

# Vision™ PLC+HMI

# User Guide

V130-33-TR6/V130-J-TR6  
V350-35-TR6/V350-J-TR6  
V430-J-RH6

- 8 Digital Inputs, including 2 Analog, 1 HSC/Shaft-encoder inputs
- 6 Relay Outputs
- 4 Analog Inputs (Current)
- 2 high-speed npn Transistor Outputs (TR6 Only)

## General Description

The products listed above are micro-PLC+HMIs, rugged programmable logic controllers that comprise built-in operating panels.

Detailed Installation Guides containing the I/O wiring diagrams for these models, technical specifications, and additional documentation are located in the Technical Library in the Unitronics website:

<https://unitronicsplc.com/support-technical-library/>



| Item  | V130-TR6<br>V130J-TR6  |      | V350-TR6<br>V350J-TR6 |      | V430J-RH6        |
|---|--|------|-----------------------|------|------------------|
| On-board I/O  | Model Dependent  |      |                       |      |                  |
| Screen  | 2.4"   |      | 3.5" Color Touch      |      | 4.3" Color Touch |
| Keypad  | Yes  |      | None                  |      |                  |
| Function Keys   | None   |      | Yes                   |      |                  |
| Com Port, Built-in  |  |      |                       |      |                  |
| RS232/485   | Yes  | Yes  | Yes*                  | Yes* | Yes*             |
| USB device, mini-B  | None   | None | Yes*                  | Yes* | Yes*             |
| Com Ports, separate order, user-installed   | The user may install a CANbus port (V100-17-CAN), and <b>one</b> of the following: <ul style="list-style-type: none"><li>• RS232/RS485 port (V100-17-RS4/V100-17-RS4X)</li><li>• Ethernet (V100-17-ET2)</li><li>• Profibus Slave (V100-17-PB1)</li></ul> |      |                       |      |                  |
| * V430J/V350/V350J comprises both RS232/485 and USB ports; note that only <b>one</b> channel may be used at a time. |  |      |                       |      |                  |

## Standard Kit Contents



| Item                          | V130-TR6<br>V130J-TR6 |  | V350-TR6<br>V350J-TR6 |  | V430J-RH6     |
|-------------------------------|-----------------------|--|-----------------------|--|---------------|
| Controller                    | Yes                   |  |                       |  |               |
| Terminal Blocks               | Yes                   |  |                       |  |               |
| Battery (installed)           | Yes                   |  |                       |  |               |
| Slides (2 sets of key labels) | None                  |  | Yes                   |  | None          |
| Mounting Brackets             | Yes (2 parts)         |  |                       |  | Yes (4 parts) |
| Rubber Seal                   | Yes                   |  |                       |  |               |

## Alert Symbols and General Restrictions



When any of the following symbols appear, read the associated information carefully.

| Symbol   | Meaning | Description   |
|--|---------|---|
|  | Danger  | The identified danger causes physical and property damage.      |
|  | Warning | The identified danger could cause physical and property damage. |
| <i>Caution</i>   | Caution | Use caution.  |

- Before using this product, the user must read and understand this document.
- All examples and diagrams are intended to aid understanding, and do not guarantee operation. Unitronics accepts no responsibility for actual use of this product based on these examples.
- Please dispose of this product according to local and national standards and regulations.
- Only qualified service personnel should open this device or carry out repairs.

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>▪ Failure to comply with appropriate safety guidelines can cause severe injury or property damage.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>▪ Do not attempt to use this device with parameters that exceed permissible levels.</li> <li>▪ To avoid damaging the system, do not connect/disconnect the device when power is on.</li> </ul> |

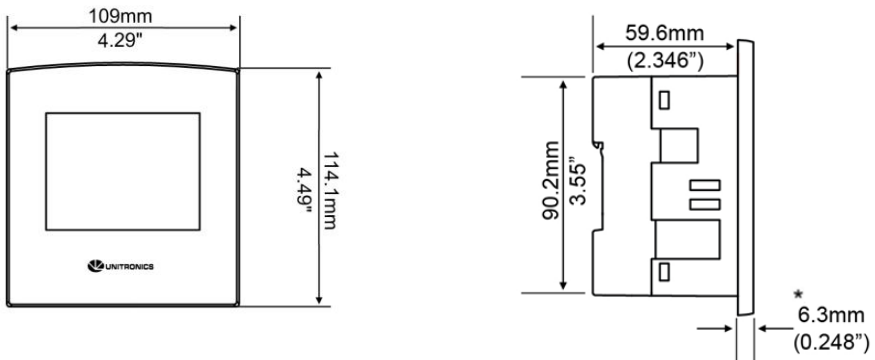
## Environmental Considerations

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>▪ Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration, in accordance with the standards given in the product's technical specification sheet.</li> <li>▪ Do not place in water or let water leak onto the unit.</li> <li>▪ Do not allow debris to fall inside the unit during installation.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>▪ Ventilation: 10mm space required between controller's top/bottom edges &amp; enclosure walls.</li> <li>▪ Install at maximum distance from high-voltage cables and power equipment.</li> </ul>   |

