CloudCell 4G

Installation manual

Written by

Paula Araujo	IT Project and Process Manager
Alexey Shorokhov	Industrial Designer

Reviewed by

Tim Kipley	Infrastructure director
Vitaly Kleban	CTO
Slava Vityk	Hardware engineer

Content

Objectives part 1 **4**

Terms of use part 2 **4**

Warranty part 3 **5**

Components part 4 **7**

4.1 CloudCell Gateway 7
4.2 Outdoor Omnidirectional Antenna 7
4.3 RF jumper cable 8
4.4 Lightning protector 8
4.5 Two Micro SIM cards 8
4.6 Grounding straps 9
4.7 Butyl mastic tape 9
4.8 Clamps and cable ties 9
4.9 Ethernet cabling 10
4.10 Recommended equipment 11

Preparing the Gateway and cabling the network part 5 **13**

5.1 Connectors specification 13
5.2 Grounding 14
5.3 Mount Antenna 14
5.4 Mount Gateway 16
5.5 Connect RF jumper cable to the gateway 19
5.6 Ethernet to gateway cable connection 20
5.7 Ethernet to PoE adapter cable connection 23
5.8 Verify all the connectors are correct 26
5.9 Check LEDs indication 26
5.10 Verify gateway is affixed securely on the tower 27

History of revision part 6 **28**

Red **28**

FCC **30**

Objectives part 1

The purpose of this document is to provide cabling, installation, and bootup instructions of a Everynet gateway in an external or tower environment.

Terms of use part 2

- Installer **MUST** strictly follow installation requirements as conditions of product warranty.
- Gateways **MUST** be professionally installed and it is the professional installer's responsibility to make sure the gateway is properly configured and operated within local country regulatory requirements.
- There are no operator serviceable parts inside this equipment. Service MUST be provided only by a qualified service technician approved by gateway manufacturer.
- Compliance is required with respect to voltage, frequency, and current requirements indicated by manufacturer. Connection to a different power source than those specified may result in improper operation, damage to the equipment or pose a fire hazard.
- PoE power source must have a detachable power cord which has an integral safety ground wire connection to a grounded safety outlet.
- Do not substitute the power cord with one that is not the provided approved type. Never use an adapter to connect a 3-wire cable to a 2-wire outlet as this will damage the equipment.
- The equipment requires the use of the ground wire as a part of the safety certification. Modification or misuse may provide a shock hazard that could result in serious injury or death.
- Contact a qualified electrician or the manufacturer if there are questions about the installation prior to connecting the equipment.
- Protective earthing is provided by approved PoE adapter. Building installation shall provide appropriate short-circuit and GFI protection.
- Protective bonding must be installed in accordance with local national wiring rules and regulations.
- Surge protection and grounding should be used for all outdoor installations
- Equipment cabinet located on the bottom of the tower should be grounded to the grounding system of the tower.
- Shielded Category 5 (or above) cabling with drain wire and earth grounding MUST be used for all terminations of wired connections.
- Ethernet cable MUST be properly grounded through the AC ground of the PoE.
- Gateway should be grounded to the grounding point on the tower. It is not permitted to ground a gateway directly to the tower structures.
- Lightning arrestor MUST be used to protect for the gateway, lighting protection should be grounded to the grounding point on the tower. It is not allowed to ground a lighting protector directly to the tower structures.
- All coaxial connections should be properly weatherproofed.
- Gateway should be attached to tower pole using metal ties. Use of plastic / nylon ties is prohibited.

Limited Warranty

Everynet, B.V. (“EVERYNET”) warrants that the product(s) furnished hereunder (the “Product(s)”) shall be free from defects in material and workmanship for a period of one (1) year from the date of shipment by EVERYNET under normal use and operation. EVERYNET sole and exclusive obligation and liability under the foregoing warranty shall be for EVERYNET, at its discretion, to repair or replace any Product that fails to conform to the above warranty during the above warranty period. The expense of removal and reinstallation of any Product is not included in this warranty. The warranty period of any repaired or replaced Product shall not extend beyond its original term.

