Manuals+ — User Manuals Simplified.

unitronics Vision PLC+HMI Programmable Logic Controller User Manual

Contents

unitronics Vision PLC+HMI Programmable Logic Controller

Vision™PLC+HMI User Guide

Vision™PLC+HMI	User Guide	
V130-33-RA22/V130-J-RA22 V350-35-RA22/V350-J-RA22 V430-J-RA22	§ 12 Digital Inputs, including 1 HSC/Shaft-encoder Inputs, 2 Analog, 2 PT100/TC inputs	
	§ 8 Relay Outputs	§ 2 Analog Outputs
V130-33-TRA22/V130-J-TRA22 V350-35-TRA22/V350-J-TRA22 V430-J-TRA22	§ 12 Digital Inputs, including 1 HSC/Shaft-encoder Inputs, 2 Analog Inputs, 2 PT100/TC inputs	
	§ 4 Relay Outputs	§ 2 Analog Outputs
	§ 4 high-speed npn Transistor Outputs	

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-RA22 V130J-RA22	V130-TRA22 V130J-TRA22	V350-RA22 V350J-RA22	V350-TRA22 V350J-TRA22	V430J-RA22 V430J-TRA22
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 **one** of the following: · RS232/RS485 port (V100-17-RS4/V100-17-RS4X) · Ethernet (V100-17-ET2) · Profibus Slave (V100-17-PB1)				
* V430J/V350/V350J comprises both RS232/485 and USB ports; note that only **one** channel may be used at a time.					

Standard Kit Contents

Item	V130-RA22 V130J-RA22	V130-TRA22 V130J-TRA22	V350-RA22 V350J-RA22	V350-TRA22 V350J-TRA22	V430J-RA22 V430J-TRA22
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

| 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.
Caution	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.		
	§ Failure to comply with appropriate safety guidelines can cause severe injury or property damage.	
	§ Do not attempt to use this device with parameters that exceed permissible levels. § To avoid damaging the system, do not connect/disconnect the device when power is on.	

Environmental Considerations

|	
	§ 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. § Do not place in water or let water leak onto the unit. § Do not allow debris to fall inside the unit during installation.
	§ Ventilation: 10mm space required between controller's top/bottom edges & enclosure walls. § Install at maximum distance from high-voltage cables and power equipment.

Mounting

Note that figures are for illustrative purposes only.

Dimensions: V130/V350/V130J/V350J
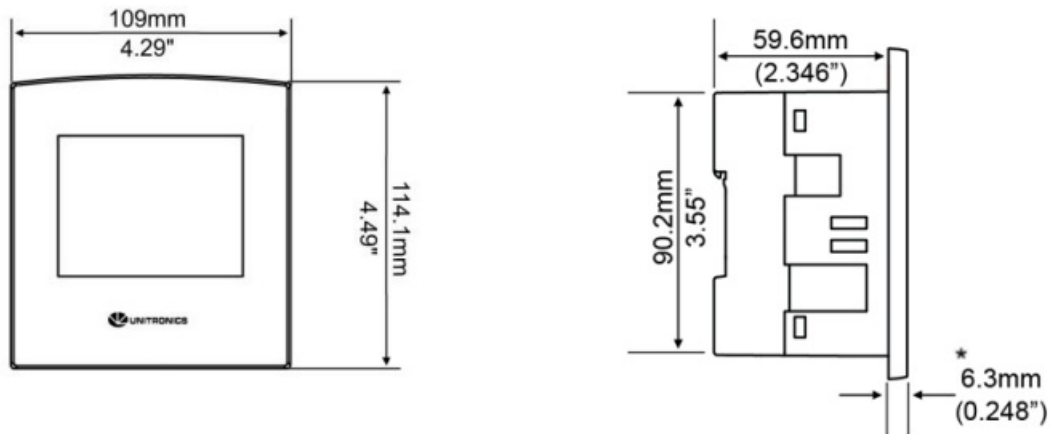
Note that for models V130/V350, the bezel width is up to 8.4 mm (0.33").

