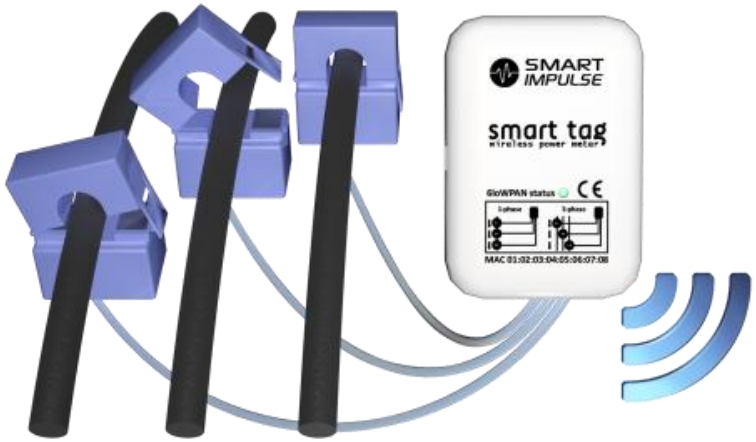
SMART Impulse



Quick Start Guide

Smart Analyzer® & Smart Tag®

Full documentation and video tutorials on:
http://doc.smart-impulse.com

1. Content

You have received a smart power meter solution which includes:

Mobile Smart Analyzer version:

- A pre-built electrical cabinet equipped (*Smart Analyzer, 24V power supply, power outlet, 30 mAmp differential switch*)
- One or several sets of 3 current sensors (*no current measurement for neutral*)

Standalone Smart Analyzer version:

- One Smart Analyzer
- One 24 V power supply with a power lead and orange 3-way connector
- One or several sets of 3 current sensors (*no current measurement for neutral*)

Optional:

- One UMTS modem with power supply and antennas *(if 3G communication is selected)*
- One Smart Router *(integrated in the cabinet for the cabinet version)*
- One or several Smart Tag
- 5-metre BNC cable extensions

In addition to this kit, you must provide:

- The tools you need to connect the wires (neutral, lines, earth)
- A laptop equipped with an Ethernet port + an Ethernet cord in order to run the tests

If you have a **standalone Smart Analyzer**:

- One 4-pole differential circuit-breaker, 6 Amp max., 30 mAmp
  (service breaking capacity should comply with your setup).

If you have a **mobile Smart Analyzer:**

- One 4-pole circuit-breaker, 6 Amp max. (service breaking capacity should comply with your setup).

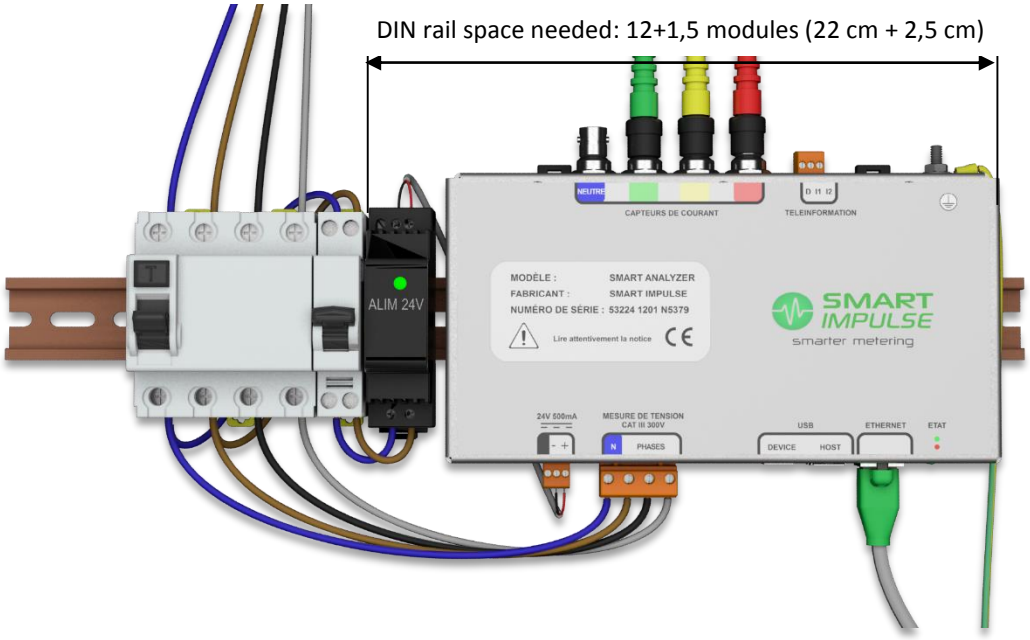
If you are installing any Smart Tag:

- One current clamp

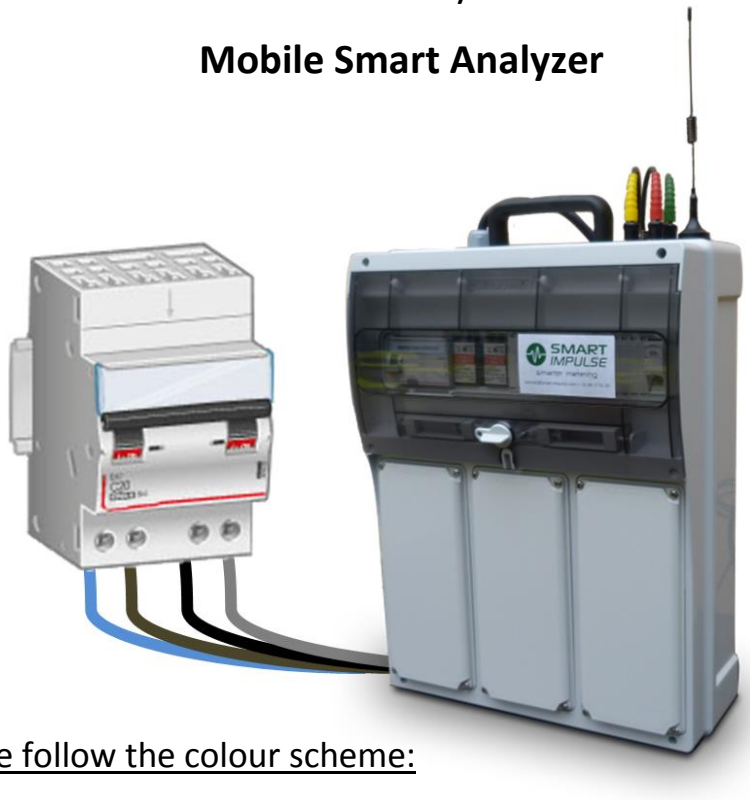
2. Installation of the Smart Analyzer in the main switchboard

Once the 4-pole circuit-breaker is installed in the switchboard, connect it to the Smart Analyzer.

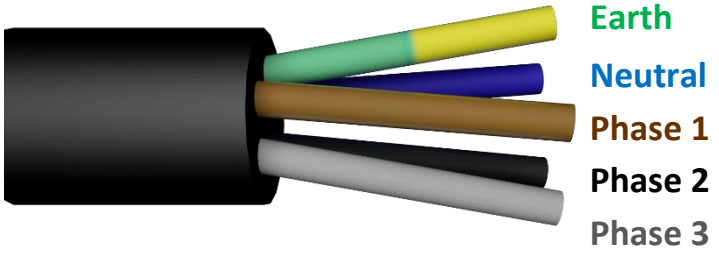
Standalone Smart Analyzer



Mobile Smart Analyzer



Please follow the colour scheme:



⚠ Once the connection is done, check the continuity with a proper device.

⚠ If the earthing system is « IT » (impedant or independant neutral), an additional protection is needed. **Please contact Smart Impulse for more information**.

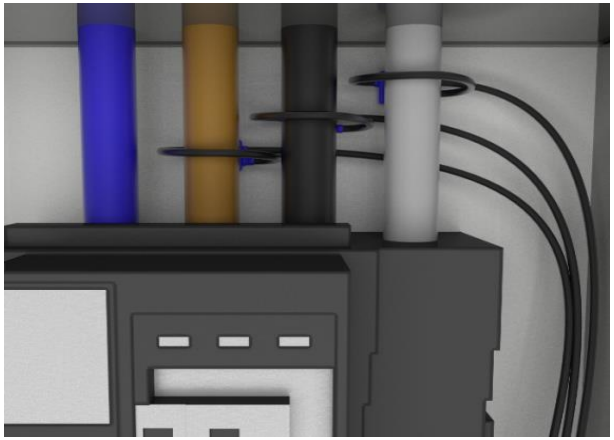
⚠ The « neutral » input must be connected to the neutral of the network (or the Earth if no neutral is present), otherwise the Smart Analyzer can be damaged.

