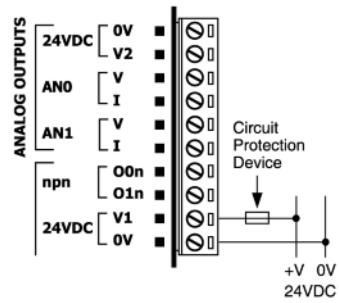
Digital Outputs

Wiring Power Supplies

Use a 24VDC power supply for both relay and transistor outputs.

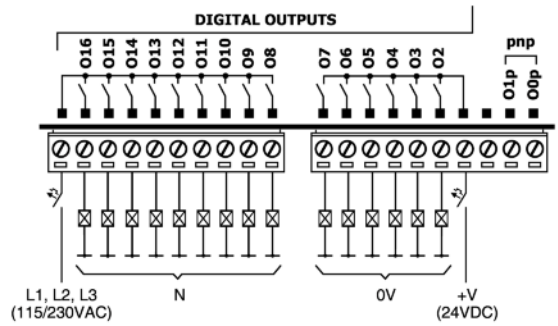
1. Connect the "positive" lead to the "V1" terminal, and the “negative” lead to the "0V" terminal.

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



Relay Outputs

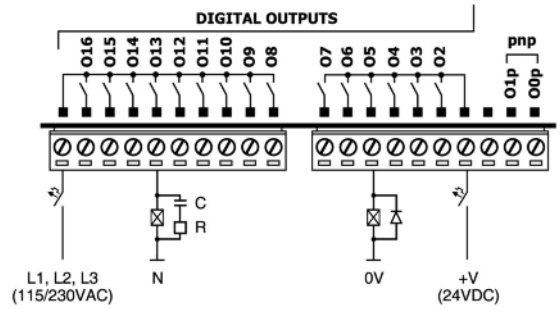
- Each group can be wired separately to either AC or DC as show.
- The 0V signal of the relay outputs is isolated from the controller’s 0V signal.



Increasing Contact Life Span

To increase the life span of the relay output contacts and protect the device from potential damage by reverse EMF, connect:

- a clamping diode in parallel with each inductive DC load,
- an RC snubber circuit in parallel with each inductive AC load.



V200-18-E6B Technical Specifications

Digital Inputs

Number of inputs	18 (in two 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 17 8.8mA@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	10kHz maximum
Minimum pulse width	40µs

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	5mA@24VDC.
Max. current consumption	85mA@24VDC. See Note 3.
Galvanic isolation	
Digital power supply to bus	Yes
Digital power supply to relay outputs	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.

Relay Outputs

Number of outputs	15 relays (in two groups). See Note 4.
Output type	SPST-NO (Form A)
Isolation	By relay
Type of relay	Tyco PCN-124D3MHZ or compatible
Outputs' power supply	See Digital Output's Power Supply page 11.
Galvanic isolation	
Relay outputs to bus	Yes
Group to group, relay outputs	Yes
Relay to transistor outputs	Yes
Output current	3A maximum per output (resistive load) 8A maximum total for common (resistive load)
Rate voltage	250VAC / 30VDC
Minimun load	1mA@5VDC
Life expectancy	100k operations at maximum load
Response time	10mS (typical)
Contact protection	External precautions required (see Increasing Contact Life Span, p.4)

Notes:

4. Outputs 2, 3, 4, 5, 6 and 7 share a common signal. Outputs 8, 9, 10, 11, 12, 13, 14, 15 and 16 share a common signal.

Transistor Outputs/H.S.O.

Number of outputs	2, high-speed. Each can be individually wired as pnp (source) or npn (sink).
Output type	pnp: P-MOSFET (open drain) npn: N-MOSFET (open drain)
Galvanic isolation	
Transistor outputs to bus	Yes
Transistor outputs to transistor outputs	No
Transistor outputs to relay outputs	Yes
Output current	pnp: 0.5A maximum per output npn: 50mA maximum per output
Maximum frequency	Resistive load pnp: 0.5kHz npn: 50kHz Inductive load 0.5Hz
ON voltage drop	pnp: 0.5VDC maximum npn: 0.4VDC maximum
Short circuit protection	Yes (pnp only)
Voltage reference	
pnp (source)	See Digital Output's Power Supply page 11
npn (sink)	3.5V to 28.8VDC, unrelated to the voltage of either the I/O module or the controller

Analog/RTD/TC Inputs

Number of inputs	5
Type of input	Set via appropriate wiring and jumper settings. See Note 5.
Isolation	None

