GOEBEL | VPC Avionics Interface Modules

The Goebel Company has designed a family of test instruments to fit within the Virginia Panel (VPC) Interface Test Adapter (ITA) receiver slot. By hosting in the ITA, the need for host computer PCI slots, host computer drivers, and wiring from host to ITA is eliminated. Moving IO signals to the ITA results in simpler and less expensive host computer. Since no OS driver is required, OS dependencies and driver maintenance across version updates is eliminated. A simpler more intuitive web interface is utilized based on standard HTTP/UDP interfaces available across OS and processor architectures. Eliminating host IO interface cards, reduces cost in racks, wiring and host computer as well as improving signal integrity by moving the signals closer to the UUT.

Presently all signal cards use the 192 pin ITA connector. Cards can be single function, with access to all 192 pins or a modular format where an ITA slot can host 4 independent signal modules. The module format provides a way to provide a variety of signal functions in the ITA.

Cards need not reside in ITA but can also reside as stand alone units.

Hardware features

- power and communication over POE ethernet interface
- Installs in ITA or as stand-alone
- Trigger bus between cards for synchronization
- Cover plates to insulate from ITA cards
- LED status for power and ready
- Factory reset without removing from ITA

Benefits

- Reduced wiring cost and complexity
- Improved signal integrity by eliminating long wiring runs
- Reduced requirement for host computer IO
- Simplified software through standard network http and UDP protocols
- Reduced host computer software/driver maintenance

SW Features

- HTTP web server embedded for control and status of signals
- UDP low overhead interface
- Scripting control via curl or equivalent http interface tools
- No OS software install or maintenance.
- Intuitive interface with natural units in place of register access protocols.
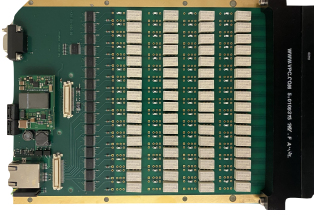
Single function cards

GIO-RLY for fault insertion, source measurement

GIO-RLY provides 48 channels of 1 x 3 relay with flexible configuration options. The main use for fault insertion has the three relay outputs assigned to: signal flow thru, fault 1, fault 2. Faults can either be on ITA pins or routed to the a rear fault bus connector. Faults are typically open signal, signal to ground, signal to voltage or signal to signal.

For source measurement, redefine one or both of the fault busses to a measurement device such as digital volt meter. When connected in this manner each of the 48 signal pins can be routed to the measurement device.

Another configuration is to use two relay positions as a real/sim mux with the third relay position a fault or measurement bus. If real/sim muxing is the only requirement use the GIO-SPDT or GIO-SPDTD to increase the channel count.

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GIO-SPDT for real / sim muxing

GIO-SPDT provides 64 channels of 1 x 2 relay typically used to multiplex a signal between real and simulated signals to a UUT. To allow a disconnect state where neither real or sim signal is connected to the UUT use the alternate PN GIO-SPDTD-V64.

GIO-SPDTD for real / sim muxing with disconnect

GIO-SPDTD adds a disconnected state, where neither real or sim signal is connected to the UUT.

GIO-PSC for power system control

Our GIO-PSC is a variant of relay board meant to handle up to 96 channels of SPST relays for power control. The relays can be used directly to supply up to 5a of current, or be wired to secondary SSR or power relays. Our web page allows channels to be named with their function, eliminating the need for custom web pages. When VPC ITA is not used for power control, the GIO-VPC can be mounted in a custom power system control chassis with breakers and optionally switches and LEDs with remote and local control options.

GIO-VRS variable resistor

Our variable resistor architecture provides up to 16 channels at 8 bit resolution. Resolutions of 12 and 16 bits are supported as well.

Individual channels can be routed to a DMM for calibration, or measured by the instrument itself. By placing the resistance in the ITA accuracy is improved by eliminating cable runs to the host computer. A wide variety of resistance values and accuracy is required for various sensor simulations. We concentrate on a select set of avionics sensors to provide the requisite specifications. Customization of resistance values is possible for any application.
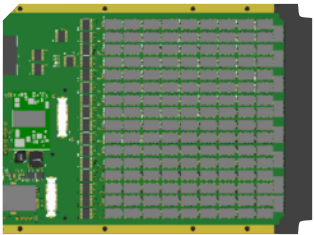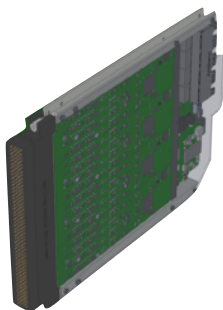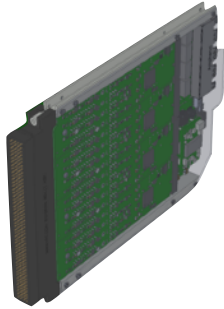
MIO Modular IO system

The MIO family of products allows a single VPC slot to support up to 4 signal modules. Modules may be of the same or dissimilar signal types. Each module has it's own processor and web and UDP server. A module is routed to 48 pins of the 192 pin VPC connector. MIO modules require a carrier that supplies power, ethernet and routes the IO signals to the VPC connector.

The MIO system is coming for deliveries in Q1 2023.

MIO-PSW Carrier for 4 MIO modules

The PIO-PSW carrier only needs one Ethernet RJ45 cable with POE capability. The ethernet port supports 1 Gb speeds. An ethernet switch on the carrier routes traffic to each of the 4 modules hosted by the carrier. The modules can be of dissimilar types.

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MIO-DSC32 32 channel discrete input/output module

The MIO-DSC32 is an alternative to the GIO-DSC32 IP module. It has the same specs of the IP module, with some significant additions.

