Universal Device Interface with 20 mA Current Loop Output

Features

- High resolution and speed in a compact and cost-effective package.
- Source for 20 mA precision current control
- Permits simple interfacing of existing devices to a fast fiber-optic communication loop.
- Can be mounted on or close to the device being controlled
- Up to sixteen devices can be connected on a single fiber-optic loop
- Very low transition transient on analog output DACs, for compatibility with wide-band power supplies.

Applications

- Remote control of power supplies and similar devices over fiber-optic.
- Waveform generation for scanned or swept devices.
- Control of devices across high voltage barriers.
- Connection of multiple devices to a PC host. Each device independently addressable.
- Fully automated systems operating in electrically noisy environments.
- Addition of high-performance remote control to existing systems.

Specifications

Analog output (voltage)	Number of independent outputs	1
	Output voltage range	-10 V to + 10 V
	Output current compliance	+/- 5 mA
	Settling time	< 8 µs to within +/- 10 mV for any step
	Resolution over full voltage span.	16 bit
	Linearity max deviation over span	<0.1% of full scale any point to linear fit
	Noise	< 0.5 mV RMS at 16.7 or 20 msec averaging
	Thermal stability	< 200 µV C-1
Analog output (current)	Number of independent outputs	1
	Output current range	0.0 to 20.0 mA
	Output voltage compliance	+/- 10 V
	Resolution over full current span.	16 bit
	Linearity max deviation over span	<0.1% of full scale any point to linear fit
	Noise	< 1 µA RMS at 16.7 or 20 msec averaging

Specifications (continued)

Analog input	Number of independent inputs	2
	Configuration	Differential, high impedance
	Input voltage range	-10 V to +10 V (software configurable to +/- 5V, 0 to +5V, or 0 to +10V)
	Linearity max deviation over span	< 0.1% of full scale any point to a linear fit
	Noise	< 0.5 mV RMS at 16.7 or 20 msec averaging Typical measured rms noise with shorted inputs: < 100 µV at 1e-4 s averaging < 20 µV at 1e-2 s averaging < 6 µV at 1 s averaging
	Crosstalk	< 1 mV with 10 VDC on other input < 30 mV with 10 VAC 1 MHz on other input
	Input protection	10 kohm series on + and - inputs
	Common mode rejection	>20 dB
	Digitization	16 bit successive approximation
	Conversion rate	50 kSa/s
	Sample rate to host	Up to 10 k readings per second with real-time loop controller
Digital output	Number of independent outputs	4
	Voltage level	TTL
	Maximum current drive capability	3 mA (source or sink)
	Output series impedance	100 ohm
Digital input	Number of independent inputs	4
	Voltage level	TTL
	Configuration	Active low, internal 10 kohm pullup to +5 V
	Input impedance	> 1 Mohm

Power input	+24V (+/- 2V) DC, 250mA maximum
Controls	16 position rotary switch for address selection
Displays	Status LEDs (power, processor status, comms status)
Case material	Stainless steel sheet.
Weight	0.24kg (0.55 lb)
Operating environment	10 to 35C, < 80% humidity, non-condensing, vibration < 0.2g all axes, 1 to 100 Hz
Storage environment	0 to 50C, < 80% humidity, non-condensing, vibration < 2g all axes, 1 to 100 Hz

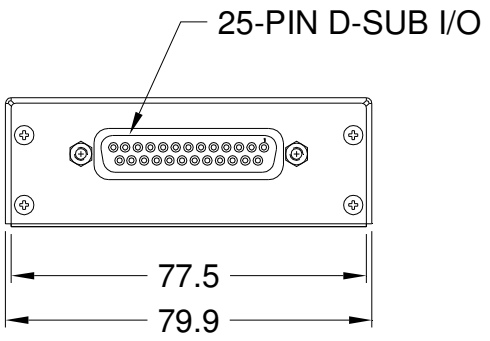
Interfacing and control

Interfaces	Fiber-optic loop, 10 Mbit/sec serial.
Data rate	Typical read/write rate >= 1 kHz, depending upon loop configuration. Rate to A500 host memory (special applications) >= 10kHz.
	Fibre-optic loop to host system interfacing available using loop controllers: A360 (Ethernet), A500, A560 (Real-time controllers)
Host computer	PSI Diagnostic and PTC DiagnosticG2 host programs provided for Windows PC. IG2 interface provides interface to EPICS and EPICS clients including Labview™, Python, C#, C++.

