COURSE OVERVIEW IE0397
FOC Cable OTDR Testing

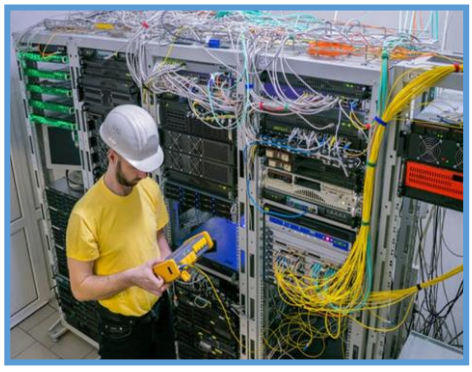
Course Title
FOC Cable OTDR Testing

Course Date/Venue
May 17-21, 2026/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference
IE0397

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes practical sessions and exercises where participants carryout fiber optic splicing, testing and troubleshooting. Theory learnt in the class will be applied using our state-of-the-art equipment.

This course is designed to provide participants with a detailed and up-to-date overview of Fiber Optic Cable (FOC) Optical Time Domain Reflectometer (OTDR) Testing. It covers the fiber optic communication systems, fiber optic cable construction and optical fiber loss mechanisms; the OTDR technology, components, architecture, OTDR safety and handling practices; and the OTDR key measurement parameters, dynamic range, dead zones and OTDR resolution and accuracy.

Further, the course will also discuss the purpose of launch fibers, receive fiber importance, proper launch cable selection and common setup mistakes; the OTDR setup procedures, OTDR trace basics and OTDR trace interpretation; the event types in OTDR traces covering reflective events, non-reflective events, ghost events and false reflections and fiber end and macro-bends; the splice loss measurement, fault location techniques and bidirectional OTDR testing; the long-haul and high-loss network testing and OTDR testing in access networks; and the macro-bend and micro-bend detection and live fiber testing techniques.

During this interactive course, participants will learn the OTDR testing standards and acceptance criteria including common OTDR measurement errors; the OTDR test documentation, reporting, data storage best practices and network documentation integration; and the new fiber acceptance testing, periodic maintenance testing, baseline trace creation and network health assessment.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on fiber optic cable (FOC) optical time domain reflectometer (OTDR) testing
- Discuss fiber optic communication systems, fiber optic cable construction and optical fiber loss mechanisms
- Recognize OTDR technology, components and architecture and apply OTDR safety and handling practices
- Discuss OTDR key measurement parameters, dynamic range and dead zones and OTDR resolution and accuracy
- Identify the purpose of launch fibers, receive fiber importance, proper launch cable selection and common setup mistakes
- Apply OTDR setup procedures, OTDR trace basics and OTDR trace interpretation
- Recognize event types in OTDR traces covering reflective events, non-reflective events, ghost events and false reflections and fiber end and macro-bends
- Carryout splice loss measurement, fault location techniques and bidirectional OTDR testing
- Illustrate long-haul and high-loss network testing, OTDR testing in access networks and macro-bend and micro-bend detection and live fiber testing techniques
- Recognize OTDR testing standards and acceptance criteria including common OTDR measurement errors
- Apply OTDR test documentation and reporting, data storage best practices and network documentation integration
- Employ new fiber acceptance testing, periodic maintenance testing, baseline trace creation and network health assessment

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of fiber optic cable (FOC) optical time domain reflectometer (OTDR) testing for fiber-optic technicians and installers, field service engineers, telecommunications technicians, network test and measurement engineers, fiber optic project supervisors / coordinators, network designers and planners, maintenance and support teams, quality assurance inspectors and other technical staff.

