USER GUIDE

GU_JUPITER+_V1_09EN.docx

Pre-identify LV and MV off line Cables and feeders

JUPITER+

CAUTION: Read this manual before using the device

M A D E
167, Impasse de la garrigue
F 83210 LA FARLEDE
Phone. : +33 (0) 494 083 198
E-mail : contact@made-sa.com - Web : www.made-sa.com
FQ 47B-EN - V1.11 - 28/10/2019

MODIFICATION'S DIRECTORY

Rév.	Subject of Amendments	Date and Author
1.04 1.05 1.06 1.07 1.08 1.09	CRÉATION Graphic charter update A5 format version Doc update §3.2 – minor update Update charger instruction	04/2014 P.COSTE 12/2015 L.ZOMERO 03/2018 C. DELLES 11/2019 T HUBERT 11/2019 P. Picon 04/2021 T HUBERT

This manual is important for your safety. Read it carefully in its entirety before using the equipment and keep it for future reference.

SUMMARY

1. SAFETY INFORMATION 4

1.1. Safety recommendations 4

1.2. Following the safety recommendations 4

1.3. Warning labels 5

2. OVERVIEW 6

2.1. Working Principle 6

2.2. Composition 7
2.2.1. Transmitter 7
2.2.2. Receiver 8

3. IMPLEMENTATION 11

3.1. JUPITER+ TRANSMITER 11
3.1.1. Overview of the Transmitter 12
3.1.2. Transmitter general functioning 13
3.1.3. Precautions for using the transmitter 15

3.2. JUPITER+ RECEIVER 16
3.2.1. Use of receiver 19
3.2.2. Batteries 24

4. TECHNICAL FEATURES 24

5. MAINTENANCE, WARANTY AND COPYRIGHT 25

5.1. Maintenance 25

5.2. Warranty 25

5.3. Copyright 25

This document is the JUPITER+ User's Guide. It describes the implementation of the device, as well as the different modes of operation to facilitate its use.

1.SAFETY INFORMATION

1.1.Safety recommendations

Please read this guide carefully before unpacking, configuring or using this equipment. Note all indications of danger and other warnings. Failing to observe these recommendations could result in serious injury to the operator or could damage the equipment. To ensure that the protection provided by this equipment is appropriate, do not use or install it other than in accordance with the conditions indicated in this manual.
Dismantling the cases is forbidden. This operation is limited exclusively to personnel qualified by MADE.

1.2.Following the safety recommendations

DANGER: Indicates a dangerous or potentially dangerous situation which, if not avoided, could cause serious or deadly injuries.

WARNING: Indicates a potentially dangerous situation which could cause superficial to moderate injuries.

Remark*:* Information requiring particular attention.

1.3.**Warning labels**

Read all labels and wordings shown on the instrument. Injuries or equipment damage could occur if these instructions are not respected.

	Symbol requiring reference to the instruction manual for instructions concerning operation or safety recommendations.
	Dangerous Voltage
	Ac current
IP 21	IP standard – Protection against dust and water : TRANSMITTER
IP 44	IP standard – Protection against dust and water : RECEIVER
	Do not throw away with household waste

2.OVERVIEW

2.1.Working Principle

- **Identification** of cables in a trench, gutter and in cable shelf.
  ➔**With short-circuited ends**

- **Identifying the phases and checking cable continuity to transmitter S1**

➔**With short-circuited ends** (closed circuit)
➔**With open-circuit ends**.

The configuration required for each of these modes is described in this document.

Each of the functions is usually carried out on unpowered MV & LV cables (customer loads on-line).

The signals and the physical principles used are common for each function.

The **JUPITER** system is made up of a Transmitter and a Receiver.

The Transmitter is in a shock-proof carrying case which also contains the various accesories.

The Receiver is in a soft carrying case which fits into the Transmitter case. This also contains the 3 sensors used for cable and conductor/phase identification:

- **Cable identification**
- **Continuity and core identification in open circuit.**
- **Continuity and core identification in short circuit**

Option:

- **Core identification in short circuit adapted for LV 4 conductor cables, with visually unidentifiable neutral**

2.2.Composition

2.2.1.Transmitter

- 3 current clamps with their connecting cable*
- 220V~ supply cable
- 1 Short-Circuiting cable

2.2.2.Receiver

2.2.2.1.Standard Sensors

- **Sensor for « Core identification, short-circuited ends » :**

- **Sensor for « Core identification, open circuit ends » :**

- **Sensor for identification :**

2.2.2.2.Optional Sensor

- **Sensor for core identification, short-circuited ends, adapted for LV 4 conductor cables, with unidentifiable neutral visually**.

