



DELTA Fiber Nederland  
PtP FTTH Interface / Config Specification

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## Disclaimer

When a new version of this specification is published it supersedes all previous versions of this specification. Users are advised to regularly check for updates on this specification.

DELTA Fiber Nederland reserves the right to deviate from this specification, in certain geographical areas for technical tests and network development purposes.

DELTA Fiber Nederland does not take any responsibility for the correctness of the reference values included in this specification.

This interface specification implements the following (in Dutch):

- Besluit van 12 december 2016, houdende regels inzake eindapparaten ter implementatie van richtlijn 2008/63/EG (Besluit eindapparaten).
- ACM Beleidsregel handhaving besluit randapparaten (bepaling van het netwerkaansluitpunt en de vrije keuze van eindapparaten) – Staatscourant nr. 26456, 27 juli 2021.
- Nota van bevindingen – Beleidsregel handhaving besluit eindapparaten (bepaling van het netwerkaansluitpunt en de vrije keuze van eindapparaten) – Zaaknr. ACM/19/036305/ Documentnr. ACM/UIT/558420.

and is intended for fiber modem device manufacturers. The declaration of conformity with this interface specification is the sole responsibility of the manufacturer.

The interface specification does not apply under abnormal operating conditions such as:

- operating conditions arising as a result of operating services other than PtP FTTH over the dedicated fiber interface.
- operating conditions arising as a result of a fault, maintenance and construction work or to minimize the extend of interruption of service.
- operating conditions arising as a result of force majeure or third-party interference.
- operating conditions arising as a result of test signal injection governed by regulation.
- In case of non-compliance of a network user's installation or non-compliance of equipment with the relevant standards or non-compliance with the technical requirements for connection, established either by this interface specification or the public authorities including the relevant limits for electromagnetic compatibility.

The characteristics given in this interface specification are intended to be used to derive and specify requirements for equipment such as fiber cables and fiber modems to connect them to the dedicated fiber interface or Ethernet interface. The values in this interface specification take precedence over requirements in equipment product standards and installation standards.

This interface specification may be changed at any time and may break backward compatibility with previous versions. Manufacturers are therefore asked to provide regular software updates. This



interface specification may be superseded in total or in part by the terms of a contract between the individual network user and DELTA Fiber Nederland.

Contact Information:

DELTA Fiber Nederland BV

Department Core & FTTH

Overschieseweg 203, 3112 NB Schiedam

<https://www.deltafibernederland.nl>

Information for individual customers regarding the use of own fiber modems on the DELTA Fiber networks is available at:

<https://www.delta.nl/klantenservice/vrije-modemkeuze/>

<https://www.caiway.nl/klantenservice/vrije-modemkeuze/>



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## Conventions

Throughout this document, key words need to be interpreted in accordance with:

“MUST, SHALL”	This word means that the item is an absolute requirement of this specification.
“MUST NOT”	This phrase means that the item is an absolute prohibition of this specification.
“SHOULD”	This word means that there MAY exist valid reasons in particular circumstances to ignore this item, but the full implications SHOULD be understood and the case carefully weighed before choosing a different course.
“SHOULD NOT”	This phrase means that there may exist valid reasons in particular circumstances when the list behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
“MAY”	This word means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.

## References

[1] ATTEMA FTU, Datasheet article nr AT29100,

<https://assets.attema.com/media/15/15140/Datasheet%20FTU%20DeltaFiber%20NL%20AT12372%20V1.0.pdf>

[2] <https://ieeexplore.ieee.org/document/1636411> D. Kokkinos, C. Saravanos, W. Stanford, Wenjia Wang and Yan Hua, "SC/APC fiber optic connectors connected and disconnected under high optical power," 2006 Optical Fiber Communication Conference and the National Fiber Optic Engineers Conference, 2006, pp. 6 pp.-, doi: 10.1109/OFC.2006.215381. SC/APC connector

[3] [https://www.ieee802.org/21/doctree/2006\\_Meeting\\_Docs/2006-11\\_meeting\\_docs/802.3ah-2004.pdf](https://www.ieee802.org/21/doctree/2006_Meeting_Docs/2006-11_meeting_docs/802.3ah-2004.pdf) Physical Medium Dependent (PMD) sublayer and medium, type 1000BASE-LX10 (Long Wavelength) and 1000BASE-BX10 (BiDirectional Long Wavelength)

[4] <https://ieeexplore.ieee.org/document/7374647> "IEEE Standard for Local and metropolitan area networks--Bridges and Bridged Networks--Corrigendum 1: Technical and editorial corrections," in *IEEE Std 802.1Q-2014/Cor 1-2015 (Corrigendum to IEEE Std 802.1Q-2014)*, vol., no., pp.1-122, 12 Jan. 2016, doi: 10.1109/IEEESTD.2016.7374647.

