# 24-Channel I/O Card (FloBoss™ 500-Series)

The 24-Channel I/O (Input/Output) Card provides 24 input and output points for expanded monitoring and control applications. The card is intended for use with the FloBoss 503 and 504. The I/O card provides these additional I/O channels:

- ♦ 8 Analog Inputs – AI.
- ♦ 2 Analog Outputs – AO.
- ♦ 2 Pulse Inputs – PI.
- ♦ 2 Discrete Inputs – DI.
- ♦ 2 Relay Discrete Outputs – DO.
- ♦ 8 Selectable Discrete Inputs/Discrete Outputs.

The parameters of the I/O channels are configured using ROCLINK™ for Windows Configuration Software. Refer to Specification Sheet 4:RLFW.

The I/O card uses a microprocessor for monitoring, controlling, and acquiring data from external devices connected to the I/O channels, as well as for relaying the information to and from the main processor card. The I/O channels have removable plug-in terminal blocks for field wiring. Sockets for AI scaling resistors are provided on the back of the I/O card, along with switches for the selectable DI/DO channels.

The I/O card receives its power from the main processor card. The processor is isolated from noisy I/O circuits by optical coupling and a DC/DC power converter, which supplies power for most of the I/O circuits. External 24-volt loop power can be connected for the Analog Input circuits; otherwise, 12-volt loop power is supplied by the DC/DC converter.
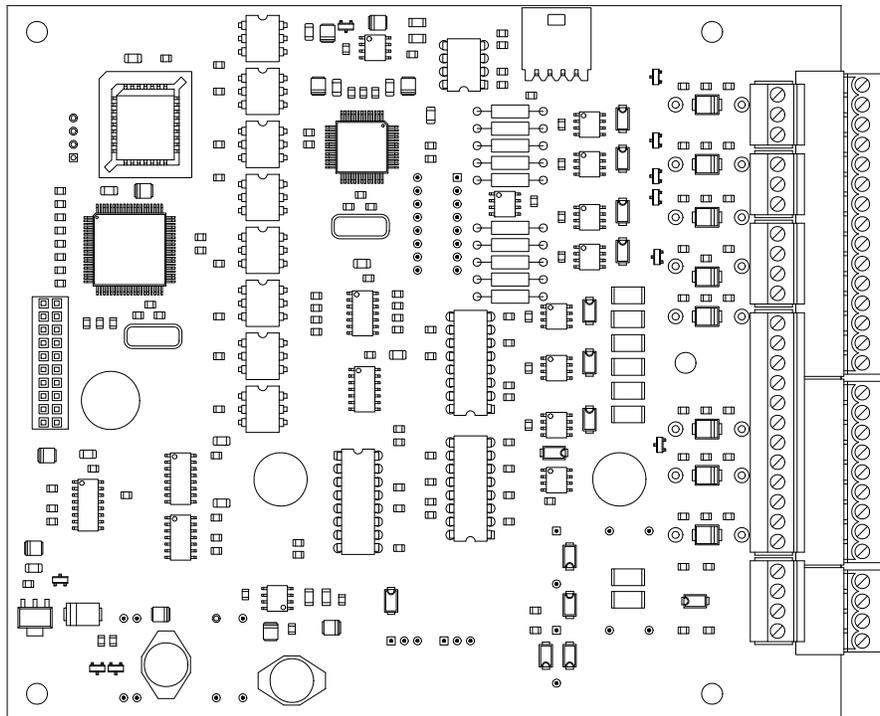

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24-Channel I/O Card

D301146X012

EMERSON

Process Management

Specification Sheet

Analog Inputs

Analog Inputs (AI) monitor current loop and voltage input devices, such as pressure and temperature transmitters.

