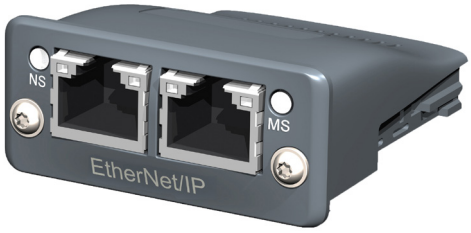
EMERSON

Uninterruptible Power Systems Instruction Manual

SDU AC - B SERIES COMM CARDS



Active Card

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1.0 Introduction

The new SDU AC - B Series UPS has added capability to communicate to systems or networks through modular COMM CARDS.

1.1 Active Cards

Plug-in modules that provide the SDU AC - B Series UPS network flexibility and a modular solution. It is especially suitable for both general purpose and for high-end applications with large I/O data transfer, fast network cycles and synchronization demands. Utilizing a common Ethernet module that allows your chosen Ethernet protocol in a specific communications module to be chosen for your application.

1.1.1 SDUENETIPCARD

The COMM CARD for EtherNet/IP™ is a complete module which enables your products to communicate on an EtherNet/IP™ network. The module supports fast communication speeds, making it suitable for high-end industrial devices. The EtherNet/IP™ SDUENETIPCARD has been tested and approved for conformance by the ODVA. More information about EtherNet/IP™ and the ODVA can be obtained from the following website: www.odva.org.

1.1.2 Other Industrial Protocols

Modules that support fast Industrial Internet communication speeds with other networks are being developed.

Contact your SolaHD representative for availability.

SDUMBUSCARD - Modbus TCP 2-port, COMM CARD which enables your products to communicate on a Modbus TCP network

SDUPNETCARD - Profinet IRT 2-port, COMM CARD which enables your products to communicate on a Profinet network

SDUECATCARD - EtherCAT 2-port, COMM CARD which enables your products to communicate on an EtherCAT network

1.2 Passive Card

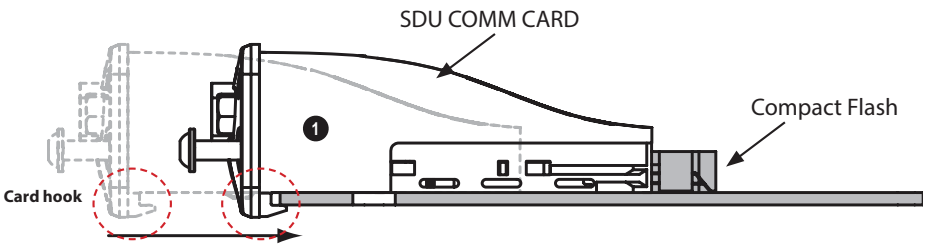
The SDUCFRELAYCARD supports digital I/O processing applications and is equipped with LED diagnostics. The SDUCFRELAYCARD is a communication module used to control two 1-form-c SPDT relays (N.O.). Each relay contact side, N.O., C and N.C., is connected to three pins of an 8-pin push-in connector. An optional external momentary switch can be connected to the remaining two interface pins 7-8 for remote standby mode operation.

The SDUCFRELAYCARD is a Safety Extra Low Voltage (SELV) circuit and acts as an interface between the UPS and the end user system.

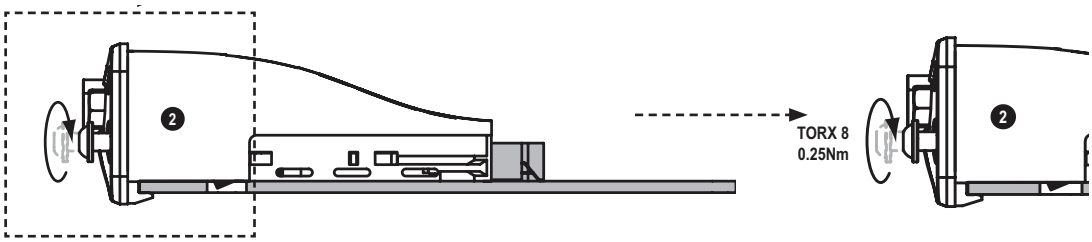
2.0 Installation

Only qualified personnel should install or service the card. Electrical safety precautions must be followed when installing or servicing the SDUCFRELAYCARD. To prevent risk of electric shock, turn OFF and lock out all power sources to the UPS before making electrical connections.

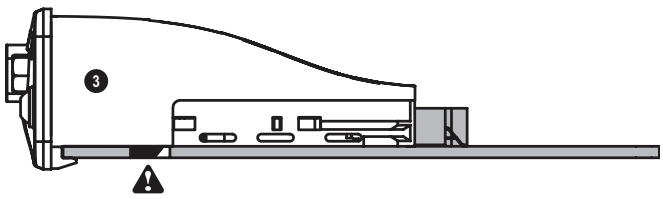
Remove the SDUCOMMCVR (COMM PORT COVER) from the UPS then slide the SDUCFRELAYCARD into the slot.
For proper COMM CARD installation instructions, please refer to the SolaHD YouTube video: https://youtu.be/1wYElxdjL50.
Note: This video shows the A series COMM CARD installation. The procedure is the same for the B series.



1) When securing the module into the SDU, ensure the card module is properly aligned into the Compact Flash socket inside the UPS prior to applying any force. The card hook should be aligned with the PCB.

