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[www.stackltd.com/tpms](http://www.stackltd.com/tpms)



## TPMS Lite Installation Guide

- Sensor Installation
- Antenna Installation
- Configuration Software
- Display Gauge
- CAN Message Formats
- Troubleshooting

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<i>Issue</i>	<i>Possible Solution</i>	<i>Action Needed</i>
<b>No sensors can be detected.</b>	Sensors not authorised for use in interrogator.	Add sensors.
	Sensor damage	Replace sensors.
	Antenna position bad.	Refer to manual.
	Antenna cables not done up.	Tighten connectors.

## 6. TPMS Installation Troubleshooting

Issue	Possible Solution	Action Needed
Sensor readings incorrect.	SensorID allocated to wrong corner in interrogator.	Assign sensor to correct corner.
	Sensor is damaged.	Send back?
	Atmospheric pressure compensation set to wrong value	Set correct pressure or set to 1013 for no compensation.

Issue	Possible Solution	Action Needed
Low signal strength.	Antenna mounting position incorrect.	Refer to manual.
	SMA connector not done up correctly.	Tighten connectors.

Continued overleaf...

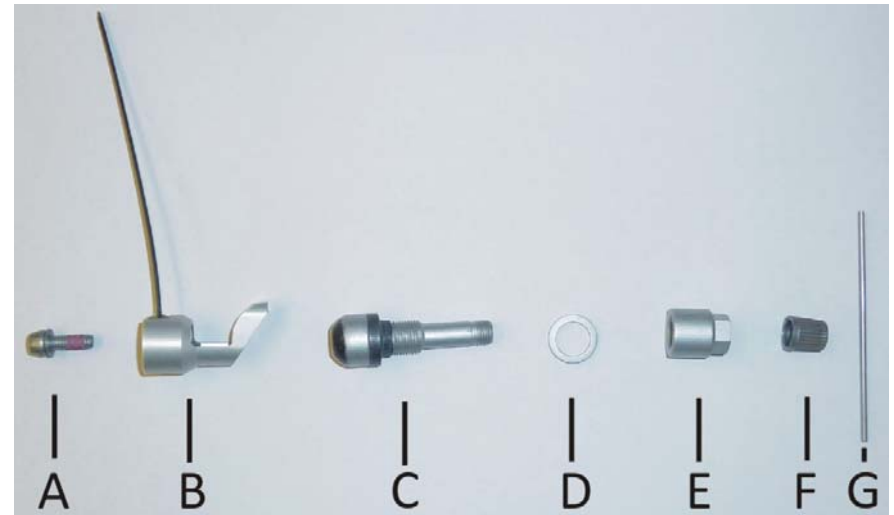
## 1. TPMS Lite Sensor Installation

### Tools Required

The following tools will be required for the fitting process:

- Torx (R) T20 Screwdriver /Torque driver (RS 662-608, DemonTweaks BIKTORXKEY)
- 4Nm Torque screwdriver ¼" Drive (e.g. Teng Tools 1492SD)
- 11mm x 50mm Socket (e.g. Teng Tools M140611-C)

### Parts Description



### TPMS Fitting Kit

- A: Self Locking Torx Screw
- B: Sensor
- C: Valve
- D: Spacer Ring
- E: Collar Nut
- F: Valve Cap
- G: Installation Bar

## Valve Fitting

- Ensure the wheel rim is cleaned and degreased around the valve and wheel well (Green area).



- Insert valve into wheel rim. Fit the spacer ring (D) and then the collar nut (E) finger tight.



## CAN Receive Message Format

The TPMS interrogator can receive CAN messages to control some parameters

	Byte 0	Byte 1	Byte 2	Byte 3	Byte4	Byte 5	Byte6	Byte 7
CAN ID	Car Speed		Atmospheric Pressure (mb)		Spare	Moving Mode	Spare	Moving Flag
0x5A4	U16		U16		N/A	U8	N/A	U8

### Car Speed:

This is used to detect the car moving state when the Moving mode is set to 2. The units of this are not important as long as when the car is not moving the value is zero.

### Atmospheric Pressure:

This is used to compensate for atmospheric pressure changes. The units are mBar.

*Note: To enable this function you must enable Use CAN derived atmos. Pressure in the Misc tab of the configuration software.*

### Moving Flag:

This is the CAN bit that signals the moving state of the car when the Moving Mode is set to 1. Setting this to 1 will indicate the car is moving and setting it to zero will indicate to the interrogator that the car is stationary.

### Moving Mode:

This sets the mode that the interrogator uses to determine when to scan for wheel changes and new sensors, i.e. when the car is not moving.

### Value      Moving Mode

0	Internal
1	CAN Moving Flag
2	CAN WSPD

*Note: It is recommended to leave the Interrogator in Internal moving mode.*

## 5. TPMS Lite Control Unit CAN Message Format

### Background

This section will describe the CAN message format for the TPMS control unit.

### CAN Transmit Message Format

The TPMS control unit outputs the following CAN messages:

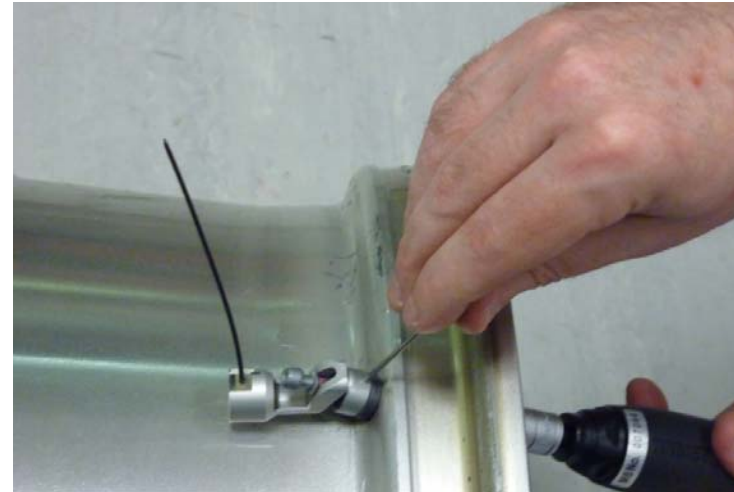
Corner	CAN ID*	Rate (ms)	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
			SensorID		Pressure (0.001BAR)	Temp (0.01DegC)	System Status			
FL	0x5A0	1000	0-65535	e.g 2094 = 2.094bar	e.g 2094 = 20.94DegC	Bit0 = 1 = No Sensor				
FR	0x5A1	1000	0-65535	e.g 2094 = 2.094bar	e.g 2094 = 20.94DegC	Bit0 = 1 = No Sensor				
RL	0x5A2	1000	0-65535	e.g 2094 = 2.094bar	e.g 2094 = 20.94DegC	Bit0 = 1 = No Sensor				
RR	0x5A3	1000	0-65535	e.g 2094 = 2.094bar	e.g 2094 = 20.94DegC	Bit0 = 1 = No Sensor				

