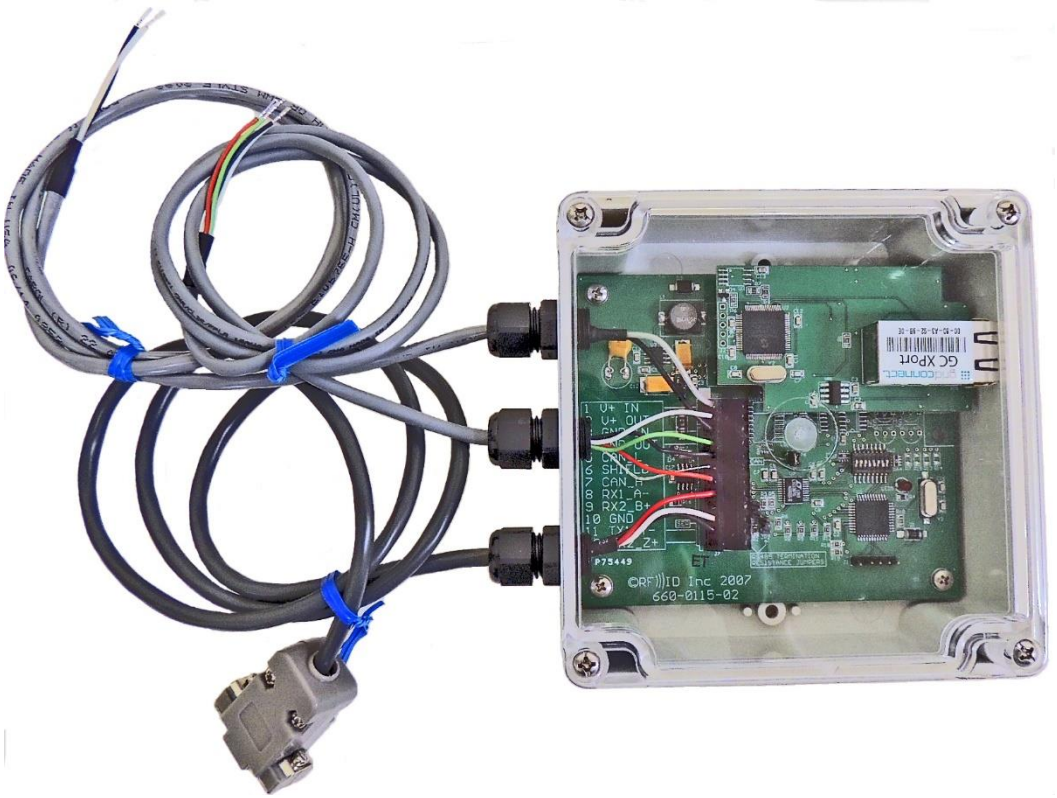
Product Manual

Model 8075E PROFINET Series Interface

for LF 125 kHz and 148 kHz Smart Antennas



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Table of Contents

How to Contact Us 3
Part Numbers 3
Hardware Description 4
Specifications 4
Drawing 5
Pigtail Wire Specifications 6
Power Requirements 6
Cabling the Reader – Power 6
Wiring Color Codes 6
M12 Pinouts 6
CAN Smart Antenna Readers and LF Passive RFID Tags 7
Integer Data 7
SW1 & SW2 Dipswitches 7
RW/RO (read write or read only) 8
Summary Default Settings 8
Serial Port Settings 9
Serial Port Commands to the Interface 10
Serial Port Commands to the Smart Antenna RFID Readers 12
Configuring PROFINET - LED Status Lights 13
Setting up PRFINET Interface 14
Issuing Commands via PROFINET 15
“I/O Command Bits 1 Byte” 15
Example Module setups Integer Mode Smart Antenna Readers 17
Example Module setups ASCII Mode Smart Antenna Readers 21
Example Module setups Integer Mode Serial Smart Antenna Reader 29
Example Module setups ASCII Mode Serial Readers 33
Smart Antenna Reader Addressing 41
Warranty 42

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Not Happy?	Contact our President: 303-378-9500 cell or james@rfidinc.com

Part Numbers

Model Number	Part Number	Description
8075E-04SA08	801-8075-04SA08	Model 8075E-04SA08 PROFINET Interface, CAN Smart Antennas, M12 connector, 24vdc, 8 characters
8075E-14SA08	801-8075-14SA08	Model 8075E-14SA08 PROFINET Interface, CAN Smart Antennas, pigtail wiring, 24vdc, 8 characters
8075E-24SA08	801-8075-24SA08	Model 8075E-24SA08 PROFINET Interface, CAN Smart Antennas, dual pigtail wiring, 24vdc, 8 characters
8075E-04SA16	801-8075-04SA16	Model 8075E-04SA16 PROFINET Interface, CAN Smart Antennas, M12 connector, 24vdc, 16 characters
8075E-14SA16	801-8075-14SA16	Model 8075E-14SA16 PROFINET Interface, CAN Smart Antennas, pigtail wiring, 24vdc, 16 characters
8075E-24SA16	801-8075-24SA16	Model 8075E-24SA16 PROFINET Interface, CAN Smart Antennas, dual pigtail wiring, 24vdc, 16 characters

Hardware Description

This Interface is the master in managing a network of up to 32 networkable CAN based RFID Readers termed Smart Antennas (or as an PROFINET bridge from our series of serial Reader Models 4000E, 5000E, and 7000E), and ultimately presents RFID Tag data from the networked Smart Antennas in PROFINET format. Any sections of this manual pertaining to settings or functions with serial RFID Readers have the word serial highlighted in yellow to alert users of the CAN based Smart Antennas those sections can be skipped or ignored. Dual pigtail wiring would be used if the Interface is to be located in the center of the trunk network line of Smart Antenna RFID Readers thus providing a connection in either direction or an M12 T-Connector can be used to split the single on board M12 connector into two directions.