Warranty Conditions

The above warranty does not apply if the Product:

- Has been modified and/or altered, or an addition made thereto, except by EVERYNET, or EVERYNET’ authorized representatives, or as approved by EVERYNET in writing;
- Has been painted, rebranded or physically modified in any way;
- Has been damaged due to errors or defects in cabling;
- Has been subjected to misuse, abuse, negligence, abnormal physical, electromagnetic or electrical stress, including lightning strikes, or accident;
- Has been damaged as a result of using third party firmware;
- Has no original EVERYNET label, or is missing any other original EVERYNET label(s); or
- Has not been received by EVERYNET within 30 days of issuance of the RMA.
- In addition, the above warranty shall apply only if: the product has been properly installed and used
- At all times in accordance, and in all material respects, with the applicable Product documentation; all outdoor installation cabling runs use braided, shielded and grounded Ethernet CAT5 (or above), and for indoor installations, indoor cabling requirements are followed.

Returns

No Products will be accepted for replacement or repair without obtaining a Return Materials Authorization (RMA) number from EVERYNET during the warranty period, and the Products being received at EVERYNET facility freight prepaid in accordance with the RMA process of EVERYNET. Products returned without an RMA number will not be processed and will be returned freight collect or subject to disposal.

Disclaimer

EXCEPT FOR ANY EXPRESS WARRANTIES PROVIDED HEREIN, EVERYNET, ITS AFFILIATES AND ITS AND THEIR THIRD PARTY DATA, SERVICE, SOFTWARE AND HARDWARE PROVIDERS HEREBY DISCLAIM AND MAKE NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND,

EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, REPRESENTATIONS, GUARANTEES, OR WARRANTIES OF MERCHANTABILITY, ACCURACY, QUALITY OF SERVICE OR RESULTS, AVAILABILITY, SATISFACTORY QUALITY, LACK OF VIRUSES, QUIET ENJOYMENT, FITNESS FOR A PARTICULAR PURPOSE AND NON INFRINGEMENT AND ANY WARRANTIES ARISING FROM ANY COURSE OF DEALING, USAGE OR TRADE PRACTICE IN CONNECTION WITH SUCH PRODUCTS AND SERVICES. BUYER ACKNOWLEDGES THAT NEITHER EVERYNET NOR ITS THIRD PARTY PROVIDERS CONTROL BUYER'S EQUIPMENT OR THE TRANSFER OF DATA OVER COMMUNICATIONS FACILITIES, INCLUDING THE INTERNET, AND THAT THE PRODUCTS AND SERVICES MAY BE SUBJECT TO LIMITATIONS, INTERRUPTIONS, DELAYS, CANCELLATIONS AND OTHER PROBLEMS INHERENT IN THE USE OF COMMUNICATIONS FACILITIES. EVERYNET, ITS AFFILIATES AND ITS AND THEIR THIRD PARTY PROVIDERS ARE NOT RESPONSIBLE FOR ANY INTERRUPTIONS, DELAYS, CANCELLATIONS, DELIVERY FAILURES, DATA LOSS, CONTENT CORRUPTION, PACKET LOSS, OR OTHER DAMAGE RESULTING FROM ANY OF THE FOREGOING. In addition, EVERYNET does not warrant that the operation of the Products will be error free or that operation will be uninterrupted. In no event shall EVERYNET be responsible for damages or claims of any nature or description relating to system performance, including coverage, buyer's selection of products (including the Products) for buyer's application and/or failure of products (including the Products) to meet government or regulatory requirements.

