Data Center Certified Training (DCCT) programme

HUBER+SUHNER

Connect your data center to growth

Data centers serve as the operating core of networked-based services. As such, it must guarantee stable operations and answer to high demands on uptime, speed, security and quality.

HUBER+SUHNER offers the passive fiber optic equipment and solutions needed to build a strong and scalable physical layer that lasts. Our offering supports you in doing more with less space by designing and setting up an immaculate system that delivers optimal performance.

In order to ensure the successful design, installation and maintenance of your data center, we provide the Data Center Certified Training (DCCT) programme. This course supports you in getting the most out of your equipment and solutions and enables you to become an official certified partner of HUBER+SUHNER .

Structure
Set up your data center with fiber optic equipment that makes the most out of available space and requires less manual operation.
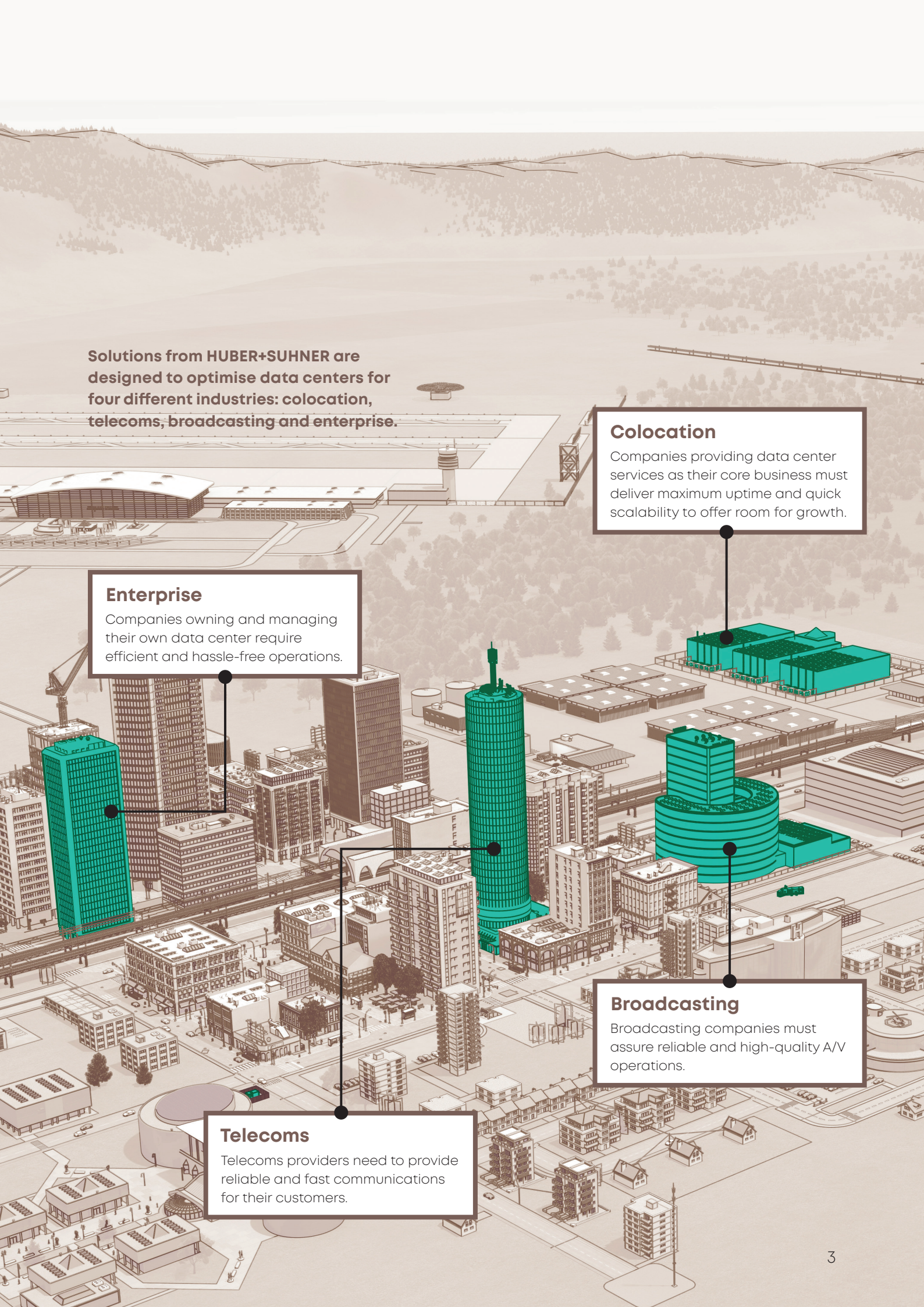
Enhance
By fully structuring your data center, you will free up crucial space and valuable time that you can redirect to enhance your current offering.