## Mounting

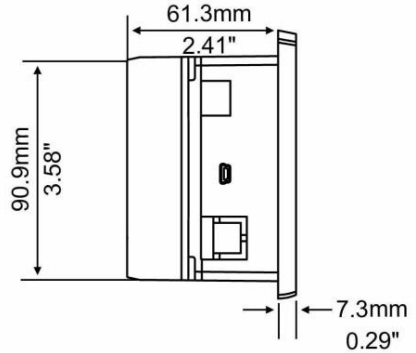
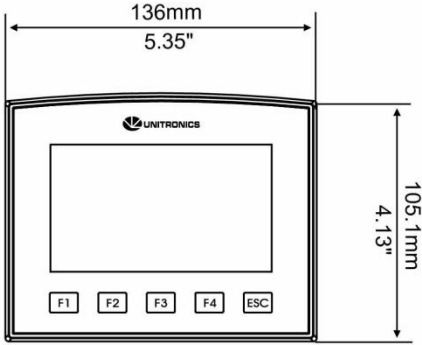
Note that figures are for illustrative purposes only.

### Dimensions: V130/V350/V130J/V350J



\* Note that for models V130/V350, the bezel width is up to 8.4 mm (0.33").

**Dimensions: V430J**



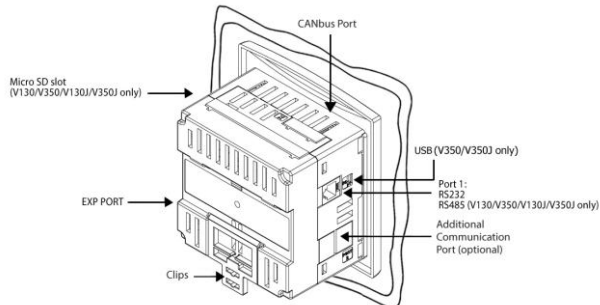
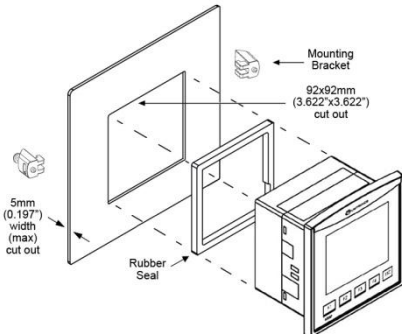
| Model      | Cut-out                    | View area                 |
|------------|----------------------------|---------------------------|
| V130V130J  | 92x92 mm (3.622"x3.622")   | 58x30.5mm (2.28"x1.2")    |
| V350/V350J | 92x92 mm (3.622"x3.622")   | 72x54.5mm (2.95"x2.14")   |
| V430J      | 122.5x91.5 mm (4.82"x3.6") | 96.4x55.2mm (3.79"x2.17") |

**Panel Mounting**

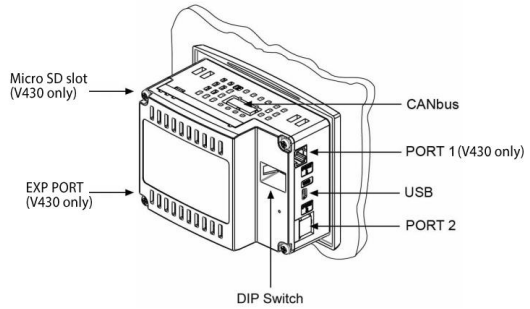
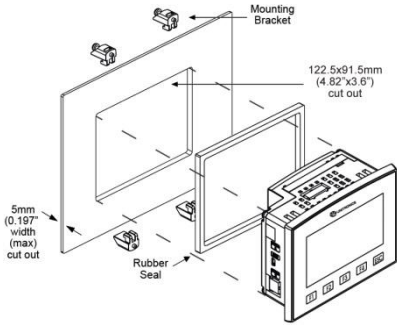
Before you begin, note that the mounting panel cannot be more than 5 mm thick.

