OPERATOR GUIDE
FOR
JUPITER

Commentaire [P1]: Suivi des modifications

V 0.02 Version BETA
V 0.03 Version BETA EN
V 1.00 EN
V 1.10 EN modifications mineures de synthaxe - PC
V 1.20 Corrections techniques mineures – Mise à jour photo récepteur - PC
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1 SAFETY INFORMATION

1.1 Safety advice :

Please read this manual carefully before unpacking, configuring or using this equipment. Note all indications of danger and other warnings. The failure 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.
Do not dismantle the cases. This operation is limited exclusively to personnel qualified by MADE.

1.2 Using these security notes :

DANGER : Indicates a situation eminently or potentially dangerous that, if not avoided, would cause serious or deadly injuries.

ATTENTION : Indicates a potentially dangerous situation that could cause superficial or moderate injuries.

Remark : Information that merits attention.

1.3 Warning labels

Read all labels and wordings affixed to the instrument. Bodily 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.
	Class II - Double and increased insulation
Cat. III	Category of overvoltage or installation
IP 63	IP Std. - Degree of protection against dust and water

1.4 Dangerous situations

DANGER :

Even though some of the systems supplied by MADE are designed and certified for installation in dangerous environments, several MADE systems are not intended for use in such environments. It is

incumbent upon those who install these systems in dangerous environments to determine the acceptability of the system for its environment. Additionally, to guarantee safety, the installation of systems in dangerous environments must be compliant to the manufacturer's instructions. Any modification of systems or their type of installation is not recommended and could cause deadly injuries and/or damage to facilities.

2 OVERVIEW

JUPITER is a system for :

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

- Checking **Cable continuity**

- **Identifying the cores**

  ➔ **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 carried out on unpowered HV & 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 connector for the current injection clamps is on the front face of the Transmitter.

The Receiver is in a soft carrying case which fits into the Transmitter case. This also contains the 4 sensors used for cable and conductor/phase identification :

- **Cable Identification**
- **Continuity**
- **Core identification in open circuit**
- **Core identification in short circuit**

On option :

Core identification in short circuit adapted for LV 4 conductor cables, unidentifiable neutral visually.

3 COMPONENTS OF THE JUPITER SYSTEM

3.1 TRANSMITTER

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

3.1.1 Option

Transmitter JUPITER S2 (with a different frequency set) to allow simultaneous use of two systems at the two ends of the same cable.
This option enables checking the continuity of the cable in both directions after cutting it.

3.2 RECEIVER

3.2.1 Sensors

Probes for «continuity»

Probes for «Core identification, *open circuit ends*»

Sensor for
«Identification *in short-circuit*».

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

3.2.2 Option

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

4 JUPITER TRANSMITTER

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

The possible operations are :

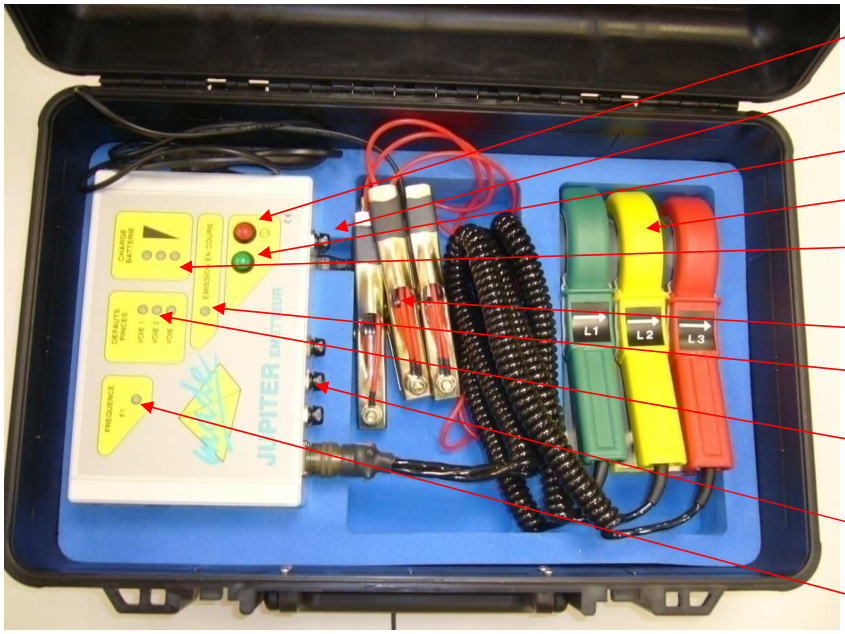
- **Identification of cables** (short-circuited ends)
- Checking the C**ontinuity** (after cutting the cable)
- **Identifying the cores** (with short-circuited or open circuit ends).