3.IMPLEMENTATION

3.1.JUPITER+ TRANSMITER

From turn-on by the operator, the Transmitter is activated and generates the frequency signals necessary for identifying unpowered MV & LV cables.

It is possible to turn the **JUPITER+** Transmitter on S2 mode (with different frequencies) for a utilization with two Transmitters at the same time at the ends of a cable, one in S1 mode and the second on S2 mode.

The type of utilization allows cores identification in open circuit once the cable is cut at both ends without moving the Transmitter (useful operation with replacing a joint or example).This Transmitter allows only an utilization in S1 mode, or S2 mode with another Transmitter in S1 mode.

Only one JUPITER+ Transmitter in S2 mode does not allow core identification in open and short circuit function!

The possible operations are:

- **Identification of cables** (Short-circuited ends)
- **Continuity and identifying the cores with open circuit ends (after cutting the cable)**
- **Identifying the cores with short circuited.**

Once the Transmitter is started, no further action by the operator is necessary to activate the functions described below.

When turned-on, the Transmitter is on S1 mode. A press on S1/S2 button activates S2 mode. Another press turn the Transmitter back to S1 mode.

These functions are possible on an unpowered MV or LV network and for all types of cables:

HN, Paper, PE.

When used on an LV network, it is not necessary to disconnect the customer loads.

3.1.1.Overview of the Transmitter

3.1.2.Transmitter general functioning

3.1.2.1.Power supply

The JUPITER+ Transmitter runs on 7,2Ah 12V DC batteries.

When turned on, the charge level of the battery is indicated on the front face.

The minimum autonomy of the transmitter is 8h.

The transmitter can run on internal batteries or during the charge when using the external charger connected to the front connector closed to the case handle.

For charge the transmitter, please refer directly to the instruction on the charger

The continuous use of this type of charger enables the long term storage of the Transmitter, whilst maintaining the battery in optimum charged condition (charger connected).

3.1.2.2.Transmitter functions

The JUPITER+ Transmitter consists of:

- Three synthesized power generators
- A monitoring unit for the internal components which :
  - Detects any faults in the transmission circuits (over-currents or low currents) and indicates which clamp is concerned.
  - Monitors the discharge level of the battery – the transmission is automatically stopped if the battery reaches a discharge level that could affect its life time.
- A front face – instrument panel with 4 different zones:
  - Faults zone
  - S1 or S2 signal selection button
  - ON/OFF button

- Battery zone : Battery charge indicator and protection fuse

- An external plug for charging the battery

3.1.2.3. Transmitter connection

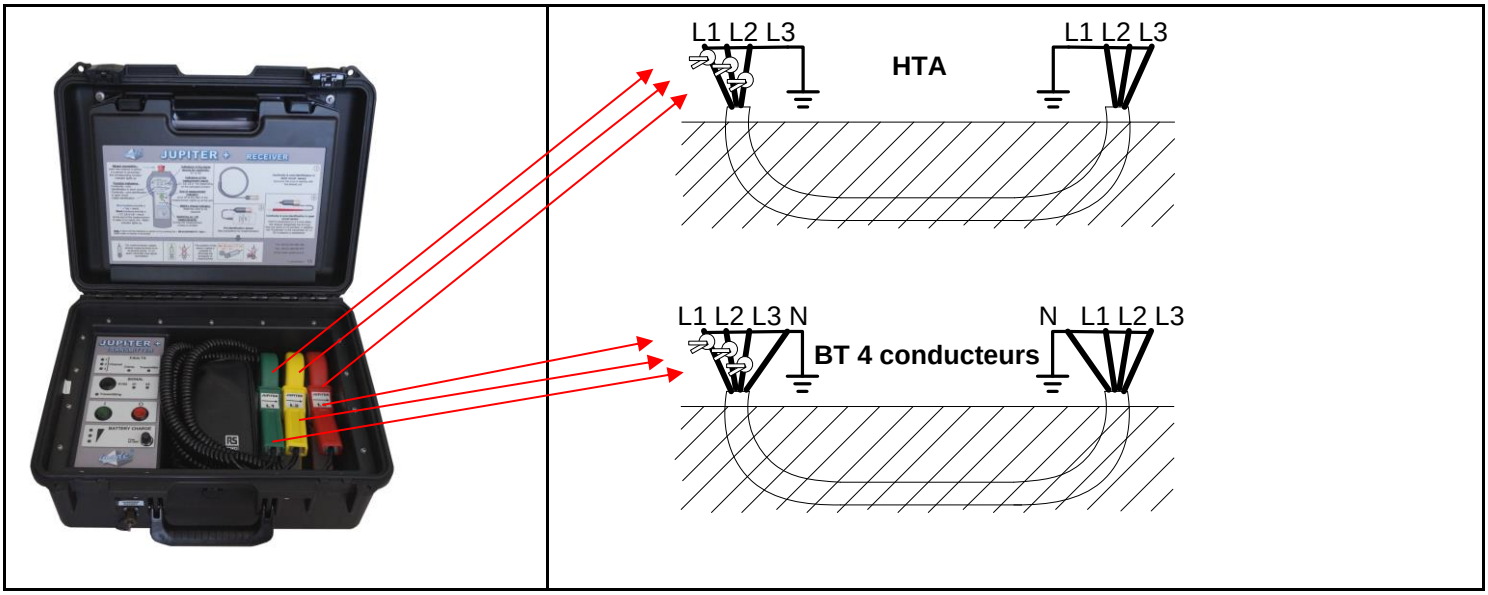
- The transmitter is connected on the near end of the cables using the current clamps on the connection case. Both cable ends are short-circuited and can be earthed (Do not include the cable screen).