1. Make a panel cut-out of the appropriate size:
2. Slide the controller into the cut-out, ensuring that the rubber seal is in place.
3. Push the mounting brackets into their slots on the sides of the panel as shown in the figure below.
4. Tighten the bracket's screws against the panel. Hold the bracket securely against the unit while tightening the screw.
5. When properly mounted, the controller is squarely situated in the panel cut-out as shown in the accompanying figures.

**V130/V350/V130J/V350J**



**V430J**

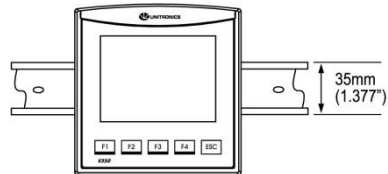


**DIN-rail Mounting (V130/V350/V130J/V350J)**

1. Snap the controller onto the DIN rail as shown in the figure to the right.



2. When properly mounted, the controller is squarely situated on the DIN-rail as shown in the figure to the right.



**UL Compliance**

The following section is relevant to Unitronics' products that are listed with the UL.

The following models: V130-33-R34, V130-J-R34, V130-T4-ZK1, V350-35-RA22, V350-J-RA22, V350-35-R34, V350-J-R34, V430-J-R34 are UL listed for Hazardous Locations.

The following models: V130-33-B1, V130-J-B1, V130-33-TA24, V130-J-TA24, V130-33-T38, V130-J-T38, V130-33-TR20, V130-J-TR20, V130-33-TR34, V130-J-TR34, V130-33-RA22, V130-J-RA22, V130-33-TRA22, V130-J-TRA22, V130-33-T2, V130-J-T2, V130-33-TR6, V130-J-TR6, V130-33-R34, V350-35-B1, V130-T4-ZK1, V350-J-B1, V350-35-TA24, V350-J-TA24, V350-35-T38, V350-J-T38, V350-35-TR20, V350-J-TR20, V350-35-TR34, V350-J-TR34, V350-35-TRA22, V350-J-TRA22, V350-35-T2, V350-J-T2, V350-35-TR6, V350-J-TR6, V350-S-TA24, V350-JS-TA24, V350-35-RA22,

V350-J-RA22,V350-35-R34, V430-J-B1,V430-J-TA24,V430-J-T38, V430-J-R34,V430-J-RH2, V430-J-TR34,V430-J-RA22,V430-J-TRA22,V430-J-T2,V430-J-RH6 are UL listed for Ordinary Location.

For models from series V130, V130-J, V430, that include “T4” or “J4” in the Model name, Suitable for mounting on the flat surface of Type 4X enclosure.  
For examples: V130-T4-R34, V130-J4-R34, V430-J4-T2

### **UL Ordinary Location**

In order to meet the UL ordinary location standard, panel-mount this device on the flat surface of Type 1 or 4 X enclosures


### **UL Ratings, Programmable Controllers for Use in Hazardous Locations,**

#### **Class I, Division 2, Groups A, B, C and D**

These Release Notes relate to all Unitronics products that bear the UL symbols used to mark products that have been approved for use in hazardous locations, Class I, Division 2, Groups A, B, C and D.

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#### ***Caution***

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, or Non-hazardous locations only.
- Input and output wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.
-  **WARNING—Explosion Hazard—**substitution of components may impair suitability for Class I, Division 2.
- **WARNING – EXPLOSION HAZARD –** Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- **WARNING –** Exposure to some chemicals may degrade the sealing properties of material used in Relays.
- This equipment must be installed using wiring methods as required for Class I, Division 2 as per the NEC and/or CEC.

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### **Panel-Mounting**

For programmable controllers that can be mounted also on panel, in order to meet the UL Haz Loc standard, panel-mount this device on the flat surface of Type 1 or Type 4X enclosures.

### **Relay Output Resistance Ratings**

The products listed below contain relay outputs:

Programmable controllers, Models: V430-J-R34, V130-33-R34,V130-J-R34 and V350-35-R34, V350-J-R34

- When these specific products are used in hazardous locations, they are rated at 3A res.
- Except for models V430-J-R34, V130-33-R34, V130-J-R34, V130-T4-ZK1 and V350-35-R34, V350-J-R34,when these specific products are used in non-hazardous environmental conditions, they are rated at 5A res, as given in the product's specifications.

### **Communication and Removable Memory Storage**

When products comprise either USB communication port, SD card slot, or both, neither the SD card slot nor the USB port are intended to be permanently connected, while the USB port is intended for programming only.

### **Removing / Replacing the battery**

When a product has been installed with a battery, do not remove or replace the battery unless the power has been switched off, or the area is known to be non-hazardous.



