

Test Bench for IRS

Overview:

The new high end IRS systems available since January 2010 are equipped with a Datalog module that can be used to record all the events occurring in the IRS and power supply.
This function allows for much better maintenance of IRS systems.
This document describes the testing procedure to detect damages in IRS systems.

Attention:



When connecting a computer to IRS module through the serial link, you have to ensure that both devices are wired to the same ground to avoid any electrical discharge that can damage both devices.

Safety :



The installation, configuration, commissioning and maintenance of the IRS products must only be carried out by personnel qualified and trained to work with low voltage electrical equipment in an industrial environment.



The front door should not be opened except by competent technicians when connecting or disconnecting the device. Electrical isolation must be ensured between the equipment and the power supply.



In both off and on modes, the IRS regulator doesn't ensure isolation from the power supply. One should pay attention to the fact that electrical shock may occur when touching the lamps or the cables coming from the IRS. It is thus recommended to turn off the power supply (400 V) within 2 sec following the end of regulation.

1. Testing the ground circuit

1.1 Testing the ground circuit between IRS door and IRS box

1.1.1 Technical requirements

To measure the resistance between IRS door and IRS box. The measured value must be in tenths of Ohms.

1.1.2 Instruments and tools

Multimeter.

1.1.3 Procedure

The IRS under examination must be disconnected from the power supply!

Turn 24V power supply OFF. Set your Multimeter to resistance measuring mode and select the Ohms section. Open the IRS box door and place one mutimeter probe on it. Place the other probe on IRS box. Measure the resistance.

1.1.4 Test report

If the measured resistance value meets the requirements of clause 1.1.1, then the test - **Passed (P)**, if not - **Not Passed (N)**.

1.2 Testing the ground circuit between the earth ground of MCU board and IRS box

1.2.1 Technical requirements

To measure the resistance between the earth ground of MCU board and IRS box. The measured value must be in tenths of Ohms.

1.2.2 Instruments and tools

Multimeter.

1.2.3 Procedure

The IRS under examination must be disconnected from the power supply!

Turn 24V power supply OFF.

Set your Multimeter to resistance measuring mode. Select the Ohms section. Open the IRS box door and place one multimeter probe at the control point TP2 of MCU board (as shown in Fig.). Place the other probe on IRS box. Measure the resistance between these 2 points.



1.2.4 Test report

If the measured resistance value meets the requirements of clause 1.2.1, then the test - **Passed (P)**, if not - **Not Passed (N)**.

1.3 Testing the ground circuit between PROFIBUS connector and IRS box

1.3.1 Technical requirements

To measure the resistance between the ground of Profibus and IRS box. The measured value must be in tenths of Ohms.

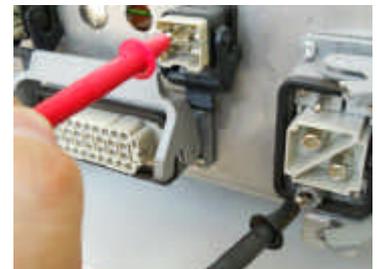
1.3.2 Instruments and tools

Multimeter.

1.3.3 Procedure

The IRS under examination must be disconnected from the power supply! Turn 24V power supply OFF.

Set your Multimeter to resistance measuring mode. Select the Ohms section. Place one Multimeter probe at the Profibus connector (as shown in Fig.). Place the other probe on IRS box. Measure the resistance.



1.3.4 Test report

If the measured resistance value meets the requirements of clause 1.3.1, then the test - **Passed (P)**, if not - **Not Passed (N)**.

1.4 Testing the ground circuit between the earth ground of Power board and IRS box

1.4.1 Technical requirements

To measure the resistance between the earth ground of MCU board and IRS box. The measured value must be in tenths of Ohms.

1.4.2 Instruments and tools

Multimeter

1.4.3 Procedure

The IRS under examination must be disconnected from the power supply! Turn 24V power supply OFF.

Set your Multimeter to resistance measuring mode. Select the Ohms section. Open the IRS box door and disconnect CN6 from MCU board. Place one multimeter probe at pin2 of CN6 connector (as shown in Fig), place the other probe on IRS box. Measure the resistance. Then connect CN6 back to MCU board.



1.4.3 Test report

If the measured resistance value meets the requirements of clause 1.4.1, then the test **Passed (P)**, if not - **Not Passed (N)**.

2. Testing the insulation

2.1 Testing the insulation between IRS box and poles of the power connector (breakers in "close" position, 24V OFF)

2.1.1 Technical requirements

To measure the resistance of the insulation between IRS box and poles of the power connector. The measured value must be no less than 470 KOhms.

2.1.2 Instruments and tools

Multimeter

2.1.3 Procedure

The IRS under examination must be disconnected from the power supply! Turn 24V power supply OFF. Open the IRS box door and set both breakers to "close" position. Set your Multimeter to resistance measuring mode and select the measuring limit - MOhms. Place one multimeter probe on IRS box, place the other probe at one of the power connector poles (as shown in Fig). Wait for the reading on the Multimeter display to stabilize. Measure the resistance. Then change the polarity of the probes and measure the resistance again. Repeat the procedure for the other pole of the power connector.



2.1.4 Test report

If the measured resistance value meets the requirements of clause 2.1.1, then the test **Passed (P)**, if not - **Not Passed (N)**.

2.2 Testing the insulation between IRS box and poles of the power connector (breakers "close", 24V ON)

2.2.1 Technical requirements

To measure the resistance of the insulation between IRS box and poles of the power connector. The measured value must be no less than 470 KOhms.

2.2.2 Instruments and tools

Multimeter, 24V power supply unit. Tool T5.

2.2.3 Procedure

The IRS under examination must be disconnected from the power supply! Connect 24V power supply to IRS with the cable Tool T5 (as shown in Fig). Attention! When 24V power supply unit is switched on for the first time, watch the absorbed current! It must not exceed 300mA.