Dimensions: V430J
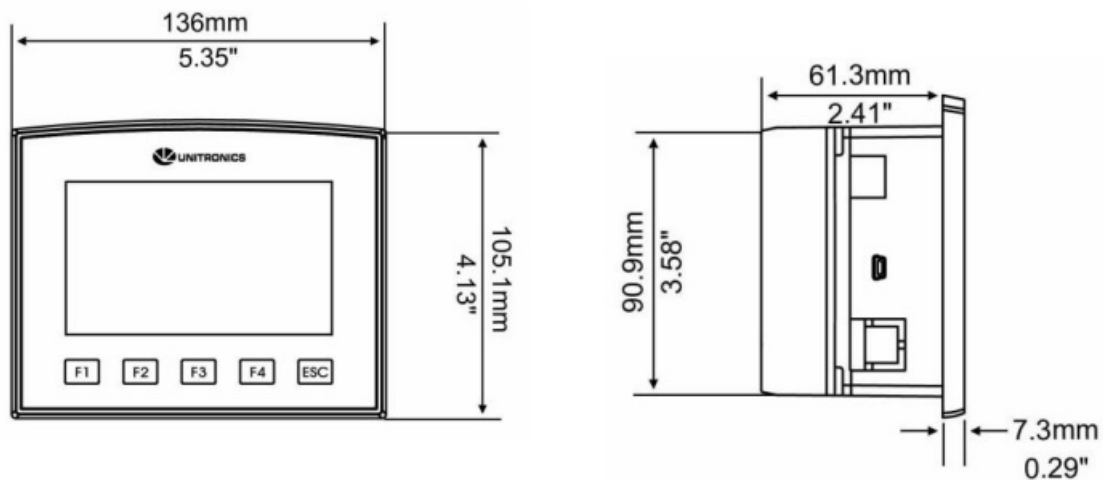
| Model	Cut-out	View area
V130V130J	92×92 mm (3.622"x3.622")	58×30.5mm (2.28"x1.2")
V350/V350J	92×92 mm (3.622"x3.622")	72×54.5mm (2.95"x2.14")
V430J	122.5×91.5 mm (4.82"x3.6")	96.4×55.2mm (3.79"x2.17")

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
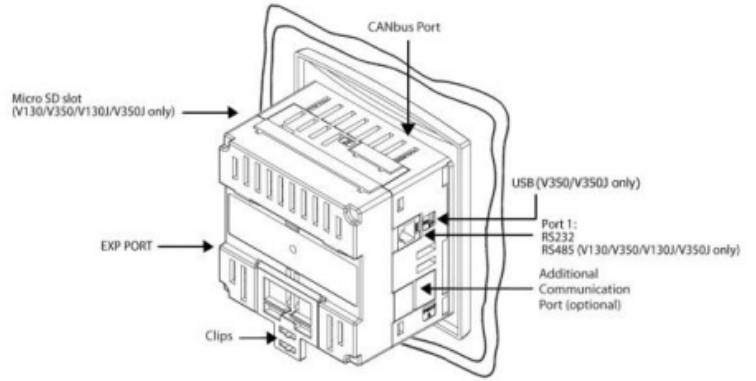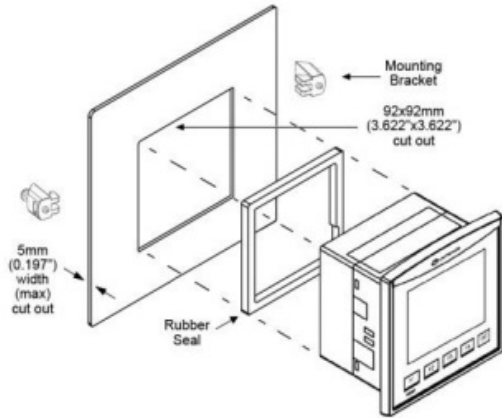
V130/V350/V130J/V350J
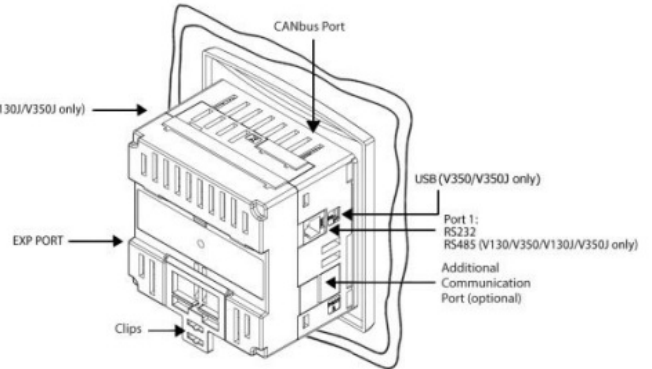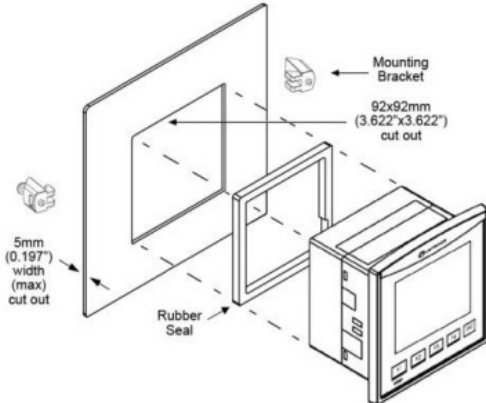
DIN-rail Mounting (V130/V350/V130J/V350J)
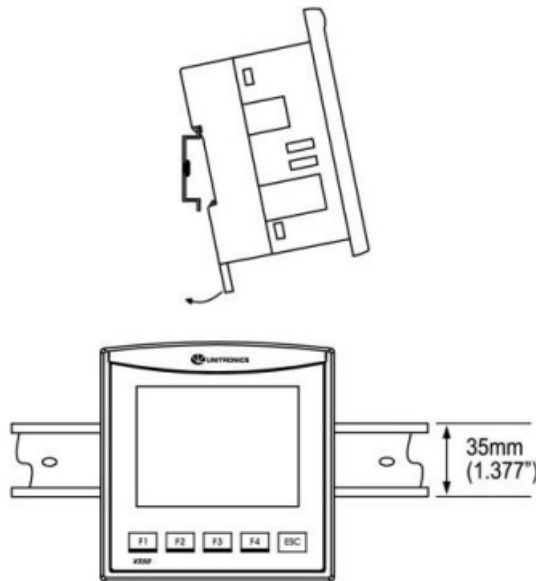
1. Snap the controller onto the DIN rail as shown in the figure to the right.

