UNITRONICS Vision OPLC PLC Controller User Guide

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UNITRONICS Vision OPLC PLC Controller User Guide

This guide provides basic information for Unitronics' controllers V560-T25B.

General Description

V560 OPLCs are programmable logic controllers that comprise a built-in operating panel containing a 5.7” Color Touchscreen. The V560 offers an alpha-numeric keypad with function keys as well as a virtual keyboard. Either may be used when the application requires the operator to enter data.

Communications

- 2 isolated RS232/RS485 ports
- Isolated CANbus port
- The user can order and install an Ethernet port
- Communication Function Blocks include: SMS, GPRS, MODBUS serial/IP Protocol FB enables PLC to communicate with almost any external device, via serial or Ethernet communications

I/O Options

V560 supports digital, high-speed, analog, weight and temperature measurement I/Os via:

- Snap-in I/O Modules Plug into the back of the controller to provide an on-board I/O configuration
- I/O Expansion Modules Local or remote I/Os may be added via expansion port or CANbus.

Installation instructions and other data may be found in the module’s technical specification sheet.

Information Mode

This mode enables you to:

- Calibrate the touchscreen
- View & Edit operand values, COM port settings, RTC and screen contrast/brightness settings
- Stop, initialize, and reset the PLC

  To enter Information Mode, press the <i> button, or press the touchscreen and maintain contact for several seconds.

Programming Software, & Utilities

The Unitronics Setup CD contains VisiLogic software and other utilities

- VisiLogic Easily configure hardware and write both HMI and Ladder control applications; the Function Block library simplifies complex tasks such as PID. Write your application, and then download it to the controller via the programming cable included in the kit.
- Utilities These include UniOPC server, Remote Access for remote programming and diagnostics, and DataXport for run-time data logging.

To learn how to use and program the controller, as well as use utilities such as Remote Access, refer to the VisiLogic Help system.

Removable Memory Storage

SD card: store datalogs, Alarms, Trends, Data Tables; export to Excel; backup Ladder, HMI & OS and use this data to 'clone' PLCs.
For more data, refer to the SD topics in the VisiLogic Help system.

Data Tables

Data tables enable you to set recipe parameters and create datalogs.

Additional product documentation is in the Technical Library, located at www.unitronicsplc.com.
Technical support is available at the site, and from support@unitronics.com.

Standard Kit Contents

- Vision controller
- 3 pin power supply connector
- 5 pin CANbus connector
- CAN bus network termination resistor
- Battery (not installed)
- Mounting brackets (x4)
- Rubber seal
- Extra set of keypad slides

Danger Symbols

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.

