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Tashi InfoComm Limited

TASHI INFOCOMM LIMITED

BIDDING DOCUMENT FOR SUPPLY OF

“Fiber Equipment for FY-2023”

Reference No: TICL/PRO-08/2023/148

Date: 28 / 01 / 2023

Procurement Officer
Procurement & Inventory Section
Tashi InfoComm Ltd.
Thimphu : Bhutan



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SECTION-I INVITATION OF BIDS FOR SUPPLY OF

“Fiber Equipment for FY-23”

1. Tashi InfoComm Limited hereinafter referred to as “**Purchaser**” invites sealed bids from eligible Bidders for the supply of fiber equipment for FY-23.
2. Interested eligible bidder(s) may obtain further information on the bid form directly from our website- www.tashicell.com or Procurement & Inventory Section, Samten Lam, Post Box No. 1502, Thimphu, Bhutan. Contact Procurement & Inventory Section at the given contact details during office hours only.
3. The Purchaser shall not be responsible for any costs or expenses incurred by the Bidder(s) in connection with the preparation or delivery of bids.
4. All Bidders/Representatives of the Bidders may be present during the opening of the Bidding Documents.
5. All correspondences with regard to the Bidding Documents shall be made in writing or email to the following address. Telephone enquires shall not be accepted.

Address for communication/contact.

Procurement & Inventory Section,
Tashi InfoComm Limited,
Samten Lam, Post Box No-1502,
Thimphu, Bhutan.

Email:

procurement@tashicell.com/manager.procurement@tashicell.com/manager.power@tashicell.com/procurement.finance@tashicell.com


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SECTION-II INSTRUCTION TO BIDDERS

A. GENERAL

1. Scope of Bid:

- 1.1. The scope of Bid shall be the supply of fiber equipment for the FY-2023.
- 1.2. All the Bids are to be completed and submitted to the Purchaser in accordance with the Instruction to Bidders.

2. Eligibility:

- 2.1. The invitation for Bid is open to all the interested licensed national and global suppliers.

3. Cost of Bidding:

- 3.1. The Bidder(s) shall bear all costs associated with the preparation and delivery of its bids, and the purchaser shall in no case be responsible or liable for those costs.

4. Bidding Documents:

- 4.1. The goods/services to be procured, bidding procedures, and terms & conditions are prescribed in the Bidding Documents. In addition to the invitation for bids, the bidding document includes:
 - a) Instructions to bidders
 - b) General terms & conditions
 - c) Detail list of goods/ and or services to be supplied along with detailed specifications.
- 4.2. The bidder(s) are expected to examine the bidding document, including all instructions, forms, terms, and specifications. Failure to furnish all information required by the bidding document or submission of a bid not substantially responsive to the bidding document in every respect will result in rejection of the bid.

5. Bid Prices:

- 5.1. The bidder(s) shall complete the appropriate price schedule included herein, stating unit prices, extended amount and the expected countries of origin of the goods to be supplied, if applicable
- 5.2. Prices quoted by the bidders shall remain fixed and valid for the period stated in **Section-II, Clause 6** of the bidding document, and will not be subject to variation on any account.
- 5.3. The bid currency shall be Ngultrum (Nu) for this bidding document. Except for third country bidder(s), the bidder(s) from the rest of the countries are not allowed to quote in US Dollar.



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The third country bidder(s) who quoted in US Dollar shall be converted into Ngultrum at the prevailing exchange rate (Selling TT rate of any financial institution) as on the date of tender opening for evaluation purpose.

5.4. Trade Terms shall be:

Unless otherwise stated, the following shall be the trade terms for this bidding document:

- a) CIF, TICL Warehouse, Thimphu for local bidders.
- b) CIF, TICL Warehouse, Phuentsholing for Indian and other third-country bidder(s).

6. Bid Validity:

- 6.1. The Bids shall be valid for 12 months from the date of bid submission.

7. Taxes/Duties & other levies:

- 7.1. Unless otherwise stated, the applicable taxes/duties/any other levy both within and outside Bhutan shall be under the scope of the bidder.
- 7.2. The third country bidder(s) or bidder(s) from India may exclude applicable taxes/duties within Bhutan while submitting the bid. The applicable taxes including customs clearance within Bhutan shall be under the scope of the purchaser. However, applicable taxes/duties, etc shall be factored in during the time of evaluation to determine the final landing cost.

8. Evaluation:

- 8.1. The purchaser shall evaluate the quotations based on specifications given in the bidding document to ascertain the lowest evaluated bidder(s).
- 8.2. The evaluation shall not only be based on the quoted unit rate but the specifications and complete datasheet of the fiber equipment against the purchaser's requirement.
- 8.3. The Evaluation Team & Management Tender Committee's evaluation decision shall be final and binding, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform and explain the affected bidder or bidders on the grounds of the evaluation team & Management Tender Committee's evaluation decisions and reports. In addition, the performance of previous tenders with the purchaser, if any shall also be factored in during the time of evaluation.
- 8.4. The lowest quoted unit rates alone do not guarantee the award of contract or Purchase Order.
- 8.5. The evaluation shall be based on lot-wise.


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9. Award of Purchase Order/Contract:

- 9.1. The purchaser shall award the PO or supply contract to the successful bidder against respective lot.

10. Delivery:

- 10.1. Delivery should be completed as per the given schedule:
- Within 60 days from the date of confirmed PO depending on the nature of the items(s) awarded to the respective successful bidder(s).
 - The detailed terms & conditions shall be mentioned in the confirmed Purchase Order/Supply Contract.
- 10.2. The purchaser (TICL) may provide delivery time extension beyond the actual delivery date taking into account the actual need-by-day and project schedule of TICL. However, subject to the approval of the Management Tender Committee after levying the Liquidity Damaged (LD) Penalty.
- 10.3. The Time Extension request/provided may not exceed 15 days at the maximum OR depend on the approval granted by the Management Tender Committee of the purchaser. The supplier has to send an email/in writing requesting a time extension with genuine reasons (along with supporting documentation).

11. Inspection of Goods:

- 11.1. The goods are subject to Physical Inspection upon delivery at TICL Warehouse and testing & commissioning in due course of time. The Goods found to be faulty, DOA, not meeting specifications/requirement of TICL after the final inspection, installation, and testing shall be rejected at the cost of the bidder.

12. Warranty (If applicable):

- 12.1. The Warranty shall be minimum 12 months from the date of delivery OR standard manufacturer's warranty, whichever is longer

13. Payment:

- 13.1. The Payment shall be made 100% against delivery within 7 working days from the date of receiving of Bill/Invoice.
- 13.2. Advance payment up to a maximum of 30% of the total PO value may be released at Purchaser's discretion against furnishing equivalent amount of bank guarantee for the advance payment valid 6 months beyond the delivery deadline.



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14. TDS/FCT:

- 14.1. TDS (Tax Deduction at Source) and or FCT (Foreign Contract Tax) shall be deducted as per the existing Rules and Regulations of the Department of Revenue & Customs, Bhutan (wherever applicable).

15. EMD (Earnest Money Deposit):

- 15.1. The bidder should submit **not less than 2% of the total quoted value** as part of the EMD along with the quotation in the form of Demand Draft or Bank Guarantee from any of the financial institutions located in Bhutan. The bidder(s) other than Bhutanese national can furnish EMD from the financial institutions in their respective countries OR from any of the Bhutanese Financial Institutions. The EMD may be directly deposited into the Purchaser's bank account (please contact the purchase requesting for bank details via email).
- 15.2. The bidder(s) failing to submit the EMD as per the requirement shall result in the rejection/cancellation of their bid.
- 15.3. The EMD shall be valid for 60 days beyond the submission/submission deadline of the bidding document. The EMD should be drawn in favor of "**Tashi InfoComm Ltd., Samten Lam, Thimphu, Bhutan**".
- 15.4. EMD of unsuccessful bidder(s) shall be returned promptly after the finalization of the quotation.
- 15.5. EMD shall be forfeited if:
- a) A bidder withdraws its bids prior to the finalization of the bids in every respect.
 - b) The successful bidder fails to submit Performance Security as per the terms specified in the bidding document.
- 15.6. EMD of the successful bidder shall be returned promptly upon submission of Performance Security.

16. Performance Security:

- 16.1. The successful bidder should submit not less than 10% of the total PO/contract value as Performance Security within 1 week from the date of PO/signing of the supply contract.
- 16.2. Performance Security shall be drawn in favor of "**Tashi InfoComm Ltd, Thimphu**" in the form of Demand Draft or Bank Guarantee or can be deposited directly into the purchaser's bank account (contact purchaser via email requesting bank details).
- 16.3. Performance Security shall be valid for the period of **1 YEAR** from the date of Purchase Order/Supply Contract.



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- 16.4. If the successful bidder fails to submit the performance security within 1 week, the EMD shall be forfeited and purchase order shall stand cancelled and awarded to the second lowest evaluated bidder.
- 16.5. Performance Security shall be returned within 1 week from the date of successful completion of all obligations under the issued Purchase Orders or signed supply contract.
- 16.6. Performance Security shall be forfeited if:
- The successful bidder fails to execute the supplies/works as per the terms and conditions stated in the purchase order in any manner deemed unsatisfactory by the purchaser (TICL) or the end-user(s).
 - The successful bidder fails to deliver the goods on the given deadline and is not recommended by the end-user(s) for a time extension or replacement.
 - The goods supplied do not conform to the specifications/brands/requirements, etc stated in the purchase order/BOM.

17. Liquidity Damage (LD) Penalty:

- 17.1. The LD penalty shall be charged at 0.01% per day up to a maximum of 10% of the total PO value should the supplier fail to deliver on the specified deadline.

18. The purchaser Right:

- 18.1. The purchaser reserves the following rights without thereby incurring any liability to the affected bidder or bidders or any obligation to inform and explain the affected bidder or bidders on the grounds of the purchaser's action:
- The right to accept or reject any bid and reject all the bids at any time prior to issuance of Award Notification and or Purchase Order.
 - The right at the time of award of the purchase order to increase or decrease the quantity of goods specified in the bidding document, without any changes in the price or other terms & conditions.
 - The right to reject all or in part, the item supplied during the time of physical inspection/testing or found to be non-standard/non-specific/unreliable in terms of quality/not meeting specification.
 - The right to direct negotiation, call quotations and receives the same via email from the manufacturers; authorized distributors; authorized dealers; frequent supplier(s) of similar goods in Bhutan/India/China/Other countries to compare the rates with those offered by the vendors through this Bidding Document. If need be, to procure directly. The Purchaser also reserves the right to negotiate with the lowest evaluated bidder(s) or all of the bidders at any time prior to award of Purchase Order/Signing of Supply Contract.



