



8070E
Operational manual



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1.0 Smart antennas and the 8070E

The Smart antenna is a fully functional RFID reader writer enclosed in what previously constituted an antenna enclosure. This eliminates the need for antenna cables and the tuning associated with them. Another advantage is the ability to communicate with several antennas through a single interface box.

1.1 Hardware

Communications: CAN (controller area network) at 125 KBS
 Power: +24VDC linear regulated 200mA max
 Interconnections: 5 pin M12 male

1.2 ASCII Data

All tags store 16 ASCII characters (limited to capital letters, numbers and some symbols)
 The Smart antenna can read and write the tags

1.3 Integer Data

Although the smart antenna and tags only use the 16-character format, the 8070E can convert DW data from the PROFIBUS Outs to 16 character numerical strings and convert the string from the tag in to a DW to place on the PROFIBUS Ins

1.4 RW/RO

All smart antennas are RW. When the interface is configured for RO, you are simply removing Tag data from the Outs.

1	2	3	
OFF	ON	OFF	CAN ASCII RW
ON	ON	OFF	CAN INTEGER RW
OFF	ON	ON	CAN ASCII RO
ON	ON	ON	CAN INTEGER RO

Table 1 SW2 and the Smart antenna interface modes

A command bits module should always be the first module selected.
 Use "I/O Command_Bits 1 Byte" and one of the following modules depending on the application

CAN ASCII RW	Use GSD Module "I/O CAN_ASCII_ADD 2 Bytes" Use GSD Module "I/O CAN_ASCII_DATA 16 Bytes"
CAN INTEGER RW	Use GSD Module "I/O CAN_INT_ADD 1 Byte" Use GSD Module "I/O CAN_INT_DATA 4 Bytes"
CAN ASCII RO	Use GSD Module "Input CAN_ASCII_ADD 2 Bytes" Use GSD Module "Input CAN_ASCII_DATA 16 Bytes"
CAN INTEGER RO	Use GSD Module "Input CAN_INT_ADD 1 Byte" Use GSD Module "Input CAN_INT_DATA 4 Bytes"

Table 2 Smart antenna PROFIBUS GSD Modules

2.0 8070E Serial Port

2.1 Hardware

The serial port can be configured to operate as:
 RS232 full duplex
 RS422 full duplex (5 wire)
 RS422 half duplex (3 wire)



7	8	
OFF	OFF	RS232 full duplex
ON	OFF	RS422 half duplex
OFF	ON	RS422 full duplex

Table 3 SW2 and Serial Port hardware select

4	5	6	
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 4 SW2 and Bit Rate selection

1	2	3	
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 5 SW2 and the serial reader modes

A command bits module should always be the first module selected.
 Use "I/O Command_Bits 1 Byte" and one of the following modules depending on the application

SERIAL ASCII RW	Use GSD Module "I/O SER_ASCII 16 Bytes"
SERIAL INTEGER RW	Use GSD Module "I/O SER_INTEGER 4 Bytes"
SERIAL ASCII RO	Use GSD Module "Input SER_ASCII 16 Bytes"
SERIAL INTEGER RO	Use GSD Module "Input SER_INTEGER 4 Bytes"

Table 6 Serial Port PROFIBUS GSD Modules

2.2 Start and End characters

The serial port software frames data from 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)

2.3 Command characters [and]

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



3.0 Serial Port Commands

3.1 To 8070E (Antenna controller)

3.1.1 [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

3.1.2 [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

3.1.3 [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

For the following 4 commands, the factory default settings are:

Serial port = Single Tag report mode

Profibus port = Polling Tag report mode

3.1.4 [S] (Profibus) (can be issued through serial or Profibus line)

This command changes the data output mode to SINGLE Tag report on the Profibus line

Format: S = Single Mode

Response: OK Example: [S]

3.1.5 [P] (Profibus) (can be issued through serial or Profibus line)

This command changes the data output mode to POLLING Tag report on the Profibus line

Format: P = Polling Mode

Response: OK Example: [P]

3.1.4 [SC] (Serial) (can be issued only through serial line)

This command changes the data output mode to SINGLE Tag report on the serial line