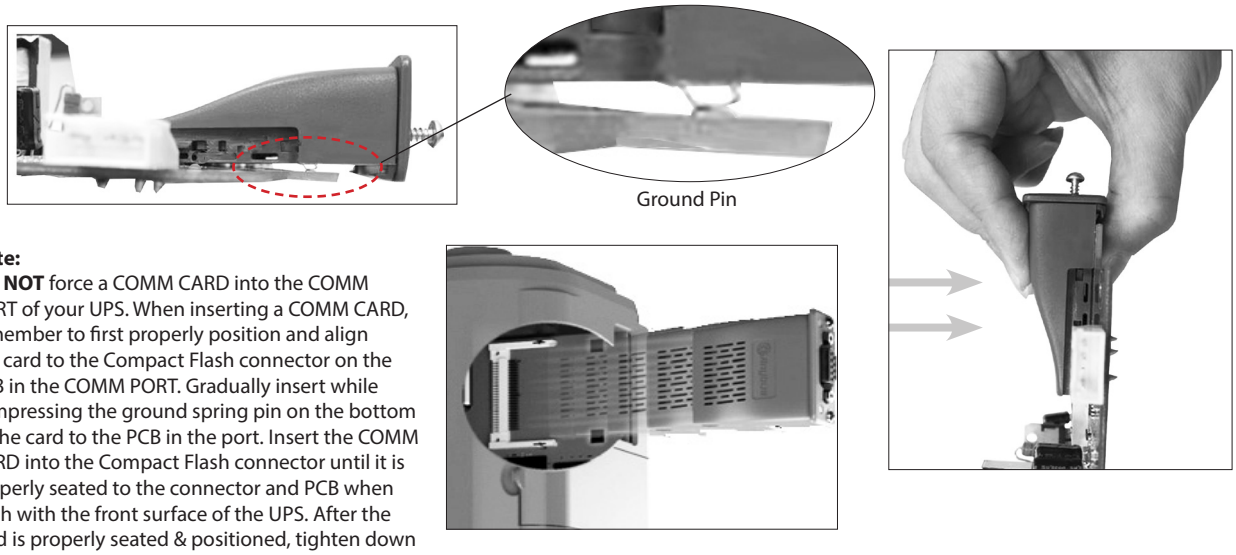


2) Turn the screws clockwise until flush. DO NOT OVER TORQUE. Recommended screw tightening torque is 0.25 N.m (0.18 lb.ft).



3) As the screws tighten, a fastening mechanism will lock on the PCB.

Figure1: Installing Communication Card to UPS



Note:
DO NOT force a COMM CARD into the COMM PORT of your UPS. When inserting a COMM CARD, remember to first properly position and align the card to the Compact Flash connector on the PCB in the COMM PORT. Gradually insert while compressing the ground spring pin on the bottom of the card to the PCB in the port. Insert the COMM CARD into the Compact Flash connector until it is properly seated to the connector and PCB when flush with the front surface of the UPS. After the card is properly seated & positioned, tighten down the card screws to properly secure the card.

Figure 2: Installing Communication Card to UPS; Special Instruction

3.0 System Features and General Description

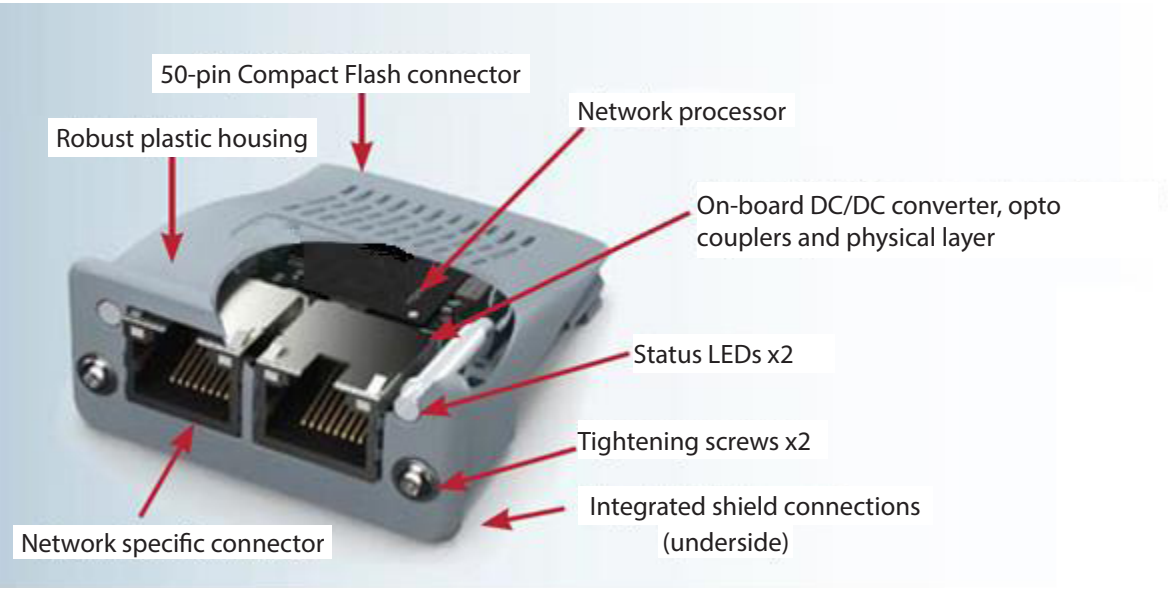
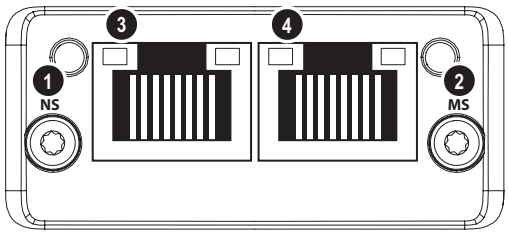


Figure 3: SDUENETIPCARD Construction

#	Item	Connector	
1	Network Status LED	Ethernet, RJ45	
2	Model Status LED		
3	Link/Activity LED (port 1)		
4	Link/Activity LED (port 2)		

Test sequences are performed on the Network and Module Status LEDs during startup.

Figure 4 : Front View - SDUENETIPCARD Details

LED State	Description
Network Status LED	
Off	No power or no IP address
Green	Online, one or more connections established (CIP Class 1 or 3)
Green, flashing	Online, no connections established
Red	Duplicate IP address, FATAL error
Red, flashing	One or more connections timed out (CIP Class 1 or 3)
Module Status LED	
Off	No power
Green	Controlled by a Scanner in Run state
Green, flashing	Not configured, or Scanner in Idle state
Red	Major fault (EXCEPTION-state, FATAL error etc.)
Red, flashing	Recoverable fault(s). Module is configured, but stored parameters differ from currently used parameters.
LINK/Activity LED 3/4	
Off	No link, no activity
Green	Link (100 Mbit/s) established
Green, flickering	Activity (100 Mbit/s)
Yellow	Link (10 Mbit/s) established
Yellow, flickering	Activity (10 Mbit/s)

Table 1: LED Status for SDUENETIPCARD

#	Item
1	RUN LED
2	ERROR LED
3	EtherCAT (IN port)
4	EtherCAT (OUT port)
5	Link/Activity (IN port)
6	Link/Activity (OUT port)

