Ultrasonic Thickness Gauge

Multigauge 5700
Datalogger
User Manual

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1. Introduction

Thank you for purchasing a Tritex Multigauge 5700 Datalogger. We are sure that the gauge will give you many years of reliable use. To ensure that you can gain maximum benefit from the gauge, please read this manual carefully.

The Multigauge 5700 Datalogger is a simple, robust ultrasonic thickness gauge designed for most common thickness gauging applications. The easy to use keypad allows operator interface, whilst the bright colour LCD display can be used in all light conditions. The moulded soft rubber surround feels comfortable, looks good and provides extra protection against knocks and scrapes.

The Tritex Multigauge 5600 has been manufactured to comply with British Standard BS EN 15317:2007, which covers the characterisation and verification of ultrasonic thickness measuring equipment.

1.1. Multigauge 5700 Datalogger Specification Table

Sound Velocity Range	*From 1000 m/s to 8000 m/s (0.0394 in/µs to 0.3150 in/µs)*		
Single Crystal Soft Faced Probe Options	*2.25 MHz*	*3.5 MHz*	*5 MHz*
Probe Measurement Range	*3 - 250 mm (0.120" to 10")*	*2 - 150 mm (0.080" to 6")*	*1 - 50 mm (0.040" to 2")*
Probe Sizes	*13 mm (0.5") & 19 mm (0.75")*	*13 mm (0.5")*	*6 mm (0.25") & 13 mm (0.5")*
Resolution	*0.1 mm (0.005") or 0.05 mm (0.002")*		
Accuracy	*± 0.1 mm (0.005") or ± 0.05 mm (0.002")*		
Display	*Multi character Colour LCD*		
Storage Capacity	*Up to 895 files, each file containing up to 100 records. Each record contains up to 250 measurements.*		
Data Transmission	*RF Transceiver, 2.4GHz*		
Batteries	*3 x disposable AA alkaline batteries or rechargeable NiMH / NiCD*		
Battery Life	*20 Hours continuous use using alkaline batteries*		
Gauge Dimensions	*147 mm x 90 mm x 28 mm (5.75" X 3.5" X 1")*		
Gauge Weight	*325 g (11.5 ounces) including batteries*		
Environmental	*Case rated to IP65. RoHS and WEEE compliant*		
Operating Temperature	*-10°C to +50°C (14°F to 122°F)*		
Storage Temperature	*-10°C to +60°C (14°F to 140°F)*		

2. Kit Contents

Key:

1 - Test Block - The 15 mm test block is used to test the performance and serviceability of the gauge.

Membrane Key - Used to remove the membrane retaining ring. See page 9 for further details.

Batteries - 3 X AA disposable batteries.

Membranes - See page 9 for fitting instructions. Pack of 10 supplied.

2 - Ultrasonic Gel - 150 ml.

3 - Gauge Body - See page 10 for further details.

4 - Membrane Oil - 15 ml.

5 - Probe Cable - 1.5m long. Longer or shorter cables can be ordered.

6 - Manual, calibration certificate and 3 year warranty certificate.

7 - Neck Strap - Used with optional leather case.

8 - Probe - See page 7 for further details.

9 - RF Transceiver - Link between gauge and PC / Laptop

3. Getting Started

3.1. Quick Start Guide

Following is a quick start guide to help you get a feel for the gauge without reading the entire manual. For a more detailed explanation of each of these steps please read the full manual.

1 Unscrew the probe knurled ring and apply a few drops of membrane oil to the face of the probe. (Pg 9)
2 Screw the knurled ring back onto the probe ensuring no air has been trapped and the membrane is flat to the probe face. (Pg 9)
3 Connect the probe, cable and gauge together. (Pg 5)
4 Turn the gauge on using the 'ON/OFF' switch. (Pg 11)
5 If the 'Home' screen is displayed, navigate using the arrows to the 'Measuring' screen option and press the ✓ key. (Pg 18)
6 Apply a small amount of ultrasonic gel to the surface being measured.
7 Place the probe onto the ultrasonic gel / test piece.
8 A measurement will be displayed.

3.2. Assembly

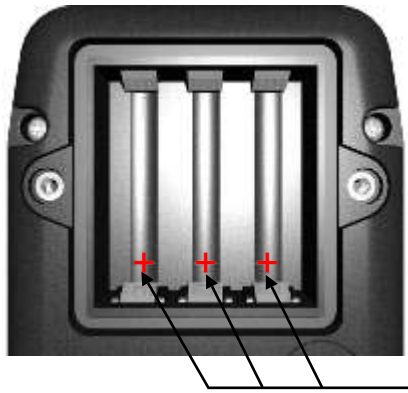
To assemble the gauge for use:

i. Attach the probe to the probe cable by pushing the cable Lemo plug into the socket on the probe.
ii. Connect the other end to the gauge Lemo socket.

Note: To remove the connectors, simply pull back on the connector collars to release the plug from the socket. Do not force or twist under any circumstances.

3.3. Batteries

The Multigauge 5700 uses 1.5Vdc 'AA' alkaline disposable batteries supplied with the kit. NiMH and NiCD rechargeable batteries can also be used. Insert the batteries into the battery compartment as shown below, ensuring the batteries are inserted the correct way round:



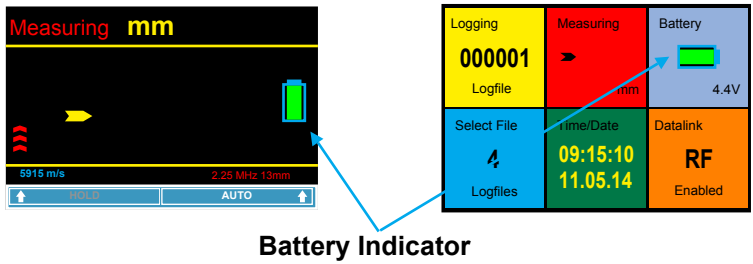
WARNING: If the gauge is to be left unused for an extended period of time then the batteries must be removed prior to storage.

Warning: *Do not mix rechargeable and disposable batteries in the gauge.*

3.4. Low Battery Warning

When the batteries become low, the battery symbol in the right of the display in measurement mode and in the top right on the 'Home' screen will indicate a decrease in battery power. It will change from green to orange as an advanced warning, and to red when the battery level is critical.

When the batteries become very low it is advisable to replace them. Otherwise after a short time the gauge will turn off automatically.



4. Probes

4.1. Introduction

All probes used with Tritex Multigauges are single crystal soft faced probes. The table below identifies the different probe options and which probe is the most suitable for different applications. All probes are colour coded to help identify their frequency.

The single crystal means that measurements are taken using a straight path of ultrasound, giving perfect linearity throughout the measuring range. The probes are not affected by V-beam error.

4.2. Intelligent Probe Recognition (IPR)

All probes have **IPR** (Intelligent Probe Recognition). IPR transmits data from the probe to the gauge so that it is instantly recognised. This includes data such as the probe serial number, frequency, size and the unique signature of the probe. The gauge uses this information to automatically adjust settings to achieve the best performance. When a probe is connected, the display will show 'IPR Probe connected: 2¼ MHz 13mm'.

If a probe is connected that does not have IPR, the gauge will prompt the user to select the correct setting from a list of probe options.

See 'iProbe' on page 14 for further details.

4.3. Probe Selection Table

Frequency	*2.25 MHz*	*3.5 MHz*	*5 MHz*
Measuring Range	*3 - 250 mm (0.120" to 10")*	*2 - 150 mm (0.080" to 6")*	*1 - 50 mm (0.040" to 2")*
Colour	*Yellow*	*Green*	*Blue*
Diameters Available	*13 mm (0.5") & 19 mm (0.75")*	*13 mm (0.5")*	*6 mm (0.25") & 13 mm (0.5")*
Suitable for	*Most thickness gauging applications. Works particularly well on heavy corrosion, especially the 19 mm probe.*	*Will measure relatively thin metal which is corroded. Normally used only if measuring down to 2 mm is of importance.*	*Ideal for measuring thin metal in relatively good condition. Not advisable to use as the main probe.*

4.4. Probe Membranes

All probes are fitted with protective membranes to help prolong the life of the probe. The membranes also provide a flexible interface which acts as an aid when working on rough surfaces. Membrane wear should be monitored and checked at regular intervals.

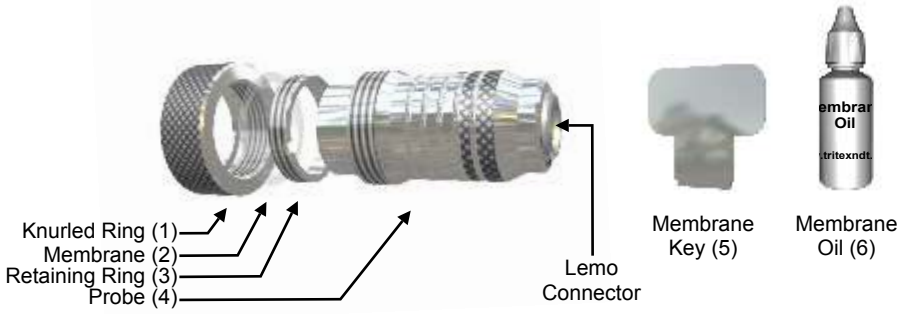
Normal Temperature Membranes

Standard membranes allow measurements to be taken on hot surfaces up to a maximum of 70°C (158°F).