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

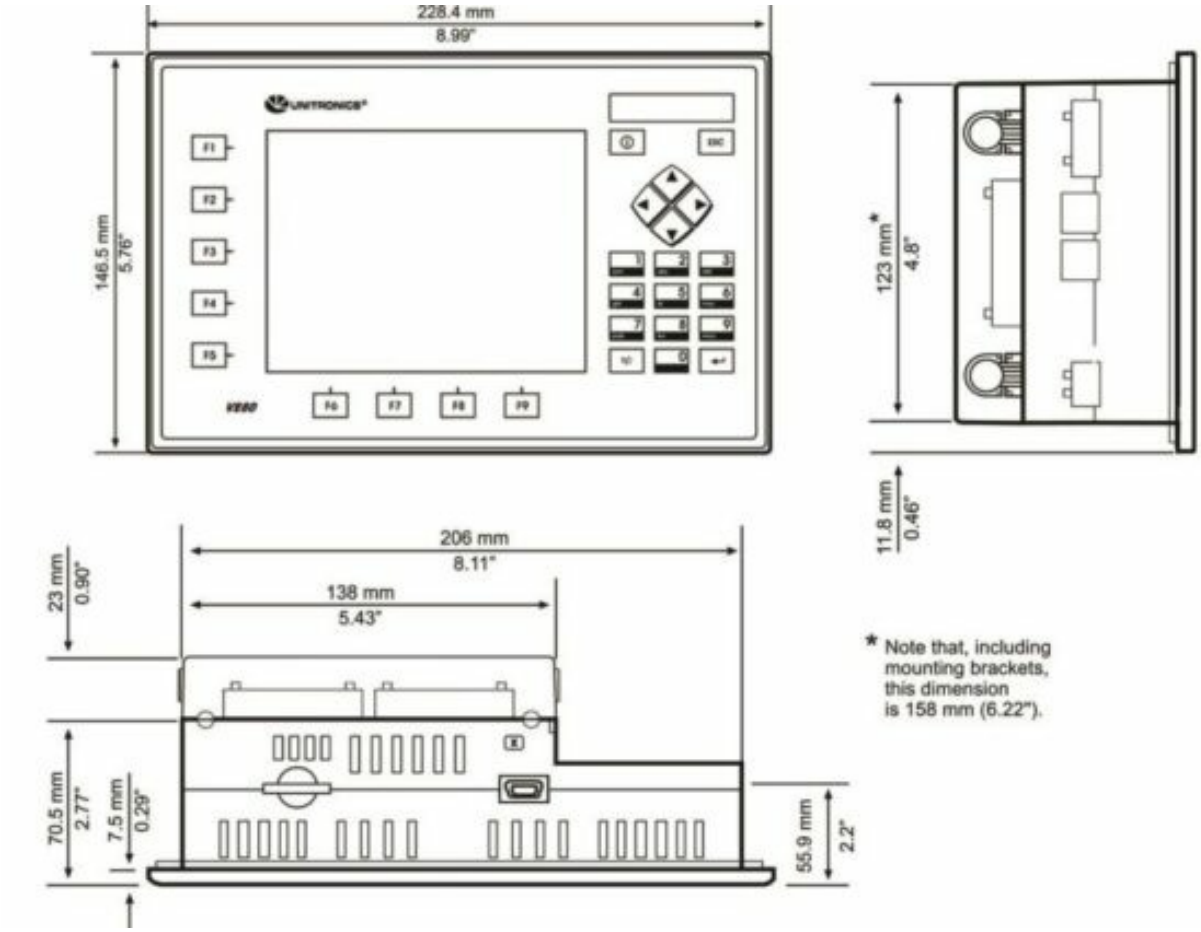
Inserting the Battery

In order to preserve data in case of power-off, you must insert the battery.
The battery is supplied taped to the battery cover on the rear of the controller.

1. Remove the battery cover shown on page 4. The polarity (+) is marked on the battery holder and on the battery.
2. Insert the battery, ensuring that the polarity symbol on the battery is: – facing up – aligned with the symbol on the holder
3. Replace the battery cover.

Mounting

Dimensions

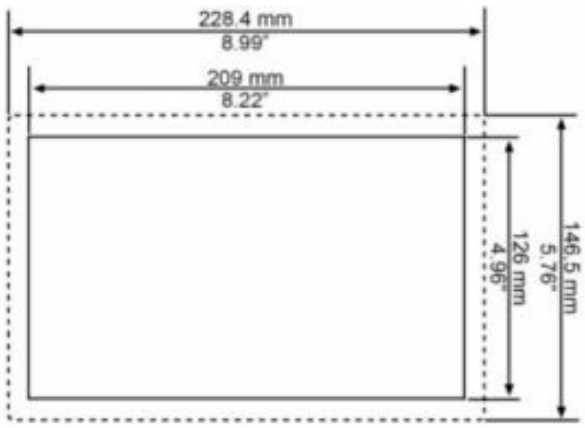


Note that the LCD screen may have a single pixel that is permanently either black or white.

Panel Mounting

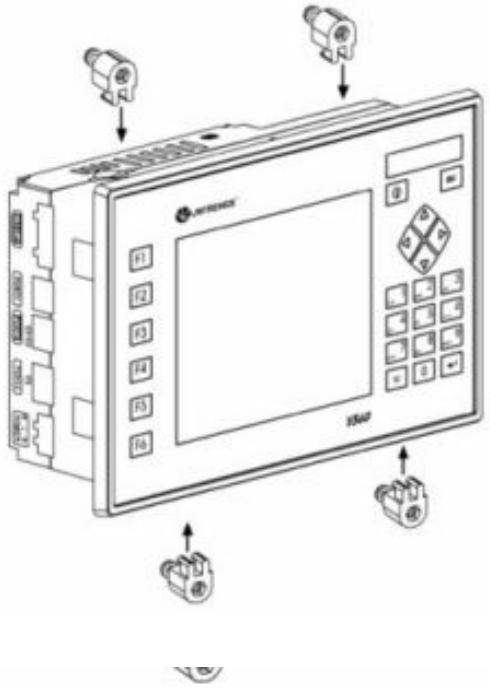
Before you begin, note that the mounting panel cannot be more than 5 mm thick.