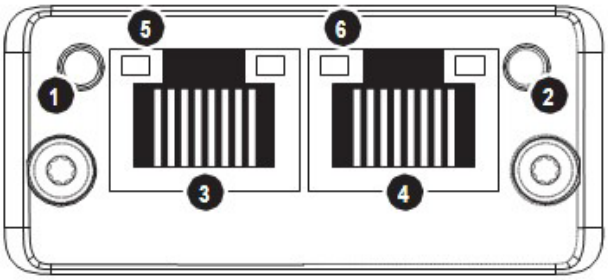


Figure 5 : Front View - SDUECATCARD Details

LED State	Indication	Description
RUN LED		
Off	INIT	EtherCAT device in 'INIT'-state (or no power)
Green	OPERATIONAL	EtherCAT device in 'OPERATIONAL'-state
Green, blinking	PRE-OPERATIONAL	EtherCAT device in 'PRE-OPERATIONAL'-state
Green, single flash	SAFE-OPERATIONAL	EtherCAT device in 'SAFE-OPERATIONAL'-state
Flickering	BOOT	The EtherCAT device is in 'BOOT ' state
Red	(Fatal Event)	If RUN and ERR turn red, this indicates a fatal event, forcing the bus interface to a physically passive state. Contact HMS technical support
ERR LED		
Off	No error	No error (or no power)
Red, blinking	Invalid configuration	State change received from master is not possible due to invalid register or object settings.
Red, single flash	Unsolicited state change	Slave device application has changed the EtherCAT state autonomously.
Red, double flash	Sync Manager watchdog timeout	Watchdog Functionality.
Red	Application controller failure	If RUN and ERR turn red, this indicates a fatal event, forcing the bus interface to a physically passive state.
Flickering	Booting error detected	E.g. due to firmware download failure.
LINK/Activity LED		
Off	No link	Link not sensed (or no power)
Green	Link sensed, no activity	Link sensed, no traffic detected
Green, flickering	Link sensed, activity	Link sensed, traffic detected

Table 2. LED Status for SDUECATCARD

Pin #	Signal	Notes
1	Tx+	-
2	Tx-	-
3	Rx+	-
4	-	Normally left unused; to ensure signal integrity, these pins are tied together and terminated to PE via a filter circuit in the module.
5	-	
6	Rx-	-
7	-	Normally left unused; to ensure signal integrity, these pins are tied together and terminated to PE via a filter circuit in the module.
8	-	

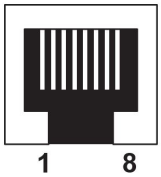
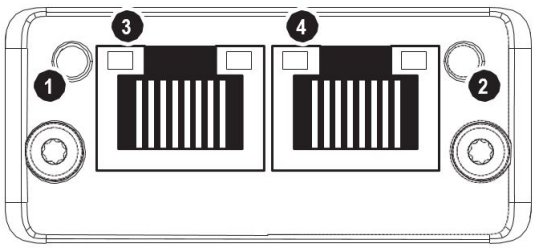


Table 3. Ethernet Interface (RJ45 Connectors) for SDUECATCARD

#	Item	Connector
1	Network Status LED	Ethernet, 45
2	Module Status LED	
3	Link/Activity LED (port 1)	
4	Link/Activity LED (port 2)	



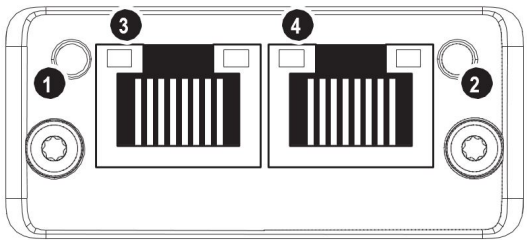
Test sequences are performed on the Network and Module Status LEDs during startup.

Figure 6: Front View - SDUMBUSCARD Details

LED State	Descruotuib
Network Status LED	
Off	No IP address or in state EXCEPTION
Green	At least one Modbus message received
Green, flashing	Waiting for first Modbus message
Red	IP address conflict detected, FATAL ERROR
Red, flashing	Connection timeout. No Modbus message has been received within the configured "process active timeout" time
Module Status LED	
Off	No power
Green	Normal operation
Red	Major fault, FATAL
Red, flashing	Minor fault
Alternating red/green	Firmware update from file system in progress
LINK/Activity LED 3/4	
Off	No link, no activity
Green	Link (100 Mbit/s) established
Green, flickering	Activity (100 Mbit/s)
Yellow	Link (10 Mbit/s) established
Yellow, flickering	Activity (10 Mbit/s)

Table 4. LED Status for SDUMBUSCARD

#	Item
1	Network Status LED
2	Module Status LED
3	Link/Activity LED (port 1)
4	Link/Activity LED (port 2)



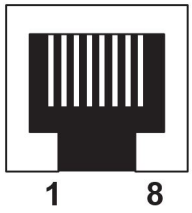
Test sequences are performed on the Network and Module Status LEDs during startup.

Figure 7: Front View - SDUPNETCARD Details

LED State	Description	Comments
Network Status LED		
Off	Offline	No power No connection with IO Controller
Green	Online (RUN)	Connection with IO Controller established IO Controller in RUN state
Green, 1 flash	Online (STOP)	Connection with IO Controller established IO Controller in STOP state or IO data bad IRT synchronization not finished
Green, blinking	Blink	Used by engineering tools to identify the node on the network
Red	Fatal event	Major internal error (this indication is combined with a red module status LED)
Red, 1 flash	Station Name error	Station Name not set
Red, 2 flashes	IP address error	IP address not set
Red, 3 flashes	Configuration error	Expected Identification differs from Real Identification
Module Status LED		
Off	Not Initialized	No power OR Module in SET UP or NW_INIT state.
Green	Normal Operation	Module has shifted from the NW_INIT state.
Green, 1 flash	Diagnostic Event(s)	Diagnostic event(s) present
Red	Exception error	Device in state EXCEPTION.
	Fatal event	Major internal error (this indication is combined with a red network status LED)
Alternating Red/Green	Firmware update	**DO NOT** power off the module. Turning the module off during this phase could cause permanent damage.
LINK/Activity LED		
Off	No Link	No link, no communication present
Green	Link	Ethernet link established, no communication present
Green, flickering	Activity	Ethernet link established, communication present

Table 5. LED Status for SDUPNETCARD

Pin #	Signal
1, 2, 4, 5	Connected to chassis ground over serial RC circuit
3	RD-
6	RD+
7	TD-
8	TD+
Housing	Cable Shield



The Ethernet interface operates at 100 Mbit, full duplex, as required by PROFINET

Table 6. Ethernet Interface (RJ45 Connectors) for SDUPNETCARD

3.1 Identification

Each Protocol has different parameters for identifying the SDU on the network. The following section specifies how the SDU is identified on each network. It is organized by the instance attribute number of the corresponding Host object. The SDU must respond to requests with highlighted values. For default value it will suffice for response with error response - indicated by Respond with Error. For Respond with Error, it is not required to specify type.

