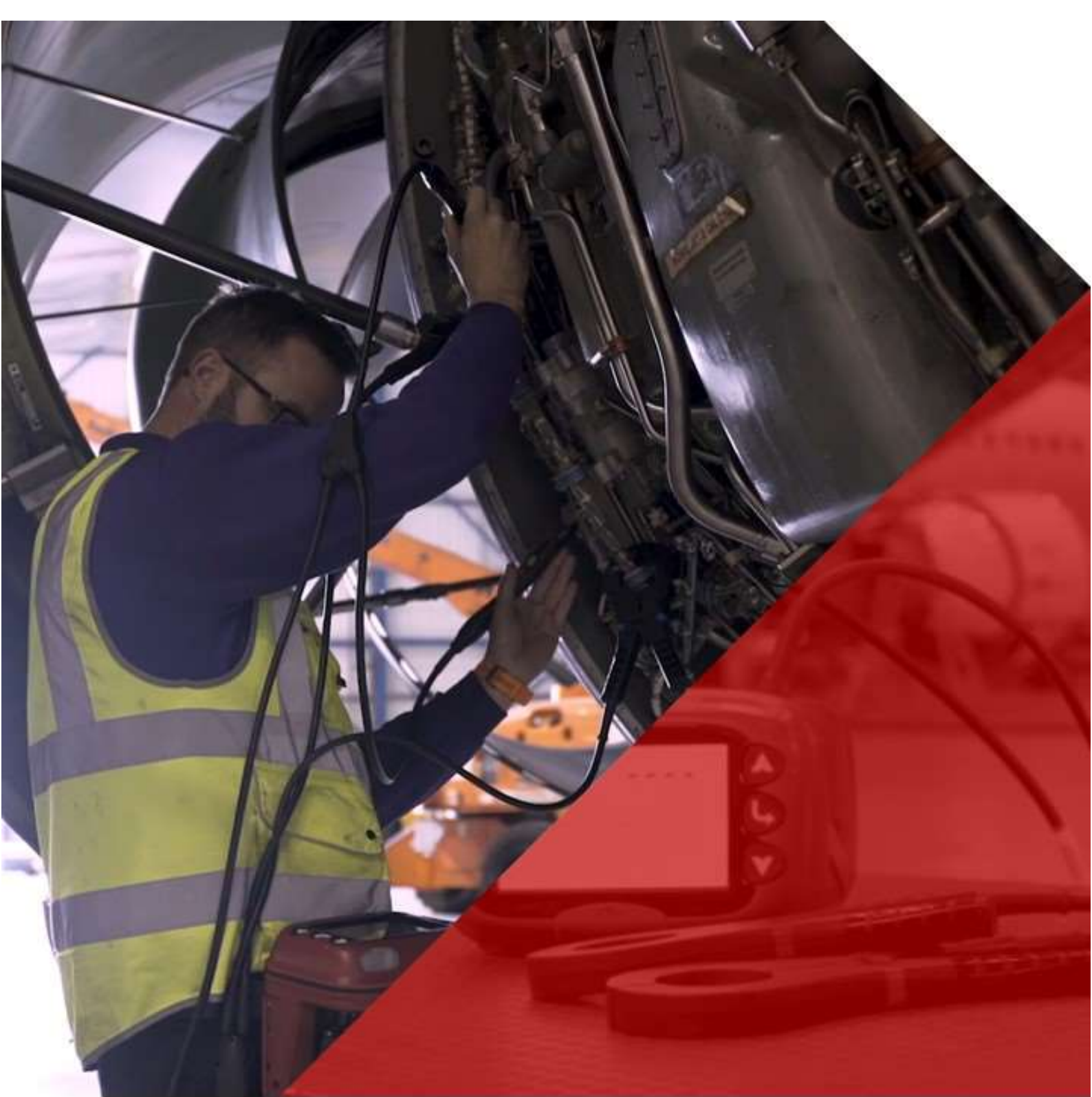




# **OPERATOR MANUAL**

ExLRT Intrinsically Safe Loop Resistance Tester



[www.mktest.com](http://www.mktest.com)



## OPERATOR MANUAL

### EXLRT

### XLR-104-3

|           |                        |       |                                 |
|-----------|------------------------|-------|---------------------------------|
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| Approved: | <u>Alan Wilson</u>     | Date: | <u>4<sup>th</sup> Dec 2023</u>  |

## MODIFICATIONS

| Revision | Date                      | Modified by | ECR   | Changes / ECR                                                                       |
|----------|---------------------------|-------------|-------|-------------------------------------------------------------------------------------|
| 1        | 6 <sup>th</sup> Feb 2020  | G Prisco    | n/a   | First Release                                                                       |
| 2        | 22 <sup>nd</sup> May 2020 | G Prisco    | E0003 | Corrected grammatical errors.<br>Corrected Battery charging table indicator colours |
| 3        | 27 <sup>th</sup> Nov 2023 | G Prisco    | E0054 | Added new battery state                                                             |

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## 1 INTRODUCTION

This manual is provided to the end user to understand the operation of the ExLRT and its associated components.

**This manual does not include safety information for the ExLRT**

**Refer to document XLR-927**

**Do not operate the ExLRT without reading and understanding the Safety Manual.**

**The manual does not include servicing or repair literature.**

**There are no user serviceable parts.**

## 2 HARDWARE

### 2.1 Product overview

The ExLRT is a battery-operated device that is designed to measure the resistance of complex constructed loops for the use of electrically bonding parts within structures and sub-frames. It has an additional joint mode that can measure the bond joints within the loops.

The ExLRT uses current couplers that non-intrusively couple an AC signal into the loop. A drive coupler is used to inject the signal with a known voltage and a second coupler is used to measure the current. To measure individual joints within the loop, a pair of joint probes are used to measure the voltage presented across the joint resistance. Knowing the voltage and current for each test, the ExLRT calculates the resistance.