1. Make a panel cut-out according to the dimensions in the figure to the right.



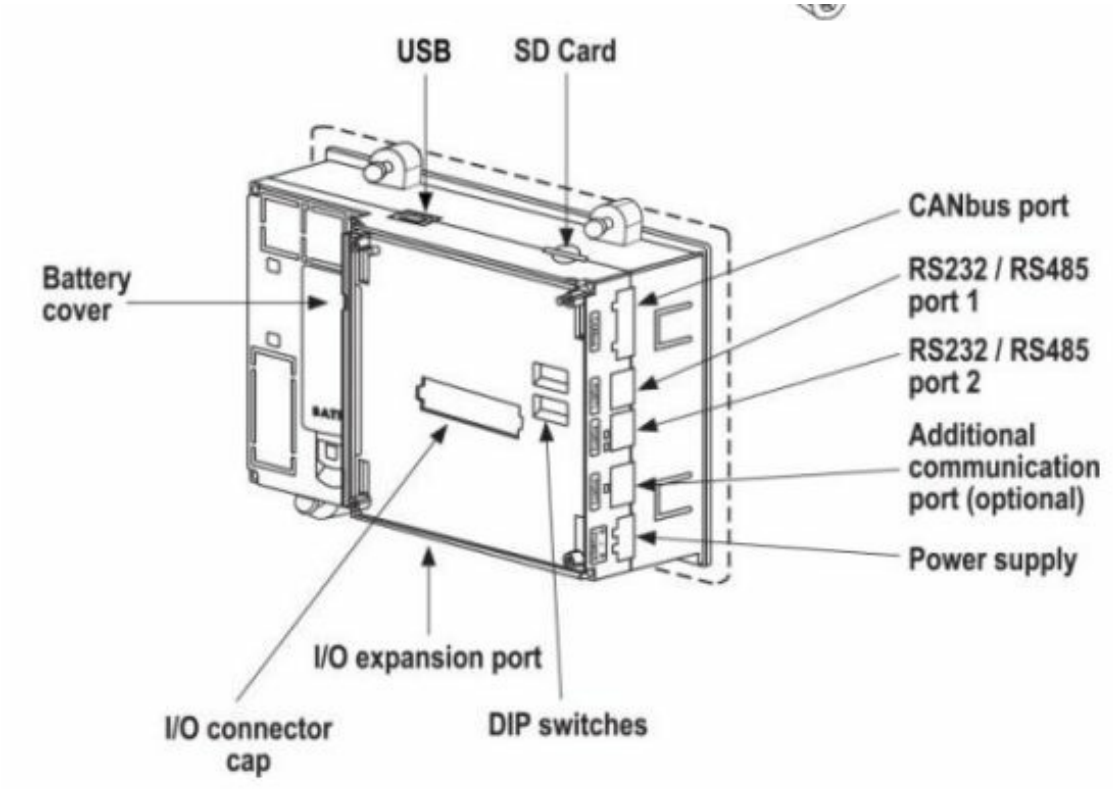
2. Slide the controller into the cut-out, ensuring that the rubber seal is in place.

3. Push the 4 mounting brackets into their slots on the sides of the controller as shown in the figure to the right.



4. Tighten the bracket 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 below.



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.

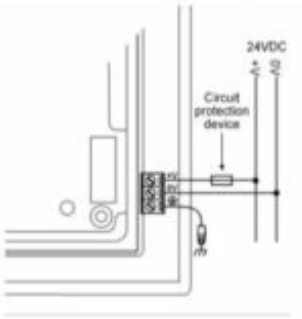
Wiring Proced
Use crimp terminals for wiring; use 26-12 AWG wire (0.13 mm 2–3.31 mm2).

1. Strip the wire to a length of 7±0.5mm (0.250–0.300 inches).
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.

Power Supply

The controller requires either an external 12 or 24VDC power supply. Permissible input voltage range: 10.2-28.8VDC, with less than 10% ripple.

⚠	• The power supply must include double insulation. Outputs must be rated as SELV/PELV/Class 2/Limited Power. • Do not connect either the 'Neutral or 'Line' signal of the 110/220VAC to device's 0V pin.
⚠	• Install an external circuit breaker. Guard against short-circuiting in external wiring. • Double-check all wiring before turning on the power supply. • In the event of voltage fluctuations or non-conformity to voltage power supply specifications, connect the device to a regulated power supply.



Earthing the OPLC

To maximize system performance, avoid electromagnetic interference by:

- Mounting the controller on a metal panel.
- Connect the functional earth terminal of the OPLC, and the common and ground lines of I/Os, directly to the earth ground of your system.