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.

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.

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.

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.

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 13.

- Incompatible jumper settings and wiring connections may seriously damage the controller.
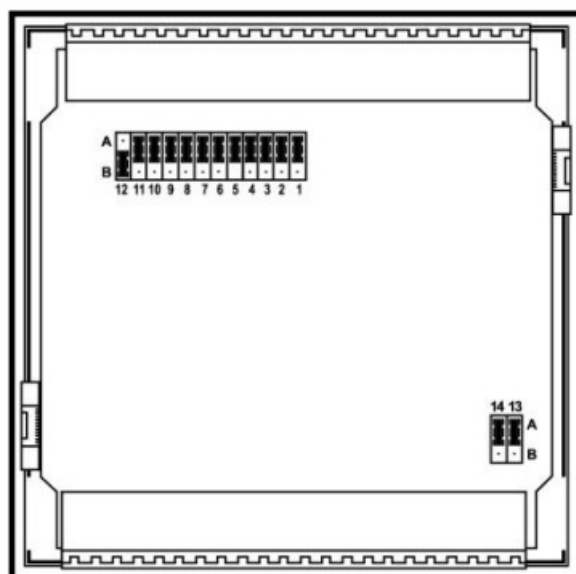
Digital Inputs 0-11: Set Type			
Set to	**JP12 (all Inputs)**		
npn (sink)	A		
pnp (source)*	B		

Inputs 7/8: Set Type – Digital or RTD/TC #1			
Set to	**JP1**	**JP2**	**JP3**
Digital*	A	A	A
Thermocouple	B	B	B
PT100	B	A	B

Inputs 9/10: Set Type – Digital or RTD/TC #0			
Set to	**JP5**	**JP6**	**JP7**
Digital*	A	A	A
Thermocouple	B	B	B
PT100	B	A	B

Input 11: Set Type – Digital or CM for PT100	
Set to	**JP11**
Digital*	A
CM for PT100	B

Input 5: Set Type – Digital or Analog #3		
Set to	**JP4**	**JP10**
Digital*	A	A
Voltage	B	A
Current	B	B

Input 6: Set Type – Digital or Analog #2		
Set to	**JP8**	**JP9**
Digital*	A	A
Voltage	B	A
Current	B	B

Analog Output 0: Set to Voltage/Current		
Set to	**JP13**	
Voltage*	A	
Current	B	

Analog Output 1: Set to Voltage/Current		
Set to	JP14	
Voltage*	A	
Current	B	

npn (sink) Input

Input wiring
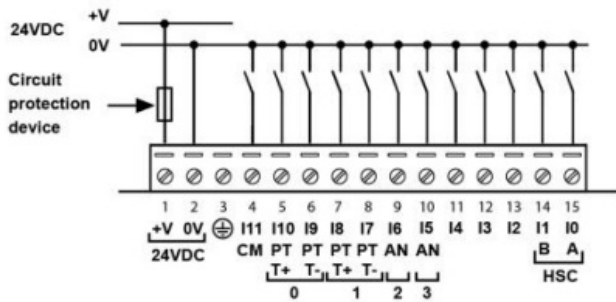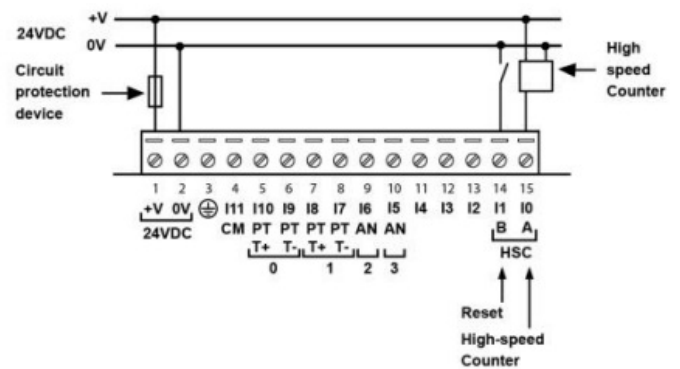
HSC input wiring

