



Power Node Reader V2

User's Guide

Revision 3.2



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Read This First

Welcome to the CXIGNITED. This User's Guide is designed to help you get up and running quickly using this high-quality Radio Frequency Identification (RFID) system. It describes all you need to know about how to install and use the CXIGNITED system and its associated applications.

This guide is designed for all CIT (Certified Integrators by CXIGNITED) and for CXIGNITED Expert Network customers implementing a low-cost and high-performance RFID solution.

This document does not assume any previous knowledge of Radio Frequency Identification (RFID) technology.

Conventions

Symbol	Meaning
	<p>CAUTION: A note that advises users that a specific action could result in the loss of data or damage the hardware.</p> <p>WARNING: A note that advises users that a specific action may result in physical harm.</p>
	<p>A note that provides additional information that helps the user performing a task or obtaining the best performance from the product.</p>

If you need assistance

Please contact your nearest CXIGNITED Sales Representative or the CXIGNITED Welcome Desk at:

Telephone: +33 (0)4 42 18 89 00
Fax: +33 (0)4 42 18 89 01
E-Mail: info@cxignited.com
Website: <http://www.cxignited.com>

Contact for Comments

We welcome your feedback to help us provide high quality documentation.

For technical comments, please contact our Welcome Desk:

Telephone: +33 (0)4 42 18 89 00
Fax: +33 (0)4 42 18 89 01
E-Mail: info@cxignited.com

Please remember to quote the Document Reference Number **DOC I6594A0**, your job title and your company.

Quality Issues

CXIGNITED implements stringent quality controls at all stages of its manufacturing process. However, should you find a defect with this product, please notify your CXIGNITED Quality Service representative using the dedicated Product Return Form.

Telephone: +33 (0)4 42 18 89 00
E-Mail: rma@cxignited.com

TABLE OF CONTENT

PUBLISHING INFORMATION	2
DISCLAIMER AND LIMITATION OF LIABILITY	2
READ THIS FIRST	4
CONVENTIONS	4
IF YOU NEED ASSISTANCE	4
CONTACT FOR COMMENTS	4
QUALITY ISSUES	5
1 FOR YOUR SAFETY	9
1.1 GENERAL USE	9
1.2 CARE AND MAINTENANCE	9
1.3 SAFETY INFORMATION	10
1.3.1 OPERATING ENVIRONMENT	10
1.3.2 OPERATING CONDITIONS	10
1.3.3 BATTERIES	10
2 CERTIFICATION	11
2.1 REGULATORY NOTICES FOR OPERATION IN THE US	11
2.2 REGULATORY NOTICES FOR OPERATION IN THE EU AND DoC	13
2.3 ELECTRICAL SAFETY	14
2.4 ROHS (RESTRICTION OF THE USES OF CERTAIN HAZARDOUS SUBSTANCES)	14
2.5 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)	14
3 POWER NODE READER DESCRIPTION	15
3.1 DELIVERY PACK	15
4 POWER NODE READER COMMUNICATION INTERFACES	17
4.1 POWER NODE PARTS	17
4.2 POWER NODE ANTENNA CLUSTERS	18
5 POWER NODE READER INSTALLATION AND OPERATION	21
5.1 POWER NODE INSTALLATION	21
5.1.1 INSTALLATION BEST PRACTICES SUMMARY	23
5.2 POWER NODE CONFIGURATION SOFTWARE	24
6 ENVIRONMENTAL AND MECHANICAL DATA	29
7 TROUBLESHOOTING	30

8	WARRANTY CONDITIONS	31
8.1	WARRANTY	31
8.2	WARRANTY EXCLUSIONS	31
8.2.1	GENERAL PROVISIONS	31
8.2.2	HOW TO RETURN DEFECTIVE PRODUCTS	32

TABLE OF FIGURES

Figure 1: Power Node Radio Part.....	16
Figure 2 : Battery and Power Supply Pack.....	16
Figure 3 : Connectors' cover	16
Figure 4 : Power Node Notch Cover.....	16
Figure 5 : Power node Reader dismantled	17
Figure 6 : Patch Antenna in its casing.....	19
Figure 7 : Bow Tie Dipole Antenna.....	20
Figure 8 : Bow-Tie Dipole Dimensions	20
Figure 9 : Power Node Standing Up right with integral antenna vertical.....	21
Figure 10 : Plastic Stand to position the Power Node Reader in Upright Position	22
Figure 11: Fixture Side Bar Power Node Strap Fixation.....	22
Figure 12 : Power Node or Antenna Wall fixation	23
Figure 13 : PN installation best practices.....	23
Figure 14 : Main Windows after entering Hot Spot parameters	24
Figure 15 : Main Screen following a Test PN query	25
Figure 16 : Start of the Read PN sequence with the first PN.....	26
Figure 17 : Final Screen after completion of the 2 PN reading cycles.....	27
Figure 18 : HTML result file open in a Window Explorer browser.	27
Figure 19 : Log file of all passed commands to HS and PN.....	28

I For Your Safety

I.1 General Use

The Power Node Reader is designed to be reliable and to provide years of trouble-free service. Please observe the following general tips:

- Take care not to scratch the device. Keep the device clean. When working with the device, use only CXIGNITED-approved accessories.
- This device is not waterproof and should not be exposed to rain or moisture. Under extreme conditions, water may enter the circuitry.
- Protect the device from extreme temperatures. For example, do not place the device in a windowed area where the sun may cause extreme temperatures, and keep it away from heaters and other heat sources.
- Do not store or use the device in any location that is extremely dusty, damp, or wet.
- Use a soft, damp cloth to clean the device. If the surface of the device becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.

I.2 Care and Maintenance

This device is a product of superior design and should be handled with care. The suggestions below will further increase the lifetime of this device.

- Keep the device and all parts and accessories out of the reach of small children.
- Keep the device dry. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits.
- Do not use or store the device in dusty, dirty areas. Its moving parts can be damaged.
- Do not store in hot areas. High temperatures can shorten the life of electronic devices, damage batteries and warp or melt certain plastics.
- Do not store in cold areas. When the device warms up (to its normal temperature), moisture can form inside the device, which may damage electronic circuit boards.
- Do not attempt to open the device. Non-professional handling of the device may damage it.
- Handle the device with care. Shocks may break internal circuit boards.
- Do not clean the device with harsh chemicals, cleaning solvents or strong detergents. Gently wipe the device with a soft cloth slightly dampened in a mild soap-and-water solution.
- Do not paint the device. Paint may clog the device's moving parts and prevent proper operation. Paint with metallic contents may limit device performances.
- Do not bend the antenna part or lean on it.
- Do not put stress on antenna cables. Avoid bending the antenna cables to a radius of less than 1 inch (2.5 cm).
- Do not pull the cables for connecting and disconnecting. Always handle the connectors itself, either with your hands or with an adapted tool.
- If an antenna cable is broken, position the cable such that the broken ends do not touch metal until it has been replaced. Contact your nearest qualified CXIGNITED representative.
- If the device or any accessory are not working properly, take it to your nearest qualified CXIGNITED representative.
- Do not attempt to remove or dispose of fitted batteries. Contact your nearest qualified CXIGNITED representative or contact.
- Remove at once any condensation using a dry and clean piece of cloth to prevent corrosion of metallic parts

1.3 Safety Information

1.3.1 Operating Environment

When connecting the device or any accessory to another device, read its user's guide for detailed safety instructions. Do not connect incompatible products.