- For ground wiring, use the shortest and thickest possible wire.

Communication Ports

This series comprises a USB port, 2 RS232/RS485 serial ports and a CANbus port.

⚠ ▪ Turn off power before making communications connections.
Caution ▪ Always use the appropriate port adapters.

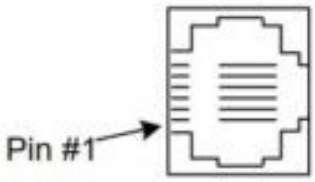
The USB port may be used for programming, OS download, and PC access.
Note that COM port 1 function is suspended when this port is physically connected to a PC.
The serial ports are type RJ-11 and may be set to either RS232 or RS485 via DIP switches, in accordance with the table shown below.
Use RS232 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 PLC port signals.
To connect a PC to a port that is set to RS485, remove the RS485 connector, and connect the PC to the PLC via the programming cable. Note that this is possible only if flow control signals are not used (which is the standard case).

RS232	
Pin #	**Description**
1*	DTR signal
2	0V reference
3	TXD signal
4	RXD signal
5	0V reference
6*	DSR signal

RS485**	
Pin #	**Description**
1	A signal (+)
2	(RS232 signal)
3	(RS232 signal)
4	(RS232 signal)
5	(RS232 signal)
6	B signal (-)

Controller Port

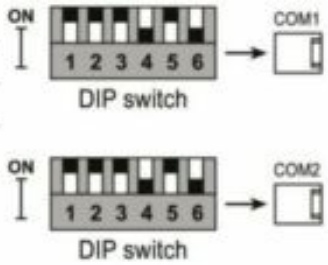


*Standard programming cables do not provide connection points for pins 1 and 6.
**When a port is adapted to RS485, Pin 1 (DTR) is used for signal A, and Pin 6 (DSR) signal is used for signal B.

RS232 to RS485: Changing DIP Switch Settings
The ports are set to RS232 by factory default.
To change the settings, first remove the Snap-in I/O Module, if one is installed, and then set the switches according to the following table.

RS232/RS485: DIP Switch Settings
The settings below are for each COM port.

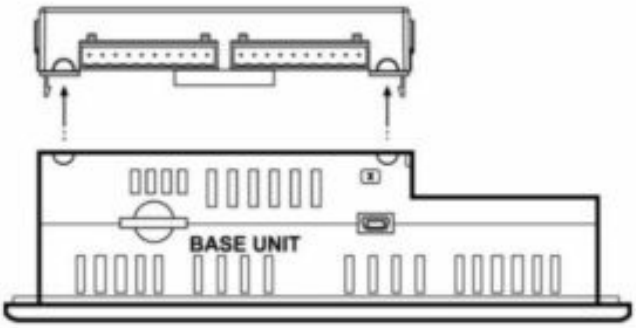
	Switch Settings					
	1	2	3	4	5	6
RS232*	**ON**	**ON**	**ON**	OFF	**ON**	OFF
RS485	OFF	OFF	OFF	**ON**	OFF	**ON**
RS485 with termination**	**ON**	**ON**	OFF	**ON**	OFF	**ON**

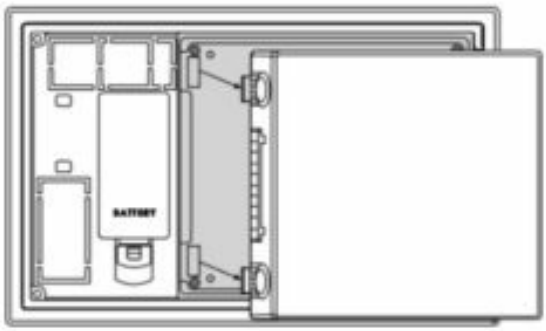


*Default factory setting
**Causes the unit to function as an end unit in an RS485 network

