User Guide
A272-365 Rev. 1.1
3/2023

Ethernet/IP Communications Module (SCM-E-EIP)

SCM SolaHD Communication Module
For use with SolaHD™ SDN-D Power Supplies

SOLAHD

EMERSON

TABLE OF CONTENTS

REVISION HISTORY

Revision Code	Revision Date	Description
Rev. 1	8/2022	Final
Rev. 1.1	3/2023	Miscellaneous text and illustrations additions and changes.

PREFACE

Thank you for purchasing SolaHD SCM-E-EIP!

This user manual defines how to use the communication functions of SCM-E-EIP. It also contains important safety instructions that must be followed during the installation and operation of the communication module. Before attempting to install the product, please read the all safety, installation, and operation warnings and instructions thoroughly.

You can also download the PDF version of this, and other documents, at **www.solahd.com**.

INTRODUCTION

The SCM Series of SolaHD Communication Modules provides network connectivity support for one or two SDN-D Series power supplies over popular industrial protocols. The SCM-E-EIP model provides Ethernet/IP protocol support, and is fully ODVA-conformant. The SCM-E-EIP also includes an embedded web server with a graphical user interface (GUI), to provide a simple means to monitor and configure SDN-D power supply data and parameters using a standard web browser.

FEATURES

- Provides a means to connect up to two SDN-D Power Supplies to an Ethernet/IP network
- Monitoring via an embedded webserver Graphical User Interface accessible via common browsers like Google Chrome, Microsoft Edge, and Mozilla Firefox
- Utilizes the Common Industrial Protocol (CIP) for its upper layers
- Uploading and downloading of parameters and setpoints via TCP
- Transfer of basic I/O data via User Datagram Protocol (UDP)-based implicit messaging
- Dual Ethernet ports to accommodate different network configurations
- Built-in thermal sensor to measure the device's internal temperature. Since the SCM generates minimal heat itself, the internal temperature of the SCM should approximate ambient temperature.

WHAT'S INCLUDED

SCM-E-EIP is shipped with the following items:

- 1 x SCM-E-EIP Ethernet/IP Communication Module
- 2 x SCM-E-EIP I2C cable
- SCM-E-EIP Safety Instruction Sheet

ADDITIONAL REQUIREMENTS (NOT INCLUDED)

The following items/accessories not included in the SCM-E-EIP package are also needed:

- Ethernet cable (with straight-through configuration, shielded Cat6 or higher)
- Windows PC with pre-installed internet browser

COMPATIBLE DEVICES/APPLICATIONS

SCM-E-EIP is compatible with the following SolaHD SDN-D power supplies:

- SDN1024100D version xx 06 10
- SDN2024100D version xx 05 16

As an ODVA-conformant Ethernet/IP adapter, the SCM-E-EIP should function properly with any other Ethernet/IP device meeting ODVA certifications. The web server embedded in the SCM-E-EIP should be compatible with any MS Windows-based Internet browser, including Google Chrome, Microsoft Edge, and Mozilla Firefox.

SAFETY INSTRUCTIONS

⚠ CAUTION - Risk of personal injury and explosion hazard.

SAVE THESE INSTRUCTIONS - This manual contains important instructions that should be followed during installation and maintenance.

Risk of personal injury and explosion hazard when used in a Class I, Division 2/Class I, Zone 2 environment.

Refer to the *"Safety Instruction Sheet - SCM Communications Modules"* provided with the product or located on our website at www.SolaHD.com. Be sure to adhere to all safety procedures provided in the sheet.

1. PRODUCT OVERVIEW

1.1 GENERAL SPECIFICATIONS

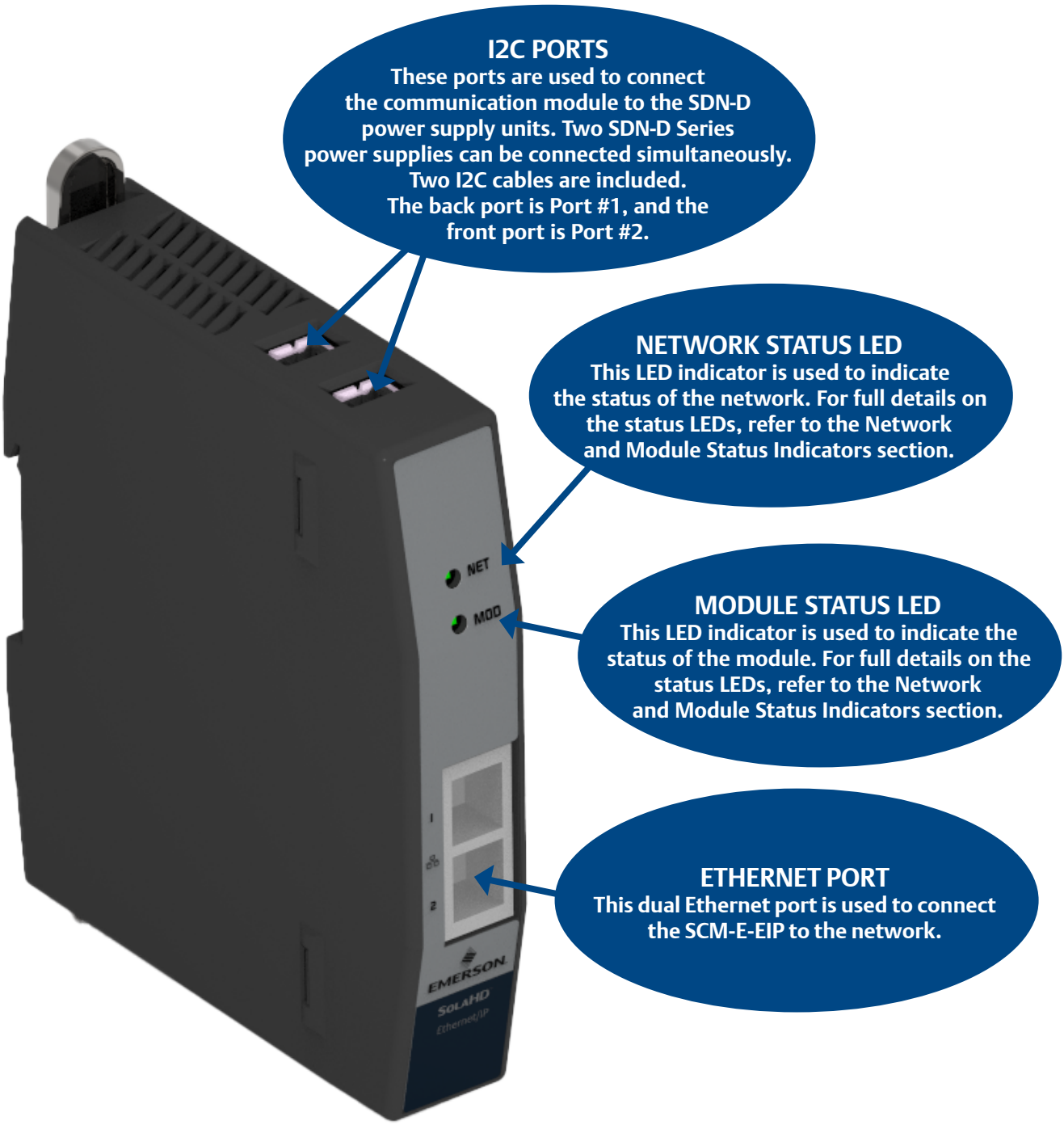
Environmental	
Operating Temperature	-40°C to 70°C
Storage Temperature	-40°C to 85°C
Relative Humidity	5-95% RH
Altitude	0 to 3,000m
Weight/Dimensions	
H x W x D	140 x 25.5 x 106.9 mm, with sliding arm 123.3 x 25.5 x 106.9 mm, without sliding arm
Net Weight	161g

1.2 COMMUNICATION SPECIFICATIONS

Item		Specification
Communication Protocol		Ethernet/IP (CIP), ODVA-conformant
Topology		Star, Linear Bus, Device Level Ring (DLR)
Transmission		One to one (unicast), one to many (multicast), and one to all (broadcast)
Transmission Speed		10Mbps, 100Mbps
Transmission Medium		Shielded Cat6 Twisted-pair cable
Maximum Transmission Distance		100 meters
Process Data	Class 1	Connection resource: 1 max.
	Packet interval (RPI)	100 ms maximum
	Connection type	Exclusive-Owner Connection
Explicit message	Class 3	Number of clients that can communicate at one time: 6
	UCMM	Number of clients that can communicate at one time: 6
Default IP Address		DCHP enabled

1.3 CONSTRUCTION

The important parts of the SCM-E-EIP Communication Module are as follows:



1.4 NETWORK AND MODULE STATUS INDICATORS

As shown in **Section 1.3**, there are two LED indicators on the SCM-E-EIP, one for Network and one for Module.

The table below defines the different status of both the Network and Module LED indicators compliant with CIP Specification as stated in Volume 2:EtherNet/IP Adaptation of CIP, Chapters 9-4.2 and 9-4.3.

LED Indicator	LED State	Summary	Definition
Module	Steady Off	No power	No power is supplied to the SCM.
	Steady Green	Device operational	SCM-E-EIP and Power Supplies are operating correctly.
	Flashing Green	Standby	The SCM is in the initialization state.
	Flashing Red	Major Recoverable Fault	A Power Supply has a Major Recoverable Fault.
	Flashing Green / Red	Self-test	SCM is performing a self-test.
Network	Steady Off	Not powered, no IP address	The device is powered off, or is powered on but with no IP address configured.
	Flashing Green	No connections	An IP address is configured, but no CIP connections are established, and an Exclusive Owner connection has not timed out.
	Steady Green	Connected	An IP address is configured, at least one CIP connection is established, and an Exclusive Owner connection has not timed out.
	Flashing Red	Connection timeout	An IP address is configured, and an Exclusive Owner connection for which this device is the target has timed out.
	Steady Red	Duplicate IP	The SCM has detected that its IP address is already in use.
	Flashing Green / Red	Self-test	SCM is performing a self-test.

1.4.1 INDICATORS AT POWER UP

As stated in Volume 2:EtherNet/IP Adaptation of CIP 9-4.1.4, the Module Status indicator shall turn Green for approximately 0.25 second, turn Red for approximately 0.25 second, and then turn Green and hold that state until the power-up test has completed. Network Status indicator shall turn Green for approximately 0.25 second, turn Red for approximately 0.25 second, and then turn Off and hold that state until the power-up test has completed.

1.5 SETUP AND CONNECTIVITY

1.5.1 ELECTROSTATIC DISCHARGE

NOTICE

Always use ESD precautions when handling electronic circuit equipment as they contain parts and assemblies susceptible to damage by electrostatic discharge (ESD).

To prevent possible electrostatic discharge (ESD) from rendering the SCM non-functional and possible data corruption, it is recommended to take proper precautions when setting up the system or handling products.

- Avoid hand contact by transporting and storing SCMs in static-safe containers.
- Always be properly grounded (e.g., using antistatic wrist strap) when contacting SCM or plugging in or removing cables from power supply or host device.

1.5.2 POWER SUPPLY REPLACEMENT

To avoid any data corruption, when changing one or both power supplies or SCM in a dual power supply and SCM setup, it is recommended to follow these steps:

1. Turn off AC or DC input power to the power supplies,
2. Replace power supplies and/or SCM as intended,
3. Reconnect the mains, and communication wiring,
4. Re-apply AC or DC input power to the power supplies.

1.5.3 SOLAHD POWER SUPPLIES (SDN-D SERIES)

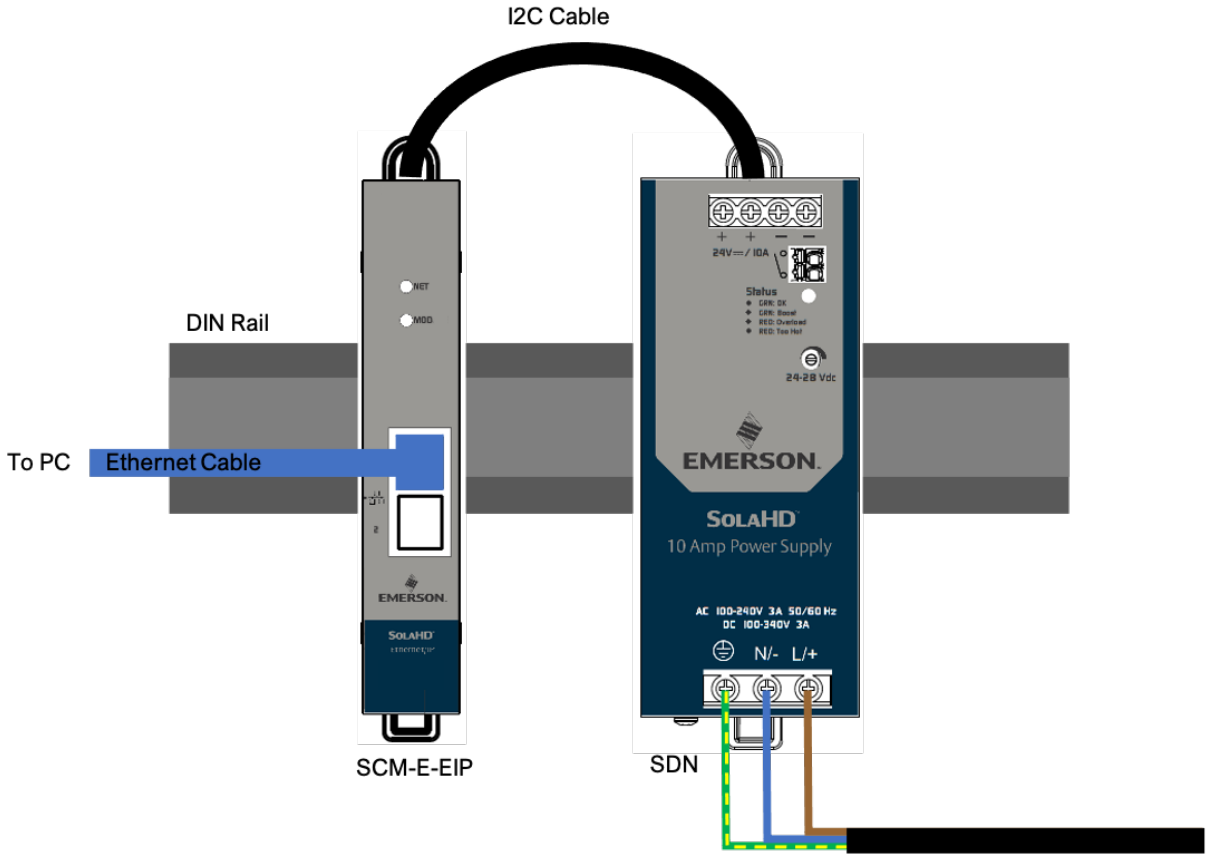
Two cables are included with the SCM-E-EIP for interconnecting either one or two SDN-D power supplies. These cables are inserted to one of the I2C ports of the SCM-E-EIP. For the location of the I2C port, refer to **Section 1.3**.

For the Ethernet port connectors, use a standard RJ45 cable (shielded Cat6 or higher).

The sections below show the wiring of the SCM-E-EIP to the SDN-D power supply.

