RFIDEAS

ASCII Command Protocol

Configuration and User Manual

Contents

Glossary Of Terms

Terms	Definitions
ACP	ASCII Command Protocol
Telnet	An application protocol used on the Internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection.
Minicom	A text-based modem control and terminal emulation program for Unix-like operating systems
EIP	Ethernet Industrial Protocol
PoE	Power over Ethernet

Information Symbols

Symbol	Meaning	Definitions
	Note	Notes refer to useful information related to the text.
	Tip	Tips can provide hints and pointers in addition to the text.
	Important	Important information can include prerequisites, limitations or cautions.

Chapter 1. The Basics

1.1 ACP Overview

ASCII Command Protocol (ACP) allows direct configuration of the device without downloading an application or creating a proprietary interface. This feature is available on CDC, Serial, PoE and Ethernet based readers. The serial Prox reader communicates using ASCII commands. The reader then parses the command, performs the operation, and displays the result or an error code. All command strings begin with the prefix rfid: and end with a Return key (Enter), CR or LF.

A remote serial connection must be made to communicate the commands to the device. Telnet is typically used in Windows. Minicom is typically available in all forms of Linux.

> There are other free communication programs that can also be used. RF IDeas does not endorse the use of any particular utility. A few popular utilities like Terminal or Putty can be obtained if a Telnet session or other utility is not provided with your operating system.

1.2 Determine the COM Port

Windows

Use device manager to verify the COM port selected for the device is available and installed correctly. CDC devices will install a virtual COM port over USB. Ethernet based models will install a Lantronix CPR port. Take note of the COM port that the device is on.

Using Telnet or another terminal application session, connect to the reader through the installed serial port located in device manager. If a Telnet or similar terminal program is not available, there are many free utilities that can be downloaded from the internet.

Linux

Most Linux distributions include an application called Minicom. Use Minicom or a similar terminal utility to communicate with the serial device. Be sure that the utility supports com ports higher than the typical 1 through 8.

After the USB CDC device is enumerated on the Linux machine, a device of either /dev/ttyACM0 or /dev/ttyACM1 can be found in the /dev/directory. Minicom users may have to create a symbolic link from /dev/ttyACM0 to /dev/modem using the command In -s /dev//tty/ACMO /dev/modem or In -s /dev/ ttyACM1 /dev/modem.

Mac OS X

The /dev/cu.usbmodemfa211 device is found on a Mac OS X. Use a terminal utility to communicate with the serial device. Be sure that the utility supports com ports higher than the typical 1 through 8.

Communication

Serial based readers communicate at 9600 baud, with no parity, 1 stop bit, and echo off. USB CDC readers are virtual COM port and do not need the baud rate set.

Ethernet and PoE based readers will communicate through a serial tunnel over the Ethernet connection. The EIP PoE readers will require a Telnet type session to communicate to the reader and typically will not require any special software settings.

Chapter 2. Reader Communication

2.1 Communication with the Reader

Open a Terminal or Telnet session through a serial communications program.

Be sure to set the data rate (baud) to 9600, Data bits to 8, Stop bits to 1, and Parity to None if using a program other than a Telnet session. Flow control is not needed as there is no software or hardware handshaking.

Telnet connection

Connection to the reader can be accomplished directly through a Telnet session or other terminal based application.

Determine the IP address of the connected reader.

From Windows

Go to `Start > Run` and type `CMD` then press `Enter` to open a dos window

(From Windows 7, Go to `Start` and type `CMD` in the search box and press `Enter`)

At the command prompt, begin a Telnet session by typing the Telnet IP address, 10001, where the IP address is assigned to the PoE reader.

