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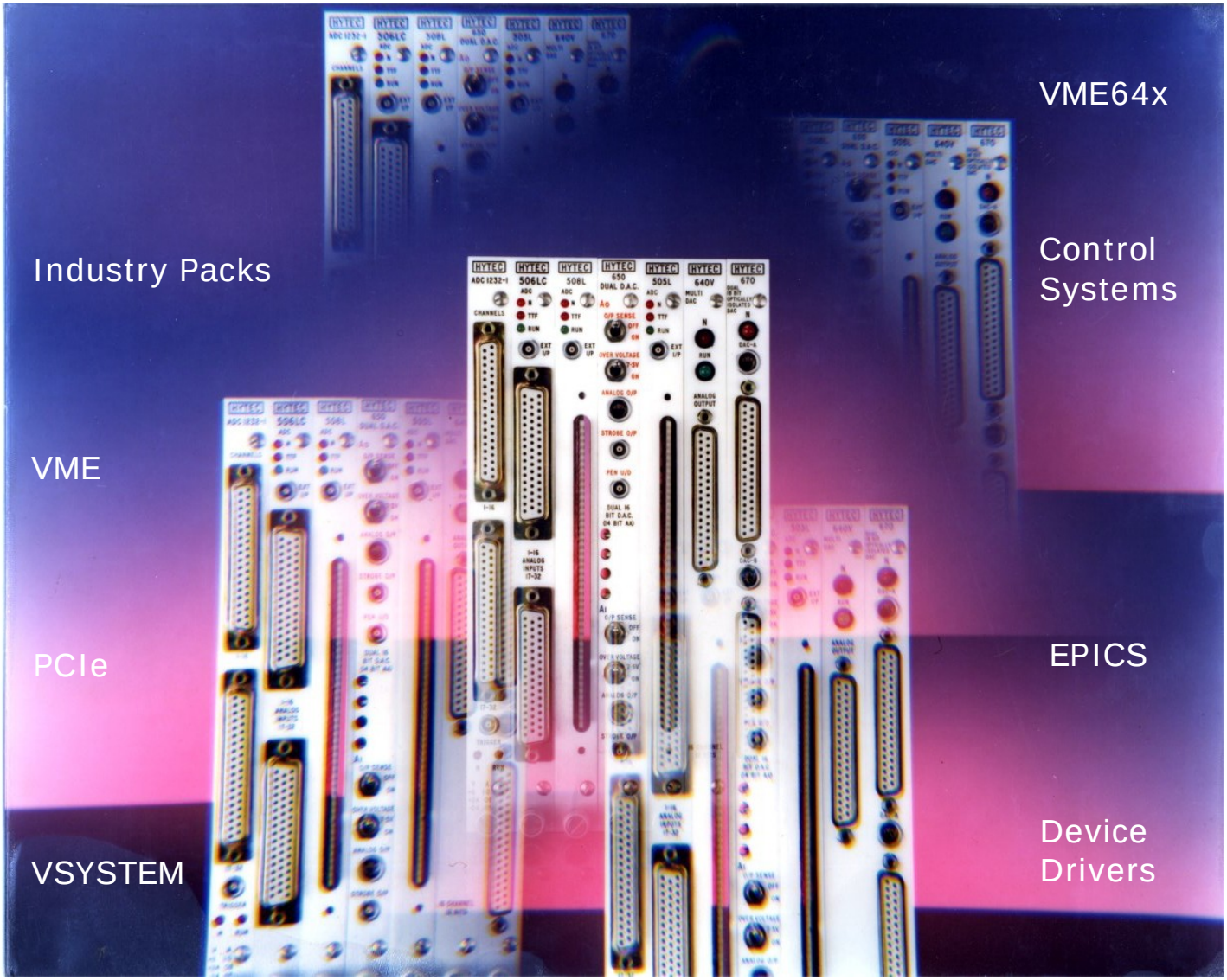
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NEWWOOD SOLUTIONS LIMITED

# PRODUCT SUMMARY




## INSTRUMENTATION, SOFTWARE AND SYSTEMS




# Introduction

Newwood Solutions Ltd formally Hytec Electronics has been providing control and data acquisition system solutions for over 30 years. We design and manufacture high specification instrumentation and systems for the most demanding of industrial research environments. Our customers extend across the world and include Diamond Light Source, Swiss Light Source, Rutherford Appleton Laboratory, Australian National University, Brookhaven National Laboratory, SLAC, Fermi Lab, ORNL, JET, Jefferson Laboratory, CERN, KEK and many industrial and power generation companies.

We pride ourselves on the level of hardware and software support provided to all our customers, both new and existing, ranging from detailed application consultancy based on the use of the very latest technology, through to maintaining products supplied over 25 years ago.

We design high specification analogue and digital modular instrumentation based on the stringent requirements of VME, VME64x, PCIe, Industry Packs and implement software solutions ranging from system device drivers in all the leading operating systems, to complete high-reliability turnkey system applications. This includes support for VxWorks, RTEMS, Windows, Linux, EPICS, TANGO, OPC UA etc.

Our expertise covers not only new technology systems, integrating process and management information, but also re- configuring and re-using existing plant, enabling legacy systems to live on with the latest generation hardware and software technology.

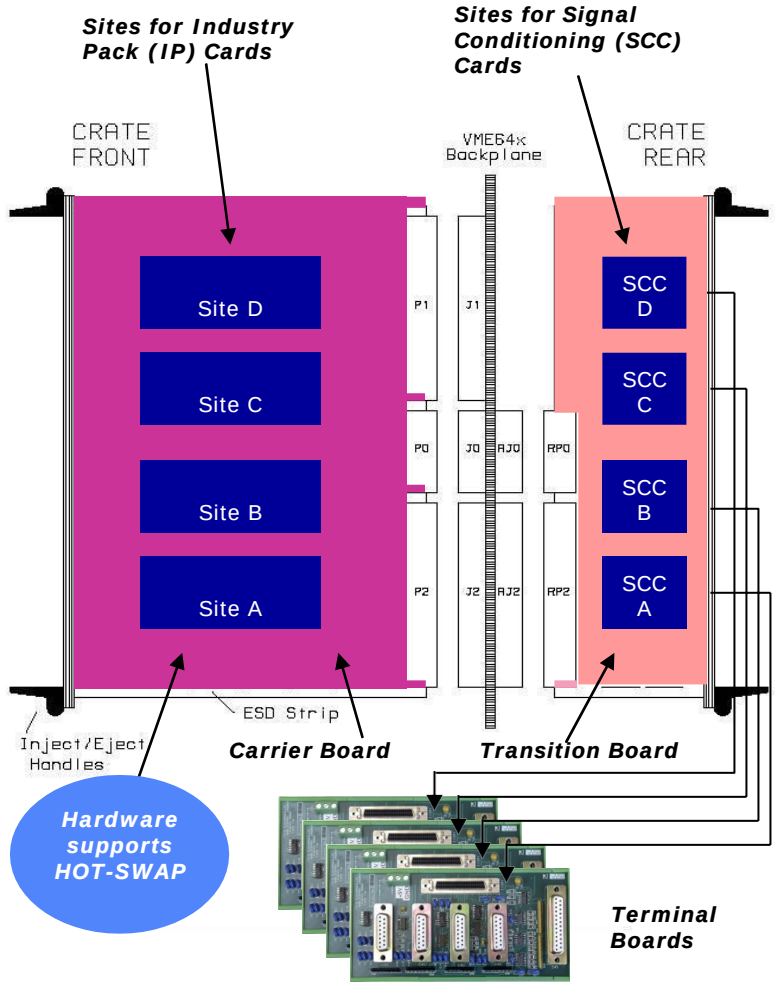
# VME64x

The introduction of VME64x (VME Extensions) resulted in significant enhancements to existing specifications, satisfying the demand for more flexible I/O capability, rugged mechanics with EMC/ESD protection and larger address capability, while at the same time making it easier to use with geographical addressing and Hot- Swap.