pnp (source) Input

Input wiring
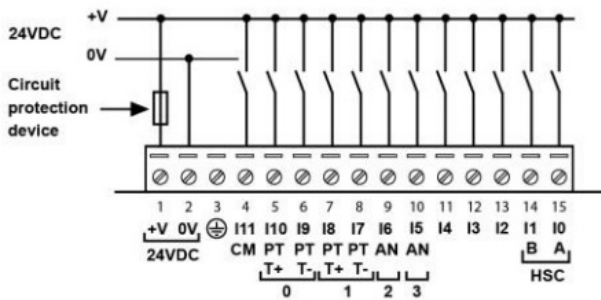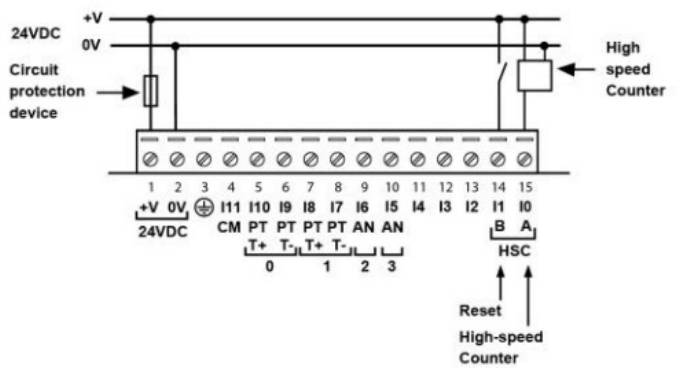
HSC input wiring

Shaft-encoder
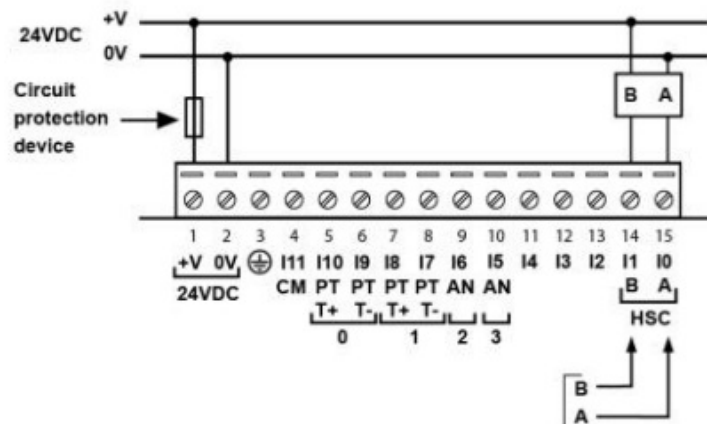
Analog Input

Analog input wiring, current (2/3 wire)

Analog input wiring, current (4-wire), and voltage
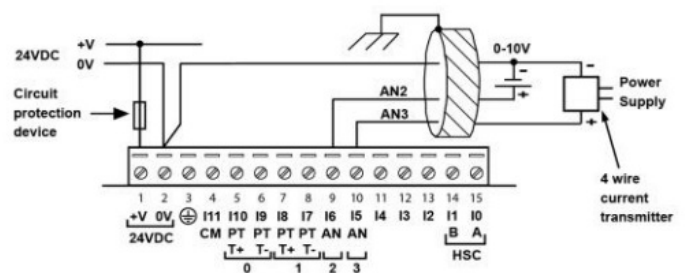
Thermocouple
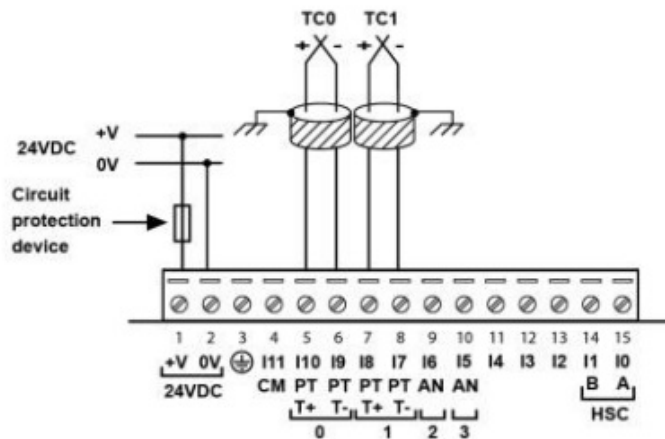
- Shields should be connected at the signal's source.
- The 0V signal of the analog input must be connected to the controller's 0V.
- Thermocouple 0: use Input 9 as negative input and 10 as positive.
- Thermocouple 1: use Input 7 as negative input and 8 as positive.

