# PTP 300/500 Series
## Deployment Guide


## *Contents*



MOTOWi4™

# Protect Your Installation

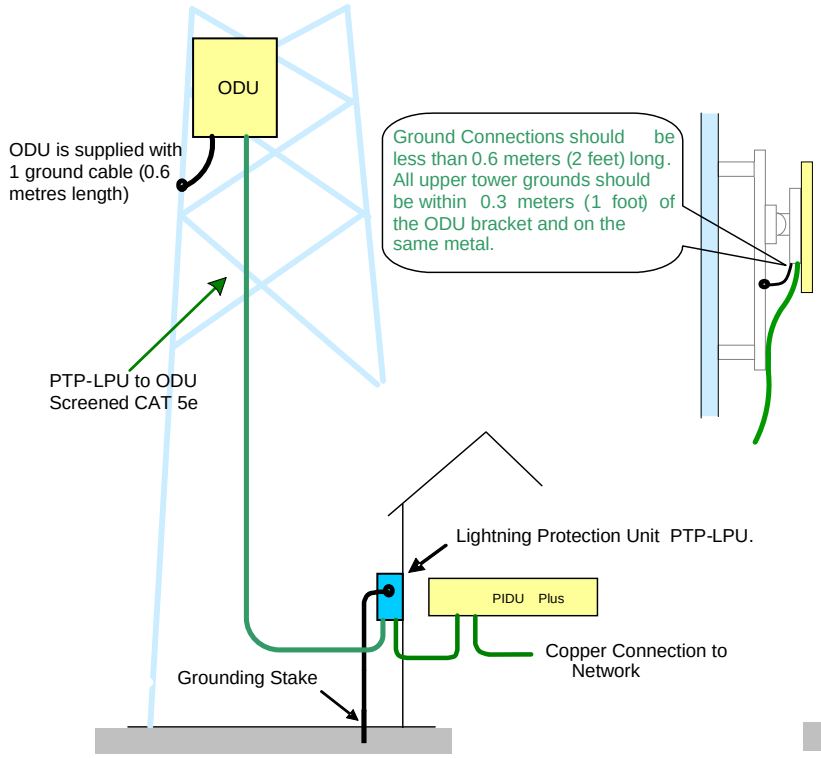
# Attention

**E**lectro**M**agnetic **D**ischarge (**Lightning**)

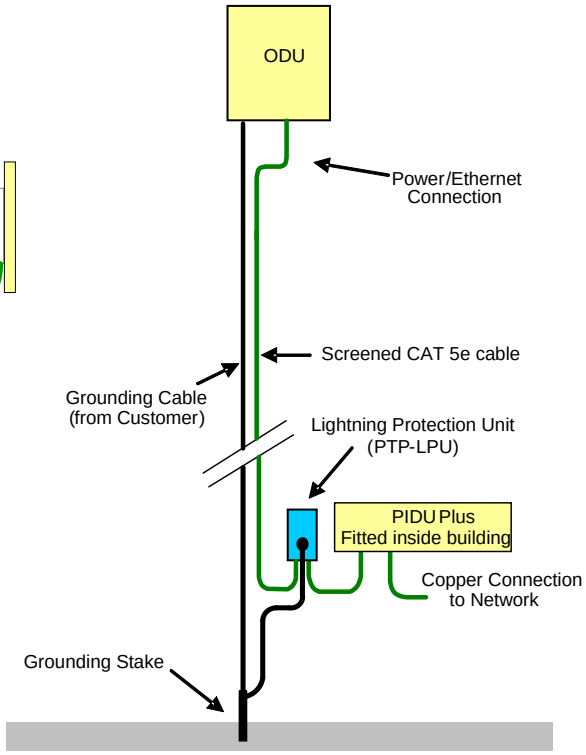
Protect Your Installation!

**EMD (Lightning) damage is not covered under warranty.**

**The recommendations on this card and in the user manual, when installed correctly, give the user the best protection from the harmful effects of EMD. However 100% protection is neither implied or possible.**




**Typical Mast /Tower Installation**




**Typical Wall Installation**

The recommended standard components for protecting installations are:

- Screened CAT 5e cable also known as Shielded CAT 5e or CAT 5e STP (Shielded Twisted Pair)
- Surge arrestor: type PTP-LPU: 2 per link (1 Motorola Kit Part Number WB2978AA)
- Grounding stake (if no suitable grounding point can be found)
- Grounding cable: minimum size 8 AWG, preferably 6 or 4 AWG
- RJ45 screened connectors
- Andrew grounding assembly type 223158 or similar (if required by local regulations).

**NOTE:** If a coaxial (or other) cable is already cross-bonded to the mast or tower, the same cross bonding points on the mast or tower must be used for the CAT 5e cable.

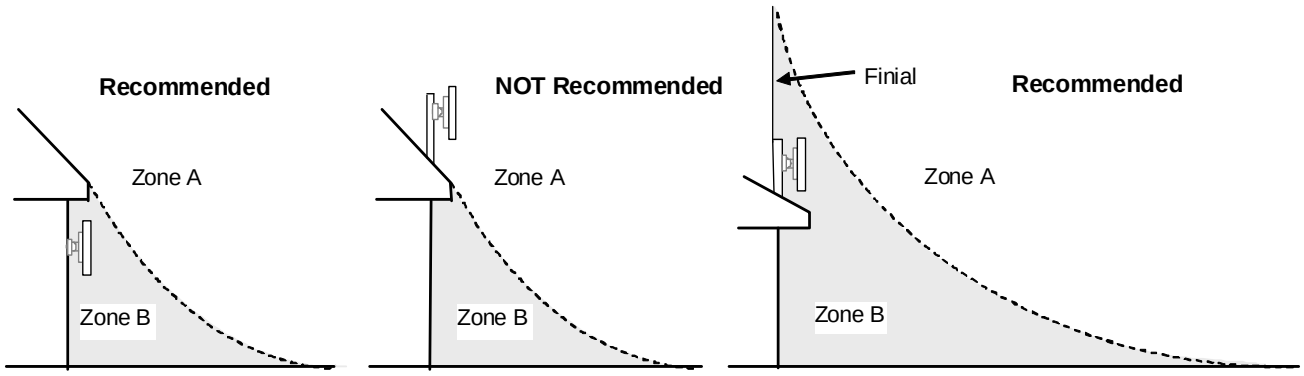
We recommend that the practices and procedures detailed in the Motorola manual R56 STANDARDS AND GUIDELINES FOR COMMUNICATION SITES (68P81089E50) be applied to all new site build activities. This manual is provided on the PTP 300 or PTP 500 CD-ROM.