The arrangement of modules within a crate is represented below. The ***Carrier Board*** plugs in from the front of the crate in the normal way. As it is inserted, ESD protection contacts discharge any dangerous voltage safely to earth. The card begins to contact the P1 and P2 connectors and long pre-charge pins provide power to the back-end circuitry to prepare the Hot-swap logic. While the card is levered into position by the inject/eject handles, the ***Hot-Swap*** controller is powering on the card logic and checking the supply rails. Locking the handles into position completes the power-on sequence.

Newwood Solution's Hot-Swap support allows carrier card replacement without the need to power down. In VxWorks and EPICS systems, our software drivers will automatically re-instate the new hardware.

There are five hard-coded pins on the VME64x back-plane which provide ***Geographical Addressing*** information to the card. The card uses this information to set its default base address in A16 (short- addressing) space. These five data bits are used as the top five bits of the A16 address decode. The host processor operates a scan of unoccupied slots, using these default A16 geographical addresses, until it finds the newly inserted card. It then reads identifying data from the card, including manufacturer ID, card type, serial number, hardware revision.




**VME64x Module Assembly**

***Rear I/O.*** In earlier VME the I/O cables were front panel connected. With VME64x, all I/O is connected to the rear of the crate, via rear transition modules. This allows VME module exchange and hot swap without the need to disconnect plant cables.

To support this function we supply a range of rear ***Transition Boards.*** These boards provide the connection required for I/O functions and allow ***signal conditioning*** and ***plant isolation*** to be added. All the Newwood Solutions transition cards use the same I/O connector on the rear panel. We have chosen the 50-way SCSI II connector so that inexpensive, commercially available cables can be used to connect to terminal blocks, such as our 8901 DIN-rail mounted ***Terminal Board***.

To complement the flexibility of VME64x, Newwood Solutions have introduced a number of plug-in cards based on the Industry Pack format. ***Industry Packs (IP)*** are about the size of a credit card and provide a wide range of I/O functions. The IP cards are accommodated on carrier boards such as the 8802 and 8804 which provide sites for four industry packs. An open specification defines their key characteristics ensuring compatibility between suppliers. An ID PROM includes identification and in some cases calibration data, which makes auto-configuration with application software a possibility. They have connectors that are keyed for ease of installation. A wide range of software support is available from Newwood Solutions.


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# VME64x Compatibility Chart



IP Cards

Carrier Board
4 IP Sites

Transition
Boards

DIN Rail
Terminal Boards

| | 8802 8804 IP Sites | 8201 | 8202 | 8203 | 8204 | 8205 | 8207 | 8208 | 8211 | 8213 | 8301 | 8302 | 8303 | 8304 | 8307 SEE SEPARATE TABLE | 8308 SEE SEPARATE TABLE | 8901 | 8901TD | 8902 | 8904 | 8906 | 8906U | 8911 | 8912 | 8992 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8701 IN | A,B,C,D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ |
| 8702 OUT | A,B,C,D | | ✓ | | | ✓ | | ✓ | | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ |
| 8714 IN | A,B,C,D | | ✓ | | | | | | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ |
| 8715 OUT | A,B,C,D | | ✓ | | | | | | | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ |
| 8417 IN | A,B,C,D | | ✓ | | | | | | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ |
| 8424 IN | A.B C.D | | ✓ | | | | | | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8600 I/O | A,B,C,D | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8606 IN | A,B,C,D | | | | | | | | | | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8606 OUT | A,B,C,D | | | | | | | | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8606 I/O | A,B,C,D | | | | | | | | | | | | | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8522 IN | A,B, C,D | | | | ✓ | | | | | | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8512 IN | A,B,C,D | | | | ✓ | | | | | | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | | | | | | ✓ |
| 8513 IN | A,B,C,D | | | | | | | | | | | | | ✓ | | | | | | | ✓ | ✓ | | | |
| 8515 I/O | A,B,C,D | | | | | | | | | | | | | ✓ | | | | | | ✓ | | | | | |
| 8516 I/O | A,B,C,D | | | | | | | | | | | | | ✓ | | | | | | ✓ | | | | | |
| 8602 I/O | A,B,C,D | | | | | | | | | | | | | ✓ | | | | | | | ✓ | ✓ | | | |


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# IP Carrier Boards



The VCB8802 is a VMEbus module that can carrier up to 4 IndustryPack® (IP) cards and can be used to build modular, flexible and cost effective I/O solutions for industrial and research environments.
The VCB8802 is constructed to the VME64x standard, with EMC front panel, injector/ejector handles, guide pin and slot keying, Hot-Swap ability, static discharge protection, blue power up LED, geographical or jumper selected addressing, 5-row P1 and P2 connectors and 5-row P0 connector.
The VME64x-compliant connectors allowing all of the 200 I/O lines from the 4 IP slots to be available at the VME64x connectors P0 and P2. The I/O mapping is compliant to the ANSI/VITA 4.1-1996 standard.

All power lines are fuse protected with the IP power lines being protected by self-healing fuses.
The carrier board supports 8MHz and 32MHz IP interfaces clock rates which can be software selectable for each IP slot.
Four front panel mounted LED's flash to visually confirm completed IP access cycles to individual slots.

One of VMEbus interrupt lines IRQ1 to IRQ7 can be selected and enabled by writing to an on-board register. The Industry Pack interrupt lines IntReq0* and IntReq1* from each of the four sites can be enabled on an individual basis and mapped to the selected VME IRQ line.

The VCB8802 has a Lemo TTL input on the front panel that allows connection to any or all of the IP card Strobe* lines via a jumpers for each IP slot. This allows allow overall control to be applied to IP boards in data acquisition systems.