Please note that it is recommended to back up all data retained in RAM, in order to avoid losing data when changing the battery while the power is switched off. Date and time information will also need to be reset after the procedure.

### **UL des zones ordinaires:**

Pour respecter la norme UL des zones ordinaires, monter l'appareil sur une surface plane de type de protection 1 ou 4X

### **Certification UL des automates programmables, pour une utilisation en environnement à risques, Class I, Division 2, Groups A, B, C et D.**

Cette note fait référence à tous les produits Unitronics portant le symbole UL - produits qui ont été certifiés pour une utilisation dans des endroits dangereux, Classe I, Division 2, Groupes A, B, C et D.

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- Attention** ■ Cet équipement est adapté pour une utilisation en Classe I, Division 2, Groupes A, B, C et D, ou dans Non-dangereux endroits seulement.
-  ■ Le câblage des entrées/sorties doit être en accord avec les méthodes de câblage selon la Classe I, Division 2 et en accord avec l'autorité compétente.
-  ■ **AVERTISSEMENT:** Risque d'Explosion – Le remplacement de certains composants rend caduque la certification du produit selon la Classe I, Division 2.
- **AVERTISSEMENT - DANGER D'EXPLOSION -** Ne connecter pas ou ne débranche pas l'équipement sans avoir préalablement coupé l'alimentation électrique ou la zone est reconnue pour être non dangereuse.
- **AVERTISSEMENT -** L'exposition à certains produits chimiques peut dégrader les propriétés des matériaux utilisés pour l'étanchéité dans les relais.
- Cet équipement doit être installé utilisant des méthodes de câblage suivant la norme Class I, Division 2 NEC et /ou CEC.
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### **Montage de l'écran:**

Pour les automates programmables qui peuvent aussi être monté sur l'écran, pour pouvoir être au standard UL, l'écran doit être monté dans un coffret avec une surface plane de type 1 ou de type 4X.

### **Certification de la résistance des sorties relais**

Les produits énumérés ci-dessous contiennent des sorties relais:

- Automates programmables, modèles : V430-J-R34, V130-33-R34, V130-J-R34 and V350-35-R34, V350-J-R34
- Lorsque ces produits spécifiques sont utilisés dans des endroits dangereux, ils supportent un courant de 3A charge résistive.
- Excepté les modèles: V430-J-R34, V130-33-R34, V130-J-R34, V130-T4-ZK1 et V350-35-R34, V350-J-R34 lorsque ces produits spécifiques sont utilisés dans un environnement non dangereux, ils sont évalués à 5A res, comme indiqué dans les spécifications du produit Plages de températures

### **Communication et de stockage amovible de mémoire (carte mémoire)**

Produits comprend un port USB de communication, soit un port carte SD ou les deux, ni le port SD, ni le port USB ne sont censés être utilisés en permanence, tandis que l'USB est destiné à la programmation uniquement.

### **Retrait / Remplacement de la batterie**

Lorsqu'un produit a été installé avec une batterie, retirez et remplacez la batterie seulement si l'alimentation est éteinte ou si l'environnement n'est pas dangereux.

Veillez noter qu'il est recommandé de sauvegarder toutes les données conservées dans la RAM, afin d'éviter de perdre des données lors du changement de la batterie lorsque l'alimentation est coupée. Les informations sur la date et l'heure devront également être réinitialisées après la procédure

## Wiring



- Do not touch live wires.



- Install an external circuit breaker. Guard against short-circuiting in external wiring.
- Use appropriate circuit protection devices.
- Unused pins should not be connected. Ignoring this directive may damage the device.
- Double-check all wiring before turning on the power supply.

### Caution

- To avoid damaging the wire, do not exceed a maximum torque of 0.5 N·m (5 kgf·cm).
- Do not use tin, solder, or any substance on stripped wire that might cause the wire strand to break.
- Install at maximum distance from high-voltage cables and power equipment.

## Wiring Procedure

Use crimp terminals for Use crimp terminals for wiring;

- Controllers offering a terminal block with pitch of 5mm: 26-12 AWG wire (0.13 mm<sup>2</sup> – 3.31 mm<sup>2</sup>).
- Controllers offering a terminal block with pitch of 3.81mm: 26-16 AWG wire (0.13 mm<sup>2</sup> – 1.31 mm<sup>2</sup>).

1. Strip the wire to a length of 7±0.5mm (0.270–0.300“).
2. Unscrew the terminal to its widest position before inserting a wire.
3. Insert the wire completely into the terminal to ensure a proper connection.
4. Tighten enough to keep the wire from pulling free.