3. Installation of the current sensors of the Smart Analyzer

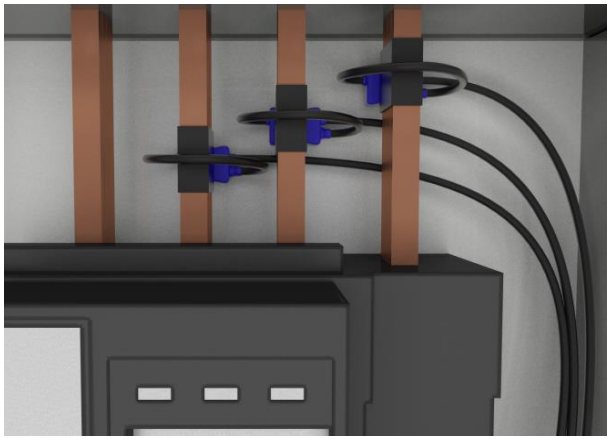
The Smart Analyzer® supports two types of sensors: «RT» and « ART ».

The order of phases and sensor directions are important. The arrow positioned inside the core must point toward the direction of the current, from the power source to the instrumented incoming. The Smart Analyzer will not be able to measure and analyze the signals with a wrong set-up.

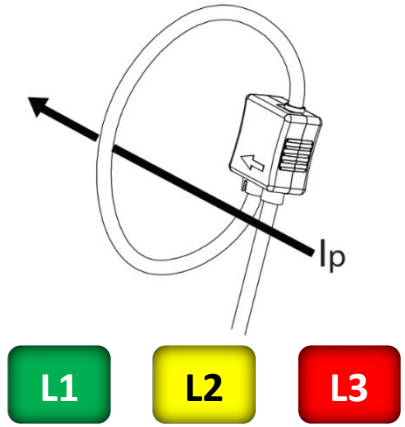
In order to get the sensors well installed, please follow one of the following examples:



RT or ART sensors on cables



ART sensors on busbars



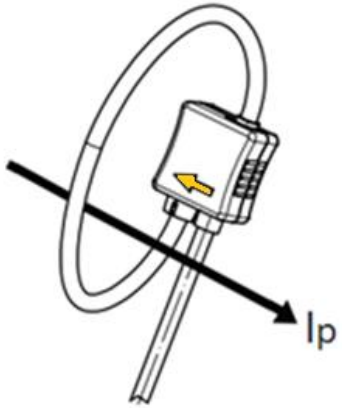
Note 1 : The current sensors come with a 3-metre cable, if you need more length (5-metre extensions available), please contact Smart Impulse.

Note 2 : If several wires are used on a single phase, it is allowed to encircle only a part of the conductors. **Please tell Smart Impulse if you do so.**

Note 3 : If there are busbars, only ART sensors must be used.

Note 4 : If there are several incomings, it is recommended to install sensors on each of them in order to sum the measurements.

4. Capacitors banks



If the main switchboard is equipped with a capacitor bank, a set of sensors has to be installed to measure and isolate its consumption.

Unlike the main measurement, those sensors must be installed so that the arrow points towards the **opposite direction of the current, from the capacitor bank to its protection circuit breaker.**

When the sensors are being installed, please pay attention to the order of the phases: the phases 1 of the capacitor bank and the mains must be plugged together on the same coupler, on the Smart Analyzer. Ditto for the other phases.

If **BNC extension cables** are used, they must be connected to every sensor: those for the mains and those for the capacitor bank, so that the wire lengths are the same.

If there are several incomings, **each of them** as well as **each capacitor bank** have to be measured.

5. Switching On

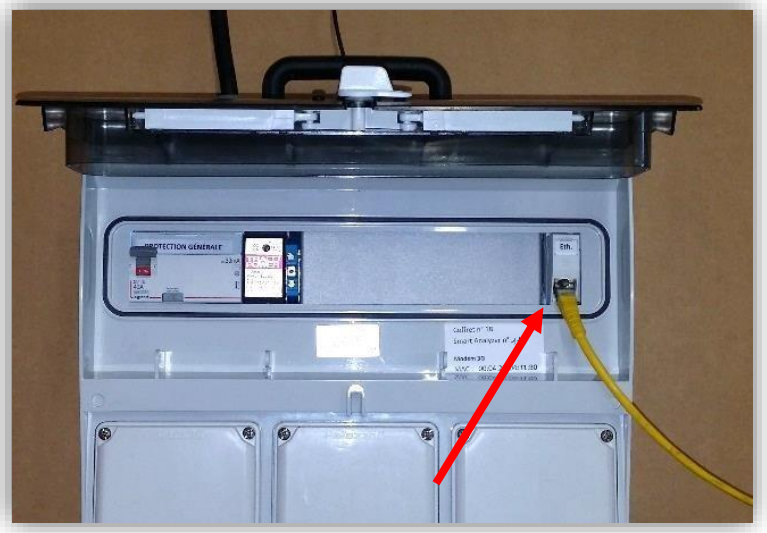
The device starts automatically as soon as it is supplied with power. Please check the following indicators:

1. The green LED of the 24 V power supply should be lit.
2. The green LED of the Smart Analyzer should be lit and the red LED should be blinking slowly.
3. The Ethernet LED of the Smart Analyzer should be on.

