS300 300 deg/sec. The BGA package has hindered users for long enough. You can now use gyroscope rate sensing in your own projects with this miniature breakout board from Spark Fun Electronics.



Units come fully populated and tested with an empty 0.1" spaced footprint ready for a straight header, right angle header (recommended), or your own wires/umbilical cable.

Dimensions: 18x18mm (0.70"x0.70")
Weight: 1.1g without header

Price Each	1	5+
GYR-005 Gyro Breakout Board - ADXRS150	\$99.95	less 10%
GYR-007 Gyro Breakout Board - ADXRS300	\$109.00	less 10%

Dual Axis Gyro Breakout Board

This is the first dual-axis MEMs gyro available on the open market. The IDG-300 is a 3.3V leadless IC with a smaller profile than other single axis gyros. Originally designed for image stabilization, the IDG300 dual axis gyro is now available for the consulting and research markets.

Applications:

- * Inertial Measurement Units (IMUs)
- * Handheld GPS Navigation Devices
- * Radio controlled helicopters
- * Toys and game devices
- * Robotic and power tools
- * Antenna positioning
- * Remote control



Features:

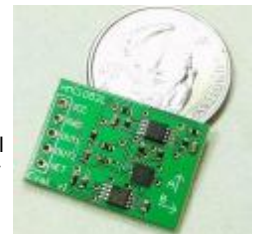
- * Integrated X- and Y-axis gyro on a single chip
- * Factory set full scale range of $\pm 500^\circ/\text{sec}$
- * Low offset voltage
- * Integrated low-pass filters
- * Integrated reset switches for high-pass filters
- * Superior vibration rejection over a wide frequency range
- * High cross-axis isolation by design
- * **3V single supply operation**
- * 5000 g shock tolerance
- * RoHS Compliant (Completely Lead Free)

Dimensions: 18x18 mm (0.70x0.70")

Price Each	1	5+
GYR-001 Dual Axis Gyro board	\$69.95	less 10%

Magnetic Sensor

This is a simple evaluation board for the HMC1052L magnetic sensor. The MOSFET reset and amplifier circuitry are all on board. All you need is a sensitive ADC and a logic pin for the reset control and you can get magnetic heading! No external circuitry required. We recommend at least a 16-bit ADC to get as much resolution as possible.



Price Each	1	5+
MAG-001 HMC1052L Magnetic Sensor Card	\$39.50	less 10%

OCEAN CONTROLS - SENSORS

IMU 5 Degrees of Freedom

Description: The Inertia Measurement Unit Combo Board is now available with smaller, better, faster, and cheaper components! This small PCB board incorporates the new IDG300 dual-axis gyroscope and Analog Devices triple axis accelerometer in a tight footprint. The IMU board uses a standard 0.1" footprint and includes all outputs from both the IDG300 Gyro and ADXL330 Accelerometer ICs.

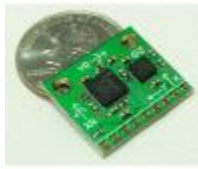
This IMU 5DOF is the latest in a long line of development boards. This latest version allows an unheard of 5 axis of sensing (Roll, Pitch, X, Y, Z) in less than 1 square inch, and under 2 grams!

By combining the IDG300 and ADXL330 sensors, the IMU board enables students and hobbyists to easily incorporate roll, pitch, and tilt measurements into their projects or robots.

Board comes fully assembled and tested. Units come as shown without headers installed. We recommend right-angle break away headers, straight pin headers, or wire up your own cable!

Dimensions: 0.75"x0.9" (20x23mm)

Weight: 2g



Price Each	1	5+
SFG-001 IMU 5 Degrees of Freedom-SEN-00741	\$135.00	less 10%

Current Sensor ACS712 Breakout

This is a breakout board for the fully integrated Hall Effect based linear ACS712 current sensor. The sensor gives precise current measurement for both AC and DC signals. Thick copper conductor and signal traces allows for survival of the device up to 5 times overcurrent conditions.

The ACS712 outputs an analog voltage output signal that varies linearly with sensed current. The device requires 5VDC for VCC and a couple of filter capacitors.

Features:

- * x05B (5 Amp) version
- * Low noise analog signal path
- * Device bandwidth is set via the FILTER pin
- * 5us output rise time in response to input current
- * 80kHz bandwidth
- * 1.5% output error at 25 degrees C
- * 1.2mOhm internal conductor resistance
- * 2.1 kVRMS minimum isolation voltage from pins 1-4 to pins 5-8
- * 5.0 VDC, single supply operation
- * 66 to 185 mV/A output sensitivity
- * Output voltage proportional to AC or DC currents
- * Factory-trimmed for accuracy
- * Extremely stable output offset voltage
- * Nearly zero magnetic hysteresis
- * Ratiometric output from supply voltage



Price Each	1	5+
SFC-001 ACS712 Breakout	\$12.50	less 10%

Real Time Clock Module

This is a custom designed module for the DS1307 Real Time Clock. The module comes fully assembled and pre-programmed with the current time (ok, so it's our current time - MST). The included Lithium coin cell battery (CR1225 41mAh) will run the module for a minimum of 9 years (17 years typical) without external 5V power. The DS1307 is accessed via the I2C protocol. We've written a test-bed to program the modules. This test-bed code should give you some insight on how to interface the module to any microcontroller using our example software I2C and BCD routines.

Features:

- * Two wire I2C interface
 - * Hour : Minutes : Seconds AM/PM
 - * Day Month, Date - Year
 - * Leap year compensation
 - * Accurate calendar up to year 2100
 - * Battery backup included
 - * 1Hz output pin
 - * 56 Bytes of Non-volatile memory available to user
- Dimensions: 0.75x0.75" (20x20mm)



Price Each	1
SFC-010 Real Time Clock Module	\$24.95

PL-D Series Length Sensor

Product Features :

- Can measure the length of cloth, paper plastics, etc.
- Photoelectric output with stable signals and long service life.
- Using Nickel-Zinc alloy, it's weightily and doesn't skid.
- The wheels adopt imported tire latex, endurable to friction.

Specification

Item No.	PL-D2M(Y)	PL-D3M(Y)
Unit	10cm(0.1Y)	1cm(0.01Y)
Output Type	Quadrature	
Output Impedance	2.7K	
Current Consumption	70MA	
Output Current	100MA	
Power Supply	12-24V	



Price Each	1	5+
COS-301 PL-D2M 10CM Length Sensor	\$165.00	less 10%
COS-302 PL-D3M 1CM Length Sensor	\$199.00	less 10%

PL-S Series Length Sensor

Product Features :

- Can measure the length of cloth, paper plastics, etc.
- Photoelectric output with stable signals and long service life.
- Using Nickel-Zinc alloy, it's weightily and doesn't skid.
- The wheels adopt imported tire latex, endurable to friction.

Product Specifications :

Item No.	PL-S1M(Y)	PL-S2M(Y)	PL-S3M(Y)	PL-S4M
Unit	1M(1Y)	10CM(0.1Y)	1CM(0.1Y)	1MM
Current	25MA	35MA		
O/p Current	150MA	100MA		
Output Type	Single Phase			
Output Impedance	2.7K			
Power Supply	12-24V			



Price Each	1	5+
COS-311 PL-S2M 10CM Length Sensor	\$149.00	less 10%
COS-312 PL-S3M 1CM Length Sensor	\$159.00	less 10%
COS-313 PL-S4M 1MM Length Sensor	\$169.00	less 10%

Current Sensor ACS712 Low Current Sensor Breakout

This current sensor gives precise current measurement for both AC and DC signals. These are good sensors for metering and measuring overall power consumption of systems. The ACS712 current sensor measures up to 5A of DC or AC current. We added an opamp gain stage for more sensitive current measurements. By adjusting the gain (from 4.27 to 47) you can measure very small currents.

The ACS712 Low Current Sensor Breakout outputs an analog voltage that varies linearly with sensed current. To calibrate, first set the output offset to the desired level (with zero current on the sense lines, read output with a DVM). Then with a known current input (a 100mA limited supply works well for this), set the output deflection with the gain pot. Sensitivity is then calculated as (Vref - Vdeflect)/(current input).

The bandwidth on the ACS712 Low Current Sensor Breakout has been set to 34Hz to reduce noise when using at high gains. The full 80KHz bandwidth that the sensor is capable of can be recovered by removing C1.

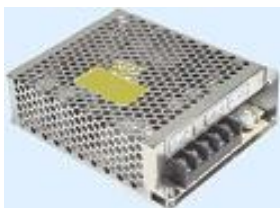


Price Each	1	5+
SFC-002 ACS712 Low Current Sensor Breakout	\$23.95	less 10%

OCEAN CONTROLS - SWITCH MODE POWER SUPPLIES

40W Single Rail Switchmode Supplies

These switchmode power supplies are available in 12VDC and 24VDC are over voltage protected and current limited with UL/TUV/CE approvals. Powered from 85-260VAC they are fitted with screw terminals. The specifications are
Tolerance +/-1%
Ripple and Noise 100mV
Efficiency >75%
DC adjust range +/-10%
Measurements 129(L)x98(W)x38(H)mm
Output Current 3.5A(12VDC) 1.8A(24VDC)
2 year warranty



60W Single Rail Switchmode Supplies

These switchmode power supplies are available in 12VDC and 24VDC are over voltage protected and current limited with UL/TUV/CE approvals. Powered from 85-260VAC they are fitted with screw terminals. The specifications are
Tolerance +/-1%
Ripple and Noise 125mV(12VDC), 150mV(24VDC)
Efficiency >=80%
DC adjust range +/-10%
Measurements 159(L)x98(W)x38(H)mm
Output Current 5.1A(12VDC) 2.7A(24VDC)
2 year warranty

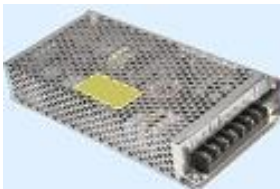


Price Each	1	3+
PSM-001 40W Power Supply 12VDC	\$52.00	less 10%
PSM-002 40W Power Supply 24VDC	\$52.00	less 10%

Price Each	1	3+
PSM-003 60W Power Supply 12VDC	\$58.00	less 10%
PSM-004 60W Power Supply 24VDC	\$58.00	less 10%

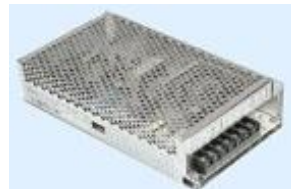
100W Single Rail Switchmode supplies

These switchmode power supplies are available in 12VDC and 24VDC are over voltage protected and short circuit and overload protected with UL/TUV/CE approvals. Powered from 85-260VAC they are fitted with screw terminals. The specifications are
Tolerance +/-1%
Ripple and Noise 125mV(12VDC), 150mV(24VDC)
Efficiency >=80%
DC adjust range +/-10%
Measurements 199(L)x98(W)x38(H)mm
Output Current 8.5A(12VDC) 4.5A(24VDC)
1 year warranty



150W Single Rail Switchmode supplies

These switchmode power supplies are available in 12VDC and 24VDC are over voltage protected and short circuit and overload protected with UL/TUV/CE approvals. Powered from 85-260VAC they are fitted with screw terminals. The specifications are
Tolerance +/-1%
Ripple and Noise 180mV(12VDC), 240mV(24VDC)
Efficiency >80%
DC adjust range +/-10%
Measurements 199(L)x110(W)x50(H)mm
Output Current 12.5A(12VDC) 6.5A(24VDC)
2 year warranty