- Input or output cables should not be run through the same multi-core cable or share the same wire.
- Allow for voltage drop and noise interference with I/O lines used over an extended distance. Use wire that is properly sized for the load.
- The controller and I/O signals must be connected to the same 0V signal.

## I/Os

**V130/V350/V130J/V350J-TR6 models** comprise a total of 12 inputs, 6 relay and 2 npn outputs

**V430J-RH6** comprises a total of 12 inputs and 6 relay outputs.

Input functionality can be adapted as follows:

8 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.

4 inputs may be used as analog inputs, current (AN2-AN5).

In addition, according to jumper settings and appropriate wiring:

- Inputs 6 and 7 can function as either digital or analog inputs.
- Input 0 can function as high-speed counter, as part of a shaft-encoder, or as normal digital input.
- Input 1 can function as either counter reset, as part of a shaft-encoder, or as normal digital input.

- If input 0 high-speed counter (without reset), input 1 can function as normal digital input.

### Input Jumper Settings

The tables below show how to set a specific jumper to change input functionality. To access the I/O jumpers, you must open the controller according to the instructions beginning on page 11.

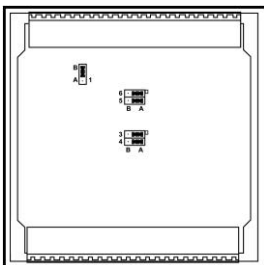


- Incompatible jumper settings and wiring connections may seriously damage the controller.

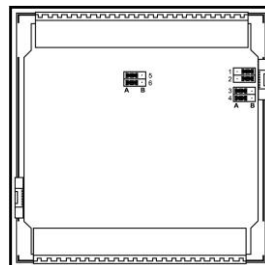
| Digital Inputs 0-7: Set Type         |                  |               |
|--------------------------------------|------------------|---------------|
| Set to                               | JP1 (all Inputs) |               |
| npn (sink)                           | A                |               |
| pnp (source)*                        | B                |               |
| Inputs 6/7: Set as Digital or Analog |                  |               |
| Set to                               | JP5 (Input 6)    | JP6 (Input 7) |
| Digital*                             | A                | A             |
| Analog                               | B                | B             |
| Analog Inputs AN0/AN1: Set Type      |                  |               |
| Set to                               | JP3 (AN0)        | JP4 (AN1)     |
| Voltage*                             | A                | A             |
| Current                              | B                | B             |

\*Default settings

TR6

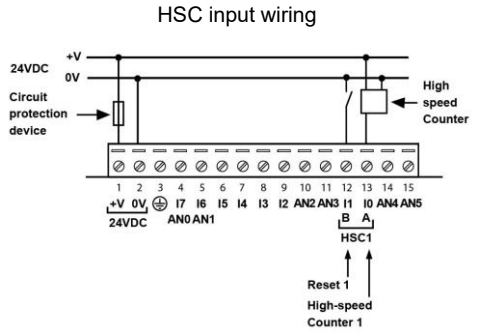
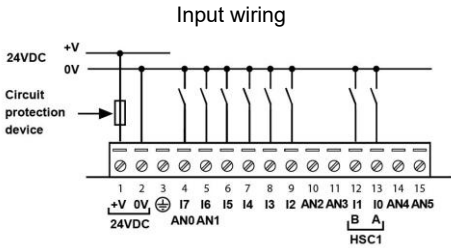


RH6

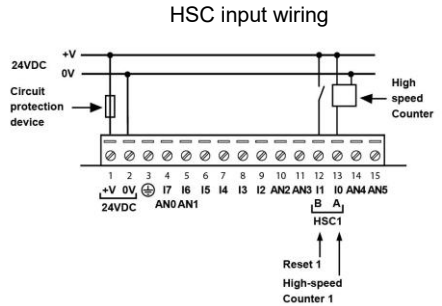
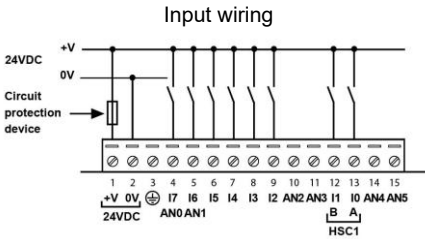