# Protect Your Installation

## Lightning Protection Zones

When the ODU is installed on a mast, tower or wall, it may be in one of two possible lightning protection zones:

- Zone A: In this zone a direct lighting strike is possible. Do not mount the ODU in this zone.
- Zone B: In this zone, direct EMD (Lightning) effects are still possible, but mounting in this zone significantly reduces the possibility of a direct strike. Mount the ODU in this zone.




The following protection requirements are mandatory:

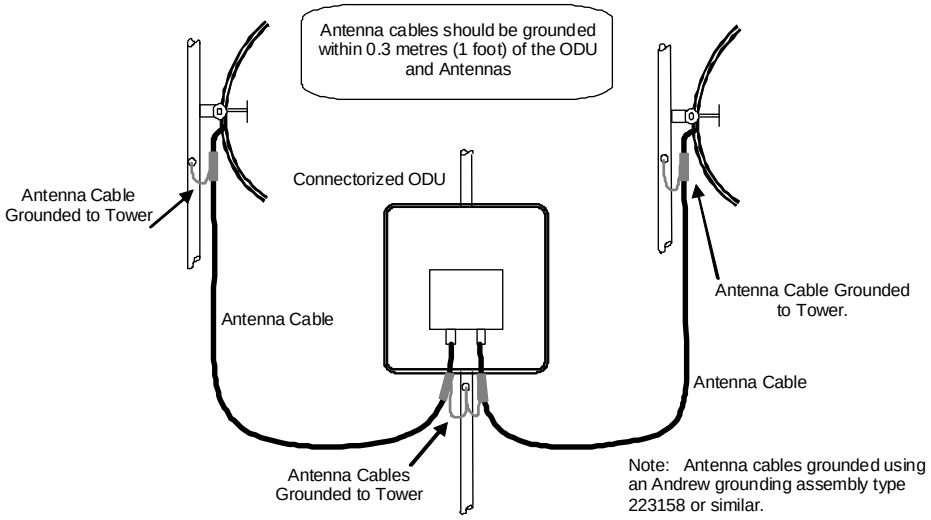
- The ODU must be earthed
- Screened CAT 5e cable must be used
- Surge arrestor of type PTP-LPU must be installed at building entry
- There must be an earth connection at building entry

| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Lightning Protection" |
|---|---|---|---|

# Protect Your Installation

## Additional Grounding Requirements for Connectorized ODU

Where the ODU is mounted outdoors and is mounted some distance from the antenna, it is advisable to add additional grounding by utilizing Andrew assemblies (such as Andrew Type 223158):




**Additional Grounding Requirements for Connectorized ODU**

**NOTE:** Refer to instructions contained in the Andrew grounding kit for correct installation, or if instructions are missing, refer to:

http://awapps.commscope.com/catalog/product_details.aspx?id=15832&tab=2

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Connectorized PTP 500 Series Bridge" |

# Checklist, Site Survey and Tools

**CAUTION:** Before performing an installation of a Motorola PTP 300 or PTP 500 Series system, ensure that you have read this entire guide and taken note of any safety information contained.

## Checklist

- Check the contents of all packages against the packing list
- Check the Web site for the latest software load

## List of Special Tools Required

- 13mm wrench and 22 mm wrench for use with the glands
- RJ45 crimp tool (it must be the correct tool for the type of RJ45 being used)
- Personal Computer (PC) with 10, 100 or 1000 BaseT Ethernet
- Either Internet Explorer version 6 or higher, or FireFox 2.0 or higher are recommended
- Ethernet patch cables
- Motorola PTP LINKPlanner report for this link
- Crimp tool for grounding lugs (only required when installing a connectorized ODU)

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Installation" |

## Pre-installation: Site Survey and Link Planning

A site survey must be performed to identify all the obstructions (such as trees or buildings) in the path and to assess the risk of interference. This information is important if you are to achieve an accurate link feasibility assessment.

The PTP 300 and PTP 500 Series are designed to operate in Non-Line-of-Sight (NLoS) and Line-of-Sight (LoS) environments. Link planning enables a link of known quality to be installed. This involves the acquisition of path profile data (using Motorola's free LINKPlanner utility). The LINKPlanner predicts data rates and reliability over the path. It allows the user to try different antenna heights and RF power settings. When the link is installed, the mean path loss can be checked to confirm that the predicted data rate and link reliability is achievable. Motorola LINKPlanner is available to download from http://www.motorola.com/ptp/support.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Site Planning" |

## Pre-installation: License Keys and Regulatory Conformity

If the units have been purchased as a pair (link) then the License Keys (at the end of this guide or printed on a separate card in the box) will show how the units have been pre-configured to work as a link. Software, license key, unit IP address, subnet mask, gateway address, target address, master/slave and arming state are pre-configured.

**CAUTION:** Check that the link is configured with the correct Region Code. If Region Code is incorrect, then re-configure the units with Alternative License Keys before installing and commissioning the link. Refer to "Configuration Checks" for details of how to change the License Key.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Radio Link Planning and Regulations" |

# Bench Testing (Optional)

It is advised that the link be configured and tested on a bench before the final installation of the units on a pole or a mast. The following steps give details of how to connect an ODU to a PC in order to check the configuration details, change the IP settings or modify the license key. For the purpose of these tests, normal off-the-shelf Ethernet cables can be used.

## Power Checks

**Step 1:** Connect the RJ45 at one end of a cable to the ODU.


**Step 2:** Undo the retaining screw of the PIDU Plus and hinge back the cover.

**Step 3:** Plug in the ODU to PIDU Plus Cable, ensuring that it snaps home.

**Step 4:** Put the cover back and tighten the screw.

**Step 5:** Plug in power lead using a cable appropriate for the installation.

# Bench Testing (Optional)

**NOTE:** If the power LED does not illuminate, remove the power cable and the ODU connection from the PIDU Plus. Re-connect the power lead and check the power LED illumination (green). If the power LED still does not light then check the power source.

**Step 6:** Connect a second Ethernet cable (shown in yellow) to the “LAN” socket of the PIDU Plus.

**Step 7:** 30 seconds after powering, the Ethernet LED should be observed to flash slowly 10 times. If the Ethernet LED does not illuminate (orange), then either the PIDU Plus or the cable to the ODU may be faulty. Replace cable and/or PIDU Plus and repeat from Step 1.

**Step 8:** Ensure PC is set to correct IP address 169.254.1.x, where 2 < x < 254. Connect the LAN cable to the PC (shown here in yellow).

**NOTE:** If this IP address is not recognised, try 10.10.10.11 (Master) and 10.10.10.10 (Slave). Some units may have been pre-configured with these IP addresses. If it is necessary to use IP addresses 10.10.10.11 and 10.10.10.10, ensure that the PC is configured with an IP address of 10.10.10.n, where n is any value between 2 and 254 but excluding 10 and 11, to configure these units.

**Step 9:** Check that the Ethernet LED is now ON. If the LED does not show any activity when accessing web pages, refer to “Testing and Fault Finding (Troubleshooting)”.

