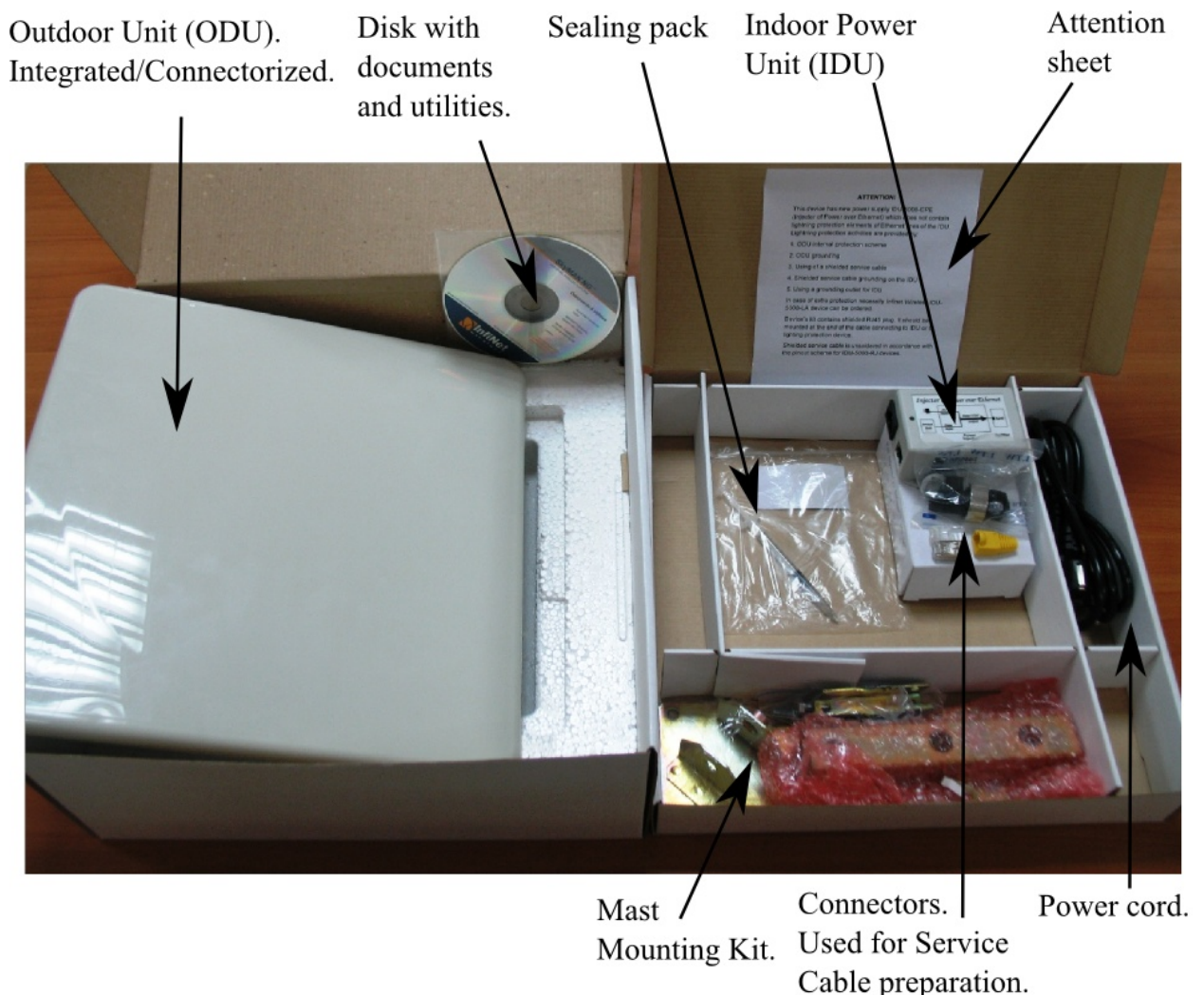# Installation Quicksheet

Please follow these easy steps to install InfiNet Wireless equipment.

1. Unpack.

After receiving the equipment please locate the following items in your box as shown on the picture below:
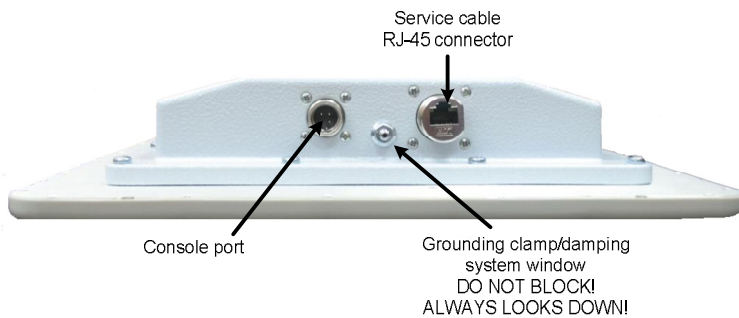
Outdoor Unit (ODU). Integrated/Connectorized.