**ExLRT**



**Battery**



**Charger**



**AC-DC Power Supply**



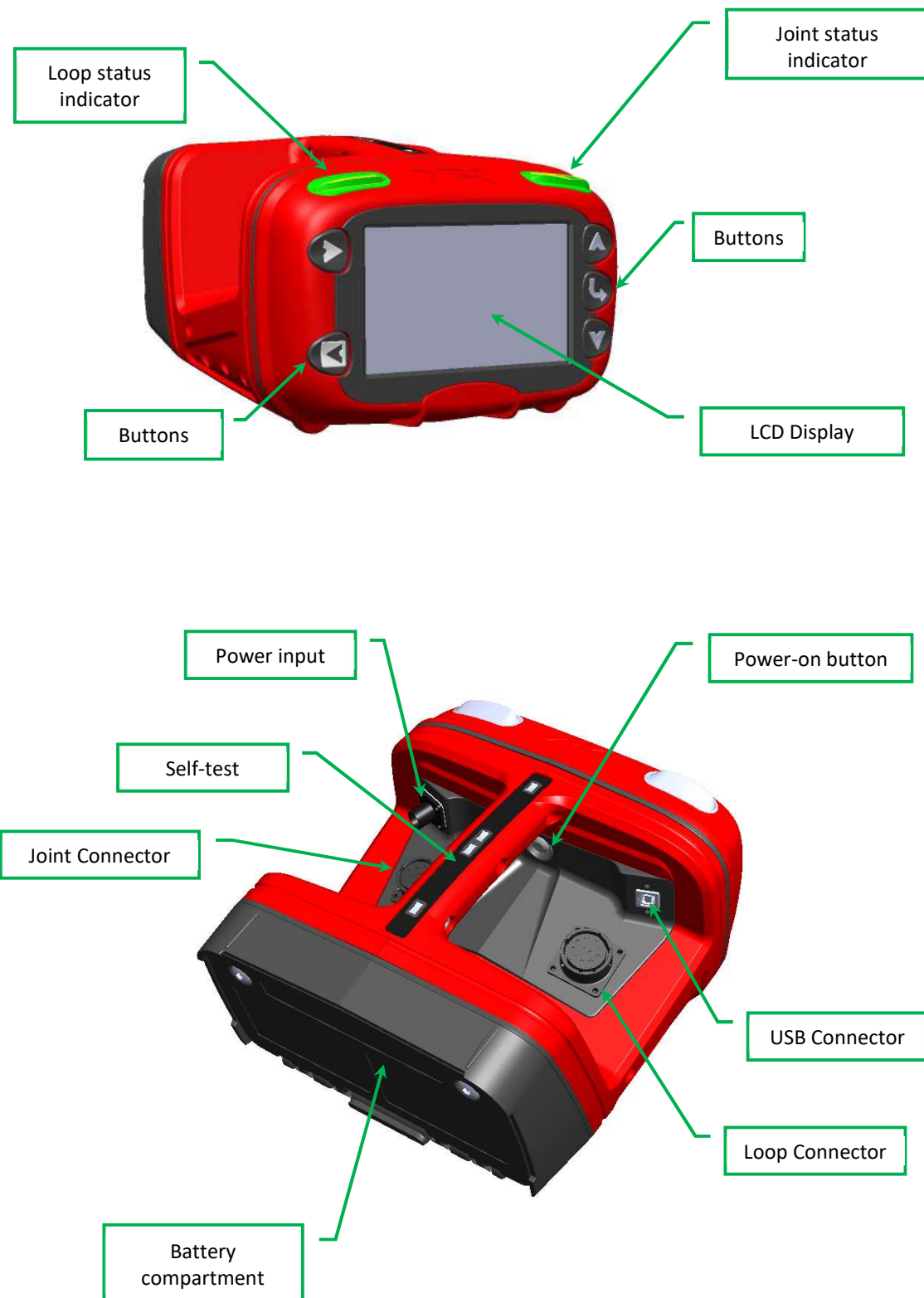
**Loop Cable**



**Joint Cable**



## 2.2 ExLRT Overview





## 2.3 Buttons

Five buttons serve the following main functions

- 1) Start and Stop measurements in manual mode
- 2) Browse menus
- 3) Change/Set parameters

## 2.4 Indicators

Two indicators are situated on the top of the ExLRT. The left indicator shows the status of the loop measurement and the right indicator shows the status of the joint measurements. The indicators act as repeaters to the LEDs situated on the Loop and Joint cables.

The indicator colours identify the following test status.

| Loop status indication |                                        |
|------------------------|----------------------------------------|
| <b>Green Flashing</b>  | Waiting for loop test to commence      |
| <b>Amber ON</b>        | Loop test measuring                    |
| <b>Amber Flashing</b>  | Paused State<br>(Continuous mode only) |
| <b>Red flashing</b>    | Loop test error                        |
|                        | Drive/Sense Coupler open               |

| Joint status indication |                                                 |
|-------------------------|-------------------------------------------------|
| <b>Green Flashing</b>   | Waiting for user to connect joint probes to UUT |
| <b>Amber ON</b>         | Joint test measuring                            |
| <b>Amber Flashing</b>   | Paused State<br>(Continuous mode only)          |
| <b>Red flashing</b>     | Joint test error                                |
|                         | Joint test intermittent                         |





## 3 CHARGING THE BATTERY

### 3.1 External charging

Insert the battery into the charger as shown and attach the supplied MK PSU. The table below shows the list of the LED states to indicate the state of the battery.



| Charger State     | LED 1 (Left) | LED 2 (Right) |
|-------------------|--------------|---------------|
| No Power          | OFF          | OFF           |
| Ready / Complete  | OFF          | GRN           |
| Charging          | RED          | GRN           |
| Top-off charge    | AMBER        | GRN           |
| Over temperature* | X            | AMBER         |
| Fault detected**  | OFF          | RED           |

\*In the event of a battery over-temperature detected, insert the battery in an ExLRT and after one hour, check that the battery maintains full charge. Return the battery pack to MK Test Systems if the over-temperature detection persists or if the battery loses charge quicker than expected.

