Vision™ OPLC™

V350-35-TR6/V350-J-TR6
Technical Specifications

The Unitronics V350-35-TR6/V350-J-TR6 offers the following onboard I/Os:

- 8 Digital Inputs, configurable via wiring to include 2 Analog (current/voltage) and 1 HSC/Shaft-encoder Input
- 4 Analog Inputs (current)
- 6 Relay Outputs
- 2 high-speed npn Transistor Outputs

I/O configurations can be expanded to include up to 512 I/Os via Expansion Modules.
Available by separate order: Ethernet, additional RS232/RS485, CANbus, Profibus Slave.

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	See Note 1
npn inputs	207mA@24VDC
pnp inputs	183mA@24VDC

Notes:

1. To calculate the actual power consumption, subtract the current for each unused element from the maximum current consumption value according to the values below:

Backlight	Ethernet card	Relay Outputs (per output)
10mA	35mA	8mA

Digital Inputs

Number of inputs	8. See Note 2	
Input type	See Note 2	
Galvanic isolation	None	
Nominal input voltage	24VDC	
Input voltage	Normal digital input	High Speed Input. See Note 3
pnp (source)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'	0-3VDC for Logic '0' 20.4-28.8VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1	20.4-28.8VDC for Logic '0' 0-3VDC for Logic '1
Input current	I0, I1: 5.4mA@24VDC I2-I7: 3.7mA@24VDC	
Input impedance	I0, I1: 4.5KΩ I2-I7: 6.5KΩ	
Response time	10mS typical, when used as normal digital input	
Input cable length		
Normal digital input	Up to 100 meters	
High Speed Input	Up to 50 meters, shielded, see Frequency table below	

High speed inputs Specifications below apply when wired as HSC/shaft-encoder. See Note 2

Frequency, HSC

Driver type	pnp/npn	Push-pull
Cable length (max.)		
10m	95kHz maximum	200kHz maximum
25m	50kHz maximum	200kHz maximum
50m	25kHz maximum	200kHz maximum

Frequency, Shaft-encoder

Driver type	pnp/npn	Push-pull
Cable length (max.)		
10m	35kHz maximum	100kHz maximum
25m	18kHz maximum	100kHz maximum
50m	10kHz maximum	100kHz maximum

Duty cycle	40-60%
Resolution	32-bit

Notes:

2. This model comprises a total of 12 inputs. Input functionality can be adapted as follows: 8 inputs may be used as digital inputs. They may be wired, in a group, and set to either npn or pnp via a single jumper. 4 inputs may be used as analog inputs, current (AN2-AN5).

   In addition, according to jumper settings and appropriate wiring:
   - Inputs 6 and 7 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 a normal digital input.
   - Input 1 can function as either counter reset, as part of a shaft-encoder, or as a normal digital input.
   - If input 0 is set as a high-speed counter (without reset), input 1 can function as a normal digital input.
3. pnp/npn maximum frequency is at 24VDC.

Analog Inputs (current/voltage)

Number of inputs	2, according to wiring as described above in Note 2	
Input type	Multi-range inputs: 0-10V, 0-20mA, 4-20mA	
Input range	0-20mA, 4-20mA	0-10VDC
Input impedance	243Ω	>150KΩ
Maximum input rating	25mA, 6V	15V
Galvanic isolation	None	
Conversion method	Succesive approximation	
Resolution (except 4-20mA)	10-bit (1024 units)	
Resolution (at 4-20mA)	204 to 1023 (820 units)	
Conversion time	One configured input is updated per scan. See Note 4	
Precision	0.9%	
Status indication	Yes – if an analog input deviates above the permissible range, its value will be 1024.	

Analog Inputs (current)

Number of inputs	4 (AN2-AN5)
Input range	0-20mA, 4-20mA
Input impedance	243Ω
Maximum input rating	25mA, 6V
Galvanic isolation	None
Conversion method	Successive approximation
Resolution (except 4-20mA)	10-bit (1024 units)
Resolution (at 4-20mA)	204 to 1023 (820 units)
Conversion time	One configured input is updated per scan. See Note 4
Precision	0.9%
Status indication	Yes – if an analog input deviates above the permissible range, its value will be 1024

Notes:

4. For example, if 6 inputs are configured as analog, it takes 6 scans to update all analog values.

Relay Outputs

Number of outputs	6 relay
Output type	SPST-NO (Form A)
Isolation	By relay
Type of relay	Fujitsu, JY-24H-K or compatible
Output current	5A maximum (resistive load)
Rated voltage	250VAC / 30VDC
Minimum load	10mA, 5VDC
Life expectancy	50k operations at maximum load
Response time	10ms (typical)
Contact protection	External precautions required (see *Increasing Contact Life Span* in the product's Installation Guide)

Transistor Outputs

Number of outputs	2 npn (sink). See Note 5
Output type	N-MOSFET, (open drain)
Galvanic Isolation	None
Maximum output current (resistive load)	100mA per output
Rated voltage	24VDC
Maximum delay OFF to ON	1μS
Maximum delay ON to OFF	10μS
HSO freq. range with resistive load	5Hz-200kHz (at maximum load resistance of 1kΩ)
Maximum ON voltage drop	1VDC
Short-circuit protection	None
Voltage range	3.5V to 28.8VDC

Notes:

5. Outputs 6 and 7 share a common 0V signal.
   The 0V signal of the output must be connected to the controller's 0V.

Graphic Display Screen

LCD Type	TFT, LCD display
Illumination backlight	White LED, software-controlled
Display resolution	320x240 pixels
Viewing area	3.5"
Colors	65,536 (16-bit)
Touchscreen	Resistive, analog
'Touch' indication	Via buzzer
Screen brightness control	Via software (Store value to SI 9)
Virtual Keypad	Displays virtual keyboard when the application requires data entry

Keypad

Number of keys	5 programmable function keys
Key type	Metal dome, sealed membrane switch
Slides	Slides may be installed in the operating panel faceplate to custom-label the keys. Refer to V350 Keypad Slides.pdf Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set

Program

Memory size: Application Logic – 512kb, Images – 6Mb, 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
Fast Bits	1023	XB	Fast Bits (coil) – not retained
Fast Integers	512	XI	16 bit signed/unsigned (fast, not retained)
Fast Long Integers	256	XL	32 bit signed/unsigned (fast, not retained)
Fast Double Word	64	XDW	32 bit unsigned (fast, not retained)
Timers	384	T	Res. 10 ms; max 99h, 59 min, 59.99 s
Counters	24	C	32 bit

Data Tables	120K dynamic data (recipe parameters, datalogs, etc.) 192K fixed data (read-only data, ingredient names, etc) Expandable via SD card. See Removable Memory below
HMI displays	Up to 1024
Program scan time	15µS per 1kb of typical application

Removable Memory

Micro SD card	Compatible with standard SD and SDHC; up to 32GB store datalogs, Alarms, Trends, Data Tables, backup Ladder, HMI, and OS. See Note 6

Notes:

6. User must format via Unitronics SD tools utility.

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')
RS485	
Input voltage	-7 to +12VDC differential maximum
Cable type	Shielded twisted pair, in compliance with EIA 485
Cable length	1200m maximum (4000')
Nodes	Up to 32
Port 2 (optional)	See Note 8
CANbus (optional)	See Note 8

Notes:

7. 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.
8. The user may order and install one or both of the following modules:
   - An additional port (Port 2). Available port types: RS232/RS485 isolated/non-isolated, Ethernet.
   - A CANbus port.
   Port module documentation is available on the Unitronics website.

I/O Expansion

	Additional I/Os may be added. Configurations vary according to module. Supports digital, high-speed, analog, weight and temperature measurement I/Os.
Local	Via I/O Expansion Port. Integrate up to 8 I/O Expansion Modules comprising up to 128 additional I/Os. Adapter required (P.N. EX-A2X).
Remote	Via CANbus port. Connect up to 60 adapters to a distance of 1000 meters from controller; and up to 8 I/O expansion modules to each adapter (up to a total of 256 I/Os). Adapter required (P.N. EX-RC1).

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	V350	109x114.1x68mm (4.29x4.49x2.67"). See Note 9
	V350-J	109x114.1x66mm (4.92x4.49x2.59"). See Note 7
Weight		300g (10.5oz)

Notes:

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

Environment

Operational temperature	0 to 50ºC (32 to 122ºF)
Storage temperature	-20 to 60ºC (-4 to 140ºF)
Relative Humidity (RH)	10% to 95% (non-condensing)
Mounting method	Panel mounted (IP65/66/NEMA4X)
	DIN-rail mounted (IP20/NEMA1)

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