



SAFETY MANUAL

ExLRT Intrinsically Safe Loop Resistance Tester

LANGUAGE STATEMENT

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SAFETY MANUAL

ExLRT

XLR-927-2

Author: Giuseppe Prisco Date: 10th January 2020

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MODIFICATIONS

REVISION	DATE	MODIFIED BY	CHANGES / ECR
1	10 th January 2020	Giuseppe Prisco	Released for CML Certification
2	23 rd January 2020	Sally Appleby	Front page added and language statements added

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1 INTRODUCTION

This safety manual is provided to the end user to understand the safety precautions and safe use of the ExLRT and its associated components.

The safety manual does not include detailed information regarding the operation of the ExLRT. For operating instructions, download the latest release from www.mktest.com.

For PC software, download the latest release from www.mktest.com.

The ExLRT is not a serviceable product. The equipment must not be dismantled, serviced or repaired by the user.

2 SAFETY INSTRUCTIONS

The following safety precautions apply to both operators and maintenance personnel of the product and must be followed and understood during operation, service and repair of the ExLRT product.

2.1 BEFORE FIRST USE



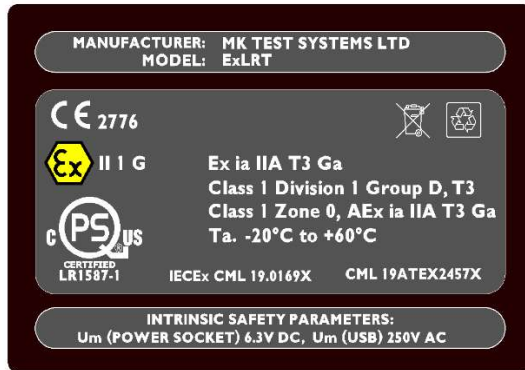
- Check that the ExLRT and cables have been shipped and supplied in good condition.
- Report to MK Test Systems Ltd immediately if you suspect that the ExLRT has been damaged during the delivery of the ExLRT or any of its accessories.
- Check that all parts are present and that all labelling on the ExLRT and cables are clearly readable.
- Cross check the contents with the delivery note supplied with the unit and report to MK Test Systems Ltd immediately if the contents do not match the delivery note.
- The user manual must be read to understand the intended use of the ExLRT and its accessories.
- It is the responsibility of the end user to ensure that the ExLRT is used in an appropriate manner in appropriately classified hazardous areas, and that the stated special conditions of use are complied with. MK Test Systems Ltd does not accept any responsibility if any of the individual parts are operated outside of their specification or designated classification areas.
- The ExLRT with two-tone black and red enclosure colours is certified for use in potentially explosive atmospheres. The appropriate labels are applied to the product to identify its classification. The ExLRT must NOT be used if the labelling is not present or if any of the information on the label cannot be read clearly.

2.2 LABELLING



INFORMATION

- The labelling is located on the rear of the ExLRT on the battery door.
- Ensure that the three certificate numbers are clearly visible
- The part number and serial number of the ExLRT is clearly legible
- The following classification markings are clearly legible



- The following warnings must be clearly legible



2.3 EXLRT CONNECTIONS AND WORKING VOLTAGES



INFORMATION

- The ExLRT is a battery-operated device and does not require mains voltage for operation.
- The ExLRT outputs an AC test signal at 200Hz with a maximum working voltage of 4Vrms.
- The ExLRT Loop Cables are not battery powered and are required to be plugged into the ExLRT for operation.
- The ExLRT Joint Cables are not battery powered and are required to be plugged into the ExLRT for operation.
- The ExLRT USB connection may only be used in a non-hazardous area.
- The ExLRT USB port may only be used to connect to a USB host that complies with the USB 1.1 or USB 2.0 standards.
- The working voltage of the USB connection is 5.25V.

2.4 LIVE MAINS WORKING



Live working is not permitted. The ExLRT is NOT designed to measure loops in live mains applications.

The ExLRT joint probe connections are not designed to measure any live mains connections and is only to be operated in its intended use. If accidental or intentional connections to live mains parts are made, then the ExLRT must be labelled as DO NOT USE and then must be returned to MK Test Systems Ltd for investigation.

Do not attempt to power the ExLRT from a mains outlet.

2.5 INSPECTION BEFORE EACH USE



- The ExLRT must be visually inspected to check for signs of damage.
- Any carrying harnesses must be visually inspected for wear and tear. If any part of the harness is faulty, then the harness must not be used. Discard and use another.
- The ExLRT must only be used by MK Test Systems Ltd approved harness parts.
- The cables should be visually inspected for signs of damage. Any kinks or splits in the cable must be identified, then the cable labelled as DO NOT USE.
- The cable glands are to be inspected for wear and tear. Any damage should be identified, then the cable labelled as DO NOT USE.
- All connectors should be inspected for any ingress build up that may affect the safety or performance of the instrumentation.
- If it has been identified that the ExLRT cover has been modified in any way, then the ExLRT must be labelled as DO NOT USE. The ExLRT must be returned to MK Test Systems Ltd for repair.