- Ensure that both cable ends are short-circuited, using the appropriate connection wires.

- Turn on the transmitter.

It is better to place the current clamps before starting the transmitter.

If not, opening the clamps during transmitter causes the clamp fault lights to illuminate.



3.1.3.Precautions for using the transmitter

THE CURRENT CLAMPS MUST ALL HAVE THE SAME ORIENTATION WITH RELATION TO THE CABLE END (Indicated by the arrows on the clamps).

CHECK THAT THE CLAMPS ARE ON AN UNSCREENED LENGTH OF CABLE. IF NECESSARY, USE WOODEN CLAMPS OR TAPE TO HOLD THEM IN POSITION.

TO AVOID RISK OF ERROR IN CABLE DESIGNATION, USE ONLY ONE JUPITER+ TRANSMITTER ON A SITE.

AFTER TURN-ON, CHECK ON THE FRONT FACE:

- **THAT THERE ARE NO TRANSMISSION CIRCUIT FAULTS**
- **THE BATTERY CHARGE LEVEL**

3.2. JUPITER+ RECEIVER

The JUPITER+ Receiver assembly consists of:

- **The Receiver to which are connected the sensors**
- **Inductive sensor for identification**
- **Probes for core identification and continuity with open circuit.**
- **Flexible Identifying loops for short-circuited core identification**
- **On option: a double flexible loop for core identification on a 4 conductor LV cable.**

The Receiver and its sensors are supplied in a carrying case, which itself fits into the lid of the Transmitter case.

The JUPITER+ Receiver is used to **identify** a cable of which the extremities are in short-circuit and earthed, to **identify the cores** in an **open or closed circuit** cable.

This is done in normal operation on **unpowered** HV & LV networks.

The JUPITER+ Receiver is equipped with sensors dedicated to each function to « extract » the signals emitted by the JUPITER+ Transmitter.

The results obtained, by the Receiver, require no interpretation, the detection algorithms assure safety.

Receiver with its various sensors

Socket for sensor connection

Indication of the transmitter source of the signal

Measurement display in core identification mode

Measurement display in identification and continuity mode

End of measurement indicator

On and measurement initiation button

Battery fault indication

3.2.1. Use of receiver

Connecting a sensor to the Receiver automatically sets the operating mode which is indicated by a LED.

These modes are:

- Continuity and Identification in short-circuit
- Continuity and Identification in open-circuit
- Pré-identification

One press of the « **Measurements** » button turns on and illuminates the LED corresponding to the mode selected by the chosen sensor, which confirms to the operator the type of measurement to carry out.

After 30 seconds with no press of the « **Measurements** » button, the Receiver switches off until a new button press.

If there is no sensor connected, one press on « **Measurements** » button illuminates during 1 second all LEDs to be sure they are all operational.

Certain modes are only available when the Transmitter is in S1 mode or when two Transmitters, one in S1 mode and the second on S2 mode are connected to the ends of the same cable. A transmitter in S2 mode only does not allow core identification in open-circuit or short-circuit. This kind of utilization automatically appears when two transmitters in S1 and S2 mode are connected to the same cable and that this cable is cut after pre-identification.

3.2.1.1.Pre-identification mode

A pre-identification sensor for all type of cable.

Mode only usable with a transmitter in S1 mode or two transmitters in S1 and S2 mode.

