V200-18-E62B Snap-in I/O Module

The V200-18-E62B plugs directly into the back of compatible Unitronics OPLCs, creating a self-contained PLC unit with a local I/O configuration.

Features

- 30 isolated digital inputs configurable to type pnp/npn (source/sink), includes 2 shaft encoder inputs.
- 28 isolated pnp outputs.
- 2 isolated pnp/npn (source/sink) transistor outputs, includes 2 high-speed outputs.
- 2 analog inputs.

- Before using this product, it is the responsibility of the user to read and understand this document and any accompanying documentation.
- All examples and diagrams shown herein are intended to aid understanding, and do not guarantee operation. Unitronics accepts no responsibility for actual use of this product based on these examples.
- Please dispose of this product in accordance with local and national standards and regulations.
- Only qualified service personnel should open this device or carry out repairs.

User safety and equipment protection guidelines

This document is intended to aid trained and competent personnel in the installation of this equipment as defined by the European directives for machinery, low voltage, and EMC. Only a technician or engineer trained in the local and national electrical standards should perform tasks associated with the device's electrical wiring.

Symbols are used to highlight information relating to the user's personal safety and equipment protection throughout this document. When these symbols appear, the associated information must be read carefully and understood fully.

Symbol	Meaning	Description
⚡	Danger	The identified danger causes physical and property damage.
⚠	Warning	The identified danger can cause physical and property damage.
Caution	Caution	Use caution.

⚡	▪ Failure to comply with appropriate safety guidelines can result in severe personal injury or property damage. Always exercise proper caution when working with electrical equipment.
⚠	▪ Check the user program before running it. ▪ Do not attempt to use this device with parameters that exceed permissible levels. ▪ Install an external circuit breaker and take appropriate safety measures against short-circuiting in external wiring. ▪ To avoid damaging the system, do not connect / disconnect the device when the power is on.
Caution	▪ Ascertain that terminal blocks are properly secured in place.

Environmental Considerations

⚡	▪ Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration.
⚠	▪ Provide proper ventilation by leaving at least 10mm of space between the top and bottom edges of the device and the enclosure walls. ▪ Do not place in water or let water leak onto the unit. ▪ Do not allow debris to fall inside the unit during installation.

Wiring

⚡ ▪ Do not touch live wires.

⚠ ▪ Unused pins should not be connected. Ignoring this directive may damage the device.
▪ Do not connect the 'Neutral' or 'Line' signal of the 110/220VAC to the device's 0V pin.
▪ Double-check all wiring before turning on the power supply.

Wiring Procedures

Use crimp terminals for wiring; use 26-12 AWG wire (0.13mm^2–3.31mm^2) for all wiring purposes.

1. Strip the wire to a length of 7±0.5mm (0.250–0.300 inches).
2. Unscrew the terminal to its widest position before inserting a wire.
3. Insert the wire completely into the terminal to ensure that a proper connection can be made.
4. Tighten enough to keep the wire from pulling free.

▪ To avoid damaging the wire, do not exceed a maximum torque of 0.5 N·m (5 kgf·cm).
▪ Do not use tin, solder, or any other substance on stripped wire that might cause the wire strand to break.
▪ Install at maximum distance from high-voltage cables and power equipment.

I/O Wiring—General

▪ Input or output cables should not be run through the same multi-core cable or share the same wire.
▪ Allow for voltage drop and noise interference with input lines used over an extended distance.
  Use wire that is properly sized for the load.
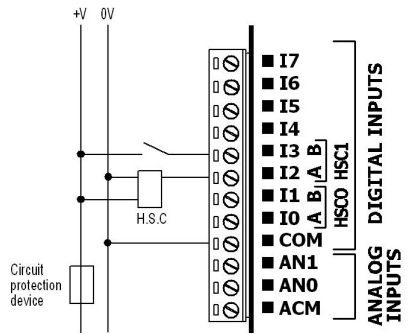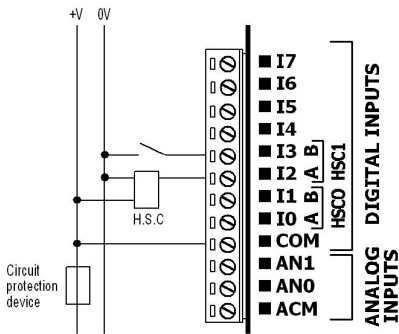
Digital Inputs

These inputs are organized into 3 groups. A common signal must be separately wired for each group. Each group can be used as either pnp (source) or npn (sink), when appropriately wired as shown in the following figures.