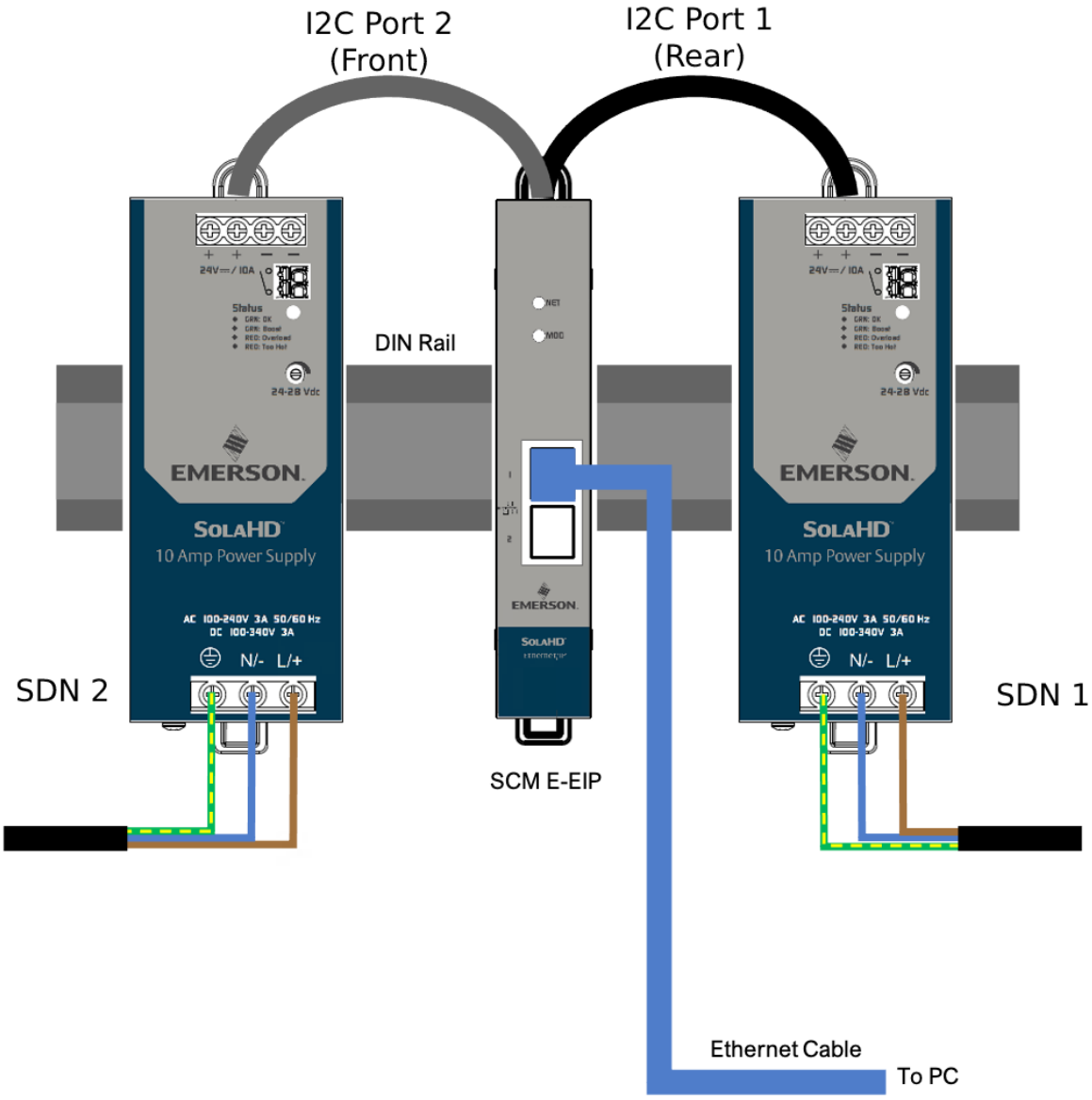
1.5.3.1 WIRING: SCM-E-EIP AND SDN-D 1:1 CONNECTION

The set-up below shows typical connections of one SCM-E-EIP to one SDN-D Power Supply.



1.5.3.2 WIRING: SCM-E-EIP AND SDN-D 1:2 CONNECTION

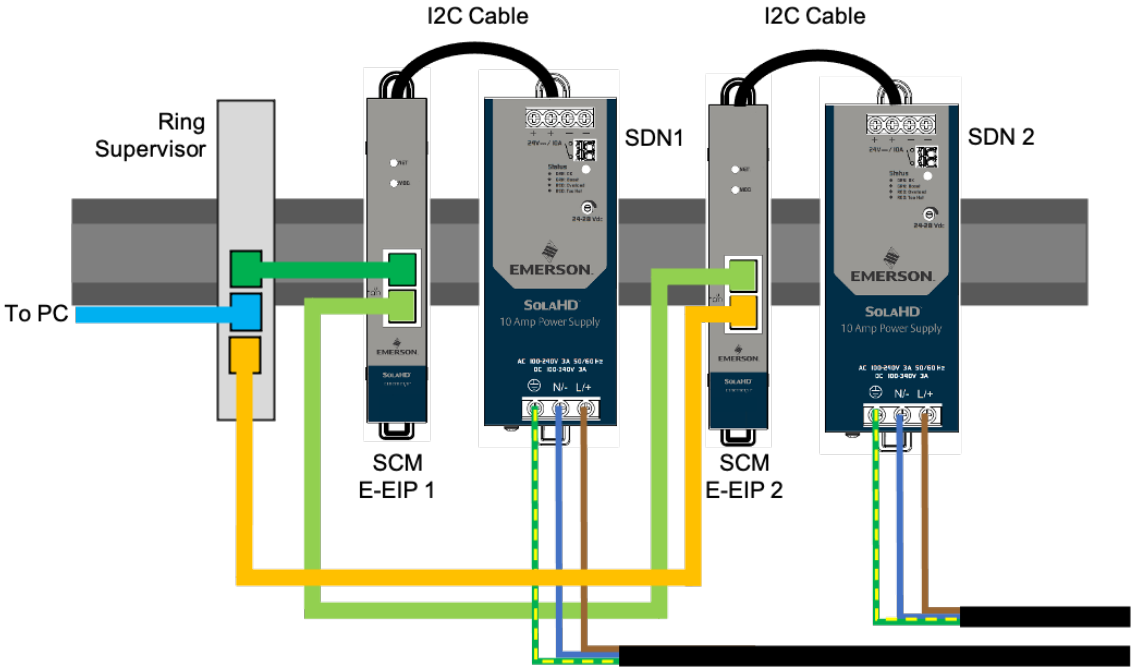
The set-up below shows typical connections of one SCM-E-EIP to two SDN-D Power Supplies.



1.5.3.3 WIRING: SCM-E-EIP AND SDN-D DEVICE LEVEL RING (DLR) CONNECTION

A Device Level Ring (DLR) network is a single fault tolerant network intended for the interconnection of automation devices without the need for additional switches.

The setup below shows the typical network connections for two SCM-E-EIP modules connected in a DLR topology. In this example, each SCM-E-EIP is connected to a single SDN-D Power Supply. This setup also makes use of a ring supervisor, a device that verifies the integrity of the ring, reconfigures the ring to recover from a single fault, and collects diagnostic information for the ring.

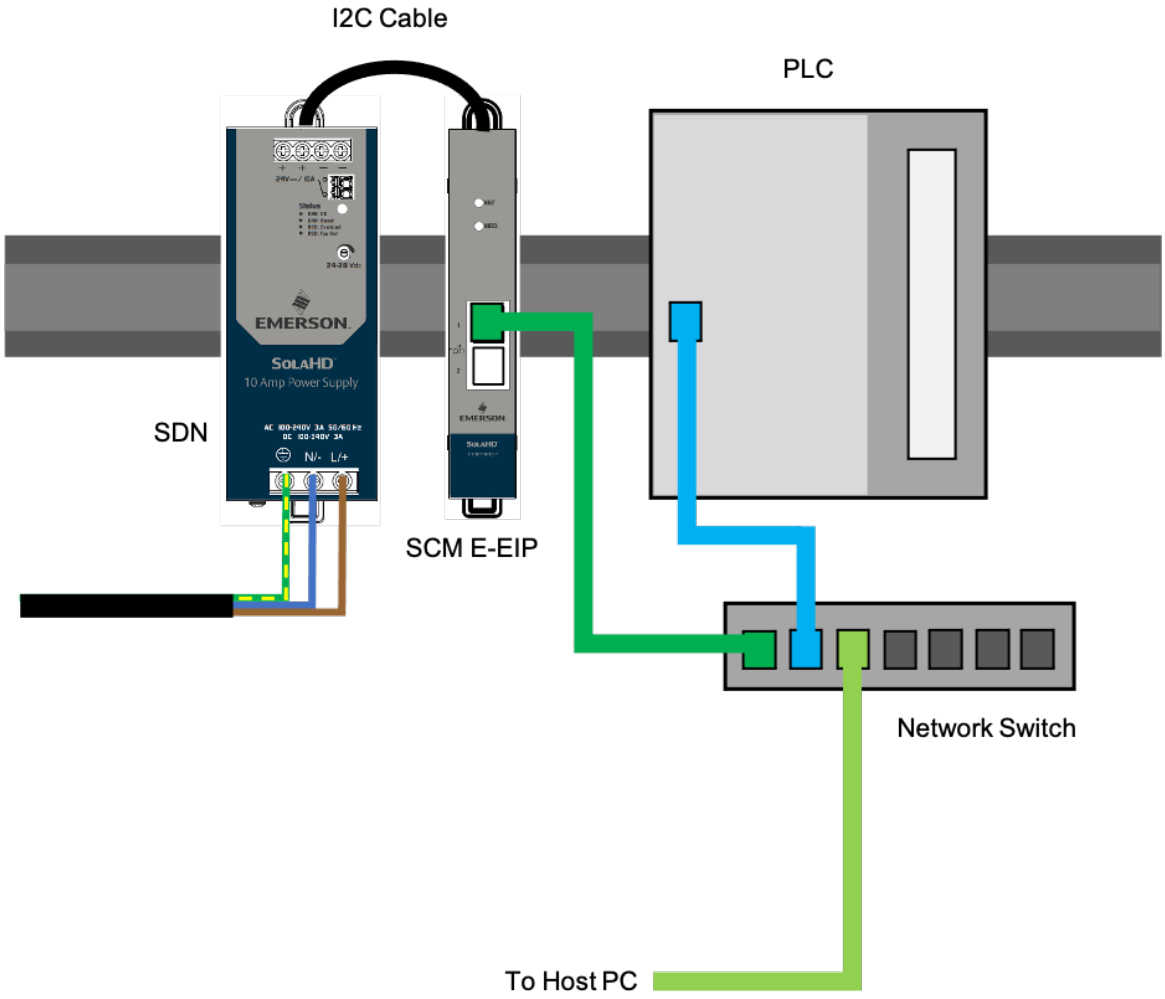


1.5.4 ROCKWELL ALLEN BRADLEY LOGIX PROCESSOR

To connect a SolaHD SDN-D Power Supply to an Allen Bradley Logix Processor, it must be wired either via a star topology or a ring topology as shown in the examples below. Both topologies make use of a network switch. For more details, refer to **Section 4 Rockwell Allen Bradley Setup**.

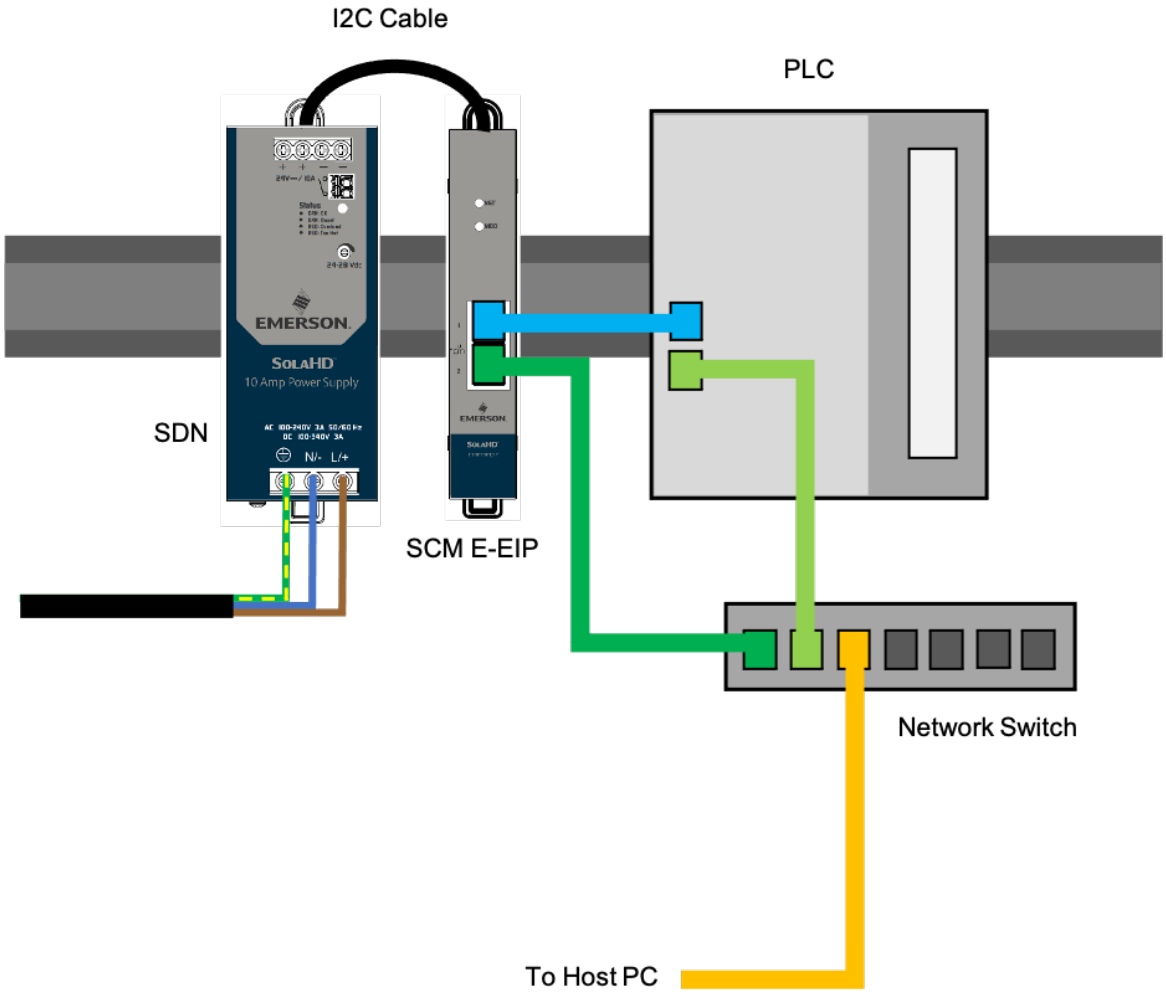
1.5.4.1 WIRING: ROCKWELL ALLEN BRADLEY LOGIX PROCESSOR STAR TOPOLOGY

The set-up below shows the wiring of a SCM-E-EIP - SDN-D Power Supply to a Rockwell Allen Bradley Logix Processor in star topology.



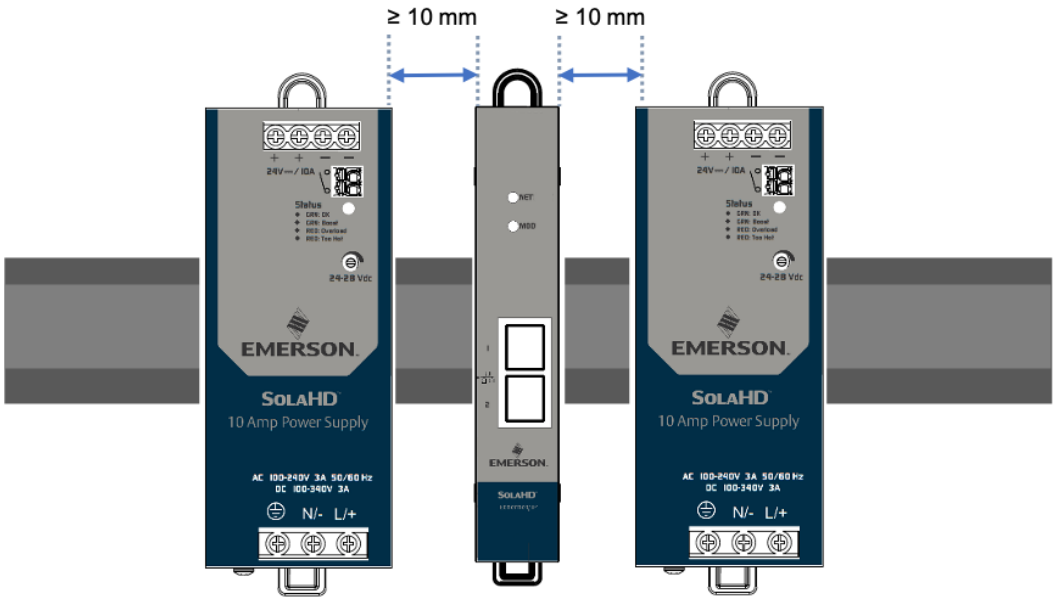
1.5.4.2 WIRING: ROCKWELL ALLEN BRADLEY LOGIX PROCESSOR DEVICE LEVEL RING (DLR) TOPOLOGY

The set-up below shows the wiring of a SCM-E-EIP - SDN-D Power Supply to a Rockwell Allen Bradley Logix Processor in ring topology.



1.5.5 SPACING

The setup below shows the spacing of the SCM-E-EIP to the SDN-D Power Supplies. Please note that all devices are mounted on a standard DIN-rail.



1.6 PROCESS DATA

The measurement and calculation data shown below can be read through the SCM-E-EIP. For the full list of SCM parameters, please refer to **Section 4.3**.