Example: `c:\>telnet 52.46.49.44 10001`

Once connected, press `Enter`
A prompt will be displayed as shown:

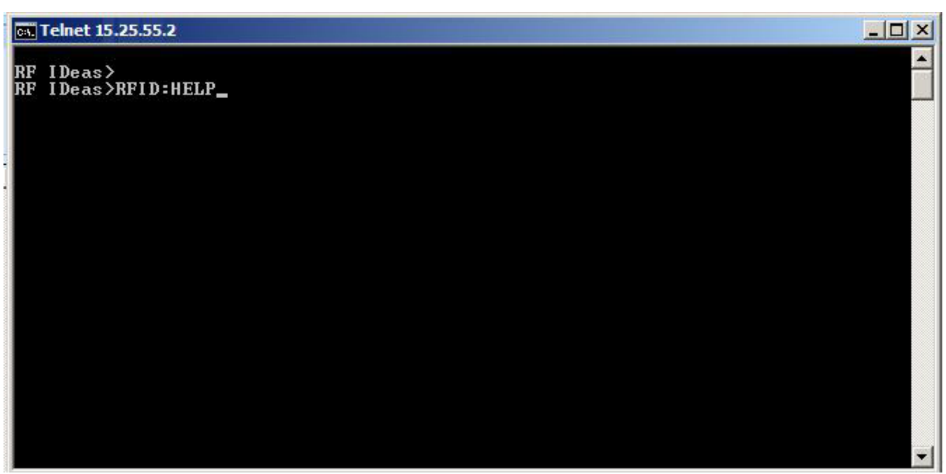

Image 1: Telnet window

2.2 Help Command

Help displays the commands followed by its data type and expected syntax. Type `rfid:help` and press `Enter`.

The Help command output displays as shown in the below left image:

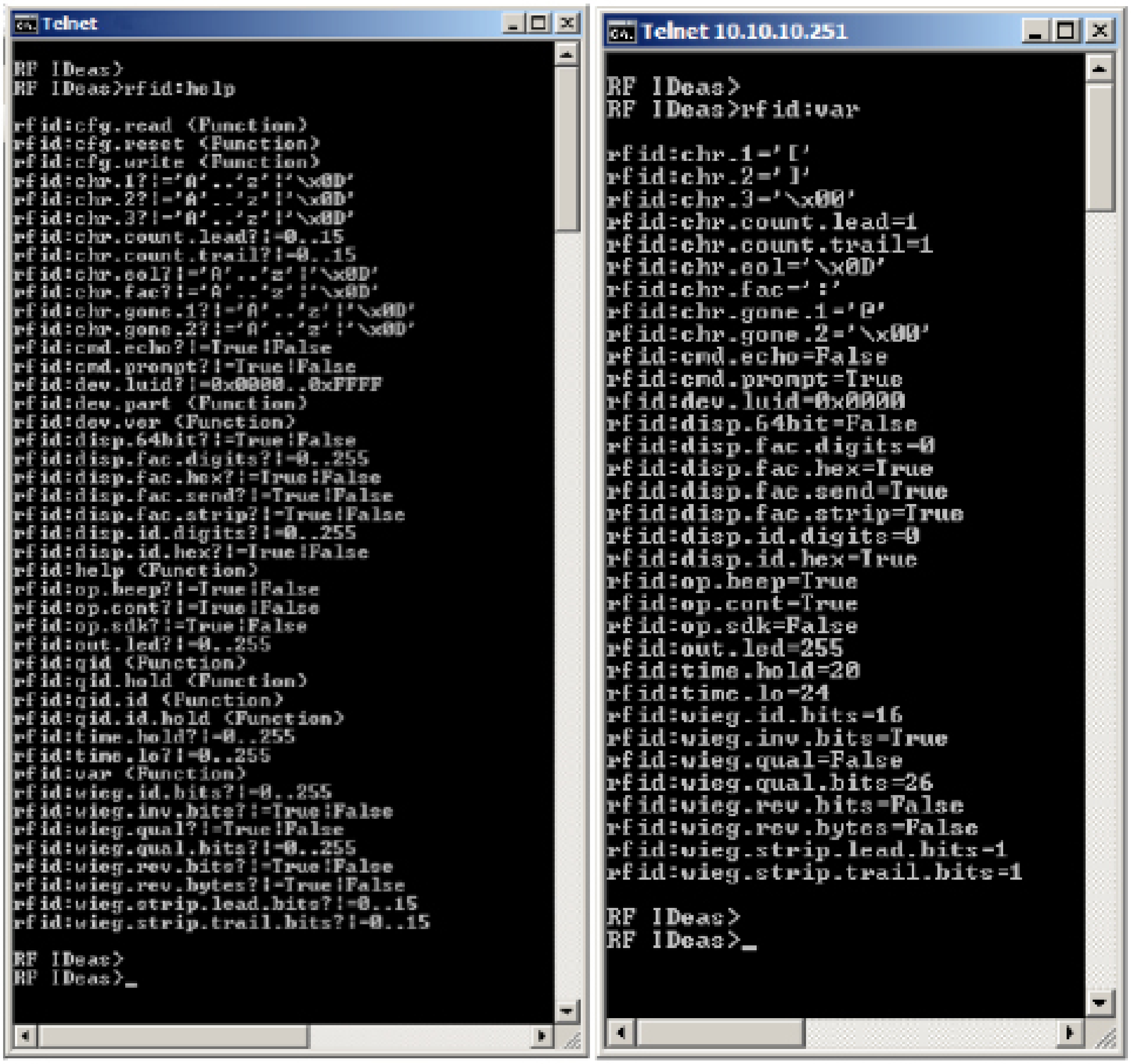

Image 2: Help Command

> To see what configuration settings the reader is currently set to, type `RFID:VAR` in the image above to the right.

Chapter 3. Commands

3.1 Command Structure

The commands give users the ability to alter their data output to meet application needs and enhance user interaction. Use the commands to make the necessary changes to the reader configuration.

Some commands have an immediate effect on the reader. However, most commands will require that they be stored to flash memory in order to become activated.

Variables are set and viewed in RAM. With the exception of immediate commands, changes are lost when the reader loses power or the session is closed without sending the `rfid:cfg.write` command.
Use `rfid:var` to display the list of current ram settings.
The `rfid:cfg.write` function writes the RAM variables to flash memory.
Once the variables are written to flash memory, they are non-volatile and are used by the reader.

Commands are NOT case sensitive.

Variables assigned to variables ARE case sensitive.

- All commands begin with a prefix string followed by one or more token strings with a period delimiter character between multiple tokens
- Functions must end with a CR or LF (From terminal or Telnet sessions; press enter or the return key)
- Variables can be assigned a value with an equal sign followed by the value or queried for its current value with a question mark
- Any control characters other than CR, LF, and backspace terminate the command
- The Escape key cancels a command

Command structure falls into one of three groups:

1. Perform a function
2. Assign a variable
3. Query a variable

3.2 Perform a Function

A function performs an operation that may or may not display any results.
A function may not be queried.

For example, to write changes made to ACP variables into flash memory the function `rfid:cfg.write` CR would be used.

Certain functions that display a value or series of values display the string between curly braces for easy parsing.

For example, the `rfid:qid` function output displays:

{0x00BB,1,0x0000,80;0x000000801CD1931B2F14}

The general syntax is:
PREFIX TOKEN { DELIMITER TOKEN } { { =Value} | {?} }
The prefix string is rfid:

3.3 Assign a Variable

There are three types of variables:

1. Boolean
2. Integer
3. Character

Examples of Boolean Assignments

rfid:op.beep=0
rfid:op.beep=true
rfid:op.beep=False
rfid:op.beep=F

Examples of Integer Assignment

rfid:out.led=0003
rfid:out.led=3

> All 16 bit integer values require a hexadecimal entry
>
> For Example:
> pcProx Plus card types: rfid:cfg.card.type=0xFFFF

Examples of Character Assignment

rfid:chr.fac=':' CR
rfid:Chr.fac='x3a' CR

3.4 Query a Variable

A Variable can be queried to display its current value.

If a Variable is changed incorrectly, the settings can be replaced with those from flash using the `rfid:cfg.read` command.

- The output of the Variable displays between curly braces

  For example:

  RF IDeas>rfid:out.led?
  {3}

- Booleans display as true or false
- Integers display as 0..255 with leading zero suppression. 16 bit integers display in hex.
- Characters display as single quoted printable ASCII characters in the range 0x20..0x7E
- Values from 0x00 .. 0x1F and 0x7F..0xFF will appear with a leading backslash lowercase x and the two digit upper case hex number.