Open the IRS box door and switch the both breakers to “close”. Set your Multimeter to resistance measuring mode and select the measuring limit - MOhms. Place one multimeter probe on IRS box, place the other probe at one of the power connector poles (as shown in Fig item 2.1.3). Wait for the reading on the Multimeter display to stabilize. Measure the resistance. Then change the polarity of the probes and measure the resistance again. Repeat the procedure for the other pole of the power connector.

2.2.4 Test report

If the measured resistance value meets the requirements of clause 2.2.1, then the test **Passed (P)**, if not – the test **Not Passed (N)**.

2.3 Testing the resistance between the power connector poles (breakers “close”, 24V ON)

2.3.1 Technical requirements

To measure the resistance between IRS box and poles of the power connector. The measured value must be 570 Ohms +/-10%.

2.3.2 Instruments and tools

Multimeter, 24V power supply unit. Tool **T5**.

2.3.3 Procedure

The IRS under examination must be disconnected from the power supply!

Connect 24V power supply to IRS with the cable Tool **T5** (as shown in Fig).



Open the IRS box door and switch the both breakers “close”. Set your Multimeter to resistance measuring mode and select the measuring limit - MOhms. Place one multimeter probe on IRS box, place the other probe at one of the power connector poles (as shown in Fig). Wait for the reading on the Multimeter display to stabilize.

Measure the resistance. Then change the polarity of the probes and measure the resistance again.

2.3.4 Test report

If the measured resistance value meets the requirements of clause 2.3.1, then the test **Passed (P)**, if not – **Not Passed (N)**.

3. Testing the communication

3.1 Testing USB communication

3.1.1 Technical requirements

To check USB communication between IRS and personal computer (PC)

3.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable.

3.1.3 Procedure

Open the IRS box door. Connect USB cable to PC or NoteBook, connect the other end of the cable to MCU board. Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently, and the indicating icon must appear in the bottom of **SuperVisor** window:



3.1.4 Test report

If the USB operates OK without failures, then the test **Passed (P)**, if not - **Not Passed (N)**.

3.2 Setting the clock, checking the clock rate accuracy and backup supply

3.2.1 Technical requirements

To check if the clock is set up, to test the rate accuracy and backup supply. availability

3.2.2 Instruments and tools

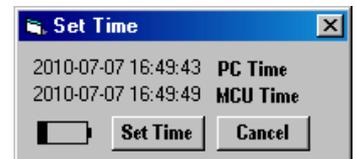
24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable.

3.2.3 Procedure

To set up the Real Time Clock (RTC) it is necessary to set up USB connection. Open the IRS box door. Connect USB cable to the PC or NoteBook, connect the other end of the cable to MCU board.



Switch the PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Next you need to select **SetTime** from the menu. At his moment your PC time will be set for the RTC Datalog, and the window with the current RTC value will open (see pic. below).



Then press **Set Time** button. PC Time and MCU Time must get the same. Then turn the 24V power supply OFF for 10 minutes and turn it ON again. PC Time and MCU Time must be the same.

3.2.4 Test report

If RTC has set up correctly, the rate is correct and the time reading remains correct after switching off the 24V power supply, then the test **Passed (P)**, if not – **Not Passed (N)**.

3.3 Testing PROFIBUS

3.3.1 Technical requirements

To test Profibus communication and Oven ON command operation.

3.3.2 Instruments and tools

24V power supply unit. PLC OMRON with Profibus module. Personal computer (PC) or NoteBook with installed **SuperVisor** and **CXOne** software. Tool **T5**. Tool **T4**. RS232 OMRON cable. USB cable.

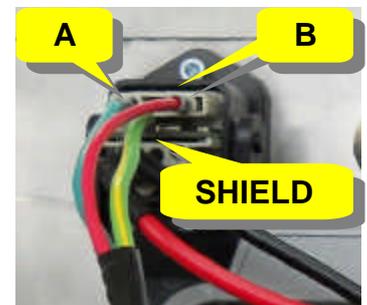
3.3.3 Procedure

Connect PLC OMRON to MCU board of the tested IRS with cable Tool **T4**, connect PLC OMRON to PC or Notebook with special RS232 cable (**12**) (supplied with OMRON). To make the connections follow the general testing scheme in clause 10.2. Start up CX One Programmer on PC or Notebook. Then start up the testing program in Programmer.

Watch that Profibus address is set correctly on MCU board. Turn 24V power supply ON. Start up the testing program in CX Programmer. Profibus LED on MCU board must be glowing permanently. It will indicate that the Profibus protocol connection is OK. For more detailed information about Profibus operation, read **AN PROFIBUS AND AUTOMATION EXAMPLE WITH OMRON PLC CJ1M**.

3.3.4 Test report

If Profibus communication operates OK without failures, then the test **Passed (P)**, if not - **Not Passed (N)**.



4. Checking the Firmware versions

4.1 Checking the Firmware versions

4.1.1 Technical requirements

To check compatibility of the Firmware and Hardware versions:

	IRS-SDL	IRS-STD
Version	Hardware v.101; Firmware v.20.17	Hardware v.20; Firmware v.50.18
	10 channels	10 channels or 12 channels
Power Source	400VAC+/-10%; if 400VAC+/-20% - event	208...530VAC if 400VAC +20% - event
Regulation	0-100% U ²	Power regulation
Type of Regulation	Single Cycle	Single Cycle and Phase Angle
	Fast identification of broken lamp	Resistance measurement

4.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable.

4.1.3 Procedure

Open the IRS box door. Connect USB cable to PC or NoteBook, connect the other end of the cable to MCU board. Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. In the bottom of **SuperVisor** window see information about Firmware and Hardware versions.



4.1.4 Test report

Record Firmware and Hardware versions in the test report.