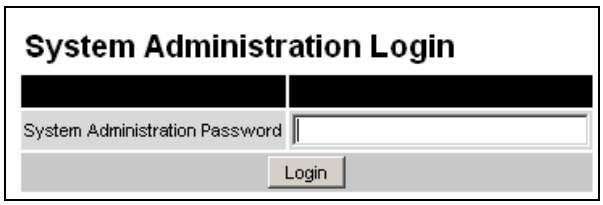

**CAUTION:** Do not dress the RJ45 cables too tightly, as this may make the connections unreliable.


| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | “Connecting Up” |
|---|---|---|---|

# Bench Testing (Optional)

## Configuration Checks

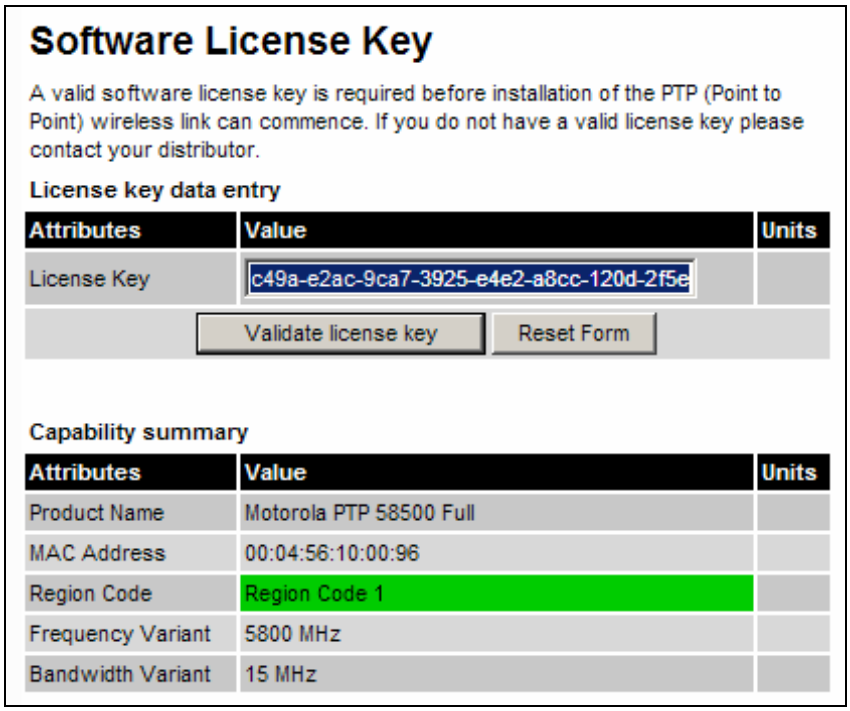
**Step 1:** Use a web browser to connect to IP address **http://169.254.1.1** for Slave and **http://169.254.1.2** for Master units. Select **System Administration** and **Login** (the password is empty for new units). We recommend that you change the password by selecting **Change Password**.




**Step 2:** If an upgrade to the software is required, select **Software Upgrade** and follow the on-screen instruction. Latest software is available from our web site:

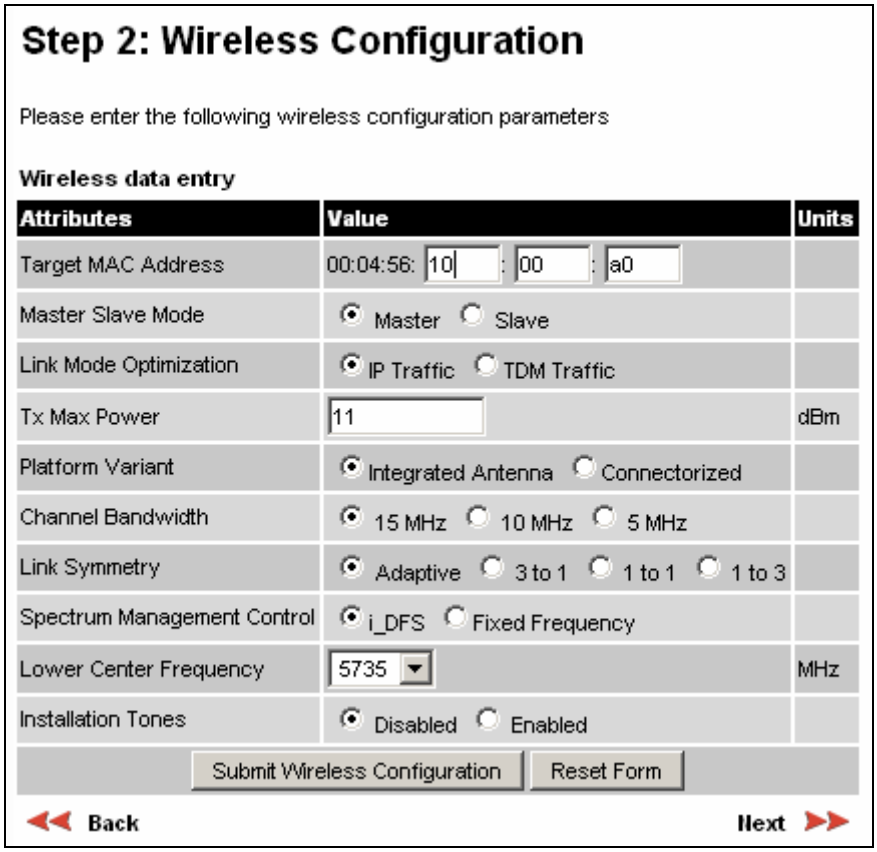
(http://motorola.motowi4solutions.com/software/#ptp)

**Step 3:** Check the License Key information and ensure you are using the correct Region Code. Otherwise, select **License Key** and replace with the alternative key supplied and reboot the unit.



# Bench Testing (Optional)

**Step 4:** Access the 'Installation Wizard' page. Confirm the target MAC Address, Master/Slave choice, Symmetry, Max Transmit Power. Confirm installation configuration and reboot.



## Step 2: Wireless Configuration

Please enter the following wireless configuration parameters

**Wireless data entry**

| Attributes | Value | Units |
|---|---|---|
| Target MAC Address | 00:04:56: 10 : 00 : a0 | |
| Master Slave Mode | (•) Master ( ) Slave | |
| Link Mode Optimization | (•) IP Traffic ( ) TDM Traffic | |
| Tx Max Power | 11 | dBm |
| Platform Variant | (•) Integrated Antenna ( ) Connectorized | |
| Channel Bandwidth | (•) 15 MHz ( ) 10 MHz ( ) 5 MHz | |
| Link Symmetry | (•) Adaptive ( ) 3 to 1 ( ) 1 to 1 ( ) 1 to 3 | |
| Spectrum Management Control | (•) i_DFS ( ) Fixed Frequency | |
| Lower Center Frequency | 5735 | MHz |
| Installation Tones | (•) Disabled ( ) Enabled | |

Submit Wireless Configuration | Reset Form

Back Next

## Paired Unit

Repeat the Power Checks and Configuration Checks for the paired unit and check that the status of the link shows UP on the 'Status Page'.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "System Administration Pages" |

# Mast, Tower or Building Installation

## Hoist and Safety Loop

Use the integral safety loop for hoisting the ODU up a mast, tower or building. When the ODU is in position, use the safety loop as a fixing point to secure a permanent lanyard from the mast, tower or building to the ODU, as a precaution against mounting failure.