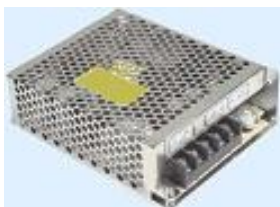


Price Each	1	3+
PSM-005 100W Power Supply 12VDC	\$70.00	less 10%
PSM-006 100W Power Supply 24VDC	\$70.00	less 10%

Price Each	1	3+
PSM-007 150W Power Supply 12VDC	\$84.00	less 10%
PSM-008 150W Power Supply 24VDC	\$84.00	less 10%

40W Multiple Rail Switchmode Supplies

These 40W Multiple rail supplies incorporate short circuit, over load and over voltage protection with CSA/CE/NRTL approvals. Powered from 85-264VAC they are fitted with screw terminals. The specifications are
Tolerance +/-2% 5VDC, +/-6% 12VDC and 15VDC
Ripple and Noise 100mV on 5VDC, 120mV on 12VDC and 15VDC
Efficiency 72%
Working Temperature 0-50degC
Measurements 129(L)x98(W)x38(H)mm
2 year warranty



60W Multiple Rail Switchmode Supplies

These 60W Multiple rail supplies incorporate short circuit, over load and over voltage protection with UL/CUL/TUV/CE/TB approvals. Powered from 85-264VAC they are fitted with screw terminals. The specifications are
Tolerance +/-2% 5VDC, +/-6% 12VDC and 15VDC
Ripple and Noise 100mV on 5VDC, 100mV on 12VDC and 15VDC
Efficiency 72%
Working Temperature 0-50degC
Measurements 159(L)x97(W)x38(H)mm
2 year warranty



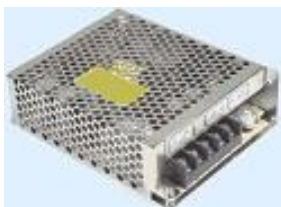
Price Each	1	3+
PSM-051 +5VDC/3A, +12V/2A and -5VDC/0.5A	\$62.00	less 10%
PSM-052 +5VDC/3A, +12V/2A and -12VDC/0.5A	\$62.00	less 10%
PSM-053 +5VDC/3A, +15V/1.5A and -15VDC/0.5A	\$62.00	less 10%

Price Each	1	3+
PSM-054 +5VDC/7A, +12V/3.5A and -5VDC/1A	\$70.00	less 10%
PSM-055 +5VDC/5A, +12V/3.5A and -12VDC/1A	\$70.00	less 10%
PSM-056 +5VDC/5A, +15V/2A and -15VDC/0.5A	\$70.00	less 10%

OCEAN CONTROLS - POWER SUPPLIES, BATTERY CHARGERS

120W Multiple Rail Switchmode Supplies

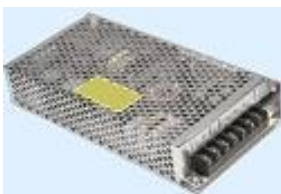
Incorporate short circuit, over load and over voltage protection with UL/CUL/TUV/CE/TB approvals. Powered from 85-264VAC they are fitted with screw terminals. The specifications are
Tolerance +/-2% 5VDC, +/-6% -5VDC
12VDC and -12VDC
Ripple and Noise 80mV on 5VDC, 120mV on 12VDC, 150mV on 15VDC
Efficiency >75%
Working Temperature 0-50degC
Measurements 199(L)x110(W)x38(H)xmm
2 year warranty



Price Each	1	3+
PSM-057 +5V/11A, +12V/4A, -5V/0.5A, -12V/1A	\$104.00	less 10%
PSM-058 +5V/10A, +15V/3.5A, -5V/1A, -15V/1A	\$104.00	less 10%
PSM-059 +5V/8A, +12V/2A, +24V/2A, -12V/1A	\$104.00	less 10%

55W Switchmode supply with Battery Charger

Features short circuit, over load and over voltage protection. Battery low and Battery polarity protection. Approvals include UL/CUL/TUV/CB/CE. Free air cooling convection. Powered from 88-264VAC they are fitted with screw terminals. The specifications are
Tolerance +/-1%
Ripple and Noise 100mV
Efficiency >71%
Working Temperature 0-50degC
Measurements 159(L)x97(W)x38(H)xmm
2 year warranty



Price Each	1	5+
PSM-104 13.8VDC/4A supply, 13.4V/0.23A charger	\$84.00	less 10%
PSM-105 27.6VDC/2A supply, 26.5V/0.16A charger	\$84.00	less 10%

20W Slimline DIN Rail Switchmode Supplies

These are available in 5, 12 and 24VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Feature DC OK Relay contact.

- Overload protection 105%~160% constant current limiting, auto-recovery
- Over voltage protection 115%~135% rated output voltage, shut off
- Working temperature -20~50°C@100%, 70°C@50% load -
- Input voltage from 85-264VAC.
- DC adjustment range ±10%
- Ripple and Noise 120mV(12VDC), 150mV (24VDC)
- Efficiency 80%(12VDC) 84%(24VDC)
- Output Current 1.67A(12VDC) 1.0A(24VDC)
- Case dimension (LxWxH) 22.5x90x100 mm
- 3 year warranty



Price Each	1	3+
PSM-150 20W Power Supply 5VDC	\$64.00	less 10%
PSM-151 20W Power Supply 12VDC	\$64.00	less 10%
PSM-152 20W Power Supply 24VDC	\$58.00	less 10%

30W Industrial DIN Rail Switchmode Supplies

These switchmode power supplies are available in 5VDC, 12VDC and 24VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 85-264VAC.

- Tolerance +/-1%(12VDC), +/-1%(24VDC)
- Ripple and Noise 120mV(12VDC), 150mV (24VDC)
- Efficiency >74%
- Measurements 78x93x56mm
- Output Current 2.0A(12VDC) 1.5A(24VDC)
- 3 year warranty



216W Desktop Battery Charger

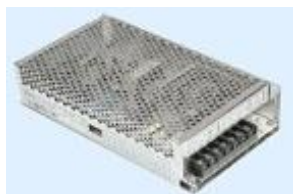
Incorporates short circuit, over load, over voltage and over temperature protection with CSA/NRTLCE/CE approvals. Powered from 176-264VAC it is fitted with terminal connections. The specifications are
Tolerance +/-2% 13.5VDC, +/-1% 27VDC and 54VDC
Ripple and Noise 100mV on 13.5VDC, 150mV on 27VDC and 400mV on 54VDC
Efficiency >81%
Working Temperature 0-40degC @ 100degC, -10C @80%, 60C @ 60% load
Measurements 150(L)x140(W)x75(H) xmm
2 year warranty



Price Each	1	5+
PSM-101 Battery Charger +13.5VDC/16A	\$174.00	less 10%
PSM-102 Battery Charger +27VDC/8A	\$174.00	less 10%

155W Switchmode supply with Battery Charger

Features short circuit, over load and over voltage protection. Battery low and Battery polarity protection. Approvals include UL/CUL/TUV/CB/CE. Free air cooling convection. Powered from 88-264VAC. The specifications are
Tolerance +/-2% 13.8V, +/-1% 27.6V and 54V
Ripple and Noise 150mV on 13.8V and 27.6V, 240mV on 54V
Efficiency >80%
Working Temperature
Without Fan -10~50degC 70% load
With Fan -10~50degC 100% load
Measurements 199(L)x110(W)x50(H) xmm
2 year warranty



Price Each	1	5+
PSM-106 13.8V/11A, 5V/3A & 13.3V/0.5A charger	\$162.00	less 10%
PSM-107 27.6V/5.5A, 5V/3A & 27.1V/0.5A charger	\$162.00	less 10%
PSM-108 54V/2.7A, 5V/3A & 53.5V/0.5A charger	\$162.00	less 10%

40W Slimline DIN Rail Switchmode Supplies

These are available in 5, 12, 24 and 48VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Features DC OK Relay Contact

- Input voltage from 85-264VAC.
- DC adjustment range ±10%
- Overload protection 105%~160% constant current limiting, auto-recovery
- Over voltage protection 115%~135% rated output voltage, shut off
- Working temperature -20~50°C@100%, 70°C@50% load
- Ripple and Noise 120mV(12VDC), 150mV (24VDC)
- Efficiency 86%(12VDC) 88%(24VDC)
- Output Current 3.3A(12VDC) 1.7A(24VDC)
- Case dimension (LxWxH) 40x90x100 mm
- 3 Year warranty



Price Each	1	3+
PSM-153 40W Power Supply 12VDC	\$76.00	less 10%
PSM-154 40W Power Supply 24VDC	\$70.00	less 10%
PSM-155 40W Power Supply 48VDC	\$76.00	less 10%

Price Each	1	3+
PSM-020 30W Power Supply 5VDC	\$58.00	less 10%
PSM-021 30W Power Supply 12VDC	\$58.00	less 10%
PSM-022 30W Power Supply 24VDC	\$58.00	less 10%

OCEAN CONTROLS - POWER SUPPLIES

60W Slimline DIN Rail Switchmode Supplies

These are available in 5, 12, 24 and 48VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Features DC OK Relay Contact

- Input voltage from 85-264VAC.
- DC adjustment range $\pm 10\%$ rated output voltage
- Overload protection 105%~160% constant current limiting, auto-recovery
- Over voltage protection 115%~135% rated output voltage, shut off
- Working temperature -20~50°C@100%, 70°C@50% load
- Ripple and Noise 120mV(12VDC), 150mV(24VDC)
- Efficiency 86%(12VDC) 88%(24VDC)
- Output Current 5A(12VDC) 2.5A(24VDC)
- Case dimension (LxWxH) 40x90x100 mm , 3 year warranty



Price Each	1	3+
PSM-156 60W Power Supply 12VDC	\$80.00	less 10%
PSM-157 60W Power Supply 24VDC	\$74.00	less 10%
PSM-158 60W Power Supply 48VDC	\$80.00	less 10%

75W Industrial DIN Rail Switchmode Supplies

These supplies are available in 12VDC and 24VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 85-264VAC.

- Tolerance $\pm 2\%$ (12VDC), $\pm 1\%$ (24VDC)
- Ripple and Noise 100mV(12VDC), 150mV(24VDC)
- Efficiency >75%
- Measurements 100x56x125mm
- Output Current 12.5A(12VDC) 6.5A(24VDC)
- 3 year warranty



Price Each	1	3+
PSM-032 75W Power Supply 12VDC	\$100.00	less 10%
PSM-033 75W Power Supply 24VDC	\$100.00	less 10%

240W Industrial DIN Rail Switchmode Supplies

This switchmode power supplies is available 24VDC and 48VDC. It is temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 85-264VAC.

- Tolerance $\pm 1\%$
- Ripple and Noise 84mV
- Efficiency >84%
- Measurements 126x100x126mm
- Output Current 10A(24VDC)
- 3 year warranty



Price Each	1	3+
PSM-036 240W Power Supply 24VDC	\$185.00	less 10%
PSM-040 240W Power Supply 48VDC	\$185.00	less 10%

45W Industrial DIN Rail Switchmode Supplies

These switchmode power supplies are available in 5VDC, 12VDC and 24VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED.