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18.2. Should the selected Bidder(s) fail to supply full order quantity within the given deadline, the purchaser reserves the right to cancel the quantities not supplied and place the order to the Second Lowest Evaluated Bidder. In such a case, the Purchaser shall recover as part of Liquidated Damages, the difference amount between purchase order rate and the actual rate paid to the second-lowest evaluated bidder for the quantities not supplied. The amounts shall be either adjusted from the Performance Security or bill/invoice amount of the supplied quantity.

19. Force majeure:

19.1. Force Majeure shall mean such unforeseeable occurrences beyond the control of the Purchaser and Bidder which occur after the date of issuance of Purchase Order or signing of Supply Contract and which were not reasonably foreseeable at the time of issuance of Purchase Order or signing of Supply Contract and which effects are not capable of being overcome without the unreasonable expense and/or loss of time to the Purchaser and the Bidder concerned, including, provided that the aforementioned conditions are met, but not limited to:

- i) Natural catastrophes, earthquakes
- ii) Strikes and blockages
- iii) War or war-like conditions, mobilizations, revolutions or riots, an act of Public enemy, sabotage, terrorism.
- iv) Restriction by or actions, omissions, or interventions from Public Authorities (including but not limited to changes in laws, regulations or import/export, security restrictions).
- v) The Party who wishes to plead Force Majeure shall inform the other party of the First party's perception of the effects of such force majeure on the fulfillment of issued purchase order/signed Supply Contract. Should any event of force majeure cause an increase in the time required for the performance of any part of the purchase order/signed Supply Contract, an equivalent adjustment shall be made in the time required for performance.

However, if the force majeure situation continues for more than two months, the purchaser and bidder shall decide whether the contract should be terminated.

20. Termination:

20.1. In the event of any failure by the Bidder to perform any of its obligations under the issued purchase order or signed Supply Contract or upon unsatisfactory performance, the purchaser shall terminate the purchase order or signed Supply Contract by giving a prior written notice of Fifteen (15) days, without any obligation to the Bidder. However, the purchaser shall pay the actual due amount for the quantity supplied and accepted by the Purchaser to Bidder on termination of the issued purchase order or signed Supply Contract.

21. Indemnity:

21.1. The bidder(s) shall comply with all the laws in force in Bhutan and outside. The laws will include all national, provincial, municipal, or other laws that affect the performance of the issued purchase orders or signed Supply Contract and bind upon the Bidder(s). The Bidder(s)

Address: P.O Box # 1502, Norzin Lam, Thimphu: Bhutan
Phone: +975 77889977 website: www.tashicell.com

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shall indemnify and hold harmless the Purchaser for and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever the nature arising or resulting from the violation of such laws by the Bidder(s).

22. Dispute Settlement:

- 22.1. If any dispute should arise in connection to the issued purchase order or signed Supply Contract, the Parties shall try to settle any such dispute through good faith and negotiations including escalation to senior Management where each party deems it appropriate. If negotiations fail, the matter shall be referred to the Court of Law.

23. Governing Law and Jurisdiction:

- 23.1. The terms and conditions in this Bidding Document or issued Purchase Order or signed Supply Contract shall be read and construed in accordance with the laws of the Kingdom of Bhutan and the District Court of Thimphu, Bhutan shall have jurisdiction over any disputes arising out of the Contract.


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SECTION-III GENERAL TERMS & CONDITIONS:

In this Bidding Document, the following terms shall be interpreted as indicated below:

“**The Bid**” means the proposal submitted by the Bidder

“**The Purchaser**” means the organization purchasing the Goods. In this case, M/s. Tashi InfoComm Limited (TICL).

“**Day**” means a calendar day.

- Bid Submission:** The Bids should be submitted in a sealed envelope (Single Envelope Method- **copy not required**) addressed to “ **Procurement & Inventory Section, TICL** against Reference No.. TICL/PRD-08/2023/148..... dated 28/01/2023.....”.
- Bid Submission:** 11:00 AM, 15/feb/2023 (Bhutan Standard Time);
- Bid Opening Time:** 2:10 PM : 15/02/2023 at TICL conference hall. Interested Bidder(s) may attend the bid opening on the given deadline and place.
- Bidding Document received after the deadline (time & date of submission) shall not be accepted and opened during the bid opening. The quotations shall automatically stand as “Rejected”.
- The Purchaser shall not be responsible for any damages, losses, breakages, or shortages of any items while in transit for delivery of Goods to TICL Store/warehouse.
- The Bidder should enclose a Xerox copy of valid Trade License, Tax clearance, Power of Attorney, and other relevant documents.
- Clarification on Bidding Document:** The bidder(s) are expected to examine the Terms and Conditions stated in the Bidding Document, Bill of Materials, Specifications, Drawings, etc furnished along with the Bidding Document. Once the bids are submitted by the bidder(s), It shall mean:
 - The bidder(s) have examined, read, and accepted all the terms and conditions stated in the Bidding Document, the specifications of the goods/services, Drawings/Designs, etc furnished in the Bidding Document. Thereafter, no grievance, complaints, etc (whatsoever nature may be) shall be accepted.
 - The bidder(s) can seek clarification (through email/in writing) with regard to the terms & conditions of the Bidding Document, the specifications of the goods/services, Drawings/Designs, etc furnished in the Bidding Document before the submission of the Bids.


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- c) Clarification can be sought through email or in writing to any of the given officials during office hours. Email ID: manager.procurement@tashicell.com OR procurement.finance@tashicell.com OR procurement@tashicell.com.

Address: Manager, Procurement & Inventory Section, Tashi InfoComm Ltd., Norzin Lam, Post Box No. 1502, Thimphu, Bhutan.

8. The Bids not substantially responsive to the Bidding Document in every respect will result in rejection of the Bids.
9. For any complaints or grievances, the bidder(s) may write directly to the Management Tender Committee of the Purchaser through email. The Email ID is procurement@tashicell.com.
10. Product samples, catalog/brochures containing details technical and functional specifications shall be submitted along with the Bids wherever applicable. Failing which, shall result in rejection of the Bidding Document.
11. The decision of the Corporate/Management Tender Committee shall be final and binding.


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SECTION-IV

The complete **Bill of Materials (BOM)** is as stated in **Annexure-I**. The Bids should be submitted in the below format in your company Quotation Form.

Appendix-I:

S/L	Description	UoM	Qty	Unit Rate	Amount
1.	1. Detail as given in Annexure-I				

Total


Note:

1. Please attached details of the technical and functional specification along with Bidding Doc. Failing to do so, will result in the rejection of your bidding document.
2. Mention the Country of origin of goods in the bidding document.

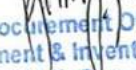

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Annexure-I BOM & Price schedule

SL	Description	UoM	Qty	Rate	Amount	Remarks
I	Fiber Cables					
1	ADSS Fiber Cable 24 Fiber Core	KM	30			Specification attached
2	Under Ground Fiber Cable 48 Fiber Core	KM	10			Specification attached
3	Anti-Rodent Fiber Cable 24 Fiber core	KM	10			Specification attached
4	Drop Cable 24F	KM	15			Specification attached
5	Drop Cable 12F	KM	30			Specification attached
6	Indoor FTTH Cable (4 core)	KM	6			Specification attached
7	Indoor UTP cable (Not Comscope)	Drum	25			Specification attached
8	Outdoor UTP cable (Not Comscope)	Drum	10			Specification attached
9	CPRI Cable (20mm) (armoured, Multimode), IP67 protection,	Roll	20			Specification attached
10	CPRI Cable (20mm) (armoured, Single mode), IP67 protection,	Roll	15			Specification attached
Sub-total for fiber cables (Lot-I)						
II	Fiber Accessories					
1	SC/UPC to SC/UPC Patch cords, G652D, Single mode, 2mm dia. Duplex 1 meter, outer jacket LSZH. Blue colour	Nos	100			Specification attached
2	SC/UPC to SC/UPC Patch cords, G652D, Single mode, 2mm dia. Duplex 5 meter, outer jacket LSZH. Blue colour	Nos	100			Specification attached
3	Patch Cord LC/UPC-LC/UPC, SM, 2mm Dia, 1 mtr, Simplex/ Colour Blue	Nos	100			Specification attached
4	Patch Cord LC/UPC-LC/UPC, SM, 2mm Dia, 2 mtr, Simplex/ Colour Blue	Nos	100			Specification attached
5	Patch Cord LC/UPC-LC/UPC, SM, 2mm Dia, 5 mtr, Simplex/ Colour Blue	Nos	100			Specification attached
6	Patch Cord LC/UPC-LC/UPC, SM, 2mm Dia, 10 mtr, Simplex/ Colour Blue	Nos	100			Specification attached


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7	Optical Transceiver(SFP+,850nm,10Gb/s,-7.3~-1dBm,-9.9dBm,LC, MM,0.3km)	Pairs	20			Cisco and Huawei compatable
8	Optical Transceiver(SFP+, 1310/1550 nm,10Gb/s,-7.3~-1dBm,-9.9dBm,LC, SM, 20km)	Pairs	5			Cisco and Huawei compatable
9	Optical Transceiver(SFP+, 1310/1550 nm,10Gb/s,-7.3~-1dBm,-9.9dBm,LC, SM, 10km)	Pairs	10			Cisco and Huawei compatable
10	10G BIDI SFP+ transceiver modules(10 Gbps, 10km,SM, Output Power(-3 to -2dBm), LC, 1330/1550nm)	Pairs	10			Cisco and Huawei compatable
11	10G BIDI SFP+ transceiver modules(10 Gbps, 20km,SM, Output Power(-3 to-2dBm), LC, 1330/1550nm)	Pairs	25			Cisco and Huawei compatable
12	10G BIDI SFP+ transceiver modules(10 Gbps, 40km,SM, Output Power(0 to 5 dBm), LC, 1330/1550nm)	Pairs	10			Cisco and Huawei compatable
13	Optical functional module,1000BASE-T -SFP RJ45Electrical Module, Auto Negotiate,100m ,-40~85degC	Pairs	20			Cisco and Huawei compatable
14	Optical Transceiver,eSFP,1310nm,155M~2.67G,-10~-3dBm,-18dBm,LC,SM,20km	Pairs	10			Cisco and Huawei compatable
15	Optical Transceiver,eSFP,1310nm,155M~2.67G,-10~-3dBm,-18dBm,LC,SM,40km	Pairs	5			Cisco and Huawei compatable
16	Optical Transceiver,eSFP,1310nm,155M~2.67G,-10~-3dBm,-18dBm,LC,SM,80km	Pairs	5			Cisco and Huawei compatable
17	Optical Transceiver,eSFP,1310nm,155M~2.67G,-10~-3dBm,-18dBm,LC,SM,120km	Pairs	5			Cisco and Huawei compatable
18	Optical Transceiver,eSFP,1310nm, 622M~2.67G,-10~-3dBm,-18dBm,LC,SM, 40km	Pairs	3			Cisco and Huawei compatable
19	1.25Gbps SFP BiDi Transceiver Module (Single-mode, 20km, LC,1310nm/1550nm)	Pairs	30			Cisco and Huawei compatable
20	1.25Gbps SFP BiDi Transceiver Module (Single-mode, 40km, LC,1310nm/1550nm)	Pairs	10			Cisco and Huawei compatable
21	1.25Gbps SFP BiDi Transceiver Module (Single-mode, 80km, LC,1310nm/1550nm)	Pairs	10			Cisco and Huawei compatable