The I/O card Analog Inputs each consist of a current source and a multiplexed A/D converter with 12-bit resolution. The signal-input range is from 1 to 5 volts. A 4 to 20 milliAmp current input is accommodated with a socketed 250-ohm resistor (supplied).
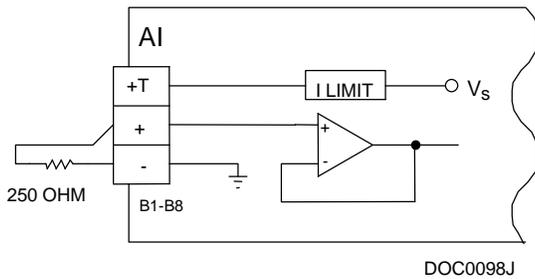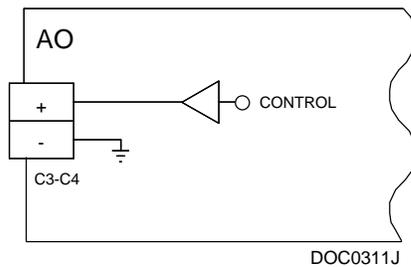

AI Circuit Schematic (Current Loop Mode)

Analog Outputs

The I/O card Analog Outputs (AO) provide a current output for powering analog devices.

The Analog Output is a 4 to 20 milliAmp loop signal. The AO uses a 12-bit D/A converter and a voltage-to-current converter.
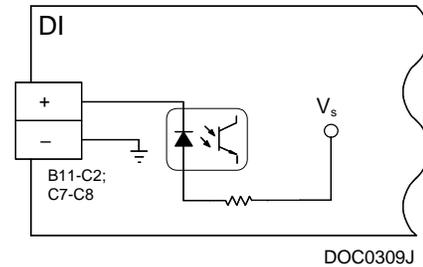

AO Circuit Schematic

Discrete Inputs

Discrete Inputs (DI) monitor the status of relays, solid-state switches, or other two-state devices. The Discrete Inputs can be configured in either of two modes: standard or latched.

The I/O card provides two dedicated DI channels and eight selectable DI channels, which can also be individually configured as Discrete Outputs. The dedicated DI channels use isolated sourcing power, while the selectable DI channels can source either isolated or non-isolated power. For both DI types, the signal from the field is coupled through an optical isolator.
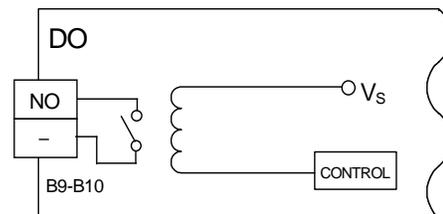

DI Circuit Schematic

Discrete Outputs

The I/O card Discrete Outputs (DO) control two-state devices, such as motor and pump relays. The Discrete Outputs can be configured to be used in any of these modes:

- ♦ Latched mode
- ♦ Timed Discrete Output (TDO) mode
- ♦ TDO Toggle mode (variable pulse width).

The I/O card provides two dedicated DO relay channels and eight selectable DO channels, which can also be configured as DI channels. The DO relays provide normally-open contacts, while the selectable DO channels are normally-open, solid-state switches that are used for activating externally-powered devices.
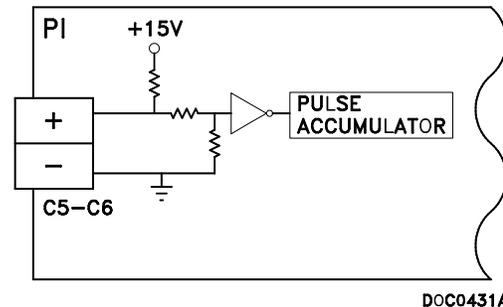

DO Relay Circuit Schematic

Specification Sheet
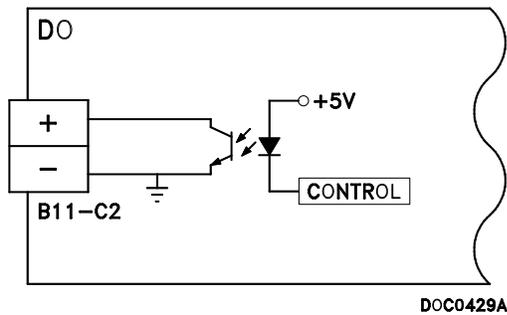
Selectable DO Circuit Schematic

Pulse Inputs

Pulse Inputs (PI) are used for sensing and counting pulses from pulse-generating devices. The I/O card Pulse Inputs consist of two high-speed pulse counter inputs, each sourced from the power converter.

