

# Fiber Line

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## 1 Introduction

1. This document describes the services offered by Swisscom in the context of the Fiber Line product.
2. Where nothing to the contrary is mentioned, the points of contact mentioned in the list of contacts are responsible for the processes between Swisscom and the PTS, and declarations of intent are exchanged electronically (e.g. e-mail, fax, web tool/electronic interfaces, etc.).

## 2 Service overview

1. The Fiber Line is a passive layer 1 service (physical layer) based on mono mode optical fibers for rendering telecommunications services and is available to the PTS for its exclusive use.
2. Fiber Line is available with either one (1) or two (2) optical fibers.
3. The interconnection points (SAP) are on the two end points, generally on the OP distributor (FTTO) resp. OTO box (FTTH), and are disclosed to the PTS according to the line design or within the scope of the commissioning.
4. To meet the different availability requirements, Swisscom Fiber Line offers the Basic and Premium service levels. The services rendered in connection with Fiber Line can be specified as follows:

SLA Parameter	Basic	Premium
<b>End-to-end availability</b>	99.80% non-guaranteed value	99.90% guaranteed value
<b>Fault reporting</b>	365 days x 24 hours	
<b>Fault repair</b>	365 days x 24 hours <sup>1</sup>	
<b>Fault rectification period</b> (after receipt of the fault report and within the operating times)	Typical value, not guaranteed ≤ 8 hours (if no mechanical damage on the fiber optic cable)	
<b>Quality of service reports</b>	No	Yes
<b>Guarantee claim</b>	No	Yes
<b>Service monitoring</b>	No, reactive after fault acceptance by the PTS	

## 3 Prerequisites and limitations

1. Fibre line requests are checked for available capacity in the access and backbone fibre optic network as part of a feasibility study. If there is a lack of capacity in the backbone, the fibre line is handed over to the central office (CO).  
If there are multiple demands for fibre line in the same access network, fiber is as well handed over directly in the CO. For the handover in the CO, the rent of space and fibre optic inhouse cable for leased lines<sup>2</sup> is required.

<sup>1</sup> Depending on location factors and personnel capacities of Swisscom.

<sup>2</sup> The prerequisite for this is the contract for Fläche und Gebäudeinfrastruktur (F&G)

### 3.1 Personal and cable protection

- If the PTS intends to use laser power  $>21.3\text{dBm}/136\text{mW}$  for the operation of Fiber Line, the PTS must ensure that an intelligent shutdown system is used (IPA/APS<sup>3</sup>) to avoid endangering persons and property, including cable systems.  
In this case, Swisscom must be notified to ensure that a detailed check can be carried out by Swisscom regarding the suitability of the entire system (cables and plug types). Important note: When using laser power  $>21.3\text{dBm}/136\text{mW}$ , only plugs of type E2000/APC may be used. Other plugs, such as FC/PC or LC/APC, are not permitted!**

## 4 Technical service attributes

### 4.1 Fiber type

- The optical fiber cables on which the Fiber Lines are provided correspond to ITU G.652 D or IEC 60793-2-50 B1, 3 and G. 655 or IEC 60793-2-50 B4 (Single Mode Optical Fiber 9/125 $\mu\text{m}$ ) standards.
- The plug at the interconnection point is generally an E2000 (OP) or LC/APC 8° connector (OTO).

### 4.2 Latency

- The maximum latency of the Fiber Line depends on the physical distance and according to the cable specification under ITU-TG.652 amounts to approximately 1ms over a fiber distance of 200 km.

### 4.3 Attenuation

- The maximum attenuation of the Fiber Line depends on the physical distance, number of connection points (patches) and varies depending the used wavelength according to cable specification according ITU-T G.652 as follows:

*Fibre optic line per wavelength:*

- The attenuation per km of fibre optic line at 1310nm is typically 0.4 dB.
- The attenuation per km of fibre optic line at 1550nm is typically 0.25dB.

*Splice/plug connection:*

- The attenuation per splice is typically  $\leq 0.15$  dB.
- The attenuation per plug connection is typically  $\leq 0.5$  dB.

- Calculation example: a calculation of the approximate attenuation for 10km, with 10 splices*

- 1310nm:

10km x 0.40dB/km (cable) + 10 splices x 0.15dB/splice + 4 x 0.50dB/connector (2 connectors on each side if there is an intermediate splitter) = 7.5dB end to end

Calculated value (incl. reserve 1 dB) = 8.5dB E2E for 1310nm

- 1550nm:

10km x 0.25dB/km (cable) + 10 x 0.15dB + 4 x 0.50dB = 6 dB @ 1550nm

Calculated value (incl. reserve 1 dB) = @1550nm E2E = 7 dB

<sup>3</sup> Intelligent power adjustment/Automatic power shutdown

## **5 Service fulfilment**

### **5.1 Offer**

- <sup>1.</sup> To obtain an offer the PTS shall submit a request to Swisscom with the fully completed order form.
- <sup>2.</sup> Offer requests for Fiber Line are generally answered within fifteen working days.
- <sup>3.</sup> Following receipt of the offer request, Swisscom carries out a feasibility check and provides an offer with the following details:
  - Feasibility
  - Details regarding fiber distance
  - Pricing information
  - Realisation date from date of receipt of the order
  - Period during which the offer will remain valid
- <sup>4.</sup> No resources are reserved within the scope of the feasibility check.