Immediate Commands

There are two commands which have an immediate effect on the reader's end user experience. Those are `rfid:beep.now` and `rfid:out.led`.

Changes to these Variables can be made in the end application to enhance the users experience with the reader or alert them to a certain mode.

For example, the LED can be toggled between color modes to provide a visual prompt for action or the beeper can be sounded in a given pattern to provide an audible prompt to the user.

Queued ID Commands

The queued ID commands are a powerful group of commands that package the Identification data with data statistics.

They provide:
- A counter to reveal how long ago the data was read and whether it is still present at the reader
- Buffer overwrite statistics
- Lockout time revealing how long before another ID can be read
- ID in hex
- Bit count of the ID presented
- Card Age

Format
pcProx: {0x1000,0,0x00,00;0x00000000000000000000}
pcProxPlus: {0x1000,0,0x00,0;0x00}

Field Names

{AGE, OVERRUN, LOCKOUT, BITCOUNT; ID}

AGE: A hexadecimal age of the last card read in multiples of 48ms. Value stops incrementing when it reaches 0xFFFF indicating the ID has not been present in over 52 minutes. The value resets when a new credential is presented to the reader.
The `rfid:qid.id` or `rfid:qid.id.hold` functions can be used to clear the age counter. As shown in the Format examples on the previous page, the card was read 4,096 (0x1000 hex) x .048 = 196.608 seconds ago or 3 minutes and 16 seconds.
The Age value also functions as a means of detecting card presence.

> See the following sections on "Queued ID on pcProx readers" or "Queued ID on pcProx Plus line of readers" for more information.

OVERRUN: A counter indicating the number of times the buffer has been over written with new data without the content being read. Value range: 0 through 255

LOCKOUT: Time (in multiples of 48ms) remaining until another ID can be read. The `rfid:qid.id.hold` function can be used to clear the lockout field, allowing a new card to be read immediately after clearing the lockout time.

BITCOUNT: The bit length of card data (26 to 255). The `rfid:qid.id` or `rfid:qid.id.hold` functions can be used to clear the bit count field along with other associated fields in the data package. Queued ID Commands (cont.--)

ID: Card data in hexadecimal. The value will update, provided that the lockout time has expired and new data has been read. The `rfid:qid.id` or `rfid:qid.id.hold` functions can be used to clear the ID field.

Queued ID on pcProx® Readers

When first powered on, all values will be set to zero. The ID data is framed to 10 bytes and padded to provide a set ID field limited to 80 bits in length.

With a credential still present in RF Field, the Card Age field will increment to a low value number and reset as the data is updated from the RF data transmission. This provides a means to detect card presence.

When the card is removed from the RF field, the data transmission is no longer updated. The ID data will be retained in the queued ID data package and the Card Age will increment to 0xFFFF (approximately 52 minutes) unless a new credential is presented to the reader.

The queued ID data package can then be cleared, if desired, using `rfid:qid.id` or `rfid:qid.id.hold` commands.

See the Command Summary list on page 14 for more information.

pcProx Output Examples
Reader first initialized and no card presented (powered on):
{0x0000,0,0x00,00;0x00000000000000000000}

After card read (as shown with leading and trailing parity stripped):
{0x0002,0,0x05,24;0x0000000000000CE0004}

`rfid:qid.id` sent to the reader:
{0x0002,0,0x05,24;0x0000000000000CE0004} << Data collected
{0x0000,0,0x04,00;0x00000000000000000000} << then cleared.

Make note of the lockout time remaining.

Queued ID on pcProx® Plus Readers

The pcProx Plus introduced the ability for an ID to be any length up to 256 bits. The queued ID package fields remain consistent with the pcProx readers. The ID data is no longer framed to 10 bytes and the Card Age field has been enhanced to give a faster indication of card presence.

When a pcProx Plus reader is first powered on, the Card Age will be set to 0xFFFF and all other values will be set to zero. With a credential still present in RF Field, the Card Age field will remain at 0x0000 until the RF data transmission has ended, indicating the card is no longer present.

When the card has left the RF field, the Card ID will remain and the Card Age counter will increment to 0xFFFF unless a new credential is presented, repeating the process again.

