

MODULUS

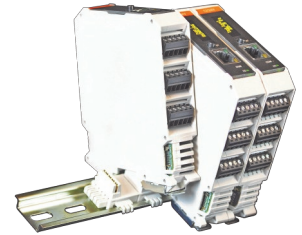
Serial Communications Module - 2110

Modulus Serial Communications modules can interconnect Modulus SCADA controllers and 3rd party devices by hardwired connections or external radios and modems. Standard communications protocols such as Modbus, DF1, SDI-12 and Ethernet IP, as well as Ethernet-Serial bridging and Ethernet Routing are supported.

Modulus Serial Communications modules have built-in analog and digital I/O for applications such as tank level monitoring and pump control. They can also serve as communications concentrators with intelligent links to smart monitoring and control devices such as variable frequency drives and power meters.

Modulus Serial Communications modules have two general purpose serial ports that support multiple types of interfaces; RS-232, RS-485 (2-wire), RS-422 (4-wire), and SDI-12. The buss port may also be used as a general purpose RS-485 serial port if not used for high-speed bus communications with other Modulus I/O modules.

8x-5000 2DI, 1DO, 1AI (20mA/V)



- 1 ETHERNET PORT
- 3 SERIAL PORTS (2 GENERAL PURPOSE AND 1 BUS PORT)
- 2 DISCRETE/HIGH-SPEED PULSE INPUTS
- 1 DISCRETE OUTPUT (PROTECTED FET)
- 1 ANALOG INPUTS (ANALOG INPUT (PROCESS—mA/V))

STANDALONE OPERATION

Modulus Serial Communications modules can serve as standalone devices with SCADA communications, local and web human machine interfaces (HMIs), historical trending and data logging, alarming, reporting, and programmable logic.

COMMUNICATIONS

Serial communications modules have an Ethernet port and two serial ports to communicate directly with Modbus devices and Allen Bradley PLCs. The module can serve as a communications concentrator or master controller. Ethernet to Serial bridging, and Ethernet routing to other Modulus modules' Ethernet ports, is also supported.

GRAPHICAL, MOBILE, AND LOCAL HMIs

Configurable graphical web and mobile device interfaces are built into the serial communications modules. The front panel display can also be customized to show live process values and states, and make setting changes.

HISTORICAL TRENDING AND EVENT LOGGING

Serial communications modules have an internal solid state flash disk, as well as a micro SD memory card slot to record over 100 years of data! Use built-in web tools to retrieve and display historical trend and event data and extract it as spreadsheet files.

REPORTING

Reports can be created in minutes showing live values, production totals, trend and event data, alarm summaries, etc. Customize reports with your own logos and graphics. Call up reports on demand, or have them automatically transferred to your computer.

ALARMING

A serial communications module can manage alarm conditions on any of its local inputs, as well as over 500 conditions monitored by communications with other devices. Alarms conditions can be displayed locally and annunciated with its discrete output, as well as with a Modulus Cellular Communications module (or text message and e-mail alerts). The module maintains a journal spreadsheet file of when alarms occurred, when they were acknowledged, by whom, and when the alarm conditions cleared.

PROGRAMMABLE LOGIC

Serial communications modules support programmable logic written in ladder logic, function block and text languages; all with 32-bit and floating point math. Programmable logic can supplement the built-in functions of the module.

PID & PUMP CONTROL

Serial communications modules have a quad PID controller and a triplex pump controller (float or level control) with error detection and alarming. Without requiring any additional modules, the Serial Communications Module is an ideal solution for SCADA operation of wells, lift stations, and booster pump stations.

REDUNDANCY

Serial communications modules support redundancy for enhanced reliability. If a module goes off-line, a designated backup can take over automatically.

Modulus Serial Communications Module - 2110 Specifications

STANDARD FIELD I/O

Digital Inputs:

Input Range:
Input Current:
Filtering

- 2 Non-isolated DC or contact closure, DC to 20KHz maximum
Contact closure/open collector driver to ground, or 0 to 30Vdc (ON=<1.5V, OFF > 2.5V), **60Vdc absolute maximum**
Approximately 0.5mA (internal current source)
Individually configurable: 5Hz, 10Hz, 20Hz, 50Hz, 100Hz, 500Hz, 1KHz, 2KHz, 5KHz, 10KHz+

Digital Outputs:

Output Rating:

- 1 Solid-state Protected FET high-side driver (switches to input power when ON)
30Vdc, 2A maximum, current limited to approximately 2.25A.

Analog Inputs:

Input Ranges:

- 1 16-bit, Delta Sigma, selectable input ranges
Software selectable:
 - 20mA (minimum input for full accuracy is 0.5mA)
 - 5V and +/- 5V, 10V and +/- 10V, 30V

Maximum signal level

35Vdc on any range, **40Vdc absolute maximum**

COMMUNICATIONS

Ethernet:

SCADA Protocols
Internet Protocols

- 1 10/100mb/s (10/100 Base-T)
Modbus TCP & UDP (master/slave), Ethernet IP (master/slave PLC5 & SLC5/05 emulation), Ethernet to Serial bridging
HTTP (server), FTP (server & client), ICMP (ping; server & client), NTP (client), DHCP (server & client), DNS, DDNS

Serial:

- 1 RS-232, RS-485, RS-422, SDI-12 (COM1 - general purpose communications port.)
- 1 RS-232, RS-485, RS-422 (COM2 - general purpose communications port.)
- 1 RS-485 Bus port (this port is available for general purpose communications if not used for high-speed bus communications with other modules)
115K, 38.4K, 19.2K, 9600, 4800, 2400, 1200 baud
Modbus RTU (master/slave), DF1 (slave), SDI-12 (1st general purpose serial port only)

Baud Rates
Protocols

HMIs

Local:

128x32 graphical, wide temperature range yellow OLED and single pushbutton

Graphical:

Web based, graphic library included. Compatible with most browsers, including Internet Explorer, Firefox, Chrome, Safari, Android

Mobile:

Web based, text only, up to 50 registers. Compatible with most browsers, including Internet Explorer, Firefox, Chrome, Safari, Android

PROGRAMMING

Languages:

Ladder Logic, Function Block, Text—built-in web based graphical and text editor and debugger

Capacity:

64KB logic, 2MB source code, 32-bit integer and floating point math

STORAGE

Registers:

504 Numeric registers, 504 Boolean registers

Internal Flash disk:

64MB

Removable disk:

Micro SD Card (up to 256GB, supplied by customer)

CLOCK

Real Time Clock:

Stability

Temperature compensated with lithium battery backup power
+/- 3ppm from -30°C to 70°C

GENERAL

Input Power:

10Vdc to 30Vdc

Power Consumption

Not using Ethernet
Using Ethernet

18mA @ 12Vdc / 14mA @ 24Vdc (Ethernet power saver enabled)
60mA @ 12Vdc / 35mA @ 24Vdc

Field Wiring Termination:

[81-5000] screw terminal blocks **[82-5000]** lever terminal blocks, 3.5mm, 22 to 14GA wires

Temperature:

-40°C to 70°C (operating), -40°C to 85°C (storage)

Humidity:

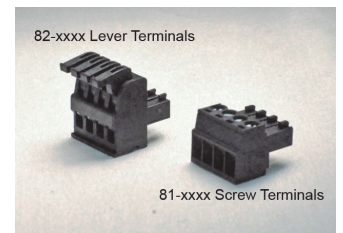
<95% RH (non-condensing)

Enclosure:

Polyamide, light gray (RAL 7035)

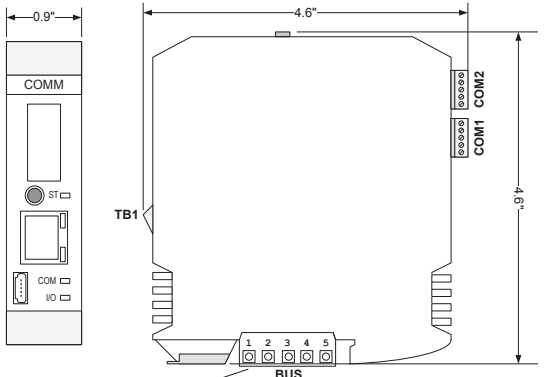
Mounting:

35mm DIN rail with bus connector block



Modulus Serial Communications Module - 2110 DIMENSIONS and WIRING

DIMENSIONS and WIRING

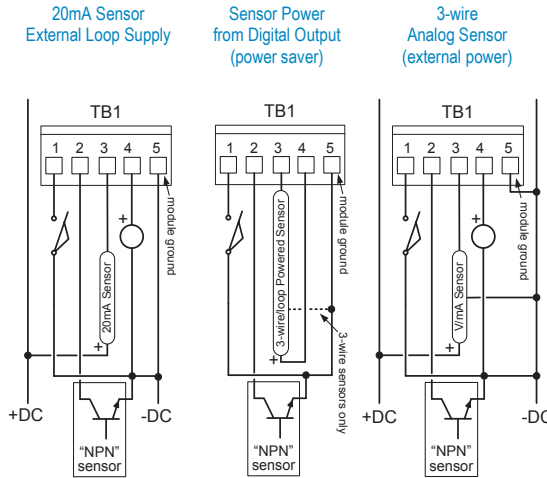


Terminal	Function
1	-485
2	+485
3	RESET#
4	GND
5	+V

TB1 terminals	Inputs/Outputs
1	DI1
2	DI2
3	AI1
4	DO1
5	GND

Refer to the installation manual for additional installation details and precautions.

DISCRETE & ANALOG INPUTS/OUTPUTS—TB1



All discrete and analog inputs/outputs are referenced to the ground terminal (5). This terminal is connected internally to the modules power supply ground.

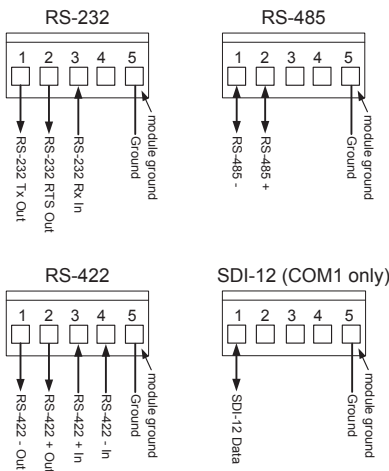
Discrete Inputs accept a contact closure or open-collector ("NPN" style) input signal. An external pull-up resistor is not required.

The Discrete Output sources current ("PNP" style) from the modules input power.

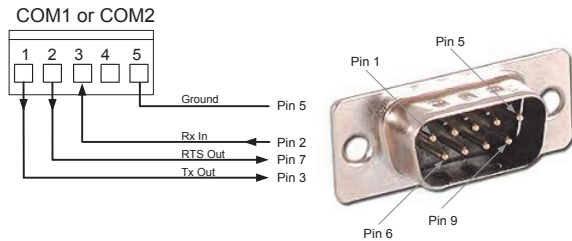
The Analog Input may be software configured to accept either current or voltage signals. In low power applications, the analog sensor may be powered from the Discrete Output, configured to power the sensor on only when needed to take an analog reading (with configurable "warmup" time).

Contact ICL Customer Service for available pre-wired Field Wiring Panels

General Purpose Communications Ports COM1 and COM2 (modes are software configured)



Typical COM1/COM2 RS-232 Wiring to Modem/Radio





Industrial Control Links, Inc.
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