\*\*Remove the battery and power cycle the battery charger. Re-insert the battery and re-try. If the fault persists, check if the fault is pertinent to the battery or charger. Return the faulty unit to MK Test Systems for a replacement.

Contact: [sales@mktest.com](mailto:sales@mktest.com)

### 3.2 Internal charging

Simply plug the PSU into the ExLRT to charge the battery. The battery container will display flashing bars to indicate that the battery is charging.



## 4 USING THE EXLRT

### 4.1 Calibration

Calibration Verification is a method to verify the ExLRT instrumentation hardware to calibrated standards. Adjustment is performed using MK PC software and is run by a user with appropriate permissions. Once the verification is performed and the ExLRT has passed, the ExLRT will display

the  icon when the correct combination of cables are connected to the ExLRT.

#### Calibration Warning Date:

This is set within the PC ExLRT software at the time of verification. It is used as a warning to the user when the ExLRT is due for calibration.

#### Calibration Expiry Date:

This is set within the PC ExLRT software at the time of verification and is the date to which calibration of the unit is valid until.

## 5 USING THE INTEGRATED SELF-TEST FIXTURE

The ExLRT has an integrated Self-Test fixture. To test the ExLRT instrumentation, simply connect the loop and joint cables to the ExLRT and clamp the loop couplers around the handles as shown.

### NOTE:

*The designed nominal value of the internal self-test fixture loop is 9.5mΩ. It is expected to see small deviations due to manufacturing tolerances so the indicated value may yield slightly different results. MK does not hold itself responsible if the Self-Test Loop yields a measurement outside of the tolerance due to poor care or attention of the ExLRT.*



Typical loop value

9.5mΩ (+/-0.5mΩ).

*Navigate through the menus to the measurement screen and take a loop test.*



Typical joint value

8mΩ (+/-0.5mΩ)

*To take a high value joint test, connect the joint probes to the outer points.*



Typical joint value

0.2mΩ (+/-0.1mΩ)

*To take a low value joint test, connect the joint probes to the inner points.*

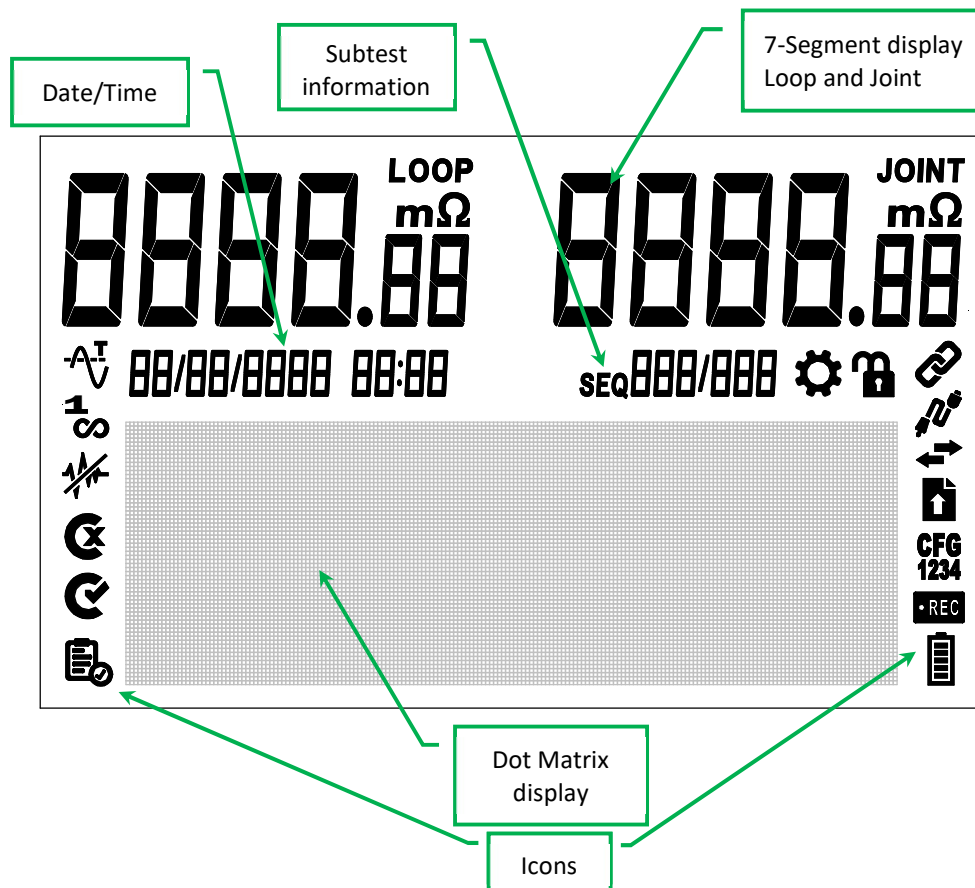
## 6 FUNCTIONS AND FEATURES

The ExLRT provides the following functions and features

- Manual Measurements (Two modes: Continuous and Single Shot)
  - Measures the resistances of loops and joints
  - User interface providing responsive status and error messaging to the user
- Supports multiple users
  - Login using user ID and Password
  - Up to 32 users (Setup with permissions/restrictions)
  - Up to 15 user configurations (one allocated for Customer Administrator)
- Icons showing the following status' during operation
  - Calibration
  - Battery life (including charging status)
  - Configuration Level in use
  - Measurement mode and settings
- Date and Time
- Connection to PC via USB