High Temperature Membranes

Teflon™ membranes are available for measurements on hotter surfaces. In this case measurements can be taken on surfaces up to 150°C (302°F). Care should be taken that the probe does not overheat. The probe should be allowed to cool down in between each measurement. A high temperature ultrasonic gel is advised for this application.

4.5. Changing the Membrane



i Unscrew the knurled ring (1) from the probe (4).
ii Using the membrane key (5), remove the retaining ring (3) from inside the knurled ring (1).
iii Push the old membrane (2) out from the front.
iv Fit a new membrane (2) from the back and push it down until it locates in the groove on the inside front edge.
v Refit the retaining ring (3) and secure it in place using the membrane key (5).
vi Place a few drops of membrane oil (6) onto the face of the probe (4). Do not use too much.
vii Screw the knurled ring (1) back onto the probe (4) whilst applying pressure on the membrane (2) with the thumb to expel any air from behind the membrane.

Note: Do not apply too much membrane oil underneath the membrane. Once fitted, the membrane should be flat with no air bubbles trapped behind.

Warning: *Never use a probe without a membrane fitted.*

4.6. Care of Probes

All probes should be treated with respect. When taking measurements, they should not be scraped or dragged along the surface. Although the membranes will protect the probe against everyday wear and tear, they will not protect against rough treatment and misuse.

Warning: *Never try to repair a probe or try to remove scratches from the face of the probe. This may result in further damage. Always return it to Tritex NDT for investigation and possible repair.*

5. Getting to know your Multigauge 5700

Front

Colour LCD Display

Option Key 1 (1)

Left Selection (2)

ON/OFF Button (3)

OK / Enter (4)

Up Selection (5)

Option Key 2 (6)

Right Selection (7)

Menu (8)

Down Selection (9)

Back

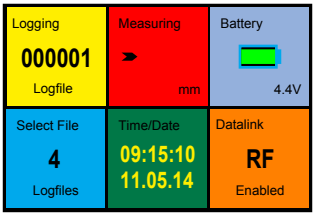
Battery Compartment

Top

Probe Cable Connector

5.1. Switching the Gauge On

i To switch the gauge on, press the 'ON/OFF' switch (3).
ii After booting up, the gauge will display the 'Home' screen if a probe is connected as follows:



***Note 1**: If no probe is connected when the gauge is turned on the display will show 'No Probe connected'. See page 15 for further details.*

***Note 2:** If a probe other than a Tritex probe is attached before switching on then the gauge will display a list of probe options once 'OK' has been selected See page 14 for further details.*

5.2. Switching the Gauge Off

To switch the gauge off, press and release the 'ON/OFF' switch (3)

5.3. Automatic Shutoff

The gauge will automatically shut off after 8 minutes of inactivity to save battery power.

5.4. Automatic Display Dimming

The display will dim automatically after 30 seconds to preserve the battery power. Pressing any key or the commencement of measurements will return the display to its normal brightness.

5.5. Measurement Hold Feature

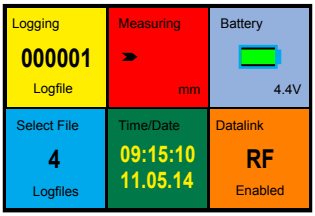
To hold a measurement, press the 'Option Key 1' (1) button whilst a measurement is displayed. The display will hold the measurement and flash 'Holding' in the top right corner.

To resume measuring, press the 'Option Key 1' (1) button which is labelled 'Resume'

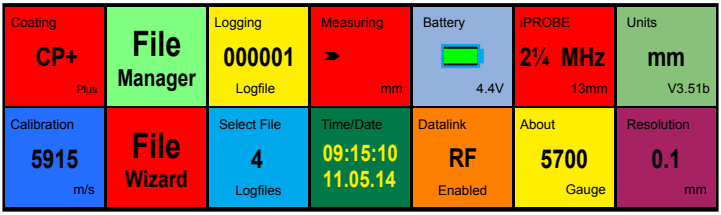
6. Navigating the Menus

6.1. Entering the Menus

i Press and release the ‘Menu’ button (8).
ii The ‘Home’ screen will be displayed.

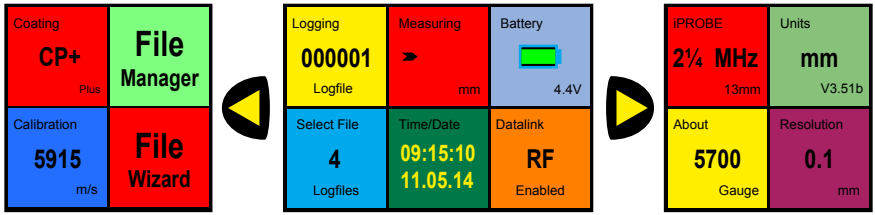


iii To navigate the menus use the ‘Arrow’ buttons (2,5,7 & 9).
iv To select a menu item, press ‘OK’ (4).
v To see additional menu items, navigate left and right from the ‘Home’ screen using the left (2) and right (7) arrow key.
vi The following shows the complete menu:



6.2. Definition of Menu Items

To enter the menu at any time, press the 'Menu' (8) key.



Coating Plus+ - Allows measurements to be taken through extremely thick coatings up to 20mm, depending on the type of coating. In normal mode the gauge can still ignore up to 6mm of coating.

Calibration - All materials have varying velocity of sound properties and this section allows the gauge to be calibrated for the different materials that the gauge can measure.

File Manager - Allows editing of stored logfiles and templates.

File Wizard - Allows the creation of new logfiles and logfiles from templates. Also the creation of new templates.

Logging - Shows the measurements being stored.

Select File - Allows the selection of file to which measurements are to be added.

Measuring - Displays the measurements being taken by the gauge.

Time / Date - Displays the current time and date.

Battery - Displays the remaining battery life. The green changes to amber when the battery is getting low and then changes to red when the batteries are critically low.

Data Link - Shows when the RF datalink is enabled or disabled. Disabling the datalink when not in use will conserve battery life. It only needs to be enabled when transferring files.

iProbe - Shows that an iProbe has been connected. The probes are automatically recognised by the gauge and all the relevant probe data is transferred to the gauge to perfectly match the probe to the gauge for optimum performance.

About 5700 - Displays the software and firmware versions and includes a facility to reset the gauge to factory settings.

Units - The measurements can be displayed in metric or imperial.

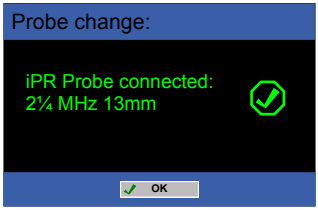
Resolution - The measurements can be displayed to a resolution of 0.05mm or 0.1mm.

6.3. iProbe

There are three different modes for probe selection: automatic, manual and no probe connected.

Automatic - When a Tritex probe is connected, the gauge will automatically identify the probe type and set the gauge accordingly. All the relevant probe data is transferred to the gauge to perfectly match the probe to the gauge for optimum performance.

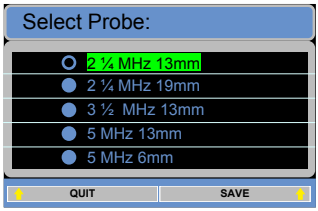
The following screen will appear prompting confirmation of the probe. Press 'OK' (4) to continue.



The selected probe will then be displayed at the bottom right of the screen in measurement mode.

Manual - When a suitable probe other than a Tritex probe is fitted, the gauge will automatically detect this and display the following screen:

This is a prompt to select the correct setting for the probe that has been connected. Press 'OK' (4) and then use the 'Up' (5) and 'Down' (9) arrow buttons to select from the following displayed list:

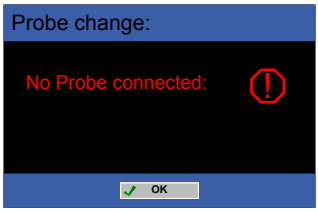


Press 'Option Key 2' (6) to save the selection. The selected probe will be displayed at the bottom of the screen in measurement mode.

The above menu can also be displayed by selecting 'iProbe' from the 'Home' screen menu.

Note: This feature only shows in the menu if a compatible probe other than a Tritex probe with IPR is fitted.

No Probe - If no probe is connected when the gauge is turned on, or if a probe is disconnected, the screen will display the following:



Either connect a suitable probe or simply press the 'OK' (4) button to enter the 'Home' screen. This will allow navigation of the menus without a probe fitted. Once 'OK' has been selected, the display will show 'No Probe!' on the 'Home' screen and at the bottom right of the screen in measurement mode.