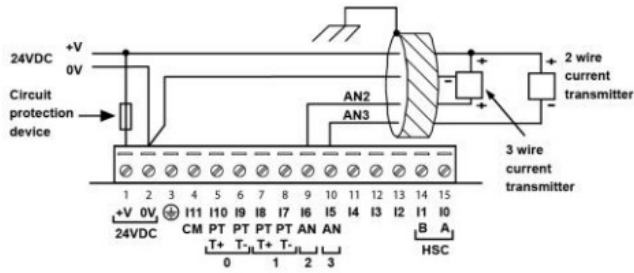| Type	Temp. Range	Wire Color	
		ANSI (USA)	BS1843 (UK)
mV	-5 to 56mV		
B	200 to 1820˚C (300 to 3276˚F)	+Grey -Red	+None -Blue
E	-200 to 750˚C (-328 to 1382˚F)	+Violet -Red	+Brown -Blue
J	-200 to 760˚C (-328 to 1400˚F)	+White -Red	+Yellow -Blue
K	-200 to 1250˚C (-328 to 2282˚F)	+Yellow -Red	+Brown -Blue
N	-200 to 1300˚C (-328 to 2372˚F)	+Orange -Red	+Orange -Blue
R	0 to 1768˚C (32 to 3214˚F)	+Black -Red	+White -Blue
S	0 to 1768˚C (32 to 3214˚F)	+Black -Red	+White -Blue
T	-200 to 400˚C (-328 to 752˚F)	+Blue -Red	+White -Blue

RTD

- PT100 (Sensor 0): use Input 9 and 10, related to CM signal.
- PT100 (Sensor 1): use Input 7 and 8, related to CM signal.
- 4 wire PT100 can be used by leaving one of the sensor leads unconnected.

2 Wire connection

PT100 #1

24VDC +V
0V

Circuit protection device →

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
+V	0V	⏚	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0

24VDC | CM PT PT PT PT AN AN | B A
T+ T- T+ T- | HSC
0 1 2 3

4 Wire connection

PT100 #0

3 Wire connection

PT100 #1

24VDC +V
0V

Circuit protection device →

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
+V	0V	⏚	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0

24VDC | CM PT PT PT PT AN AN | B A
T+ T- T+ T- | HSC
0 1 2 3

Analog Outputs

Analog out
| A1 | A0 | 0V |

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Load | Load

Current connection | Voltage connection

npn Outputs (TRA22)

O7 O6 O5 O4

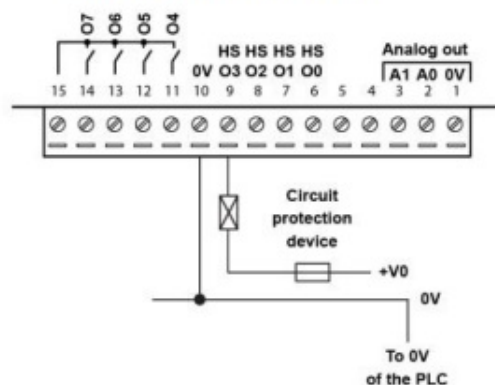| 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

HS HS HS HS
0V O3 O2 O1 O0

Analog out
| A1 | A0 | 0V |

Circuit protection device

+V0
0V

To 0V of the PLC

Relay Outputs

RA22

O7 O6 O5 O4   O3 O2 O1 O0

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

0V
N

+V (24VDC)
L1, L2, L3
(110/220VAC)

TRA22

O7 O6 O5 O4

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

0V
N

+V (24VDC)
L1, L2, L3
(110/220VAC)