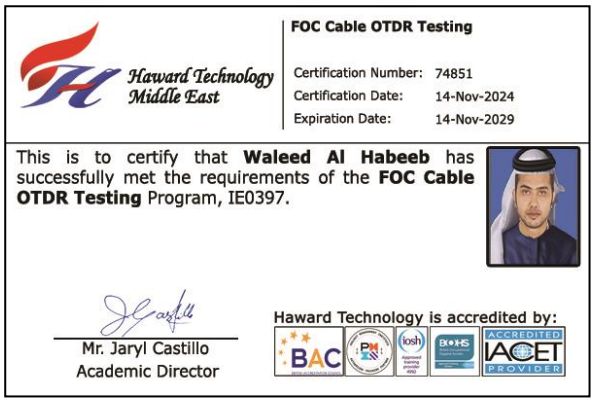
Course Certificate(s)

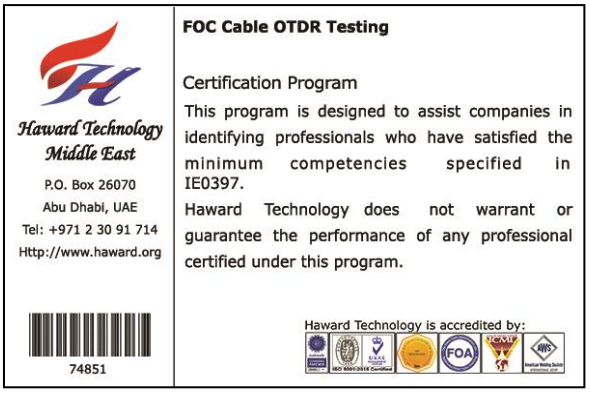
(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-





(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Nov-24

HTME No. 74851

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
IE0397	FOC Cable OTDR Testing	Nov 10-14, 2024	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Jaryl Castillo
Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2018 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2018 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor (s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Salah Zuriekat, BSc, PMP, is a **Senior Electrical Engineer** with extensive years of experience within the **Power & Water Utilities** and other **Energy** sectors. His expertise widely covers **Fiber Optics** Access Network Planning, **Fiber Optic Applications** in Protective Relaying Systems, Advanced **Fiber Optics** Technology, **Fiber Optic** Termination Equipment Operation & Maintenance, **Cyber Security of Distributed Control System (DCS)**, **SCADA Cyber Security**, **Cyber Security** Fundamentals, **Variable Frequency Drives** (VFD), **PLC & SCADA** for Automation & Process Control, **DCS** Automated Process Control Systems, **PLC** for Process Control & Automation, **Process Control** Techniques & Troubleshooting, **Control Valves & Actuators**, Safety Integrity Level (**SIL**), **Transformer Maintenance & Testing**, **Electrical Substation & Design**, **Power Quality** Studies & Load Criteria, LV/MV Electrical Safety (**11 KV, 415 & 220 Voltage**), **Substation Earthing System**, **Electrical Equipment** Maintenance, **Electrical Power** System, **Electrical** Installations & Utilities, **Electrical Distribution Systems & Control Circuits**, **Electrical Drawings**, **Relay Logic Circuits**, Troubleshooting **Transformers**, **System Grounding**, **Circuit Breakers**, **Protection Devices & Technology**, **Protection Relay**, **Transformers**, **Generators**, **Power Transformers**, **Motors**, **Substations**, **Switchgears & Distribution**, **Power System** Analysis, **Electrical Equipment** Control Systems, **Cables & Wiring**, **Cable & Overhead Line** Quality Control & Inspection, **Overhead Transmission Lines**, **Electrical Safety**, **Electrical Protection**, **Batteries**, **Chargers & UPS**, **Electrical Submersible Pumps** (**ESP**), **Power Supply** Substations, Area Classification, Safety Management System, Permit to Work & Issuing Authority, Emergency **Diesel Generator**, High & Low Voltage **Electrical Safety**, **Electrical Inspection** & Testing, **Electrical Control** & Monitoring System, **Electric Power System**, Intensive Overhead **Transmission** Line (OHTL), **Transmission** Line Networks, **Distribution** Engineering, HVDC **Transmission** & Control, **Substation** Maintenance Techniques, **Electrical Drawings** & **Schematics**, **Distribution Networks** & **Load Forecasting**, **Power Generation**, **Overhead Power Line** Construction & Patrolling, and **Generator** Maintenance & Troubleshooting. He is currently the **Electrical Construction Manager** of Hiba Engineering Construction wherein he is involved in managing and supervising electrical engineers, electricians and other electrical personnel to ensure proper staffing levels and effective teamwork.