- Input voltage from 85-264VAC.
- Tolerance $\pm 1\%$ (12VDC), $\pm 1\%$ (24VDC)
- Ripple and Noise 100mV(12VDC), 150mV(24VDC)
- Efficiency >75%
- Measurements 93x78x67mm
- Output Current 3.5A(12VDC) 2.0A(24VDC)
- 3 year warranty



Price Each	1	3+
PSM-029 45W Power Supply 5VDC	\$66.00	less 10%
PSM-030 45W Power Supply 12VDC	\$66.00	less 10%
PSM-031 45W Power Supply 24VDC	\$66.00	less 10%

120W Industrial DIN Rail Switchmode Supplies

These switchmode power supplies are available in 12VDC and 24VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 85-264VAC.

- Tolerance $\pm 2\%$ (12VDC), $\pm 1\%$ (24VDC)
- Ripple and Noise 100mV(12VDC), 150mV(24VDC)
- Efficiency >75%
- Measurements 100x56x125mm
- Output Current 12.5A(12VDC) 6.5A(24VDC)
- 3 year warranty



Price Each	1	3+
PSM-034 120W Power Supply 12VDC	\$115.00	less 10%
PSM-035 120W Power Supply 24VDC	\$115.00	less 10%
PSM-039 120W Power Supply 48VDC	\$115.00	less 10%

480W Industrial DIN Rail Switchmode Supplies

This switchmode power supplies is only available 24VDC. It is temperature, over voltage protected and current limited.

- Built in EMI filter and power on LED. Input voltage from 85-264VAC.
- Tolerance $\pm 1\%$
- Ripple and Noise 120mV
- Efficiency >89%
- Measurements 227x100x126mm
- Output Current 20A(24VDC)
- 3 year warranty



Price Each	1	3+
PSM-037 480W Power Supply 24VDC	\$275.00	less 10%
PSM-038 480W Power Supply 48VDC	\$275.00	less 10%

240W 3 Phase Industrial DIN Rail Switchmode Supplies

This switchmode power supplies is only available 24VDC and 48VDC. It is temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 340-550VAC.

- DC Adjustment range 24V: 24-28V, 48V: 48-55V
- Tolerance $\pm 1\%$
- Ripple and Noise 80mV
- Efficiency 89%
- Working Temperature -20 to 70degC (Refer to Derating Curve)
- Measurements 126x100x126mm
- Output Current 10A(24VDC) 5A(48VDC)
- 3 year warranty



Price Each	1	3+
PSM-072 240W Power Supply 24VDC	\$210.00	less 10%
PSM-073 240W Power Supply 48VDC	\$210.00	less 10%

OCEAN CONTROLS - POWER SUPPLIES & DC-DC CONVERTERS

480W 3 Phase Industrial DIN Rail Switchmode Supplies

This switchmode power supplies is only available 24VDC and 48VDC. It is temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 340-550VAC.

Tolerance +/-1%
Ripple and Noise 80mV
Efficiency >89%
Measurements 227x100x126mm
Output Current 20A(24VDC) 10A(48VDC)
3 year warranty



Price Each		1	3+
PSM-074 480W Power Supply	24VDC	\$299.00	less 10%
PSM-075 480W Power Supply	48VDC	\$299.00	less 10%

960W 3 Phase Industrial DIN Rail Switchmode Supplies

This switchmode power supplies is only available 24VDC and 48VDC. It is temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 340-550VAC.

Tolerance +/-1%
Ripple and Noise 80mV
Efficiency >91%
Measurements 276x100x126mm
Output Current 40A(24VDC) 20A(48VDC)
3 year warranty



Price Each		1	3+
PSM-076 960W Power Supply	24VDC	\$540.00	less 10%

25W Single Output DC-DC Converter

These 25W industrial grade DC-DC converters feature:
500VDC I/O isolation
Insulation resistance 100MOhm@500VDC
Built in EMI Filter
Over voltage protected, short circuit and overload protected
UL/TUV/CE approvals.
Screw terminals.
Line Regulation +/-0.5%
Load Regulation +/-0.5%
Ripple and Noise <150mV
Efficiency >70%
Measurements 99(L)x97(W)x35(H)xmm
Output Current 2.1A(12VDC) 1.1A(24VDC)
1 year warranty



Price Each		1	3+
PDC-001 9.2-18V(Input) 12V, 2.1A(Output)		\$60.00	less 10%
PDC-002 9.2-18V(Input) 24V, 1.1A(Output)		\$60.00	less 10%
PDC-003 19-36V(Input) 12V, 2.1A(Output)		\$60.00	less 10%
PDC-004 19-36V(Input) 24V, 1.1A(Output)		\$60.00	less 10%

TOL-060 DC to DC converter module

Description: This is a SMD non-isolated dc-dc converter that can deliver up to 5A of output current with full load efficiency of 89% at 3.3V output. These modules provide precisely regulated output voltage programmable via external resistor from 0.75Vdc to 5.5Vdc over a wide range of input voltage (VIN = 10 - 14V). Their open-frame construction and small footprint enable designers to develop cost- and space-efficient solutions. Standard features include remote On/Off, programmable output voltage and overcurrent protection.

Features:

- * 10-14V Input voltage
- * 3.3V Regulated output
- * 5A max output current
- * High reliability: 5.6M hours at 25C fully loaded
- * Low output ripple and noise
- * Line Regulation: 0.3%
- * Load Regulation: 0.4%
- * Temperature Regulation: 0.4%
- * -40C to 85C operating temperatures



Price Each		1	5+
PDC-060 DC to DC converter module		\$18.77	less 10%

120W 415VAC DIN Rail Switchmode Supplies

These switchmode power supplies are available in 24VDC and 48VDC. They are temperature, over voltage protected and current limited. Built in EMI filter and power on LED. Input voltage from 340-550VAC.

DC Adjustment range 24V: 24-28V, 48V: 48-55V

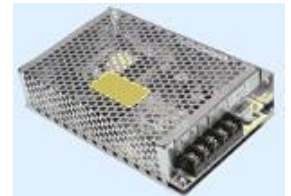
Tolerance +/-1%
Ripple and Noise 80mV
Efficiency 85%
Working Temperature -20 to 60degC
Measurements 100x65x125mm
Output Current 5A(24VDC) 2.5A(48VDC)
3 year warranty



Price Each		1	3+
PSM-070 120W Power Supply	24VDC	\$164.00	less 10%
PSM-071 120W Power Supply	48VDC	\$164.00	less 10%

50W Single Output DC-DC Converter

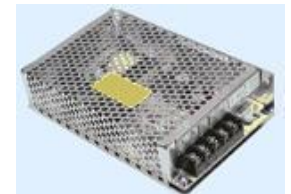
These 50W industrial grade DC-DC converters feature:
500VDC I/O isolation
Insulation resistance 100MOhm@500VDC
Built in EMI Filter
Over voltage protected, short circuit and overload protected
UL/TUV/CE approvals.
Screw terminals.
Line Regulation +/-0.5%
Load Regulation +/-0.5%
Ripple and Noise <150mV
Efficiency >70%
Measurements 159(L)x97(W)x38(H)xmm
Output Current 4.2A(12VDC) 2.1A(24VDC)
1 year warranty



Price Each		1	3+
PDC-005 9.2-18V(Input) 12V, 4.2A(Output)		\$74.00	less 10%
PDC-006 9.2-18V(Input) 24V, 2.1A(Output)		\$74.00	less 10%
PDC-007 19-36V(Input) 12V, 4.2A(Output)		\$74.00	less 10%
PDC-008 19-36V(Input) 24V, 2.1A(Output)		\$74.00	less 10%

100W Single Output DC-DC Converter

These 100W industrial grade DC-DC converters feature:
500VDC I/O isolation
Insulation resistance 100MOhm@500VDC
Built in EMI Filter
Over voltage protected, short circuit and overload protected
UL/TUV/CE approvals.
Screw terminals.
Line Regulation +/-0.5%
Load Regulation +/-0.5%
Ripple and Noise <150mV
Efficiency >74%
Measurements 199(L)x98(W)x38(H)xmm
Output Current 8.5A(12VDC) 4.2A(24VDC)
1 year warranty



Price Each		1	3+
PDC-011 19-36V(Input) 12V, 8.5A(Output)		\$96.00	less 10%
PDC-012 19-36V(Input) 24V, 4.2A(Output)		\$96.00	less 10%

OCEAN CONTROLS - DC-DC CONVERTERS

1W DC-DC Unregulated Single Output

Features:

- 1000VDC I/O isolation •
- Internal SMD technology •
- Built - in EMI filter •
- Protection: Short circuit •
- Cooling by free air convection •
- Non-conductive plastic case •
- Dual in line package •
- SIP package is available •
- 100% full load burn-in test •
- Low cost , high reliability •
- 2 years warranty



Price Each	1	3+
SDC-001 DC-DC 1W 5±10% VDC(Input) 5VDC(Output)	\$12.60	less 10%
SDC-003 DC-DC 1W 5±10% VDC(Input) 12VDC(Output)	\$12.60	less 10%
SDC-005 DC-DC 1W 12±10% VDC(Input) 5VDC(Output)	\$12.60	less 10%
SDC-007 DC-DC 1W 12±10% VDC(Input) 12VDC(Output)	\$12.60	less 10%
SDC-009 DC-DC 1W 24±10% VDC(Input) 5VDC(Output)	\$12.60	less 10%
SDC-011 DC-DC 1W 24±10% VDC(Input) 12VDC(Output)	\$12.60	less 10%

5-6W DC-DC Regulated Single and Dual Output

Features:

- 2:1 wide input range
- 4:1 wide input range (option)
- 1000VDC I/O isolation
- 3000VDC I/O isolation (option)
- Built - in EMI filter
- Protection: Short circuit / Overload
- Cooling by free air convection
- Five-sided shield metal case
- 100% full load burn-in test
- Low cost , high reliability
- 2 years warranty



Price Each	1	3+
SDC-501 DC-DC 5-6W 9-18VDC(Input) 5VDC(Output)	\$30.42	less 10%
SDC-503 DC-DC 5-6W 9-18VDC(Input) 12VDC(Output)	\$30.42	less 10%
SDC-505 DC-DC 5-6W 18-36VDC(Input) 5VDC(Output)	\$30.42	less 10%
SDC-507 DC-DC 5-6W 18-36VDC(Input) 12VDC(Output)	\$30.42	less 10%
SDC-509 DC-DC 5-6W 36-72VDC(Input) 5VDC(Output)	\$30.42	less 10%
SDC-511 DC-DC 5-6W 36-72VDC(Input) 12VDC(Output)	\$30.42	less 10%
DDC-501 DC-DC 5-6W 9-18VDC(Input) ±5VDC(Output)	\$33.84	less 10%
DDC-502 DC-DC 5-6W 9-18VDC(Input) ±12VDC(Output)	\$33.84	less 10%
DDC-504 DC-DC 5-6W 18-36VDC(Input) ±5VDC(Output)	\$33.84	less 10%
DDC-505 DC-DC 5-6W 18-36VDC(Input) ±12VDC(Output)	\$33.84	less 10%
DDC-507 DC-DC 5-6W 36-72VDC(Input) ±5VDC(Output)	\$33.84	less 10%
DDC-508 DC-DC 5-6W 36-72VDC(Input) ±12VDC(Output)	\$33.84	less 10%