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

These functions are possible on an unpowered HV 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*.**

4.1 Overview of the **JUPITER** Transmitter



OFF button

12V dc supply fuse

ON button

Current clamps

Charge indicating lamps for the batteries

Short-circuit

Transmission indicator

Fault indicators for the injection circuits

Protection fuses for the injection circuits

Frequency set Indicator

4.2 General operation of the **JUPITER** Transmitter

4.2.1 Supply

The **JUPITER** Transmitter runs on 8Ah 12V DC batteries.
A 230V razor-type socket is used to recharge the battery.
On turn-on, the charge level of the battery is indicated on the front face.
The minimum autonomy of the transmitter is 10h.

Because of the type of charger incorporated, the Transmitter can run on internal batteries or from the 230V AC supply. A power cord makes it possible to reload the battery.

The charger operates in three modes :

- **BOOST Mode**, starts automatically on connecting the charger to the mains if the battery is discharged. The current delivered by the charger is then a maximum. The BOOST mode enables the supply of up to 80% of the battery capacity and can support the impact of loads due to transmission when the Transmitter is active.
- **ABSORPTION Mode**, starts as soon as the battery voltage has reached the maximum value of the BOOST. The current then begins to reduce. The duration of the two phases together (BOOST + ABSORPTION) will be a function of the initial discharge state of the battery and whether the Transmitter is activated or not. At the end of the absorption phase, the battery is recharged to 95%.
- **FLOATING Mode**, at the finish of the two initial phases (BOOST + ABSORPTION), the charger automatically configures in FLOATING mode. The value of the current delivered by the charger becomes asymptotic as it approaches zero. This phase corresponds to holding the batteries in charge (trickle current).

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).

4.2.2 Transmitter Fonctions

The **JUPITER** Transmitter has these basic components :

- Three synthesised power generators
- A monitoring unit for the internal components which :
  - Detects any faults in the transmission circuits – improperly closed clamp, fuse blown, cut cable
  - Monitors the discharge level of the battery – the transmission is automatically stopped if the battery reaches a discharge level that could affect it's condition.
- A front face – instrument panel with :
  - Indicators (LED) of clamp faults
  - Indicators (LED) of battery charge
  - An indicator (LED) showing the transmission pulses
  - An indicator (LED) indicating the range of frequencies preset in manufacture for the Transmitter. Two ranges can be synthesised : F1 as basic or F2 (see §3.3 options)
  - The ON button
  - The OFF button.
- A connector panel with :
  - The connector for the cable from the current clamps
  - The three fuse holders for the current clamps
  - The fuse holder for battery protection
  - The mains power socket.

4.3 Connecting the **JUPITER** Transmitter

The Transmitter is connected on the heads of cables using the current clamps on the connection case.
The two 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 connection box mechanism or the cables supplied.
- Turn on the Transmitter.

It is better to place the current clamps before starting the Transmitter.
If not, opening the clamps during transmission causes the clamp fault lights to illuminate.

4.4 Precautions for operation of the **JUPITER** 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.**

5 **JUPITER** RECEIVER

The **JUPITER** Receiver assembly consists of :

- **The Receiver to which are connected the sensors**
- **Inductive sensor for identification**
- **Probes for continuity (Black)**
- **Probes for open-circuit core identification (red)**
- **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 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

5.1 Overview

Socket for sensor connection

Battery fault Indication

Measurement display in core identification mode

Measurement display in identification and continuity mode

ON and measurement initiation button

5.2 Using the **RECEIVER**

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

- Identification in short-circuit
- Identification in open-circuit
- Continuity.

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.

5.2.1 Identification mode

- Connect the sensor to the Receiver
- Place the sensor on the cable, so that the groove under the sensor fits around the cable
- Press the « measurements » button, the identification led lights
- Press the « measurements » button
- Wait for the result (6 seconds), either **YES** or **NO**

  ➔ If the result is NO, repeat the operation on the other cables
  ➔ If the result is YES, it is always good to confirm this by repeating the measurement at several points along the cable.

The Receiver indicates by « YES » or « NO » the cable identification.

5.2.2 Continuity mode

➔ Connect the **Black** probes to the Receiver, press the « measurements » button, the identification led lights
➔ The cable being cut, probe any 2 cores of the 3 or 4
➔ Press the « measurements » button
➔ Wait for the result (3 seconds), either **YES** or **NO**
➔ If the result is NO, repeat the operation at the other extremity of the cable
➔ The section of cable giving a YES result, indicates the continuity towards the Transmitter.

The receiver indicates by « YES » or « NO » reception of the transmitted signal.