\*Factory default settings

The rate is dependent on the system type being used. It can be 1000ms, 200ms or 100ms (1Hz, 5Hz or 10hz)

The CAN ID's can be changed via the PC configuration software, but the message structure remains the same.

- Insert the installation bar (G) into the valve body and tighten the collar nut (E) to a torque of 4Nm +/-0.5Nm



- Press the sensor down into the wheel well so that base of the sensor is touching the rim.

**NOTE: The base of the sensor must make contact with the wheel rim.**

**NOTE: The sensor antenna must point away from the centre of the wheel.**

- Tighten the Torx screw (A) to 4Nm +/- 0.5N



- Once tightened check the sensor is still in contact with the rim.



To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge. The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch.

The gauge will now return to real time mode.

## Wheel Set Selection

The TPMS lite system has 3 wheel sets which can be configured. The driver will be able to set which set the interrogator will read and scale the data for. This will be done by setting the  $S2F$  menu to  $SEt$  and then pressing external switch 2 momentarily to change the set number.

With each press the gauge will display the set number in the form  $S-1$ ,  $S-2$  and  $S-3$ .

When you have chosen the set you want the set number will remain on the display for 3 seconds. After that the gauge will return to real time mode and the set number will be changed.

## Alarms

If any of the parameters go outside the thresholds defined in the menus then the gauge will generate an alarm warning for the user. The alarm can be cleared by a single press of external switch 1. This action will acknowledge the alarm indicated, the display will still indicate an error condition on that corner with the RED corner LED. However the gauge will return to normal operation mode.

If multiple alarms occur on multiple corners then the alarms will be cycled through in the order they appeared. Each alarm will be displayed for 3 seconds before moving onto the next one.



## S2F – Switch 2 Function



Switch 2 can be configured for 3 functions.

- **ILL** – Illumination Level  
Pressing switch 2 will cycle through the 4 brightness levels for the gauge.
- **ILT** – Illumination Toggle  
Switch 2 can now be a toggle switch or vehicle input and will toggle between High brightness and Low brightness. See LBL menu for setting the low brightness level.

## SEL – Wheel Set Selection

Switch 2 now selects which tyre set the interrogator used to scale the data.

To change the menu option, press the  switch on the gauge to cycle through them. To select the new option press the  switch on the gauge.



The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  switch and to cancel the change press the  switch.



The gauge will now return to real time mode.

## LBL – Low Brightness Level

This sets the low brightness level for the gauge illumination. There are 4 adjustments steps 0 (Lowest) to 3 (highest). When the S2F menu is set to **ILT** the illumination is toggled between the highest brightness level and the low brightness Level.

In the other S2F modes this menu can be used to adjust the brightness of the gauge.

To change the menu option, press the  switch on the gauge to cycle through them. To select the new option press the  switch on the gauge.

The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  switch and to cancel the change press the  switch.

The gauge will now return to real time mode.

## ETD – Parameter Display Timeout

This sets the amount of time that a temperature or pressure reading is displayed when **non** is selected in the **d/5** menu. For example setting this to 10 will keep the value displayed for 10 seconds after you press SW1. The value can be set from 0 to 120. 0 means there is no timeout and the value will remain on the display indefinitely whereas 1-120 will keep the value being displayed for that number of seconds.

**The sensor is now fitted correctly to the rim and ready for the tyre mounting.**

**NOTE: It is recommended to fit some identifying mark on the outside of the tyre to indicate the rim is fitted with a TPMS sensor. This will alert tyre fitters to the fact there is a sensor fitted and extra care should be taken when mounting/dismounting the tyres.**

### Incorrect Fitting Examples

The following are examples of bad fitment that will degrade the performance of the system:

- Sensor not in contact with rim.



- Sensor antenna pointing away from wheel centre and sensor base not touching rim.



### PU - Pressure Units

The pressure units can be selected as either PSI or Bar.

To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge. The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch.

The gauge will now return to real time mode.

### TU - Temperature Units

The temperature units can be selected as either DegC (C) or Deg (F)

To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge.

The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch.

The gauge will now return to real time mode.

### LT - Low Temperature Alert Type

The type of alert when there is a low temperature on a wheel can be selected. The two options are “ind” indicator or “alm” alarm.

This is useful if you want to know your tyres are below temperature but the conditions are such that this does not necessarily indicate an alarm. A typical example is on a warm up lap out of the pits.

To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge.

The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch.



The gauge will now return to real time mode.





### thr - Gauge Threshold Type

The gauge thresholds can be setup to work in two different ways.

- **5nL** - (Single) in this mode all wheels are compared against a single pressure band and a single temperature band.
- **SEP** – (Separate) each wheel has its own pressure and temperature threshold band.

To change the menu option, press the  switch on the gauge to cycle through them. To select the new option press the  switch on the gauge.


The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  switch and to cancel the change press the  switch.

The gauge will now return to real time mode.

### Ph, PL0, th, tLo - Gauge Thresholds

The options within this menu change depending on the thr setting:


- In thr = 5nL (Single) mode the threshold is set and applies to all wheels.


To change the threshold press – to decrement the value and  to increment the value. When you have reached the desired value wait for 3seconds, the new value will flash 5 times and then display S-C (Save- Cancel)

Press – to save and  to cancel the changes.

The gauge will now return to real time mode.

- In thr = SEP (Separate) mode the wheel must be selected first before the threshold is set. The threshold only applies to that wheel.

To change the selected Wheel press - to edit the threshold value press . The current threshold value will be displayed.