**WARNING:** The safety lanyard must not exceed 1m (approx 3 ft) in length. The lanyard must be made from a material that does not degrade in an outdoor environment.

**WARNING:** The safety lanyard must be fixed to a separate fixing point that is not part of the direct mounting system for the ODU.

**WARNING:** If the safety loop or its fixing is damaged in any way or has been exposed to a shock loading due to a fall, replace it with a new one before undertaking any further operations.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Mounting the ODUs" |

# Mast, Tower or Building Installation

## Mast or Tower Installation Instructions

The ODU is pre-fitted with a mounting bracket (designed to ease installation) and with an earth bonding lead.

**WARNING:** When mounting the ODU, observe the following precautions against failure of the assembly:

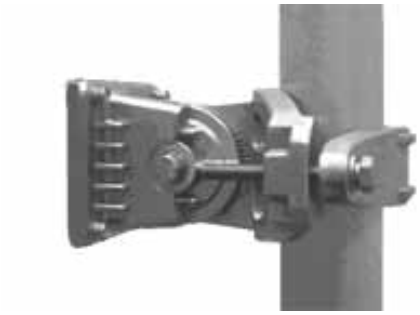
- Do not remove the pre-fitted mounting bracket from the ODU.
- Do not mount the ODU on poles with diameter less than 50mm (2”) or greater than 75mm (3”). The ODU mounting bracket is designed to work only with poles with diameter in the 50 mm (2”) to 75 mm (3”) range.
- Do not over-tighten the bolts.

The ODU must be mounted using the following steps, ensuring that the cable entry is at the bottom:

**Step 1:** Attach the bracket strap to the pole using M8 x 70 mm bolts, M8 flat washers and M8 coil washers. Tighten to ensure the assembly grips but can be adjusted.

# Mast, Tower or Building Installation

**Step 2:** Offer the ODU (with pre-fitted mounting bracket) to the bracket strap and affix using the captive M8 bolt. Tighten to ensure the assembly grips, but can be adjusted on the pole.



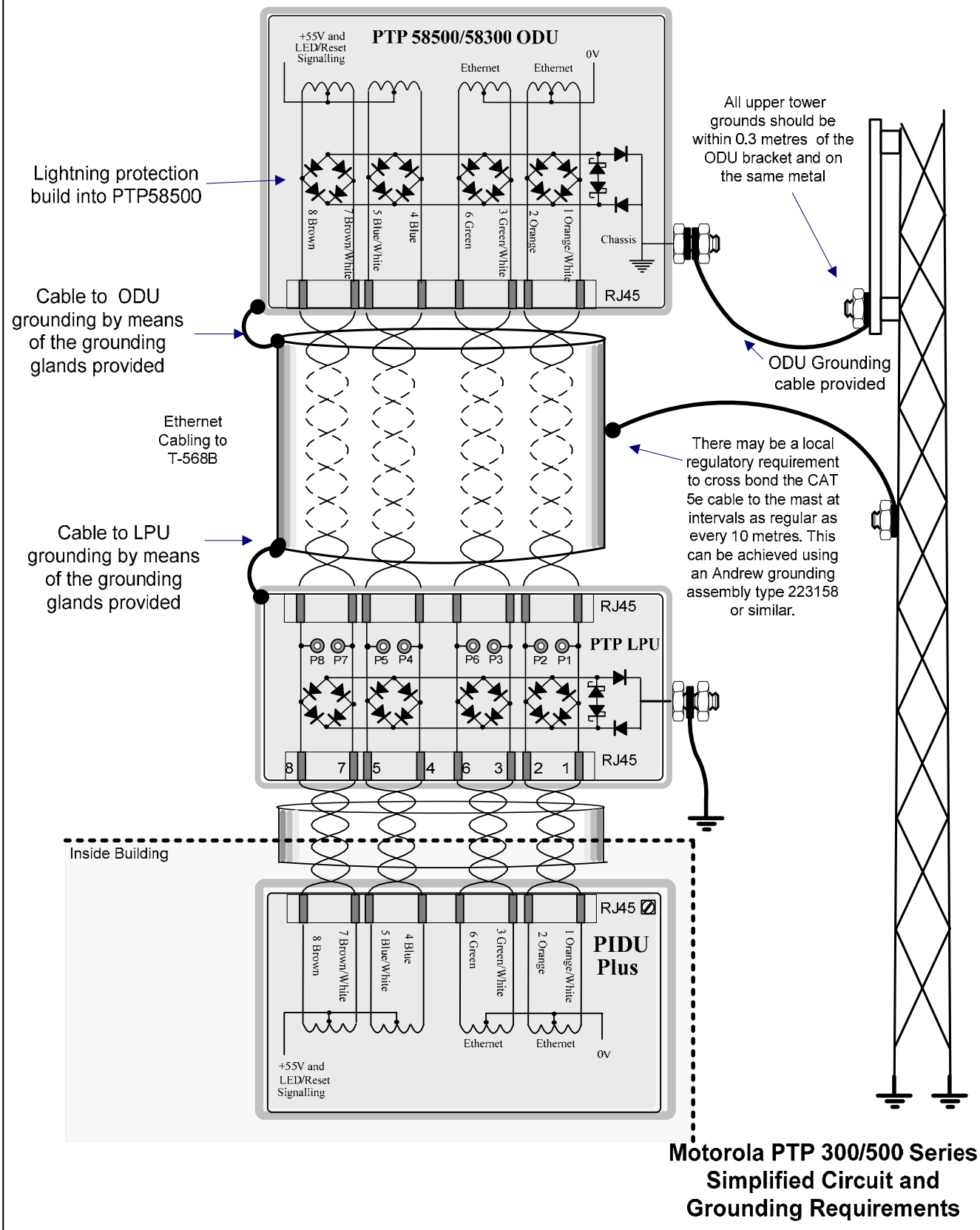
**Step 3:** Adjust the elevation and azimuth of the unit before tightening to the required torque settings of 14 Nm (11 lbft) for both bolts.