Drive
With a fast, secure and efficient system, you can focus on new investments and revenue-driving activities.

Solutions from HUBER+SUHNER are designed to optimise data centers for four different industries: colocation, telecoms, broadcasting and enterprise.

Colocation

Companies providing data center services as their core business must deliver maximum uptime and quick scalability to offer room for growth.

Enterprise

Companies owning and managing their own data center require efficient and hassle-free operations.

Broadcasting

Broadcasting companies must assure reliable and high-quality A/V operations.

Telecoms

Telecoms providers need to provide reliable and fast communications for their customers.

Data Center Certified Training (DCCT)

What is DCCT?

Data Center Certified Training is a fiber optic training course aimed at installers, system integrators and end customers who want to become official certified partners of HUBER+SUHNER (DCCT certification).

The course combines theoretical content and practical hands-on training so that a balanced level of content is provided. Our objective is to ensure that anyone working with our products has the necessary skills to both consult, design and install. The course is compiled by HUBER+SUHNER and can be delivered in one to three days depending on the type of individuals we are training and their availability. Training durations can be reduced based on the knowledge level of participants. Successful participants will be eligible to install and warranty installations made using the HUBER+SUHNER data center portfolio.

Who should attend the course?

Anyone wishing to become an approved DCCT partner of HUBER+SUHNER for the data center market or operators looking to update existing knowledge, and anyone wishing to receive comprehensive fiber optic training for non-partner related reasons.

Can the training be adjusted to your needs?

Yes it can. We will adapt the training to suit the particular needs of your organisation and also the competence level of your employees. We can also focus on more detail or particular aspects should you require it. We do insist that companies wishing to become certified partners complete the appropriate aspects of the DCCT course content.
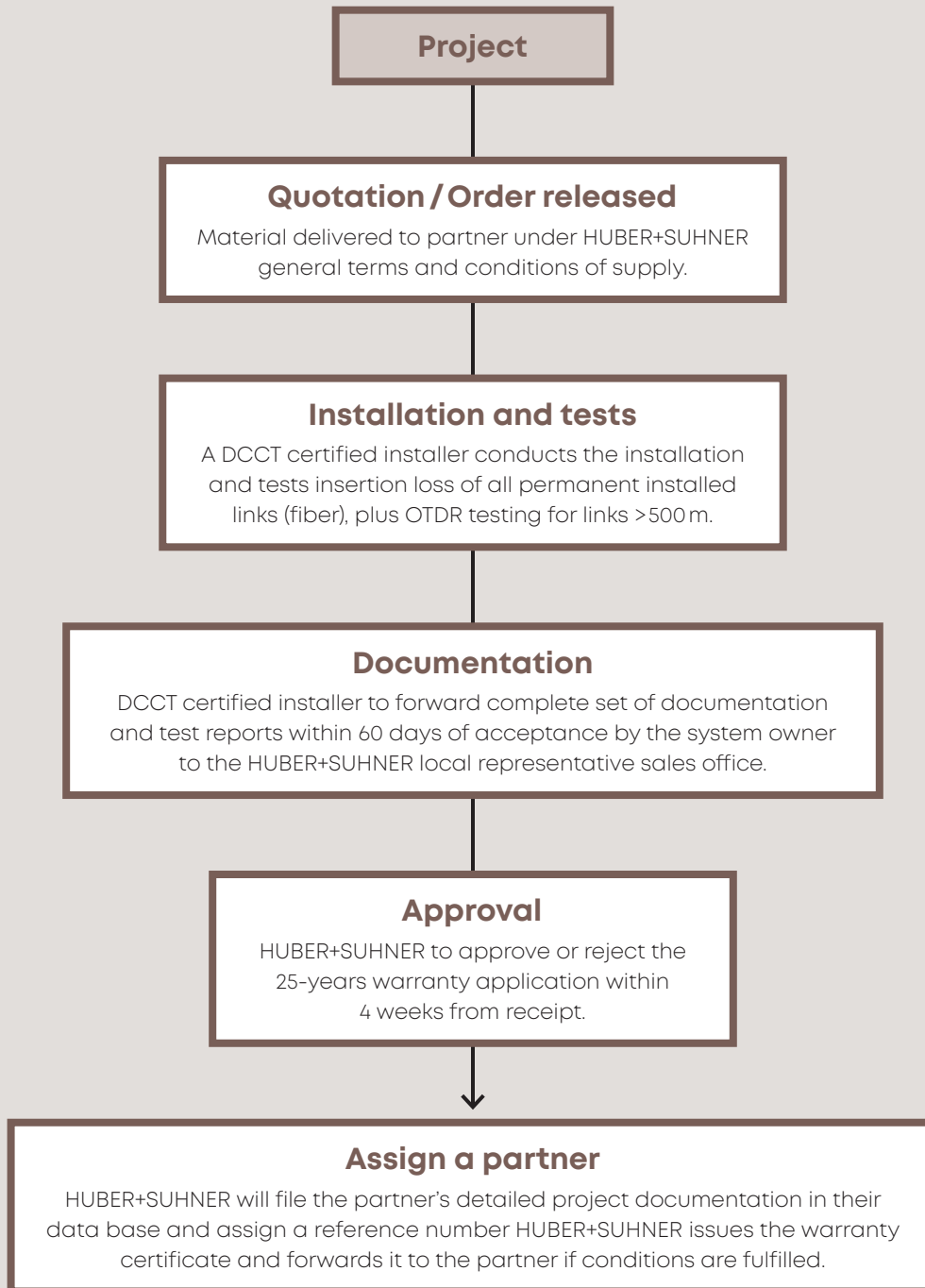
Where does the training take place?

