

Samba™ PLC+HMI Installation Guide

SM70-J-T38

- 22 Digital Inputs, including 2 Analog, 2 HSC/Shaft-encoder inputs
- 16 Transistor Outputs

General Description

All of the controllers covered in this guide are micro-PLC+HMIs, rugged programmable logic controllers that comprise built-in operating panels and on-board I/Os.

On-board I/O	Yes
Screen	7" Color Touch
Keypad or Function Keys	None
Programming Com Port, Built-in	USB device, mini-B
Com Ports, separate order, user-installed	The user may install a CANbus module (V100-17-CAN), and one of the following: <ul style="list-style-type: none">• RS232/RS485 port (V100-17-RS4/V100-17-RS4X)• Ethernet (V100-17-ET2)

Standard Kit Contents

Controller	Yes
Terminal Blocks	Yes
Battery	Yes
Mounting Brackets	Yes (6 parts)
Rubber Seal	Yes

Alert Symbols and General Restrictions

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

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

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

 Failure to comply with appropriate safety guidelines can cause severe injury or property damage.

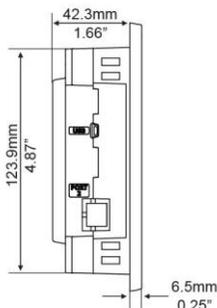
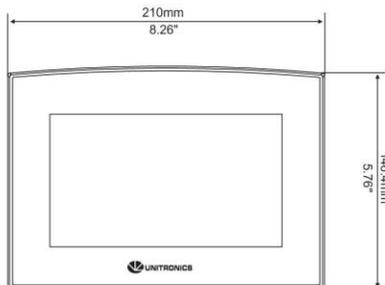
- Do not attempt to use this device with parameters that exceed permissible levels.
- To avoid damaging the system, do not connect/disconnect the device when power is on.

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

Dimensions



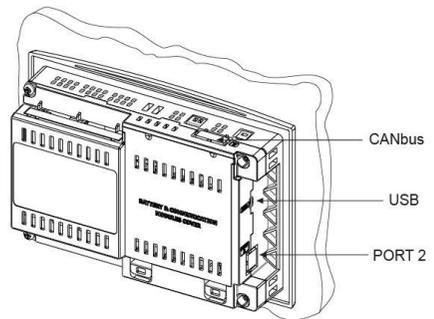
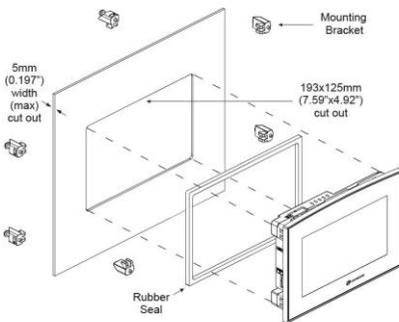
Panel Mounting

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

UL listed models:

To meet the UL508 standard, panel-mount the device on the flat surface of a Type 1 enclosure.

1. Make a panel cut-out of the appropriate size: 193x125mm (7.59"x4.92").
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.



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 3.31 mm² –0.13 mm² wire (12-26 AWG):

- 1.Strip the wire to a length of 7±0.5mm (0.270–0.300”).
 - 2.Unscrew the terminal to its widest position before inserting a wire.
 - 3.Insert the wire completely into the terminal to ensure a proper connection.
 - 4.Tighten enough to keep the wire from pulling free.
- Input or output cables should not be run through the same multi-core cable or share the same wire.
 - Allow for voltage drop and noise interference with I/O lines used over an extended distance. Use wire that is properly sized for the load.
 - The controller and I/O signals must be connected to the same 0V signal.

I/Os

SM70-J-T38 model comprise a total of 22 inputs and 16 transistor outputs.

Input functionality can be adapted as follows:

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

According to jumper settings and appropriate wiring:

- Inputs 14 and 15 can function as either digital or analog inputs.
- Inputs 0 and 2 can function as, high-speed counters, as part of a shaft-encoder, or as normal digital inputs.
- Inputs 1 and 3 can function as either counter reset, as normal digital inputs, or as part of a shaft-encoder.

If inputs 0 and 2 are set as high-speed counters (without reset), inputs 1 and 3 can function as normal digital inputs.

Input Jumper Settings

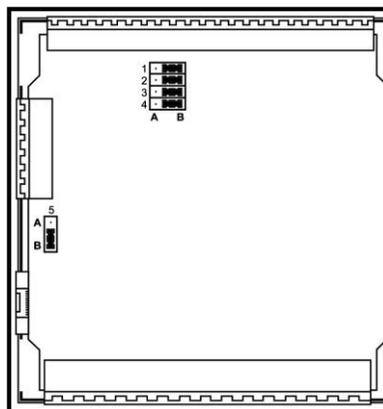
The tables below show how to set a specific jumper to change input functionality. To access the I/O jumpers, you must open the controller according to the instructions beginning on page 7.