Specifications

Physical:	Dimensions (w/o connectors):	4.8" square x 2.175"	122mm square x 55mm
	Weight (w/o cable):	11 oz.	312 grams
	Connector Options:	CAN Port(s): M12 or pigtails	Power: M12, Quick Connect power jack or pigtails
		RS232 Port: 9pin D-sub or pigtails	PROFINET: RJ45

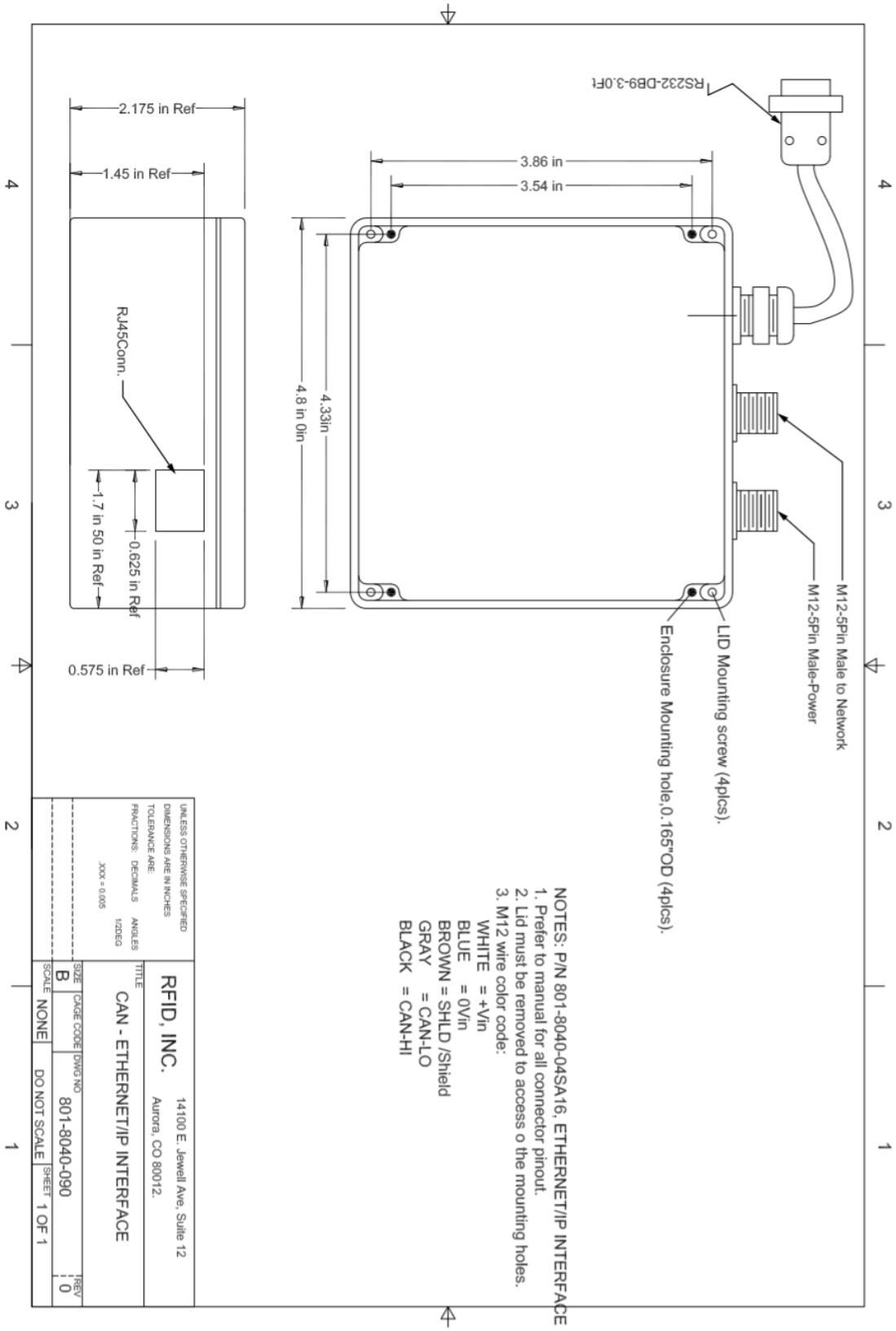
Electrical:	Input:	+9VDC – +28VDC	
	Draw:	125mA min – 200mA max	150mA typical

Materials:	Housing, Base:	Polycarbonate, opaque	NEMA 4X
	Lid:	Polycarbonate, clear	
	LED:	On = power	Blink = read achieved

Environment:	Storage Temperature:	-40°F to 185°F	-40°C to +85°C
	Operating Temperature:	-40°F to +131°F	-40°C to +55°C
	Certs:	IP-50	RoHS & CE & REACH

Drawing

PROFINET Interface w/M12 Connectors Drawing Shown



Pigtail Wire Specifications

Shielded (22 AWG for cable length up to 25' and 16 AWG for communication lengths beyond 25') insulated, stranded wire is recommended. All wires should be stripped approximately 3/8 inches and tinned.

Power Requirements

The Interface can be powered from regulated, linear, or switching power sources having the characteristics defined in the Specifications section of this document (9 to 28 volts). The Interface should be operated from a grounded supply that has the same ground reference as the host computer or logic device.

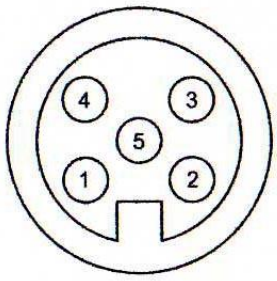
Cabling the Reader – Power

The Interface is delivered with two power connection options, an M12 connection or connection to bare pigtail wiring.

Wiring Color Codes

CAN WIRE COLOR	SIGNAL NAME
RED	+9 to +28VDC Input Unfused
BLACK	DC Ground (-)
WHITE	CAN-HI
BLUE	CAN-LO
BARE/DRAIN	EARTH GROUND, DRAIN, SHIELD
RS232 WIRE COLOR	**SIGNAL NAME**
BLACK	Tx
RED	Rx
WHITE	Ground