Limitation of Liability

EXCEPT TO THE EXTENT PROHIBITED BY LOCAL LAW, IN NO EVENT WILL EVERYNET OR ITS SUBSIDIARIES, AFFILIATES OR SUPPLIERS BE LIABLE FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES (INCLUDING LOST PROFIT, LOST DATA, OR DOWNTIME COSTS), ARISING OUT OF THE USE, INABILITY TO USE, OR THE RESULTS OF USE OF THE PRODUCT, WHETHER BASED IN WARRANTY, CONTRACT, TORT OR OTHER LEGAL THEORY, AND WHETHER OR NOT ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

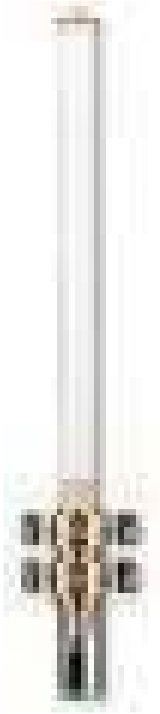
4.1 CloudCell Gateway

- 48VDC PoE input
- 15W power consumption
- Triple redundant backhaul
- Weatherproof ethernet jack
- Externally accessible dual SIM slot
- Internal antenna option
- 4 hour internal battery
- Tropical/Equatorial environment operation
- High visibility status LEDs
- Pre-loaded Everynet Agent
- Pre-configured VPN for Everynet RAN

4.2 Outdoor Omnidirectional Antenna

LoRa antenna must meet these minimum specifications

- 50 Ohm N female connector
- 868 MHz or 915 MHz frequency range. Please select frequency range depending on local RF regulations and gateway model.
- UV protected and IP67 rated
- 125 mph wind load
- Metal mounting bracket for pole mount
- -40 c to + 85 c temp range
- Antenna must be installed perpendicular to the ground +/-1 degree
- Antenna must have lightning arrestor installed at N connector and grounded directly to tower grounding point



4.3 RF jumper cable

Please make sure that RF jumper cable meets these minimum specification

- 50 Ohm N male connector
- 50 Ohm LMR240 or LMR400 type cable
- UV protected and weatherproof
- 1 meter length
- -40 to +85*C temperature range

4.4 Lightning protector

Please make sure that lightning protector meets these minimum specification

- N male on antenna side
- N female on equipment side
- 0.4dB max insertion loss
- DC-2GHz operation range
- 90V breakdown voltage
- 30W max input power
- -40 to +85*C temperature range

4.5 Two Micro SIM cards

Please make sure the SIM cards meet the following specification

- M2M 1GB data per month per SIM card
- Do not use cellular phone data SIM
- Access to the SIM management platform for troubleshooting purposes
- -40 to +85 c temp range
- Each SIM selected must be from different carrier using different infrastructure and backhaul

4.6 Grounding straps

- Cable minimum diameter 2.5 mm2 or 14 AWG
- Must use termination lugs
- Grounding bolt on CloudCell is 5mm diameter
- Grounding bolt on lightning protector is 3mm
- Ground directly to tower grounding points only using anti oxidation agent and appropriate lugs
- Two grounding straps required

4.7 Butyl mastic tape

- 3M Butyl Mastic Tape 2212 - 3M ID 7000133439

4.8 Clamps and cable ties

Antenna mounting clamps

- Use only manufacturer approved mounting brackets to attach antenna
- Follow antenna manufacturer recommended procedures
- Do not use any other attachment method

Clamps

- Use only high quality stainless steel ring clamps to securely attach gateway to mounting pole
- Do not use plastic zip ties for attaching the gateway

Cable ties

- 20 cm and 35 cm lengths
- UV stabilized Nylon 6/6
- Weather resistant and continuous exposure outdoor use rated
- 50-pound test

4.9 Ethernet cabling

Ubiquiti TOUGHcable PRO Carrier

- Outdoor use CAT5e
- UV protected
- 24 AWG
- Braided shield
- Foil Shield
- Ground wire

Grounded ethernet connector (PoE side)

- Ubiquiti TC-GND

Ethernet connector and boot (gateway side)

- CONEC 17-10001
- Ubiquiti TC-CON

PoE adapter

- Ubiquiti 48 volt 24 watt PoE injector MPN: POE-48-24W
- Use only 3 pin grounded power cord for PoE power

NOTE: Verify with continuity meter that earth grounding pin of PoE power cable is continuous thru the power cord.

