SDN-D High Performance DIN Rail Series

In spite of its small size, the SDN-D high performance DIN rail power supply boasts one of the highest efficiencies available in the market today. Higher efficiency means less heat is generated, potentially extending the life of all components in the enclosure. Extensive diagnostic monitoring capabilities are possible with the optional SCM network communication module, which utilizes popular industrial network protocols to provide critical power supply data to computers, PLCs, DCSs HMIs, and other devices. For applications requiring even higher reliability, combine the SDN-D with SDN redundancy modules. With its extensive capabilities, compact design, and notable global certifications, the SDN-D is the ideal solution for use in harsh environments, extreme temperatures (–40 °C to +70 °C), and hazardous locations worldwide.

Applications

- Industrial Automation
- Process Control
- Material Handling and Conveyors
- Hazardous Locations

Features

- High performance unit in a compact package
- Optional network communications modules provides important diagnostic information to controllers, HMI, and computers
- Continuous Power Boost: Up to 120% continuous, for temperatures up to 50 °C
- Multi-turn potentiometer simplifies accurate setting of output voltage
- Extensive international hazardous location certifications, including Class I Zone 2, ATEX, and IECEx. Hazardous location temperature code (T-Code) rating of T4
- Inductive Load Power Boost additional short term power, to assist in starting loads with high inrush current
- Dual output terminals for convenience in wiring
- DC OK relay to provide diagnostic information to a PLC, controller, or monitoring system
- Circuit Interruption Power Boost provides short duration peak current sufficient to trip properly-sized load side fuse or circuit breaker in the event of a load fault
- Universal AC and DC input voltages to accommodate global requirements
- Wide operating temperature range accommodates both extreme hot and extreme cold environments
- Active Power Factor Correction greater than 0.98
- Parallel operation capability standard
- Supports redundant power supply operation using optional SDN™ Redundancy modules
- 5-year limited warranty

* Refer to user manual for installation requirements when used in hazardous locations.

E61379 E137632 E234790

IECEx

Certifications and Compliances *

- c UL us Listed, Electrical Equipment for Measurement, Control and Laboratory Use; Control Equipment, E61379
  - UL 61010-1, UL 61010-2-201, CSA 61010-1, CSA 61010-2-201
- c TÜV us UL Recognized Component, ITE, E137632
  - UL/CSA 60950-1, UL/CSA 62368-1
- c TÜV us UL Recognized Component, Haz Loc, E234790; Class I Div 2, Groups A, B, C, D T4
  - UL 121201/CSA 213
- CE - Low Voltage Directive
  - IEC/EN60950-1, IEC/EN 62368-1, IEC/EN 61010-1, IEC/EN 61010-2-201
- Ex ATEX Directive

  Model SDN 10-24-100D
  - EN IEC 60079-0, EN IEC 60079-7
  - Ex II 3 G, Ex ec IIC T4 Gc

  Model SDN 20-24-100D
  - EN IEC 60079-0, EN IEC 60079-7, EN IEC 60079-15
  - Ex II 3 G, Ex ec nC IIC T4 Gc
- IECEx Certified

  Model SDN 10-24-100D
  - IEC 60079-0, IEC 60079-7; Ex ec IIC T4 Gc

  Model SDN 20-24-100D
  - IEC 60079-0, IEC 60079-7, IEC 60079-15; Ex ec nC IIC T4 Gc
- RoHS (Europe, China)