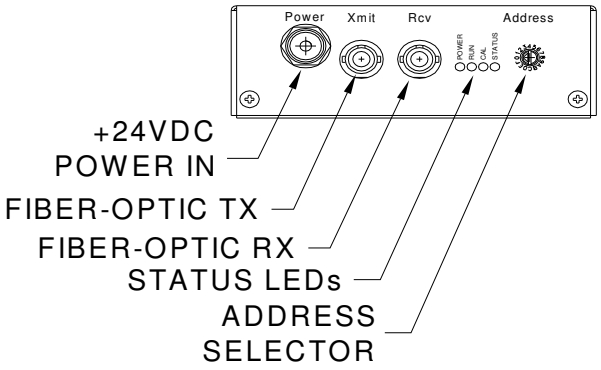
Connectors

Fiber optics	Two 1mm Avago ST bayonet, compatible with 1 mm plastic fiber or 200 µm silica fiber, 640 nm (red) light
Power in	2.1mm threaded jack. Mates with Switchcraft S761K or equivalent.
Signal	25 way DSub female

1	PSU 0V in	14	+24V DC in
2	Shield (M10 case)	15	Analog ground
3	Analog In 1 +	16	Analog In 1 -
4	Digital out 1	17	Digital out 2
5	Analog In 2 +	18	Analog In 2 -
6	Analog ground	19	Analog out 1
7	Analog ground	20	Analog out 2 (0—20 mA)
8	Analog ground	21	+5V digital out
9	Digital ground	22	Digital out 3
10	Digital out 4	23	Digital ground
11	Digital In 4	24	Digital In 3
12	Digital In 2	25	Digital In 1
13	Digital ground		

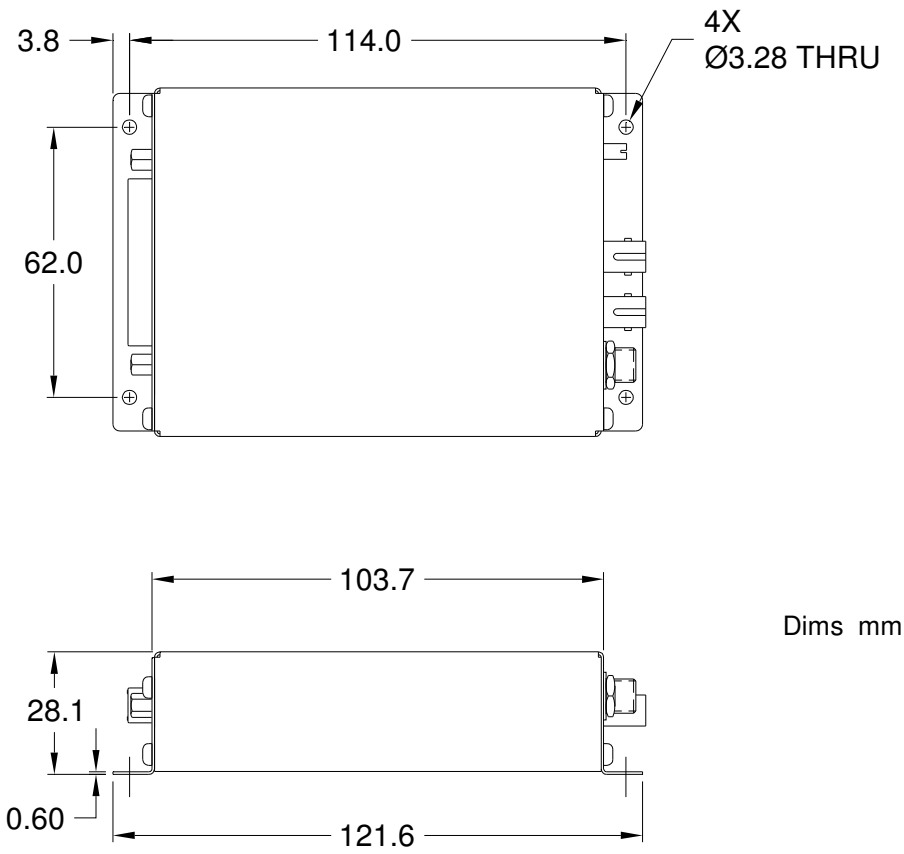


Dims mm



Ordering information

M10	M10 device with two voltage analog outputs, two analog inputs, four digital inputs and four digital outputs. Including PTCDiagnostic host software See separate data sheet.
M10-C	M10 device with one 0-20 mA current output, one voltage analog output, two analog inputs, four digital inputs and four digital outputs. Including PTCDiagnostic host software.



