IGI Systems Process Interface

As simple to use as the dIGIbox and other IGI digital flow interface products for use with Brooks Instrument digital mass flow products, the Process Interface is the complete plug-and-play, out-of-the-box solution for your experimental or R&D flow process application. In conjunction with the IGI "LAB Interface" control/automation software and a single USB connection to your Windows PC your system will be up and running in minutes.

The Process Interface is designed to control "gas flow systems" which require more than just a flow control interface. Additional inputs are provided to quickly hook-up pressure transducers (provides 24V DC power and reads analogue signal) and solenoid valves, acquire analogue level signals and provide digital (TTL/custom level) I/O. The Process Interface can be supplied with one or more built-in temperature controllers with heat and cool output. All of these features are present in the Process Interface shown in Figure 1 below (Brooks Instrument digital flow device connection and PC USB connection are located on the rear panel).

Figure 1: Process Interface in 19" Rack format

Each Process Interface is built to order after you have selected the features you require for your application. We can add more features e.g. 16 channels of analogue input as opposed to the standard 8 channels, or add extra interfacing to other analytical instrumentation e.g. via RS232/485 (see Figure 2 and Case Study below).

IGI "LAB Interface" software provides an easy to use Windows PC application to provide manual control of all "active features" (e.g. valve states, flow set points, digital output states, temperature set points and ramp rates), and automation Process Recipes providing deterministic timed set point and valve state changes can be pre-programmed via a simple spread-sheet with the Process Recipe Builder Tool ("passive" features are defined as analogue input and transducer inputs). Process Recipes can be saved and reused. If the standard level of functionality in insufficient, "LAB Interface" can be expanded to meet the specific requirements of your application.

In addition to "LAB Interface", we provide "IGI DLL" a standard 32-bit Windows PC based dynamic link library (with example LABview code) to allow you to integrate the Process Interface into your own 32-bit

LABview software application ("IGI DLL" for 64 bit applications will be available towards the end of 2011). If you are using "BrooksDLL" (© IGI Systems Ltd) to control Brooks Instrument digital mass flow devices then you will find "IGI DLL" for Process Interface works in exactly the same way.

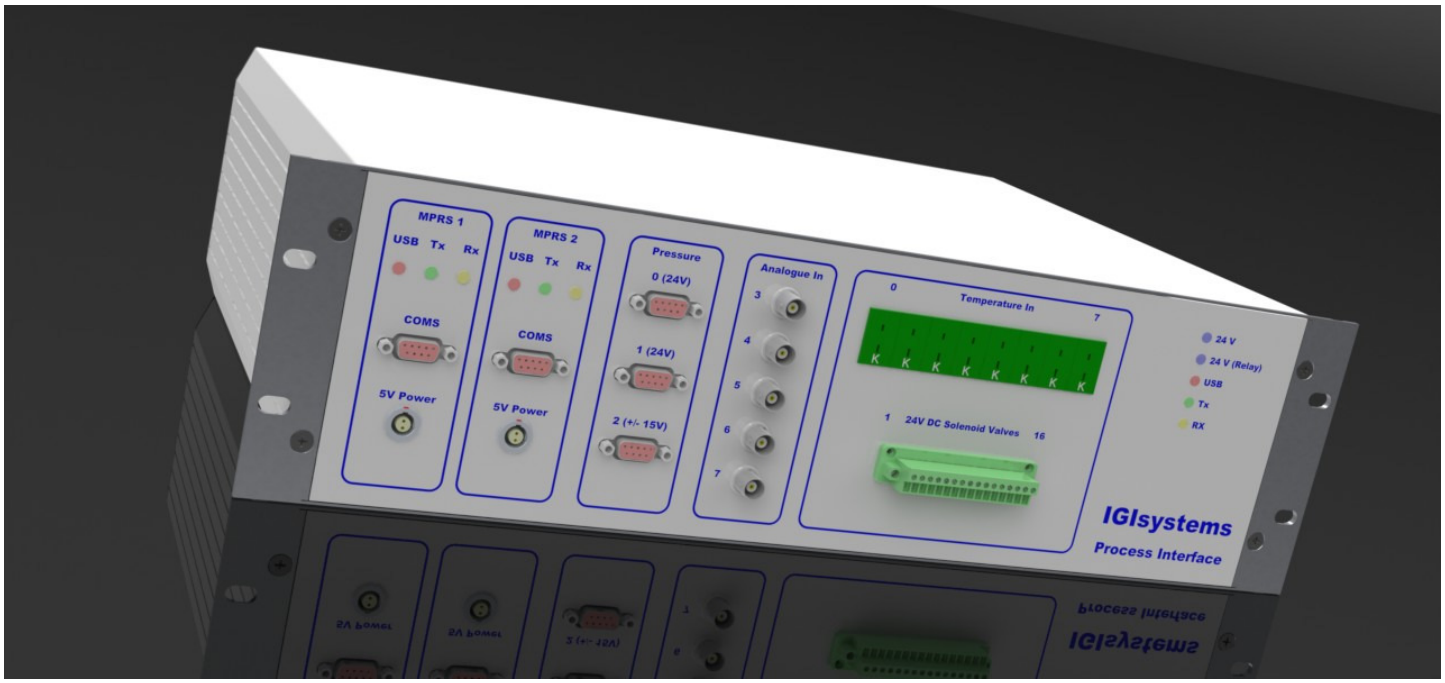

Figure 2: Dual MPRS Process Interface

Process Interface Case Study (low light level detection in gas-phase resonance fluorescence):

