PTP 600 Series

Optical Interface Upgrade Kit User Guide

MOTOROLA POINT-TO-POINT WIRELESS SOLUTIONS

MOTOROLA, Inc.

Point-to-Point Wireless Bridges – PTP 600 Series

Optical Interface Upgrade Kit

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http://www.motorola.com

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MOTOROLA

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1 About This User Guide

This guide covers the installation, commissioning, operation and fault finding of the Motorola PTP 600 Series of Point-to-Point Wireless Ethernet Bridge Optical Interface Upgrade Kit.

1.1 Interpreting Typeface and Other Conventions

This document employs distinctive fonts to indicate the type of information, as described in Table 1.

Font	Type of Information
variable width bold	Selectable option in a graphical user interface or settable parameter in a web-based interface.
`constant width regular`	Literal system response in a command-line interface.
`constant width italic`	Variable system response in a command-line interface.
`constant width bold`	Literal user input in a command-line interface.
`constant width bold italic`	Variable user input in a command-line interface.

Table 1: Font Types

This document employs specific imperative terminology as follows:

- Type means press the following characters.
- Enter means type the following characters and then press Enter.
- Highlight means click anywhere in a row of data to highlight the entire row.
- Select means use the mouse to click on or branch to the menu item that follows.

Use this table and the Glossary to aid in interpreting the technical acronyms used throughout this User Guide.

This document also employs a set of consistently used admonitions. Each type of admonition has a general purpose that underlies the specific information in the box. These purposes are indicated in Table 1.

Admonition Label	General Message
	**Note** Informative content that may: • Defy common or cursory logic. • Describe a peculiarity of the PTP 600 Series solutions implementation. • Add a conditional caveat. • Provide a reference. • Explain the reason for a preceding statement or provide background for what immediately follows. • Suggestion for an easier, quicker, or safer action or practice.
	**Important** Informative content that may: • Identify an indication that you should watch for. • Advise that your action can disturb something that you may not want disturbed. • Reiterate something that you presumably know but should always keep in mind.
	**Caution!** A notice that the risk of harm to equipment or service exists.
	**Warning!** A notice that the risk of harm to person exists.

Table 2 - Admonition Types

1.2 Getting Additional Help

To get information or assistance as soon as possible for problems that you encounter, use the following sequence of action:

1. Search this document, the user manuals that support the modules, and the software release notes of supported releases:
    a. In the Table of Contents for the topic.
    b. In the Adobe Reader® search capability for keywords that apply.[1]
2. Visit the Motorola website at www.motorola.com/ptp
3. Ask your Motorola products supplier to help.
4. Gather information from affected units such as:
    a. the IP addresses and MAC addresses
    b. the software releases
    c. data from the Event Log
    d. the configuration of software features
    e. any available diagnostic downloads
5. Escalate the problem to Motorola Technical Support (or another Tier 3 technical support that has been designated for you) as follows. You may either:
    a. Send e-mail to support.ptp@motorola.com
    b. Call our 24x7 Technical Support Center on +1 (0) 877 515 0400 (Worldwide) or +44 (0) 808 234 4640 (UK Customers)

For warranty assistance, contact your reseller or distributor for the process.

1.3 Sending Feedback

We welcome your feedback on the PTP 600 Series system documentation. This includes feedback on the structure, content, accuracy, or completeness of our documents, and any other comments you have.

[1] Reader is a registered trademark of Adobe Systems, Incorporated.

2 Getting Started

2.1 For Your Safety

WARNING This kit contains a Class 1 Laser product.

Installers and maintenance personnel should take care not to look into the source of the laser beam (optical receptacle) directly or through an optical system. Looking directly at the Laser source is highly likely to impair your vision.

The characteristics of the Laser device are:

- Type Class 1, Vertical Cavity Surface Emitting Laser
- Operating Wavelength 850nm or 1310nm
- EN60825-1 (1994) + A1:2002 +A2:2001

It is highly recommended that power should always be removed from the system before the Fiber optic connection is made or unmade.

When installing the Fiber interface, the installer must either:

- Cap the fiber connector or
- Mate the connector to an appropriate equipment connector

In any event the installer must also ensure that the 'indoor' end of the Fiber is appropriately labeled to ensure that service personnel are aware the same Class 1 Laser hazard could exist at the indoor end of the cable.

2.2 Welcome

Congratulations on the purchase of the PTP 600 Series Bridge Optical Interface Upgrade Kit from Motorola. This upgrade will allow connection of a PTP 600 Series Bridge unit to a network over a 1000BaseSX or 1000BaseLX fiber interface. Please note that the two kits are different and not interchangeable.

2.2.1 About This Guide

This guide covers the installation, commissioning, operation and fault finding of the PTP 600 Series Bridge Optical Interface Upgrade Kit.

This document should be read in conjunction with the PTP 600 Series Bridge System User Manual.

2.2.2 Who Should Use This Guide

The guide is for use by the system installer and the end user IT professional.

The system installer will require expertise in the following areas:

- Network configuration
- Use of web browsers for system configuration, monitoring and fault finding
- The installation of fiber optic cables and connectors

2.2.3 Contact Information

Postal Address:	Motorola, Inc. Unit A1, Linhay Business Park, Eastern Road, Ashburton, Devon. TQ13 7UP United Kingdom
Web Site:	http://www.motorola.com/ptp
Sales Enquiries:	sales.ptp@motorola.com
Web Support:	http://www.motorola.com/ptp/
Email Support:	support.ptp@motorola.com
All Other Enquiries:	info.ptp@motorola.com
Telephone Enquiries and Global Support:	+1 (0) 877 515 0400 (Toll Free in the USA) and +44 (0) 808 234 4640 (Toll Free in the UK).

Table 3 - Contact Information

2.2.4 Repair and Service

For unit repair or service, contact your service provider or an authorized Motorola Point-to-Point Distributor for Return Material Authorization (RMA) and shipping instructions. Alternatively, contact the PTP Global Technical Support Center to process an RMA (following troubleshooting).