3W DC-DC Regulated Single and Dual Output

Features:

- 2:1 wide input range
- 4:1 wide input range (option)
- 1000VDC I/O isolation
- 3000VDC I/O isolation (option)
- Built - in EMI filter
- Protection: Short circuit / Overload
- Cooling by free air convection
- Five-sided shield metal case
- 100% full load burn-in test
- Low cost , high reliability
- 2 years warranty



Price Each	1	3+
SDC-301 DC-DC 3W 9-18VDC(Input) 5VDC(Output)	\$27.54	less 10%
SDC-302 DC-DC 3W 9-18VDC(Input) 12VDC(Output)	\$27.54	less 10%
SDC-304 DC-DC 3W 18-36VDC(Input) 5VDC(Output)	\$27.54	less 10%
SDC-305 DC-DC 3W 18-36VDC(Input) 12VDC(Output)	\$27.54	less 10%
SDC-307 DC-DC 3W 36-72VDC(Input) 5VDC(Output)	\$27.54	less 10%
SDC-308 DC-DC 3W 36-72VDC(Input) 12VDC(Output)	\$27.54	less 10%
DDC-301 DC-DC 3W 9-18VDC(Input) ±5VDC(Output)	\$28.98	less 10%
DDC-302 DC-DC 3W 9-18VDC(Input) ±12VDC(Output)	\$28.98	less 10%
DDC-304 DC-DC 3W 18-36VDC(Input) ±5VDC(Output)	\$28.98	less 10%
DDC-305 DC-DC 3W 18-36VDC(Input) ±12VDC(Output)	\$28.98	less 10%
DDC-307 DC-DC 3W 36-72VDC(Input) ±5VDC(Output)	\$28.98	less 10%
DDC-308 DC-DC 3W 36-72VDC(Input) ±12VDC(Output)	\$28.98	less 10%

12W DC-DC Regulated Single and Dual Output

Features:

- 2:1 wide input range
- 1500VDC I/O isolation
- Built - in remote ON/OFF control
- Protection: Short circuit / Overload
- Cooling by free air convection
- Five-sided shield metal case
- 100% full load burn-in test
- Low cost , high reliability
- 2 years warranty

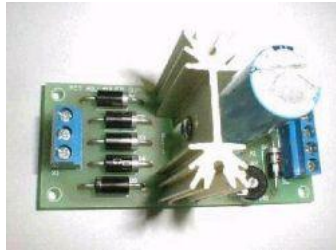


Price Each	1	3+
SDC-701 DC-DC 12W 9-18VDC(Input) 5VDC(Output)	\$52.74	less 10%
SDC-702 DC-DC 12W 9-18VDC(Input) 12VDC(Output)	\$52.74	less 10%
SDC-704 DC-DC 12W 18-36VDC(Input) 5VDC(Output)	\$52.74	less 10%
SDC-705 DC-DC 12W 18-36VDC(Input) 12VDC(Output)	\$52.74	less 10%
SDC-707 DC-DC 12W 36-72VDC(Input) 5VDC(Output)	\$52.74	less 10%
SDC-708 DC-DC 12W 36-72VDC(Input) 12VDC(Output)	\$52.74	less 10%
DDC-701 DC-DC 12W 9-18VDC(Input) ±5VDC(Output)	\$55.62	less 10%
DDC-702 DC-DC 12W 9-18VDC(Input) ±12VDC(Output)	\$55.62	less 10%
DDC-704 DC-DC 12W 18-36VDC(Input) ±5VDC(Output)	\$55.62	less 10%
DDC-705 DC-DC 12W 18-36VDC(Input) ±12VDC(Output)	\$55.62	less 10%
DDC-707 DC-DC 12W 36-72VDC(Input) ±5VDC(Output)	\$55.62	less 10%
DDC-708 DC-DC 12W 36-72VDC(Input) ±12VDC(Output)	\$55.62	less 10%

OCEAN CONTROLS - POWER SUPPLY KITS & BATTERY HOLDERS

Positive Adjustable Power Supply

A compact, easy to build and use, positive variable power supply module. It is ideal for powering any application requiring a DC supply at current levels up to 1.5 amperes. Can be combined with PSU-011 to create a dual-rail supply.



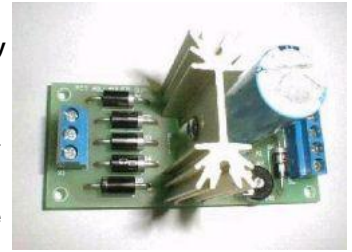
Features:

- Output reverse polarity and back-voltage protection
- LED power on indication
- On board heatsink for regulator IC (LM317T)
- Variable output voltage from 1.2V to 35V
- AC or DC input voltage
- Screw terminals for input, output and LED indicator
- Compact dimensions - 84mm x 37mm (3.3" x 1.4")

Price Each	1	5+
PSU-009 Positive Adjustable PS as kit	\$22.50	less 10%
PSU-010 Positive Adjustable PS assembled	\$35.00	less 10%

Negative Adjustable Power Supply

A compact, easy to build and use, positive variable power supply module. It is ideal for powering any application requiring a DC supply at current levels up to 1.5 amperes. Can be combined with PSU-009 to create a dual-rail supply.



Features:

- Output reverse polarity and back-voltage protection
- LED power on indication
- On board heatsink for regulator IC (LM337T)
- Variable output voltage from -1.2V to -35V
- AC or DC input voltage
- Screw terminals for input, output and LED indicator

Price Each	1	5+
PSU-011 Negative Adjustable PS as kit	\$22.50	less 10%
PSU-012 Negative Adjustable PS assembled	\$35.00	less 10%

VPack5.0V 2-AA Battery Holder w/ 5V Regulator

This battery holder from Bodhilabs takes two AA cells and has an efficient 5V step-up regulator on the back, giving you a simple power source for your 5V circuits. If you're looking for an easy way to get a regulated 5V for your electronics project, this battery holder from Bodhilabs is just what you need. It comes with a step-up DC-to-DC converter on the back that can provide up to 200 mA (typical; 500 mA max), and there is a jumper that can be removed to disconnect the batteries from the regulator and give you direct access to the battery voltage.

Dimensions

Weight: 0.35 oz

General specifications

Maximum supply current: 200 mA
 Default output voltage: 5 V
 Lead length: 4.5 in
 Cells: 2
 Cell type: AA



Price Each	1	5+
POL-781 VPack5.0V 2-AA Battery Holder w/ 5V Regulator	\$18.50	less 10%

VPack5.0V 2-AAA Battery Holder w/ 5V Regulator

This battery holder from Bodhilabs takes two AAA cells and has an efficient 5V step-up regulator on the back, giving you a simple power source for your 5V circuits. If you're looking for an easy way to get a regulated 5V for your electronics project, this battery holder from Bodhilabs is just what you need. It comes with a step-up DC-to-DC converter on the back that can provide up to 200 mA (typical; 500 mA max), and there is a jumper that can be removed to disconnect the batteries from the regulator and give you direct access to the battery voltage.

Dimensions

Weight: 0.32 oz

General specifications

Maximum supply current: 200 mA
 Default output voltage: 5 V
 Lead length: 4.5 in
 Cells: 2
 Cell type: AAA



Price Each	1	5+
POL-783 VPack5.0V 2-AAA Battery Holder w/5V Regulator	\$18.50	less 10%

BVPack3.3V 1-AA Battery Holder w/ 3.3V Regulator

This battery holder from Bodhilabs takes one AA cell and has an efficient 3.3V step-up regulator on the back, giving you a simple power source for your 3V3 circuits. If you're looking for an easy way to get a regulated 3.3V for your electronics project, this battery holder from Bodhilabs is just what you need. It comes with a step-up DC-to-DC converter on the back that can provide up to 100 mA, and there is a jumper that can be removed to disconnect the batteries from the regulator and give you direct access to the battery voltage.

Dimensions

Weight: 0.22 oz

General specifications

Maximum supply current: 100 mA
 Default output voltage: 3.3 V
 Lead length: 4.5 in
 Cells: 1
 Cell type: AA



Price Each	1	5+
POL-796 VPack3.3V 1-AA Battery Holder w/3.3V Regulator	\$17.50	less 10%

VPack3.3V 1-AAA Battery Holder w/ 3.3V Regulator

This battery holder from Bodhilabs takes one AAA cell and has an efficient 3.3V step-up regulator on the back, giving you a simple power source for your 3V3 circuits. If you're looking for an easy way to get a regulated 3.3V for your electronics project, this battery holder from Bodhilabs is just what you need. It comes with a step-up DC-to-DC converter on the back that can provide up to 100 mA, and there is a jumper that can be removed to disconnect the batteries from the regulator and give you direct access to the battery voltage.

Dimensions

Weight: 0.18 oz

General specifications

Maximum supply current: 100 mA
 Default output voltage: 3.3 V
 Lead length: 4.5 in
 Cells: 1
 Cell type: AAA



Price Each	1	5+
POL-797 VPack3.3V 1-AAA Battery Holder w/3.3V Regulator	\$17.50	less 10%

OCEAN CONTROLS - POWER SUPPLY KITS & BATTERY HOLDERS

Plug Packs

We stock a selection of non regulated Plugs Packs suitable for use with our data acquisition equipment, relay controllers and micro-controller programmers.

Each of the plug packs have a selection of plug connectors making it easy to connect to your equipment



Price Each	1
PLP-001 6V, 7.5V, 9V, 12V 1Amp Plug Pack	\$20.00
PLP-003 12VDC 450mA Plug Pack	\$14.55
PLP-006 12VAC 500mA Plug Pack	\$15.18
PLP-005 18VDC 500mA Plug Pack	\$22.00



LiPoly Charger - Single Cell 3.7-7V Input

Description: This is a Polymer Lithium Ion battery charger based on the MAX1555 IC. This charger uses either USB bus power (MAX1555 internally limits this to 100mA) or 2.1mm center positive wall-wart power (MAX1555 internally limits this to 300mA). Current is automatically reduced to a trickle when charging is complete. Cheap, easy to use, and flexible, this board serves as a great demo board for the MAX1555. This charger is a 'must have' for quick and clean charging of Lithium Polymer chemistry batteries.



Check out this iPhone Charger!

Features:

- * Intelligent IC monitored charging - Constant current/Constant Voltage
- * Do not use this charger to charge NiMH, NiCd, or any other battery type
- * Comes fully assembled and tested
- * Single Cell Charger
- * Requires 3.7V to 7V(max!) Input
- * MAX1555 will automatically choose the wall-wart charging if both USB and barrel jacks are connected to power
- * Separate header for external power in
- * Separate headers for battery and load system so batteries don't have to be removed for charging

Price Each	1	5+
BAT-003 LiPoly Charger - Single Cell 3.7-7V Input	\$22.60	less 10%



Polymer Lithium Ion Batteries - 860mAh

Description: These are very slim, extremely light weight batteries based on the new Polymer Lithium Ion chemistry. This is the highest energy density currently in production. Each cells outputs a nominal 3.7V at 860mAh! Comes terminated with a standard 2-pin JST connector - 2mm spacing between pins. These batteries require special charging : Do not attempt to charge these with anything but a specialized LiPo charger.



Battery includes built-in protection against over voltage, over current, and minimum voltage.