4.10 Recommended equipment

- Wire stripper/cutter

- 8P8C cable crimping pliers

- Cutting pliers

- Cat5 cable tester

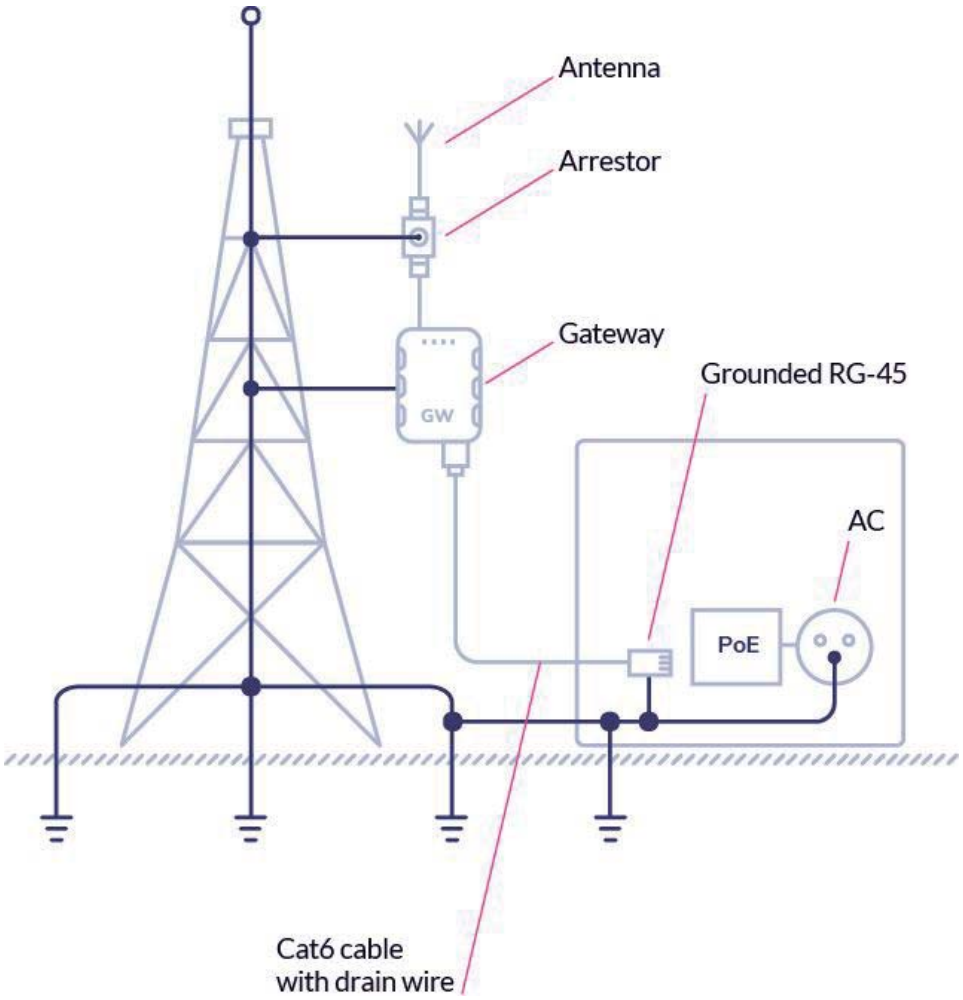
5.1 Connectors specification

1. LoRa radio cable
2. SIM cards holders + USB + reset
3. Ethernet cable

5.2 Grounding

⚠Grounding all components is extremely important for protection against lightning strikes and dissipation of static electricity in the cables and equipment.

Please see drawing below for grounding diagram.