2.3 Product Description

This User Manual is specifically written for the "PTP 600 Series Bridge Optical Interface Upgrade Kit". This User Manual must be read in conjunction with the PTP 600 Series Bridge "User Guide".

The "PTP 600 Series Bridge Optical Interface Upgrade Kit" allows a PTP 600 Series Bridge unit to be connected to a network via a 1000BaseSX or 1000BaseLX Fiber interface[2].

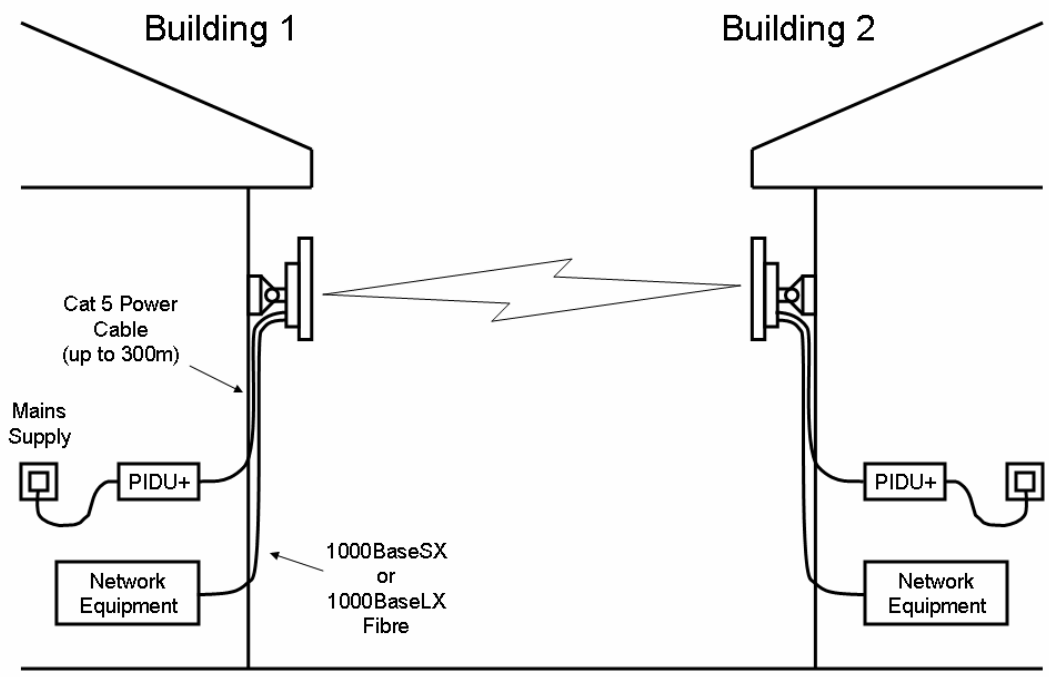


Figure 1 - System Diagram

When using the 1000BaseSX/LX interface the PTP 600 Series bridge unit is powered over a standard CAT5e Ethernet cable connected to either the power port (labeled PWR) on earlier versions or the 1000BaseT port (labeled PIDU+) on current variants.

[2] Note that the 1000BaseSX and the 1000BaseLX are different interfaces and not interchangeable.

Earlier versions are identified by the fact that they do not have a “Mod Strike” label on the back of the ODU. ODU units with a “Mod Record” label showing “1” or higher (Figure 2) are powered via the 1000BaseT port.

Figure 2 - Mod Record label (Power over 1000BaseT Variant)

The PTP 600 Series Bridge implements Automatic Media Selection (AMS). If both 1000BaseSX/LX Fiber and 1000BaseT connections are present the PTP 600 Series Bridge unit will use the 1000BaseSX/LX Fiber connection. If the fiber optic cable should fail the PTP 600 Series Bridge unit will fall back to the 1000BaseT connection.

NOTE: Although a distance in excess of 300m (984 feet) can be achieved over the Fiber interface there is a restriction of 300m on the power cable feeding power to the 1000BaseT port.

NOTE: If you require fall-back to the copper Ethernet cable you must restrict the length of the copper Ethernet cable to 100m

3 Fiber Specification

There are two version of the “PTP 600 Series Bridge optical Interface Upgrade Kit” one containing a 1000BaseSX (850nm) SFP Module and the other containing a 1000BaseLX (1310nm) SFP Module.

The fiber optic cable and fiber optic cable terminations are not supplied as part of the kit.

The various Fiber optic cable specifications are shown in Table 4 and Table 5.

	Core/Cladding (microns)				Units
	62.5/125	62.5/125	50/125	50/125	
Mode	Multi	Multi	Multi	Multi	
Bandwidth at 850nm	160	200	400	500	MHz/km
Operating Distance	220	275	500	550	meters
Insertion Loss	2.38	2.6	3.37	3.56	dB

Table 4 - Fiber Specification 1000BaseSX (850nm) modules

	Core/Cladding (microns)				Units
	62.5/125	50/125	50/125	10/125	
Mode	Multi	Multi	Multi	Single	
Bandwidth at 1310nm	500	400	500	N/A	MHz/km
Operating Distance	550	550	550	5000	meters
Insertion Loss	1.67	0.07	1.19	0.16	dB

Table 5 - Fiber Specification 1000BaseLX (1310nm) modules

4 Contents of the Upgrade Kit

The “PTP 600 Series Bridge Optical Upgrade Kit” contains the following items:

Description	Quantity
SFP Optical Module - (1000BaseSX) or (1000BaseLX) - Figure 3, Figure 4	1
Extension Tube (complete with ‘O’ Ring seal) - Figure 5	1
Weatherproofing Gland - Figure 6	1
Instruction Manual (on CD) – This Document	1
License Key Instructions and ID Code	1

Table 6 - Contents of the Upgrade Kit

Figure 3 - SFP Optical Module – 1000BaseSX (850 nm)