The queued ID data package can then be cleared, if desired, using `rfid:qid.id` or `rfid:qid.id.hold` commands.

See the Command Summary list on page 14 for more information.

pcProx Plus Output Examples
Reader first initialized and no card presented (powered on):
{0xFFFF,0,0x00,0;0x00}

After card read (as shown with leading and trailing parity stripped) card still present:
{0x0000,0,0x05,24;0xBE0004}

After card removed (as shown with leading and trailing parity stripped):
{0x0051,0,0x05,24;0xBE0004}

rfid:qid.id sent to the reader:
{0x0002,0,0x05,24;0xCE0004} << Data collected
{0x0000,0,0x04,00;0x00}   << then cleared.

Make note of the lockout time remaining.

3.5 Command Summary

Command	Data Type	R, W, R/W	Definition
`rfid:beep.now`	INT	W	Sounds the beeper immediately up to 5 short beeps or 2 long beeps. beep.now variables: 1 – single short beep 2 – two short beeps 3 – three short beeps 4 – four short beeps 5 – five short beeps 101 – single long beep 102 – two long beeps
`rfid:cfg`	INT	R/W	Verify or switch the current configuration set in RAM (Config 1 or 2) Some readers have multiple configurations. Each configuration has settings associated with the designated card type setting.
`rfid:cfg.card.hipri`	BOOL	R/W	Enable priority card read. IF true, current configuration is given priority over the alternate configuration
`rfid:cfg.card.list`	Function		View list of supported card types and their hexadecimal entries for the rfid:card.type command.
`rfid:cfg.card.type`	INT (hex)	R/W	Verify or set card type for current configuration in RAM as 16 bit INT (0x0000..0xFFFF) Make note that 0x0000 is off.
`rfid:cfg.read`	Function		Read the flash memory settings in to RAM
`rfid:cfg.reset`	Function		Reset the flash memory to the factory defaults.
`rfid:cfg.write`	Function		Write the variables from RAM in to flash memory.
`rfid:chr.1`	CHAR	R/W	1st card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
`rfid:chr.2`	CHAR	R/W	2nd card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
`rfid:chr.3`	CHAR	R/W	3rd card data delimiter character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
`rfid:chr.count.lead`	INT	R/W	Verify or set the leading character count (0 to 3)
`rfid:chr.count.trail`	INT	R/W	Verify or set the trailing character count (0 to 3)
`rfid:chr.eol`	CHAR	R/W	Verify or set end of line termination character (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:chr.fac	CHAR	R/W	Verify or set separating character between the facility code and ID data (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D) Ex: 123 ; 456789

Command	Data Type	R, W, R/W	Definition
rfid:chr.gone.1	CHAR	R/W	1st character sent when card is removed (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:chr.gone.2	CHAR	R/W	2nd character sent when card is removed (A - Z, 0 - 9, a - z or ASCII \0x00 ….\0x0D)
rfid:cmd.echo	BOOL	R/W	IF True, enable echo of user input and use of backspace key
rfid:cmd.prompt	BOOL	R/W	IF True, enable RF IDeas command prompt
rfid:dev.luid	INT (hex)	R/W	Verify or set the logical unique identifier as 16 bit INT (0x0000..0xFFFF)
rfid:dev.part	Function		Read the device part number
rfid:dev.ver	Function		Read firmware version (major . minor . variant)
rfid:disp.64bit	BOOL	R/W	IF True, use 64 bit math on ID data
rfid:disp.fac.64bit	BOOL	R/W	IF True, use 64 bit math on facility code data
rfid:disp.fac.digits	INT	R/W	Verify or set Length of facility code output (up to 25 digits)
rfid:disp.fac.hex	BOOL	R/W	IF True, enable facility code output as hex
rfid:disp.fac.send	BOOL	R/W	Enable output of facility code
rfid:disp.fac.strip	BOOL	R/W	Set to True to separate ID and FAC. False processes ID and FAC together.
rfid:disp.hex.lower	BOOL	R/W	IF True, hex ID data is output in lowercase
rfid:disp.id.digits	INT	R/W	Verify or set ID data length (0 to 25 digits). If value is shorter than actual Id length the left most significant digits will be truncated The Help Command screen shot shows the value range of 0-255, since internally this is stored as a byte.
rfid:disp.id.hex	BOOL	R/W	IF True, enable ID data output as hex
rfid:help	Function		View menu of commands, summary of output types and variable options
rfid:op.beep	BOOL	R/W	Beeper output control True=beep, False=silent
rfid:op.cont	BOOL	R/W	Continuous read mode True=continuous output, False=single output of credential data
rfid:op.sdk	BOOL	R/W	IF True, enable Quiet mode. (IE: Credential data is not displayed) Data can still be retrieved using function rfid:qid
rfid:out.led	BOOL	R/W	LED output control 0=off, 1=red, 2=green, 3=Amber (Immediate out w\o write) 255=Automatic control by reader (requires write to flash) red on standby, green when credential is read