▪ Inputs I0 and I2 can be used as normal digital inputs, as high-speed counters, or as part of a shaft encoder.
▪ Inputs I1 and I3 can be used as normal digital inputs, as high-speed counter resets, or as part of a shaft encoder.

npn (sink) digital input wiring

pnp (source) digital input wiring
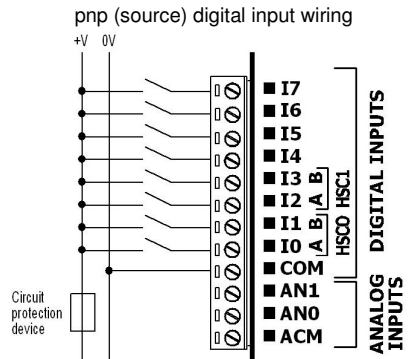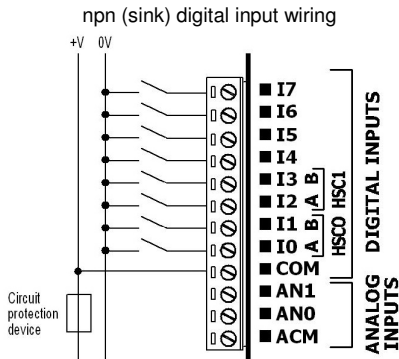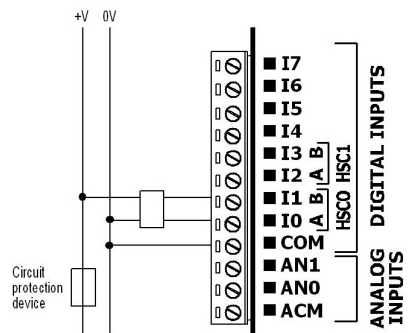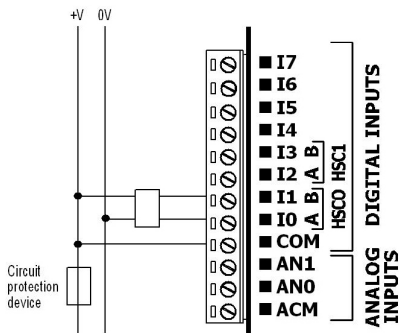
npn (sink) high-speed counter

pnp (source) high-speed counter

Inputs I0, I1, and I2, I3 can be used as shaft encoders as shown below.

npn (sink) shaft encoder wiring
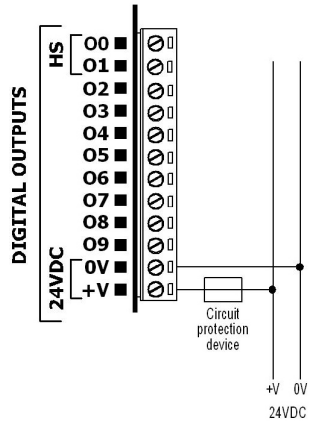
pnp (source) shaft encoder wiring

Digital Outputs

Wiring Power Supplies

Use a 24VDC power supply for transistor outputs.

1. Connect the "positive" lead to the "+V" terminal, and the "negative" lead to the "0V" terminal.

- In the event of voltage fluctuations or non-conformity to voltage power supply specifications, connect the device to a regulated power supply.