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22	Media converter 1*10/100/1000Base-Tx to 1*1000Base-FX single fiber SM Tx1550nm/Rx1310nm 20KM SC external power supply 220V AC	Nos	30			Cisco and Huawei compatible
23	Fiber optics tool kit/ PK-1700 NB (Proskit)	Nos	11			
Sub-total for fiber accessories (Lot-II)						
III	Fiber tools	UoM	Qty	Rate	Amount	
1	High Definition core aligning splicer (Sumito/Fujikura)	Nos	2			Specification attached
2	Active V-Groove Fusion Splicer (Sumito/Fujikura)	Nos	2			Specification attached
3	OTDR (EXPO/Fujikura)	Nos	7			Specification attached
Sub-total for fiber tools (Lot-III)						
Grand Total (Lot-I+Lot-II+Lot-III)						


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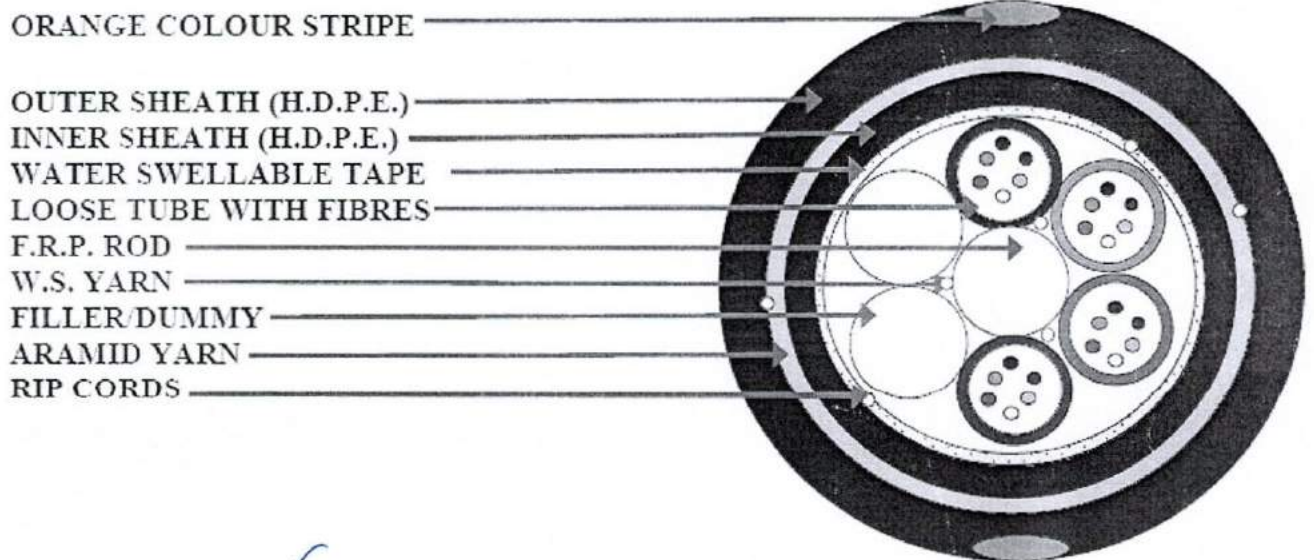
Technical particulars of 24F DWDM ADSS Optical Fiber Cable

1. Fiber properties			
Sl.No	Characteristics	Unit	Value
1	Attenuation @ 1310 nm @1550 nm	dB/km	≤ 0.36 ≤ 0.23
2	Chromatic dispersion between 1270 - 1340 nm 1285 - 1330 nm 1550 nm 1625 nm	ps/(nm ² km)	≤ 5.3 ≤ 3.5 ≤ 18 ≤ 22
3	Zero dispersion wavelength	Nm	1300 to 1324
4	Zero dispersion slope	ps/(nm ² km)	≤ 0.092
5	Cut off wavelength	nm	≤ 1320
6	Mode field diameter at 1310 nm	μm	9.3 ± 0.5
7	Core-clad concentricity error	μm	≤ 0.6
8	Cladding non circularity	μm	≤ 1.0%
9	Cladding diameter	μm	125 ± 1.0
10	Coating diameter	μm	245 ± 10
11	Polarization mode dispersion	ps/√km	≤ 0.20
2. Mechanical & Environmental properties			
A	Tensile Strength	KN	13.0
B	Crush resistance	Newton/100mm	2000 (200Kg load on 100x100mm plate for one minute), change in loss ≤ 0.05dB (IEC-60794-1-21-E3 standard)
C	Bending radius	mm	280 (IEC-60794-1-21-E11 standard)
B	Strain Margin	%	≤ 0.25
C	Impact Resistance	N	50, Change in loss ≤ 0.05dB (IEC-60794-1-21-E4 standard)
D	Torsion resistance	N	75, (10 cycles, ±180degree Change in loss ≤ 0.05dB (IEC-60794-1-21-E7 standard))
E	Max. operating /installation temperature	°C	-30 to +70
3. Physical & dimensions properties			
I	Number of fibers		24F
II	Numbers of loose tubes Number of filler/Dummy Number of fiber per tube		4 2 6
III	Type of fiber		SM G652D
IV	Central strength member		FRP rod
V	Peripheral strength elements		Aramid Yarn – 12.6 kg/km
VI	Sequence of loose tubes (as per EIA/TIA 598)		Blue, Orange, Green, Brown, Slate & White
VII	Color of fiber		Blue, Orange, Green, Brown, Slate, & White
VIII	Inner & Outer sheath material		UV resistant (Black) polyethylene (H.D.P.E)
IX	Inner sheath thickness	mm	≥ 1.2
X	Outer sheath thickness	mm	≥ 2.0

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XI	Outer cable diameter	mm	14.8 ± 0.5 mm
XII	Cable weight	Kg/km	165 ± 20
XIII	Printing on cable	<ol style="list-style-type: none"> 1. Manufacturer name 2. Labelled "24F G652D ADSS OFC" 3. Year of manufacture 4. Labelled "BPC" 5. Sequential length marking in meter 6. Two orange colour (UV stabilized) lines of minimum 3 mm width diametrically opposite to each other, continuous over the length of the cable shall be applied (marked) for easy identification of this cable from other cables. 	
XIV	Standard length	2 km + 5%	

Cross Section diagram of ADSS cable

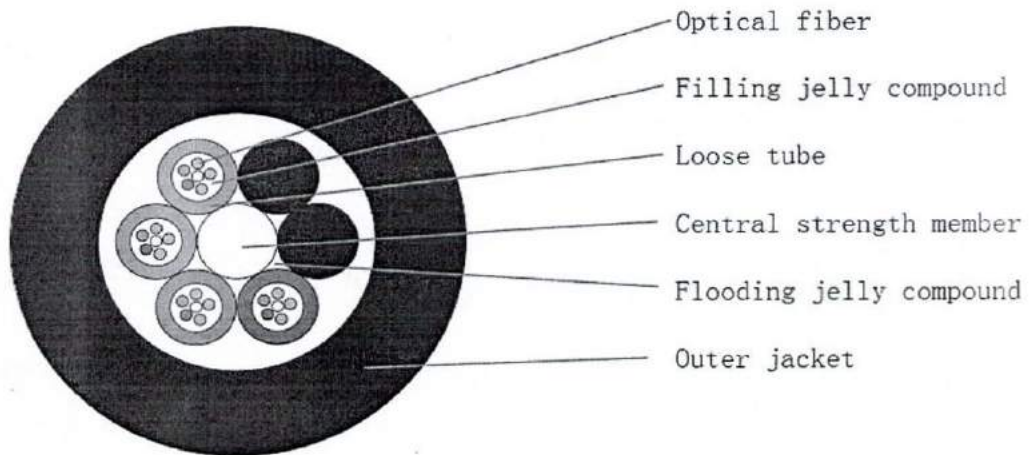


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UG Duct cable without Armour

Cross Section of Cable



Optical Fiber Type and Properties

Item		Unit	Specification
Fiber Type			G.652
Mode field diameter	1310nm	μm	9.2 ± 0.4
	1550nm	μm	10.4 ± 0.8
Cladding diameter		μm	125.0 ± 1
Cladding non-circularity		%	±1.0
Core/cladding concentricity error		μm	±0.5
Coating diameter		μm	242 ± 7
Coating/cladding concentricity error		μm	±12
Cable cut-off wavelength		nm	±1260
Attenuation Coefficient	1310nm	dB/km	±0.36
	1550nm	dB/km	±0.22

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Proof stress level	kpsi	≥100
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Note: Other parameters meet standard ITU-T G.652

Dimensions of Cable Constructions

Fiber count	Structure	Fibers per tube	Loose tube diameter (mm)	CSM diameter / pad diameter (mm)	Thickness of outer jacket (mm)	Cable diameter (mm)	Cable Weight (kg/km)
4	1+6	4	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	68
6	1+6	6	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	68
8	1+6	4	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	68
12	1+6	6	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	68
18	1+6	6	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	69
24	1+6	6	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	69
30	1+6	6	1.8±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	70
36	1+6	6	1.8 ±0.1	2.2 /2.2	1.6±0.1	9.0 ±0.5	70
48	1+6	12	2.0±0.1	2.3 /2.3	1.6±0.1	9.5 ±0.5	78
60	1+6	12	2.0±0.1	2.3 /2.3	1.6±0.1	9.5 ±0.5	78
72	1+6	12	2.0±0.1	2.3 /2.3	1.6±0.1	9.5 ±0.5	79
84	1+7	12	2.0±0.1	3.0 /3.0	1.6±0.1	10.2 ±0.5	94
96	1+8	12	2.0±0.1	2.6/3.5	1.6±0.1	10.7 ±0.5	100
108	1+9	12	2.0±0.1	2.6 /4.2	1.6±0.1	11.4 ±0.5	113
120	1+10	12	2.0±0.1	2.6/ 4.9	1.6±0.1	12.1 ±0.5	126
132	1+11	12	2.0±0.1	3.0 /5.5	1.6±0.1	12.7 ±0.5	140
144	1+12	12	2.0±0.1	3.0 /6.3	1.6±0.1	13.5 ±0.5	157

Cable Performance

Item		Parameters
Loose tube	Material	PBT
	Color	Full color spectrum
Filler	Material	PE
	Color	Black
CSM	Material	FRP
Outer jacket	Material	MDPE
	Color	Black
Min. bending radius	Static	10 times cable diameter
	Dynamic	20 times cable diameter
Tensile performance	Short term	1500N
Crush	Short term	1000N/100mm

Working Condition

Item	Standard	Parameters
Operation temperature	IEC 60794-1-2 F1	-20°C ~ +60°C
Water penetration	IEC 60794-1-2-F5	Water level: 1m, sample: 3m, After 24h, no water ingress.

