

# 100% UP TO DATE WITH TRAININGS



## Trainings 2024

- Optical fiber measurements on Swisscom networks according to ETOP\_1816
- FastReporter3 training
- Fiber optic basic training on measurement technology
- Weekly maintenance of splicing and measurement equipment
- Introduction to the basics of mobile radio technology
- Workshop Test & Measurement Automation with Python

# TRAINING

## Fit in optical fiber measurements on Swisscom networks according to ETOP\_1816

### Description

At the beginning all relevant basics of the different Swisscom network topologies such as FTTS, FTTO, FTTH, XGS-PON are discussed. This includes, among other things, the different fiber types, splitters, limit values and Swisscom's requirements for measurement documentation.

The correct handling of the measuring equipment such as fiber launch, fiber inspection camera, OTDR is in the foreground of the practical training. Typical errors in the fiber optic cabling are identified and localized. The participants learn how to maintain the measuring equipment, keep it up to date and how to operate the corresponding software applications efficiently.

### Agenda

- Basics Swisscom network topologies
  - > FTTS, FTTO, FTTH, XGS-PON
  - > Safety at work and handling of optical fibers
- Theory of fiber optic measurement
  - > Basic terms OTDR and OTDR measurement results interpretation
- Practical fiber optic measurement
  - > Handling of measuring instruments: Setting and operation (manual input of identification) plus measurement with testflow
  - > Configuration of OTDR software
  - > Practice: Different use cases (joints, BEP, OTO) with focus on interpretation and efficiency

<b>Duration</b>	1 day from 8:00 am till 16:30 pm
<b>Location</b>	Training at Computer Controls AG Training Center in Otelfingen or Prilly
<b>Audience</b>	Technicians who install optic fibre cable systems, carry out acceptance measurements and localise and evaluate faults
<b>Requirements</b>	Technical education, basic knowledge of fiber optic technology
<b>Goal</b>	Participants will be able to carry out acceptance measurements on fiber optic networks themselves. Typical faults in fiber optic cabling are recognised and localised according to Swisscom Guideline ETOP_1816.
<b>Material</b>	Training documents (pdf) and calculation tools
<b>Completion</b>	Training certificate and confirmation of participation for safety briefing
<b>Inclusive</b>	Break & lunch catering
<b>Price</b>	495 CHF
<b>Dates</b>	16.01.24   27.02.24   19.03.24   30.04.24   14.05.24 25.06.24   27.08.24   24.09.24   22.10.24   19.11.24



# TRAINING

## FastReporter3 Software

### Description

For this training, real measurement data is provided or alternatively the exercises are done using the customer's existing measurement data. This enables participants to generate templates (also in German) for automatic report generation based on the requirements of the DIN/EN standards. At the beginning the requirements for an acceptance measurement, different measurement methods and the reference to standardization or the special requirements of network operators are defined. In addition, the fibre optic cable parameters, and basics relevant for acceptance are explained. The training is divided into the following topic blocks: Operating elements, project management, customer project templates, measurement data analysis and documentation creation. Tasks are explained using practical examples. Practical exercises of all participants as well as the creation of an acceptance protocol from A to Z for a customer project conclude the training.

### Agenda

- Introduction acceptance measurement requirements & measurement methods, examples of limit values of network drivers and DIN/EN standards
- Introduction Software FastReporter3
  - > Operating elements and functions
  - > Data and project management
  - > Personalize & create project templates with limit values for customer projects
  - > Evaluation of individual measurement results, e.g., OTDR uni- and bi-directional measurement data mapped to cable plan
- Report generation with output setting and format (pdf, xls)
- Handover of acceptance protocol incl. measured values to customer

**Duration** 1 day from 8:00 am till 16:30 pm

**Location** Training at Computer Controls AG Training Center in Otelfingen or Prilly

**Audience** Technicians who install optic fibre cable systems, carry out acceptance measurements, and localise and evaluate faults

**Nice to have** Provide own measurement data from projects

**Goal** Participants will learn how to effectively use the FastReporter3 software for quick creation of clear and reliable acceptance reports for fibre optic cable systems

**Material** Training materials and sample templates for report generation based on DIN/EN standards

**Completion** Training certificate and confirmation of participation

**Inclusive** Break & lunch catering

**Price** 495 CHF

**Dates** 18.01.24 | 29.02.24 | 20.03.24 | 25.04.24 | 27.06.24



# TRAINING

## Fiber optic basic training on measurement technology

### Description

In the context of rapid digitalisation and the constant demand for data throughput and higher speeds, high-performance communication networks are needed. The ideal medium for data transport are fiber optic networks. This has been proven and further developed over the past decades. In this training, participants learn the basics of measurement technology. Among other subjects, the following questions will be answered: How does an optical fiber work? What types of optical fibers are there? What measurement methodology is used to determine them? and What test and measurement procedures are available?

### Agenda

- Function and physical basis of optical fibers
- Overview of fiber types and their optical properties
- Measuring and testing procedures
- Standards and guidelines
- Network architecture
- Bakom Standard
- Practical exercises

### Duration

1 day from 8:00 am till 16:30 pm

### Location

Training at Computer Controls AG Training Center in Otelfingen or Prilly

### Audience

Newcomers and career changers as fiber optic technicians as well as fiber optic technicians who want to learn the basics of measurement technology and understand measurements.

