

bf1systems Limited  
TPMS Mini Analyser  
User Guide & Quick Start Guide



F1-100-1451-001 – 433MHz  
F1-100-1451-002 – 315MHz

Version – 3.08

## Revision History

Date	Modifications	Author	Version	Modified Sheets	Approved
03-Jan-2007	Draft for comment	MRC	Draft A	All	
06-Feb-2007	Released	MRC	2.00	NONE	
06-Jun-2007	Revised System Components list	GU	2.01	None	
25-Apr-2008	Template Updated	JRS	3.01	All	JRS
29-Jan-2009	IRTPTMS functional changes Added IRTPTMS page in 4ch display cycle Remove Setup Trigger Time page Added IR option in Setup-Channel Config.	MRC	3.02	15, 15 & 36	GMS
10-Feb-2009	LF Tools Section removed to reflect changes to firmware	JRS	3.03	All	GMS
13-May-2009	Generation display and Autodetect information added	GMS	3.04	12, 13, 31	MRC
30-Sept-2009	Part Number Updated	GU	3.05	1	GMS
15-April-2015	Template updated	BG	3.06	All	JRS
13-May-2015	Template updated	CC	3.07	All	JRS
03-Feb-2017	Updated screenshots Updated paragraphs 2.5, 2.6, 2.7.3, 2.7.4, 2.7.11, 2.8 Paragraph numbering update Added part 2.6.2, 2.6.3, 2.6.6, 2.7.8 Removed Appendix 3.1 Merged with the Quick Start Guide	IS	3.08	12, 13, 32 16-23, 25, 26, 31, 32 All 18, 20, 21, 28 33 4-8	BAG

## Table of Contents

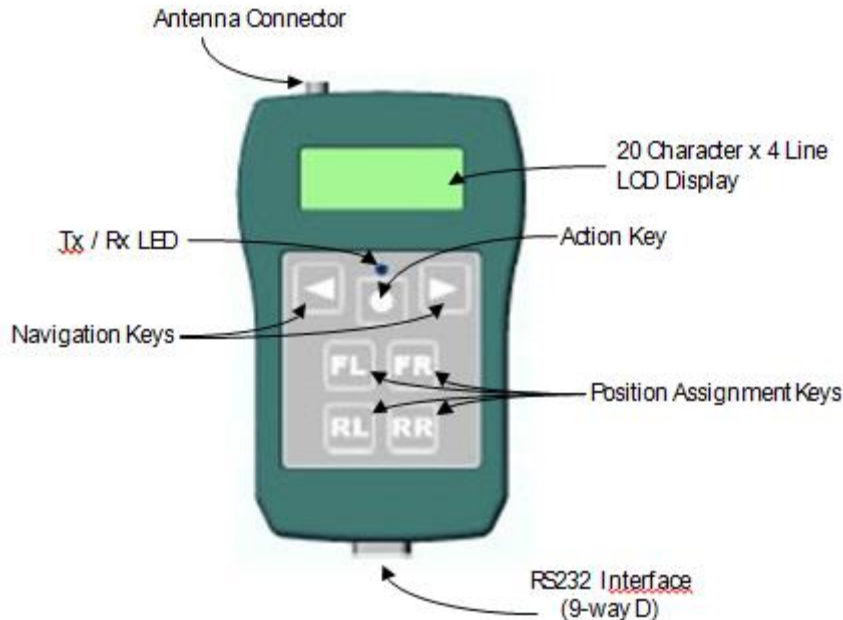
Part 1 – Quick Start Guide.....	5
1 Analyser Overview – Button Functionality.....	5
1.1 Action Key .....	5
1.2 Navigation Keys.....	5
1.3 Shortcuts .....	5
1.4 Position Assignment Keys.....	5
1.5 Clear Set / Clear Positions.....	5
2 Permit List Upload .....	6
3 Setup Channel Config.....	7
4 RF Receive Menu .....	8
4.1 – Individual Sensor Displayup .....	8
4.2 LF Setup .....	9
Part 2 – User Guide .....	11
1 Introduction .....	11
1.1 System Components.....	11
1.2 Wheel Electronics .....	11
1.2.1 Quiet Mode (1e).....	12
1.2.2 Stationary Mode (1a).....	12
1.2.3 Moving Mode (1b) .....	12
1.2.4 Stationary Entry Mode (3) .....	12
1.2.5 Fast Transmission Mode (2a) .....	12
1.3 Low Frequency Triggering (LF) .....	12
2 General Operation.....	13
2.1 Permit List.....	13
2.2 Position File .....	14
2.3 Analyser Overview .....	15
2.3.1 Action Key.....	15
2.3.2 Navigation Keys.....	15
2.3.3 Position Assignment Keys.....	15
2.3.4 Shortcuts.....	15
2.3.4.1 Backlight .....	15
2.3.4.2 Setup Menu .....	15
2.3.4.3 Clear Set / Clear Positions .....	16
2.4 Main Menu.....	16
2.5 Before You Start Using Your Analyser.....	16
2.6 RF Receive Pages.....	16
2.6.1 Individual Sensor Display Page 1 .....	17
2.6.1.1 Individual Sensor - LF Setup .....	17
2.6.2 Individual Sensor Display Page 2 (IR, 5PIXEL and 5ChWTS).....	18
2.6.3 Individual Sensor Display Page 3 (5PIXEL and 5ChWTS).....	18
2.6.4 Compensated Pressure Display.....	19
2.6.4.1 Compensated Pressure - LF Setup .....	19
2.6.5 Tyre Set Pressure / Temperature Display .....	19
2.6.5.1 Tyre Set - LF Setup .....	20
2.6.6 Tyre Set – Amb+Obj Temperature Display (IR, 5PIXEL and 5ChWTS) .....	20
2.6.7 Tyre Set ID Display.....	21
2.6.8 Tyre Set Count / Mode Display .....	21
2.6.8.1 Count / Mode - LF Setup .....	22
2.6.9 Wheel Position and Tyre Set Assignment.....	22
2.7 Setup Pages.....	23
2.7.1 Setup Units .....	23
2.7.2 Setup Position Settings .....	24
2.7.3 Setup Set Display.....	25
2.7.4 Setup Reference Settings.....	26
2.7.5 Setup Power Settings.....	26
2.7.6 Setup Beep/LED 1 .....	27

---

2.7.7	Setup Beep/LED 2 .....	28
2.7.8	Setup Beep/LED 3 .....	28
2.7.9	Setup System Info .....	29
2.7.9.1	Diags .....	29
2.7.9.2	Software .....	29
2.7.9.3	Hardware .....	30
2.7.9.4	Manufacture Information .....	30
2.7.10	Setup Contrast.....	30
2.7.11	Setup Channel Config.....	31
2.8	Firmware Update.....	32
3	Specifications .....	33

# Part 1 – Quick Start Guide



## 1 Analyser Overview – Button Functionality



### 1.1 Action Key

The Action Key is used to select menu options and to scroll through selection items. The Mini Analyser is also powered on and off by pressing and holding the Action Key.

### 1.2 Navigation Keys





The Navigation Keys   are used for moving between screen display pages and selecting individual fields on a certain page. Press and hold the left hand arrow key to navigate up to a higher menu level.

### 1.3 Shortcuts

Backlight - Simultaneously press both Navigation Keys to toggle the display backlight on and off.



Setup Menu - Simultaneously press the Left Navigation Key and the action Key to quickly enter the Setup Menu.

### 1.4 Position Assignment Keys

The position assignment keys     are used to allocate sensors to given wheel positions as required for the generation of wheel position and set data. Pressing a position assignment key immediately after the reception of a LF triggered datagram will allocate the responding sensor to the selected position within the internally generated position (.pos) file. If a full set of wheel sensors is learned consecutively then the user is prompted to assign the sensors as a wheel set. Position files generated within the Mini Analyser can be uploaded to a PC and then transferred to the TPMS ECU.

### 1.5 Clear Set / Clear Positions

Simultaneously pressing the Position Assignment Keys   will cause the Mini Analyser to clear any partially learned set data held in temporary store. A splash screen is displayed to indicate the action has taken place.

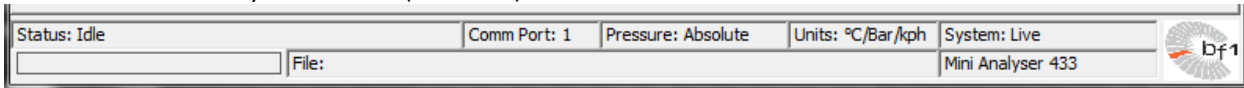
Simultaneously pressing the Position Assignment Keys   will cause the Mini Analyser to clear all position and set data held within the unit. A splash screen is displayed to indicate the action has taken place.

## 2 Permit List Upload

Before the Mini Analyser can be used it is a requirement that a permit list be loaded into the unit. bf1systems provide a permit list whenever new wheel electronics are supplied. A permit list is transferred to the Mini Analyser using the PC DigiTyre utility in the same manner for sending permit lists to the TPMS ECU on the car.

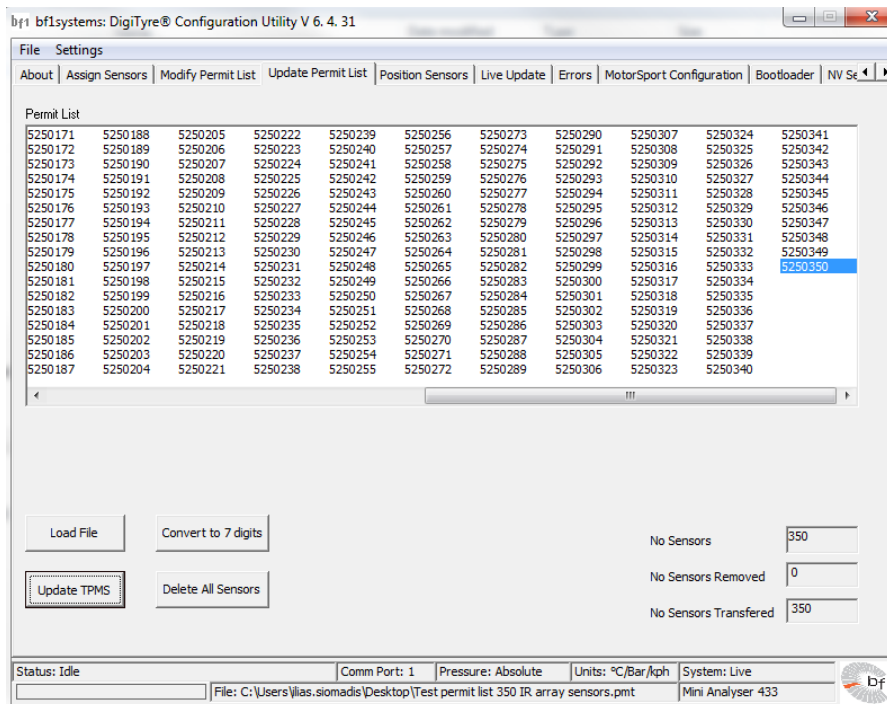
To connect the Mini Analyser to the PC software (DigiTyre Utility) follow the steps below:

- Physically, connect the unit to the PC via an RS-232 cable
- Power it on using the Action Key (see 2.3.1)
- Run the DigiTyre utility. The Mini Analyser should be automatically connect via Comm Port 1. The software will notify the user that the System is “Live” (see below).



