TPM Handheld
User Manual

Model: TPM-HH-700-00

Revisions

Revision	Date	Revised By:	Description
Prelim	12/29/21	Mark Compton	Preliminary

Contents

General Information & Considerations

1. This device complies with part 15 of the FCC Rules. 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.
2. Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
3. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
4. JR Automation TPM products & related equipment must be integrated into the end users manufacturing system by JR Automation, or by a JR Automation recommended automation Systems Integrator
5. JR Automation TPM products are meant for industrial manufacturing settings only.
6. JR Automation does not manufacture or provide TPM valve stems, only the equipment that is used to communicate to those stems during tire, wheel, & vehicle manufacturing.

Safety

1. Only personnel who are properly trained and have adequate knowledge and skill related to this product should undertake any troubleshooting and repair.
2. This device is capable of generating electrical voltages high enough to create a shock hazard, only qualified personnel who have a technical understanding of this device should ever attempt to open the cover on this device to troubleshoot or repair.
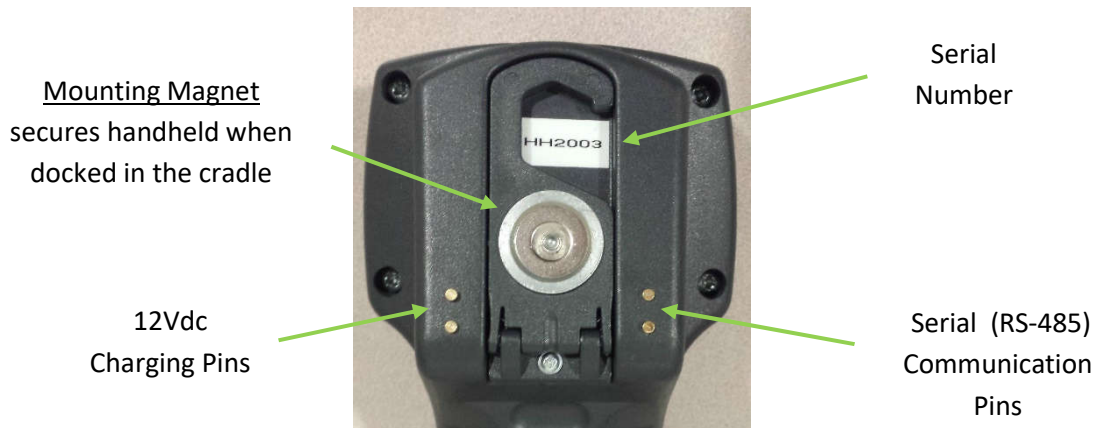
Handheld Overview

The Esys TPM Handheld Reader is built specifically for the manufacturing environment. It is typically used in conjunction with our in-line TPM Antenna Systems or by itself in very low production environments. This wireless reader can update the plant system with the correct data to program the vehicle.

The TPM Handheld reader is fully cordless and come in a rugged industrial case. It utilizes a powerful Low Frequency wake-up signal (125 kHz) and comes with an integrated barcode scanner for reading vehicle IDs. Multiple TPM stems (315MHz and 433 MHz) can be programmed in the same unit and read with dual receivers. The stem types can be quickly changed with a one button press. TPM data is stored for up to 50 vehicles. A docking station can be supplied for data transfer and battery charging.

The handheld is typically secured to the docking station by a magnet on the back of the handheld. The docking station is typically provided by an automation System Integrator and customized to the end user's needs. The docking station has two pins that provide 12V DC and two other pins are a RS-485 serial communication to upload the data. Typically, to communicate to a PLC, the RS-485 link can be converted to other communication protocols (e.g. Ethernet) based on the needs of the end user's manufacturing system. This is done with a 3rd party communication conversion device supplied by an automation System Integrator.

Mounting Magnet
secures handheld when
docked in the cradle

Serial
Number

12Vdc
Charging Pins

Serial (RS-485)
Communication
Pins

The integrated barcode scanner can scan 1D and 2D barcodes for the vehicle identifier. Through the option menu, the system can be setup so the barcode is forced to be scanned before TPM stems are read.

