# VISION350™

Advanced PLC integrated with a 3.5" color touchscreen. Includes an onboard I/O configuration; expand up to 512 I/Os

## Features:

### HMI

- 1024 user-designed screens
- 250 images per application
- HMI graphs - color-code Trends
- Built-in alarm screens
- Text String Library - easy localization
- Memory and communication monitoring via HMI - No PC needed

### PLC

- I/O options include high-speed, temperature & weight measurement
- Auto-tune PID, up to 24 independent loops
- Recipe programs and datalogging via Data Tables
- Micro SD card - log, backup, clone & more
- Date & Time-based control

### Communication

- TCP/IP via Ethernet
- Web server: Use built-in HTML pages, or design complex pages to view and edit PLC data via the Internet
- Send e-mail function
- SMS messaging
- GPRS/GSM
- Remote Access utilities
- MODBUS protocol support
- CANbus: CANopen, UniCAN, SAE J1939 and more
- DF1 Slave
- SNMP Agent V1
- FB Protocol Utility: enables serial or TCP/IP communications with 3rd-party device; barcode readers, frequency converters, etc
- Ports: supplied with 1 RS232/RS485; 2 ports may be added: 1 Serial/Ethernet/Profibus and 1 CANbus

**V350-J**
Flat Panel

**V350**
Classic Panel

**spectra**

> "There were significant cost savings using the Unitronics PLC."
>
> **Justin Butler,**
> Senior Electrical Engineer at Energy Plant Solutions

# V350

| Article Number | | V350-S-TA24 / V350-JS-TA24 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Classic Panel** | V350-35-B1 | V350-35-TR20 | V350-35-R34 | V350-35-TR34 | V350-35-TR6 | V350-35-RA22 | V350-35-TRA22 | V350-35-T2 | V350-35-T38 | V350-35-TA24 |
| | **Flat Panel** | V350-J-B1 | V350-J-TR20 | V350-J-R34 | V350-J-TR34 | V350-J-TR6 | V350-J-RA22 | V350-J-TRA22 | V350-J-T2 | V350-J-T38 | V350-J-TA24 |
| | | No onboard I/Os | **10** Digital **2** D/A Inputs[1] **6** Relay Outputs **2** High-speed Transistor Outputs | **20** Digital **2** D/A Inputs[1] **12** Relay Outputs | **20** Digital **2** D/A Inputs[1] **8** Relay **4** High speed Transistor Outputs | **6** Digital, **2** D/A **4** Analog Inputs[1] **6** Relay Outputs **2** High-speed Transistor Outputs | **8** Digital, **2** D/A **2** PT100/TC/ Digital[1] Inputs **8** Relay **2** Analog Outputs | **8** Digital, **2** D/A **2** PT100/TC/ Digital[1] Inputs **4** Relay, **2** Analog **4** High-speed Transistor Outputs | **10** Digital **2** D/A Inputs[1] **12** Transistor Outputs | **20** Digital **2** D/A Inputs[1] **16** Transistor Outputs | **8** Digital **2** D/A, **2** PT100/ TC/Digital[1] Inputs **10** Transistor **2** Analog Outputs |

## Inputs

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Digital pnp/npn | None | | **12** | **22** | **22** | **8** | **12** | **12** | **12** | **22** | **12** |
| HSC/Shaft-Encoder/ Max. Freq. Measurer[2&3] | | | **3** 200kHz[4] 32-bit | **3** 30kHz 32-bit | **3** 200kHz[4] 32-bit | **1** 200kHz[4] 32-bit | **1** 30kHz 32-bit | **1** 200kHz[4] 32-bit | **3** 30kHz 32-bit | **2** 30kHz 32-bit | **1** 30kHz 32-bit |
| Analog | | | **2** 10-bit, 0-10V 0-20mA 4-20mA | **2** 10-bit, 0-10V 0-20mA 4-20mA | **2** 10-bit,0-10V 0-20mA 4-20mA | **2** 10-bit, 0-10V 0-20mA, 4-20mA **and** **4** 10-bit, 0-20mA 4-20mA | **2** 14-bit 0-10V, 0-20mA 4-20mA | **2** (2 modes) Normal: 14-bit Fast: 12-bit 0-10V, 0-20mA 4-20mA | **2** 10-bit 0-10V 0-20mA 4-20mA | **2** 10-bit 0-10V 0-20mA 4-20mA | **2** (2 modes) Normal:14-bit Fast: 12-bit 0-10V, 0-20mA, 4-20mA |
| Temperature Measurement | | | None | None | None | None | **and** **2** PT100/TC | **and** **2** PT100/TC | None | None | **and** **2** PT100/TC |

## Outputs

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Digital | None | | **6** relay | **12** relay | **8** relay | **6** relay | **8** relay | **4** relay | **12** pnp | **16** pnp | **10** pnp |
| High-Speed Outputs/PWM | | | **2** npn (2 PTO) 200kHz max | None | **4** npn (3 PTO) 200kHz max | **2** npn (2 PTO) 200kHz max | None | **2** npn (2 PTO) 200kHz max | **7** 0.5kHz | **7** 0.5kHz | **5** 0.5kHz |
| Analog | | | None | None | None | None | **2** 12-bit 0-10V, 4-20mA | **2** 12-bit 0-10V, 4-20mA | None | None | **2** 12-bit 0-10V, 4-20mA |