The Mini Analyser will only recognise and display sensors contained within the loaded permit list. The use of permit lists prevents other system owners interrogating sensors not belonging to them.

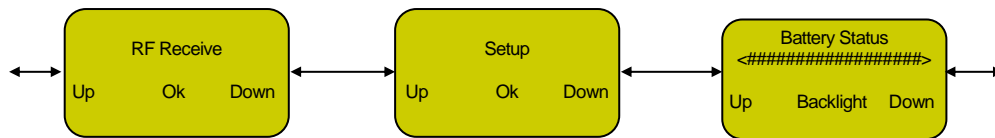
To load a permit list into the Mini Analyser, it should be connected to the PC. Using the < Update Permit List > page of the DigiTyre utility the permit file (.pmt) is written to the analyser using the < Update TPMS > button at the bottom of the page.



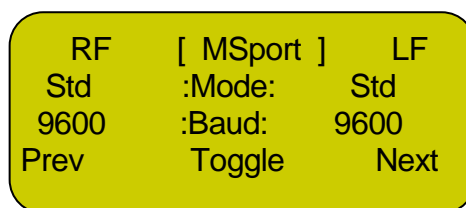
### 3 Setup Channel Config

The channel config options page allows the user to configure the Mini Analyser for different generations of bf1systems wheel sensors. Changing this option affects the display pages of the < RF Receive> functions.

Depending on what state the Mini Analyser starts up in, press and hold the left hand arrow to navigate to the top level menu; you will see one of the screens shown below.



Scroll to the <Setup> screen, press the <Ok> button and scroll to the < Channel Config> page, hit <OK> will enter the < Channel Config> options page.



Pressing the < Toggle> button cycles between the different types of wheels sensors that bf1systems manufacture.

- Roche – Pharmaceutical application
- IR – Single point IRTPTMS sensor
- 5PIXEL – 5 points IRTPTMS sensor
- 5ChWTS – 5channel rim temperature sensor
- MSport – TPMS sensor
- Auto – Automatically detects the sensor type. Note that this mode is less efficient due to the number of LF commands/RF data to encode/decode

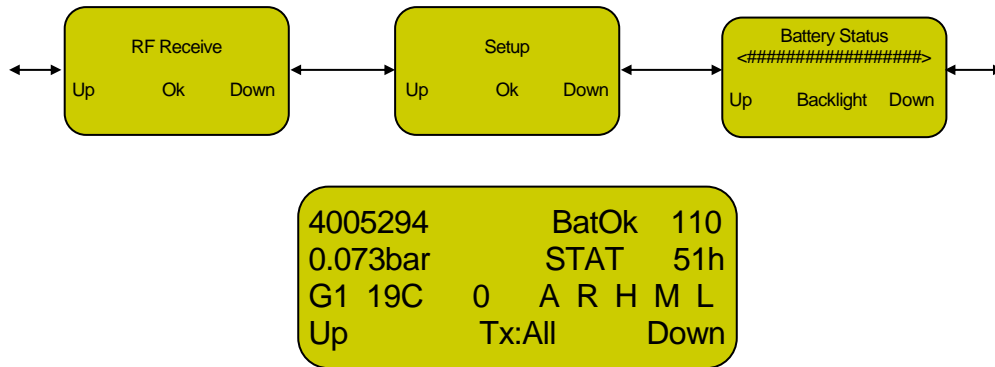
Note: For V8 Supercars, “MSport” should be selected.

Once the required value has been set, holding down the Left Navigation Key returns to the < Channel Config> menu. Holding down the Left Navigation Key again returns to the < Setup > page.

## 4 RF Receive Menu

### 4.1 – Individual Sensor Displayup

Depending on what state the Mini Analyser starts up in, press and hold the left hand arrow to return to the top level menu, when you will see one of the screens shown below. Navigate to < RF Receive > and click <OK>. The first page you will enter onto is the individual sensor display.



The individual sensor display provides information regarding a single sensor. The Mini Analyser can be configured to display data selectively based on the reported sensor mode, or to display data from any sensor that is received. This display page also provides a facility to transmit selected LF codes and the means of allocating position and set data.

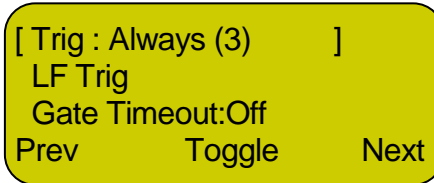
4005294	-	ID of received sensor
BatOk 110	-	Sensor battery lifetime countdown (it starts at 120 and counts down with each internal process)
0.073bar	-	Uncompensated sensor pressure, bar/psi, gauge/abs set via <Setup Units> (see 2.7.1)
STAT 51h	-	Sensor operating mode
G1, G2, G3	-	Sensor generation
19C	-	Sensor temperature reading, C/F selected via <Setup Units> (see 2.7.1)
0	-	Sensor CRC
ARHML	-	Sensor mode flags
		A – Auto transmit (no LF)
		R – Roll switch active (moving)
		H – Hardware error
		M – Measurement error
		L – LF triggered transmission

Pressing and releasing the centre key will cause the Mini Analyser to transmit the configured LF code and receive a response from the sensor in the vicinity (<30cm).



## 4.2 LF Setup

In order to change the LF operation of the Mini Analyser or to filter the type of data received by the sensor please navigate to the <LF Setup> page. The <LF Setup> page should be set up as shown below. Once this is done, press and hold the left hand arrow key to return to the <RF Receive> page



### Trig: - LF code to transmit

- Inflated (0) – Historic bf1systems sensors, 1 datagram when sensor is pressurised (Tx:0)
- Inflated (2) – NASCAR sensors, 1 datagram when sensor is pressurised (Tx:2)
- Always (3) – All sensors, 2 datagrams in any mode (Tx:All)
- Multi Tx (7) – bf1systems motorsport diagnostic mode, 255 datagrams at 1Hz (Tx:Mul)

### Live - Reception filter

- Live – Any permitted sensor regardless of mode
- LF Trig – Triggered data only
- Move – Moving sensors only
- Move/LF – Moving or LF triggered sensors

### Gate Timeout - timeout time set via <Setup Trigger Time>

- On
- Off

I would recommend using LF Trig mode since this cuts out all automatic transmissions inside the garage and lets you focus on the sensor in front of you. The Live function can also be useful in some situations but I recommend using the red settings.

This page has been intentionally left blank

# Part 2 – User Guide

## 1 Introduction

The Mini Analyser is an integral part of the bf1systems Tyre Pressure Monitoring System (TPMS). The unit is designed to allow the user to test the functionality of individual wheel electronics, and to provide a convenient method for the generation of tyre set and position information.

### 1.1 System Components

The Mini Analyser is a hand held unit composed of the following parts:

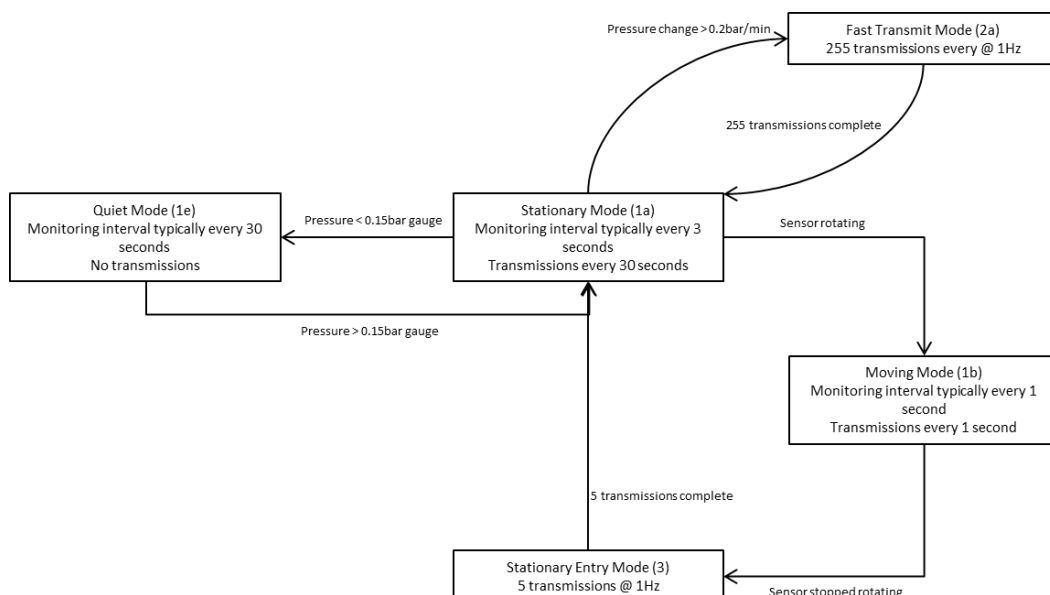
- 20 character x 4 line dot-matrix display with backlight and contrast control
- Custom membrane keypad
- 433MHz or 315MHz RF receiver (Depending on the product version)
- 125kHz LF transmitter
- Configurable LED/Buzzer for confirmation of LF Transmission & RF Reception
- External stub antenna, connected via RP-SMA socket
- Internal battery (PP3/6LR61 size)

### 1.2 Wheel Electronics

The wheel sensor is the main TPMS data source, providing pressure and temperature data to the TPMS ECU via a RF link. Depending on the application, one or more sensors are fitted within the wheel/tyre assembly. The sensor consists of a battery, microprocessor, RF transmitter, LF receiver, absolute pressure sensor, temperature sensor and a g-sensor.