Command	Data Type	R, W, R/W	Definition
`rfid:qid`	Function		Reads current queued ID data EXAMPLE Output String: {0x1000,2,0x0000,80;0x000000801DD1910B2F04} ---Note the use of commas and semicolons-- FORMAT of Output String: {AGE,OVERRUN,LOCKOUT,BITCOUNT;ID} AGE (New: Age (in hex) of last card read as a multiple of 48ms. Value stops at 0xFFFF. Use qid.id function to clear the age counter. As shown: the card was read 4,096 (0x1000 hex) x .048 = 196.608 seconds ago or 3 minutes and 16 seconds. OVERRUN counter (Values: 0 through 255): number of times buffer has been over written with new data without content transfer. LOCKOUT: Time (in multiples of 48ms) remaining until another card can be read. BIT COUNT bit length of card data (26 to 255). As shown: The ID contains 80 bits. ID: Card data in hexadecimal. As shown: Card is 80 bits and is 0x000000801DD1910B2F04.
`rfid:qid.hold`		R	Read the card data and reset lockout timer. Once the function is called, a new card can be read immediately after without waiting for the lock out time period to expire.
`rfid:qid.id`		R	Reads the card data, clears the age, overrun, and bit count after function is called.
`rfid:qid.id.hold`		R	Combined functions of rfid:qid.hold and rfid:qid.id
`rfid:time.hold`	INT	R/W	Verify or set current data hold time setting in multiples of 48ms. (0 - 200) Also controls duration of Green LED during Auto mode.
`rfid:var`	Function		Outputs current command variables in ram (Similar to a .HWG file). Output can be captured, edited and written back into the device. To prevent an input buffer overflow, delay each character by several milliseconds.
`rfid:wieg.id.bits`		R/W	Verify or set card data output bit count (0- 255)
`rfid:wieg.inv.bits`	BOOL	R/W	IF True, Invert card data output bits (1 to 0, 0 to 1)
`rfid:wieg.qual`	BOOL	R/W	IF True, use wiegand qualifier to verify card bit count
`rfid:wieg.qual.bits`	INT	R/W	Wiegand Qualifier: Number of bits (0 - 255) card data must have to be acknowledged as a read
`rfid:wieg.rev.bits`	BOOL	R/W	IF True, reverse bits of credential output lsb to msb

Command	Data Type	R, W, R/W	Definition
`rfid:wieg.rev.bytes`	BOOL	R/W	IF True, reverse the bytes of credential output LSB to MSB
`rfid:wieg.strip.lead.bits`	INT	R/W	Leading parity bit count to be stripped from credential data (0 to 15 bits)
`rfid:wieg.strip.trail.bits`	INT	R/W	Trailing parity bit count to be stripped from credential data (0 to 15)

Key:
R = Read only command
W = Write only command
R/W = Command can be read for its current value or written with a new value.

Value changes are stored in RAM till `rfid:cfg.write` is used to store the value in to Flash.

These three commands (specified in the above Key descriptions) identify the delimiter characters that can be displayed.

Three characters may be divided up as pre and/or post delimiters.

The `rfid:chr.count.lead` command identifies how many of the three characters (chr.1 .. chr.3) display before the card data.