Format: S = Single Mode

Response: OK Example: [S]

3.1.5 [PC] (Serial) (can be issued only through serial line)

This command changes the data output mode to POLLING Tag report on the serial line

Format: P = Polling Mode

Response: OK Example: [P]



3.2 To Readers

3.2.1 [MAAXX]

This command changes the write mode of the addressed reader

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

Valid values: 00, 08, 10, 18

Response: If successful OK, if not ERROR

Example: [M1812] Write new WRITE MODE value to reader #12

Example response: 12 OK, 12 = reader #, OK = successful EEPROM write

3.2.2 [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

3.2.3 [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 the antenna reads then the master outputs the tag data normally

Format: AA = CAN address, T = poll

Response: e = no tag in range, 16Char tag data = tag in range read

3.2.4 [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

3.2.5 [WAADATA]

Writes 16 characters of data for tag on addressed reader

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

Response: PROGRAMMED if successful, FAILED if not successful

Example: [W0155555553333333] Write 55555553333333 to tag on reader 1

Example response successful: PROGRAMMED

Example response if failure: NO RESPONSE



4.0 “I/O Command_Bits 1 Byte”

4.1 Description

This Module should be the first one on any setup. It is via this byte that commands are sent from the PROFIBUS master to the Smart antenna. The In Byte contains error bits; the data type bits are also there, they indicate if ASCII or Integer mode is being used

Command Byte Out:

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:

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

4.2 Out Toggle bit

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

4.3 In Toggle bit

The slave toggles this bit every time it loads new values on to the field bus
In Error bits indicate if a command failed and why

4.4 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

SmartAntenna ASCII	0	0
SmartAntenna INTEGER	0	1
Serial Reader ASCII	1	0
Serial Reader INTEGER	1	1

Table 9 Data Type Bits 6:7



5.0 Example Module setups Integer Mode Smart Antennas

5.1 Write Tag Command, SmartAntenna Integer Mode “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 “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

5.2 Single Mode Command, SmartAntenna Integer Mode “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 “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



5.3 Polling Mode Command, SmartAntenna Integer Mode “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 “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

5.4 Transfer Command for Polling Mode, SmartAntenna Integer Mode “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 “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



5.5 Write Mode Command, SmartAntenna Integer Mode “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 “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

5.6 View Write Mode Command, SmartAntenna Integer Mode “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 “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



6.0 Example Module setups ASCII Mode Smart Antennas

6.1 Write Tag Command, SmartAntenna ASCII Mode “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	Smart Antenna ASCII Address High							
2 Bytes	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 “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	Smart Antenna ASCII Address High							
2 Bytes	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



6.2 Single Mode Command, SmartAntenna ASCII Mode “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	Smart Antenna ASCII Address High							
2 Bytes	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 “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	Smart Antenna ASCII Address High							
2 Bytes	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



6.3 Polling Mode Command, SmartAntenna ASCII Mode “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	Smart Antenna ASCII Address High							
2 Bytes	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 “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	Smart Antenna ASCII Address High							
2 Bytes	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



6.4 Transfer Command for Polling Mode, SmartAntenna ASCII Mode “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	Smart Antenna ASCII Address High							
2 Bytes	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 “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	Smart Antenna ASCII Address High							
2 Bytes	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



6.5 Write Mode Command, SmartAntenna ASCII Mode “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 “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



6.6 View Write Mode Command, SmartAntenna ASCII Mode “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 “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



7.0 Example Module setups Integer Mode Serial reader

7.1 Write Tag Command, Serial Reader Integer Mode “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 “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

7.2 Single Mode Command, Serial Reader Integer Mode “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 “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



7.3 Polling Mode Command, Serial Reader Integer Mode “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 “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

7.4 Transfer Command for Polling Mode, Serial Reader Integer Mode “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 “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



7.5 Write Mode Command, Serial Reader Integer Mode “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 “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

7.6 View Write Mode Command, Serial Reader Integer Mode “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 “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



8.0 Example Module setups ASCII Mode Serial readers

8.1 Write Tag Command, Serial Reader ASCII Mode “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 “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



