TRAINING COURSES

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Training Courses

This chapter describes the content of some of the courses I offer. Please regard the descriptions as a basis, as all courses will be adjusted according to your needs. All courses are given in English and Danish, some of them in German too.

Ericsson Ribbonet / Certification	Duration: Two days

A two day course for people experienced with fiber. During the course you will learn to install Ericsson's Ribbonet FTTH system. In brief, the course comprises:

- ▨ Handling of ducts, fiber and cables
- ▨ Installation of ODFs and enclosures
- ▨ Ribbonet fiber splicing
- ▨ Blowing with Ericsson's air blow gun

The course is a mix of theory and practice. During the course there will be regular checks and you will have the opportunity of getting a certificate, entitling you to perform certified work authorized by Ericsson, and furnished with an Ericsson system guarantee.

AUTHORIZED PARTNER

ERICSSON ⦚

Ericsson Ducting / Certification **Duration:** One day
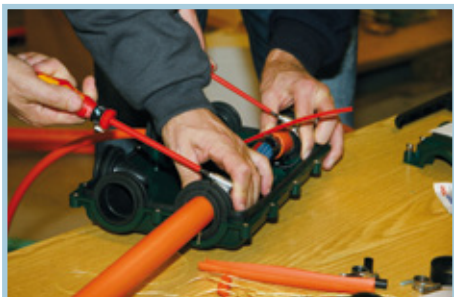
The Ericsson Ducting course comprises:
- Mounting of Ericsson enclosures
- Handling of ducts, bending radius, significance of thrust – and drag forces
- Differences in handling of tubes and cables

The course is intended for people concerned with the laying out of tubes, typically contractors.

The course is a one day course, given in English or German. During the course you will be working with tubes and enclosures in practice, and have approx 2 hours of theory.

AUTHORIZED PARTNER

ERICSSON

Ducting / Certification

Duration: One day

The ducting course comprises:
- Mounting of various types of enclosures
- Handling of ducts, bending radius, significance of thrust – and drag forces
- Differences in handling of tubes and cables

The course is intended for people concerned with the laying out of ducts, typically contractors.

The course is a one day course, given in English or German. During the course you will be working with tubes and enclosures in practice, and have approx 2 hours of theory. Brands of ducts and enclosures by your own choice, e.g. a mix of Ericsson, Emtelle, Wavin and Dantax products. Anyone who passes the course, will get a course certificate.
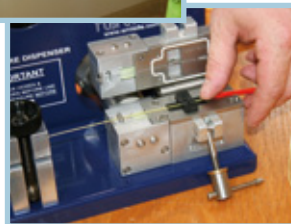

Emtelle Installation and Maintenance

Duration: Two days

During the course you will learn how to install a complete FTTH network, comprising ducts, cables, fiber and enclosures etc. from Emtelle. You will experience practical exercises regarding:
- Preparation of fiber
- Duct connections and break–outs
- Fiber blowing
- Mounting of enclosures

Approx half of the course will be theoretical, the other half will consist of practical exercises regarding the handling of tubes, fiber, blowing equipment and enclosures. At the end of the course there will be a certification test.

Emtelle Design of Networks

Duration: One day

This is a theoretical course, dealing with the elements and the design of a FTTH network. We will look at tubes, fiber, man holes, street cabinets or in brief, all things needed to build a network. The course may also be arranged as a two-day course, containing more exercises in the designing of installations.

Prysmian Fiber Blowing / Certification

Duration: Two days

The course includes installation and handling of Prysmian's ducting system, as well as handling and blowing of Prysmian's fibers. The course does not include fiber splicing.

The teaching contains both theory and practical exercises. The practical exercises comprise:
- Fiber blowing, center and further blowing
- Fault finding in duct installations using STILT (Sirocco Tube Integrity Length Tester)
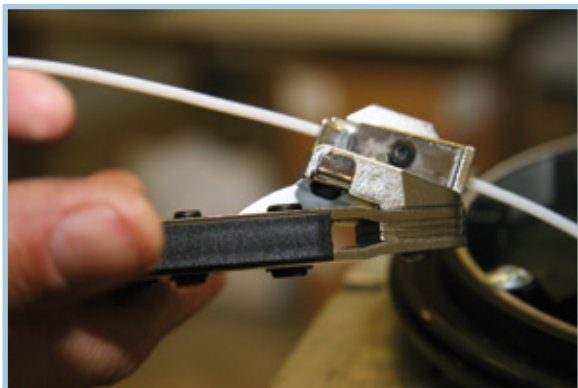- The use of Plumett's microjet air blow gun

Mounting of Enclosures   **Duration:** Two days

This course is widely based on practical exercises. You will practice/ learn about:

- Preparing cables
- Mounting different kinds of enclosures
- Shrinking
- Mid-span breakouts, correct cable finishing and cable reliefs

You will use products, which you are familiar with from your own company such as: Tyco, Hellermann Tyton or Tykoflex. The practical exercises include mid-span breakouts from tubes.