## I/O Expansion

Local or Remote I/Os may be added via expansion port or via CANbus

## Program

| | |
|---|---|
| Application Memory | Application Logic: 1MB • Images: 6MB • Fonts: 512K |
| Scan Time | 15µ sec per 1K of typical application |
| Memory Operands | 8192 coils, 4096 registers, 512 long integers (32-bit), 256 double words (32-bit unsigned), 64 floats, 384 timers (32-bit), 32 counters Additional non-retainable operands: 1024 X-bits, 512 X-integers, 256 X-long integers, 64 X-double words |
| Data Tables | 120K dynamic RAM data (recipe parameters, datalogs, etc.), up to 256K fixed data |
| SD Card (Micro) | Store datalogs, Alarm History, Data Tables, Trend data, export to Excel • Back up Ladder, HMI & OS, clone PLCs |
| Enhanced Features | Trends: graph any value and display on HMI • String Library: instantly switch HMI language |

## Operator Panel

| | |
|---|---|
| Type & Colors | TFT LCD • 65,536 colors, 16-bit resolution • Brightness- Adjustable via touchscreen or software |
| Display | Resolution: 320 x 240 pixels (QVGA) • Size: 3.5" |
| Touchscreen | Resistive, Analog |
| Keys | 5 programmable keys. Labeling options- function keys, arrows, or customized |

## General

| | |
|---|---|
| Power Supply | 24VDC, except for V350-35-B1, which is 12/24VDC |
| Battery | 7 years typical at 25°C, battery back-up for all memory sections and RTC |
| Clock | Real-time clock functions (date and time) |
| Environment | IP66/IP65/NEMA4X (when panel mounted) |
| Standard | CE, UL Many of our products are also UL Class 1 Div 2 and GOST certified - please contact Unitronics |

# Vision™ OPLC™

**V130/V130J-T38**  Art. No. 117823 / 130992
**V350/V350J-T38**  Art. No. 117967 / 130518
**V430J-T38  Art. No. 142952**
## Technical Specifications

## Order Information

### Item

| | |
|---|---|
| V130-33-T38 | PLC with Classic panel, Monochrome display 2.4" |
| V130-J-T38 | PLC with Flat panel, Monochrome display 2.4" |
| V350-35-T38 | PLC with Classic panel, Color touch display 3.5'' |
| V350-J-T38 | PLC with Flat panel, Color touch display 3.5'' |
| V430-J-T38 | 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-T38<br>V130J-T38 | V350-T38<br>V350J-T38 | V430J-T38 |
|---|---|---|---|
| Input voltage | 24VDC | | |
| Permissible range | 20.4VDC to 28.8VDC with less than 10% ripple | | |
| Max. current consumption | See Note 1 | | |
|    npn inputs | 180mA@24VDC | 205mA@24VDC | 205mA@24VDC |
|    pnp inputs | 115mA@24VDC | 140mA@24VDC | 140mA@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 |
|---|---|---|
| V130/J | 10mA | 35mA |
| V350/J/V430J | 20mA | 35mA |

## Digital Inputs

| | |
|---|---|
| Number of inputs | 22. 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 | 3.7mA@24VDC |
| Input impedance | 3KΩ |
| 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 (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:**

2. V130/V350/V130J/V350J/V430J-T38 models comprise a total of 22 inputs.

   22 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 14 and 15 can function as either digital or analog inputs.
   - Inputs 0 and 2 can function as, high-speed counters, as part of a shaft-encoder, or as normal digital inputs.
   - Inputs 1 and 3 can function as either counter reset, as part of a shaft-encoder, or as normal digital inputs.
   - If inputs 0 and 2 are set as high-speed counters (without reset), inputs 1 and 3 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 | 16 transistor pnp (source) |
| Output type | P-MOSFET (open drain) |
| Isolation | None |
| Output current (resistive load) | 0.5A maximum per output<br>4A 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

| Item | V130-T38<br>V130J-T38 | V350-T38<br>V350J-T38 | V430J-T38 |
|---|---|---|---|
| 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<br>(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<br>(Store value to SI 9,<br>0 = Off, 1 = On) | Via software<br>(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-T38<br>V130J-T38 | V350-T38<br>V350J-T38 | V430J-T38 |
|---|---|---|---|
| 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 *V130 Keypad Slides.pdf.*<br>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 *V350 Keypad Slides.pdf.*<br>Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set. | None |

## Program

| Item | V130-T38<br>V130J-T38 | V350-T38<br>V350J-T38 | V430J-T38 |
|---|---|---|---|
| Memory size | | | |
|    Application Logic | 512KB | 512KB | 512KB |
|    Images | 256KB | 6MB | 12MB |
|    Fonts | 128KB | 1MB | 1MB |

| Operand type | Quantity | | Symbol | Value |
|---|---|---|---|---|
| Item | V130-T38<br>V130J-T38 | V350-T38<br>V350J-T38<br>V430J-T38 | | |
| 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<br>(fast, not retained) |
| Fast Long Integers | 256 | 256 | XL | 32 bit signed/unsigned<br>(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.)<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 | 20µs per 1kb<br>of typical<br>application | 15µs per 1kb<br>of typical<br>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:**

6. User must format via Unitronics SD tools utility.

## Communication Ports

| | |
|---|---|
| Port 1 | 1 channel, RS232/RS485 and USB device (V430 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 only)** | |
|     Port type | Mini-B, See Note 9 |
|     Specification | USB 2.0 complaint; full speed |
|     Cable | USB 2.0 complaint; up to 3m |
| 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.

9. 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). |

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## 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-T38<br>V130J-T38 | V350-T38<br>V350J-T38 | V430J-T38 |
|---|---|---|---|---|
| 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 | | 335g (11.81 oz) | 355g (12.52 oz) | 385g (13.58 oz) |

**Notes:**

10.  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) |
| 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. |

spectra