6.4. Setting the Calibration

The gauge should be calibrated to the type of material that is being measured. This is because all materials have different velocity of sound properties.

There are two methods of changing the calibration. Either adjust the velocity of sound setting according to the metal being measured, or adjust the the gauge to a known thickness of metal.

Gauges are supplied with the calibration set to mild steel at approximately 5900 m/s (0.2323 in/µs). This may vary according to the properties of the supplied 15 mm test block material.

Note: The calibration does not need to be reset each time the gauge is used. The last setting will be remembered.

Calibrating the Velocity of Sound

i Navigate to 'Calibration' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

iii Use the 'Left' (2) and 'Right' (7) buttons to adjust the velocity of sound to the the required new velocity.

iv Press 'Option Key 2' (6), the gauge will save the new calibration and return to the 'Home' screen.

Calibrating to a Known Thickness

i Navigate to 'Calibration' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*
ii Press 'OK' (4).
iii Place the probe on a piece of material of a known thickness such as the test block supplied with the kit.
iv Adjust the measurement displayed to the known thickness using the 'Left' (2) and 'Right' (7) buttons.
v Press 'Option Key 2' (6), the gauge will save the new calibration and return to the 'Home' screen.

6.5. Velocity Table (approximate values)

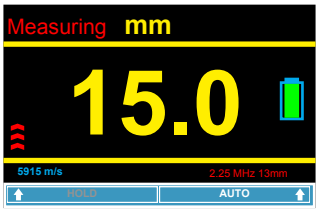
The given values are in certain cases strongly dependent on the alloy, heat treatment, manufacturing and processing and are therefore only approximate standard values. They are given here as a guide only.

Reference: Mathies, Klaus (1998), Thickness Measurement with Ultrasound, Berlin: German Society of Nondestructive Testing.

Material	Velocity - m/s	Velocity - in/µs
Aluminium Rolled Duraluminium	6200 -6360 6420 6320	0.2441 - 0.2504 0.2528 0.2488
Bronze (5%P)	3531	0.1390
Copper	3666 - 4760	0.1443 - 0.1874
Glass, Plate	5766	0.2270
Inconel, Forged	7820	0.3079
Lead	2050 - 2400	0.0807 - 0.0945
Steel, Mild Supplied Test Block	5890 - 5960 5900 approx.	0.2319 - 0.2346 0.2323 approx.
Steel, Stainless 10 Cr Ni 18 8, ann	5530 - 5790 5530	0.2177 - 0.2280 0.2177
Steel, Tool C105 Annealed C105 Hardened	 5490 - 5960 5854	 0.2339 - 0.2346 0.2305
Tin	3210 - 3320	0.1264 - 0.1307
Titanium	5823 - 6260	0.2293 - 0.2465
Zinc	3890 - 4210	0.1531 - 0.1657

6.6. Measuring

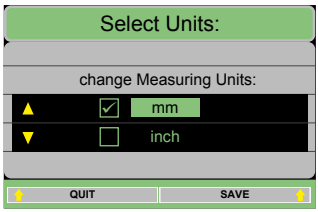
In ‘Measuring’ mode, the following screen will be displayed:



See Chapter 9, page 50 for further details.

6.7. Setting the Units

Either metric (mm) or imperial (inch) units can be selected.



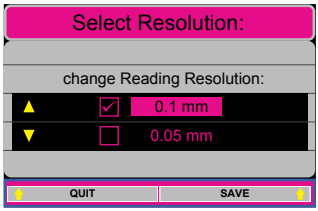
i Navigate to ‘Units’ on the ‘Home’ screen using the ‘Arrow’ keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*
ii Press ‘OK’ (4).
iii Use the ‘Up’ (5) and ‘Down’ (9) buttons to select the required units.
iv Press ‘Option Key 2’ (6), the gauge will save the new units and return to the ‘Home’ screen.
v Pressing the ‘Option Key 1’ (1) will quit the units setup and return to the ‘Home’ screen.

6.8. Battery

The battery voltage is displayed in the ‘Home’ screen. See Chapter 3, page 6 for further details regarding batteries.

6.9. Setting the Resolution

Either 0.1 mm (0.002”) or 0.05 mm (0.005”) resolution can be selected.



i Navigate to ‘Resolution’ on the ‘Home’ screen using the ‘Arrow’ keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press ‘OK’ (4).

iii Use the ‘Up’ (5) and ‘Down’ (9) buttons to select the required resolution between ‘0.05’ and ‘0.1’ (metric) or ‘0.005’ and 0.002’ (imperial).

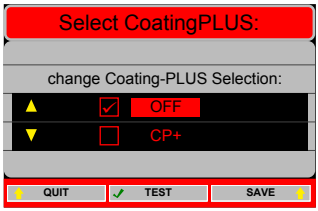
iv Press ‘Option Key 2’ (6), the gauge will save the new resolution and return to the ‘Home’ screen.

v Pressing the ‘Option Key 1’ (1) will quit the resolution setup and return to the ‘Home’ screen.

6.10. Coating Plus+

Coating Plus+ mode is used to measure metal thickness when thick coatings up to 20 mm exist. Normal measurement mode will ignore coatings up to approximately 6 mm. In both modes, the actual thickness of coating that can be ignored depends on the type of coating.

Note: Coating Plus+ mode should not be left on for all measurements. The gauge will achieve a better performance on standard coatings with this function turned off.



i Navigate to 'Coating Plus' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

iii Use the 'Up' (5) and 'Down' (9) buttons to select the required setting.

iv Press 'OK' (4), the gauge will turn 'CoatingsPLUS' on for the current session only. When the gauge is switched off, the 'CoatingPLUS' feature will be automatically switched off to prevent inadvertent use of this feature. The gauge will return to the 'Home' screen.

v If 'CoatingPLUS' is required to be switched on permanently, press 'Option Key 2' (6) after making the selection, the gauge will save the new setting, after asking for confirmation, and return to the 'Home' screen.

vi Pressing the 'Option Key 1' (1) will quit the CoatingPLUS setup and return to the 'Home' screen.

vii If selected, the icon 'CP+' will be shown in the right of the display in measurements mode.

6.11. About 5700

Entering this menu feature displays the gauge software and firmware versions. It also allows the gauge to be returned to 'Factory Settings' as follows:

i Navigate to 'About 5700' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

iii Press the 'Option Key 1' (1) to reset the gauge to Factory Settings. A warning screen will be displayed asking if you are sure you want to return the gauge to Factory Settings.

iv Pressing the 'Option Key 1' (1) will quit the 'Factory Reset' and return to the 'Home' screen.

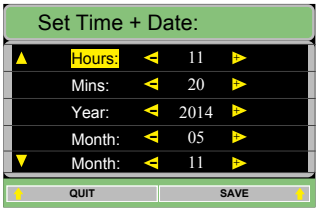
v Pressing the 'OK' (4) will confirm the 'Factory Reset' and return to the 'Home' screen.

vi Pressing the 'Option Key 2' (6) will return the display to the 'About 5700' option.

6.12. Setting the Time / Date

The time and date are displayed in the following format on the home screen:

HH:MM:SS DD.MM.YY



i Navigate to 'Time / Date' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

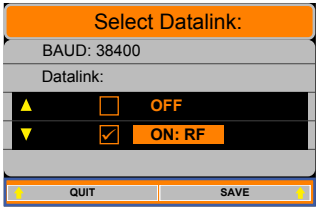
iii Use the 'Up' (5) and 'Down' (9) buttons to select the required setting to be adjusted.

iv Use the 'Left' (2) and 'Right' (7) buttons to adjust the gauge to the correct time and date.

v Press 'Option Key 2' (6), the gauge will save the new time and date and return to the 'Home' screen.

vi Pressing the 'Option Key 1' (1) will quit the Time / Date setup and return to the 'Home' screen.

6.13. Enabling and disabling the Datalink



i Navigate to 'Datalink RF' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

iii Use the 'Up' (5) and 'Down' (9) buttons to select the required setting.

iv Press 'Option Key 2' (6), the gauge will save the new setting and return to the 'Home' screen.

v Pressing the 'Option Key 1' (1) will quit the Time / Date setup and return to the 'Home' screen.

7. Datalogging

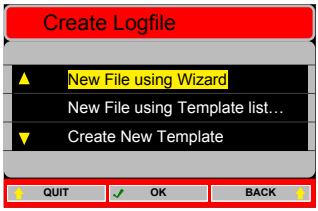
7.1. Using the File Wizard

The File Wizard guides the users through the setting up templates and logfiles on the gauge. Templates and logfiles can also be setup using Communicator software, supplied with the gauge, and then downloading these to the gauge.

i Navigate to 'File Wizard' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*
ii Press 'OK' (4).
iii Use the 'Up' (5) and 'Down' (9) buttons to select the required option for the list below.
iv Press either Option Key 1' (1) or 'Option Key 2' (6), the gauge will return to the 'Home' screen.