5. Checking the configuration parameters

5.1 Checking the configuration parameters

5.1.1 Technical requirements

Check the values of:

- a. Serial Number (ID)
- b. Number of hardware version
- c. Running Mode (Single Cycle or Phase Angle)
- d. Broken Lamp Factor
- e. Broken Lamp Tick
- f. Value of constant MMV (MainMaxVolts = 700...900V)
- g. Value of constant MMA (MainMaxAmps = 10...20A)
- i. Burst Firing Threshold
- k. Burst Firing Power

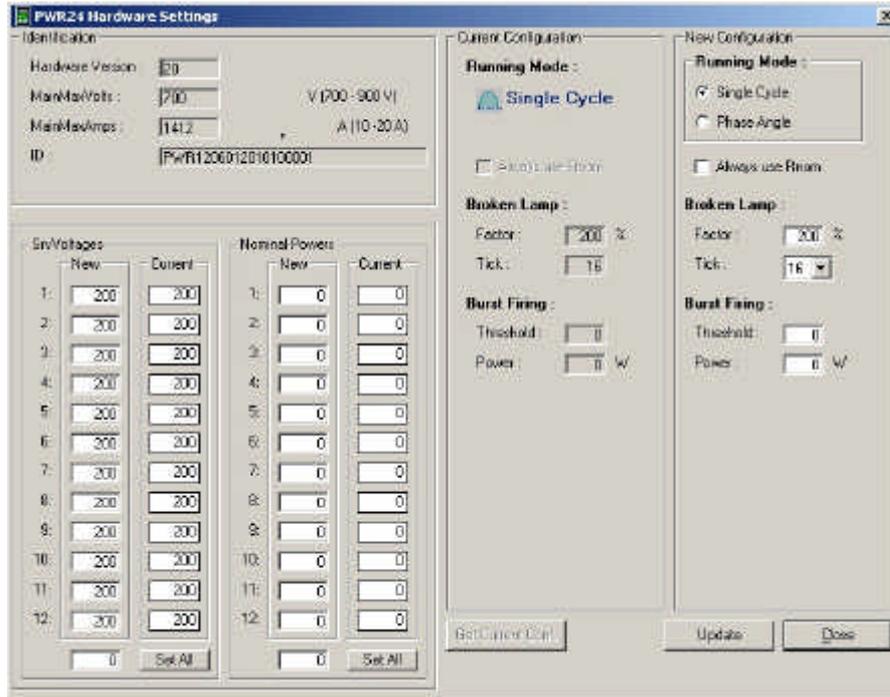
5.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable.

5.1.3 Procedure

Open the IRS box door. Connect USB cable to PC or NoteBook, connect the other end of the cable to MCU board. Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Select Hardware Setting in the menu:





5.1.4 Test report

Record the values of the parameters listed in clause 5.1.1 in the test report.

6. Testing and calibrating current and voltage

6.1 Testing and calibrating current

6.1.1 Technical requirements

To set the calibrating current value of 3000mA and Offset of current.

6.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable. Cable to connect the IRS to the mains.

6.1.3 Procedure

Open the IRS box door. Connect USB cable to PC or NoteBook, connect the other end of the cable to MCU board.

For convenience of further work with the IRS box closed, we recommend to unscrew the tap in the box and use the technological hole for laying USB cable and later **T6** tool for Overload mode test (as shown in Fig).



USB LED

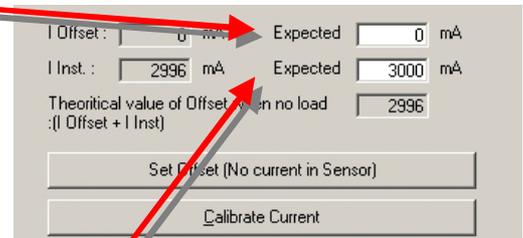
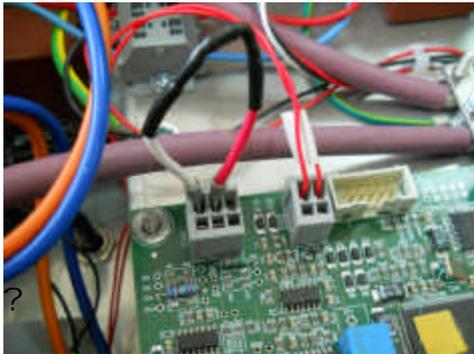
USB Connector

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Then switch the IRS to the main power supply.

We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed.

AC power ON, Oven OFF. Tune the Offset to get $I_{Inst} = 0 \pm 10\text{mA}$ ($I_{Inst} = I_{Read} - I_{Offset}$) and press **Set Offset** button.

Turn the power supply and 24V unit OFF. Disconnect the cables from the current sensor and set Tool **T1** (calibrating resistor) in CN1 connector as shown in Fig below.



Turn the 24V power supply ON, turn the AC power supply ON. Current must set to 3000mA. Press **Calibrate Current** button.

After testing, connect the current sensor back.

6.1.4 Test report

If the current calibration is done OK, then the test **Passed (P)**, if not - **Not Passed (N)**.

6.2 Testing and calibrating voltage

6.2.1 Technical requirements

To set the calibrating voltage value.

6.2.2 Instruments and tools

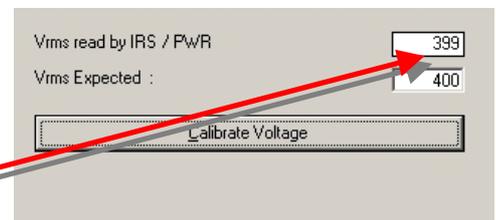
24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable. Cable to connect the IRS to the mains.

6.2.3 Procedure

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently.

Then switch the IRS to the mains.

Use your Multimeter and measure mean square value of AC voltage at the IRS input under the general testing scheme (**U4**) clause 10.2. Enter the measured value and press **Calibrate Voltage** button. V_{rms} read and V_{rms} expected must get equal.



6.2.4 Test report

If voltage calibration is done OK, then the test **Passed (P)**, if not - **Not Passed (N)**.

7. Testing the fans

7.1 Testing the fans

7.1.1 Technical requirements

To test the fans operation.

7.1.2 Instruments and tools

24V power supply unit. Tool **T5**.

7.1.3 Procedure

Turn the 24V power supply ON. Hold your hand near the IRS rear wall (from the radiator side). There must be a feeling of the air flow from the fans blades near the first and the second holes in the rear wall.