[5] <https://datatracker.ietf.org/doc/html/rfc2131> DHCPv4

[6] <https://datatracker.ietf.org/doc/html/rfc7857> Network Address Translation (NAT) Behavioral Requirements



[7] <https://datatracker.ietf.org/doc/html/rfc4638> Accommodating a Maximum Transit Unit/Maximum Receive Unit (MTU/MRU)

[8] <https://datatracker.ietf.org/doc/html/rfc2236> Internet Group Management Protocol, Version 2

## 1. Scope

This document describes the basic requirements to be met by PTP FTTH modem equipment for using data, IPTV, voice services at the “fixed network termination point” (vaste netwerk aansluitpunt) as described in the “ACM Beleidsregel Handhaving Besluit Eindapparaten”.

The document covers the basic physical requirements as well as PTP FTTH requirements for using Internet Protocol services (IP) over the PTP FTTH Fiber Network. Additionally, the requirements for the service settings are also covered.

These requirements may change from time to time to reflect changes in the network. Anyone using this specification should therefore regularly consult the website of DELTA Fiber Nederland to look for the latest version of this document.

Any device that is connected to the network that violates this specification can be refused access to the network.

DELTA fiber will not perform or facilitate software updates for the 3<sup>rd</sup> party modem. The 3<sup>rd</sup> party modem MUST NOT accept new firmware/software unless it has been digitally signed by the original manufacturer of the 3<sup>rd</sup> party modem. Alteration of the software itself MUST NOT be possible in any other way.

## 2. Definitions and Abbreviations

### Definitions

### Abbreviations

CPE	Customer Premise Equipment
DS	Downstream

IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
IPTV	Internet Protocol Television
ITU	International Telecommunication Union
QoS	Quality of Service
RFC	Request For Comment
RG	Residential Gateway
RX	Receiver sensitivity
TX	Transmit sensitivity
UP	Upstream
VLAN	Virtual Local Area Network
VoIP	Voice over Internet Prototcol

### 3. General

The PTP FTTH modem MUST be connected to the outlet of the Attema FTU with a simplex single mode (9/125  $\mu\text{m}$ ) fiber patch cable between the PTP FTTH modem and the Attema FTU with a SC/APC connector at the side of the FTU and a suitable fiber patch assembly for the Attema FTU. [1]

The patch fiber assembly is available for modem manufacturers at:

Attema BV  
 Afdeling Verkoop binnendienst  
 +31(0)183 650 650

## 4. Network PTP FTTH Requirement

Third party modem MUST comply to the standards as defined in the following chapters.

### 4.1. Standards

- Use of a SC/APC connector [2] at the FTU with fiber patch assembly [1]
- IEEE 802.3 Clause 59 (1000BASE-BX10-U) [3]
  - TX 1310 nm
  - RX 1480 - 1580 nm
  - 10 km range
  - > 12 dB power budget
  - Class 1 laser product
  - Transmit power -3 ... -9 dBm
  - Receive power -3 ... -21 dBm
- IEEE802.1Q VLAN [4]
- DHCP IPv4 RFC2131 [5]
- NAT rfc7857 [6]
  - TCP Session Tracking
  - Port parity
  - IP Identification
  - Forward error correction (FEC)
- IEEE802.1p [4]



## 5. PtP FTTH Manual Configuration Settings

This chapter will describe the end users service modem settings which are minimal required to interface to the Delta's PtP FTTH infrastructure.

The modem must follow the defined service model of the operator, i.e. specified VLANs, p-bit values etc.

Depending on the end user subscription max three services can be deployed

- Internet
- IPTV
- Fixed Voice

There is no RGW management configuration done by Delta for 3<sup>rd</sup> party modems.

The end user is responsible for applying the correct setting as specified by Delta.

The 3<sup>rd</sup> party modem is not managed by Delta. The end user is responsible for using the latest validated modem software and the correct settings.

### IP-services

The PtP FTTH modem **MUST** get an IPv4 address via DHCPv4 [5] for every VLAN [4] that the customer is intending to use. MTU [7] size **MUST** be set to 1500. The QoS [4] settings **SHOULD** be set at the given value below to ensure the best quality.

### Internet Service

At least the Internet service should be set at the 3<sup>rd</sup> party modem

<b>Internet</b>	
Type	DHCPv4
VLAN	100
MTU	1500
IP-protocol version	IPv4

Applicable if the end-user has a subscription for this service

<b>IPTV</b>	
Type	DHCPv4
VLAN	101
MTU	1500
IP-protocol version	IPv4
IGMP proxy	min IGMPv2
QoS marking	2

## Voice

Applicable if the end-user has a subscription for this service. Further information about the VoIP configuration and requirements if found in the Voice documentation.

<b>VoIP</b>	
Type	DHCPv4
VLAN	102
MTU	1500
IP protocol version	IPv4
QoS marking	5



## Routing

To ensure to get the best possible network experience, the router SHOULD have the following routes configured in the routing table.

Routing from source customer LAN to one of the following subnets needs to be routed through VLAN100

62.45.57.36/32

Routing from source customer LAN to the following subnets needs to be routed through VLAN101

62.45.57.34/32

62.45.57.0/24

62.45.59.0/24

62.45.76.0/24

62.45.58.226/32

62.45.45.150/32

62.45.49.0/24

212.115.196.0/25

217.63.90.128/25

217.63.91.0/26

62.45.61.32/27

62.45.61.16/28

62.45.61.64/28

217.102.255.57/32