### Requirements

Technical understanding

### Goal

Participants get an overview of fiber optic technology, its data transmission capability and know the basics of measurement techniques

### Material

Training materials on paper (pdf)

### Completion

Training certificate

### Inclusive

Break & lunch catering

### Price

495 CHF

### Dates

28.02.24 | 26.06.24 | 20.11.24



# TRAINING

## Weekly maintenance of splicing and measurement equipment

### Description

For high-quality operations in the fiber optic infrastructure, it is mandatory that splicing and measuring devices are regularly calibrated and in faultless condition. In this workshop, participants will learn which weekly cleaning and checks are to be carried out on splicing and measuring devices.

### Agenda

#### ■ Splicing device

- > Selection of the correct cleaning products
- > External cleaning of instrument and transport case
- > Cleaning of fiber optic overlays and down holder, V-groove, and optical lenses
- > Replacing electrodes and performing instrument self-test
- > Splice settings on the device and general operation settings
- > Read out of data and use of accessories

#### ■ Cleaver

- > External cleaning of instrument and removal of fiber optic residues
- > Cleaning of fiber optic overlays and cleaver blade
- > Checking cleaver blade and cut
- > Operation settings of cleaver

#### ■ OTDR

- > External cleaning of device
- > Checking and cleaning the ferrules (OTDR and fiber launch)
- > Operation settings on the OTDR and software update
- > Check calibration date
- > Data formats and data storage

<b>Duration</b>	2 to 3 hours
<b>Location</b>	On-site training at the customer's premises
<b>Audience</b>	Splice fitters, measurement technicians and fiber optic technicians
<b>Requirements</b>	Practical experience in splicing and fiber optic measurement technology
<b>Goal</b>	Participants will be able to carry out cleaning and maintenance work
<b>Material</b>	Own splicing or measuring device, if available
<b>Price</b>	745 CHF
<b>Dates</b>	On demand



# TRAINING

## Introduction to the basics of mobile radio technology

### Description

We start by discussing the history of radio technology and the use of frequencies for wireless communication. After a short excursion into GSM and UMTS (3G), LTE (4G) is introduced. Following the presentation of the tasks of an eNodeB as well as the connections in the core network and IMS, the physical layer on the air interface and the functioning of mobile radio antennas are considered.

Next, the extensions of 4G in 5G networks are explained. Particular attention will be paid to beamforming/massive MIMO, TDD and synchronisation as well as EMC issues.

### Agenda

- Historical development of wireless communication
- Frequency use, transmission conditions, bandwidth, modulation methods
- Network topology and air interface of GSM (2G) and UMTS (3G)
- Network topology and air interface of LTE (4G), MIMO, IMS, VoLTE
- Mobile radio antennas for 2G to 4G
- Features of 5G, changes to 4G on the air interface and in the core network
- 5G TDD, problem area synchronisation: campus networks, competitors & abroad
- EMC considerations for 5G beamforming

### Duration

1 day from 8:00 am till 15:00 pm

### Location

Training at Computer Controls AG Training Center in Otelfingen or Prilly

### Audience

Technicians and installation engineers in mobile communications as well as network planners and network optimisers

### Requirements

Technical understanding, basic knowledge of high frequency technology

### Goal

Participants are familiar with the mobile technologies and the changed conditions with 5G

### Material

Training materials (pdf) and DVD with materials and videos

### Completion

Training certificate

### Inclusive

Break & lunch catering

### Price

495 CHF

### Dates

01.02.24 | 29.02.24 | 25.04.24 | 13.06.24



# HANDS-ON WORKSHOP

## Agile Test & Measurement Automation with Python

### Description

In this workshop we focus on instrument automation with Python. After completing this session, you will gain a good understanding of remote instrument control and you're able to write a Python script that automates a simple measurement on any instrument. You will learn to find the necessary resources to expand and adapt your testing-solution to your own requirements and needs.

In an environment of growing test automation complexity many engineers gravitate towards agile languages like Python instead of using proprietary software solutions. Python is free and open source, provides an enormous support base, and the ability for Python users to both inspect and improve its codebase. Python is a cross-platform language, it supports Windows, Mac OS, and Linux and runs on many hardware-platforms from small embedded systems like Raspberry PI or Arduino to PCs and supercomputers. The versatility, wide adoption in industry and other communities, and vast set of packages, makes Python the perfect candidate for test and measurement automation.

### Agenda

- Learn basic concepts and needed components like SCPI, VISA, communication interfaces
- Install needed software and drivers
- Create a simple Python script to control multiple instruments. This serves as a template for your own projects
- Timing control to synchronize measurements

**Duration** 1 day

**Location** Presence training in Otelfingen/Zurich

**Audience** Test-Engineers, R&D Engineers

**Prerequisites** Basic Python knowledge or basic programming skills

**Aim** Good understanding of remote instrument control by writing a Python script that automates simple measurements on any instrument

**Material** Bring your own laptop computer, Windows 10 and at least one available USB port needed

**Closure** Training certificate and confirmation of participation

**Included** Break & lunch catering & instruments to test your scripts are provided for the duration of the workshop

**Price** 350 CHF

**Dates** On Demand





**To stay up to date order your training quickly and easily in our webshop!**

Oder kontaktieren Sie unser Training Center direkt:



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