MODEL 3037E

HAND HELD WAND TAG READER
HAND HELD WAND TAG PROGRAMMER

OPERATING MANUAL

version 9.02

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If you are reading a PDF version of this manual you may notice page numbers and the above contents to be off by a page from time to time. The conversion to Acrobat has a tendency to move sections, as the fonts don't translate perfectly.

QUICK START GUIDE

Simply power the unit on by applying a battery. If the slide power switch is included, slide it forward to the on position. You will know power is on if you depress the READ button located in the center of the label and the Wand's LED turns from off to red.

Present a Tag to the nose of the Wand and depress the READ button. A positive read will result in the LED turning from Red to Green, as well as vibration of the Wand. If a read is not achieved, the Tag may not yet be programmed.

To program a Tag, you must have available to you a terminal program, like Procomm or HyperTerminal, and of course a PC. RFID, Inc. supplies its own terminal program free of charge.

Upon powering the Wand on, the following start up message will appear:

> RFID, Inc.

> V (0049)-01 (version numbers will differ dependent upon part number)

This message will not appear however when using RFID, Inc.'s terminal program. Upon scanning and reading a Tag, that Tag's data will be displayed in the terminal program.

To power the Wand off, slide the side power switch back, or if not available, remove the battery. DO NOT LEAVE WAND ON for extended periods of time as the battery will last a maximum of 3 days with a heavy duty battery, less with a standard battery.

LOADING AND USING RFID, INC.'s TERMINAL PROGRAM

If you are using another terminal program, see section 3.2 to read and write Tags to your PC.

To load the RFID, Inc. terminal program, simply insert the CD ROM, go the directory, open the folder displayed, and double click the Setup.exe file and follow the prompts.

Remember what directory you install the program to so that you can execute it, or go to Start, Programs, find the program, then execute. If the Wand is not yet connected to your COM port, the software will tell you so, but once you are connected and power the Wand on, the program will respond. The Connected indicator in the program should turn from red to green letting you know you are connected.

From here the program is very simply to operate. Ignore the icon selections for Single (S) or Duplicate (D) report read mode as these icons are not needed in using the Wand. The Wand only operates in a single mode. This terminal program is also used for other RFID, Inc. Readers and hardware. If you now scan a Tag, its data will appear in the area labeled "Tag Reading".

To program a Tag, in the "Write Tag Data" area, select the Prepare to Write "P" icon, type the data you would like to program in the box provided, and select the Write "W" icon to execute the write. A brief delay will be experienced, but if the Tag is presented to the nose of the Wand a "Success" indication will be displayed.

SECTION 1
GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides information pertaining to the installation and operation of the Model 3037E under the following part numbers:

| Part Number	Tag Characters	Tag Type	Power Control
PN800-0091-02	32 Tag Characters	Read Write	Slide Switch
PN800-0091-03	32 Tag Characters	Read Write	Remove/Apply Battery
PN800-0091-04	16 Tag Characters	Read Write	Slide Switch
PN800-0091-05	16 Tag Characters	Read Write	Remove/Apply Battery
PN800-0091-06	8 Tag Characters	Read Write	Slide Switch
PN800-0091-07	8 Tag Characters	Read Write	Remove/Apply Battery
PN800-0091-08	10 Characters	Read Only	Slide Switch
PN800-0091-09	10 Characters	Read Only	Remove/Apply Battery

1.2 DESCRIPTION

The Model 3037E reads and reprograms electronic Tags, transponders, interfacing to a PC or logic device through a serial port. The Wand provides a half-duplex asynchronous bit serial data stream interfacing to various equipment compatible with RS-232-C specifications. The Interface is configured as Data Terminal Equipment (DTE) standard ASCII communications.

The 3037E detects, filters and amplifies the data emitted from a Tag and converts that data into a serial string. Basically, the Interface provides RF to digital translation of the signal produced by RF Electronic Labels, Tags, when scanned in proximity to the Wand. Advanced error detection algorithms provide error-free operation. All messages are transmitted in printable ASCII characters.

Via the serial connection, the Wand can also be commanded to program Tags, dependent upon the Tag version in use, lock that Tag's, or portions of the memory.