**CAUTION:** Attach the free end of one earth bonding lead (large tag M10) to the tower metal work. On no account must this be attached to the mounting bracket bolts.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Mounting the ODUs" |

**WARNING:** A cable measuring card must NEVER be used at the ODU end connected to power from the PIDU. It must only be used at the bottom of the mast with a multimeter. This is because the PIDU voltage exceeds the limit allowed in some countries for safe handling in wet conditions and therefore may create a safety hazard.

# Installation Wiring



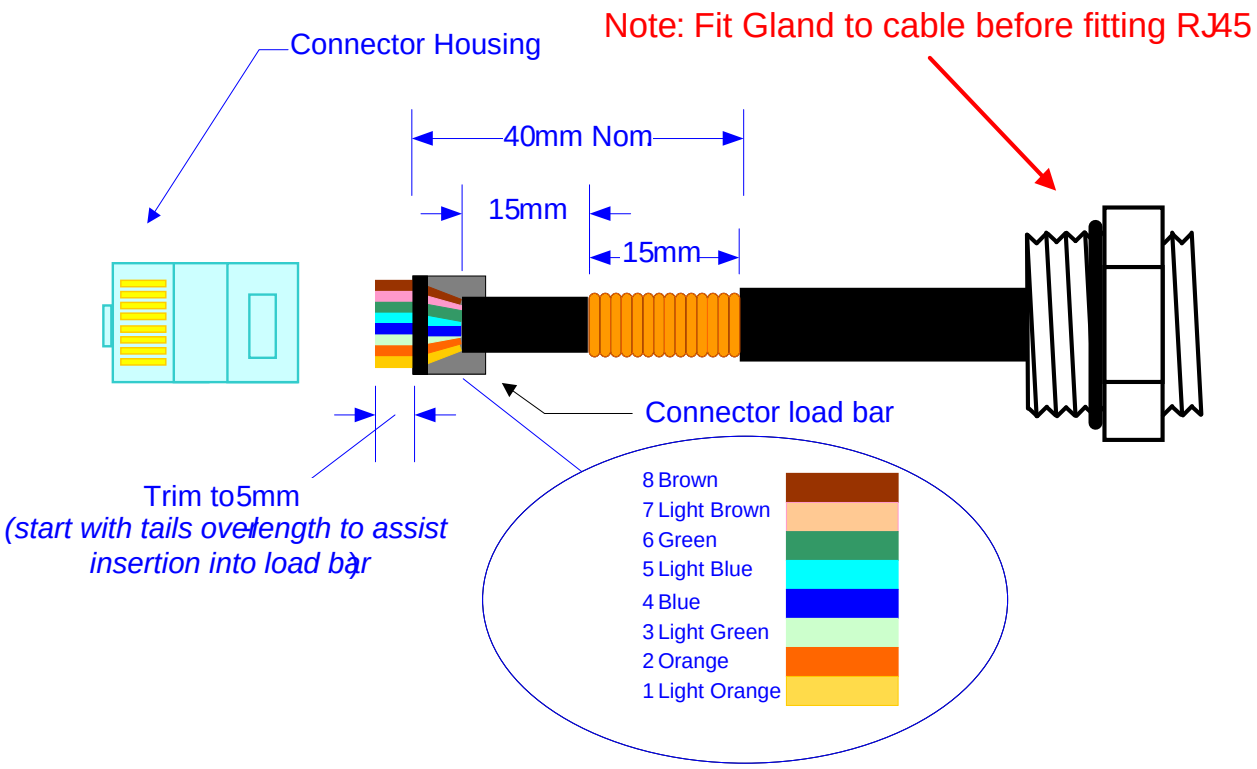

**Motorola PTP 300/500 Series Simplified Circuit and Grounding Requirements**

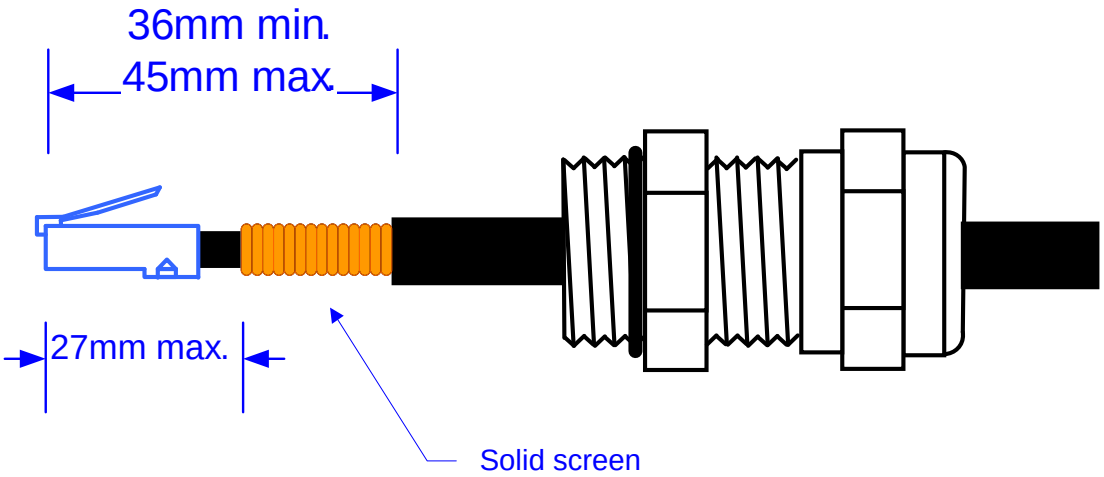
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Lightning Protection" |
|---|---|---|---|

# Cable Preparation and Installation

The maximum cable length between the ODU and the user's network equipment is 100 m (330 ft).

## Correct cable preparation for the recommended cable




| | |
|---|---|
| Cable Type: | Superior Essex, BBDGE CAT5e |
| Connector Type: | Tyco (AMP), 5-569278 |
| Crimp Tool: | Tyco (AMP), 2-231652, Die set 1-853400-0 |
| Gland: | Motorola WB1811 |

**CAUTION**: Check that the crimp tool matches the RJ45 connector being used.

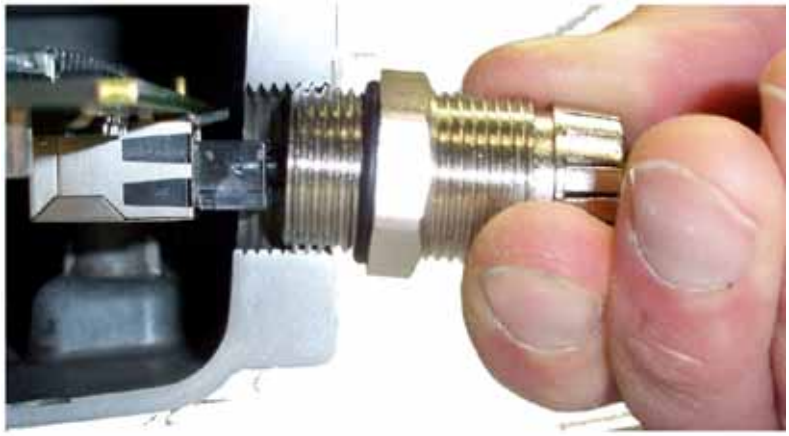
# Cable Preparation and Installation

## Cable and Gland Installation

To install the cables and glands, follow these steps:

**Step 1:** Make a cable as specified in “Cable Preparation”. Plug in the RJ 45 into the ODU.

**Step 2:** Support the drop cable and gently hand screw the gland body into the ODU until the O ring seal is flush to the ODU body.