6. Network

En LAN :

Connect the Ethernet cable of the RJ45 port (under the Smart Analyzer or in front of the cabinet).



En 3G :

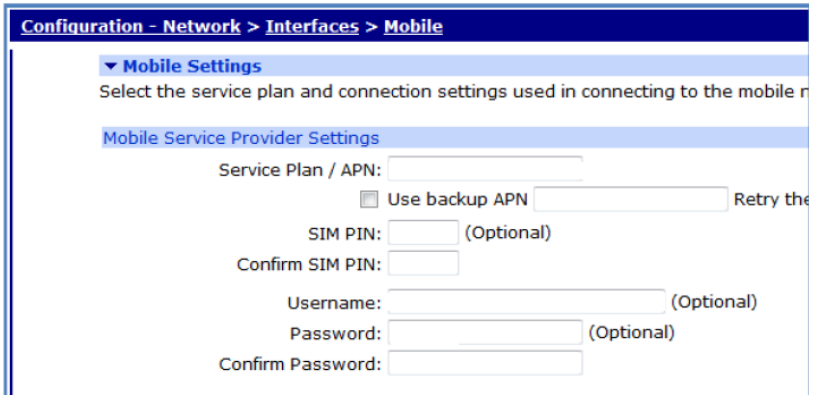
Place the antenna (magnet) where the UMTS network coverage is best: check the « **SIGNAL** » and « **SERVICE** » LEDs on the modem.

Connect the Ethernet cable from the LAN 0 connector on the modem to the RJ45 connector (under the Smart Analyzer or in front of the cabinet).

POWER lit = modem on	**SIGNAL** = signal strength
SERVICE lit = network detected	**SERVICE** blinking = network not detected

By default, the modems are not configured for any provider. To configure the modem with your SIM card parameters:

1. Connect your laptop to the modem using an Ethernet cable.
2. Open a browser and go to http://192.168.0.254.
3. Log in (username and password provided by Smart Impulse).
4. Browse to Configuration > Network > Interfaces > Mobile
5. Insert your **APN** and, if needed, **PIN**, **username** and **password**.
6. **Apply** the changes and **save** the configuration



7. Validation of the installation of the Smart Analyzer

In order to validate the setup, please follow these steps.

The meter includes a web configuration interface allowing the modification of the device parameters, to access it:

1) Connect a laptop using a straight Ethernet cable:

- UMTS: using the port LAN 1 of the modem.
- LAN: using a switch, in order to keep the Smart Analyzer connected to Internet.