M12 Pinouts



CAN-M12
CONNECTOR

Pin No.	Description
1	DRAIN
2	+VDC
3	-VDC
4	CAN-HI
5	CAN-LO

CAN Smart Antenna Readers and LF Passive RFID Tags

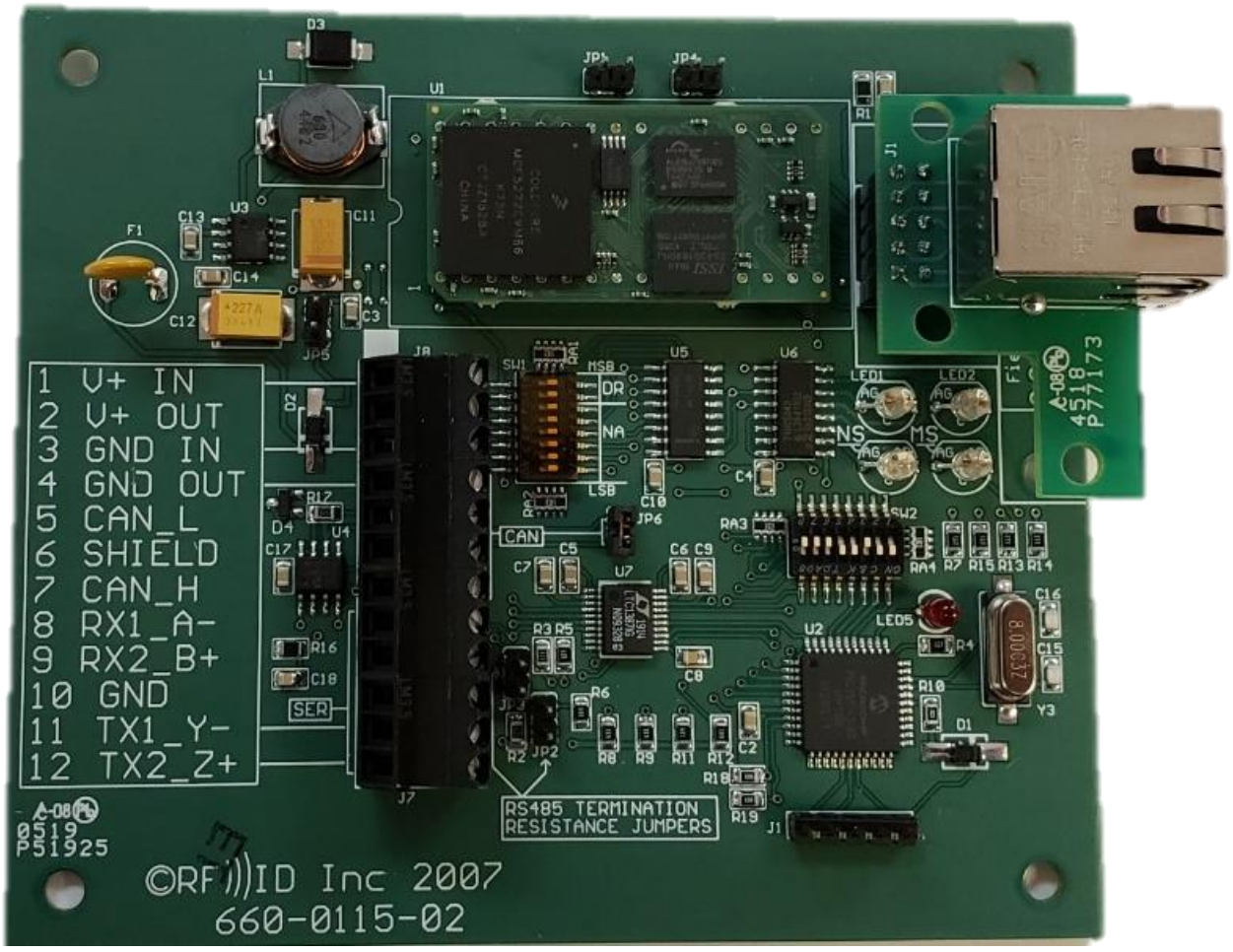
Smart Antenna RFID Readers are addressable and simply provide a means of emitting the RF signal to energize a Tag, receive data back from a Tag and pass Tag data back to the Interface. Smart Antennas can also program RFID Tags. RFID Tags store 8 or 16 ASCII characters (limited to capital letters, numbers and some symbols). Smart Antenna Readers operate at +9VDC to +28VDC consuming 160mA max.

Integer Data

Although the Smart Antenna RFID Readers and Tags use 8 or 16 character formats, the Model 8075E Interface can convert DINT data from the PROFINET scanner to 8/16 character numerical strings and convert the string from the Tag into a DINT before sending to the PROFINET bus.

SW1 & SW2 Dipswitches

The SW1 switch block is inactive. SW2 is located at right center shown below used to configure ASCII or Integer data, serial type, and serial baud rate.



RW/RO (read write or read only)

All Smart Antenna Readers are RW. When the Interface is configured for RO however, you are simply removing Tag data from the scanner output. Use the SW2 dipswitch settings of the first 4 rows below for networkable CAN Smart Antenna Readers and the second 4 rows for serial Readers like the Models 4000E, 5000E, 7000E:

Summary Default Settings

RS232 - Full Duplex, 9600, 8, N, 1, Single Read Mode

PROFINET – CAN RW Integer, Dynamic IP Address, Single Tag Report Read Mode

Defaults are noted with an asterisk in tables below

Switch 1 (LSB)	Switch 2	Switch 3	Smart Antenna Data Type
OFF	ON	OFF	CAN ASCII RW
ON	ON	OFF	CAN INTEGER RW*
OFF	ON	ON	CAN ASCII RO
ON	ON	ON	CAN INTEGER RO
OFF	OFF	OFF	SERIAL ASCII RW
ON	OFF	OFF	SERIAL INTEGER RW
OFF	OFF	ON	SERIAL ASCII RO
ON	OFF	ON	SERIAL INTEGER RO

Table 1 - SW2 CAN Smart Antenna Interface Modes

The PROFINET Interface can only use even values. The extra byte of data must be ignored

Type	CMD	ADD	DATA	Total	Actual
CAN ASCII RW	1	2	16	19	20
CAN INTEGER RW*	1	1	4	6	6
CAN ASCII RO	1	2	16	19	20
CAN INTEGER RO	1	1	4	6	6

Table 2 - CAN Smart Antenna PROFINET data sizes

Serial Port Settings

Switch 4	Switch 5	Switch 6	Serial Baud Rate
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600*
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	Do not use
ON	ON	ON	Do not use

Table 3 - SW2 & Baud Rate Selection

*9600, 8, 1, N

RS232 full duplex, RS422 full duplex (5 wire), RS422 half-duplex (3 wire)

Switch 7	Switch 8	Serial hardware type
OFF	OFF	RS232 full duplex*
ON	OFF	RS422 half-duplex
OFF	ON	RS422 full duplex

Table 4 - SW2 Serial Port Hardware Select

The PROFINET Interface can only use even values. The extra byte of data must be ignored.