There are three options:

a. Create a new file using a Wizard
b. Create a new file using a Template list
c. Create a new Template



Note: The procedure for creating a New File or New Template is the same and will be covered together below. At the end, however, the File is allocated a number whereas the Template number can be selected:

7.1.a Create a New File / New Template using a wizard

i Use the 'Up' (5) and 'Down' (9) buttons to select 'New File using Wizard' or 'Create New Template'.
ii Press 'OK' (4).
iii The following screen will appear:

iv Select the type of datalogging required:

1. String - Stores Readings in a continuous string. Single strings, multiple strings or variable strings can be chosen. Multiple strings have 2 or more records of the same number of Readings. Variable strings have 2 or more records, each with a different number of Readings.

2. Grid - Stores measurements in a grid format where the number of X and Y coordinates are selected. This Grid should be selected if measurements are to be first taken along the Y axis.

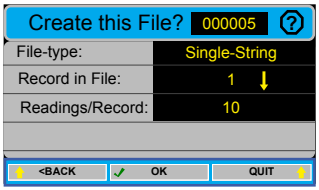
3. Grid - Stores measurements in a grid format where the number of X and Y coordinates are selected. This Grid should be selected if measurements are to be first taken along the X axis.

1. Setting up a String File or String Template

Select 'String' from the File Wizard 'Step 1 of 3'
The following appears:

Single-String

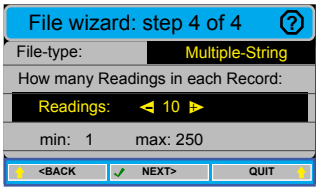
1. Select the number of Readings in the Record using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).



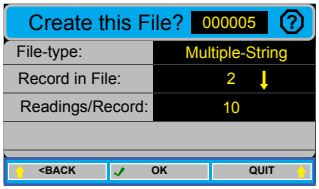
3. Confirm the File settings.
4. Press 'OK' (4) to save the File as the File number allocated.

Multiple-String

1. Select the number of Records using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).

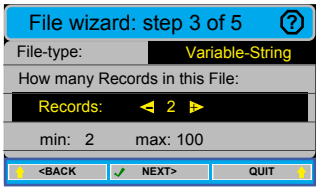


3. Select the number of Readings in each Record using the 'Left' (2) and 'Right' (7) buttons.
4. Press 'OK' (4).

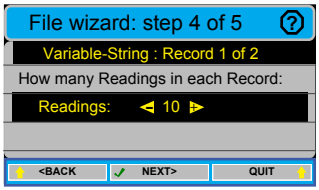


5. Confirm the File settings.
6. Press 'OK' (4) to save the File as the File number allocated.

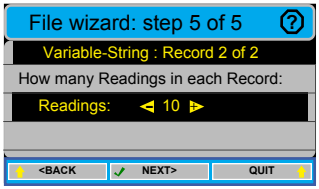
Variable-String



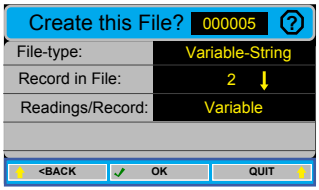
1. Select the number of Records using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).



3. Select the number of Readings in the first Record using the 'Left' (2) and 'Right' (7) buttons.
4. Press 'OK' (4).



5. Select the number of Readings in the second Record using the 'Left' (2) and 'Right' (7) buttons.
6. Press 'OK' (4).



7. Confirm the File settings.
8. Press 'OK' (4) to save the File as the File number allocated.

2. Setting up a Grid File or Grid Template

Select ‘Grid’ from the File Wizard ‘Step 1 of 3’. The following steps are the same whether Grid ⇄ or Grid ⇊ are chosen. The following appears:

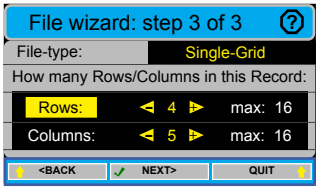
Select the type of Grid Record that is required

Single - One Record containing a Grid of Readings.

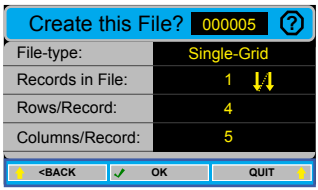
Multiple - Two or more Records, each containing a Grid with the same dimensions.

Variable - Two or more Records, each containing a Grid with differing dimensions.

Single-String



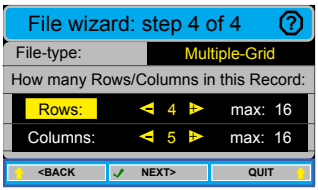
1. Select the number of Rows / Columns in the Record using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).



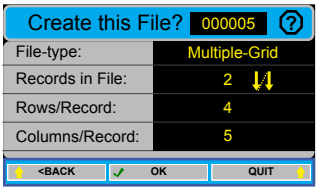
3. Confirm the File settings.
4. Press 'OK' (4) to save the File as the File number allocated.

Multiple-String

1. Select the number of Records using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).



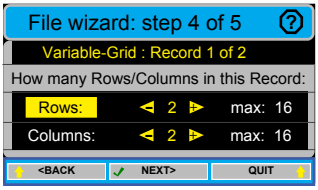
3. Select the number of Rows / Columns in each Record using the 'Left' (2) and 'Right' (7) buttons.
4. Press 'OK' (4).



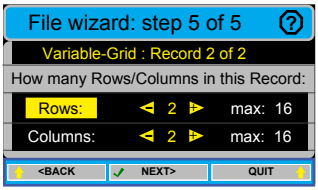
5. Confirm the File settings.
6. Press 'OK' (4) to save the File as the File number allocated.

Variable-String

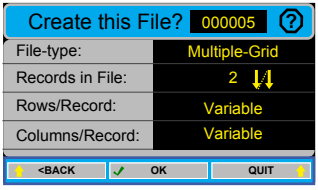
1. Select the number of Records using the 'Left' (2) and 'Right' (7) buttons.
2. Press 'OK' (4).



3. Select the number of Rows / Columns in the first Record using the 'Left' (2) and 'Right' (7) buttons.
4. Press 'OK' (4).



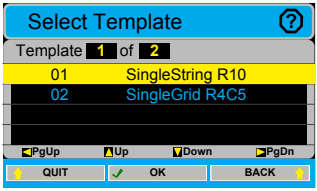
5. Select the number of Rows / Columns in the second Record using the 'Left' (2) and 'Right' (7) buttons.
6. Press 'OK' (4).



7. Confirm the File settings.
8. Press 'OK' (4) to save the File as the File number allocated.

7.1.b Create a New File from Template List…

i Use the ‘Up’ (5) and ‘Down’ (9) buttons to select ‘New File using Wizard’.
ii Press ‘OK’ (4).
iii The following screen will appear:

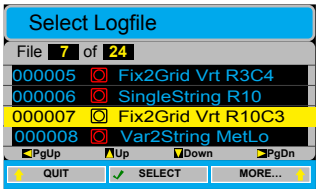


iv Use the ‘Up’ (5) and ‘Down’ (9) buttons to select the required template
v Press ‘OK’ (4).
vi The gauge will show the Logfile screen. See page 29.

7.2. Selecting a Logfile

Each file created using the File Wizard or Communicator software is listed in this section. A File needs to be selected prior to logging measurements. Each file has a short description as a reminder.

i Navigate to 'Select File' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*
ii Press 'OK' (4).
iii The following screen will be displayed:



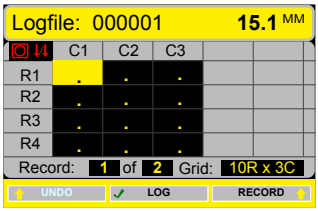
iv Use the 'Up' (5) and 'Down' (9) buttons to select the required File.
v Press Option Key 1' (1) to Quit back to the Home Screen at any time.
vi Press the 'Option Key 2' (6) to display more details about each File.
vii Press 'OK' (4) once the required file is highlighted.
viii A brief description of the File is displayed. As some Files contain more than one record, the user can select which Record is to be used at this point by using the 'Left' (2) and 'Right' (7) buttons.
ix Press 'OK' (4).
x The gauge will show the Logfile screen. See page 29.

Note: The symbol ◯ will be replaced with the symbol ? when the File has been part completed. When a File has been fully completed, the symbol ☑ will be displayed.

7.3. Logging

Logging must be selected to start storing measurements. Once the required File has been selected, the gauge will automatically switch to Logging. Alternatively, the Logging section can be accessed from the Home menu.

i Navigate to 'Logging' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*
ii Press 'OK' (4).
iii The following screen will be displayed:



iv The dark area shows the Grid or String measurement points according to the file being used. The highlighted square is where the measurement will be stored when the measurement is logged.
v The measurements are displayed in the top right corner of the screen.
vi Different squares can be selected by using the 'Arrow' keys (2,5,7 & 9). Measurements can be re-stored by positioning the highlighted square over a previous measurement and logging the new measurement.
vii When the highlighted square is in the required position, the measurement is logged using the 'LOG' button (4).
viii The following symbols may be displayed:

15.1	Recorded measurement.
- -.- -	Measurement not obtainable / Missed measurement.
.	No measurements stored

ix Press 'Option Key 1' (1) to UNDO the last stored measurement.
x Press the 'Option Key 2' (6) to switch between records within the File.