As with all RF equipment, users are advised that the equipment should only be used in its normal operating position.

This product is designed and tested to withstand normal indoor environmental conditions following the FCC Part 15 guidelines.

- Temperature ranging from 0 to 55°C
- Humidity level ranging from 40% to 60% Relative Humidity

To insure optimum operating performance the temperature to which the equipment is exposed should be in the range 10°C to 30°C.

1.3.2 Operating Conditions

The Power Node activation time is controlled by the inventory scheduling that is defined by CXIgnited.

Do not change the inventory schedule without prior agreement from CXIgnited.

Under any circumstances, the following operation sequence of the Power Nodes must be respected, otherwise the device may be damaged and may harm the environment:

- Respect a ratio of Power Node activation time and relax time of 1 to 5, i.e. after 10 second activation, wait 50 seconds before the following activation cycle.
- A Power Node must not be activated for more than 2 minutes consecutively and must remain inactive for at least 10 minutes before the following activation.


1.3.3 Batteries

CXIgnited RFID products contain batteries of very specific types and technology. Do not attempt to change them yourself. Public safety would inevitably put at risk.

Power node can host up to three 2600mAH Lithium Ion batteries.

Do not add or change cells: if a single cell is present leave it that way. At initial system installation, the number of necessary batteries is carefully assessed per the settings.

If you think capacity is not adequate, please contact CXIgnited support.

	<p>WARNING: Do not attempt to open Product Casing to change or dispose of batteries. Contact your designated CXIgnited designated maintenance and support person.</p>
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When handling the battery pack for installation or maintenance, please take care to not short circuit the contacts of the battery back when touching them with metal objects.

2 Certification


2.1 Regulatory Notices for operation in the US

An RFID system, typically composed of a Radio Frequency emission device such as the Power Node Reader connected to an antenna, is subject to local national regulations that may differ by country.

In the present case, the Hot Spot Power Node RFID System has been designed developed and tested to only operate in the USA or any country allowing FCC certified Radio Modules contained in the present product.

	<p>If the Power Node Reader is further integrated in a different product, it is the responsibility of the manufacturer of this complementary product to obtain the required approvals for this product.</p>
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The Power Node Reader has been designed to comply with Part 15 C and B of the FCC Rules for the US version. It has been Granted an Authorization as a radio and computer peripheral Equipment. The grant of operation is FCC ID is QHKPNV2CLUSTER. All necessary proofs of conformity, including Grants of Equipment Authorization are available from the FCC Web site using the FCC ID.

	<p>Changes or modifications not expressly approved by CXIgnited could void the user's authority to operate the equipment.</p>
--	---

This equipment includes an intentional radiator with its FCC ID:

SQGBL652 for the BLE652-SC Low Energy Blue Tooth module connected to an external antenna FlexPIFA LAIRD part number 001-0022 tested and approved with the present module.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The Power Node Reader itself, includes the Low Energy Blue Tooth module.

This device complies with FCC RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Power Node Reader QHKPNV2CLUSTER

WARNING TO USERS IN THE UNITED STATES

FEDERAL COMMUNICATIONS COMMISSION (FCC) RADIO

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different to that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

2.2 Regulatory Notices for operation in the EU and DoC

The Power Node Reader has been designed to comply with the EU Radio Equipment Directive. It has been tested by a notified laboratory in France.

EU DECLARATION OF CONFORMITY

Manufacturer's Name: TAGSYS RFID - CXI
 Manufacturer's Address: 286 Avenue du Pastré ZI des Paluds
 F-13400 AUBAGNE

Declares that the following Products:

HOT SPOT V2 **DDP16577**
POWER NODE V2 **DDP16540**

Powered with the following AC to DC supplies:

- CISCO SF300-24MP-K9-EU PoE+ Ethernet Switch
- ANKER A2123 6 ports USB Charger

Conforms to the following Standards:

EVALUATION OF HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS
 EN62311-1 2008 Edition

RADIO EMISSION
 EN302208-2 V2.1.1
 EN300440-2 V1.4.1
 EN300440-1 V1.6.1

ELECTROMAGNETIC COMPATIBILITY
 EN301489-3 rev. 1.8.1 2002/08 Edition & EN301489-1 rev. 1.4.1 2008/04 Edition

ELECTRICAL SAFETY LOW VOLTAGE ITE
 EN60950-1 2006 Edition

This Product Complies with the Requirements of the following Directives and carries the CE Marking Accordingly:

- 1995/519/EC "Council Recommendation of 12 July 1999 on the Limitation of Exposure of the Public to Electromagnetic Fields (0Hz to 300GHz)"
- 2014/53/EU "RED of Radio Equipment Directive"
- 2014/30/EU "EMC Directive"
- 2006/95/EC and 2014/35/UE "Electrical equipment Low Voltage Directive"

This declaration is issued on the sole responsibility of the manufacturer TAGSYS RFID – CXI based on test reports performed by a notified certification body following harmonized standards.



Changes or modifications not expressly approved by CXIgnited could void the user's authority to operate the equipment.

2.3 Electrical Safety

CXIgnited products are Information Technology Equipment. They all follow the IEC60950 standard.

All parts used in the product follow the UL guidance and are UL recognized.

All Power supplies delivered with the HSPN system are UL listed and LPS.

Plastic enclosures are made using the highest safety grades for flammability according the IEC60950 standard.

	<p>To insure the highest possible level of safety do not replace our PSU or recommended PoE+ switches by equivalent ones without LPS and UL marking.</p>
--	--

2.4 RoHS (Restriction of the uses of certain Hazardous Substances)

CXIGNITED certifies that this product is compliant with the European Directive 2002/95/EC for the restriction in Electric and Electronic Equipment (RoHS) of the use of the following hazardous substances:

- Lead
- Mercury
- Cadmium
- Hexavalent Chromium
- Polybrominated biphenyl flame retardants
- Polybrominated diphenyl ether flame retardants

This declaration is based on information provided by our suppliers and subcontractors.

2.5 WEEE (Waste Electrical and Electronic Equipment)

	<p>Do not dispose yourself of electronic goods: contact your local CXIgnited correspondent. He will advise you of the best way to dispose of our products.</p>
--	--



This product bears the selective sorting symbol for waste electrical and electronic equipment (WEEE)

This means that this product must be handled pursuant to European Directive 2002/96/EC in order to be recycled or dismantled to minimize its impact on the environment.

Do not dispose of your old product in your general household waste bin.

For further information, please contact your local or regional authorities.

3 Power Node Reader Description

The Power Node Reader is designed to be part of a whole “Hot Spot Power Node” system.

The “Hot Spot Power Node” system is designed to emphasize the range of a RFID reader addressing passive tags. The system uses UHF frequency band, following the FCC 15.247 standard (including frequency hopping feature), and ISO 18000-6c protocol.

In this system, the Hot Spot, that includes a RFID reader, pilots many Power Nodes through remote links. The Power Nodes are put close to tags areas, to efficiently energize the tags. The Power node repeats and amplifies the RFID interrogation signal. The Hot Spot transmits the RFID interrogation and receives the backscattered signal from the passive tags.