The Pulse Input, after optical isolation, is routed to a pulse accumulator, where the pulses are counted and accumulated.

PI Circuit Schematic

Specifications

ANALOG INPUTS

Quantity/Type: 8 single-ended, voltage-sense Analog Inputs (current loop if scaling resistor is used).

Terminals: "+T" loop power, "+" positive input, "-" negative input (common).

Signal: 1 to 5 V dc, software configurable. 4-20 mA, with 250Ω resistor (supplied) installed in sockets on back of I/O card.

Accuracy: 0.1% over –40 to 65°C (-40 to 149°F) range.

Isolation: 2500 V from processor.

Input Impedance: 1 MΩ.

Filter: Double-pole, low-pass.

Resolution: 12 bits.

Conversion Time: 200 μs.

Sample Period: 50 ms minimum.

ANALOG OUTPUT

Quantity/Type: 2 current-loop signal outputs.

Terminals: "+" positive output and "-" common.

Range: 4-20 mA with 0 to 22 mA overranging.

Loop Resistance: 300 ohm Max. at 12 V dc source voltage.

Resolution: 12 bits.

Accuracy: 0.1% of full-scale output.

Settling Time: 100 μs maximum.

Reset Action: Output goes to zero percent output or last value (software configurable) on power-up (warm start) or on watchdog timeout.

DISCRETE INPUTS

Quantity/Type: 2 contact-sense Discrete Inputs. Up to 8 additional DI channels available when Selectable DI/DO is so configured (see below).

Terminals: "+" positive input; "–" negative input (common, shared between pair of DI channels).

Signal Current: 0.5 to 3.5 mA in the active (on) state, 0 to 0.2 mA in the inactive (off) state.

Isolation: 2500 V from processor.

Frequency: 50 Hz maximum.

Sample Period: 10 ms minimum.

DISCRETE OUTPUTS

Quantity/Type: 2 dry-contact relay outputs. Up to 8 additional DO channels available when Selectable DI/DO is so configured (see below).

Terminals: "NO" normally-open contact; "-" common.

Contact Rating: 30 V dc, 5 A maximum.

Isolation: 3000 V.

Frequency: 10 Hz maximum.

Specifications (Continued)

SELECTABLE DI/DO

Quantity/Type: 8 channels, individually switch-selectable as either a contact-sense DI or a solid-state relay DO.

Terminals: "+" positive input for DI or normally-open contact for DO; "-" common (shared between pairs of channels).

DI Signal Current: 0.5 to 3.5 mA in the active (on) state, group-sourced either from non-isolated or isolated on-board power (jumper selectable). 0 to 0.2 mA in the inactive (off) state.

DO Contact Rating: 120 V dc, 0.15 A maximum.

Isolation: 2500 V for DI; 3000 V for DO.

Frequency: 50 Hz max. for DI; 5 Hz max. for DO.

PULSE INPUTS

Quantity/Type: 2 sourced, high-speed pulse counter inputs.

Terminals: "+" positive input, "-" negative input (common).

Isolation: 2500 V.

Frequency: 10 kHz maximum.

Signal Current: 0.5 to 3.5 mA in the active (on) state, 0 to 0.2 mA in the inactive (off) state.

POWER

Input: 8 to 15 V dc (supplied by main processor card), 40 mA typical without I/O devices.

AI Loop: 12 V dc nominal from internal power converter; 24 V dc can be supplied externally. Available at +T terminals of all AI channels.

FIELD I/O ISOLATION

1000 V minimum.

DIMENSIONS

21 mm H by 137 mm W by 160 mm L (0.8 in. H by 5.4 in. W by 6.3 in. L).

WEIGHT

0.45 kg (1 lb) nominal.

ENVIRONMENTAL

Meets the Environmental specifications of the FloBoss 503 or 504 unit in which the card is installed, including Temperature and Voltage Surge specifications.

APPROVALS

Covered by the CSA approval for the FloBoss 503 or 504 unit in which it is installed.