We strongly recommend that the training takes place in dedicated HUBER+SUHNER facilities. This will allow us to prepare the environment and ensure that the necessary hardware is available for the practical aspects of the course.

The following topics are covered in the standard DCCT training content:

- Fiber optic fundamentals
- Structured cabling solutions
- MPO/MTP connectivity
- Polarity and connectors
- LISA centralized cross-connect
- IANOS high-density solution
- Optipack cable systems
- Network design and parallel optics
- Transceiver theory
- Test requirement serial and parallel optics
- Field testing, inspecting and measurement

25-year system warranty workflow

HUBER+SUHNER offers a 25-year system warranty for permanently installed fiber optic or copper links. To receive a 25-year warranty, the following workflow should be applied by a DCCT certified installer.

Project

**Quotation / Order released**

Material delivered to partner under HUBER+SUHNER general terms and conditions of supply.

Installation and tests

A DCCT certified installer conducts the installation and tests insertion loss of all permanent installed links (fiber), plus OTDR testing for links >500 m.

Documentation

DCCT certified installer to forward complete set of documentation and test reports within 60 days of acceptance by the system owner to the HUBER+SUHNER local representative sales office.

Approval

HUBER+SUHNER to approve or reject the 25-years warranty application within 4 weeks from receipt.

Assign a partner

HUBER+SUHNER will file the partner's detailed project documentation in their data base and assign a reference number HUBER+SUHNER issues the warranty certificate and forwards it to the partner if conditions are fulfilled.

Suggested agenda

Day 1

Time	Duration	Topic
08.00 – 08.30	30'	HUBER+SUHNER DCCT introduction and warranty certification workflow
08.30 – 09.30	60'	Fiber optic fundamentals
09.30 – 10.30	60'	Structured cabling solutions
10.30 – 11.15	45'	MPO/MTP connectivity
11.15 – 12.00	45'	Optipack cable systems
12.00 – 13.00	60'	Lunch
13.00 – 14.00	60'	Polarity and connectors
14.00 – 15.30	90'	LISA centralized cross-connect / portfolio and hands-on
15.30 – 17.00	90'	IANOS high-density solution / portfolio and hands-on

Day 2

Time	Duration	Topic
08.00 – 09.00	60'	Network design / parallel optics 40G/100G/400G
09.00 – 10.00	60'	Transceiver theory and order guide
10.00 – 11.30	90'	Testing requirements serial and parallel optics / standards
11.30 – 13.00	90'	Lunch
13.00 – 16.00	180'	Field testing, inspecting and measurement
16.00 – 17.00	60'	Questionnaire

