Vision™ and Samba™ PLC + HMI Communication Modules

Installation Guide
V100-17-xxx
V100-S-xxx

SCAN
to download

General Description

This document provides general installation guidelines for the communications module series listed above.

Detailed Installation Guides for specific models as well as technical specifications and additional documentation may be downloaded from the Technical Library in the Unitronics website: https://unitronicsplc.com/support-technical-library/

Use these modules to add Ethernet, RS232/485, Profibus, or CANbus communication ports to compatible Unitronics controllers.

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.
- Turn off power before making communications connections.
- Do not touch live wires

⚠
- Ventilation: 10mm space required between controller's top/bottom edges & enclosure walls.
- Install at maximum distance from high-voltage cables and power equipment.
- Unused pins should not be connected. Ignoring this directive may damage the device.
- Double-check all wiring before turning on the power supply.

Installation Instructions

⚠
- 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.

Caution
- Installing modules also requires you to remove and replace PCB boards already installed in the controller.
- Make certain that the pins fit correctly into their matching receptacle.

UL Compliance

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

The following models: V100-17-CAN, V100-17-ET2, V100-17-RS4, V100-17-RS4X are UL listed for Hazardous Locations.

The following models: V100-17-CAN, V100-17-ET2, V100-17-PB1, V100-17-RS4, V100-17-RS4X are UL listed for Ordinary Location.

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.

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.

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.

V100-17-CAN,V100-S-CAN CANbus Module

This guide provides specifications for Unitronics' communication module V100-17-CAN, V100-S-CAN.

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

V100-17-CAN,V100-S-CAN

Use this CANbus module to create a decentralized control network using CAN protocols:

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

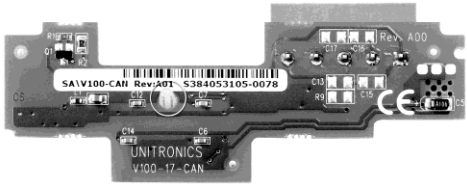
The CANbus port is galvanically isolated.

Standard Kit contents

V100-17-CAN ,V100-S-CAN

5-pin CANbus connector

Termination resistor



V100-17-CAN, V100-S-CAN Technical Specifications

CANbus port	1		
Nodes	CANopen	Unitronics' CANbus protocols	
	127	60	
Power requirements	24VDC (±4%), 40mA max. per unit		
Galvanic isolation	Yes, between CANbus and controller		
Cable type	Twisted-pair; DeviceNet® thick shielded twisted pair cable is recommended.		
Cable length/baud rate	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	* If you require cable lengths over 500 meters, contact technical support.
	1000 m*	20 Kbit/s	
Weight	9.2g (0.32 oz)		
Environment			
Relative Humidity (RH)	10% to 95% (non-condensing)		
	V100-17-CAN	**V100-S-CAN**	
Operational temperature	0 to 50ºC (32 to 122ºF)	-30 to 60ºC (-22 to 140ºF)	
Storage temperature	-20 to 60ºC (-4 to 140ºF)	-30 to 60ºC (-22 to 140ºF)	

Installation in a V130/V350/SM35 controller

Opening the Controller

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.

3. Hold the I/O PCB board by its top and bottom connectors and steadily pull the board off.

Note that if you are installing both a V100-17-CAN, V100-S-CAN module and either V100-17-RS4/X or V100-17-ET2, V100-S-ET2 or V100-17-PB1 modules, you should install the V100-17-RS4/X or V100-17-ET2, V100-S-ET2 or V100-17-PB1 modules **first**.

Installing V100-17-CAN, V100-S-CAN

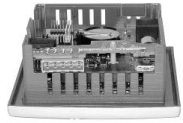
1. Remove the plastic tab marked X.

2. Plastic tab X comprises a cutout that covers the CANbus port location. Snip through the cutout holders and remove the cutout.

3. On the V100-17-CAN, V100-S-CAN, locate the:
   - white plastic pin. The main board comprises an insertion point for this pin.
   - 6-pin female CANbus connector.The main board comprises a male 6-pin CANbus connector.

4. Insert the module as shown in the accompanying figure.

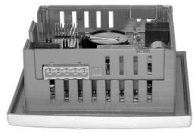
Caution	Make certain that the pins fit correctly into their matching receptacle.



5. When the module is properly installed in the controller, it is held in place by the white plastic Pin.

6. Replace the plastic tab marked X and then close the controller as shown below.

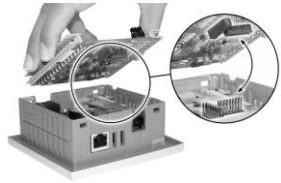
   Note that in order to remove the module; you must compress the ends of the white pin with a pair of pliers while pulling the module out of the controller.