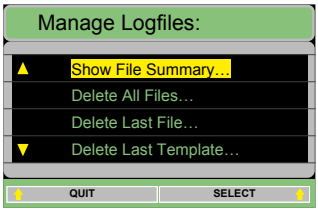
7.4. File Manager

The File Manager is used to display a summary of files stored on the gauge, delete all files, delete last file or to delete the last template.

i Navigate to 'File Manager' on the 'Home' screen using the 'Arrow' keys (2,5,7 & 9). *Use the Definition of Menu Items on pg 13 as a guide.*

ii Press 'OK' (4).

iii The following screen will be displayed:



iv Use the 'Up' (5) and 'Down' (9) buttons to select the required option.

A. Show File Summary…
Lists the total number of Files, number of completed Files, number of incomplete Files and the number of untouched Files.

B. Delete All Files…
Deletes ALL Files on the gauge. A warning is displayed asking the user for confirmation.

C. Delete Last File…
Deletes the last File on the gauge. A warning is displayed asking the user for confirmation.

D. Delete Last Template…
Deletes the last Template on the gauge. A warning is displayed asking the user for confirmation.

8. Communicator Software

Tritex Communicator software displays live measurement results from the Multigauge 5700 Datalogger Thickness Gauge onto either a laptop or PC. The software also allows Templates and Files to be produced for downloading to the gauge. Stored measurements on the gauge can be uploaded to Communicator software on the laptop or PC via a RF Transceiver.

Templates can be preset based on a grid, string of measurements or a combination of both. This gives maximum versatility for a wide range of applications.

8.1. System Requirements & Installation

Tritex Communicator will run on any PC or laptop which has Microsoft Windows™ XP, Vista, 7 or 8 installed. *Tritex Communicator* will not run on older versions of Windows™.

Tritex Communicator may require *Microsoft .NET Framework 4* to be installed on your computer. If this is not already installed, it can be manually installed from the Communicator Installation DVD. The following warning will be displayed to indicate this:

***Note:** you may require administrator privileges in order to install software on your computer.*

The hardware interface requires a spare USB port.

The installation process will begin automatically when the Tritex installation CD is inserted in your DVD/CD reader – otherwise double-click the file *setup.exe* to begin installation. Warning pop-ups may appear asking for confirmation of installation.

To Install the RF Transceiver, insert the it into any USB port. The RF Transceiver will automatically install and allocate a Comm port. The RF Transceiver will reinstall if it is used in a different USB next time it is connected.

To uninstall Tritex Communicator, use the *Add or Remove Programs* utility within *Control Panel*.

8.2. Quick Start Guide

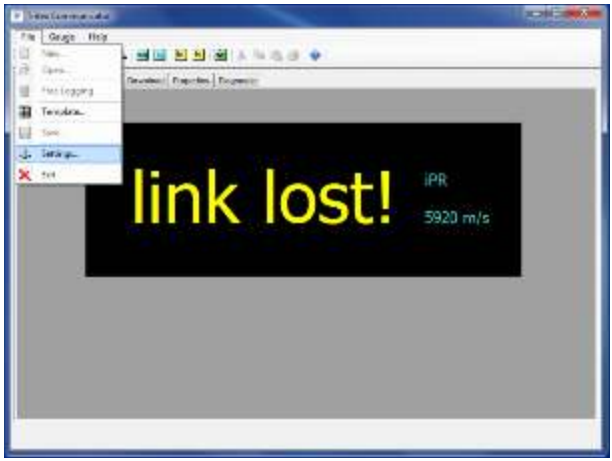
With *Tritex Communicator* program already installed and with the RF Transceiver inserted into a USB port:

i. Click to launch the program from the Start menu. Start / All Programs / Tritex Communicator / Tritex Communicator.

ii. The program will launch, and after about 5 seconds a warning will popup which indicates that the program has not yet found a Tritex gauge connected.

iii. Click the **'OK'** button to remove this popup.

iv. Set the serial COM port number to match the number obtained during the installation of the *USB Transceiver* as follows:



a. Click **'File / Settings'**.
b. Use the drop-down selector to choose the required COM port.
c. Click **'OK'**.

v. Turn the gauge on - after a few seconds, *Tritex Communicator* will begin receiving measurement and status data from the gauge and the *lost link!* message in the *Measurement tab* will disappear.

8.3. Initial Setup and Use

i. Launch *Tritex Communicator* program from the Start menu - Start / All Programs / Tritex Communicator / Tritex Communicator

ii. Use the Settings menu to set *Tritex Communicator* to receive data from the appropriate Serial Port [COM: number]. See *Quick Start Guide* (above) for details on how to identify the *Serial Port*.

Note: *The current Serial Port setting is stored and recalled by Tritex Communicator each time the program is run.*

8.3.1. Introduction

Tritex Communicator has a main menu bar and a matching icon menu toolbar below. The main display area presents the user with a tabbed interface which separates the **Measurement, Status** and **Control** functions of the gauge:

1. **Measurement Tab:** For simply viewing the measurements received from the gauge and calibrating if required.
2. **Datalogging Tab:** For viewing and storing measurements to pre-defined datalog files.
3. **Download Tab:** For uploading files and downloading templates.
4. **Properties Tab:** For viewing and/or adjusting the measurement settings of the gauge.
5. **Diagnostic Tab:** For viewing the detailed information being sent from the gauge in the event of possible interface problems.

8.3.2. Measurement Tab

The *Measurement tab* is used to view measurements received from the gauge in the simplest form, with large scale digits for convenience.

A. Display Area

The *Measurement area* contains the following annunciators:

i. **Packet received** - constantly changing annunciator shows data is being received from the gauge. The annunciator flashes between ☑ and ❶..❹

ii. **IPR** - A Tritex probe is correctly connected to the gauge and Intelligent Probe Recognition (IPR) is working correctly.

iii. **CP⁺** - Coating Plus⁺ has been turned on in the gauge. This setting is used when measuring through thick coatings up to 20mm. If blank, then Coating Plus⁺ is turned off.

iv. **Velocity** - This shows the calibration value currently set into the gauge. The units correspond to the measurement units selected i.e. metres/sec for mm or inches/microsecond for inch.

B. Calibration

Measurement calibration can be carried out from the *Measurement tab* by clicking on Gauge / Calibration / Enable menu-item, or by clicking on the Calibration icon . A *Calibration Slider Control* will appear in the measurement area:

With the gauge measuring on a sample of test material of known thickness, drag the slider to the left or right until the correct measurement is shown. The *Velocity of Sound* displayed will change at the same time

If there is no sample of test material available, Calibration can still be performed by adjusting the *Velocity of Sound* value to an appropriate value. Drag the slider to the left or right until the required velocity value is shown.

Note: *The slider offers an adjustment range of 5500 to 6500 m/s*

By default, the *Calibration Slider Control* is not shown when *Tritex Communicator* is first launched. To remove the slider from the

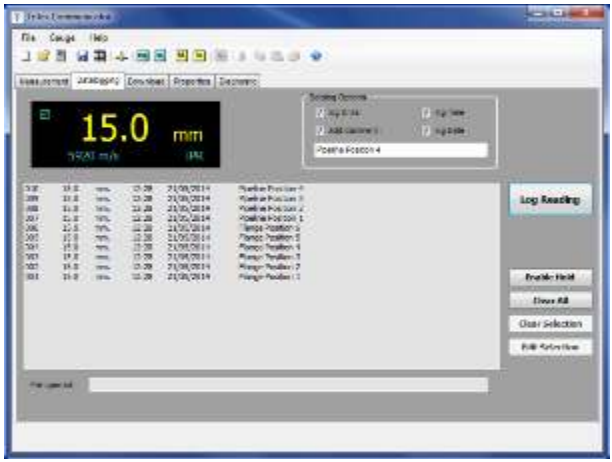
Measurement display, Click Gauge / Calibration/ Disable menu-item or click the Calibration icon

8.3.3. Datalogging Tab

Datalogging is enabled when the *Datalogging tab* is clicked – the File menu then offers New…, Open…, Free-Logging, Template and Save… menu-items. There are two methods for datalogging. The first is by Free Logging where a string of measurements are collected. The second is by setting up templates which allows measurements to be stored in a *String*, *Grid* or a combination of both.

A. Free-Logging

Free-Logging allows measurements to be stored directly on the PC when the gauge is within range and measuring. Measurements are freely added to a flexible list, which is a S*tring of Readings* up to 999 in length.



Measurements are added to the list by clicking on the Log Reading button. The newest readings are added to the top of the list and older readings are pushed down.

Each reading consists of a 3 digit number indicating the order in which the readings were taken and the measurement value itself.

Additional information can be optionally added to each reading by checking any of the *Datalogging Options* boxes. If the *add*

Comment box is checked, the contents of the text box are added to the next reading when Log Reading is clicked.

i. Enable Hold

- Holds the last reading and displays it in red next to the normal readings.