5.2.3 Core identification mode in open circuit (3 cores)

➔ Connect the **Red** probes to the Receiver, press the « measurements » button, the identification led lights
➔ The cable being cut, probe any 2 cores of the 3
➔ Press the « measurements » button
➔ Wait for the result (3 seconds), either L1, L2 or L3
➔ Repeat the operation to identify the 2 other cores.

The Receiver designates the free conductor.

5.2.4 Core identification mode in short circuit (3 cores)

➔ Connect the loop for core identification in short-circuit to the Receiver, a press of the « measurements » button lights the LED which indicates the mode
➔ Put the loop around the core to identify, and close it
➔ Press the « measurements » button
➔ Wait for the result (3 seconds), either L1, L2 or L3
➔ Repeat the operation to identify the other two cores.

The Receiver designates the core within the loop.

5.2.5 Location mode in short-circuit for 4 drivers of identical section (OPTION)

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 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

5.2.6 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.
Each battery is monitored individually and the fault LED indicates the battery which is placed immediately beneath in the battery compartment.

6 **JUPITER** TECHNICAL CHARACTERISTICS

6.1 Details

6.1.1 Total Weight :

Transmitter with Receiver : 16 kg

6.1.2 Dimensions:

Transmitter in rigid carrying case :	540mm x 390mm x 240 mm
Receiver in soft case :	400mm x 300mm x 80mm

6.1.3 Supply:

- **Transmitter :**

Battery : 12V - 7,8Ah.
Autonomy minimum : 10h for continuous use
Charger : 230 V AC integrated
The Transmitter can be used while the battery is being charged

- **Receiver :**

2 PP3 9V batteries
Autonomy : minimum 2000 measurements

6.1.4 Marks CE

6.1.5 Standards applied:

NF EN50081 et NF EN 50082-1

7 MAINTENANCE

Dismantling systems is forbidden. This operation is limited exclusively to personnel qualified by MADE.
Note : the break of the security seals void the guarantee.

An annual inspection can be carried out in our premises.

For cleaning the system use a soft, dry cloth.

Never use solvent, or a solvent-based product, to clean the system and / or its accessories.

8 RECYCLING

In accordance with the decree n° 2005-829 of July 2 0, 2005 relating to the waste disposal of electrical equipment and electronic (WEEE), the user ensures and takes responsibility for the collection and the elimination of the WEEE under the conditions of the articles 21 and 22 of this decree.

9 GUARANTEE

MADE guarantees this product, to the initial purchaser, against all material or functional failure during a period of one year from the date of delivery, unless otherwise indicated in the product manual. If a defect is discovered during the period of the guarantee, MADE agrees, at its choice, to either repair or replace the deficient part, excluding the expenses of handling and of initial delivery. All parts repaired or replaced under the terms of this agreement will be guaranteed only for the remainder of the period of initial guarantee of the system.

9.1 Limitations

This guarantee does not cover :

• Break of the security seals
• Damage caused by a "cause beyond control", natural disasters, strikes, wars (declared or not), terrorism, social conflicts or any acts under governmental jurisdiction
• Damage due to misuse, to carelessness, to any accident or an unsuitable application or installation
• Damage caused by a repair or an attempted repair not authorized by MADE
• Any product that is not used in accordance with the instructions provided by MADE
• Cost of transport back to MADE
• Cost of transport by express delivery of parts or products under guarantee
• Cost of travel for a repair on site under guarantee

This guarantee constitutes the unique explicit guarantee established by MADE for its products. All implied guarantees, including, but not limited to, guarantees on the commercial value of the product and its suitability for a particular use are positively rejected.
The present guarantee confers certain rights : the legislation of the country or jurisdiction can grant others. This guarantee constitutes the final declaration, complete and exclusive, of the terms of the guarantee and nobody is allowed to give other guarantees or promises on MADE's account.

9.2 Claims Limitations

Claims having for object repair or replacement are the only allowable claims in case of the breaking of this guarantee. The MADE Company cannot be held responsible, whether on the basis of strict responsibility or any other legal basis, of any incidental or consecutive damage resulting from a violation of the guarantee or from carelessness.

10 COPYRIGHT

11 APPENDIX

11.1 CE conformity declaration

The company :

MADE
S.A. au capital de 270 130 €
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declares by this document that the product described in this manual, that is :

JUPITER

conforms to the following directives CE , including all the applicable amendments :

Référence	Titre
73/23/CEE	Low Voltage Directive (LVD)
89/336/CEE	Electromagnetic Compatibility Directive (EMC)

and that the standards and/or technical specifications listed in this manual have been applied.

The designated product has been designed, manufactured and tested in the framework of a Quality Assurance System certified as conforming to the standard :

ISO 9001 : 2008

by the Association Française pour l'Assurance Qualité - AFAQ.

Certificate : QUAL / 2005 / 24473b
From : 2009/05/07

D. SPADA
P.D.G.