

This guide provides basic information for Unitronics' controller V570-57-T34. The V570-57-T34 offers the following onboard I/Os via HE-10 connectors:

- 16 isolated Digital Inputs, configurable via wiring to include 2 HSC/Shaft-encoder Inputs
- 2 Analog Inputs
- 16 isolated Transistor Outputs

Note that you cannot wire HE-10 I/Os directly into the PLC. HE-10 connector cables. DIN-rail connector units are available by separate order. Check the Accessories section in the V570-57-T34 technical specifications for additional information.

Using your own cable, you can also connect the PLC I/Os directly to your machine.

General Description

V570 OPLCs are programmable logic controllers that comprise a built-in operating panel containing a 5.7" Color Touchscreen which displays a virtual keyboard when the application requires the operator to enter data. Some models also offer an on-board I/O configuration.

Communications

- 2 isolated RS232/RS485 ports
- Isolated CANbus port
- The user may 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

V570 supports digital, high-speed, analog, weight and temperature measurement I/Os via:

- On-board I/O configuration
Model-dependent
- 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:

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

To enter Information Mode, press the <i> button 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
Includes 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
- CANbus network termination resistor
- Battery (not installed)
- Mounting brackets (x4)
- Rubber seal


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

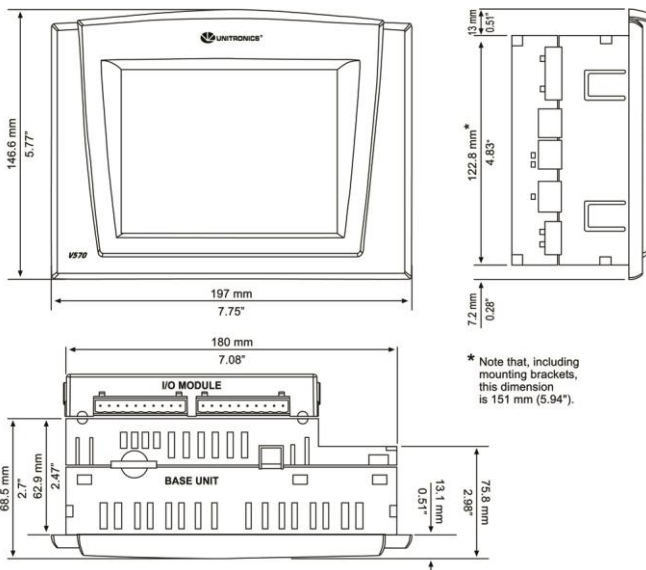
In order to preserve data in case of power-off, you must insert the battery.

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



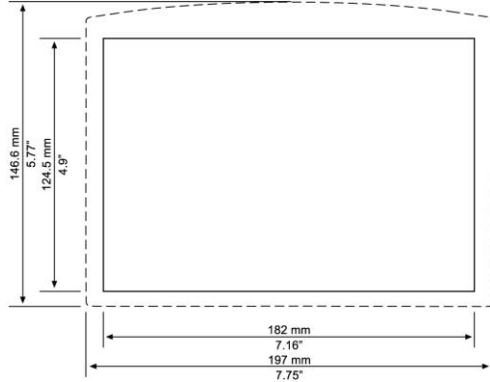
Note that the LCD screen may have a single pixel that is permanently either black or white.

Panel Mounting

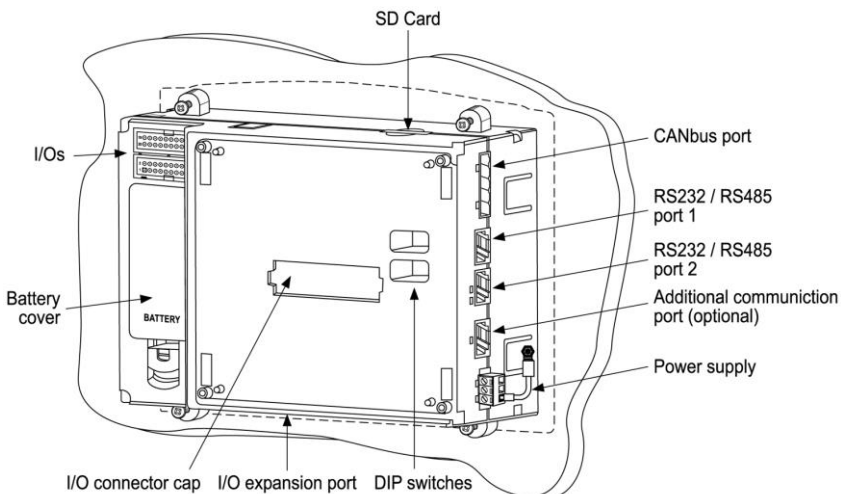
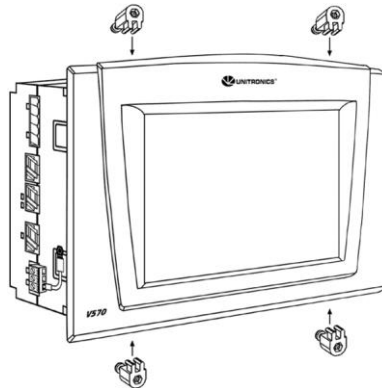
Before you begin, note that the mounting panel cannot be more than 5 mm thick.