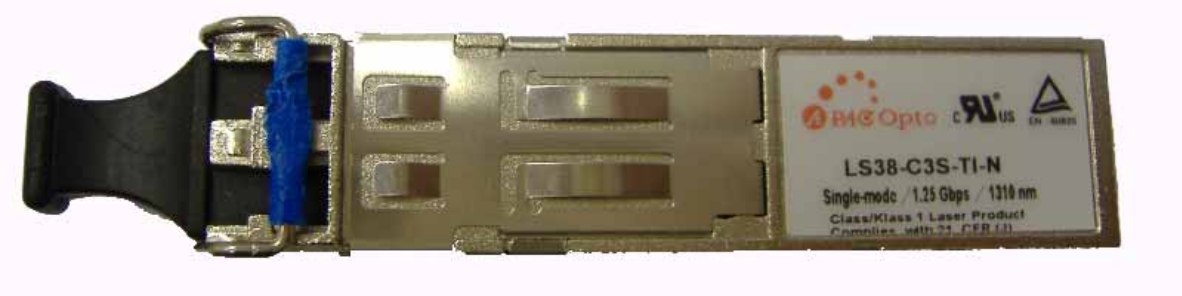


Figure 4 - Optical Module – 1000BaseLX (1310 nm)

WARNING The SFP Optical Module is sensitive to ESD. Observe ESD handling procedures.

CAUTION The performance of 1000BaseSX/LX connections can be seriously affected by dust build up. Keep all dust covers in place until just before the connection is to be made.

Figure 5 - Extension Tube

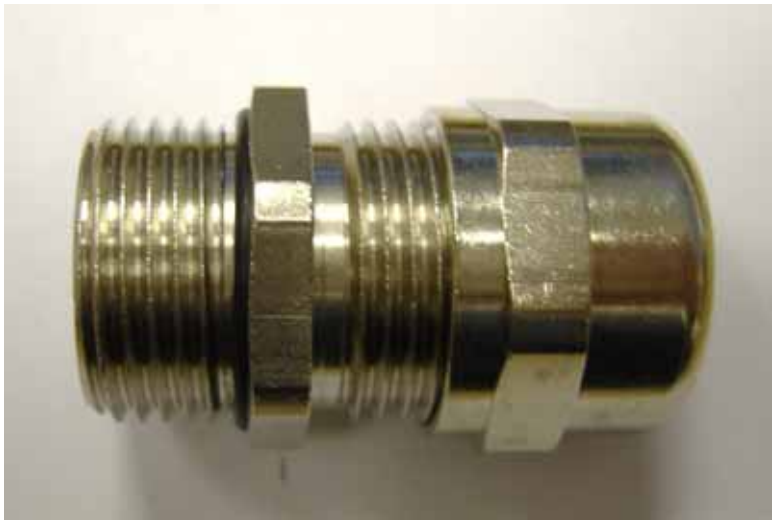


Figure 6 - Weatherproofing Gland

5 Items Not Supplied As Part of the Kit

The Fiber optic cable and connectors are not supplied as part of the “PTP 600 Series Bridge Optical Upgrade Kit”.

The Fiber optic cable and connectors should be procured from a specialist Fiber optic cable fabricator. The Fiber optic cable and connectors should be procured to the following specification.

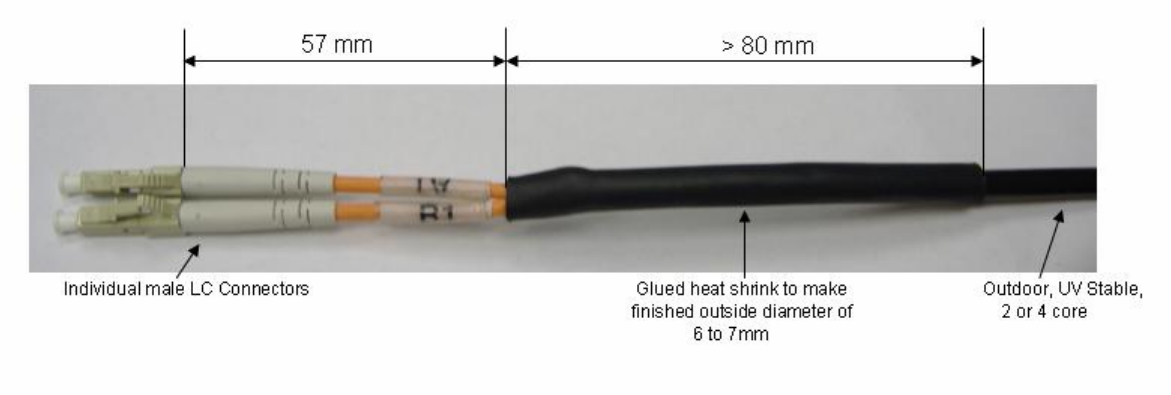


Figure 7 - Optic Cable and Connector Procurement Details

Important Notes:

- **Individual LC connectors are specified to aid installation and removal of the fiber optic cable assembly to and from the SFP module installed in the PTP 600 Series Bridge unit.**
- **The finished diameter of the cable where the weatherproofing gland clamps the cable should be between 6 and 7 mm. If the finished diameter is less than 6 mm the weatherproofing gland may not seal correctly. If the finished diameter is greater than 7 mm it will be difficult to assemble the weatherproofing gland without damaging the fiber optic cable.**
- **Assembly can be made easier by fitting the weatherproofing gland before fitting the connectors to the fiber optic cable.**
- **LC Connects should be supplied with dust caps to prevent dust build up.**

6 Unpacking and Inserting the SFP Optical Module

The SFP Optical Module is sensitive to ESD and comes packed in an ESD protective case. Observe ESD handling precautions when unpacking the module and inserting the module into the PTP 600 Series Bridge unit.

Step 1 – Remove the blanking plug from the Fiber port (on earlier versions this blanking plug should be screwed into the redundant 1000BaseT port labeled ETH) and insert the SFP Module …

Figure 8 - SFP Module (1000BaseLX Type)

… into the SFP receptacle in the PTP 600 Series Bridge unit …

Figure 9 - SFP Module Receptacle

… with the modules PCB connector down and label up, as shown.

