



International Pocket Tag Reader

User Guide



Warranty

Stanley Healthcare Solutions' products are warranted against defects in materials and workmanship and shall perform in accordance with published specifications for 1 year.

Stanley Healthcare Solutions' warranty is limited solely to the repair or replacement of the defective part or product. Stanley Healthcare Solutions reserves the right to change product specifications without notice.

Important Recommendation

Stanley Healthcare Solutions' systems are designed to assist staff in providing a high degree of safety for people and assets and therefore should be used as a component of a comprehensive security program of policies, procedures, and processes. As with every security system, **Stanley Healthcare Solutions highly recommends regular system operational checks** to verify functional integrity.



Table of Contents

Introduction	1
Important Security Warning	1
Controls and Display	2
Turning the Pocket Tag Reader On	2
To Turn the Pocket Tag Reader Off	3
Backlight	3
Battery Replacement	4
Pocket Tag Reader Operation Overview	5
Tag and Controller Reading Range	5
LED Display	6
Functions and Modes	7
User Mode Operations	8
Tech Mode Operations	9
Working in User Mode	10
Tag Test Mode	10
Tag Revision Mode	11
Check Field Mode	12
Check RF Noise Mode	13
Working in Tech Mode	14
TLM Mode	14
Show Tag Message Mode	18
Downloading Data to a PC	21
Installing and Using the Tag Reader Program	22
Glossary	27
Index	29

Introduction

This User Guide describes the use of the Stanley Healthcare Solutions Pocket Tag Reader. The Pocket Tag Reader is a test tool for reading, testing and configuring Stanley Healthcare Solutions active Radio Frequency Identification (RFID) tags and setting the preliminary strength of the controller exciter field. The Pocket Tag Reader can assess Radio Frequency (RF) power levels and noise levels at both controller and tag frequencies. The Pocket Tag Reader: AR3TR02-POC

- ◆ Displays tag electronic serial numbers
- ◆ Provides a quick pass/fail indication for evaluating tag performance
- ◆ Automatically measures tag battery level
- ◆ Can test tags that are deployed or stored
- ◆ Enables, disables and modifies Tag Location Messages (TLM)
- ◆ Can continually listen for and can test Tag Initiated Communication (TIC) messages and Tag Location Messages

These operations can be recorded in the unit's non-volatile memory and downloaded to a separate PC for storage and analysis.

Important Security Warning

The Pocket Tag Reader is a mobile testing device intended for use by authorized, qualified personnel.

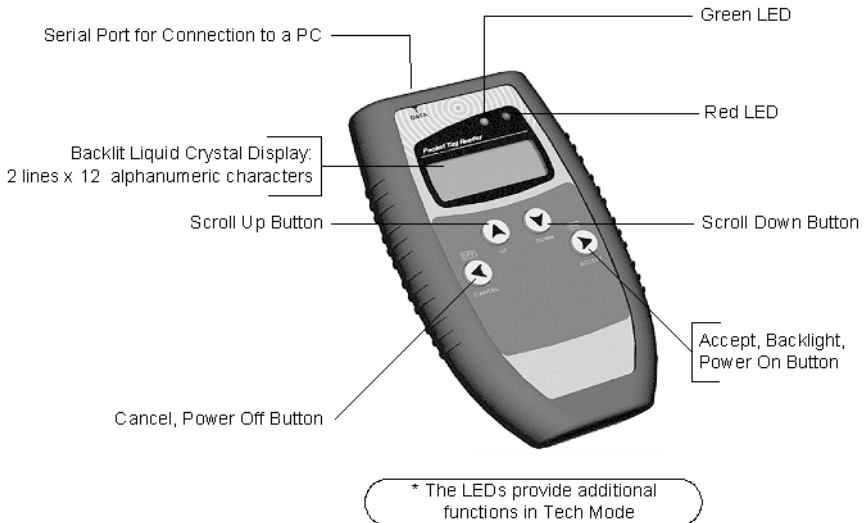
Used improperly, the Pocket Tag Reader can compromise the security system.



Ensure that adequate procedures and precautions are in place to control the movement of this device; and to prevent the use of this device by unauthorized personnel.

Controls and Display

Figure 1 Controls and Display of the Pocket Tag Reader



Turning the Pocket Tag Reader On

When you power on the Pocket Tag Reader you select either User Mode or Tech Mode. These are described later on page 8.

User Mode: To power on press  until the screen displays:



TAG READER
USER MODE

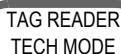
The Pocket Tag Reader will display the self test screen and then display the top screen of the User Menu:

REV 1.00
DEVICE OK

USER MENU
USE UP/DOWN

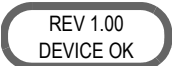
Note: *If the battery voltage is low when the Pocket Tag Reader is turned on then a low battery message will be displayed and the Pocket Tag Reader will power off. See “Battery Replacement” on page 5.*

Tech Mode: To power on press and hold both  and  until the screen displays the following:

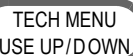


TAG READER
TECH MODE

The Pocket Tag Reader will display the self test screen and then display the top screen of the Tech Menu:




REV 1.00
DEVICE OK



TECH MENU
USE UP/DOWN

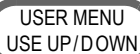
Note: *After 60 seconds of inactivity, the Pocket Tag Reader will automatically power off.*

To Turn the Pocket Tag Reader Off

Press and hold the  until the screen becomes blank.

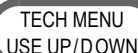
Backlight

To use the backlight: While either the top screen of the User Menu



USER MENU
USE UP/DOWN

or the top screen of the Tech Menu



TECH MENU
USE UP/DOWN

is displayed, press and hold .