Attr #	Name	Datatype Response	Response Value
EtherNet/IP - SDUENETIPCARD (object 0xF8)			
1	Vendor ID (from ODVA)	UINT16	1181
2	Device Type	UINT16	Respond with Error
3	Product Code	UINT16	2
4	Software Revision	Struct of {UIN8, UINT8}	1.03
5	Serial Number	UINT32	Respond with Error
6	Product Name	Array of CHAR	SDU Industrial UPS
EtherCAT - SDUECATCARD (object 0xF5)			
1	Vendor ID (from ET G*)	UINT32	0x00000906
2	Product Code	UINT32	1F4
3	Major Rev	UINT16	1
4	Minor Rev	UINT16	03
5	Serial Number	UINT32	Respond with Error
6	MFG Device Name	Array of CHAR (max 64)	SDU Industrial UPS
PROFINET - SDUPNETCARD (object 0xF6)			
1	Device ID**	UINT16	1F4
2	Vendor ID (from PNO*)**	UINT16	Respond with Error
3	Station Type**	Array of CHAR	SDU Industrial UPS
8	I&M Order**	Array of CHAR	SDU Industrial UPS
9	I&M Serial Number	Array of CHAR	Respond with Error
19	System Description	Array of CHAR	SDU Industrial UPS
Modbus Host (object 0xFA)			
1	Vendor Name	Array of CHAR	SOLA HD
2	Product Code***	Array of CHAR	SDU Industrial UPS
3	Major Minor Rev***	Array of CHAR	1.03
4	Vendor URL	Array of CHAR	www.solaHD.com
5	Product Name	Array of CHAR	SDU Industrial UPS
6	Model Name	Array of CHAR	SDU Industrial UPS
7	User Application Name	Array of CHAR	Respond with Error

** PNO = PROFINET User Organization*
*** Entries must match the information located in the GSDML Device File.*
**** Used IPCONFIG tool.*

Table 7. Network Identifications

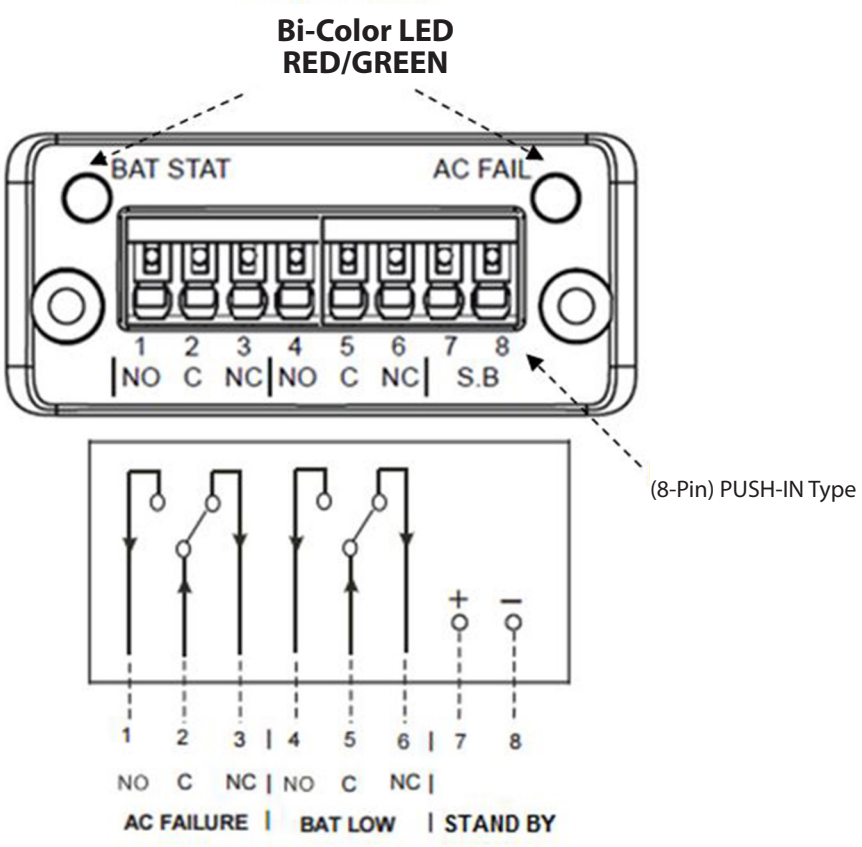


Figure 8: SDUCFRELAYCARD Front Face and Designations

The SDUCFRELAYCARD contains the following:

1. Switching logic through pins 1-6, as a signal for the UPS condition relays.
2. Non-polarized ports, pins 7-8 enable remote signaling and allow the UPS to go on STANDBY mode during BACK-UP MODE only. When in STANDBY MODE, the UPS begins a 3 minute counter (maximum or set by user in UPSMON) that starts once STANDBY MODE is activated by a momentary normally open switch or signal (minimum 1 second) before UPS will enter STANDBY mode.
3. A Bi-Color LED to represent UPS condition.