Barcode
Scanner

Battery Save Feature

The handheld has a battery save feature that disables both the display and the keypad when no movement is detected after 10 minutes. This maximizes the handheld's battery life. If the battery save feature is active, the display will be shut off and none of the buttons on the keypad will work (including the power button). Move the handheld to re-enable the keypad and display.

> If the display does not turn on by pressing the power button, the battery save feature is most likely active. Just pick up the handheld. It should turn on. If it still does not turn on, then the handheld needs to be charged by placing it in the dock.

Keypad

The keypad allows for control of the handheld. Each button on the keypad may have multiple functions. These different functions are used depending on the current screen or function that is being used by the operator.

Dual Purpose Keys

Some keys, such as the keys with numbers on them, have a dual purpose. For example, the upper left button. The top row, 1ABC, is used for character entry. For example, when an operator is prompted to enter a VIN or PVI, the keys with numbers & letters will enter in their corresponding characters. During these prompts, when the operator presses the '1 ABC' key, then 1 will be entered. Otherwise, when not entering characters, this 'LF' key will be active. Sp pressing this button will initiate a read of the 'LF' (that is Left Front) stem.

How to enter Letters

Letters are entered with quick a succession of presses of the same key. As these quick presses happen the cursor will scroll through the number and letters associated with that key. For instance if the operator wants to enter the character 'R', then he will press the '6' key. After that he will quickly press the same key 3 more times until the cursor displays 'R'. Then he will pause for a short time, the 'R' will be entered and the cursor will move over, ready for the next character. If the key is pressed beyond the last character defined for that key, then it will simply "scroll back" to the original number, and keep scrolling through that keys associated characters until he stops pressing the key.

The settings menu has an option to disable letters and only allow number entry for a vehicle identifier.

The figure bellows shows the keypad, and gives some information on the special functions of the keys.

'LF, RF, LR, & RR' Initiates a stem read and associates those reads with the appropriate wheel

'Clear/Esc' is used to clear data and to exit out from the current screen

'BC Scan' initiates the barcode reader

'Arrow' keys allow movement of the cursor through prompts and selection lists. It also is used to scroll across multiple vehicles currently stored.

'Stem Sel' opens the stem select screen

'Enter' is used to make selections.

Holding in this key opens the settings

Settings Menu

The settings menu allows the operator to setup and customize the use of the handheld. To enter the settings menu, press and hold the Enter/Settings key for 3 seconds.

There are 3 screens for the settings menu. Use the 'down arrow' or the 'up arrow' keys to move the cursor up and down. When the cursor gets past the bottom item in the list, the second settings menu screen will appear.   Below are pictures showing the screens in the settings menu:
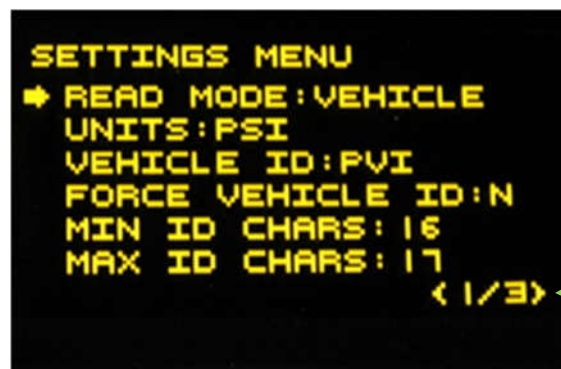
Screen page indicator
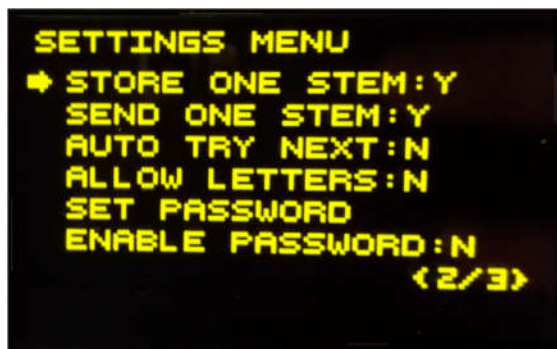
As can be seen, there are several functions within this menu. Simply use the 'arrow' keys to scroll through the menu with the cursor. Once the desired setting has the cursor on it, use the 'enter' key to go to that particular settings submenu, or change its current setting. Each setting is described below.