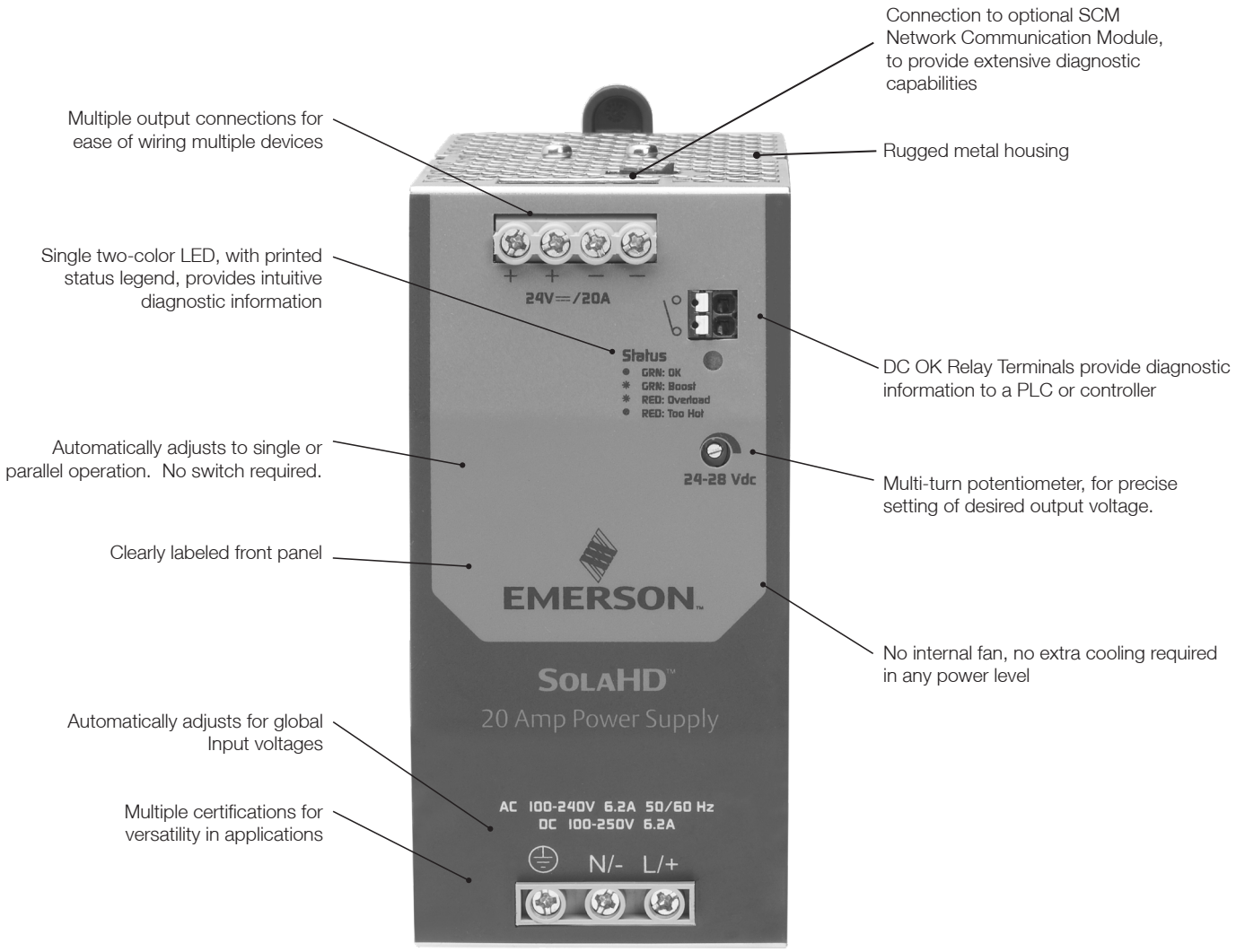
Related Products

- IP67 SCP-X Standalone Power Supplies
- SDU UPS

Accessories

- SCM Network Communication Modules for Power Supplies
- SDN Redundancy Modules
- Chassis Mount Brackets

The SolaHD Difference



Up to 31% narrower than SDN-C models

LED Light Status Conditions

Bi-color LED: Green indicates output power is present. Red indicates no output power due to power supply protection circuitry.

OK	Loss of AC	Continuous Power Boost	Inductive Load Power Boost	Overload	Too Hot
Green (steady)	–	Green (blinking)	Power alternatives On/Off: Green (4s blinking): Output ON Red (4s blinking): Output OFF	Red (blinking)	Red (steady)

SDN-D Specifications (Single Phase)