Features:

- * 2C continuous discharge
- * Excellent long-term self-discharge rates (<8% per month)
- * Robust power source under extreme conditions (-25 to 60C)

Dimensions: 0.23x1.16x2.0" (5.84x29.5x51mm)

Price Each	1	5+
BAT-002 Polymer Lithium Ion Batteries - 860mAh	\$11.95	less 10%



LiPoly Fast Charger - 5-12V Input

Description: A SparkFun original Lithium Polymer charger. This little black box charges single cell lithium polymer batteries with a max rate of 1A. This works well with our 5V/1A regulated supply. The charge output is via a 2-pin screw terminal. Top pin is ground, bottom pin is charge pin. Based on the popular Microchip part MCP73843-410.



Price Each	1	5+
BAT-004 Lipoly Fast Charger - 5-12V Input	\$27.65	less 10%



Polymer Lithium Ion Batteries - 100mAh

Description: This is a very small, extremely light weight battery based on the new Polymer Lithium Ion chemistry. This is the highest energy density currently in production. Each cells outputs a nominal 3.7V at 100mAh! Comes terminated with a standard 2-pin JST connector - 2mm spacing between pins. These batteries require special charging. Do not attempt to charge these with anything but a specialized Lithium Polymer charger.

Battery includes built-in protection against over voltage, over current, and minimum voltage.

Features:

- * 2C continuous discharge - very high for low price
- * Excellent long-term self-discharge rates (<8% per month)
- * Robust power source under extreme conditions (-25 to 60C)

Dimensions: 0.19x0.52x1.19" (4.7x13x28mm)

Weight: about 3g - Our scale doesn't go this low



Price Each	1	5+
BAT-005 Polymer Lithium Ion Batteries - 100mAh	\$8.34	less 10%

OCEAN CONTROLS - TEST EQUIPMENT

Digital Function Generator

This digital function generator has variable sweep rate and width, as well as functioning as a standard waveform generator with sinusoidal, triangle and square wave outputs. DC offset adjustment allows the waveform to be shifted above or below 0V, and symmetry adjustment can be used to generate asymmetrical waveforms, with positive going cycles of narrower width than the negative going pulses. Output amplitude is adjustable from 0 to 10V p-p via front panel control, with a switchable -20dB attenuator. Output frequency is adjustable between 0.02Hz to 2MHz



Price Each 1
MET-100 Function Generator & Frequency Counter \$453.64

Digital Tachometer Laser Photo/Contact

Model DT-1236L

Features

- * From Lutron World's patent, Multi-functions, one instrument combine Photo Tach. (RPM) & Contact Tach. (RPM, m/min., ft/min.).
- * High visible LCD display gives RPM reading exactly with no guessing or errors & saves battery
- * Laser light source, long detecting distance.
- * Wide measuring range from 0.5 to 100,000 RPM
- * This tachometer uses one chip LSI circuit & crystal time base, offering a high accurate measurement & fast sampling time.
- * 0.1 RPM resolution measured value < 1000 RPM.
- * The use of durable, long lasting components, including a strong, light weight ABS plastic housing, assures almost maintenance free performance for many years. Carry case included.
- * High precision with 0.05% accuracy.
- * The last value, max., value, min. value will be stored into the memory automatically & can be obtained by pressing Memory Call Button.
- * The housing cabinet has been carefully shaped to fit comfortable in either hand. 9V Alkaline Battery



Price Each 1
MET-005 DT-1236L Digital Tachometer \$308.00

Digital Tachometer Laser Photo/Contact

Features include

- * From Lutron World's patent, Multi-functions, one instrument combine Photo Tachometer (RPM) and Contact Tachometer (RPM, m/min., ft/min.).
- * Wide measuring range : 0.5 to 100,000 RPM.
- * < 1,000 RPM, 0.1 RPM resolution .
- * High precision with 0.05% accuracy.
- * Memorize the last value, max., value, min. value
- * High visible LCD display.
- * Exclusive one chip LSI circuit & crystal time base
- * The use of durable, long lasting components, including a strong, light weight ABS plastic housing, assures almost maintenance free performance for many years. Battery and Hard Carry Case included



Price Each 1
MET-010 DT-2236 Digital Tachometer \$276.00

Power Meter

Description: By simply plugging this compact meter into a standard power point (GPO), you are able to calculate the running costs of any connected appliance. It tracks power usage and can display instantaneous voltage or current draw. Internal batteries maintain data during mains failure. To calculate real running costs, key in the local price per unit of electricity as charged by your provider.



Price Each 1
MET-042 Power Meter \$30.90

Digital Tachometer

This easy-to-use hand held digital tachometer measures up to 99,999 RPM and features a large LCD display, laser pointer, low battery indicator, and memory recall for the last displayed value, minimum value, and maximum value. It can also be switched to measure either actual RPM or total revolutions. Supplied with carry case and 600mm reflective tape marks, which can be cut to size.



Specifications:

Display: 5 Digits, 16mm 0.7" LCD
Test range: 2.5 to 99,999 RPM
Resolution: 0.1RPM (2.5 - 999.9 RPM), 1RPM (over 1000RPM)
Accuracy: 0.05%

Price Each 1
MET-001 Digital Tachometer \$72.68

Dwell Tachometer Digital Multimeter

Features include a 3.5 digit LCD display with automatic zero adjustment, low battery warning and auto power off after 15 minutes. Includes dwell angle and RPM (x1, x10) for 4, 5, 6 and 8 cylinder engines.

Specifications

- RPM x 1, x10
- Dwell angle
- Resistance
- DC volts
- 15 amp DC
- Continuity buzzer
- Probe clips and Holster included
- Comprehensive user guide describes how to:
- Use dwell angle function
- Dual point distributors
- Set idle speed and mixture setting
- Adjust fast idle speed
- Air fuel ratio test
- Air filter test
- Cylinder power balance test
- Positive crankcase ventilator (PCV) test
- Distributor centrifugal advance test
- Heavy and light load battery test
- Charging system test
- Starter circuit
- Alternator output voltage
- Generator output voltage



Price Each 1
MET-003 Dwell Tachometer and DVM \$54.50

Tempgun with Laser Sight

This is TempGun PE2, the next generation non-contact infrared thermometer. Higher accuracy, laser sighting, and a tighter emission profile make this new unit a must have for tighter tolerance measurements. Just point it at any object and get the surface temperature. Remember the days when you couldn't buy a laser pointer for under AUD\$150? Now you can get one for AUD\$65 with a surface temperature to boot!

* Range: (-27°F to 428°F) switchable to Celsius (-33°C to 220°C)

- * Resolution: 0.1°
- * Accuracy: ±2 Degrees
- * Response Time: 1 second
- * Field of View (D:S Ratio): 8:1
- * Modes: Max/Min/Lock
- * Emissivity: 0.05~1 adjustable
- * 40 hours continuous use battery life
- * Two CR2032 batteries
- * Weight 80 grams
- * Warranty 1 Year
- * Dimensions: 22x50x110mm



Price Each 1
MET-022 Tempgun with Laser Sight \$74.95

OCEAN CONTROLS - TEST EQUIPMENT

Infra-red Thermometer

Compact, lightweight, handheld infra-red thermometer enables accurate laser guided non-contact temperature measurement of any given object (even in the dark). It features easy one hand operation and can measure temperatures from -30°C to 550°C. It includes functions for minimum and maximum readings, selectable auto power off, data hold and adjustable warning alarm when temperature rises or falls below user set levels. The backlit display allows easy reading in dark areas. Can display in either °C or °F.

Specifications:

Detection element: Thermopile, Optical lens: Fresnel
Sighting: < 1mW laser marker, Range: -30°C to 550°C
Resolution: 0.5°C Accuracy: ± 2°C (-30°C to 100°C), ± 2% reading (101°C to 550°C)
Temp coefficient: ±0.2% of reading or 0.2°C (which ever is greater)
Response time: 0.25 seconds Spectral response: 6 to 14µm nominal
Adjust emissivity (e): 0.1 to 1.0

Dimensions: ~ 105W x 42D x 148H mm

Price Each	1
MET-020 Infra-Red Thermometer	\$104.55



Relative Humidity and Temperature

This practical and convenient pocket instrument accurately measures and displays temperature and relative humidity simultaneously. It is an invaluable companion for the HVAC technicians, laboratory researchers, food storage operators, librarians, or any professional involved in computer rooms, printing shops, paper, pulp and wood plants..

Specifications:

Measuring range: 5-95% RH; -10 to 50°C
Accuracy: +3% FS for RH and +0.2% for temperature.
Sensors: capacitive polymer for RH and precision thermistor for °C.
Response time: 60s typical.
HI and LO memory and HOLD function.
Auto shut-off in 20 seconds.
Measures in °C and °F.
Powered by 2 AAA batteries in Elegant enclosure with protective case.
Convenient pocket clip. Dimensions: 48x165x16 mm



Price Each	1
MET-030 Relative Humidity and Temperature Meter	\$125.00

Network Cable Tester and DVM

2 instruments in one. Ideal for network installers or technicians and allows the user to easily check cable integrity or measure AC & DC voltage, current, resistance, and continuity etc. without needing to carry two separate devices. The unit will check for cable continuity, open-circuits, short-circuits, and cross-connects etc. A remote terminator is included and enables the user to check network cables at a wall jack or patch panel. Supplied with loop back cable, LAN terminator, and multimeter leads.

LAN tester specifications:

* LAN tester checks faults & miss wired conductors

* Manual or automatic testing

DMM Specifications:

- * 600 volt max input
- * 200mA AC/DC
- * 20M ohm resistance
- * 3.5 digit
- * Diode test, Data Hold and Max hold



Price Each	1
MET-002 Network Cable Tester and DVM	\$90.86

K Type Thermocouple Meter

Easy to Use Digital Thermometer

A handy pocket-size digital thermometer, suitable for the lab, workshop or in the field. It features an excellent measurement range from -50 to 750°C and a hold function to lock the reading on the display. Thermocouple included. Requires 9V battery (included).

Accepts standard K-type thermocouples.

Specifications:

- Display: 3.5 digit LCD
- Range: -50 - 750°C
- Accuracy: ±1°C
- Dimensions: 118(L) x 70(W) x 29(H)mm



Price Each	1
MET-035 Digital Thermometer	\$45.40

Multimeter-USB Interface

MET-050 Multimeter Auto Ranging USB Datalogger DMM

An autoranging multimeter featuring an optically isolated USB interface and Windows® software. The optical adaptor ensures the DMM is electrically isolated from the PC, so no damage can occur to the computer should there be a fault in the circuit under test. It also measures temperature, frequency, capacitance, AC/DC voltage & current up to 10A. Includes PC software, high quality rubber insulated test leads, temperature probe and is housed in a shock-proof rubber coated case. Data Acquisition: The USB interface and software allows you to log and store measurements for later analysis. This is particularly useful for monitoring the performance of battery chargers or dischargers, timed circuits or other quantities that change with time. Suits Windows® XP & Vista.