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 Procedure

Use crimp terminals for wiring; use 26-12 AWG wire (0.13 mm²–3.31 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.
 - 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 input lines used over an extended distance. Use wire that is properly sized for the load.

I/Os

This model comprises a total of 16 digital inputs, 2 analog inputs and 16 outputs.

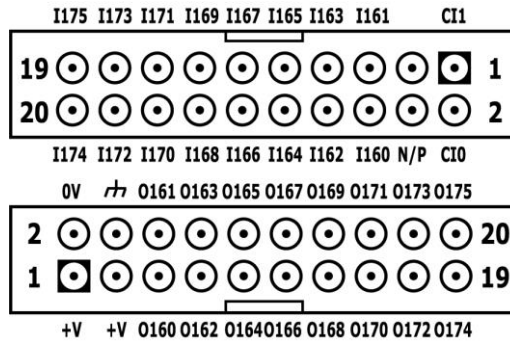
1. Input functionality can be adapted as follows:

All 16 inputs may be used as digital inputs. All 16 may be wired in a group, via a pin on the connector, as either npn or pnp. In addition, according to jumper settings and appropriate wiring:

 - Inputs 160 & 162 can function as either a high-speed counter, as part of a shaft-encoder, or as a normal digital input
 - Inputs 161 & 163 can function as either a counter reset, as part of a shaft-encoder, or as a normal digital input
 - If inputs 160 & 162 is set as a high-speed counter (without reset), inputs 161 & 163 can function as normal digital inputs
2. Output functionality is as follows:
 - All 15 (161-175) outputs are pnp outputs
 - Output 160 is an npn - High Speed Output

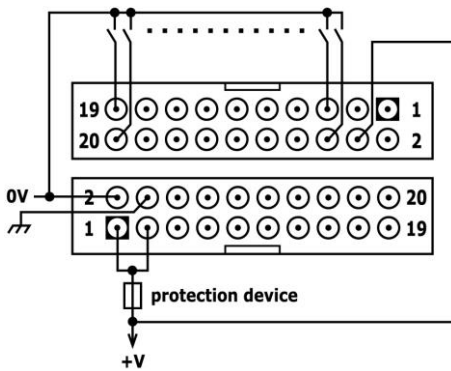
I/O Wiring (HE-10 connectors)