Description	Catalog Number	
	SDN 10–24–100D	SDN 20–24–100D
Input		
Nominal Input Voltage, AC (Range)	100 - 240 Vac (85-264 Vac)	
Nominal Input Voltage, DC (Range)	100-300 Vdc (90-375 Vdc)	100-250 Vdc (90-275 Vdc)
Frequency, AC Input	43 - 67 Hz	
Input Current, AC (typical value at 24.5 Vdc, 10A/20A output)	3.0A at 100 Vac, 1.11A at 240 Vac	6.2A at 100 Vac, 2.19A at 240 Vac
Input Current, DC (typical value at 24.5 Vdc, 10A/20A output)	3.0A at 100 Vdc, 0.85A at 300 Vdc	6.2A at 100 Vdc, 2.04A at 250 Vdc
Typical Input Inrush current, AC 120 Vac, 25 °C, 100% full load current	<7A	<10A
Worst case Input Inrush current, AC 240 Vac, 60 °C, 100% full load current	<10A	<13A
Efficiency (Losses) at full load. Losses are heat dissipation in watts	93.7%	94.2%
Power Factor Correction (PFC) at 25 °C	Active PFC >0.98	
Output		
Output Voltage, Nominal	24 Vdc	
Output Voltage, Adjustable Range	Multi-turn potentiomenter: 3-turn (approximate) Minimum range: 24-28 Vdc Absolute Maximum: 28.8 Vdc Typical Maximum: 28.6 Vdc	
Output Voltage, Initial Factory Setting	24.5 V ± 1%	
Output Voltage, Tolerance	< ±2 % overall	
Output Voltage Ripple, typical (measured with a 20 MHz bandwidth scope and 50 Ohm resistor)	<50 mvpp	
Periodic and Random Deviation (PARD)	<100 mvpp	
Nominal Output Current (Power)	10A (240W) at +60 °C, continuous	20A (480W) at +60 °C, continuous
Continuous Power Boost	12A (288W) from -40 °C to +50 °C, continuous	22A (528W) from -40 °C to +50 °C, continuous
High Temperature Output Power De–rating	Linear derating from 240W to 216W power from +60 °C to +70 °C	Linear derating from 480W to 360W power from +60 °C to +70 °C
Parallel Output Operation for increased power (using similar SDN–D power supplies)	Power supplies can be connected in parallel for increased power. However, for loads higher than 100% of individual SDN-D, it is recommended that power supplies are initially powered up with no load applied. The outputs of SDN-D should also be adjusted to <100mV of each other. Otherwise, unexpected results may occur due to differences in power up time for each power supply.	
Parallel Output Operation for Redundancy (using two similar SDN–D power supplies)	Yes, with SDN Redundancy modules.	
Turn On Time, after AC is applied to input, 25 °C	Resistive load: < 1.0 sec Capacitive load (7000µF): < 1.5 sec	
Holdup Time	> 20 msec	
Output Voltage Fall Time (from 95% to 10% rated voltage, at full load, 25 °C)	< 150 msec	

NOTE: Unless otherwise noted, all specifications apply to the full range of rated line, load, and temperature parameters, after 5 minutes run time. Convection cooled; no fans required.

SDN-D Specifications (Single Phase)

Description	Catalog Number	
	SDN 10–24–100D	SDN 20–24–100D
Protection		
Inductive Load Power Boost	Short duration: 1.5X for 4 sec	
Circuit Interruption Power Boost	Peak Current: 6X for 15 msec at >19 V	
Short Circuit Protection	Output automatically goes to near zero and output is protected from continuous short circuit. Auto-recovery.	
Back EMF Immunity	< 35 V No damage, Auto-recovery	
Overvoltage Protection	30.0 V maximum. Auto-recovery.	
Overtemperature Protection	Output shutdown, LED Alarm. Auto-recovery.	
Environmental Data		
Surge Ratings	2kV L-N, 4kV L-PE, 4kV N-PE (EN 61000-4-11, Criterion A)	
Emissions	EN61000-6-3, EN61000-6-4, EN 61326-1, EN55011, EN55032 Class B. EN61000-3-2, EN 61000-3-3	
Immunity	EN61000-6-1, EN61000-6-2, EN 61326-1, EN 55035, IEC 61000-4 Series (Level 4, Class A). SEMI F47 Sag Immunity	
General Protection / Safety	Protected against continuous short circuit, continuous overload, continuous open circuit. IEC 62477-1: Overvoltage Category III, Pollution Degree II, up to 3000m. Overvoltage Category II from 3000-6000m UL/CSA 60950-1, UL/CSA 62368-1, Overvoltage Category II, Pollution Degree II, SELV UL/CSA 61010-1, UL/CSA 61010-2-201, Overvoltage Category II, Pollution Degree II CB Report: IEC/EN 60950-1, IEC/EN 62368-1 Overvoltage Category II, Pollution Degree II, SELV	
Environmental Rating	Pollution Degree II	
Ingress Protection (IP) Rating	IP20	
Temperature, Operating	From -40 °C to +70 °C. Refer to temperature-dependent de-rating and Continuous Power Boost specifications in Output section. Convection cooling	
Temperature, Storage	-40 °C to +85 °C	
Humidity	5 to 95 % RH Non-Condensing; IEC 60068-2-2, IEC 60068-2-3	
Vibration	2.5(g) RMS, 10-2000 Hz (random); three axes for 20 minutes each - IEC 60068-2-6	
Shock	30g 6 msec, 20g 11 msec, 3-axis, 3 bumps/direction (18 bumps in total) - IEC 60068-2-27	
Altitude	0-3000 meters full power	
Restriction on Hazardous Substances (RoHS)	Directive 2011/65/EU amended with Directive EU 2015/863, China RoHS	