7.1.4 Test report

If you've got the feeling of the air movement – it means that the fans operate OK, then the test **Passed (P)**, if not - **Not Passed (N)**.

8. Testing the channels operation

8.1 Lamp ON in the selected channel at 100% power

8.1.1 Technical requirements

To test operation of the 1st to the 10th channel or the 1st to the 12th channel – depending on the IRS modification.

8.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. USB cable. Cable to connect the IRS to the mains. Auto transformer. Multimeter.

8.1.3 Procedure

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Switch the load Tool **T3** to the 1st channel output under the general testing scheme clause 10.2 (see the table in the diagram).

We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed.

Then switch the IRS to the mains.

Use SuperVisor to set the nominal voltage or nominal power (depending on the IRS version) in the 1st channel and switch the Oven ON. The load lamps must be glowing permanently. Then sequentially set the nominal voltage or nominal power for all the rest channels. There, the load lamps must not glow. Switch the Oven OFF. Disconnect the IRS from the mains and switch load Tool **T3** to the next channel 2. Repeat the procedure for the 2nd channel. Continue for all the rest channels.

8.1.4 Test report

If in each channel, for which the nominal voltage or nominal power is set, the load lamps are permanently ON, and for the channel, which is not selected, the lamps are OFF, then for each channel the test **Passed (P)**, otherwise - **Not Passed (N)**.

Power regulation in the selected channel and stabilization at changing the input (power) voltage

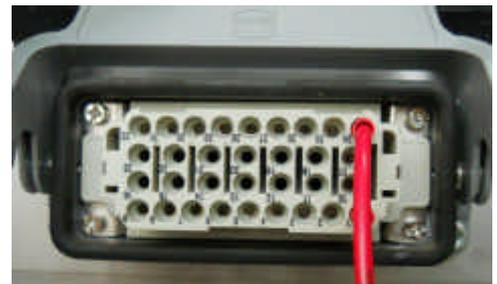
8.1.5 Technical requirements

To check the power regulation and stabilization at changing the input voltage in the 1st to the 10th channel or in the 1st to the 12th channel depending on the IRS modification.

8.1.6 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. USB cable. Cable to switch the IRS to the mains. Auto transformer. Multimeter.

8.1.7 Procedure



Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Switch the load Tool **T3** to the 1st channel output under the general testing scheme in clause 10.2 (see the table in the diagram).

We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed.

Then switch the IRS to the mains.

Use SuperVisor and set the half value of the nominal voltage or the half value of the nominal power (depending on the IRS version) in the 1st channel and switch the Oven ON. The load lamps must glow half heat. At the auto transformer output, using the Multimeter to control the voltage, set the voltage +10% of the nominal. The load lamps must glow with the same brightness. At the auto transformer output, using the Multimeter to control the voltage, set the voltage -10% of the nominal. The load lamps must glow with the same brightness. Switch the Oven OFF. Turn the IRS off the mains and switch the load Tool **T3** to the next channel 2. Repeat the procedure for the 2nd channel. Repeat for all other channels.

8.1.8 Test report

If in each channel, for which half nominal voltage or half nominal power is set, the load lamps glow half heat and their brightness does not change at changing the input supply voltage, then for each channel the test **Passed (P)**, otherwise - **Not Passed (N)**.

8.2 DeadLamps identification

8.2.1 Technical requirements

To test the mode of the DeadLamps identification from the 1st to the 10th channel or from the 1st to the 12th channel depending on the IRS modification.

8.2.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. USB cable. Cable to switch the IRS to the mains. Auto transformer.

8.2.3 Procedure

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Switch the load Tool **T3** to the 1st channel output under the general testing scheme clause 10.2 (see the table in the diagram).

We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed.

Then switch the IRS to the mains.

Use SuperVisor to set the nominal voltage or nominal power (depending on the IRS version) in the 1st channel and switch the Oven ON. Then press the button on Tool **T3**, thus imitating a dead lamp. DeadLamp icon must appear in SuperVisor window.

Switch the Oven OFF. Disconnect the IRS from the mains and switch load Tool **T3** to the next channel 2. Repeat the procedure for the 2nd channel. Continue for all the rest channels.

8.2.4 Test report

If the DeadLamp is detected for each channel, then for each channel the test **Passed (P)**, otherwise – **Not Passed (N)**.

Settings	Set	Expected	Applied	Resistance Flood
1	0	N/A	N/A	N/A
2	0	0	0	36.45
3	0	0	0	36.45
4	0	0	0	36.45

9. Testing SD card operation and Overload, Cutout, Sector Default modes

9.1 Preparation and testing SD card operation (initialization, writing, reading)

9.1.1 Technical requirements

To test SD card initialization, writing and reading.

9.1.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. USB cable. Cable to connect the IRS to the mains. Auto transformer. Multimeter. SD card.

9.1.3 Procedure

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently.

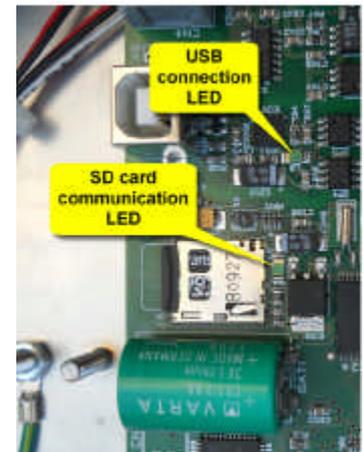
Datalog uses **Transcend**, **Kingston** SD cards up to 2GB. SD cards of other make might be used, but they were not tested and their reliability is not guaranteed. Insert MicroSD into the adapter and then insert the adaptor into the PC or NoteBook card reader. Before use SD card must be prepared. To do so, choose in the tool bar **Tools -> Log -> Prepare SD Card**. For more details about **SD Card** operation, read **AN Work with a DATALOG STD**. Next, check the prepared card operation in the known-good MCU board Datalog. For this, insert the SD card into the card holder of the MCU board. You may insert and remove the card without turning off the 24V supply. But you can do so **ONLY** when the "SD Card communication LED" is flashing. After the card is inserted, "SD Card communication LED" must be glowing permanently. Then insert the tested and good SD card into the MCU board of the tested IRS. After the card is inserted, "SD Card communication LED" must be glowing permanently. It means, that MCU board Datalog initialize, write on and read the SD Card.