1.3 SPECIFICATIONS

Protocol:	Half-duplex, RS-232-C
Baud Rate:	19200
Bits Per Character:	8
Parity:	None
Stop Bits:	1
Error Rate:	Less than 1 in 10 to the 14th readings
Serial Connector:	9 Pin D-Sub female
Battery:	Standard 9 volt
Temperature Range	Operating: -40 to +70 degrees C
	Non-operating: -55 to +85 degrees C
Dimensions:	See drawing below
Weight with battery:	8 ounces 216 grams
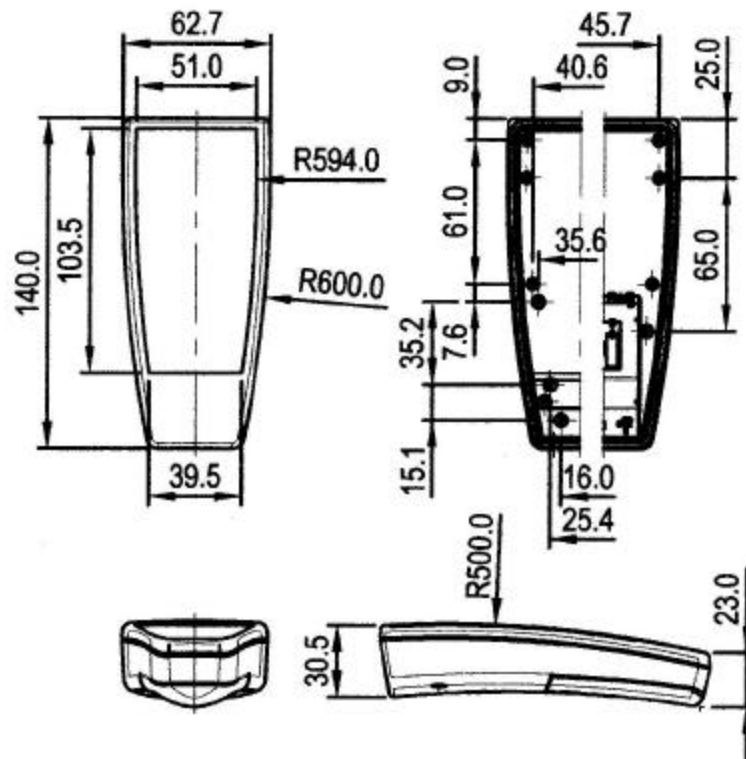
SECTION 2
PREPARING TO OPERATE THE WAND

2.1 POWER USAGE

A battery is included in the shipment of each Wand.

220 mA is drawn on the battery when a read or write is executed. In its idle mode 15 mA is drawn. Battery life will depend upon the type of battery you intend to use. Obviously a rechargeable 9 volt battery will make economic sense if you intend to use the Wand frequently, and a high grade heavy duty battery will last longer.

DO NOT LEAVE WAND ON for extended periods of time as the battery will last a maximum of 3 days with a heavy duty battery, less with a standard battery.

2.2 SERIAL CONNECTION

The Model 3037E Wand connects to the host via 9-pin female "D" sub connector. Therefore, a cable with a 9-pin male "D" sub connector on one end and the appropriate connector required for the host on the other end must be built or purchased if your host does not already contain this COM port. Determine which type of equipment you have for your host.

Communication characteristics, speed, parity, and number of bits per character, must be matched between the Wand and the connected host. If the Wand is talking at 19200 baud (bits per second) and the host at 4800, they'll never understand each other. If Tag reports or the power up message is reporting in an unintelligible language, this is good, at least you have established communications and only need to change your program or host settings to 19200, 8, N, 1, at half duplex.

The Wand's 9 pin serial port is configured as Data Terminal Equipment (DTE) meaning that it transmits its data on pin 2 and receives data on pin 3. Conversely, a Data Communication Equipment (DCE) device receives on Pin 2 and transmits on Pin 3. Most terminals and IBM-PC compatible interfaces have 9 pin COM ports configured as DCE. But if your control device's 9 pin COM port does not receive on pin 3, there exist simple converters called modem eliminators, which accomplish the crossing of pins 2 and 3 for you. Since RS-232 pin designations are not always standardized, check your host's operating manual for verification. The important thing is to connect the Interface's Transmit Data (TD) signal (pin 2) to the host's Receive data (RD) signal, the Interface's Receive Data (RD) signal (pin 3) to the host's Transmit Data (TD) signal, and the Interface's Ground (pin 7) to the host's Ground.

- If your 9 PIN COM port is Data Communications Equipment (DCE) configured a straight connection may be made.

- If your 9 PIN COM port is Data Terminal Equipment (DTE) then a null modem connector will be necessary. The null modem switches the activity on pins 2 & 3, so that they do not transmit and receive on the same lines. Here are the pin designations on the Wand serial cable.

PIN#	SIGNAL NAME
2	TD - Transmitted Data
3	RD - Received Data
7	GND - Signal Ground

2.3 SERIAL PROTOCOL AND APPLICABLE DOCUMENTS

EIA Standard, RS-232-C August 1969
RFID, Inc. Interface Specification 710-0004-021

OPERATE THE WAND

3.1 POWER UP MESSAGE

Power the Wand on by either applying the battery or applying the battery and sliding the power switch up to the on position. Whenever the Wand is powered up or reset, it issues a power up message. This message lets you know that a self diagnostic test has been performed and the Wand is ready for use. In any program you have developed, or any generic terminal program the following power up message should be received:

   RFID, Inc.