TYPE	CMD	DATA	Total	Actual
SERIAL ASCII RW	1	16	17	18
SERIAL INTEGER RW	1	4	5	6
SERIAL ASCII RO	1	16	17	18
SERIAL INTEGER RW	1	4	5	6

Table 5 – Serial Port PROFINET Data Sizes

Start & End Characters for Serial to PROFINET Bridge Mode

This section pertains only to use of the Interface when linked with serial Readers, NOT the networkable CAN Smart Antenna Readers. The serial port software frames Tag data from the Smart Antenna RFID Readers based on its End and Start character settings. Start may be set to zero in which case any character is accepted as a start character. End must be set to a value other than zero to delimit incoming tag data.

The default settings are:

Start = 0x00

End = 0x0D (Carriage return)

Serial Port Commands to the Interface

The characters of open square bracket and closed square bracket are used to frame an incoming command message. When the serial port software receives the open square bracket [character it expects the rest of the message to be a command and the last character to be a closed square bracket].

[1CXX]

Format: 1 = Start and End Char setting, C = Start or End character, XX = hex value

Valid values: C = 'S' or 'E', XX = a hex value. Values outside of ASCII letters and numbers are recommended

Response: OK

Example 1: [1S0A] sets the start character as a Line Feed

Example 2: [1E0D] sets the end character as a Carriage Return

Example 3: [1S00] sets the start character to none

[2NNOO] – Change Reader Address

Format: 2 = Set Reader CAN address, NN = New CAN address, OO = Current (old) CAN address

Valid Addresses: 01 to 32

Response: OK, FAILED1, or FAILED2

Example: [23001] change Reader from address #01 to address #30

Example response 1: OK = #01 existed on the CAN bus and has been reset to #30

Example response 2: FAILED1 = #01 does not exist on the bus

Example response 3: FAILED2 = #30 is already in use

[3]

Format: 3 = Scan for present Readers

Response: RDR1, RDR2, RDRn…

Example: [3] Request a scan of present Readers

Example response 01 07 19 31

[4=IP address]

There are options for either a static IP address or a dynamic IP address. Interfaces are shipped with dynamic IP address as the default. The following command is for a static IP address:

Format: 4=NNN.NNN.NNN.NNN

Response: OK

Example: [4=10.0.1.42] Set new IP address

To return to a dynamic IP address, issue the command [4=0.0.0.0]

[5=Mask]

Format: 5=NNN.NNN.NNN.NNN

Response: OK

Example: [5=255.255.255.0] Set new subnet mask

[6=Gateway]

Format: 6=NNN.NNN.NNN.NNN

Response: OK

Example: [6=10.0.1.1] Set new gateway

[7]

Format: 7 = Get IP settings

Response:

IP=10.0.1.42

Mask=255.255.255.0

Gateway=10.0.1.1

Example: [7] Request IP settings

[S] (default operating mode)

This command changes the data output mode to SINGLE on the PROFINET connection, meaning a Tag will be read and reported one time.

Format: S = Single Mode

Response: OK

Example: [S]

[SC]

This command changes the data output mode to SINGLE on the Serial connection.

Format: SC = Single Mode

Response: OK

Example: [SC]

[P]

This command changes the data output mode to POLLING on the PROFINET connection. Use [TAA] command below to poll.

Format: P = Polling Mode

Response: OK

Example: [P]

[PC]

This command changes the data output mode to POLLING on the Serial connection. Use [TAA] command below to poll.

Format: PC = Polling Mode

Response: OK

Example: [PC]

Serial Port Commands to the Smart Antenna RFID Readers

[MAAXX]

This command changes the write mode of the addressed Smart Antenna Reader. There are different types of RFID Tags with differing types of coils and tuning. The values discussed below place a Smart Antenna Reader into the writing mode appropriate to the RFID Tags in your possession. Default mode is 18, used for all planar coil based Tags. Mode 08 is used for all ferrite coil based RFID Tags. Contact us if you are unsure or having difficulty in writing Tags.

Format: M = mode command, AA = CAN address, XX = value

Valid values: 00, 08, 10, 18

Response: If successful OK, if not ERROR

Example: [M1218] Establish new WRITE MODE value to Smart Antenna Reader #12

Example response: 12 OK, 12 = Reader #, OK = successful EEPROM change

[VAA]

This command reads the addressed Reader's write mode

Format: AA = CAN address, V = view

Response: The value of addressed Reader write mode

Example: [V07] Read WRITE MODE value of Reader #07

Example response: 07 18, 07 = reader #, 18 = WRITE MODE

[TAA]

This command erases the Readers' Tag buffer causing it to read the tag again if one is present. If the Reader does not respond within 400mS, the master ends the command by sending a lower case e. If a Tag is present to the Reader then the master outputs the Tag data normally

Format: AA = CAN address, T = poll

Response: e = no tag in range, or Tag data = Tag present to Reader

[IAA]

This command reads the firmware version of the addressed Reader

Format: AA = CAN address, I = Firmware Version

Response: The current Firmware version AA.v.x.xx

Response format: AA = Reader address, v.x.xx = Firmware Version

Example: [I22] Read the Firmware Version of Reader #22

Example response: 22.v.1.12, 22 = Reader #, v.1.12 = firmware version

[WAADATA]