Mr. Salah gained his expertise and experience through several positions as an **MEP Manager**, **Project Manager**, **Senior Electrical Project Engineer**, **Electromechanical Project Engineer**, **Site Engineer**, **Fiber Optic Sales Engineer**, **Sales Engineer**, **Maintenance Engineer**, **Optical Engineer**, **MEP Coordinator**, **Telecommunications Technician** and **Senior Instructor/Trainer** for various companies such as the Al Menthar of Medical investment, Drake & Scull International Company (DSI), Axal Arabia Contracting Company (SBG), Alsamah Contracting Company, Control & Communication Company (CCC) and Spectrum Company.

Mr. Salah has a **Bachelor's** degree in **Electrical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Project Manager Professional** (**PMI-PMP**) and has delivered various trainings, seminars, conferences, workshops and courses globally.

Course Fee

US$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday, 17th of May 2026***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Fiber Optic Communication Systems*** *Principles of Light Transmission in Optical Fibers • Single-Mode versus Multimode Fiber Characteristics • Optical Wavelengths (850, 1310, 1550, 1625 nm) • Applications of Fiber Optics in Telecom Networks*
0930 – 0945	*Break*
0945 – 1030	***Fiber Optic Cable Construction*** *Core, Cladding, and Coating Functions • Loose Tube versus Tight Buffer Cables • Armored and Non-Armored Cable Types • Environmental and Mechanical Protection*
1030 – 1130	***Optical Fiber Loss Mechanisms*** *Attenuation and Absorption Losses • Scattering (Rayleigh, Mie) Effects • Bending Losses (Macro & Micro Bending) • Connector and Splice Insertion Losses*
1130 – 1215	***Basics of OTDR Technology*** *Definition and Purpose of OTDR • Working Principle of OTDR Pulse Reflection • Role of OTDR in Fiber Maintenance • Comparison with Other Fiber Test Methods*
1215 – 1230	*Break*

1230 – 1330	***OTDR Components & Architecture*** *Laser Source and Detector • Pulse Generator and Receiver • Signal Processing Unit • Display and Data Storage Systems*
1330 – 1420	***OTDR Safety & Handling Practices*** *Laser Safety Classifications • Fiber Handling Precautions • Eye and Skin Safety Measures • Equipment Protection and Storage*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: Monday, 18th of May 2026

0730 – 0830	***OTDR Key Measurement Parameters*** *Pulse Width Selection • Measurement Range Settings • Averaging Time Impact • Index of Refraction (IOR) Configuration*
0830 - 0930	***Dynamic Range & Dead Zones*** *Definition of Dynamic Range • Event Dead Zone versus Attenuation Dead Zone • Causes of Dead Zones • Techniques to Minimize Dead Zones*
0930 – 0945	*Break*
0945 – 1100	***OTDR Resolution & Accuracy*** *Spatial Resolution Concepts • Event Detection Sensitivity • Impact of Pulse Width on Resolution • Accuracy versus Speed Trade-Offs*
1100 – 1215	***Launch & Receive Fiber Usage*** *Purpose of Launch Fibers • Receive Fiber Importance • Proper Launch Cable Selection • Common Setup Mistakes*
1215 – 1230	*Break*
1230 – 1330	***OTDR Setup Procedures*** *Fiber Cleaning and Inspection • Proper Connection Techniques • Setting Test Parameters Correctly • Verifying Test Readiness*
1330 – 1420	***Understanding OTDR Trace Basics*** *Backscatter Signal Interpretation • Baseline and Noise Floor • Event Spikes and Slopes • End-of-Fiber Identification*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 19th of May 2026

0730 – 0830	***OTDR Trace Interpretation*** *Reading Distance and Loss Values • Understanding Trace Slopes • Identifying Fiber Sections • Recognizing Abnormal Patterns*
0830 – 0930	***Event Types in OTDR Traces*** *Reflective Events (Connectors, Breaks) • Non-Reflective Events (Splices) • Ghost Events and False Reflections • Fiber End and Macro-Bends*
0930 – 0945	*Break*
0945 – 1100	***Splice Loss Measurement*** *Fusion Splice Identification • Mechanical Splice Characteristics • Measuring Splice Attenuation • Acceptance Criteria and Standards*