5.3 Mount Antenna

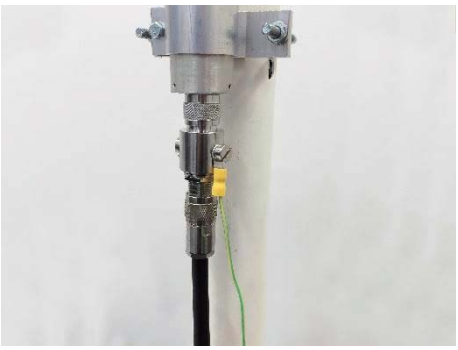
- Install the clamps that will attach the antenna to the tower

- Attach the antenna on the tower to manufacturer specifications

- Connect one grounding strap to the lightning protector. Connect the other end to the grounding point of the tower. Penetrox or anti-oxidation agent must be used when attaching grounding strap to tower grounding point

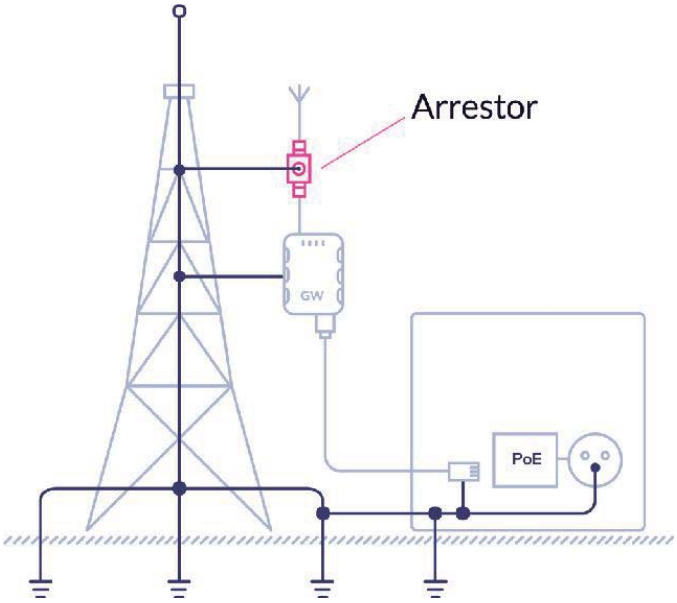
- Connect lightning arrestor to antenna
- Hand tighten RF cable into the antenna

NOTE: Do not use a wrench or pliers as this will damage the gateway or connector. Tightening of RF connectors must be made by hand.



- Connect lighting protection and grounding strap to the grounding point on the tower.

NOTE: It is not allowed to ground a lighting protector directly to the tower structures.



- Completely wrap all RF cable connections and N connectors with 3M Mastic Tape then at least two layers of Super 33+ sealing tape. Two zip tie wraps shall be used for top and bottom of sealing area (one at top and one at bottom of connector).

- Verify weatherproofing on all cable connections

5.4 Mount Gateway

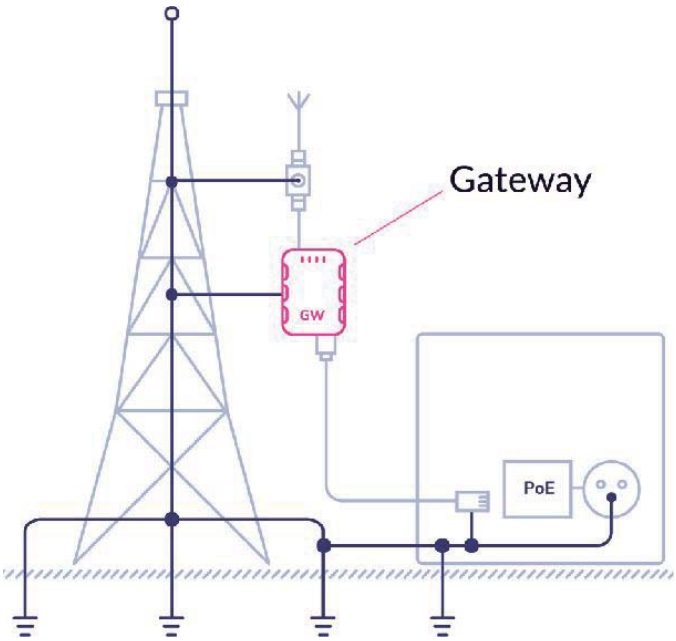
Mounting gateway to tower pole

- Insert two steel ring clamps through the gateway
- Use metal ties only

- Mount gateway on the tower pole. Tighten steel ring clamps

- Connect the second grounding strap to the ground stud on the gateway. Connect opposite end to the grounding point of the tower.
- Penetrox or anti-oxidation agent must be used when attaching grounding strap to tower grounding point