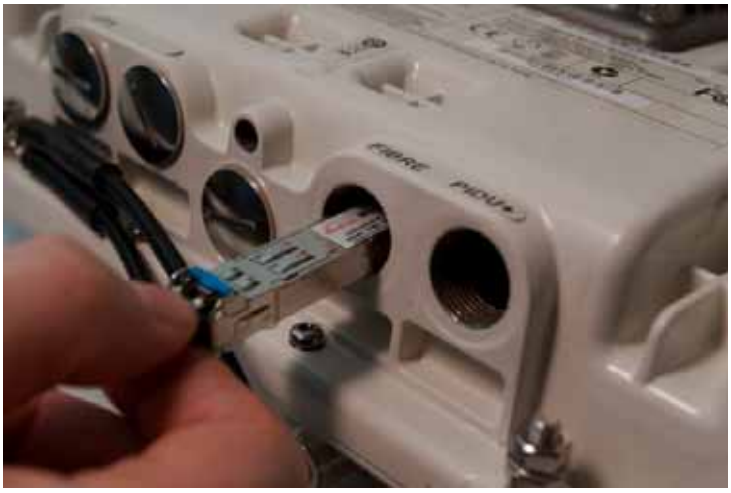


Figure 10 - Inserting the SFP Module

Step 2 – Push home the module until it you feel it click into place.

Figure 11 – Pressing the SFP Module Home

Step 3 – Then remove the optical dust protection cap.

Figure 12 - Removing the Dust Protection Cap

7 Connecting the Fiber Optic Cable

The Fiber optic cable assembly is very delicate. Extreme care should be taken when handling to avoid damage.

CAUTION Care must be taken to ensure that the Fiber optic cable does not twist during assembly. Extra care needs to be taken when fitting and tightening the weatherproofing gland.

7.1 Installation

Step 1 - Thread the gland and extension tube over the Fiber optic cable as shown.

Figure 13 - Fiber Optic Cable Assembly

NOTE: It is preferable to thread the gland onto the Fiber optic cable before termination. It is possible to thread the LC connectors through the gland by separating the rubber seal into its component parts then stretching them open with a sleeve spreading tool.

Do not over tighten the glands

You risk damaging the internal seal and structure of the gland

Step 2 – Remove the dust caps and plug the LC connectors into the SFP Optical Module ensuring that they snap home.

Figure 14 - Inserting the LC Connectors

Step 3 – Fit the extension tube and tighten hand tight plus 1/8 of a turn.

Figure 15 - Fitting the Extension Tube

Step 4 – Fit the Weatherproof Gland body and tighten hand tight plus 1/8 of a turn.

Figure 16 - Fitting the Weatherproof Gland Body

Step 6 – Fit the Weatherproof Gland Nut and tighten until the rubber part of the gland gives a good seal around the cable.

Figure 17 - Fitting the Weatherproof Gland Nut

Figure 18 - Completed Fiber Optic Assembly

Step 7 – On earlier versions it is necessary to a fit the spare blanking plug in the redundant port labeled ETH if not already fitted.

7.2 Removal

To remove the Fiber Optic Cable assembly the above procedure should be reversed. The LC connectors are removed by pressing their release tabs. Special care should be taken when removing the LC connectors to ensure that the release mechanism does not snag on the threaded part of the hole in the PTP 600 Series Bridge enclosure.

8 Removing the SFP Optical Module

Before attempting to remove the SFP module carefully remove the cable assembly by reversing the instructions in Section 7 “Connecting the Fiber Optic Cable”.

Then locate the plastic latches in the LC connectors and using a screwdriver push downwards to release the cables as shown in Figure 19 and Figure 20.

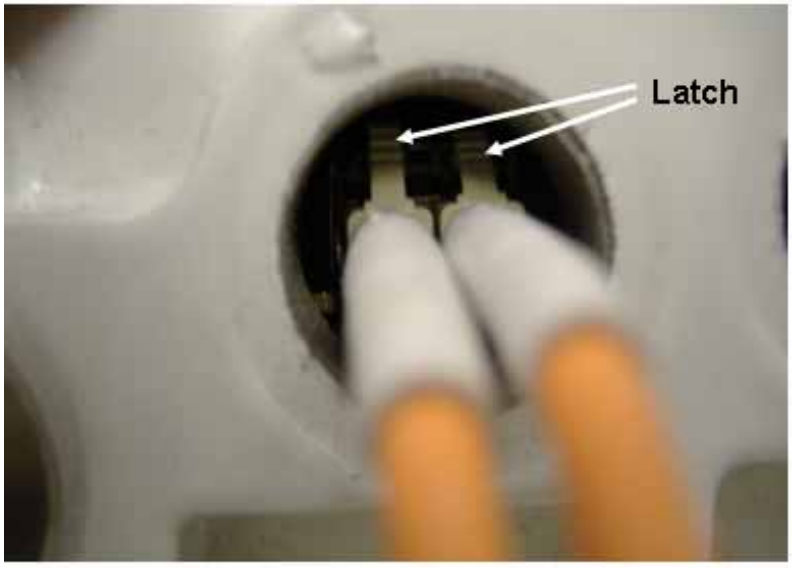


Figure 19 - LC Connectors Latch Mechanism

Figure 20 - Release LC Connectors Latches

To remove the SFP Optical module it must first be unlatched from the receptacle in the PTP 600 Series Bridge unit and then carefully removed with a pair of tweezers or pointed nose pliers as shown in Figure 21 and Figure 22.

Figure 21 - Optical Module Latch Release Mechanism – 1000BaseLX

Figure 22 - Optical Module Latch Release Mechanism - 1000BaseSX

Using a screwdriver, locate the Latch Release Mechanism and with an upwards push release the latch. The SFP module should then be released and removed.