Writes 8 or 16 characters of data for tag on addressed Reader

Format: W = Write command, AA = CAN address, DATA = 8 or 16 ASCII characters

Response: PROGRAMMED if successful, FAILED if not successful

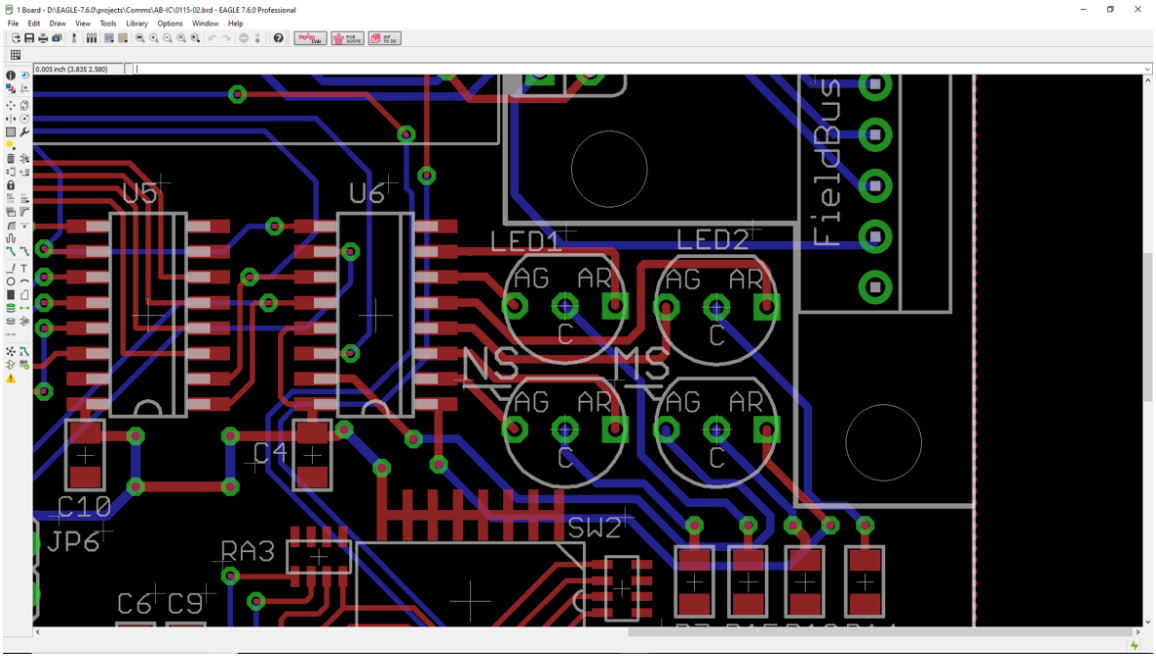
Example: [W015555555533333333] Write 5555555533333333 to tag on Reader 1

Example response successful: PROGRAMMED

Example response if failure: NO RESPONSE

Configuring PROFINET - LED Status Lights

There are 4 status LED's. There are some typos on the silk LED labels on the PCB of versions 0115-01 and 0115-02 Interface PCB's. LED1 is actually NS, LED2 is actually MS, NS is actually Data Rate, and MS is actually Link Activity. Below are detailed explanations of each.



LED1 Network Status

- Off = No power or no IP address
- Green = Ethernet IP connection established
- Green Flashing = No Ethernet IP connection established
- Red = Duplicate IP address detected
- Red Flashing = Ethernet IP connection timed out
- Alternating Red/Green = Self-test in progress

LED2 Module Status

- Off = No power
- Green = Ethernet IP connection established
- Green Flashing = No Ethernet IP connection established
- Red = Mayor Fault (unrecoverable)
- Red Flashing = Minor Fault (recoverable)
- Alternating Red/Green = Self-test in progress

NS = Data Rate

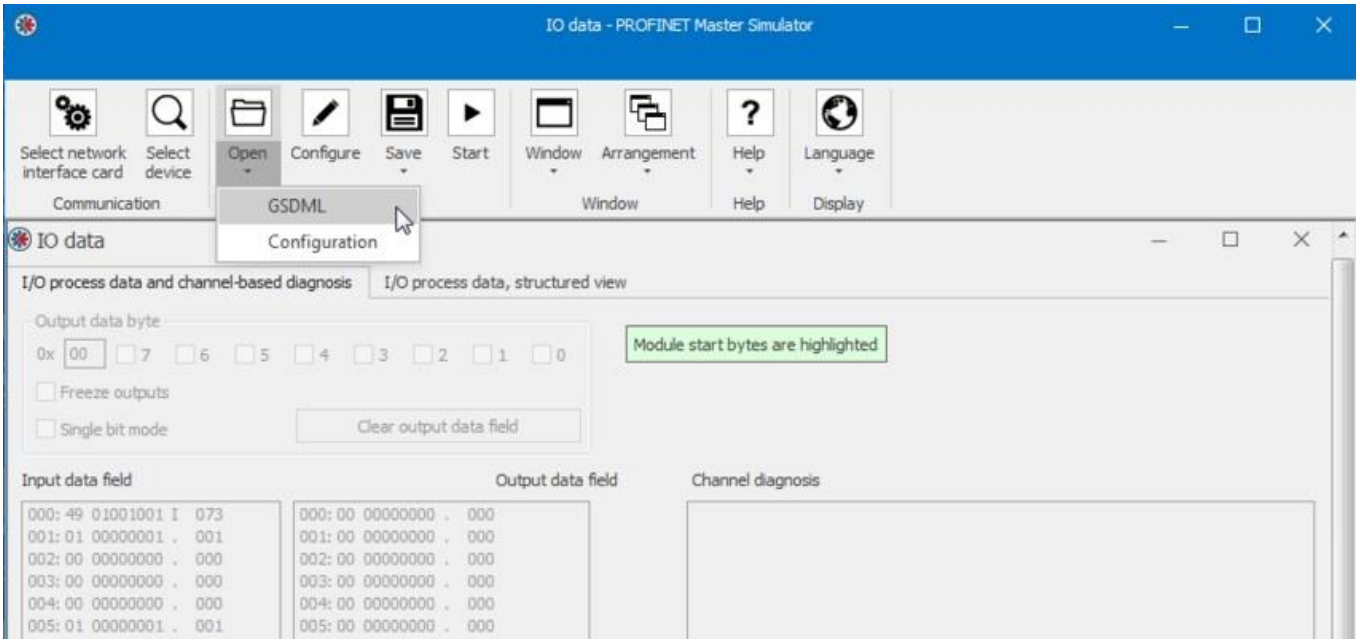
- Off = 10 Mbps
- Green = 100 Mbps
- Alternating Red/Green = Self-test in progress