### 6.1 LCD display

The LCD is split into the following sections

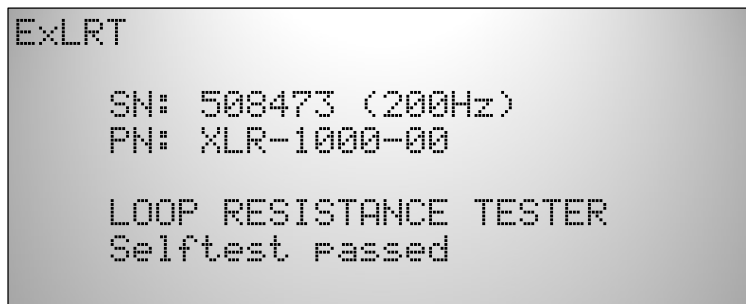


## 6.2 7-Segment Display and Icons description

|                    |                       |                                                                                                                                            |
|--------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                       | Loop or Joint measurement                                                                                                                  |
|                    |                       | Date and Time                                                                                                                              |
|                    |                       | Sequence number (Maximum of 999 subtests per test program)                                                                                 |
| <b>LOOP</b>        | Loop Cable Connect    | Appears when the loop cable is connected to the ExLRT                                                                                      |
| <b>JOINT</b>       | Joint Cable Connect   | Appears when the joint cable is connected to the ExLRT                                                                                     |
|                    | Link                  | Displayed if software has established a handshaking to the PC software either via USB or Bluetooth                                         |
|                    | Cable                 | Displayed if the ExLRT has detected a cable                                                                                                |
|                    | Locked                | Displayed if the ExLRT has expired its calibration. The icon is used to indicate to the user that ExLRT is not able perform measurements   |
|                    | Unlocked              | Displayed if the user type is super user or has permissions to perform measurement if the ExLRT is not calibrated                          |
| <b>CFG</b><br>1234 | Configuration         | Level of configuration is displayed depending on user permissions                                                                          |
|                    | Calibrated            | Displayed when the unit is in calibration and verified cables that are associated with that particular unit are connected.                 |
|                    | Not Calibrated        | Displayed when the ExLRT is in calibration but cables that are not associated with the particular unit or unverified cables are connected. |
| <b>1</b>           | Single shot           | Displayed when the ExLRT is taking a single shot measurement                                                                               |
|                    | Continuous            | Displayed when the ExLRT is taking a continuous measurement                                                                                |
|                    | Averaging             | Displayed when averaging mode is enabled (Available in continuous mode)                                                                    |
|                    | Trigger               | Displayed when triggering is enabled (Available in continuous mode)                                                                        |
|                    | Averaging and Trigger | Displayed when both averaging and triggering is enabled                                                                                    |
|                    | Self-Test             | Displayed if internal self-test has passed                                                                                                 |
|                    | Flashing              | Flashing if internal self-test has failed                                                                                                  |
|                    | Battery life          | Shows battery charge level                                                                                                                 |
|                    | Charging              | While charging, the battery container and bars will flash. The bars will also 'increment' as the battery is charging                       |

## 7 START-UP (POWER ON)

To power on, press the button on the rear of the front panel. The ExLRT will start up and briefly display the following information



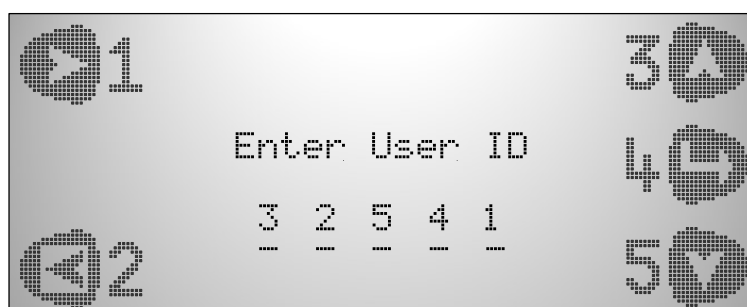
### 7.1 Login (Option)

If enabled, the ExLRT will present the Log On screen. If Log On is not enabled, then the ExLRT will proceed straight to the ExLRT main menu. See section 8 Main Menu. See document XLR-105 Section - ExLRT Device Settings to how to configure Log On

#### Enter User ID

If login is enabled at start-up, then the ExLRT will prompt for a user ID as follows.

Upon entry of a recognised user ID, the ExLRT will advance to prompt for a Password as soon as the fifth correct digit has been entered. Below shows an example of the user ID being entered.



#### Password entry

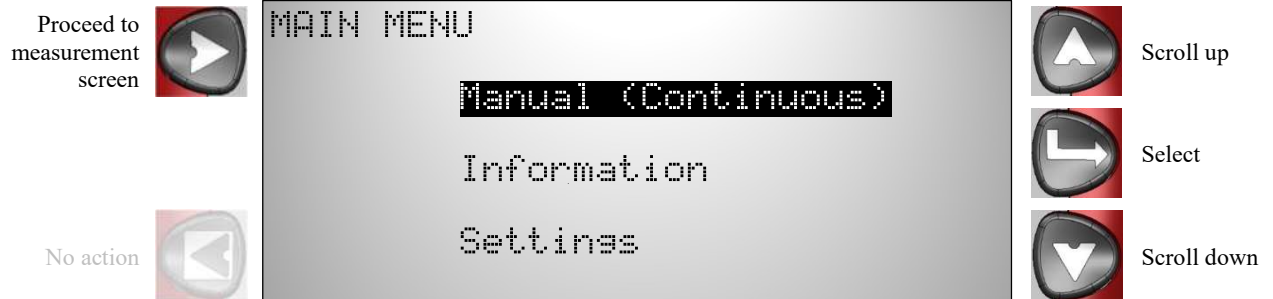


If the password has been incorrectly entered three times, the ExLRT will return to the user ID entry screen.