Parameter	Data Type	Resolution	Accuracy
SCM | Status LED	BYTE	-	-
SCM | Temperature	SINT	0.1°C	+-2.0°C
P1 | Vout	UINT	0.01V	+-2%
P1 | Iout	UINT	0.01A	+-2.5%
P1 | Vin	UINT	0.01V	+-5.0%
P1 | Temperature	SINT	0.1°C	+-8°C
P1 | LED Status	BYTE	-	-
P1 | Event Flags	WORD	-	-
P1 | Time On Now	UDINT	1sec	-
P1 | Lifetime On	UDINT	1sec	-
P2 | Vout	UINT	0.01V	+-2%
P2 | Iout	UINT	0.01A	+-2.5%
P2 | Vin	UINT	0.01V	+-5.0%
P2 | Temperature	SINT	0.1°C	+-8°C
P2 | LED Status	BYTE	-	-
P2 | Event Flags	WORD	-	-
P2 | Time On Now	UDINT	1sec	-
P2 | Lifetime On	UDINT	1sec	-
P1 | Alarm Flag	DWORD	-	-
P2 | Alarm Flag	DWORD	-	-

NOTES:

- The accuracy defined in the table above is valid over the entire operating input, load, Vout range and 0–60°C (unless specified otherwise)
- P1, P2 Temperature (power supply internal ambient temperature) accuracy at > 50°C
- Iout accuracy at > 20% of max. operating load

1.7 EVENTS

The events shown below can be flagged through communication with SCM-E-EIP.

Event	Event Code	Origin	Meaning
Short Circuit Protection	SCP/OCP	PSU	Short circuit fault occurred at the output of the power supply. This is triggered when the load current is greater than 150% of the rated load.
Overvoltage Protection	OVP	PSU	The output voltage of the power supply is greater than 32V for SDN10 and SDN20.
Power Boost	PB	PSU	Power supply loaded a reactive load which is less than 150% of the rated load but greater than 125% of the rated load.
Overtemperature Protection	OTP	PSU	Internal temperature of the power supply exceeding safe operating levels. This occurs when the main transformer temperature exceeds 125°C.

1.8 PRODUCT INFORMATION AND DEFAULT COMM. CONFIGURATION

These communication configuration and product information shown below can be read or written through SCM-E-EIP.

Name	Default Factory Settings	Process Data	CIP
Part Number	SCM-E-EIP	None	Read
Serial Number[1]	...	None	Read
Manufacturing Info[1]	...	None	Read
Manufacturer Name	SolaHD	None	Read
Model Revision[1]	...	None	Read
Primary Revision[1]	...	None	Read
Secondary Revision[1]	...	None	Read
MAC Address	00:00:00:00:00:00	None	Read

[1] *Factory dependent, no fixed value*

Default Communication			
DHCP	Enabled	None	Read/Write
IP Address	0.0.0.0	None	Read/Write
Subnet Mask	0.0.0.0	None	Read/Write
Gateway Address	0.0.0.0	None	Read/Write
Host Name			Read/Write
Domain name			Read/Write
DNS Server #1	0.0.0.0	None	Read/Write
DNS Server #2	0.0.0.0	None	Read/Write
Port 1			Read/Write
Port 2			Read/Write

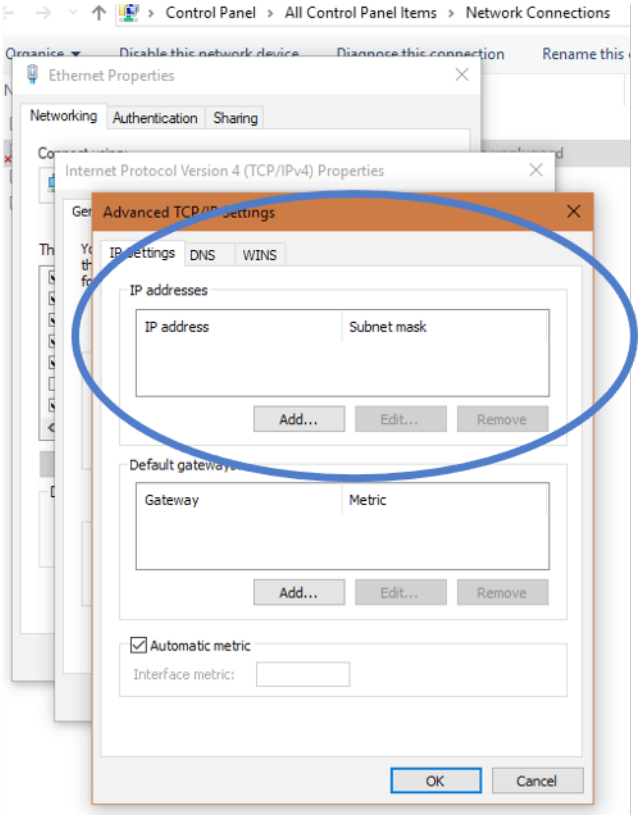
2. NETWORK CONFIGURATION/ IP SETTINGS

2.1 NETWORK CONFIGURATION

2.1.1 STATIC IP

The following example shows how to change to a Static IP Address of 192.168.1.20 from a PC connected on the network. Note that by default, SCM-E-EIP is DHCP-enabled. If the SCM-E-EIP is still configured for DHCP, it must be changed to Static. This can be done using the HMS IPConfig tool, described in the next section.

1. Go to Settings > Network and Internet > Change adapter options
2. Right-click on your Local Area Network (LAN) and select Properties
3. Click Internet Protocol Version 4 (TCP/IPv4)
4. Select Use the following address and click on Advanced
5. Add IP 192.168.1.20 and Subnet Mask 255.555.555.0



2.1.2 HMS IP CONFIG TOOL

HMS Ipconfig is a Windows-based tool for configuration of TCP/IP settings in HMS devices. Ipconfig will detect all compatible and active HMS devices on the local network. The devices do not have to be on the same Ethernet subnet as the computer running.

1. Click this **link** to download the IPConfig tool.
2. Select HMS IP Config – Utility for module TCP/IP configuration.
3. After the download is finished, upack the items on the zip file and run the installer.
4. Connect the SCM-E-EIP to the PC where you installed the HMS IP Config tool, preferably direct connection.
5. Follow the **HMS IPConfig User Guide**.
6. Click Next until you reach the Registration process.

3. MONITORING

3.1 WEBSERVER MONITORING

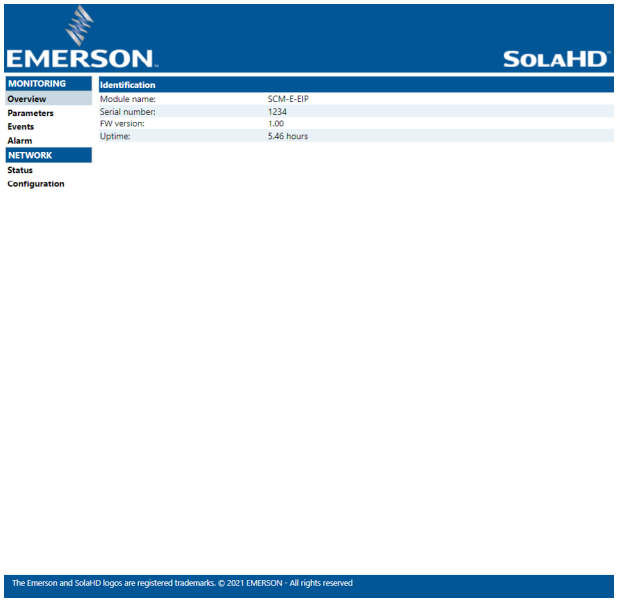
3.1.1 PROCEDURE

The SCM-E-EIP Communication Module comes with a webserver Graphical User Interface (GUI) that allows the user to monitor the different parameters and alarms from the device connected to it. It also allows the user to configure SCM-E-EIP network settings such as IP address and net mask.

This webserver can be opened by most browsers such as Google Chrome, Microsoft Edge, Mozilla Firefox, Safari, etc.

To open the SCM webserver, follow the instructions below:

1. Set-up the wiring of the SCM-E-EIP and the SOLAHD Power Supply. For information on the wiring setup of SOLAHD Power Supplies to the SCM-E-EIP, refer to **Section 1.5.1**.
2. Once the setup is finished, turn the devices on and configure the network. For instructions on how to configure the network, refer to **Section 2.1**. If the network is already configured, this step can be skipped.
3. To make sure that the SCM is really connected to the network, the user can ping the device using the IP address set in Section 2.1. (e.g 192.168.1.5). Type ping 192.168.1.5 at the command prompt. The Command Prompt can be opened by typing cmd in the Windows search bar and pressing Enter. (This step can be skipped.)
4. Once the connection is established, open the desired browser and type the IP address (192.168.1.5) on the address bar.
5. The webserver should be loaded with the default tab opened (Overview tab).

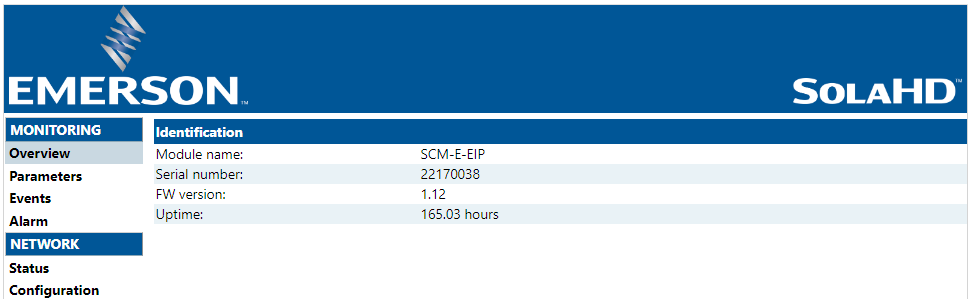


3.1.2 PARTS

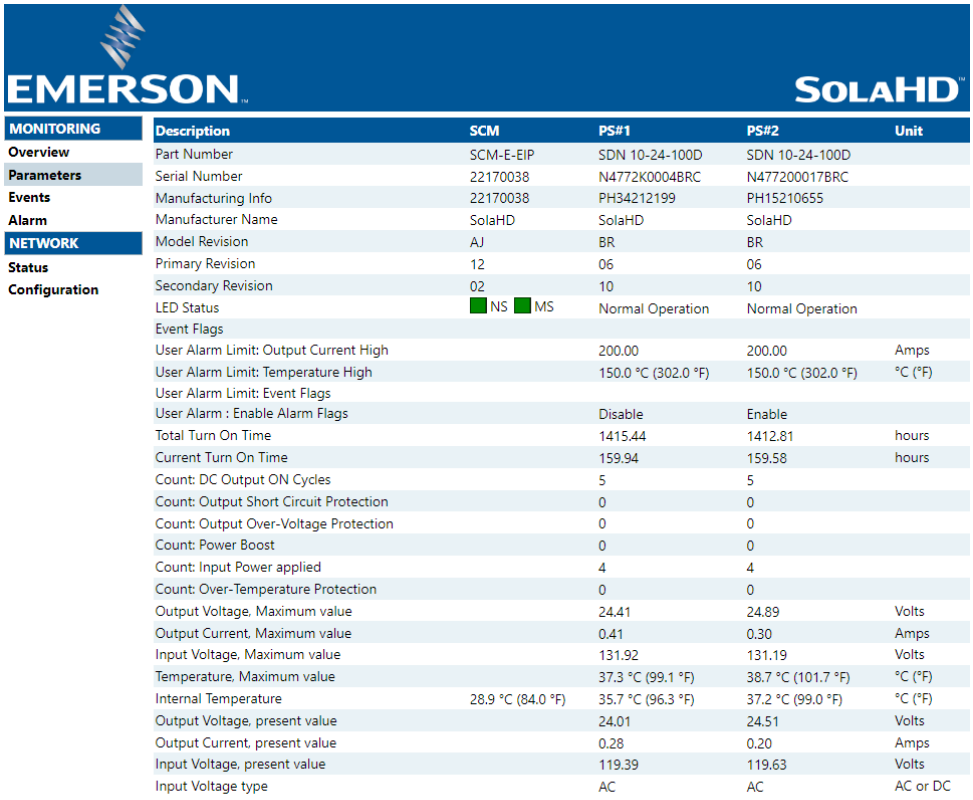
The webserver is divided into two main tabs: Monitoring and Network. The monitoring tab consists of Overview, Parameters, Events while the Network tab consists of Status and Configuration.

3.1.2.1 MONITORING TAB

The Overview tab shows the identification of the module attached to the network such as module name, serial number, firmware version, and uptime.

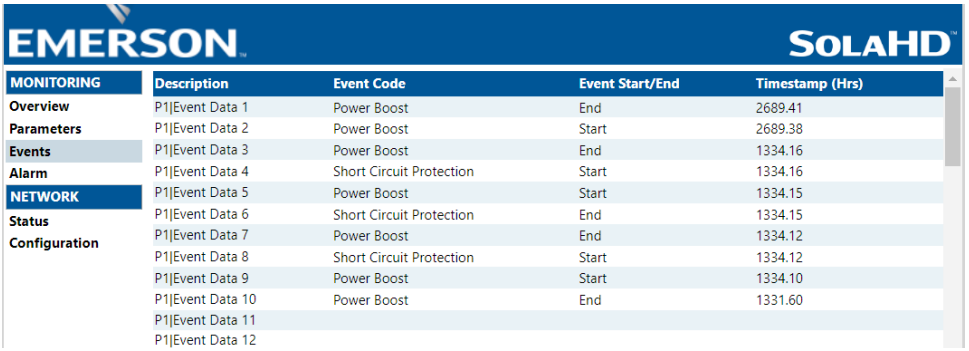


The Parameters tab shows all the measurement and calculation data of the devices (SDN-D Power supplies, etc) connected to the communications module. The FRU data of the SCM-E-EIP are also shown in this tab.



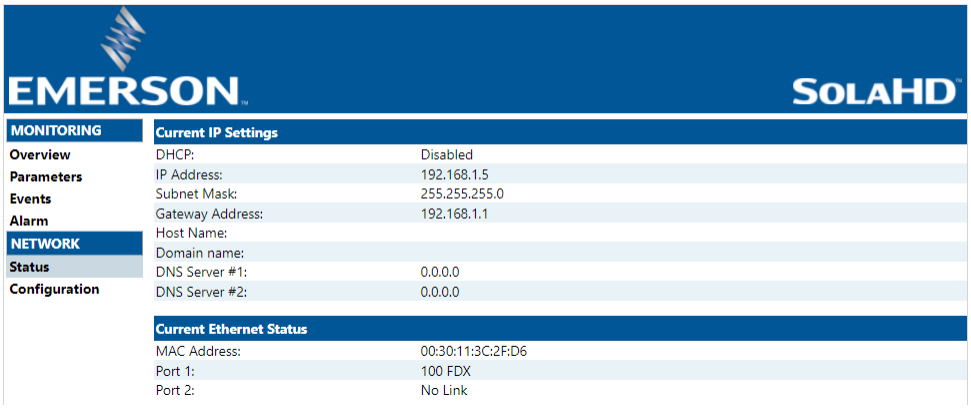
Description	SCM	PS#1	PS#2	Unit
Part Number	SCM-E-EIP	SDN 10-24-100D	SDN 10-24-100D	
Serial Number	22170038	N4772K0004BRC	N477200017BRC	
Manufacturing Info	22170038	PH34212199	PH15210655	
Manufacturer Name	SolaHD	SolaHD	SolaHD	
Model Revision	AJ	BR	BR	
Primary Revision	12	06	06	
Secondary Revision	02	10	10	
LED Status	NS MS	Normal Operation	Normal Operation	
Event Flags				
User Alarm Limit: Output Current High		200.00	200.00	Amps
User Alarm Limit: Temperature High		150.0 °C (302.0 °F)	150.0 °C (302.0 °F)	°C (°F)
User Alarm Limit: Event Flags				
User Alarm : Enable Alarm Flags		Disable	Enable	
Total Turn On Time		1415.44	1412.81	hours
Current Turn On Time		159.94	159.58	hours
Count: DC Output ON Cycles		5	5	
Count: Output Short Circuit Protection		0	0	
Count: Output Over-Voltage Protection		0	0	
Count: Power Boost		0	0	
Count: Input Power applied		4	4	
Count: Over-Temperature Protection		0	0	
Output Voltage, Maximum value		24.41	24.89	Volts
Output Current, Maximum value		0.41	0.30	Amps
Input Voltage, Maximum value		131.92	131.19	Volts
Temperature, Maximum value		37.3 °C (99.1 °F)	38.7 °C (101.7 °F)	°C (°F)
Internal Temperature	28.9 °C (84.0 °F)	35.7 °C (96.3 °F)	37.2 °C (99.0 °F)	°C (°F)
Output Voltage, present value		24.01	24.51	Volts
Output Current, present value		0.28	0.20	Amps
Input Voltage, present value		119.39	119.63	Volts
Input Voltage type		AC	AC	AC or DC

The Events tab shows all the flagged alarms, their corresponding code, and description. It also contains a download button to save the flagged events in a csv file.

