SC100-MP

SMART I/O™

Multi-Protocol Controller
(NATIVE BACnet®, LonTalk®)

APPLICATIONS

- Air Handling Units
- Fan Coil Units
- Roof Top Units
- Heat Pumps
- VAVs
- CO2 Sensor Monitor
- Occupancy Sensor Monitor
- Room Pressurization Control
- Energy Management
- Refrigeration
- Custom Applications

FEATURES

- NATIVE BACnet, LonTalk Protocol Communication
- IP support of BACnet/IP & LonTalk/IP when used with a Router
- FT-10 (Free Topology) and RS-485 Communication
- Precision Onboard 0-2" W.C. Air-Flow/Pressure Sensor (XP Version) Never needs to be Zero'd. Exceptional performance at extremely low airflows.
- 5 universal inputs: UI1-UI4 has 0-5V, thermistor or dry contact. UI5 has 0-5V, 0-10V, 4-20mA, thermistor or dry contact. (no jumpers to set)
- 5 digital outputs (Triac, 1 A)
- Fully programmable, Application Downloading in Field
- DIN-rail mounting
- Compact Size for Minimal Panel Space
- 2 Year Limited Warranty

DESCRIPTION

Setting a NEW Standard in the industry, only one controller is needed to satisfy today's Building Automation protocols. Smart Controls' new MP series controllers can connect to Native BACnet and LonTalk simultaneously.

The Smart I/O SC100-MP breaks the multi-protocol communication barrier by providing NATIVE BACnet, and LonTalk communication all in one controller. BACnet can communicate over an RS-485 communication channel while BACnet/Free Topology and LonTalk/FT (Free Topology) are communicating over a TP/FT-10 communication channel simultaneously to provide monitoring, control and diagnostic information.

In addition, the SC100-MP has the capability to communicate BACnet/IP or LonTalk/IP in a manner that is transparent to both the application and FT network. With BACnet/IP, applications on the SC100-MP run unmodified over a very reliable Free Topology channel delivering BACnet Objects. With LonTalk/IP, applications on the SC100-MP run unmodified over the same reliable Free Topology channel delivering network and configuration variables. The IP address is established at the device level. The SC100-MP is fully compatible and discoverable using industry standard, BTL certified, BACnet management clients and LONWORKS® network management software.

The SC100-MP is a fully programmable controller allowing a complete sequence of customized operations for today's ever-changing control strategies that are required to meet continued energy efficiency requirements. The reliable cost effective I/O is continuously monitored and precisely controlled by an on-board 32-bit microprocessor.

The controller features an additional local serial communication to a Smart Controls SI-20 remote room sensor interface. The SI-20 features a fully programmable display for unprecedented custom application functionality.

As an option, a precision airflow sensor can be added that provides reliable and accurate measurements expanding the superior performance of the SC160-MP for Pressure Independent VAV applications or static pressure applications under 2 inches WC (0-500 Pa).

The five universal inputs (UI) can be software selected to sense analog or digital signals. There are no jumper adjustments or settings on the SC100-MP. Inputs are automatically set-up in the application program that is downloaded into the controller. Universal inputs 1 though 5 will monitor an analog signal from resistive (10K ohm Type 2, 3 or 20K ohm) sensors or voltages (0-5V) from a transducer accurately with a resolution of 12 bits. Digital input signals can also be monitored from a dry contact or open-collector output device. Universal input 5 provides additional software selectable capability to measure analog input voltages that are 0-10 volts or input currents that are 4-20mA. A +20 VDC source is available to provide power for external transducers and is protected by an internal auto-resetable fuse. No external DC power supplies are required for your 4-20ma Loop Powered sensors.

The five digital outputs (DO) are Triac outputs for control of additional on/off or pulsed external devices where the current does not exceed 1A at 24 VAC.

The SC100-MP controller is protected from reverse power-supply input wiring, over-voltages, transients, and other common events that can damage unprotected inputs and outputs.