## 8 MAIN MENU

The following options are listed in the main menu. Use the scroll up and down buttons to highlight your desired choice.

In this screen, the ExLRT will display the device/asset information if it has been programmed into the device



### Proceed to measurement screen

Press the  to proceed straight to the measurement screen.

- If manual mode is set to 'Continuous', go to section 10 Continuous mode measurements
- If manual mode is set to 'Single Shot, go to section 11 Single Shot Measurements

Highlight Manual and press  to proceed to the Manual Menu. Go to section 9 Manual Menu.

Highlight Settings and press  to proceed to the Settings Menu. Go to section 17 Settings Menu

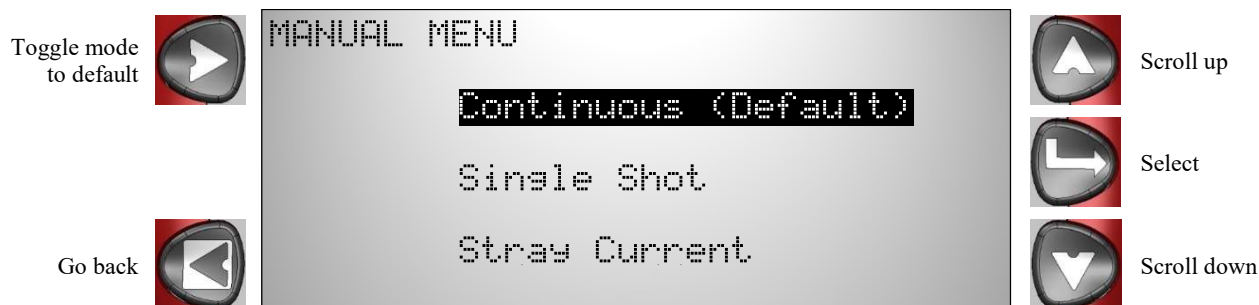
.



## 9 MANUAL MENU

The ExLRT can operate in two modes, Continuous and Single Shot and each can be individually disabled, if required.

The Manual menu will display the following options with one selected to the default mode



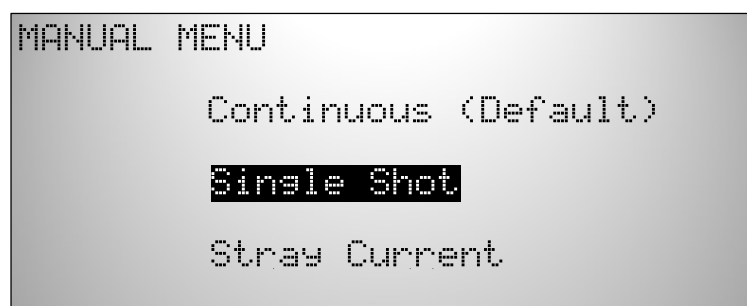
The ExLRT will automatically highlight the mode that has been set to default. The above screen shot shows that the ExLRT default is set to continuous

To operate in continuous mode, press select . See section 10 Continuous mode measurements  
To operate in single shot mode, use the up/down buttons to highlight Single shot then press the select  button. See section 11 Single Shot

### Operating the ExLRT temporarily in the non-default mode

Scroll to the non-default mode and press the select  button. Once the unit exits out of its measurement mode (manual or automatic), the ExLRT will return to the default mode.

For example, continuous mode is set to default, but single shot is highlighted as the temporary mode of operation.



### Setting the default mode

To set the ExLRT default mode, scroll up or down to select the mode and press the toggle  button.

## 9.1 Manual measurement modes

### 9.1.1 Overview

#### Loop measurements

A loop test is performed by placing both loop couplers around a loop. If the loop couplers have been coupled incorrectly, the ExLRT will display either a DRIVE COUPLER OPEN or SENSE COUPLER OPEN. Correct coupling will allow the ExLRT to commence measurement. Valid Loop measurements are displayed as a 4-digit number with two decimal places.



If the joint measurement is not valid, the ExLRT will null the 7-segment display and show a description of the error on the dot matrix display.



#### Joint measurements

A joint measurement is performed by placing the joint probes onto any two parts of the loop circuit. The ExLRT will only validate the joint measurement if the joint probes are attached to the loop with good integrity and the loop couplers are coupled correctly. Valid joint measurement will be displayed as a 4-digit number with two decimal places.



If the joint measurement is not valid, the ExLRT will null the 7-segment display and show a description of the error.



## 10 CONTINUOUS MODE MEASUREMENTS

During continuous mode, the  icon is turned on to indicate continuous mode of operation. Measurements are continuously updated to the screen and are cleared in the event of a change in cable state or measurement error.

### 10.1 Starting Continuous

From the manual mode screen, press the front panel start  button to automatically initiate continuous mode.

If the joint cable is connected, then the ExLRT will commence continuous mode for both loop and joint measurements.

The ExLRT will automatically start taking loop measurements. To take a joint measurement, simply connect the joint probes to the UUT.



### 10.2 Pausing continuous mode measurements

To halt continuous mode measurements, press any of the red buttons on the in-line controller or a red button on either of the joint probes.

By halting the measurement, the loop and joint measurements are latched until measuring is resumed.

The ExLRT indicators will flash Amber during the pause state. This is a convenient way to quickly start/stop the measurement without opening and closing the couplers.



