

Order Information

Item

| | |
|--------------|--|
| V130-33-TR20 | PLC with Classic panel, Monochrome display 2.4" |
| V130-J-TR20 | PLC with Flat panel, Monochrome display 2.4" |
| V350-35-TR20 | PLC with Classic panel, Color touch display 3.5" |
| V350-J-TR20 | PLC with Flat panel, Color touch display 3.5" |
| V430-J-RH2 | PLC with Flat panel, Color touch display 4.3" |

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

Power Supply

| Item | V130-TR20 V130J-TR20 | V350-TR20 V350J-TR20 | V430J-RH2 |
|--------------------------|--|-------------------------|-------------|
| Input voltage | 24VDC | | |
| Permissible range | 20.4VDC to 28.8VDC with less than 10% ripple | | |
| Max. current consumption | See Note 1 | | |
| npn inputs | 215mA@24VDC | 240mA@24VDC | 280mA@24VDC |
| pnp inputs | 190mA@24VDC | 215mA@24VDC | 190mA@24VDC |

Notes:

- 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) |
|--------------|-----------|---------------|----------------------------|
| V130/J | 10mA | 35mA | 8mA |
| V350/J/V430J | 20mA | 35mA | 8mA |

Digital Inputs

| | | |
|-----------------------|---|--|
| Number of inputs | 12. 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' |
| nnp (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-I5: 5.4mA@24VDC I6-I11: 3.7mA@24VDC (8mA@24VDC for V430J-RH2) | |
| Input impedance | I0-I5: 4.5KΩ I6-I11: 6.5KΩ (3KΩ for V430J-RH2) | |
| 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:

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 (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 | 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.

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 <i>Increasing Contact Life Span</i> in the product's Installation Guide) |

Transistor Outputs (TR20 Only)

| | |
|--|---|
| 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 | 1 μ s |
| Maximum delay ON to OFF | 10 μ s |
| HSO freq. range with resistive load | 5Hz-200kHz (at maximum load resistance of 1k Ω) |
| 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

| Item | V130-TR20 V130J-TR20 | V350-TR20 V350J-TR20 | V430J-RH2 |
|---------------------------|---|---|-------------------|
| LCD Type | STN, LCD display | TFT, LCD display | TFT, LCD display |
| Illumination backlight | White LED | White LED | White LED |
| Display resolution | 128x64 pixels | 320x240 pixels | 480x272 pixels |
| Viewing area | 2.4" | 3.5" | 4.3" |
| Colors | Monochrome | 65,536 (16-bit) | 65,536 (16-bit) |
| Screen Contrast | Via software (Store value to SI 7, values range: 0 to 100%) | Fixed | Fixed |
| Touchscreen | None | Resistive, analog | Resistive, analog |
| 'Touch' indication | None | Via buzzer | Via buzzer |
| Screen brightness control | Via software (Store value to SI 9, 0 = Off, 1 = On) | Via software (Store value to SI 9, values range: 0 to 100%) | |
| Virtual Keypad | None | Displays virtual keyboard when the application requires data entry. | |

Keypad

| Item | V130-TR20 V130J-TR20 | V350-TR20 V350J-TR20 | V430J-RH2 |
|----------------|---|--|-----------|
| Number of keys | 20 keys, including 10 user-labeled 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>V130 Keypad Slides.pdf</i> . A complete set of blank slides is available by separate order | 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. | None |

Program

| Item | V130-TR20 V130J-TR20 | V350-TR20 V350J-TR20 | V430J-RH2 |
|-------------------|-------------------------|-------------------------|-----------|
| Memory size | | | |
| Application Logic | 512KB | 1MB | 1MB |
| Images | 128KB | 6MB | 12MB |
| Fonts | 128KB | 512KB | 512KB |

| Operand type | Quantity | | Symbol | Value |
|--------------------|-------------------------|--------------------------------------|--------|---|
| Item | V130-TR20 V130J-TR20 | V350-TR20 V350J-TR20 V430J-RH2 | | |
| Memory Bits | 4096 | 8192 | MB | Bit (coil) |
| Memory Integers | 2048 | 4096 | MI | 16-bit signed/unsigned |
| Long Integers | 256 | 512 | ML | 32-bit signed/unsigned |
| Double Word | 64 | 256 | DW | 32-bit unsigned |
| Memory Floats | 24 | 64 | MF | 32-bit signed/unsigned |
| Fast Bits | 1024 | 1024 | XB | Fast Bits (coil) – not retained |
| Fast Integers | 512 | 512 | XI | 16 bit signed/unsigned (fast, not retained) |
| Fast Long Integers | 256 | 256 | XL | 32 bit signed/unsigned (fast, not retained) |
| Fast Double Word | 64 | 64 | XDW | 32 bit unsigned (fast, not retained) |
| Timers | 192 | 384 | T | Res. 10 ms; max 99h, 59 min, 59.99s |
| Counters | 24 | 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 | 20µs per 1kb of typical application | 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 and USB device (V430/V350/V350J only). 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 |
| USB device (V430/V350/V350J only) | |
| Port type | Mini-B, See Note 9 |
| Specification | USB 2.0 compliant; full speed |
| Cable | USB 2.0 compliant; up to 3m |
| 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.
 - Note that physically connecting a PC to the controller via USB suspends RS232/RS485 communications via Port 1. When the PC is disconnected, RS232/RS485 resumes.
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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

| Item | | V130-TR20 | V350-TR20 | V430J-RH2 |
|--------|--------|---|---|---|
| | | V130J-TR20 | V350J-TR20 | |
| Size | Vxxx | 109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 10 | 109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 10 | |
| | Vxxx-J | 109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 10 | 109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 10 | 136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41"). See Note 10 |
| Weight | | 297g (10.47 oz) | 317g (11.18 oz) | 350g (12.34 oz) |

Notes:

10. 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) |
| Operating Altitude | 2000m (6562 ft) |
| Shock | IEC 60068-2-27, 15G, 11ms duration |
| Vibration | IEC 60068-2-6, 5Hz to 8.4Hz, 3.5mm constant amplitude, 8.4Hz to 150Hz, 1G acceleration. |

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