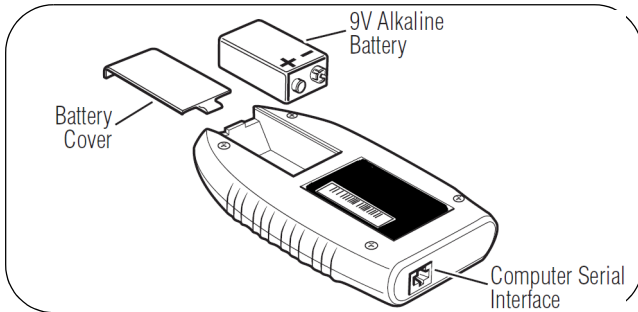
Battery Replacement

The Pocket Tag Reader display will indicate when the battery voltage is low as follows:

- ♦ At power on, a low battery message will be displayed and the Pocket Tag Reader will power off.
- ♦ When in use, after every six keystrokes the Pocket Tag Reader will beep three times, the Green and Red LEDs will flash, and the battery low message will appear.

Install a new 9 V alkaline battery as shown in Figure 2.

Figure 2 Battery Installation

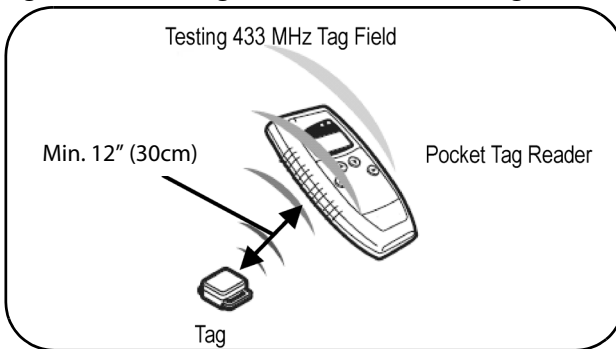


Pocket Tag Reader Operation Overview

Tag and Controller Reading Range

Tags are best read at a minimum of 12" (30 cm) below the Pocket Tag Reader. However, tags may be placed adjacent to the Pocket Tag Reader when both are on a flat surface.

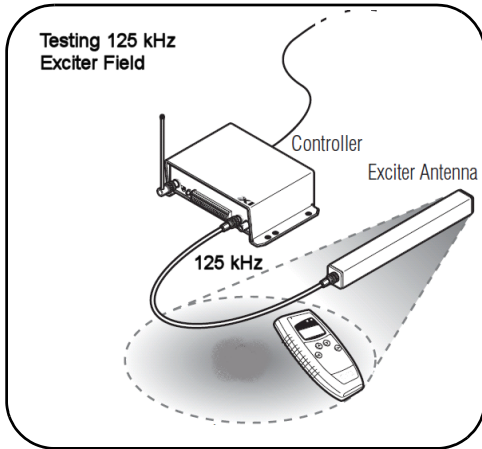
Figure 3 Pocket Tag Reader in RF Field from Tag



For best results, place skin sensing tags on a shielded (e.g. metal) surface when testing. Skin sensing tags are curved to fit against the wrist or ankle and have large areas of copper visible beneath the clear plastic of the tag back.

Note: *The performance of the Pocket Tag Reader may vary according to its surroundings. The Pocket Tag Reader should acquire the tag signal within 2 to 3 seconds but acquisition could be as long as 30 seconds.*

Figure 1: Pocket Tag Reader in RF Field from Controller



The type of tag and radio frequency (RF) noise may affect the performance of the Pocket Tag Reader. RF noise radiates from notebook computers, PC monitors, and other devices. If performance seems slow then try the following:

- ◆ Move the tags and reader to another area away from devices radiating RF energy,
- ◆ Move the Pocket Tag Reader around the tag; or,
- ◆ Position the Pocket Tag Reader at different angles to the tag.

To find areas that are relatively free of RF noise, please see “Check RF Noise Mode” on page 15.

The ranges of door controller fields are deliberately restricted. When checking a door controller field, stand within the area where a tag would affect the door controller.

LED Display

The Pocket Tag Reader has one green and one red LED. These display the information shown in Table 1.

Table 1 LED Display

Status	LED	Mode
433 MHz signal detected	Green LED blinks.	All test modes.
125 kHz signal detected	Red LED blinks.	Only in Check Field Mode, or in Check Noise Mode.
Operation Completed	Red LED blinks once.	All modes.
Additional RF activity	Both LEDs blink.	Only in Check Field Mode, or in Check Noise Mode.

Functions and Modes

The Pocket Tag Reader can be used in either User Mode or Tech Mode. User Mode provides a set of operations that are useful for maintaining a fleet of tags. Tech Mode enables and modifies advanced tag communications. Table 2 below provides a summary of the Pocket Tag Reader functions in each mode.

Table 2 Function and Mode Summary

Operating Mode	User Mode	Tech Mode
Tag Test Mode Reads the tag serial number by generating an RF field. Tests the tamper mechanism of a Supervised tag. Reads the battery status and firmware revision of the tag.	X X X	
Tag Revision Mode Queries the tag to display serial number, revision number, and expiration date.	X	
Check Field Mode Checks the exciter field strength near a door controller.	X	
Check RF Noise Mode Checks for ambient RF noise in either the low or high frequency band.	X	
TLM Mode Queries tag and displays tag TLM status. Enables or disables the tag pulse and sets the TLM rate.		X X
Show Tag Message Mode Continuously monitors for TIC or TLM and displays messages received.		X
Data Download Downloads data to a PC for analysis.	X	X