Condition	Signal State (T-True)				LED Status		Relay Logic			
					AC OK	Battery Status	Connector Relay Pins (x = closed)			
	AC Failure	BAT Low	STANDBY	BAT Fail			Pin 1-2	Pin 2-3	Pin 4-5	Pin 5-6
No Fault					GREEN	GREEN		x		x
UPS at Back-Up Mode	T				RED	GREEN	x			x
Battery is Low	T	T			RED	RED	x		x	
Battery Failure				T	GREEN	RED		x	x	
Standby/Inverter is OFF			T		OFF	OFF		x		x

Table 8. SDUCFRELAYCARD Relay Logic and LED State

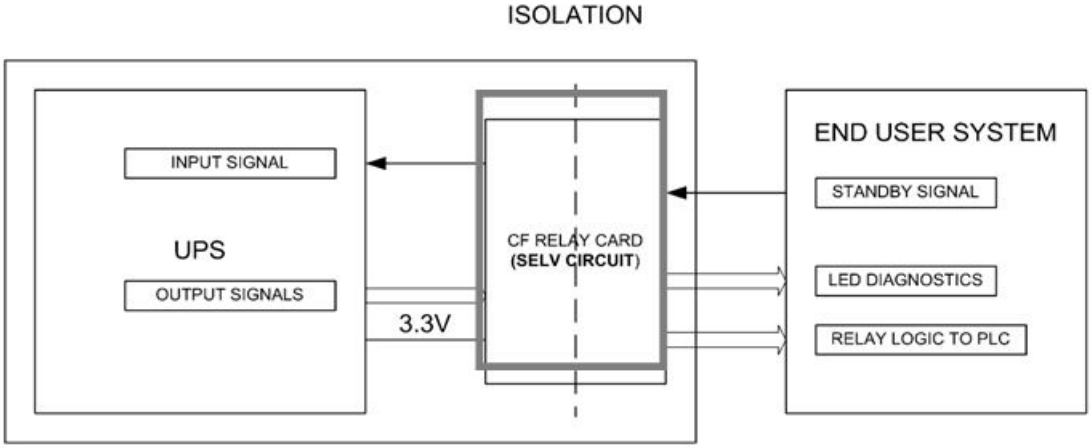


Figure 9: SDUCFRELAYCARD Application Block Diagram

4.0 Interface and Mechanical Description

4.1 SDU COMM CARD Interface to UPS

The UPS COMM PORT is designed with a 50-pin Compact Flash connector as application connector. The UPS offers a host connector, that is designed to simplify the mounting and to meet the demands for a secure and stable connection of the communication modules.

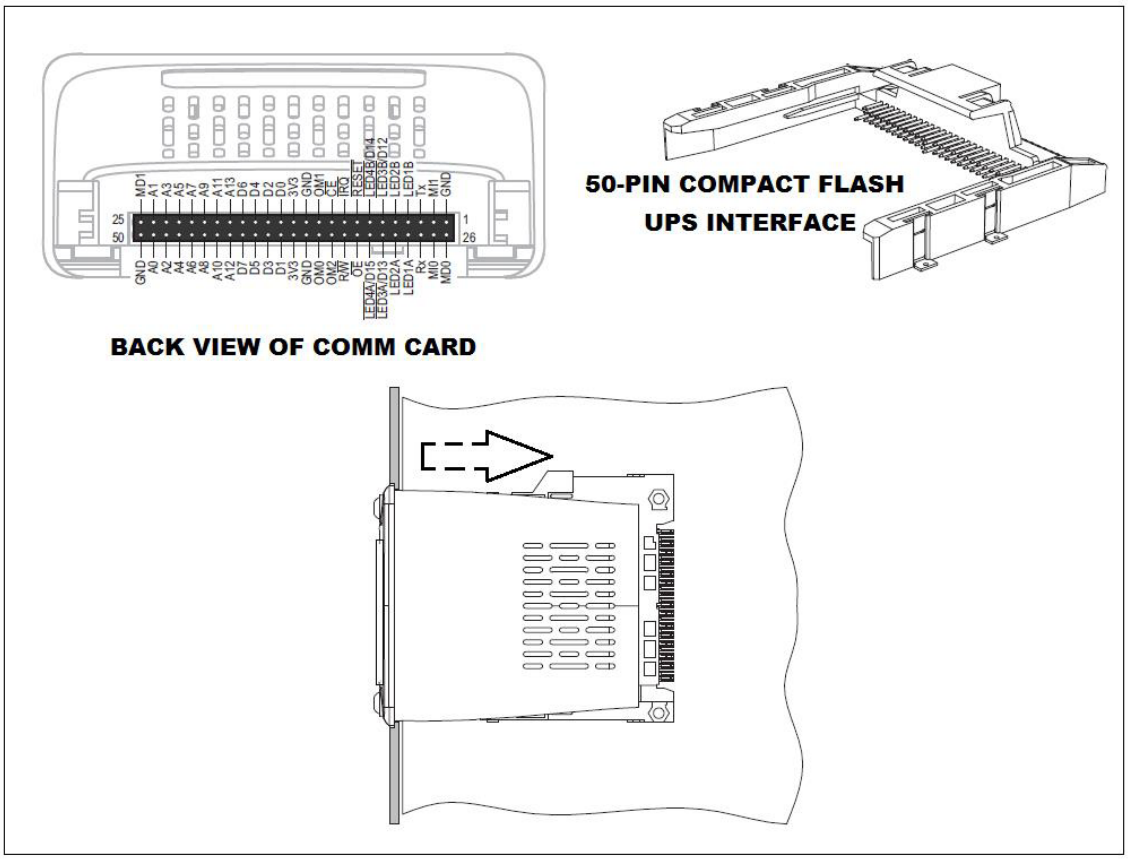


Figure 10: SDU COMM CARD Interface to UPS

NOTICE:

UPS should be turned OFF (powered down) when COMM CARD modules are installed or removed. Failure to observe this practice may cause damage to the UPS or the COMM CARD.

4.2 SDU COMM CARD Interface to End User Network

4.2.1 The SDUENETIPCARD uses 2-port high speed RJ45 connectors for network interface.

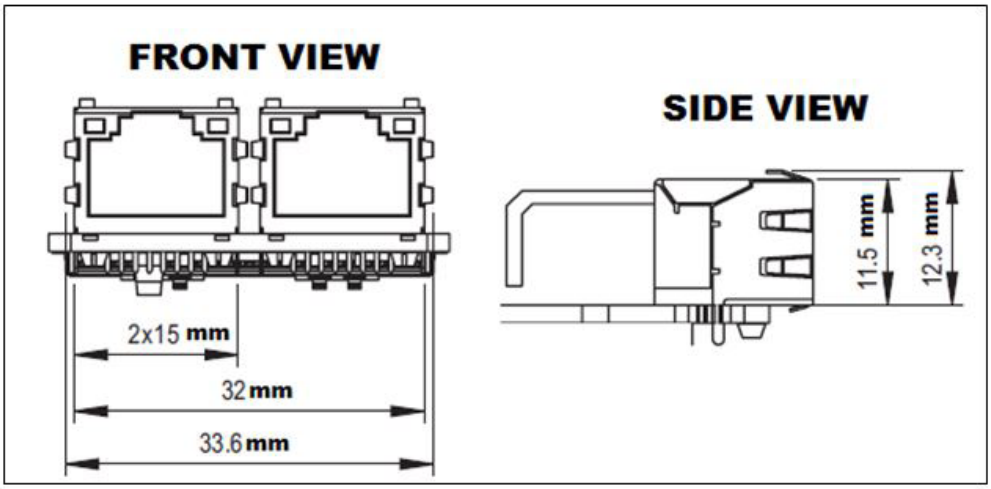


Figure 11: RJ45 Connector For Ethernet Style Card

4.2.2 SDUCFRELAYCARD Interface

The SDUCFRELAYCARD has a 1x8 Push-In style connector. Push the plastic pin and insert the wire into the hole then release to lock it in place. Each terminal position can accommodate 0.2 – 1.5 mm^2 (AWG 24 – AWG 16) wire. The maximum force that should be applied on the connector mechanism is 40 N (9lbs.).