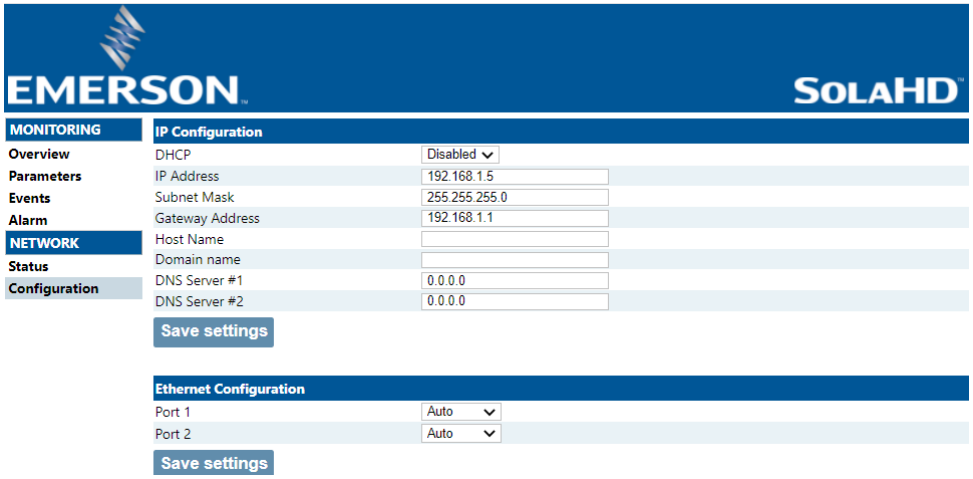


3.1.2.2 NETWORK TAB

The Status tab shows the status of the network such as its current IP settings and current Ethernet status.

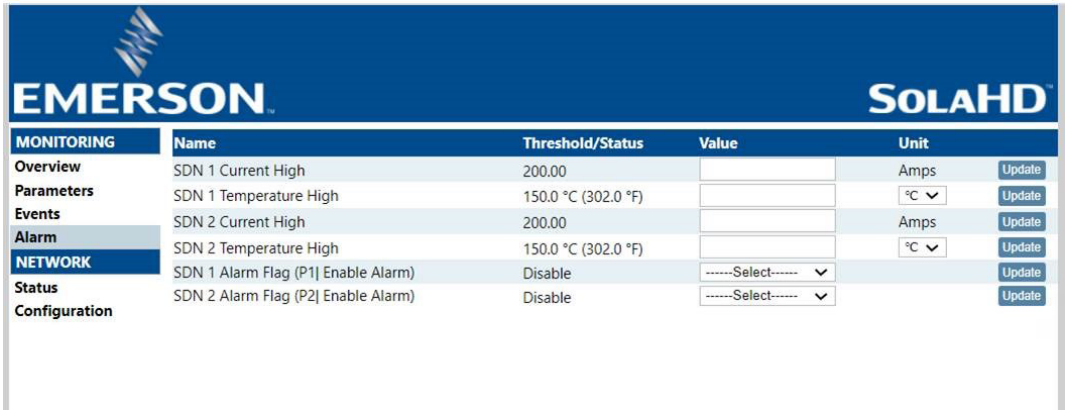


The configuration tab is where the user can change current IP configuration such as the IP address, subnet mask, gateway address, and DNS servers. The status of the DHCP can also be changed in this tab.



3.1.3 CONFIGURABLE ALARMS

Configurable Alarms allows the user to set threshold values to the device through the GUI. The threshold values are stored in a non-volatile memory in the SCM Device.

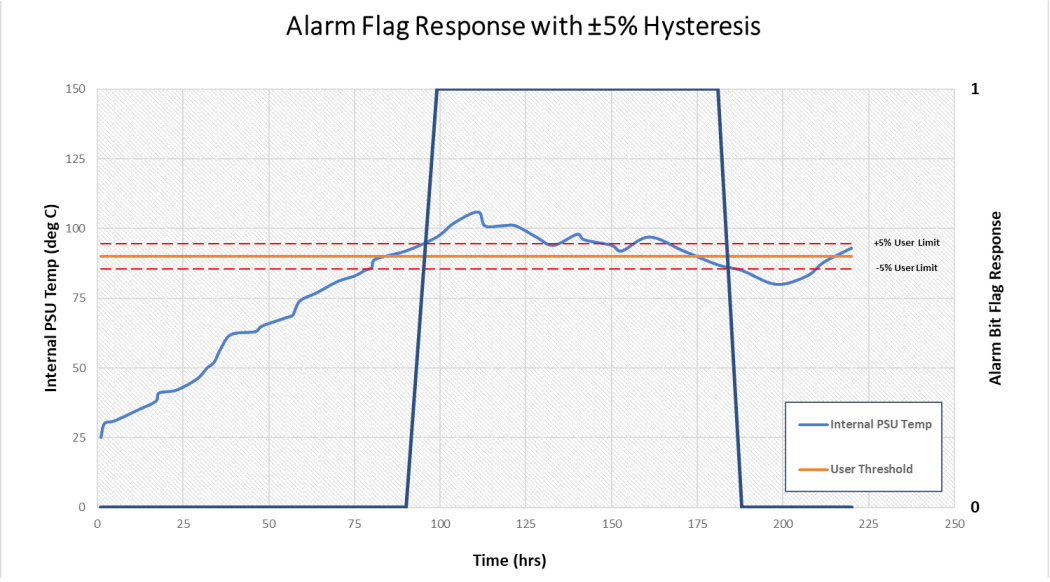


The GUI allows the user to input preferred limits by pressing the Update button on the right side and immediately the value will be saved in the non-volatile memory.

Once the value in the non-volatile memory is changed from its default value, the firmware will start evaluating the live parameter periodically and will check if the parameter exceeds the threshold limit.

To prevent abrupt changes in the Alarm Bit Flag, hysteresis is added to the threshold. The current setting for the hysteresis value is at ±5% of the threshold value. Initially the value of the bit flag is set to 0 upon startup of the device. The Bit Flag will toggle into its reverse state if the device parameter exceeds the hysteresis limits.

In the example below, the Internal PSU Temperature Alarm is set to 90 degrees. With 5% hysteresis, or 4.5 degrees, the alarm bit will be set to 1 when the temperature is equal to or greater than 94.5 degrees. The alarm bit will be set to 0 when the temperature is less than or equal to 85.5 degrees.



The following table provides the allowable range for settable fields in the User Configurable Alarms. In case of SDN Temperature, the user can select to input either in Fahrenheit or in Celsius. The system will adjust the minimum and maximum values accordingly.

	Range		
Parameter	Min	Max	Units
SDN Current High	0	200	Amps
SDN Temperature High (°C)	-50	+150	deg C
SDN Temperature High (°F)	-58	+302	deg F

The user configurable Alarm Flags can be monitored according to the two tables below. A 32-bit integer has been allocated for this purpose, which corresponds to Inst 400 and 401 the table in **Section 4.3.2**. At this time, only Bits 2 and 3 are used, and the other bits are reserved for future functionality.

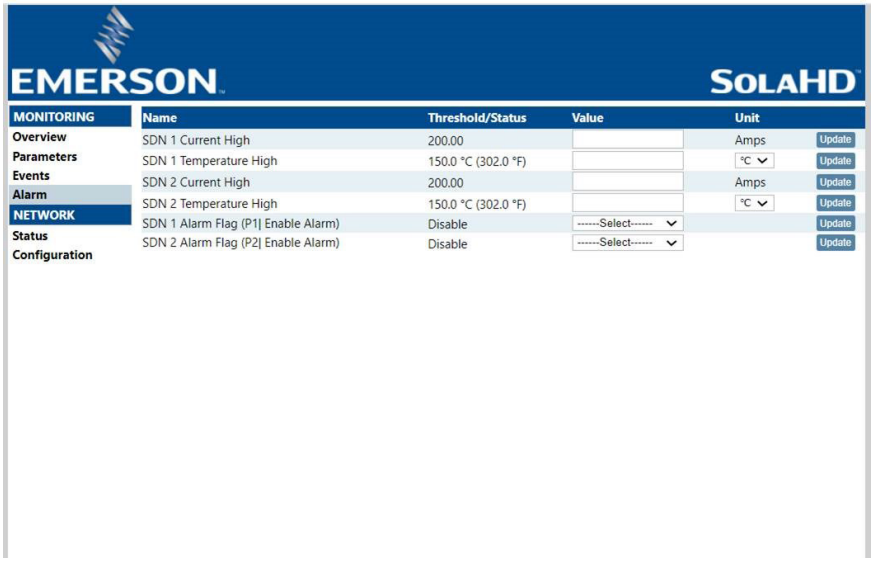
If an alarm limit is exceeded, the corresponding Bit position in the 32-bit Alarm Flag becomes High.

Bit Number	Bits 4-31	Bit 3	Bit 2	Bits 0, 1
Description	"0 (reserved for future use)"	Internal Temperature > Threshold	Output Current > Threshold	"0 (reserved for future use)"

Internal Temp	Output Current	Register Value
<= Threshold	<= Threshold	0x00000000
<= Threshold	> Threshold	0x00000004
> Threshold	<= Threshold	0x00000008
> Threshold	> Threshold	0x0000000C

3.1.3.1 ENABLING/DISABLING ALARM FLAGS

The alarm flag for each PSU can be enabled or disabled according to user needs. If the ENABLE ALARM is disabled, the SCM-E-EIP ignores the value set in the threshold value and always return a 0x0000 value in the alarm flag. The Class 1 Alarm Flag Process Data will also produce a 0x0000 value when ENABLE ALARM is disabled.



4. ROCKWELL ALLEN-BRADLEY SETUP

This section describes how to utilize information in the PLC system using a Class 1 data connection.

Prior to setting up a connection to the Allen Bradley Logix Processor, the following must be done:

- Install Studio 5000 software. Studio 5000 is a design and configuration software for the Allen-Bradley® ControlLogix® and CompactLogix™ controllers.
- Configure the Network IP settings. For details regarding the IP configuration, refer to **Section 2.1**.

4.1 EDS FILE

This section will describe setting up a Class 1 IO connection with an Allen Bradley Logix Processor through an EDS File. EDS files are text files used by network configuration tools to help you identify products and easily commission them on a network. The knowledge of assembly instance numbers, data size, data types, etc. are no longer needed when this method is used. In lieu of this, however, is the EDS file. The EDS file must be imported to the EDS repository in order to be accessed by the Logix Designer.

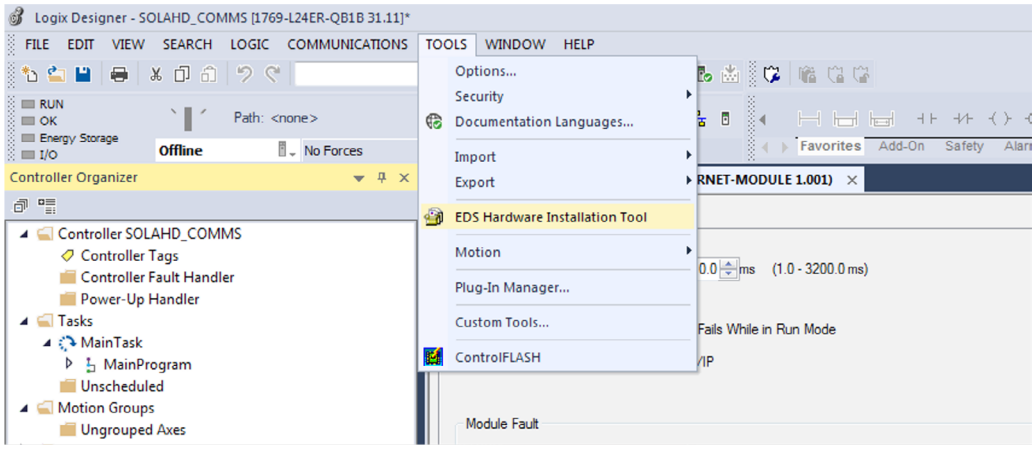
The EDS file for the SCM-E-EIP can be downloaded from the following location:

https://www.appleton.emerson.com/catalog/en-us/shop/appleton/solahd-sdn-d

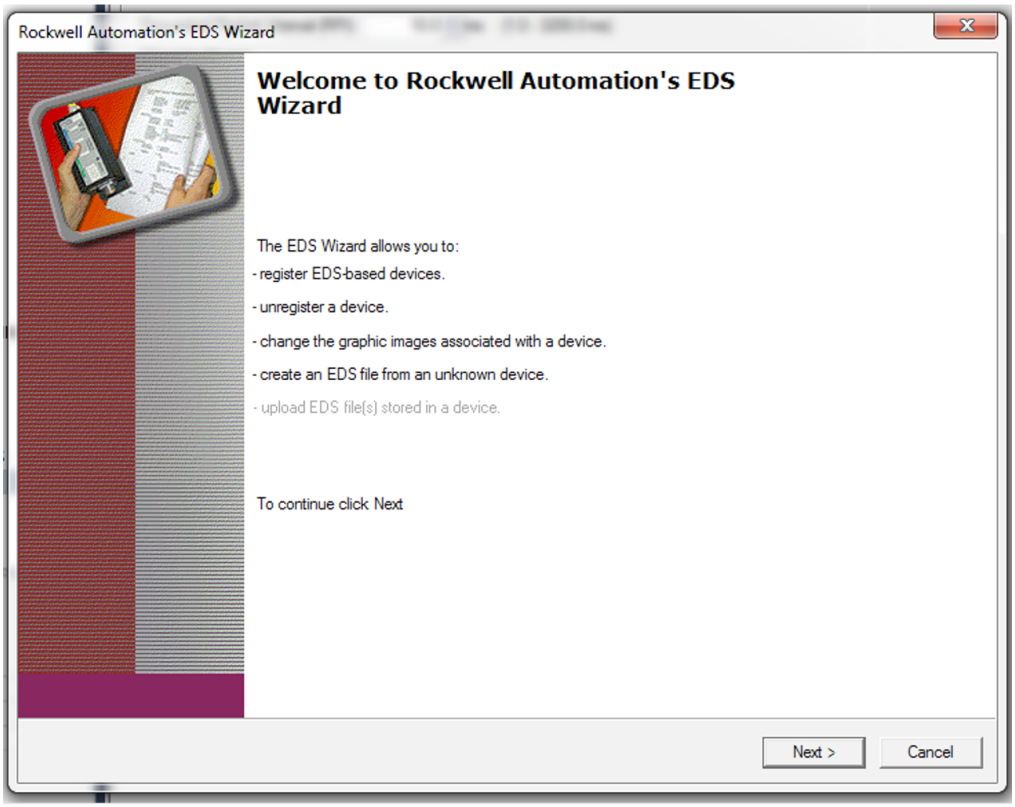
at the DOCUMENTS & DRAWINGS tab under SOFTWARE DOWNLOADS & DRIVERS.

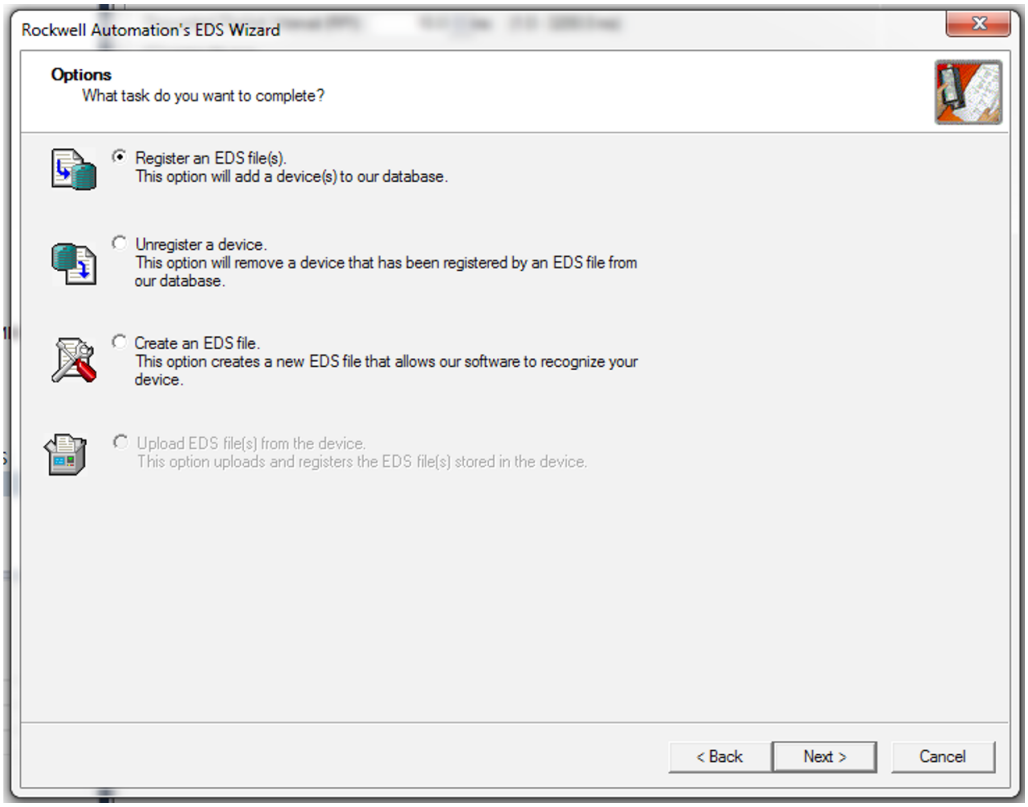
The procedure below is the Class 1 IO connection set-up of the SCM Module to the Allen Bradley CompactLogix using the EDS file method:

1 To import the EDS file, select EDS Hardware Installation Tool under Tools. This will prompt the Rockwell Automation EDS Wizard to open.