IMPORTANT: It is not permitted to ground the gateway directly to the tower structures.



5.5 Connect RF jumper cable to the gateway

- Attach the RF jumper cable to the gateway

IMPORTANT: Do not use a wrench or pliers as this will damage the gateway and connector. Tightening of RF connectors must be made by hand

- Completely wrap all RF cable connections and N connectors with 3M Mastic Tape then at least two layers of Super 33+ sealing tape. Two zip tie wraps shall be used for top and bottom of sealing area (one at top and one at bottom of connector).

- Fix the RF jumper cable in the tower with cable ties leaving two laps to spare for future relocation of the gateway

NOTE: Do not bend the RF cable to less than 4 cm radius. Kinking coaxial cable will damage the cable and cause poor radio performance.

IMPORTANT: DO NOT use metal zip ties to secure the cable as it will significantly reduce the performance and could damage the gateway. Use only plastic ties.

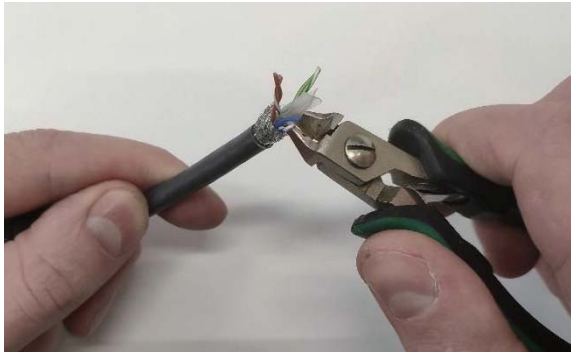
5.6 Ethernet to gateway cable connection

- Insert the CONEC housing over the ethernet cable

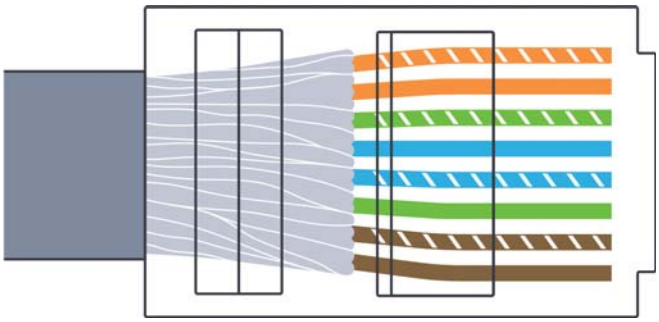
- Etch 4 cm of PVC cover with the wire stripper. Carefully remove the braided cable shield jacket.
- Use a TOUGHCable connector to measure the exposed cable needed (approximately 22mm) and trim accordingly.
- Remove the shielding from the cable.
- Carefully fold the aluminum shield to expose the transparent plastic wrapping around the twisted pair cable.

Be careful when trimming the braided cable to avoid cutting the shield and ground wire.

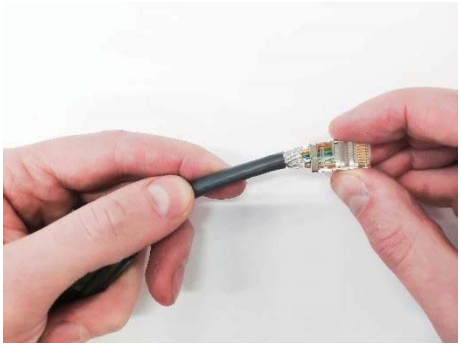
- Cut the clear plastic around the twisted pair cable.
- Use wire cutters to cut off the exposed part of the plastic.