1100 – 1215	***Connector Loss & Reflectance*** *Connector Reflectance Levels • APC versus UPC Connector Signatures • Dirty versus Damaged Connectors • Reflectance Troubleshooting*
1215 – 1230	*Break*
1230 – 1330	***Fault Location Techniques*** *Identifying Fiber Breaks • Locating High-Loss Points • Distance Accuracy Considerations • Verifying Fault Locations*
1330 – 1420	***Bidirectional OTDR Testing*** *Need for Bidirectional Testing • Loss Averaging Methodology • Eliminating Measurement Bias • Practical Field Implementation*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 20th of May 2026

0730 – 0830	***Long-Haul & High-Loss Network Testing*** *Testing Long-Distance Fiber Links • Managing High Attenuation Networks • Optimizing Pulse Settings • Noise Reduction Techniques*
0830 – 0930	***OTDR Testing in Access Networks*** *FTTH Network Challenges • Splitter Identification • Testing Through PON Splitters • Limitations of OTDR in PON*
0930 – 0945	*Break*
0945 – 1100	***Macro-Bend & Micro-Bend Detection*** *Causes of Bending Losses • OTDR Signature of Bends • Wavelength-Dependent Analysis • Preventive Measures*
1100 – 1215	***Live Fiber Testing Techniques*** *In-Service Testing Principles • Use of 1625/1650 nm Wavelengths • Risk Management During Live Testing • Network Safety Considerations*
1215 – 1230	*Break*
1230 – 1330	***OTDR Testing Standards & Acceptance Criteria*** *ITU-T and IEC OTDR Standards • Typical Loss Limits • Documentation Requirements • Client Acceptance Testing*
1330 – 1420	***Common OTDR Measurement Errors*** *Incorrect Parameter Settings • Poor Fiber Cleanliness • Misinterpretation of Traces • Environmental Influences*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5: Thursday, 21st of May 2026

0730 – 0830	***OTDR Test Documentation & Reporting*** *Test Report Components • Trace Labeling and Annotation • Saving and Exporting Data • Customer and Project Documentation*
0830 – 0930	***OTDR Software & Data Management*** *OTDR File Formats (.SOR) • Trace Comparison and Overlay • Data Storage Best Practices • Network Documentation Integration*

0930 – 0945	*Break*
0945 – 1100	***Troubleshooting Fiber Optic Faults*** *Step-by-Step Troubleshooting Approach • Identifying Intermittent Faults • Verification After Repair • Preventing Repeat Failures*
1100 – 1145	***Pre-Commissioning & Maintenance Testing*** *New Fiber Acceptance Testing • Periodic Maintenance Testing • Baseline Trace Creation • Network Health Assessment*
1145 – 1200	*Break*
1200 – 1230	***Practical OTDR Testing Case Studies*** *Real-World Fault Scenarios • Splice and Connector Issues • Long-Haul versus Access Network Cases • Lessons Learned from Field Practice*
1230 – 1300	***Hands-On Practical OTDR Exercises*** *End-to-End OTDR Testing • Fault Simulation and Detection • Trace Analysis Workshop • Performance Evaluation and Feedback*
1300 – 1315	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1315 – 1415	***COMPETENCY EXAM***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

