

This guide provides specifications for Unitronics' model V130-33-TA24. General features include: 12 pnp/npn Digital, including 2 Analog, 2 PT100/TC, 1 HSC/Shaft-encoder Inputs, 10 pnp Outputs, I/O Expansion Port, built-in RS232/RS485. Ports available by separate order: Ethernet, additional RS232/RS485, CANbus.

You can find additional information, such as wiring diagrams, in the product's installation guide located on the Unitronics' Setup CD and in the Technical Library at www.unitronics.com.

Technical Specifications

Power Supply

Input voltage	24VDC
Permissible range	20.4VDC to 28.8VDC with less than 10% ripple
Max. current consumption	TBD
Typical power consumption	TBD

Digital Inputs

Number of inputs	12. See Note 1
Input type	See Note 1
Galvanic isolation	None
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	3.7mA@24VDC
Input impedance	6.5KΩ
Response time	10mSec typical, when used as normal digital inputs
Input cable length	Up to 100 meters, unshielded
High speed inputs	Specifications below apply when wired as HSC / shaft-encoder. See Note 1.
Resolution	32-bit
Frequency	10kHz maximum
Minimum pulse width	40μs

Notes:

This model comprises a total of 12 inputs. Input functionality can be adapted as follows

- All 12 inputs may be used as digital inputs. They may be wired in a group via a single jumper as either npn or pnp. In addition, according to jumper settings and appropriate wiring:
 - Inputs 5 and 6 can function as either digital or analog inputs.
 - Input 0 can function as a high-speed counter, as part of a shaft-encoder, or as normal digital inputs.
 - Input 1 can function as either counter reset, normal digital input, or as part of a shaft-encoder.
 - Inputs 9 and 10 can function as either digital, thermocouple, or PT100 inputs; Input 11 can also serve as the CM signal for PT100.

Digital Outputs

Number of outputs	10 pnp source
Output type	P-MOSFET (open drain)
Isolation	None
Output current (resistive load)	0.5A maximum per output 3A maximum total for common
Maximum frequency	50Hz (resistive load) 0.5Hz (inductive load)
HSO maximum frequency	2kHz (resistive load). See Note 2
Short circuit protection	Yes
Short circuit indication	Via software
On voltage drop	0.5VDC maximum
Power supply for outputs	
Operating voltage	20.4 to 28.8VDC
Nominal voltage	24VDC

Notes:

2. Outputs 0 to 4 can be used as high-speed outputs.

Analog Inputs

Number of inputs	2, according to wiring as described above in Note 1.	
Input type	Multi-range inputs: 0-10V, 0-20mA, 4-20mA	
Input range	0-20mA, 4-20mA	0-10VDC
Input impedance	12.77k Ω	37 Ω
Maximum input rating	30mA, 1.1V	\pm 15V
Galvanic isolation	None	
Conversion method	Voltage to frequency	
Normal mode		
Resolution, except 4-20mA	14-bit (16383 units)	
Resolution, at 4-20mA	3277 to 16383 (13107 units)	
Conversion 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)	
Full-scale error	\pm 0.4%	
Linearity error	\pm 0.04%	
Status indication	Yes. See Note 3.	

Notes:

3. The analog value can indicate faults as shown below:

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.
Isolation	None
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 4.

Notes:

4. The analog value can indicate faults as shown below:

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 5.
Isolation	None
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:

5. 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:

Type	Temp. Range	Type	Temp. Range
mV	-5 to 56mV	N	-200 to 1300°C (-328 to 3214°F)
B	200 to 1820°C (300 to 3276°F)	R	0 to 1768°C (32 to 3214°F)
E	-200 to 750°C (-328 to 1382°F)	S	0 to 1768°C (32 to 3214°F)
J	-200 to 760°C (-328 to 1400°F)	T	-200 to 400°C (-328 to 752°F)
K	-200 to 1250°C (-328 to 2282°F)		

Analog Outputs

Number of outputs	2
Output range	0-10V, 4-20mA. See Note 6.
Resolution	12-bit (4096 units)
Conversion time	Synchronized to scan time.
Load impedance	1k Ω minimum—voltage 500 Ω maximum—current
Galvanic isolation	None
Linearity error	$\pm 0.1\%$
Operational error limits	$\pm 0.2\%$

Notes:

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

Graphic Display Screen

LCD Type	STN, LCD display
Illumination backlight	White LED, software-controlled
Display resolution	128x64 pixels
Screen contrast	Via software (Store value to SI 7). Refer to VisiLogic Help topic Setting LCD Contrast.

Keyboard

Number of keys	20 keys, including 10 user-labeled keys
Key type	Metal dome, sealed membrane switch
Slides	Slides may be installed in the operating panel faceplate to custom-label the keys and logo picture. A complete set of blank slides is available by separate order.

Program

Memory size Application Logic – 512kb, Images – 156 kb, Fonts – 128 kb

Operand type	Quantity	Symbol	Value
Memory Bits	4096	MB	Bit (coil)
Memory Integers	2048	MI	16-bit signed/unsigned
Long Integers	256	ML	32-bit signed/unsigned
Double Word	64	DW	32-bit unsigned
Memory Floats	24	MF	32-bit signed/unsigned
Timers	192	T	32-bit
Counters	24	C	16-bit

Data Tables 120K dynamic data (recipe parameters, datalogs, etc.),
192K fixed data (read-only data, ingredient names, etc)

HMI displays	Up to 1024
Execution time	TBD
Program scan time	20 μ S per 1kb of typical application

Communication Ports

Port 1	1 channel, RS232/RS485. See Note 7.
Galvanic isolation	No
Baud rate	300 to 115200 bps
RS232	
Input voltage	±20VDC absolute maximum
Cable length	15m maximum (50 feet)
RS485	
Input voltage	-7 to +12VDC differential maximum
Cable type	Shielded twisted pair, in compliance with EIA 485
Cable length	1200m maximum (4000 feet)
Nodes	Up to 32
Port 2 (optional)	See Note 8.
CANbus (optional)	See Note 8.

Notes:

- This model is supplied with a serial port: RS232/RS485 (Port 1). The standard is set to either RS232 or RS485 according to jumper settings. Refer to the product's Installation Guide.
- The user may order and install one or both of the following modules:
 - An additional port (Port 2). Available port types are: RS232/RS485 and Ethernet
 - A CANbus port
 For port module specifications, refer to DIG-V100-COM.pdf

I/O Expansion Port

Expansion modules	Via adapter, use up to 8 I/O Expansion Modules comprising up to 128 additional I/Os. Number of I/Os and types vary according to module.
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Miscellaneous

Clock (RTC)	Real-time clock functions (date and time).
Battery back-up	7 years typical at 25°C, battery back-up for RTC and system data, including variable data.
Battery replacement	Yes. Coin-type 3V, lithium battery, CR2450

Dimensions

Size	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 9.
Weight	TBD

Notes:

- For exact dimensions, refer to the product's Installation Guide.

Environment

Operational 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)
Mounting method	Panel mounted (IP65/NEMA4X) DIN-rail mounted (IP20/NEMA1)

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