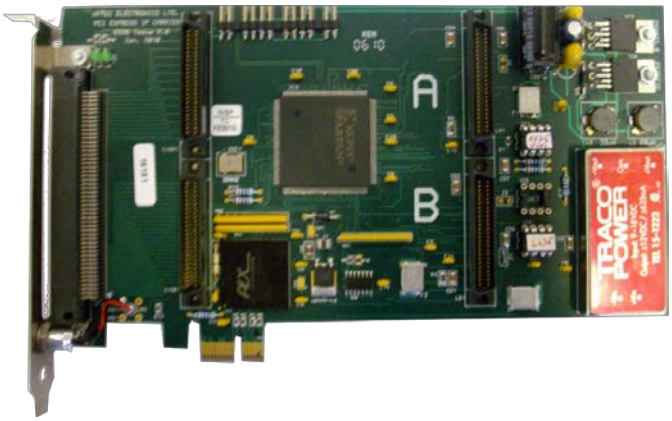
The VCB8802 also has a Lemo TTL output can be connected to the TTL input of another unit through a jumper to synchronise timing between carrier boards.

The carrier board has some thickened I/O tracks to allow the IP boards to be powered externally to give full isolation.

The VCB8802 has the capability to multiple-address the memory of IP sites and read/write data to them simultaneously using a data width of 32 BLT A32:D32 data transfers cycles.

The VCB8804 has the added capability to multiple-address the memory of IP sites and read/write data to them simultaneously using a data width of 32 or 64 bits using MBLT A32 D64 data transfers cycles.

## PCIe IP Carrier




6335 - 2 IP site PCIe Industry Pack® carrier card.
This card is used in a 'X1' (single lane) PCI Express slot and can accommodate two Industry Packs, which can be clocked at either 8MHz or 32MHz (individually selected).
The IP interface supports Memory, I/O, ID and Interrupt access to the Industry Packs. IP interrupts are mapped to the PCI Express bus. Driver support is available for LINUX, RTEMS, Windows and EPICS.
I/O connections are through a 100-way PCB connector and an external adaptor cable, dividing this into two 50-way SCSI-2 plugs. These I/O connections are compatible with Newwood Solutions range of DIN-rail mounted I/O termination and breakout assemblies.



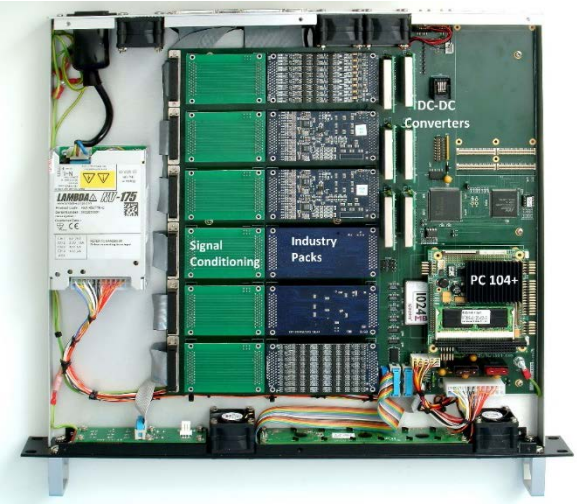
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# Standalone IOCs

## IOC9010 Rack Mounted IOC 6-Site Industry Pack® Carrier




The IOC 9010 is a 1U high rack mounting Input Output Controller. The IOC has 6 IndustryPack® slots each with a mini signal conditioning card and an Intel® Atom™ 1.33Ghz PC104+ processor, with network (10/100/1000 Mbps), USB 2.0, 320GB hard disc and 2GB RAM (other options possible). As a system component it is available as an EPICS IOC running either RTEMS or LINUX or Windows, as a VSYSTEM Controls computer running Linux or Microsoft Windows or as an OPC server.
The functionality of the IOC is determined by industry packs fitted, these include ADC, DAC, Digital I/O, Isolated I/O, RS232, RS485, Stepper Motor Controller and Scaler.

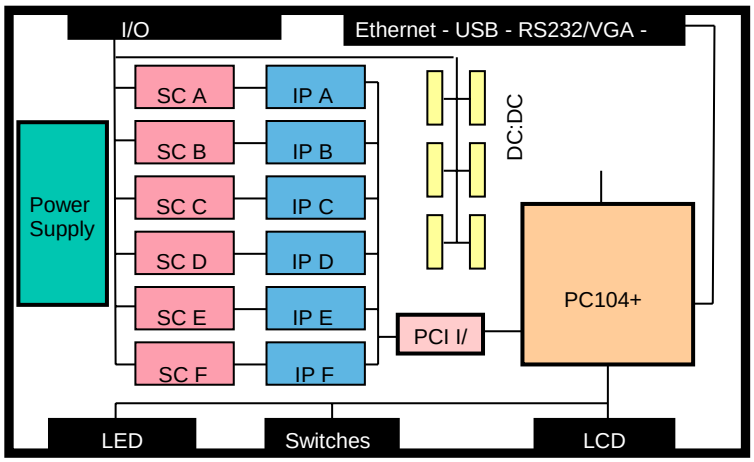



Six sites are provided for ***Industry Packs (IP)*** providing a wide range of I/O functions. An open specification defines the key characteristics ensuring compatibility between suppliers.

Auto configuration scans the IP slots to determine the current I/O for rapid configuration. Drivers for Newwood's IP cards will allow systems to be operational quickly.

Each industry pack has a ***Signal Conditioning Board*** which allows signal conditioning and plant isolation to be added. We have chosen the 50-way SCSI II connector so that inexpensive, commercially available cables can be used with Newwood's range of DIN Rail ***Terminal Boards*** for connection to plant wiring.

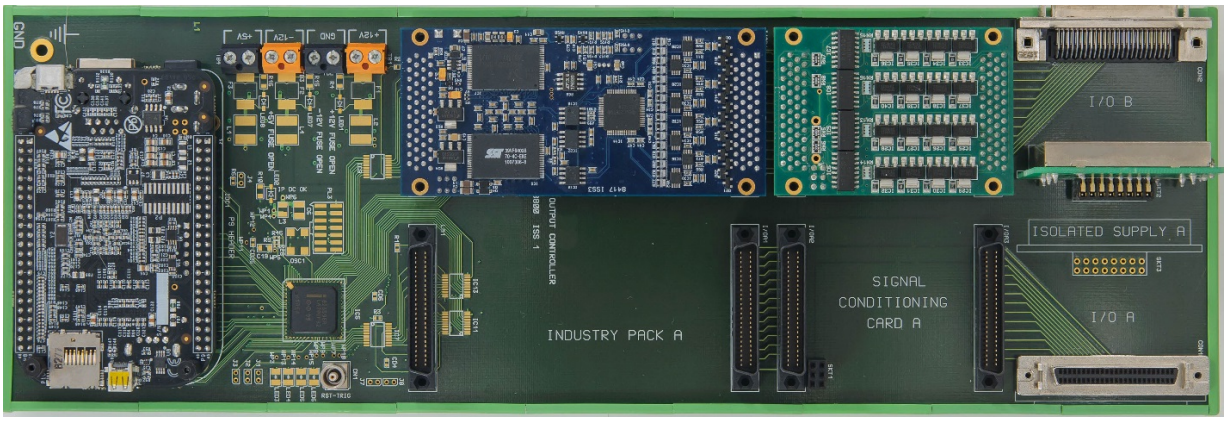
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Auto configuration scans the IP to determine the current I/O for rapid configuration. Drivers for Newwood Solutions IP cards will allow systems to be operational quickly.