Disk with documents and utilities.

Sealing pack

Indoor Power Unit (IDU)

Attention sheet

Mast Mounting Kit.

Connectors. Used for Service Cable preparation.

Power cord.

2. Switch on.

■ Connect ODU and IDU with STP/FTP cable.

⚠️ *The total cable length between LAN (behind IDU) and ODU should not be longer than 100 meters.*

ODU:

IDU:
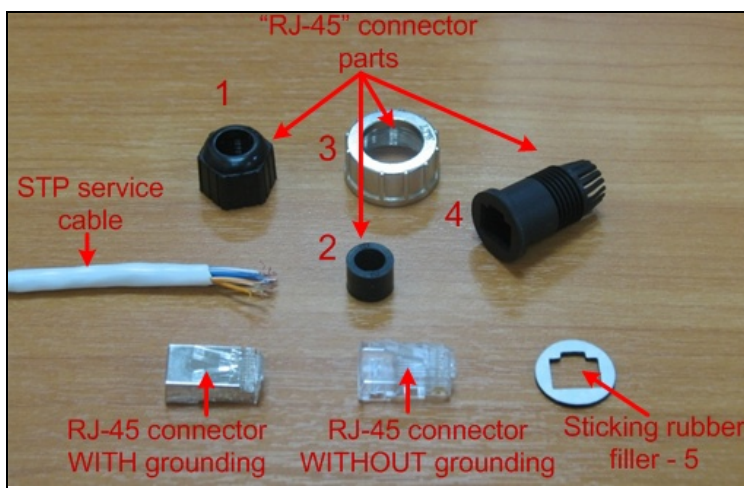

When connectorizied device is used ODU module has one or several N-type connectors for external antenna.

If other IDUs used (IDU-5000-RJ, IDU-5000-SCR or IDUs with E1 ports) please study their installation instructions in Technical User Manual
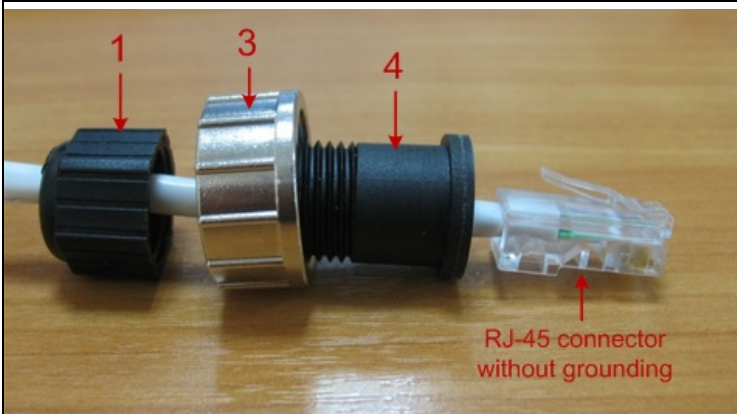
Cable preparation:

Step 1. Peel STP service cable and prepare "RJ-45" connector parts.

Use RJ-45 connector without grounding here (RJ-45 connector with grounding should be used for connecting service cable to IDU).

