

The Unitronics V350-35-T2/V350-J-T2 offers the following onboard I/Os:

- 12 Digital Inputs, configurable via wiring to include 2 Analog and 3 HSC/Shaft-encoder Inputs
- 12 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.

## Technical Specifications

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### 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               | 230mA@24VDC                                  |
| pnp inputs               | 135mA@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:

| <u>Backlight</u> | <u>Ethernet card</u> |
|------------------|----------------------|
| 10mA             | 35mA                 |

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### 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'<br>17-28.8VDC for Logic '1'     |
| npn (sink)            | 17-28.8VDC for Logic '0'<br>0-5VDC for Logic '1'     |
| Input current         | 8mA@24VDC  |
| Input impedance       | 3KΩ  |
| 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 |

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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 |
|---------------------|-------|---------------|
| 10m                 | 30kHz | 20kHz         |
| 25m                 | 30kHz | 13kHz         |
| 50m                 | 25kHz | 9kHz          |

Duty cycle

40-60%

Resolution

32-bit

### **Notes:**

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

In addition, according to jumper settings and appropriate wiring:

- Inputs 10 and 11 can function as either digital or analog inputs.
- Inputs 0, 2, and 4 can function as high-speed counters, as part of a shaft-encoder, or as normal digital inputs.
- Inputs 1, 3, and 5 can function as either counter reset, as part of a shaft-encoder, or as normal digital inputs.
- If inputs 0, 2, 4 are set as high-speed counters (without reset), inputs 1, 3, 5 can function as normal digital inputs.

3. 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

|      |        |
|------|--------|
| 243Ω | >150KΩ |
|------|--------|

Maximum input rating

|          |     |
|----------|-----|
| 25mA, 6V | 15V |
|----------|-----|

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 2 inputs are configured as analog, it takes 2 scans to update all analog values.

**Digital Outputs**

|                                    |  |
|------------------------------------|--|
| Number of outputs                  | 12 transistor pnp (source)                             |
| Output type                        | P-MOSFET (open drain)                                  |
| Isolation                          | None   |
| Output current<br>(resistive load) | 0.5A maximum per output<br>3A maximum total per common |
| Maximum frequency                  | 50Hz (resistive load)<br>0.5Hz (inductive load)        |
| PWM maximum frequency              | 0.5KHz (resistive load). See Note 5                    |
| 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:**

5. Outputs 0 to 6 can be used as PWM outputs.

**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><br>Two sets of slides are supplied with the controller:<br>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.)<br>192K fixed data (read-only data, ingredient names, etc)<br>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.<br>See Note 6 |
|---------------|---|

**Notes:**

- 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:**

- 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: 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 9 |
|        | V350-J | 109 x 114.1 x 66mm (4.29 x 4.49 x 2.67"). See Note 9 |
| Weight |        | 211g (7.44 oz)                                       |

**Notes:**

9. 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 (IP65/66/NEMA4X) |
|                         | DIN-rail mounted (IP20/NEMA1)  |

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