To decrement the value press – and to increment the value press . When you have reached the desired value wait for 3 seconds and the value will flash 5 times then the display will show S-C (Save – Cancel).

To save the change press – to cancel press .

The gauge will now move onto the next wheel. To skip this wheel press -.

## 2. TPMS Lite Antenna Installation

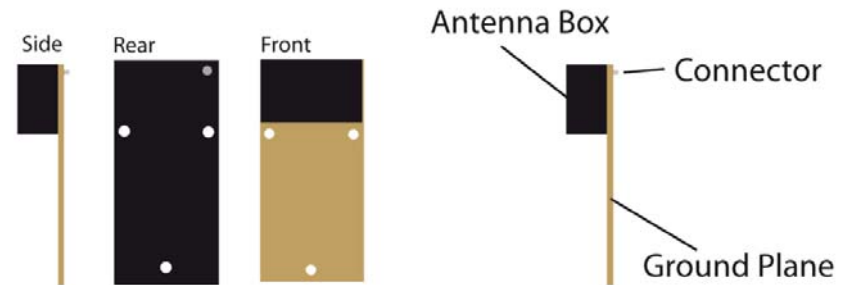
### Introduction

This chapter will describe the fitting of the TPMS Dual-Band Antennas to a vehicle. Please ensure you read this guide carefully to obtain the best performance out of the system.

### Antenna Details

The Stack TPMS antenna is an advanced Dual-Band Antenna (DBA). For optimum system performance, care should be taken to fit the antennas according to the guidelines in this document. The system performance can be impaired with poor antenna placement.

The antenna picks up 2 signals. The first is the SAW (433 MHz). This is the signal used to measure pressure and temperature. The second signal is the RFID or Sensor ID (868 MHz). This is used to pick up the sensor serial number and the calibration details. Both signals are required for successful operation of the TPMS system.

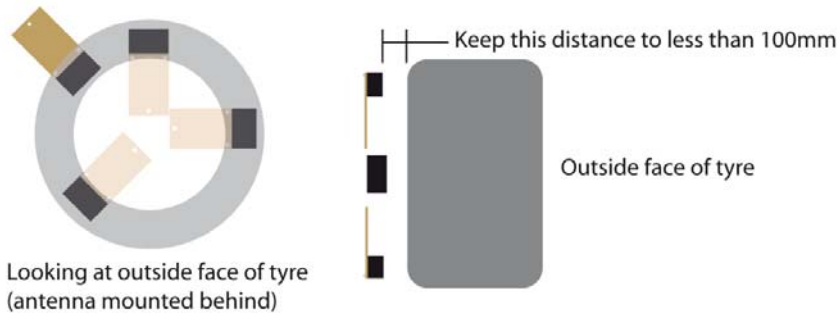


### Antenna Placement

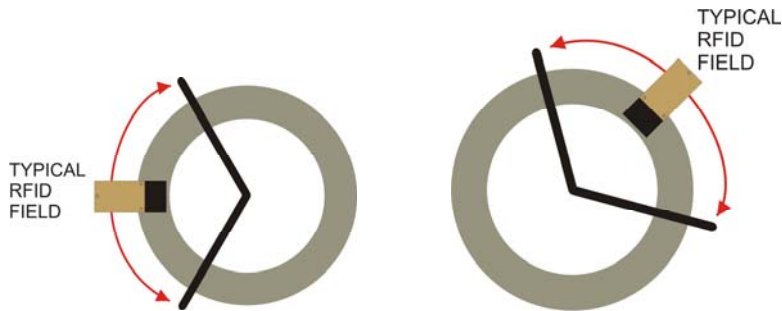
The goal of choosing an antenna position is to achieve the strongest signal strength for both SAW and RFID over the widest wheel rotation. There will be some points of wheel rotation where a signal will not be strong enough to take a measurement. These are generally called NULLS. It is common to have 3 nulls per rotation of the wheel for the SAW signal.

- The antenna must be placed as close as possible to the wheel.
- The antenna front “box” must be directly in line with the tyre sidewall

- The antenna must be mounted radially from the centre of the tyre.
- The Ground plane can point towards or away from the centre of the wheel.
- The antenna can be mounted behind NON conductive panels (Kevlar, GRP)



In a typical installation you will achieve 90-120deg of RFID coverage and 270 degrees of SAW coverage. It is important to optimise the RFID coverage to maximise the area at which the RFID can be read over.



Typically the RFID cannot be read outside the area shown above. This should not be a concern when finding an antenna position as long as you have the coverage shown above.

It is important to get to as close to 120deg of rotational coverage as possible for optimum system operation.

For ease of installation we recommend you use the Monitor mode in the TPMS configuration software. This can be found on the **Monitor** tab of the configuration software. Selecting simple monitoring mode will allow you to see the following information.

## Menu Descriptions

### SCr – Scroll Mode

This sets the way the gauge scrolls round the temperature and pressure values that are displayed on the numeric display. The options are as follows:

Scroll Order									
Mode	1	2	3	4	5	6	7	8	
P <sub>on</sub>	FL Pres	FR Pres	RL Pres	RR Pres	Back to 1	NA	NA	NA	
t <sub>on</sub>	FL Temp	FR Temp	RL Temp	RR Temp	Back to 1	NA	NA	NA	
RPT	FL Pres	FR Pres	RL Pres	RR Pres	FL Temp	FR Temp	RL Temp	RR Temp	Back to 1
cPT	FL Pres	FL Temp	FR Pres	FR Temp	RL Pres	RL Temp	RR Pres	RR Temp	Back to 1

To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge.

The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch.

The gauge will now return to real time mode.

### d! S – Display Mode

This menu controls how the gauge should display the values selected above. There are 3 options for this:

- *Aut*: The gauge will automatically scroll round each reading in the order set in the SCr menu. Each value will be displayed for 3seconds before moving onto the next.
- *USr*: The gauge will scroll round each reading in the order set in the SCr when SW1 is pressed. Each press of SW1 will move the display on 1 parameter.
- *non*: The gauge will display no value until SW1 is pressed. Each press of SW1 will move the parameter on to the next one. If no user input is detected within the time set in the TIO menu then it will return to a blank display.