Technical particulars of 24F SM G652 D ANTIRODENT ADSS OFC

1. Fiber properties			
Sl.No	Characteristics	Unit	Value
1	Attenuation @ 1310 nm @1550 nm	dB/km	≤ 0.36 ≤ 0.23
2	Chromatic dispersion between 1285 – 1330 nm 1550 nm	ps/(nm ² km)	≤ 3.5 ≤ 18
3	Zero dispersion wavelength	Nm	1300 to 1324
4	Zero dispersion slope	ps/(nm ² km)	≤ 0.092
5	Cut off wavelength	nm	≤ 1320
6	Mode field diameter at 1310 nm	μm	9.1 ± 0.5
7	Core-clad concentricity error	μm	≤ 0.6
8	Cladding non circularity	μm	$\leq 1.0\%$
9	Cladding diameter	μm	125 ± 1.0
10	Coating diameter	μm	245 ± 10
11	Polarization mode dispersion	ps/ $\sqrt{\text{km}}$	≤ 0.20
2. Mechanical & Environmental properties			
A	Tensile Strength	KN	13.0
B	Max. installation tensile	N	3800 N
C	Crush resistance	Newton/10cm	2000 N/ 10 cm
D	Min. Bending radius (static)	mm	12.5 x D mm
E	Min. Bending radius (dynamic)	mm	25 x D mm
F	Max. operating /installation temperature	°C	20 °C to +65 °C
3. Physical & dimensions properties			
I	Number of fibers		24F
II	Loose Tube / Dummy		4/2
III	Number of fiber per tube		6
IV	Type of fiber		SM G652D

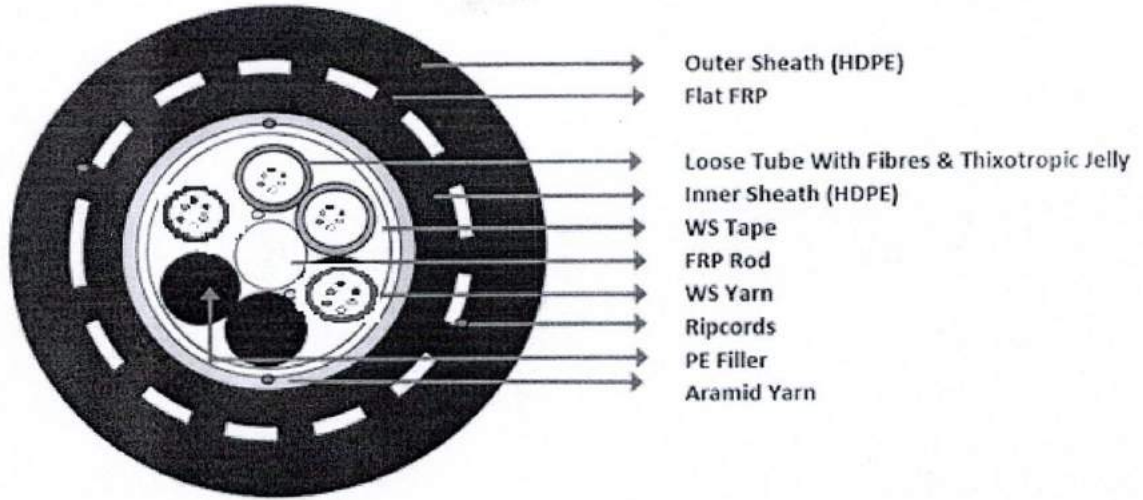
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V	loose tube Material / Diameter (INNER)		PP (Polypropylene)
VI	Central Strength Member		FRP (Fiber Reinforced Plastic)
VII	Peripheral Strength Members		Flat FRP
VIII	Peripheral Strength Members		High Strength Aramid Yarns
VIII	Color of fiber		Blue, Orange, Green, Brown, Slate & White
IX	Color of loose tube/ dummy		Blue, Orange, Green, Brown, Filler-1 & Filler-2
X	Inner sheath materials		UV resistant (Black)
XI	Inner sheath thickness	mm	0.80 mm NOMINAL
XII	Outer sheath materials		HDPE - BLACK
XIII	Outer sheath thickness	mm	1.70 mm NOMINAL
XIV	Outer Cable Diameter	mm	14.8 ± 0.5 mm
XV	Cable weight	KG	160 kg/km + 15 Kg/Km
XVI	Standard length	KM	2 km + 5%
XVII	Printing on cable	<ol style="list-style-type: none"> 1. Manufacturer name 2. Labelled "24F G652D FRP OFC" 3. Year of manufacture 4. Labelled "BPC" 5. Sequential length marking in meter <p>Two orange colour (UV stabilized) lines of minimum 3 mm width diametrically opposite to each other, continuous over the length of the cable shall be applied (marked) for easy identification of this cable from other cables.</p>	

Cross Section diagram of ADSS cable

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8. E

Fiber Optic Patch Cords

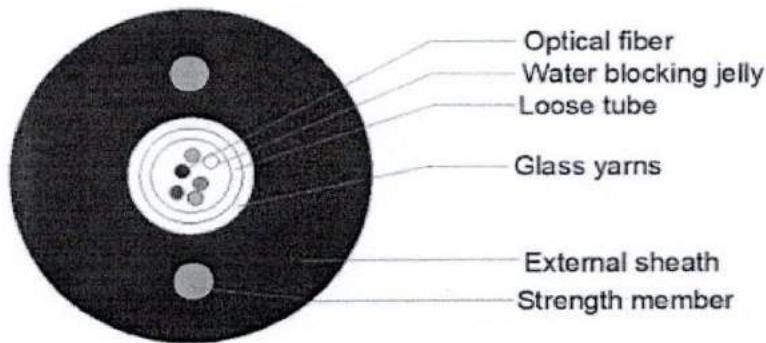
Features:

- End-Face Type: PC/UPC/APC
- Fiber Diameter: 0.9mm, 2.0mm or 3.0mm
- Available for simplex and duplex
- The outer jacket can be PVC or LSZH
- Available for different connectors: SC, LC, FC, ST, MPO, MTP, MU, DIN, D4, E2K etc
- Fiber Type: Single mode fiber G652D, G657A1 and G657A2, Multimode fiber OM1, OM2, OM3 and OM4 are available
- Low insertion loss and high return loss, high dense connection, easy for operation
- Customer lengths and connectors are available upon request



Parameter	Unit	FC, SC, LC, ST, MU, DIN, D4, MPO, SC/APC, FC/APC, LC/APC, MU/APC Duplex			
		SM(9/125 SMF-28 or equivalent OS1)		MM(50/125, 62.5/125(OM2&OM1), 50/125, 10G(MM) OM3	
		PC	UPC	APC	PC
Insertion loss(typical)	dB	≤0.3	≤0.2	≤0.25	≤0.2
Return loss	dB	≥45	≥50	≥60	≥30
Operating wavelength	Nm	1310, 1510			
Exchangeability	dB	≤0.2			
Vibration	dB	≤0.2			
Operating temperature	°C	-40~75			
Storage temperature	°C	-45~85			
Cable Type		Simplex or duplex (zip cord) φ3.0, φ2.0, φ0.9, PVC or LSZH			

Optics Drop Cables



Optical Fiber Characteristics (ITU-T G.652D).

Parameters	Speciation	
	Before Cable	After Cable
Fiber Type	SM G652D Fiber	
Mode Field Diameter (um)	9.2±0.4 (@1310nm)	
Cladding Diameter (um)	125±0.7	
Coating Diameter (um)	245±10	
Core Concentricity Error (um)	≤ 0.6	

Fiber attenuation (dB/Km)	@1310nm	≤ 0.35
	@1550nm	≤ 0.21
Macro Bending Loss (dB)	30mm radius, 100turns	≤ 0.05 @1550nm

Fiber Cable Specifications

Parameters		Specifications
Fiber Count		2~12
Loose Tube	Materials	PBT
	Diameter	2.0
	Fiber/tube	2~12
	Filling compound	Fiber jelly
Strength member	Material	FRP
	Diameter (mm)	0.8
	Number	2
Additional strength member	Material	HDPE
Jacket	Colour	Black













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	Nominal Thickness (mm)	1.8
Approx. Cable Diameter (± 0.5)		6.2
Cable weight Approx. (kg/Km)		33
Tensile Strength (N)	Long Term	2000
	Short Term	1000
Crush Resistance (N/100mm)	Short Term	2000
Bending Radius (mm)	Dynamic	20D
	Static	10D
Cable Attenuation (dB/Km)	@1310	≤ 0.36
	@1550	≤ 22
Package (Km/drum)		2
Operating Temp ($^{\circ}\text{C}$)		-10~ + 45

Fiber Colours

Fiber counts	1	2	3	4	5	6	7	8	9	10	11	12
Colour												

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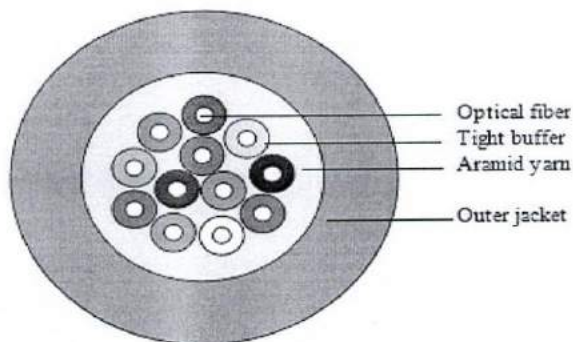
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Indoor Fiber Cable

Features:

- 1 ~ 72 cores
- bunched or ribbon fiber
- SM (G.652D, G.655, G.657.A1, G.657.A2) and MM (OM1, OM2, OM3, OM4) are available;
- LSZH, PVC outer jacket material optional
- High-strength aramid reinforcement with good tensile properties
- Tight-set dry structure for easy construction and maintenance
- Small outer diameter, light weight, flame retardant, easy to peel off, and high flexibility
- Tight sleeve optical fiber, easy to peel;
- The outer jacket is corrosion-resistant, waterproof, flame retardant and environmentally friendly

Product Structure



The way of Cabling	Fiber count	Specifications (mm)	Weight (kg/km)	Tensile(N)		Crush(N)		Bending Radius(mm)	
				Long term	Short term	Long term	Short term	Static	Dynamic
Level	4	4.7	19	130	440	200	1000	10D	20D
Level	6	5.2	25	130	440	200	1000	10D	20D
Level	8	5.8	29	130	440	200	1000	10D	20D
Level	12	6.3	35	130	440	200	1000	10D	20D
Vertical	4	5.0	22	200	660	300	1000	10D	20D