- Put the wires in order
  - White-Orange
  - Orange
  - White-Green
  - Blue
  - White-Blue
  - Green
  - White-Brown
  - Brown



- Place the wires in the correct order, leave half the foil to connect the shield to the plug.
- Insert the wires carefully into the RJ45 connector and press firmly to seat the wires into fully into the plug.
- Crimp completely and double-check cable wiring



- Insert connector into the CONEC housing and screw nut.

- Plug the network cable into the gateway.

NOTE: Verify CONEC and RJ45 keys are aligned before inserting

Check the necessary cable length, always remembering to leave two laps to spare for future relocation of the gateway.

- Make two laps on the network cable for leftovers for future relocations.
- Use plastic cable ties (model 20.32cm) to fix the cable.

- Fix the network cable in the tower with cable ties (model 35.56cm) every 2 meters

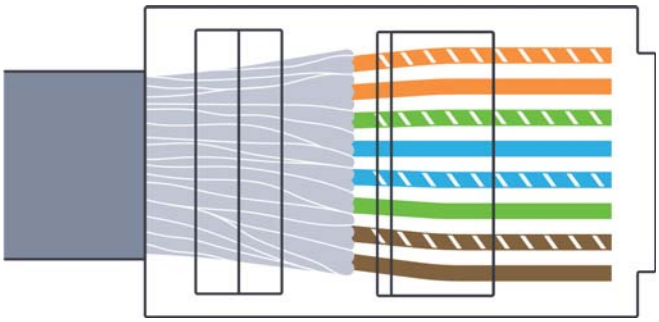
5.7 Ethernet to PoE adapter cable connection

- Use TC-GND for PoE injector side of ethernet cable

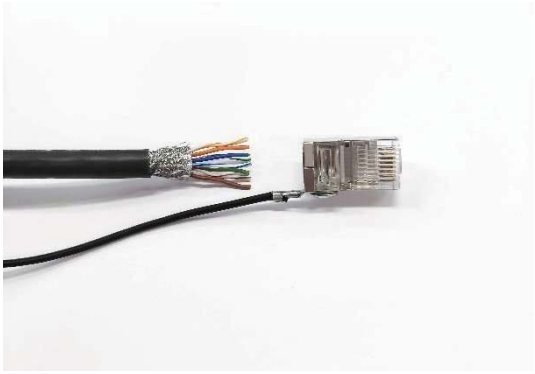
- Etch 4 cm of PVC cover with the wire stripper. Carefully remove the braided cable shield jacket.
- Use a TOUGHCable connector to measure the exposed cable needed (approximately 22mm) and trim accordingly.
- Remove the shielding from the cable.
- Carefully fold the aluminum shield to expose the transparent plastic wrapping around the twisted pair cable.

- Cut the clear plastic around the twisted pair cable.
- Use wire cutters to cut off the exposed part of the plastic.

- Put the wires in order
  - White-Orange
  - Orange
  - White-Green
  - Blue
  - White-Blue
  - Green
  - White-Brown
  - Brown



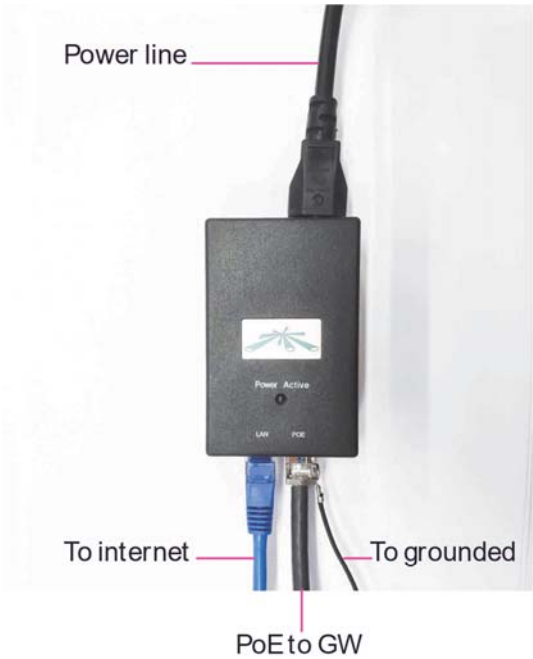
- Place the wires in the correct order, leave half the foil to connect the shield to the plug.
- Insert the wires carefully into the RJ45 connector and press firmly to seat the wires into fully into the plug.
- Crimp completely and double-check cable wiring