To change the menu option, press the  $\ominus$  switch on the gauge to cycle through them. To select the new option press the  $\triangle$  switch on the gauge.

The gauge will now flash the chosen value 5 times then display S-C (Save – Cancel) to save the selection press the  $\ominus$  switch and to cancel the change press the  $\triangle$  switch. The gauge will now return to real time mode.




## Alarms

The gauge features a configurable pressure and temperature thresholds for each of the wheels. There is an upper and lower pressure limit and an upper and lower temperature threshold. The wheels are constantly monitored to see if they fall outside these thresholds. If they do the gauge will display an alarm.

## Acknowledging Alarms

To acknowledge an alarm press switch 1, this will clear the alarm display. The RED corner LED will remain illuminated until the actual alarm condition is cleared.

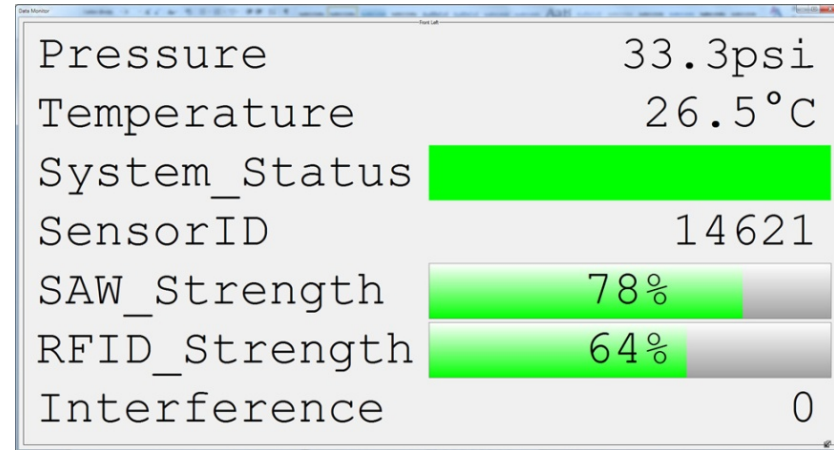
## Configuration Menus

- To enter the menus press the  switch on the gauge.
- To scroll through the menu items press the  switch on the gauge.
- When you have reached the menu item you wish to edit press the  switch on the gauge.

The menus are shown below:

Menu	Description
Scr	Value Scroll Mode
dl S	Display Mode
PUh	Pressure Units
EUh	Temperature Units
thr	Threshold Type
Phl	Pressure Threshold High
PlO	Pressure Threshold Low
thi	Temperature Threshold High
tLo	Temperature Threshold Low
LoA	Low Temperature Alert Type
S2F	Switch 2 Function
lbl	Low Brightness Level
ti o	Corner Display Timeout

**Note:** If no user input is detected within 5 seconds after entering the menu the gauge will return to real-time mode.



The SAW\_Strength and RFID\_Strength indicators can be used to tune the antenna position.

## Antenna Placement

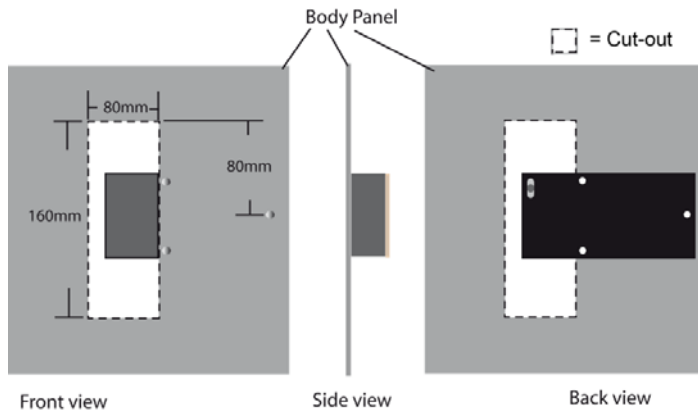
The antenna installation is normally done in several parts. The first is to choose an initial location for the antenna based on the above guidelines and measure the signal strength during a complete wheel rotation. This will give a baseline to work from. Then the process is repeated with a new antenna position. Each time the goal is to increase the wheel rotation coverage or signal strength.

**Note:** Please ensure that the antenna is secured onto the car with Velcro/dual lock when taking measurements. Holding the antenna can lead to signal variations.

**NOTE:** It is strongly recommended that you spend the time at this stage to find the optimum antenna position as it will significantly reduce the potential for problems later on.

## Antenna Placement Restrictions

- If you have to mount the antenna to a conductive surface (metal, carbon) then you MUST space it off the surface by 10mm. Dual lock is ideal for this.
- Should you have to mount the antenna behind a conduction surface then please ensure that you cut a window for the antenna that is the same as the dimensions below. This is essential for the correct operation of the antenna.



## Antenna Do's and Don'ts

### Do

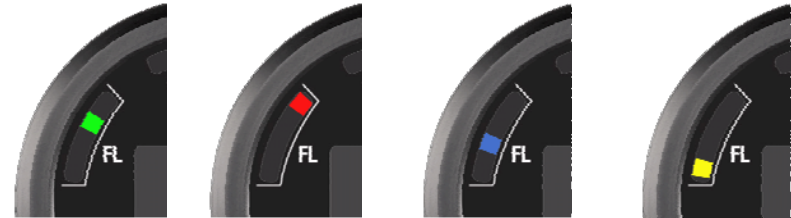
- Ensure the antenna is mounted following the guidelines in this manual
- Take the time to ensure the antenna placement and tuning is as good as possible
- Make sure the RFID signal can be read over at least 90deg of wheel rotation
- Ensure the SAW signal is as strong as possible throughout the whole wheel rotation

### Don't

- Mount the antenna behind a conductive panel (Carbon, Metal) without first making the hole as above in the panel
- Don't hold the antenna when performing the installation. Use dual lock
- Don't cut or modify the ground plane of the antenna. This is crucial for correct operation.

## Corner Indicators

In normal operation the gauge will display the status of the tyres via 4 LEDs on each "corner" of the gauge. These corners are positioned on the dial to reflect the real life position of the wheels on the vehicle this allows for quick "at a glance" feedback.