**Caution:** Do not fit the back shell prior to securing the gland body.

**Step 3:** Once the gland is fully hand screwed into the ODU it may be tightened to a torque of 7 ftlbs/10Nm, with a 22mm wrench.

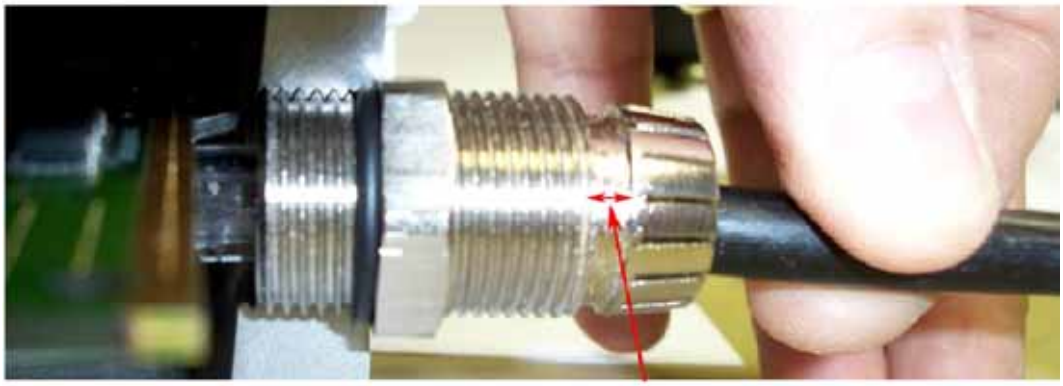
# Cable Preparation and Installation

**Step 4:** When the gland body has been fitted, tighten the gland back shell.

**Caution!** Do not over tighten the gland back shell.

Gland on the right-hand side has been over tightened. As a result, the internal seal and structure have been damaged:

**Step 5:** Should it be necessary to disconnect the cable at the ODU (or PTP LPU), this can be achieved by removing the gland back shell first. Then, wiggle the cable to release the tension of the gland body as shown in the figure below. Then you can unscrew the gland body and depress the RJ45 locking tab with a small screwdriver.



**Apply small movements to the cable until you see a gap here before unscrewing the gland body.**

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Connecting Up" |

# Testing and Fault Finding (Troubleshooting)

Perform troubleshooting (fault finding) procedures either on a newly installed link, or on an operational link if communication is lost.

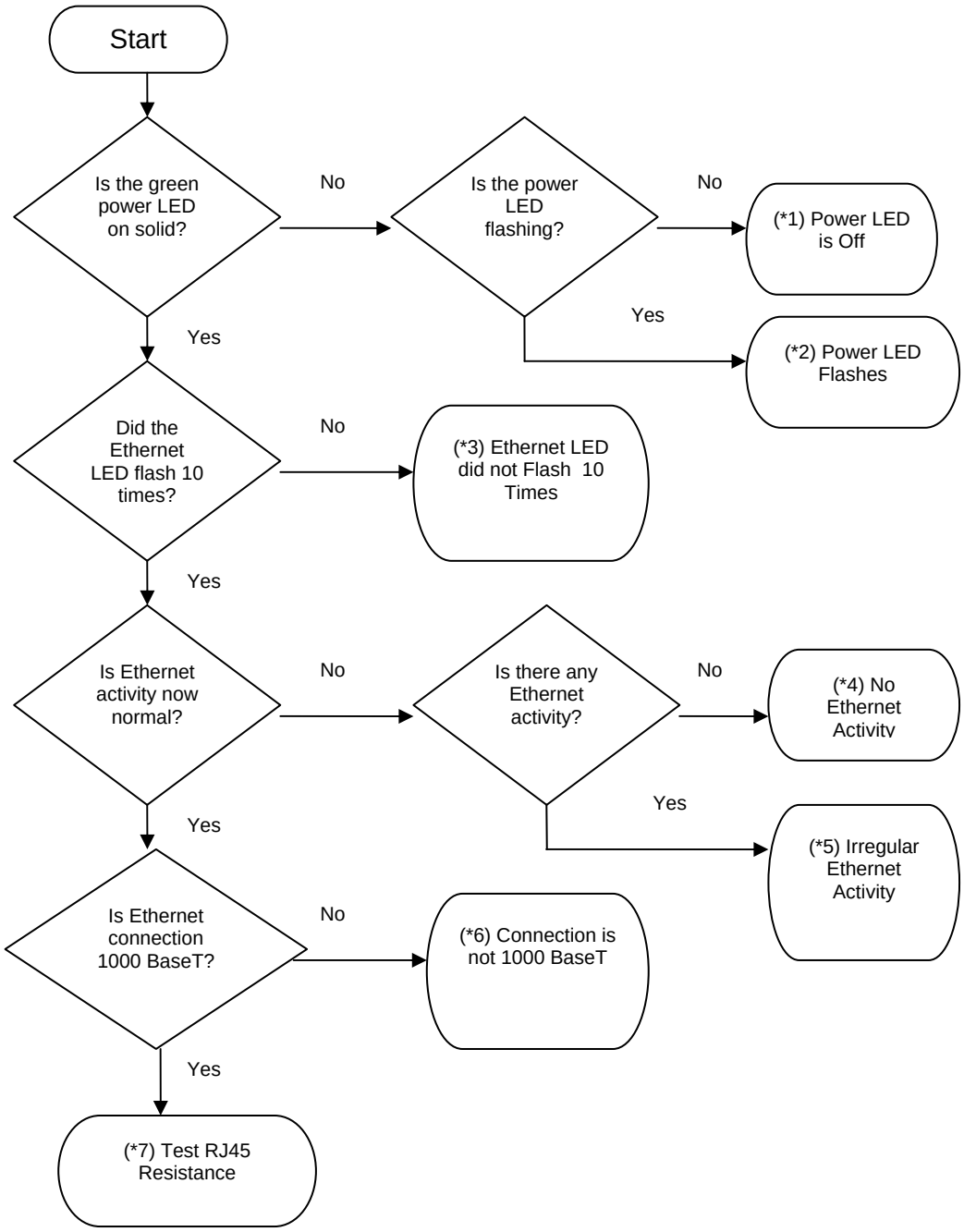
When the link end hardware (PIDU, LPU, ODU and cabling) has been installed, start it by following this procedure:

**Step 1:** Connect the RJ45 from the ODU (or LPU if fitted) to the PIDU and apply mains or battery power to the PIDU. The green Power LED should illuminate continuously.