Note: MCU board program is made so that after the card is inserted into the holder, the SD card is initialized first, and only then the data are tried to write or read.

Note: MCU board program is made so that after the card is inserted into the holder, the SD card is initialized first, and only then the data are tried to write or read.

9.1.4 Test report

If the SD Card is initialized, written on and read, then the test **Passed (P)**, if not – **Not Passed (N)**.



9.2 Testing Overload mode and writing the event on the card

9.2.1 Technical requirements

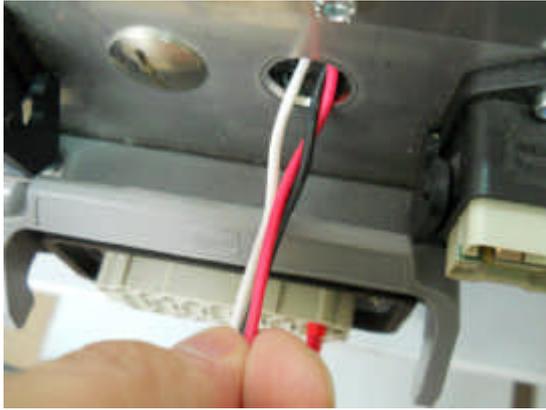
To test Overload mode and write the event on the card.

9.2.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. Tool **T6**. USB cable. Cable to connect the IRS to the mains. Auto transformer. Multimeter. SD card.

9.2.3 Procedure

Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Open the IRS box door. Connect Tool **T6** and **USB cable** through the servicing hole. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Insert the prepared SD card into the card holder of the MCU board.



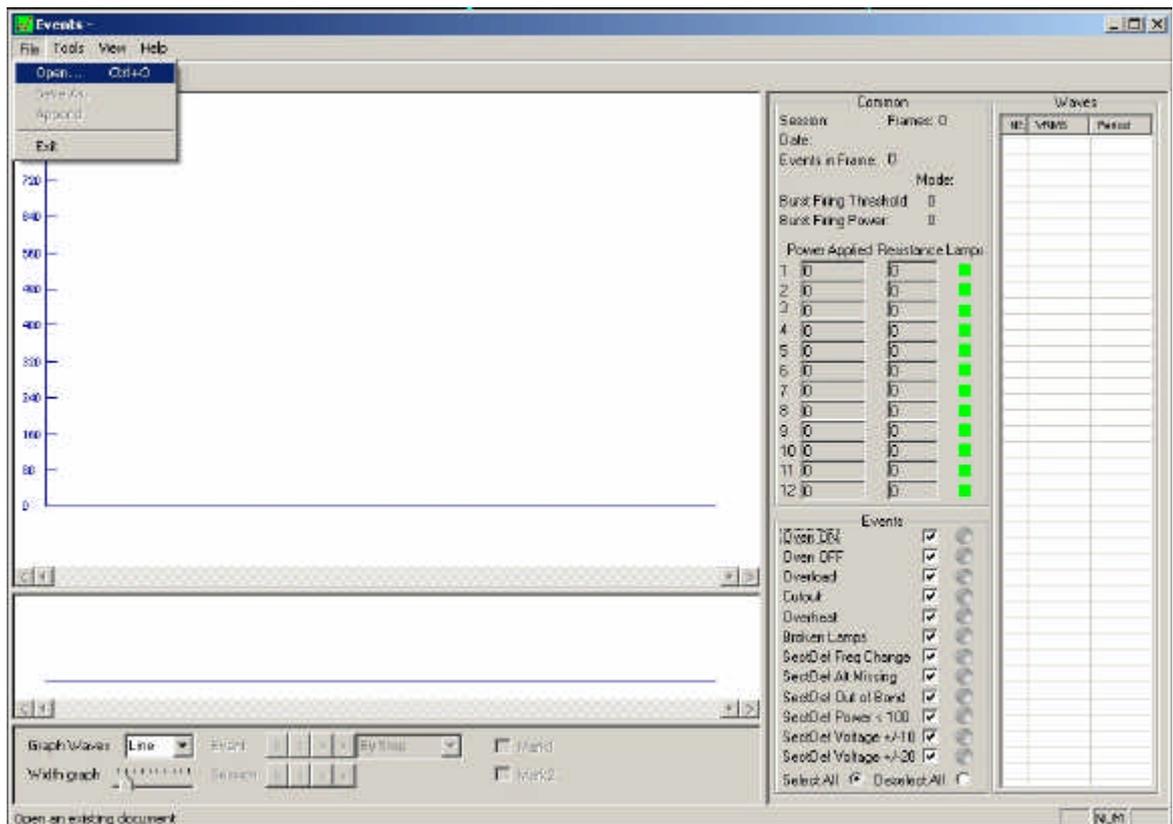
We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed. For this and other tests, switch the breaker after the auto transformer to 45A – see the general testing scheme in clause 10.2.

Then switch the IRS to the mains.

Check that the IRS box door is closed. Press the button on T6. Overload protection must get activated. Overload message must appear in SuperVisor window. Switch off the IRS from the mains. Open the IRS box door – both breakers must be “open”.

Remove the SD card from the MCU board holder and insert it into the card reader. In SuperVisor menu go to **File -> Open**. In the opened window select **events** file and press **open** button.

To view the log file use **Events** window:



9.2.4 Test report

If both the breakers operate, Supervisor displays Overload, and the Overload event is written on the SD card, then the test **Passed (P)**, if not – **Not Passed (N)**.

9.3 Testing the Cutout mode and writing the event on the card

9.3.1 Technical requirements

To test Cutout mode and write the event on the card.