Read Mode setting
There are 2 modes that the handheld can be put into: *vehicle mode* and *single stem mode.*

In *vehicle mode,* the handheld will read up to 4 stems, associate them to a particular vehicle (PVI, VIN, etc.), and to a particular wheel (Left Front, Right Front, etc.). In this mode, the handheld communicates all the stem serial numbers and pressures associated with a vehicle through its serial communication port. It also communicates the vehicle identifier (PVI, VIN, etc.) This mode is typically used for a TPM Data Extraction System.

In *single stem mode* then only a single stem is read and displayed. This is intended for use in a tire and wheel assembly operation.

Units
This setting selects the units that the pressure will be set to. MPa or PSI are available.

Vehicle ID
This setting allows the operator to set the acronym that will be used for the vehicle identification. VIN & PVI are available as selections. This selection also changes the serial output of the handheld.

Force Vehicle ID

When this is set to *Y*, then the operator must scan or enter a vehicle ID before the handheld will allow a stem read to work.

Min ID Chars

This sets the minimum number of characters accepted by the handheld as a valid vehicle ID. If an operator enters in a number of characters less than this value, then the handheld will not accept the VIN or PVI entry, and prompt the operator to re-enter a new one.

Max ID Chars

This sets the maximum number of characters accepted by the handheld as a valid vehicle ID. If an operator enters in a number of characters more than this value, then the handheld will not accept the VIN or PVI entry, and prompt the operator to re-enter a new one.

Store One Stem

This setting is only valid for single stem mode. When this is set to *N*, it allows the user to read more than one stem in *single stem mode* before deleting or downloading records. If it is set to *Y,* then only one stem can be stored at a time. This setting does not affect *vehicle mode.*

Send One Stem

This setting is only valid for single stem mode. When this is set to *Y*, the handheld will output the data when docked. If it is set to *N,* the handheld does not output any data in single stem mode. This setting does not affect *vehicle mode.*

Auto Try Next

When this is set to *Y*, if the handheld fails a stem read, it will automatically switch to the next stem type and try to read that one. This will continue until a stem is read or all of the different types of stems have been tried.

Allow Letters

This setting allows letters to be entered from the keypad if set to *Y.* Otherwise the keypad will only enter numbers.

Set Password

This opens up a dialog that allows a unique password to be set. The password will only protect the settings menu from being entered.

Keypad version

This setting should always be set to LR for new handhelds. This setting if for supporting supports older handhelds only.
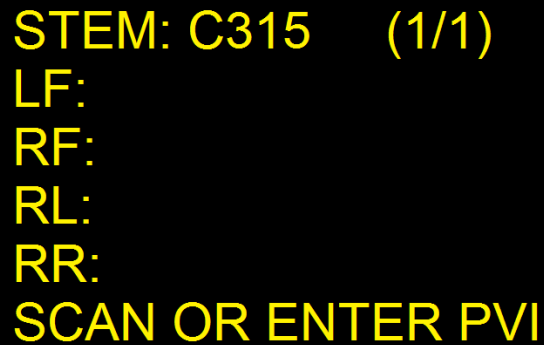
Recv Enabled

This setting is for diagnostic use only. The handheld has 2 receivers on it, receiver A and receiver B. This setting is to allow a test a receiver individually. Under normal production, this setting needs to be set to *BOTH*. If *Receiver A Only* or *Receiver B Only* is selected, additional information is shown in *single stem mode:* the relative signal strength indicator (RSSI) is displayed.
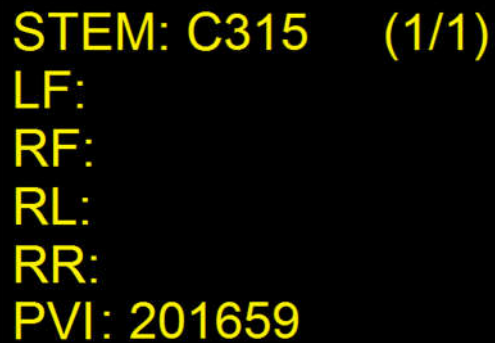
Using the Handheld to Repair a Vehicle Record