I/O Configuration

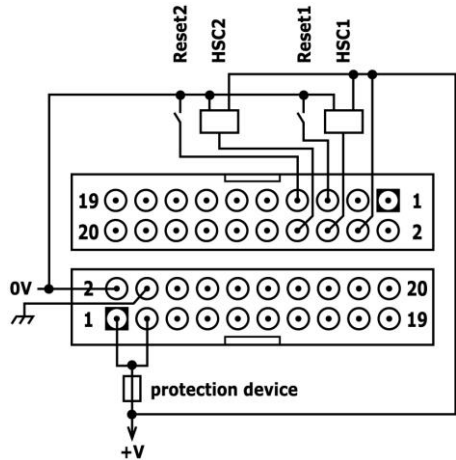


npn (sink) Input Wiring

Input wiring

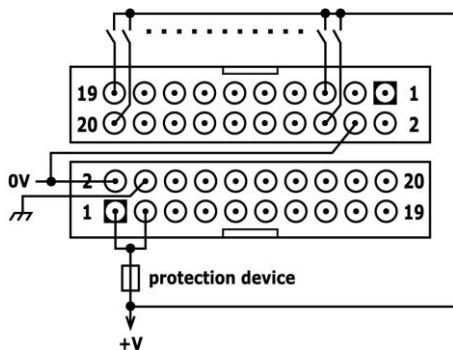


HSC input wiring

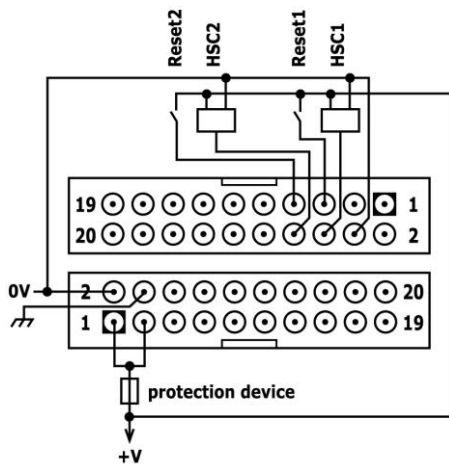


pnp (source) Input Wiring

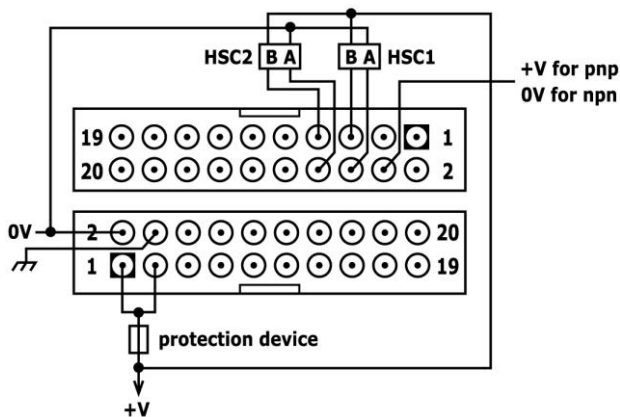
Input wiring



HSC input wiring

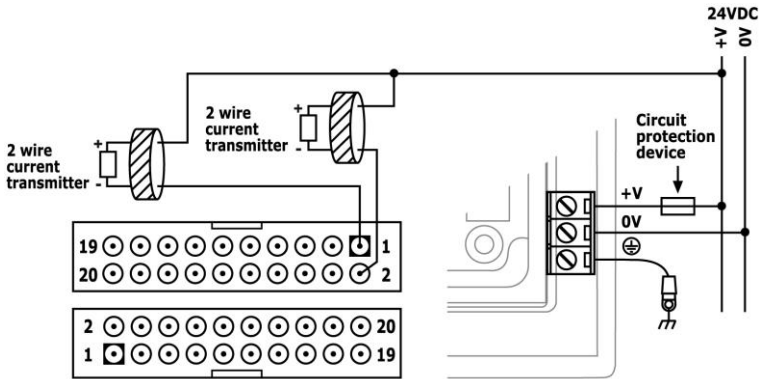


Shaft-encoder

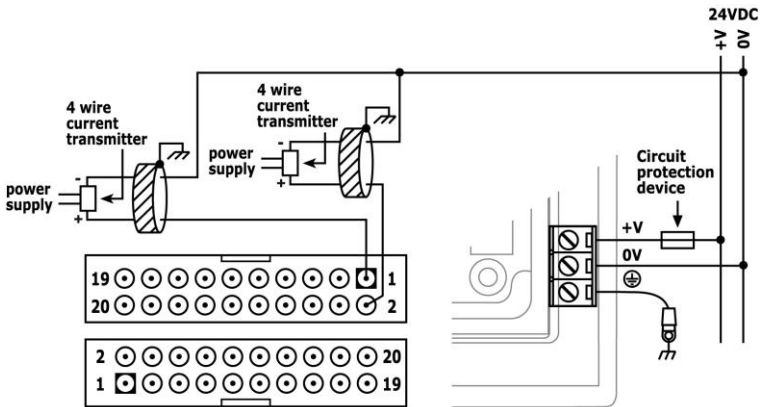


Analog Input Wiring

Analog input wiring, current (2-wire)



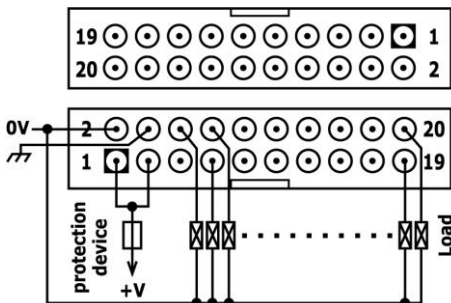
Analog input wiring, current/voltage (4-wire)