Timings are flexible and at the discretion of the instructor.
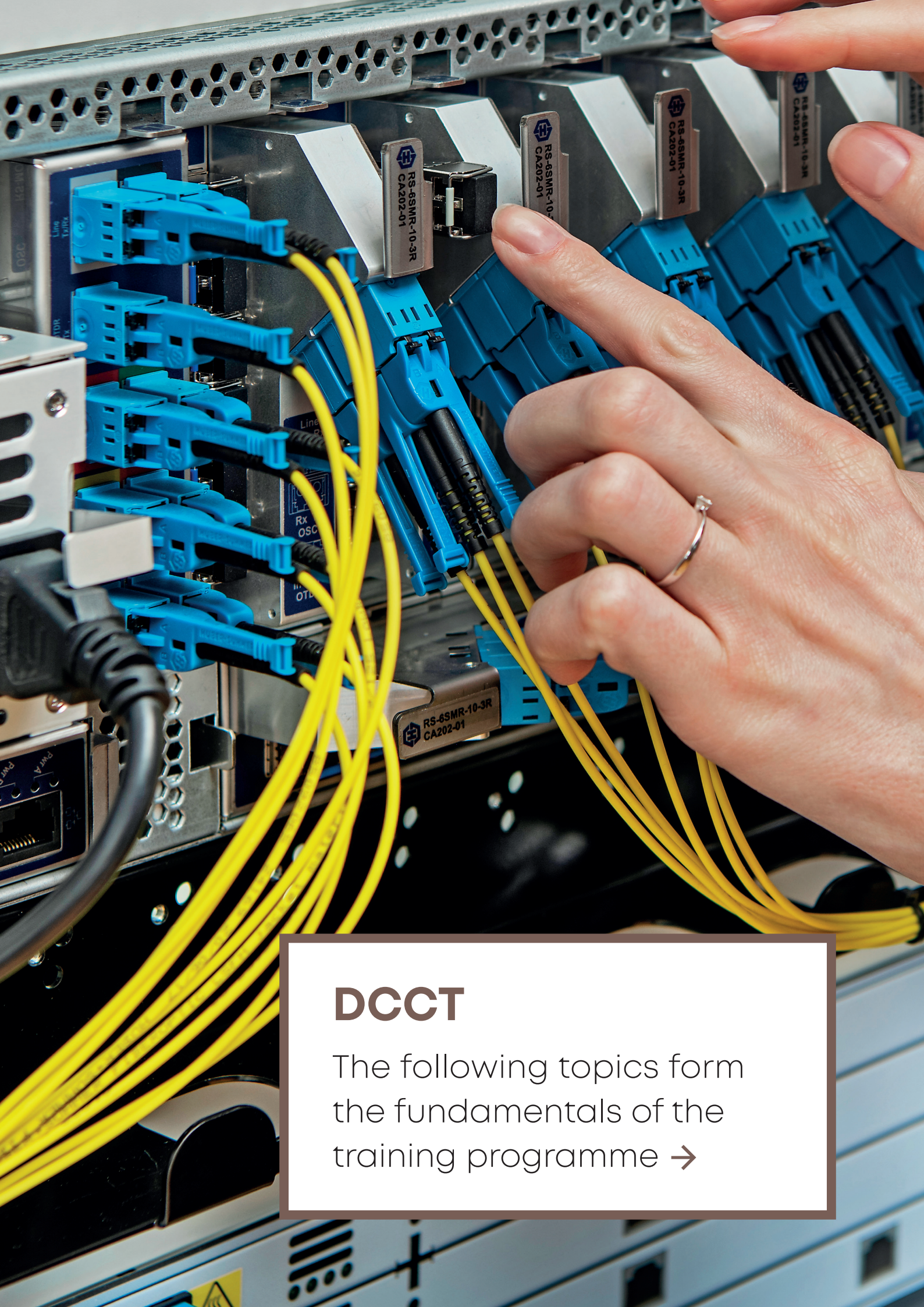
DCCT

The following topics form the fundamentals of the training programme →

Training topics

Fiber optic fundamentals

This section of the training covers the basics about fiber optic transmission and light propagation. Here we look at the conditions required for communication over glass and some of the influences that affect the quality of signal. This module can be adjusted based on the participants existing knowledge.

- Why fiber optics?
- How the glass is made
- Fiber cable construction
- Wavelengths
- Laser types
- Light reflection

- Modes
- Numerical aperture
- Optical loss
- Fiber attenuation
- Dispersion
- Choosing the right glass

IANOS high-density panels

The 19-inch cabinet is a well-established solution for fiber management systems. In this session we will look at the high-density solution IANOS and how it can be used effectively to offer the highest level of scalability. This session includes a hands-on training.