1. Power on the handheld. Wait for handheld to boot. The startup splash screen is displayed. Once the handheld has finished booting the Vehicle Entry screen will be displayed

```
STEM: C315    (1/1)
LF:
RF:
RL:
RR:
SCAN OR ENTER PVI
```

2. Press the 'BC Scan' button and point the handheld barcode scanner at the PVI barcode. The scanner will read the PVI and update the display. The PVI can also be manually entered using the keypad. Simply press the 'enter' button to begin keying in the PVI.

```
STEM: C315    (1/1)
LF:
RF:
RL:
RR:
PVI: 201659
```

3. Select the desired stem by either:
   a. Pressing the 'Stem Sel' button to scroll through the certain types of stems.
   b. Or select the stem from a list of all available stems. To do this:
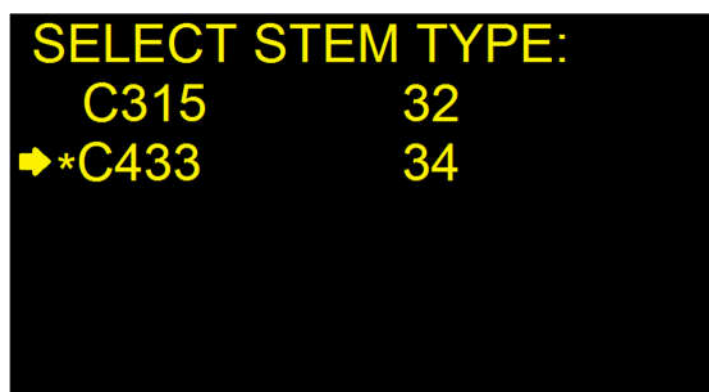
      Hold down the 'Stem Sel' button to display the stem select screen.
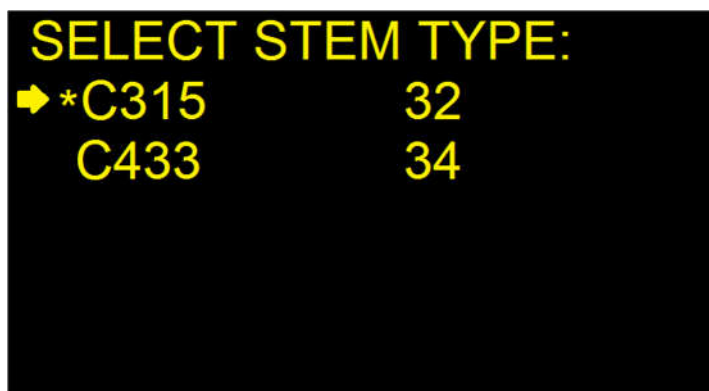
To switch from the currently selected recipe press the 'ᵛ' (down arrow button) to highlight the desired stem type.
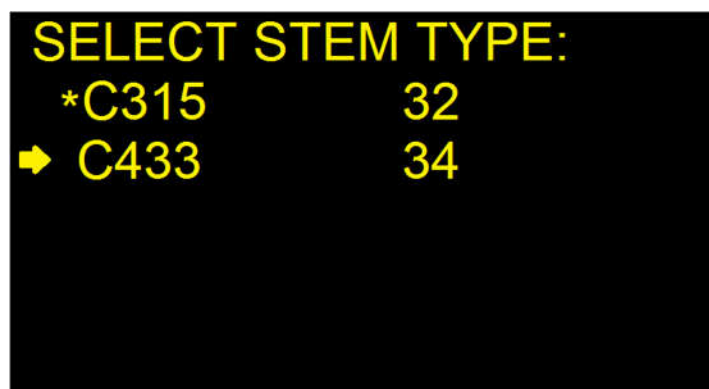
Then press 'ENTER' to select the C433 recipe 34. The asterisk * symbol indicates which stem is currently selected.