Analog Inputs

	AN0-AN2 (10-bit)	AN3-AN4 (14-bit)
Input range	0-10V, 0-20mA , 4-20mA	0-10V, 0-20mA , 4-20mA
Conversion method	Succesive approximation	Voltage to frequency
Normal mode		
Resolution, except 4-20mA	10-bit (1024 units)	14-bit (16384 units)
Resolution at 4-20mA	204-1023 (820 units)	3277 to 16384 (13107 units)
Conversion time	Synchronized to scan time	100mSec minimum per input (according to filter type)
Fast Mode		
Resolution, except 4-20mA	—	12-bit (4096 units)
Resolution at 4-20mA	—	819 to 4095 (3277 units)
Conversion time	—	30mSec minimum per input (according to filter type)
Input impedance	>100kΩ—voltage 500Ω—current	12.77kΩ —voltage 37Ω —current
Absolute maximum rating	±15V—voltage ±30mA, 15V—current	±15V—voltage ±30mA, 1.1V—current
Full-scale error	±3 LSB (0.3%)	±0.4%
Linearity error	±3 LSB (0.3%)	±0.04%
Status indication	Yes. See Note 6.	Yes. See Note 7.

Notes:

5. Inputs 0 to 2 may be wired to work with either current or voltage.
   Inputs 3 and 4 can function as either analog, RTD, or thermocouple.
6. The analog value can indicate a fault:

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

7. The analog value can indicate faults:

Value: 12-bit	Value: 14-bit	Possible Cause
-1	-1	Deviates slightly below the input range
4096	16384	Deviates slightly above the input range
32767	32767	Deviates greatly above or below the input range

RTD Inputs

Input range	-200 to 600°C/-328 to 1100°F. 1 to 320Ω. See Note 8.
RTD type	PT100
Temperature coefficient α	385/392
Conversion method	Voltage to frequency
Resolution	0.1°C/0.1°F
Conversion time	300mS minimum per channel, depending on software filter type
Input impedance	>10MΩ
Auxillary current for PT100	150µA typical
Full-scale error	±0.4%
Linearity error	±0.04%
Status indication	Yes. See Note 9.

Notes:

8. The device can also measure resistance with the range of 1-320Ω at a resolution of 0.1Ω.
9. The analog value can indicate faults:

Value	Possible Cause
32767	Sensor is not connected to input, or value exceeds permissible range
-32767	Sensor is short-circuited

Thermocouple Inputs

Input range	See Note 10.
Conversion method	Voltage to frequency
Resolution	0.1°C/0.1°F maximum
Conversion time	100mS minimum per channel, depending on software filter type
Input impedance	>10MΩ
Cold junction compensation	Local, automatic
Cold junction compensation error	±1.5°C/±2.7°F maximum
Absolute maximum rating	±0.6VDC
Full-scale error	±0.4%
Linearity error	±0.04%
Warm-up time	½ hour typically, ±1°C/±1.8°F repeatability
Status indication	None

Notes:

10. The device can also measure voltage within the range of -5 to 56mV, at a resolution of 0.01mV. The device can also measure raw value frequency at a resolution of 14-bits (16384). Input ranges are shown in the following table:

Table 1: Thermocouple input ranges

Type	Temperature range	Wire Color	
		ANSI (USA)	BS 1843 (UK)
mV	-5 to 56mV	-	-
B	200 to 1820°C (300 to 3276°F)	+Grey -Red	+None -Blue
E	-200 to 750°C (-328 to 1382°F)	+Violet -Red	+Brown -Blue
J	-200 to 760°C (-328 to 1400°F)	+White -Red	+Yellow -Blue
K	-200 to 1250°C (-328 to 2282°F)	+Yellow -Red	+Brown -Blue
N	-200 to 1300°C (-328 to 2372°F)	+Orange -Red	+Orange -Blue
R	0 to 1768°C (32 to 3214°F)	+Black -Red	+White -Blue
S	0 to 1768°C (32 to 3214°F)	+Black -Red	+White -Blue
T	-200 to 400°C (-328 to 752°F)	+Blue -Red	+White -Blue

Analog Outputs

Analog Output's Power Supply

Nominal operating voltage	24VDC
Operating voltage	20.4 to 28.8VDC
Quiescent current	30mA@24VDC
Max. current consumption	80mA@24VDC
Galvanic isolation	
Analog power supply to bus	Yes
Analog power supply to analog outputs	No

Analog Outputs

Number of outputs	2 (single-ended)
Output range	0-10V, 4-20mA. See Note 11.
Resolution	12-bit (4096 units)
Conversion time	Synchronized to scan time
Load impedance	1kΩ minimum—voltage 500Ω maximum—current
Galvanic isolation	
Analog outputs to bus	Yes
Analog output to analog output	No
Linearity error	±0.1%
Operational error limits	±0.2%

Notes:

11. Note that the range of each I/O is defined by wiring and within the controller's software.

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)

About Unitronics

Unitronics has been producing PLCs, automation software and accessory devices since 1989.

Unitronics' OPLC controllers combine full-function PLCs and HMI operating panels into single, compact units. These HMI + PLC devices are programmed in a single, user-friendly environment. Our clients save I/O points, wiring, space, and programming time; elements that translate directly into cost-efficiency.

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