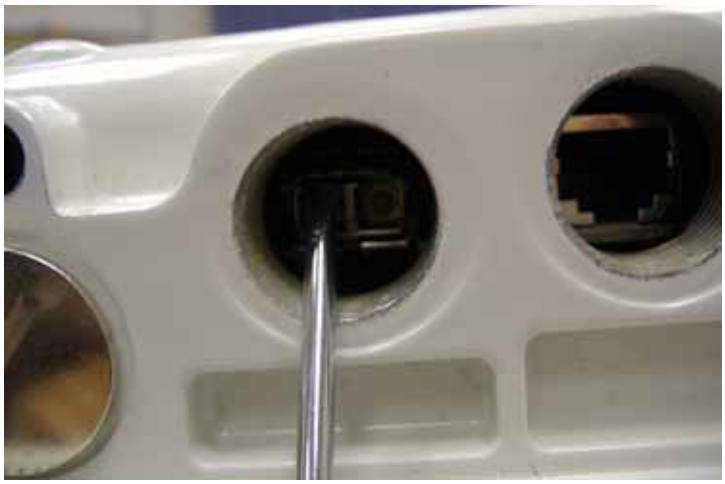


Figure 23 - Actuating the Optical SFP Module Release Mechanism

Figure 24 - Removing the SFP Optical Module

9 Connecting the Power

For information on powering the PTP 600 Series Bridge System please refer to the “PTP 600 Series Bridge System User Manual”

The “PTP 600 Series Bridge System User Manual” must be followed for the following:

- Cable specification
- Cable Assembly
- Connection to the PTP 600 Series Bridge Power Indoor Unit Plus (PTP 600 Series Bridge PIDU Plus)
- Lightning Protection

10 Configuring the Wireless Unit

A new license key must be installed on the PTP 600 Series Bridge unit in order to enable the 1000BaseSX/LX interface. The new license key is specific to a single wireless unit.

Prior to installation the license key must be obtained from the Motorola website. Instructions on how to obtain the license key and a unique ID Code are provided in a sealed envelope as part of the "PTP 600 Series Bridge Optical Interface Upgrade Kit" (Figure 25**Error! Reference source not found.**).

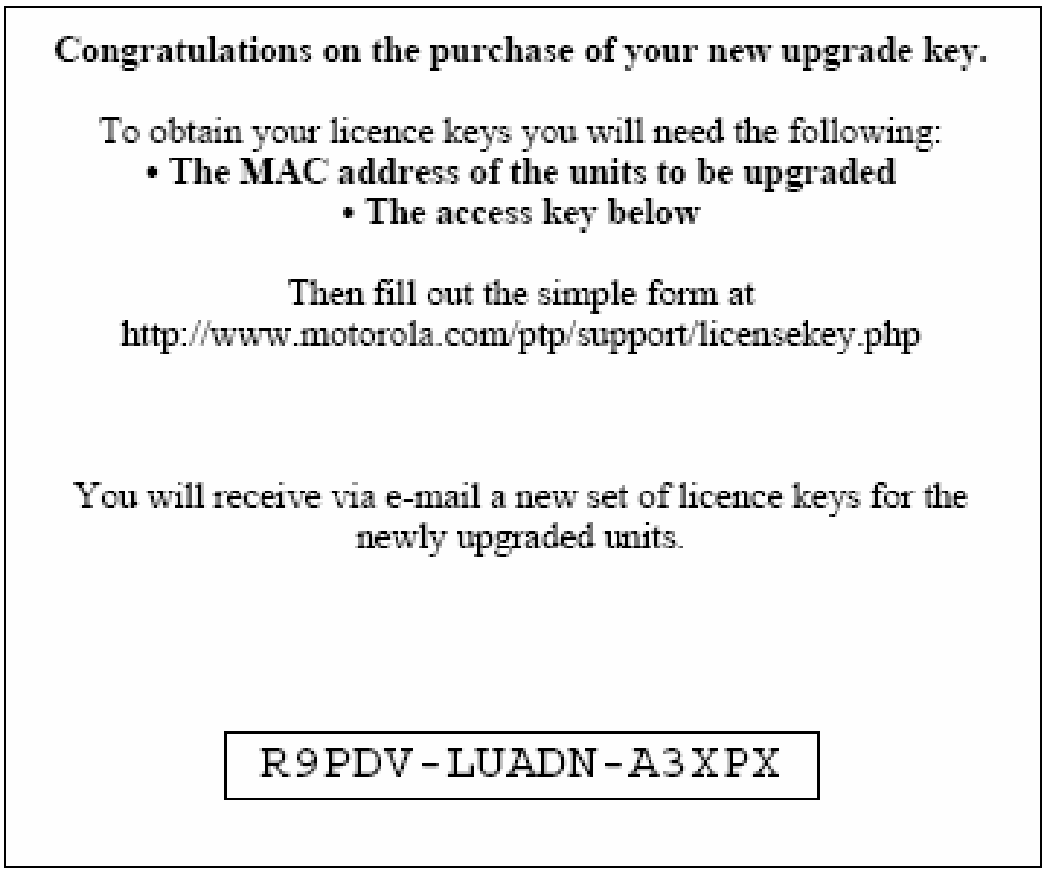


Figure 25 - License Key Instructions and ID Code

The following section is a step-by-step guide to installing the key and establishing a 1000BaseSX/LX connection to the wireless unit.

If problems arise during installation then read the notes in Section 12 "Troubleshooting".

If you intend to install your PTP 600 Series Bridge unit without retaining Copper Ethernet connectivity you will need to pre-configure the unit on the bench prior to installation.

Step 1 – Connect to the PTP 600 Series Bridge Unit

Using a standard CAT 5 patch cable, connect the PTP 600 Series Bridge unit to your network and then switch the unit on. Direct your web browser to the IP address of the PTP 600 Series Bridge unit.

Note: On earlier units this will be directly into the Outdoor Unit (ODU), on later units this will be via the PTP 600 Series Bridge PIDU+.

If you have already installed your SFP Optical Module an alarm will be displayed which indicates that an SFP module has been detected but that the current license key does not include Fiber support (Figure 26). The absence of an alarm indicates that either the SFP module is not connected correctly or that the current license key already includes Ethernet Fiber support.