Press the 'Clear' button to return to the Vehicle Entry screen.

4. Next, read a stem. Place the handheld reader near the stem with the magnet touching the tire.

Press the corresponding wheel location button to initiate a read. It is important to press the corresponding wheel location, since this associate the stems serial number to that wheel. Once the stem read completes, the serial number and pressure will be displayed.

a. 'LF' is for the left front wheel
b. 'RF' is for the right front wheel
c. 'RL' is for the left rear wheel
d. 'RR' is for the right rear wheel
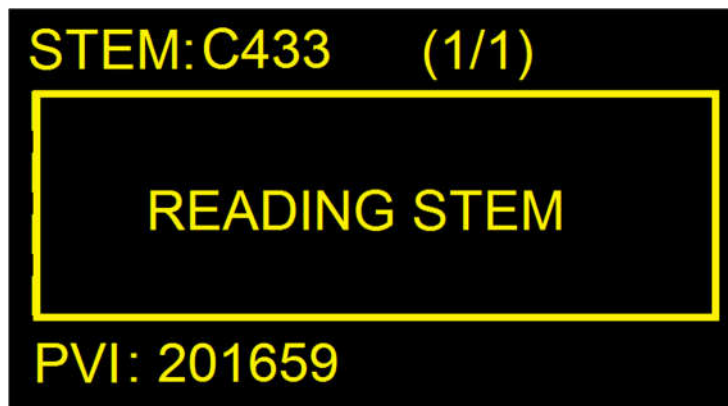
```
STEM: C433     (1/1)
LF:
RF: 8F345EA      32.5 PSI
RL:
RR:
PVI: 201659
```

5. Once all missing stems have been read, dock the handheld in the docking station to start the upload to PLC. The screen will display 'UPLOADING DATA' when the upload starts.

```
STEM: C433     (1/1)
LF:  8F34501      32.0 PSI

    UPLOADING DATA

PVI: 201659
```

6. When the upload finishes the screen will display 'UPLOAD COMPLETE'. The PLC repairs the job stack with the missing information completing the repair process on this vehicle.

```
STEM: C433     (1/1)
LF:  8F34501      32.0 PSI

    UPLOAD COMPLETE

PVI: 201659
```

- Note: The handheld is capable of storing up to 50 vehicles worth of data. Steps 1 – 6 can be completed on each vehicle requiring repair up to 50. Once all vehicles are scanned proceed to step 7 to upload all repair data. The PLC will receive each record from the handheld and update the job stack.

Deleting a Record

To delete a stem or an entire vehicle record press the 'clear' key. This will bring up a dialog that will allow you to clear either a single stem, or the entire vehicle. Press the corresponding wheel key (LF, RF, etc.) to delete only a particular stem. Press 'enter' to delete the entire vehicle's record

Appendix A: Product Data Sheet

The table below summarizes the general product data and specifications:

Attribute:	Data:
Manufacturer Name	Esys Automation LLC
Model #	TPM-HH-700-000
Brand Name (Marketed by)	JR Automation
Country of Origin	USA
Country of Assembly	USA
Trade Name	TPM Handheld
General HS Code Category (Trade Code)	8517.62
Mexico HS Code (Trade Code)	8517.62.99
Low Frequency Transmission (LF)	125 KHz
Ultra High Frequency Receivers (UHF)	315 MHz and 433 MHz
Input Voltage	12 VDC
External communication interface protocol	RS485 Serial
Product Packaging	No retail packaging included

Appendix B: Reader Position Sign

On the next page is a printable graphic to show where the handheld should be positioned to optimally read TPM valve stems.

TPM Handheld Reader
Read Position

Position the handheld with the **magnet against the <u>tire</u>** and directly above the TPM stem.