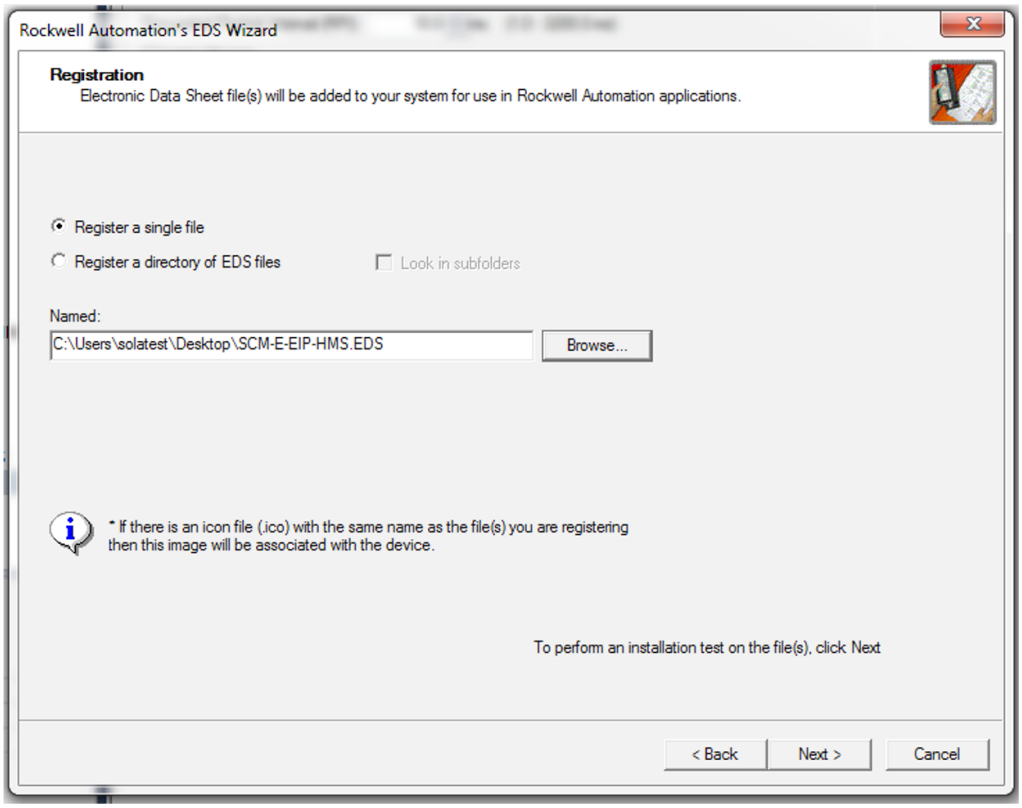


2 Click Next until you reach the Registration process.

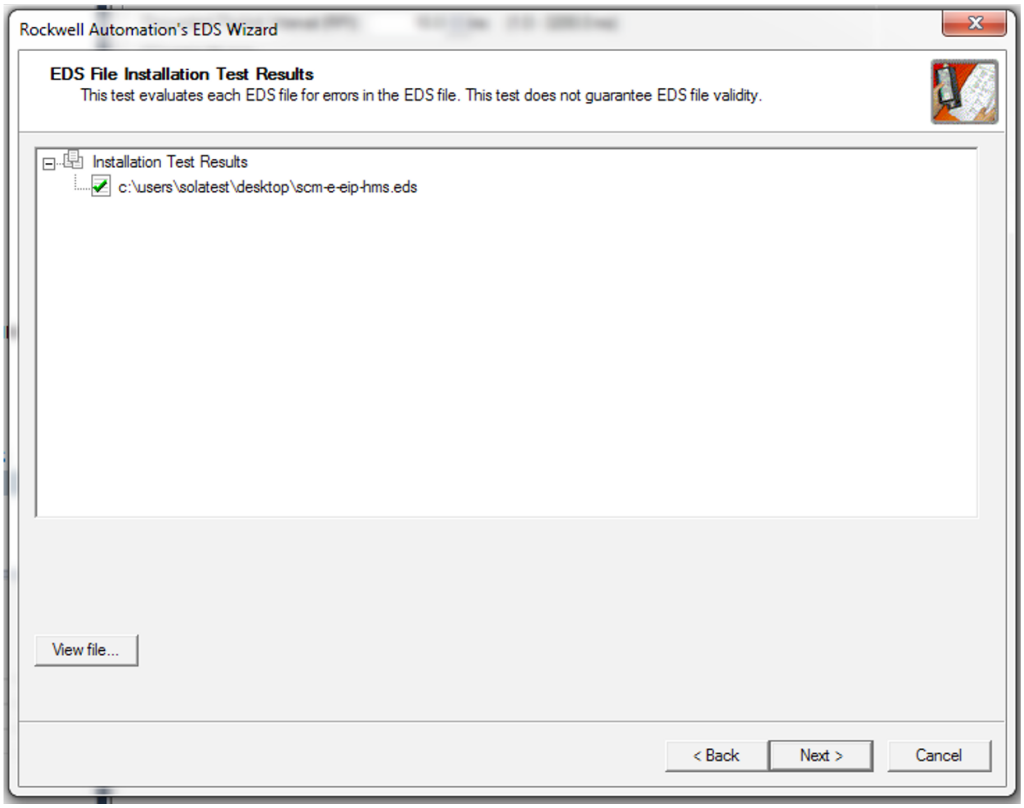


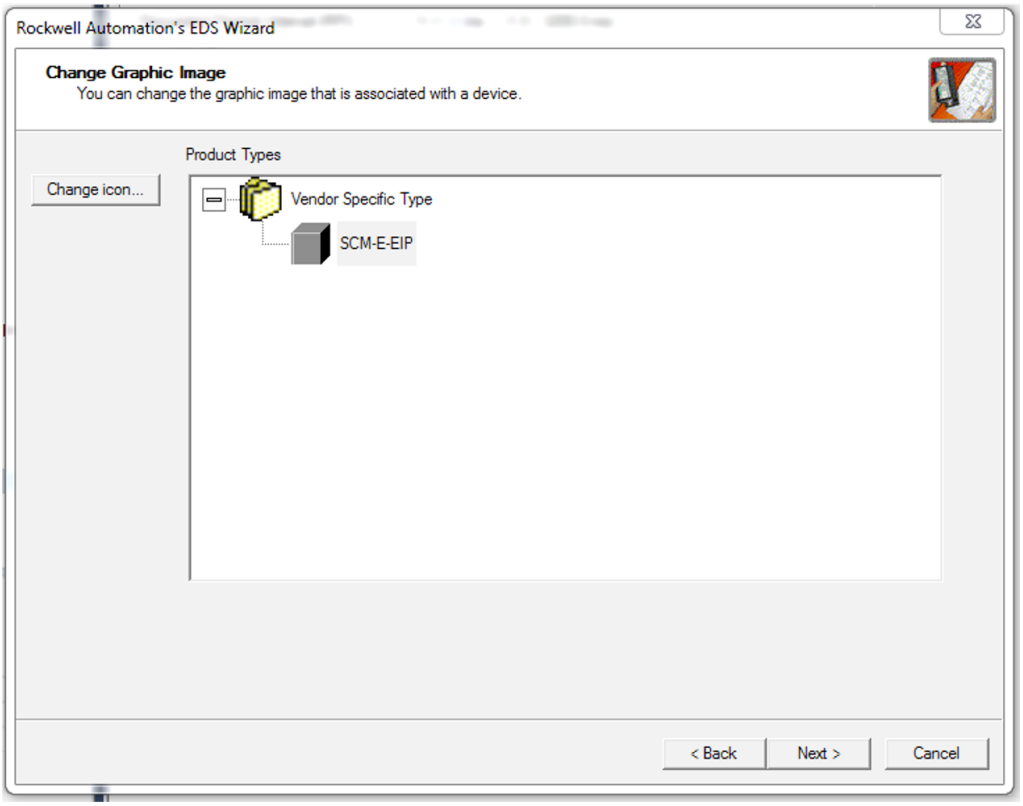

Rockwell Automation's EDS Wizard
Options
What task do you want to complete?
Register an EDS file(s).
This option will add a device(s) to our database.
Unregister a device.
This option will remove a device that has been registered by an EDS file from our database.
Create an EDS file.
This option creates a new EDS file that allows our software to recognize your device.
Upload EDS file(s) from the device.
This option uploads and registers the EDS file(s) stored in the device.
< Back
Next >
Cancel

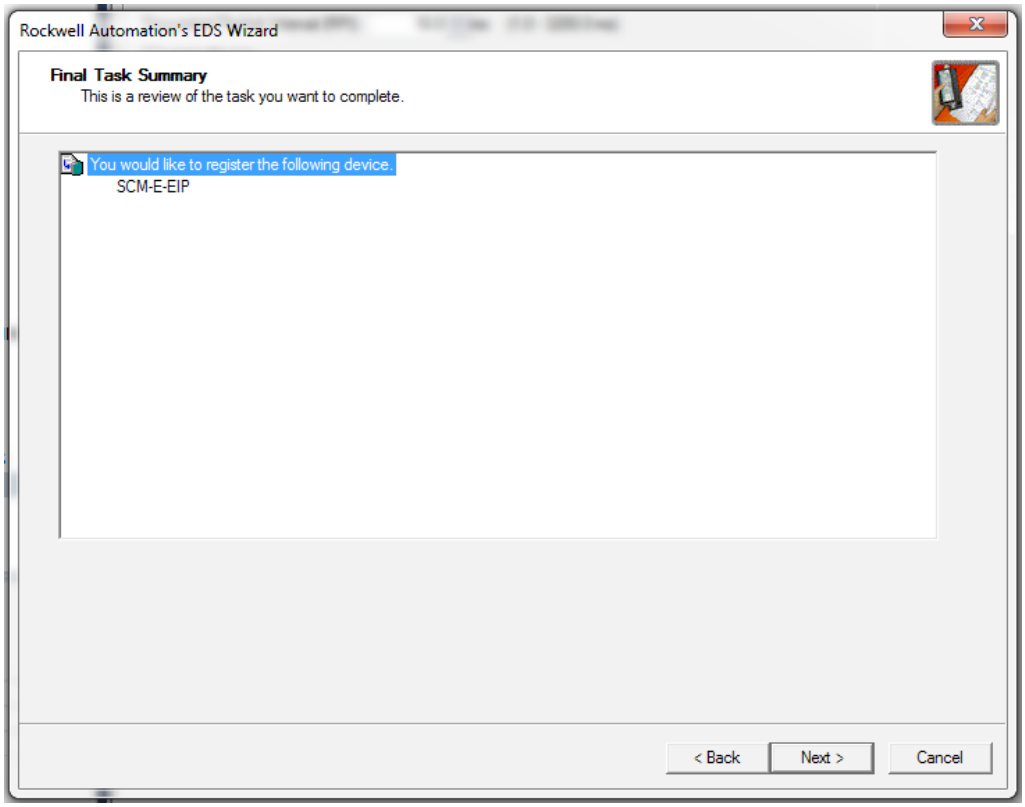
3 Tick Register a single file and click the Browse button to select the EDS file on the host PC.



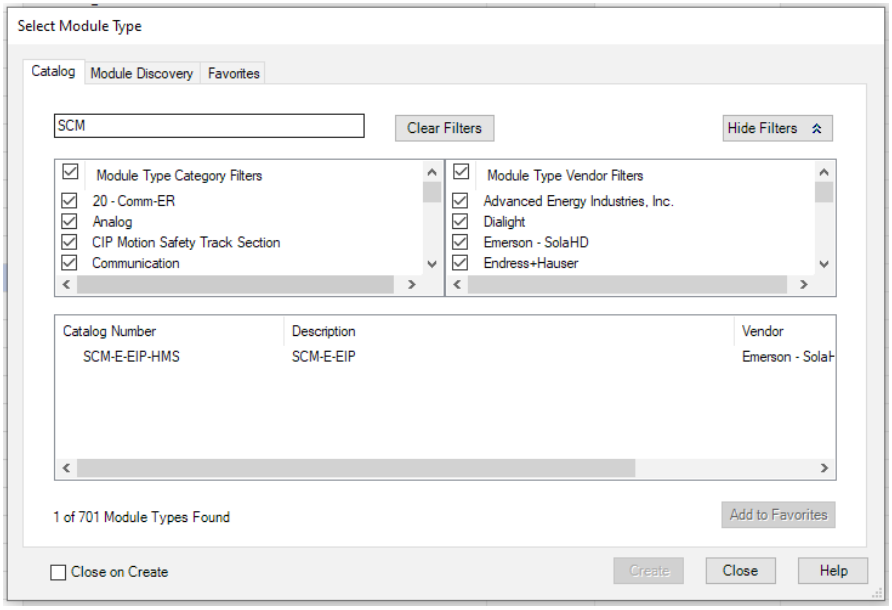
4 Click Next until the prompt ends.







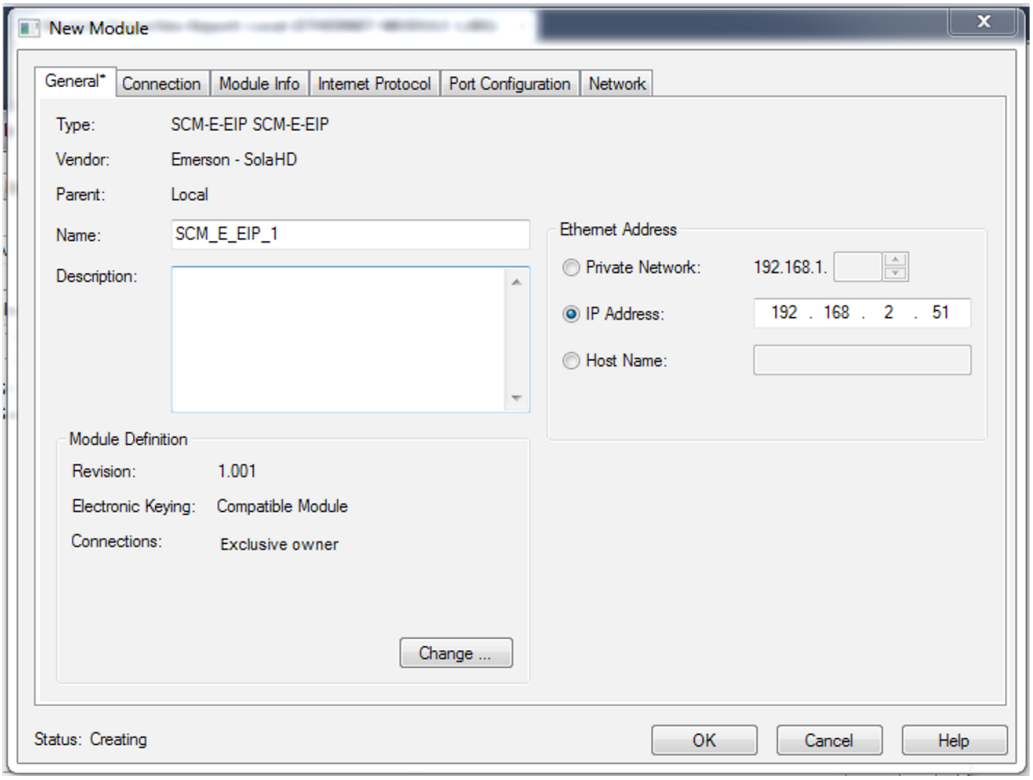
5 After importing the EDS file, the device can now be added to the Ethernet network. Like in the Generic Ethernet Module method, in order to communicate with I/O modules such as the SCM-E-EIP, they must be added to the I/O Configuration folder first. Create new module by right clicking Ethernet and selecting New Module. Ethernet is located under the I/O Configuration folder in the Controller Organizer window. SCM-E-EIP can now be filtered using the keyword “SCM” or “SOLAHD”. Select "SCM-E-EIP" and click the Create button.