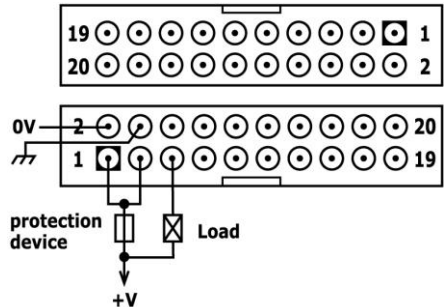
- Shields should be connected at the signal's source.
- Analog inputs are not isolated. They relate to the controller's main power supply.

Output Wiring

Transistor Outputs (pnp)



Transistor High Speed Output (npn)



Power Supply

The controller and the digital IO require an external 24VDC power supply.

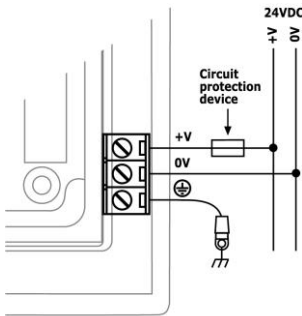


- A non-isolated power supply can be used if a 0V signal is connected to the chassis.

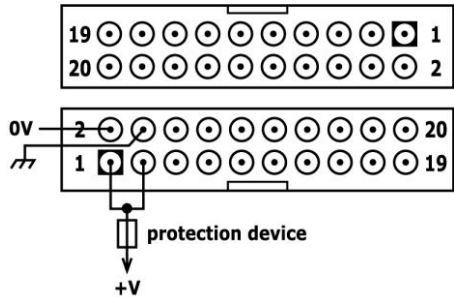


- Install an external circuit breaker. Guard against short-circuiting in external wiring.
- Double-check all wiring before turning on the power supply.
- Do not connect either the 'Neutral' or 'Line' signal of the 110/220VAC to device's 0V pin.
- In the event of voltage fluctuations or non-conformity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

Controller Power Supply



Digital I/O Power Supply



Earthing the Power Supply

To maximize system performance, avoid electromagnetic interference by:

- Mounting the controller on a metal panel.
- Earthing the controller's power supply: connect one end of a 14 AWG wire to the chassis signal; connect the other end to the panel.

Note: If possible, the wire used to earth the power supply should not exceed 10 cm in length. However, it is recommended to earth the controller in all cases.

Communication Port

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



- Turn off power before making communications connections.

Caution ▪ Always use the appropriate port adapters.

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.

By factory default, the port is set to RS232, termination ON.

- 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.

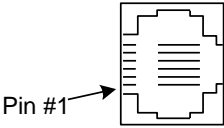
Pinouts

The pinouts below show the PLC port signals.

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



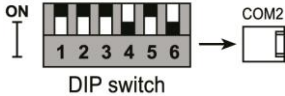
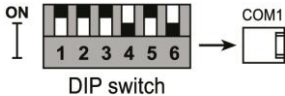
*Standard programming cables do not provide connection points for pins 1 and 6.

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

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

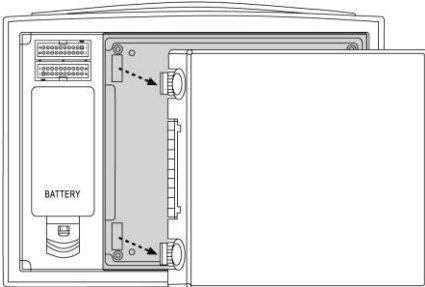
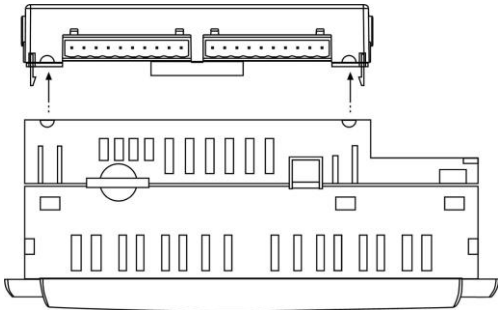


