Foxboro
Process Automation System

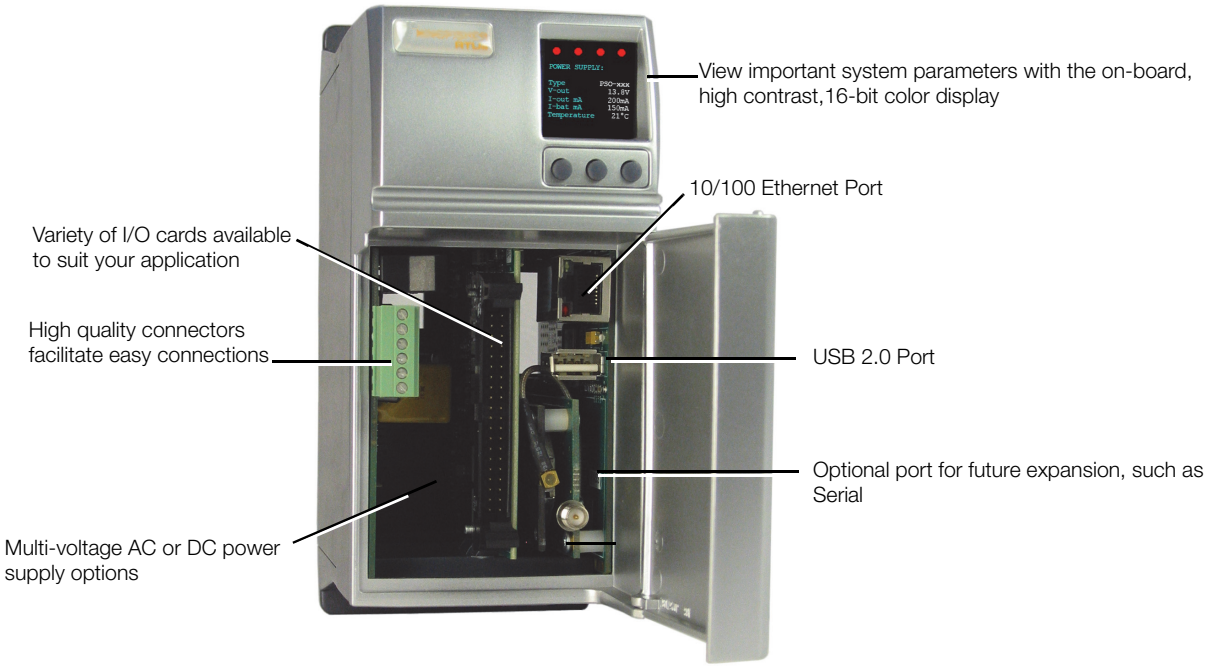
Product Specifications

Foxboro®

by Schneider Electric

PSS 31H-8J2

Remote Terminal Unit (RTU)
SCD2100 for Ultra Compact Oil, Gas, and Upstream SCADA Applications



The I/A Series® SCD2100 combines class leading features such as on-board OLED display and high specification I/O in an award winning compact package. SCD2100 is part of the Foxboro® Station Computing Device (SCD2x00) family.

SCD2100 OVERVIEW

The SCD2100 has been designed to remotely operate in harsh environments and to be easily configured for SCADA applications such as:

- Oil and gas production including offshore platforms
- Well monitoring, wet gas, and high level well control applications
- Oil and gas transportation facilities plus pipelines
- Water and wastewater treatment plants
- Water, power, and heating distribution networks.

In order to match customer needs, the SCD2100 supports several modular plug-and-play options. For example, high-density I/O cards, optional serial RS232C/RS422/RS485 communication card, a choice of a regulated AC power supply or DC power supply, and optimized transmission techniques for low-speed data lines are available.

Based on a 166 MHz high performance CPU, and extensive flash memory, the SCD2100 performs a wide range of control functions, from simple data acquisition to sophisticated, closed-loop algorithms,

through a user-friendly sequence configurator (graphic and literal programming languages compliant to IEC 61131-3 & IEC 61499).

The SCD2100 combines class leading features, such as on-board LED displays and high specification Input / Output cards in an award-winning compact package. The SCD2100 RTU is suitable for indoor mounting or outdoor field mounting when installed within an IP65/NEMA4 certified enclosure supplied by third party vendors. The SCD2100 is suitable for use in Class I, Division 2, Groups A-D, ATEX Zone 2, or non-hazardous locations.