The microprocessor contains bf1systems custom code to collect raw data from the sensors, scale and format the data and pass it to the RF transmitter for communication to the TPMS ECU. The LF receiver section allows the wheel electronic to respond to external commands issued by the TPMS ECU or Mini Analyser.

The pseudo state diagram below shows the basic operating modes of the wheel electronic:



A more detailed description of the above diagram is presented in the following sections.

### 1.2.1 Quiet Mode (1e)

When delivered all sensors are in Quiet Mode (1e). In this mode the sensor measures pressure at a periodic interval. Typically, this is set to give a measurement interval of 60 seconds. In mode 1e the sensor does not transmit RF datagrams.

When in Quiet Mode (1e) the sensors will respond only to LF codes 3 & 7.

### 1.2.2 Stationary Mode (1a)

When the sensor measures the pressure to be above 1.15 Bars Absolute, it immediately enters Stationary Mode (1a). In this mode the sensor measures and transmits RF datagrams at a periodic rate. Typically, this is set to provide a transmission interval of 30 seconds.

In Stationary Mode (1a) the sensor monitors the accelerometer at 3 second intervals in order to check for wheel rotation. The accelerometer is a low-resolution sensor that is used for the detection of wheel rotation only.

When in Mode (1a) the sensor will respond to all LF codes.

### 1.2.3 Moving Mode (1b)

When wheel rotation is detected via the accelerometer the sensor enters Moving Mode (1b). In this mode the sensor transmits RF datagrams at a periodic rate, typically 1Hz.

The sensor will remain in Moving Mode (1b) until a period of no wheel rotation has been detected using the accelerometer. After a prescribed period of no wheel motion, the sensor will transition to Stationary Mode (1a).

When in Mode (1b) the sensor will respond to all LF codes.

### 1.2.4 Stationary Entry Mode (3)

When the wheel sensor detects it has stopped rotating, it enters mode 3 where it will transmit 5 datagrams at 1Hz, while monitoring the accelerometer at 1Hz in case the vehicle begins to move again, with the sensor state showing as being stationary. After this the sensor enters Stationary Mode (1a).

### 1.2.5 Fast Transmission Mode (2a)

If the wheel sensor detects a pressure change rate (positive or negative) of greater than 200mbar/minute the sensor will enter this mode where it transmits 255 datagrams at 1Hz and then returns to its previous state.

This mode exists to allow an engineer to accurately monitor a tyre pressure during inflation or deflation.

## 1.3 Low Frequency Triggering (LF)

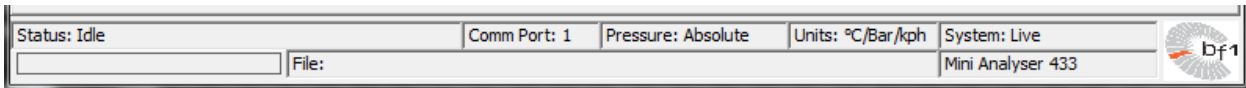
The LF circuitry within the wheel sensor permits the execution of external commands sent via the TPMS ECU or a Mini Analyser. In order to ensure correct operation of the LF triggering a number of important rules must be observed.

- The Mini Analyser should be positioned as close as possible to the wheel sensor under test. The LF transmission has a very short range (30cm).
- Ensure any other wheel sensors are at least 1.5m from the sensor under test.
- Ensure that the correct LF code is transmitted to the sensor under test. (See 2.6.1.1)

## 2 General Operation

To connect the Mini Analyser to the PC software (DigiTyre Utility) follow the steps below:

- Physically, connect the unit to the PC via an RS-232 cable
- Power it on using the Action Key (see 2.3.1)
- Run the DigiTyre utility. The Mini Analyser should be automatically connected via Comm Port 1. Also the software notifies the user that the System is “Live” (see screenshot below).

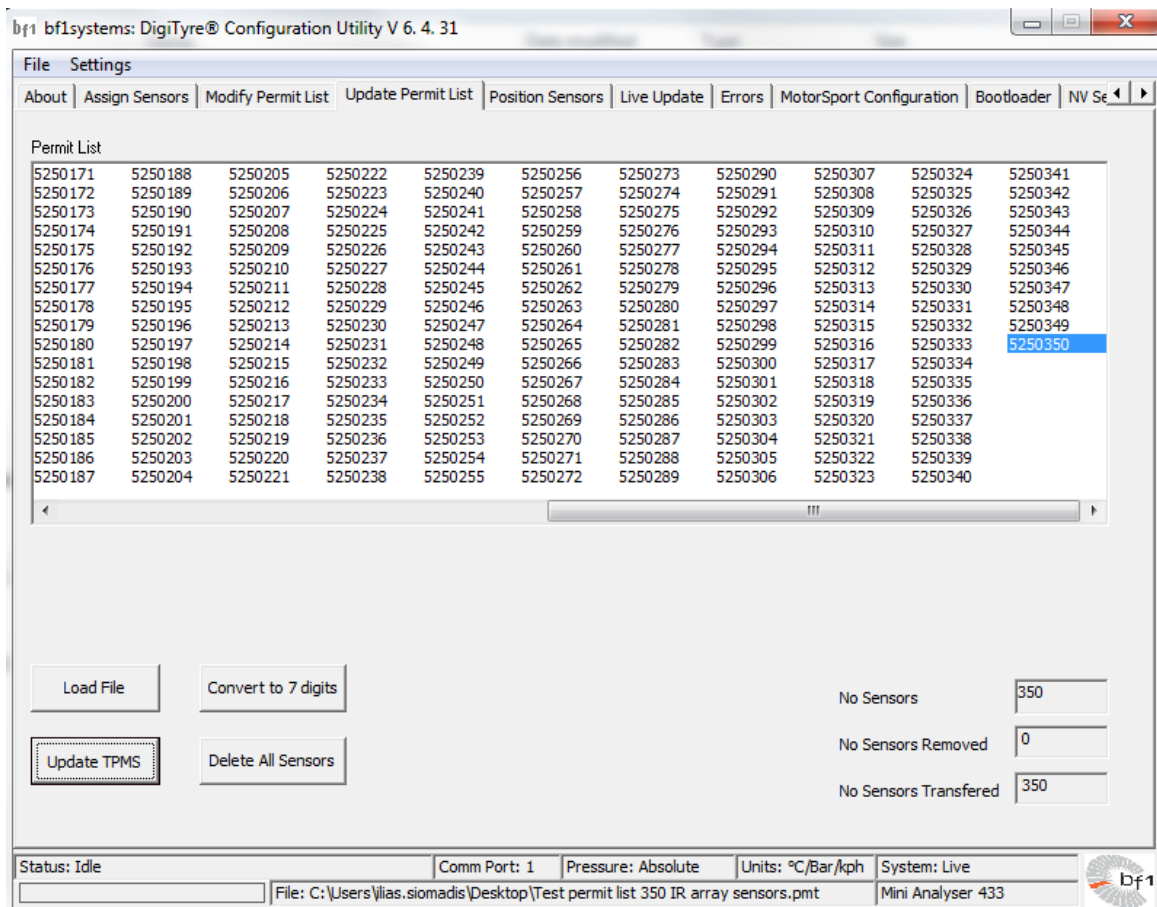


### 2.1 Permit List

Before the Mini Analyser can be used it is a requirement that a permit list be loaded into the unit. bf1systems provide a permit list whenever new wheel electronics are supplied. A permit list is transferred to the Mini Analyser using the PC DigiTyre utility in the same manner for sending permit lists to the TPMS ECU on the car.

The Mini Analyser will only recognise and display sensors contained within the loaded permit list. The use of permit lists prevents other system owners interrogating sensors not belonging to them.

To load a permit list into the Mini Analyser, it should be connected to the PC. Using the < Update Permit List> page of the DigiTyre utility the permit file (.pmt) is written to the analyser using the < Update TPMS> button at the bottom of the page.



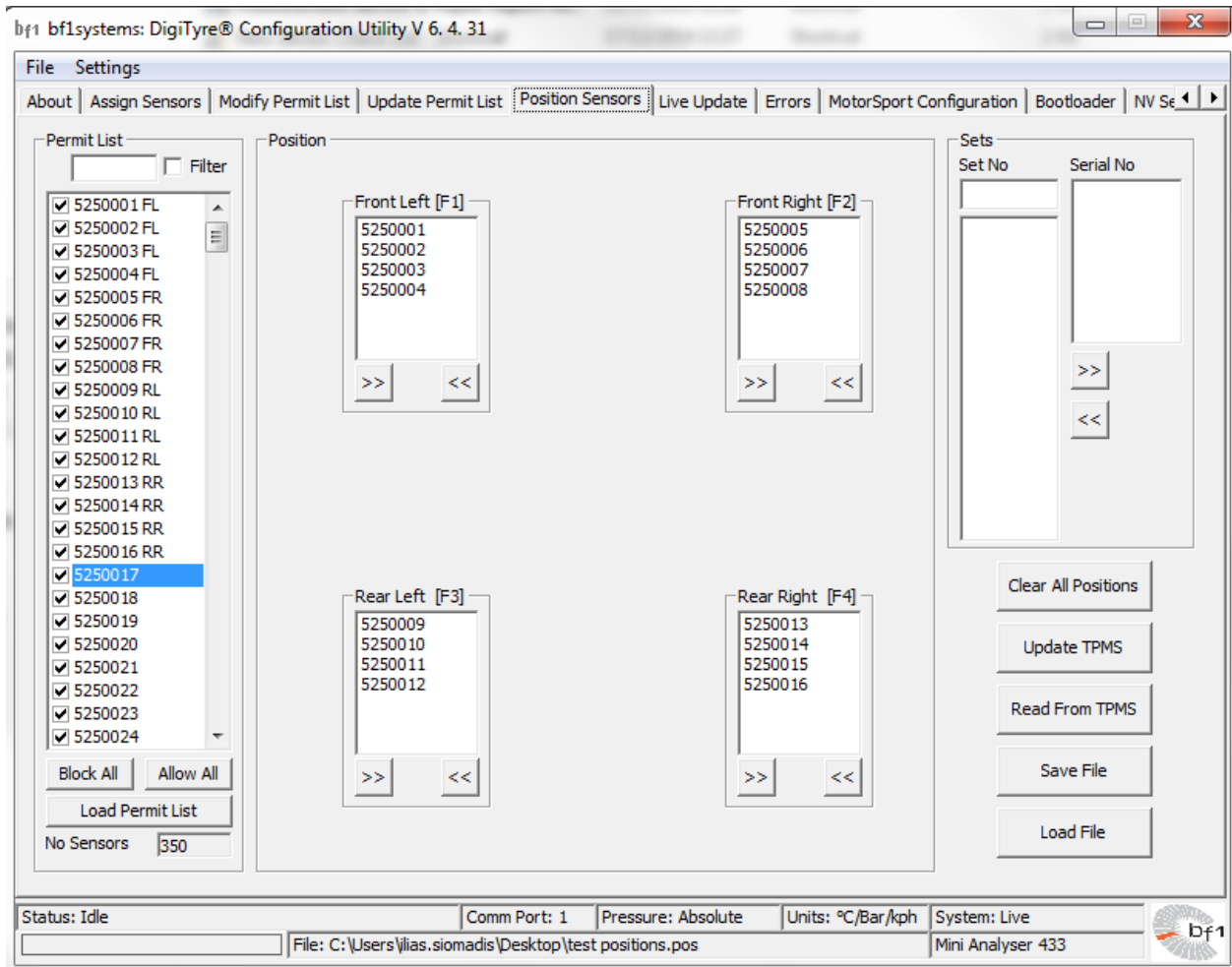
Where ever possible bf1systems load a customer’s latest permit list prior to delivering a new Mini Analyser.