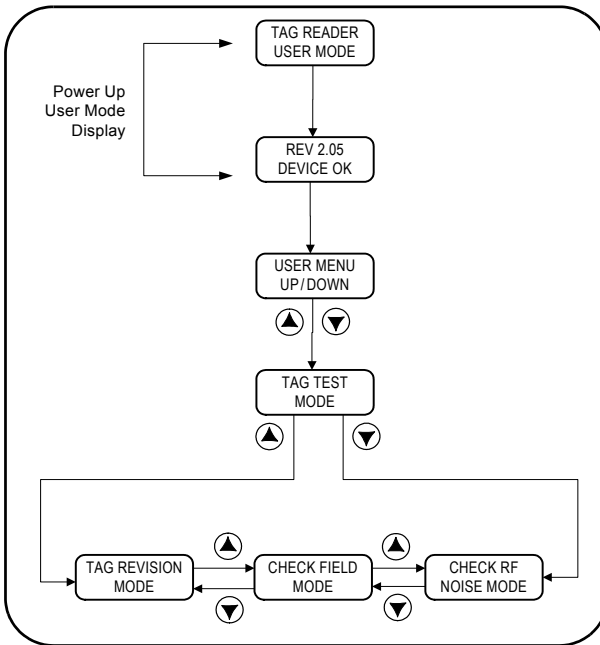
User Mode Operations

User Mode is described in Table 3 and in Figure 5.

Table 3 User Mode Operations and Pocket Tag Reader Modes

Operation	Pocket Tag Reader User Mode
Maintain a fleet of tags	Tag Test Mode Tag Revision Mode
Check a controller RF field	Check Field Mode
Assess the ambient RF noise level	Check RF Noise Mode

Figure 4 User Mode Top-Level Menu Options



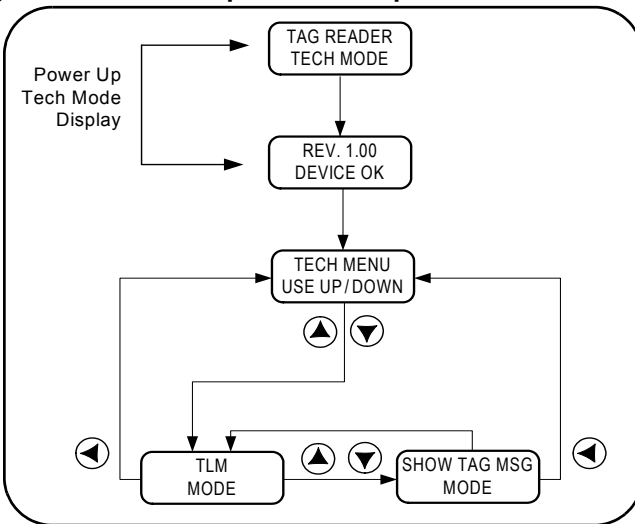
Tech Mode Operations

Tech Mode is described in Table 4 and Figure 6.

Table 4 Tech Mode Operations and Pocket Tag Reader Modes

Operation	Pocket Tag Reader Tech Modes
Enable, disable and set the rate for Tag Location Messages (TLM)	TLM Mode
Verify correct Tag Initiated Communication (TIC)	Show Tag Message Mode

Figure 5 Tech Mode Top-Level Menu Options



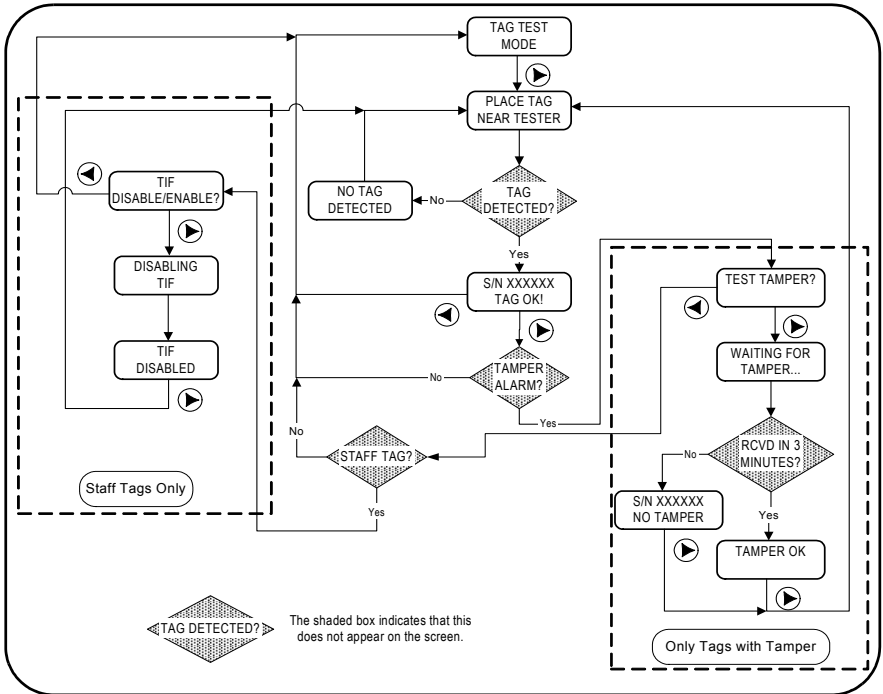
Working in User Mode

Tag Test Mode

The tag testing procedure shown in Figure 7 enables you to:

- ◆ Read the tag serial number
- ◆ Test the tag alarm
- ◆ Enable and disable the Tag in Field (TIF) alarm on Staff tags only
- ◆ Check the tag battery — Results are displayed *ONLY* if the battery fails the test.

Figure 6 Testing Tags in Tag Test Mode



Testing the Tamper Alarm of an Infant tag: Infant tags can be recognized by the large copper area visible through the clear plastic on the back of the tag.

- ▶ To test the Tamper Alarm of an Infant tag:
Hold the tag with your thumb covering the entire skin sensor for at least 10 seconds. Move your thumb off the sensor. The tag will transmit a Tamper Alarm.