FEATURES

Key features include:

- Extremely low power consumption
- On-board 10/100 Ethernet for communications to other devices or PCs for use as a high speed programming port.
- Color on-board OLED screen shows important system parameters and status, such as, address, date and time, power supply, I/O status in real time and in easy to read high contrast color.
- Our broad offering of communications protocols includes Modbus master/ slave (ASCIII & TCP), SNMP, DNP3 master/slave, and Allen-Bradley DF1.
- DNP3 Secure Authentication 2.0
- USB2.0 host port
- AC or DC power supplies
  - Available with a regulated worldwide voltage AC power supply, or an unregulated DC supply for use with external regulated power supplies.
- Input / Output Card
  - Various MX I/O cards provide up to 32 I/O points of either Digital In, Digital Out, Analog In or Analog Out featuring counters up to 10 KHz, 0 to 20 V dc or 4 to 20 mA signals are software selectable.
  - Digital outputs feature frequency generation and pulse generation.
  - Sequence of events (SOE) is available on all digital inputs.
  - Selectable failsafe setting on communication failures.

SCD2100 TYPICAL FUNCTIONS AND FUNCTIONAL PROGRAMMING ENVIRONMENT

SCD2100 functions and programming environment include:

- Pulse inputs acquisition, counting and freezing
- Pulse or permanent digital outputs
- Digital and analog outputs with check-before-operate security
- Programmable Sequence Control functions through user-friendly package
- I/O signals driven by local Sequences
- Sequence-programs allowing remote loading/unloading
- Store and Forward communication technique for time-stamped digital/analog chronological archives
- Report by Exception scanning
- Broadcast addressing (DNP) Dial-up, unsolicited and spontaneous calls from RTU to control centers on switched telephone lines
- Interface to a local operator workstation or diagnostic terminal
- Sequence of Events (SOE) with 1 ms resolution
- Flow calculation AGA3, AGA7, AGA8, NX19
- Management of PID algorithms

See Figure 1.