# Standalone IOCs

## IOC8800 LOW COST DIN-RAIL MOUNTED IOC 2 SITE Industry Pack® CARRIER

The Newwood Solutions Ltd IOC8800 uses the wide range of Industry Packs® available and the power of a small single board processor running Linux (or other operating system) which delivers a compact DIN rail mounting IOC solution.
The IOC8800 also comes complete with space for our 9000 series range of plug in signal conditioning cards (Optical isolation, analogue filtering etc.) and our plug-in DC/DC converter cards for plant isolation.
The IOC8800 connects to plant wiring through 50-way SCSI II connector so that inexpensive, commercially available cables can be used with Newwood's range of DIN Rail Terminal Boards.




**Main Features:**

- Cost Effective All-in-One IOC solution with flexible I/O options via IP cards
- Compact Alternative to VME, cPCI, PXIe
- Large range of ADC, DAC, DIO, RS232, Scaler Industry Pack cards available
- Low cost 'BeagleBone Black' Single-Board Computer
- DC/DC converter slots to power optical isolation
- Signal Conditioning Boards for digital isolation and analogue filtering
- Mix and Match I/O types
- External triggers for synchronisation and control of modules
- Status Leds for DC power and thermal fuses status
- Ethernet 10/100 Mbps
- Free Software downloads and support for Linux, EPICS, Windows.

**Processor**

The IOC8800 uses the 'BeagleBone Black' Single Board Computer (SBC) this has 1Ghz ARM A8 processor with 512MB DDR3 800MHz ram, 4GB eMMC flash, micro SD card slot, 10/100 Ethernet, 2xUSB and 2x 200MHz PRU 32-bit microcontrollers.

**FPGA Interface**

The logic on the IOC8800 consists of an FPGA which interfaces the Single Board Computer such as the Beaglebone Black (BBB) to the Industry Packs.
The IP clocks can run at 8MHz or 32MHz and can be individually set per IP card in the main FPGA using registers.
Led indicators on the board show when the IP cards are addressed by the Single Board Computer.
There are 3 buffered digital inputs (TTL, LTTL compatible) to the IOC8800 which can be used for synchronisation and control of the IP modules.

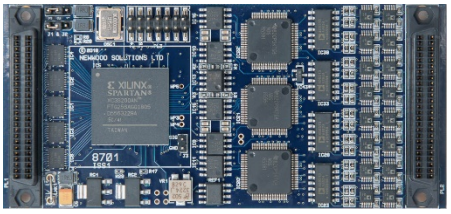


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# Industry Packs®

Industry Packs® are small plug-in cards based on an industry standard format and are designed to have wide application. They are very compact, 1.8 inches by 3.9 inches in size and they include an ID PROM which aids auto-configuration. They have connectors that are keyed for ease of installation. There is a broad range of products available from Newwood Solutions and from a wide selection of suppliers all over the world. Software support is available for Newwood Solutions cards for Linux, Windows, Rtems, VxWorks, Vsystem and EPICS.

## Analogue to Digital Converter (ADC)

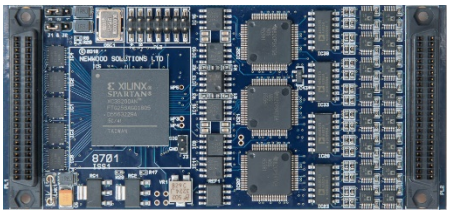


### 16bit 8 channel — IP-ADC-8701/8401

ADC 8 channel 16 bit resolution 14 bit accuracy. Programmable Voltage range +/-10V or +/-5V plus programmable gain ranges 1, 2, 4 and 8. Up to 200KHz simultaneous sampling rate, true differential inputs. 1Mx16 bit RAM giving 128K conversions per channel. Active low pass filter and c The whole ADC may be isolated via a transition board and a single DC/DC converter. Inputs withstand +/-30 V. Hytec 8401 ADC register superset.

### 16bit 16 channel — IP-ADC-8714/8414

ADC 16 channel 16 bit resolution 14 bit accuracy. Programmable Voltage ranges +/-10V or +/-5V plus programmable gain ranges 1, 2, 4 and 8. Up to 200KHz simultaneous sampling rate, true differential inputs. 1Mx16 bit RAM giving 64K conversions per channel. Active low pass filter and on-board calibration by FPGA firmware using stored offset and gain data. The whole ADC may be isolated via a transition board and a single DC/DC converter. Inputs withstand +/-30 V. Hytec 8401 ADC register superset.



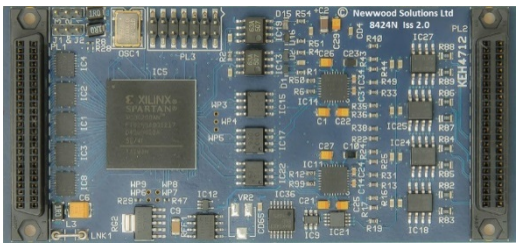


### 24bit 8 channel — IP-ADC-8417

8 channel 24 bit simultaneously sampled delta-sigma ADC with 1Mx16bit on board RAM (64K samples per channel in 24bit mode). Up to 100K samples per second. On-board calibration by FPGA firmware using stored offset and gain data. Programmable voltage ranges +/-5V or +/-10V with 16bits accuracy. True differential inputs. Programmable 16 or 24 bit resolution.
The whole ADC may be isolated via a transition board and a single DC/DC converter. Inputs withstand +/-30 V. Hytec 8401 ADC register superset.

### 16bit 4 channel 1MHz — IP-ADC-8424

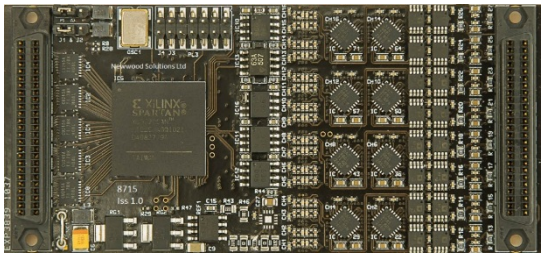
16 channel 24 bit simultaneously sampled delta-sigma ADC with RAM. Up to 100K samples per second. Programmable bi-polar/uni-polar and 5 or 10V scale. True differential inputs. 512K 24bit RAM (32Ksamples per channel in 16 channel 24bit mode). Programmable number of channels and 16 or 24 bit



# Industry Packs®

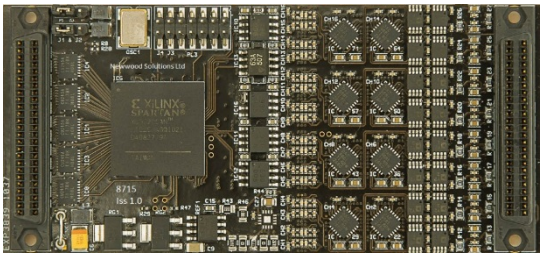
## Digital to Analogue Converter (DAC)

**18bit 16 channel — IP-DAC-8715**



16 channel 18 bit DAC with programmable gain ranges and function generator RAM. Programmable output ranges +/-10V,+/-5V, 0-10V, 0-5V. Up to 50KHz output update rate. Output drive current +/-10mA per output in to capacitive load to 10000pF.
On-board calibration by FPGA firmware using stored offset and gain data. The whole ADC may be isolated via a transition board and a single DC/DC converter.
The 1Mx16bit memory may be loaded and the DAC outputs triggered, by the internal program timer or by the external trigger input. This forms a simple arbitrary waveform generator.