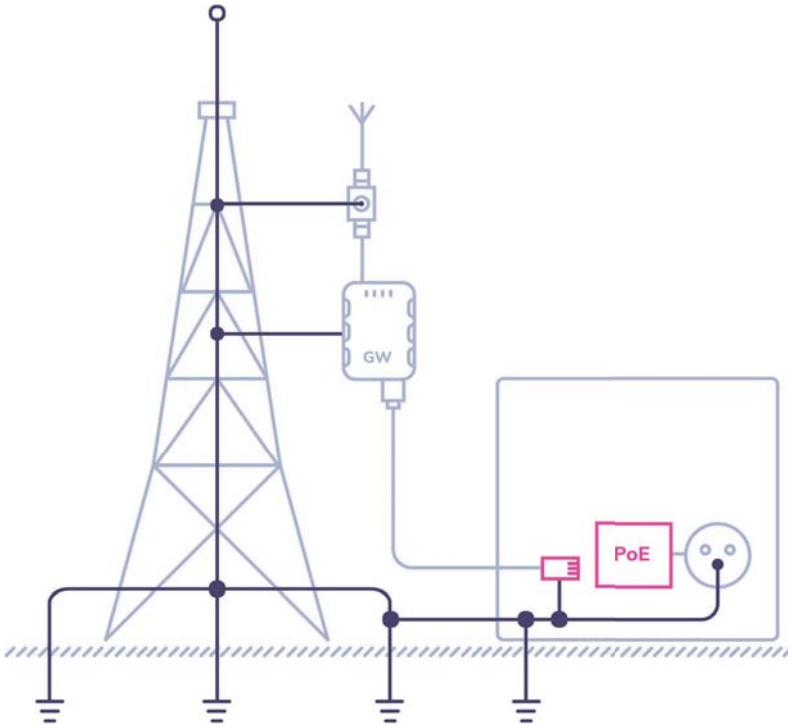
IMPORTANT: Always verify all ethernet connections with cable map tool and continuity tester

- Connect network cable POE port of PoE- Ubiquiti PoE 48v-24w injector

- Connect ethernet round wire to the tower according to the scheme.
- Connect PoE power cable to 3 pin AC power jack



PoE injector MUST have a detachable 3 pin power cord which contains an integral safety ground wire. This ground pin must be connected to a grounded safety outlet.
Ethernet cable shield MUST also be grounded through the AC ground pin of the PoE power cable.



5.8 Verify all the connectors are correct

5.9 Check LEDs indication

- Check that the connecting lights are in the correct colors.

LTE – green

ETH – red or green

PWR – green or blue
(blue means that the battery is charging)

GPS – green

LORA – green

5.10 Verify gateway is affixed securely on the tower

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE:
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 instructions, 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 from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
To maintain compliance with FCC's RF Exposure guidelines, The 20cm is the minimum distance that has to be maintained between your body and the device.

1. Scan QR code
2. The label and text will appear below

CloudCell 4G

Model: CloudCell 4G FCC ID: 2AJNFCLOUDCELL4GCL

Contains:

FCC ID: XMR201805EC21AU

Everynet B.V.

Westerdoksdijk 4231013 BX AmsterdamThe Netherland

1. Scan QR code
2. The label and text will appear below

CloudCell 4G
Model: CloudCell 4G

Everynet B.V.
Westerdoksdijk 4231013 BX AmsterdamThe Netherland
www. everynet.com