9.3.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. USB cable. Cable to connect the IRS to the mains. Auto transformer. Multimeter. SD card.

9.3.3 Procedure

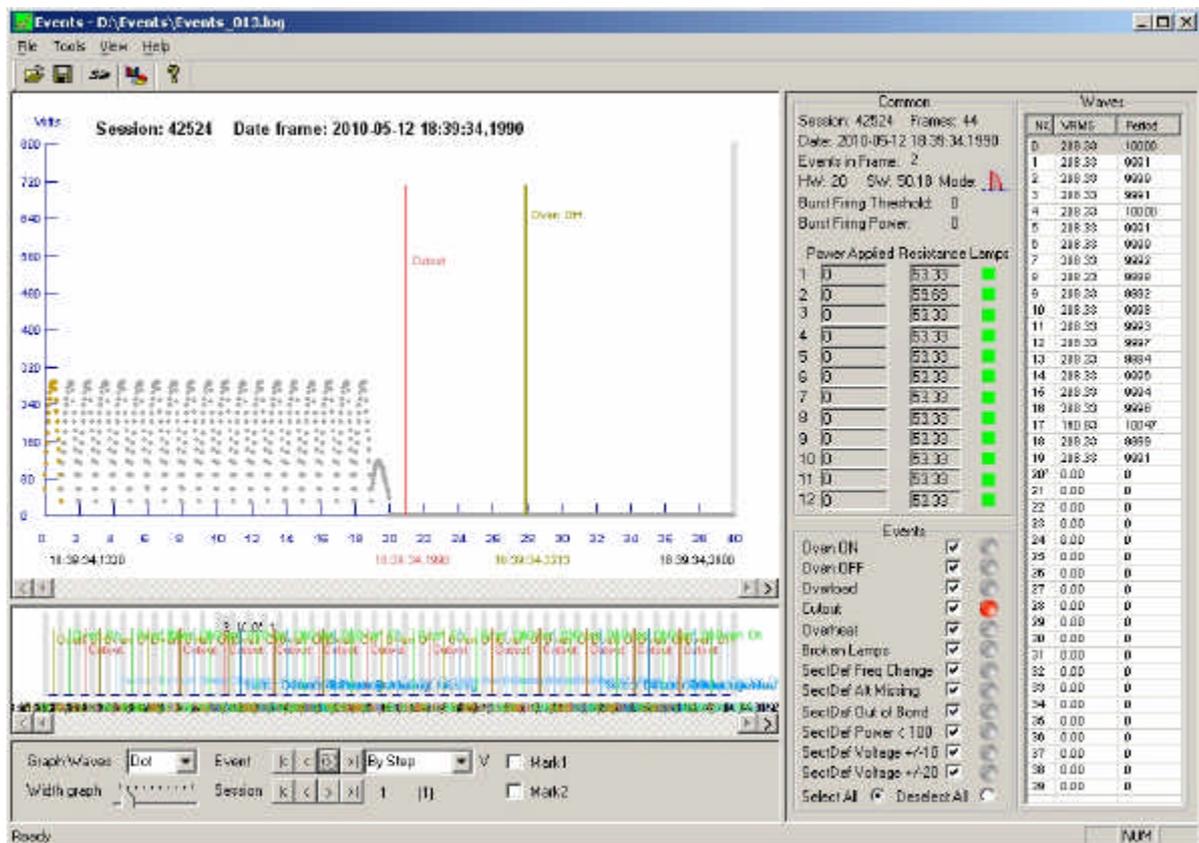
Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Open the IRS box door. Connect Tool **T6** and **USB cable** through the servicing hole. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Insert the prepared SD card into the card holder of the MCU board.

We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed. For this and other tests, switch the breaker after the auto transformer to 45A – see the general testing scheme in clause 10.2.

Then switch the IRS to the mains.

Check that the IRS box door is closed. Switch breakers 45A BR1 (after auto transformer) to “open”. Cutout protection must get activated. Cutout message must appear in SuperVisor window. Switch off the IRS from the mains. Remove the SD card from the MCU board holder and insert it into the card reader. In SuperVisor menu go to **File -> Open**. In the opened window select **events** file and press **open** button.

To view the log file use **Events** window:



9.3.4 Test report

If Supervisor displays Cutout, and the Cutout event is written on the SD card, then the test **Passed (P)**, if not - **Not Passed (N)**.

9.4 Testing the Sector default mode and writing the event on the card

9.4.1 Technical requirements

To test Sector default mode and write the event on the card .

9.4.2 Instruments and tools

24V power supply unit. Personal computer (PC) or NoteBook with installed **SuperVisor** software. Tool **T5**. Tool **T3**. USB cable. Cable to connect the IRS to the mains. Auto transformer. Multimeter. SD card.