DO NOT OPERATE THE INSTRUMENT IF DAMAGED

- If the ExLRT is damaged, appears to be damaged, or if there is any doubt relating to the safe operation of the ExLRT, the ExLRT is to be moved into a safe area immediately and turned off. Remove the battery and any cables and label it as DO NOT USE. The ExLRT must be returned to MK Test Systems Ltd for investigation/repair.

2.6 PARTS CLASSIFIED FOR USE IN EXPLOSIVE ATMOSPHERES



INFORMATION

**ExLRT
Part Number
XLR-1931**



**ExLRT MK52 Loop
Cable
Part Number
XLR-3001**



**ExLRT Joint Cable
Part Number
XLR-4001**



2.7 SPECIAL CONDITIONS OF USE



INFORMATION

- The ExLRT shall only be used with couplers and probes supplied by MK Test Systems Ltd and marked for use with the ExLRT.
- The battery shall not be disconnected, replaced or charged in a hazardous area.
- External power shall not be applied in a hazardous area.
- External power shall only be applied from a power supply provided by MK Test Systems Ltd and marked for use with the ExLRT.
- The USB interface shall not be connected in a hazardous area.

2.8 PARTS NOT CLASSIFIED FOR USE IN EXPLOSIVE ATMOSPHERES



WARNING

**ExLRT Battery Charger
Part Number XLR-2100**



**ExLRT Power Supply
Part Number XLR-2400**



USB interface cable



2.9 OPERATION



The ExLRT is designed to be operated in dry areas. Do not operate the ExLRT:

- In relative humidity conditions outside of the ExLRT's specification.
- In an environment outside of the ExLRT's temperature range.
- In the presence of noxious or corrosive vapour or corrosive chemicals. A risk assessment shall be carried out by the operator to identify if any vapour is present. If any vapour or substance is present that may compromise the construction of the ExLRT or the general safety to the operator or others, then the ExLRT must be removed from the area.
- Do not pull the ExLRT by the power cord, loop/joint or USB cables.
- During operation, ensure that the ExLRT or cables are not creating a trip hazard.
- During operation, the loop cables must not be pulled away from the UUT that will force pressure on the loop couplers or the UUT.
- During operation, provide enough cable relief to ensure that joint measurements can be taken with ease.
- Do not operate this ExLRT using power sources that are not approved/supplied by MK Test Systems Ltd for use with the ExLRT.
- Do not place any heavy objects on top of the ExLRT.
- Do not operate the ExLRT if it is not being held securely. The ExLRT is designed to be operated on its bottom or rear base, facing up.
- Do not operate the ExLRT if it has been exposed to any corrosive substance. Mark the unit as DO NOT USE.

2.10 EXLRT MATERIAL COMPOSITION



INFORMATION

ITEM	MATERIAL
ExLRT Enclosure	Polycarbonate, Static Dissipitive
ExLRT Loop and Joint Connectors	Alloy with Zinc Cobalt plating
ExLRT power input connector	Thermoplastic
Loop Cable (Circular connector to in-line controller)	PVC
Loop Cable (In-line controller to couplers)	PVC
Loop In-Line Controller	Polycarbonate, Static Dissipitive
Loop Couplers (52mm)	Polycarbonate, Static Dissipitive
Joint Cables (All)	PVC
Joint 3-way cable splitter	Polycarbonate, Static Dissipitive
Joint Probes	Polycarbonate, Static Dissipitive
Loop and Joint buttons	Polycarbonate
Loop and Joint lens	Polycarbonate

2.11 CLEANING



INFORMATION

Do not clean the ExLRT, its switches or connectors with any abrasives, lubricants, acids/bases or other such chemicals.

Use a damp lint free cloth only.

2.12 DISPOSAL



WARNING

If the ExLRT has been damaged and is beyond repair, then the ExLRT should be classed as industrial electrical waste and should be disposed of following appropriately.

2.13 TAMPERING



WARNING

The ExLRT enclosure covers must not be removed by untrained personnel. Component replacement (covers or internal parts) are to be performed by qualified personnel the relevant maintenance training.

- Do not substitute parts that are not approved by MK Test Systems Ltd.
- Do not modify the ExLRT in any way.
- Do not remove any product labelling.
- Do not affix any labelling that has fixing accessories which may cause damage to the ExLRT or cables.