The remote link to the Power Nodes and the interrogation signals are not transmitted in the same time intervals.


The Power Node radio receives the Hot Spot, RFID interrogation signal, amplifies it and transmits it to the passive tags.

The Power Node Battery pack has up to three 2400mAh 1850 Lithium Ion Rod type rechargeable batteries.

The number of batteries inserted can vary according to the installation. Usually, when PN are permanently supplied with power from the USB port inlet, only one battery is fitted.

On the bottom of the battery pack a micro USB connector allows to charge and supply power using a 6 port ANKER A2123 USB charger.

It takes typically up to 6 hours to fully recharge the 3 batteries in parallel.

	To insure the highest possible level of safety do not replace our recommended PSU or by equivalent ones. In doing so you will also keep the compliance of your system.
---	--

A Power Node RFID reader cannot operate on its own.

It needs BLE signals from the Hot Spot V2 to get operation commands and a 2.45GHz analogue signal broadcast to generate its RFID interrogation signal in the 902-928MHz US band or 866-867MHz EU band.

3.1 Delivery Pack

The power node is delivered with the following parts:

- A power node Radio Pack refer to [Figure 1](#)
- A Battery and Supply Pack [Figure 2](#)
- A notch cover [Figure 4](#) to easily feed through a Zip-Tie to affix the power node to fixtures side bars
- A specific key to unlock and separate the power pack from the Radio feeding it through two holes
- A Connectors' cover [Figure 3](#) to discreetly hide the cables and connectors from the view of customers.

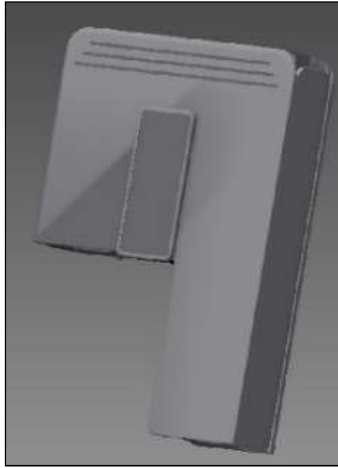


Figure 1 : Power Node Radio Part

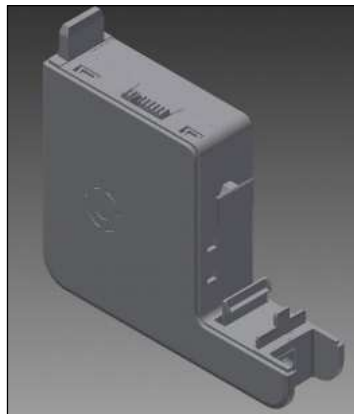


Figure 2 : Battery and Power Supply Pack

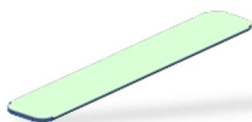


Figure 3 : Connectors' cover

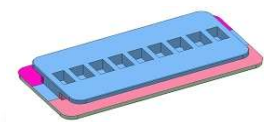


Figure 4 : Power Node Notch Cover

Only one universal main Power Supplies is strongly recommended by CXIgnited to fit the Power Node electrical and safety requirements:

- The ANKER 2123 USB charger with six ports available. It is well suited for up to 6 Power Nodes connection.

4 Power Node Reader Communication Interfaces

4.1 Power Node Parts

The Power Node Reader has 8 external MCX jack connector's Antenna ports:

From the Bottom to the top left:

- RF Output Port #8
- RF Output Port #7
- RF Output Port #6
- RF Output Port #5
- RF Output Port #4
- RF Output Port #3
- RF Output Port #1
- RF Output Port #1
- 5V0 DC input 2,5 A maximum micro USB socket (bottom left side of Battery Pack)



The Power Node Reader V2 can only to be powered by the recommended Power Supply Units.
Only the USB port is available for powering and charging

The main disconnecting devices for the auxiliary Power Supply Units are their IEC plug Inlets. If personal cannot reach them easily when placed high up, do make sure the mains plug used can be isolated from a dedicated circuit breaker easily accessible.


Figure 5 shows the Power node dismantled. Left hand side the Radio Part, Right hand side the Integral Battery Pack. Further left the 8 MCX plugs are visible. Battery back should always be placed downwards for optimum integral antenna orientation.



Figure 5 : Power node Reader dismantled

4.2 Power Node Antenna Clusters

This new generation of distributed RFID interrogators readers can only work with specific set of antennas call clusters for the Power node optimum operation.

	<p>The Power Node Reader V2 915MHz transmit antenna Clusters are supplied by CXIgnited. They have been designed to efficiently illuminate and interrogate items and tested to be compliant to US and EU ETSI regulations. They also limit the human exposure to Electromagnetic fields.</p> <p>Do not connect any other antenna but the one supplied and fitted by CXIGNITED!</p>
---	--

Each RF port can supply 4 clusters of 4 antennas without significant loss in performance. Each cluster possesses an MCX RF inlet from either the PN RF port for the first one of from a cluster. In that case, a specific cable from SMB to MCX must be used to daisy chain the cluster. It is made of LRM195 coaxial cable with losses of 0.4dB/m at 915MHz operating frequency.

Figure 6 shows the cable arrangement supplied by TAGSYS – CXI to connect the first cluster to one of the 8 RF ports available from the Power Node. The length A ranges from 0.5m to 3m in 0.5m steps.

Figure 7 shows the cable arrangement supplied by TAGSYS – CXI to connect the cluster n nearest to the PN V2 to the cluster n+1. The lengths available range from 0.5m to 3m in 0.5m steps.

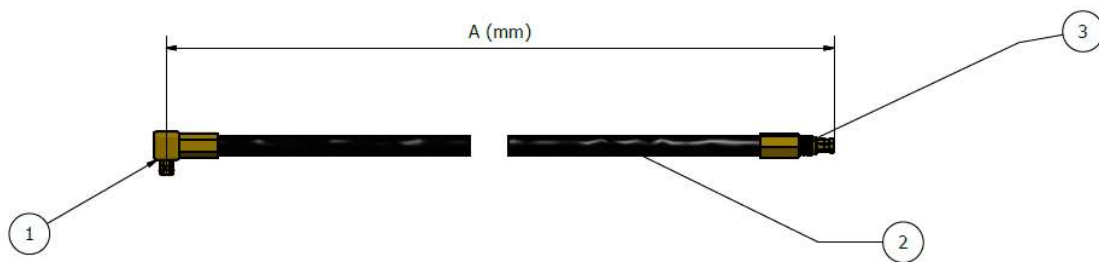


Figure 6: MCX PN V2 RF Port to Cluster Input Port Cable

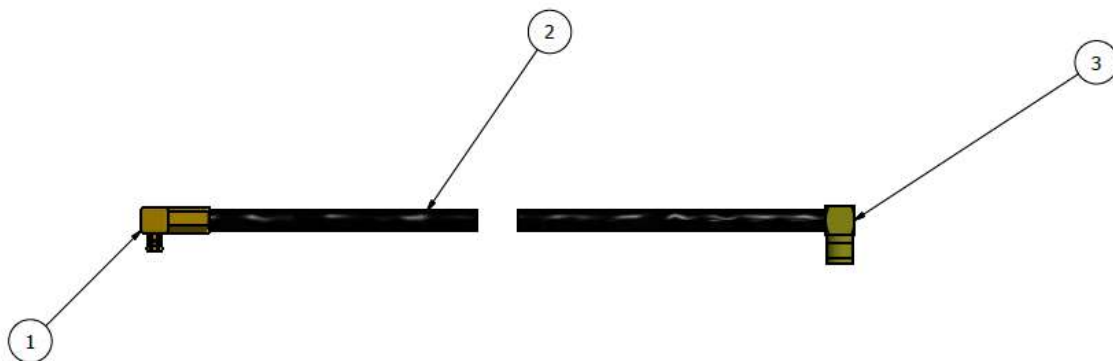


Figure 7: MCX Cluster n RF Input left to SMB female RF Cluster n-1 RF Output


	<p>When connecting the PN V2 RF Port or daisy chaining from a previous cluster make sure to use the low loss supplied cables by TAGSYS – CXI!</p> <p>The use of any other type of RF coaxial cables will heavily degrades the system performance</p>
---	---