NOTE: Unless otherwise noted, all specifications apply to the full range of rated line, load, and temperature parameters, after 5 minutes run time. Convection cooled; no fans required.

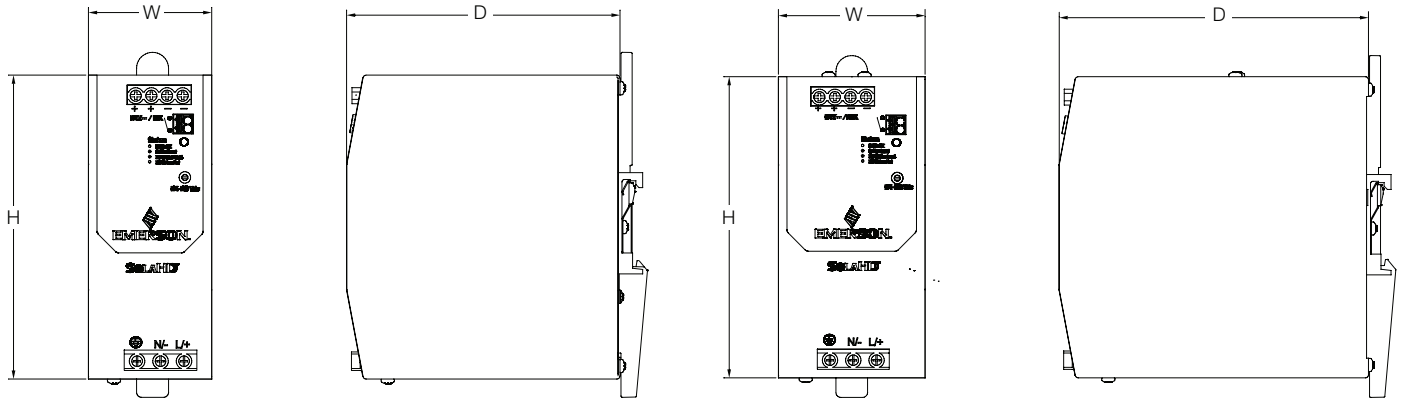
SDN-D Specifications (Single Phase)