**I/O Wiring**

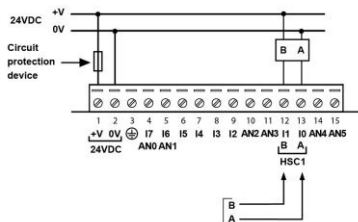
**npn (sink) Input**



**pnp (source) Input**



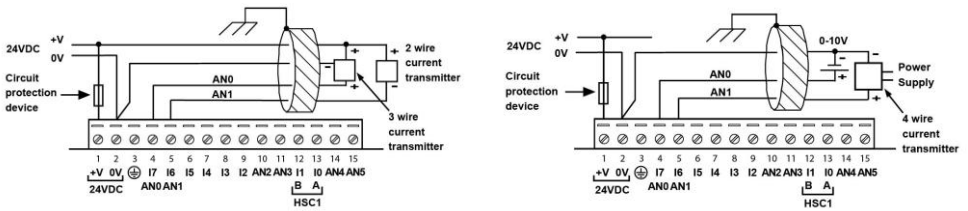
**Shaft-encoder**



**Analog Input**

Current connections (2/3-wire)

Analog input wiring, current (4-wire), voltage

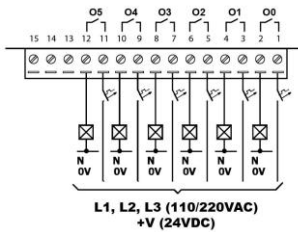


Shields should be connected at the signal's source.

The 0V signal of the analog input must be connected to the controller's 0V.

Please notice that AN2 to AN5 may be used as analog current inputs only.

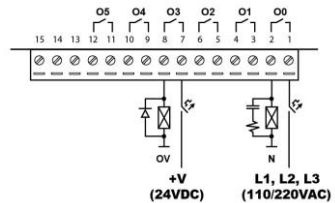
### Relay Outputs



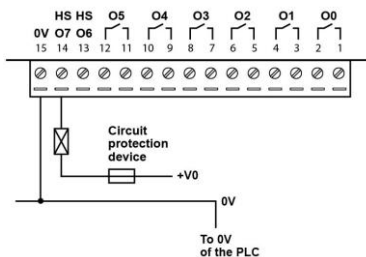
### Increasing Contact Life Span

To increase the life span of the relay output contacts and protect the device from potential damage by reverse EMF, connect:

- A clamping diode in parallel with each inductive DC load
- An RC snubber circuit in parallel with each inductive AC load



### npn Outputs (TR6 Only)

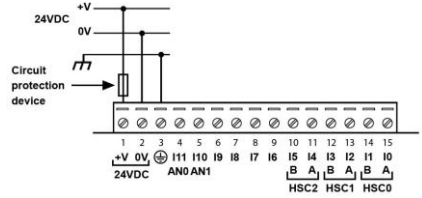


## Power Supply

The controller requires an external 24VDC power supply.

- The power supply must include double insulation. Outputs must be rated as SELV/PELV/Class2/Limited Power.

- Use separate wires to connect the functional earth line (pin 3) and the 0V line (pin 2) to the system earth ground.
- Install an external circuit breaker. Guard against short-circuiting in external wiring.
- Double-check all wiring before turning on the power supply.
- Do not connect either the 'Neutral' or 'Line' signal of the 110/220VAC to device's 0V pin
- In the event of voltage fluctuations or non-conformity to voltage power supply specifications, connect the device to a regulated power supply.



**Earthing the PLC+HMI**

To maximize system performance, avoid electromagnetic interference by:

- Mounting the controller on a metal panel.
- Connect each common and ground connection directly to the earth ground of your system.
- For ground wiring uses the shortest and thickest possible wire.

## Communication

- **V130/V130J**  
These models comprise a built-in RS232/RS485 serial port (Port 1)
- **V430J/V350/V350J**  
These models comprise built-in ports: 1 USB and 1 RS232/RS485 (Port 1).

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.

### RS232/RS485 Port



- Turn off power before making communications connections.

**Caution** ▪ Always use the appropriate port adapters.

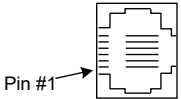
- Signals are related to the controller's 0V; the same 0V is used by the power supply.

**Caution** ▪ The serial port is not isolated. If the controller is used with a non-isolated external device, avoid potential voltage that exceeds  $\pm 10V$ .

- Use RS232 to download programs from a PC, and to communicate with serial devices and applications, such as SCADA.
- Use RS485 to create a multi-drop network containing up to 32 devices.