### 10.3 Resuming continuous mode

To resume continuous mode measurements, press the in-line controller green button or any of the green buttons on the joint probes. The ExLRT will return to continuous measurements.



### 10.4 Exiting from continuous mode

Continuous mode can be exited using the front panel stop button .

## 10.5 Averaging

Averaging applies to both the loop and joint measurements and can only be enabled and disabled when the ExLRT is not taking measurements.

### Averaging ON

With averaging on, the following icon is displayed .

Averaging the loop and joint measurements is implemented by taking the first valid sample of the measurement then applying a sum over count method. The start of averaging occurs under the following conditions:

- 1) Start of continuous mode
- 2) Any change of state
- 3) After an error condition

During continuous mode measurements with averaging enabled, the following will be shown in the dot matrix area.

```

Loop Measuring
Joint Measuring
L: Latest:           n/a
L: Lowest:           n/a
L: Highest:          n/a
L: High/Low variation: n/a
L: First/Latest variation: n/a
J: Latest:           n/a
    
```

*If the joint probes are not connected J: Latest: will not appear.*

Below is a description of the values displayed on the screen

|                            |                                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| L: Latest:                 | Latest loop resistance calculated                                                                                                               |
| L: Lowest:                 | Lowest resistance recorded since commencing continuous mode, last error or change of state                                                      |
| L: Highest:                | Highest resistance recorded since commencing continuous mode, last error or change of state                                                     |
| L: High/Low variation:     | Difference (or pk-pk) between the last recorded highest and lowest measurements since commencing continuous mode, last error or change of state |
| L: First/Latest variation: | Difference between the first measurement at the start of continuous/last error or change of state to the latest measurement                     |
| J: Latest:                 | Latest Joint resistance (if joint cable connected)                                                                                              |

## 10.6 Triggering

This feature applies to loop measurements only.

### Trigger OFF

The ExLRT will not report or display any trigger condition.

### Trigger ON

Triggering can be enabled with averaging on or off. The following icons will appear accordingly

|                                                                                   |                                |
|-----------------------------------------------------------------------------------|--------------------------------|
|  | Averaging OFF, with triggering |
|  | Averaging ON, with triggering  |

### Method of triggering

The ExLRT can trigger in two different ways

Trigger on Percentage Value

Trigger on Resistance Limits

Both methods can be enabled at the same time or either method can be applied individually. The use of triggering is to primarily fault-find suspect loops. The ExLRT triggering feature can be used to set limits based around a given loop value. For fault-finding, any large deviation in loop resistance due to poor construction can be identified using the trip mechanism.

### Trigger on Percentage

This trigger method can be set to a percentage from 1% to 100% and is defined as the percentage of loop based on the first value when continuous mode starts. For instance, take three loops and their corresponding trigger limits based on percentage of value.

## 11 SINGLE SHOT MEASUREMENTS

The **1** icon appears on the LCD screen to indicate that the ExLRT is in single shot mode.

### 11.1 Initiating a single shot test

Refer to the table below on how to initiate a test.

| CONNECTED CABLES           | TEST WAITING INDICATOR                                                     | HOW TO INITIATE A TEST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loop cable ONLY            | Loop cable green led flashing                                              |  <p>Press the green button on the In-Line controller or press the  button to initiate a test.</p> <p>When the test stops, the loop value or the loop error will latch on the screen.</p> <p>If an error is shown, then press the loop inline controller to clear the error to return to flashing green status.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Loop cable AND Joint cable | <p>Loop cable green LED flashing</p> <p>Joint probe green LED flashing</p> |  <p>Press the green button on the In-Line controller. This will perform a loop only test (Joint indicator and data is cleared)</p> <p>When the test stops, the loop value will be reported and latched on the screen and both the loop and joint LED's will flash green.</p> <p>If an error is shown, then press the loop inline controller red button to clear the error to return to flashing green status.</p> <p>OR</p>  <p>Connect the tips of the joint probes to the UUT to initiate a joint test.</p> <p>Both loop and joint measurements will be cleared for the duration of the test</p> <p>When the test stops, the ExLRT will report and latch the valid measurements until the next measurement is started</p> <p>If an error is reported for a given test, then the ExLRT will report and latch the error until the red button is pressed for that measurement type. During this latched period, the other measurement type will clear its indicator.</p> |

## 11.2 Taking a measurement

### Loop Test

During the loop test, the loop inline controller and the ExLRT front panel indicator will illuminate amber for the duration of the loop test. If an error has occurred during the loop test, the in-line controller and ExLRT front panel indicator will flash red with the error condition printed on the LCD screen.

To clear the screen, initiate a loop or joint test.

### Joint Test

After the joint test has been initiated by connecting the joint probes to the UUT, the ExLRT will automatically start taking a loop and joint measurement. All ExLRT and cable indicators will illuminate amber for the duration of the test. After the test, the ExLRT will display the valid measurements.

After the joint test the ExLRT will re-start the joint process (probe green LED flashing).

If a joint error was detected, the joint probe red LED will flash until the user clears the error by pressing the green button again. This will return to waiting for another joint test to commence (flashing green)

If a loop error was detected, the loop in-line controller red LED will be flashing until the user clears the error by pressing either the green button on the in-line controller or the green button on the joint probe.