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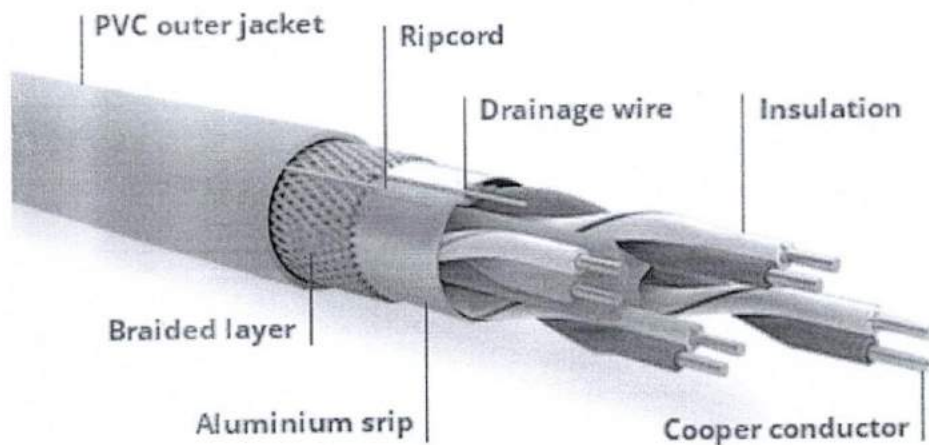
Cat6/6a UTP LAN Ethernet Cable (Brand: D-Link)

Product Description:

The Cat6 LAN cables transmission performance is much higher than the Cat5e standard, making it ideal for Gigabit-rate network transmission applications. The Cat6 LAN cable has a transmission bandwidth of 250MHz. The Cat6a LAN cable is an improved version of Cat6 and is used primarily in 10 Gigabit networks. The Cat6a LAN cable has a transmission bandwidth of 500 MHz and a maximum transmission speed of 10 Gbps.

Features:

- SFTP
- 26AWG/24AWG/23AWG
- PVC/PE/LSZH Jacket
- Standard supports up to 250MHz and speeds up to 1000Mbps over 100 meters of Cat6 cable.
- Fully backward compatible with all the previous categories.
- RJ-45 plugs on both sides of the short LAN cable are designed with 50 mm gilt, with good contact and transmission properties, oxidation resistance, rust, and no blackening.
- Operating Temperature: -20 to 60°C



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Outdoor UTP cable

Features:

- Comply with Cat6 specifications
- 4-pair shielded twisted pair cable
- 23 AWG solid copper conductor
- Pairs are wrapped in polyester tape and aluminum foil with drain wire
- High Density Polyethylene Insulation
- FR PVC Jacket
- Verified compliant with EIA/TIA standards
- Packaged in an easy-to-pull box for easier installation

Specification:

- **Category** : 6 SFTP Solid cable
- **Conductor** : 23 AWG Multi-cores (Solid)
- **Conductor Meta** : Bare Copper
- **Insulation Materia** : HD-PE
- **Pairs** : 2 Insulated conductors twisted together
- **Shield** : Aluminum / Polyester Foil Tinned copper Braiding
- **Sheath** : PVC/LSZH
- **Cable Diameter** : 7.5 mm nominal

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CPRI Patch Cords

Features:

- The CPRI patch cords are used for outdoor RRU transmitting optical signal and remote fiber feeder
- Standard Duplex LC connector, well connected with standard LC adaptor
- Available Single mode and Multimode
- IP67 protection, salt-mist proof, humidity proof, dustproof
- Low insertion/return loss, steady optical transmitting.
- Lightweight, waterproof, dustproof, moisture-proof, Metal hard housing.
- 500 cycles Mechanical life

G.652D

No.	Items	Unit	Specification	
			G.652D	
1	Mode Field Diameter	1310nm	μm	9.2 ± 0.4
		1550nm	μm	10.4 ± 0.5
2	Cladding Diameter	μm	124.8 ± 0.7	
3	Cladding Non-Circularity	%	≤ 0.7	
4	Core-Cladding Concentricity Error	μm	≤ 0.5	
5	Coating Diameter	μm	245 ± 5	
6	Coating Non-Circularity	%	≤ 6.0	
7	Cladding-Coating Concentricity Error	μm	≤ 12.0	
8	Cable Cutoff Wavelength	nm	$\lambda_c \leq 1260$	
9	Attenuation (max.)	1310nm	dB/km	≤ 0.4
		1550nm	dB/km	≤ 0.3



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10Gbps SFP+ Optical Transceiver, 300m Reach

Features

- * Optical interface compliant to IEEE 802.3ae 10GBASE-SR
- * Electrical interface compliant to SFF-8431
- * Hot Pluggable
- * 850nm VCSEL transmitter, PIN photo-detector
- * Maximum link length of 300m on 2000MHz/km MMF
- * Operating case temperature: 0 to 70°C
- * Low power consumption
- * All-metal housing for superior EMI performance
- * Advanced firmware allow customer system encryption information to be stored in transceiver
- * Cost effective SFP+ solution, enables higher port densities and greater bandwidth

Product Description

This 850 nm VCSEL 10Gigabit SFP+ transceiver is designed to transmit and receive optical data over

50/125 μm or 62.5/125 μm multimode optical fiber (Table 1).

Fiber type	Minimum modal bandwidth@850nm(MHz*km)	Operating range (meters)
62.5um MMF	160	2 to 26
	200	2 to 33
50 μm MMF	400	2 to 66
	500	2 to 82
	2000	2 to 300

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Optical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ_t	840	850	860	nm	
RMS spectral width	P_m	-	-	4	nm	
Average Optical Power	P_{avg}	-5	-	-1	dBm	2
Extinction Ratio	ER	3	-	-	dB	3
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	R_{in}	-	-	-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance		-	-	12	dB	
Receiver						
Center Wavelength	λ_r	840	850	860	nm	
Receiver Sensitivity	P_{sens}	-	-	-11	dBm	4
Stressed Sensitivity in OMA		-	-	-8	dBm	4
Los function	Los	-30	-	-12	dBm	
Overload	P_{in}	-	-	0	dBm	4
Receiver Reflectance		-	-	-12	dB	
LOS De-Assert	LOSD			-13	dBm	
LOS Assert	LOSA	-23			dBm	

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10Gbps SFP+ Optical Transceiver, 10km or 20km Reach

Features:

- * Optical interface compliant to IEEE 802.3ae 10GBASE-LR
- * Electrical interface compliant to SFF-8431
- * Hot Pluggable
- * 1310nm DFB transmitter, PIN photo-detector *
- * Operating case temperature:
 - Standard: 0 to +70°C
 - Industrial: -40 to +85°C
- * Low power consumption
- * Applicable for 10km or 20km SMF connection
- * All-metal housing for superior EMI performance
- * Advanced firmware allow customer system encryption information to be stored in transceiver
- * Cost effective SFP+ solution, enables higher port densities and greater bandwidth

Product Description

This 1310 nm 10G SFP+ LR transceiver is a very compact 10Gb/s optical transceiver module for serial optical communication applications at 10Gb/s. The TSPLXG20D converts a 10Gb/s serial electrical data stream to 10Gb/s optical output signal and a 10Gb/s optical input signal to 10Gb/s serial electrical data streams. The high-speed 10Gb/s electrical interface is fully compliant with SFI specification.

The high performance 1310nm DFB transmitter and high sensitivity PIN receiver provide superior performance for Ethernet applications at up to 10km or 20km links

The SFP+ Module compliants with SFF-8431, SFF-8432 and IEEE 802.3ae 10GBASE-LR. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472. The fully SFP compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission.

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Optical Parameters (TOP = 0 to 70 °C, VCC = 3.135 to 3.465)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ_t	1290	1310	1330	nm	
spectral width	$\Delta\lambda$			1	nm	
Average Optical Power	Pavg	-8.2		0.5	dBm	1
Optical Power OMA	Poma	-5.2			dBm	
Laser Off Power	Poff			-30	dBm	
Extinction Ratio	ER	3.5			dB	7
Extinction Ratio	ER	6			dB	6
Transmitter Dispersion Penalty	TDP			3.2	dB	2
Relative Intensity Noise	Rin			-128	dB/Hz	3
Optical Return Loss Tolerance		20			dB	
Receiver Section:						
Center Wavelength	λ_r	1260		1355	nm	
Receiver Sensitivity	Sen			-14.5	dBm	4,7
Receiver Sensitivity	Sen			-14.5	dBm	4,6
Stressed Sensitivity (OMA)	SenST			-10.3	dBm	4
Los Assert	LOSA	-25		-	dBm	
Los Dessert	LOSD			-15	dBm	
Los Hysteresis	LOSH	0.5			dB	
Overload	Sat	0			dBm	5
Receiver Reflectance	Rrx			-12	dB	

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V

1. 155M~1.25G BIDI SFP

Features:

- Simplex SC or LC Interface
- Single +3.3V power supply
- Built-in digital diagnostic functions
- Transmission distance up to 120km over SMF
- Supports data rates from 100Mb/s to 1.25Gb/s
- Operating Case Temperature: Standard: 0~70°C; Extended: -20~85°C ;Industrial: -40~85°C

Compliant

- RoHS-6
- SFP MSA
- FC-P1 13.0
- IEEE Std 802.3

Application:

- Fast Ethernet
- Gigabit Ethernet
- 1X Fibre Channel
- SONET/SDH OC-3/STM-1
- SONET/SDH OC-12/STM-4
- SONET/SDH OC-24/STM-8

PN	Data Rate	Distance	Fiber	Output Power (dBm)	Sensitivity (dBm)	Interface	Temp.	DDM
1. OC-3/STM-1/Fast Ethernet/155Mbps BIDI								
	155M	20km	SM	-15~-7	-34	Simplex LC/SC	0 to 70°C	D
	155M	40km	SM	-9~-3	-34	Simplex LC/SC	0 to 70°C	D
	155M	80km	SM	-6~-3	-34	Simplex LC/SC	0 to 70°C	D
	155M	120km	SM	0~2	-36	Simplex LC/SC	0 to 70°C	D

PN	Data Rate	Distance	Fiber	Output Power (dBm)	Sensitivity (dBm)	Interface	Temp.	DDM
2. OC-12/STM-4/Fast Ethernet/622Mbps BIDI								
	622M	40KM	SM	-3~0	-24	Simplex LC/SC	0 to 70°C	D
3. Gigabit Ethernet/1XFibre Channel/1.25Gbps BIDI								
	1.25Gbps	20KM	SM	-9~-3	-24	Simplex LC/SC	0 to 70°C	D
	1.25Gbps	40KM	SM	-3~0	-24	Simplex LC/SC	0 to 70°C	D
	1.25Gbps	80KM	SM	-4~0	-26	Simplex LC/SC	0 to 70°C	D

2. 10G BIDI SFP+

Product Features:

- Simplex LC Interface
- Built-in digital diagnostic functions
- 1270nm & 1330nm or 1490nm&1570nm
- Up to 11.3 Gbps Bi-directional Data Links
- Single Fiber Bi-Di SFP+ Optical Transceiver
- Transmission distance up to 80km over SMF
- Operating Case Temperature: Standard: 0~70°C; Extended: -20~85°C; Industrial: -40~85°C

Compliant

- RoHS-6
- SFF-8472
- SFP+ MSA
- IEEE 802.3ae 10GBASE-BX or SDH/SONET standards

Products	Data Rate (Gbps)	Distance	Fiber	Output Power (dBm)	Sensitivity (dBm)	Interface	Temp.	DDM
CISCO & Huawei Compatible	9.95~11.3	10km	SM	-6~-1	-14.5	Simplex LC	0-70°C	D
	9.95~11.3	20km	SM	-3~-2	-14.5	Simplex LC	0-70°C	D
	9.95~11.3	40km	SM	0~5	-16	Simplex LC	0-70°C	D

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10/100/1000base t copper SFP (Distance: 100m)

Features:

- Hot-Pluggable SFP
- Compliant with SFP MSA
- Compliant with IEEE Std 802.3-2002
- Fully Metallic Enclosure for Low EMI
- Compact RJ-45 Connector Assembly
- Detailed Product Information in EEPROM
- Operating Case Temperature: Standard: 0~70°C
- Access to Physical Layer IC via 2-Wire Serial Bus
- Support 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T/100 BASE-T
- 10 Gigabit Ethernet over Cat 6a cable, Gigabit Ethernet over UTP Cat5 Cable

Application

- 10/100/1000Base-T LAN
- Gigabit Ethernet
- Switch to Switch Interface
- Router/Server Interface



Media converter

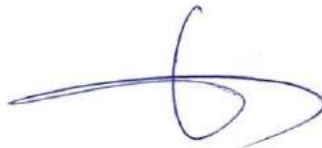
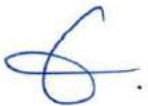
Product Description

10/100/1000M 1 Port Fiber Media Converter SC Interface Media Converter

Feature:

- Complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T, IEEE 802.3z 1000Base-SX/LX
- Provides DIP switch for LFP function (Disable / Enable) setting
- 10/100/1000Mbps Ethernet
- 10/100/1000 BASE-T/TX electrical port
- 1000 BASE-SX/LX optical port
- Electrical port supports Auto-Negotiation for 100Mbps or 1000Mbps, full duplex or half-duplex data.
- Optical port supports 1000Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Distances up to 2km for Multi-mode; Up to 120km for Single mode
- Voltage transient protection on all power and signal inputs. output lines provide unconditional protection from power surges and other voltage transient events
- No in-field optical adjustments are required
- LED indicators for easy network diagnostics

LED	Function
1000M	Lit when the electrical link speed is 1000Mbps
100M	Lit when the electrical link speed is 100Mbps Off when the electrical link speed is 10Mbps
FX Link/Act	Lit when the fiber port connection with remote device is good. Blinks when data is transmitting.
TX Link/Act	Lit when the RJ45 connection with remote device is good. Blinks when data is transmitting.
FDX	Lit when full-duplex mode is active on RJ45. Off when half-duplex mode is active on RJ45.
PWR	Lit when power is on



Technical Specifications

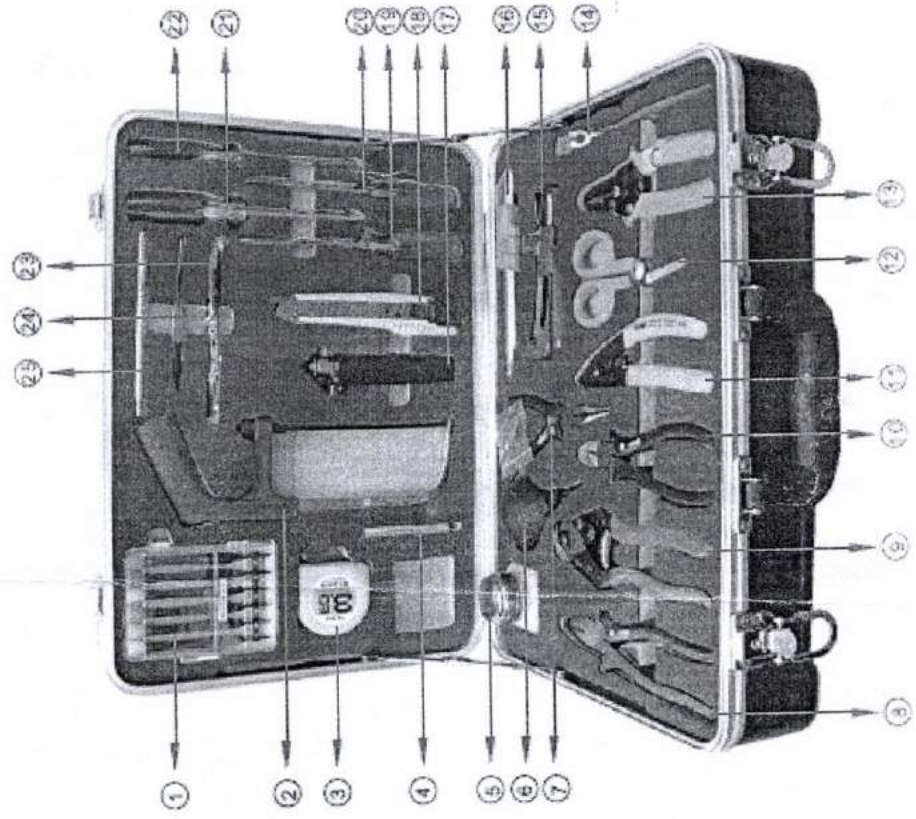
Parameters	Specifications
Standards	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3ab 1000Base-TX/FX
Optic Wavelength	Dual Fiber: SPM-ET28 series: 850nm 500M SPM-ET23 series: 1310nm 1KM 20KM 40KM SPM-ET25 series: 1550nm 60KM 80KM 120KM Single Fiber: SPM-ET235 series: TX:1310nm/RX:1550nm 20KM 40KM SPM-ET253 series: TX:1550nm/RX:1310nm 20KM 40KM SPM-ET245 series: TX:1490nm/RX:1550nm 60KM 80KM SPM-ET254 series: TX:1550nm/RX:1490nm 60KM 80KM
Transmission Distance	Multimode: 0.5,1km Single mode:10km~120km
Port	Optical: Dual Fibers or Single Fiber (SC/ST/FC Optional) Power: Terminal Block Electrical: RJ45
Led Indicators	Optical Link/Data Activity Electrical Link/Data Activity
MDI/MDI-X	Auto selection
Mac address table	4K
Memory buffer	256K
Forward / Filter Rate	10M: 14,880/14,880pps 100M: 148,800/148,800pps 1000M: 1,488,000/1,488,000pps
Power Supply	External : 5V DC 2A Input power: 100 V to 240 V AC 50Hz to 60 Hz or 48V DC
Operating Temperature	0 °C to +50 °C
Storage Temperature	-20 °C to +80 °C
Relative Humidity	5% to 90% (non-condensing) MTBF: >100,000 hours
Dimensions	95mm * 70 mm * 25mm
Net Weight	0.165 kg
Emissions	FCC , Class A, RoHS, CE Mark

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(SL-10)

FIBER OPTICS TOOL KIT / PK-1700 NIB (PROSKIT)

No.	DESCRIPTION	QUANTITY
1	Screwdriver bit for Adjusting Cutter	1
2	Small Hacksaw	1
3	Tape line	1
4	Cotton Swab	1
5	Alcohol Dispenser	1
6	Brush for Cleaning air ball	1
7	Needle Point Pliers	1
8	8 inch Pliers	1
9	Strengthened Core Cutter	1
10	Acuate clamp	1
11	Clouser	1
12	Pigtail Fiber Scissors	1
13	Loose Tube Stripper	1
14	Medium-sized Adjustable Spanner	1
15	Horizontal Stripper	1
16	Mini Socket head Wrench Groups	1
17	Socket head Wrench	1
18	Cutter	1
19	Straight Screwdriver	1
20	Straight Screwdriver	1
21	Cross Screwdriver	1
22	Cross Screwdriver	1
23	Marker	1
24	Fiber Nipper	1
25	Tungsten Carbide Fiber Cutter	1
26	Carring Case	1



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Technical Specification of the Fiber Tools.

1. Splicing Machine High end (Sumito/ Fujikura)-Specification & Catalogue attached
2. Active V-Groove Fusion Splicer (Sumito/ Fujikura)-specification & catalogue attached

Sl. No	Product	Brand	Types
1	Splicing machine High end	Sumitomo	82C
	Splicing machine High end	Fujikura	FSM 66S+
2	Splicing machine FTTx	Sumitomo	T-400S
	Splicing machine FTTx	Fujikura	FSM 28S

3. OTDR ((EXPO/ Fujikura)-specification & catalogue attached

Sl. No	Product	Brand	Features
3	OTDR	EXFO	MaxTester 730C PON/metro OTDR
	OTDR	Fujikura	FlexScan® FS200 SM OTDR

TYPE-82C



(SL-1)



High Definition Core Aligning
fusion splicer

TYPE-82C

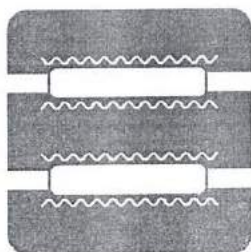


Useful cloud hosted
splicer services via
your smartphone App.