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

Digital Inputs 0-21: Set Type		
Set to	JP5 (all Inputs)	
npn (sink)	A	
pnp (source)*	B	
Inputs 14/15: Set as Digital or Analog		
Set to	JP2 (Input 14)	JP1 (Input 15)
Digital*	B	B
Analog	A	A
Analog Inputs AN0/AN1: Set Type		
Set to	JP4 (AN0)	JP3 (AN1)
Voltage	A	A
Current*	B	B

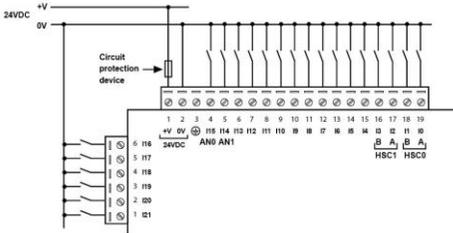
*Default settings



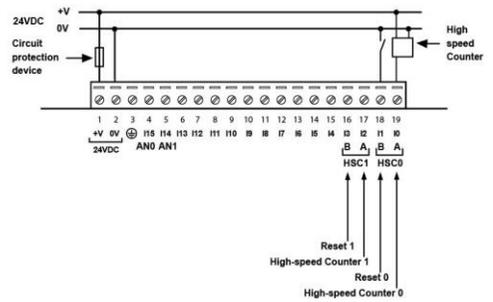
I/O Wiring

npn (sink) Input

Input wiring

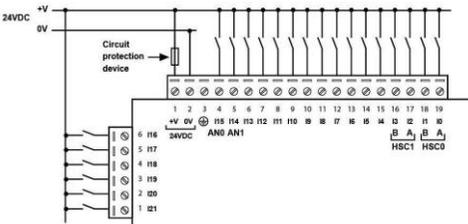


HSC input wiring

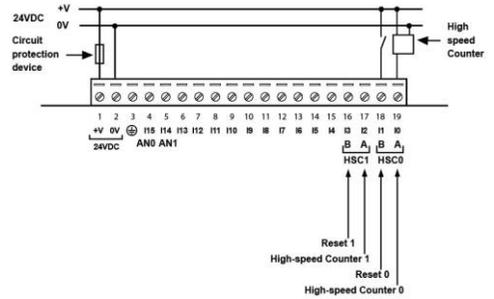


pnp (source) Input

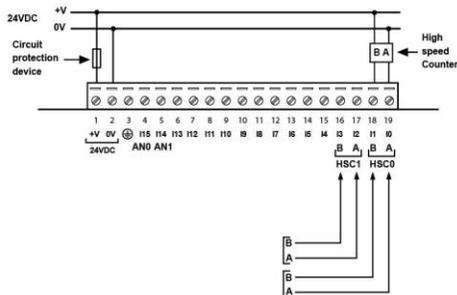
Input wiring



HSC input wiring

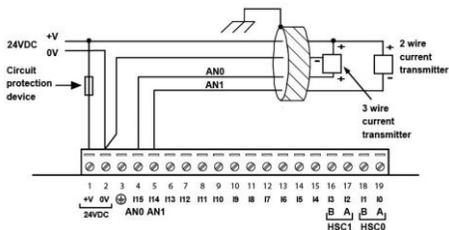


Shaft-encoder

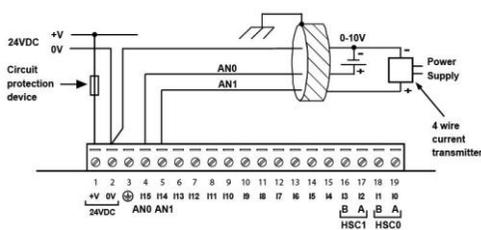


Analog Input

Analog input wiring, current (2/3-wire)

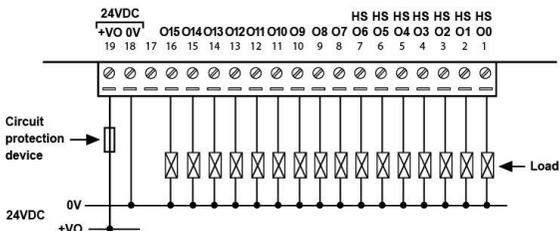


Analog input wiring, current (4-wire), voltage



- Shields should be connected at the signal's source.
- The 0V signal of the analog input must be connected to the controller's 0V.

Transistor Outputs (pnp)



- Outputs 0 to 6 can be used as PWM outputs.

Power Supply

The controller requires an external 24VDC power supply.

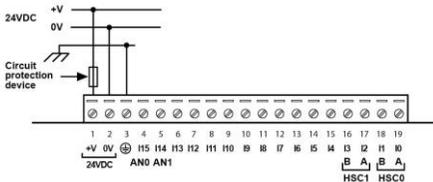


- The power supply must include double insulation. Outputs must be rated as SELV/PELV/Class2/Limited Power.

- 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 Port



- Turn off power before making communications connections.

Caution ▪ Always use the appropriate port adapters.

This series comprises a USB port.

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, disconnects, and dismantles 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

The I/O board of the controller is now exposed, enabling you to change I/O settings (module dependent) according to the jumpers setting above.

Note: Photo is for illustration purposes only.
(Using SM70)



Closing the Controller

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.

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