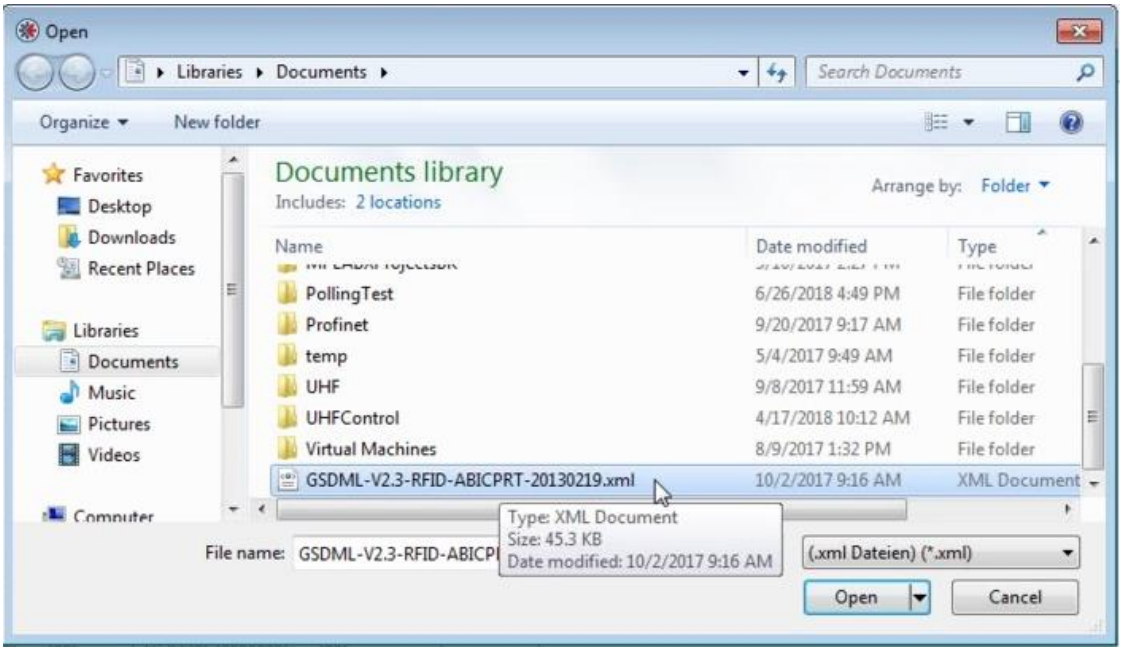
MS = Link Activity

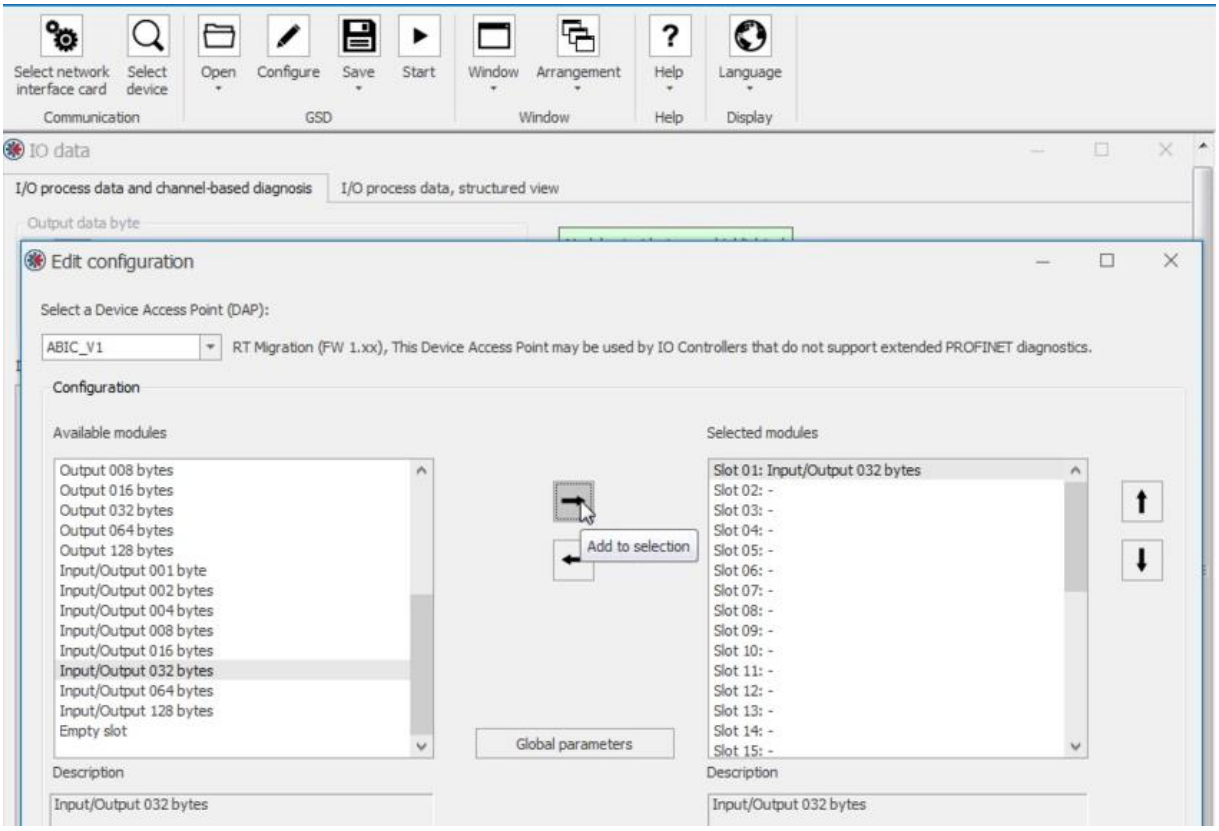
- Off = No power
- Green = Connected to Ethernet network
- Green Flashing = RX/TX Activity
- Alternating Red/Green = Self-test in progress

Setting up PRFINET Interface

You need a GSDML XML file.







Issuing Commands via PROFINET

Writing Tags via PROFINET is not available but may be done so via the serial port.

"I/O Command Bits 1 Byte"

Description

This Byte should be the first one on any setup. It is via this byte that commands are sent from the PROFINET scanner to the Smart antennas. The In Byte contains error bits to indicate command failure types. Data type bits are also represented. They indicate if ASCII or Integer mode in in use.

Command Byte Out (from scanner):

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write with Zeros				Command code bits			Out Toggle

Command Byte In (to scanner):

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		Command code bits			In Toggle

Out Toggle bit

Every time this bit is toggled, the slave will execute the command as per the command bits.

In Toggle bit

The salve toggles this bit every time it loads new values on to the field bus.