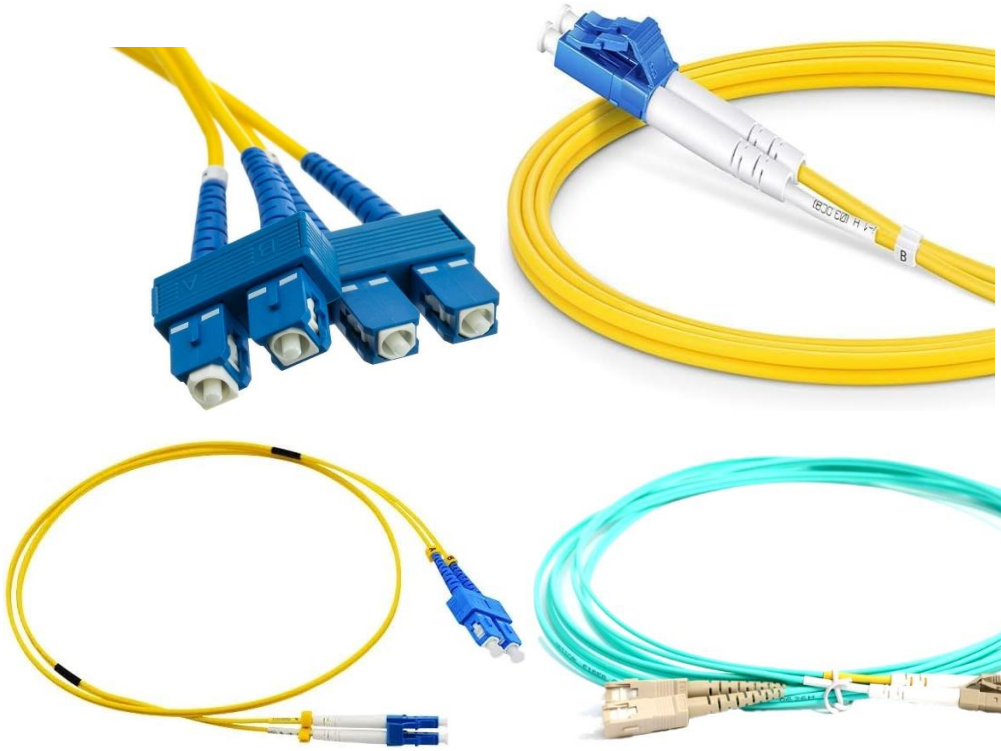
Practical Sessions

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout fiber optic splicing, testing and troubleshooting exercises using the following state-of-the-art fiber optics technology and equipment, suitable for classroom training.