2.14 APPLICATION OF CALIBRATION STICKERS



INFORMATION

MK Test Systems allow permit the use of stickers to be applied to the ExLRT to indicate that the ExLRT has been calibrated. However, stickers should NOT be applied to the product labels.

- Do not substitute parts with ones that are not approved by MK Test Systems Ltd.
- Do not modify the ExLRT in any way.
- Do not remove any product labelling.
- Do not affix any labelling that has fixing accessories which may cause damage to the ExLRT or cables.

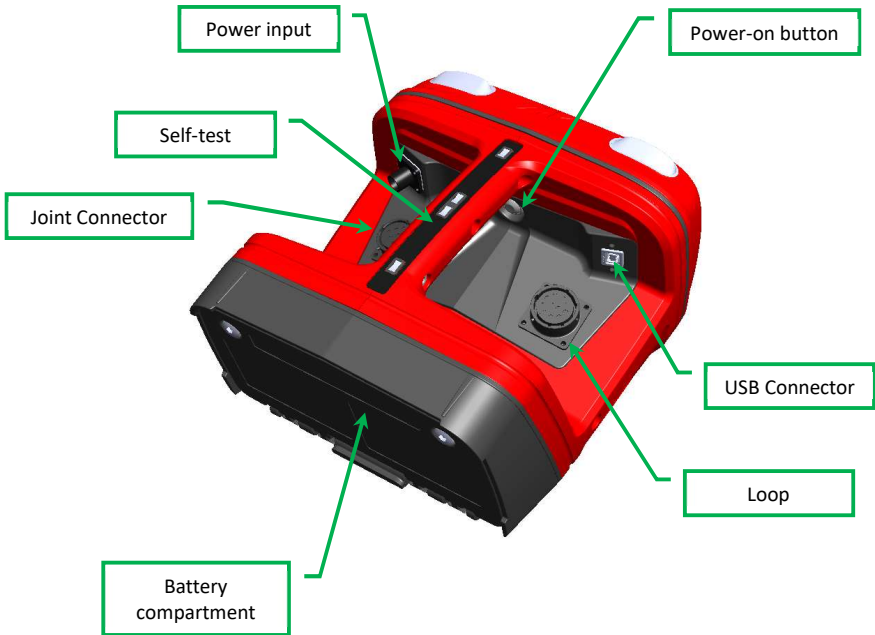
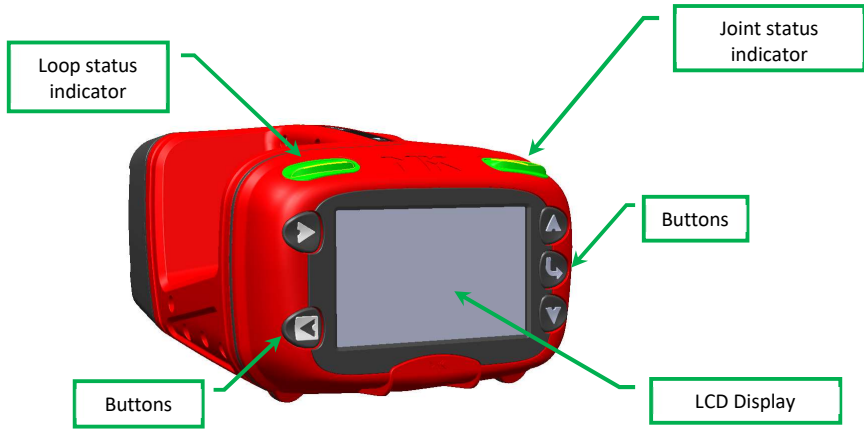
3 OVERVIEW OF OPERATION

3.1 PRODUCT

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

The ExLRT uses handheld current couplers that non-intrusively magnetically couple a test frequency into the loops. 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 set of joint probes are used to measure each joint resistance.

3.2 FEATURES



4 FIRST USE

To become familiar with the product, the ExLRT can be used straight out of the box. The ExLRT has an internal self-test loop that is used so that the basic operation of the ExLRT and cables can be tested.

4.1 TAKING A LOOP TEST

To initiate a loop test, connect the loop MK52 cable circular connector to the ExLRT.

NOTE: The circular connectors on the ExLRT are different sizes. Once the correct connector is located, connect each coupler around the handle as shown.



To perform a loop test, press the green button located on the in-line controller



4.2 TAKING A JOINT TEST

To initiate a joint test, first connect the joint cable to the circular connector to the ExLRT. Note, the joint cable circular connector is a different size to the loop connector.

To initiate a joint test, simply connect the joint tips to the exposed self-test point as shown in the photo below. The ExLRT will automatically detect that the joint tips have connected and the ExLRT will continue to take a test.



End.