Description	Catalog Number	
	SDN 10–24–100D	SDN 20–24–100D
Reliability		
MTBF: Telcordia SR–332 Issue 2 Method 1 Case 3	>773,575 hours @ 115 Vac, 25 °C >869,055 hours @ 230 Vac, 25 °C >527,547 hours @ 115 Vac, 40 °C >584,514 hours @ 230 Vac, 40 °C	>944,000 hours @ 115 Vac, 25 °C >1,048,000 hours @ 230 Vac, 25 °C >609,000 hours @ 115 Vac, 40 °C >837,000 hours @ 230 Vac, 40 °C
Operating Service Life [1]	>304,000 hours @ 100 Vac input, 25 °C, 24 Vdc @ 10A output >453,100 hours @ 230 Vac input, 25 °C, 24 Vdc @ 10A output >198,600 hours @ 100 Vac input, 40 °C, 24 Vdc @ 10A output >260,300 hours @ 230 Vac input, 40 °C, 24 Vdc @ 10A output	>114,600 hours @ 100 Vac input, 25 °C, 24 Vdc @ 20A output >322,100 hours @ 230 Vac input, 25 °C, 24 Vdc @ 20A output >56,000 hours @ 100 Vac input, 40 °C, 24 Vdc @ 20A output >154,200 hours @ 230 Vac input, 40 °C, 24 Vdc @ 20A output
Installation		
Fusing – Input	Internal non-replaceable fuse.	
Fusing – Output	Outputs are capable of providing high currents for short periods of time for inductive load startup or switching. Fusing may be required for wire/loads if 2x Nominal O/P current rating cannot be tolerated. Continuous current overload allows for reliable fuse tripping.	
Mounting	Simple snap-on to DIN TS35/7.5 or TS35/15 rail system.	
Input Terminal Connections	Screw terminals. Connector size range: 16–10 AWG (1.5–6 mm^2) for solid or stranded conductors. Screw torque: 4.4-6.5 lb-inch (50-73 N-cm). Use only one copper wire per terminal.	
Output Terminal Connections	Two terminals per output. Connector size range: 16–10 AWG (1.5–6 mm^2) for solid or stranded conductors. Screw torque: 4.4-6.5 lb-inch (50-73 N-cm). Use only one copper wire per terminal.	
DC OK Terminal Connections	Connector size range: 16-24 AWG (1.5-0.25 mm^2) solid or stranded conductors. Use only one copper wire per terminal.	
Free Space – Above and Below	0.98 in (25 mm)	
Free Space – Left and Right	0.39 in (10 mm)	
Free Space – Front	0.59 in (15 mm)	
Dimensions – WxDxH in (mm)	4.8 x 2.0 x 4.4 (123 x 50 x 111)	4.8 x 2.4 x 5.0 (123 x 60 x 127)
Weight – lbs (kg)	1.54 lbs (0.7 kg)	2.2 lbs (1.0 kg)
General		
Case	Fully enclosed metal housing with fine ventilation grid to keep out small parts.	
Diagnostic Status Indicators	Single 2-color LED “DC OK” Relay: N.O. contact rated 50 Vdc, 1A. Signal Active when Vout> 18.5 Vdc +/-5%.	
Warranty	5 Year Limited Warranty	

1. Based on the lifetime expectancy of the built-in electrolytic capacitors, as reported by the capacitor manufacturer’s specification. Values exceeding 131,400 hours are theoretical calculations, provided for comparison purposes only.

NOTE: Unless otherwise noted, all specifications apply to the full range of rated line, load, and temperature parameters, after 5 minutes run time. Convection cooled; no fans required.

SDN-D Series Dimensions



Catalog Number	Dimensions – inches (mm)		
	H	W	D
SDN–10–24–100D	4.8 (123)	2.0 (50)	4.4 (111)
SDN–20–24–100D	4.8 (123)	2.4 (60)	5.0 (127)

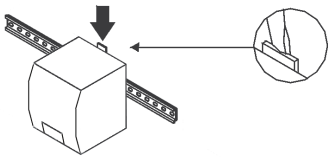
SDN-D Series Mounting

SolaHD SDN-D power supplies are designed to be easily and reliably mounted to DIN rail. For applications requiring mounting the power supply directly to the panel, optional Panel Mount Adapter Brackets are available.

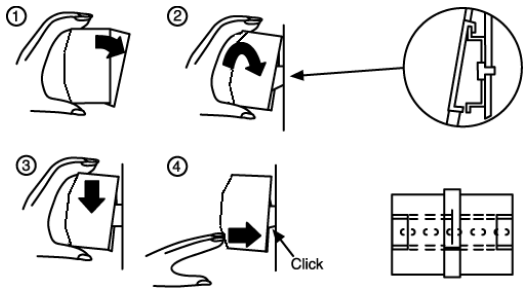
DIN Rail Mounting

Snap on the DIN rail:

1. Tilt unit slightly backwards. Put it onto the DIN rail
3. Push downwards until stopped
4. Push at the lower front edge to lock
5. Shake the unit slightly to ensure that the retainer has locked



Detachment from DIN Rail:

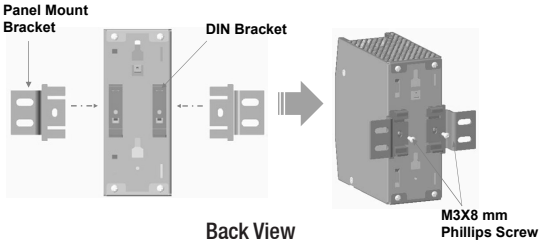


Panel Mounting

Panel mounting of SDN-D power supplies is simplified by using an optional SDN-PMBRK3 Panel Mounting Bracket kit. Each kit comes with two brackets for screw mounting one power supply to a panel. Note that the Panel Mount bracket will add approximately 2-4mm in depth, compared to DIN rail mounting. Refer to the manual that comes with the bracket kit for detailed instructions on assembly and mounting.

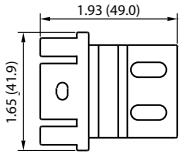
SDN-PMBRK3

Power Supply
SDN 10-24-100D
SDN 20-24-100D

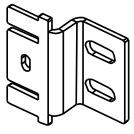


Back View

Dimensions - in. (mm)



Top View



3D View

Ethernet/IP

HART 7

SOLAHD COMMUNICATION MODULES

The digital transformation journey begins by leveraging the SolaHD Communication Module's (SCM) communication capability for increased efficiency and predictive maintenance. The SCM provides network connectivity support for one or two SDN-D Series high performance power supplies over popular industrial protocols. This allows key diagnostic data, alarms and operating parameters to be communicated to supervisory systems. Monitoring the health and performance of devices ensures greater reliability to reduce unscheduled downtime due to equipment failures, lower maintenance costs and extend equipment life. The SCM can be utilized to overcome operational challenges including machines and devices not offering condition monitoring, leading to unexpected downtime and the inability to identify problematic devices and schedule maintenance.

APPLICATIONS

- Industrial Automation
- Process Control
- Material Handling and Conveyors
- Hazardous Locations

FEATURES

- Monitor important power supply parameters to identify an abnormal condition
- Monitor power supply current and temperature and set alarm threshold
- Monitor power supply total turn on time to indicate end of useful life
- Monitor SCM temperature as a proxy for internal enclosure temperature
- Monitor power supply events, event counts, and the event logs (only SCM-E-EIP)
- LEDs for status indications
- Each SCM supports (2) SDN-D series power supplies
- Each SCM is shipped with (2) I2C cables for power supply connection

CERTIFICATIONS AND COMPLIANCE

All Models

- CE
  - LV – IEC/EN 62368-1; IEC/EN 61010-1; IEC/EN 61010-2-201
- CB:
  - IEC/EN 62368-1; IEC/EN 61010-1; IEC/EN 61010-2-201; IEC/EN 60950-1
- c UL us Listed, Ind. Control Equip., E61379
  - UL/CSA 61010-1; UL/CSA 61010-2-201
- c TÜV us Recognized Component, ITE, E137632; Haz Loc E234790
  - UL/CSA 60950-1; UL/CSA 62368-1; UL 121201/CSA C22.2 No. 213 – Class I Division 2, Groups A, B, C, D, T4; UL/CSA 60079-0; UL/CSA 60079-7 – Class I, Zone 2, IIC, T4
- ATEX:
  - Ex II3G Ex ec IIC Gc
  - IEC/EN 60079-0; IEC/EN 60079-7
- IECEx:
  - Ex ec IIC Gc
  - IEC/EN 60079-0; IEC/EN 60079-7
- RoHS Compliant
  - EU RoHS
  - China RoHS

Model SCM-E-EIP

- CE
  - EMC – EN 55032 Class B; EN 61000-3-2; EN 61000 3-3; EN 61326-1; EN 55011 Group 1 Class B; EN 55035; EN 61000-6-1; EN 61000-6-2; EN 61000-6-3; EN 61000-6-4
- ODVA CONFORMANT

Model SCM-W-HRT7

- CE
  - EMC – EN 55032 Class B; EN 61000-3-2; EN 61000 3-3; EN 55011 Group 1 Class B; EN 61000-6-3; EN 61000-6-4; EN 55035
- HART COMMUNICATION PROTOCOL