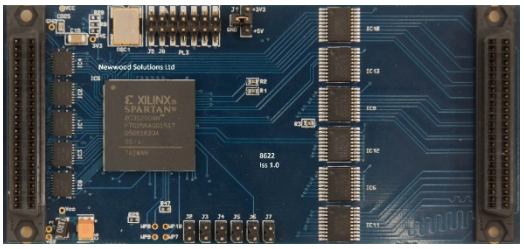
**16bit 16 channel IP-DAC-8702**



16 channel 16 bit DAC with programmable gain ranges and function generator RAM. Programmable output ranges +/-10V, +/-5V, 0-10V, 0-5V. Up to 50KHz output update rate. Output drive current +/-10mA per output in to capacitive load to 10000pF.
On-board calibration by FPGA firmware using stored offset and gain data. The whole ADC may be isolated via a transition board and a single DC/DC converter.
The 1Mx16bit memory may be loaded and the DAC outputs triggered, by the internal program timer or by the external trigger input. This forms a simple arbitrary waveform generator.

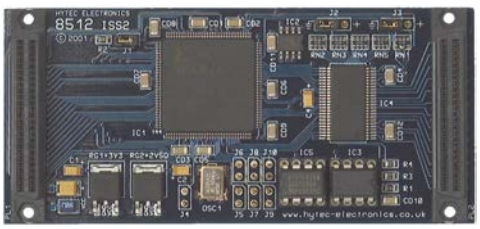
## Scalar / Counter

**MULTI CHANNEL SCALER 8522—200MHz 16 channel 32bit**



32-bit counter depth and 64 bit histogram capability, 2MB on board RAM. Histogram, coincidence pattern matching histogram mode with gate/Bin advance by internal timer or programmable number of external pulses. Straight counter and pre-set scalar mode. TTL, LVDS and LVPECL inputs, External hardware trigger or software trigger, Trigger output to allow Trigger In / Out daisy-chain connection for synchronisation.

**IP-SCALER & TIMER-8512**



16-channel 32 bit 20MHz Scalar. This gives 16 separate 32 bit counters with a common count enable line, controlled by an external input, or software controlled. One channel may be programmed as a timer, and used to control the others. The DC to 20MHz scalars may be read on the fly while they are counting.

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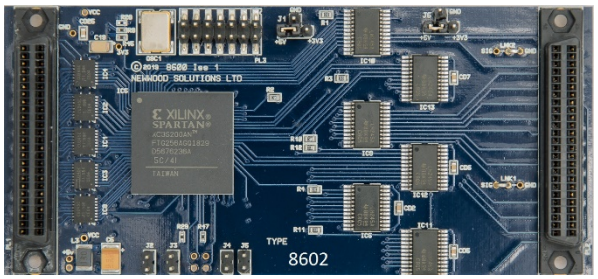
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# Industry Packs®

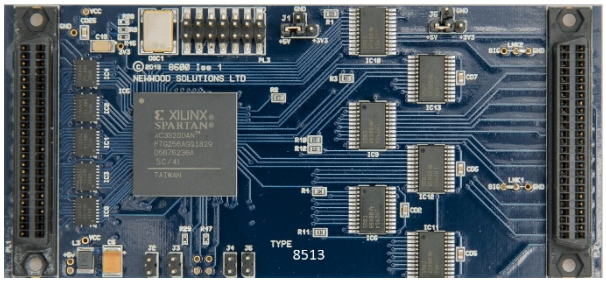
## Step motor controller

**IP-STEPPER-SM8602/1— 4 Axis Stepper Motor controller**

Provides 4 channels of stepper motor control. Each channel has: 32-bit step register, 32-bit absolute position up/down counter, which records movements, profile register with bits to select speed, ramp rate, direction and other motion control functions, all writeable and readable. Start/stop speed and high speed are programmable in the range 1-65000 steps per second. The ramp rate is programmable in the range 64- 65000 steps per second. Control and status register shows status of the drive, the controller and the limit switches can be observed (run/stop, hit limit, driver dead etc.).




**IP-ENCODER-EC8513—Quadrature Encoder Reader**




4-channel Quadrature Encoder Industry Pack. The signals Phase A, Phase B and index are connected as inputs and operate on four 32-bit up/down counters, which can be read at any time (and written too). Index pulses can be observed and may also generate interrupts. Maximum counting rate is 10MHz. EPICS driver available.

## Serial Communication

**IP-SI8515 and IP-SI8516 — 8 channel RS232/RS485**

These 8-channel UART Industry Pack have 64 byte Tx and Rx buffers and RTS/CTS or Xon / Xoff flow control. Programmable data rates (100bps-921.6Kbps), number of bits, parity etc.
8515 is Octal RS232.
8516 is Octal RS485. Programmable full-duplex/half-duplex mode. Auto RS-485 half-duplex control with programmable turn-around delay.




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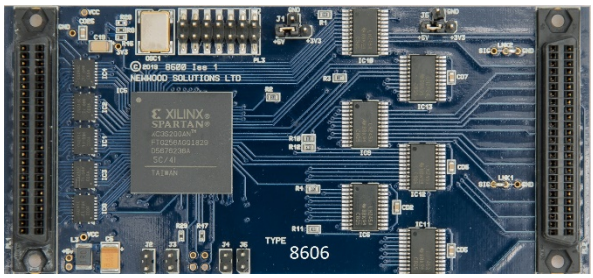


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# Industry Packs®

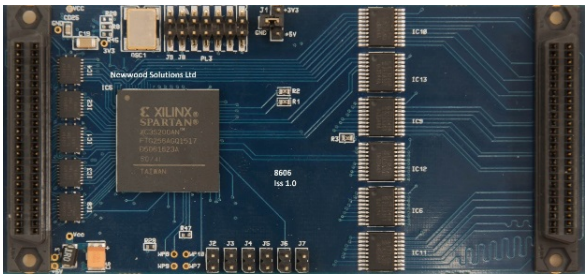
## Digital Input/Output

### IP-DIO8606—48 bit Digital I/O



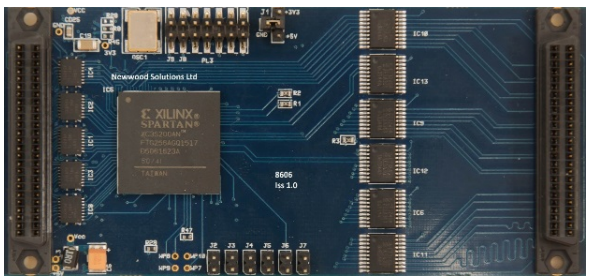

Forty-eight channels of buffered digital input/output. Can be configured in banks of 16 bits as inputs or outputs. Reading the port when in output mode will read back the last data written. Further registers allows selecting individual bits as interrupt sources when in input mode. All the above registers occupy I/O space on the IP card. Inputs or outputs can be optically isolated via external signal conditioning. One ground signal for each bank of 16 bits. Outputs can set to be levels or pulses with programmable pulse duration. Input bit de-bounce can be configured.