Advanced, Adept, Assured

Splicing 5s / Heating 9s
Splicing loss SMF 0.01dB (Typical)



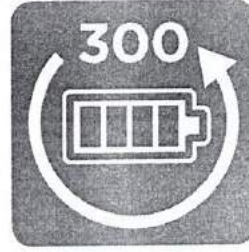
High speed
dual independent ovens
for productivity



Touch optimised
user interface and
high resolution display



Proven field
toughness



Long life battery
for 300 splice
& heat cycles

SUMITOMO
ELECTRIC
GROUP

Handwritten signatures

Specifications		
Items		TYPE-B2C
Optical fiber requirements	Material	Silica glass
	Fiber count / Profile types Fiber diameter Cleave length	Single / SMF(G.652), MMF(G.651), DSF(G.653), NZDSF(G.655), BIF(G.657), CSF(G.654), EDF Cladding diameter : 80 - 150µm, Coating diameter : 100 - 1,000µm 5 - 16mm with coating clamp
Standard performance	Splice loss (typical)*1	SMF : 0.01dB, MMF : 0.01dB, DSF : 0.03dB, NZDSF : 0.03dB
	Return loss (typical)	60dB or greater
	Splice time (typical)	5sec(SM G652 Quick Mode), 7sec(SM G652 Std. Mode), 7sec(Auto Mode)
	Heating time (typical)	9sec (FPS-61-2.6 sleeve, S60mm 0.25 Quick Mode)
Functions	Splice image capture / Splice data storage	200 images / 10,000 splice data (internal memory only) 50,200/20,000 (with 8GB SD card)
	Attenuation splicing	0.1dB to 15dB in 0.1dB increments
	Universal clamps	Provided, 250µm, 900µm tight & loose buffer fiber
	Reversible coating clamps	Provided
Size / Weight	Size	128(W) x 154(D) x 130(H) mm (without anti-shock rubber)
	Weight	1.9kg (without Battery) / 2.2kg (with Battery BU-16)
	Monitor	5.0" touch screen color LCD display
	Terminals	DC output USB port Storage media
Power supply	AC input	AC 100 - 240V, 50/60Hz (ADC-16)
	DC input Battery pack	DC 10 - 15V Li-ion 10.8V, 6,400mAh (BU-16)
Operating condition		Altitude : 0 - 6,000m, Temperature : -10 ~ +50°C, Humidity : 0 - 95% (non-condensing), Wind velocity : up to 15m/sec
Storage condition		Temperature : -40 ~ +80°C, Humidity : 0 - 95% (non-condensing), Battery : -20 ~ +30°C (long term)
Electrode life **		6,000 arc discharges
Software updates		Internet
Data management		Can be stored, edited and analyzed by dedicated PC software

*1 : Average value of the final inspection in room temperature with Sumitomo identical fiber. Measured by cut-back method relevant to ITU-T and IEC standards.
 *2 : Splice & Heat cycles may vary depending on the battery status and the operating environment.
 *3 : Wireless LAN connectivity is not available in all countries. For more details, please refer to our Web site. <http://global-sei.com/sumitomo-electric-splicers/>
 *4 : Achieved in lab condition. Electrode life may vary depending on the operating environment.

Environmental Durability*

Test details	
Shock resistance	Drop from 76cm on 5 faces (excluding top face)
Impact resistance	Equivalent to IK07 on LCD monitor (Protected against 2J impact, it is equivalent to a 500g force from 40cm)
Water resistance	Equivalent to IPX2 (Operates normally after being exposed to water dripping at 3mm/min for at least 2.5 min on each of 4 surfaces tilted at 15°)
Dust resistance	Equivalent to IP5x (Operates normally after 8 hours in a test chamber with circulating dust particles smaller than 75 µm)

*Splicer operation after shock, impact, water or dust tests, was confirmed under battery power, by Sumitomo.
 Does not guarantee the product will not be damaged by these conditions.

Basic Accessories

Part name	Part No.	Qty.
AC adapter	ADC-16	1 pc
AC power cord	PC-AC<X>*	1 pc
Cooling tray	-	1 pc
Spare electrode	ER-10	1 pair
Quick reference guide	-	1 pc
Carrying case with worktable	CC-82	1 pc
Hand strap	-	1 pc
USB cable	-	1 pc

*X=2(USA), 3(EU), 4(JP), 5(UK/HK), 8(CHINA), 9(INDIA), 10(BRAZIL)
 Items listed in Basic Accessories are always included with the splicer body. Overall kit content may vary regionally. Please check with your local authorised reseller to confirm kit content in your region.



Carrying case with worktable
CC-82



Handy cleaver
FC-8R series



Table-top cleaver
FC-6 / FC-6R series



Jacket remover
JR-M03



Available for
Lynx-Custom Fit™
Splice-On Connector



Electrode
ER-10

Accessories

Part name	Part No.	Remarks
Wireless LAN SD card	WLSD-0308	For SumiCloud™ connection
Fiber holder	FHS-025	For φ0.25mm single fiber
	FHS-09	For φ0.9mm single fiber
	FHS-025/LB5	For 0.9mm loose buffered single fiber
	FHD-1	For drop/indoor cable (Cable size : typical 2.0 x 3J or 2.6mm)
Battery pack	ISM-ST	For indoor cable (Cable size : typical 1.6 x 2.0mm)
	FHC-3	For 3mm cable
	BU-16	Li-ion 6,400mAh
Battery charger	BC-16	-
Car battery cable	PCV-16	For car battery operation (cigarette socket type)
V-groove cleaning brush	VGT-2	Brush for cleaning V-groove
Electrode	ER-10	-
Handheld fiber cleaver	FC-8R-FC	Automatic blade rotation cleaver with cleave counter
	FC-8R-F	Automatic blade rotation cleaver
Fiber cleaver	FC-6S-C	Table-top high precision cleaver
	FC-6RS-C	Automatic blade rotation cleaver
Jacket remover	JR-M03	Jacket remover for single fiber
Loose tube cutter	LTC-01	-
Alcohol dispenser	HR-3	-
Fiber protection sleeve	FPS-1	60mm, diameter after shrink approx. φ3.2mm
	FPS-40	40mm, diameter after shrink approx. φ3.2mm
	FPS-61-2.6	61mm, diameter after shrink approx. φ2.6mm

SUMITOMO ELECTRIC INDUSTRIES, LTD.

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■ Specifications are subject to change without prior notice.

Designed in Japan
082C01-ASIA/SA-EN001 (2017.07)
(TP)

(SL-3)

Fujikura



Core Alignment Fusion Splicer

66S+

Designed to keep you going



ACTIVE FUSION
CONTROL TECHNOLOGY

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Specifications

Item		Specification
Fiber alignment method		Active core alignment
Fiber count can be spliced		Single fiber
Applicable fiber	Fiber type	SMF(G.652/657), MMF(G.651), DSF(G.653), NZDSF(G.655)
	Cladding dia.	80 to 150um
Applicable coating	Sheath clamp	Coating dia : Max. 3.000um Cleave length : 5 to 16mm
	Splice loss	ITU-T G.652 : Avg. 0.02dB ITU-T G.651 : Avg. 0.01dB ITU-T G.653 : Avg. 0.04dB ITU-T G.654 : Avg. 0.04dB ITU-T G.655 : Avg. 0.04dB ITU-T G.657 : Avg. 0.02dB
Fiber splice performance	Splice time	Typical 7 sec.
	Sleeve type	Heat shrinkable sleeve
Applicable protection sleeve	Sleeve length	Max. 66mm
	Sleeve dia.	Max. 6.0mm before shrinking
Sleeve heat performance	Heat time	60mm mode : typical 25sec.
Fiber tensile test force		Approx. 2.0N
Electrode life		Approx. 5,000 splices
Physical description	Dimensions (mm)	170W x 173D x 150H without projection
	Weight	Approx. 2.7kg including battery
Environmental condition	Temperature	Operate : -10 to 50°C Storage : -40 to 80°C
	Humidity	Operate : 0 to 95%RH non-condensing Storage : 0 to 95%RH non-condensing
	Altitude	Max. 5,000m
AC adaptor	Input	AC100 to 240V, 50/60Hz, Max. 1.5A
	Output	Approx. DC 12V, Max. 7A
DC adaptor	Input	DC10 to 15V, Max. 7A
	Type	Rechargeable Lithium Ion
Battery pack	Output	Approx. DC14.4V / 6.380mAh
	Capacity	Approx. 300 splice and heat cycles
	Temperature	Operate : -10 to 50°C Recharge : 0 to 40°C Storage : -20 to 30°C
		Battery life
Display	LCD monitor	TFT 4.9 inches with touch screen
	Magnification	200 to 320x
Illumination	V-grooves	LED lamp
	PC	USB2.0 Mini B type
Interface	External LED lamp	USB2.0 A type Approx. DC5V, 500mA
	Ribbon Stripper	Mini DIN 6pin DC12V, Max. 1A
	Splice mode	100 splice modes
Data storage	Heat mode	30 heat modes
	Splice result	20,000 splices
	Splice image	100 images
Other features	Automatic functions	Splice mode select by fiber type analysis
		Fusion control
		Wind protector : open and close
		Sheath clamp : open
		Splice start
	Heater start	
	Special splice	Attenuation splice
	Reference guide	Video and PDF file stored in splicer
	Sheath clamp	Easy sleeve positioning clamp
	Electrode	Replaceable without tool
Software for PC	Splicer firmware update via internet	
	Parameter upload and download	
	Operating splicer with PC Splice image download to PC	

66S+ Standard package

Description	Model No.	Qty
(1) Core alignment fusion splicer	66S+	1pc
(2) Battery pack ²⁾	BTR-15	1pc
(3) AC adapter	ADC-20	1pc
(4) AC power cord	ACC-15	1pc
(5) USB cable	USB-01	1pc
(6) Fusion splicer strap	ST-02	1pc
(7) Electrodes (spare)	ELCT2-16B	1pair
(8) Fiber holder set plate	SP-03	1pair
(9) Carrying case	CC-38	1pc
(10) Alcohol dispenser	AP-02	1pc
(11) Quick reference guide	QRG-05-E	1pc
(12) Single fiber stripper	SS03	1pc
(13) Optical fiber cleaver	CT-08	1pc
(14) Fiber strap collector	FDB-04	1pc
(15) Fiber setting plate	AD-50	1pc
(16) Instruction manual	M-CT08-E	1pc

66S+ Options

Item	Model	Remark
Fiber holder	FH-70-200	200um coating diameter
	FH-70-250	250um coating diameter
	FH-70-900	900um coating diameter
	FH-70-160	160um coating diameter
	FH-70-500	500um coating diameter
	FH-60-DC250	250um in drop wire cable
	FH-FC-20	900um in 2mm diameter cable
	FH-FC-30	900um in 3mm diameter cable
DC Adapter	DCA-03	Connect AC adaptor not through battery
	DCC-20	Car cigar socket to BTR-15/DCA-03
DC power cord	DCC-21	Car battery to BTR-15/DCA-03
	JP-10	Attaching to splicer, not to work tray
J-Plate	JP-10-FC	JP-10 with fiber clamps
	FP-03	60mm Max. 900um coating diameter
Protection sleeve	FP-03(L=40)	40mm Max. 900um coating diameter
	FP-03M	FP-03 with non-magnetic material

*1: Bluetooth® mark and logos are the registered trademarks of Bluetooth SIG, Inc.

*2: Please follow IATA regulation when shipping the battery by air.