## 11.3 Exit from single shot mode

Ensure that both ExLRT front panel test status indicators are turned off and press the back button to exit out of the manual mode and return to the main menu



## 12 STRAY CURRENT

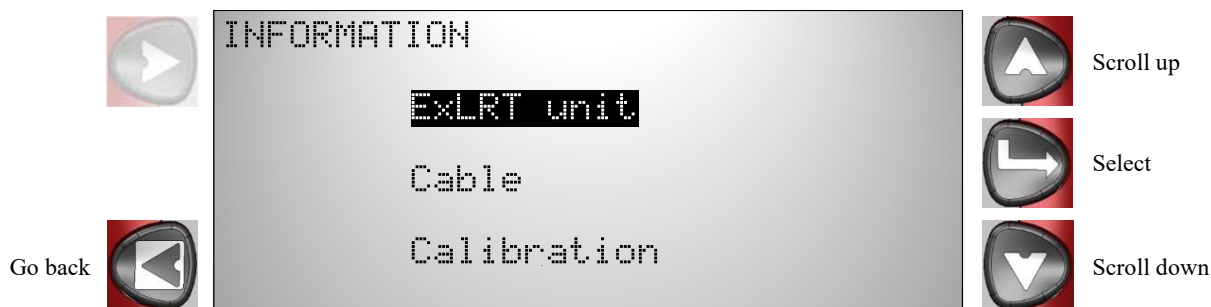
To perform a stray current measurement, simply connect the MK52 Sense Coupler to the loop and navigate into the Stray Current Measurement

Main Menu -> Manual -> Stray Current

This will give you a magnitude (in current) of induced current in the loop

## 13 INFORMATION MENU

The information screen will provide the following options. Use the scroll buttons to highlight the option then press the select button to enter the selected menu



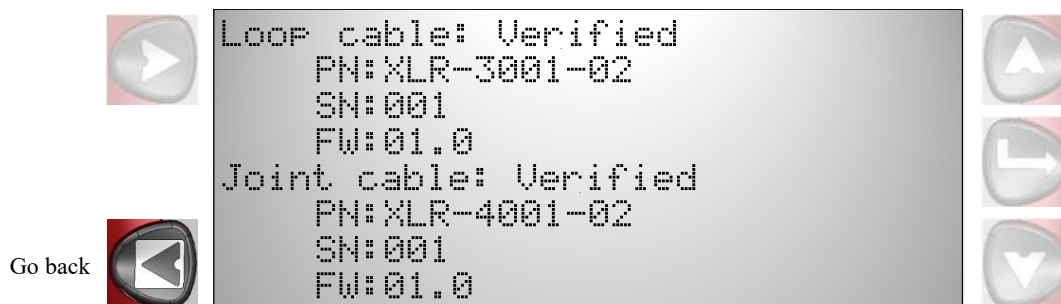
## 14 ExLRT UNIT



## 15 CABLE

Entering this screen will provide live information of the connected cables

As an example, the following screen shows that both the loop cable and the joint cable are connected to the ExLRT and verified.





## 16 CALIBRATION INFORMATION



Go back

Calibration Information

Calibrated: 03/02/2020

Warning: 22/02/2021

Expiry: 03/02/2021

Press → to list verified cables




Select





Go back

| CABLE | PN          | SN   |
|-------|-------------|------|
| Loop  | XLR-3000-01 | 0027 |
| Joint | XLR-4000-01 | 0016 |




Select



## 17 SETTINGS MENU



Go back to  
previous  
menu

SETTINGS

Measurement

Calibration

System



Scroll up



Select



Scroll down

Go to section 18 to enter the Measurement menu

Go to section 19 to enter the Calibration menu

Go to section 20 to enter the System menu

## 18 MEASUREMENT

If the user has the appropriate permissions, the following parameters are available for changing for the instance of the logged in user.

Any changes within this menu will not cause permanent changes to the configuration. Expect the values to reset as defined in the configuration at the time of logging in.

Use the scroll buttons to highlight the desired option then press the  button to go to the value. Once the value has been highlighted, press the  button to toggle the value.

Toggle value when highlighted 

Go back 

MEASUREMENT

Averaging? ON / OFF

Trigger On Percentage? ON / OFF

Trigger On Value? ON / OFF

Change trigger limits? YES / NO

 Scroll up

 Select

 Scroll down

### 18.1 Averaging?

Toggle to **ON** / OFF to enable averaging

Toggle to ON / **OFF** to disable averaging

### 18.2 Trigger on Percentage?

Toggle to **ON** / OFF to enable trigger on percentage

Toggle to ON / **OFF** to disable trigger on percentage

### 18.3 Trigger on Value?

Toggle to **ON** / OFF to enable trigger on value

Toggle to ON / **OFF** to disable trigger on value

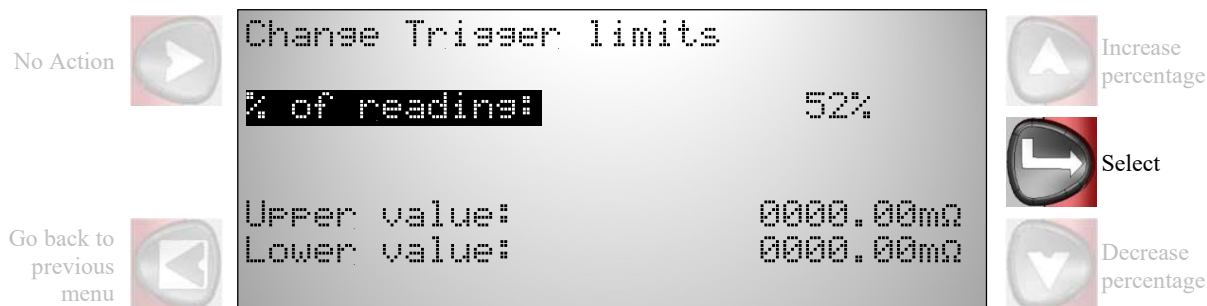
## 18.4 Change trigger values?