Optical Fiber Fusion Splicer

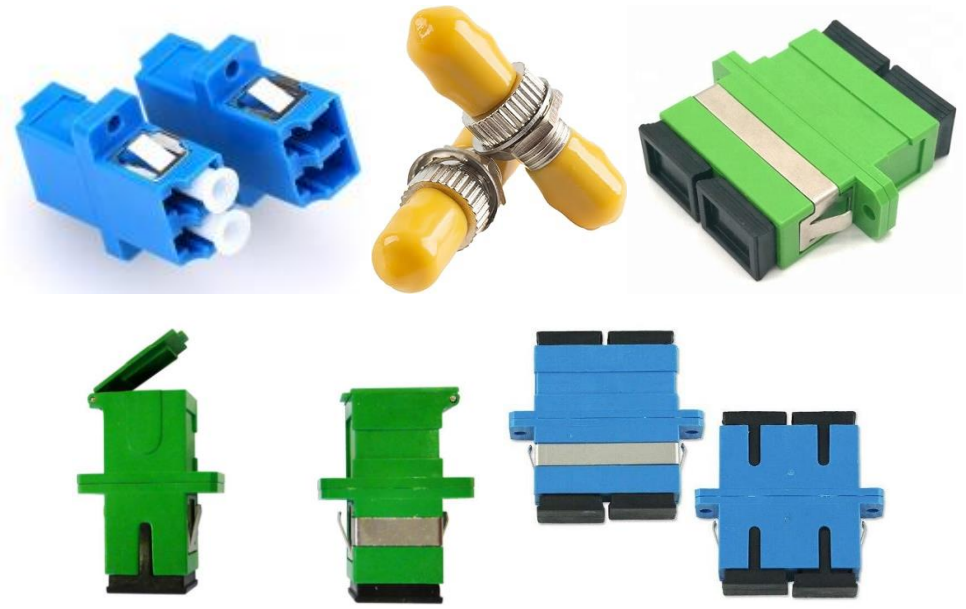
Optical Fiber Comprehensive Tester

Optical Fiber Cold Connection Tools Set



Fiber Optic Patch Cables

Fiber Optic Cable Tester

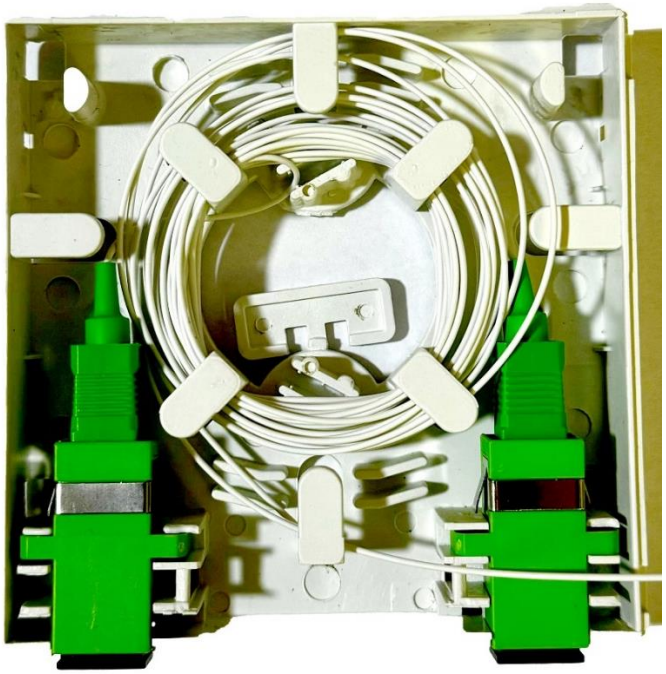


Fiber Optic Adapters

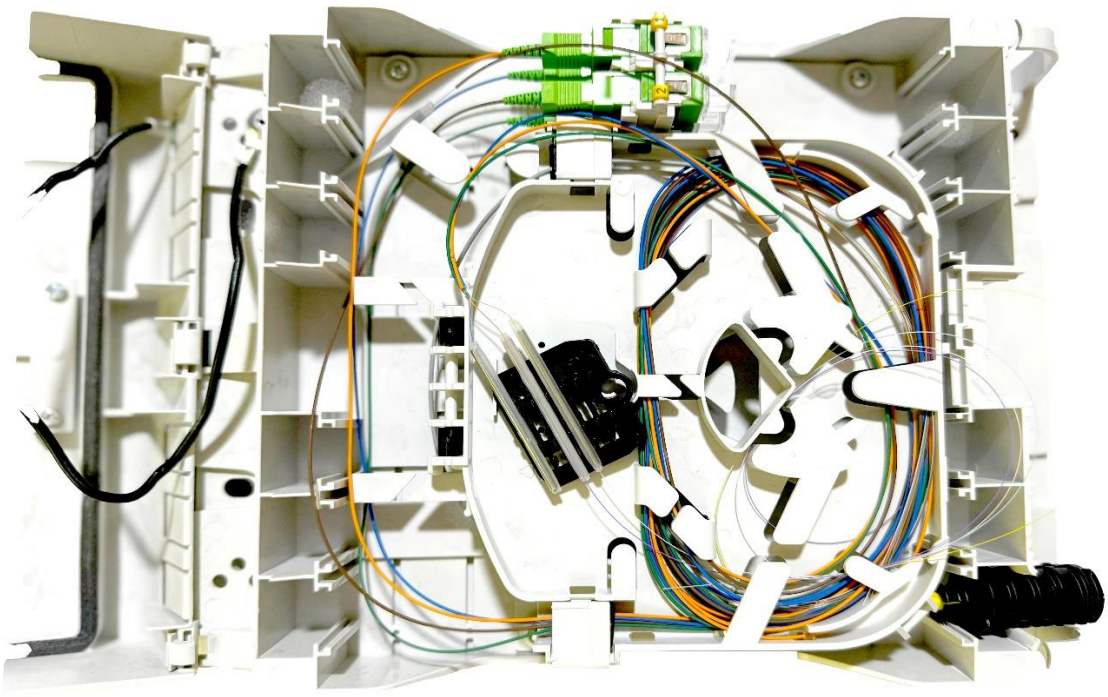