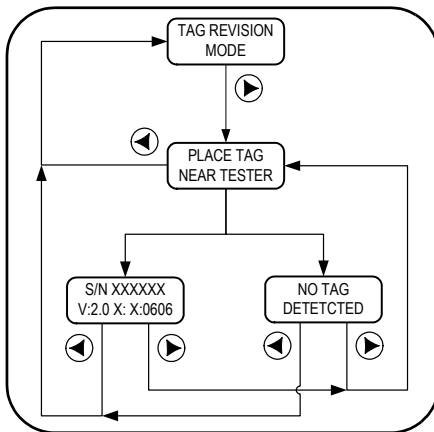
Testing the Tamper Alarm of an Asset Tag: Asset tags can be recognized by the small pin protruding from the back of the tag.

- ▶ To test the Tamper Alarm of an Asset tag:
Hold the tag pin in for at least 10 seconds and then release the pin. The tag will transmit a Tamper Alarm.

Tag Revision Mode

Using the procedure shown in Fig. 8 to check the following: serial number, version number, and revision level.

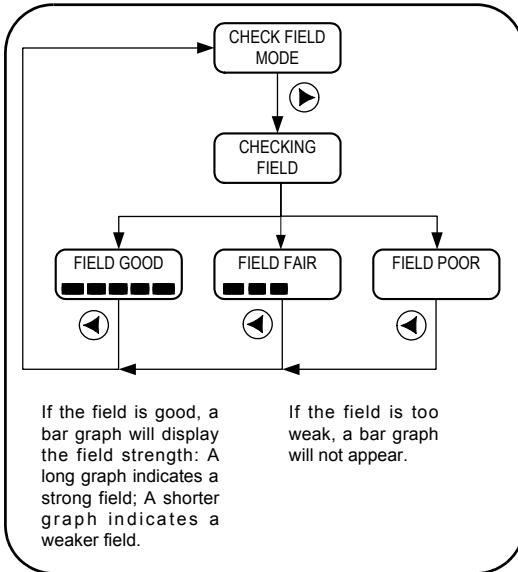
Figure 7 Tag Revision Mode



Check Field Mode

Using the following procedure you can check the strength of the RF field of the controller.

Figure 8 Check Field Mode



Different controllers have different uses, and as a result, the controller RF field may be deliberately limited. For example, a controller designed to lock a door when a tag approaches will have a field which is limited to an area within a few feet of the door. When checking the RF field strength, stand within the area where you would expect the tags to be recognized.

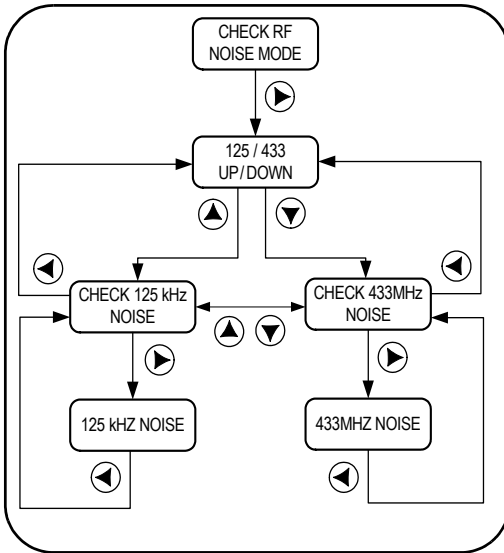
Decreased RF Field Strength

when Tag Nearby: The strength of the RF field will appear to decrease by about half when a tag enters the field. This is an erroneous reading. Only test field strength when a tag is not in the field.

Check RF Noise Mode

Using the following procedure, you can check for RF signals from sources other than the Stanley Healthcare Solutions equipment.

Figure 9 Check RF Noise Mode



Unwanted RF signals are usually termed noise. RF noise is only a problem when it occurs at the same frequencies as used by the Stanley Healthcare Solutions equipment. RF noise at these frequencies can make it difficult for you to detect the tag or controller signals when using the Pocket Tag Reader.

If you are having difficulty using the Pocket Tag Reader to check your tags, then you have two possible solutions to your problem:

- ♦ Move your work area to a spot that is relatively free of RF noise; or,
- ♦ Remove devices which make RF noise from your work area.

By using the Check RF Noise Mode, you can identify equipment that is producing RF noise, and you can find areas that are relatively free from RF noise.

What is Displayed: When using Check RF Noise Mode at 125 kHz, the display shows both noise and the Stanley Healthcare Solutions controller exciter signals. Noise will appear as random illumination of the red LED. Exciter signals will appear as periodic blinking of the red LED. You will likely see both patterns while using this mode.

Working in Tech Mode

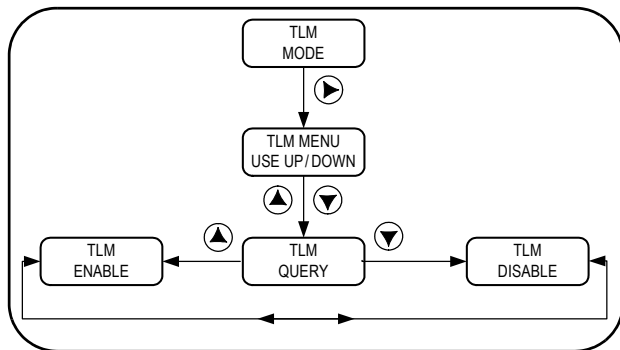
TLM Mode

In Tag Location Message (TLM) Mode, you can enable and disable the TLM and set the TLM rate.

You can set a TLM rate ranging from once every 16 seconds, to once every 24 hours. The tag will then automatically transmit the TLM at the set rate.