The SDUCFRELAYCARD is designed for Safety Extra Low Voltage (SELV) circuit applications only.

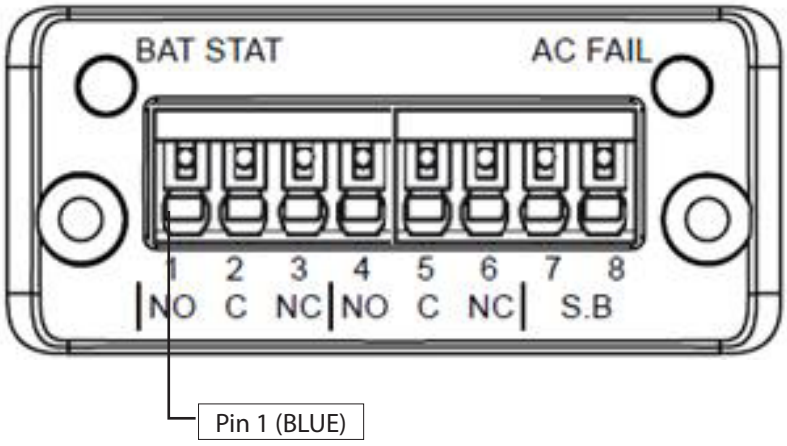


Figure 12: SDUCFRELAYCARD Front Face

PIN CONFIGURATION

Pin #	Designation	Description	Comment
1 (BLUE)	N.O.	Normally Open	AC Failure
2	C	COM	
3	N.C.	Normally Closed	
4	N.O.	Normally Open	Battery Low
5	C	COM	
6	N.C.	Normally Closed	
7	BLANK	Input	Standby (triggered by external N.O. momentary switch)
8	BLANK	Output	

Table 9. SDUCFRELAYCARD PIN Configuration

Pins 1-6: Relay Switch

An SPDT relay is used as switching relay on the Relay Interface. This should be able to break 30VRMS, 42.4VPEAK or 60VDC @ 1A. The maximum current on the relay contact side is 1A limited by the allowable trace width.

The STANDBY input is shown by the schematic. The TX signal going to the UPS is normally HIGH unless the UPS goes to BACK-UP Mode and the STANDBY switch is pressed (minimum of 2 seconds). It requires a momentary, N.O. type switch to be connected on pins 7 and 8. Upon pressing the external switch (or simulating closure of pins 7 and 8 for a minimum of 2 seconds), the UPS will go into STANDBY MODE in approximately 3 minutes. ONLY in STANDBY MODE will the UPS auto recover once AC is restored.

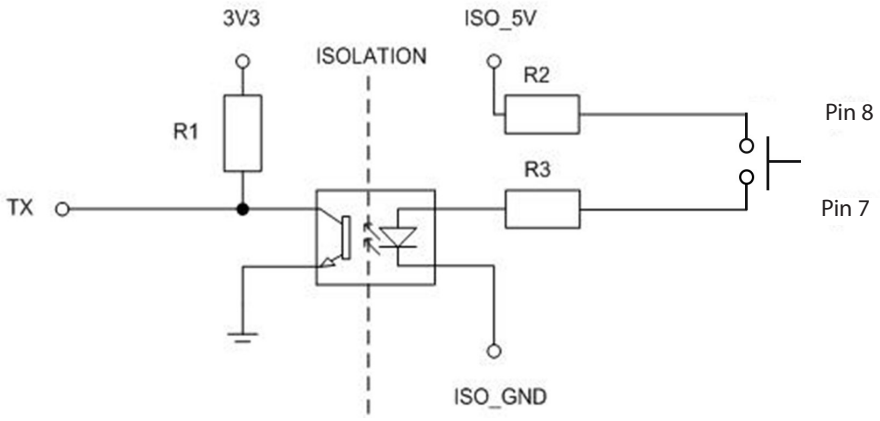


Figure 13: SDUCFRELAYCARD PIN Standby Circuit

5.0 Specifications

Description	Catalog Number	
	Passive Card (SDUCFRELAYCARD)	Active Cards ① (SDUENETIPCARD, SDUMBUSCARD, SDUPNETCARD, SDUECATCARD)
Input		
Nominal Voltage	+3.3 V ±5 %	
Standby signal	Active low via normally open momentary switch	
Frequency	50/60 Hz	
Output		
LED Diagnostics	Refer to Figure 8	Refer to Figure 8 NS = Network Status, MS=Module Status
Relay Logic Signals	Refer to Figure 8	—
Relay Contact Ratings	60V peak, 1A	—
Case/Enclosure Material	Housing: LCP (Liquid Crystal Polymer) Color: Natural, Thermoplastic,UL 94 V-0	
Weight & Dimensions		
H x W x D, in. (mm)	0.91 x 2.0 x 2.2 (23 x 50 x 55) approximate	
Net Weight, oz. (g)	1.0 (28.4) approximate	
EMC		
Immunity/Emissions	Emission EN 61000-6-4 EN55016-2-3 Radiated emission EN55022 Conducted emission Immunity EN 61000-6-2 EN61000-4-2 Electrostatic discharge, EN61000-4-3 Radiated immunity. EN61000-4-4 Fast transients/burst, EN61000-4-6 Conducted immunity	
Approvals ①	EN/IEC 60950-1 ; UL/CSA 60950-1 Pollution Degree 3 ; UL 508 Pollution Degree 3 CSA 107.1; EU ROHS2, China RoHS2	
Temperature °F (°C)	Storage: -40 to +185 (-40 to +85) Operating: -40 to +158 (-40 to +70) Convection cooling; no forced air required.	
Vibration	Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @19.6m/S^2, displacement of 0.35mm, 60 min per axis for all X, Y, Z direction. Non-Operating: IEC60068-2-6, Random : 5hz to 500Hz (2.09Grms); 20 min per axis for all X,Y,Z direction.	
Shock	Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis). Non-Operating: IEC60068-2-27, Half Sine Wave : 50G for duration of 11ms, 3 shocks for each 3 directions.	
Humidity	1% to 90% RH, noncondensing; IEC 68-2-2, 68-2-3	
Warranty	2 Years	
MTBF (bellcore)	1,968,800 Hours	
General Protection/ Safety	Protected against Continuous short -circuit, Continuous overload, Continuous open circuit. Galvanic Isolation: I/P to O/P: 3KVac, I/P to GND: 1.5KVac, O/P to GND: 0.5KVac Protection class 1 (IEC536), degree of protection IP20 (IEC 529) Safe low voltage: SELV (acc. EN60950); RoHS	