**Step 2:** After 30 seconds, the yellow Ethernet LED should be observed starting with 10 slow flashes.

**Step 3:** Connect the RJ45 from the LAN port of the PIDU to the network. The yellow Ethernet LED should blink randomly as traffic passes through.

If the Power and Ethernet LEDs do not illuminate correctly, test the link end as described in this flowchart (references such as (*1) are to the tests on the following pages):



# Testing and Fault Finding (Troubleshooting)

## (*1) Power LED is Off

Unplug the ODU connection from the PIDU and check the power LED illumination. If the power LED still does not light then check the power source.

## (*2) Power LED is Flashing

Check that pins 4&5 and 7&8 are not crossed with pins 1&2 and 3&6 on the RJ45, and also greater than 100K ohms between pins 1&8.

## (*3) Ethernet LED did not Flash 10 Times

Check that the wiring to pins 4&5 and 7&8 is correct. For example, the wiring to pins 4 and 7 may be crossed.

## (*4) No Ethernet Activity

Check that the wiring to pins 1&2 and 4&6 is correct. For example, the wiring to pins 1 and 3 may be crossed.

## (*5) Irregular Ethernet Activity

The yellow Ethernet LED should blink randomly as normal traffic passes through. If the Ethernet LED flashes irregularly, for example there is a short flash followed by a long flash, this indicates that the ODU has booted in recovery mode. The causes may be installation wiring or a corrupt ODU software load.

## (*6) Connection is not 1000 BaseT

If the Ethernet connection to the network is only 10/100 BaseT, when 1000 BaseT is expected, check that the wiring to pins 4&5 and 7&8 is correct. For example, the wiring to pins 4 and 7 may be crossed.

## (*7) Test RJ45 Resistance

If the above tests fail to diagnose the issue, there may be a fault in the wiring of the RJ45 cable that connects the ODU (or LPU) to the PIDU. Perform the following tests:

**Step 1:** Unplug the RJ45 cable from the PIDU and check that the resistances between pins are correct as specified in Table 1.

Resistances should fall within + or -10% of the stated values.

**Step 2:** Ensure that there is greater than 100K ohms between pin 1 and ODU ground for all cable lengths.

**Step 3:** Ensure that there is greater than 100K ohms between pin 8 and ODU ground for all cable lengths.

**Step 4:** Ensure that there is greater than 100K ohms between pin 1 and pin 8 for all cable lengths.

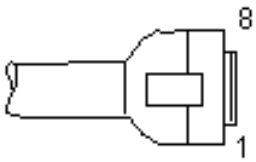
| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Troubleshooting (Fault Finding)" |

# Testing and Fault Finding (Troubleshooting)

**Table 1 - Resistance Table Referenced to the RJ45 at the PIDU**

Resistances should fall within + or -10% of the stated values.

| CAT-5 Length (Meters) | Resistance between pins 1&2, 3&6 , 4&5 and pins 7&8 (ohms) | Resistance between pins 1&3 (ohms) | Resistance between pins 4&7 (ohms) |
|---|---|---|---|
| 0 | 0.8 | 1.0 | 1.6 |
| 10 | 2.7 | 2.7 | 3.3 |
| 20 | 4.6 | 4.4 | 5.0 |
| 30 | 6.5 | 6.1 | 6.7 |
| 40 | 8.3 | 7.8 | 8.4 |
| 50 | 10.2 | 9.5 | 10.1 |
| 60 | 12.1 | 11.2 | 11.8 |
| 70 | 14.0 | 12.9 | 13.5 |
| 80 | 15.8 | 14.6 | 15.2 |
| 90 | 17.7 | 16.3 | 16.9 |
| 100 | 19.6 | 18.0 | 18.6 |
| 150 | 29.0 | 26.5 | 27.1 |
| 200 | 38.4 | 35.0 | 35.6 |
| 250 | 47.7 | 43.5 | 44.1 |
| 300 | 57.1 | 52.0 | 52.6 |



Identification of pin 1

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Troubleshooting (Fault Finding)" |

# Installation and Commissioning

## Aligning the PTP 300 or PTP 500 Series Bridge ODUs

The PTP 300 and PTP 500 Series Bridges use audible tones during installation to assist the installer with alignment. The installer should adjust the alignment of the ODU in both azimuth and elevation until highest pitch tone is achieved.

The pitch of the alignment tone is proportional to the received power of the wireless signals. The best results are usually achieved by making small incremental movement in angular alignment.

The tones and their meanings are as follows:

| State Name | Tone Description | State Description | Pitch Indication (Higher pitch = higher power) |
|---|---|---|---|
| Free Channel Search | Regular beep | Executing band scan | N/A |
| Scanning | Slow broken tone | Not demodulating the wanted signal | Rx Power |
| Synchronized | Fast broken tone | Demodulating the wanted signal | Rx Power |
| Registered | Solid tone | Both Master and Slave units exchanging Radio layer MAC management messages | Rx Power |
| Alarm | Fast broken dual tone | A fatal error has occurred. | |

The term ‘wanted signal’ refers to that of the peer unit being installed.

In each of the states detailed above, the unit should be aligned to give the highest pitch tone. It should be noted that if, when in the Synchronized or Registered state, the tone varies wildly, you may be suffering from interference or a fast fading link. Installing in this situation may not give a reliable link. The cause of the problem should be investigated.

For the ease of alignment, both Master and Slave units use the install tones in the same way but with some small behavioral differences. This allows the installer to install the Slave unit first and carry out the initial alignment with the Master unit if desired. However, due to the behavioral differences of Master and Slave units, it is recommended that the Master unit is installed first and the initial alignment carried out at the Slave unit.

Once the optimum performance has been achieved by directing the Slave unit (indicated by highest frequency of tone) then adjustment of the direction of the Master unit should be done without moving the Slave. Repeat if necessary at the Slave and then the Master until optimum alignment has been obtained.