## 2.2 Position File

Before a Mini Analyser generated .pos file is downloaded to the TPMS ECU it should be checked that the ECU contains the same permit list (.pmt file). This will ensure that all sensors contained within the generated .pos file exist within the TPMS ECU permit list.

Once position / set data has been generated within the Mini Analyser it is necessary to upload the data to the PC, before transferring it to the TPMS ECU, by downloading the created .pos file. Generation of position files within the Mini Analyser is described in section 2.6.

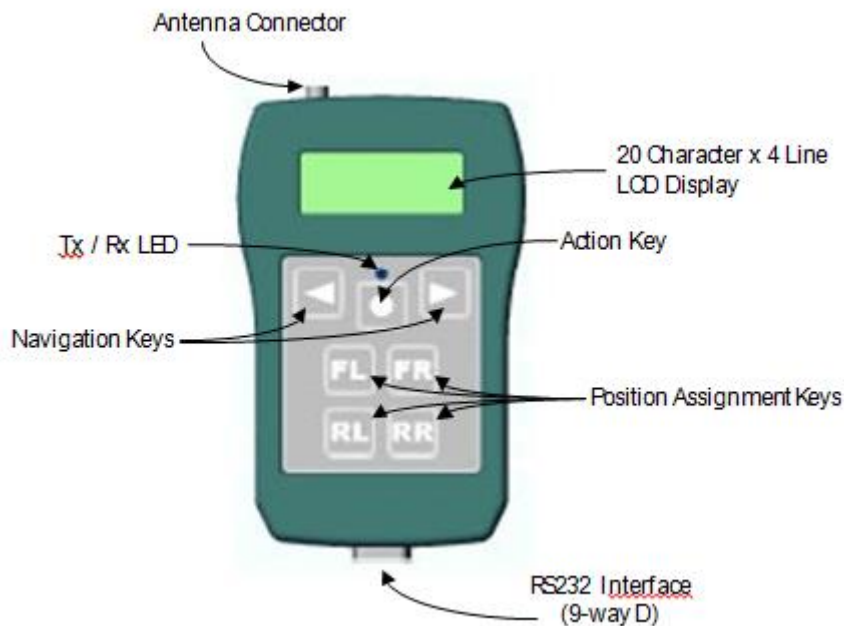
To upload the position file from the Mini Analyser it should be connected to the PC via an RS-232 cable. Using the < Position Sensors> page of the DigiTyre utility the position file (.pos) is read from the analyser using the < Read From TPMS> button.



The created position data will appear in the relevant boxes, as shown above. The data should then be stored to disk using the < Save File> button. The Mini Analyser can now be disconnected from the PC.

To transfer the newly created position data to the TPMS ECU, the ECU should be connected to the PC and the < Update TPMS> button pressed. The TPMS ECU will now contain the newly generated position file and the system is ready to run.

## 2.3 Analyser Overview





### 2.3.1 Action Key

The Action Key is used to select menu options and to scroll through selection items. The Mini Analyser is also powered on and off using the Action Key.





With the unit powered off, pressing and holding the Action Key will cause the unit to turn on. Depending upon configuration settings the unit will display either the last page used or the main menu.

The unit can be powered off from any screen by pressing and holding the Action Key.

### 2.3.2 Navigation Keys

The Navigation Keys   are used for moving between screen display pages, and also for the selection of fields within pages having multiple selectable items.

### 2.3.3 Position Assignment Keys

The position assignment keys     are used to allocate sensors to given wheel positions as required for the generation of wheel position and set data. Pressing a position assignment key immediately after the reception of a LF triggered datagram will allocate the responding sensor to the selected position within the internally generated position (.pos) file. If a full set of wheel sensors is learned consecutively then the user is prompted to assign the sensors as a wheel set. Position files generated within the Mini Analyser can be uploaded to a PC and then transferred to the TPMS ECU.

### 2.3.4 Shortcuts

A number of keypad shortcuts are available to activate commonly used functions. These shortcuts operate from any Mini Analyser display page.

#### 2.3.4.1 Backlight


Simultaneously pressing the Navigation Keys   toggles the display back light on and off.

#### 2.3.4.2 Setup Menu

Simultaneously pressing the Left Navigation Key and the Action Key   causes the analyser to enter the Setup Menu.

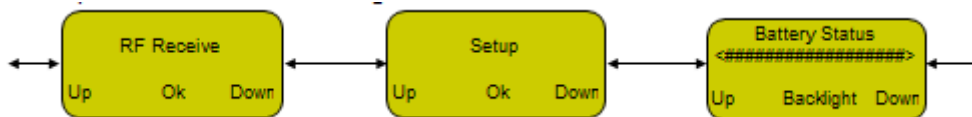
### 2.3.4.3 Clear Set / Clear Positions

Simultaneously pressing the Position Assignment Keys will  cause the Mini Analyser to clear any partially learned set data held in temporary store. A splash screen is displayed to indicate the action has taken place.

Simultaneously pressing the Position Assignment Keys  will cause the Mini Analyser to clear all position and set data held within the unit. A splash screen is displayed to indicate the action has taken place.

## 2.4 Main Menu

Depending upon the unit configuration the Main Menu is displayed at power on. The Main Menu consists of three pages that provide access to the functions of the Mini Analyser, grouped by category (see screenshot below).




The Navigation Keys < Up > / < Down > are used to scroll through the menu pages. To access the functions within a menu the Action Key < Ok > is pressed whilst the required top level menu page is being displayed.

To return to the top level menu from any of the sub-menu pages, hold down the < Up > button.

## 2.5 Before You Start Using Your Analyser

It is recommended that you set up the Mini Analyser to only receive the type of wheel sensors that they are in use.

To do this, simultaneously pressing the Left Navigation Key and the Action Key  causes the analyser to enter the Setup Menu. You will then see "Setup Units" displayed on the screen. Press the Left Navigation Key once to go to the "Channel Config" page, then press the Action Key to go into this page.

Once in the Channel Config page, use the Action Key to toggle the setting at the top of the page until the preferred wheel sensor is selected. The choices available are:

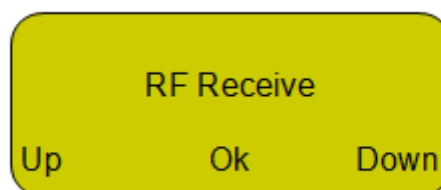
- Roche – Pharmaceutical application
- IR – Single point IRTPTMS sensor
- 5PIXEL – 5 points IRTPTMS sensor
- 5ChWTS – 5channel rim temperature sensor
- MSport – TPMS sensor
- Auto – Not efficient due to the number of LF commands/RF data to encode/decode

Then hold down the Left Navigation Key to leave this page, then hold down the Left Navigation Key again to exit the Setup menu. You will then be able to scroll to the "RF Receive" page and enter this by pressing the Action Key.

**Note:** The Mini Analyser functionality described below apply to all the above types of wheel sensors, unless stated.

## 2.6 RF Receive Pages

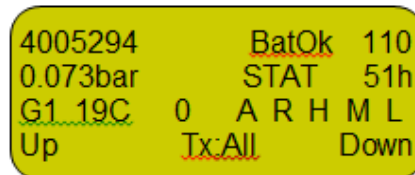
The RF receive pages decode and display incoming RF datagrams. The unit can be configured to display only certain received data based on the serial number, transmission mode, position or set allocation. Pressing the < Ok > button at the RF Receive menu option page will enter the main receive pages and their relevant options.





## 2.6.1 Individual Sensor Display Page 1

The individual sensor display provides information regarding a single sensor. The Mini Analyser can be configured to display data selectively based on the reported sensor mode, or to display data from any sensor in the permit list whenever it is received. This display page also provides a facility to transmit selected LF codes and the means of allocating position and set data (see 2.6.2).



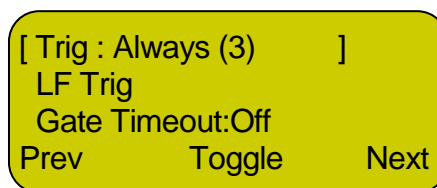
4005294	-	ID of received sensor
BatOk 110	-	Sensor battery lifetime countdown (it starts at 120 and counts down with each internal process)
0.073bar	-	Uncompensated sensor pressure, bar/psi, gauge/abs set via <Setup Units> (see 2.7.1)
STAT 51h	-	Sensor operating mode
G1	-	Sensor generation
19C	-	Sensor temperature reading, C/F selected via <Setup Units> (see 2.7.1)
0	-	Sensor CRC
ARHML	-	Sensor mode flags
		A – Auto transmit (no LF)
		R – Roll switch active (moving)
		H – Hardware error
		M – Measurement error
		L – LF triggered transmission

Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the < LF Setup> page.

Pressing the < Down> button whilst in the < Individual Sensor Display Page 1> page will move to the < Individual Sensor Display Page 2> page. Pressing the < Up> button whilst in the < Individual Sensor Display Page 1> page will move to the < Tyre Set Count / Mode Display> page.

### 2.6.1.1 Individual Sensor - LF Setup

The < LF Setup> page is used to configure the LF transmission of the Mini Analyser. To enter the <LF Setup> page, hold down the <Down> Navigation Key.