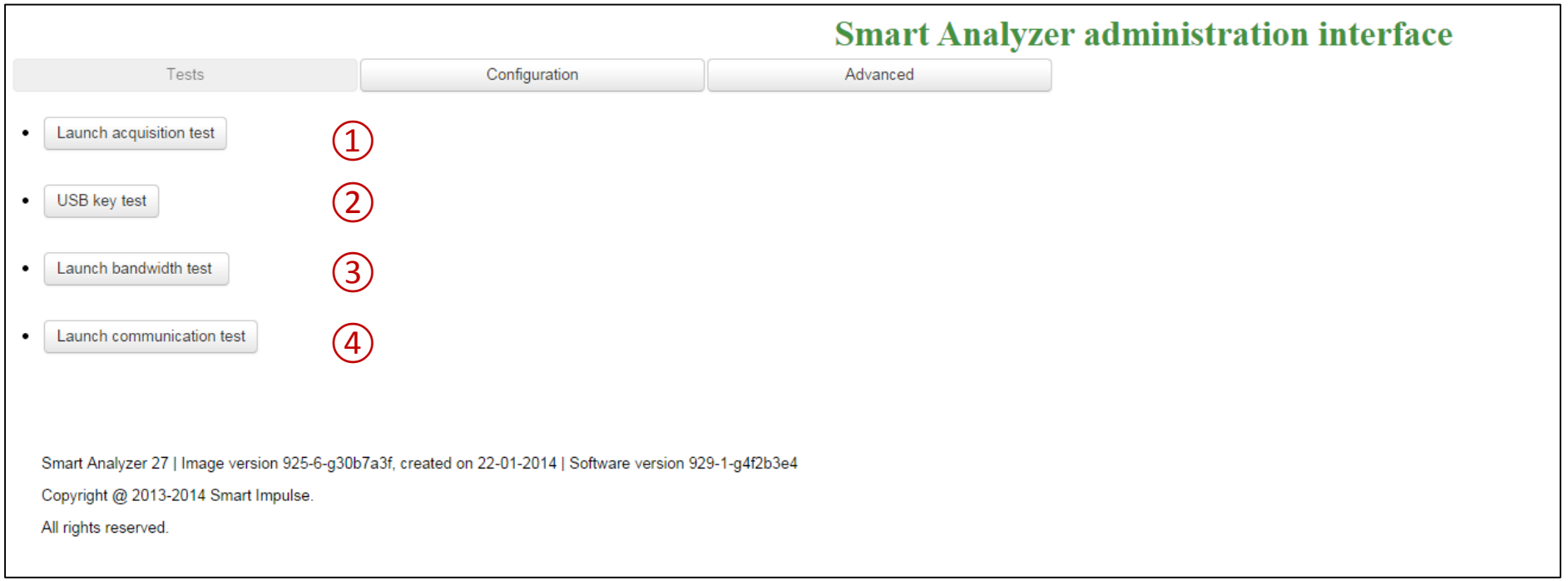
2) Open a web browser and go to the web configuration interface of the Smart Analyzer:

- UMTS: **http://192.168.0.6** (default static IP of the meter)
- LAN : **http://...** (IP address assigned on local network)

The following page is displayed:

Log in with the password: « **smartinstall** », then click « Valider ».

Once logged in, the Tests tab is displayed:



If your setup includes several measuring points (capacitor bank(s), coupled transformers, …), please **test each element independently of the others and then all connected together**.

Example:

- Main incoming only
- 1st capacitor bank
- 2nd capacitor bank
- Main incoming + 1st and 2nd capacitor banks (all connected to the Smart Analyzer)

NOTE: Please make screenshots after each test and save them on a Word document or in pictures.

Proceed with test ①

Expected results for the measurement of the main incoming or all connected elements:

Ⓐ The active powers P must all be positive.

Ⓑ The reactive powers Q are generally lower than the active powers P (|Q|< P).

Ⓒ Phi phase shifts are less than ± 45°.

Example of a valid result on a main incoming:

- Launch acquisition test

Test in progress ...

Ⓐ Ⓑ Ⓒ

Channel	P (W)	Q (VA)	Phi (°)	Urms (V)	Irms (A)
Green	22540.2	-2783.33	-7.03942	235.256	96.9952
Yellow	23432.2	-3296.28	-8.00745	233.93	101.88
Red	25752.6	-2679.55	-5.94022	235.619	110.675
Blue	-	-	-	-	0.000446399

Restarting Keep-alive daemon (for acquisition): acquisition_daemon.shDaemon not present Program not present Acquisition is already running failed! ... *test finished.*