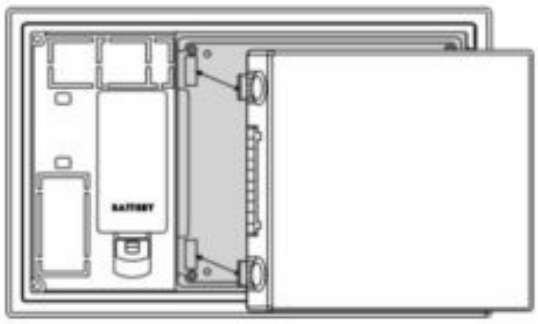
Removing a Snap -in I/O Module

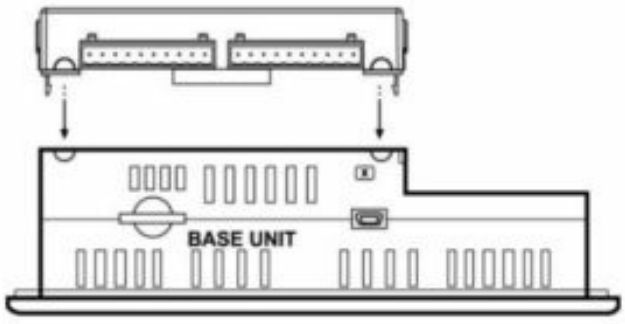
1. Locate the four screws on the sides of the controller, two on either side.
2. Press the buttons and hold them down to open the locking mechanism.
3. Gently rock the module from side to side, easing the module from the controller.





Re-installing a Snap-in I/O Module
1. Line the circular guidelines on the controller up with the guidelines on the Snap-in I/O Module as shown below.
2 Apply even pressure on all 4 corners until you hear a distinct ‘click’. The module is now installed. Check that all sides and corners are correctly aligned.





CANbus
These controllers comprise a CANbus port. Use this to create a decentralized control network using one of the following CAN protocols:

- CANopen: 127 controllers or external devices
- CANLayer 2
- Unitronics’ proprietary UniCAN: 60 controllers, (512 data bytes per scan)

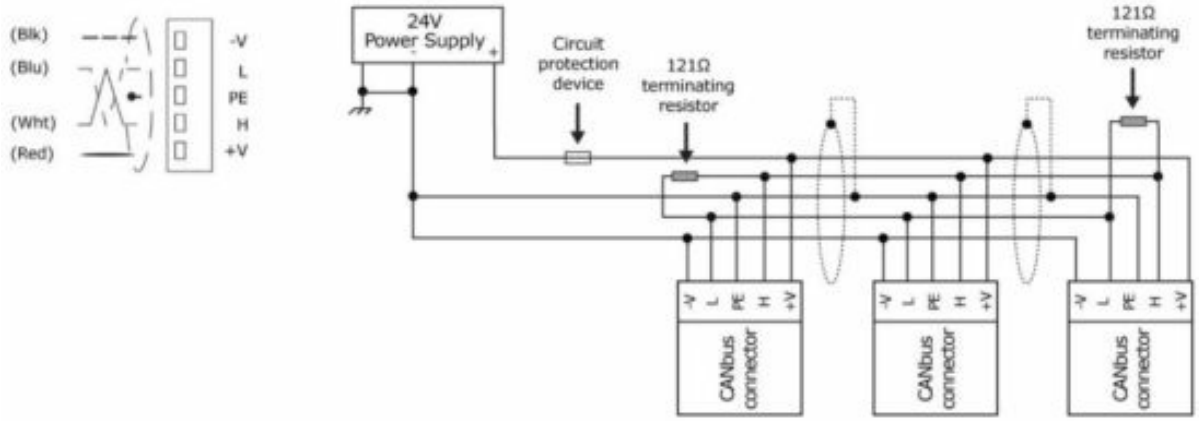
  The CANbus port is galvanically isolated.

CANbus Wiring

Use twisted-pair cable. DeviceNet® thick shielded twisted pair cable is recommended.
Network terminators: These are supplied with the controller. Place terminators at each end of the CANbus network.
Resistance must be set to 1%, 121Ω, 1/4W.
Connect ground signal to the earth at only one point, near the power supply.

The network power supply need not be at the end of the network.

CANbus Connector



Technical Specifications

This guide provides specifications for Unitronics' controller V560-T25B, which comprises a built-in operating panel containing a 5.7" color touchscreen and an alpha-numeric keypad with function keys. You can find additional documentation on the Unitronics' Setup CD and in the Technical Library at www.unitronics.com.

Power Supply

Input voltage	12 or 24VDC
Permissible range	10.2-28.8VDC
Max. current consumption	540mA@12V 270mA@24V

Battery

Back-up	7 years typical at 25°C, battery back-up for RTC and system data, including variable data.
Replaceable	Yes, without opening the controller.

Graphic Display Screen	See Note 1
LCD Type	TFT
Illumination backlight	White LED
Display resolution, pixels	320x240 (QVGA)
Viewing area	5.7"
Colors	65,536 (16-bit)
Touchscreen	Resistive, analog
'Touch' indication	Via buzzer
Screen brightness	Via software (Store value to SI 9).
Keypad	Displays virtual keyboard when the application requires data entry.