Figure 8 shows inside a typical antenna cluster made of conventional dipoles. It tends to radiate all over the place with a preferred polarization i.e. communication is optimum when tags and Bow-Tie Dipole longest sides are parallel. Its Bow-Tie radiating element

makes it less sensitive to close by material. Thus, affixing it to metal parts still allows a reduced range operation despite non-optimum placement.

- On the top part is located an antenna multiplexer with switches setting the number of connected antennas. 1 to 4
- The two dipole Antennas, with a gain of 0dBi each

Figure 9 shows inside a 4 antennas clusters as an example.

Standards Clusters are supplied entirely covered up with antennas well protected from external chocs.

They can be placed either inside the furniture when metallic or behind it when wooden.

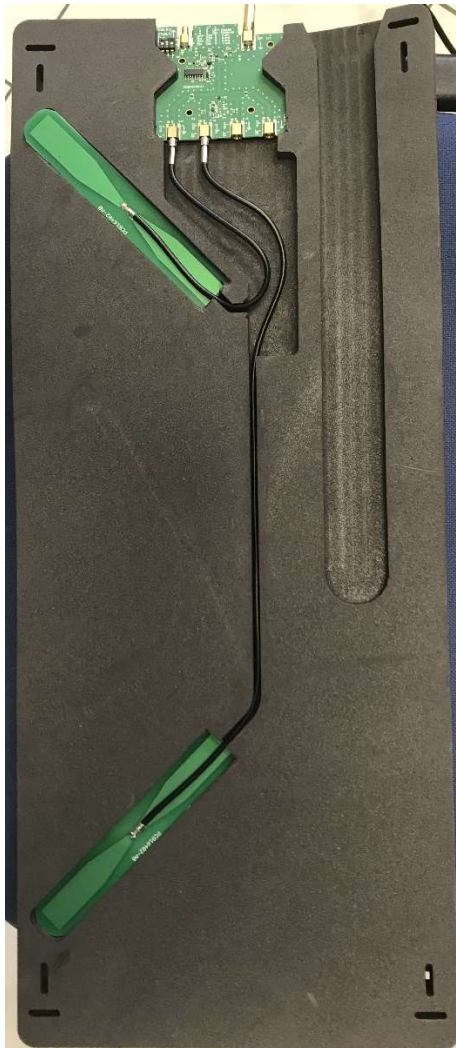


Figure 8 : Cluster of 2 Dipole Antennas

Another type of cluster of circular patch antennas can be seen on Figure 10.

Beam width is narrower which can be approximated to a cone of 90° angle of operation. There are ideal to fit into metallic shelves thanks to their reflectors irradiating only forward.



Figure 9 : Cluster with 4 Bow-Tie Antennas



Clusters come into 3 different widths per type of antennas (Dipole or Patch) including 2, 3 and 4 antennas. **Do make sure to order and fit the best width and type of antennas according to the furniture material (wood or metal) and its dimensions!**



Figure 10 : Cluster 4 antennas fitted with Circular Patch Antennas

Make sure to always use supplied antenna casings! The spacing's and material have been carefully designed to insure optimum radiation and avoid interferences with over apparatus.



Never Connect directly an antenna to a Power Node V2 Reader RF Port!
The V2 system can only work if connected to a cluster and its multiplexor board!

5 Power Node Reader Installation and Operation

5.1 Power Node Installation

The latest generation of Power Nodes readers has no external antennas nearby. This design allows ease of installation and a compact design.

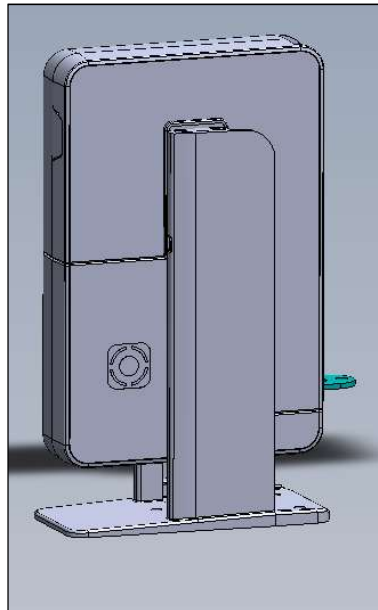


Figure 11 : Power Node Standing Up right with integral antenna vertical

Up to 8 RF channels are available to connect to 8 distant and remote 866-867MHz or 902-928MHz antennas using a shielded cable of up to 5 meters.

During installation, the Power Node Readers should be located high up to easily communicate with the Hot Spot minimizing interferences and fading caused by customers' activity on the floor plan.

In a typical store, the Hot Spots are placed in ceiling. Power Nodes readers should be placed in direct line of sight well above the floor at a minimum of 2-meter height.



For optimum range and read performance, the Power Node Reader 2.45GHz PIFA antennas should be aligned with the Hot Spot Readers in vertical position, upright. No obstacles should be within the line of sight of any PN towards one of the 4 sides of the Hot Spot.

The Power Node casing has rectangular openings/notches in the front and rear surfaces. These notches are used to slide the Power Node onto a plastic stand or mounting plate for placing it on the fixture. If the opening is not used for fixing the Power Node, it shall be covered with the appropriate Power Node Notch Cover.


	<p>For customer's safety in the front store and personal safety in the back store do make sure that the sticky tape liner is removed and the stand well stuck to the surface. This will prevent the Power Node to fall on the head of person if they inadvertently shake the furniture or fixture supporting it.</p>
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Figure 11 shows a typical installation on top of a metal or wooden surface.

Figure 12 shows the plastic stand to be used for placing the Power Node.

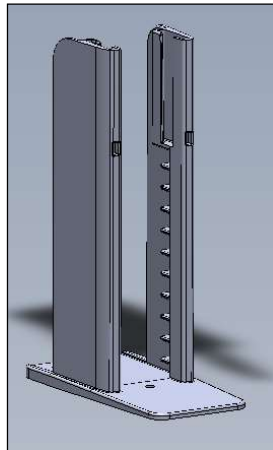


Figure 12 : Plastic Stand to position the Power Node Reader in Upright Position

Alternatively, Power Nodes can be placed close to the item using the metallic structure (Side Bars) of fixtures. This is particularly convenient for dense fixture like rounder's fixtures with up to 200 items. Figure 13 shows that plastic part. This part allows the placing of the PN at any angle.