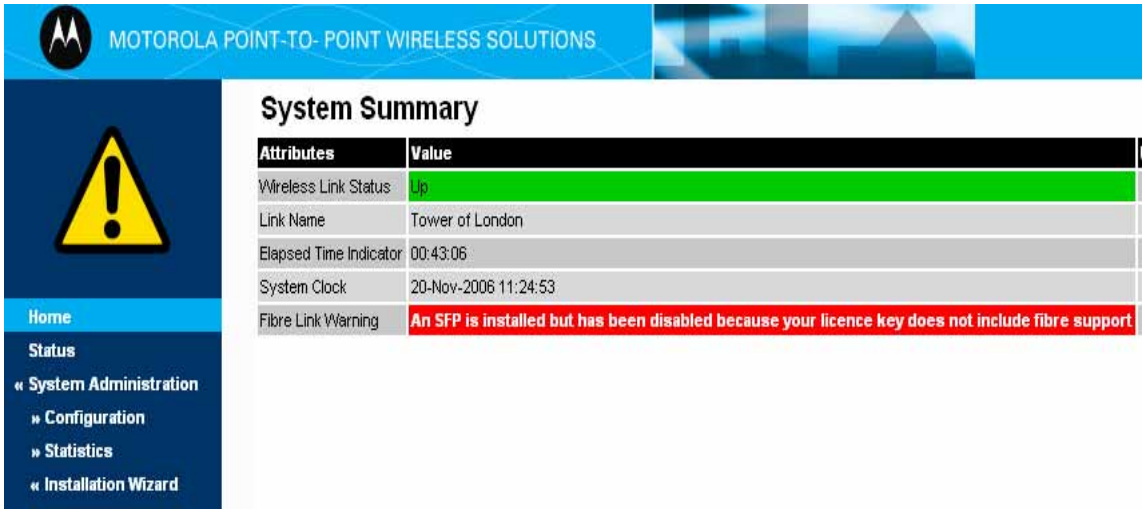


Figure 26 - PTP 600 Series Bridge Management Home Page

You may confirm that the SFP module has been connected correctly by viewing the "SFP Configuration" menu which is described in Section 11.

Step 2 – Enter the new License Key (if not already valid)

Click on the "System Administration" menu on the navigation bar, the "License Key" menu appears. Click on the "License Key" menu, you will be prompted to enter a system administration password. Either enter the password or leave this field blank if no password has been configured. Click the "Login" button to proceed. The software license key page is shown in Figure 27.

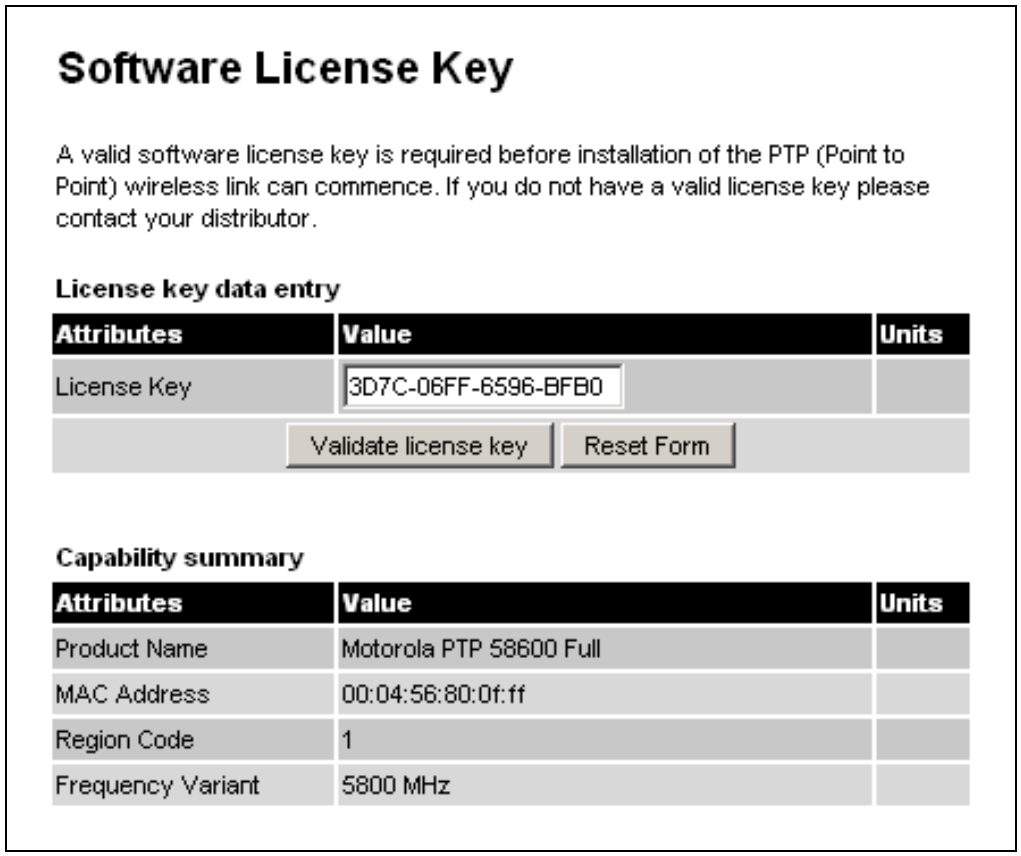
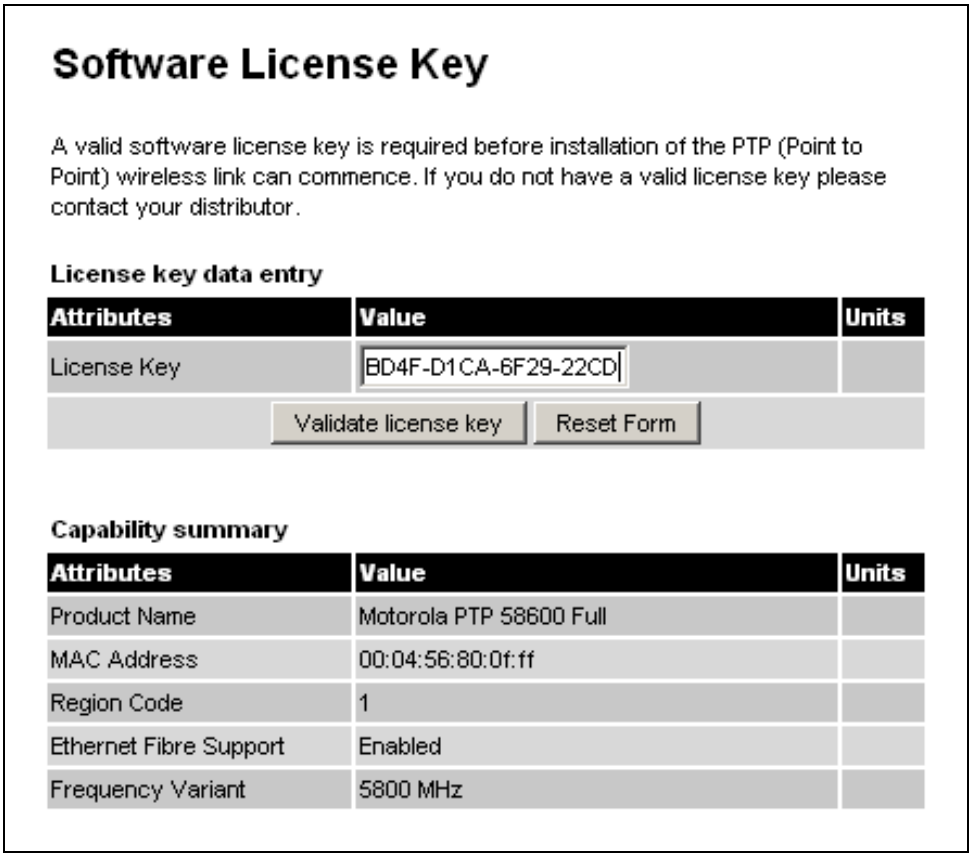