6 Enter the desired name* that will be shown in the controller tags, description, and IP address of the module.

*If considering using the Emerson SCM Add on Instruction, the name should be set to SCM_1.

(To change the data type that will be set for the controller tags, click on the change button. However, it is best recommended to keep the default data type which is SINT.) Click OK to add the device to the I/O configuration. The controller tags will now be available for the SOLAHD Power Supplies through SCM-E-EIP.

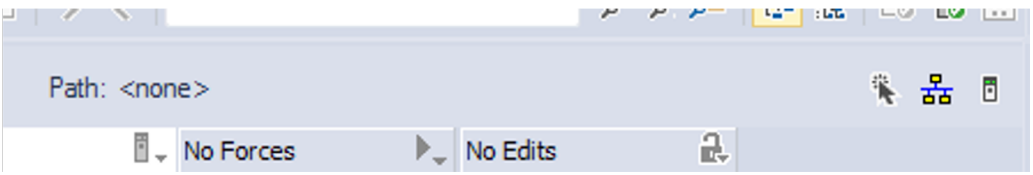


4.2 ROCKWELL ALLEN-BRADLEY LOGIX PROCESSOR MONITORING

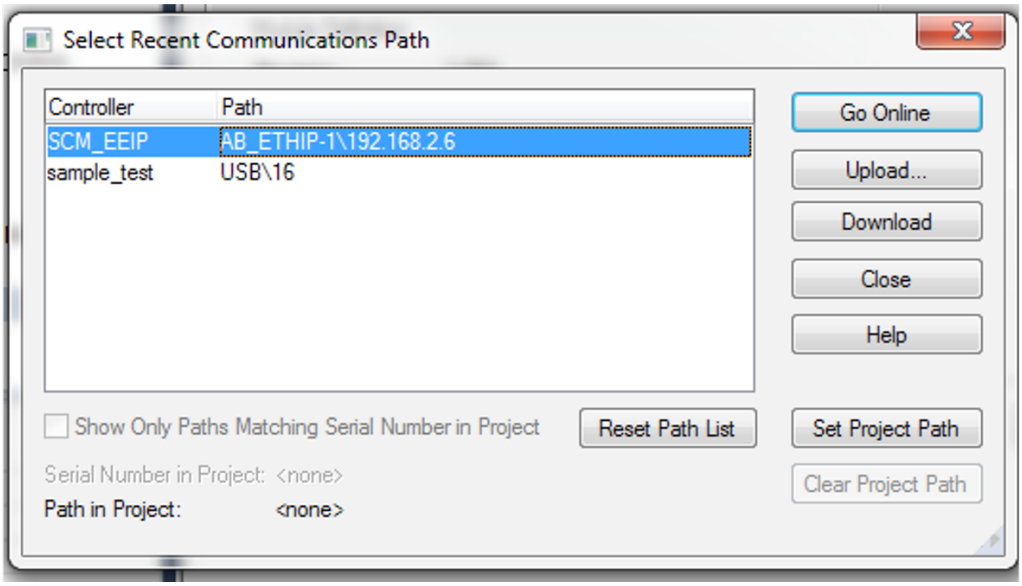
Before the data can be accessed, the connection and network setup of SCM-E-EIP to Allen-Bradley Logix Processor should first be completed.

To monitor the data using Rockwell Allen-Bradley Logix Processor, follow the instructions below:

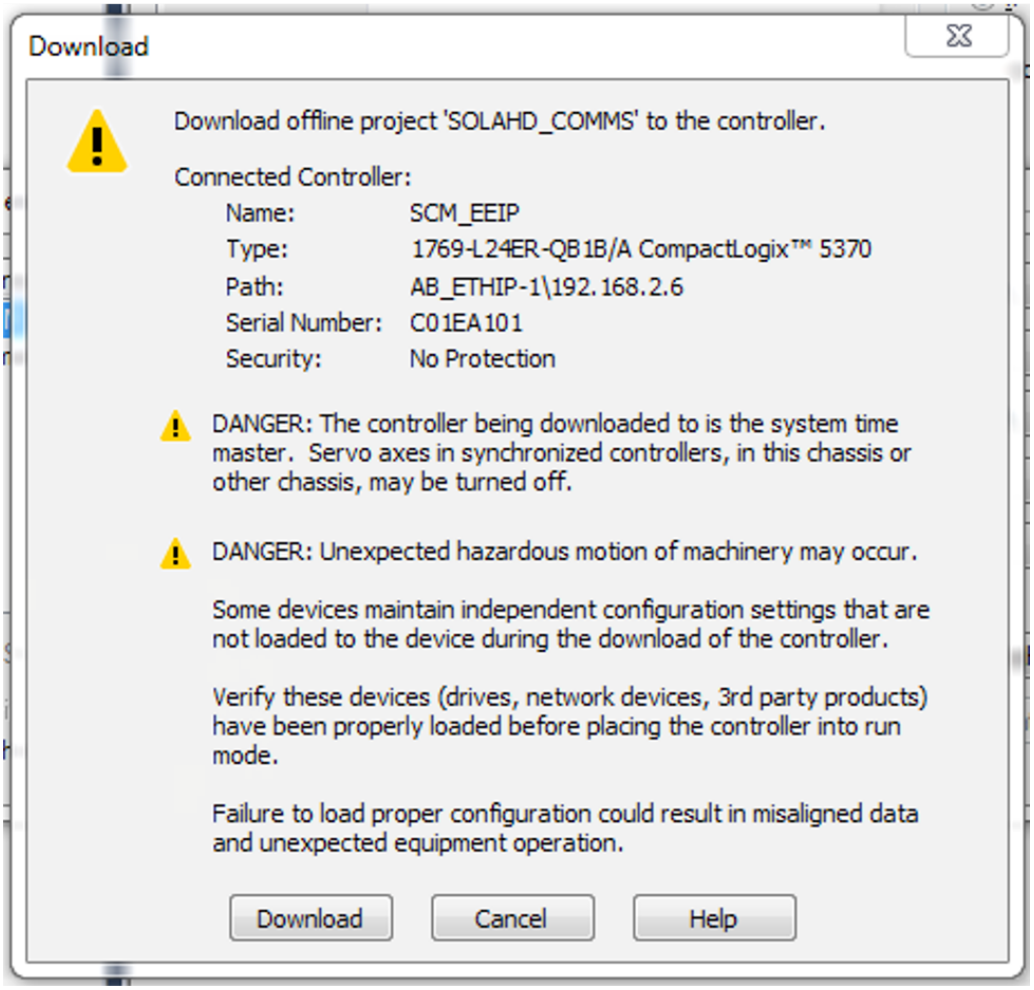
1 Once the connection is established, you may now select the path and download the program to the PLC. To set the device path, click on the RSWho button as shown below. This will scan the network using the network interface card on your PC to locate the PLC. Ensure that the PLC is set to PROG or REM before going online to download the program.



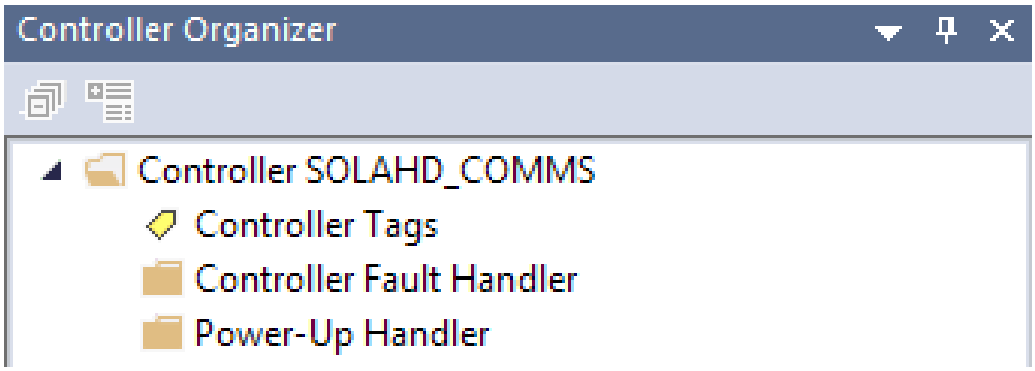
2 To download the program to the PLC, click on the Go Online button on the Select Recent Communications Path window.



3 Click 'Download' on the next prompt.



4 After downloading the program to the PLC, data can now be accessed through the controller tags.



4.3 I/O DATA AND EXPLICIT MESSAGING CONNECTIONS

The SCM is capable of supporting both Class 1 I/O Data and Class 3 Explicit Messages.

4.3.1 CLASS 1 I/O DATA (PROCESS DATA)

Class 1 I/O Data is supported through the Assembly Object Producing Instance (64h). The Class 1 I/O data block is defined in the table below.

Parameter	Data Type	Resolution	Accuracy
SCM | Status LED	BYTE	-	-
SCM | Temperature	SINT	0.1°C	+-2.0°C
P1 | Vout	UINT	0.01V	+-2%
P1 | Iout	UINT	0.01A	+-2.5%
P1 | Vin	UINT	0.01V	+-5.0%
P1 | Temperature	SINT	0.1°C	+-8°C
P1 | LED Status	BYTE	-	-
P1 | Event Flags	WORD	-	-
P1 | Time On Now	UDINT	1sec	-
P1 | Lifetime On	UDINT	1sec	-
P2 | Vout	UINT	0.01V	+-2%
P2 | Iout	UINT	0.01A	+-2.5%
P2 | Vin	UINT	0.01V	+-5.0%
P2 | Temperature	SINT	0.1°C	+-8°C
P2 | LED Status	BYTE	-	-
P2 | Event Flags	WORD	-	-
P2 | Time On Now	UDINT	1sec	-
P2 | Lifetime On	UDINT	1sec	-
P1 | Alarm Flag	DWORD	-	-
P2 | Alarm Flag	DWORD	-	-

NOTES:

- The accuracy defined in the table above is valid over the entire operating input, load, Vout range and 0–60°C (unless specified otherwise)
- P1, P2 Temperature (power supply internal ambient temperature) accuracy at > 50°C
- Iout accuracy at > 20% of max. operating load

4.3.2 CLASS 3 APPLICATION DATA INTERFACE

Parameter attributes values can be accessed by Class 3 Explicit Message through the ADI Object (0xA2) with supported services Get_Attribute_Single and Set_Attribute_Single.

ADI Inst. #	Parameter	Data Type	Size	Units	Service
1	SCM| Part Number	CHAR	16		Get Access only
2	SCM| Serial Number	UINT32	4		Get Access only
3	SCM| Manufacturer Lot Code	UINT32	4		Get Access only
4	SCM| Manufacturer Name	CHAR	16		Get Access only
5	SCM| Model Revision	CHAR	2		Get Access only
6	SCM| Primary Firmware Rev	UINT8	1		Get Access only
7	SCM| Secondary Firmware Rev	UINT8	1		Get Access only
8	SCM| Status LED	UINT8	1	See Section 4.3.3	Get Access only
10	SCM| Ambient Temperature	SINT16	2	0.1°C	Get Access only
101	SDN 1| Product Name	CHAR	16		Get Access only
102	SDN 1| Serial Number	CHAR	16		Get Access only
103	SDN 1| Manufacturer Lot Code	CHAR	16		Get Access only
104	SDN 1| Manufacturer Name	CHAR	16		Get Access only
105	SDN 1| Model Revision	CHAR	2		Get Access only
106	SDN 1| Primary Revision	UINT8	1		Get Access only
107	SDN 1| Secondary Revision	UINT8	1		Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
108	SDN 1 | Output Voltage, present value	UINT16	2	0.01V	Get Access only
109	SDN 1 | Output Current, present value	UINT16	2	0.01A	Get Access only
110	SDN 1 | Input Voltage, present value	UINT16	2	0.01V	Get Access only
111	SDN 1 | Power Supply Internal Temperature	SINT16	2	0.1°C	Get Access only
112	SDN 1 | LED Status	UINT8	1	See Section 4.3.4	Get Access only
113	SDN 1 | Event Flags	BITS16	2	See Section 4.3.5	Get Access only
114	SDN 1 | Current Turn On Time	UINT32	4	seconds	Get Access only
115	SDN 1 | Total Turn On Time	UINT32	4	seconds	Get Access only
116	SDN 1 | Input Voltage Type	BOOL	1	0 - AC; 1 - DC	Get Access only
117	SDN 1 | DC ON Cycles	UINT16	2	count	Get Access only
118	SDN 1 | Count: Output Short Circuit Protection	UINT16	2	count	Get Access only
120	SDN 1 | Count:Output Over-Voltage Protection	UINT16	2	count	Get Access only
121	SDN 1 | Count: Power Boost	UINT16	2	count	Get Access only
122	SDN 1 | Count: Input Power applied	UINT16	2	count	Get Access only
123	SDN 1 | Count: Over-Temperature Protection	UINT16	2	count	Get Access only
125	SDN 1 | Output Voltage, Maximum value	UINT16	2	0.01V	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
126	SDN 1| Output Current, Maximum value	UINT16	2	0.01A	Get Access only
127	SDN 1| Input Voltage, Maximum value	UINT16	2	0.01V	Get Access only
128	SDN 1| Temperature, Maximum value	SINT16	2	0.1°C	Get Access only
201	SDN 2| Product Name	CHAR	16		Get Access only
202	SDN 2| Serial Number	CHAR	16		Get Access only
203	SDN 2| Manufacturer Lot Code	CHAR	16		Get Access only
204	SDN 2| Manufacturer Name	CHAR	16		Get Access only
205	SDN 2| Model Revision	CHAR	2		Get Access only
206	SDN 2| Primary Revision	UINT8	1		Get Access only
207	SDN 2| Secondary Revision	UINT8	1		Get Access only
208	SDN 2| Output Voltage, present value	UINT16	2	0.01V	Get Access only
209	SDN 2| Output Current, present value	UINT16	2	0.01A	Get Access only
210	SDN 2| Input Voltage, present value	UINT16	2	0.01V	Get Access only
211	SDN 2| Power Supply Internal Temperature	SINT16	2	0.1°C	Get Access only
212	SDN 2| LED Status	UINT8	1	See Section 4.3.4	Get Access only
213	SDN 2| Event Flags	BITS16	2	See Section 4.3.5	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
214	SDN 2| Current Turn On Time	UINT32	4	seconds	Get Access only
215	SDN 2| Total Turn On Time	UINT32	4	seconds	Get Access only
216	SDN 2| Input Voltage Type	BOOL	1		Get Access only
217	SDN 2| DC ON Cycles	UINT16	2	count	Get Access only
218	SDN 2| Count: Output Short Circuit Protection	UINT16	2	count	Get Access only
220	SDN 2| Count:Output Over-Voltage Protection	UINT16	2	count	Get Access only
221	SDN 2| Count: Power Boost	UINT16	2	count	Get Access only
222	SDN 2| Count: Input Power applied	UINT16	2	count	Get Access only
223	SDN 2| Count: Over-Temperature Protection	UINT16	2	count	Get Access only
225	SDN 2| Output Voltage, Maximum value	UINT16	2	0.01V	Get Access only
226	SDN 2| Output Current, Maximum value	UINT16	2	0.01A	Get Access only
227	SDN 2| Input Voltage, Maximum value	UINT16	2	0.01V	Get Access only
228	SDN 2| Temperature, Maximum value	SINT16	2	0.1°C	Get Access only
300	SDN 1| User Alarm Limit: Output Current High	UINT16	2	0.01A	Set / Get Access
301	SDN 1| User Alarm Limit: Temperature High	SINT16	2	0.1°C	Set / Get Access