## Behaviour During Installation

The following behavior should be noted:

- **Band scan:** When first started up and from time to time, the Master unit will carry out a band scan to determine which channels are not in use. During this time, between 10 and 15 seconds, the Master unit will not transmit and as a consequence of this neither will the Slave unit. During this time the installation tone on the master unit will drop back to the band scan state, and the Slave unit will drop back to the Scanning state with the pitch of the tone set to the background noise level. Alignment of the unit should cease during this time.
- **Radar detection:** If the unit is operating where mandatory radar avoidance algorithms are implemented, the ranging behaviour for the bridge may be affected. The Master has to monitor the initially chosen channel for 60 seconds to make sure it is clear of radar signals before transmitting. If a radar is detected during any of the installation phases, a further compulsory 60 seconds channel scan will take place as the master unit attempts to locate a new channel that is free of radar interference.
- **Ranging:** The PTP 300 and PTP 500 Series do not require the user to enter the link range. The Master unit typically takes less than 60 seconds to determine the length of the link being installed. The Master unit will remain in the Scanning state until the range of the link has been established. The Master unit will only move to the Synchronized state when the range of the link has been established.
- **Retrying same channel:** If, at the end of the ranging period, the Registered state is not achieved due to interference or other reasons, the Master unit will retry twice more on the same channel before moving to another available channel. Should this occur it might take a number of minutes to establish a link in the Registered state.
- **Slave unit:** The Slave unit does not have a ranging process. The slave unit will change to the Synchronized state as soon as the wanted signal is demodulated.

## DVM Alignment

It is possible to use the BNC connector on the PTP 500 Series ODU and a digital voltmeter (DVM) to help with the alignment process. The BNC connector provides an analogue voltage which is proportional to the received signal strength. To use, remove the protective cap from the case mounted BNC connector and connect a DVM. You may have to invert the pole for correct reading. The user guide shows the relationship between measured values and the receive signal strength.

| | | | |
|---|---|---|---|
| More information: | *PTP 300 Series User Guide* or *PTP 500 Series User Guide* | Section: | "Establishing a Radio Link" |

## Adjust Power Settings

The transmit power levels of the installed units must be adjusted to ensure they are not too high. Excessive power levels may cause saturation of the receivers or false radar detection (in radar enabled regions), leading to degradation of link performance and link failure. To adjust power levels, follow this procedure:

**Step 1:** Consult the report generated by the LINKPlanner tool and note the Transmit power recommended levels.

**Step 2:** Set the local unit power equal to the “LOCAL - Max Transmit Power setting while pointing” value from the LINKPlanner report.

**Step 3:** Set the remote unit power equal to the “REMOTE - Max Transmit Power setting while pointing” value from the LINKPlanner report.

**Step 4:** Access each unit separately.

**Step 5:** Align the units.

**Step 6:** Repeat Step 2 and 3 using the values “LOCAL - Max Transmit Power setting before disarm” and “REMOTE - Max Transmit Power setting before disarm”, if different than the corresponding “while pointing” values.

**Step 7:** Reboot the local unit then reboot the remote unit.

**Step 8:** Disarm the units.

## Disarm on Completion

When the alignment process is complete, the installer MUST REMEMBER TO DISARM BOTH UNITS in the link. This is necessary in order to:

- Turn off the audible alignment aid.
- Enable Adaptive Modulation
- Clear unwanted installation information from the various systems statistics
- Store the link range for fast link acquisition on link drop

## Items for Future Reference

Take note of the following items for future reference:

- Save a copy of the configuration using the “Save and Restore” functionality found under the “System Administration – Configuration” menu.
- Take a screen shot or print of the status page.
- Note the position and orientation of the antenna.
- Note surrounding objects that may interfere with the link (a photograph is recommended).
- After 1 hour of operation, the mean value of Link Loss on the status page should be within the values given in the LINKPlanner report. Further adjustments of the power levels may be necessary, so consult the LINKPlanner report notes and adjust the powers accordingly. You will be required to reboot the units for that to take effect.
- The LINKPlanner may need re-running to account for new known obstacles any time during the operation of the link.

**Note:** For short ranges and for links installed when Radar is Enabled, the PTP 300 and PTP 500 Series software will adjust automatically the maximum Transmit Power when the unit is disarmed.

# User Information to be Recorded

Use Table 2 and Table 3 to record the specified information. This information will be useful if there is a need to contact Motorola support or to identify future changes in the installation.

**Table 2 – Resistance Values**

| Measure Resistance Between Pins | Measured Resistance Value LOCAL | Measured Resistance Value REMOTE |
|---|---|---|
| 1&2 | | |
| 3&6 | | |
| 4&5 | | |
| 7&8 | | |
| 1&3 | | |
| 4&7 | | |
| 1&8 | | |
| 1&ODU Ground | | |
| 8&ODU Ground | | |

**Table 3 – Link Identification**

| | LOCAL | REMOTE |
|---|---|---|
| IP Address | | |
| Link Name | | |
| MAC Address | | |

# User Information to be Recorded

## User Notes

# Registration Warranty and Ordering Information

The PTP 300/500 is an extraordinarily robust radio communications link with unsurpassed availability and reliability. Along with your Motorola PTP Bridge you get a 12-month Standard Warranty that provides a 30-day repair-and-replacement program for hardware defect failures and minor software enhancements as they become available.

Although our bridges are extremely robust even in severe weather conditions, equipment failures can occur. We, therefore, recommend that you consider upgrading your first-year Standard Warranty to a PTP Extended or PTP “All Risk” Advanced Replacement Warranty. Extended Warranty extends your initial 12-month standard hardware warranty through the second, third or fifth years of ownership, providing 30-day repair and return for defective parts.

Advanced Replacement Warranty proposes up to five years of cover with next-business-day shipping of replacement equipment. Our Advanced Replacement warranties provide “All Risks” cover including:

- Lightning Damage.
- Damage caused by improper wiring, electrical shorts, building fires, vandalism.
- Dropped Units.
- Component or manufacturing defects.

With our warranties, you have peace-of-mind knowing that your investment is fully protected and, if you are covered with the Advanced Replacement Warranty, your communications will be back in operation in the shortest time possible.

**Register Your Units to receive updates and activate your warranty**

Upon receipt of your new PTP link, you should register your units to activate your free standard 12-month warranty and receive notification of software updates. For convenience, you can do that online at www.motorola.com/ptp/support/registration.

| Item | Part Number |
|---|---|
| 1 Year PTP Software Support Contract (1-2 Links) | WB3106 |
| 1 Year PTP Software Support Contract (3-5 Links) | WB3107 |
| 1 Year PTP Software Support Contract (5+ Links) | WB3108 |
| 2nd Year Extended Year (30 Day Return & Repair) | WB3133 |
| 3rd Year Extended Year (30 Day Return & Repair) | WB3134 |
| 5th Year Extended Year (30 Day Return & Repair) | WB3135 |
| Upgrade 1st year 24hr Advanced Replacement “All Risks” | WB3136 |
| Upgrade 2nd year 24hr Advanced Replacement “All Risks” | WB3137 |
| Upgrade 3rd year 24hr Advanced Replacement “All Risks” | WB3138 |
| Upgrade 5th year 24hr Advanced Replacement “All Risks” | WB3139 |

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