The Unitronics V350-35-R2 offers the following onboard I/Os:
- 12 Digital Inputs, configurable via wiring to include 2 Analog and 3 HSC/Shaft-encoder Inputs
- 6 Relay 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.

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](http://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: 280mA@24VDC
  - pnp inputs: 190mA@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:

<table>
<thead>
<tr>
<th>Backlight</th>
<th>Ethernet card</th>
<th>Relay Outputs (per output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20mA</td>
<td>35mA</td>
<td>8mA</td>
</tr>
</tbody>
</table>

#### Digital Inputs
- **Number of inputs**: 12. See Note 2
- **Input type**: See Note 2
- **Galvanic isolation**: None
- **Nominal input voltage**: 24VDC
- **Input voltage**
  - npn (source): 0-5VDC for Logic ‘0’
    - 17-28.8VDC for Logic ‘1’
  - nnp (sink):
    - 17-28.8VDC for Logic ‘0’
    - 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
High speed inputs Specifications below apply when wired as HSC/shaft-encoder.

See Note 2

<table>
<thead>
<tr>
<th>Frequency (max.)</th>
<th>HSC</th>
<th>Shaft-encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>10m</td>
<td>30kHz</td>
<td>20kHz</td>
</tr>
<tr>
<td>25m</td>
<td>30kHz</td>
<td>13kHz</td>
</tr>
<tr>
<td>50m</td>
<td>25kHz</td>
<td>9kHz</td>
</tr>
</tbody>
</table>

Duty cycle 40-60%

Resolution 32-bit

Notes:
2. 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, 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**: 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)

**Graphic Display Screen**

- **LCD Type**: TFT, LCD display
- **Illumination backlight**: White LED, software-controlled
- **Display resolution**: 320x240 pixels
- **Viewing area**: 3.5"
- **Colors**: 256
- **Touchscreen**: Resistive, analog
- **‘Touch’ indication**: Via buzzer
- **Screen brightness**: Via software (Store value to SI 9)
- **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 – 1Mb, Images – 3Mb, Fonts – 512 Kb
- **Operand type**
<table>
<thead>
<tr>
<th>Quantity</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Bits</td>
<td>8192</td>
<td>MB</td>
</tr>
<tr>
<td>Memory Integers</td>
<td>4096</td>
<td>MI</td>
</tr>
<tr>
<td>Long Integers</td>
<td>512</td>
<td>ML</td>
</tr>
<tr>
<td>Double Word</td>
<td>256</td>
<td>DW</td>
</tr>
<tr>
<td>Memory Floats</td>
<td>64</td>
<td>MF</td>
</tr>
<tr>
<td>Timers</td>
<td>384</td>
<td>T</td>
</tr>
<tr>
<td>Counters</td>
<td>32</td>
<td>C</td>
</tr>
</tbody>
</table>

- **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 fast SD cards; store datalogs, Alarms, Trends, Data Tables, backup Ladder, HMI, and OS.

See Note 5

Notes:
5. User must format via Unitronics SD tools utility.

Communication Ports

Port 1  1 channel, RS232/RS485. See Note 6
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 7
CANbus (optional)  See Note 7

Notes:
6. 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.
7. 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-A1).

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  109 x 114.1 x 68mm (4.29 x 4.49 x 2.67”). See Note 8
Weight  227g (8 oz)

Notes:
8. For exact dimensions, refer to the product’s Installation Guide.
## Environment

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational temperature</td>
<td>0 to 50°C (32 to 122°F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 to 60°C (-4 to 140°F)</td>
</tr>
<tr>
<td>Relative Humidity (RH)</td>
<td>10% to 95% (non-condensing)</td>
</tr>
<tr>
<td>Mounting method</td>
<td>Panel mounted (IP65/NEMA4X)</td>
</tr>
<tr>
<td></td>
<td>DIN-rail mounted (IP20/NEMA1)</td>
</tr>
</tbody>
</table>