The coloured LED descriptions are as follows:

LED	Description
Red	Alarm state present on Corner
Green	Wheel OK
Blue	Low Temperature*
Amber	No sensor detected in wheel

### Red LED

- will illuminate if the gauge detects an alarm state on that corner. If the red LED is illuminated you should be aware that one of the parameters is now outside the thresholds set.

### Green LED

- indicates that the wheel is working within the thresholds set.

### Blue LED

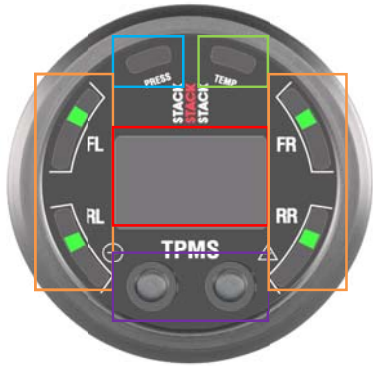
- illuminated when the temperature is lower than the low temperature threshold.

\*The blue LED will illuminate when the LOT menu (see Configuration Menus on Page 3 for details) is set to "ind" and the measured temperature is below the low temperature threshold.

### Amber LED

- will illuminate when the system does not detect a sensor in the wheel. If a sensor is fitted then please refer to the troubleshooting guide.

## Gauge Layout



- Numeric display
- Pressure Status
- Temperature Status
- Corner Indicators
- Switches

The gauge has been designed to provide a clear and simple view of the status of the tyres on the vehicle. There is also a numeric display which can display any of the pressures or temperatures required for more in depth information.

### Pressure and Temp status LEDs

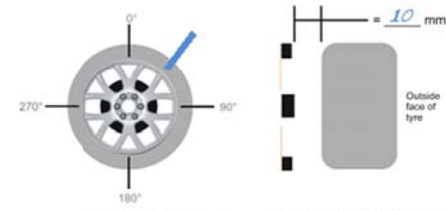
The pressure and temperature status LED's at the top of the gauge illuminate when each corner is selected to indicate which parameter is displayed on the numeric display. There is a red and green LED for each one. The green LED indicates that the parameter being displayed is "normal" and within limits. The red LED indicates the parameter being displayed is outside the thresholds set.



## Example Antenna Installation Log

Keeping a hard copy log during antenna installation is a useful way of capturing the data in the field but can also be helpful in aiding a Stack engineer diagnose possible problems with an installation. A sample log may look like this:

### Stack TPMS Installation Log



Mark sensor positions on the wheel diagram above. Mark distance between sensors and tyre.

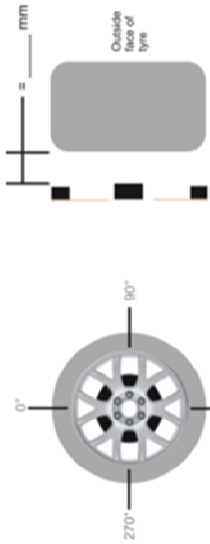
Car 2  
 Corner 1  
 Date 19-Jul-11

Angle °	Saw Strength %	RFID
0°	42	113
45°	39	110
90°	38	105
135°	29	0
180°	0	0
225°	0	0
270°	37	10
315°	39	105

A blank example log for your use is printed overleaf.

Car _____
Corner _____
Date _____

Stack TPMS Installation Log



Note distance between sensors and tyre.

Mark sensor positions on the wheel diagram above.

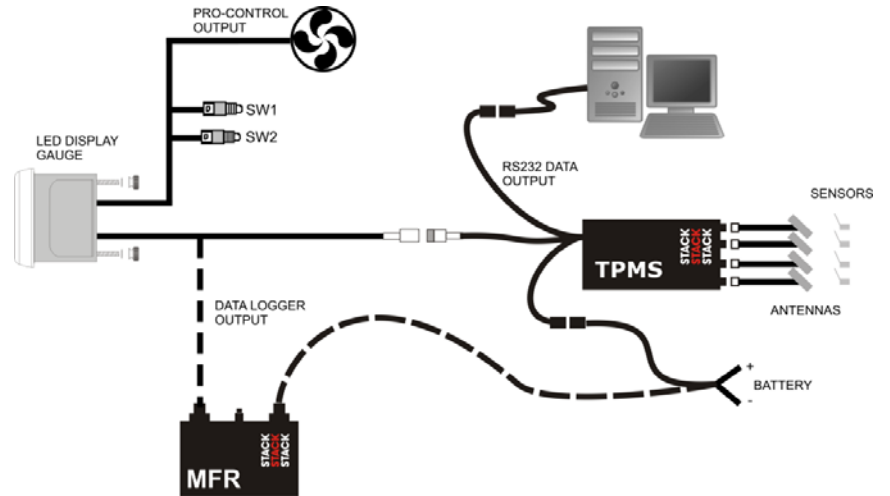
Angle °	Saw Strength %	RFID
0°		
45°		
90°		
135°		
180°		
225°		
270°		
315°		

## 4. TPMS Lite Display Gauge Installation

### Introduction

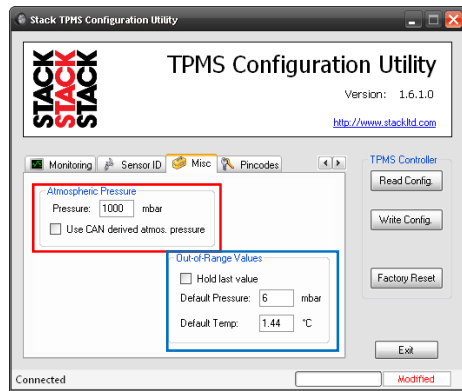
The TPMS display gauge has been designed to display pressure and temperature data in real-time from a Stack TPMS system. The gauge allows you to set alarms and parameters to alert you to tyre problems while the vehicle is running on track.

### Connection & Setup



The gauge is connected to the TPMS interrogator via the NET harness connection. The gauge is powered via this connection too. The gauge is operated using the two switches on the gauge and two external switches. These switches can be located near to the driver to enable easy and quick operation of the gauge.

**NOTE:** The TPMS Interrogator still requires power supplied even when connected to a Stack Data Logging product.



Atmospheric Adjust

Out-Of-Range Adjust

### 3. TPMS Lite Configuration Software Set-up

#### Introduction

This guide will describe the TPMS configuration software and how to use the features in it. This software can be used to configure the TPMS control unit and to monitor the values in real time being measured.