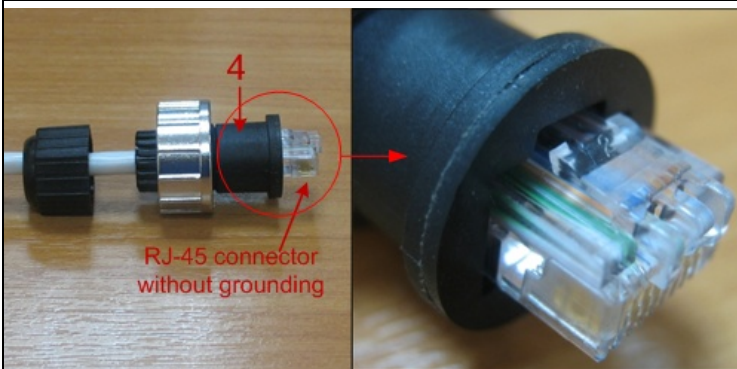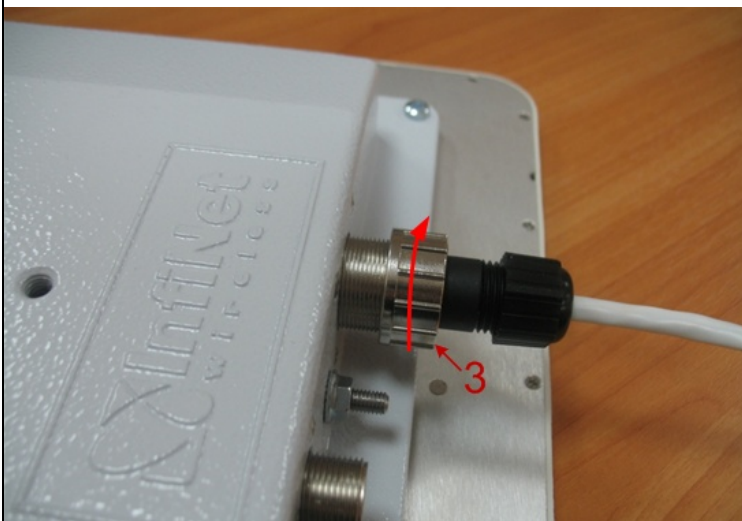|	
	Step 2. Stick rubber filler – 5 on the Part 4, previously having removed protective white layer from rubber filler -5. Insert Part 2 inside part 4 up to the stop. Part 2 must be entirely within Part 4.
	Step 3. Put connector parts on the STP service cable as shown. Attach RJ-45 connector without grounding to the STP service cable according to the "RJ-45" soldering scheme (below in this section) and crimp the connector using a crimp tool. ⚠ Please tightly crimp the RJ-45 connector. Not crimped or badly crimped connector damages the unit when assembled into it which is not considered as a warranty case.
	Step 4. Put Part 4 on the attached in the previous step RJ-45 connector.
	Step 5. Screw Part 2 on Part 4. This fixes the "RJ-45" connector on the cable. Check that the connector is properly fixed on the cable.
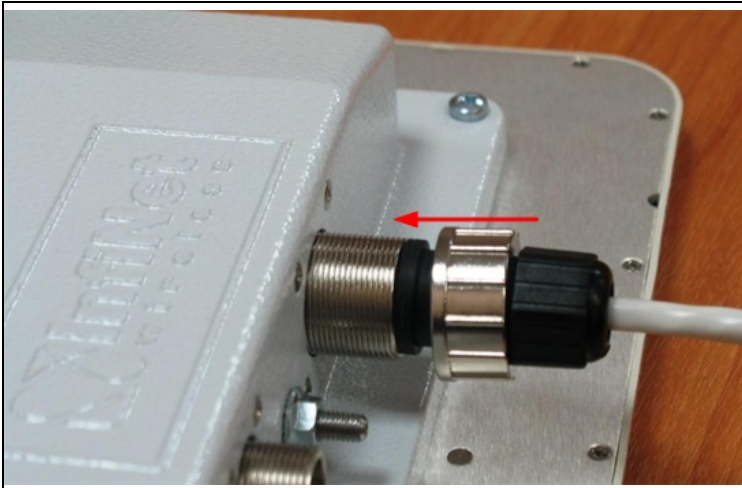
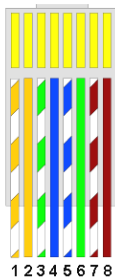|	
	Step 6. Assemble the connector to the unit.
	Step 7. Fix the connector by screwing Part 3. Now the connector is hermetically attached to the unit. No additional sealing needed.

"RJ-45" service cable connector soldering scheme:

RJ-45 Male Ethernet connector

Male connector to ODU

1
2
3
4
5   Phase(+)
6
7   Neutral(-)
8
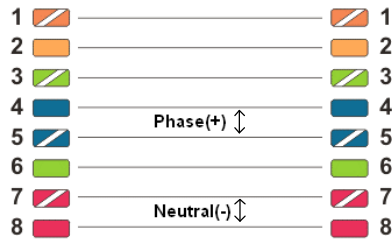
Male connector to IDU

1: White-orange
2: Orange
3: White-green
4: Blue
5: White-blue
6: Green
7: White-brown
8: Brown

■Power on

Plug the power cord into the IDU Power supply connector and to the Power supply socket (220V 50 Hz or 110V 60 Hz depending on the country of residence).

Power supply
connector → 10/100BaseT
Ethernet

■Accessing the Unit:

To access via console please see p.5 of the "Quick Start Guide".

To access via Ethernet please see p.8 of the "Quick Start Guide".