Figure 27 - Software License Key Entry Page

If the "Capability summary" table includes a row with the title "Ethernet Fiber Support" then your unit already supports Fiber connection as shown in Figure 28.



Software License Key

A valid software license key is required before installation of the PTP (Point to Point) wireless link can commence. If you do not have a valid license key please contact your distributor.

License key data entry

Attributes	Value	Units
License Key	BD4F-D1CA-6F29-22CD	

Validate license key | Reset Form

Capability summary

Attributes	Value	Units
Product Name	Motorola PTP 58600 Full	
MAC Address	00:04:56:80:0f:ff	
Region Code	1	
Ethernet Fibre Support	Enabled	
Frequency Variant	5800 MHz	

Figure 28 - License Key Page with Fiber support

Make a note of your current license key. If you retain this key you may use it to revert the wireless unit to its current configuration.

The key comprises four, four digit hexadecimal numbers separated by three hyphens. Enter the key exactly as it is written in the email sent as a result of registering the unique ID code and MAC address on the Motorola website. Having entered the license key, press the validate license key button.

If the subsequent web page includes the message "ERROR Invalid License Key" then use the back button and re-enter a valid license key string. If the license key format is incorrect then you will be notified by a pop-up dialog box. In this case, dismiss the dialog box and re-enter the license key. If your license key is not valid then contact your distributor.

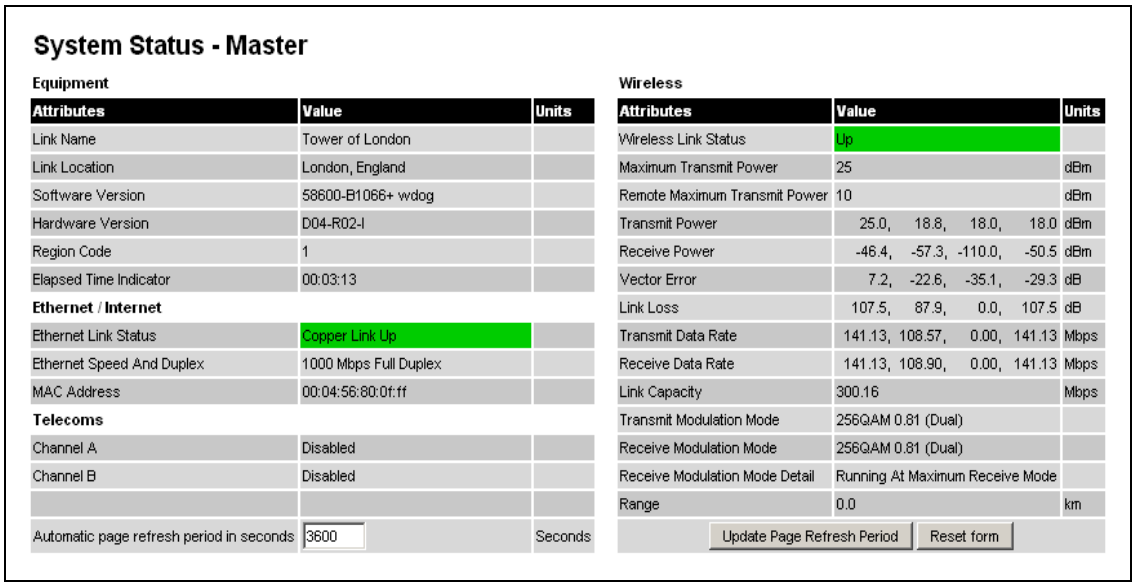
Having entered a valid license key, you will be prompted to reboot the wireless unit. Press the "Reboot Wireless Unit" button and confirm the reboot in the dialog box which follows.

Step 3 – Check the configuration

After the unit has rebooted navigate to the “PTP 600 Series Bridge Management Home Page”. The SFP alarm shown in Figure 26 should no longer be present.

Disconnect the CAT 5 network connection and make a 1000BaseSX connection between your network and the SFP Optical Module. Navigate to the “Status Page” and confirm that the "Ethernet Link Status" field is set to "Fiber Link Up" (Figure 29).

WARNING If your 1000BaseSX interface becomes active the PTP 600 Series Bridge unit will immediately switch to the 1000BaseSX interface and no longer communicate over the 1000BaseT interface.