The < Prev> and < Next> buttons are used to select the field to be modified. The currently selected field is highlighted by the [...] indicators. Pressing the < Toggle> button causes the selected field to cycle through its available options.

Trig	-	LF code to transmit
		Inflated (0) – Pro 2010, 1 datagram when sensor is pressurised (Tx:0)
		Inflated (2) – NASCAR sensors, 1 datagram when sensor is pressurised (Tx:2)
		Always (3) – All sensors, 1 datagram in any mode (Tx:All)
		Multi Tx (7) – All sensors, multiple datagrams in any mode (Tx:Mul)
Live	-	Reception filter
		Live – Any permitted sensor regardless of mode
		LF Trig – Triggered data only
		Move – Moving sensors only
		Move/LF – Moving or LF triggered sensors
Gate Timeout	-	On/Off timeout time

Once the required options have been set pressing and holding the <Prev> button returns to the <Individual Sensor Display Page 1> page.

Note: Trig: Always (3), Reception filter: LF Trig and Gate Timeout: Off are the recommended settings (see screenshot above).

## 2.6.2 Individual Sensor Display Page 2 (IR, 5PIXEL and 5ChWTS)

This page provides further information regarding a single sensor. It is only available to the IR, 5PIXEL and 5ChWTS wheel sensors.

```

5250125      BatOk  110
T3= 45.5C    AMB= 22.1C
5PX
Up           Tx:All   Down
  
```

5250125	-	ID of received sensor
BatOk 110	-	Sensor battery lifetime countdown (it starts at 120 and counts down with each internal process)
T3= 45.5C	-	IR Tyre Temperature (single for the IR sensor or PIXEL3 for the 5PX). Rim temperature at point 3 when the 5ChWTS sensor is being used.
AMB=22.1C	-	Ambient temperature of the IR element. C/F selected via <Setup Units> (see 2.7.1)
5PX	-	Sensor generation

Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the < LF Setup> page. To enter the < LF Setup> page, hold down the < Down> Navigation Key.

Pressing the < Down> button whilst in the < Individual Sensor Display Page 2> page will move to the < Individual Sensor Display Page 3> page. Pressing the < Up> button whilst in the < Individual Sensor Display Page 2> page will move to the < Individual Sensor Display Page 1> page.

## 2.6.3 Individual Sensor Display Page 3 (5PIXEL and 5ChWTS)

This page provides further information regarding a single sensor. It is only available to the IR, 5PIXEL and 5ChWTS wheel sensors.

```

5250125      T1:  26.0C
T2:  27.5C    T3:  27.5C
T4:  28.0C    T5:  29.0C
Up           Tx:All   Down
  
```

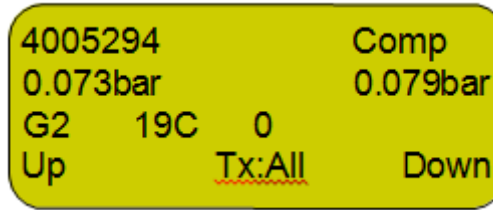
5250125	-	ID of received sensor
T1: 26.0C	-	Tyre temperature point 1 (5PIXEL). Rim temperature point 1 (5ChWTS)
T2: 27.5C	-	Tyre temperature point 2 (5PIXEL). Rim temperature point 2 (5ChWTS)
T3: 27.5C	-	Tyre temperature point 3 (5PIXEL). Rim temperature point 3 (5ChWTS)
T4: 28.0C	-	Tyre temperature point 4 (5PIXEL). Rim temperature point 4 (5ChWTS)
T5: 29.0C	-	Tyre temperature point 5 (5PIXEL). Rim temperature point 5 (5ChWTS)

Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the < LF Setup> page. To enter the < LF Setup> page, hold down the < Down> Navigation Key.

Pressing the < Down> button whilst in the <Individual Sensor Display Page 3> page will move to the <Compensated Pressure Display> page. Pressing the < Up> button whilst in the < Individual Sensor Display Page 3> page will move to the < Individual Sensor Display Page 2> page.

### 2.6.4 Compensated Pressure Display

The compensated pressure display provides the pressure value corrected for the difference in sensor temperature from the reference temperature. The reference temperature can be set either via the < Setup Reference Settings> page (see 2.7.4), or via the < Compensated Pressure - LF Setup> page. This display page also provides a facility to transmit selected LF codes and the means of allocating position and set data (see 2.6.5).

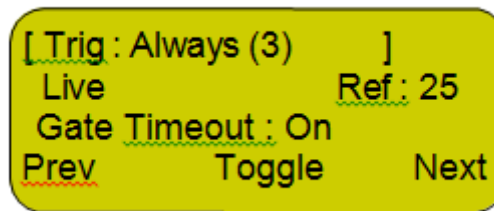


Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the <LF Setup> page. To enter the <LF Setup> page, hold down the <Down> Navigation Key.

Pressing the <Down> button whilst in the <Compensated Pressure Display> page will move to the <Tyre Set Pressure / Temperature Display> page. Pressing the <Up> button whilst in the <Compensated Pressure Display> page will move to the < Individual Sensor Display Page 3> page.

#### 2.6.4.1 Compensated Pressure - LF Setup

This page is essentially the same as the < Individual Sensor – LF Setup>, having an additional field for the setting of the reference temperature.



The < Prev> and < Next> buttons are used to select the field to be modified. The currently selected field is highlighted by the [...] indicators. Pressing the < Toggle> button causes the selected field to cycle through its available options.

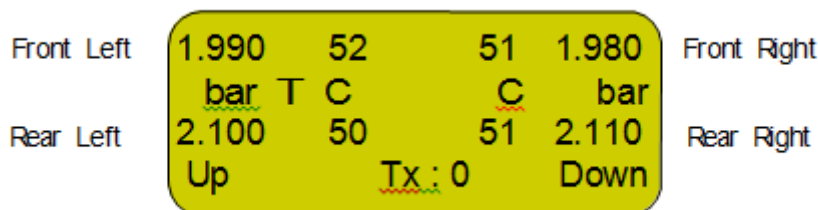
Ref: 25 - Reference temperature 0...100°C in 5°C steps. Set via <Setup Reference Settings> (see 2.7.4)

Once the required options have been set pressing and holding the < Prev> button returns to the < Compensated Pressure Display> page.

### 2.6.5 Tyre Set Pressure / Temperature Display

The < Tyre Set Pressure / Temperature Display> page provides the facility to display data corresponding to complete tyre sets. In order for this page to operate it is necessary to have either generated a position file within the Mini Analyser, or downloaded one via the DigiTyre PC software. To make the reception of new data more obvious to the user an indicator (^/v) to the newly updated location is temporarily displayed when new data is received and displayed.

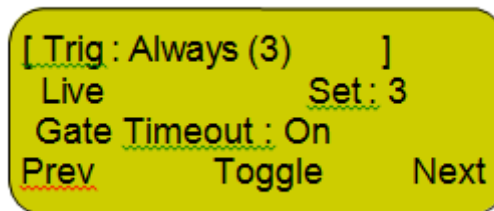
Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The wheel position and tyre set assignment is described in section 2.6.9.



The LF settings are configured via the < LF Setup> page. To enter the < LF Setup> page, hold down the <Down> Navigation Key. Pressing the < Down> button whilst in the < Tyre Set Pressure / Temperature Display> page will move to the < Tyre Set / Amb+Obj Temperature Display> page. Pressing the < Up> button whilst in the < Tyre Set Pressure / Temperature Display> page will move to the < Compensated Pressure Display> page.

### 2.6.5.1 Tyre Set - LF Setup

This page is essentially the same as the <Individual Sensor – LF Setup>, having an additional field for the setting of the allowed tyre set(s).



The <Prev> and <Next> buttons are used to select the field to be modified. The currently selected field is highlighted by the [...] indicators. Pressing the <Toggle> button causes the selected field to cycle through its available options.

- Set: 3 - Tyre set display filter
  - 1...63 - Individual set data only
  - AnySet - Any configured tyre set
  - AnyPos - Any positioned sensor, even if not allocated to a set
  - Range - Selected tyre set range, set Setup Set Display (see 2.4.3)

Once the required options have been set pressing and holding the <Prev> button returns to the <Tyre Set Pressure / Temperature Display> page.

### 2.6.6 Tyre Set – Amb+Obj Temperature Display (IR, 5PIXEL and 5ChWTS)

The < Tyre Set / Amb+Obj Temperature Display > page provides the facility to display data corresponding to complete tyre sets. In order for this page to operate it is necessary to have either generated a position file within the Mini Analyser, or downloaded one via the DigiTyre PC software. To make the reception of new data more obvious to the user an indicator (•/T) to the newly updated location is temporarily displayed when new data is received and displayed.

Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code.

This page is only available to the IR, 5PIXEL and 5ChWTS wheel sensors.

Front Left	21.8	28.5	26.2	21.0	Front Right
	Amb	Obj	Obj	Amb	
Rear Left	21.1	25.6	27.5	21.3	Rear Right
	Up	Tx:All		Down	

- Amb - Ambient temperature of the IR element. C/F selected via <Setup Units> (see 2.7.1)
- Obj - IR Tyre Temperature (single for the IR sensor or PIXEL3 for the 5PX). Rim temperature at point 3 for the 5ChWTS sensor.

Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the <LF Setup> page. To enter the <LF Setup> page, hold down the <Down> Navigation Key. The < LF Setup> page entered from the < Tyre Set ID Display> page is identical to that described in section 2.6.5.1.

Pressing the <Down> button whilst in the < Tyre Set / Amb+Obj Temperature Display > page will move to the < Tyre Set ID Display > page. Pressing the <Up> button whilst in the < Tyre Set / Amb+Obj Temperature Display > page will move to the < Tyre Set Pressure / Temperature Display > page.

### 2.6.7 Tyre Set ID Display

The < Tyre Set ID Display> page provides the facility to display ID data corresponding to complete tyre sets. In order for this page to operate it is necessary to have either generated a position file within the Mini Analyser, or downloaded one via the DigiTyre PC software. To make the reception of new data more obvious to the user an indicator (•/T) to the newly updated location is temporarily displayed when new data is received and displayed.

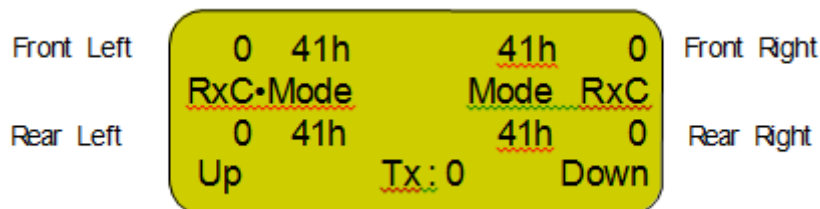


Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the < LF Setup> page. To enter the < LF Setup> page, hold down the < Down> Navigation Key. The < LF Setup> page entered from the < Tyre Set ID Display> page is identical to that described in section 2.6.5.1.