### **5.2 Order**

- <sup>1.</sup> The PTS can order the requested Fiber Lines based on a positive feasibility check and the subsequent offer.
- <sup>2.</sup> The order is executed by the first possible date (as per the feasibility check or the customer's preferred date) unless the fibers have been used elsewhere in the period between the (non-binding) feasibility check and the order.
- <sup>3.</sup> Swisscom generally confirms the planned commissioning date within ten working days<sup>4</sup> following receipt of the order from the PTS. The PTS also receives the following information with this confirmation:
  - Service description with the corresponding addresses and necessary specifications
  - Line identification
  - Recurring and one-time charges
- <sup>4.</sup> If no objection is received from the PTS by e-mail within one working day following receipt of the confirmation, this is viewed as the conclusion of an individual agreement for the respective Fiber Line.
- <sup>5.</sup> Swisscom sends the PTS installation instructions with the interconnection points (SAP).
- <sup>6.</sup> The PTS is responsible to ensure an appropriate infrastructure (PTS infrastructure, such as rooms and in-house installation) is available in a timely manner.
- <sup>7.</sup> Commissioning is carried out by Swisscom.

### **5.3 Options**

- <sup>1.</sup> A measurement can be carried out on the corresponding Fiber Line (which is subject to a charge) at the request of the PTS, to determine the effective attenuation values and latencies.
  - Single-sided attenuation measurement, end-to-end, incl. measurement report (unidirectional

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<sup>4</sup> The given guideline values are only valid if sufficient resources are available. In the event of extensions, confirmation will be postponed by the corresponding extension time.

- OTDR measurement)
- Double-sided attenuation measurement, end-to-end, incl. measurement report (bidirectional OTDR measurement)
- Detailed bidirectional OTDR measurement: Dispersion measurement CD, PMD (chromatic dispersion (CD) and polarisation mode dispersion (PMD) incl. event table)

#### 5.4 Change of location:

- <sup>1</sup> When the location changes, the end point of an existing Fiber Line can be moved. A mutual change of both end points is treated as a cancellation and new order.
- <sup>2</sup> The PTS can order the requested change of location after a positive feasibility check or offer.
- <sup>3</sup> The commissioning time for a change of location is the same as for an order.

#### 5.5 Splices

- <sup>1</sup> During the commissioning process, cable sections with patch cable (plugged) are used by default. The PTS can order splicing of individual sections with a fee. For reason of faster trouble shooting, Swisscom does however not recommend it.  
No SLA Premium is possible for spliced links.

#### 5.6 Fiber Inhouse

- <sup>1</sup> Fiber Line can also be used within a central office (CO), described as Fiber Inhouse.

### 6 Service assurance

- <sup>1</sup> The services includes in particular fault acceptance and fault rectification.
- <sup>2</sup> Fiber Line does not include any service monitoring. The fault rectification is reactive after fault acceptance of the PTS.
- <sup>3</sup> The PTS shall only contact Swisscom after it has confirmed that the fault is not in its equipment or in-house installation.
- <sup>4</sup> An order for fault rectification can be placed with Swisscom 24 hours a day<sup>5</sup>, seven days a week.
- <sup>5</sup> Swisscom is responsible for fault rectification between the two interconnection points (SAP). Fault reporting outside this area of responsibility is subject to a charge.
- <sup>6</sup> The PTS will provide Swisscom employees with access to its premises within the scope of service delivery and activities for avoiding and rectifying faults.

#### 6.1 Maintenance: Coordinated Maintenance Window (CMW)

- <sup>1</sup> Periodic network maintenance is needed to ensure quality. Whenever possible, reconfigurations, hard and software changes will be carried out during the CMW.

**The CMW is always scheduled on a Sunday between 2:00 am and 6:00 am.**

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<sup>5</sup> Depending on location factors and personnel capacities of Swisscom.

2. If the planned interruption is expected to last more than three minutes, the affected PTS will be informed by Swisscom at least ten working days beforehand.
3. If the planned interruption is expected to be three minutes or less, the work will still be carried out during the CMW, but the PTS will not be informed.
4. In special cases work may be needed outside the CMW. In such cases the PTS will also be informed at least ten working days in advance.
5. Swisscom reserves the right to adjust the CMW. Swisscom will inform the PTS in good time about any such changes.

## 7 Prices

1. Prices for Fiber Line are provided on request. A detailed feasibility study must be carried out beforehand.
2. Prices for the feasibility study are shown on the order form. These OTCs are waived if the fibre line is ordered.
3. One-time prices are charged for rectifying faults outside Swisscom's area of responsibility. Prices are on request according to expenditure.
4. One-time prices are charged for creating a measurement report. The prices are shown on the order form.
5. The invoicing methods are dealt with in the Billing handbook.

### 7.1 Cancellation following commissioning and prior to expiry of the minimum contract term

1. In case Fiber Line is cancelled after service delivery and prior to the expiry of the minimum contract term or contractually agreed utilisation period, the PTS shall owe Swisscom the following:

Agreed utilisation period	Percentage	Definition
3 years (standard)	30 %	of the monthly recurring charge for the rest of the remaining duration
4 years	25 %	of the monthly recurring charge for the rest of the remaining duration
5 years and more	20 %	of the monthly recurring charge for the rest of the remaining duration

Table 1: Cancellation prior to expiry of the minimum contract term

2. The obligation to pay a fee for early cancellation (prior to expiry of the minimum contract term) shall not apply in case the PTS orders a similar service from Swisscom with a similar price, replacing the cancelled service.