Closing the controller

1. Replace the I/O board.

2. Close the controller by snapping the plastic cover back in its place. If the card is placed correctly, the cover will snap on easily.



3. Replace the screws in the corners of the back cover.

Installation in a V430/SM43 controller

Opening the Controller

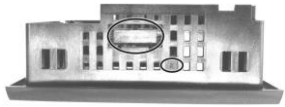
1. Turn off the power supply, disconnect and dismount the controller.

2. The back cover of the controller comprises 4 screws, located in the corners. Remove the screws, and pull off the back cover.

3. Hold the I/O PCB board by its top and bottom connectors and steadily pull the board off.

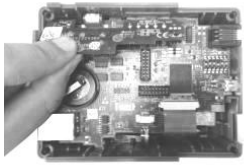
Installing V100-17-CAN, V100-S-CAN

1. Break the plastic tab marked X.

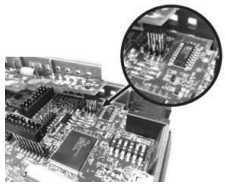


2. Plastic tab X comprises a cutout that covers the CANbus port location.

3. locate the white plastic pin and remove it by compressing the ends of the white pin with a pair of pliers.



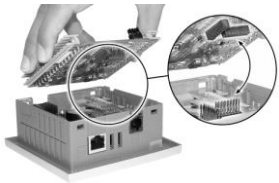
4. Insert the module as shown in the accompanying figure.
6-pin female CANbus connector. The main board comprises a male 6-pin CANbus connector.



Caution	Make certain that the pins fit correctly into their matching receptacle.

Closing the controller

1. Replace the I/O board.



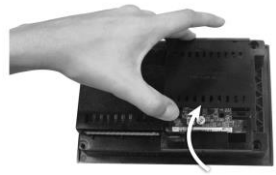
2. Close the controller by snapping the plastic cover back in its place. If the card is placed correctly, the cover will snap on easily.

3. Replace the screws in the corners of the back cover.

Installation in a SM70 controller

Opening the Controller

1. Open the door marked "Battery & Communication Module Cover",under the arrow direction.



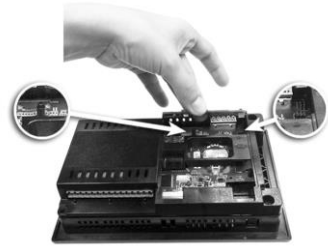
2. Break the plastic tab marked X.

3. Plastic tab X comprises a cutout that covers the CANbus port location.

Installing V100-17-CAN, V100-S-CAN

1. locate the black plastic pin.

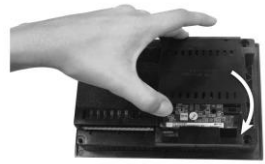
2. Install the module as shown in the accompanying figure 6-pin female CANbus connector.The main board comprises a male 6-pin CANbus connector



Caution	Make certain that the pins fit correctly into their matching receptacle

Closing the controller

1. Close the controller by closing the Door marked "Battery & Communication Module Cover" back in its place.



V100-17-RS4/X, V100-17-ET2, V100-S-ET2, V100-17-PB1

This guide shows you how to install an additional communication module in a Vision130™ or Vision350™ or Vision430™ or SM35™ or SM43™ or SM70™ controller. Instructions are included for modules:

- V100-17-RS4 (RS232/RS485,non-isolated), V100-17-RS4X (RS232/RS485,isolated)
- V100-17-ET2 (Ethernet), V100-S-ET2 (Ethernet-Wide Temperature)
- V100-17-PB1 (PROFIBUS slave supported by Vxxx Series Only)

V100-17-RS4 V100-17-RS4X RS232/485 Module

This guide provides specifications for Unitronics' communication modules V100-17-RS4 V100-17-RS4X.

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

V100-17-RS4 (not isolated) V100-17-RS4X (isolated) Serial Modules

Use these modules to add an additional serial communication port to the controller.

- 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.

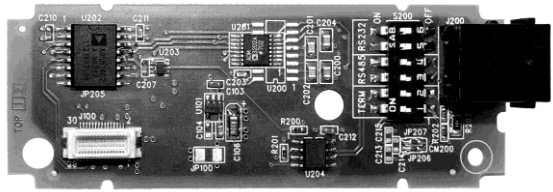
The modules are identical except for isolation. Module ports are type RJ-11 and may be set to **either** RS232 or RS485 via wiring and DIP switch settings, in accordance with the table on page 8.

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).

Standard Kit contents

RS232/485 Module

RS485 cable



Caution

- Signals are related to the controller's 0V; the same 0V is used by the power supply.
- Do not connect the device directly to a telephone or telephone line.
- Note that the V100-17-RS4 port is not isolated. If the controller is used with a non-isolated external device, avoid potential voltage that exceeds ± 10V. To avoid damaging the system, all non-isolated device ports should relate to the same ground signal.