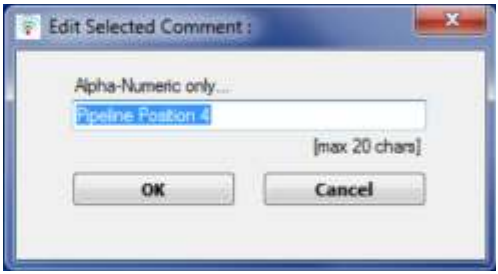
ii. Editing the Datalog List

Clear All - Deletes the entire list.

Click '**OK**' to delete the entire current list of readings or click '**Cancel**' to return to Free-Logging, with the current list unchanged.

Clear Selection - Any individual reading can be deleted from the list. Click to highlight the reading, then click the '**Clear Selection**' button. The selected reading will disappear from the list and all newer readings will be renumbered.

Edit Selection - Any individual comment can be edited, or a previously empty comment can be added to a reading. Click to highlight the reading, then click the '**Edit Selection**' button. A



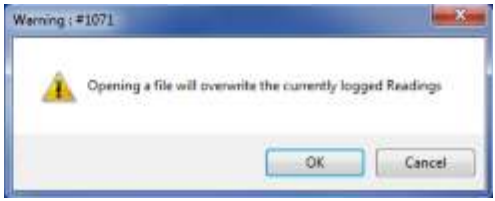
window will popup allowing a comment to be added. Click '**OK**' when finished.

iii. Saving and Opening Files

The datalogged readings can be saved to file by clicking on the File/ Save. A standard File-Save dialog will pop up. Navigate to your required sub-directory, and enter a name for the new file. The file will be saved as <new name>.txt.

Note: *Free logging files are saved as text files [*.txt], with tab separated values to allow convenient opening in other programs such as Microsoft™ Excel if required.*

The file can be saved at any time and later re-opened to resume logging by clicking File/ Open. If the current list has not been saved you will be prompted to cancel opening the file to allow it to be saved first:

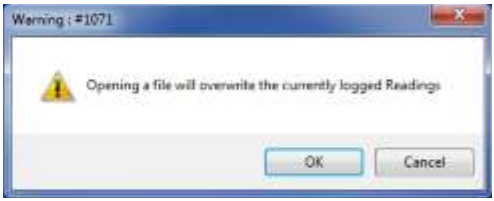


Click '**Cancel**' to decline opening a file and return to the original unsaved list or click '**OK**' to overwrite the current list and replace with the new file.

B. Logging to Templates

Templates can be setup in advance to gather information in either a *grid* or *string* format, or a combination of both. (See *Template Generation* on page 18).

i. Open a New File for Datalogging



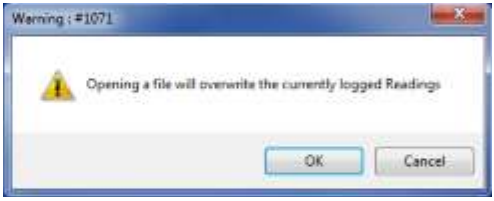
To open a new file, ensure the *Datalogging tab* is selected and click File/ New file. If the current list has not been saved you will be prompted to cancel opening the file to allow it to be saved first.

Click '**Cancel**' to decline opening a file and return to the original unsaved list or click '**OK**' to overwrite the current list and replace with the new file as follows:

a. A standard File-Open dialog will pop up.
b. Navigate to the sub-directory which contains your template files [*.ttx].
c. Select and open the required template.

ii. Open an Existing File to Continue a Previous Session

To open an existing file, ensure the *Datalogging tab* is selected and click File/ Open file. If the current list has not been saved you will be prompted to cancel opening the file to allow it to be saved first.



Click '**Cancel**' to decline opening a file and return to the original unsaved list or click '**OK**' to overwrite the current list and replace with the new file as follows:

a. A standard File-Open dialog will pop up.
b. Navigate to the sub-directory which contains your datalog files [*.txt].
c. Select and open the required file.

iii. Logging Readings

The *Datalogging tab* will reconfigure to allow datalogging to the new file structure.

a. ***Datalog File box*** - lists information about the file which has just been opened :

Datalogging File type - describes the datalogging file structure (see *Template Generation* on page 43 for the full description of available file structures).

File reference name - a descriptive name included when the template is created. To edit this name, click on the Edit button

Working Axis - (for *Grid* collections only) to assist the surveyor when taking readings. The working direction within the *Grid* is preset in the template:
- Vertical : work down columns
- Horizontal : work along rows, left to right

Template - Shows the most recent file path name after either saving or opening a file or template.

b. 'Grid Collection' or 'String Collection' box

The file structure consists of 1 to 100 *Strings of Readings* or 1 to 100 *Grids of Readings*. Click on the << or >> buttons to step through the collections. The number of grid or string collections is always displayed.

Grid reference name - This name is optionally included when the template is created (see *Template Generation* on page 43). To edit this name, click on the Edit button.

c. Datalogging Matrix

The main display area shows the current grid or string collection of readings as follows:

- The highlighted cell . shows the current position in the grid or string where the next measurement will be logged.

- Click on the Log Reading button and the currently displayed measurement will appear in the highlighted cell in the grid or string.
- The highlighted cell . will then step on to the next position ready for the next measurement to be logged.
- You can click on any cell to manually move the highlighted cell . to a new position.

Grid Collection - Horizontal Working Axis:

When Log Reading is clicked, the highlighted cell . will step left-to-right across the current row. When the end of the row is reached, the highlight jumps back to the start of the next row, below the current row.

Grid Collection - Vertical Working Axis:

When Log Reading is clicked, the highlighted cell . will step down the current column. When the end of the column is reached, the highlight jumps up to the top of the next column, to the right of the current column.

8.3.4. Download Tab

The *Download Tab* is used to transfer Templates and Files between the gauge and Communicator software.

i. Show list of Files on Gauge

Show list of Files on Gauge - Calls the Files stored in the gauge into Communicator software. The Files are listed on the right hand side along with their filename, whether they have been completed and their File number #.

ii. Upload Selected

Upload Selected - Uploads a file to the gauge

iii. Delete All Files

Delete All Files - Deletes all files on the gauge. A warning will be displayed asking for confirmation prior to deleting all the files.

iv. Delete Last File

Delete Last File - Deletes the last file created on the gauge.

v. Select a Template

Select a Template - Opens a dialog box to select a previously stored template. Once selected the following will be displayed. To download this template to the gauge, click Download this Template

vi. Create a Template

Create a Template - Templates are created to store measurements into different formats depending on the application being measured. Once the template has been created it can be reused for each new datalogging location.

Template File Structures
There are six templates available:

1. *Single String: Fixed Length*
   - A single *string of readings*.
   - The length of the string [number of readings] is specified in the template.

2. *Multiple String: Fixed Lengths*
   - A set of *strings of readings*.
   - The number of strings in the set is specified in the template.
   - The length (number of readings) of every string is the same.
   - This length is specified once during template generation.

3. *Multiple String: Variable Lengths*
   - A set of *strings of readings*.
   - The number of strings in the set is specified in the template.
   - The lengths (number of readings) of each string can be different.
   - The length of each string is specified during template generation.

4. *Single Grid: Fixed Dimensions*
   - A single *grid of readings*.
   - The dimensions of the grid (number of rows, number of columns) is preset.

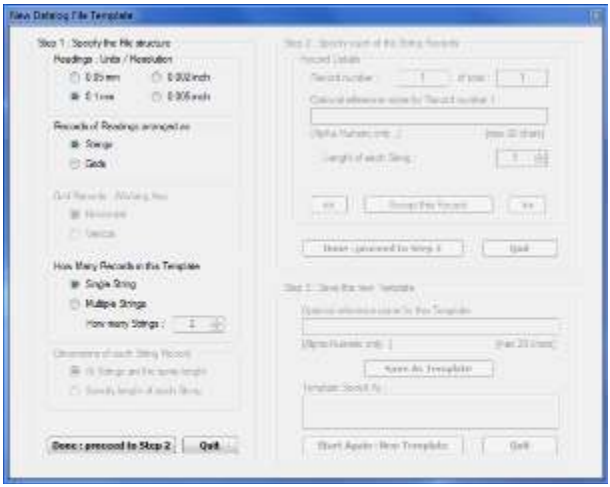
5. *Multiple Grid: Fixed Dimensions*
   - A set of *grids of readings*.
   - The number of strings in the set is specified in the template.
   - The dimensions (number of rows, number of columns) of every grid are the same.
   - These dimensions are specified once during template generation.

6. *Multiple Grid: Variable Dimensions*
   - A set of *grids of readings*.
   - The number of grids in the set is specified in the template.
   - The dimensions (number of rows, number of columns) of each grid can be different.
   - The dimensions of each grid are specified during template generation.

Template generation is a 3 step process:

1. Specify the *File Structure*.
2. Specify each of the *string or grid records* that make up the structure.
3. Save the new *template* with an appropriate filename.