The TLM is received by receivers or controllers. In some applications, if a TLM is not detected at the appropriate time then an alarm will begin.

Figure 10 TLM Mode Three Main Functions



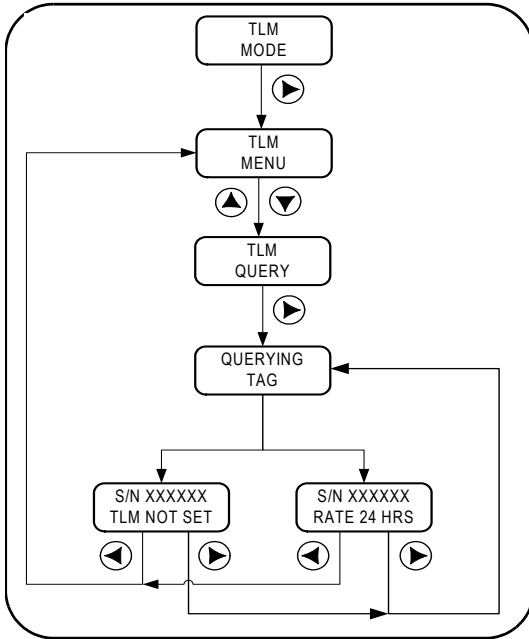
The TLM feature may be referred to as 'Tag Pulse' or as 'Beacon' depending on the application.

A test tag that emits TLM messages when its test button is pressed can be used to perform RF coverage tests.

The TLM Mode has three main functions that can be accessed from the Tech Mode top menu. These are shown in Figure 11.

TLM Query: Use TLM Query Mode shown in Figure 12 to discover the tag's TLM rate.

Figure 12 TLM Query Mode



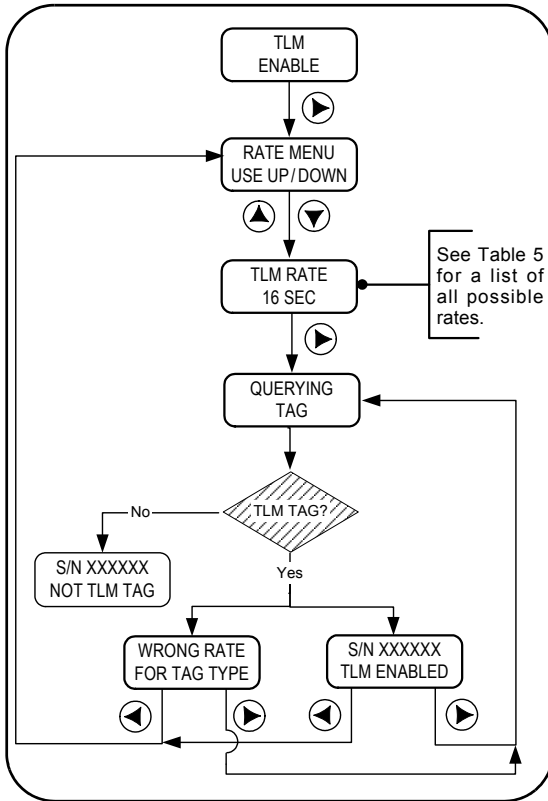
TLM Enable: Use TLM Enable function to activate TLM messages and to set the TLM rate.

Different types of tags support different TLM rates. See Table 5.

Table 5 TLM Rates Possible with Different Tag Types

TLM Rate	Wrist	Staff
16 seconds	✓	✓
1 minute	✗	✓
5 minutes	✗	✓
30 minutes	✗	✓
60 minutes	✗	✓
4 hours	✗	✓
12 hours	✗	✓
24 hours	✗	✓

Figure 2: TLM Enable



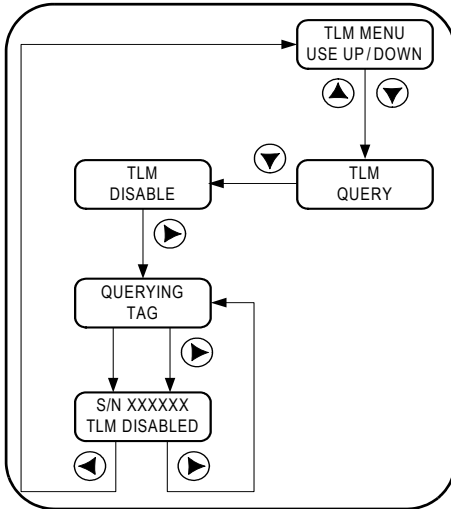
In Figure 13 the TLM rate is shown as 16 seconds, however, any of the rates in Table 5 could be used depending on the tag type queried.

Choosing a TLM Rate: The TLM rate depends on the type of tag and its use. Infant and Wrist tags are set at 16 seconds. Staff tags and Asset tags can be set at any rate. In choosing a TLM rate, consider:

- ♦ The need for real-time tracking
- ♦ How important is it to know where a staff person is at any moment
- ♦ The value of assets as well as their mobility — Small, mobile assets will require a more rapid TLM rate than will large, or comparatively immobile assets.

TLM Disable: Use TLM Disable to deactivate the TLM as shown in Figure 14.

Figure 13 TLM Disable



Show Tag Message Mode

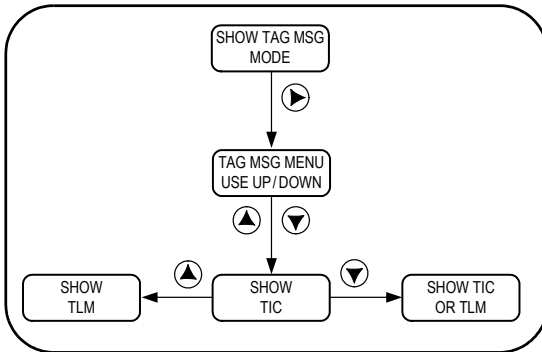
Show Tag Message Mode has three main functions:

- ♦ Show TLM
- ♦ Show TIC
- ♦ Show TIC or TLM

All of these functions display information that is automatically and periodically transmitted by the tag. In each function, a counter is displayed that records the number of messages received. Use these functions as shown in Figure 15.