- Connect the sensor to the receiver, the pre-identification light illuminates.
- Place the sensor on the cable, so that the groove under the sensor fits around the cable.
- Press the « measurement » button, the « **end of measurement** » light turns off.
- Wait for the result (6 seconds) without moving the sensor, the « **end of measurement** » light illuminates and if the cable is pre-identified, then the YES LED illuminates.
- If the cable is not pre-identified, repeat the operation on other points of the cable with 10cm of distance between them.
- If the answer is YES, it is always good to confirm this by repeating the measurement at several points along the cable.

The receiver indicates by « YES » the identification of the cable.

3.2.1.2. Core identification in open circuit and continuity to S1 Transmitter mode

Mode usable in all cases.

- Connect the red probes to the receiver, press the « measurement » button, the "**Open circuit identification and S1 continuity**" LED illuminates.
- The cable being cut, probe any 2 cores of the 3.
- Press the « measurement » button, the « end of measurement » LED turns off.
- Wait for the result (3 seconds), the « end of measurement » LED turns on.
- The result will depend on the probed cores and on the cable extremity they are connected to :
  - If the probe is connected towards S1, the LED "YES" for the S1 continuity turns on.
  - If the phase is identified, the **L1**, **L2** or **L3** LED illuminates.
- Repeat the operation to identify the other cores.

The receiver designates the free conductor.

3.2.1.3. Core identification and continuity in short circuit mode

Mode usable in all cases

- Connect the loop for core identification in short circuit to the receiver, press the « measurement » button, the "**Short circuit identification and S1 continuity**" LED switches on.
- Put the loop around the core to identify, and close it.
- Press the « measurement » button, the « end of measurement » turns off.
- Wait for the result (3 seconds), the « end of measurement » turns on.
- If the core is identified, the L1, L2 or L3 and the **YES** LED illuminates.
- Repeat the operation to identify the other cores.

The receiver designates the core within the loop.

3.2.1.4. Location in short circuit for 4 drivers of identical section mode (option)

Mode usable in all cases

The sensor intended for this function has two flexible loops, of which one serves as a reference and the other for the measurement (marked **red**).

- Connect the short circuit for 4 drivers to the end of the cable
- Connect the double loop to the Receiver; a press of the « measurements » button lights the LED which indicates the mode
- Put the loop marked **red** around the core to identify, and close it
- Put the unmarked loop around any other core and close it. This core serves as a reference during the identification of the other cores. This reference core will then be identified by the **red** loop using one of the previously identified cores as reference
- Press the « measurements » button
- Wait for the result (3 seconds), either L1, L2 or L3 or NEUTRAL (**blue** LED on the connector), **THE IDENTIFIED CORE IS THE ONE PASSING THROUGH THE LOOP MARKED RED**
- Repeat the operation to identify the other two cores
- Switch the loops after the last core has been identified, to be able to identify the core which has served as reference.

The receiver designates the core within the measurement loop marked with red.

3.2.2.Batteries

The Receiver is powered by two 9 Volt batteries.

When the battery charge level is insufficient for correct operation of the Receiver, a LED indicates the fault.

To Change the Batteries: Unscrew the battery compartment on the bottom of the receiver and replace the 2 batteries with similar ones.

Be careful to the direction

4.TECHNICAL FEATURES

Characteristic.	Transmitter	Receiver
Dimensions	**Transmitter in rigid carrying case:** 540mm x 390mm x 240 mm	**Receiver in soft case :** 400mm x 300mm x 80mm
Total weight	**Transmitter and receiver:** 16 kg	
Supply	**Battery** : 12V - 7,2Ah **Minimum autonomy** : 8h for continuous use **Charger** : 100 - 240 V AC 50/60 Hz The Transmitter can be used while the battery is being charged.	2 PP3 9V batteries **Minimum autonomy** : 2000 measurements

Marks : CE

Standards applied : NF EN50081 et NF EN 50082-1

5.MAINTENANCE, WARANTY AND COPYRIGHT

5.1.Maintenance

Dismantling systems is forbidden. This operation is limited exclusively to personnel qualified by MADE.
Never use solvent, or a solvent-based product, to clean the system and / or its accessories.
For cleaning and maintenance of JUPITER+, it is sufficient to:

- Check that the **sensors** are clean : wipe off with a dry cloth
- Do not use corrosive products to clean the instrument faces
- Use only the accessories delivered with the system
- Follow a training programme by a qualified person

5.2.Warranty

Our warranty and general sales are available and sent by MADE-SA at the customer's request.

5.3.Copyright

The content of this document is destined for use only as information. It can be modified without prior notice and must not be considered as an obligation by MADE.

MADE declines all responsibility for mistakes or inaccuracies that the present document may contain.