*Default factory setting

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

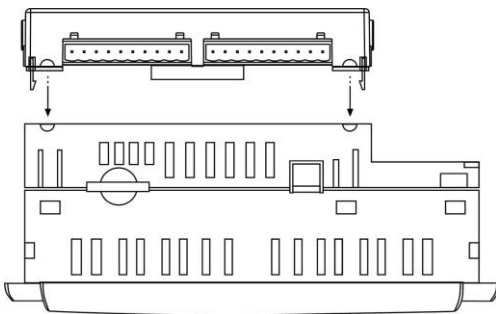
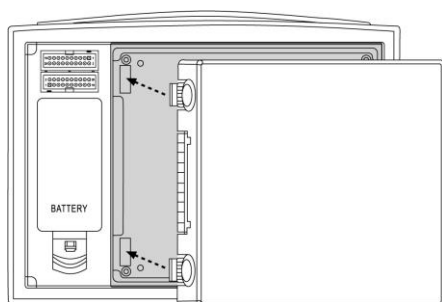
Removing a Snap-in I/O Module

1. Locate the four buttons 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.

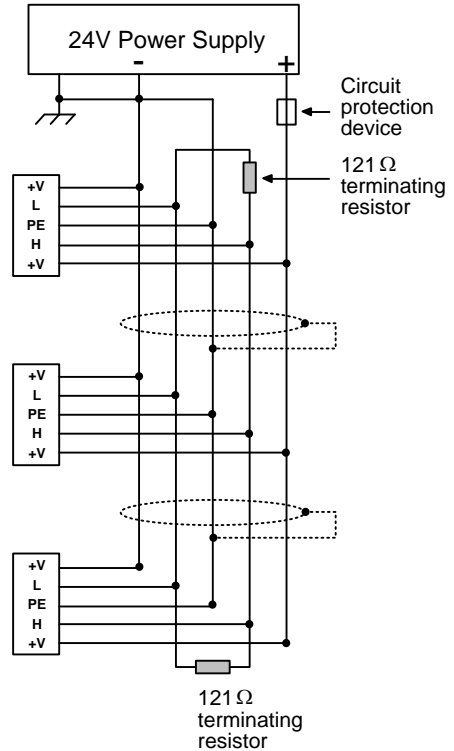
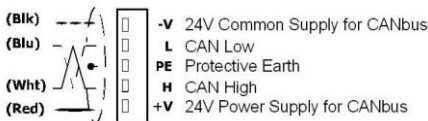
Network terminators: These are supplied with the controller. Place terminators at each end of the CANbus network.

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

Controller Power Supply

Input voltage	24VDC
Permissible range	20.4 VDC to 28.8VDC (ripple < 10%)
Max. current consumption	270mA@24V

Digital I/Os Power Supply

Input voltage	24VDC
Permissible range	20.4 VDC to 28.8VDC (ripple < 10%)
Max. current consumption	30mA@24V. See Note 3

Notes:

3. Maximum current consumption does not provide for pnp output requirements. The additional current requirement of pnp outputs must be added.

Digital Inputs

Number of inputs	16. See Note 4	
Input type	See Note 4	
Galvanic isolation	Yes. See Note 5	
Nominal input voltage	24VDC	
Input voltage	Normal digital input	High Speed Input. See Note 6
pnp (source)	0-5VDC for Logic '0' 17-28.8VDC for Logic '1'	0-3VDC for Logic '0' 21.6-26.4VDC for Logic '1'
npn (sink)	17-28.8VDC for Logic '0' 0-5VDC for Logic '1'	21.6-26.4VDC for Logic '0' 0-3VDC for Logic '1'
Input current	3.7mA@24VDC	
Input impedance	6.5KΩ	
Response time	10mS typical, when used as normal digital inputs	
Input cable length	Up to 30 meters, unshielded	
High speed inputs	Specifications below apply when wired as HSC/shaft-encoder. See Note 6	
Frequency	Driver type	
	pnp/npn	Push-pull
	HSC	30kHz maximum
	Shaft-encoder	15kHz maximum
		25kHz maximum
Duty cycle	40-60%	
Resolution	32-bit	

Notes

4. Input functionality can be adapted as follows:

All 16 inputs may be used as digital inputs. All 16 may be wired in a group, via a pin on the connector, as either npn or pnp. In addition, according to jumper settings and appropriate wiring:

Inputs 160 & 162 can function as either a high-speed counter, as part of a shaft-encoder, or as a normal digital input

Inputs 161 & 163 can function as either a counter reset, as part of a shaft-encoder, or as a normal digital input

If inputs 160 & 162 is set as a high-speed counter (without reset), inputs 161 & 163 can function as normal digital inputs

5. The digital inputs and outputs are not isolated from each other. They are isolated from the analog inputs and from the controller.