Note: *The Pocket Tag Reader will NOT automatically power off in Show Tag Message Mode.*

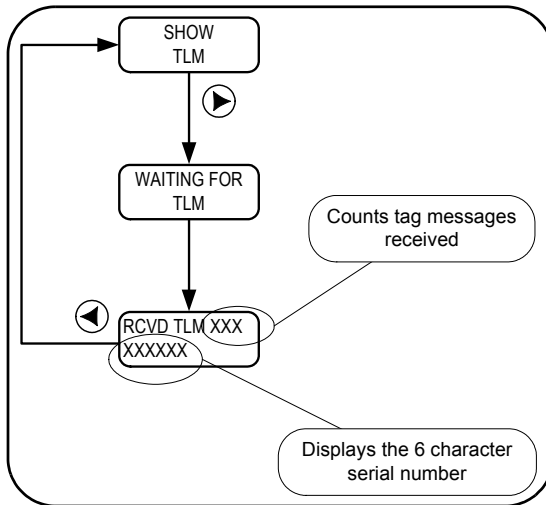
Figure 14 Show Tag Message Mode



Show TLM: Displays the actual TLM and counts the number of TLMs received. For information about TLM see "TLM Mode" on page 16 or the Glossary.

The procedure is shown in Figure 16.

Figure 15 Show TLM



Show TIC: Displays the TIC (Tag Initiated Communication) message and the number of TIC messages received. For a description of the TIC message, see “Glossary” on page ii.

The **Show TIC** procedure has the same keystrokes as the **Show TLM** procedure. Use Figure 16 and substitute “TIC” for “TLM”.

Show TIC or TLM: Displays the number of TLM or the TIC messages received and the actual TLM or TIC message. If both messages are received the display will alternate between the two message types. Again, use the same keystrokes as in Figure 16.

Downloading Data to a PC

By downloading data from the Pocket Tag Reader to a PC you can display, sort, and analyze the data using spreadsheet programs such as Microsoft® Excel®. You can also use the data to create a tag maintenance log.

This information downloaded from the Pocket Tag Reader is organized as a group of records. Each record is identified by its own number.

All records contain the same types of information. Each information type is called a data field. Table 6 lists the data fields in each record.

When the records are downloaded, they are stored as a text file. An example of such a file, displaying data fields and records, is shown in Figure 17 "Sample Tag Reader Text File" on page 27.

Storing data for later analysis is called data logging. When data logging is enabled, the Pocket Tag Reader will store 800 records. Each record will contain the information about a single transaction with a tag as detailed in Table 6.

Table 6 Information in Each Record

Data Field	Description
Record#	The number identifying a unique record.
Tag ID	The serial number of the tag.
Batt V	Tag battery voltage.
Action	The function that was performed by the tag in the transaction. For example, Show TLM.
Result	What was displayed or what occurred as a result of the function performed.
Version	The tag firmware version where applicable.
Expires	The tag expiry date where applicable.

Data logging is enabled and disabled by the same utility program that downloads the data: Tag Reader. Data logging is disabled when the Pocket Tag Reader is shipped.

Installing and Using the Tag Reader Program

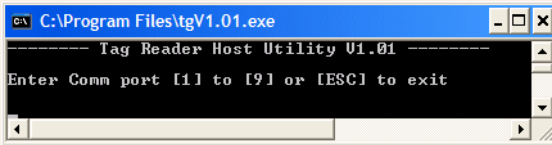
A serial cable is required to connect the Pocket Tag Reader with a PC. The cable connects to one of the COM ports on a PC and to the serial port at the top of the Pocket Tag Reader.

► To install Tag Reader:

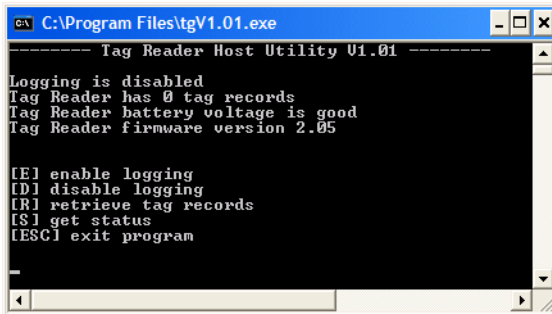
- 1 From the Tag Reader CDROM, copy `tgV1.01` to your hard drive. You can put this program in any folder; however we suggest you put it into a folder labelled "Tag Reader".

Note: *Although you can start Tag Reader by double-clicking the file while it is still on the CD, you will not be able to download data.*

- 2 Attach a serial cable between your PC COM port and the Pocket Tag Reader. Note the number of the COM port.
- 3 Power on the Pocket Tag Reader.
- 4 In Windows Explorer double-click the `tgV1.01.exe` file. A DOS window will open.



- 5 Enter the COM port number from step 2.
- 6 Immediately after you key in the COM port, the screen will display the following:



7 To enable data logging press E. The screen will display as follows:

```

C:\Program Files\tgV1.01.exe
----- Tag Reader Host Utility V1.01 -----
Logging is enabled
Tag Reader has 0 tag records
Tag Reader battery voltage is good
Tag Reader firmware version 2.05

[E] enable logging
[D] disable logging
[R] retrieve tag records
[S] get status
[ESC] exit program
  
```

-- -- -- -- End of Procedure -- -- -- --

Pressing any of the keys listed in Table 7 will run the associated command. The DOS window containing Tag Reader must be the active window.