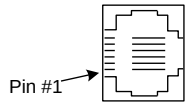
Pinouts

The pinouts below show the PLC port signals.

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 port is set to RS232, termination ON, by factory default.

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

*Default factory setting

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

V100-17-RS4 V100-17-RS4X Technical Specifications

RS232 Port Specifications

Voltage limits	±20V
Input voltage	±20VDC absolute maximum
Cable length	15m maximum (50 feet)

RS485 Port Specifications

Input Voltage	-7 to +12V differential max.
Cable type	Shielded twisted pair, in compliance with EIA RS485
Cable length	1200m maximum (4000 feet)
Baud rate	300– 115,200 bps
Nodes	Up to 32

Isolation

V100-17-RS4	No
V100-17-RS4-X	Yes

Weight

V100-17-RS4/X	12.6g (0.44 oz)

V100-17-ET2, V100-S-ET2 Ethernet Module

This guide provides specifications for Unitronics' communication module V100-17-ET2, V100-S-ET2.

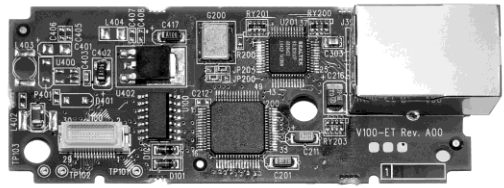
You can find additional information, such as wiring diagrams, in the product's installation guide located on the Unitronics' Setup CD and in the Technical Library at www.unitronics.com.

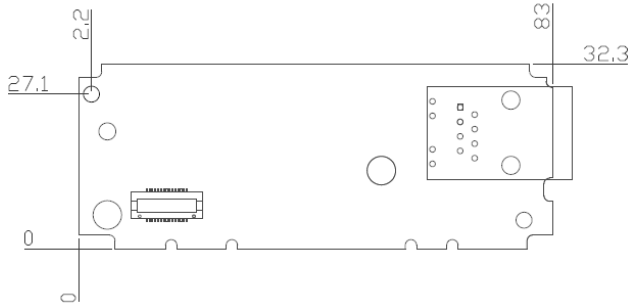
V100-17-ET2, V100-S-ET2

Use this module to add an Ethernet port to the controller and implement communications via TCP/IP, such as MODBUS over TCP.

Standard Kit contents

V100-17-ET2, V100-S-ET2





RJ45 Connector Pinout			Ethernet LEDS	
Pin #	Description		LED	Function
1	T+ = Positive transmit signal		Green (LNK)	ON when link exists
2	T- = Negative transmit signal			
3	R+ = Positive receive signal		Yellow (ACT)	Blinks during RX/TX
6	R- = Negative receive signal			

Ethernet Connections

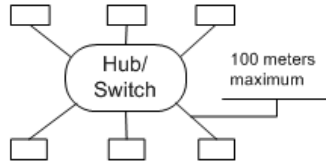
Controller to hub/switch connection				
Controller			Hub/Switch	
Pin #	Function		Pin #	Function
1	T+	→	1	T+
2	T-	→	2	T-
3	R+	←	3	R+
6	R-	←	6	R-

Controller to controller connection				
Controller			Controller	
Pin #	Function		Pin #	Function
1	T+	→	3	R+
2	T-	→	6	R-
3	R+	←	1	T+
6	R-	←	2	T-

V100-17-ET2, V100-S-ET2 Technical Specifications

Port type	RJ45
Transmission speed	10/100Mbps
Network topology	Star, based on external hub/switch
Cable type	Category 5 STP (shielded twisted pair) is recommended; UTP (unshielded twisted pair) may also be used
Drop line length	Up to 100 meters, controller to hub/switch or controller to controller.
Weight	22g (0.77 oz)

Star Topology



Environment

Relative Humidity (RH)	10% to 95% (non-condensing)	
	V100-17-ET2	**V100-S-ET2**
Operational temperature	0 to 50ºC (32 to 122ºF)	-30 to 60ºC (-22 to 140ºF)
Storage temperature	-20 to 60ºC (-4 to 140ºF)	-30 to 60ºC (-22 to 140ºF)

V100-17-PB1 PROFIBUS DP Slave Module

This guide provides specifications for Unitronics' communication module V100-17-PB1.

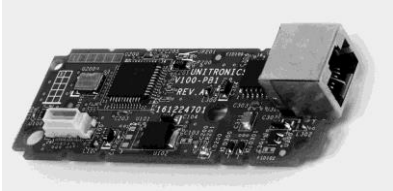
You can find additional information, such as wiring diagrams, in the product's installation guide located on the Unitronics' Setup CD and in the Technical Library at www.unitronics.com.

