



Motorola PTP 600 5.4 GHz Deployment

Deploying 5.4 GHz PTP 600 Series Bridges in European Union (EU) Countries



Introduction

This Technical Note provides guidelines for deploying 5.4 GHz PTP 600 Series wireless Ethernet bridges in EU countries. The note explains regulatory conditions in the EU and shows typical throughputs which can be achieved when deploying PTP 600 Series bridges in the 5.4 band.

Regulatory Situation in the EU

Deployment of broadband wireless in the 5470 MHz to 5725 MHz band in the EU is subject to the Candidate Harmonised European Standard EN 301 893 produced by ETSI Project Broadband Radio Access Networks (BRAN). EN 301 893 v1.2.3 was replaced by v1.3.1 in 2006. This version has more stringent controls on Dynamic Frequency Selection (to meet radar avoidance requirements of all EU member states) and on EIRP. Motorola’s PTP 600 Series bridges comply with both versions of EN 301 893.

EIRP

Under EN 301 893 the following EIRP limits for the 5470 to 5725 MHz band apply to PTP 600 Series systems in 5.4 GHz:

- Mean EIRP density ≤ 17dBm/MHz
- Mean EIRP ≤ 30dBm

With a channel size of <30 MHz, PTP 600 Series bridges are highly, spectrally efficient radios, and may be deployed with **EIRP = 30dBm**

Region Keys

The PTP 600 Series 5.4 GHz wireless Ethernet bridge is shipped with a **default Region 12** key which ensures that the Integrated model of a 5.4 GHz PTP 600 system is fully compliant to EN 301 893 and may be deployed in the EU. With the default Region 12 key:

Maximum Power = 7 dBm, EIRP = 30 dBm, DFS = ON

In regions outside of the EU, other EIRP limits are permitted. Therefore on the PTP 600 Series Quick Start Guide, a second alternative license key is provided which “unlocks” the transmit power of the radio whilst maintaining DFS=ON (Figure1).

In the case where a PTP 600 bridge in 5.4 GHz is to be deployed with an external higher gain antenna, the maximum transmitter power will need to be reduced to comply with the 30 dBm EIRP limit. The power setting can be calculated from:

Maximum Power (dBm) = 30 – New Antenna Gain (dBi) + Feeder Loss (dB)

Default Region 12 Key

Alternate Region 13 Key

Link Configuration Data

These two units have been pre-configured as a link:

Units:

ODU serial number	ODU serial number
097PHC0578	097PHC0579
Ethernet MAC address	Ethernet MAC address
00:04:56:80:17:F3	00:04:56:80:17:DD
Software version	Software version
54600-04-00	54600-04-00

Configured as:

Master	Slave
Target MAC address	Target MAC address
00:04:56:80:17:DD	00:04:56:80:17:F3
IP address	IP address
169.254.1.2	169.254.1.1
Licence key	Licence key
091C-AAF6-D42F-7E00	7C77-520D-30AC-569A

Alternate licence keys:

BC93-8CBE-F814-1228	99AF-C833-F39D-C9BF
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Region 12 key: Complies to EU and FCC (Part 15) regulations with 23dBi integrated antenna

Region 13 key: Complies to Canadian and Australian regulations with 23dBi integrated antenna

WARNING: User must ensure product is configured to conform to local regulatory requirements. Refer to User Manual.

Figure 1: The location of the License Keys on the Quick Start Guide which is shipped with your link.

PTP 600 Series Bridge – 5.4 Reach Capability

Even with the stringent EIRP limits in the EU, PTP 600 5.4 GHz systems can be deployed in many applications.

In general terms, for line-of-sight hops <10 km and short range non-line-of-sight (NLoS), the **Integrated version of the PTP 600 Series bridge**, with its compact integrated antenna, is a cost effective solution. Deploying this solution, you can achieve the throughput shown in Figure 2.

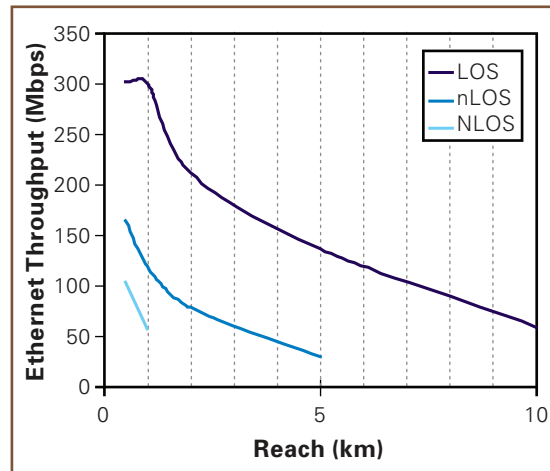


Figure 2: Typical reach and throughput rates with a PTP 600 Series bridge, Integrated model.

A **PTP 600 Series Integrated** system can also be successfully deployed on NLoS links <1 km. Used line-of-sight data rates in excess of 50 Mbps can be achieved over links of 10 km.

For more challenging deployments, we recommend using the **Connectorised version of the PTP 600 Series bridge**. With a 1.2-metre (4-foot) dual polarized antenna, the extra system gain can significantly improve throughput (Figure 3).

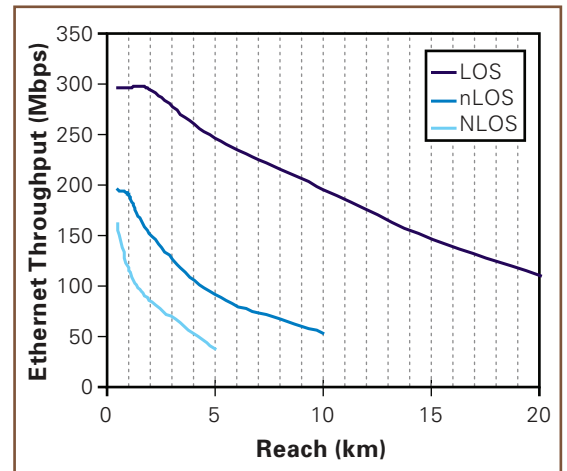


Figure 3: Typical reach and throughput rates with a PTP 600 Series bridge, Connectorised model.

Throughput rates in excess of 50 Mbps become possible on 10 km NLoS hops. Line-of-sight data rates greater than 100 Mbps can be achieved on links of 20+ km.

Note: The examples shown in Figures 2 and 3 provide indicative throughputs only and are not guaranteed.

Motorola recommends that the **PTP Link Estimator** – available from the Partners page at www.motorola.com/ptp – is used to plan every path before you deploy your link. Doing a path calculation using the PTP Link Estimator ensures that local terrain, mast height, and atmospheric and other conditions specific to your link are all taken into account. This way you will know before you deploy what the throughput and availability of your link will be, ensuring that your deployment goes according to plan.



The Motorola Point-to-Point Wireless Ethernet Bridges – PTP 600 Series – are part of Motorola’s **MOTOwi4™** portfolio of innovative wireless broadband solutions that create, complement and complete IP networks. Delivering IP coverage to virtually all spaces, the **MOTOwi4** portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for private and public networks.

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