Table 7 Functions Available in Tag Reader

Function	Key-stroke	Description
Enable logging	E	Commands the Pocket Tag Reader to log data internally.
Disable logging	D	Commands the Pocket Tag Reader to <i>NOT</i> log data internally.
Retrieve tag records	R	Download the data log from the Pocket Tag Reader to the PC.
Get Status	S	Check voltage, firmware, logging, and number of records.
Quit Program	the "Esc" key	Exits the Tag Reader program.

Retrieving Records: When the Tag Reader DOS window is active, pressing the "R" key will download records from the Pocket Tag Reader to the PC. The records will be in a file named TAGREADER.txt in the same folder as the file tgV1.01.exe.

After a successful download, the downloaded records will be deleted from the Pocket Tag Reader memory.

Figure 17 shows a Tag Reader text file. A description of the fields is given in Table 6 on page 23.

Figure 17 Sample Tag Reader Text File

```

To: 24-OCT-2005 13:35:13

Record# Tag ID Batt U Action Result Version Expires
-----
001 A000AC OK TEST ENABLED - -
002 A000AC OK TAMPER OK - -
003 A000AC OK TEST ENABLED - -
004 A000AC OK TEST ENABLED - -
005 A000AC OK TLM-CHK 1 MIN U2.2 JUN-2006
006 A000AC OK TLM-CHK 1 MIN U2.2 JUN-2006
007 F01076 OK TEST ENABLED - -
008 F01076 OK TEST ENABLED - -
009 F01076 OK TEST ENABLED - -
010 F01076 OK TEST ENABLED - -
011 F01076 OK TEST ENABLED - -
012 F01076 OK TEST ENABLED - -
013 A000AC OK TEST ENABLED - -
014 A000AC OK TAMPER OK - -
015 A000AC OK TLM-CHK 1 MIN U2.2 JUN-2006
016 A000AC OK TEST ENABLED - -
017 A000AC OK TAMPER OK - -
018 B0841D OK TEST ENABLED - -
019 B0841D OK TEST ENABLED - -
020 B0841D OK TEST ENABLED - -
021 D1155A OK TEST ENABLED - -
022 D1155A OK TAMPER OK - -
023 D1155A OK TEST ENABLED - -
024 F01076 OK TEST ENABLED - -
025 F01076 OK TEST ENABLED - -

Press [SPACE BAR] to continue

```

Importing into a Spreadsheet: The text of the Tag Reader text file can be imported into an Excel spreadsheet program as follows: In the Excel menu bar, click **Data > Get External Data > Import Text File**. Select the file: TAGREADER.txt. In the Import Wizard, select **Delimited** and click **Next**. Select **Tabs** and click **Next**. Continue to the end of the wizard.

Other spreadsheet programs capable of importing tab delimited text files should work as well. Look in the spreadsheet help file for instructions.

The file shown in Figure 17 was imported into an Excel spreadsheet program. The unformatted results are shown in Figure 18.

Figure 18 TAGREADER.txt file Imported into an Excel Spreadsheet

The screenshot shows a Microsoft Excel spreadsheet with the following data:

Record#	Tag ID	Batt V	Action	Result	Version	Expires
1	A000AC	OK	TEST	ENABLED	-	-
2	A000AC	OK	TAMP	OK	-	-
3	A000AC	OK	TEST	ENABLED	-	-
4	A000AC	OK	TEST	ENABLED	-	-
5	A000AC	OK	TLM-CHK	1 MIN	V2.2	Jun-06
6	A000AC	OK	TLM-CHK	1 MIN	V2.2	Jun-06
7	F01076	OK	TEST	ENABLED	-	-
8	F01076	OK	TEST	ENABLED	-	-
9	F01076	OK	TEST	ENABLED	-	-
10	F01076	OK	TEST	ENABLED	-	-
11	F01076	OK	TEST	ENABLED	-	-
12	F01076	OK	TEST	ENABLED	-	-
13	F01076	OK	TEST	ENABLED	-	-
14	F01076	OK	TEST	ENABLED	-	-
15	F01076	OK	TEST	ENABLED	-	-
16	F01076	OK	TEST	ENABLED	-	-
17	F01076	OK	TEST	ENABLED	-	-
18	A000AC	OK	TEST	ENABLED	-	-
19	A000AC	OK	TAMP	OK	-	-
20	A000AC	OK	TLM-CHK	1 MIN	V2.2	Jun-06
21	A000AC	OK	TEST	ENABLED	-	-
22	A000AC	OK	TAMP	OK	-	-
23	B0841D	OK	TEST	ENABLED	-	-
24	B0841D	OK	TEST	ENABLED	-	-
25	B0841D	OK	TEST	ENABLED	-	-
26	D1155A	OK	TEST	ENABLED	-	-
27	D1155A	OK	TAMP	OK	-	-
28	D1155A	OK	TEST	ENABLED	-	-
29	F01076	OK	TEST	ENABLED	-	-
30	F01076	OK	TEST	ENABLED	-	-

Tag Serial Number Formats

Tag serial numbers distinguish between tags and between types of tags. Tag types are indicated by the letter which begins the serial number.

Different tag types have different uses and functions. Table 8 shows the different tag types and their functions.

Table 8 Tag Types and Functions

Tag Serial Number	Tag Type	Tamper	TLM Rate Select
AXXXXX	Pendant	Y	Y
BXXXXX	Asset	Y	Y
FXXXXX	Wrist	No	There are two sub-types: one has no rate; one has a 16 second rate.