#### System Requirements

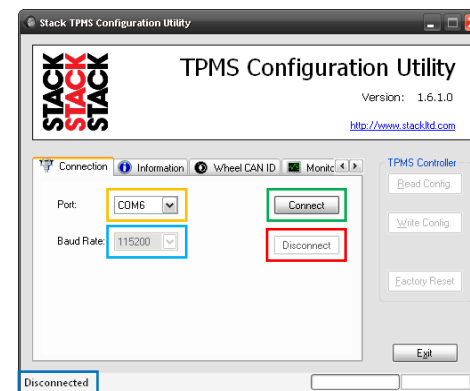
The TPMS configuration software is compatible with the following 32-bit and 64-bit operating systems:

- Microsoft® Windows 7
- Microsoft® Windows Vista SP2
- Microsoft® Windows XP SP3

#### Connecting to the TPMS Interrogator



1. Double click on the TPMS Configuration Utility icon on the desktop or by navigating to Start->All Programs->Stack Limited->TPMS Configuration Utility.
2. After a few seconds, the main screen will appear. Please take some time to become familiar with this screen and the layout. Some of the options will remain greyed out and non-selectable until a connection is made to the TPMS interrogator.



Select Serial port

Select Baud Rate

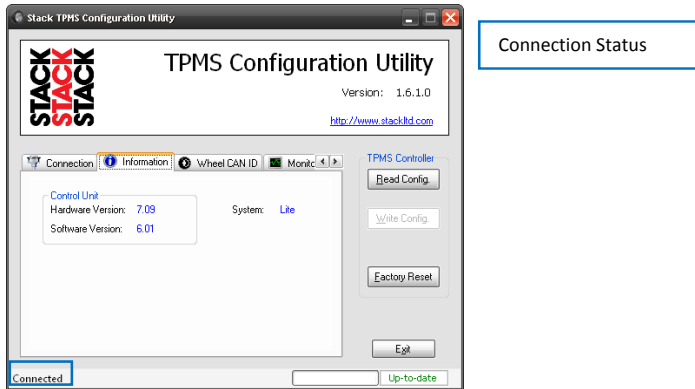
Connect to Box

Disconnect from Box

Connection Status

**Note: Please ensure that 115200 is selected as the Baud Rate.**

3. Select the **Serial (COM)** port you have connected the TPMS Control unit to and press the **Connect** button. If the connection is made to the box the program will display the Information Tab and display the information for the unit. To confirm a connection has been made the **Connection Status** changes from **Disconnected** to **Connected**.

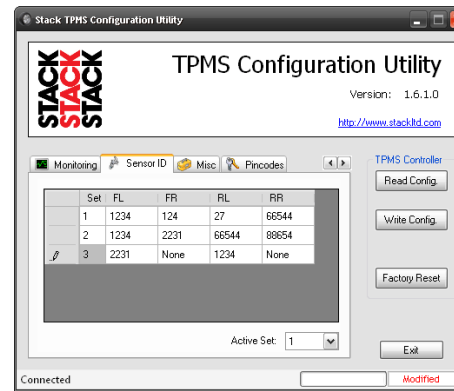


## Reading and Writing Configurations

The software will automatically read the configuration from the interrogator when the **Connect** button is pressed.

Any changes that are then made to the configuration will need to be written to the interrogator. This is done with the **Write Config** button. The **Write Config** button is only activated when the configurations of the interrogator and config software do not match. The **Config Status** will show **Up-To Date** if they match and **Modified** if they don't.

The **Read Config** button can be used to get the configuration from the interrogator at any time.



The wheel set configuration can be written to the box by pressing the write config button.

## Misc. Options

The "misc." options allow the user to configure the way the atmospheric compensation and out of range values are handled by the interrogator.

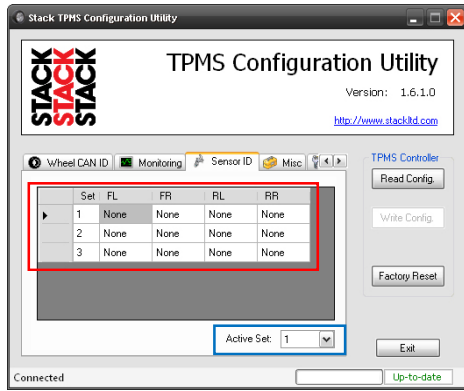
The atmospheric compensation value can be handled by setting the atmospheric pressure manually. This is typically done at the start of each day. It is also possible to send the interrogator the atmospheric pressure over the CAN link from an existing logger. In this mode the compensation can be more accurate as it compensates in real time from an existing sensor reading.

*The CAN spec is covered in Section 5 of this document.*

The out of range values tell the interrogator how to handle a loss of signal from a sensor. Should a sensor become damaged and the interrogator is unable to read temperature and pressure from it after 10secs the interrogator will set the output from that channel to either of the two following states:

- **Hold last Value**  
this keeps the last value that was successfully measured with the sensor on the output until the sensor can be read again.
- **Default Pressure/Temperature**  
this will force the output to the values defined if the sensor cannot be read. For example this can be set to a large value outside normal operating range so it is very clear when the sensor is not being read.



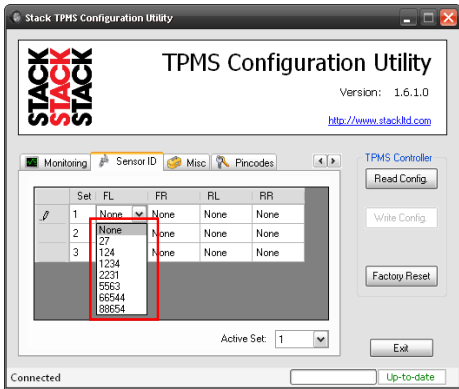


Set Configuration  
Selected Set

- To assign a sensor to a set, click on the corner and a drop down of the sensors that are authorised will appear.
- Select the sensor required for this corner.