For example, if `rfid:chr.count.lead` is set to 1, only one character displays before the card data and chr.2 and chr.3 can be set as post delimiters. Then `rfid:chr.count.trail` can have a value of 0, 1, or 2.

If `rfid:chr.count.lead` is 2, chr.1 and chr.2 are set as leading delimiters. Then, only chr.3 can be set as a trailing delimiter.

However they are used, the same character location cannot be used for both leading and trailing delimiter.

3.6 ACP Error Codes

ACP Errors	Descriptions
`Error#1`	Illegal Command. Will return "Try "rfid:help". Possible Wrong or missing prefix "rfid:"
`Error#2`	Input buffer overrun. Too many characters received without CR or LF
`Error#3`	Illegal Operation. - Variable assigned to function or variable used as function
`Error#4`	Range Error. Value assigned to variable exceeds limit (EX: 257 for 255 limit)

Chapter 4. Tips and Troubleshooting

4.1 Troubleshooting

If the device is not connecting, fails to respond or stops responding:

1. Confirm that the device is plugged into the USB or RS-232 port. When the workstation is on and no card is being read, the LED is red. A valid proximity card causes the LED to turn green, provided the configuration is not set to only read certain bit lengths.
2. Only one COM port application can own the RS-232 port at a time. Make sure there is not another COM port application running. This prevents our software from seeing the device.
3. Verify that the correct model and the software configuration screen agrees with the device attached.
4. Verify that the port chosen in the application is assigned to the workstation connector that the device is connected to.
5. In the case of a CDC or Virtual COM port device, check the driver installation. If using a Windows based system, right click on “My Computer” and chose “properties” from the drop-down menu. Click on Device Manager. Verify there are not exclamation points or red “X” indications under the COM port options. If one exists on the Virtual COM port, reinstall the appropriate driver then reboot the workstation. When the workstation boots up, re-attach the device and the driver should re-install automatically.
6. If the device does not read the card (no beep or transition from red to green from the LED), verify that the card or credential is compatible with the model or card type configuration chosen. Not all cards and credentials are the same. Cards and credentials may share logos but, may be of a different operating frequency and/or data format. If you are unsure if the card or credential is compatible with the reader model, contact your sales associate for more information on reader models.

4.2 Precautions

Do not mount the device directly on a metal surface. This could interfere with the RF signal and the operation of the device.

The device may not recognize valid cards in the presence of high RF fields. If current readings are erratic, **move the equipment from any nearby known transmitters**.

Contact Technical Support at 866.439.4884 for more information.

4.3 Before You Call Technical Support

Please make sure you've identified your reader model and credential type being used. Have this information ready so that your call will be routed to the correct specialist.

For Assistance:

Ph: 847.870.1723
E: TechSupport@RFIDeas.com

4.4 Talking to the Technician

Provide the reader model and credential type being used to the Technical Support Specialist.

Explain your problem to the specialist.

Be prepared to provide the following information:

- Error messages displayed on the computer
- What you were doing when the problem occurred
- What steps you have taken to resolve the problem, including results from each steps

Listen and follow the steps provided by the specialist.

Let the specialist know what happens when you perform these steps.

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FCC Compliance Statement

FCC ID: M9MPCPROXHUSB100 (HID USB model)	FCC ID: M9MBUPCPROXH100 (HID RS-232 model)
FCC ID: M9MPCPROXM101 (Indala model)	FCC ID: M9MBUPCPROXA100 (AWID)
FCC ID: M9MRDR6X8X (Kantech, Indala, Casi-Rusco)	FCC ID: M9MPCPROXP100 (Pyramid)
FCC ID: M9MPCPROXC101 (Casi-Rusco model)	FCC ID: M9MRDR7P71 (FIPS 201 13.56MHz)
FCC ID: M9MRFID1856I100 (MIFARE/iCLASS models)	FCC ID: M9MRDR7L81 (Legic 13.56MHz)
FCC ID: M9MRDR7081 (iCLASS Module based)	FCC ID: M9MRDR7580 (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7581 (iCLASS MIFARE and Other 13.56MHz)	FCC ID: M9MRDR7081AKF (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7081AKE (iCLASS MIFARE and Other 13.56MHz)	FCC ID: M9MRDR75DX (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR8XX8U (Plus combo model)	FCC ID: M9MRDR758X (iCLASS MIFARE and Other 13.56 MHz)
FCC ID: M9MRDR8058X (Multi-protocol Combo model)	FCC ID: M9M8058XCCL (Multi-protocol and Contact model)
FCC ID: M9M758XCCL (MIFARE and Contact model)	FCC ID: M9M7580CCL (MIFARE and Contact model)

"Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by RF IDeas might cause harmful interference and void the FCC authorization to operate this product.