Open the template generation wizard by clicking on the Create a Template button. The following popup window will display:



Step 1: Specify the File Structure.

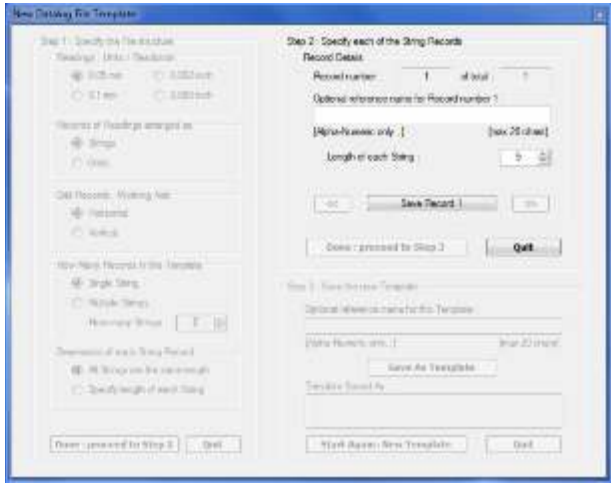
i. Select the resolution required. It is recommended to use low resolution under normal circumstances.
ii. Select either *String* or *Grid*.
iii. If *Grids* are selected, the *Working Axis* options become active.
    a. Horizontal - sets for measurements to be taken across rows.
    b. Vertical - sets for measurements to be taken down columns.
iv. Select the number of records of *Strings* or *Grids* in this template. The options are either *Single* or *Multiple*. If *Multiple* is selected, the quantity selector will become active.
    a. Use the up or down arrows to select between 2 to 100.
    b. The template dimensions can be set to all the same length or the length can be specified for each *String* or *Grid*.

Once the above has been set, click on the *Done : proceed to Step 2* button.

Step 2: Specify each of the *String* or *Grid* Records.

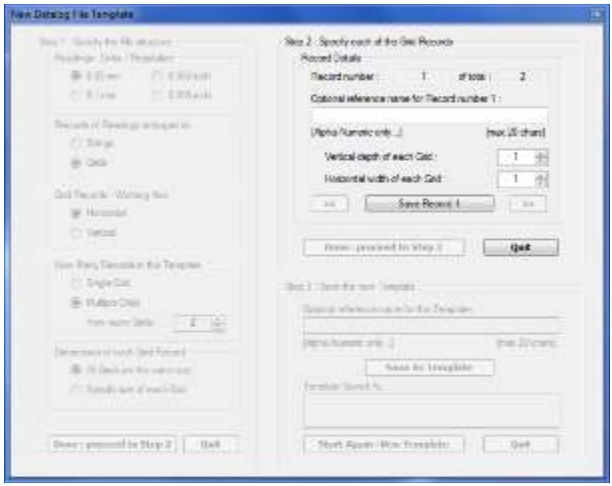
String:

1. Select the length of each *String* using the up and down arrows to set the value from 1 to 100.



Grid:

1. Adjust the *Vertical depth of Grid number 1* using the up and down arrows to set the value from 1 to 100.
2. Adjust the *Horizontal width of Grid number 1* using the up and down arrows to set value from 1 to 30.



To optionally add a reference name for *Record number 1*, check the text box and type a name up to 30 characters long. Save the settings of *Record number 1* by clicking **'Save Record 1'** button.

The next steps are dependent on the file structure selected in Step 1:

1. If Single String or Single Grid was selected:
   This completes Step 2. **'The Done : proceed to Step 3'** button will become active.

2. If Multiple String or Multiple Grid was selected:
   i. With all *Strings* or *Grids* the same length, all remaining records will automatically be preset to the same length as *record number 1*. The up/down value selection boxes will be greyed-out inactive and the **'Done : proceed to Step 3'** button will become active. Each remaining record can be optionally named before proceeding. If they are not named at this stage then they can be later edited when the template is opened.
   ii. If the *Strings* or *Grids* have different lengths then the number of vertical and horizontal measurement points must be set in at each stage. Also, a name can be optionally added at each step.
   iii. Use the << and >> keys to toggle between the different records to make any changes.
   iv. When finished, click on **'Done : proceed to Step 3'** button. This button only becomes active after the last **'Save Record'** button has been clicked.

Step 3: Save the New Template

1. The template can be given a descriptive name for easier identification. This reference name will appear on the *Datalogging tab* when the template is opened.
2. Now click Save as Template button. A standard File-Save dialog will pop up. Navigate to your required sub-directory, and enter a name for the new file. The file will be saved as <new name>.ttx

***Note:** Tritex Communicator templates are saved as text files with .ttx file extension [*.ttx]. These files should not be edited, except by Tritex Communicator program, to prevent incompatibility.*

This completes the generation of a *Datalogging Template* file. Click Quit to close the wizard or click Start Again : New Template if you wish to generate another template.

8.3.5. Properties Tab

The *Properties tab* shows the current measurement settings of the gauge and provides a direct facility to change these settings.

Measurement settings which can be changed:

i. ***Units*** - click on mm or inch button to change the measurement units. The following text boxes will change:
   a. *Units* text box.
   b. *Resolution* text box.
   c. *Measurement Calibration* fields.

ii. ***Resolution*** - click on HiRes or LoRes button to change the display resolution.
   a. mm - Resolution will switch between 0.05 mm and 0.1 mm.
   b. inch - Resolution will switch between 0.002 inch and 0.005 inch.

iii. ***Coating Plus***$^{+}$ - click on Normal or CP+ button to turn Coating Plus^{+} ON or OFF. Used for very thick coatings up to 20 mm.

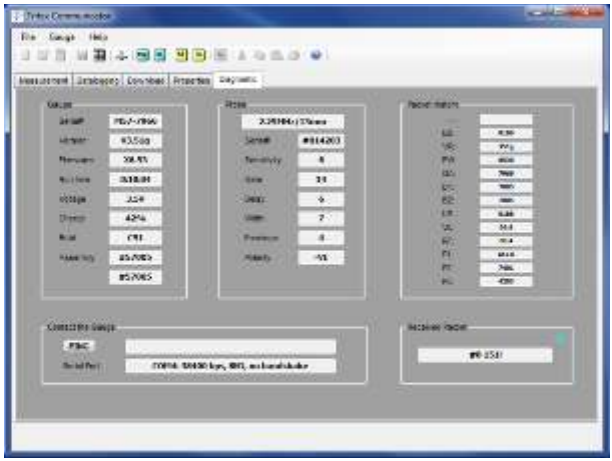
iv. ***Measurement Calibration*** - The calibration can be adjusted in two ways by using the slider control to make adjustments.

a. **Calibration by Measurement**
Place the probe onto a test piece of known thickness and adjust the slider control until the correct reading is achieved. The *Velocity of Sound* display will show the calibrated value for this sample.

b. **Calibration by Velocity**
When a suitable test sample is unavailable, calibrate the gauge by adjusting the *Velocity of Sound* to an appropriate value (see the velocity table in the gauge manual).

8.3.6. Diagnostics Tab

Diagnostics should not normally be required when using Tritex gauges, the information is provided to check the correct performance of the gauge and link.



The only control provided on the *Diagnostics tab* is the *PING* button. Click on *PING* at any time and the gauge should respond immediately. The contents of the text box is cleared and replaced with information identifying the connected gauge type.

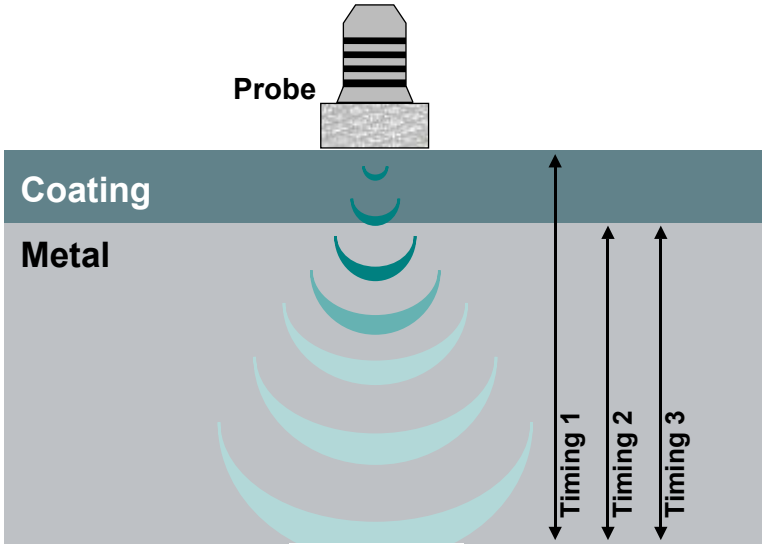
9. Using the Multigauge 5700

9.1. How Multiple Echo Works

All Ultrasonic Thickness Gauges should be calibrated to the velocity of sound of the material being measured. Coatings have a different velocity of sound than metal and it is important they are not included in the measurement. Multiple echo ensures all coatings are completely eliminated from the measurement.