Features

- Auto ranging with override
- Auto power off
- USB Interface
- Duty cycle % range
- Data hold & relative modes
- Bar graph readout
- Continuity buzzer & diode check
- Temperature sensor included
- Battery included
- Cat II 1000V



Specifications

DC voltage: 400mV, 4V, 40V, 400V
AC voltage: 400mV, 4V, 40V, 400V, 750V
DC current: 400µA, 4000µA, 40mA, 400mA, 4A, 10A
AC current: 400µA, 4000µA, 40mA, 400mA, 4A, 10A
Resistance: 400, 4k, 40k, 400k, 4M, 40M Ohm
Frequency: 100Hz, 1000Hz, 10kHz, 100kHz, 1MHz, 30MHz
Duty Cycle: 0.1% to 99.9%
Capacitance: 40nF, 400nF, 4µF, 40µF, 200µF
Continuity: <50 Ohm, Audible tester
Diode test: Test Current ~1mA
Temperature: -20°C to 400°C, 400°C to 1000°C
Display: 3.75 digit LCD, 4000 count

Dimensions: 95W x 48D x 192H mm

Price Each	1
MET-050 Multimeter-USB Interface	\$99.00

OCEAN CONTROLS - TEST EQUIPMENT

Digital Function Generator

One of the most versatile pieces of test equipment you can own. It provides a consistent waveform output, useful for checking response of audio circuits etc. This digital function generator has an in-built frequency counter, as well as functioning as a standard waveform generator with sinusoidal, triangle and square wave outputs. DC offset adjustment allows the waveform to be shifted above or below 0V. Output amplitude is adjustable from 0 to 10V p-p via front panel control, with a switchable -20dB attenuator. Output frequency is adjustable between 0.03Hz to 3MHz via front panel rotary dial over seven ranges. It has an external sync output for synchronising other test equipment to the signal generator, such as CROs and logic probes. This allows observation of phase shifts relative to the signal generator output. It also features a 3 MHz 4 digit frequency counter with external BNC counter input. A self calibration mode ensures excellent accuracy at all times.



Features

- Sine, square & triangle waveforms
- External TTL sync output
- Tilt bail arm handle for bench stand angle adjustment
- High brightness seven segment LED displays
- BNC input/output connectors
- Push button range and waveform switching
- 3 MHz frequency counter
- External voltage controlled frequency

Specifications

Output
Frequency range:0.3Hz to 3MHz
Accuracy:±5% (at 3MHz position)
Amplitude:=10V p-p
Attenuator:-20dB ±1dB
Impedance:50 ohm ±5%
Sine Wave
Flatness:<0.3dB (0.3Hz - 300kHz), <0.5dB (300kHz - 3MHz)
Distortion:=1% (0.3Hz - 200kHz) =35dB below fundamental in all ranges.
Square Wave
Rise / fall time:100ns or less
Symmetry variation:±2% (0.3Hz - 200kHz)
Triangle Wave
Linearity:.....98% or more to 100kHz
Frequency Counter
Range:.....0.3Hz - 3MHz
Accuracy:Time base accuracy ± 1 count
Time base:±20ppm
Resolution:10Hz up to 1Hz. 0.1Hz up to 100MHz
Input impedance:1MO
CMOS output level:.....4V p-p (±1V) / 14.5V p-p (±0.5V)
TTL output level:=3V p-p, fan out 20 TTL load
VCF input voltage:0-10V ±1V (100 : 1)
VCF input impedance:.....10kΩ ±10%
General
Power requirements:.....240V AC
Dimensions:.....251W x 291D x 91H mm
Weight:.....~ 2kg

Price Each 1
MET-105 Digital Function Generator \$312.73

Digital AC Clamp Meter & DMM

Compact and durable, this digital clamp meter provides accurate AC current measurement up to 400A. Fits snugly into one hand with thumbwheel function selector allowing simple operation just about anywhere! Includes the functionality of a typical standard DMM but with the addition of a non contact AC voltage detector. Very useful when locating or working on live equipment. The hold button will freeze the display on the last measured reading. It also features autoranging AC/DC volts and current, resistance, temperature, capacitance ranges plus a diode and continuity test function. An essential piece of test gear for high voltage technicians, instrument fitters and other electrical trades people. Supplied with high quality test leads, temperature probe and poromeric carry case



Features

- Autoranging
- Non contact AC voltage detection
- Up to 400A AC current
- Auto power off
- Hold function
- Quality test leads
- Easy one handed operation
- Temperature probe
- Carry case
- Battery included
- Cat III 600V

Specifications

DC voltage:400mV, 4V, 40V, 400V, 600V
AC voltage:.....4V, 40V, 400V, 600V
AC current:400A
Resistance:.....400Ω, 4kΩ, 40kΩ, 400kΩ, 4MO, 40MO
Continuity:Audible tone
Diode test:Test current 0.3mA typical
Temperature:-20°C to 760°C
Capacitance:40nF, 400nF, 4μF, 40μF, 100μF
Display:4 digit LCD, 4000 count, backlight
Dimensions:.....~ 60W x 30D x 195H mm.

Price Each 1
MET-110 Digital AC Clamp Meter & DMM \$63.59

DO-5510HA Oxygen Meter

The DO-5510 oxygen meter has a polarographic type oxygen probe with an incorporated Temp. sensor, high precision measurement for Dissolved Oxygen(DO), Oxygen in air (O2) & Temp. measurement.

Features Include

- Heavy duty dissolved oxygen probe, probe head can connect with BOD bottle.
- Automatic Temp. compensation from 0 to 50 degC for sensor probe.
- Build in " % SALT " & " Mountain Height " compensation adjustment button.
- Microprocessor circuit.
- Sampling Time: Approx 0.4 seconds
- Dimensions: 185 x 78 x 38mm
- Weight: 265g
- Battery and Soft Carry Case included



Price Each 1
LUT-011 DO-5510A Oxygen Meter \$395.00

OCEAN CONTROLS - TEST EQUIPMENT

MS-7000 Moisture Meter

A portable, easy-to-use wood moisture meter with built-in self calibration. Nine different material groups in memory, providing calibrations for about 150 different material (wood) types. Built-in self calibration with manual temperature compensation adjustment.

Product Highlights

- * Data hold, Min/Max, Record & Recall functions
- * RS232 interface
- * 9 Material Species groups in memory
- * Remote pin type moisture probe for easy operation
- * Auto shut off & low battery indication
- * Moisture probe, contact pins, battery & hard carrying case included
- * Humidity Range: 9 to 30% Moisture Content
- * Humidity Resolution: 0.1%
- * Humidity Accuracy: $\pm 4\%$ from 9 to 24%
- * Temperature Range: 32 to 122 F / 0 to 50 C
- * Temperature Resolution: 0.1 F/C
- * Temperature Accuracy: ± 1.5 F / ± 0.8 C



Price Each 1
LUT-012 MS-7000 Moisture Meter \$206.00

PH-207HAH pH Meter

The PH-207AH Meter is portable and provides fast accurate readings, it comes supplied with a pH and temperature probe - carry case and full operating instructions.

Functions include: Max/Min Readings, Dual Display and Memory Recall.

Measurement Ranges: -

- 0 to 14 pH x .01 pH
- mV 0 to 1999 mV Humidity
- Temperature 0 to 65 degC



Features

- Max, min., Data Hold and RS232 Output
- u-P circuit with LCD display
- pH, mV, temp., manual temp adj.
- Sampling Time Approx. 0.8 second.
- Accuracy pH: $\pm (0.03 \text{ PH} + 2 \text{ d})$
- Operating Temperature: 0 to 50 deg C.
- Operating Humidity Less than 80% RH

Price Each 1
LUT-013 PH-207AH pH Meter \$272.00

Vibration Meter

Comes with accelerometer and Carry Case
All industrial machinery vibrates. The level of vibration is a useful guide to the condition of the machine.
Poor balance, misalignment and looseness of the structure will cause the vibration level to increase and it is a sure sign that the maintenance is needed.

Features Include:

- * Frequency range 10 Hz - 1 kHz, sensitivity relative meet ISO 2954.
- * Supply with vibration sensor & magnetic base, full set.
- * Velocity range : 200 mm/s.
- * Acceleration range : 200 m/s²
- * RMS & Peak measurement.
- * Data hold, Memory (Max. & Min.).
- * Separate vibration probe.
- * Optional data acquisition software.
- * Auto shut off saves battery life.



Price Each 1
LUT-020 VB-8201 Vibration Meter \$436.00

CD-4303 Conductivity Meter

The CD4303HA Conductivity Meter is portable and provides fast accurate readings, it comes supplied with an ATC conductivity probe - carry case and full operating instructions.

Functions include: Max/Min Readings, Dual Display and Memory Recall.

Measurement Range: -

Conductivity: 200 uS, 2mS, 20mS.

Values: 0.1uS to 199.9uS, 0.2mS to 1.999mS, 2mS to 19.99mS.

Resolution: 0.1uS, 0.001mS, 0.01mS.

Accuracy: $\pm 2\%$ (full scale + 1d)

Temperature: 0 to 60 degrees C.



Price Each 1
LUT-010 CD-4303HA Conductivity Meter \$236.00

LX-107HA Lux Meter

The LX-107HA Light Meter is portable and provides fast accurate readings, it comes supplied light probe - carry case and full operating instructions.

Features

- 2000/20000/100000 Lux Measurement Ranges

- Data hold, Max, Min, Zero, 2 filters
- Displays in Lux, Ft-candle & % Value
- Tungsten, Fluorescent, Mercury, Sodium, 4 light type select, microprocessor circuit
- Accuracy Lux Measurement $\pm (5\% + 2d)$
- Size: 185 x 78 x 38mm



Price Each 1
LUT-014 LX-107HA Lux Meter \$168.00

Digital ORP Meter

Comes with Remote Probe

Used for oxidation/reduction measurement in plating baths, waste water monitoring and other applications such as AQUARIUM, BEVERAGE, FISH HATCHERIES, FOOD PROCESSING, PHOTOGRAPHY, LABORATORY, QUALITY CONTROL, SCHOOL & COLLEGES, SWIMMING POOLS etc

Features Include:

- * Range : -1,999 mV to +1,999 mV.
- * Resolution : 1 mV.
- * Easy operation, compact size.
- * Water resistance on the front panel.
- * All function keys are used the rubber button.
- * Large LCD display.
- * Temperature: 0 to 60 degrees C .
- * Hard carrying case included.



Price Each 1
LUT-022 YK-23RP Digital ORP Meter \$110.00

Salt Water Meter

A portable, easy-to-use digital salt water tester. It can measure between 0 to 10%. It has wide applications in water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, schools & colleges.

Features Include:

- * Separate electrode, easy operation.
- * The portable Salt meter provides fast, accurate readings, with digital readability.
- * Measuring range : 0 to 10 % salt.
- * Automatic temp. compensation for the probe.
- * Water resistance on the front panel.
- * All function keys are used the rubber button.
- * Data hold.



Price Each 1
LUT-026 YK-31SA Digital Salt Meter \$209.00

OCEAN CONTROLS - TEST EQUIPMENT

Pure Water Meter

A portable, easy-to-use digital pure water tester

* Applications include: water conditioning, aquariums, food processing, photography, schools, laboratories, industry and quality control

* Check the condition of water filters

* Measurement Range: 0-1999 uS

* Automatic temperature compensation from 32 to 122 degF or 0 to 50 degC

* Large LCD display

* Data Hold function



Price Each

LUT-024 YK-30WA Digital Pure Water Test

\$188.00

Sound Level Meter

A portable, easy-to-use sound Level meter. Rugged and ergonomically built to fit into the palm of your hand.