Dims mm

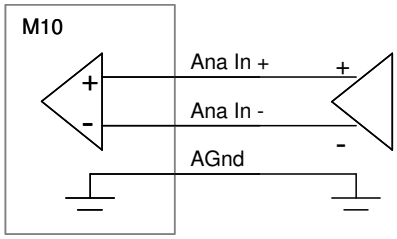
Pyramid Technical Consultants, Inc.,
1050 Waltham Street Suite 200
Lexington MA 02421 USA
Tel: +1 781 402 1700 (USA),
+44 1273 492001 (UK)

Email: support@ptcusa.com **www.ptcusa.com**

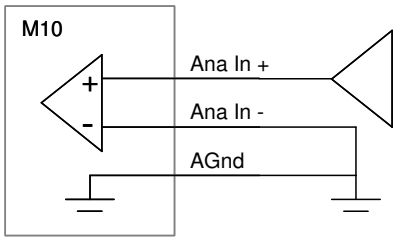
M10C_DS_150225

Recommended Connection Arrangements

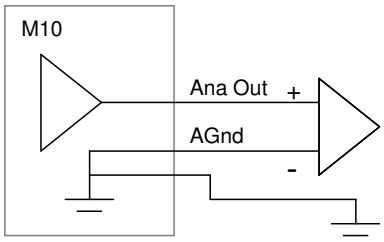
Analog input : differential source



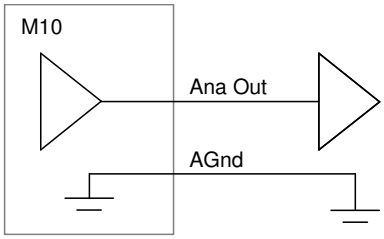
Analog input : single-ended source



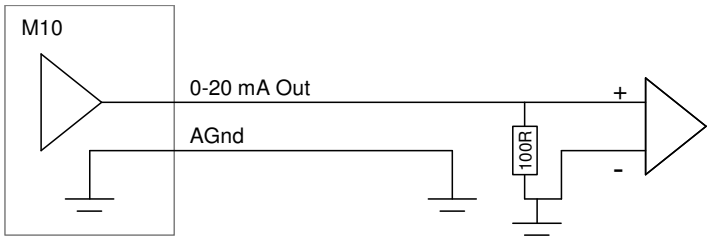
Analog output : differential destination



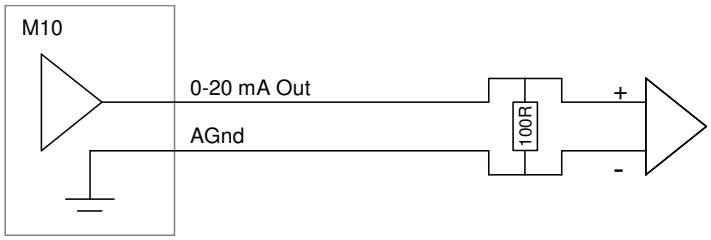
Analog output : single-ended destination



Analog output (0 –20 mA current) : single-ended destination



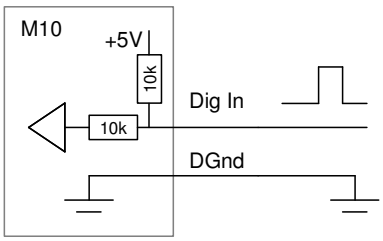
Analog output (0 –20 mA current) : differential destination



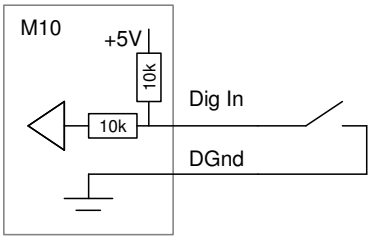
Choose terminating resistor according to required voltage at receiver:

50 ohm	0.0 to +1.0 V
100 ohm	0.0 to +2.0 V
500 ohm	0.0 to +5.0 V
1 kohm	0.0 to + 10.0V

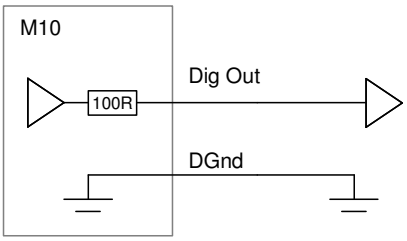
Digital input : TTL input



Digital input : volts-free contact



Digital output : TTL load



Digital output : optoisolator