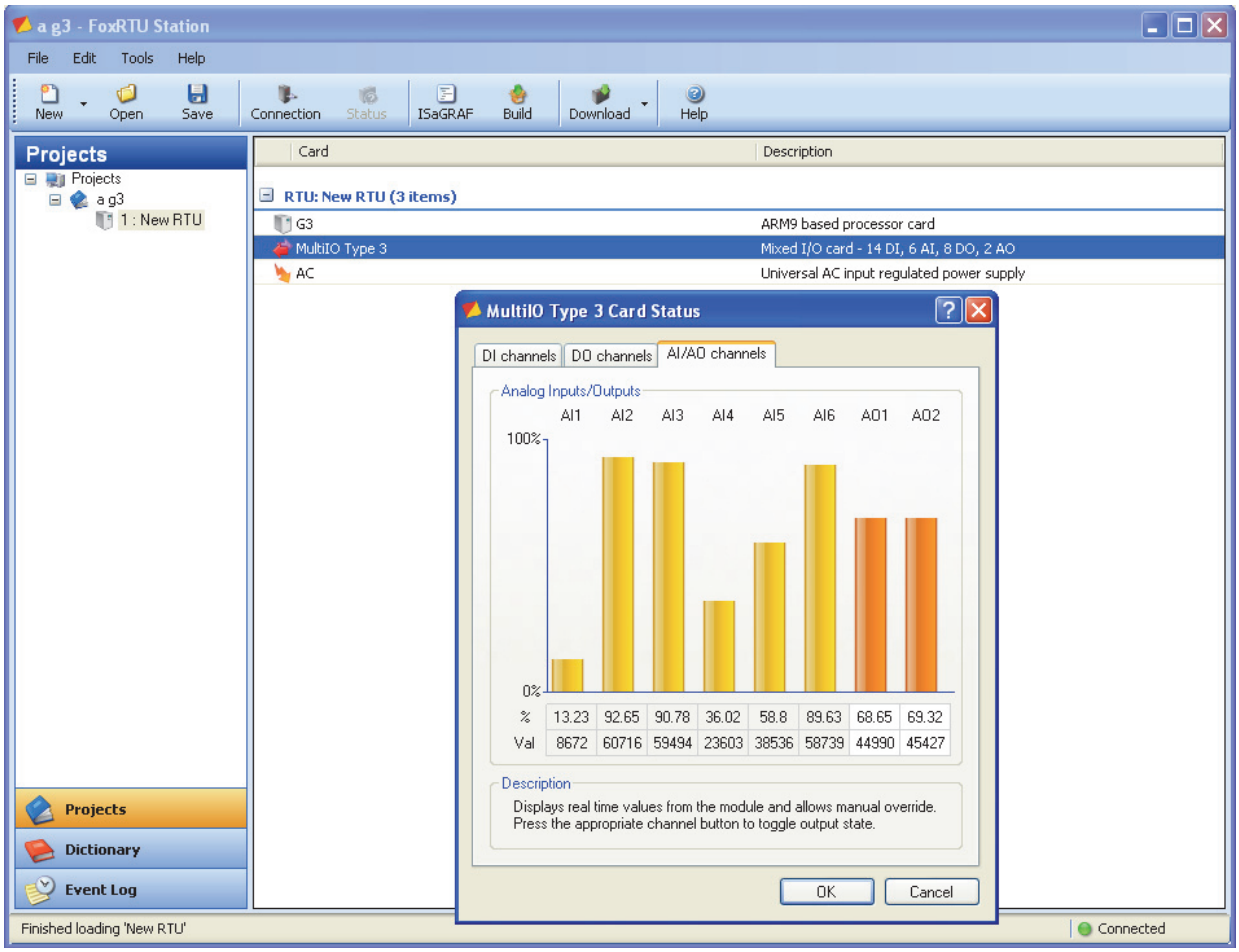


Figure 1. Functional Engineering Environment (Foxboro Evo FoxRTU Station)

Foxboro Evo FoxRTU Station Software

The Foxboro Evo™ FoxRTU Station software is a new integrated operating environment that combines configuration, programming, development, and maintenance in one simple-to-use package. Now you can view, edit, and diagnose your SCD2100 solution with a single, highly intuitive user interface.

Foxboro Evo FoxRTU Station eliminates the need to change back and forth between software packages or engage in complicated programming as you move from module to module. With its embedded IEC-61131-compliant standard, the system supports:

- Ladder Logic
- Structured Text
- Function Block Diagrams
- Sequential Function Charts
- Instruction Lists
- Flowcharts.

In addition, pre-programmed function blocks make it easy to add new capabilities to your SCD2100 RTU solution.

MODULARITY

Power Supplies

Power supplies provide filtering and conditioning and also battery charging capabilities.

- AC Power 90 to 260 V ac, 96 to 340 V dc
- DC Power 10 to 30 V dc unregulated

The AC power cord features a special right angle plug. The following AC power cord choices are declared as part of the SCD2100 model structure definition at the time of placing an order:

- North America (NEMA15)
- Europe (CEE 7/4)
- UK (BS 1363)
- Australia/China (AS3112)
- India/Pakistan

Input Output cards

Input/output cards provide an interface to other systems/devices and support standard industrial signals:

- IOD-MX2
  - 14 Digital Inputs
  - 8 Digital Outputs
  - 6 Analog Inputs
- IOD-MX3
  - 14 Digital Inputs
  - 8 Digital Outputs
  - 6 Analog Inputs
  - 2 Analog Outputs
- IOD-MX4
  - 16 Digital Inputs
  - 16 Digital Outputs

Each I/O card comes with a termination block (see Figure 2) and a cable. The cables are available in 1, 2, or 5 meter lengths. The choices of I/O module and cable length are declared as part of the SCD2100 Model Structure definition at the time of placing an order.

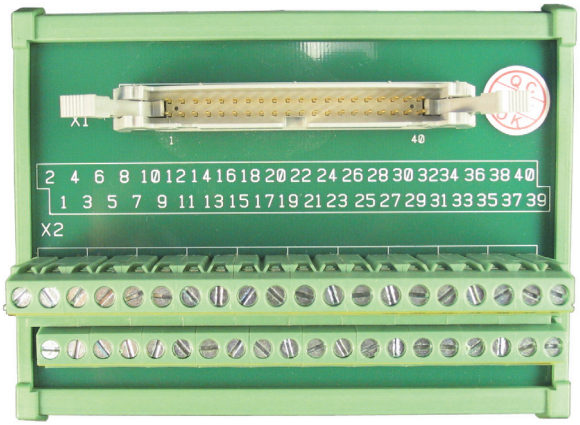


Figure 2. I/O Card Termination Block

Communication Card Options

The communications card is an optional card that provides an interface to other systems and devices. The following card is available:

- Serial card supporting RS-232C / RS-422 / RS-485 communications.

