MODULUS

DI-24 Discrete Input Modules

Modulus DI-24 Discrete Input modules extend the I/O capacity of Modulus SCADA controllers, as well as the many 3rd party devices. The modules have an Ethernet port supporting Modbus, Ethernet IP, MQTT, and SDX protocols, as well as Ethernet-Serial bridging and Ethernet Routing. Their bus port may be used for general purpose RS-485 communications (when not bussed with other Modulus I/O), operating as a master or slave using industry-standard protocols such as Modbus, DF1, SDX (AES-128 encryption), and SDI-12.

DI-24 modules are available as 12/24V or 120/240V Discrete Input models. Both AC and DC signals are supported.

Modulus DI-24 Discrete Input modules have built-in web pages for configuration, programming, monitoring and manuals. No application software is needed; just a web browser. Custom user documentation can also be loaded into the module, so that drawings, datasheets, etc. are always available for site support and maintenance.

Discrete Input Modules
8x-1002 24DI (12/24V)
8x-1102 24DI (120/240V)

Optional Field Wiring Panel

Modulus DI-24 Discrete Input Module

- **24 DISCRETE INPUTS (OPTICALLY ISOLATED)**
- **1 ETHERNET PORT**
- **1 SERIAL PORT**

STANDALONE OPERATION

Modulus DI-24 Discrete Input modules can serve as standalone devices with SCADA communications, local and web human machine interfaces (HMIs), trending and data logging, alarming, reporting, and programmable logic control.

COMMUNICATIONS

DI-24 modules have an Ethernet port and a serial port to communicate directly with Modbus devices, as well as Allen Bradley PLCs. They can serve as communications concentrators or master controllers, as well as providing web and data access to any other Modulus modules on the high-speed bus. They support Ethernet to Serial bridging, and routing through Ethernet ports in other Modulus modules on the bus.

GRAPHICAL, MOBILE, AND LOCAL HMIs

Configurable graphical web and mobile device interfaces are built into DI-24 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

DI-24 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 with custom graphics and logos can be created in minutes, showing live values, totals, trend/event data, alarm summaries, etc. They can be called up on demand, or sent out automatically via an Ethernet/Internet connection.

ALARMING

A DI-24 module can manage alarm conditions on any of it's local inputs, as well as over 500 conditions monitored by communications with other devices. Alarms can be annunciated by text message and e-mail alerts over the Internet via its Ethernet port. Alarm status with times of occurrence, response and clearing can be displayed via its built-in graphical HMI. 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

DI-24 modules support programmable logic written in ladder logic, function block and text languages; all with 32-bit integer and floating point math. Programmable logic can supplement the built-in functions of the module.

PID AND PUMP CONTROL

DI-24 modules support four Proportional, Integral and Derivative (PID) loops and have a built-in triplex Pump Controller (float or level control with alternation). Although the DI-24 module has no outputs of its own, it can perform control operations via communications with other Modulus modules or external output devices.

REDUNDANCY

DI-24 modules support redundancy for enhanced reliability. If a module goes off-line, a designated backup can take over automatically.

ICL
www.iclinks.com

Modulus DI-24 Discrete Input Module Specifications

FIELD I/O

Digital Inputs: **24** Optically Isolated, bipolar (AC/DC, not polarity sensitive)

Input Range:
- **[8x-1002]** 0 to 30V (OFF < 6V, ON>9V)
- **[81-1102]** 0 to 240V (OFF < 60V, ON>90V)
- **[82-1102]** 0 to 120V (OFF < 60V, ON>90V)

Input Current: **[8x-1002]** 1.2mA @ 12V, 3mA @ 24V   **[8x-1102]** 1.2mA @ 120V, 3mA @ 240V

Filtering   Inputs 1 through 8: individually selectable—5Hz, 10Hz, 20Hz, 50Hz, 100Hz, 500Hz, 1KHz, 2KHz+

Inputs 9 through 24: individually selectable—20Hz, 100Hz

COMMUNICATIONS

Ethernet: **1** 10/100mb/s (10/100 Base-T)

SCADA Protocols   Modbus TCP & UDP (master/slave), Ethernet IP (master/slave PLC5 & SLC5/05 emulation), SDX (AES-128 Encryption), MQTT, Ethernet to Serial bridging

Internet Protocols   HTTP (server), FTP (server & client), E-mail (SMTP and POP3), ICMP (ping; server and client), NTP (client), DHCP (server & client), DNS, DDNS

Serial: **1** RS-485 (115K, 38.4K, 19.2K, 9600, 4800, 2400, 1200 baud). This port is available if not used for bus communications with other modules.

Protocols   Modbus RTU (master/slave), DF1 (slave), SDX (AES-128 Encryption)

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: 32MB

Removable disk: Micro SD Card (up to 256GB, supplied by customer)
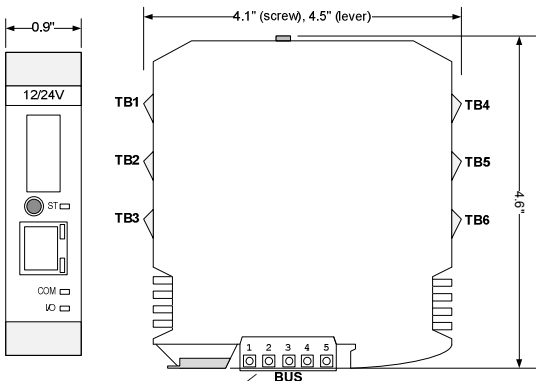
GENERAL

Input Power: 10Vdc to 30Vdc

Power Consumption

Not using Ethernet   18mA @ 12Vdc / 13mA @ 24Vdc (Ethernet power saver enabled)

Using Ethernet   78mA @ 12Vdc / 43mA @ 24Vdc

Field Wiring Termination: **[81-1x02]**   screw terminal blocks   **[82-1x02]**   lever terminal blocks, 3.5mm, 22 to 14GA wires

Temperature: -40ºC to 70ºC (operating), -40ºC to 85ºC (storage)

Humidity: <95% RH (non-condensing)

Enclosure: Polyamide, light gray (RAL 7035)

Mounting: 35mm DIN rail with bus connector block

82-xxxx Lever Terminals

81-xxxx Screw Terminals

Specifications subject to change without notice. Consult factory to ensure that you are working with current information.
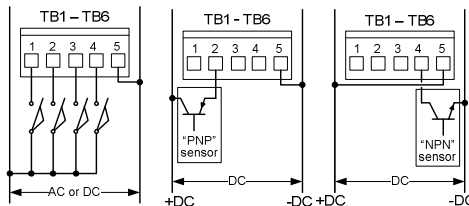
DIMENSIONS and WIRING

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

OPTICALLY ISOLATED DISCRETE INPUTS

The discrete inputs on each terminal block share a common with only the inputs on that same block and are isolated from all other I/O points. All inputs are bipolar (not polarity sensitive).

82-00xx Field Wiring Panel

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

Terminal Block	Inputs
TB1	DI1 - DI4
TB2	DI5 - DI8
TB3	DI9 - DI12
TB4	DI13 - DI16
TB5	DI17 - DI20
TB6	DI21 - DI24