- Inter-connect topology
- IANOS product portfolio
- Different connectivity methods (splice/patch/pre-term)
- Link examples
- MPO/MTP conversion modules
- Upgrade examples to higher data rates

- Patch-through products
- Cable management
- Patch cord management
- Accessories
- Server and switch connections

LISA centralised cross-connects

Centralised cross-connects provide the highest level of infrastructure flexibility. In this session we will look at the benefits of this type of topology and learn more about LISA, the high-density, cross-connect passive fiber management system from HUBER+SUHNER. This session includes a hands-on training.

- Pros and cons of each topology (direct, inter-connect and cross-connect)
- Placement of the cross-connect and its primary functions
- CDR size variants and packing density
- LISA product portfolio
- Cold aisle/hot aisle containment systems

- Identification
- Construction and benefits
- Installing and accessing
- Patch cord management
- Typical applications
- Connecting to servers and switches
- Typical link designs
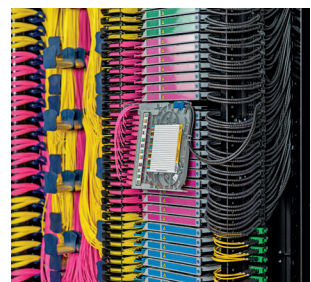
MPO and MTP connectivity

MPO/MTP connectivity has been used in many applications since the 1980's and has become the connector of choice for modern data centers running parallel optics. In this session we will look at the history of this connector and also consider the future applications that will depend on this interface in the years to come.

- History of MPO/MTP connectivity
- MPO/MTP benefits
- MPO/MTP performance
- MTP versus MPO
- Singlemode and multimode constraints

- MPO/MTP options and accessories
- Identification
- Cleaning
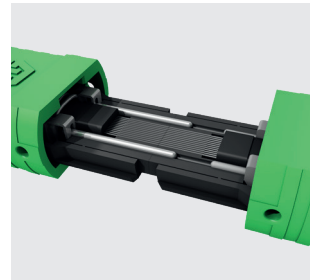
Polarity management and connectors

Making sure that light passes from a transmit port to a receive port can be a complex topic, especially with the rise in parallel optics over MPO/MTP cable systems and modules. In this session we will explain the main polarity methods and how they can be deployed in a logical way to ease deployment and scalability of the data center.

- Polarity basics and background
- The main types of polarity methods for 12 fiber and 24 fiber MPO/MTP array systems
- Pros and cons of each polarity method
- The impact of polarity methods when upgrading to higher data rates

- Which components can be inter-connected and which not?
- HUBER+SUHNER polarity system for simpler planning and ugrades
- Examples of link designs from 1G to 120G
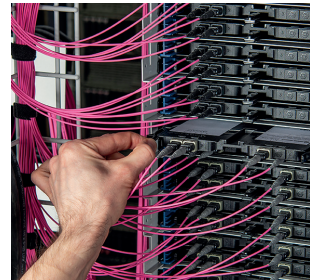
Optipack cable systems

Saving time and money is always top of mind when choosing the right cable backbone. In this session we look at the HUBER+SUHNER Optipack portfolio which has significant benefits in terms of speed of installation and packing density.

- Simplex versus multi-strand
- MPO/MTP at the device
- Fiber selection
- Optipack options and fiber density
- Bend-optimised fiber

- Typical applications of each type
- Backbone trunks
- Equipment harnesses
- Labelling and naming schemes

Transceiver theory

This session is optional and explains the different transceivers available on the market. Participants will gain knowledge of the transceiver theory and will be able to use the HUBER+SUHNER transceiver selection guide.

- What are transceivers and how are they built?
- Types and functions

- Transceiver selection guide
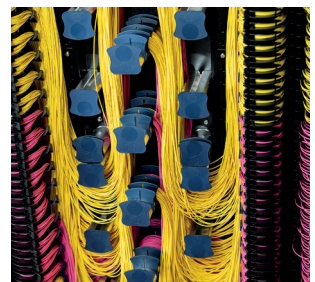- Which transceiver for which scenario?

Structured cabling designs and solutions

This section will cover the common data center design approaches for the room space requirements and layout, ducting, optipack cabling systems and rack designs.

- Introduction to HUBER+SUHNER Visio stencils

- ToR, EoR
- Design considerations

Bandwidth expansion

Smaller and more robust fiber-optical transport systems will play a significant role in the future for different applications. HUBER+SUHNER offers a wide range of products for data center interconnect applications. This is an optional session.