Fiber Optic Connectors

Fiber Optic Sleeves

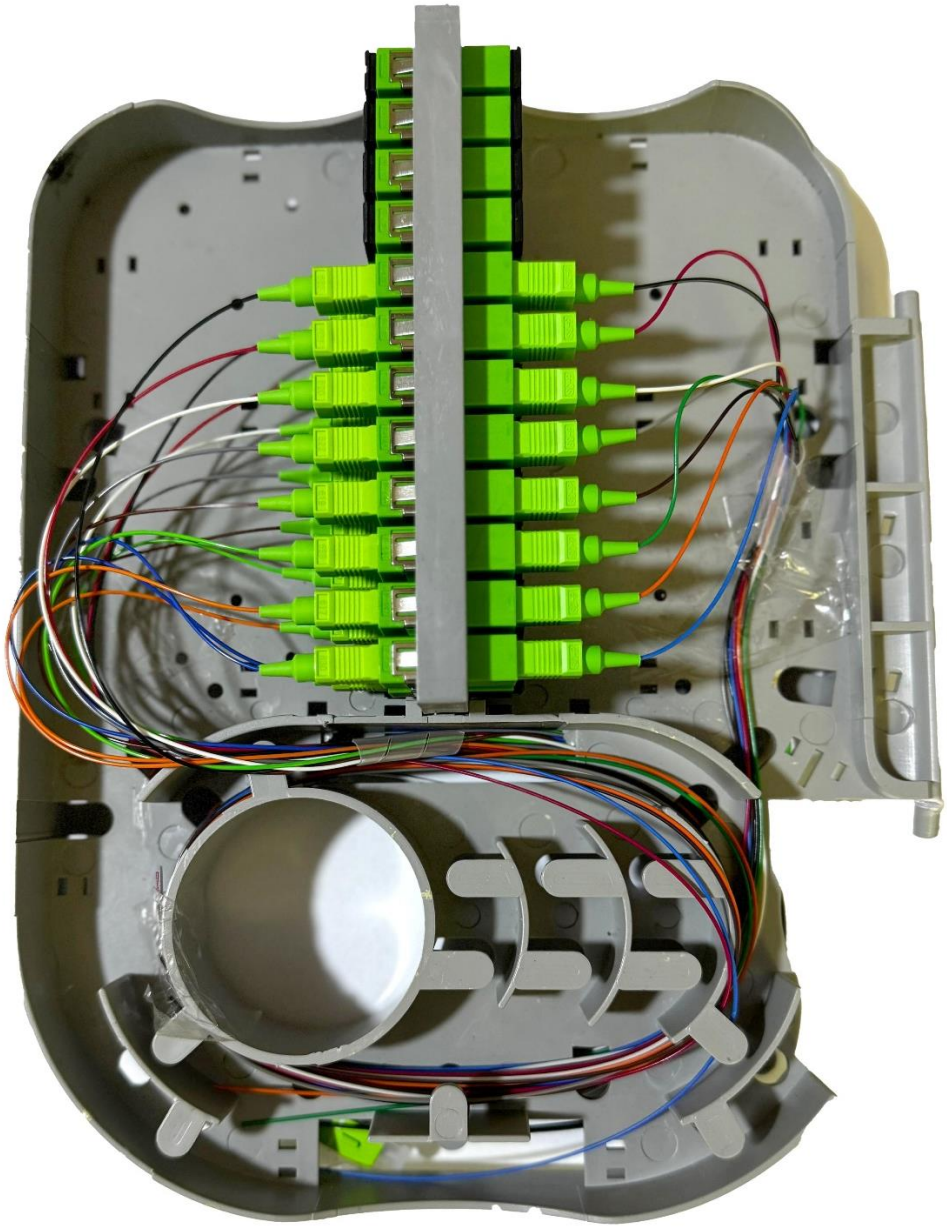
Fiber Optic Cables



Termination Box with Two Splicing Distribution



Patch Panel Using Direct Terminal



Fiber Optic Cable Box Connection with Multiple Terminations

Course Coordinator
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