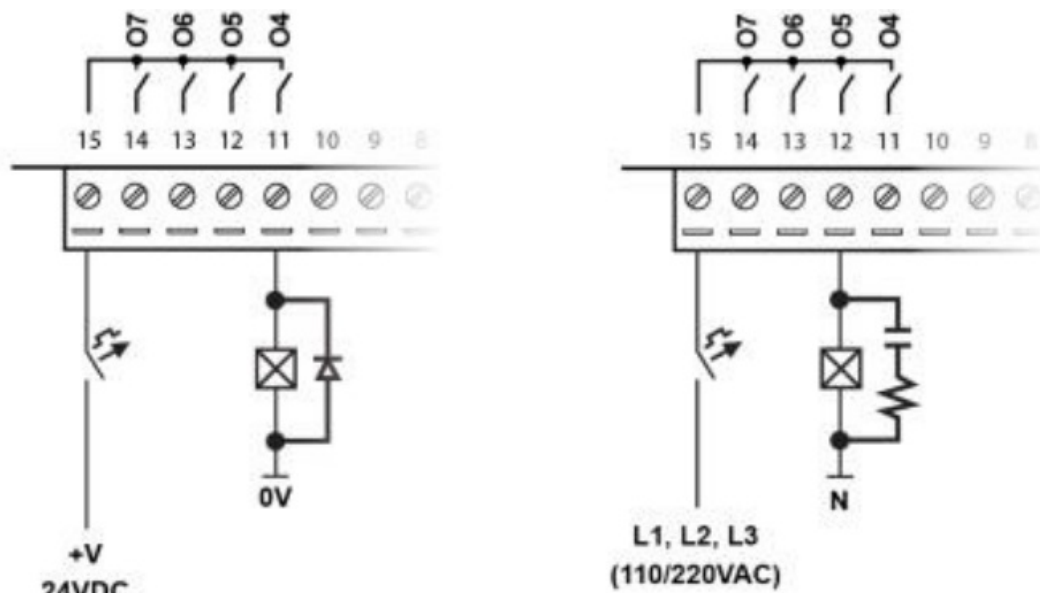**Relay Outputs**

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

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.
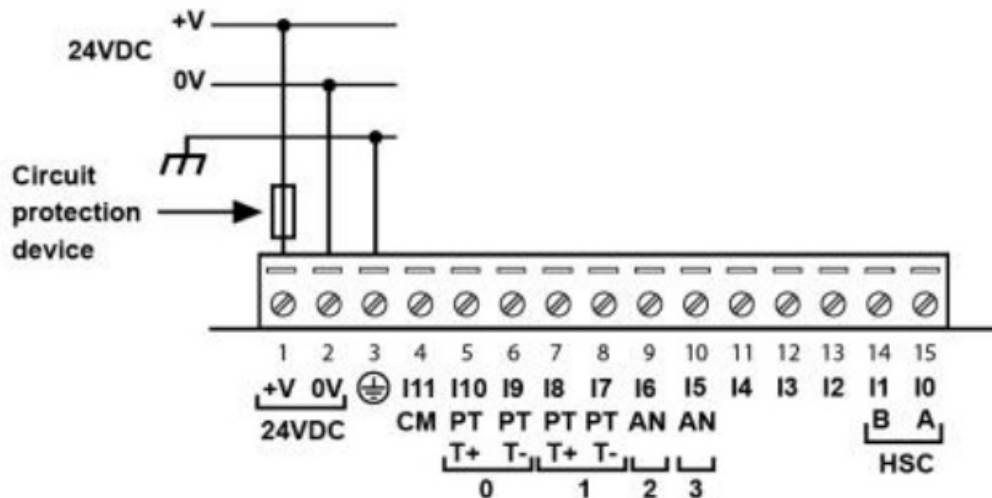
- Use separate wires to connect the functional earth line (pin 3) and the 0V line (pin 2) to the system earth ground.
- Install an external circuit breaker. Guard against short-circuiting in external wiring.
- Double-check all wiring before turning on the power supply.
- Do not connect either the 'Neutral' 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/V350J

  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.
Caution	§ Signals are related to the controller's 0V; the same 0V is used by the power supply. § The serial port is not isolated. If the controller is used with a non-isolated external device, avoid potential voltage that exceeds ± 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
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)	Pin #1
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
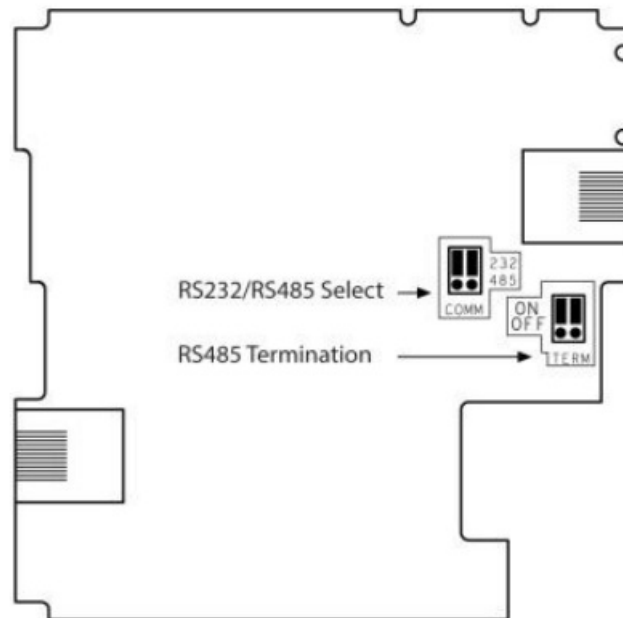
This port may be set to either RS232 or RS485 via jumper.
The accompanying figure shows the jumper factory default settings.
These jumpers may be used to:

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

To access the jumpers, you must open the controller according to the instructions on page 13.