FUNCTIONAL SPECIFICATIONS

RTU Station

PROCESSOR TYPE
Cirrus ARM9 EP9301, 166 MHz maximum (internal)

CLOCK
Real Time Clock with super capacitor back up

MEMORY
Flash 16 Mb/ SDRAM 32 Mb / SRAM 32 Kb
Communication

Port 1:
Ethernet (10/100BaseT)

Port 2:
USB 2.0 Host, Full Speed 12 Mbps max
Port 3:
Serial communications card (optional)

ETHERNET PROTOCOL
TCP/IP, UDP, TCP, ARP and ICMP TCP/UDP
SCD2x00 FoxRTU protocol port number: 4058

OLED DISPLAY
Color 96 x 64 pixel OLED
(Organic Light Emitting Diode).
Displays 8 lines of 19 characters

RTU ADDRESS RANGE

For Modbus
1-255

For DNP3 Protocol
1-65535

AUXILIARY OUTPUT
24 V dc @ 250 mA (6 W) Isolated
(for powering IO).
Protected against continuous short circuit.
Isolated to 1500 V (for up to 60 seconds)
Maximum capacitive load 100µF

PROGRAMMING VIA FOXBORO EVO FOXRTU STATION

LOGIC PROCESSING
IEC 61131-3

INPUT VOLTAGE RANGE
AC Power 90 to 260 V ac,
96 to 340 V dc - 35 W Total
DC Power 10 to 30 V dc, 2.5A @ Supply voltage

POWER CONSUMPTION
2.5W maximum

MX2:
3 W / 9 W maximum with Auxiliary output OFF / ON, respectively

MX3:
4 W / 10 W maximum with Auxiliary output OFF / ON, respectively

MX4:
2 W / 8 W maximum with Auxiliary output OFF / ON

EMC AND SAFETY COMPLIANCE
Complies with:

UL 60950-1, UL60950-1, CSA C22 2 No 60950-1
UL1604 for Use in Class I and Class II Hazardous Locations
CSA C22.2 No. 213-M1987 for use in Class I, Division 2 Hazardous Locations
EN60079-0: 2006 Part 0
EN60079-15:2005 Part 15

This equipment is suitable for use in Class I, Division 2, Groups A-D or nonhazardous locations only if used with a PSO-DCU power supply card.

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Digital Input I/0 Cards
Common Characteristics

DIGITAL INPUTS

Impedance:
4.7 kΩ
On-state Voltage:
+19.0 to 28.8 V DC Channels 1 and 2
±19.0 to 28.8 V DC all other channels
Off-state Voltage:
0 to +5.0 VDC Channels 1 and 2
0 to ±5.0 VDC all other channels
On-state Current:
1.4mA minimum. Current=(Vin-1.2) / 5.7mA
Off-state Current:
0.5 mA maximum
Input Scan Time
1 ms (for all channels)
Debounce
0 (default) to 16000 ms; configurable on any channel(s)
Channel Inversion
Yes. Selectable on any channel(s).
Sequence Of Events
Yes. Selectable on any channel(s).
Edge Counting
Yes. Selectable on any channel(s).

Digital Input I/0 Cards
Specific Characteristics

MX2 / MX3 DIGITAL INPUTS

Inputs per card
14
Rated Input Voltage
12 to 24 V dc (supports reverse polarity)
Input Type Current
Sinking
Input Grouping 2 groups
Inputs 1 to 6 and inputs 7 to 14
Input Scan Time
1 ms
Frequency Counting
10 KHz counters on channels 1 to 2 (hardware)
10 KHz counters on channels 3 to 8 (interrupt driven software)
500 Hz counters on channels 9 to 16 (software counters)
Quadrature Counting
Selectable on input channels: 1&2, 3&4, 5&6, 7&8, 9&10,11&12, 13&14

MX2 / MX3 ANALOG INPUTS

Inputs per card
6
Input Ranges
4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V
Input Scan Time
12 ms (software configurable)
Input impedance
250Ω for current input.
1 MΩ for voltage input
Accuracy
+0.05% @ 20°C / + 0.15% @ -40 to 70°C
Resolution
16 bit