Glossary

Term	Definition
125 kHz	The exciter antenna transmission frequency. The exciter signal causes the tags to initiate communication with the system.
433 MHz	The tag transmission frequency.
Exciter Field	The field of RF coverage generated by a Controller. The Controller transmits a “wakeup word” and waits for the response from any transponder tags that are present in the field.
kHz	Kilohertz is a measure of frequency equal to 1,000 cycles per second.
LED	Light Emitting Diode. A type of indicator light.
MHz	Megahertz is a measure of frequency equal to 1,000,000 cycles per second.
PC	Personal Computer. For example, a desktop computer, a notebook, and a laptop.
RF	Radio Frequency. An RF signal is an electromagnetic signal at radio frequencies. RF energy is electromagnetic energy at radio frequencies.
RFID	Radio Frequency Identification. Identifying an object by its radio signal. Stanley Healthcare Solutions active tags are RFID devices.
Tag	An RFID transponder that can be attached to assets or worn by people. See also Table 5 on page 18 and Table 8 on page 29.
Tag — Asset tag	A tag that is attached to assets such as wheelchairs and laptops. If removed, Asset tags transmit TIC messages. The tag also supports TLM and TIF messages.
Tag — Infant tag	A waterproof ergonomically shaped tag. If removed from the infant’s skin, Infant tags transmit TIC messages. The tag also supports TIF and TLM messages.

Term	Definition
Tag — Staff tag	Staff tags are capable of TIF, TLM, and TIC messages. The tags can be programmed to bypass protected exit points. TIC communication occurs when the distress button is pressed.
Tag — Supervised tag	A tag that transmits a message when it is removed. For example, Infant tags, and Asset tags.
Tag — Wrist tag	For wandering and pediatric patients. The tag transmits TIF messages and optional TLMs.
TIC	Tag Initiated Communication. Infant or Asset tags transmit their serial number when the tag is removed. This feature is also called a “Tamper” alarm. Staff tags transmit their serial number when the distress button is pressed.
TIF	Tag in Field. Communication between the tag and the controller that occurs when the tag enters the controller’s exciter field. All Stanley Healthcare Solutions tags have this ability.
TLM	Tag Location Message. A message containing the tag’s serial number transmitted at set intervals. See Table 5 page 18. The TLM feature is also called “Beacon” or “Tag Pulse”.

Index

Numerics

- 125 kHz
 - glossary, 27
- 433 MHz
 - glossary, 27

A

- Asset tag
 - glossary, 27

B

- Backlight, 3
- Battery
 - low voltage message, 3
 - replacement, 4
 - type, 4

Beacon, 28

C

- Check Field Mode, 12
- Check RF Noise Mode, 13
- Controls and Display, 2

D

- Data field, 21
- Data logging, 21
 - enable, 23
- Door controller, 6
- Downloading Data to a PC, 21

F

- Field, 21
 - door controller, checking, 6
- Functions, 7
- Functions and Modes, 7

G

Green LED, 6

I

- Infant tag
 - glossary, 27

L

LED Display, 6

M

- Mode
 - Check Field, 12

- RF noise, 13
- Show Tag Message, 18
- Tag Revision, 11
- Tag Test, 10
- Tech, 14
- Tech Mode, 14
- TLM, 14
- TLM Mode, 14
- TLM Query, 15
- User, 10

Modes

- summary of modes and functions, 7

O

- Off, 3
- On, 2
- Operation
 - modes, 7
 - overview, 5

P

- PC
 - downloading, 21

Performance

- problems, 6
- RF noise, check, 13

R

Reading

- flat surface, 5
- performance, 6
- problems, 6
- range, 5
- skin sensing tags, 5
- tag, 5

Records, 21

- maximum number of, 21
- picture of text file containing records, 24

Red LED, 6

RF

- glossary, 27

RF coverage tests, 14

RF field

- decreased when tag present, 12

- strength, check, 12
- RF noise, 6
 - check level, 13
- RFID
 - glossary, 27
- S**
- Security
 - warning, 1
- Serial port, 22
- Show Tag Message Mode, 18
- spreadsheet programs, 21
- Staff tag
 - glossary, 28
- T**
- Tag
 - battery, check, 10
 - flat surface, 5
 - message, show, 18
 - read, how to, 5
 - revision number, 11
 - serial number, 11
 - serial number format, 26
 - serial number, read, 10
 - Tag Location Message, 14
 - tamper, 26
 - testing, 10
 - testing in User Mode, 10
 - TIF, 10
 - TLM rate select, 26
 - TLM rates for various, 16
 - version number, 11
- Tag Location Message, 14
- Tag maintenance log, 21
- Tag Pulse, 28
- Tag reader
 - file, import into spreadsheet, 24
 - functions available, 23
 - install, 22
 - text file, 23
- Tamper, 26
- Tamper alarm
 - testing, 10
- Tech Mode, 7
 - operations in, 9
 - top-level menu options, 9
- working in, 14
- TIC
 - (Tag Initiated Communication), 20
 - displayed, 20
 - glossary, 28
- TIF
 - enable, disable, 10
 - glossary, 28
- TLM
 - (Tag Location Messages), 1
 - disable, 18
 - displayed, 19
 - enable, 16
 - glossary, 28
- TLM alarm, 14
- TLM messages, 14
- TLM Mode, 14
- TLM or TIC
 - display both, 20
- TLM Query, 15
- TLM Query Mode, 15
- TLM rate, 17
 - choosing, 17
 - select, 26
- TLM tag, 14
- Turning off, 3
 - automatically, 3
- Turning on, 2
- U**
- User Mode, 7
 - operations in, 8
 - operations overview, 8
 - working in, 10
- W**
- Working in Tech Mode, 14
- Working in User Mode, 10
- Wrist tag
 - glossary, 28



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