Continuing the commitment to OPEN Controls, Smart Controls controllers can be programmed by multiple software packages available in the industry. User defined algorithms and functions can be programmed using VisualControl™, NodeBuilder®, LonBuilder® or other third party LONWORKS programming tools. The application program is stored in non-volatile memory allowing the application to be retained even after loss of power. The versatile I/O allows numerous applications to be developed and implemented with the SC100-MP.

The enclosure snaps right onto a 35mm DIN-rail for quick and easy mounting. Its spring-loaded latching mechanism makes it easy to remove.

The wide operating temperature range, -20 to 70 °C, makes the SC100-MP well suited for many demanding applications.

SELECTION GUIDE

Models:

SC100-MP

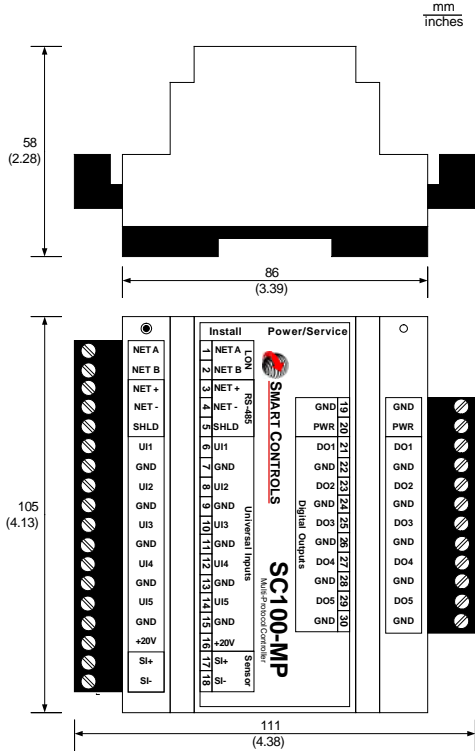└────── Fully Programmable I/O Controller

SC100-MP-XP

└────── Fully Programmable I/O Controller with 0-2" WC air-flow/pressure sensor

DIMENSIONS

$$\frac{mm}{inches}$$

58
(2.28)

86
(3.39)

105
(4.13)

Install	Power/Service

SMART CONTROLS

RS-485

Universal Inputs

Digital Outputs

Sensor

SC100-MP
Multi-Protocol Controller

NET A
NET B
NET +
NET -
SHLD
UI1
GND
UI2
GND
UI3
GND
UI4
GND
UI5
GND
+20V
SI+
SI-

1 NET A
2 NET B
3 NET +
4 NET -
5 SHLD
6 UI1
7 GND
8 UI2
9 GND
10 UI3
11 GND
12 UI4
13 GND
14 UI5
15 UI5
16 +20V
17 SI+
18 SI-

LON

GND 19
PWR 20
DO1 21
GND 22
DO2 23
GND 24
GND 25
GND 26
DO4 27
DO5 28
GND 29
GND 30

GND
PWR
DO1
GND
DO2
GND
DO3
GND
DO4
GND
DO5
GND

111
(4.38)

CONTACT

SMART CONTROLS™

Office:
10000 St. Clair Avenue
Fairview Heights, IL 62208
U.S.A.
Phone: +1 618 394 0300
Fax: +1 618 394 1575

E-mail:
sales@smartcontrols.com

Web site:
www.smartcontrols.com

BACnet® is a registered trademark of ASHRAE. Echelon®, LONWORKS®, LonTalk®, NodeBuilder®, LonBuilder® , Neuron® and LON® are registered trademarks of Echelon Corporation.

Smart I/O™, Smart Controls™, VisualControl™ and Smart Controls Logo are trademarks of Smart Controls, LLC. Smart Controls, LLC reserves the right to make changes without further notice to this product for improvements in design and reliability. Smart Controls, LLC does not assume any liability arising out of the application or use of this product; neither does it convey any license under its patent rights of others.