System Status - Master

Equipment

Attributes	Value	Units
Link Name	Tower of London	
Link Location	London, England	
Software Version	58600-B1066+ wdog	
Hardware Version	D04-R02-I	
Region Code	1	
Elapsed Time Indicator	00:03:13	
Ethernet / Internet		
Ethernet Link Status	Copper Link Up	
Ethernet Speed And Duplex	1000 Mbps Full Duplex	
MAC Address	00:04:56:80:0f:ff	
Telecoms		
Channel A	Disabled	
Channel B	Disabled	
Automatic page refresh period in seconds	3600	Seconds

Wireless

Attributes	Value	Units
Wireless Link Status	Up	
Maximum Transmit Power	25	dBm
Remote Maximum Transmit Power	10	dBm
Transmit Power	25.0, 18.8, 18.0, 18.0	dBm
Receive Power	-46.4, -57.3, -110.0, -50.5	dBm
Vector Error	7.2, -22.6, -35.1, -29.3	dB
Link Loss	107.5, 87.9, 0.0, 107.5	dB
Transmit Data Rate	141.13, 108.57, 0.00, 141.13	Mbps
Receive Data Rate	141.13, 108.90, 0.00, 141.13	Mbps
Link Capacity	300.16	Mbps
Transmit Modulation Mode	256QAM 0.81 (Dual)	
Receive Modulation Mode	256QAM 0.81 (Dual)	
Receive Modulation Mode Detail	Running At Maximum Receive Mode	
Range	0.0	km

Update Page Refresh Period | Reset form

Figure 29 - System Status Page

Your wireless unit now supports Ethernet Fiber connection.

11 The SFP Configuration Menu

Figure 30 shows the SFP Configuration page.

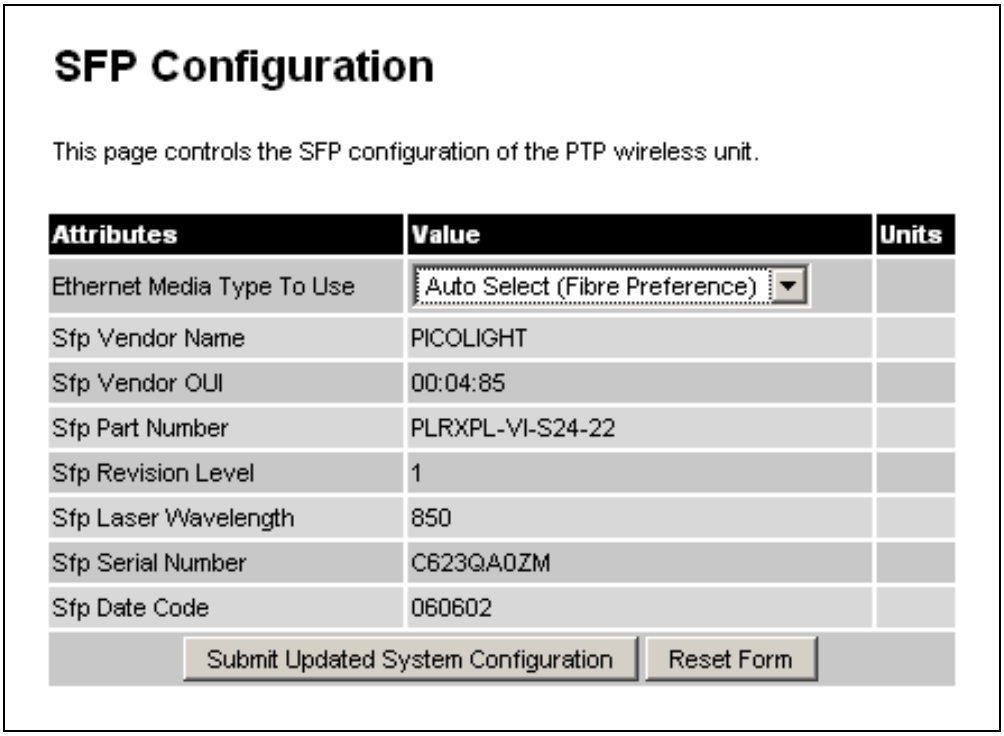


Figure 30 - SFP Configuration Page

This page contains a single user selectable option “Ethernet Media Type To Use”. This option has two settings: to either auto select between the copper and Fiber optic network connections or enable the copper connection only. When both 1000BaseSX and 1000BaseT connections are available and the PTP 600 Series Bridge unit will always give preference to 1000BaseSX.

The remaining fields contain information read from the SFP Optical Module.

Note: If the SFP Optical Module is not automatically sensed by the PTP 600 Series Bridge unit the “SFP Configuration” menu option will not be available.

12 Troubleshooting

The unit does not respond when connected via the 1000BaseT connection.

- Check that the CAT 5 cables have been inserted correctly
- Ensure that the network settings on your PC are correct.
- If a fiber connection has been made to your network, then remove it. In the default configuration the wireless unit will ignore the copper connection if a fiber connection is available.
- Confirm that you have entered the IP address of the unit correctly into your browser.
- Refer to the PTP 600 Series Bridge System User Manual if a connection still cannot be made.

The unit does not respond when connected via the 1000BaseSX connection.

- Browse to the unit over the wireless link (from a computer connected to the remote unit), and check whether the "SFP Configuration" menu is available.

  If the SFP Configuration menu is not available: Switch off the power to the wireless unit. Remove and then replace the SFP module. Switch the unit back on and confirm that the SFP Configuration menu is now available.

  If the SFP Configuration menu is available: Check the "Ethernet Link Status" on the "Status" page to see if it indicates a fault.
- Trying swapping the transmit and receive fibers
- Remove and remake both ends of the fiber connection ensuring that is no dust or other debris contaminating the connections.

License key is incorrect.

- If the license key which you have is incorrect then contact your distributor or reseller.

ALARM: An SFP is installed but has been disabled because your license key does not include Fiber support.

- This alarm indicates that license key entered into the PTP 600 Series Bridge unit is invalid.

ALARM: No Fiber link established but no LOS (i.e. an optical carrier is detected). Broken TX Fiber or link disabled at Fiber link partner?

- This alarm indicates that a signal is being received over the fiber interface but the transmit fiber is broken or the receiver at the far end is disabled.

Unit A1, Linhay Business Park
Eastern Road, Ashburton
Devon, TQ 13 7UP, UK
In North America: +1 877 515-0400
www.motorola.com/ptp