ADI Inst. #	Parameter	Data Type	Size	Units	Service
316	SDN 2| User Alarm Limit: Output Current High	UINT16	2	0.01A	Set / Get Access
317	SDN 2| User Alarm Limit: Temperature High	SINT16	2	0.1°C	Set / Get Access
400	SDN 1| User Alarm Limit: Event Flags	BITS32	4	See Section 4.3.6	Get Access only
401	SDN 2| User Alarm Limit: Event Flags	BITS32	4	See Section 4.3.6	Get Access only
402	SDN 1| User Alarm Limit: Enable Alarm Flags	BOOL	1	0 - Disable; 1 - Enable	Set / Get Access
403	SDN 2| User Alarm Limit: Enable Alarm Flags	BOOL	1	0 - Disable; 1 - Enable	Set / Get Access
500	SDN 1| Event 1	STRUCT	6	Refer to Section 4.3.7	Get Access only
501	SDN 1| Event 2	STRUCT	6	Refer to Section 4.3.7	Get Access only
502	SDN 1| Event 3	STRUCT	6	Refer to Section 4.3.7	Get Access only
503	SDN 1| Event 4	STRUCT	6	Refer to Section 4.3.7	Get Access only
504	SDN 1| Event 5	STRUCT	6	Refer to Section 4.3.7	Get Access only
505	SDN 1| Event 6	STRUCT	6	Refer to Section 4.3.7	Get Access only
506	SDN 1| Event 7	STRUCT	6	Refer to Section 4.3.7	Get Access only
507	SDN 1| Event 8	STRUCT	6	Refer to Section 4.3.7	Get Access only
508	SDN 1| Event 9	STRUCT	6	Refer to Section 4.3.7	Get Access only
509	SDN 1| Event 10	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
510	SDN 1 | Event 11	STRUCT	6	Refer to Section 4.3.7	Get Access only
511	SDN 1 | Event 12	STRUCT	6	Refer to Section 4.3.7	Get Access only
512	SDN 1 | Event 13	STRUCT	6	Refer to Section 4.3.7	Get Access only
513	SDN 1 | Event 14	STRUCT	6	Refer to Section 4.3.7	Get Access only
514	SDN 1 | Event 15	STRUCT	6	Refer to Section 4.3.7	Get Access only
515	SDN 1 | Event 16	STRUCT	6	Refer to Section 4.3.7	Get Access only
516	SDN 1 | Event 17	STRUCT	6	Refer to Section 4.3.7	Get Access only
517	SDN 1 | Event 18	STRUCT	6	Refer to Section 4.3.7	Get Access only
518	SDN 1 | Event 19	STRUCT	6	Refer to Section 4.3.7	Get Access only
519	SDN 1 | Event 20	STRUCT	6	Refer to Section 4.3.7	Get Access only
520	SDN 1 | Event 21	STRUCT	6	Refer to Section 4.3.7	Get Access only
521	SDN 1 | Event 22	STRUCT	6	Refer to Section 4.3.7	Get Access only
522	SDN 1 | Event 23	STRUCT	6	Refer to Section 4.3.7	Get Access only
523	SDN 1 | Event 24	STRUCT	6	Refer to Section 4.3.7	Get Access only
524	SDN 1 | Event 25	STRUCT	6	Refer to Section 4.3.7	Get Access only
525	SDN 1 | Event 26	STRUCT	6	Refer to Section 4.3.7	Get Access only
526	SDN 1 | Event 27	STRUCT	6	Refer to Section 4.3.7	Get Access only
527	SDN 1 | Event 28	STRUCT	6	Refer to Section 4.3.7	Get Access only
528	SDN 1 | Event 29	STRUCT	6	Refer to Section 4.3.7	Get Access only
529	SDN 1 | Event 30	STRUCT	6	Refer to Section 4.3.7	Get Access only
530	SDN 1 | Event 31	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
531	SDN 1 | Event 32	STRUCT	6	Refer to Section 4.3.7	Get Access only
532	SDN 1 | Event 33	STRUCT	6	Refer to Section 4.3.7	Get Access only
533	SDN 1 | Event 34	STRUCT	6	Refer to Section 4.3.7	Get Access only
534	SDN 1 | Event 35	STRUCT	6	Refer to Section 4.3.7	Get Access only
535	SDN 1 | Event 36	STRUCT	6	Refer to Section 4.3.7	Get Access only
536	SDN 1 | Event 37	STRUCT	6	Refer to Section 4.3.7	Get Access only
537	SDN 1 | Event 38	STRUCT	6	Refer to Section 4.3.7	Get Access only
538	SDN 1 | Event 39	STRUCT	6	Refer to Section 4.3.7	Get Access only
539	SDN 1 | Event 40	STRUCT	6	Refer to Section 4.3.7	Get Access only
540	SDN 1 | Event 41	STRUCT	6	Refer to Section 4.3.7	Get Access only
541	SDN 1 | Event 42	STRUCT	6	Refer to Section 4.3.7	Get Access only
542	SDN 1 | Event 43	STRUCT	6	Refer to Section 4.3.7	Get Access only
543	SDN 1 | Event 44	STRUCT	6	Refer to Section 4.3.7	Get Access only
544	SDN 1 | Event 45	STRUCT	6	Refer to Section 4.3.7	Get Access only
545	SDN 1 | Event 46	STRUCT	6	Refer to Section 4.3.7	Get Access only
546	SDN 1 | Event 47	STRUCT	6	Refer to Section 4.3.7	Get Access only
547	SDN 1 | Event 48	STRUCT	6	Refer to Section 4.3.7	Get Access only
548	SDN 1 | Event 49	STRUCT	6	Refer to Section 4.3.7	Get Access only
549	SDN 1 | Event 50	STRUCT	6	Refer to Section 4.3.7	Get Access only
550	SDN 1 | Event 51	STRUCT	6	Refer to Section 4.3.7	Get Access only
551	SDN 1 | Event 52	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
552	SDN 1 | Event 53	STRUCT	6	Refer to Section 4.3.7	Get Access only
553	SDN 1 | Event 54	STRUCT	6	Refer to Section 4.3.7	Get Access only
554	SDN 1 | Event 55	STRUCT	6	Refer to Section 4.3.7	Get Access only
555	SDN 1 | Event 56	STRUCT	6	Refer to Section 4.3.7	Get Access only
556	SDN 1 | Event 57	STRUCT	6	Refer to Section 4.3.7	Get Access only
557	SDN 1 | Event 58	STRUCT	6	Refer to Section 4.3.7	Get Access only
558	SDN 1 | Event 59	STRUCT	6	Refer to Section 4.3.7	Get Access only
559	SDN 1 | Event 60	STRUCT	6	Refer to Section 4.3.7	Get Access only
560	SDN 1 | Event 61	STRUCT	6	Refer to Section 4.3.7	Get Access only
561	SDN 1 | Event 62	STRUCT	6	Refer to Section 4.3.7	Get Access only
562	SDN 1 | Event 63	STRUCT	6	Refer to Section 4.3.7	Get Access only
563	SDN 1 | Event 64	STRUCT	6	Refer to Section 4.3.7	Get Access only
564	SDN 2 | Event 1	STRUCT	6	Refer to Section 4.3.7	Get Access only
565	SDN 2 | Event 2	STRUCT	6	Refer to Section 4.3.7	Get Access only
566	SDN 2 | Event 3	STRUCT	6	Refer to Section 4.3.7	Get Access only
567	SDN 2 | Event 4	STRUCT	6	Refer to Section 4.3.7	Get Access only
568	SDN 2 | Event 5	STRUCT	6	Refer to Section 4.3.7	Get Access only
569	SDN 2 | Event 6	STRUCT	6	Refer to Section 4.3.7	Get Access only
570	SDN 2 | Event 7	STRUCT	6	Refer to Section 4.3.7	Get Access only
571	SDN 2 | Event 8	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
572	SDN 2| Event 9	STRUCT	6	Refer to Section 4.3.7	Get Access only
573	SDN 2| Event 10	STRUCT	6	Refer to Section 4.3.7	Get Access only
574	SDN 2| Event 11	STRUCT	6	Refer to Section 4.3.7	Get Access only
575	SDN 2| Event 12	STRUCT	6	Refer to Section 4.3.7	Get Access only
576	SDN 2| Event 13	STRUCT	6	Refer to Section 4.3.7	Get Access only
577	SDN 2| Event 14	STRUCT	6	Refer to Section 4.3.7	Get Access only
578	SDN 2| Event 15	STRUCT	6	Refer to Section 4.3.7	Get Access only
579	SDN 2| Event 16	STRUCT	6	Refer to Section 4.3.7	Get Access only
580	SDN 2| Event 17	STRUCT	6	Refer to Section 4.3.7	Get Access only
581	SDN 2| Event 18	STRUCT	6	Refer to Section 4.3.7	Get Access only
582	SDN 2| Event 19	STRUCT	6	Refer to Section 4.3.7	Get Access only
583	SDN 2| Event 20	STRUCT	6	Refer to Section 4.3.7	Get Access only
584	SDN 2| Event 21	STRUCT	6	Refer to Section 4.3.7	Get Access only
585	SDN 2| Event 22	STRUCT	6	Refer to Section 4.3.7	Get Access only
586	SDN 2| Event 23	STRUCT	6	Refer to Section 4.3.7	Get Access only
587	SDN 2| Event 24	STRUCT	6	Refer to Section 4.3.7	Get Access only
588	SDN 2| Event 25	STRUCT	6	Refer to Section 4.3.7	Get Access only
589	SDN 2| Event 26	STRUCT	6	Refer to Section 4.3.7	Get Access only
590	SDN 2| Event 27	STRUCT	6	Refer to Section 4.3.7	Get Access only
591	SDN 2| Event 28	STRUCT	6	Refer to Section 4.3.7	Get Access only
592	SDN 2| Event 29	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
593	SDN 2| Event 30	STRUCT	6	Refer to Section 4.3.7	Get Access only
594	SDN 2| Event 31	STRUCT	6	Refer to Section 4.3.7	Get Access only
595	SDN 2| Event 32	STRUCT	6	Refer to Section 4.3.7	Get Access only
596	SDN 2| Event 33	STRUCT	6	Refer to Section 4.3.7	Get Access only
597	SDN 2| Event 34	STRUCT	6	Refer to Section 4.3.7	Get Access only
598	SDN 2| Event 35	STRUCT	6	Refer to Section 4.3.7	Get Access only
599	SDN 2| Event 36	STRUCT	6	Refer to Section 4.3.7	Get Access only
600	SDN 2| Event 37	STRUCT	6	Refer to Section 4.3.7	Get Access only
601	SDN 2| Event 38	STRUCT	6	Refer to Section 4.3.7	Get Access only
602	SDN 2| Event 39	STRUCT	6	Refer to Section 4.3.7	Get Access only
603	SDN 2| Event 40	STRUCT	6	Refer to Section 4.3.7	Get Access only
604	SDN 2| Event 41	STRUCT	6	Refer to Section 4.3.7	Get Access only
605	SDN 2| Event 42	STRUCT	6	Refer to Section 4.3.7	Get Access only
606	SDN 2| Event 43	STRUCT	6	Refer to Section 4.3.7	Get Access only
607	SDN 2| Event 44	STRUCT	6	Refer to Section 4.3.7	Get Access only
608	SDN 2| Event 45	STRUCT	6	Refer to Section 4.3.7	Get Access only
609	SDN 2| Event 46	STRUCT	6	Refer to Section 4.3.7	Get Access only
610	SDN 2| Event 47	STRUCT	6	Refer to Section 4.3.7	Get Access only
611	SDN 2| Event 48	STRUCT	6	Refer to Section 4.3.7	Get Access only
612	SDN 2| Event 49	STRUCT	6	Refer to Section 4.3.7	Get Access only
613	SDN 2| Event 50	STRUCT	6	Refer to Section 4.3.7	Get Access only

ADI Inst. #	Parameter	Data Type	Size	Units	Service
614	SDN 2| Event 51	STRUCT	6	Refer to Section 4.3.7	Get Access only
615	SDN 2| Event 52	STRUCT	6	Refer to Section 4.3.7	Get Access only
616	SDN 2| Event 53	STRUCT	6	Refer to Section 4.3.7	Get Access only
617	SDN 2| Event 54	STRUCT	6	Refer to Section 4.3.7	Get Access only
618	SDN 2| Event 55	STRUCT	6	Refer to Section 4.3.7	Get Access only
619	SDN 2| Event 56	STRUCT	6	Refer to Section 4.3.7	Get Access only
620	SDN 2| Event 57	STRUCT	6	Refer to Section 4.3.7	Get Access only
621	SDN 2| Event 58	STRUCT	6	Refer to Section 4.3.7	Get Access only
622	SDN 2| Event 59	STRUCT	6	Refer to Section 4.3.7	Get Access only
623	SDN 2| Event 60	STRUCT	6	Refer to Section 4.3.7	Get Access only
624	SDN 2| Event 61	STRUCT	6	Refer to Section 4.3.7	Get Access only
625	SDN 2| Event 62	STRUCT	6	Refer to Section 4.3.7	Get Access only
626	SDN 2| Event 63	STRUCT	6	Refer to Section 4.3.7	Get Access only
627	SDN 2| Event 64	STRUCT	6	Refer to Section 4.3.7	Get Access only

4.3.3 SCM LED STATUS DETAIL

Module	Network	Decimal Value	Hex Value
OFF	OFF	0	00
OFF	GREEN	1	01
OFF	RED	2	02
GREEN	OFF	4	04
GREEN	GREEN	5	05
GREEN	RED	6	06
RED	OFF	8	08
RED	GREEN	9	09
RED	RED	10	0A

4.3.4 POWER SUPPLY LED STATUS DETAIL

Power Supply LED Indicator	Meaning	Decimal Value	Hex Value
Green Steady	Normal Operation	1	01
Green Blinking	Heavy Load	9	09
Green Blinking, Red Blinking (alternating)	Power Boost	10	0A
RED Blinking	Short Circuit	4	04
Red Steady	Overtemperature Protection	2	02
Off	No DC Output	0	00

4.3.5 POWER SUPPLY EVENT FLAGS DETAIL

	Bit Value							
Byte [1]	15	14	13	12	11	10	9	8
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte [2]	7	6	5	4	3	2	1	0
	Power Down	Over Temperature Protection	Reserved	Power Boost	Over Voltage Protection	Reserved	Short-Circuit Protection	Over Current Protection

4.3.6 USER ALARM EVENT FLAGS DETAIL

Bit	31	30	29	28	27	26	25	24
Value	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Bit	23	22	21	20	19	18	17	16
Value	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Bit	15	14	13	12	11	10	9	8
Value	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Bit	7	6	5	4	3	2	1	0
Value	Reserved	Reserved	Reserved	Reserved	Power Supply Temperature High	Output Current Hight	Reserved	Reserved

4.3.7 EVENT DATA STRUCTURE DETAIL

ADI	Event Data					
	STRUCT [6]					
ADI Inst	Byte [5]	Byte [4]	Byte [3]	Byte [2]	Byte [1]	Byte [0]
500-563	P1 | Event timestamp[N]				P1 | Event Start[N]	P1 | Event Code[N]
564-627	P2 | Event timestamp[N]				P2 | Event Start[N]	P2 | Event Code[N]

4.3.7.1 EVENT CODE DEFINITION

Byte [0]	Event Code
0x08	SCP
0x09	Reserved
0x0A	OVP
0x0B	Power Boost
0x0F	OTP
0xFF	No Event

4.3.7.2 EVENT START DEFINITION

Byte[1]	Event Start
0	End
1	Start
1	No Event (pls. refer also to Event Code)

4.3.7.3 EVENT TIMESTAMP DEFINITION

Timestamp Definition (Little Endian format)				Conversion	
Byte [2]	Byte [3]	Byte [4]	Byte [5]	Hex	Dec (seconds)
0xC8	0x89	0x00	0x00	0x000089C8	35,272

5. ROCKWELL SOFTWARE PACKAGE

A software package (PLC program) is available that streamlines the engineering time it takes to access the data and quickly utilize for advanced monitoring scenarios. The software includes:

- Routines containing an example setup consisting of four message instructions
- UDT accessible from an HMI containing alarms, status of the SCM, and other info
- A list of alarm texts that correspond to different alarms
- Example HMI program to demonstrate PLC code functionality

The Rockwell Software Package can be downloaded from the following location:

https://www.appleton.emerson.com/catalog/en-us/shop/appleton/solahd-sdn-d

at the DOCUMENTS & DRAWINGS tab under SOFTWARE DOWNLOADS & DRIVERS.

5.1 ETHERNET IP LINK INITIALIZATION AND MONITORING

The PLC program will automatically read class 3 data upon entering run mode.

The PLC program will monitor communication link and attempt to reestablish if lost.

The PLC program will provide a status message representing the current status of the link. If the communication status has been lost, it will trigger an alarm in the HMI UDT.

The PLC program will also monitor the On Time values from each of the power supplies. If the time fails to increment, this means the power supply has lost communication and the PLC will trigger a corresponding alarm.

5.2 ALARMS (HMI MESSAGE PROVISIONING)

The PLC program will send, monitor, and evaluate alarm and warning conditions from different sources including the SCM and internal calculations. It will set an appropriate status and write alarm values in the HMI UDT. An additional text list will associate these alarm values with an alarm text that can be displayed on an HMI screen. Specific alarm and warning conditions are explained in other sections.

5.3 MESSAGES

There will be four message instructions in the example routine that will interface with the SCM and PLC program.