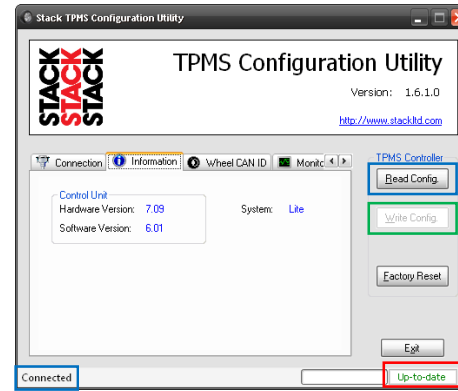
Note: The configuration software will only allow valid sensor assignments, for example it is not possible to select the same sensor in the same wheel set.

- To disable a corner, for example on a motorbike or if a sensor has not been fitted select none. This will stop the interrogator measuring that channel.



Sensor IDs

When the set configuration is complete, select the wheel set that should be used by default when the box is powered up.



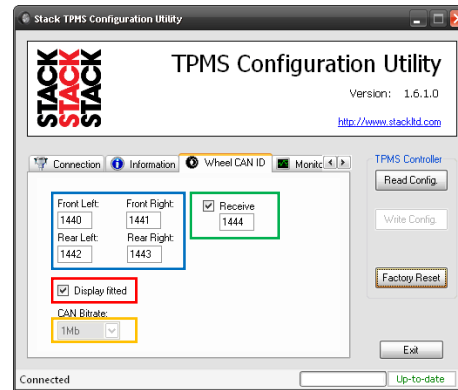
Read Config  
Read Config  
Config Status

### CAN Configuration

The TPMS interrogator has a fully configurable CAN bus output. This is used to send data to the TPMS gauge and can also be used to connect the system to a data logger.

**Note: The gauge is fixed to received CAN data on ID 1440 (FL), 1441(FR), 1442(RL) and 1443(RR). The gauge expects and will only function with these CAN IDs.**

To configure the CAN options click on the **Wheel CAN ID** tab.



CAN IDs  
CAN Receive ID  
Gauge Fitted  
CAN Bit Rate

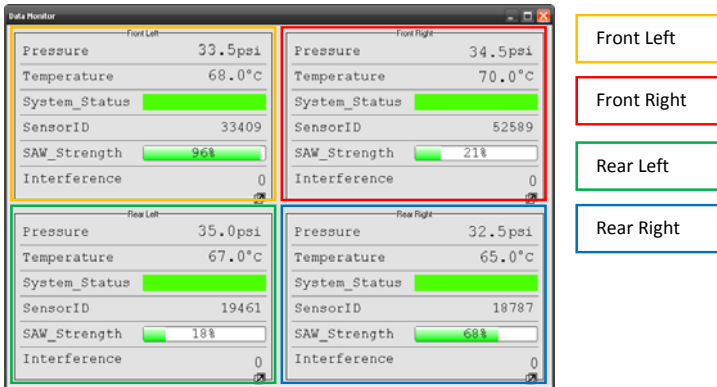
- CAN IDs**  
The interrogator outputs a CAN data message per wheel. By default the interrogator outputs on IDs 1440 to 1443. These are the IDs the TPMS gauge reads. The CAN IDs can be changed to suit the system the TPMS is connecting to.

- CAN Receive ID**  
The TPMS interrogator can receive data over the CAN bus.
- Display Fitted**  
Unchecking this option stops the TPMS interrogator sending the CAN messages to the gauge. This is useful if the gauge CAN IDs are taken by another device on the system and should not be sent out by the TPMS interrogator.  
Checking this option allows the CAN IDs of the interrogator to be changed while keeping the gauge functionality.
- CAN Bit Rate**  
The bit rate of the TPMS interrogator can be selected. If the TPMS system is not being connected to an external data logger then this can be left at 1Mbit. If the system is being connected to a data logger, set this to the bit rate of the system you are connecting it too.

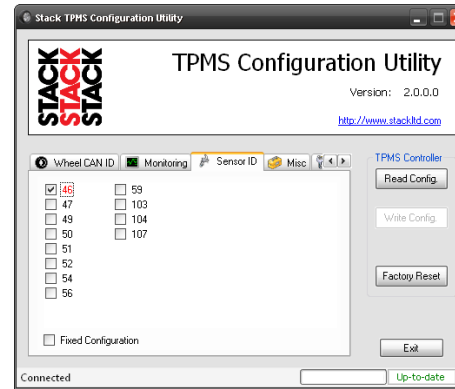
### Real-time Monitoring

The configuration software can be used to display real time information from the TPMS interrogator. This is useful during installation and the running of the system.

To enable the real time monitor click the **Monitor** tab, then click the **Monitor** button



**Note:** The monitor window can be resized by dragging the bottom right corner to the size desired.

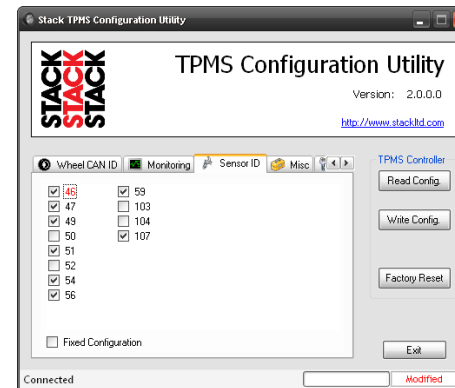


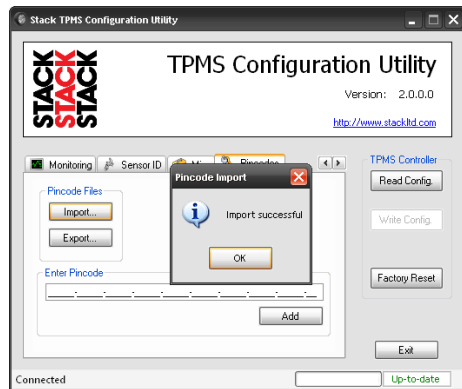
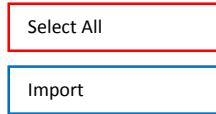
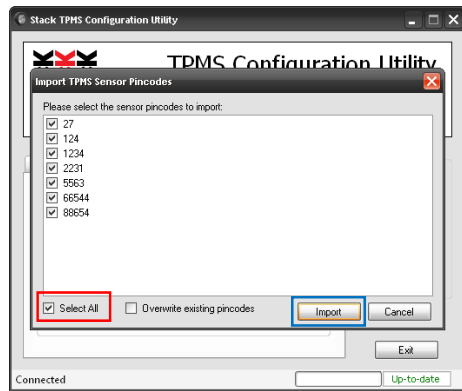
The sensors that have valid imported PIN codes will now be listed.