### Pinouts

The pinouts below show the PLC port signals.

| RS232 |              | RS485** |                | Controller Port<br> |
|-------|--------------|---------|----------------|--|
| Pin # | Description  | Pin #   | Description    |  |
| 1*    | DTR signal   | 1       | A signal (+)   |  |
| 2     | 0V reference | 2       | (RS232 signal) |  |
| 3     | TXD signal   | 3       | (RS232 signal) |  |
| 4     | RXD signal   | 4       | (RS232 signal) |  |
| 5     | 0V reference | 5       | (RS232 signal) |  |
| 6*    | DSR signal   | 6       | B signal (-)   |  |

\* Standard programming cables do not provide connection points for pins 1 and 6.

\*\* When a port is adapted to RS485, Pin 1 (DTR) is used for signal A, and Pin 6 (DSR) signal is used for signal B.

Note that it is possible to establish a PC to PLC connection using RS232 even when the PLC is set to RS485 (this eliminates the need to open the controller to set jumpers).

To do so, remove the RS485 connector (pins 1 & 6) from the PLC and connect a standard RS232 programming cable.

Note that this is possible only if DTR and DSR signals of RS232 are not used (which is the standard case).

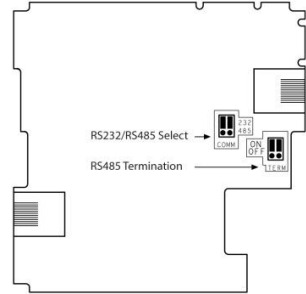
### Setting RS232/RS485 Communication Parameters, V130/V350/V130J/V350J

This port may be set to either RS232 or RS485 via jumper. The accompanying figure shows the jumper factory default settings.

These jumpers may be used to:

- Set communications to RS485, by setting both COMM jumpers to '485'.
- Set RS485 termination, by setting both TERM jumpers to 'ON'.

To access the jumpers, you must open the controller according to the instructions on page 11.



### Setting RS232/RS485 Communication Parameters, V430J

This port may be set to either RS232 or RS485 via DIP switches:

The table shows the DIP switches factory default settings. Use the table to adapt the settings.

|                                 | Switch Settings |     |     |     |     |     |
|---------------------------------|-----------------|-----|-----|-----|-----|-----|
|                                 | 1               | 2   | 3   | 4   | 5   | 6   |
| <b>RS232*</b>                   | ON              | OFF | OFF | ON  | OFF | OFF |
| <b>RS485</b>                    | OFF             | ON  | ON  | OFF | OFF | OFF |
| <b>RS485 with termination**</b> | OFF             | ON  | ON  | OFF | ON  | ON  |

\* Default factory setting

\*\* Causes the unit to function as an end unit in an RS485 network

### USB Port

**Caution** ▪ The USB port is not isolated.  
Make sure that the PC and the controller are grounded to same potential.

The USB port may be used for programming, OS download, and PC access.

### Opening the Controller

- ⚠ ▪ Before performing these actions, touch a grounded object to discharge any electrostatic charge.
- Avoid touching the PCB board directly. Hold the PCB board by its connectors.

1. Turn off the power supply, disconnect, and dismount the controller.
2. The back cover of the controller comprises 4 screws, located in the corners.  
Remove the screws, and pull off the back cover.

### Changing I/O Settings

After opening the controller and exposing the I/O board, you can change the jumper settings according to the table shown above.

### **Changing Communication Settings (V130/V350/V130J/V350J Only)**

1. To access the communication jumpers, hold the I/O PCB board by its top and bottom connectors and steadily pull the board off.
2. Locate the jumpers, and then change the settings as required, according to the jumpers' settings shown on page 10.

### **Closing the Controller**

1. Gently replace the board. Make certain that the pins fit correctly into their matching receptacle.  
Do not force the board into place; doing so may damage the controller.
2. Replace the back cover of the controller and fasten the corner screws.

**Note that you must replace the back cover securely before powering up the controller.**

# Vision™PLC+HMI

## V130/V130J-TR6 V350/V350J-TR6 V430J-RH6 Technical Specifications

### Order Information

#### Item

|             |  |
|-------------|--|
| V130-33-TR6 | PLC with Classic panel, Monochrome display 2.4"  |
| V130-J-TR6  | PLC with Flat panel, Monochrome display 2.4"     |
| V350-35-TR6 | PLC with Classic panel, Color touch display 3.5" |
| V350-J-TR6  | PLC with Flat panel, Color touch display 3.5"    |
| V430-J-RH6  | PLC with Flat panel, Color touch display 4.3"    |