SPECIFICATIONS

General
Communication:	NATIVE BACnet, LonTalk
IP Support:	BACnet/IP, LonTalk/IP over TP/FT-10 (Requires Router)
Transceiver:	RS-485 (termination jumper) Selectable Baud Rate: 38400 default, 19200, 9600. FTT-10 (Free Topology)
MAC Address:	Dip Switch Selectable
I/O Processor:	32-bit Microcontroller
Application Processor:	Neuron® FT6050
Application Memory:	64 KB RAM 1.0 MB External Serial FLASH

Enclosure
Dimensions:	L 105 x W 86 x H 58 mm (4.13" x 3.39" x 2.28")
Cover:	Lexan 940, UL94-V0 rated
Base:	Noryl VO1550, UL94-V0 rated

Power
Nominal Input Voltage:	24 VAC
Input Voltage Range:	19.2-28.8 VAC
Typical Consumption:	0.6 VA
Maximum Consumption:	1.0 VA, does not include Triac loading

Environmental
Operating Temperature:	-20 °C to +70 °C, -4 °F to 158 °F
Storage Temperature:	-40 °C to +70 °C, -40 °F to 158 °F
Relative Humidity:	5% to 95% (non-condensing)

Warranty
Period:	2 Years (Limited)

Air-Flow/Pressure (XP Version)
Type:	Differential Pressure
Range:	0-2" W.C. (0-500 Pa)
Resolution:	12-bit
Accuracy:	0.2% Full Scale (32°F –122°F, 0°C–50°C)

Inputs
Number:	5

UI1-UI4
Voltage:	0-5 Volts
Thermistor:	Type 2, 3: 10K ohms (25°C, 77°F) 20K ohms (25°C, 77°F)
Digital:	Dry Contact, Open-collector

UI5 Only
Voltage:	0-5 Volts, 0-10 Volts
Current:	4-20mA
Thermistor:	Type 2, 3: 10K ohms (25°C, 77°F) 20K ohms (25°C, 77°F)
Digital:	Dry Contact, Open-collector

All Inputs
Analog Resolution:	12-bit
Accuracy:	±1% FS (25°C, 77°F)
Protection Circuitry:	Transient Voltage, ESD

Outputs
Number:	5
5-Digital:	Triac 1.0 A @ 24 VAC Voltage Sourcing
Protection Circuitry:	Transient Voltage, ESD

+20 VDC Supply
Voltage:	+20 ± 0.5 VDC
Current Continuous:	0.3A Max. (20°C, 68°F)
Fused:	0.6A trip, Auto-Reset (20°C, 68°F)

SI-20 (SI+, SI-)
Connection:	2-wire (15V Polarity Sensitive)
Communication:	Serial

EXAMPLE WIRING DIAGRAM

IMPORTANT WIRING INFORMATION

1) Secondary of Class 2 Transformer should always be earth grounded to provide reliable communication and sensor readings.

2) *External fuse not supplied. Size fuse according to application load and not to exceed 5 Amps.

3) Do not connect external resistor to voltage inputs to sense 4-20 mA current devices. Incorrect readings will result.

All inputs are software selected for analog, digital, or resistive.

This diagram is an example of device connections and no reference to an application is being provided.

BACnet/Free Topology
BACnet/IP
LonTalk/FT & LonTalk/IP Network

Twisted-Pair Unshielded Cable

Earth Ground Shield in One Place Only.

BACnet/MSTP Network

RS-485 Signal Common

1 NET A
2 NET B
3 NET +
4 NET -
5 SHLD

LON

RS-485

Alarm Dry Contact
6 UI1
7 GND

Transducer 0-5 VDC Output
8 UI2
9 GND

Current Switch Dry Contact
10 UI3
11 GND

Thermistor 10K ohm, Type 2 or 3
12 UI4
13 GND

Transducer 0-10 VDC Output
14 UI5
15 GND

SI-20
TEMP 75.8

Twisted-Pair Unshielded Cable

16 +20V
17 SI+
18 SI-

Class 2 Transformer

GND 19
PWR 20
DO1 21
GND 22
DO2 23
GND 24
DO3 25
GND 26
DO4 27
GND 28
DO5 29
GND 30

24 VAC   120 VAC
*Fuse

OPEN / CLOSE — Actuated Valve

FAN — AC Contactor

CW / CCW / GND — Floating Point Actuator

Airflow Sensor — LO / HI — Airflow/ Pressure (option - XP) Sensor

Document Number: 37-0308, ver. 1.1.0