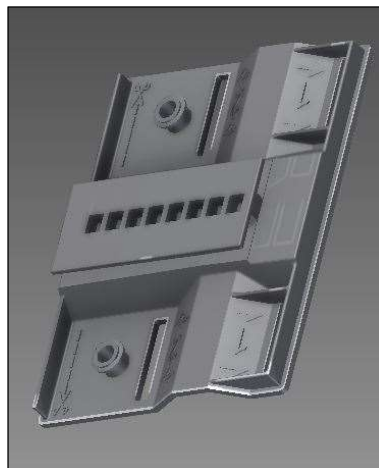


Figure 13: Fixture Side Bar Power Node Strap Fixation

To affix the Power Node to walls, a convenient specific fixation can be supplied as shown on Figure 14. As for the previous case, a ZIP-Tie or raw plugs on a plaster wall would be necessary to affix the fixation. The power node or Antenna casing will simply have to be slotted into it.

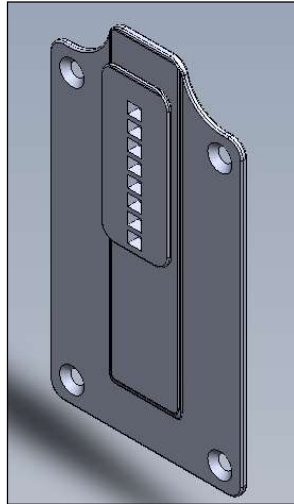



Figure 14 : Power Node or Antenna Wall fixation

	<p>For optimum range, read performance and safety reasons, always place the heavier battery pack at the bottom when in vertical position.</p>
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5.1.1 Installation best practices summary

When installing a power node, do make sure that the battery pack does not face the Hot Spot. It should always be placed behind and other PN should not be placed in front of another but staggered as shown there below.

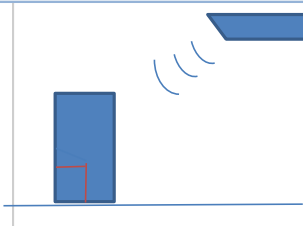
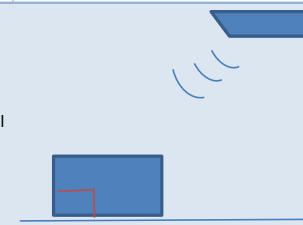

Power Node		
Position		
Vertical		
Semi vertical		
Distance HS - PN	5m max	(direct view)
Position with several PN		
Staggered	 <p style="text-align: center;">view from above shlef</p>	
Separated by 50cm		
Risks	Position	Horizontal
		Horizontal on metal
		Metalic part near PN

Figure 15 : PN installation best practices

5.2 Power Node Configuration Software

The Hot Spot Power Nodes system uses a common Human Interface software to set up some key parameters and connect to a host or Hub. In most cases, it will be a Personal Computer.

This software is intended for CXIgnited or specifically trained personal.

After powering up the Hot Spot Reader you must wait at least 4 minutes before trying to connect. It will allow the Beagle microcomputing board to correctly complete its boot and set-up phases.

To connect to the Hot Spot Reader, enter its IP address which should be "10:40: XXX: YYY" written on the Reader's product Label. Please refer to **Figure 5** for label location with Hot Spot Reader IP Address and RFID Reader's IP Address. By default, the Hot Spot ID is 10:40:29: YY and the Reader's one is 10:40:29: IYY.

Refer to the Hot Spot Configuration Software section of the User's guide to set up the Hot Spot key parameters.

Figure 16 shows the screen just after HS Configuration completion.

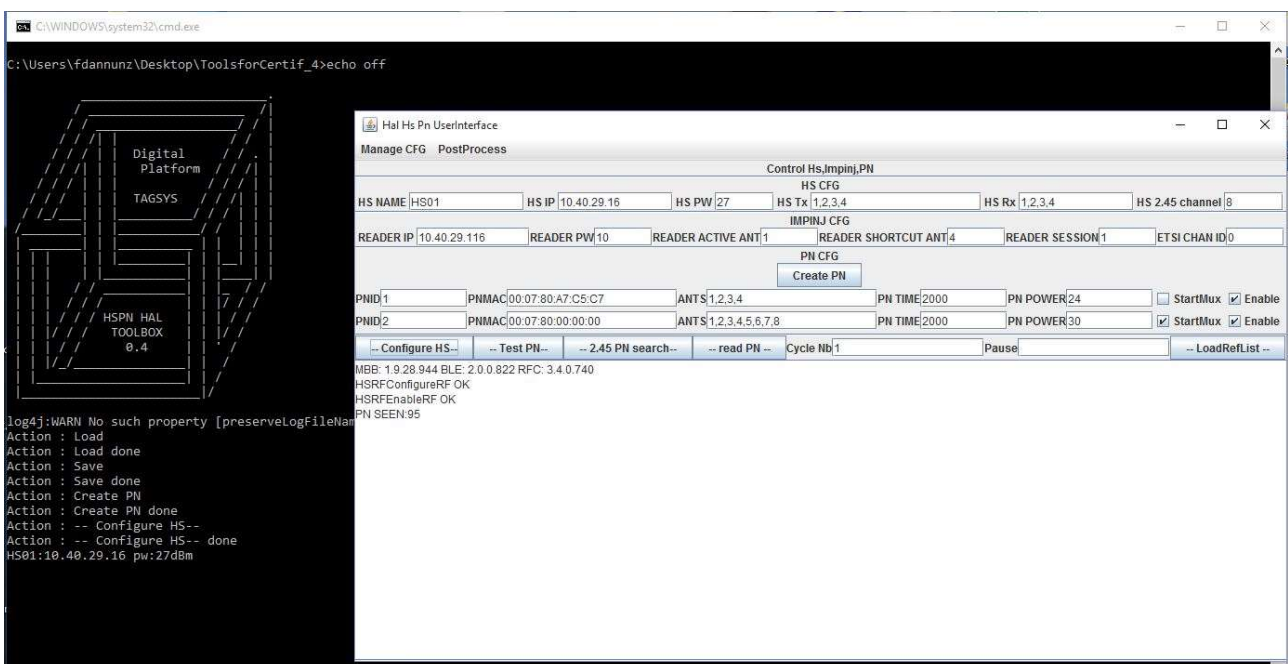


Figure 16 : Main Windows after entering Hot Spot parameters

Now each individual Power Node needs to be first registered to the Hot Spot entering a unique number associated to Unique MAC ID.

In the **PN CFG** field, enter both number and string (Capital Letters) and depress the "Create PN" button as many times as necessary to have a new field available to set.

- PNID** enter here a unique number in whatever order.
- PNMAC** enter here the MAC address of a given Power Node it usually starts with 00:07:80:XX:YY:ZZ you complete reading the product label.
- ANTS** enter here the list of the RF output channel numbers connected to an antenna. For ease of installation, N antennas are connected starting from 1 at the top of the PN. In **Figure 16**, only the first 4 antennas are connected to the PN so only the first 4 channels should be connected.

	<p>For optimum working conditions the PN should not deliver power to an unconnected channel i.e. not connected to an antenna.</p>
--	---

PN TIME

enter here the Transmit RF on time in milliseconds (ms). 2000ms to 10'000ms per antenna are standard time to complete a read round.