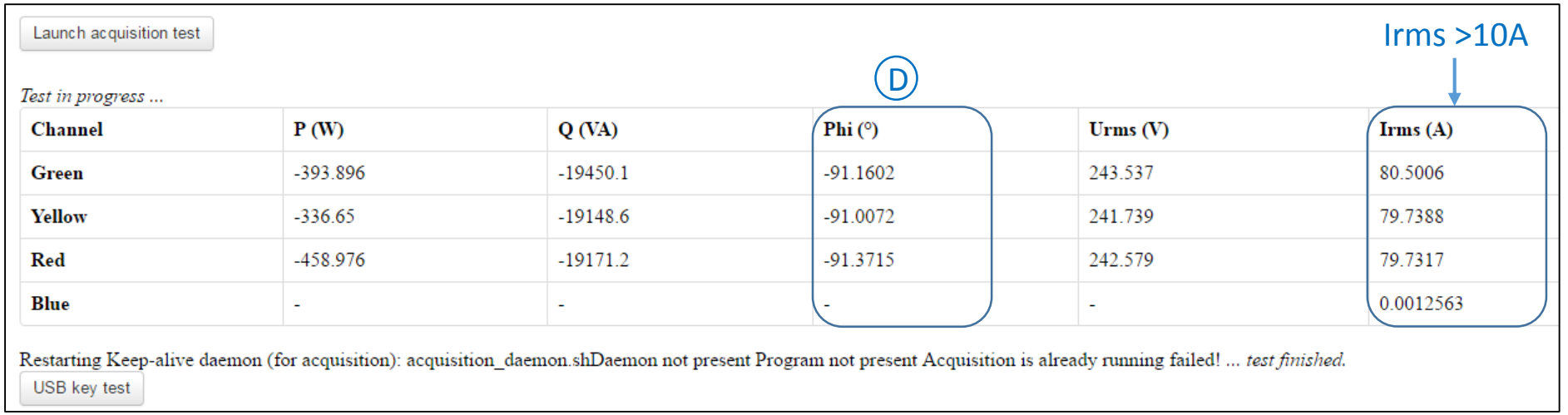
- USB key test

Si the results Ⓐ, Ⓑ and Ⓒ do not match the expected results, **please check the orientation of the sensors and the phase order and then restart the test.**

Expected results for the measurement of a capacitor bank in operation (Irms >10A):

Ⓓ Only look at Phi phase shifts, these must be between -60° et -120°.

Example of a valid result on a capacitor bank in operation:



If the result Ⓓ is not in accordance with the expected result, **please check the orientation of the sensors and the phase order and then restart the test.**

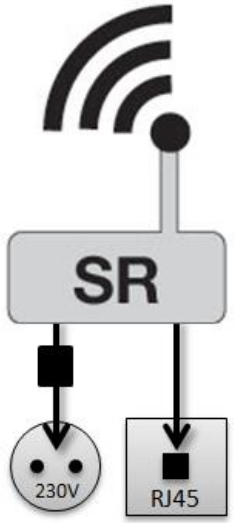
Proceed with test② : the flash drive must be ‘’plugged and working’’.

If the Smart Analyzer is connected to UMTS or LAN, proceed with test ③ then ④.

Installation of the Smart Tag

1. Installation of the Smart Router

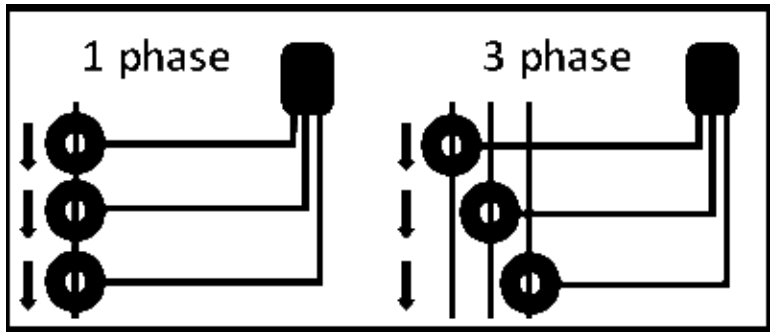
The Smart Router is the radio gateway of the Smart Tag system.
Please follow these steps:



1. Place the Smart Router in the middle of the Smart Tag network.
2. Place the antenna outside of any electrical cabinet.
3. Connect the Smart Router to the network using a straight Ethernet cable.
4. Provide the Smart Router with power using a single-phase power outlet. It will automatically boot up.

2. Installation of the Smart Tag

For each circuit you want to monitor:



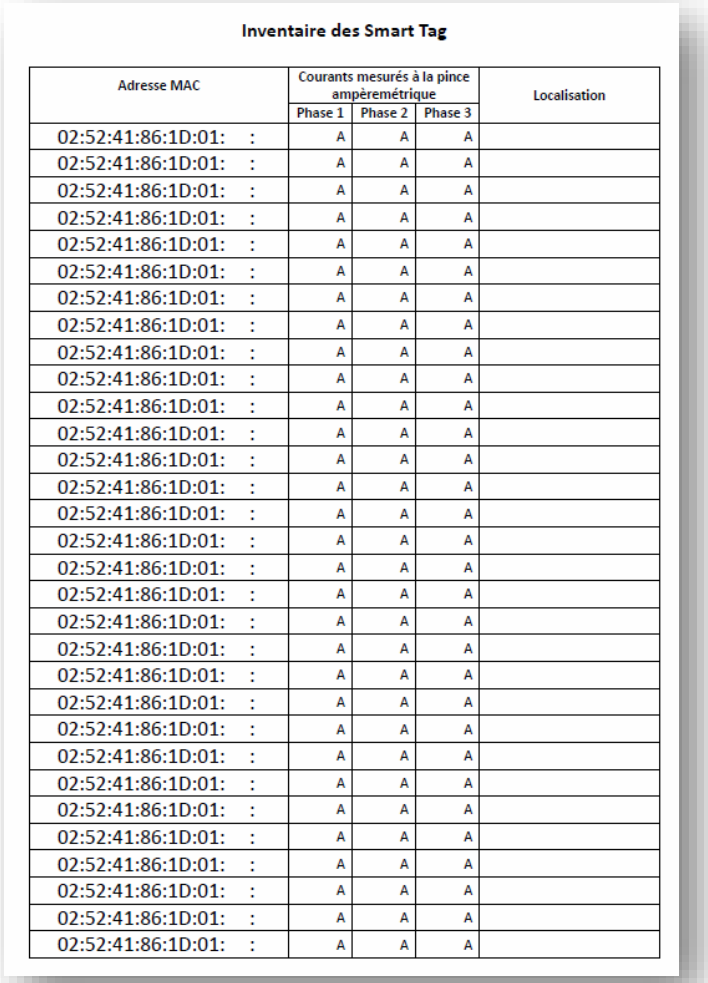
1. Measure the current using a current clamp and report the values on page 11 of this document.
2. Place the 3 sensors of the Smart Tag on the cable(s) of the chosen circuit.
   - **3-phase**: each sensor should correspond to the correct phase
   - **Single-phase**: the three sensors should be placed together on the **phase**, not the neutral.

3. Check the status of the LED:
   - « 6loWPAN status » LED (front) off: no current.
   - Red LED slowly blinking (≈ 1 s): accumulating energy.
   - Red LED rapidly blinking: measuring, trying to connect to the gateway.
   - Green LED lit: measuring, connected to the gateway.
4. Place the Smart Tag electronic box.
   - In case of a metallic cabinet, the Smart Tag must be fixed **outside of the cabinet**, using the magnet on the back.
   - In case of a plastic cabinet, the Smart Tag can, be fixed outside of the cabinet using the adhesive patch on the back.

3. Inventory of Smart Tag

Please fill in the form **« Inventory of Smart Tag »** in order to record the position of each Smart Tag, then send it to technique@smart-impulse.com.

The document is also available at: http://doc.smart-impulse.com.



Inventaire des Smart Tag

Adresse MAC	Courants mesurés à la pince ampèremétrique			Localisation
	Phase 1	Phase 2	Phase 3	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	
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02:52:41:86:1D:01: :	A	A	A	
02:52:41:86:1D:01: :	A	A	A	

Notes:

Notes:

Once all the tests have been run and the installation has been checked, please contact Smart Impulse technical support to make sure the data is collected by the server.