Pressing the < Down> button whilst in the < Tyre Set ID Display> page will move to the < Tyre Set Count / Mode Display> page. Pressing the < Up> button whilst in the < Tyre Set ID Display> page will move to the < Tyre Set Pressure / Temperature Display> page.

### 2.6.8 Tyre Set Count / Mode Display

The < Tyre Set Count / Mode Display> page provides the facility to display the mode and receive count data corresponding to complete tyre sets. In order for this page to operate it is necessary to have either generated a position file within the Mini Analyser, or downloaded one via the DigiTyre PC software. To make the reception of new data more obvious to the user an indicator (•/T) to the newly updated location is temporarily displayed when new data is received and displayed.

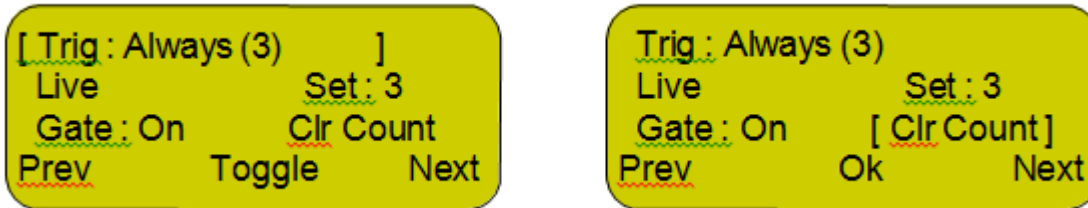


Pressing the Action Key will cause the Mini Analyser to transmit the configured LF code. The LF settings are configured via the < LF Setup> page. To enter the < LF Setup> page, hold down the < Down> Navigation Key.

Pressing the < Down> button whilst in the < Tyre Set Count / Mode Display> page will move to the < Individual Sensor Display Page 1> page. Pressing the < Up> button whilst in the < Tyre Set Count / Mode Display> page will move to the < Tyre Set ID Display> page.

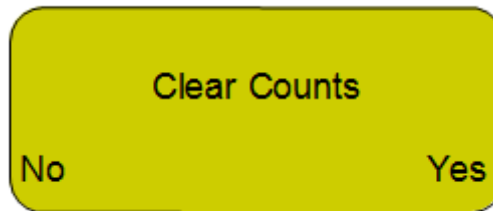
### 2.6.8.1 Count / Mode - LF Setup

This page is essentially the same as the < Tyre Set – LF Setup> , having an additional field to permit the clearing of the Rx counters.



The < Prev> and < Next> buttons are used to select the field to be modified. The currently selected field is highlighted by the [...] indicators. The Action Key performs different functions depending on the field selected.

With the < Clr Count> field selected the Action Key is labelled < Ok> . Pressing the < Ok> button will call up a confirmation screen for the clearing of the counters. Selecting < Yes> will clear the counters and return to the < Tyre Set Count / Mode Display> . Selecting < No> will return to the < Tyre Set Count / Mode Display> page without clearing the counters.



With any other field selected the Action Key performs the usual < Toggle> function.

Once the required options have been set pressing and holding the < Prev> button returns to the < Tyre Set Count / Mode Display> page.

### 2.6.9 Wheel Position and Tyre Set Assignment

The Mini Analyser provides the facility for building position and set data directly from assembled tyre sets. Before starting the set assignment process the Mini Analyser should be configured for the correct number of channels and also for the correct LF Trigger code.

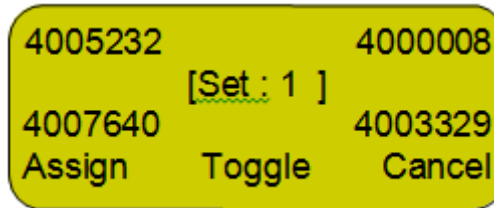
The Mini Analyser can maintain information for up to 63 tyre sets.

Generating tyre set information is very straightforward. With the Mini Analyser displaying the < Individual Sensor Display Page 1-3> pages (2.6.1, 2.6.2, 2.6.3) or the < Compensated Pressure Display> page (2.6.4), place the analyser close to the front left wheel assembly and press the < Tx> button. When the responding datagram is received press the desired FL/FR/RL/RR key. A splash screen will be displayed indicating that the sensor has been allocated to the front left position.

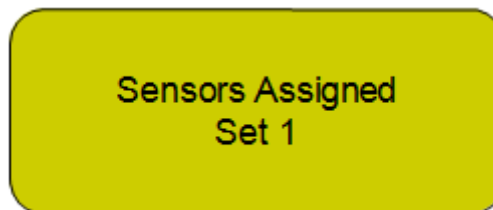
The process should then be repeated for each of the remaining wheel assemblies to make up the tyre set.



The order in which the wheel assemblies are positioned is unimportant; the analyser will maintain a record of which positions have been assigned. When all four wheel positions have been assigned, the analyser will display the set assignment page. The Mini Analyser will automatically select the next available set number, but this can be changed manually using the



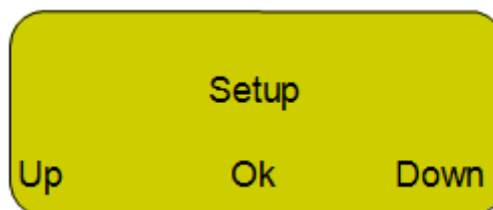
< Toggle> button, where specific set numbers are required. Once the required set number has been selected, pressing the < Assign> key will place the data into the internal position file. A splash screen is displayed to confirm the assignment.



Should the user not wish to store the set data, pressing the < Cancel> button will exit the set assignment screen without saving.

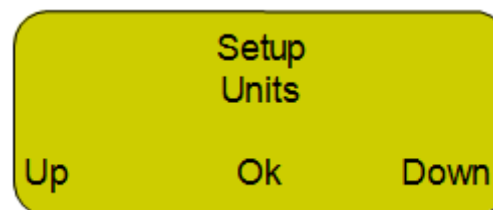
## 2.7 Setup Pages

Pressing the <Ok> button at the <Setup> main menu page will enter the setup option pages.

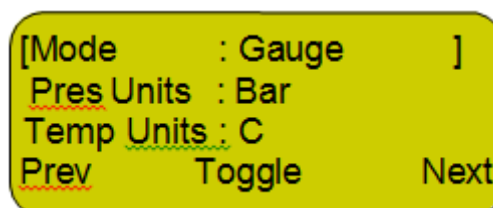


### 2.7.1 Setup Units

The setup units page allows the user to configure the Mini Analyser to display pressure and temperature data in metric or imperial units. Pressing the <Ok> button at the <Setup Units> page will enter the units options page.



Pressing the <Down> button whilst in the <Setup Units> page will move to the <Setup Position Settings> page. Pressing the <Up> button whilst in the <Setup Units> page will move to the <Setup Channel Config> page.



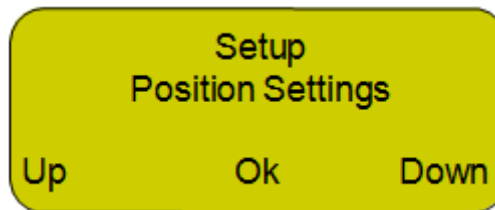
With the units option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

Mode	–	Selects between <Absolute> or <Gauge> pressure readings
Pres Units	–	Selects between <Bar> and <psi> pressure units
Temp Units	–	Selects between <C> and <F> temperature units

Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Units> page.

## 2.7.2 Setup Position Settings

The position settings page allows the user to configure the actions of the Mini Analyser during wheel position and tyre set learning. Pressing the <Ok> button at the <Setup Position Settings> page will enter the position settings options page.

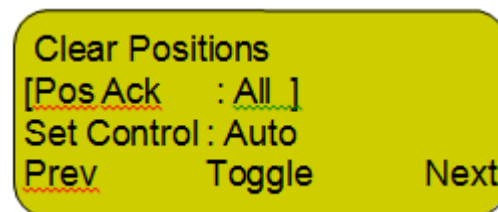
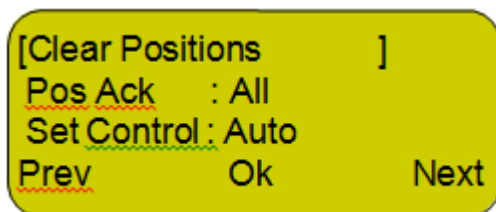


Pressing the <Down> button whilst in the <Setup Position Settings> page will move to the <Setup Set Display> page. Pressing the <Up> button whilst in the <Setup Position Settings> page will move to the <Setup Units> page.

With the position settings option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers.

The selected field determines the function of the Action Key.

With the <Pos Ack> or <Set Control> fields selected the Action Key functions as a <Toggle> button, cycling through the available options for the selected item.



Pos Ack	–	Selects the method used to acknowledge a wheel positioning operation
Splash	–	Displays a splash screen
Beep	–	Sounds internal buzzer
LED	–	Flashes Tx/Rx LED
Beep/LED	–	Sounds internal buzzer and flashes Tx/Rx LED
All	–	Sounds internal buzzer, flashes Tx/Rx LED and displays a splash screen
Set Control	–	Auto – The analyser uses the latest learned tyre set
Manual	–	The active tyre set is manually selected

With the <Clear Positions> field selected the Action Key is denoted <Ok>. Pressing the <Ok> button calls up a confirmation screen, selecting <Yes> deletes all position information currently held within the Mini Analyser.





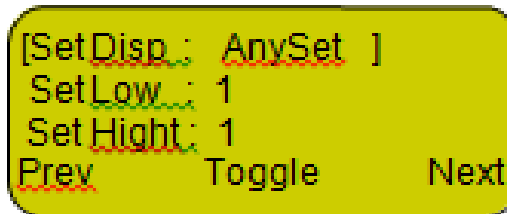
Pressing <No> will exit the confirmation screen without deleting the position information. Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Position Settings> page.

### 2.7.3 Setup Set Display

The set display options page allows the user to configure the Mini Analyser tyre set display functionality. Pressing the <Ok> button at the <Setup Set Display> page will enter the tyre set display options menu.