- High Density I/O – 32 input/output channels
- I/O Voltage – 0 to 60 VDC input/output range
- Low Side Outputs – 150 mA continuous sink
- Output Over Current Protection – 160 mA limit
- Pull Ups – Jumper configurable by port, internal 5V or external (0-60 VDC)
- Pull Up Resistor Packs – user configurable, bussed 4.7K ohm standard install
- User Selectable Resistor Packs allows for multiple discrete IO type simulation on a single device
- I/O Resistance - 235K ohm typical (output off), 1.5 ohm typical (output on)
- Fail Safe Operation – All outputs are designed to be high impedance (>200k ohms) while the board is powering on The following are feature additions of MIO-DSC32 compared to GIO-DSC32.
- Embedded WEB server for control and status
- HTTP and UDP API for driver free software API
- Pull up voltages measured and available via API
- Input channel voltages available via API

MIO-DAC20-16 20 channel analog output module

The MIO-DAC20 is a +/- 10 volt 16 bit analog output module. Ask about other voltage range requirements.

- High Density I/O – 20 analog output channels
- 16 bit resolution
- Voltage – -10 to +10 VDC ouput range standard
- Voltage – input range 0-30, 0-60, +-15 or custom, note: 0-60 is achieved on MIO-DSC32
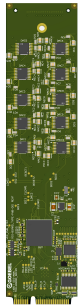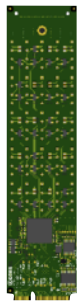
MIO-SSR24 24 channel solid state relay module

24 channels of solid state relays are available on a module. State is NO on power up. Amperage of 150 bipolar and 700 ma DC are available.

MIO-SPST24 24 channel reed relay module

24 channels of reed relays are available on a module. State is NO on power up. Signal supports 2 amps of current.

MIO-SPDT16 16 channel reed relay module

24 channels of reed relays are available on a module. State is NC on power up. Signal supports 2 amps of current.

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VPC Paddle cards

To connect user IO cards, Goebel provides a variety of paddle cards to connect to VPC 192 pin slots. Paddle cards are matched to the connector type fitting to the IO cards. In addition paddle cards are available for supplying power, and for making fan out connections. Note you can match Goebel patch panels to DSUB 78 and 104 paddle cards to provide breakout and signal injection on a cable by cable basis.
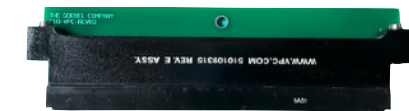
GIO-VPC-78.S and GIO-VPC-78.L

Since 78 pin DSUB connectors are slightly wider than a VPC slot, Goebel provides a short (GIO-VPC-78.S) and long (GIO-VPC-78.L) version to handle the extra width. Short and long versions are designed to be alternated within the VPC receiver. Cables should not have hoods installed to accommodate the available spacing. An added feature of the GIO-VPC-78 cards is the VPC rows unused for connecting to incoming cables are used for daisy connections. These are rows where all pins are connected together to allow routing a signal to multiple destinations.

GIO-VPC-RCVR1 and GIO-VPC-RCVR2

Similar to 78 pin DSUB the 104 pin DSUB connectors are slightly wider than a VPC slot, Goebel provides a short (GIO-VPC-RCVR1) and long (GIO-VPC-RCVR2) version to handle the extra width. Short and long versions are designed to be alternated within the VPC receiver. Cables should not have hoods installed to accommodate the available spacing.

GIO-VPC-RCVR3

GIO-VPC-RCVR3 cards are used for daisy connections. These are rows where all pins are connected together to allow routing a signal to multiple destinations.

GIO-VPC-RCVR4

GIO-VPC-RCVR4 cards are used for power connections. Each of 4 molex pins are connected to a column of the VPC slot. Thus each column can be connected to a unique source, such as ground, 28v, 5v, etc.

Ordering Information	
Part number	**Description**
GIO-RLY-V48-x	48 channels 1x3 relay with two relay positions configurable to rear fault bus or ITA pins, (x = amps 2 or 5)
GIO-SPDT-V64-x	64 channels 1x2 relay, (x = amps 2 or 5)
GIO-SPDTD-V64-x	64 channels 1x2 relay with disconnect, (x = amps 2 or 5)
GIO-PSC-V96	96 channels 5 amp relays, also available in 16, 32, 48, 64 channels.
GIO-VPC-78.S	DSUB 78 paddle card, short length
GIO-VPC-78.L	DSUB 78 paddle card, long length
GIO-VPC-RCVR1	DSUB 104 paddle card, short length
GIO-VPC-RCVR2	DSUB 104 paddle card, long length
GIO-VPC-RCVR3	Daisy paddle card
GIO-VPC-RCVR4	Power paddle card
MIO-PSW	Modular IO carrier with POE RJ45, switch to 4 module slots
MIO-P4-V	Modular IO carrier with 4 RJ45, 4 module slots, POE on one RJ45
MIO-DSC32	32 channels of 150ma input/output discretes
	The following are products planed for 2024/25
MIO-SPDT16	16 channels 1x2 SPDT 2 amp relay
GIO-VRS-V8-x-y	8 channels variable resistor, .1%. accuracy, 16 bit resolution, x - y ohms.
MIO-ADC32-12	32 channels of 12 bit analog input +/- 10v
MIO-DAC20-16	20 channels of 16 bit analog output +/- 10v
MIO-SSR24-x	24 channels of SSR (x=150 or 700 ma relay)
MIO-SPST24	24 channels of SPST 2 amp relay

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