Toggle to **YES** / OFF to change the trigger settings then press the Select  button to proceed into the “Change Trigger Limits” screen

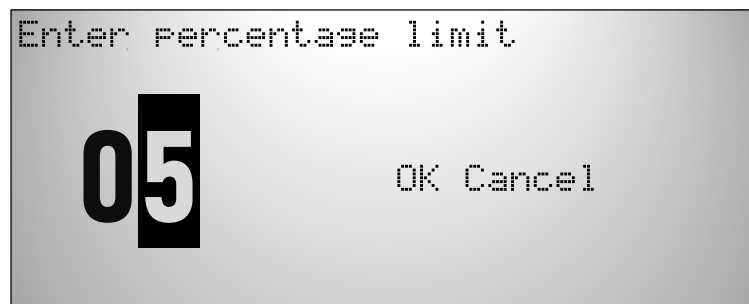
Toggle to ON / **OFF** to turn triggering off (default when entering this screen)

### 18.4.1 Change % of reading

To change the value, press the select  button to enter the change value window.



Change the percentage value in steps of 1% using the up/down buttons. When finished, scroll to the right of the editable value and enter OK.



## Change resistance lower and upper limits

Scroll to “Lower value” and press the select  button. The significant part of the resistance is highlighted as follows. Change the resistance value up or down in 1mΩ steps using the increase/decrease buttons. When finished, press the  button to move on to the decimal place part of the resistance

|                    |                                                                                   |                                                                                                                                   |                                                                                     |                        |
|--------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|
| No Action          |  | <div>Change Trigger limits</div> <div>% of reading: 52%</div> <div>Lower value: 0000.00mΩ</div> <div>Upper value: 0000.00mΩ</div> |  | Increase value         |
|                    |                                                                                   |                                                                                                                                   |  | Go to lower<br>0000.00 |
| Go back to listing |  |                                                                                                                                   |  | Decrease value         |

|                    |                                                                                    |                                                                                                                                 |                                                                                      |                        |
|--------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------|
| No Action          |   | <div>Change Trigger limits</div> <div>% of reading: 52%</div> <div>Lower value: 43.00mΩ</div> <div>Upper value: 0000.00mΩ</div> |   | Increase value         |
|                    |                                                                                    |                                                                                                                                 |   | Go to upper<br>0000.00 |
| Go back to 0000.00 |  |                                                                                                                                 |  | Decrease value         |

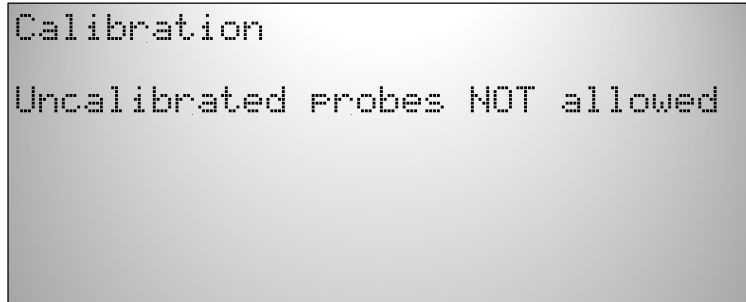
|                    |                                                                                     |                                                                                                                                 |                                                                                       |                        |
|--------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------|
| No Action          |  | <div>Change Trigger limits</div> <div>% of reading: 52%</div> <div>Lower value: 43.52mΩ</div> <div>Upper value: 0000.00mΩ</div> |  | Increase value         |
|                    |                                                                                     |                                                                                                                                 |  | Go to upper<br>0000.00 |
| Go back to 0000.00 |  |                                                                                                                                 |  | Decrease value         |

|                    |                                                                                     |                                                                                                                              |                                                                                       |                   |
|--------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------|
| No Action          |  | <div>Change Trigger limits</div> <div>% of reading: 52%</div> <div>Lower value: 43.52mΩ</div> <div>Upper value: 1.00mΩ</div> |  | Increase value    |
|                    |                                                                                     |                                                                                                                              |  | Select all values |
| Go back to 0000.00 |  |                                                                                                                              |  | Decrease value    |

|                          |                                                                                     |                                                                                                                              |                                                                                       |             |
|--------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------|
| No Action                |  | <div>Change Trigger limits</div> <div>% of reading: 52%</div> <div>Lower value: 43.52mΩ</div> <div>Upper value: 1.02mΩ</div> |  | Scroll up   |
|                          |                                                                                     |                                                                                                                              |  | Select      |
| Go back to previous menu |  |                                                                                                                              |  | Scroll down |

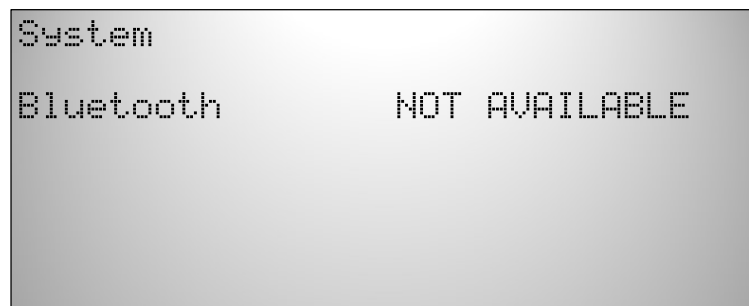
## 19 CALIBRATION

This window displays if The ExLRT will allow measurements to be taken using uncalibrated loop or joint cables. These are cables that were NOT used during the last verification process. The ExLRT user must have the appropriate permissions set in order to use this function.



## 20 SYSTEM

This window displays any specific hardware setting.



## 21 CALIBRATION VERIFICATION

To run a verification program, the ExLRT must be controlled via MK ExLRT PC Software.

After verification and if successful, the ExLRT will be set to the following

- The ExLRT will hold a list of all cables used during the calibration process. Any other cables that connect to the ExLRT will not work and the ExLRT will show a message on the screen.
- The Calibration OK icon  will be displayed with the verified cables plugged in.