### IP-DIO-8600 User configurable FPGA with 48-bit high-speed TTL-compatible bus switches for Digital I/O with Optional 16Mb on board RAM




This is a single-width IP module with user configurable FPGA in the form of a Xilinx Spartan 3 FPGA XC3S200AN-5 with 200,000 system gates, and forty eight channels of digital input/output.
The I/O comprises of 48 high-speed TTL-compatible bus switches. This allows the user to set the I/O operation as input or output in the FPGA on a bit by bit bases and also gives the user the option to use TTL, LVDS and LVPECL.
The 48 digital I/O lines have a resistor network which allows a selectable pull up/down voltage of GND, +3.3V or 5V. The unit also has an onboard 50MHz clock oscillator. The FPGA logic is configurable via JTAG plug on the IP card.
The optional memory is 16M-bit static RAM organized as 1024K words by 16 bits with a 10ns High-speed access time.
There are also three user selectable jumpers which gives the user the ability for further control of the FPGA firmware by allowing input lines to the FPGA to be pulled low.

### IP-DIO-8620 User configurable FPGA with 44-bit Digital I/O with Optional 16Mb on board RAM

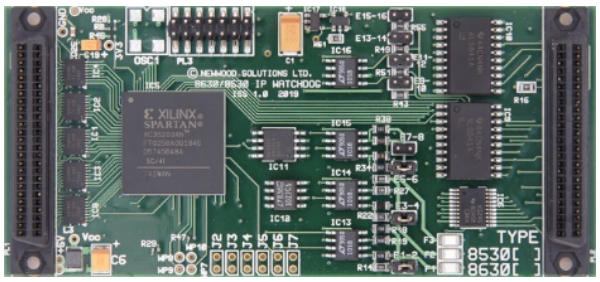



This is a single-width IP module with user configurable FPGA in the form of a Xilinx Spartan 3 FPGA XC3S200AN-5 with 200,000 system gates, and forty four channels of buffered digital input/output
The TI SN74CBT3245C FET bus switch is used to buffer the I/O lines allowing Bidirectional Data Flow, With Near-Zero Propagation Delay and Low ON-State Resistance (ron = 3ohms Typical)
The 44 digital I/O lines can be individually programmed as inputs or outputs within the FPGA Each I/O line has a resistor network which allows a selectable pull up/down voltage of GND, +3 3V or 5V).
There are also three user selectable jumpers which gives the user the ability for further control of the FPGA firmware by allowing input lines to the FPGA to be pulled low.

# Industry Packs®

## Other Industry Pack Cards

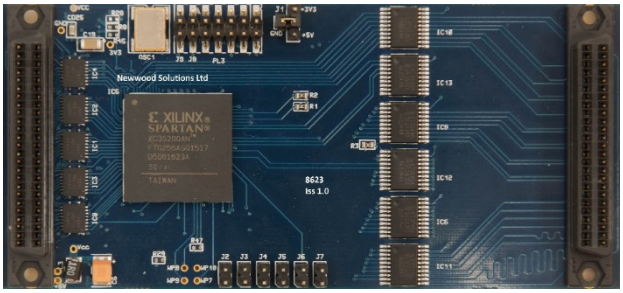
**IP-WD-8530\8630 Watchdog Timer with power Supply and Temperature Monitoring**



This a single-width Industry Pack that provides a programmable periodic or watchdog timer. Timer programmable from 1 millisecond to 65.536 seconds. Auxiliary power supply monitoring of +24V or -24V, +48V or -48V plus internal or external supplies +5V, +12V and -12V. Programmable Temperature Monitor/Thermostat. Open collector TTL outputs from Timer and Monitors with programmable polarity plus eight general purpose TTL I/O.
Interrupts available from all I/O, Timer and Monitor Functions.

**8630 Added Functionality**
The 8630 includes the power up system reset functionality of the Hytec VDS2081-R VME module.
This function ensures that a crate reset is generated for a fixed duration (160ms +/-20%) whenever the crate is powered up. The unit archives this by generating a reset on the SYSRESET* line of the P1 connector when the power is asserted.
The circuitry also ensures that intermittent power-down and power-up will generate reset for at least 80ms.

**MCS8623 Programmable Clock Generator**




The PCG8623 is a single-width Industry Pack with the following characteristics:-
This clock generator allows the user to select the frequency of a clock signal which is connected to one of the I/O lines of the IP card.

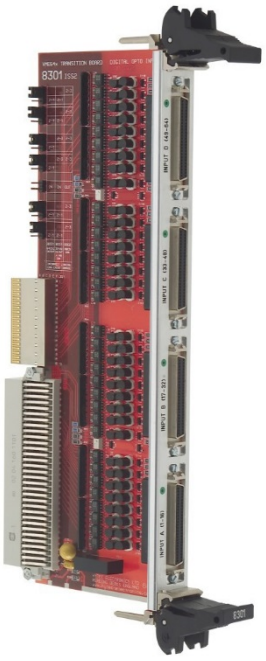
The first five bits in the clock frequency select register are used to select the clock frequencies of 1 Hz to 1MHz in multiples of 1, 2, 5 or 10. (E.g. 0=1Hz, 1=2Hz, 2=5Hz, 3=10Hz and so on to 15=100KHz, 16=200KHz, 17=500KHz, 18=1MHz).

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# Transition Boards



Newwood Solution's range of VME64x rear-mounted I/O Transition Boards provide the plant connection to IP Carrier Boards. They also optionally provide signal conditioning such as analogue filtering and analogue / digital optical isolation. They are 6U (double height) units constructed to the VME64x standard, with an EMC rear panel, injector/ejector handles, guide pin and slot keying, static discharge protection and hot swap capability. They route all I/O signals via panel mounted high density 50-way SCSI-2 or Lemo sockets depending on the module, to the Carrier Board via the J0 and J2 connectors of the VME backplane.

Some boards include sites with the option of fitting R-C low-pass filters which can be selected by jumpers to be in or out of circuit. Additionally, optional plug- in 5V to +/-12V DC-DC converters (8912) can also be fitted to some boards to facilitate powering the plant side of isolated analogue circuits on IP boards which are mounted on the carrier board. The signals connect to the Carrier Board according to the VME64x pin-out for IP module carriers.