- Active vs. passive transport system
- Technology and application
- Data center interconnect

- Access networks
- Products

Optical switching

SDN-enabled all-optical switching can bring huge benefits to the data center fiber layer. This session explores the powerful all-optical switching solutions from HUBER+SUHNER that ensure fast, automated and secure connectivity. You will also learn how to manage complex cross-connects while maintaining the integrity of an automated and remotely controlled system.

- Technology
- Products

- Application/examples
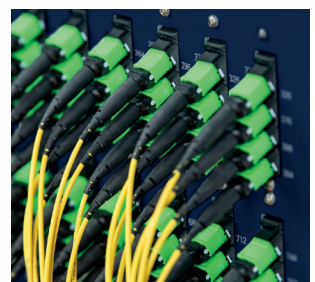
Network design and parallel optics

With rising data rates across the board, there is an increasing shift towards parallel optics using MPO/MTP connectivity over multimode fiber. In this session we will look at the possible backbone options and also consider the impact of these backbones on the final transceiver interface.

- Connectivity overview for emerging data rates
- 10 Gbs and 25 Gbs data rates (applying to 40, 100 and 400 GB/s applications)
- Common transceivers
- Fiber positions in the connector and transceiver

- Required connectivity gender
- Next-generation transceivers
- MPO/MTP building blocks (8, 12 and 24 fiber)
- Pros and cons of each backbone design
- Common link designs for higher data rates
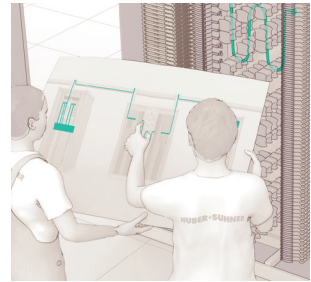
Test requirements serial and parallel optics

With data rates increasing and link lengths shortening it is very important to guarantee that links are tested and documented in the correct manner. In this session we will look at the do's and don'ts of testing and give advice on how to correctly document the achieved results.

- Justification for testing
- Basics of serial and parallel optics
- Changes in the modern DC that influence testing
- The human factor
- Allowable losses

- Equipment required
- Return loss and insertion loss testing
- What needs to be tested?
- Documenting in accordance with warranty conditions
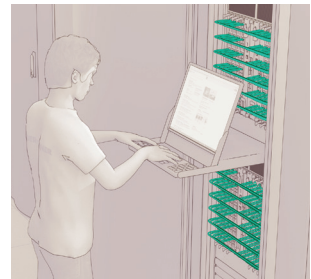
Fiber optic field cleaning, testing and measurement

Data centers are not always the cleanest environments and despite our best intentions, there is always an element of air-borne debris which can cause connector contamination. In this session we will look at the common contributors of contamination and also the best processes and tools to combat this problem. This session includes a hands-on training.

- Why clean connectors?
- What do the standards say?
- Sources of contamination

- Cleaning best practices
- Cleaning tools
- MPO/MTP cleaning
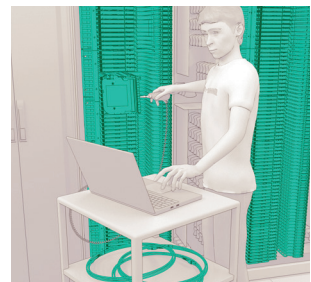
Standards

There are many standards that are applicable to structured cabling, and may be different depending on where you are in the world. HUBER+SUHNER give an overview of those most applicable, which are preferred and to which component standards our products are constructed.

- IEEE application standards
- ISO/IEC international design and installation standards

- CENELEC design and installation standards
- TIA design and installation standards
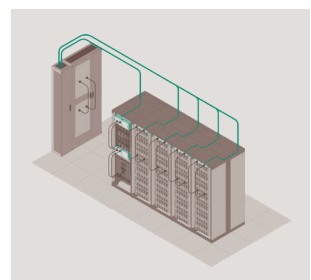
Connecting – today and beyond

About HUBER+SUHNER

We are a leading global supplier of components and systems solutions. With our broad range of products and deep know-how, we serve the industry, communications and transportation markets with applications from the three technologies of radio frequency, fiber optics and low frequency. And as a global company with a presence in over 80 countries, we stay close to our customers. Always.

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HUBER+SUHNER is certified according to ISO 9001, ISO 14001, OHSAS 18001, EN(AS) 9100, IATF 16949 and ISO/TS 22163 – IRIS.

Waiver
Fact and figures herein are for information only and do not represent any warranty of any kind.