MX4 DIGITAL INPUTS

Inputs per card
16
Rated Input Voltage
12 to 24 V dc (supports reverse polarity)
Input Type Current
Sinking
Input Grouping 2 groups
Inputs 1 to 8
Inputs 9 to 16
Frequency Counting
10 KHz counters on channels 1 to 2 (hardware)
10 KHz counters on channels 3 to 8 (interrupt driven software)
500 Hz counters on channels 9 to 16 (software counters)
Quadrature Counting
Selectable on input channels: 1&2, 3&4, 5&6, 7&8, 9&10,11&12, 13&14, 15&16

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Digital Output I/O Cards
Common Characteristics

DIGITAL OUTPUTS

Rated Switched Voltage
12 to 24 V dc
Output Type
Transistor, Open Collector, Current Sinking
Maximum Switched Current
100 mA per channel, self limited
Maximum Switched Voltage
60 V dc
Maximum Switched Current
100 mA per channel, self limited
Output Protection
Reverse polarity, transient over-voltage and current protection
Output Update Time
1 ms (for all channels)

Digital Output I/O Cards
Specific Characteristics

MX2 / MX3 DIGITAL OUTPUTS

Outputs per card
8
Output Grouping 2 groups
Outputs 1 to 4 and outputs 5 to 8.
Failsafe
Failsafe mode is software configurable on any channel.
Pulse / Tone Generation High Speed
10 KHz maximum, 1 Hz minimum @ 50% nominal duty cycle. Configurable on channels 1 to 4. Accurate to 0.01%
Low Speed Pulse/Tone Generation
500 Hz maximum @ 50% nominal duty cycle. Configurable on channels 5 to 8. Accurate to 2% @ 500 Hz, 0.5% @ 100 Hz, 0.1% @ 1 Hz
Configurable Pulse ON or OFF time
1 to 16,000 ms.

MX3 ANALOG OUTPUTS (NOT APPLICABLE TO MX2)

Outputs per card
2
Output Ranges
4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V (software selectable for each channel)
Resolution
16 bit
Accuracy
+ 0.1% @ 20°C / + 0.2% @ -40 to 70°C
Output Update Time
1 ms (for both channels)
Settling Time
20 ms max. per channel
User Load
850Ω max for current output.
1 kΩ min for voltage output
Output Protection
Protected against continuous short circuit.
Failsafe
Failsafe mode is software configurable on any channel.

MX4 Digital Outputs

Inputs per card
16
Output Grouping 2 groups
Outputs 1 to 4 and Outputs 5 to 8
Failsafe
Failsafe mode is software configurable on any channel.
Pulse / Frequency Generation High Speed
10 KHz maximum, 1 Hz minimum @ 50% nominal duty cycle. Configurable on channels 1 to 4. Accurate to 0.01%
Low Speed
500 Hz maximum @ 50% nominal duty cycle. Configurable on channels 5 to 16. Accurate to 2% @ 500 Hz, 0.5% @ 100 Hz, 0.1% @ 1 Hz
Configurable Pulse ON or OFF time
1 to 16,000 ms.

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Regulatory Compliance

ELECTROMAGNETIC COMPATIBILITY (EMC)

European EMC Directive 2004/108/EC
Meets: EN 50081-2 Emission standard
EN 50082-2 Immunity standard
EN 61326-1

CISPR 11, Industrial Scientific and Medical (ISM) Radio-frequency Equipment Electromagnetic Disturbance Characteristics - Limits and Methods of Measurement
Meets: Class A Limits

IEC 61000-4-2 ESD Immunity
Contact 4 kV, air 4 kV

IEC 61000-4-3 Radiated Field Immunity
3 V/m at 80 to 1000 MHz

IEC 61000-4-4 Electrical Fast Transient/Burst Immunity
1 kV on AC and DC power lines; 0.5kV on I/O and communication lines

IEC 61000-4-5 Surge Immunity
1kV on ac and dc power lines;1 kV on I/O and communication lines

IEC 61000-4-6 Immunity to Conducted Disturbances Induced by Radio frequency Fields
3 V (rms) at 150 KHz to 80 MHz on I/O, dc power and communication lines

IEC 61000-4-11 Voltage Dips, Short Interruptions and Voltage Variations Immunity
Compliant

PRODUCT SAFETY

MET Laboratories (MET) for U.S. and Canada
NRTL/MET-C listed as suitable for use in Class I, Division 2, Groups A-D; temperature code T6 enclosure based systems. Communications circuits also meet the requirements for Class 2 as defined in Article 725 of the National Electrical Code (NFPA No.70) and Section 16 of the Canadian Electrical Code (CSA C22.1).