Figure 2 shows a Process Interface designed and built recently to control and automate a Dual Channel Atomic Resonance Fluorescence field instrument which will be used to measure the concentration of iodine (atomic and molecular) and bromine atoms in the marine boundary layer. RS232 interfacing and 5V DC power are provided for two Excelitas Technologies GmbH (formally Perkin Elmer Optoelctronics) MPRS photon counting modules (MPRS1 & MPRS2), 24V and +15/-15V power and signal acquisition from three analogue pressure transducers (Oerlicon (formally Leybold) TTR 91 and CTR 90 and MKS 626A), 5 channels of generic differential 10V 16 bit analogue input, 8 channels of K-type thermocouple inputs, 8 channel of 24V relay power for solenoid valves and 8 Brooks Instrument S & SLA 5850 mass flow controllers.

The "LAB Interface" software was extended to integrate the two Excelitas MPRS modules. Calibration of the instrument is automated by use of the Process Recipe functionality to provide timed gas flow set point changes whilst acquiring data from the two MPRS modules. These set point changes are used to vary known concentrations of I and Br atoms supplied to the instrument inlet. Automation of field measurements is also provided via the Process Recipe pre-programming function to allow valve positions to be switched at set times to allow the instrument to measure background signals by passing the ambient gas sample through "traps" which remove the atomic or molecular species, and also to switch on/off a flow of nitric oxide gas which is used to titrate IO and BrO radicals to I and Br atoms, respectively, thus allowing the measurement of the halogen oxide radicals.

This Dual MPRS Process Interface system is ideal for gas phase atomic resonance fluorescence measurements. It is also well suited for any CW measurements of chemiluminescence, fluorescence and phosphorescence in the gas or liquid phase where the desired photon count acquisition periods are >= 50 ms.

Contact us at info@igisystems.co.uk to discuss your application.

Specifications:

CE Mark: YES

Physical:

Dimensions (HxWxD):	135 x 445 x 310 mm (3U 19” rack or bench-top housing)
Weight:	ca. 4 kg

Electrical:

AC Input:	90–264 V; 47–63 Hz
Full Load Current:	3.5 A @ 100V AC 1.9A @ 230V AC
AC Fuse Rating:	6A Anti-Surge (5x20mm form factor) on live
24V DC Output:	max 6.8A

Environmental:

Operating Temperature:	0-40 ºC
Relative Humidity:	90% max, non-condensing

LED Indicators:

Red:	USB 5V DC Power Present
Yellow:	RS485 Rx
Green:	RS485 Tx
Blue:	24V DC Present / 24V DC Present Relay

FPV Interface Connections:

Digital MFC Cable:	LEMO 2B	(max 8 Brooks Instrument flow devices)
Pressure Transducers:	D9	(50mV max per pressure transducer)
Solenoid Valves:	LEMO / Screw Terminal	(2A max per relay channel; 3.4A total)
Analogue I/O:	LEMO / BNC / Screw Terminal	(8 channels)
Digital I/O:	LEMO / BNC / Screw Terminal	(8 channels)
Temperature In:	Mini-TC Connector	(8 channels)
Temperature Controller:	Sensor: Mini-TC Connector	
	Outputs: LEMO	
PC:	USB Type B	

(Optional Ethernet connectivity from your PC to the Process Interface is available on request)

Specify T- type and signal connector types at placement of order.
The number of I/O and control channels stated above are as standard; additional channels are available on request.
Cables should be specified at placement of order.
Additional power outputs are available on request; voltage and power required should be specified at placement of order.
Temperature Controller TC-type should be specified at placement or order.
As development is an ongoing process, specifications of the Process Interface are subject to change without notice.

EC Declaration of Conformity

We **IGI Systems Ltd**
of **23, Grange Road, West Cowick, East Riding of Yorkshire, DN14 9EL, UK**

in accordance with the following Directives:

2006/95/EC	The Low Voltage Directive
2004/108/EC	The Electromagnetic Compatibility Directive

hereby declare that:

Equipment **Process Interface**

is in conformity with the applicable requirements of the following documents:

IEC 61010-1:2001 (2nd Edition) and EN 61010-1:2001	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
EN 61326-1:2006	EMC Requirements for Electrical Equipment for Measurement, Control and Laboratory Use

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable Essential Requirements of the Directives.

Signed:

Name: Dr. Trevor Ingham
Position: Director
West Cowick 4th April 2011

Document Reference: Process Interface/CE/Declaration/Rev1