

Vision™ OPLC™

V350-35-TA24, V350-S-TA24

V350-J-TA24, V350-JS-TA24

Technical Specifications

The Unitronics V350-35-TA24, V350-S-TA24, V350-J-TA24, V350-JS-TA24 offers the following onboard I/Os:

- 12 Digital Inputs, configurable via wiring to include 2 Analog, 2 PT100/TC, and 1 HSC/ Shaft-encoder Input
- 10 Transistor Outputs, 2 Analog 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.

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 | 240mA@24VDC |
| pnp inputs | 200mA@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) | All Analog Outputs, voltage/current |
|------------------|----------------------|---------------------------------------|--|
| 20mA | 35mA | 5mA | 48mA/30mA* |

*If the analog outputs are not configured, then subtract the higher value.

Digital Inputs

| | |
|-----------------------|--|
| Number of inputs | 12. See Note 2 |
| Input type | See Note 2 |
| 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 | 10ms typical, when used as normal digital inputs |
| 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 (max)

See Note 3

| Cable length (max.) | HSC | Shaft-encoder pnp | Shaft-encoder npn |
|---------------------|-------|-------------------|-------------------|
| 10m | 30kHz | 20kHz | 16kHz |
| 25m | 25kHz | 12kHz | 10kHz |
| 50m | 15kHz | 7kHz | 5kHz |

Duty cycle 40-60%

Resolution 32-bit

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.
 - If input 0 is set as a high-speed counter (without reset), input 1 can function as a normal digital input.
 - Inputs 7-8 and 9-10 can function as digital, thermocouple, or PT100 inputs; input 11 can also serve as the CM signal for PT100.
- pnp/npn maximum frequency is at 24VDC.

Analog Inputs

| | | |
|--------------------------------------|---|---------|
| 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 | 37Ω | 12.77kΩ |
| Maximum input rating | 30mA, 1.1V | ±15V |
| Galvanic isolation | None | |
| Conversion method | Voltage to frequency | |
| Normal mode | | |
| Resolution, except 4-20mA | 14-bit (16384 units) | |
| Resolution, at 4-20mA | 3277 to 16383 (13107 units) | |
| Conversion time | 100ms minimum per channel. See Note 4 | |
| Fast mode | | |
| Resolution, except 4-20mA | 12-bit (4096 units) | |
| Resolution, at 4-20mA | 819 to 4095 (3277 units) | |
| Conversion time | 30ms minimum per channel. See Note 4 | |
| Accuracy (0° to 50°C / -30° to 60°C) | ±0.5% / ±0.9% | |
| Status indication | Yes. See Note 5 | |

Notes:

4. Conversion times are accumulative and depend on the total number of analog inputs configured. For example, if only one analog input (fast mode) is configured, the conversion time will be 30ms; however, if two analog (normal mode) and two RTD inputs are configured, the conversion time will be 100ms + 100ms + 300ms + 300ms = 800ms.
5. 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

| | |
|--------------------------------------|---|
| RTD Type | PT100 |
| Temperature coefficient α | 0.00385/0.00392 |
| 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. See Note 4 above |
| Input impedance | >10MΩ |
| Auxillary current for PT100 | 150μA typical |
| Accuracy (0° to 50°C / -30° to 60°C) | ±0.5% / ±0.9% |
| Status indication | Yes. See Note 6 |

Notes:

6. 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 7 |
| Isolation | None |
| Conversion method | Voltage to frequency |
| Resolution | 0.1°C/ 0.1°F maximum |
| Conversion time | 100ms minimum per channel. See Note 4 above |
| Input impedance | >10MΩ |
| Cold junction compensation | Local, automatic |
| Cold junction compensation error (0° to 50°C / -30° to 60°C) | ±1.5°C / ±3°C maximum |
| Absolute maximum rating | ±0.6VDC |
| Accuracy (0° to 50°C / -30° to 60°C) | ±0.5% / ±0.9% |
| Warm-up time | ½ hour typically, ±1°C/±1.8°F repeatability |
| Status indication | Yes. See Note 6 above |

Notes:

7. 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 2372°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) | | |

Digital Outputs

| | |
|------------------------------------|--|
| Number of outputs | 10 transistor pnp (source) |
| Output type | P-MOSFET (open drain) |
| Isolation | None |
| Output current (resistive load) | 0.5A maximum per output 3A maximum total per common |
| Maximum frequency | 50Hz (resistive load) 0.5Hz (inductive load) |
| PWM maximum frequency | 0.5KHz (resistive load). See Note 8 |
| 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:

8. Outputs 0 to 4 can be used as PWM outputs.

Analog Outputs

| | |
|--------------------------------------|---|
| Number of outputs | 2 |
| Output range | 0-10V, 4-20mA. See Note 9 |
| Resolution | 12-bit (4096 units) |
| Conversion time | Both outputs are updated per scan |
| Load impedance | 1kΩ minimum—voltage 500Ω maximum—current |
| Galvanic isolation | None |
| Accuracy (0° to 50°C / -30° to 60°C) | ±0.3% / ±0.6% |

Notes:

9. 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 | 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 <i>V350 Keypad Slides.pdf</i> . Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set. |

Program

| | | | |
|--------------------|--|--------|---|
| Memory size | Application Logic – 1Mb, Images – 6Mb, Fonts – 512 Kb | | |
| Operand type | Quantity | Symbol | Value |
| Memory Bits | 8192 | MB | Bit (coil) |
| Memory Integers | 4096 | MI | 16-bit signed/unsigned |
| Long Integers | 512 | ML | 32-bit signed/unsigned |
| Double Word | 256 | DW | 32-bit unsigned |
| Memory Floats | 64 | 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 | 32 | 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 10 |
|---------------|--|

Notes:

10. User must format via Unitronics SD tools utility.

Communication Ports

| | |
|--------------------|---|
| Port 1 | 1 channel, RS232/RS485. See Note 11 |
| 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 12 |
| CANbus (optional) | See Note 12 |

Notes:

11. 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.
12. The user may order and install one or both of the following modules:
 - An additional port (Port 2). Available 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 512 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 | 109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 13 |
| | V350-J | 109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 13 |
| Weight | | 227g (8 oz) |

Notes:

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

Environment

| | | |
|-------------------------|---|---|
| Relative Humidity (RH) | 10% to 95% (non-condensing) | |
| Mounting method | Panel mounted (IP65/66/NEMA4X) | |
| | DIN-rail mounted (IP20/NEMA1) | |
| Operational temperature | <u>V350-35-TA24, V350-J-TA24</u> | <u>V350-S-TA24, V350-JS-TA24</u> |
| | 0 to 50°C (32 to 122°F) | -30 to 60°C (-22 to 140°F) |
| Storage temperature | -20 to 60°C (-4 to 140°F) | -30 to 60°C (-22 to 140°F) |

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