① Approvals apply for Active Cards. Contact Technical support for Passive Cards.

Table 10. Specifications

6.0 Data Exchange

6.1 Network Data Access

Access to SDU variables is provided by six monitoring instances, and one instance for control. The instance numbers and access means are unique to each network type.*

ADI Inst #	DataType	Name	Get/Set	Process Data Exchange
101	CHAR	Company	01 (Get access)	
102	CHAR	UPS Model	01 (Get access)	
103	CHAR	FW Ver.	01 (Get access)	
104	CHAR	Rating	01 (Get access)	
105	UINT 8**	Load Level(%)	09(Get access) (Write Process Data)	BYTE0
106	UINT 8	Batt. Level(%)	09(Get access) (Write Process Data)	BYTE1
107	UINT 16	Input Vol.(V)	09(Get access) (Write Process Data)	BYTE 2,3
108	UINT 16	Output Vol.(V)	09(Get access) (Write Process Data)	BYTE 4,5
109	UINT 8	Input Freq(Hz)	09(Get access) (Write Process Data)	BYTE6
110	UINT 8	Output Freq(Hz)	09(Get access) (Write Process Data)	BYTE7
111	UINT 8	UPS Status-1	09(Get access) (Write Process Data)	BYTE8
112	UINT 8	UPS Status-2	09(Get access) (Write Process Data)	BYTE9
113	UINT 8	Model Num.	09(Get access) (Write Process Data)	BYTE10
114	UINT 8	PRE-SD min Time	09(Get access) (Write Process Data)	BYTE11
115	UINT 8	PRE-SD sec Time	09(Get access) (Write Process Data)	BYTE12
116	UINT 16	PRE-On min Time	09(Get access) (Write Process Data)	BYTE 13,14
117	UINT 8	UPS FW Ver.	09(Get access) (Write Process Data)	BYTE15
118	UINT 8	Command	13H(Get/set access)	
			R/W Process Data	

* See Appendix A for details.
** ***UINT: Unassigned INTeger)***

Table 11. Variables Exchange On The Network

6.2 Process Data Exchange

The following lists the instances that are to mapped to process data exchange.

Input (16 Bytes):

BYTE0 Load Level(%)
Example: Byte0=60 the load level is 60%

BYTE1 Battery Level(%)
Example: Byte1=60 the battery level is 60%

BYTE2,3 Input voltage
Example: Byte2,3 =120 the input voltage is 120V

BYTE4,5 Output voltage
Example: Byte4,5=120 the output voltage is 120V

BYTE6 Input frequency
Example: Byte6=60 the input frequency is 60Hz

BYTE7 Output frequency
Example: Byte7=60 the output frequency is 60Hz

BYTE8 bit 0 is line fail (1 = INV, 0 = LINE)
bit 1 is low battery (1 = BAT LOW, 0 = NORMAL)
bit 2 XX
bit 3 XX
bit 4 XX
bit 5 LOAD STATUS(1 = OVER LOAD, 0 = NORMAL)
bit 6 XX
bit 7 XX

BYTE9 bit 0 XX
bit 1 BAT Failed Self-Test (1 = BAD, 0 = NORMAL)
bit 2 TEST MODE (1 = TEST, 0, NORMAL)
bit 3 Buzzer silence on/off (1=SILENCE)
Buzzer silence off = Alarm Enabled
Buzzer silence on = Alarm Disabled
bit 4 PRE-SD COUNT MODE (1 = ACTIVE)
bit 5 SCHEDULE COUNT MODE (1 = ACTIVE)
bit 6 DISBLE NO LOAD SHUTDOWN (1 = ACTIVE) (230V model only)
bit 7 XX

BYTE10 UPS model number
32H =500VA 120V
39H =500VA 230V
52H =850VA 120V
59H =850VA 230V

BYTE11 UPS PRE-SD COUNT TIME MIN

BYTE12 UPS PRE-SD COUNT TIME SEC

BYTE13,14 UPS PRE-ON COUNT TIME

BYTE15 UPS FIRMWARE Ver

Output (8 Bytes):

The command Instance is mapped to output message structure is the same as outlined in the command instance chapter.

6.3 Web Server

SDU device has a web server that can be accessed via most browsers that can be used to both monitor and configure the UPS.

Instructions:
To use the web server, enter the IP address in your URL bar.

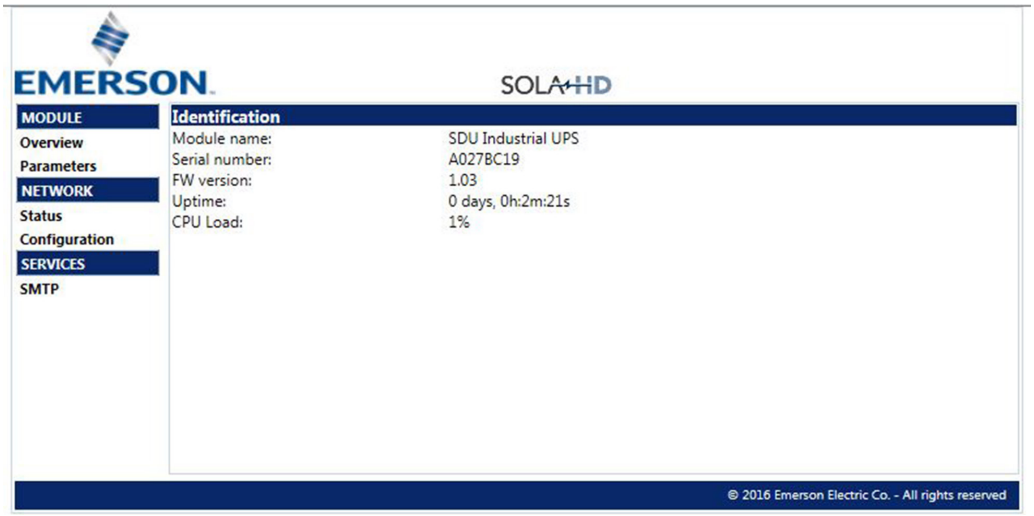


Figure 14. Web Server Window Example

7.0 Operating and Storage Temperature

Storage Conditions

Store the COMM CARD covered and upright in a cool, dry location.