Features Include:

* Large, easy-to-read LCD display

* Triple range measurement (30 to 80dB, 50 to 100dB, 80 to 130dB)

* A" frequency weighting (same as the human ear)

* Electric condenser microphone for high accuracy

& long-term stability

* Internal 94dB calibration

* Meets IEC 651 Type 2 requirements

* Data Hold & low battery indication

* 9V battery included

* Measuring Range: 35 to 130dB (A)

* Resolution: 0.1dB

* Accuracy: +/-1.5dB

* Frequency: 31.5Hz to 8kHz

* Time Weighting: Fast

* Microphone: 1/2" electric condenser



Price Each

LUT-030 SL-4010 Sound Level Meter

\$179.00

CC421-Current Voltage Calibrator

Features include

* Current Source: 0 to 24 mA, 2 ranges

* Current Measurement: 0 to 24 mA, 2 ranges

* Power & Current Measurement of 2-wire loop: 0 to 24mA, 2 ranges

* DC mV Source: -199.9 mV to +199.9 mV

* Current calibrator drives loads up to 500Ohm

* 13mm LCD display

* current source and measurement accuracy 0.25%

+1d

* voltage source and measurement accuracy 0.25%

+1d

Sampling Time: Approx 0.4 seconds

Dimensions: 185 x 78 x 38mm

Weight: 265g

Battery and Soft Carry Case included



Price Each

LUT-001 CC-421 Current and Voltage Calibrator

\$233.00

DW-6091 PORTABLE TOP POWER ANALYSER

Features Include:

*Watt (true rms), VA, Power Factor, ACV, ACA, VAR, KWh

*RS232C Output & Optional Windows Software

*CT & Current Probe Input



Price Each

LUT-034 DW-6091 PORTABLE TOP POWER ANALYSER

\$292.00

4 in 1 Environment Meter

The Lutron LM-8000 pocket environment anemometer meter measures airflow, temperature, light and relative humidity. It has a lightweight low-friction ball vane providing high accuracy at high & low air velocity. The robust case incorporates a large easy-to-read display and wrist strap. Ideal for practically all conditions.

- Selectable m/s, fpm, mph, km/hr or knots

- Shock resistant low-friction ball vane

- Easy to use push button operation

- Data hold freezes current measured value

- Min/max memory since power on

- 18mm LCD display with function indicators

- AAVM-8000 Has a 2 line display for 2 measured values e.g. Air velocity & Temperature and a K type thermocouple input

- Supplied with instructions for use

- Calibration certificates available

- Requires 1 x PP3 9V Battery ALR-61 * Microphone: 1/2" electric condenser



Price Each

LUT-015 LM-8000 Environment Meter

\$175.00

Prova 123 Calibrator

Specifications

* 4-20mA (1K ohm load, 24V loop supply)

* 0-100.00mV, 0-1.0000V, 0-12.000V ranges

* K, J, E, T Thermocouples (*C and *F)

* Frequency 1-62500Hz

* 0.025% Basic Accuracy

* Easy Key-pad Operation

* Easy Step and Auto Ramp Functions

* 0-20mA, 0-24mA selectable

* 1-100% Input (mA, mV, V)

* Beeper Warning when Output is Open (mA)



Less than 80% RH

Storage Temperature -40 to 60degC

Dimension: 88mm(L) x 168mm(W) x 26.2mm(H)

Weight 350g/12.34 oz. (Battery included)

Accessories Carrying case x 1

User manual x 1

9V Alkaline Battery

Price Each

LUT-002 Prova 123 Calibrator

\$749.00

DW-6090 DESK TOP POWER ANALYSER

Features Include:

*Watt (true rms), VA, Power Factor, ACV, ACA, VAR, KWh

*DCV,DCA,Ohm & RS232C

*CT & Current Probe Input



Price Each

LUT-032 DW-6090 DESK TOP POWER ANALYSER

\$423.00

EMF-819 RF EMF TESTER c/- Freq Probe & Hard Carry Case

Features Include:

*3 Axis RF EMF tester, general purpose application.

*Frequency range up to 3 GHz

*0 to 199.99 V/m; 0 to 99.999 W/m2; 0 to 9.9999 mW/cm2

Features include



Price Each

LUT-036 EMF-819 RF EMF TESTER c/- Freq Probe & Hard Carry Case

\$496.00

OCEAN CONTROLS - TEST EQUIPMENT

EMF-822A EMF TESTER c/- Soft Carry Case

Features Include:

- *0.1mGuass to 199.9mGuass
- *30Hz. to 300Hz Bandwidth
- *9V Battery Power Supply



Price Each

1

LUT-038 EMF-822A EMF TESTER c/- Soft Carry Case

\$139.00

EMF-839 EMF TESTER c/- Two Probes & Hard Carry Case

Features Include:

- *3 Axis RF Electromagnetic Field Meter
- *100 KHz to 3 GHz, 2 probes, professional
- *0 to 199.99 V/m; 0 to 99.999 W/m²; 0 to 9.9999 mW/cm²



Price Each

1

LUT-042 EMF-839 EMF TESTER c/- Two Probes & Hard Carry Case
\$1550.00

EMF-827 EMF TESTER c/- Remote Probe & Soft Carry Case

Features Include:

- *0.01uTesla to 2000uTesla (1uTesla = 10mGuass)
- *30Hz. to 300 Hz Bandwidth
- *9V Battery Power Supply



Price Each

1

LUT-040 EMF-827 EMF TESTER c/-Remote Probe&Soft Carry Case \$180.00

GS-5800 LEAK DETECTOR and GS-400 Ultrasonic Transmitter

Features Include:

- *GS-5800 LEAKAGE Detector
- *Detects leaks around seals, doors, gaskets & pipes etc



Price Each

1

LUT-046 GS-5800 LEAK DETECTOR

\$259.00

LUT-048 GS-400 ULTRASONIC Transmitter

\$75.00

OCEAN CONTROLS - TOOLS

TOL-001 Hemostat Curved

125mm or 5" hemostats with a curved tip. We use them exclusively to hold small SMD parts in place while soldering. A must have for any hand-assembly project.



Price Each	1	5+
TOL-001 Hemostat Curved	\$9.00	less 10%

TOL-002 Hemostat Straight

125mm or 5" hemostats with a straight tip. We use them exclusively to hold small SMD parts in place while soldering. A must have for any hand-assembly project.



Price Each	1	5+
TOL-002 Hemostat Straight	\$9.00	less 10%

TOL-010 Tweezers Curved

Basic 110mm or 4.5" high-carbon stainless steel curved tweezers for holding small components during soldering. These non-magnetic tweezers are perfect for SMD components and fine adjustments. We use them extensively for hand placement of SMD devices and general board rework.



Price Each	1	5+
TOL-010 Tweezers Curved	\$6.00	less 10%

TOL-020 Stainless Steel Long Nose Pliers

High quality polished stainless steel finish making them rust resistant. Spring-loaded action making them easier to use. Length 125mm



Price Each	1	5+
TOL-020 Stainless Steel Long Nose Pliers	\$13.20	less 10%

TOL-030 Stainless Steel Side Cutters

High quality polished stainless steel finish making them rust resistant. Spring-loaded action making them easier to use. Length 125mm



Price Each	1	5+
TOL-030 Stainless Steel Side Cutters	\$13.20	less 10%

TOL-042 1000V Insulated Screwdriver - #1 Phillips

A must for people who service 240V appliances. Rated at 1000V with insulated shaft. Super comfortable rubberised grip. Heat treated chrome vanadium tips for long life.



Specifications:
Length (mm) 80
Phillips #1

Price Each	1	5+
TOL-042 1000V Insulated Screwdriver - #1 Phillips	\$5.18	less 10%

TOL-040 1000V Insulated Screwdriver - 4mm Flat Blade

A must for people who service 240V appliances. Rated at 1000V with insulated shaft. Super comfortable rubberised grip. Heat treated chrome vanadium tips for long life.



Specifications:
Length (mm) 100
Flat Blade 4mm

Price Each	1	5+
TOL-040 1000V Insulated Screwdriver - 4mm Flat Blade	\$4.73	less 10%

TOL-043 1000V Insulated Screwdriver - #2 Phillips

A must for people who service 240V appliances. Rated at 1000V with insulated shaft. Super comfortable rubberised grip. Heat treated chrome vanadium tips for long life.



Specifications:
Length (mm) 100
Phillips #2

Price Each	1	5+
TOL-043 1000V Insulated Screwdriver - #2 Phillips	\$5.18	less 10%

TOL-041 1000V Insulated Screwdriver - 6.5mm Flat Blade

A must for people who service 240V appliances. Rated at 1000V with insulated shaft. Super comfortable rubberised grip. Heat treated chrome vanadium tips for long life.



Specifications:
Length (mm) 150
Flat Blade 6.5mm

Price Each	1	5+
TOL-041 1000V Insulated Screwdriver - 6.5mm Flat Blade	\$5.18	less 10%

TOL-044 1000V Insulated Screwdriver Set - 6pc

This set of screwdrivers is ideal for people who service 240V appliances. They are rated at 1000V and the shaft is insulated to the tip. Includes 3 slotted and 2 phillips screwdrivers, plus a 240V neon tester.



Price Each	1	5+
TOL-044 1000V Insulated Screwdriver Set - 6pc	\$20.86	less 10%

OCEAN CONTROLS - TOOLS

TOL-045 1000V Insulated Electrician Tool Set - 9pc

This insulated toolkit is ideal for electricians, technicians and those working on mains powered equipment. It includes cutters, pliers, wire strippers, 5 screwdrivers plus a neon test driver, all in a handy carry case. Also includes 2 rolls of insulation tape.



Price Each	1	5+
TOL-045 1000V Insulated Electrician Tool Set - 9pc	\$53.64	less 10%

TOL-050 Coaxial Crimping Tool T1554

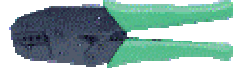
Suits coaxial cable connectors. Adjustable crimp tension with ratchet action handles. Heavy duty all metal construction. Suits RG6, RG58 and RG59



Price Each	1	5+
TOL-050 Coaxial Crimping Tool T1554	\$40.86	less 10%

TOL-051 Coaxial Crimp Tool T1555

Adjustable crimp tension with ratchet action handles. Heavy duty all metal construction. Suits RG58, Fibre Optic, SMA, SMB and RG174 connectors. Suitable for use with connectors fitted to multi-core RGB coaxial cable ie Altronics BNC P 0525 (with 5.3mm OD ferrule)



Price Each	1	5+
TOL-051 Coaxial Crimp Tool T1555	\$41.77	less 10%

TOL-052 BNC TNC F Crimp Tool to Suit RG-11 Cable

Suitable for crimping RG6 & RG11 size connectors. Include crimp jaws for RG6, RG11 & RG11 centre pin. Adjustable crimp tension. Heavy duty all metal construction.



Price Each	1	5+
TOL-052 BNC TNC F Crimp Tool to Suit RG-11 Cable	\$41.77	less 10%

TOL-053 Crimptool - For Foxtel F

This coaxial crimper is suitable for use with P 0486 Foxtel approved F connector. It crimps ferrules with overall diameter of 10.8mm. Adjustable crimp tension with ratchet action handles. All metal construction. Suits RG6, RG11 and RG59.