Pressing the <Down> button whilst in the <Setup Set Display> page will move to the <Setup Reference Settings> page. Pressing the <Up> button whilst in the <Setup Set Display> page will move to the <Setup Position Settings> page. With the tyre set display option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

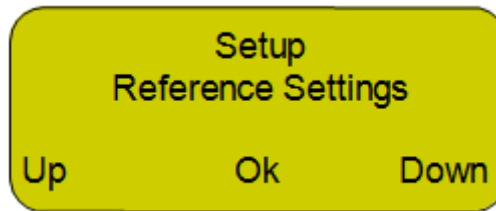


- Set Disp – Selects the tyre set for which data is to be displayed.
  - 1...63 – Displays only data for sensors in the selected tyre set
  - AnySet – Displays only data sensors assigned to tyre sets
  - AnyPos – Displays only data for sensors with position assignments
  - Range – Displays only data for sensors in the selected set range
- Set Low – Minimum set value for <Range> selection
- Set High – Maximum set value for <Range> selection

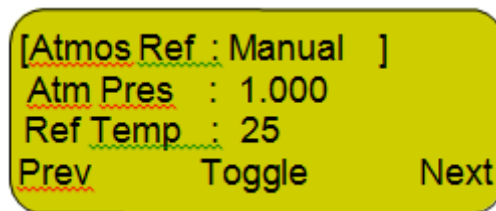
Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Set Display> page.

## 2.7.4 Setup Reference Settings

The reference settings options allow the user to configure the reference parameters used by the Mini Analyser for the calculation of compensated pressures and the display of gauge pressure. Pressing the <Ok> button at the <Setup Reference Settings> page will enter the reference settings options menu.



Pressing the <Down> button whilst in the <Setup Reference Settings> page will move to the <Setup Power Settings> page. Pressing the <Up> button whilst in the <Setup Reference Settings> page will move to the <Setup Set Display> page.



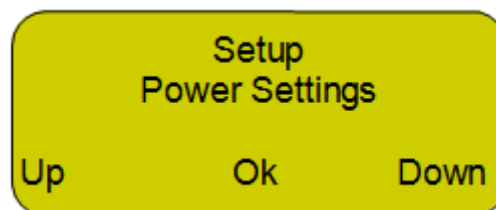
With the tyre set display option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

- |           |   |   |
|-----------|---|---|
| Atmos Ref | - | This entry is fixed at <Manual>.  |
| Atm Pres  | - | The <Atm Pres> value set in this page in the calculation of gauge pressures           |
| Ref Temp  | - | Atmospheric pressure, 0.700...1.100 bar in 0.025 Bar steps                            |
|           |   | Reference temperature for calculation of compensated pressures 0...100°C in 5°C steps |

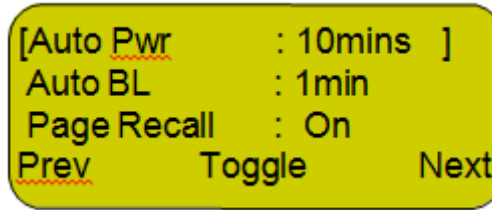
Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Reference Settings> page.

## 2.7.5 Setup Power Settings

The power settings options allow the user to configure the power management features of the Mini Analyser. Pressing the <Ok> button at the <Setup Reference Settings> page will enter the power settings options menu.



Pressing the <Down> button whilst in the <Setup Power Settings> page will move to the <Setup Beep/LED 1> page. Pressing the <Up> button whilst in the <Setup Power Settings> page will move to the <Setup Reference Settings> page.



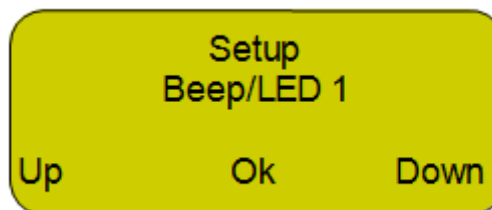
With the power settings option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

Auto Pwr	–	Mini Analyser auto power down time, 1, 2, 5, 10, 30, 60 minutes or Off
Auto BL	–	Backlight auto off time, 1, 2, 5, 10, 30, 60 minutes or Off
Page Recall	–	Whether unit powers up to main menu <Off> or last used page <On>

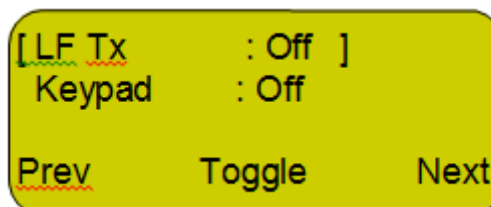
Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Power Settings> page.

## 2.7.6 Setup Beep/LED 1

The Beep/LED 1 options page allows the user to configure the buzzer/LED functions for LF Tx and keypad click functions. Pressing the <Ok> button at the <Setup Beep/LED 1> page will enter the Beep/LED 1 options page.



Pressing the <Down> button whilst in the <Setup Beep/LED 1> page will move to the <Setup Beep/LED 2> page. Pressing the <Up> button whilst in the <Setup Beep/LED 1> page will move to the <Setup Power Settings> page.



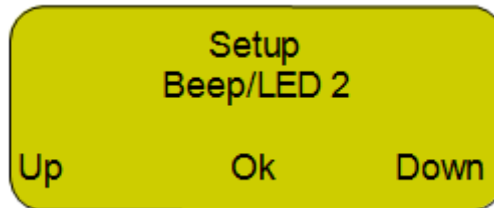
With the Beep/LED 1 option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

LF Tx	–	Off	–	No LF Tx indicator
		Beep	–	Sound internal buzzer on LF Tx
		LED	–	Flash Tx/Rx LED on LF Tx
		Beep/LED	–	Both indicators
Keypad	–	The keypad click can be turned <On> or <Off>		

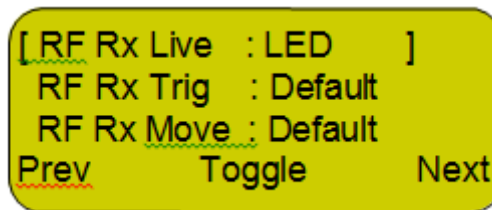
Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Beep/LED 1> page.

### 2.7.7 Setup Beep/LED 2

The Beep/LED 2 options page allows the user to configure the buzzer/LED functions for RF receive functions. Pressing the <Ok> button at the <Setup Beep/LED 2> page will enter the Beep/LED 2 options page.



Pressing the <Down> button whilst in the <Setup Beep/LED 2> page will move to the < Setup Beep/LED 3> page. Pressing the <Up> button whilst in the <Setup Beep/LED 2> page will move to the <Setup Beep/LED 1> page.



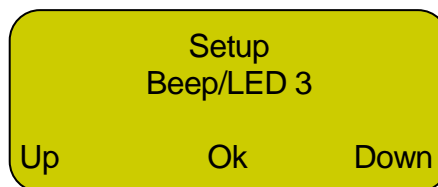
With the Beep/LED 2 option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

- RF Rx Live – Indicator for general RF receive datagrams
  - Off – No RF Rx indicator
  - Beep – Sound internal buzzer on RF Rx
  - LED – Flash Tx/Rx LED on RF Rx
  - Beep/LED – Both indicators
- RF Rx Trig – Indicator for RF receive datagrams with LF flag set.  
Options as <RF Rx Live> plus <Default>, which uses the live setting
- RF Rx Move – Indicator for RF receive datagrams with Moving flag set  
Options as per <RF Rx Live> plus <Default>, which uses live setting

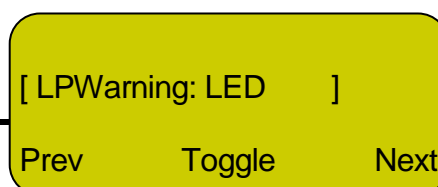
Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Beep/LED 2> page.

### 2.7.8 Setup Beep/LED 3

The Beep/LED 3 options page allows the user to configure the buzzer/LED functions for Low Pressure Warning functions. Pressing the <Ok> button at the <Setup Beep/LED 3> page will enter the Beep/LED 3 options page.



Pressing the <Down> button whilst in the <Setup Beep/LED 3> page will move to the <Setup System Info> page. Pressing the <Up> button whilst in the <Setup Beep/LED 3> page will move to the <Setup Beep/LED 2> page.



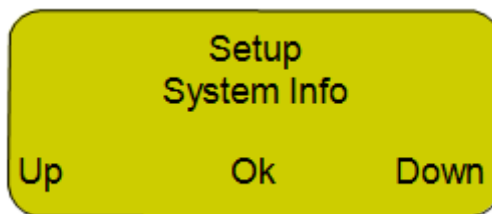
With the Beep/LED 3 option page displayed, the <Prev> & <Next> buttons move between the option fields. The item currently selected for modification is highlighted by the [...] markers. Pressing the <Toggle> button cycles through the available options for the selected item.

LPWarning	–	Indicator for low pressure warning on received datagrams
Off	–	No LP Warning indicator
Beep	–	Sound internal buzzer on LP
LED	–	Flash Tx/Rx LED on LP
Beep/LED	–	Both indicators

Once the required options have been set, pressing and holding the <Prev> button returns to the <Setup Beep/LED 3> page.

## 2.7.9 Setup System Info

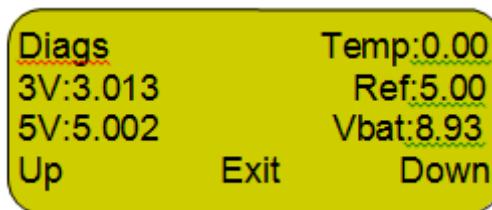
The System Info pages provide diagnostic and version details for the Mini Analyser. Pressing the <Ok> button at the <Setup System Info> page enters the System Info pages.



Pressing the <Down> button whilst in the <Setup System Info> page will move to the <Setup Contrast> page. Pressing the <Up> button whilst in the <Setup System Info> page will move to the <Setup Beep/LED 3> page.

### 2.7.9.1 Diags

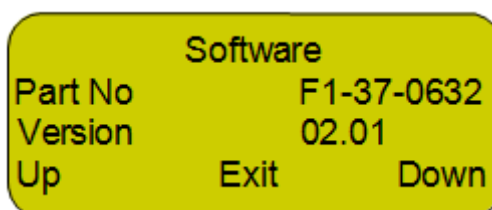
The <Diags> page displays the voltage levels of the internal supplies of the Mini Analyser. Pressing the <Exit> button will return to the <Setup System Info> page.