The 8307 and 8308 mixed signal transition boards have plug in sites for our 9000 series plug in signal conditioning and digital isolation cards. This allows greater flexibility to mix and match IP functions on a 4 site carrier saving VME slots and VME crate real estate.

## Analogue I/O Transition Boards (80mm depth)

| Module | SCSI-2 Sockets | Description | Filtering option | Isolation option |
|---|---|---|---|---|
| 8201 | 2 | 32 channel I/O. Typically 4 x 8701 IP ADC cards | ✓ | ✓ |
| 8202 | 4 | 64 channel I/O. 8701,8702,8714,8715,8417 | ✓ | ✓ |
| 8203 | 2 | 32 channel 0-20mA inputs. Typically 4 x 8701 IP ADC cards | ✓ | ✓ |
| 8204 | Lemo | 32 channel Lemo inputs with triggers. Typically 4 x 8701 IP ADC cards | ✓ | ✓ |
| 8205 | 3 | 48 channel I/O. Typically 2 x 8702 output + 1 x 8701 input | ✓ | ✓ |
| 8207 | 2 | 16 0-20mA inputs to 16 0-10V inputs. Typically 4 x 8701 IP ADC cards | ✓ | ✓ |
| 8209 | 4 | 16 summing amplifiers give 16 high resolution outputs (2 adjacent 8702 channels summed with 50:1 ratio). Outputs sensed by two 8701 ADCs | | ✓ |
| 8211 | 4 | 64 channel differential inputs with filtering plugs for 8912 | ✓ | ✓ |
| 8213 | 4 | 2 x 16 digital output change over relays plus 2 x 16 straight through | | |
| 8255 | 3 | **160mm depth** 2 x 16 channel I/O and 1 x 8 channel. For mix of 8701 ADC and other IP cards | ✓ | ✓ |

## Digital Transition Boards (80mm depth)

| Module | SCSI-2 Sockets | Description | Isolated |
|---|---|---|---|
| 8301 | 4 | 64 digital inputs, 4 input strobes, 4 output strobes. For use with 8606 | ✓ |
| 8302 | 4 | 64 digital TTL I/O can be configured as inputs or outputs by pcb link | |
| 8303 | 4 | 64 isolated digital outputs, 4 input strobes, 4 output strobes. For use with 8606 | ✓ |
| 8304 | 4 | Straight through connection transition board. 4 x 50 way connectors | |
| 8353 | 4 | **160mm depth** version of 8303 64 isolated outputs | ✓ |
| 8354 | 4 | **160mm depth** version of 8304 straight through | |

## Mixed Signal Transition Boards (80mm depth)

| Module | SCSI-2 Sockets | Description |
|---|---|---|
| 8307 | 4 | 2 x 50 way straight through plus 2 x plug in sites for 9000 series SC cards |
| 8308 | 4 | 4 plug in sites for 9000 series SC cards |

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# 9000 Series Plug In Boards

Newwood Solution's 9000 series are a range of small plug in boards that provide analogue filtering, digital optical isolation, signal multiplexing and power switch outputs that allow combination of functions on our mixed signal transition boards our 9010 IOC and 8800 IOC

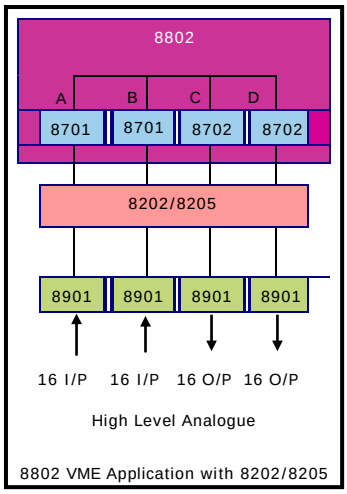


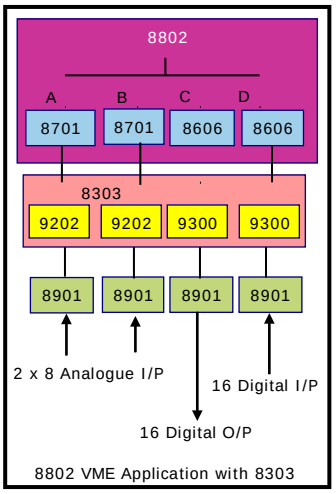


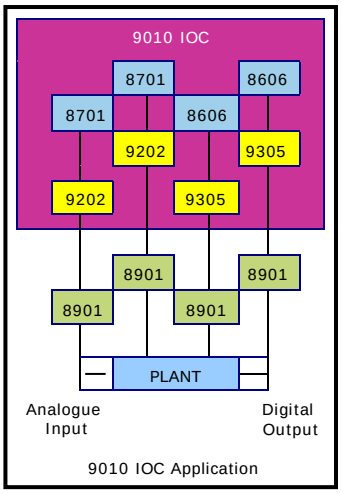



| SCB Module | Description |
|---|---|
| 9202 | 16 pairs of jumper selectable analogue cut off filter |
| 9301 | 16 optically isolated digital inputs and strobes. Use with 8606 |
| 9303 | 16 optically isolated digital outputs and strobes. Use with 8606 |
| 9304 | Straight through card. No conditioning |
| 9305 | 8 optically isolated inputs and 8 optically isolated outputs. Use with 8606 |
| 9307 | 32 optically isolated inputs for use with 8005 VME64x I/O card |
| 9308 | 32 optically isolated outputs for use with 8005 VME64x I/O card |
| | |
| **Plug In Card** | **Description** |
| 9912 | DC-DC converter for use with 9010 and 8800 IOC +/-12V 125mA |

## Application Examples



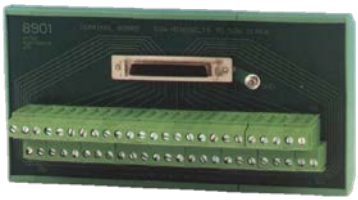






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# Terminal Boards

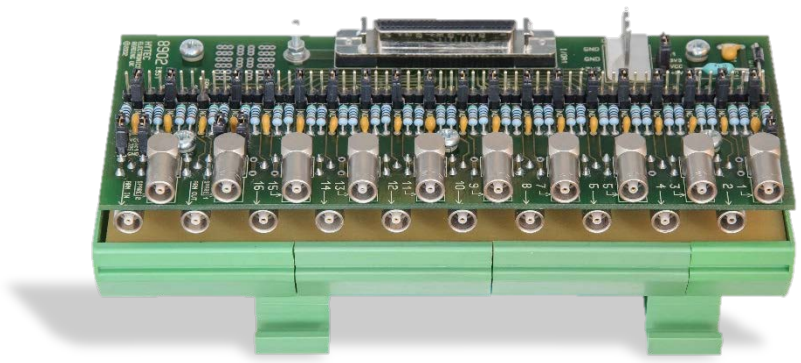


Terminal Boards offer a simple solution to the problem of connecting plant wiring to Newwood Solutions VME64x Transition Boards the 9010 IOC and 8800 IOC.