Notes:

1. Note that the LCD screen may have a single pixel that is permanently either black or white.

Keypad

Number of keys	24 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. One blank set of slides is supplied with the controller.

Program

Memory size	Application Logic – 2MB, Images – 12MB, Fonts – 1MB		
Operand type	Quantity	Symbol	Value
Memory Bits	8192	MB	Bit (coil)
Memory Integers	4096	MI	16-bit
Long Integers	512	ML	32-bit
Double Word	256	DW	32-bit unsigned
Memory Floats	64	MF	32-bit
Timers	384	T	32-bit
Counters	32	C	16-bit
Data Tables	120K dynamic data (recipe parameters, datalogs, etc.) 192K fixed data (read-only data, ingredient names, etc)		
HMI displays	Up to 1024		
Program scan time	9 µsec per 1K of typical application		

Removable Memory

SD card	Compatible with fast SD cards; store datalogs, Alarms, Trends, Data Tables, backup Ladder, HMI, and OS. See Note 2

Notes:

2. User must format via Unitronics SD tools utility.

Communication

Serial ports	2. See Note 3&4
RS232	
Galvanic isolation	Yes
Voltage limits	±20VDC absolute maximum
Baud rate range	300 to 115200 bps
Cable length	Up to 15m (50')
RS485	
Galvanic isolation	Yes
Voltage limits	–7 to +12VDC differential maximum
Baud rate range	300 to 115200 bps
Nodes	Up to 32
Cable type	Shielded twisted pair, in compliance with EIA RS485
Cable length	1200m maximum (4000')
USB	See Note 4
Port type	Mini-B
Galvanic isolation	No
Specification	USB 2.0 compliant; full speed
Baud rate range	300 to 115200 bps
Cable	USB 2.0 compliant; up to 3m

CANbus port: 1

Nodes	CANopen	Unitronics' CANbus protocols
	127	60

Power requirements: 24VDC (±4%), 40mA max. per unit. See Note 5

Galvanic isolation: Yes, between CANbus and controller

Cable length/baud rate, See Note 5:

25 m	1 Mbit/s
100 m	500 Kbit/s
250 m	250 Kbit/s
500 m	125 Kbit/s
500 m	100 Kbit/s
1000 m*	50 Kbit/s
1000 m*	20 Kbit/s

* If you require cable lengths over 500 meters, contact technical support.

Optional port: User may install a single Ethernet port, or an RS232/RS485 port. Available by separate order.

Notes:

3. The standard for each port is set to either RS232/RS485 according to DIP switch settings. Refer to the Installation Guide.
4. The USB port may be used for programming, OS download, and PC access. Note that COM port 1 function is suspended when this port is physically connected to a PC.
5. Supports both 12 and 24VDC CANbus power supply, (±4%), 40mA maximum per unit. Note that if 12 VDC is used, the maximum cable length is 150 meters.

I/Os

	Number of I/Os and types vary according to module. Supports up to 1024 digital, high-speed, and analog I/Os.
Snap-in I/O modules	Plugs into rear port to create self-contained PLC with up to 62 I/Os.
Expansion modules	Local adapter (P.N. EX-A1), via I/O Expansion Port. Integrate up to 8 I/O Expansion Modules comprising up to 128 additional I/Os.
	Remote adapter (P.N. EX-RC1), via CANbus port. Connect up to 60 adapters; connect up to 8 I/O expansion modules to each adapter.
Exp. port isolation	Galvanic

Dimensions

Size	228.4X146.5X70.5mm (8.99"X5.76"X2.77"). See Note 6
Weight	750 gm (26.4 oz)

Notes:

6. For exact dimensions, refer to the product's Installation Guide.

Mounting	
Panel-mounting	Via brackets
Environment	
Inside cabinet	IP20 / NEMA1 (case)
Panel mounted	IP65 / NEMA4X (front panel)
Operational temperature	0 to 50°C (32 to 122°F)
Storage temperature	-20 to 60°C (-4 to 140°F)
Relative Humidity (RH)	5% to 95% (non-condensing)

Read More About This Manual & Download PDF:

Documents / Resources

	UNITRONICS Vision OPLC PLC Controller [pdf] User Guide Vision OPLC, Vision OPLC PLC Controller, PLC Controller, Controller

References

- Home - Unitronics
- Home - Unitronics
- Unitronics- Programmable Logic Controller + Built-in HMI
- Unitronics- Programmable Logic Controller + Built-in HMI
- User Manual