Transistor Outputs

- Outputs 0 and 1 can function as either npn or pnp, in accordance with jumper settings and wiring. Open the device and set the jumpers according to the instructions beginning on page 6.
- Outputs 2 to 29 function as pnp only.
- The 0V signal of the transistor outputs is isolated from the controller's 0V signal.

npn (sink)   pnp (source)
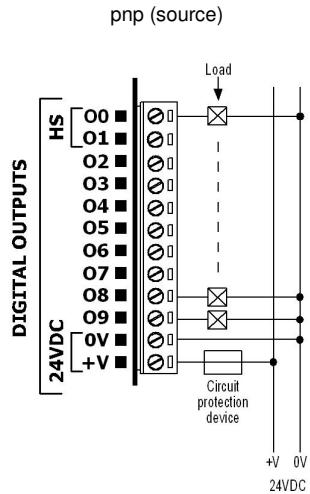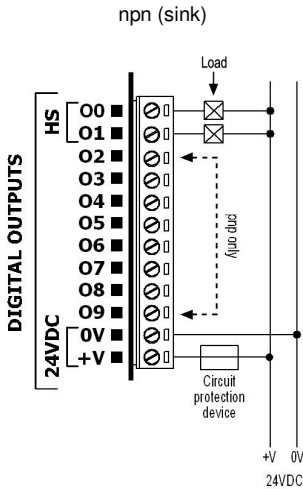
Analog Inputs

2 analog inputs:
- Inputs 0 & 1 can be wired to work with either current or voltage.

To configure an input, open the device and set the jumpers according to the instructions beginning on page 6.

Shields should be connected at the signal source.

Analog Inputs

- When set to current/voltage, all inputs share a common ACM signal, which must be connected to the 0V of the controller.

current   current/voltage
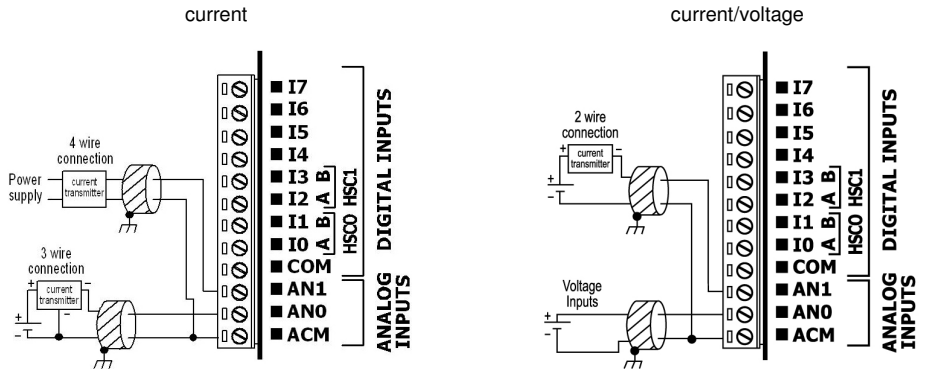
Changing Jumper Settings

To access the jumpers, you must remove the snap-in I/O module from the controller, and then remove the module's PCB board.

⚠

- Before you begin, turn off the power supply, disconnect and dismount the controller.
- Before performing these actions, touch a grounded object to discharge any electrostatic charge.
- Avoid touching the PCB board directly by holding the PCB board by its connectors.

Accessing the Jumpers

First, remove the snap-in module.

1. Locate the 4 buttons on the sides of the module, 2 on either side. Press the 2 buttons on either side of the module as shown, and hold them down to open the locking mechanism.

2. Gently rock the module from side to side, easing the module from the controller.

- Press the buttons on both sides of the controller.
- Rock the module from side to side, easing it from the controller.
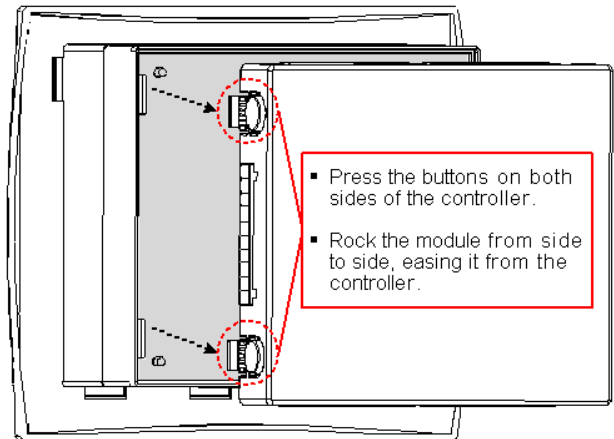
3. Using a Philips screwdriver, remove the center screw from the module's PCB board.