8.2 Single Mode Command, Serial Reader ASCII Mode “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	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 “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



8.3 Polling Mode Command, Serial Reader ASCII Mode “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 “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



8.4 Transfer Command for Polling Mode, Serial Reader ASCII Mode “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 “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



8.5 Write Mode Command, Serial Reader ASCII Mode “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 “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



8.6 View Write Mode Command, Serial Reader ASCII Mode “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								

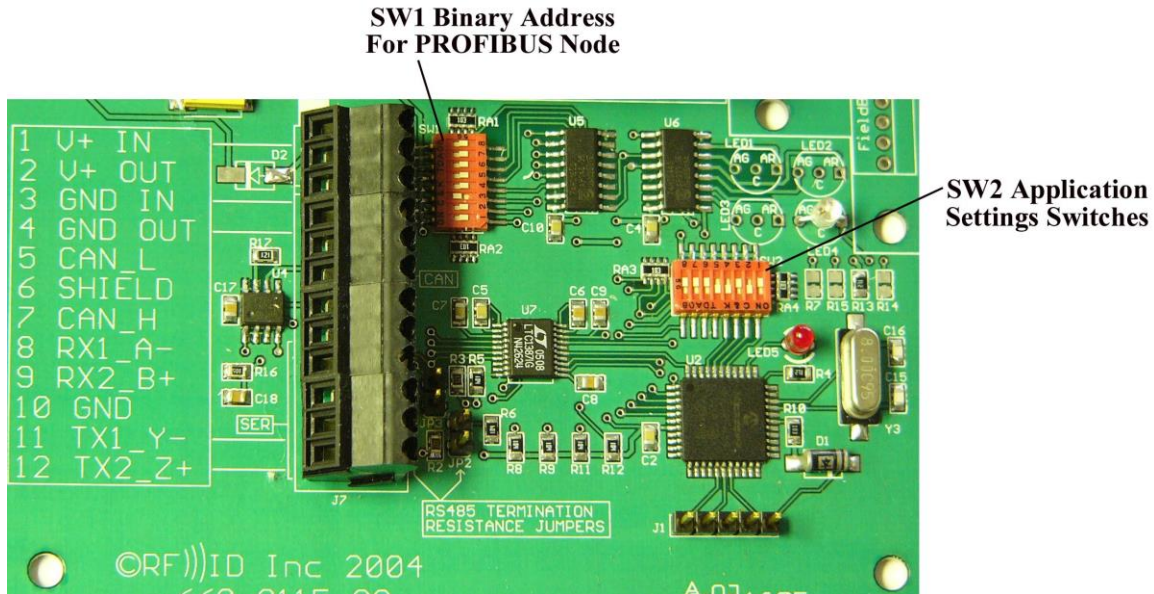
Response “In”:

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

9.0 Dipswitches



10.0 Antenna Addressing

10.1 Description

Antennas retain their address in onboard EEPROM. To change the address of an antenna use the RS232 connection to issue the [2XXXX] command. If 2 or more antennas 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 antenna addresses. Always use permanent labels to mark your antenna addresses and try not to change them often.

10.2 New Antenna installation

New Smart Antennas come with the address 63; before they can be used, you need to assign them an operational address

1. Use the [2xx63] to assign the new address
2. You should have received an OK, if so skip the rest you are done
3. You received a FAILED_X, refer to section 3.1.2 for details

10.3 Reassign antenna address

1. If you don't know its current address disconnect all other antennas from the network
2. Run a [3] scan command to learn the antenna address
3. Use [2XXXX] to assign a new address
4. Reconnect the rest of your antennas and run [3] scan again
5. If the number of addresses on the scan matches the number of antennas installed you are done skip the rest
6. You have duplicate addresses in the network. Remove one antenna at a time while running [3] scan each time.
7. After removing an antenna check that [3] returns one less antenna address than before.
8. If you remove an antenna and [3] 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.



11.0 Power Requirements

11.1 Interface operating voltage

The interface unit requires 24VDC+ and 200mA max

11.2 Antenna operating voltage

Antennas operate at 24VDC+

Each antenna consumes 160mA max