   V (0049)-01(version numbers will differ dependent upon part number)

The issuance of this message signifies to you at least one-way communication, the transmission function, is working properly. The power up message is preceded by a Carriage Return (<CR>) and then a Line Feed (<LF>), and is followed by the same.

3.2 ISSUING COMMANDS AND RECEIVING TAG READS

To test communication from the host to the Interface, issue a Carriage Return (hit return). The response you get should be that of a question mark. If successful, you now know two way communication has been established.

There are basically only 2 commands available with the Read Write Wand version. There are no commands necessary, or available, with the Read Only Wand version.

3.2.1 Read Only Tags

When a Tag is scanned, 10 characters of unique data should be received. This data is available only in an ASCII representation of hex format, that is, the characters of 0-9 and A-F.

3.2.2 Read Write Tags

Tags can be programmed with 8, 16, or 32 characters, depending upon which Wand version you have ordered. 32 characters is the example used herein.

A Tag will report in the following format:

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx<CR><LF>, where x equals data characters. Data characters are not necessarily limited to hex. 8 character Tags use only hex characters with the ASCII representations

of 0-9 A-D. In the case of 16 or 32 character Tags, Tags may be programmed with the ASCII representations detailed in the Valid Tag Character Set table below, also listing hex value.

Any of these ASCII characters found on most PC keyboards can be used as data characters. Notice that only capital letters are used.

Valid Tag Character Set

@	40	0	30	A	41	P	50
!	21	1	31	B	42	Q	51
"	22	2	32	C	43	R	52
#	23	3	33	D	44	S	53
$	24	4	34	E	45	T	54
%	25	5	35	F	46	U	55
&	26	6	36	G	47	V	56
'	27	7	37	H	48	W	57
(	28	8	38	I	49	X	58
)	29	9	39	J	4A	Y	59
*	2A	:	3A	K	4B	Z	5A
+	2B	;	3B	L	4C	[	5B
,	2C	<	3C	M	4D	\	5C
-	2D	=	3D	N	4E	]	5D
.	2E	>	3E	O	4F	^	5E
		/	2F	?	3F		

3.2.3   WRITE COMMAND

You do not have to depress the Wand's READ button to achieve a write, to program a Tag. Simply issue a Write command.

Any Write command must be preceded by an open square bracket, " [" and followed by a closed square bracket "] " or a carriage return. The Wand recognizes both a closed square bracket and a carriage return as the same keystroke. All programming must be done in capital letters. If you are using the RFID, Inc. terminal program you may notice the program automatically converts any data input to be written, into capitals.

Issue this command:

[W123] (or hit return on your keyboard to end the command)

You will receive the following message:

Tag programmed

Now go ahead and read the Tag by depressing the READ button. You will receive this response:

10

123000000000000000000000000000

Any character left unspecified by the user will be filled in with zeros.

3.3 ADVANCED TAG MEMORY MANAGEMENT

It is important for you to understand that the Read Write Tag holds 256 bits of memory, and that memory can be managed in many different ways. Many different options are available to you.

There are available lock bits that can be used to forever lock certain portions of data so they cannot be changed or reprogrammed.

More memory characters are available if RFID, Inc. uses fewer bits per character than the 6 bit hybrid ASCII set in this version.

Larger memory 1k and 2k bit eeprom chips could be used to offer more data characters.

If you feel you need advanced Tag memory options, please ask to see our 256 bit Tag specifications document which will detail for you how the eeprom is set up and different options available to manage that memory.

3.4 ERROR MESSAGES

There are basically 2 Error Messages you may receive if the wrong command or keystroke is used.

Illegal Data Character !
You will receive this error message if you attempt to use a keyboard character not specified in the Valid Tag Character Set Table found in section 3.2.2

?
You will receive this error message if you have issued an invalid command to the Wand. Basically the Wand is indicating it does not understand the command you have attempted. If you make a keystroke error, and then attempt to backspace and retype the correct keystroke, you will receive this error message as well.

WARRANTY

RFID, Inc. products are warranted against defects in materials and workmanship for one (1) year from date of shipment. RFID, Inc. shall, at its option, either repair or replace products that prove to be defective and are returned with freight prepaid to RFID, Inc.'s plant within the warranty period. The foregoing warranty shall not apply to defects resulting from abuse, misuse, accident, alteration, neglect or unauthorized repair or installation. RFID, Inc. shall have the right of final determination as to the existence and cause of the defect.

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