5.3.1 MESSAGE GROUP 1: MSG_HARDWARE_PARAMETERS_INITIAL_READ

Upon initialization of communication link, the PLC will read the following class 3 data from the SCM and write to the HMI UDT:

- SCM Part Number
- SCM Serial Number
- SCM Manufacturer Lot Code
- SCM Manufacturer Name
- SCM Model Revision
- SCM Firmware Revision
- PS 1 & 2 Product Name
- PS 1 & 2 Serial Number
- PS 1 & 2 Manufacturer Lot Code
- PS 1 & 2 Manufacturer Name
- PS 1 & 2 Model Revision
- PS 1 & 2 Primary Revision
- PS 1 & 2 Secondary Revision
- PS 1 & 2 Input Voltage Type (AC or DC)

5.3.2 MESSAGE GROUP 2: MSG_PERIODIC_READ

The PLC program will read the following class 3 data from the SCM every 3 seconds and write to the UDT_Emerson_SCM_HMI:

- PS 1 & 2 Count for DC ON Cycles
- PS 1 & 2 Count for Output Short Circuit Protection
- PS 1 & 2 Count for Output Over-Voltage Protection
- PS 1 & 2 Count for Power Boost
- PS 1 & 2 Count for Input Power Applied
- PS 1 & 2 Count for Over-Temperature Protection
- PS 1 & 2 Output Voltage, Maximum Value
- PS 1 & 2 Output Current, Maximum Value
- PS 1 & 2 Input Voltage, Maximum Value
- PS 1 & 2 Temperature, Maximum Value
- PS 1 & 2 Temperature, Minimum Value

5.3.3 MESSAGE GROUP 3: MSG_EVENT_FLAG_READ

Upon trigger of an event flag, the PLC will read the following event codes, event types, and event timestamps and write the status to the UDT_Emerson_SCM_HMI. The PLC will also set the corresponding alarm UDT:

- PS 1 & 2 Event 0 Code
- PS 1 & 2 Event 0 Type
- PS 1 & 2 Event 0 Timestamp
- PS 1 & 2 Event 1 Code
- PS 1 & 2 Event 1 Type
- PS 1 & 2 Event 1 Timestamp
- PS 1 & 2 Event 2 Code
- PS 1 & 2 Event 2 Type
- PS 1 & 2 Event 2 Timestamp

5.3.4 MESSAGE GROUP 4: MSG_USER_PARAMETER_WRITE

The user will have the ability to enter the following data. Upon change of value in the UDT_Emerson_SCM_HMI, the PLC will write the following class 3 data to the SCM upon input change:

- PS 1 & 2 User Alarm Limit: Output Current High
- PS 1 & 2 User Alarm Limit: Temperature High
- PS 1 & 2 User Alarm Limit: Alarm Flag Enable

The PLC program will monitor the alarm flags from the SCM as class 1 data. If the alarms are triggered, the PLC will set corresponding alarms in the PLC.

6. ADVANCED MONITORING SCENARIOS

6.1 STATISTICS CALCULATION AND MONITORING

The PLC program will periodically obtain and store output current and internal temperature data in a rolling buffer. It will store the past hourly averages for 25 hours on a rolling basis.

If the present average of output current or temperature has increased by more than 10% from previous averages, the PLC will set an alarm to notify the user.

6.2 POWER SUPPLY MONITORING MODES

The PLC program will be configured to allow for two different operating modes based on the power supply setup. The two different configurations are redundant power supply monitoring mode and increased power supply monitoring mode and can be configured on the PLC.

Both modes will provide an early threshold warning and a critical threshold alarm. The thresholds will be configurable by the user.

6.2.1 REDUNDANT POWER SUPPLY MONITORING

The PLC will monitor the sum of the output currents and provide an alarm when the sum of the output currents is greater than the allowable output on a single power supply. The early warning and critical warning thresholds can be set by the operator.

6.2.2 INCREASED POWER SUPPLY MONITORING

Increased Power Supply Monitoring – the PLC will monitor the sum of the output current and provide an alarm when the sum of the output currents reaches configurable limits. The early warning and critical warning thresholds can be set by the operator.

6.3 LOAD SHARING MONITORING

When the two supplies are connected in parallel operation, the PLC program will monitor the output currents and set an alarm when the ratio of the currents is greater than 60/40.

6.4 TOTAL USE-TIME MONITORING

The PLC program will allow the user to enter early warning and critical warning total-on-time thresholds.

The PLC will monitor the total use-times of the power supplies and set a warning condition when the use-time reaches the early warning threshold as well as an alarm when it reaches the critical warning threshold.

6.5 CONTROLLER TAGS

The PLC project will have the following tags and UDT instances defined this. These will need to be instantiated for every SCM configured in the project, so for every additional SCM another set of following controller tags will need to be created. The UDT contents and definitions are defined in **Section 6.6**.

- **Ethernet IP Module Tags** – A series of tags created automatically based on the hardware configuration. These tags will include all the raw class 1 data from the SCM.
- **AOI_SCM_Interface** – A single instance of the AOI datatype for use with the AOI call. Each SCM would require another instance tag.
- **SCM_HMI** – A single instance of the UDT_Emerson_SCM_HMI that will be accessible to the HMI. Every subsequent SCM would require another instance.
- **MSG_Hardware_Parameters_Initial_Read** – A message instruction to initially read hardware parameters from SCM.
- **MSG_Periodic_Read** – A message instruction to periodically read counters and user-configured parameters from the SCM.
- **MSG_Event_Flag_Read** – A message instruction to read event data when an event flag is received.
- **MSG_User_Parameter_Write** – A message instruction to write user-configurated value to the SCM.
- **SCM_Control_Data** – A single instance of the UDT_Emerson_SCM_Control_Data consisting of a series of integer arrays that acts as an intermediary between the message instructions and the AOI_SCM_Interface.
- **MSGs** – A message instance tag will need to be created for each parameter that is read through class 1 messaging.

6.6 HMI TAGS

6.6.1 SCM1_HMI

Element Name	Type	Attribute Number	Description
PS1	Section 6.6.2	-	Contains product information, present status, event counters, and user-configured parameters for PS1
PS2	Section 6.6.2	-	Contains product information, present status, event counters, and user-configured parameters for PS2
Alarms	Section 6.6.3	-	Contains event flags and alarm status for PS1, PS2, and the SCM
sSCM_PartNumber	String	1	SCM part number
sSCM_Serial_Number	String	2	SCM serial number
sSCM_Manf_Lot_Code	String	3	SCM manufacturer lot code
sSCM_Manf_Name	String	4	SCM manufacturer name
sSCM_Model_Revision	String	5	SCM model revision
sSCM_Firmware_ Revision	String	6	SCM firmware revision
iSCM_Module_LED_ Status	Integer	8	SCM Module LED Status [Bit3-2]
iSCM_Network_LED_ Status	Integer	8	SCM Network LED Status [Bit1-0]
rSCM_Ambient_Temp	Real	10	Ambient temperature in degrees Celsius
iSCM_Configuration	Int	-	User input representing configuration of power supplies 0 = no redundancy mode selected 1 = redundant supply mode 2 = increased power mode
rTotal_Current_ Warning_Limit	Real	-	User input for total current early warning limit. This value will be compared to the sum of the PS1's and PS2's output current
rTotal_Current_Critical_ Alarm_Limit	Real	-	User input for the total current critical alarm limit. This value will be compared to the sum of the PS1's and PS2's output current
rTime_On_Warning_ Limit	Real	-	User input for the time-on early warning alarm limit (in hours)
rTime_On_Critical_ Alarm_Limit	Real	-	User input for the time-on critical alarm limit (in hours)

Element Name	Type	Attribute Number	Description
rTotal_Output_Current	Real	-	Total output current of PS1 and PS2
bcfgPS1_User_Alarm_EN	Bool	402	User input for Enable/disable of user-configured alarms for PS1
bcfgPS2_User_Alarm_EN	Bool	403	User input for Enable/disable of user-configured alarms for PS2
bPS1_User_Alarm_EN	Bool	402	Enable/disable status for user-configured alarms
bPS2_User_Alarm_EN	Bool	403	Enable/disable status for user-configured alarms
PS1_High_Temp_Limit	Section 6.6.4	300	Current value and User input for high temperature limit in degrees Celsius
PS2_High_Temp_Limit	Section 6.6.4	301	Current value and User input for high temperature limit in degrees Celsius
PS1_High_Current_Limit	Section 6.6.4	316	Current value and User input for high current limit in amps
PS2_High_Current_Limit	Section 6.6.4	317	Current Value and User input for high current limit in amps

6.6.2 PS1 (AND PS2)

Element Name	Type	Attribute Number	Description
sProduct_Name	String	101 / 201	PS product name
sSerial_Number	String	102 / 202	PS serial number
sManf_Lot_Code	String	103 / 203	PS manufacturer lot code
sManf_Name	String	104 / 204	PS manufacturer name
sModel_Revision	String	105 / 205	PS model revision number
sPrimary_Revision	String	106 / 206	PS primary revision number
sSecondary_Revision	String	107 / 207	PS secondary revision number
bInput_Voltage_Type	Bool	116 / 216	PS input voltage type. 0 = AC 1 = DC
iDC_On_Cycles_Count	Int	117 / 217	Total number of PS DC “ON” cycles
iShort_Circuit_Count	Int	118 / 218	Total number of PS output short circuit protection events
iOver_Voltage_Count	Int	120 / 220	Total number of PS output Over-Voltage protection events
iPower_Boost_Count	Int	121 / 221	Total number of PS Power Boost events

Element Name	Type	Attribute Number	Description
iInput_Power_Applied_Count	Int	122 / 222	Total number of times input power applied to PS
iOver_Temp_Count	Int	123 / 223	Total count of PS over-temperature events
rMax_Output_Voltage	Real	125 / 225	Maximum output voltage in Volts
rMax_Output_Current	Real	126 / 226	Maximum output current in Amps
rMax_Input_Voltage	Real	127 / 227	Maximum input voltage in Volts
rMax_Temperature	Real	128 / 228	Maximum operating temperature in degrees Celsius
rOutput_Voltage	Real	108 / 208	Present output voltage in Volts
rOutput_Current	Real	109 / 209	Present output current in Amps
rInput_Voltage	Real	110 / 210	Present input voltage in Volts
rInternal_Temperature	Real	111 / 211	Present internal temperature in degrees Celsius
iLED_Status	Int	112 / 212	Integer value representing the status of the LED 0 = Off (No DC Output) 1 = Steady Green (Normal Operation) 2 = Steady Red (Overtemp Protection) 4 = Blinking Red (Short Circuit) 9 = Blinking Green (Heavy Load) 10 = Blinking Green/Red (Power Boost)
rPresent_OnTime	Real	114 / 214	Time in hours since last power cycle
rTotal_OnTime	Real	115 / 215	Total lifetime operating time in hours
Event_Data[0]	Section 6.6.5	500 / 564	Event N Data (Refer to Section 4.3.7.1)
Event_Data[1]	Section 6.6.5	501 / 565	Event N-1 Data (Refer to Section 4.3.7.1)
Event_Data[2]	Section 6.6.5	502 / 566	Event N-2 Data (Refer to Section 4.3.7.1)
iCurrent_Capacity	Int	-	Current Rating (for internal use)

6.6.3 ALARMS

Element Name	Type	Description
iPS1_Event_Flag	Int	Event flag PS 1
iPS2_Event_Flag	Int	Event flag PS 2
bPS1_Temp_Alarm	Bool	Over-temperature alarm PS 1
bPS2_Temp_Alarm	Bool	Over-temperature alarm PS 2
bPS1_Current_Alarm	Bool	Over-current alarm PS 1
bPS2_Current_Alarm	Bool	Over-current alarm PS 2

Element Name	Type	Description
bSCM_Total_Current_Warning	Bool	Either the warning limit for combined current or single supply current has been reached; depends on whether the SCM is configured for redundant or increased power mode
bSCM_Total_Current_Critical	Bool	Either the critical limit for combined current or single supply current has been reached; depends on whether the SCM is configured for redundant or increased power mode
bPS1_Total_OnTime_Warning	Bool	The warning limit for total on-time has been reached
bPS1_Total_OnTime_Critical	Bool	The critical limit for total on-time has been reached
bPS1_Current_Trend_Alarm	Bool	Alarm when hourly average load has changed by 10% or more in the last 24 hours
bPS1_Temp_Trend_Alarm	Bool	Alarm when hourly average internal temperature has changed by 10% or more in the last 24 hours
bPS2_Total_OnTime_Warning	Bool	The warning limit for total on-time has been reached
bPS2_Total_OnTime_Critical	Bool	The critical limit for total on-time has been reached
bPS2_Current_Trend_Alarm	Bool	Alarm when hourly average load has changed by 10% or more in the last 24 hours
bPS2_Temp_Trend_Alarm	Bool	Alarm when hourly average internal temperature has changed by 10% or more in the last 24 hours
bSCM_Comm_Failure	Bool	Alarm when PLC loses communication to the SCM
bSCM_Current_Ratio_Alarm	Bool	Alarm when the PS1/PS2 output current ratio is worse than 60/40

6.6.4 USER ALARM PARAMETERS

This contains the control structure needed to read and write user parameters to the SCM.

Element Name	Type	Description
rInput_Value	Real	User supplied input value.
rStatus_Value	Real	Current parameter value on the SCM
bWrite_Parameter	Bool	Set this value to write current parameter to the SCM

6.6.5 EVENT DATA

This contains the structure for the event data from the power supplies.

Element Name	Type	Description
iEvent_Code	Int	Event Code
bEvent_Start_Stop	Bool	Event Start/Stop
rEvent_Timestamp	Real	Event Timestamp

7. TROUBLESHOOTING AND TECH SUPPORT

7.1 TROUBLESHOOTING

Problem	Possible Cause	Solution
Module and Network LED indicators are off.	Loose connection. The I2C cable connecting SCM-E-EIP to the power supply isn't connected properly.	Check the connection between SCM-E-EIP and the power supply. Make sure that the cables are inserted to their corresponding headers properly.
	No power connection. Problems with connected SDN-D power supply.	Check SDN-D status LED, wiring, and input power for proper operation.
Module LED indicator is blinking green, but Network LED is OFF.	The SCM-E-EIP is in DHCP Configuration but there is no DHCP server present in the network .	Disable the SCM-E-EIP Enable DHCP Enable Configuration if applicable.
	The SCM-E-EIP is in DHCP Configuration and there is DHCP server present in the network.	Check if the network cable is correct and check for loose connection or break in continuity in the cable. Verify if the SCM-E-EIP's MAC address shows in the DHCP application and check if the SCM-E-EIP is registered in the DHCP.
	Static IP Address has not been configured or is not properly configured.	The configured static IP Address does not belong to the network subnet. Check the SCM-E-EIP IP Address and Subnet Mask and correct. Refer to Section 2.1.2.
Module LED indicator is steady red.	Major Unrecoverable Fault.	Contact technical support.
Module LED indicator is blinking red.	One of the PSUs connected to the SCM-E-EIP encountered a major recoverable fault.	Check the status of the SDN-D power supplies connected to the SCM and correct any issues.

Problem	Possible Cause	Solution
IO Fault or Messaging Error on PLC; Network LED indicator is blinking red.	The Implicit Messaging Connection (Class 1) between SCM and PLC has timed out.	Check the configuration on the PLC to ensure that the correct EDS file is used, the IP address is correct, and the network connection with the SCM is good. Verify that there are not multiple Class 1 connections.
Network error; Network LED indicator is steady red.	The SCM-E-EIP has a duplicate IP Address within the network.	Disconnect the SCM-E-EIP from the network. Connect to a Private LAN and reconfigure the IP Address.
Unable to load GUI; Network LED indicator is blinking or steady green.	The browser application or the PC network connection might have encountered an error.	Verify correct IP address, restart the browser and check if the GUI will show up. Restart the PC if the problem persists.
	The SCM-E-EIP might have entered a hang up state or the internal filesystem has been damaged or corrupted.	Restart the SCM-E-EIP. If problem persists, contact technical support.
The GUI logo and format is not Emerson.	The SCM-E-EIP internal filesystem has been damaged or corrupted	Contact technical support.
The SDN-D Power Supply data does not show up on the GUI or on the PLC.	SDN-D Power Supply and/or SCM-E-EIP might be in a fault state.	Restart the affected SDN-D Power supply. If problem persists, restart the SCM-E-EIP. If problem persists, contact technical support.

The information in this manual is provided as a guide for installation, operation, and maintenance. It does not affect or exceed our obligations under the Terms and Conditions of Sale.

Note that unit specifications are subject to change without notice.

TECHNICAL SUPPORT

Website: **www.solahd.com**

Technical Support E-Mail: **solahd.technicalservices@emerson.com**

Toll-Free: (800) 377-4384

USA: (847) 268-6651

WARRANTY

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