Power Node Radio Power Amplifier is not meant to continuously deliver Power over more than 60s on all channel Outputs.
Excessive current consumption may cause overheating of both radio part and battery pack. Make sure not to exceed an overall 60s on time and an off time at least ten times the on time.

PN POWER

enter here the Transmit RF on power in dBm. Typical values range from 20 to 30dBm, optimum range for standards 20mm by 40mm Tag antenna dimensions is 24 to 27dBm.

Start Mux

Tick or untick this option if desired

Enable

Tick or untick this option if you want the PN to be active or not for a specific round of measurement.

There after the Power Node does not need to be switched on to proceed further. Whenever powered by a battery or an external PSU the Power Node will be ready to answer queries and actions commanded by the Hot Spot.

To check that we can properly communicate with the targeted Power Nodes (1 and 2 in our case) we just need to depress the "-- Test PN--" button. On the main window, some information about the hardware and the battery status will appear. Here PN1 and PN2 return their battery voltage respectively 3'915mV and 4'088mV. Refer to the screen shot there below on [Figure 17](#).

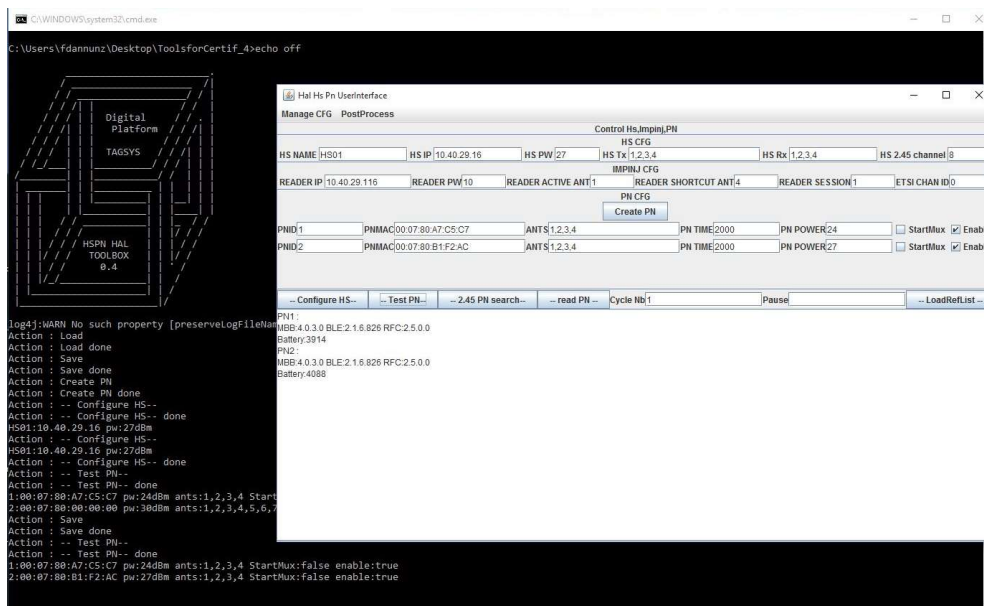


Figure 17 : Main Screen following a Test PN query



Do make sure that the battery voltage level is at least 3.6V before turning the RF on. Due to high inrush-current and high battery resistivity when depleted, the battery voltage could drop below the 3.3V minimum voltage and reduce the battery's life expectancy.

At last, the "--read PN--" command can be launched to read all tags illuminated by all the declared PN antennas and received by the Hot Spot.

A popup window will come up confirming the start of the first Power Node 1 of the list like displayed [Figure 18](#).

In the present set up, the Read PN1 Read PN2 cycles will start 8 times with a pause of 56s in-between on-cycles of 2s per antenna. Here 8 antennas in total during 2s each so 16s on time.

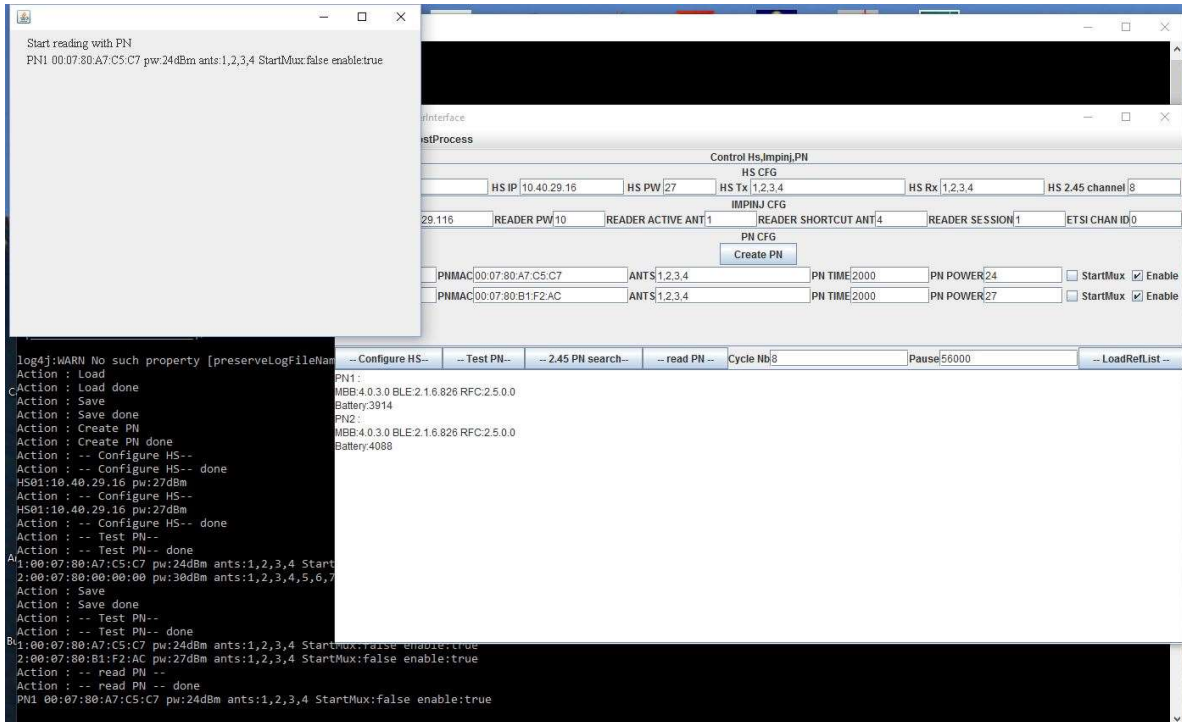


Figure 18 : Start of the Read PN sequence with the first PN.

Screen dump on [Figure 19](#) shows the 2 PN activated and the number of tags read per antenna on the background DOS window.

To distinguish a given population of tags from all neighboring tags illuminated, a "-- LoadRefList --" button allows to load a given list of tags ePC ID to be read. This will allow to get a direct Success Read Rate performance.