Price Each	1	5+
TOL-053 Crimptool - For Foxtel F	\$41.77	less 10%

OCEAN CONTROLS - AUDIO

20 Second Voice recorder module

This voice recording module offers solid state storage and playback of a single 20 second message and can be extended up to 30 seconds with a slight degradation of sound quality.

Features:

- Non volatile flash memory
- No battery backup required
- 2 button operation REC/PLAY
- Low Power Consumption
- LED Indication
- Built in mic
- 5V Operation

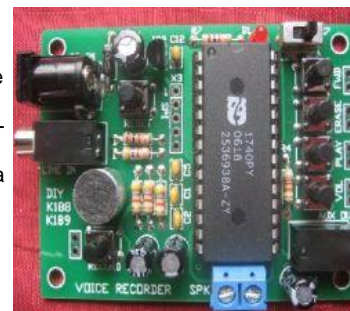


Only requires Speaker

Price Each	1	5+
KIT-363 20 Second Voice module	\$17.50	less 10%

120 Second Voice recorder module

Introducing the new kit 189. Uses a 17120 Second Voice Recorder Module. Non-volatile multi message recorder using ISD chips. Just change one resistor for longer duration. Standalone operation using just six onboard buttons. Record via built-in microphone or external line in. Speaker and line out connector. SPI interface. 8-24 VDC.



Price Each	1	5+
KIT-189 120 Second Voice module as Kit	\$45.00	
KTA-189 120 Second Voice module as Kit	\$64.00	

10W+10W Stereo Amplifier Module

The TDA2009A is a monolithic hi-fi quality audio power amplifier IC with dual class AB outputs, designed for high quality stereo applications.



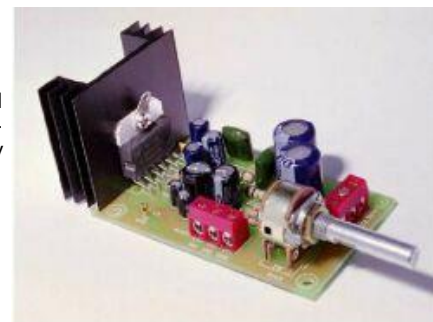
Kit uses the data book application circuit and gives a gain of 36dB. It delivers 10 watts per channel into 4 Ohm speakers with a 24V DC supply. Can be fitted into existing equipment if required.

Supply range: 8 - 28V DC. Screw terminal block connections. **Heatsink provided.** PCB: 45 x 80mm

Price Each	1	5+
KIT-088 10W+10W Stereo Amplifier Module as Kit	\$23.00	less 10%
KTA-088 10W+10W Stereo Amplifier Module Assembled	\$39.00	less 10%

6-10W Stereo Amplifier Module

This hi-fi quality class AB audio amplifier is based on the TDA2005 IC with output current and thermal protection. 8-18 VDC Supply with 1-2 Amp capability required. THD <0.1%, S/N Ratio >80dBA, Gain <30dB

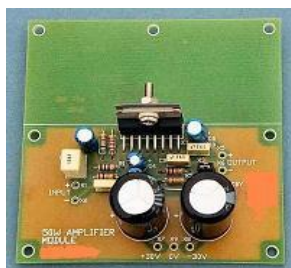


Price Each	1	5+
KIT-143 6-10W Stereo Amplifier Module as Kit	\$26.00	less 10%
KTA-143 6-10W Stereo Amplifier Module Assembled	\$42.00	less 10%

50W Mono Hi Fi Power Amplifier

High power, hi-fi quality class AB audio amplifier module using a TDA7294 IC. Provides an impressive 50W RMS into 8 Ohm or 82W RMS into 4 Ohm with only 0.1% THD. Mute and Standby are brought out to connection pads on PCB. IC has internal thermal protection.

Space is provided on the PCB for mounting a 1.4°C/W heatsink (not provided). All components including IC insulation bush, screws, nuts & washers and TO-3 silicon-impregnated insulating washer are provided. Heat sink, speaker, cables and +/-30V power supply not provided. Solder pad connections. PCB: 84x83mm (heatsink area of PCB is 37x83mm but can overhang if required).



Price Each	1	5+
KIT-106 50W Mono Hi Fi Power Amplifier as Kit	\$45.00	less 10%
KTA-106 50W Mono Hi Fi Power Amplifier Assembled	\$65.00	less 10%

50W RMS Amplifier Module Kit

Performance:

Output Power: 50W into 8Ohm; 70W into 4Ohm.

Music Power: 77W into 8Ohm; 105W into 4Ohm.

Frequency Response: -1dB at 14Hz and 70kHz (at 1W - see Fig.1).

Input Sensitivity: 0.875V for 50W into 8Ohm.

Harmonic Distortion: <0.05% from 20Hz to 20kHz; typically <0.003%.

Signal-to-Noise Ratio: -114dB unweighted (22Hz to 22kHz); -119dB A-weighted, both with respect to 50W into 8Ohm.

Damping Factor: >140dB at 100Hz & 1kHz, with respect to 8Ohm and without PTC thermistor.

Protection: Fuses plus "PTC Fuse" PTC thermistor.

Stability: Unconditional

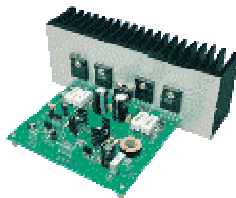


Price Each	1	5+
KIT-120 50W RMS Amplifier Module as Kit	\$52.24	less 10%
KTA-120 50W RMS Amplifier Module Assembled	\$77.50	less 10%

OCEAN CONTROLS - AUDIO

135W RMS Amplifier Module Kit

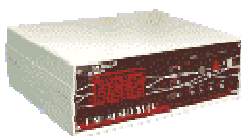
(SC August '08) This 135W amplifier module produces incredibly low levels of distortion even at high power outputs. The class AB design runs much cooler than genuine class A amplifiers, yet performance has not been sacrificed. It produces 135W into 8 Ohm or 200W into 4 Ohm with distortion levels around 0.008%. Heatsink is not supplied, we suggest the H 0545 diecast heatsink for a professional finish when mounted in a case.



Price Each	1	5+
KIT-151 135W RMS Amplifier Module Kit	\$83.59	less 10%
KTA-151 135W RMS Amplifier Module Assembled	\$108.50	less 10%

DSP Musicolour Musical Lights Kit

(SC June/July '08) Accepts audio input signals and drives coloured lights "in tune" with the music. Four output channels respond to different audio frequency bands and the light brightness is in proportion to the amplitude of the frequency components. A LED menu display is featured on the front panel and this also functions as a spectrum analyser or VU meter.



Price Each	1	5+
KIT-803 DSP Musicolour Musical Lights Kit	\$199.09	less 10%
KTA-803 DSP Musicolour Musical Lights Kit Assembled	\$229.00	less 10%

Guitar Jammer Headphone Amplifier Kit

Ever wanted to play your guitar through your headphones along with your favourite music at the same time? Well now you can with the guitar jammer. Just plug the CD and guitar into this kit and you can play along with the best of them.



Features:
 Low noise circuitry
 Separate CD & Guitar volume controls
 Frequency response: -3db @ 30Hz and 70Hz
 9V battery operated or 9VDC plugpack operated
 Supplied with professionally finished & screened case

Price Each	1
KIT-536 120 Guitar Jammer Headphone Amplifier Kit	\$36.55
KTA-536 120 Guitar Jammer Headphone Amplifier Assembled	\$52.50

Ocean Controls Manual Order Form

Ocean Controls P.O. Box 2191.... Seaford BC Factory 3, 24 Wise Ave Seaford, Vic, Australia 3198	occontrol@pac.com.au Voice: 61 3 9782 5882 Fax: 61 3 9782 5517
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Quantity:	Item:	Unit Price:	Total Price:
Total (Without Freight):			

Shipping Name & Address:	Billing Name & Address (if different):

Phone:		
Email:		
Credit Card # (Visa/MC/Bankcard):	Name On Card	Expiration:

Shipping Method:

OCEAN CONTROLS - THE FINE PRINT

Paying For Items

All our prices are in Australian Dollars. You can check the exchange rate by going to <http://www.x-rates.com> Prices on in our catalog do not include GST (Goods and Services Tax). 10% GST applies to goods delivered in Australia. Australian GST is not paid on shipments despatched to an international destination.

At this stage we accept Mastercard, Visa and American Express credit cards online. We only accept Visa and Mastercard for phone orders. We will accept payments by Western Union. We will also accept a cheque or money order from an Australian based individual or company. If you wish to make a purchase using a credit card but do not want to use our online ordering system then you can do a transaction over the phone or download our order form and fax or email it to us. Any international customer wishing to pay by bank transfer will be **required to pay all bank fees** including those of our bank (approximately AUD\$25).

Company Orders

If you are from an Australian Government Organisation we will accept an official order with a letterhead on it. If you are a company with an ABN number you can apply to set up an account with us.

Delivery to Australian Addresses and New Zealand

All deliveries in Australia are done by Express Post which means you will receive it usually the next day or the following day at the latest. We deliver by express post as it has a tracking number system.

If you want delivery by normal post you will have to ring us to determine cost of postage. For those who request normal postal service, we accept no responsibility for the length of delivery time or any loss of packages

Packages to New Zealand are delivered by air mail and take approximately 4-7 days

Delivery to International Addresses using Air Mail

We normally deliver goods by air mail. Typical delivery times are
UK and USA 6-10 days.
Canada and Europe 2 weeks
South Africa 2-3 weeks

We charge AUD\$22.50 which includes insurance. Because the item is insured you will be required to sign for it at your post office. If your country is not listed when you fill out the purchase form on our website then it means Australia Post does not insure goods to your country and you will be prevented from making an online purchase. There is no tracking number issued with Air Mail.

Please note import Custom Duty/Taxes if payable are your responsibility.

Delivery to International Addresses using EIC, DHL or Fedex

If you want faster delivery then we can deliver it by Australian Post Express International Courier or EIC. Normally it costs AUD\$45 for most small parcels and will take 3-4 days. You will be issued with a tracking number. Please contact us to arrange payment for the EIC option

If you want goods delivered by DHL or Fedex then you must have an account with them.

Please note import Custom Duty/Taxes if payable are your responsibility.

Faulty Goods and Warranty

Where such goods have been supplied we undertake to repair or replace them as quickly as possible. Contact us with a description of the fault and we will issue an authorisation to return the goods.

Our warranty period is 3 months from the date of purchase or longer as stated in our catalog or on our website.

Once a kit is under construction all warranty is void as we cannot guarantee the workmanship of the person assembling the unit. If a kit has been purchased assembled and tested from us then a 3 month warranty applies.

Warranty is subject to us being satisfied that a defect was caused by defective workmanship or materials and was not caused by or was not substantially contributed to by other factors beyond our control including incorrect installation, alterations or modifications of the product not recommended by the manufacturer.

Returns Policy

If you are dissatisfied with our goods you may return them within 7 days of the dispatch date. Contact us for an authorisation and we will refund your purchase. All returned goods must in "as sold" condition including all packaging, documentation, invoices etc. Please note

The product returned may attract a 15% restocking fee.

The customer must pay the delivery costs.

Non standard, custom made or a specially manufactured product or imported product is not returnable.

Semiconductors are not refundable.

Peter Simmonds
Managing Director