EC160

SMART I/O™

DESCRIPTION

The Smart I/O™ EC160 is a fully programmable controller allowing a complete sequence of operation customization 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 a microprocessor for exceptional performance. To eliminate memory constraints caused by today's complex applications an additional 8K of external SRAM has been added to the existing memory architecture of the EC160. As an option, a precision airflow sensor can be added that provides reliable and accurate measurements allowing superior performance. Communication for monitoring, control and diagnostics is achieved utilizing a LonTalk® TP/FT-10 network with a simple twisted-pair, non-polarized cable. The controller features 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.

The six universal inputs (UI) can individually sense analog or digital signals. There are no jumper adjustments or settings on the EC160. Inputs are automatically set-up in the application program that is downloaded into the controller. An analog signal from a resistive (10K ohm or 20K ohm) type sensor, voltages (0-5V, 0-10V) or current (4-20mA) from a transducer are accurately measured with a resolution of 12 bits. A digital input signal from a dry contact or 0-5V volt source is used to provide the status or state of external devices. A +20 VDC source is available to provide power for external transducers and is protected by an internal auto-resetable fuse.

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

The EC160 controller is protected from reverse power supply input wiring, over-voltages, transients, and other common events that can damage unprotected inputs and outputs.

User defined algorithms and functions can be programmed using VisualControl™, NodeBuilder, LonBuilder or other third party LONWORKS programming tools. The application program can be downloaded over the LonTalk network and 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 development and implemented with the EC160.

The enclosure snaps securely onto a 35mm DIN-rail for quick and easy mounting. A spring-loaded locking clip allows for quick and easy removal.

The wide operating temperature range, -20 to 70 °C, makes the EC160 well suited for many demanding applications.

APPLICATIONS

- VAV Controller
- Zone Control
- Heating & Cooling
- Electric Reheat
- Hot Water Reheat
- Single & Two Stage Reheat
- CO2 Sensor Monitor
- Occupancy Sensor Monitor
- Room Pressurization Control
- Roof Top VVT Control
- Custom Applications

FEATURES

- LonTalk Protocol
- Free Topology   Communication (FTT-10)
- Precision Onboard 0-2"W.C. Air-Flow/Pressure Sensor (XP Version)
- 6 universal inputs with 0-5V, 0-10V, 0-20mA, thermistor or dry contact (no jumpers to set)
- 6 digital outputs (Triac, 1 A)
- 4 analog outputs (0-10V)
- FLASH Memory for Network Downloading of Applications
- 62 programmable network variables with no SNVT type limitations
- DIN-rail mounting
- Compact Size for Minimal Panel Space
- Fully programmable
- 2 Year Limited Warranty
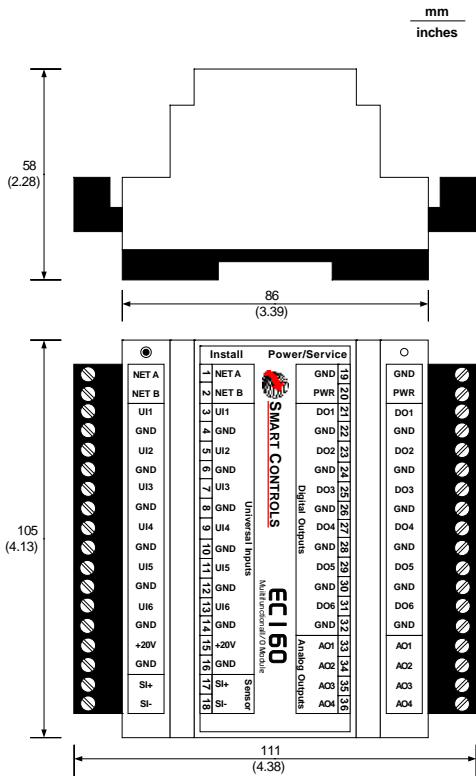
SELECTION GUIDE

Models:

S-EC160P-F
└──────── Fully Programmable I/O Controller

S-EC160-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	
NET A	1 NET A	GND 19	GND
NET B	2 NET B	PWR 20	PWR
UI1	3 UI1	DO1 21	DO1
GND	4 GND	GND 22	GND
UI2	5 UI2	DO2 23	DO2
GND	6 GND	GND 24	GND
UI3	7 UI3	DO3 25	DO3
GND	8 GND	GND 26	GND
UI4	9 UI4	DO4 27	DO4
GND	10 GND	GND 28	GND
UI5	11 UI5	DO5 29	DO5
GND	12 GND	GND 30	GND
UI6	13 UI6	DO6 31	DO6
GND	14 GND	GND 32	GND
+20V	15 +20V	AO1 33	AO1
GND	16 GND	AO2 34	AO2
SI+	17 SI+	AO3 35	AO3
SI-	18 SI-	AO4 36	AO4

SMART CONTROLS

Universal Inputs   Digital Outputs   Analog Outputs   Sensor   Multifunctional I/O Module   EC160

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

Echelon, LONWORKS and LONTALK are trademarks or registered trademarks of Echelon Corporation.

Smart I/O and VisualControl 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

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

Inputs
Number:	6
Voltage:	0-5 Volts
	0-10 Volts
Current:	4-20 mA
Thermistor:	Type 2, 3: 10Kohms (25°C, 77°F)
	20Kohm (25°C, 77°F)
Digital:	Dry Contact
Resolution:	12 bits
Accuracy:	±1% FS (25°C, 77°F)
Protection Circuitry:	Transient Over voltage, ESD

Outputs
Number:	10
6- Digital:	Triac 1.0 A @ 24 VAC Voltage Sourcing
4-Analog:	0-10V
Analog Resolution:	12 bit
Accuracy:	±1%FS (25°C, 77°F)
Protection Circuitry:	ESD

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

General
Communication:	LONTALK™ Protocol
Transceiver:	FTT-10, Free Topology
Processor:	Neuron 3150 @ 10 MHz
Memory:	48K bytes FLASH(External)
	2K bytes SRAM (Neuron)
	8K bytes SRAM (External)
	0.5K bytes EEPROM (Neuron)

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:	21-28 VAC
Maximum Consumption:	6 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)

Example Wiring Diagram

IMPORTANT WIRING INFORMATION

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

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 6 Amps.

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

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

Left Label	#	Terminal	Terminal	#	Right Label
FTT LON Network	1	NET A	GND	19	Class 2 Transformer / 24 VAC / 120 VAC
	2	NET B	PWR	20	*Fuse
Alarm Dry Contact	3	UI1	DO1	21	OPEN / Actuated Valve
	4	GND	GND	22	
Transducer 0-5 VDC Output	5	UI2	DO2	23	CLOSE
	6	GND	GND	24	
Current Switch Dry Contact	7	UI3	DO3	25	FAN / AC Contactor
	8	GND	GND	26	
Thermistor 10K ohm, Type 2 or 3	9	UI4	DO4	27	
	10	GND	GND	28	
Transducer 0-10 VDC Output	11	UI5	DO5	29	CW / CCW / GND Floating Point Actuator
	12	GND	GND	30	
Transducer 4-20mA Output	13	UI6	DO6	31	
	14	GND	GND	32	
	15	+20V	AO1	33	Modulating Valve
SI-20	16	GND	AO2	34	
	17	SI+	AO3	35	VFD
	18	SI-	AO4	36	

Twisted-Pair Unshielded Cable

Airflow Sensor — LO / HI — Airflow/Pressure Sensor (XP Version)

TEMP 75.8

Document Number: 37-0244, ver. 1.0.0