The COMM CARDs can be operated and stored at -40 to +70 °C (-40 to +158 °F).

Humidity is 5-95 % non-condensing

8.0 Warranty

Warranty Information

Please see "Terms and Conditions of Sale" at:
https://www.appleton.emerson.com/documents/appleton-grp-llc-terms-of-sale-policies-procedures-en-us-7444090.pdf

Visit the Technical Support section of our Web site at: www.solahd.com

9.0 Appendix A

ADI Inst: 102 UPS Model

SDU850B
SDU850B-5
SDU500B
SDU500B-5

ADI Inst: 104 Rating

SDU850B : "120Vac 60Hz 7.1A"
SDU850B-5: "230Vac 50Hz 3.7A"
SDU500B : "120Vac 60Hz 4.2A"
SDU500B-5: "230Vac 50Hz 2.2A"

ADI Inst: 105 load level

Example: Byte=60 the load level is 60%

ADI Inst: 106 battery level

Example: Byte=60 the battery level is 60%

ADI Inst: 107 input voltage

Example: Byte=120 the input voltage is =120V

ADI Inst: 108 output voltage

Example: Byte=120 the output voltage is =120V

ADI Inst: 109 input frequency

Example: Byte=60 the input frequency is 60Hz

ADI Inst: 110 output frequency

Example: Byte=60 the output frequency is 60Hz

ADI Inst: 111 UPS Status-1:

bit 0 is line fail (1 = INV, 0 = LINE)
bit 1 is low battery (1 = BAT LOW, 0 = NORMAL)
bit 2 XX
bit 3 XX
bit 4 XX
bit 5 LOAD STATUS (1 = OVER LOAD, 0 = NORMAL)
bit 6 XX
bit 7 XX

ADI Inst: 112 UPS Status-2:

bit 0 XX
bit 1 Bat Failed Self Test (1 = BAD, 0 = NORMAL)
bit 2 TEST MODE (1 = TEST, 0, NORMAL)
bit 3 Buzzer Silence on/off (1= Silence)
    Buzzer silence off = Alarm Enabled
    Buzzer silence on = Alarm Disabled
bit 4 PRE-SD COUNT MODE (1 = ACTIVE)
bit 5 SCHEDULE COUNT MODE (1 = ACTIVE)
bit 6 DISBLE NO LOAD SHUTDOWN (1 = ACTIVE) (230V model only)
bit 7 XX

ADI Inst: 113 UPS model number

32H =500VA 120V
39H =500VA 230V
52H =850VA 120V
59H =850VA 230V

ADI Inst: 114 PRE-SD min Time

UPS echo PRE-SD count down time----min

ADI Inst: 115 PRE-SD sec Time

UPS echo PRE-SD count down time----sec

ADI Inst: 116 PRE-On min Time

UPS echo schedule count down time----min

ADI Inst: 117 UPS FW Ver.

ADI Inst: 118 Command (8Byte) (Read/Write):

Receive data 3: UPS self-test

Receive data 4 N M 186 188 A B: SETUP Schedule ON/OFF Time (7byte)

N IS Schedule On Time HIGH BYTE MIN (0-255)

M IS Schedule On Time LOW BYTE MIN (0-255)

A IS Schedule Off Time MIN (0-60)

B IS Schedule Off Time SEC (0-59)

EX: Schedule On 1Day Schedule Off 5min

4 5 160 186 188 5 0

UPS get command > 5min > UPS Shutdown > 1440min > UPS Restart

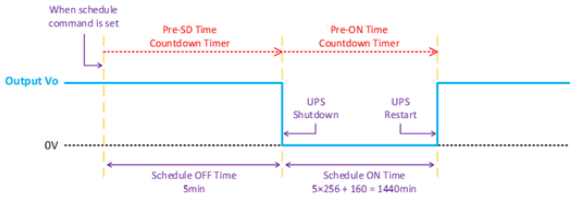


Figure 15: Timing Diagram 1.0

Receive data 5(Only for USB): Buzzer silence on/off

Receive data "B" (Only for M40): Buzzer silence off

Receive data "b" (Only for M40): Buzzer silence on

Buzzer silence off = Alarm Enabled

Buzzer silence on = Alarm Disabled

Receive data "G": ENABLE NO LOAD SHUT DOWN FUNCTION (230V model only)

Receive data "g": DISABLE NO LOAD SHUT DOWN FUNCTION (230V model only)

Receive data 185 188 A B: UPS at Battery Mode PRE-SD COUNT

A IS Schedule Off Time MIN (0-60)

B IS Schedule Off Time SEC (0-59)

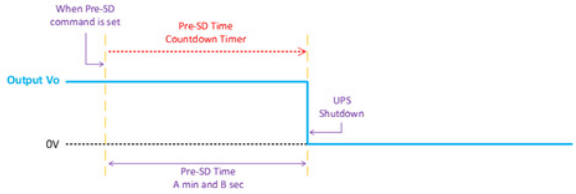


Figure 16: Timing Diagram 2.0

ADI Inst #	Instance number of the Host Application Data Object (see HMS Software Guide for info)
Data Type	Anybus Data type (e.g. UINT8)
Name	Variable Name, available on some networks
Get/SET	The value GET-able / Set-able from the network
Process Data Exchange	Variable able to be mapped to process data exchange
Range Min	Minimum value for SET access. For range checking of inputs
Range Max	Maximum value for SET access. For range checking of inputs
Update Rate	Approximate period of application update, for this value (may be asynchronous)