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
RS232*	**ON**	OFF	OFF	**ON**	OFF	OFF
RS485	OFF	**ON**	**ON**	OFF	OFF	OFF
RS485 with termination**	OFF	**ON**	**ON**	OFF	**ON**	**ON**

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 12.

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

V130-33-TRA22/V130-J-TRA22
V350-35-TRA22/V350-J-TRA22
V430-J-TRA22

Technical Specifications

Order Information

Order Information	
Item	
V130-33-TRA22	PLC with Classic panel, Monochrome display 2.4″
V130-J-TRA22	PLC with Flat panel, Monochrome display 2.4″
V350-35-TRA22	PLC with Classic panel, Color touch display 3.5''
V350-J-TRA22	PLC with Flat panel, Color touch display 3.5''
V430-J-TRA22	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.**	

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'
npn (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, I1: 5.4mA@24VDC I2-I11: 3.7mA@24VDC	
Input impedance	I0, I1: 4.5KΩ I2-I11: 6.5KΩ	
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. V130/V350/V130J/V350J/V430J-TRA22 models comprise a total of 12 inputs.

All 12 inputs may be used as digital inputs. They may be wired in a group via a single jumper as either npn or pnp.

In addition, according to jumper settings and appropriate wiring:

– Inputs 5 and 6 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 normal digital inputs.

– Input 1 can function as either counter reset, normal digital input, or as part of a shaft-encoder.

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

– Inputs 7-8 and 9-10 can function as digital, thermocouple, or PT100 inputs; input 11 can also serve as the CM signal for PT100.

3. If you configure an input as high-speed, you can use an end-device that comprises push-pull drive type. In this case, the high-speed input voltage ratings for npn/pnp apply.

Order Information	
Item	
V130-33-TRA22	PLC with Classic panel, Monochrome display 2.4″
V130-J-TRA22	PLC with Flat panel, Monochrome display 2.4″
V350-35-TRA22	PLC with Classic panel, Color touch display 3.5''
V350-J-TRA22	PLC with Flat panel, Color touch display 3.5''
V430-J-TRA22	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.**	

Conversion times are accumulative and depend on the total number of analog inputs configured. For example, if only one analog input (fast mode) is configured, the conversion time will be 30ms; however, if two analog (normal mode) and two RTD inputs are configured, the conversion time will be 100ms + 100ms + 300ms + 300ms = 800ms.

The analog value can indicate faults as shown below:

Value: 12-bit	Value: 14-bit	Possible Cause
-1	-1	Deviates slightly below the input range
4096	16384	Deviates slightly above the input range
32767	32767	Deviates greatly above or below the input range

RTD Inputs		
RTD Type		PT100
Temperature coefficient a		0.00385/0.00392
Input range		-200 to 600°C/-328 to 1100°F. 1 to 320Ω.
Isolation		None
Conversion method		Voltage to frequency
Resolution		0.1°C/0.1°F
Conversion time		300ms minimum per channel. See Note 4 above
Input impedance		>10MΩ
Auxillary current for PT100		150µA typical
Full-scale error		±0.4%
Linearity error		±0.04%
Status indication		Yes. See Note 6
Cable length		Up to 50 meters, shielded
Notes:		
6. The analog value can indicate faults as shown below:		
Value	Possible Cause	
32767	Sensor is not connected to input, or value exceeds permissible range	
-32767	Sensor is short-circuited	

Thermocouple Inputs	
Input range	See Note 7
Isolation	None
Conversion method	Voltage to frequency
Resolution	0.1°C/ 0.1°F maximum
Conversion time	100ms minimum per channel. See Note 4 above
Input impedance	>10MΩ
Cold junction compensation	Local, automatic
Cold junction compensation error	±1.5°C/±2.7°F maximum
Absolute maximum rating	±0.6VDC
Full-scale error	±0.4%
Linearity error	±0.04%
Warm-up time	½ hour typically, ±1°C/±1.8°F repeatability
Status indication	Yes. See Note 6 above

Notes:
The analog value can indicate faults as shown below:

- Value

  Possible Cause
- 32767

  Sensor is not connected to input, or value exceeds permissible range
- -32767

  Sensor is short-circuited

Thermocouple Inputs	
Input range	See Note 7
Isolation	None
Conversion method	Voltage to frequency
Resolution	0.1°C/ 0.1°F maximum
Conversion time	100ms minimum per channel. See Note 4 above
Input impedance	>10MΩ
Cold junction compensation	Local, automatic
Cold junction compensation error	±1.5°C/±2.7°F maximum
Absolute maximum rating	±0.6VDC
Full-scale error	±0.4%
Linearity error	±0.04%
Warm-up time	½ hour typically, ±1°C/±1.8°F repeatability
Status indication	Yes. See Note 6 above

Notes:
The device can also measure voltage within the range of -5 to 56mV, at a resolution of 0.01mV. The device can also measure raw value frequency at a resolution of 14-bits (16384). Input ranges are shown in the following table:

Digital Outputs	
Number of outputs	4 relay. See Note 8
Output type	SPST-NO (Form A)
Isolation	By relay
Type of relay	Tyco PCN-124D3MHZ or compatible
Output current (resistive load)	3A maximum per output 8A maximum total per common
Rated voltage	250VAC / 30VDC
Minimum load	1mA, 5VDC
Life expectancy	100k operations at maximum load
Response time	10ms (typical)
Contact protection	External precautions required (see *Increasing Contact Life Span* in the product's Installation Guide)
Notes:	
8. Outputs 4, 5, 6, and 7 share a common signal.	

Transistor Outputs	
Number of outputs	4 npn (sink). See Note 9
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	1ms
Maximum delay ON to OFF	10ms
HSO freq. range with resistive load	5Hz-200kHz (at maximum load resistance of 1.5kΩ)
Maximum ON voltage drop	1VDC
Short-circuit protection	None
Voltage range	3.5V to 28.8VDC
Notes:	
9. Outputs 0, 1, 2 and 3 share a common 0V signal. The 0V signal of the output must be connected to the controller's 0V.	

Analog Outputs	
Number of outputs	2
Output range	0-10V, 4-20mA. See Note 10
Resolution	12-bit (4096 units)
Conversion time	Both outputs are updated per scan
Load impedance	1kΩ minimum—voltage 500Ω maximum—current
Galvanic isolation	None
Linearity error	±0.1%
Operational error limits	±0.2%
Notes:	
10. Note that the range of each I/O is defined by wiring, jumper settings, and within the controller's software.	

Graphic Display Screen

Item	V130-TRA22 V130J-TRA22	V350-TRA22 V350J-TRA22	V430J-TRA22
LCD Type	STN, LCD display	TFT, LCD display	TFT, LCD display
Illumination backlight	White LED	White LED	White LED
Display resolution	128×64 pixels	320×240 pixels	480×272 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-TRA22 V130J-TRA22	V350-TRA22 V350J-TRA22	V430J-TRA22
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.* 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.* Two sets of slides are supplied with the controller: one set of arrow keys, and one blank set.	None

Program			
Item	V130-TRA22 V130J-TRA22	V350-TRA22 V350J-TRA22	V430J-TRA22
Memory size			
Application Logic	512KB	1MB	1MB
Images	128KB	6MB	12MB
Fonts	128KB	512KB	512KB

Item	V130-TRA22 V130J-TRA22	V350-TRA22 V350J-TRA22 V430J-TRA22		
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

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 11
Notes:	
11. 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 12
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 14
Specification	USB 2.0 complaint; full speed
Cable	USB 2.0 complaint; up to 3m
Port 2 (optional)	See Note 13
CANbus (optional)	See Note 13

Notes:
12. 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.
13. 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.
14. 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-TRA22** **V130J-TRA22**	**V350-TRA22** **V350J-TRA22**	**V430J-TRA22**
Size	Vxxx	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 15	109 x 114.1 x 68mm (4.29 x 4.49 x 2.67"). See Note 15	
	Vxxx-J	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 15	109 x 114.1 x 66mm (4.92 x 4.49 x 2.59"). See Note 15	136 x 105.1 x 61.3mm (5.35 x 4.13 x 2.41"). See Note 15
Weight		300g (10.58 oz)	325g (11.46 oz)	355g (12.52 oz)

Notes:
15. 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.

Documents / Resources

unitronics Vision PLC+HMI Programmable Logic Controller [pdf] User Manual
Vision PLC HMI Programmable Logic Controller, Vision PLC HMI, Programmable Logic Controller, Logic Controller

References

- **Home - Unitronics**
- **Home - Unitronics**
- **Technical library- about PLC Controllers, HMI panels, automation & control**