The Terminal Boards are designed to mount on standard DIN EN 50035 or OMEGA-DIN 50022-50045 DIN rail at the rear of rack. Plant wiring is terminated neatly at the Terminal Boards and low cost, high density SCSI-2 twisted pair cables connect to the Transition Boards or IOC9010 or IOC8800.



| Module | Terminations | Application |
|---|---|---|
| 8901 | Klippon 50way screw terminals | This allows for plant wiring to be terminated neatly in rack with simple 50 way low cost, high density SCSI-2 twisted pair cables going to the transition boards mounted at the back of the VME64x crates. |
| 8901T | Klippon 50way screw terminals | As above but with Varistors clamping each line to 30V to provide transient voltage protection. |
| 8901TD | Klippon 50way screw terminals | As above but for digital signals, incorporates bidirectional LEDs on all active lines normally off, indicating green (ON), red (ERROR) reversed. |
| 8901CC | Klippon 50way screw terminals | As above but with constant current diode connected to an external voltage source for each active line. Used in conjunction with transition board to provide protection against cable shorts and minimise risk of damage. |
| 8902 | 20 x single pole Lemo (00250) sockets | For use with analogue I/O or digital I/O IP cards<br>The I/O lines can be terminated at 50 or 100 ohms to Ground, +3.3Volts or +5 Volts. |
| 8904 | 8 x 9way Cannon D-type with female screw posts | Connection to the IP 8515 and 8516 serial I/O cards via a straight-through transition board type 8304. Supports one serial IP card. (Four units can be used for four serial IP cards mounted on one 8002 Carrier Board.) Each 9-way socket carries TX/Rx/ RTS/CTS/GND connections. Common mode bias resistors for differential inputs CTS lines brought to circuit pads. +12V brought to 8 off circuit pads via optional pull-up resistor. Transient voltage protection. |
| 8906 | 4 x 15way and 1 x 25way Cannon D-type | Connecting an 8602 Stepper Motor Controller Industry Pack or an 8613 Quadrature Encoder input Industry Pack to an external system. |
| 8909U | Screw Terminals | Klippon based 4 axis stepper motor drive module used with 8602/1 IP module. For use with 5, 6 or 8-lead hybrid stepper motors. On board logic is used to control the phase excitation of each motor under the control of STEP and DIRECTION signals from the 8602/1. Additionally, the AUX1 output of the 8602 on each channel can be used to control the power ON/OFF function of each drive channel. A green status indicator LED shows the active status of the card. |
| 8911 | Screw Terminals | Connect a number of 4-20mA input instruments to a DAC 8702 via a transition board. A circuit using an operational amplifier, an output transistor and a precision resistor is used to convert the voltage output from the DAC to a current. |
| 8912 | Plug-in card for Transition bards | DC:DC Converter 5V to +/-12V 125mA Adaptor for use with Carrier Boards |
| 8992 | 18 x BNC sockets | For use with analogue I/O or digital I/O IP cards. Transient voltage suppressor and terminating resistor can be fitted across each channel. |



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## VME64x 8005—128 bit 1Mhz Digital Input Scanner and/or Output board



The 8005 is a 6U VME64x digital I/O board provides 128 TTL digital I/O bits organised in four groups of 32 bits. Each group of 32 bits may be programmed as inputs or outputs.

When a group is in 'input mode', the module features change-of-state detection and contact de-bounce. A small FIFO memory, one for each input group, allows a historical record of the change-of-state input data to be stored; up to 64 samples. A further register associated with each input group controls which bits may generate an interrupt. This function has no effect when in output mode.

When a group is in 'output mode', outputs may be programmed as levels or pulses of programmed duration.

An 8303 transition board allows use of the 9307 32 opto-coupled inputs signal conditioning (SC) card and/or the 9308 32 opto-coupled high current output short circuit protected MOSFET drivers.

## VME64X Crates and Power Supplies



**Newwood Solutions are UK agents for Wiener Plein and Baus Crates and Power Supplies.**

**The full range of Wiener crates are available. See: www.wiener-d.com**

**Newwood Solutions are also agents for Hartmann crates. Typical crates are:**

VME64x Crate 4U high **7-slot** 440W 5V 40A, 3.3V 35A, 12V 10A, -12V 6A PSU Rack Mtg.

VME64x Crate 8U high **10-slot** 600W 5V 60A, 3.3V 35A, 12V 10A, -12V 4A PSU Rack
Mtg

VME64x Crate 11U high **21-slot** 1200W 5V 100A, 3.3V 120A, 12V 20A, -12V 6A PSU Rack Mtg

## Bus Extenders / Risers and Connectors

**Newwood Solutions are European agents for Adex Electronics, Inc.**

Adex Electronics, Inc. is considered by most, the leading manufacturer of high quality bus extenders and risers. We have a variety of straight extenders, bus isolation extenders, and many right angle risers for the 1U/2U chassis. Our extenders and risers are mostly used in the popular personal computer buses such as **ISA, EISA, PCI, PCI EXPRESS, AGP, DIMM, DDR, RIMM and etc**.

Adex also offers a complete line of connectors used in the popular personal computer buses. We have the straight through hole connectors and the hard to find **straddle mount connectors**. Our straddle mount connectors feature heavy duty, long insertion life cycles.

# Software

Our software engineers implement system drivers in all the leading operating systems to support our hardware. Software application engineers consult, design and implement complex control and data acquisition solutions. Design, development, testing and installation of solutions are to ISO9001 quality standards.

## Vsystem

Vsystem is a complete control system toolbox solution from Vista Control Systems Inc in the USA. Newwood Solutions provide software drivers, data scanners and complete data acquisition and control system solutions based on the tried and tested “Vsystem graphical control system toolbox”



**OPC client and server software**

Newwood Solutions have supplied and installed systems based on OPC server technology. Newwood Solutions developers have the tools to build and configure complete OPC server solutions.

Newwood Solutions have developed OPC DA and OPC UA servers to customer specifications.

**EPICS**

Newwood Solutions provide EPICS driver, device and record support for all our VME64x and IOC products for use in distributed real-time control systems such as particle accelerators, telescopes and other large scientific experiments. These drivers are free to download

Newwood Solutions can provide complete EPICS applications solutions and training in EPICS

**Control Systems & Data Loggers**

Our expertise covers not only new technology systems integrating with process and management information systems, but also re-configuring and re-using existing plant interface hardware enabling legacy systems to live on with the latest generation computer

**Power Station Data Loggers**

Newwood Solutions have many years experience in implementing and upgrading power station data loggers and control room display systems.

Newwood Solutions have considerable experience working in nuclear power station environmer



**Training Simulator software porting to modern CPUs**

Our engineers have ported and upgraded legacy simulator model codes written in modelling languages (PMSP) and Fortran to the latest Microsoft and Linux platforms.

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