Note: This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This product complies with FCC OET Bulletin 65 radiation exposure limits set forth for an uncontrolled environment.

The reader may not recognize value cards in the presence of high RF fields. If the current reading is erratic, the user shall take the following step: Move the equipment from any known transmitters nearby. For more information contact Tech Support at 866.439.4884.

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Appendix

Standard 26 Bit Format Structure

There are several bits constructed together that comprise data sent from the proximity card to the device. There are numerous bit formats and lengths for proximity cards. The most popular is a 26 bit card format. The typical layout for this format is 24 bits of usable information as the first and last are parity bits to ensure data integrity.

The 26 bit format consists of 255 possible facility codes. Within each facility code there is a total of 65,535 unique card numbers.

The standard 26 bit Wiegand format is H10301. It is binary encoded data. The format consists of 2 parity bits, 8 bit facility code (F) and 16 bit card number fields (B). This format displays below.

PFFFFFFFFBBBBBBBBBBBBBBBBP
EXXXXXXXXXXXX.............
.............XXXXXXXXXXXXO

Bit Coding
P = Parity
O = Odd Parity
E = Even Parity
X = Parity mask
F = Facility code, range = 0 to 255
B = Card Number, range = 0 to 65,535

In general, the 26 bit format is the industry standard format. Primary benefits of this include:

- Open format
- Convenient to order
- Universal access control panel acceptance

The sale of this format is not limited to any one company yet the range of card numbers available in this format is limited. There is a potential for card numbers to be duplicated.

Please go to www.RFIDeas.com and follow the Support > Learning Center > Proximity Card Formats link for more details. The card manufacturer may also have additional details about the card format.

Use the pcProx Device for Password Security - Complex Passwords

It is possible with certain limitations, to use the proximity token as a password for an application or operating system log on. The unique card bit-stream converted to either decimal or hexadecimal becomes the entire or a portion of the password. Enroll this card data to the password of the operating system application for the user.

Since the proximity token has no read/write memory, there is no way go change this or write alphanumeric characters such as a user name to the proximity token. Some examples are shown below. Please see RF IDeas pcProx Playback Starter Kit or call the Sales Department if this capability is needed.

Several companies have adopted a policy that requires users to change their password every xx number of days to increase security. The PIN is the portion of the password the user changes every xx number of days. Since the card data is completely numeric, any alpha and upper/lower case letter constraints are handled in the user supplied PIN.

A two-factor authentication system is made up of:

1. Card ID data
2. Personal Identification Number (PIN)

The device may be configured to allow operation under either a one or two-factor authentication system.

<u>One-Factor</u>
In a one-factor system, the user simply scans the ID card. The device may be configured to add TAB keystrokes ahead of the data as well as a TAB or ENTER keystroke after the card data.

<u>Two-Factor</u>
The two-factor approach is especially useful when insisting on password construction rules or periodic changing of passwords.

In a two-factor system, the user may enter the PIN either before or after the card data. If the user adds the PIN before the card data, the device may be configured to append the ENTER keystroke.

<u>Pre and Post Characters</u>
There are some additional measures that can be taken to make it more difficult for unauthorized users to reproduce passwords.

Adding additional keystroke characters to the card information, that is difficult to re-produce, while configuring the data. These additional characters are labeled as Sp1, Sp2, and Sp3 on the delimeters tab menu selections.

Specifications subject to change without notice.

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Please feel free to call, e-mail or visit our web site for a full list of applications, products, configuration options, supported cards and form factor specifications. Our web site includes application videos, support materials, case studies and detailed information about our product line.

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