Splicing Course

Duration: One day

In this course you will learn, in practice, how to:
- Splice and adjust your splicer
- Clean and maintain the splicer
- Adjust all adjustable parts
- Use and clean the cleaver

Normally, you will work with your own splicer, so you can maintain it in the best possible way. We will work with a standard splicer, as well as a ribbon splicer.

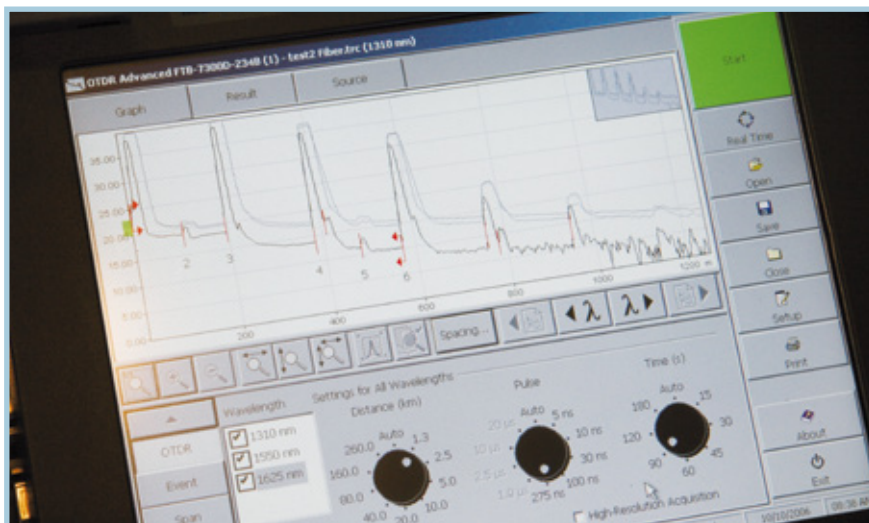## OTDR Course   **Duration:** Three days

In this course we will go through OTDR principles. You will learn how to perform many measurements in practice, how to analyse the measurements and what to be be aware of.

The course is a mix of theory and practice. Different brands of OTDRs will be used, such as EXFO, JDSU, Noyes, Yokogawa, but you are welcome to use your own instrument. In brief, the course comprises:
- Setting of different parameters
- OTDR Measuring in practice
- Transferring measurement data to pc
- How to analyse results

You will exercise measuring many types of installations, comprising the many different fiber stretches you may encounter. There will be time for investigating the many types of dead zones. You will learn, what an OTDR may tell you about different kinds of connectors, dirty connectors, good and bad splices, bends as well as shadows and "ghosts".

PON / OTDR Course   **Duration:** Three days

This course is a variant of the ordinary OTDR course. In the PON/OTDR course we will measure on PON installations, and subsequently look at the differences between these measurements – and measurements on ordinary installations. As OTDR measuring on PON installations includes splitters, it is necessary to use another technique, making the measuring more complicated.

EXFO / OTDR Course   **Duration:** Three days

In this course we will go through OTDR principles. You will learn how to perform many measurements in practice, how to analyse the measurements, and what to be aware of.

The course is a mix of theory and practice, and we will use an OTDR from EXFO. In brief, the course comprises:
- Setting of different parameters
- OTDR Measuring in practice
- Transferring measurement data to pc
- How to analyse results

You will exercise measuring many types of installations, comprising the many different fiber stretches you may encounter. There will be time for investigating the many types of dead zones. You will learn what an OTDR may tell you about different kinds of connectors, dirty connectors, good and bad splices, bends as well as shadows and "ghosts".

This course may be extended to four days, containing many more practical measurements. We will also analyze existing measurements, and it will be possible to measure on real installations.

JDSU / OTDR Course   **Duration:** Three days

In this course we will go through OTDR principles. You will learn how to perform many measurements in practice, how to analyse the measurements, and what to be aware of.