European Low Voltage Directive 2006/95/EC and Explosive Atmospheres (ATEX) Directive
94/9/EC MET Laboratories certified as Ex nA IIC T6 for use in Zone 2 potentially explosive atmospheres.

ENVIRONMENTAL SPECIFICATIONS

Operating

TEMPERATURE

SCD2100

-20 to +70°C (-4 to +158°F)

Termination Assembly

-20 to +70°C (-4 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing) at 40°C (104°F)

ALTITUDE

0 to 2,000 m (0 to 6562 ft)

Storage

TEMPERATURE

-40 to +70°C (-40 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing) at 40°C (104°F)

Vibration

5.0 m/s^2 (0.5 g) from 5 to 500Hz

PHYSICAL SPECIFICATIONS

Mounting

SCD2100 MODULE

The SCD2100 mounts on a suitable flat surface with four screws or DIN-rail bracket.

I/O MODULE TERMINATION BLOCK

The termination block (supplied with each I/O module) is DIN-rail mountable.

Weight

SCD2100 MODULE

150 g (5.3 oz) to 740 g (26.1 oz) approximate (depending on module)

I/O MODULE TERMINATION BLOCK

90.7 g (3.2 oz)

Dimensions

SCD2100 MODULE

HEIGHT

143 mm (5.6 in)

178 mm (7.0 in) including mounting lugs

WIDTH

70 mm (2.8 in)

DEPTH

129 mm (5.1 in)

I/O MODULE TERMINATION BLOCK

HEIGHT

86 mm (3.4 in)

WIDTH

112 mm (4.4 in)

DEPTH

50 mm (2.0 in)

Cables and Power Cords

SCD2100 MODULE

AC Power Cords

See page 4 for AC Power Cord Options.

External Cord Lengths

2.5 m (8.2 ft)

Cable Material

Polyvinyl Chloride

I/O MODULE TERMINATION BLOCK

Cables

Cables Lengths

1 m (3.3 ft), 2 m (6.6.ft), or 5 m (16.4 ft)

Cable Material

Polyvinyl Chloride

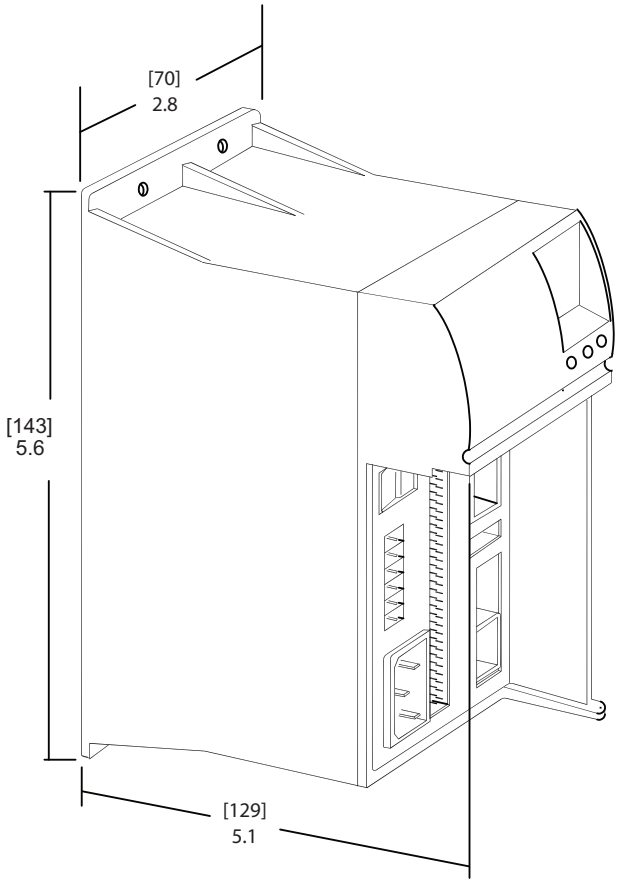
Field Connection

40 screw terminals for field wiring connection

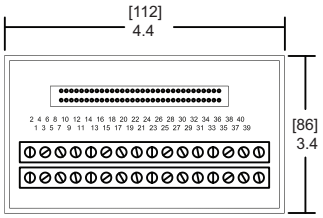
Color: Green

DIMENSIONS - NOMINAL

[mm]
in



SCD2100 Station



I/O Module Termination Block

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