6. 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.

Analog Inputs

Number of inputs	2
Input type	Current
Input range	0-20mA, 4-20mA
Input impedance	250Ω
Maximum input rating	±30mA, 7.5V
Galvanic isolation	None
Conversion method	Successive approximation
Normal mode	

Resolution, except 4-20mA	10-bit (1024 units)
Resolution, at 4-20mA	204-1023 (820 units)
Conversion time	One configured input is updated per scan. See Note 7
Full-scale error	±3 LSB (0.3%)
Linearity error	±3 LSB (0.3%)
Status indication	Yes - if an analog input deviates above the permissible range, its value will be 1024.

Notes:

7. For example, if 2 inputs are configured as analog, it takes 2 scans to update all analog values.

Digital Outputs

	1 transistor npn (sink)	15 transistor pnp (source)
Number of outputs	N-MOSFET (open drain)	P-MOSFET (open drain)
Output type	N-MOSFET (open drain)	P-MOSFET (open drain)
Galvanic isolation	Yes. See Note 5	Yes. See Note 5
Output current (resistive load)	50mA maximum	0.3A maximum per output 5A maximum total per common
Maximum frequency (resistive load)	100KHz (at maximum load resistance of 1.5kΩ)	50Hz
Short circuit protection	No	Yes
Short circuit indication	No	Via software
On voltage drop	0.4VDC maximum	0.5VDC maximum
Voltage range	3.5V to 28.8VDC, unrelated to the voltage of either the I/O module or the controller	See Digital I/Os Power Supply page 1

Graphic Display Screen

	See Note 8
LCD Type	TFT
Illumination backlight	White LED
Display resolution, pixels	320x240 (QVGA)
Viewing area	5.7"
Colors	256
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:

8. The LCD screen may have a single pixel that is permanently either black or white.

Program

Memory size	Application Logic – 2MB, Images – 6MB, 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 μ sec 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 7
---------	--

Notes:

7.User must format via Unitronics SD tools utility.

Communication

Serial ports	2. See Note 8	
RS232		
Galvanic isolation	Yes	
Voltage limits	± 20 VDC absolute maximum	
Baud rate range	300 to 115200 bps	
Cable length	Up to 15m (50')	
RS485		
Galvanic isolation	Yes	
Voltage limits	-7 to $+12$ VDC 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')	
CANbus port	1	
Nodes	CANopen	Unitronics' CANbus protocols
	127	60
Power requirements	24VDC ($\pm 4\%$), 40mA max. per unit	
Galvanic isolation	Yes, between CANbus and controller	
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
	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:

8. The standard for each port is set to either RS232/RS485 according to DIP switch settings. Refer to the Installation Guide.

I/O Modules

Snap-in I/O modules	Plugs into rear port to create self-contained PLC with up to 43 I/Os. Number of I/Os and types vary according to module.
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

Notes:

9. V570 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.

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, without opening the controller.

Dimensions

Size

197 X 146.6 X 68.5mm (7.75" X 5.77" X 2.7"). See Note 10

Weight

833 g (29.3 oz)

Notes:

10. 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)

10% to 95% (non-condensing)

Accessories

HE-10 I/O connection cable

P/N: HE1-CA100
20-wire ribbon cable, length 1 meter, ended by HE-10 sockets

HE-10 I/O connection kit

P/N: HE-IO34-100

Kit contents

- HE-10 I/O connector unit, with screw terminal blocks, DIN-mounted
- Two HE1-CA100 cables

The information in this document reflects products at the date of printing. Unitronics reserves the right, subject to all applicable laws, at any time, at its sole discretion, and without notice, to discontinue or change the features, designs, materials and other specifications of its products, and to either permanently or temporarily withdraw any of the foregoing from the market. All information in this document is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to any implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Unitronics assumes no responsibility for errors or omissions in the information presented in this document. In no event shall Unitronics be liable for any special, incidental, indirect or consequential damages of any kind, or any damages whatsoever arising out of or in connection with the use or performance of this information. The tradenames, trademarks, logos and service marks presented in this document, including their design, are the property of Unitronics (1989) (R®) Ltd. or other third parties and you are not permitted to use them without the prior written consent of Unitronics or such third party as may own them.