RELATED PRODUCTS

- Power Supply Redundancy (RED) Modules

SOLAHD

For product information:
www.solahd.com
1.800.377.4384

EMERSON

CONSIDER IT SOLVED™

SPECIFICATIONS

Catalog Number	SCM-E-EIP	SCM-W-HRT7
	General	
Protocol	Ethernet/IP (ODVA Conformant)	HART 7 (Fieldcomm Group Registered) ①
	Physical	
Power Supply Connection	Either 1 or 2 SDN-D Power Supplies can be supported by a single SCM module. Power and communication are provided with included 8 inch cables.	
Network Connection and Topologies Supported	Dual RJ-45. Pass-through. Star, Linear, or Device Level Ring.	2-wire terminal connection. Point-to-Point or Multidrop.
Transmission Speed	10 Mbps, 100 Mbps	FSK HART – 1200 baud
Transmission Medium	Shielded CAT6 Twisted-pair cable	Individual shielded twisted-pair cable
	Data	
Power Supply Parameters	Output Voltage, Output Current, Input Voltage, Power Supply Temperature, Max Output Voltage, Max Output Current, Max Input Voltage, Max Power Supply Temperature	
Power Supply Alarms and Warnings	Output Short Circuit, Over Voltage, Over Temperature, Power Boost	
User Configurable Warnings	Output Current, Power Supply Temperature	
Power Supply Timers	Lifetime, Time since last DC power up	
Power Supply Counters	Output Short Circuit, Over Voltage, Over Temperature, Power Boost	
Other Data	Part number, Serial number, Revision number, Power Supply Status, SCM Status, SCM Temperature	
	Weight and Dimensions	
H x W x D - in (mm)	5.51 x 1.00 x 4.27 (139.94 x 25.46 x 108.41) with sliding arm 4.85 x 1.00 x 4.27 (123.28 x 25.46 x 108.41) without sliding arm	
Weight - oz (g)	5.7 (161)	4.8 (137)
	Environmental	
Temperature °C (°F)	Storage: -40 to +85 (-40 to +185) Operating: -40 to +70 (-40 to +158)	
Humidity	5% to 95% RH, noncondensing	

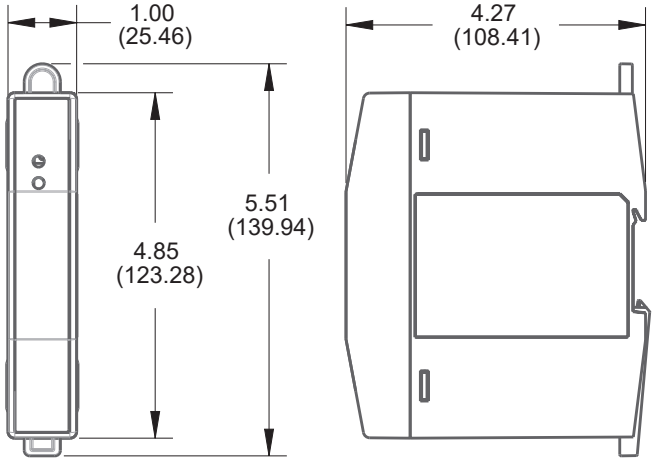
NETWORK AND MODULE STATUS INDICATORS

SCM-W-WRT7 LED Indicator	Status	Meaning
Module Status	Green, steady	Normal operation, no errors
	Red, blinking	Incompatible supply connected
Alarm Status	Green, steady	No alarm/alerts active
	Green, blinking	Device Alert active - Maintenance
	Red, blinking	Device Alert active - Failure
	Amber, blinking	Process Alarm active

SCM-E-EIP LED Indicator	Status	Meaning
Module Status	Off, steady	No power
	Green, steady	Device operational
	Green, blinking	Standby
	Red, blinking	Major Recoverable Fault
	Green/Red, blinking	Self-test
Network Status	Off, steady	Not powered, no IP address
	Green, steady	Connected
	Green, blinking	No connections
	Red, blinking	Connection timeout
	Red, steady	Duplicate IP
	Green/Red, blinking	Self-test

① *Registration pending.*

DIMENSIONS - IN (MM)



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