In Command Byte bit codes

WRITE_TAG	0	0	1
SINGLE_MODE	0	1	0
POLLING_MODE	0	1	1
TRANSFER_TAG	1	0	0
WRITE_MODE	1	0	1
VIEW_WRITE_MODE	1	1	0

Table 7 - Command Bits 1:3

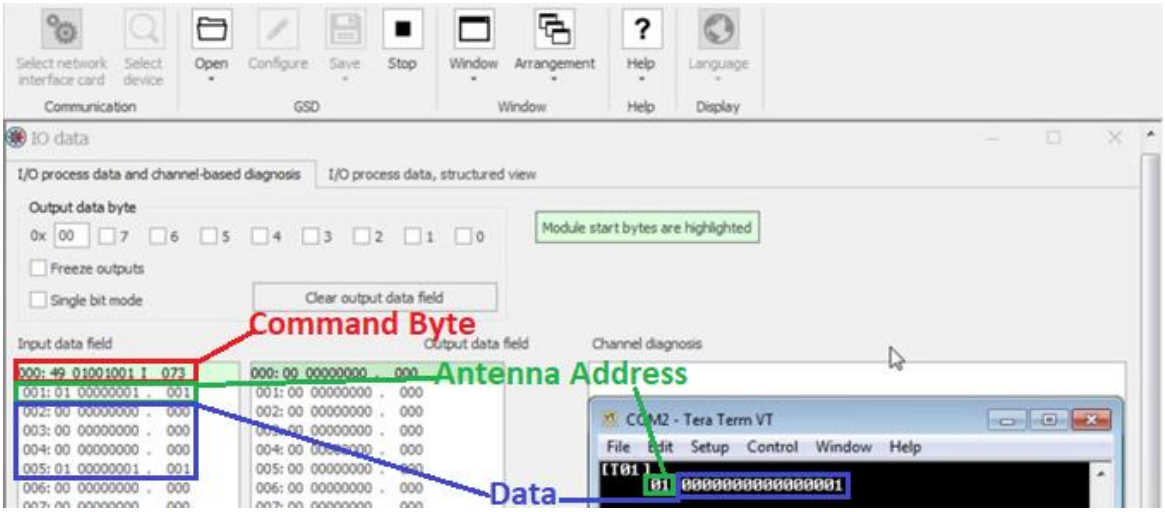
Successful command	0	0
Bad read or write/Ins data not valid	0	1
No Response from read head	1	0
Invalid Command or Command Parameters	1	1

Table 8 - ERROR Bits 4:5

Smart Antenna ASCII	0	0
Smart Antenna INTEGER	0	1
Serial Reader ASCII	1	0
Serial Reader INTEGER	1	1

Table 9 - Data Type Bits 6:7

Screenshot showing the reading of both the serial port and EIP port simultaneously.



Example Module setups Integer Mode Smart Antenna Readers

Write Tag Command, Smart Antenna Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	0	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Data to Write, 32 Bit Integer							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	0	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Written Data, 32 bit Integer							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful, Data valid
01 = Failure, Data not valid
10 = No response from Read/Write Head

Single Mode Command, Smart Antenna Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	0	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	0	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Unmodified							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:

00 = Successful Command

10 = No Response from Read/Write Head

Polling Mode Command, Smart Reader Antenna Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Unmodified							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command
10 = No response from Read Write Head

Transfer Command for Polling Mode, Smart Reader Antenna Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	0	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	0	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Data Read, 32 Bit Integer							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful, New Data
01 = Successful, No New Data
10 = No Response from Read/Write Head

Write Mode Command, Smart Antenna Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used			New Write Mode Value				
DATA 1	Not Used, Write With Zeros							
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	1	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Unmodified			New Write Mode Value				
DATA 1	Not Used, Unmodified							
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command, New Write Mode Set
01 = Failure to Set new Write Mode
10 = No Response from Read/Write Head

View Write Mode Command, Smart Antenna Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not used, Write with Zeros				1	1	0	Toggle
Address	Not used		Smart Antenna Address					
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	1	0	Toggle
Address	Not Used		Smart Antenna Address					
DATA 0	Not Used, Unmodified			Current Write Mode Value				
DATA 1	Not Used, Unmodified							
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command, Data Valid
10 = No Response from Read/Write Head

Example Module setups ASCII Mode Smart Antenna Readers

Write Tag Command, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	0	1	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Data To Write, 16 Bytes in ASCII							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type		ERROR Bits		0	0	1	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Data Written, 16 Bytes in ASCII							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:
00 = Successful, Data valid
01 = Failure, Data not valid
10 = No response from Read/Write Head

Single Mode Command, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	0	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00								
DATA 01								

DATA 02	Not Used, Write With Zeros
DATA 03	
DATA 04	
DATA 05	
DATA 06	
DATA 07	
DATA 08	
DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	0	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Not Used, Unmodified							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								

DATA 13	
DATA 14	
DATA 15	

ERROR Bits:
00 = Successful Command
10 = No Response from Read/Write Head

Polling Mode Command, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	1	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	1	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							

DATA 00	Not Used, Unmodified
DATA 01	
DATA 02	
DATA 03	
DATA 04	
DATA 05	
DATA 06	
DATA 07	
DATA 08	
DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

ERROR Bits: 00 = Successful Command 10 = No response from Read Write Head

Transfer Command for Polling Mode, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	0	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								

DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	0	Toggle
Address 2 Bytes	Smart Antenna ASCII Address High							
	Smart Antenna ASCII Address Low							
DATA 00	Data Read, 16 Bytes in ASCII							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:
00 = Successful, New Data
01 = Successful, No New Data
10 = No Response from Read/Write Head

Write Mode Command, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	1	Toggle
Address	Smart Antenna ASCII Address High							
Address	Smart Antenna ASCII Address Low							
DATA 00	New Write Mode Value							
DATA 01	Not Used, Write With Zeros							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response “Scanner In”:

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	1	Toggle
Address	Smart Antenna ASCII Address High							
Address	Smart Antenna ASCII Address Low							
DATA 00	New Write Mode Value							
DATA 01	Not Used, Unmodified							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								

DATA 07	
DATA 08	
DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

ERROR Bits:

00 = Successful Command, New Write Mode Set

01 = Failure to Set new Write Mode

10 = No Response from Read/Write Head

View Write Mode Command, Smart Antenna Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	1	0	Toggle
Address	Smart Antenna ASCII Address High							
Address	Smart Antenna ASCII Address Low							
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	1	0	Toggle
Address	Smart Antenna ASCII Address High							
Address	Smart Antenna ASCII Address Low							
DATA 00	Current Write Mode Value							
DATA 01	Not Used, Unmodified							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:
00 = Successful Command, Data Valid
10 = No Response from Read/Write Head

Example Module setups Integer Mode Serial Smart Antenna Reader

Write Tag Command, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	0	1	Toggle
DATA 0	Data to Write, 32 Bit Integer							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	0	1	Toggle
DATA 0	Written Data, 32 bit Integer							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful, Data valid
01 = Failure, Data not valid
10 = No response from Read/Write Head

Single Mode Command, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	0	Toggle
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	0	Toggle
DATA 0	Not Used, Unmodified							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command
10 = No Response from Read/Write Head

Polling Mode Command, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	1	Toggle
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	1	Toggle
DATA 0	Not Used, Unmodified							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command
10 = No response from Read Write Head

Transfer Command for Polling Mode, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	0	Toggle
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	0	Toggle
DATA 0	Data Read, 32 Bit Integer							
DATA 1								
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful, New Data
01 = Successful, No New Data
10 = No Response from Read/Write Head

Write Mode Command, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	1	Toggle
DATA 0	Not Used				New Write Mode Value			
DATA 1	Not Used, Write With Zeros							
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	1	Toggle
DATA 0	Not Used, Unmodified				New Write Mode Value			
DATA 1	Not Used, Unmodified							
DATA 2								
DATA 3								

ERROR Bits:
00 = Successful Command, New Write Mode Set
01 = Failure to Set new Write Mode
10 = No Response from Read/Write Head

View Write Mode Command, Serial Reader Integer Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not used, Write with Zeros				1	1	0	Toggle
DATA 0	Not Used, Write With Zeros							
DATA 1								
DATA 2								
DATA 3								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	1	0	Toggle
DATA 0	Not Used, Unmodified			Current Write Mode Value				
DATA 1	Not Used, Unmodified							
DATA 2								
DATA 3								

ERROR Bits:

00 = Successful Command, Data Valid

10 = No Response from Read/Write Head

Example Module setups ASCII Mode Serial Readers

Write Tag Command, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	0	1	Toggle
DATA 00	Data To Write, 16 Bytes in ASCII							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type		ERROR Bits		0	0	1	Toggle
DATA 00	Data Written, 16 Bytes in ASCII							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:
00 = Successful, Data valid
01 = Failure, Data not valid
10 = No response from Read/Write Head

Single Mode Command, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	0	Toggle
DATA 00								
DATA 01								
DATA 02								
DATA 03								
DATA 04								

DATA 05	Not Used, Write With Zeros
DATA 06	
DATA 07	
DATA 08	
DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	0	Toggle
DATA 00	Not Used, Unmodified							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:

00 = Successful Command

10 = No Response from Read/Write Head

Polling Mode Command, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				0	1	1	Toggle
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		0	1	1	Toggle
DATA 00	Not Used, Unmodified							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								

DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

ERROR Bits:
00 = Successful Command
10 = No response from Read Write Head

Transfer Command for Polling Mode, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	0	Toggle
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	0	Toggle

DATA 00	Data Read, 16 Bytes in ASCII
DATA 01	
DATA 02	
DATA 03	
DATA 04	
DATA 05	
DATA 06	
DATA 07	
DATA 08	
DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

ERROR Bits:
00 = Successful, New Data
01 = Successful, No New Data
10 = No Response from Read/Write Head

Write Mode Command, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	0	1	Toggle
DATA 00	New Write Mode Value							
DATA 01	Not Used, Write With Zeros							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								

DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	0	1	Toggle
DATA 00	New Write Mode Value							
DATA 01	Not Used, Unmodified							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

ERROR Bits:

00 = Successful Command, New Write Mode Set

01 = Failure to Set new Write Mode

10 = No Response from Read/Write Head

View Write Mode Command, Serial Reader ASCII Mode "Scanner Out":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Not Used, Write With Zeros				1	1	0	Toggle
DATA 00	Not Used, Write With Zeros							
DATA 01								
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								
DATA 09								
DATA 10								
DATA 11								
DATA 12								
DATA 13								
DATA 14								
DATA 15								

Response "Scanner In":

Byte	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
CMD	Data Type Bits		ERROR Bits		1	1	0	Toggle
DATA 00	Current Write Mode Value							
DATA 01	Not Used, Unmodified							
DATA 02								
DATA 03								
DATA 04								
DATA 05								
DATA 06								
DATA 07								
DATA 08								

DATA 09	
DATA 10	
DATA 11	
DATA 12	
DATA 13	
DATA 14	
DATA 15	

ERROR Bits:

00 = Successful Command, Data Valid

10 = No Response from Read/Write Head

Smart Antenna Reader Addressing

Description

Smart Antenna Readers retain their address in onboard EEPROM. To change the address, use the RS232 connection to issue the [2XXXX] command. If two or more Smart Antenna Readers have the same address on the bus, the system will not know due to the anti-collision hardware. It is the responsibility of the user to manage Smart Antenna Reader addresses. Always use permanent labels to mark your addresses.

New Smart Antenna Reader installation

New Smart Antennas come with the address 01; before they can be used, you need to assign them an operational address.

1. Use the command [2xx01] to assign the new address where xx = new address.
2. You should receive the response of OK. If so, skip the rest you are done.
3. If you receive a FAILED_X response, refer to Serial Port Commands to the Smart Antenna RFID Readers on page 12 for details.

Reassign Smart Antenna Reader Address

1. If you don't know a Smart Antenna Reader's address disconnect all other Readers from the network.
2. Run a [3] scan command to learn the Reader address.
3. Use [2XXXX] to assign a new address.
4. Reconnect the rest of your Readers and run [3] scan command again.
5. If the number of addresses on the scan matches the number installed you are done.
6. If you have duplicate addresses in the network, remove one Reader at a time while running [3] scan each time.
7. After removing a Reader check that the [3] command returns one less Reader address than before.
8. If you remove an Reader and the [3] command returns the same number of addresses it did before you removed it, you have found the duplicate. Follow steps 1 to 4 to assign it a new address.

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