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Select the desired function by changing the jumper settings according to the figure and tables shown below.
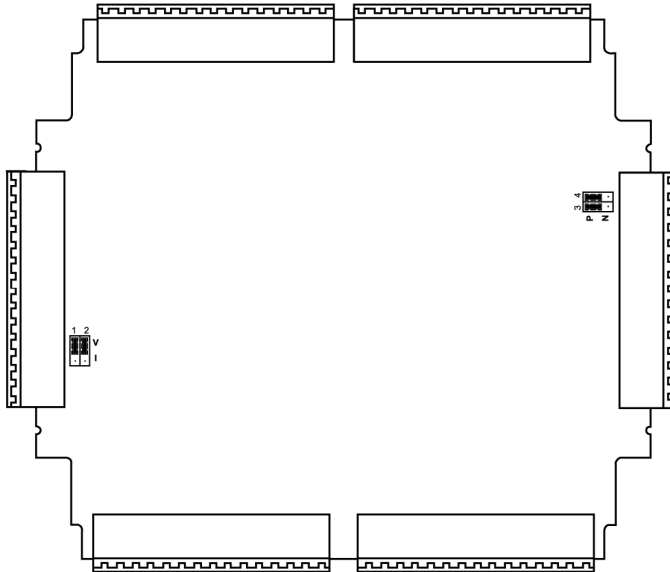
Analog Input Jumpers

	Jumper #	Voltage*	Current
Analog input 0	1	V	I
Analog input 1	2	V	I

Digital Output Jumpers

	Jumper #	PNP*	NPN
Digital Output 0	4	P	N
Digital Output 1	3	P	N

* Default factory setting

<u>Reassembling the controller</u>

1.   Return the PCB board to the module and secure the center screw.

2.   Next, reinstall the module. Line the circular guidelines on the controller up with the guidelines on the Snap-in I/O Module as shown below.

3.   Apply even pressure on all 4 corners until you hear a distinct 'click'. The module is now installed. Check that all sides and corners are correctly aligned.
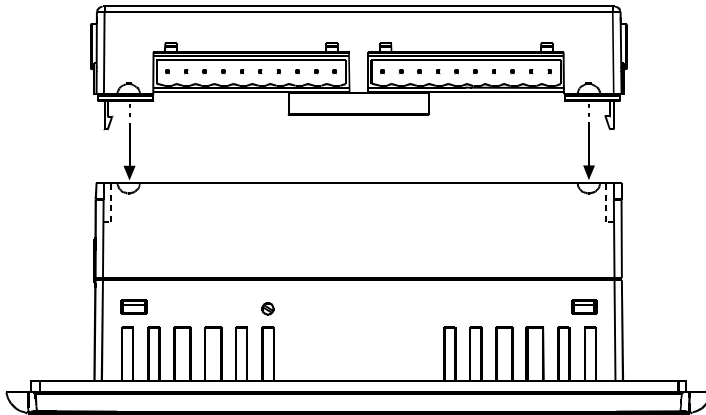
V200-18-E62B Technical Specifications

Digital Inputs

Number of inputs	30 (in 3 groups)
Input type	pnp (source) or npn (sink)
Galvanic isolation	
Digital inputs to bus	Yes
Digital inputs to digital inputs in same group	No
Group to group, digital inputs	Yes
Nominal input voltage	24VDC
Input voltage	
pnp (source)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1'
Input current	6mA@24VDC for inputs 4 to 29 10.8mA@24VDC for inputs 0 to 3
Response time	10mSec typical
High-speed inputs	Specifications below apply when these inputs are wired for use as a high-speed counter input/shaft encoder. See Notes 1 and 2.
Resolution	32-bit