### Power Supply

| Item                     | V130-TR6<br>V130J-TR6                        | V350-TR6<br>V350J-TR6 | V430J-RH6   |
|--------------------------|--|-----------------------|-------------|
| Input voltage            | 24VDC  |                       |             |
| Permissible range        | 20.4VDC to 28.8VDC with less than 10% ripple |                       |             |
| Max. current consumption | See Note 1                                   |                       |             |
| npn inputs               | 182mA@24VDC                                  | 207mA@24VDC           | 250mA@24VDC |
| pnp inputs               | 158mA@24VDC                                  | 183mA@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      | 8. 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                       |
| nnp (source)          | 0-5VDC for Logic '0'<br>17-28.8VDC for Logic '1'                          | 0-3VDC for Logic '0'<br>20.4-28.8VDC for Logic '1' |
| nnp (sink)            | 17-28.8VDC for Logic '0'<br>0-5VDC for Logic '1'                          | 20.4-28.8VDC for Logic '0'<br>0-3VDC for Logic '1' |
| Input current         | I0, I1: 5.4mA@24VDC<br>I2-I7: 3.7mA@24VDC (8mA@24VDC for V430J-RH6)       |  |
| Input impedance       | I0, I1: 4.5KΩ<br>I2-I7: 6.5KΩ (3KΩ for V430J-RH6)                         |  |
| 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.<br>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:  
 8 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. 4 inputs may be used as analog inputs, current (AN2-AN5).

In addition, according to jumper settings and appropriate wiring:

- Inputs 6 and 7 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 a normal digital input.
- Input 1 can function as either counter reset, as part of a shaft-encoder, or as a normal digital input.
- If input 0 is set as a high-speed counter (without reset), input 1 can function as a normal digital input.

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. |         |

**Analog Inputs (current)**

|                            |   |
|----------------------------|---|
| Number of inputs           | 4 (AN2-AN5)   |
| Input range                | 0-20mA, 4-20mA  |
| Input impedance            | 243Ω  |
| Maximum input rating       | 25mA, 6V  |
| Galvanic isolation         | None  |
| <u>Conversion method</u>   | <u>Successive approximation</u>   |
| 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:**

- For example, if 6 inputs are configured as analog, it takes 6 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  
(TR6 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                 | 1µs  |
| Maximum delay ON to OFF                 | 10µs   |
| HSO freq. range with resistive load     | 5Hz-200kHz (at maximum load resistance of 1kΩ) |
| Maximum ON voltage drop                 | 1VDC   |
| Short-circuit protection                | None   |
| Voltage range                           | 3.5V to 28.8VDC                                |

**Notes:**

- 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-TR6<br>V130J-TR6   | V350-TR6<br>V350J-TR6   | V430J-RH6         |
|---------------------------|---|---|-------------------|
| 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,<br>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-TR6<br>V130J-TR6   | V350-TR6<br>V350J-TR6  | V430J-RH6 |
|----------------|---|--|-----------|
| 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-TR6<br>V130J-TR6 | V350-TR6<br>V350J-TR6 | V430J-RH6 |
|-------------------|-----------------------|-----------------------|-----------|
| Memory size       |                       |                       |           |
| Application Logic | 512KB                 | 1MB                   | 1MB       |
| Images            | 128KB                 | 6MB                   | 12MB      |
| Fonts             | 128KB                 | 512KB                 | 512KB     |

| Operand type    | Quantity              |                                    |  | Symbol | Value                                       |
|-----------------|-----------------------|------------------------------------|--|--------|---|
|                 | V130-TR6<br>V130J-TR6 | V350-TR6<br>V350J-TR6<br>V430J-RH6 |  |        |   |
| 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) |

## Vision™ PLC+HMI

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|                    |  |                                     |     |   |
|--------------------|--|-------------------------------------|-----|---|
| 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.)<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 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.<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/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<br>(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 portPort 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.
- 

### 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-TR6  | V350-TR6  | V430J-RH6   |
|--------|--------|---|---|---|
|        |        | V130J-TR6   | V350J-TR6   |   |
| Size   | Vxxx   | 109 x 114.1 x 68mm<br>(4.29 x 4.49 x 2.67").<br>See Note 10 | 109 x 114.1 x 68mm<br>(4.29 x 4.49 x 2.67").<br>See Note 10 |   |
|        | Vxxx-J | 109 x 114.1 x 66mm<br>(4.92 x 4.49 x 2.59").<br>See Note 10 | 109 x 114.1 x 66mm<br>(4.92 x 4.49 x 2.59").<br>See Note 10 | 136 x 105.1 x 61.3mm<br>(5.35 x 4.13 x 2.41").<br>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)<br>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,<br>8.4Hz to 150Hz, 1G acceleration. |

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