3. Configure.

For simplest configuration in bridge mode type:

mint <RF IFNAME> start (ex. mint rf4.0 start)

switch group 1 add eth0 rf4.0

switch group 1 start

switch admin-group 1

switch start

Web-interface configuration:

To enable Web-interface support on the unit please type the following command:

http_cfg start

To access the unit via Web-interface type the following string in your Web-browser:

http://<device IP adress> (by default, http://10.10.10.1)

For complete Web-interface configuration and user guide please see Technical User Manual.

■ Check connectivity.

Type command: *mint map*

If there are active nodes in the command output then you have the connection:

On the picture there is one active node "TEST1Client".

4. Diagnose.

Diagnose tools:

■ Mint map.

Check Color indication with Signal levels and Bitrates.

```
                                        Node's ID

   Interface name    MAC and name of   Network logical number   Noise threshold   Neighbor node
                     current node                  Node's type   (in dbm)             type

#1> mint map

=============================================================================================
Interface rf4.0
Node  000E9B68DA6A  "Node_4", Id 6345, NetId 0, (mesh)
Freq  5260, Sid 10101010, Bitrate 24000, Noise floor -79

  3 active neighbors:
  --------------------
   Id      Name            Node     Cost   Sig    Bitr  R  E Options
   -----   ----            ----     ----   -----  ----  -- -- -------
   06101 Node_2         000E9B68D977   51  25/23  24/24  0  0 /mesh/     ← Common color
   22205 Node_3         000F453813F5   51  20/9   24/24  0  0 /mesh/     ← Yellow color
   28022 Node_1         000435FF2513   51  15/4   24/24  0  0 /mesh/     ← Yellow color with
   -----   ----            ----     ----   -----  ----  -- --                red background

 0 active licensed CPE (maximum 2)
 Total nodes in area: 4

  Neighbor      Neighbor    Neighbor   Cost of   Signal level (in db)  Receive/   Number of   Number of
  node ID       node name   node MAC   routes to above the noise       Transmit   retries     errors
                                       neighbor  threshold for currant bitrates
                                                 bitrate (From/To)
```

<u>Color indication of «mint map» command output:</u>

- Common color identifies neighbor nodes that have acceptable characteristics of a link to the current node.

- Yellow color identifies neighbor nodes that potentially may have problems with sustainability and quality of a link to the current node. In this case link quality can be improved through the change of certain parameters (for example, lowering bitrates).

- Yellow color with red background identifies neighbor nodes that have unsatisfactory characteristics of a link to the current node. For example, neighbor nodes that have low characteristics of a link on the lowest possible bitrate or have errors are marked this way. In this case link quality can be improved by such actions as antenna alignment, cable connectivity testing and so on.

■ Muffer utility.

Type: *muffer stat*

Muffer can be used for statistics gathering for estimating link load intensity and per client.


```
     MAC          out/rep                     in/rep
00028ae1d72a   157019/32779  <00/01/17>   155176/0    <00/00/00>  NewRWR.0.1
00028ae1d795   157371/18814  <00/03/10>   156702/1    <00/00/00>  NewRWR.0.5
TOTAL:         314390/51593  <00/02/14>   311878/1    <00/00/00>

Burst: Send 0+0 <Max=0>, Recv 1+2 <Max=3> Drop=0 Bad=0
```
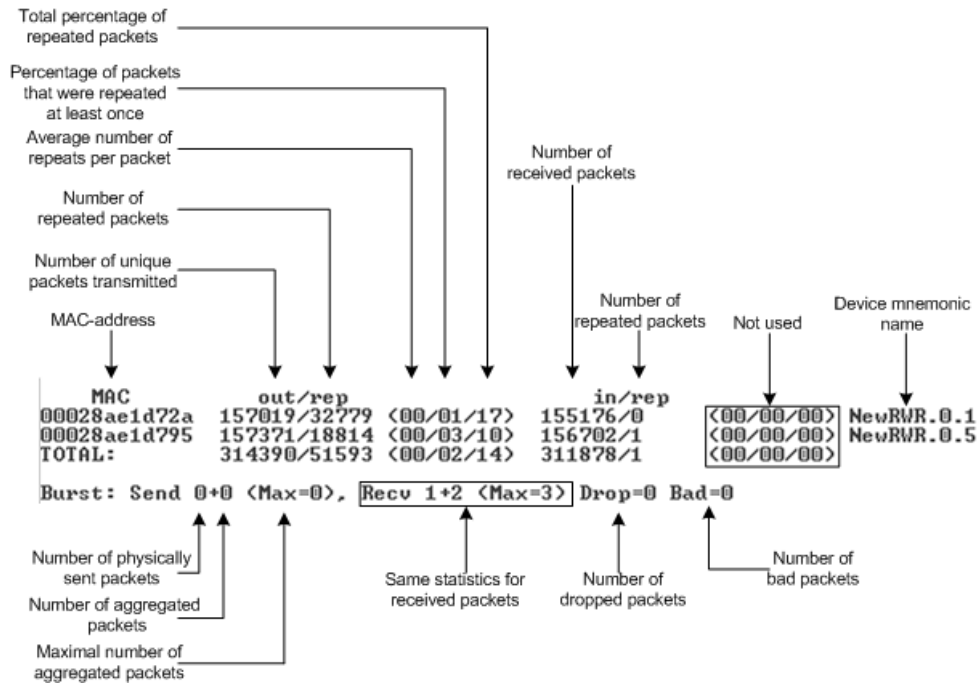
The following decisions can be made by analyzing the outputted parameters:

- If the number of repeated packets is comparable with total number of packets that means that you might have an interference source on the selected frequency. For normally operating link the percentage of repeated packets should not exceed 10%. It is extremely important to obtain a permanent zero value for the average number of repeats per packet. If the value is not zero that means that the link is NOT working properly and requires further improvement

- If total percentage of repeated packets and the percentage of packets that were repeated at least once are close to each other that might mean that you have got a permanent source of interference. Otherwise, it means that a strong interference source appears from time to time breaking your signal

- Concerning the fact that statistics module outputs the information for each MAC-address separately, you can reveal the problem for some specific unit on the wireless network

■ Load meter.

Type: *loadm –I <IFNAME> (*for example, *loadm –I rf4.0)*

Load meter is a tool to perform the channel load monitoring. It allows estimating the load of a system interfaces specified by interface parameter.

```
Load Meter 1.2          All results in Kbits per second

                  I N P U T                  O U T P U T            SUM   PACKETS
      Name   cur   avg   max  packets    cur   avg   max  packets
      rf4.0  865   864   865    226      865   864   865    226     1730    452
      rf4.0  876   870   876    226      876   870   876    226     1752    452
      rf4.0  866   869   876    229      866   869   876    229     1732    458
      rf4.0  865   868   876    226      865   868   876    226     1730    452
      rf4.0  867   867   876    228      866   867   876    228     1733    456
      rf4.0  865   867   876    225      865   867   876    225     1730    450
      rf4.0  142   763   876     48      157   766   876     48      299     96
```

Interface name

Current number
of Kbits received

Average number
of Kbits/sec received

Maximal number
of Kbit/s received

Number of
packets/sec received

Same statistics for
transmitted packets

Total number of
Kbits/sec received and
transmitted

Total number of
packets/sec received and
transmitted

■ Useful commands that should be remembered:

- "help" – lists all available commands in the unit

- "config show" (or "co sh" for short) – shows unit's current configuration

- "config save" (or "co sa" for short) – saves unit's current configuration

- "restart y" – immediate unit reboot. Reboot lasts for 20-30 seconds (approximately) and during this time you will not be able to control it over Telnet. "restart XX" can be used for a postponed reboot so the unit will be rebooted in XX seconds (this is very helpful when there is a risk of loosing a remote unit while performing risky manipulations with configuration). "restart 0" cancels postponed reboot.

- "quit" – closes current telnet session

5. Outdoor.

■ Mounting kit (MOUNT-KIT-85).

■ Grounding

Antenna should be placed on the mast on the level that is at least 1 meter lower than a mast's top. In this case it is of big probability that the lightning strikes the mast and not the antenna. The mast is to be grounded on the grounding contour according to your local standards. When the lightning strikes the antenna, the current goes through the coaxial cable which grounds ODU clamp with the mast – the mast is grounded via the grounding contour. The direct lightning strike to the STP service cable (ODU-IDU) is partially terminated on the grounded IDU case. Partial termination means that the direct lightning strike will probably destroy an STP cable. The service cable pickups from the electromagnetic impulses are terminated on the IDU case by the winding shield, and further – on the IDU grounding. IDU is grounded via a three-conductor power cord and a plug containing a ground. The data & power wires pickups are terminated via IDU protection scheme (three-conductor power cord and a plug containing a ground).

> ⚠ *Antenna pole, tower, ODU and lightning arrestor should be connected to the first common grounding contour. Cable thickness should be no less than 10AWG using corrosion-steady connectors. It is highly recommended to entrust grounding contour development to the skilled personnel.*

A special attention should be paid if antenna used is not DC-shorted. In this case additional lightning arrestor should be used between the antenna and ODU. Suggested grounding diagram is shown on the picture below.