The course is a mix of theory and practice, and we will use an OTDR from JDSU. In brief, the course comprises:
- Setting of different parameters
- OTDR Measuring in practice
- Transferring measurement data to pc
- How to analyse results

You will exercise measuring many types of installations, comprising the many different fiber stretches you may encounter. There will be time for investigating the many types of dead zones. You will learn what an OTDR may tell you about different kinds of connectors, dirty connectors, good and bad splicies, bends as well as shadows and "ghosts".

Ideal / OTDR Course   **Duration:** Three days

In this course we will go through OTDR principles. You will learn how to perform many measurements in practice, how to analyse the measurements, and what to be aware of.

The course is a mix of theory and practice, and we will use an OTDR from Ideal. In brief, the course comprises:
▨ Setting of different parameters
▨ OTDR Measuring in practice
▨ Transferring measurement data to pc
▨ How to analyse results

You will exercise measuring many types of installations, comprising the many different fiber stretches you may encounter. There will be time for investigating the many types of dead zones. You will learn what an OTDR may tell you about different kinds of connectors, dirty connectors, good and bad splicies, bends as well as shadows and "ghosts".

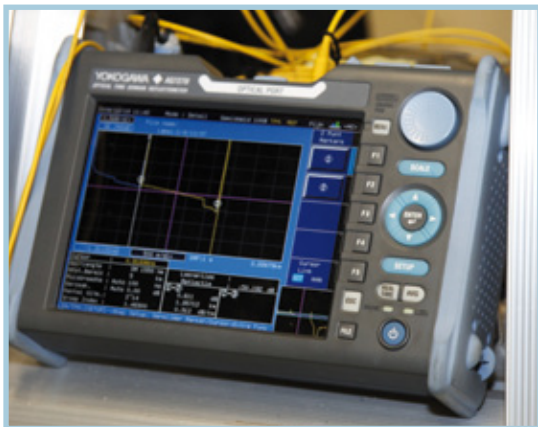## Yokogawa / OTDR Course — **Duration:** Three days

In this course we will go through OTDR principles. You will learn how to perform many measurements in practice, how to analyse the measurements, and what to be aware of.

The course is a mix of theory and practice, and we will use OTDRs from Yokogwa. In brief, the course comprises:
- Measurement parameters
- OTDR Measuring in practice
- Transferring measurement data to pc
- How to analyse results

You will exercise measuring many types of installations, comprising the many different fiber stretches you may encounter. There will be time for investigating the many types of dead zones. You will learn what an OTDR may tell you about different kinds of connectors, dirty connectors, good and bad splicings, bendings as well as shadows and "ghosts".

This course may be extended to four days, containing many more practical measurements. We will also analyse existing measurements (from your installations), and it will be possible to measure on real installations.

Advanced Measuring

Duration: Three days

The course includes advanced measuring theory, how and when to perform OSA, CD and PMD measurements. What are the consequences, if you do not measure? How do you characterise fiber, so you will be able to find out, if it may be used for e.g. 10 or 40 Gbit or the coming 100Gbit installations? We will measure on different types of fiber, such as G.652, G.653, G.655 and G.656and G.657. The course is a mix of theory and practical measurements on installations, with a length of more than 250 km of fiber. It will be a great advantage, if you first have completed the OTDR course. The course may be held as a five day course as well, including OTDR and OSA measurements. It will also be possible to measure installations from the real world.

Fiber Salesman Course
Duration: One day

This course applies to you, who have just been employed in the fiber industry as a sales-man or similar. You may need to extend your technical knowledge of fiber, qualifying you to give better answers, to all the questions your cus-tomers may ask. You will learn to tell the difference between single and multi mode fiber, get a basic knowledge about cable types, pigtails and connectors etc. All in all, we will go through the content of this book, yet with the dif-ference, that you will have the opportunity of asking a lot of questions. You will also be given the opportunity, to actually see and touch the things we are talking about. As a starting point we will use items, you deal with daily, but I will also bring a lot of examples. The course, is sometimes held as a two day course, with practical spliceing, measuring and so on.

FTTH / Fiber To The Home
Duration: From two to five weeks

We will build a complete town, with installations corresponding 80 to 400 houses. The course comprises:
- Access houses, construction and installation of
- Fiber blowing
- Street cabinets, mounting of
- Measuring and documentation

Thus, we will end up with a ready-to-use installation.
The duration of the course is dependent on the number of practical exer-cises. Typically, the duration will be 5 weeks, if the attendants are without fiber experience of any kind, e.g. a newly started firm. On the other hand, if the attendants are experienced with fiber and just need further training, the duration will be two or three weeks. Frequently, the course will provide op-portunities for one or more of the at-tendants to get certified.