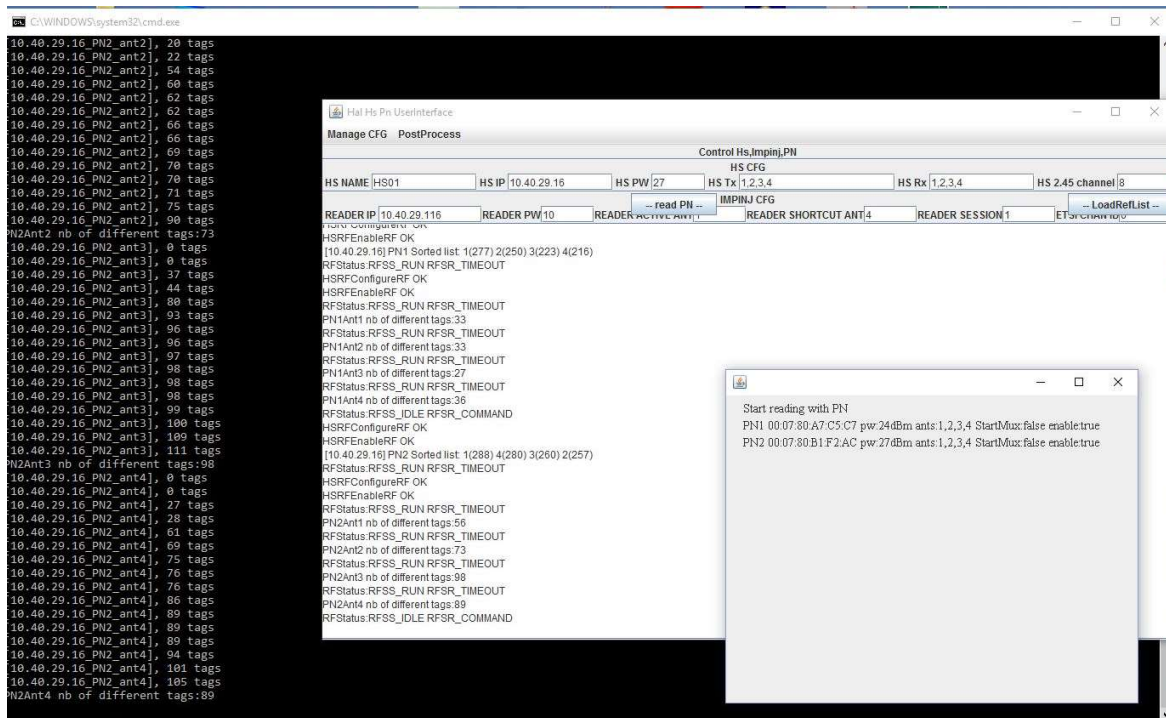


Figure 19 : Final Screen after completion of the 2 PN reading cycles

The results and statistics are saved in a .html file which can be displayed using any Internet browser like in Figure 20 thereafter. The Bac 100H reference List contains 100 tags but only 83 have been read.



Figure 20 : HTML result file open in a Window Explorer browser.

Furthermore, the folder contains a file HalHsPnTool.log which gives all the command and queries passed onto the Hot Spot and actions done by both Hot Spot and Power Nodes. Refer to Figure 21 for more details on the information returned.

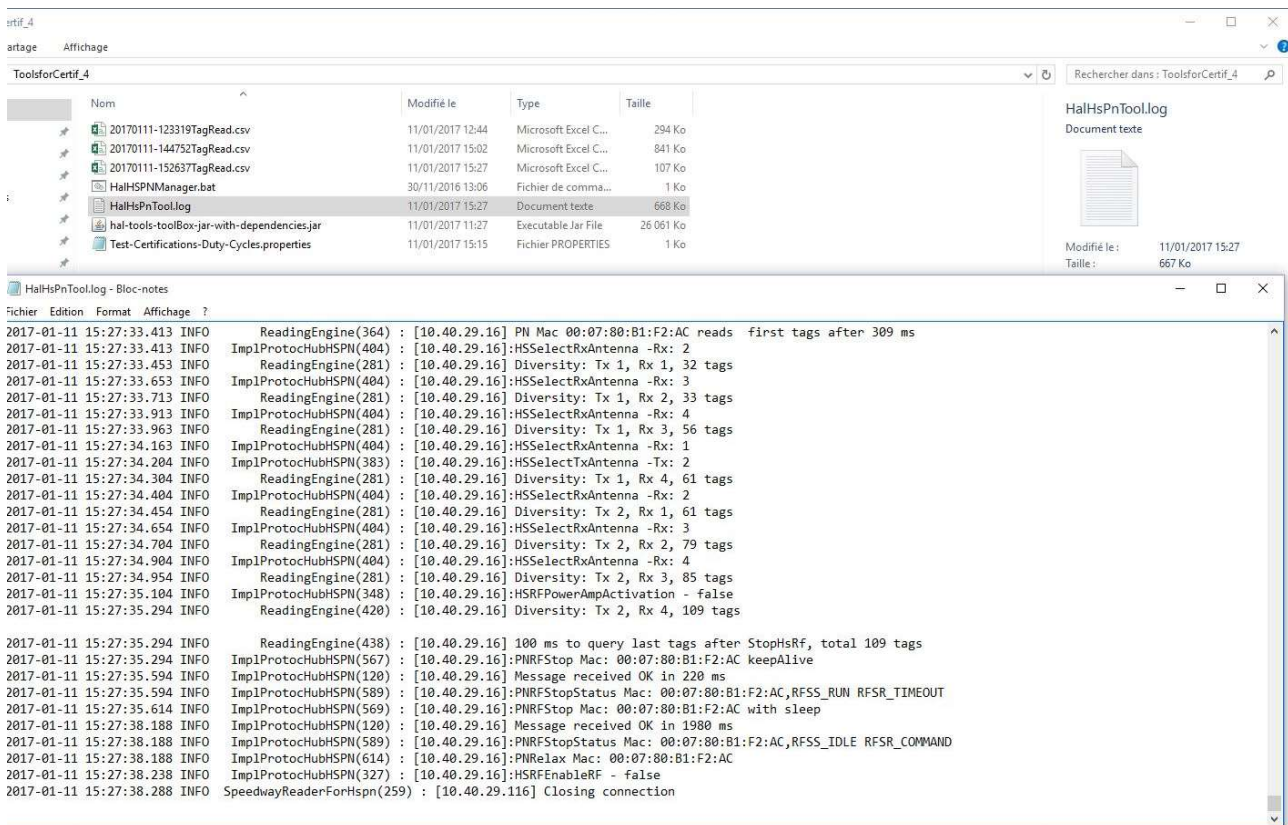


Figure 21 : Log file of all passed commands to HS and PN

Before shutting down your session, do not forget to save your configuration using the “Manage CFG” menu and the “Save” command.

The configuration file saves all parameters but the **Cycle NB**, **pause** parameters and **ETSI/FCC Channel ID** which is set to void or 0 by default.

Anyway, all these three parameters are anyway reserved to Regulatory Compliance Testing and should therefore not be used for performance testing purpose

6 Environmental and Mechanical Data

Environmental operating limits

Maximum Operating Temperature:	30°C
Minimum Operating Temperature:	0°C
Humidity Range	40 to 60% Relative Humidity

Weight	380g
Weight Battery Pack alone	220g
Weight Patch Antenna with 1m cable	230g

Mechanical Dimensions

Length	165mm
Width	110mm
Depth	25mm

Material	Injected ABS
Thickness	1.5mm

Electrical Data

USB Micro C Inlet	5V	2000mA max Current
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7 Troubleshooting

This chapter intends to give some hints in how to quickly check the system for any hardware issue.