Pressing the <Down> button whilst in the <Diags> page will move to the <Software> page. Pressing the <Up> button whilst in the <Diags> page will move to the <Manufacture Info> page.

### 2.7.9.2 Software

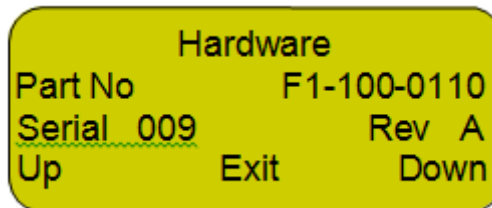
The <Software> page displays information about the installed Mini Analyser software version. Pressing the <Exit> button will return to the <Setup System Info> page.



Pressing the <Down> button whilst in the <Software> page will move to the <Hardware> page. Pressing the <Up> button whilst in the <Software> page will move to the <Diags> page.

### 2.7.9.3 Hardware

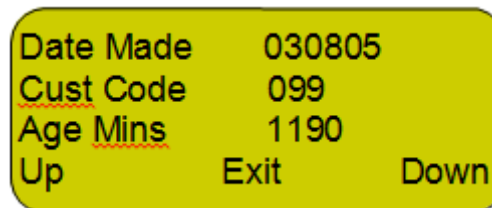
The <Hardware> page displays information regarding the Mini Analyser hardware. Pressing the <Exit> button will return to the <Setup System Info> page.



Pressing the <Down> button will move to the <Manufacture Info> page. Pressing the <Up> button will move to the <Software> page.

### 2.7.9.4 Manufacture Information

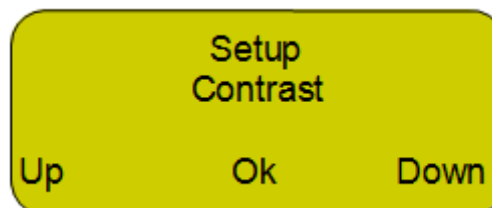
The <Manufacture Info> page provides manufacture date and customer information. Pressing the <Exit> button will return to the Setup System Info> page.



Pressing the <Down> button will move to the <Diags> page. Pressing the <Up> button will move to the <Hardware> page.

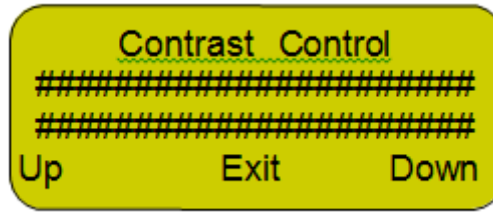
### 2.7.10 Setup Contrast

The <Contrast Control> page allows the user to adjust the LCD contrast. Pressing the <Ok> button at the <Setup Contrast> page will enter the <Contrast Control> page.



Pressing the <Down> button whilst in the <Setup Contrast> page will move to the <Setup Channel Config> page. Pressing the <Up> button whilst in the <Setup Contrast> page will move to the <Setup System Info> page.

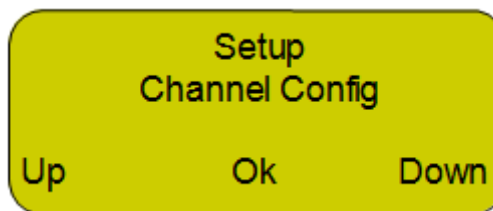
Pressing the <Up> button in the <Contrast Control> page will result in the LCD background being darkened. Pressing the <Down> button will lighten the background.



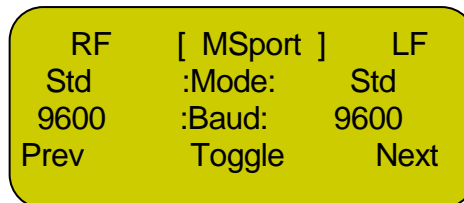
Once the desired contrast setting has been achieved, pressing the <Exit> button will return to the <Setup Contrast> page.

### 2.7.11 Setup Channel Config

The channel config options page allows the user to configure the Mini Analyser for different generations of bf1systems wheel sensors. Changing this option affects the display pages of the < RF Receive> functions. Pressing the < Ok> button at the < Setup Channel Config> page will enter the < Channel Config> options page.



Pressing the < Down> button whilst in the < Setup Channel Config> page will move to the < Setup Units> page. Pressing the < Up> button whilst in the < Setup Channel Config> page will move to the < Setup Contrast> page.



Pressing the < Toggle> button cycles between the different types of wheels sensors that bf1systems manufacture.

- Roche – Pharmaceutical application
- IR – Single point IRTPTMS sensor
- 5PIXEL – 5 points IRTPTMS sensor
- 5ChWTS – 5channel rim temperature sensor
- MSport – TPMS sensor
- Auto – Not efficient due to the number of LF commands/RF data to encode/decode

Note: For V8 Supercars, “MSport” should be selected.

Once the required value has been set, holding down the Left Navigation Key returns to the < Setup Channel Config> page.

## 2.8 Firmware Update

**WARNING: The firmware update can't be performed with DigiTyre software. A different software called "Analyser Bootloader" is required. Please, follow the instructions below very carefully!**

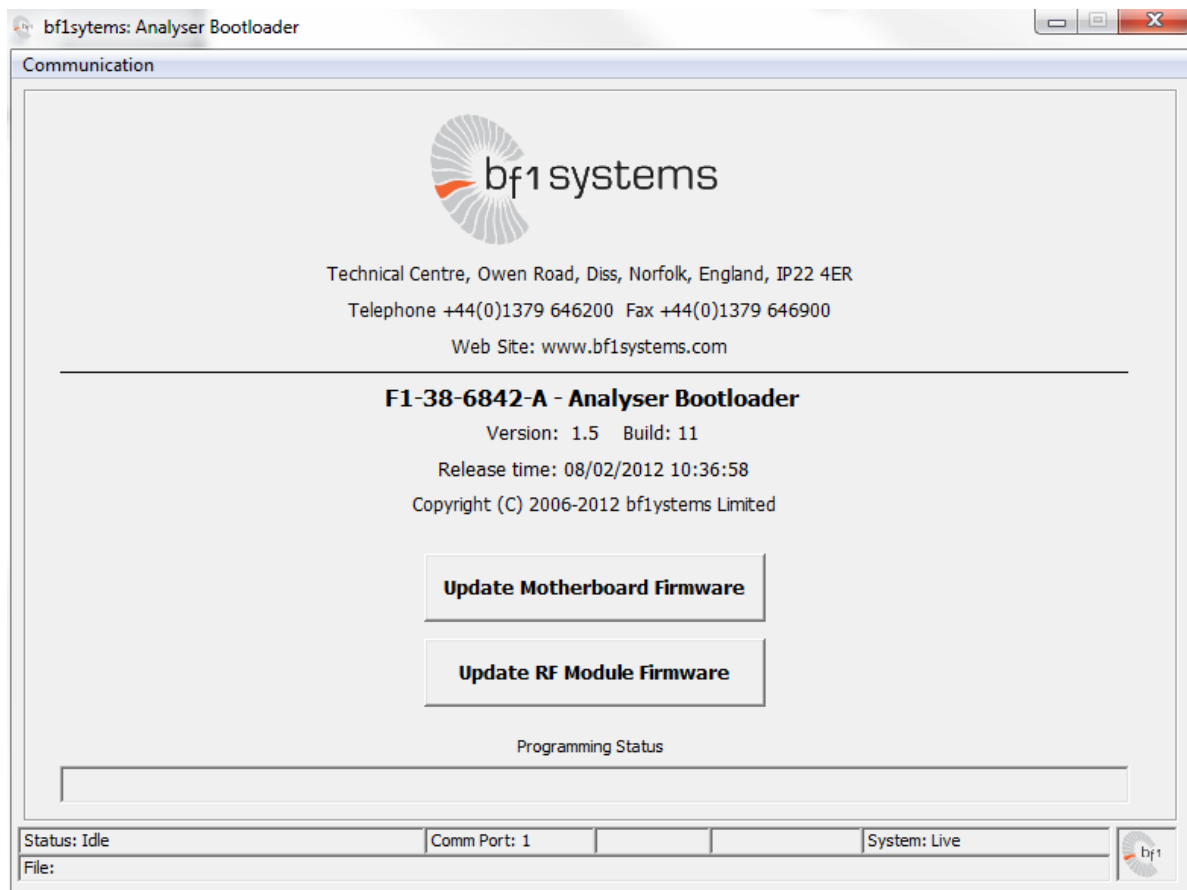
The Mini Analyser firmware may be upgraded in the field using a bf1systems supplied bootloader program. Loss of power or communications during the update process may leave the unit in an undefined (non-operating) state. The following precautions should be taken before beginning the firmware update process:

- Securely connect the RS232 cable to the Mini Analyser using the screw retainers
- Securely connect the RS232 cable to the PC using the screw retainers
- Ensure auto power down setting is disabled/off
- Ensure the Mini Analyser battery is in a good state of charge

Having connected the Mini Analyser to the host PC the unit should be turned on and the bootloader software started.

If the Mini Analyser has been detected correctly, the status in the bottom right hand corner will say "System: Live". If you need to set the correct Comm port for which the Mini Analyser is connected to, this can be done via the Communication menu at the top of the screen.

The screenshot below shows the bootloader software.





Once the Mini Analyser is connected and has been correctly detected, the following steps should be followed to update the firmware:

- Select the <Update Motherboard Firmware> button. This will call up a file dialog, where the required .fwr file can be selected.
- Once the file is selected the Mini Analyser will auto power off ready for update (Status : Starting Bootloader)
- Press the Action Key on the Mini Analyser to start the motherboard bootloader.
- The bootloader program will now erase the old firmware (Status : Erasing FLASH) and program in the selected firmware file (Status : Programming FLASH). The progress of the programming operation can be monitored via the Programming Status bar, and the Status field at the bottom of the screen.
- When programming completes (Status: Starting Firmware), the new firmware can be started by pressing the Action Key to power on the Mini Analyser

The firmware update is now complete. It is sometimes now necessary to reload any permit lists and position files into the Mini Analyser.

### 3 Specifications

Power Source	9V battery (PP3/6LR61)
Battery Life	> 6 hours (backlight off)
LF Frequency	125kHz
LF Power / Range	~0.5m
RF Frequency	433MHz or 315Mhz
Communications	RS-232
Communications Rate	4800/9600/19200/38400/57600/115200 Baud
Storage Temperature Range	0°C - 50°C
Operating Temperature Range	-20°C - 60°C
Enclosure	ABS