9.4.3 Procedure

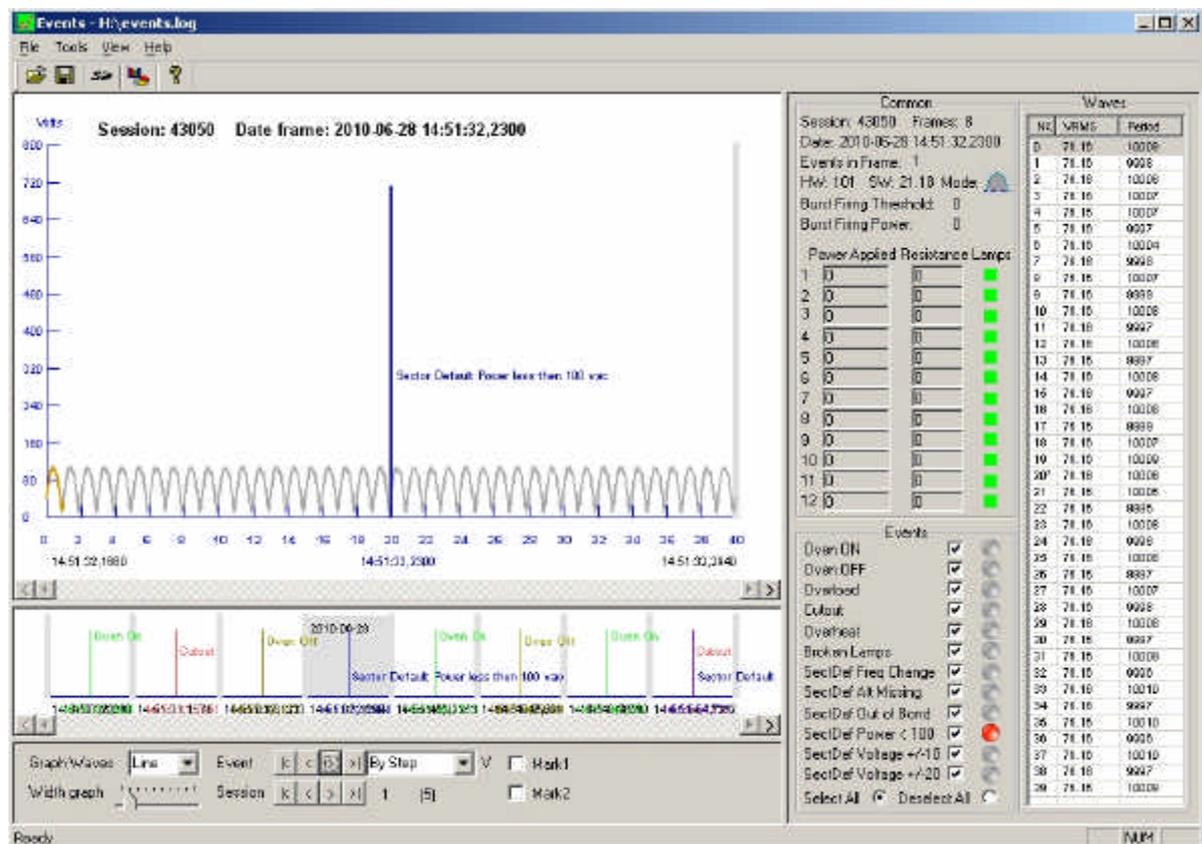
Switch PC or NoteBook ON. Start up **SuperVisor**. Select the COM port corresponding to the virtual USB COM port. Open the IRS box door. Connect Tool **T6** and **USB cable** through the servicing hole. Turn the 24V power supply ON. If the USB connection is kept OK, the green LED near the USB connector on the MCU board must be glowing permanently. Insert the prepared SD card into the card holder of the MCU board.

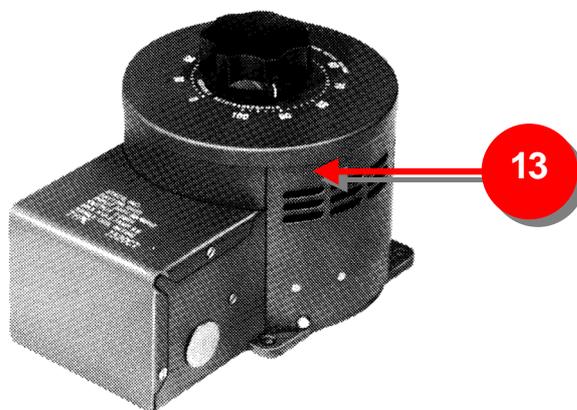
We strictly recommend to disconnect the IRS from the mains when making any connection or changes in the circuit. If the mains is required to be ON for the job, keep the door always closed. For this and other tests, switch the breaker after the auto transformer to 45A – see the general testing scheme in clause 10.2.

Then switch the IRS to the mains.

Check that the IRS box door is closed. Set the autotransformer voltage to 20% more than nominal. Sector default protection must get activated. Sector default message must appear in SuperVisor window. Switch off the IRS from the mains. Remove the SD card from the MCU board holder and insert it into the card reader. In SuperVisor menu go to **File -> Open**. In the opened window select **events** file and press **open** button.

To view the log file use **Events** window:

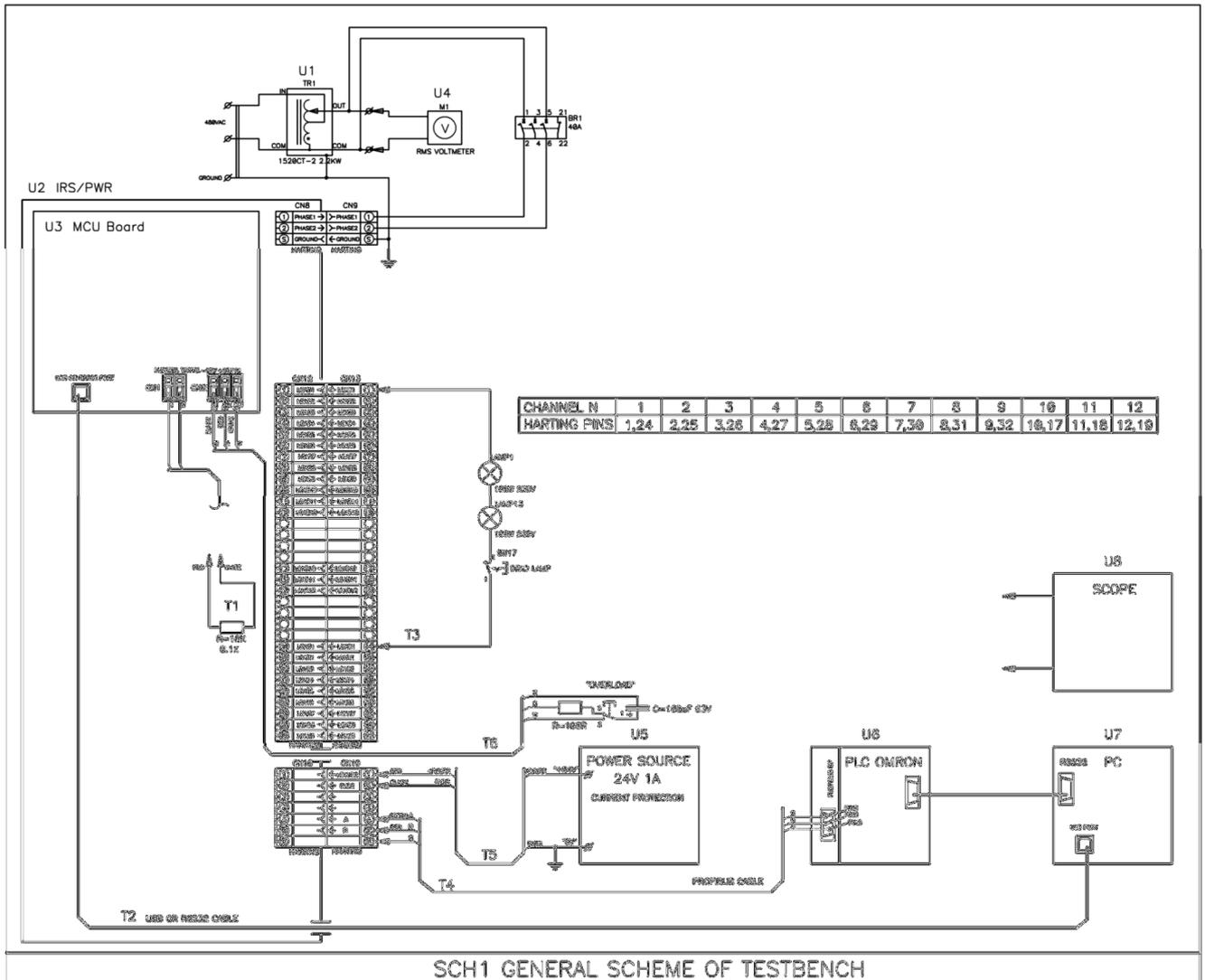


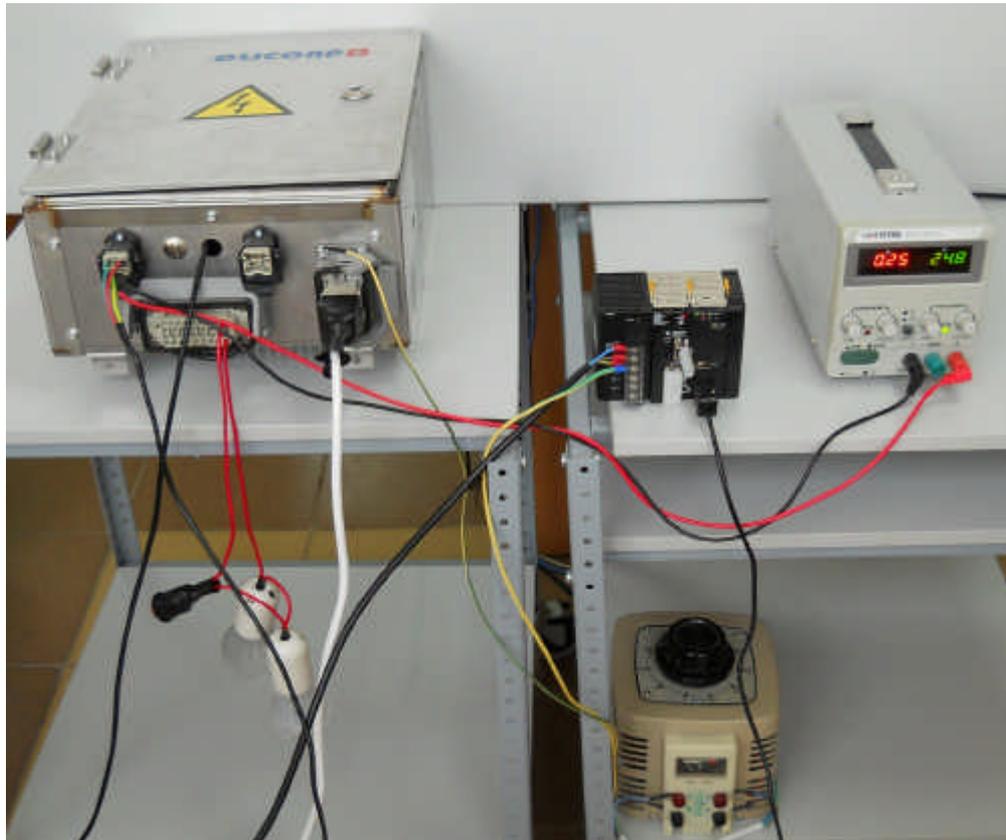


Tool ?	Name of the tool or device
1	Screwdrivers
2	Measuring probes for Multimeter
3	T3 Test load 460V 100W
4	T6 OverLoad regime testing tool
5	T1 Current calibration tool
6	T4 Connecting cable, PLC OMRON to MCU board IRS
7	T5 IRS power feeding cable
8	U5 Power supply unit 24V >3A
9	U4 Multimeter with the possibility of measuring the rms ac voltage
10	T2 USB cable
11	U6 PLC OMRON
12	Connecting cable, PLC OMRON to PC or Notebook
13	U1 Autotransformer
14	U8 FLUKE 196 ScopMeter, optional
15	Cable to connect IRS to power supply (16A)

10.2 General testing scheme

General testing scheme:





BOM for general testing scheme:

Pos.	Description	No. in Farnell catalog
U1	AutoTransformer STACO ENERGY PRODUCTS - 2520-2 - Variable Transformer	1381710
CN9	Power Connector: HARTING - 0914 002 2751 - INSERT, FEMALE, AXIAL, SCREW, 100A, HARTING - 0930 006 1750 - COUPLER, HAN6B HARTING - 0914 024 0313 - FRAME HINGED HOUSING, 6 MODULE	3453881 3454460 3329835
R	Resistor 10K +/-0.1% 0.25W	
R	Resistor 100 Ohm +/-5% 0.25W	
?	Capacitor 100uF 63V	
BR1	Breaker 40A	
LAMP1,2	LAMP 230V 100W	