The Hot Spot – Power node system is not serviceable, and you need to contact the CXIgnited support team at once.

You can only intervene following precise instructions given by your support contact from CXIgnited.

Before contacting CXIgnited support team first check:

- That all wires are properly connected to the Power Nodes which mainly consists in making sure that the antenna cables have not been disconnected and the permanent USB charger has not been disconnected or is still in operation. Check if the green LED is still lit.
- That the power pack is well latched into the main Radio module. If a small gap between the two parts is visible, then try to firmly latch them back together. Refer to Figure 5 to see how the two parts fit together.

To investigate further, you will receive precise instructions from the CXIgnited support team or you may have to ship it back and get a replacement.

8 Warranty Conditions

8.1 Warranty

CXIGNITED warrants that this Product shall comply with the functional specifications set forth herein for a period of one year from the date of delivery to the Buyer.

CXIGNITED warrants that POWER NODE READER and accessories including the batteries ("Products") are free from defects in material and workmanship under normal use and service for the period commencing upon the date of purchase by the first consumer purchaser and continuing for one (1) year.

This warranty is valid for the original Buyer of the Product and is not assignable or transferable to any other party.

CXIGNITED cannot be responsible in any way for, and disclaims any liability in connection with the operation or performance of:

- any product in which the Product is incorporated;
- any equipment not supplied by CXIGNITED which is attached to or used in connection with the Product; or
- the Product with any equipment

This warranty does only cover the Product to the exclusion of any such other equipment.

Optimal operation and performance of the Product are obtained by using CXIGNITED readers, by applying CXIGNITED installation guidelines and by having your installation reviewed by a CXIGNITED technical consultant.

CXIGNITED warranty does not cover the installation, maintenance or service of the Product and is strictly limited to the replacement of Products considered as defective by CXIGNITED and returned according to the return procedure defined below; in such case, CXIGNITED will, at CXIGNITED' option, either replace or repair every defective Product or refund the purchase price paid by Buyer to CXIGNITED for the defective Product.

8.2 Warranty Exclusions

- Engineering samples and early access products
- Defects or damages resulting from storage of the Product under conditions which do not comply with CXIGNITED specifications or normal usage
- Defects or damages resulting from use of the Product in abnormal conditions (abnormal conditions being defined as any conditions exceeding the ones stated in the product specifications).
- Defects or damages from misuse, accident or neglect.
- Defects from improper testing, operation, maintenance or installation.
- Defects from alteration, modification except modifications or adjustments specifically described in this Product reference guide, adjustment or repair, or any attempt to do any of the foregoing, by anyone other than CXIGNITED.
- Any action on Product that prevents CXIGNITED from performing an inspection and test of the Product in case of a warranty claim.
- Tampering with or abuse of the Product.
- Any use or incorporation by the Buyer or a third party of CXIGNITED Product into lifesaving or life support devices or systems, or any related products; CXIGNITED expressly excludes any liability for such use.

8.2.1 General Provisions

This warranty sets forth the full extent of CXIGNITED responsibility regarding the Product.

In any event, CXIGNITED warranty is strictly limited to (at CXIGNITED' sole option) the replacement or repair or refund of the Products purchase price to CXIGNITED, of Products considered as defective by CXIGNITED.

The remedy provided above is in lieu and to the exclusion of all other remedies, obligations or liabilities on the part of CXIGNITED for damages, whether in contract, tort or otherwise, and including but not limited to, damages for any defects in the Products or for any injury, damage, or loss resulting from such defects or from any work done in connection therewith or for consequential loss, whether based upon lost goodwill, lost resale profits, impairment of other goods or arising from claims by third parties or otherwise.

CXIGNITED disclaims any explicit warranty not provided herein and any implied warranty, guaranty or representation as to performance, quality and absence of hidden defects, and any remedy for breach of contract, which but for this provision, might arise by implication, operation of law, custom of trade or course of dealing, including implied warranties of merchantability and fitness for a particular purpose.

8.2.2 How to Return Defective Products

The Buyer shall notify CXIGNITED of the defects within 15 working days after the defects are discovered.

Defective Products must be returned to CXIGNITED in their complete original packaging, provided such original packaging is available, after assignment by a CXIGNITED Quality Department representative of an RMA (Return Material Authorization) number. If the original packaging is not available, the Buyer shall ensure that the products are returned to CXIGNITED in a packaging that adequately protects said Products. No Products shall be returned without their proof of purchase and without the acceptance number relating to the return procedure.

All Products shall be returned, at Buyer's expense, with a report from the Buyer stating the complete details of the alleged defect.

Call +33 4 42 18 89 00 for return authorization and shipping address.

If returned Products prove to be non-defective, a charge will be applied to cover CXIGNITED analysis cost and shipping costs.

If the warranty does not apply for returned Products (due to age, or application of a warranty exclusion clause), a quote for replacement will be issued, and no replacement will be granted until a valid purchase order is received. If no purchase order is received within 30 days after the date of CXIGNITED quote, CXIGNITED will return the products and charge the analysis cost and shipping costs.

All replaced Products shall become the property of CXIGNITED.

The Product Return Form is included on the following page. This form should accompany any product you need to return to CXIGNITED for analysis in the event of a problem.

Product Return Form

Customer Profile:

Company:.....
 Address:.....

 City & State:
 Zip Code:.....
 Country:.....

RMA Number:

Date:.....
 Contact Name:
 Contact e-mail :
 Contact Phone:.....
 Contact Fax:

Order identification:

Product Name: Serial or Batch nr :.....
 Return Quantity:

Reason for return:

.....

To inform CXIGNITED of this return, please email it to
rma@cxignited.com

Address to ship the product with this document attached:

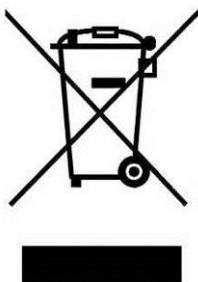
CXIGNITED - QUALITY DEPARTMENT – 286 avenue du Pastré 13400 AUBAGNE France
 To inform CXIGNITED of this return, please also fax it to your Customer Service Representative: +33 442-188-901

Return Procedure:

To give you a RMA number, please fulfill this document and send it by return to the above email address or to your Customer Service Representative. Please write the RMA number on the outside of the box. The product returned will go through stringent quality controls. If the product is no longer under warranty, a final analysis report will be sent to you as soon as possible as well as a quotation for repair.
 Please contact the Quality Representative for further details: +33 442-188-900

Quotation:

In case of no product repair coverage by CXIGNITED or product out of warranty period, any quotation will be charged to a fixed price of 100 € per product.
 This amount will be deducted of the repair price in case of the quotation acceptance, or will be kept by CXIGNITED in case of quote refusal or no answer within 2 weeks. If quote is accepted the product will be return on an Ex works basis.
 After receiving quote, in case of no answer within 2 weeks, CXIGNITED will be entitled to destroy the product.



This product bears the selective sorting symbol for waste electrical and electronic equipment (WEEE).
 This means that this product must be handled pursuant to European Directive 2002/96/EC to be recycled or dismantled to minimize its impact on the environment.
 For further information, please contact your local or regional authorities.