- Unchecked Black text = Pincode Valid not authorised in the interrogator
- Checked Black text = Pincode valid and authorised in the interrogator
- Checked Red text = Sensor authorised in interrogator but no valid pincode in library

Select each sensor by ticking the checkbox next to the sensor id. When all the sensors required are selected press the Write Config button to send the sensor list to the

**NOTE:** Any sensor highlighted red will be unable to be selected or deselected until a valid pincode for that sensor is imported into the library.





To export the pincode library click the export button, select the directory to export the pincode files too, select the files required and click Export. The files will be saved in the directory specified

## Configuring Wheel Sets

Once the sensors have been added to the library and authorised it is now possible to configure the wheel sets. Depending on the system purchased sensors can be authorised for use in the following ways:

### PRO Systems

To authorise sensors in a Pro system. Click on the Sensor ID tab.

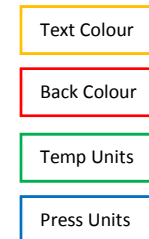
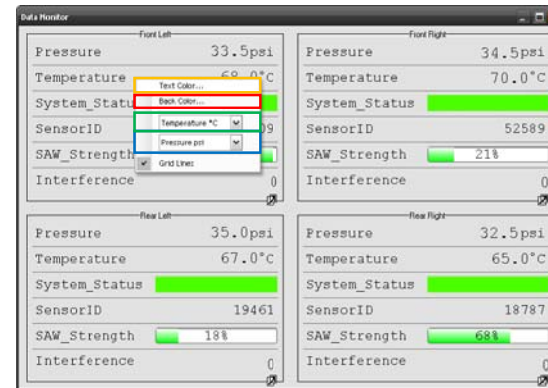
In this mode the sensors that are authorised in the interrogator can be fitted to any corner of the vehicle and the interrogator will automatically discover the sensor.

The Monitor window displays the values from each of the 4 wheels. The monitored parameters are listed below.

Parameter	Range	Optimum	Description
Pressure	0-320psi	N/A	Measured pressure
Temperature	0-320DegC	N/A	Measured temperature
System Status		Green	No Sensor Detected
			Sensor Detected - Trying to measure
			Sensor Detected - Measuring Pressure and Temp
Sensor ID	0-65000	N/A	ID of sensor on that corner
SAW Strength	0-100%	100%	Strength of the pressure and temperature signal
Interference	0-100%	0%	Amount of external radio interference


The monitor window allows for a single corner to be expanded to fill the screen. This also allows that corner to update faster allowing for more instantaneous feedback. To expand a corner to full screen, click the icon. To return to the 4 corner view click the icon again.

It is possible to customise the monitor window. Right click on any of the corner displays and a pop-up menu will appear.



The description of each parameter can be found in the table below.

Parameter	Range	Description
Text Colour	-	Sets the text colour for the corner
Back Colour	-	Sets the background colour for the corner
Temp Units	DegC/DegF	Sets the temperature display units
Press Units	Psi/Bar	Sets the pressure display units
Grid Lines	Yes/No	Shows or hides the grid lines

To close the monitor window click the red X in the corner . This will close the monitor window and return to the main program.

## Importing Sensors

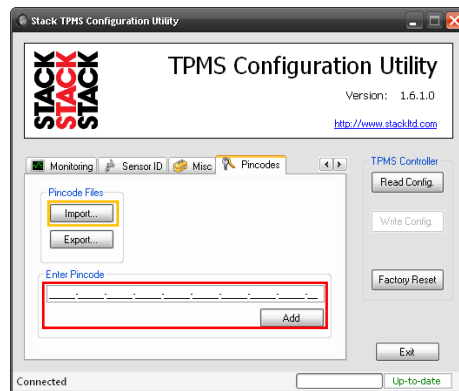
The TPMS Lite system allows for 3 sets of wheels to be configured. Each set can contain up to 4 sensors. The sensors need to be imported to the TPMS sensor library before being configured for use in the box. The action of importing a sensor in also authorises it for use with the system.

**Note:** To add a sensor to the library the TPMS config software must be used. The library is stored on the local PC.

### Sensor Importing and Authorisation

The pincodes can be found on the outside of the sensor packaging and on the id card supplied with each sensor. If you have difficulty locating your pin code please contact your dealer.

To import pincodes click the **Pincodes** tab.

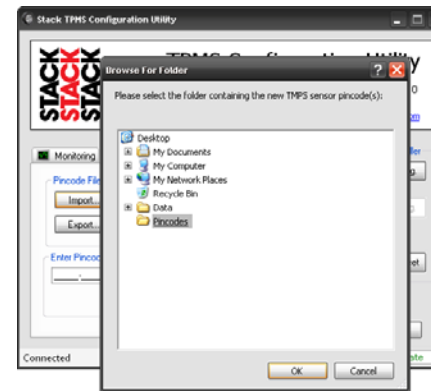


Import Pincodes

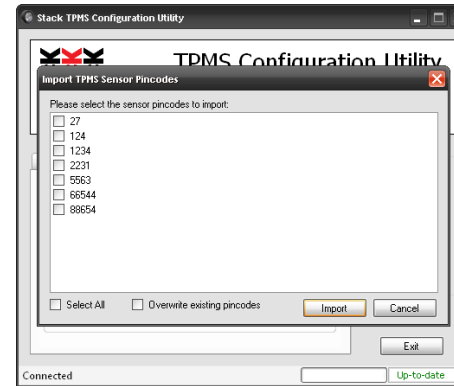
Manual Pincode

- Click the Import button and select the location on the computer where the pincode files have been saved, then click OK.

**NOTE:** It is possible to enter the pincode without a file by entering it into the pincode input and clicking the add button. This authorises and adds the sensor to the library.



- The configuration utility will scan the directory and list the sensors that are available for importing. You can identify the sensors you have by looking at each sensor's individual label which has its id printed on it.



- Select the sensor ids that are to be imported. The select all button will select all sensors in the list. Once they have been selected click the import button. The sensors will now be imported and authorised for use with the system.