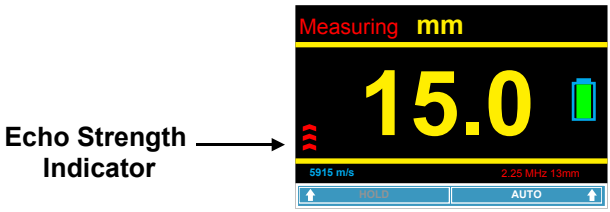
How it works:

A transmitted ultrasound pulse travels though both the coating and the metal and reflects from the back wall. The returned echo then reverberates within the metal, with only a small portion of the echo travelling back through the coating each time. The timing between the small echoes gives us the timing of the echoes within the metal, which relate to the metal thickness. The returned echoes need not be consecutive as the gauge will interpret them automatically and calculate the thickness. A minimum of three echoes is checked each time. This is referred to as the **Automatic Measurement Verification System (AMVS)**.



9.2. Echo Strength Indicator

The gauge will show an increasing number of bars on the right hand side of the display to indicate the strength of the returning echoes. The stronger the returning echoes are, the more bars will be displayed.



9.3. Precautions When Measuring

❑**Check that the material has parallel front and back walls.**
If the front and back walls are not parallel, the ultrasound hitting the back wall will be deflected away from the face of the probe. The probe will therefore not receive any echoes back.

❑**The surface being measured should be free from dirt or debris.** It may be necessary to clean or brush the surface prior to taking measurements.

❑**Ensure plenty of ultrasonic gel is used between the probe and the material to eliminate any air pockets.** Air is the enemy of ultrasound and it is essential that couplant exists to form a path for the ultrasonic signal.

❑**A membrane should be correctly fitted to the probe.**

❑**Place the probe firmly on the surface being measured to make good contact.**

❑**Do not remove protective coatings.** The gauge is designed to ignore these.

❑**Ensure the coating is solidly adhered to the surface.**
Triple echo will ignore coatings as long as they are solidly adhered to the surface. If the coating has become loose or delaminated then air pockets will exist.

❑**The correct couplant should be used.** Although we recommend couplant specifically designed for taking measurements, other liquids can be used such as liquid soap, wallpaper paste, water and some hand cleansers. Grease is not a good alternative.

❑**Remove debris from the probe face between measurements.**

❑**Sometimes it is necessary to rock the probe slightly and gently in order to obtain measurements.** This often helps the probe to receive echoes from the back wall.

❑**Ensure the coating is not layered or does not contain foreign objects in its construction.** Layered coatings cause reflections at the layer interface. This seriously weakens the strength of the ultrasound and may prevent it from travelling all the way through. The same applies to foreign objects which can deflect the ultrasound path or prevent the ultrasound from passing.

❑**Some types of casting may cause problems for ultrasonic gauges.** Castings can contain foreign elements within their construction and they also have varying velocity of sound properties throughout their structure. This may result in inaccurate measurements due to the inherent inconsistencies in the material.

10. Help

10.1. Gauge fails to switch on

Advice	Action
Check the batteries are present and serviceable.	Replace with new batteries (see pg 6).
The 'ON/OFF' key may be defective.	Return the gauge to Tritex NDT (see pg 58).

10.2. Difficult to obtain readings

Advice	Action
Check the gauge against the 15 mm test block supplied.	If this works, the problem is with the material being measured (see pg 51).
Check the correct probe for the material being measured has been selected.	Select the correct probe (see pg 7).
Check the probe membrane is properly fitted with membrane oil applied and no trapped air present.	Refit or replace the membrane (see pg 9).
Check the probe, lead and gauge are all connected together correctly and securely.	Re-connect as necessary (see pg 5).
Check the serviceability of the probe and lead.	Contact Tritex NDT for replacement items (see pg 58).
Check the serviceability of the gauge.	Return the gauge to Tritex NDT (see pg 58).
Couplant not suitable.	Use only suitable couplant supplied with the kit (see pg 52).

10.3. Gauge displays up to three ascending bars

Advice	Action
Not all echoes received are equal. The gauge has Automatic Measurement Verification System (AMVS).	Move or rock the probe slightly until all echoes are received (see pg 52).

10.4. Standing readings are displayed when not measuring

Advice	Action
Excessive membrane oil under membrane.	Refit or replace the membrane (see pg 9).

10.5. Gauge measures correctly on steel test block but not on the material under test

Advice	Action
Check the material is not too thin for the frequency of the probe being measured.	Select the correct probe (see pg 7).
Check that the material has parallel front and back walls.	See pg 51 - Precautions When Measuring.
Ensure plenty of ultrasonic gel is used between the probe and the material to eliminate any air pockets.	See pg 51 - Precautions When Measuring.
Ensure the coating is solidly adhered to the surface.	See pg 51 - Precautions When Measuring.
Ensure the coating is not layered or contains foreign objects in its construction.	See pg 51 - Precautions When Measuring.
Some types of casting may cause problems for ultrasonic gauges.	See pg 51 - Precautions When Measuring.

10.6. Communication lost between gauge and PC / Laptop

Advice	Action
Check the RF Transceiver is connected to a USB port and flashing.	Select the correct Comm port (see pg 32).
Check the correct Comm setting is selected on Communicator software.	Insert the RF Transceiver into the USB port and allow it to install. (see pg 31).
Ensure the datalink on the gauge is enabled.	See pg 21 - Enabling and disabling the Datalink.

11. General Information

11.1. Safety

Only use either alkaline, NiMH or NiCD ‘AA’ batteries. Do not mix different types of battery in the same gauge.

Do not submerge the gauge in water.

Do not open the gauge body other than to change the batteries. Always return the gauge for repair.

Never dispose of batteries in a fire. There is a serious risk of explosion and/or the release of highly toxic chemicals.

Do not expose to direct sunlight for extended periods of time.

11.2. RoHS

New legislation to help safeguard the environment has been introduced to ensure companies act responsibly. Tritex products are fully RoHS compliant which means that we do not use hazardous substances and materials at any stage of manufacture. Lead cadmium, mercury and other such materials used in electronic equipment are not present in Tritex products.

RoHS compliance is already law in the United Kingdom and European Union and will soon be adopted in other countries seeking to protect the planet for future generations.

At Tritex we are aware of our corporate social responsibility towards all our stakeholders. We take pride in our work and our environment.

11.3. WEEE Disposal Instructions

Do not dispose of this device with unsorted waste. Improper disposal may be harmful to the environment. Please refer to your local waste authority for information on return and collection schemes in your area. Otherwise, return the product to Tritex NDT for safe disposal.

11.4 RF Transceiver

This equipment has been tested and found to comply with the limits for class B digital devices pursuant to Part 15 Subpart B, of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that no interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one of the following. Either, re-orientate or relocate the receiving antennae or increase the separation between the equipment and the receiver.

11.5. Cleaning

Clean the gauge using a mild detergent, a damp (not wet) cloth, or an anti-static wipe. Never use abrasives, solvents or other cleaning products as this will damage the instrument. Do not soak the gauge with water or other liquids.

11.6. Warranty

Tritex products are guaranteed against defects in material and/or workmanship for a period of 3 years from date of delivery.

Any equipment that may be defective should be returned carriage paid direct to Tritex or to their approved local distributor who will at their discretion repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts, labour and return at no charge.

Repairs due to abuse of the equipment, accident, fair wear and tear and use of non approved third party hardware is not covered by this warranty. Probe warranty is limited to 1 year and batteries (dry cell or rechargeable) or other consumable items are not covered by this warranty.

No other warranty is expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

The customer should not attempt any repair as this will void the warranty.

Tritex shall not be liable for collateral or consequential damage of any kind from either the use or the interpretation of the results from the equipment.

11.7. Service & Repair

A full manufacturer's factory repair service is available from Tritex NDT. Priority is given to customer repairs so the gauge can be returned ready for action in the shortest possible time. The complete kit should be returned to Tritex direct or through your local agent.

Before you return your gauge

Check through the troubleshooting guide on page 53. If this does not solve the problem we can sometimes give advice over the phone.

When returning the gauge

If after troubleshooting the gauge is still faulty, then you will need to return your gauge for repair. Please package the **complete kit** in a suitable protective container and return to us at the address on page 58.

Please include your contact details including name, address, e-mail and phone number along with a brief description of the problem.

12. Contact Information

Telephone: +44 (0) 1305 257160

Facsimile: +44 (0) 1305 259573

E-mail: Sales@tritexndt.com

Website: www.tritexndt.com

Address: Unit 10, Mellstock Business Park
Higher Bockhampton
Dorchester
Dorset
DT2 8QJ
United Kingdom

simple . accurate . robust

Tritex NDT Ltd
Unit 10
Mellstock Business Park
Higher Bockhampton
Dorchester, Dorset
United Kingdom
DT2 8QJ

t: +44 (0) 1305 257160
f: +44 (0) 1305 259573
e: sales@tritexndt.com
w: www.tritexndt.com