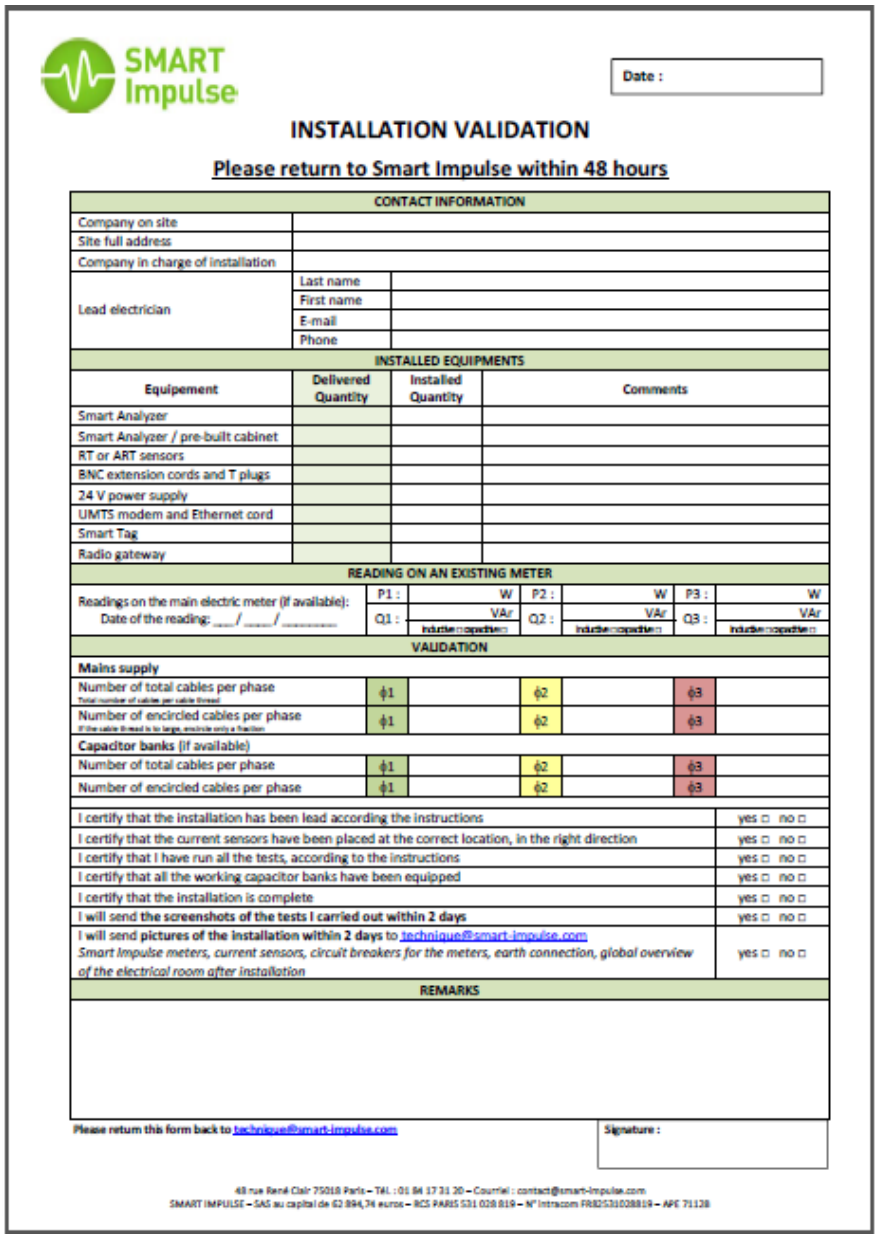
Please also send the installation validation form and the following pictures:

- Smart Impulse meter,
- current sensors,
- circuit-breaker of the meters,
- earth bonding,
- global view of the electrical room after installation.

TECHNICAL SUPPORT

+33 1.84.17.31.25

The installation will be considered as complete only after Smart Impulse checks the pictures of the installation.



SMART Impulse

Date :

INSTALLATION VALIDATION

Please return to Smart Impulse within 48 hours

CONTACT INFORMATION		
Company on site		
Site full address		
Company in charge of installation		
Lead electrician	Last name	
	First name	
	E-mail	
	Phone	

INSTALLED EQUIPMENTS			
Equipement	Delivered Quantity	Installed Quantity	Comments
Smart Analyzer			
Smart Analyzer / pre-built cabinet			
RT or ART sensors			
BNC extension cords and T plugs			
24 V power supply			
UMTS modem and Ethernet cord			
Smart Tag			
Radio gateway			

READING ON AN EXISTING METER						
Readings on the main electric meter (if available): Date of the reading: ___/___/_____	P1 :	W	P2 :	W	P3 :	W
	Q1 :	VAr inductive ☐ capacitive ☐	Q2 :	VAr inductive ☐ capacitive ☐	Q3 :	VAr inductive ☐ capacitive ☐

VALIDATION						
Mains supply						
Number of total cables per phase	ϕ1		ϕ2		ϕ3	
Number of encircled cables per phase	ϕ1		ϕ2		ϕ3	
Capacitor banks (if available)						
Number of total cables per phase	ϕ1		ϕ2		ϕ3	
Number of encircled cables per phase	ϕ1		ϕ2		ϕ3	

I certify that the installation has been lead according the instructions	yes ☐ no ☐
I certify that the current sensors have been placed at the correct location, in the right direction	yes ☐ no ☐
I certify that I have run all the tests, according to the instructions	yes ☐ no ☐
I certify that all the working capacitor banks have been equipped	yes ☐ no ☐
I certify that the installation is complete	yes ☐ no ☐
I will send **the screenshots of the tests I carried out within 2 days**	yes ☐ no ☐
I will send **pictures of the installation within 2 days** to technique@smart-impulse.com *Smart Impulse meters, current sensors, circuit breakers for the meters, earth connection, global overview of the electrical room after installation*	yes ☐ no ☐

REMARKS

Please return this form back to technique@smart-impulse.com

Signature :

48 rue René Clair 75018 Paris – Tél. : 01 84 17 31 20 – Courriel : contact@smart-impulse.com
SMART IMPULSE – SAS au capital de 62 894,74 euros – RCS PARIS 531 028 819 – N° Intracom FR82531028819 – APE 7112B