V100-17-PB1 (PROFIBUS)

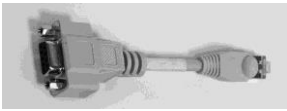
Use this module to add a PROFIBUS protocol port to the controller. Note that the module is provided together with a PROFIBUS adapter cable; use this to connect the PLC to the network.

Standard Kit contents

V100-17-PB1
(PROFIBUS DP Slave module)



PB-CA1
(PROFIBUS adapter cable)



D-Sub (DB-9F) Connector Pinout

Pin #	Description
1	Not connected
2	Not connected
3	RxD/TxD P
4	RTS
5	DGND
6	Vp
7	Not connected
8	RxD/TxD N
9	Not connected

V100-17-PB1 Technical Specifications

Interface connector	Pin D-Sub (DB-9F)
Transmission speed	Up to 12Mbps
Network topology	Line
Cable type	Shielded twisted pair
Max number of nodes	Up to 32
Weight (including PB-CA1)	50g (1.76 oz)

Installation in a V130/V350/SM35/V430/SM43/SM70 controller

Installation Instructions

This section comprises all of the installation procedures for each of the modules.

Caution
- Installing modules also requires you to remove and replace PCB boards already installed in the controller.
- Make certain that the pins fit correctly into their matching receptacle.

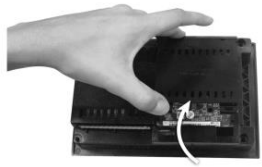
Opening the Controller

⚠
- 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.
3. Hold the I/O PCB board by its top and bottom connectors and steadily pull the board off.

Only SM70

4. Open the door marked “Battery & Communication Module Cover”, under the arrow direction.



Follow the instructions below for installing the appropriate module type.

Installing V100-17-RS4-X, V100-17-ET2, V100-S-ET2, V100-17-PB1

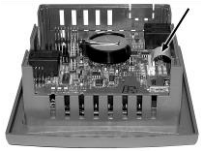
Note that the procedures below include the V130, V350, V430, SM35, SM43 and SM70. However, if you are installing the module into the V130, the keypad must be disconnected and reconnected. Separate instructions are provided for this procedure.

Only V130/V350/SM35

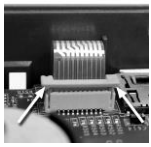
1. Remove the plastic tabs marked X and Y.
   Note that if the controller already contains a V100-17-CAN, V100-S-CAN, you must remove it, Separate IG is provided for this procedure

V130 only

2. Remove the keypad ribbon cable shown in the accompanying figure.



a. Press the sides of the cable connector and pull it slightly upwards; this releases the cable.
b. Pull the cable from the connector.



V130/V350/SM35

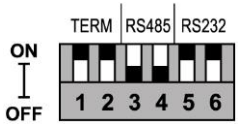
1. Locate the two screws that fasten the board to the controller and remove them.
2. Hold the main board by Port 1 and by the I/O expansion port, and pull it out of the controller.

3. Remove the plastic tab marked A and B, and then break the tab in two.

4. Install the module as shown in the accompanying figure.

5. If you are installing the V100-17-PB1, pay attention to the cable direction.
6. If you are installing the V100-17-RS4/X, Pay attention to RS232 to RS485: DIP Switch Settings:

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



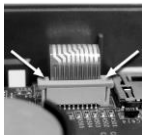
*Default factory setting

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

7. If you are installing:
   - V100-17-RS4/X Return plastic tab **B** over the new port.
   - V100-17-ET2, V100-S-ET2 or V100-17-PB1 Return plastic tab **A** over the new port.
8. Replace the main board, including the fastening screws.

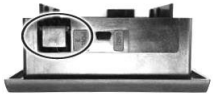
V130 only

1. Replace the ribbon cable.
2. Push the cable connector down to lock the cable in place.

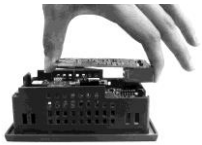


Only V430/SM43

1. Break the plastic tab marked PORT 2.



2. Install the module as shown in the accompanying figure.

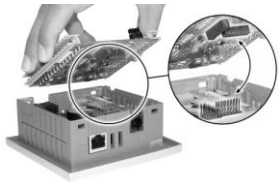


Only SM70

1. Install the module as shown in the accompanying figure.

Closing the controller

1. Replace the I/O board.
2. Close the controller by snapping the plastic cover back in its place. If the card is placed correctly, the cover will snap on easily.
3. Replace the screws in the corners of the back cover.



Only SM70

4. Close the controller by closing the Door marked "Battery & Communication Module Cover" back in its place.

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