Frequency	HSC	Shaft Encoder
	100kHz maximum	50kHz maximum

Minimum pulse width	4µs

Notes:

1. Inputs 0 and 2 can each function as either high-speed counter or as part of a shaft encoder. In each case, high-speed input specifications apply. When used as a normal digital input, normal input specifications apply.
2. Inputs 1 and 3 can each function as either counter reset, or as a normal digital input; in either case, its specifications are those of a normal digital input. These inputs may also be used as part of a shaft encoder. In this case, high-speed input specifications apply.

Digital Outputs

Digital Output's Power Supply

Nominal operating voltage	24VDC
Operating voltage	20.4 to 28.8VDC
Quiescent current	20mA@24VDC.
Max. current consumption	80mA@24VDC. See Note 3.
Galvanic isolation	
Digital power supply to bus	Yes
Digital power supply to transistor outputs	No

Notes:

3. Maximum current consumption does not provide for pnp output requirements. The additional current requirement of pnp outputs must be added.

Transistor Outputs

Number of outputs	30 (in three groups). See Note 4.
Output type	
Outputs #0 and #1	pnp: P-MOSFET (open drain)
	npn: N-MOSFET (open drain)
	Each can be individually set as pnp (source) or npn (sink) via wiring and jumper settings
Outputs #2 to #29	pnp: P-MOSFET (open drain)
Galvanic isolation	
Transistor outputs to bus	Yes
Transistor outputs to transistor outputs	No
Group to group	Yes
Output current	pnp: 0.5A maximum per output, total maximum current for each group: 3A.
	npn: 50mA maximum per output
Maximum frequency	<u>Resistive load</u>
	50Hz
	<u>Inductive load</u>
	0.5Hz
High-speed output maximum frequency (resistive load). See Note 5	pnp: 0.5kHz
	npn: 100kHz
ON voltage drop	pnp: 0.5VDC maximum
	npn: 0.4VDC maximum
Short circuit protection	Yes (pnp only)
Short circuit indication	Via software (pnp only)
Voltage reference	
pnp (source)	See Digital Output's Power Supply above
npn (sink)	3.5V to 28.8VDC, unrelated to the voltage of either the I/O module or the controller

Notes:

4. Outputs #0, 1, 2, 3, 4, 5, 6, 7,8 and 9 share a common power signal and a common 0V. Outputs #10,11,12,13,14,15,16,17,18 and 19 share a common power signal and a common 0V. Outputs #20,21,22,23,24,25,26,27,28 and 29 share a common power signal and a common 0V.

5. Output #0 and 1 may be used as high-speed outputs.

Analog Inputs

Number of inputs	2
Type of input	Set via appropriate wiring and jumper settings. See Note 6.
Isolation	None

Analog Inputs

Input range	0-10V, 0-20mA , 4-20mA
Conversion method	Succesive approximation
Resolution, except 4-20mA	10-bit (1024 units)
Resolution at 4-20mA	204-1023 (820 units)
Conversion time	Synchronized to scan time
Input impedance	>100kΩ—voltage
	500Ω—current
Absolute maximum rating	±15V—voltage
	±30mA, 15V—current
Full-scale error	±3 LSB (0.3%)
Linearity error	±3 LSB (0.3%)
Status indication	Yes. See Note 7.

Notes:

6. Inputs AN0 and AN1 may be wired to work with either current or voltage.

7. The analog value can indicate a fault:

Value: 10-bit	Possible Cause
1024	Deviates above the input range

Environmental   IP20 / NEMA1

Operating temperature	0° to 50°C (32° to 122°F)
Storage temperature	-20° to 60°C (-4° to 140°F)
Relative Humidity (RH)	10% to 95% (non-condensing)
Dimensions (WxHxD)	138x23x123mm (5.43x0.9x4.84")
Weight	140g (4.94oz)