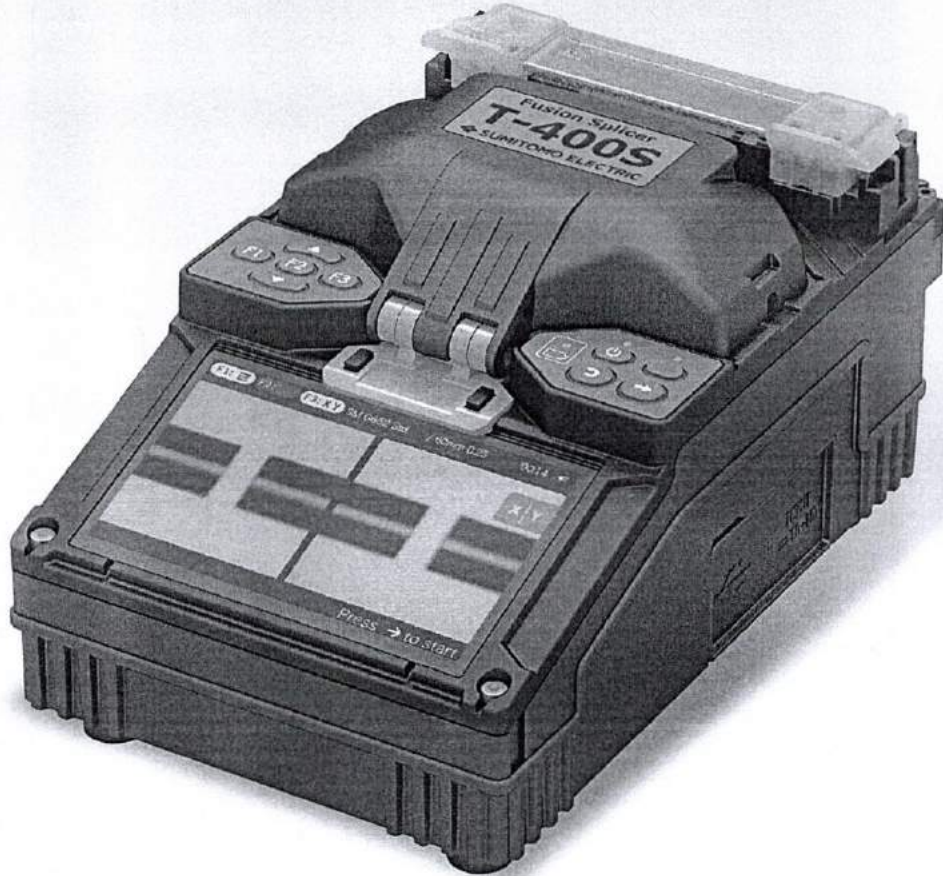


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(SL-2)

Active V-groove Fusion Splicer

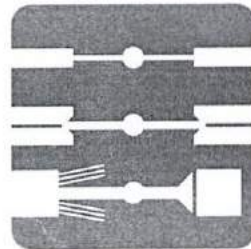
T-400S



Fast, Versatile, Easy



Carry out your mission as fast as possible



All the FTTx fiber splices in one machine



Simple operation by brand-new user interface

to . k

Specifications

Items		T-400S
Optical fiber requirements	Material	Silica glass
	Fiber count / Profile types	Single / SMF(G.652), MMF(G.651), DSF(G.653), NZDSF(G.655), BIF(G.657)
	Fiber diameter	Cladding diameter : 125µm, Coating diameter : Up to 3mm by multi clamp
	Cleave length	5 to 16mm for single fiber, 8mm for drop cable
Standard performance	Splice loss (typical)*1	SMF : 0.03dB, MMF : 0.01dB, DSF : 0.05dB, NZDSF : 0.05dB
	Return loss (typical)	60dB or greater
	Splice time (typical)	7sec (SM G652 Quick Mode)
	Heating time (typical)	24sec (FPS-61-2.6 sleeve, S60mm 0.25 Mode)
	Splice & Heat cycles per battery full charge**	Approx. 200 (BU-15)
	Fiber view & magnification	2 CMOS cameras observation, 200X Max.
	Proof test	1.96 - 2.09N
Programs	Applicable protection sleeve	60mm, 40mm & Sumitomo Nano sleeves
	Splice programs	Max. 150, 11 are pre-optimised, 100 editable by user (39 to be pre-optimised)
Functions	Heating programs	Max. 50, 11 are pre-optimised, 20 editable by user (19 to be pre-optimised)
	Splice image capture / Splice data storage	100 images / 10,000 splice data (internal memory only)
	Auto-start	Splice/Heating
	Multi clamp	Provided, applicable for 250 & 900µm coated fiber, 2 & 3mm jacket cord and rectangular drop cable
Size / Weight	Heater clamp for splice on connector	Provided
	Automatic arc calibration	Automatically compensates for environmental condition changes
	Size	129(W) x 195(D) x 99(H) mm (without protrusion)
Terminals	Weight	1.2kg (without Battery), 1.3kg (with Battery BU-15)
	Monitor	4.3" color LCD display
Power supply	USB port	USB 2.0 (mini-B type)
	AC input	AC 100 - 240V, 50/60Hz (ADC-15)
	DC input	DC 10 - 15V
Operating condition	Battery pack	Li-ion 10.8V, 35.64Wh (BU-15)
	Altitude	0 - 5,000m, Temperature : -10 - +50°C, Humidity : 0 - 95%RH (non-condensing), Wind velocity : up to 15m/sec
Storage condition	Temperature	-40 - +80°C, Humidity : 0 - 95%RH (non-condensing), Battery : -20 - +30°C (long term)
	Battery	6,000 arc discharges
Electrode life **		Internet
Software updates		

*1 : Average value of the final inspection in room temperature with Sumitomo identical fiber. Measured by cut-back method relevant to ITU-T and IEC standards.
 *2 : Splice & Heat cycles may vary depending on the battery status and the operating environment.
 *3 : Achieved in lab condition. Electrode life may vary depending on the operating environment.

Environmental Durability*

Test details	Test details
Shock resistance	Drop from 76cm on bottom face only
Water resistance	Equivalent to IPx1 Operates normally after being exposed to vertically dripping water at 1mm/min for 10 min
Dust resistance	Equivalent to IP5x Operates normally after 8 hours in a test chamber with circulating dust particles smaller than 75µm

*Confirms the battery operation in tests carried out by Sumitomo. Does not guarantee that the product is free of faults or damage.

Basic Accessories

Part name	Part No.	Qty.
AC adapter	ADC-15	1 pc
AC power cord	PC-AC<X>*-2P	1 pc
Battery pack	BU-15	1 pc
Quick reference guide	-	1 pc
Carrying case	CC-15	1 pc

*X=2(USA), 3(EU), 4(JP), 6(AUS), 8(CHINA)
 At least, the above basic accessories come with splicer main body.
 Some additional accessories may be or may not be included as a splicer standard kit contents. The standard splicer kit contents varies in each region/country.
 Please ask details to your nearest distributors.

Accessories

Part name	Part No.	Remarks
Accessories for Splicer	Fiber holder	FHS-025/LB5 FHS-SOC For 0.9mm loose buffered single fiber Connector holder
	Battery pack	BU-15 Li-ion 10.8V, 35.64Wh
	Car battery cable	PC-V25 For car battery operation (cigarette socket type)
	V-groove cleaning brush	VG-2 Brush for cleaning V-groove
	Electrode	ER-10 -
Accessories	Work table	WT-15 Handy table with neck strap
	Fiber cleaver	FC-5S Table-top cleaver
		FC-6S-C Table-top high precision cleaver
		FC-6RS-C Automatic blade rotation cleaver
	Handheld fiber cleaver	FC-8R-FC Automatic blade rotation cleaver with counter
		FC-8R-F Automatic blade rotation cleaver (without counter)
	Jacket remover	JR-M03 Jacket remover for single fiber
	Loose tube cutter	LTC-01 -
	Alcohol dispenser	HR-3 -
	Fiber protection sleeve	FPS-1 60mm, diameter after shrink approx. 3.2mm
FPS-40 40mm, diameter after shrink approx. 3.2mm		
FPS-61-2.6 61mm, diameter after shrink approx. 2.6mm		
	FPS-D60 60mm, For drop and indoor cables	



Carrying case
CC-15



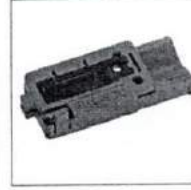
Table-top cleaver
FC-5S



Battery pack
BU-15



AC adapter
ADC-15



Connector holder
FHS-SOC



Electrode
ER-10

SUMITOMO ELECTRIC INDUSTRIES, LTD.

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■ Specifications are subject to change without prior notice.

Designed in Japan
 400S01-GLOB-EN002 (2016.07)
 (TP)

(SL-2)



Single Fiber Fusion Splicer
Fujikura 28S
Active V-groove Alignment

STANDARD PACKAGE

Description	Model No.	Q'ty
Fusion Splicer	28S	1pc
AC adapter	ADC-19A	1pc
AC Power cord	ACC-11	1pc
Built in battery pack*5	BTR-11(Li-ion)**	1pc
Single Fiber Cleaver	CT-08	1pc
Primary/secondary coat stripper	3 in one stripper	1pc
Carrying case	CC-35	1pc
Spare electrodes	ELCT2-16B	1pair
Instruction manual CD	M-31	1pc
Quick reference guide	Q-31S-E	1pc

OPTIONAL ITEMS

Description	Model No.
Fiber holder	FH-60-250 (coating dia. of 250µm)
	FH-60-900 (coating dia. of 900µm)
	FH-60-DC250 (coating dia. of 250µm in drop cable)
	FH-FC-20 (coating dia. of 900µm in 2.0mm Sheath dia.)
	FH-FC-30 (coating dia. of 900µm in 3.0mm Sheath dia.)
Sheathclamp	FH-60-LT900 (900µm dia. loose buffer fiber)
	CLAMP-S31A (included in standard package) CLAMP-S31B (900µm dia. loose buffer fiber)

*5:all senders have to ovey the IATA regulation in case of Li-ion battery transportation by air.

Please visit **NEW** web site!
<http://www.keithelectronics.in>

Fujikura 28S



NEW

TOLL FREE NO : 1800-1020-429

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Fujikura 28S

NEW

Features

- Active V-groove Alignment
- Fast splicing time 6sec.
- Touch panel with easy operation
- Simple lightweight carrying case for good mobility



Single Fiber Fusion Splicer

Fujikura 28S

Active V-groove Alignment

SPECIFICATIONS

Applicable fiber	Single / SMF(G.652/657), MMF(G.651), DSF(G.653), NZDSF(G.655)
Cladding dia. / Sheath dia.	125 μ m / Up to 3mm with sheath clamp
Cleave length	5mm to 16mm
Splice mode / heating mode	Total 100 splice modes / 30 heating modes
Typical splice loss* ¹	0.03dB (SM), 0.01dB(MM), 0.05dB(DS) and 0.05dB(NZDS)
Return loss	>>60dB
Typical splice time	6sec SM FAST, 9sec SM AUTO
Typical tube heating time	25sec FP-03, coating dia.250 μ m
Splice result storage	Last 10,000 splices
Viewing methods / magnification	Z axis 2CMOS camera with 5.0" color LCD. 132X magnification.200X magnification after splicing
Tension test	1.96 to 2.25N
Applicable protection sleeve	60mm, 40mm and Fujikura micro sleeves
No. of splice / heating per battery full charge	Typical 200 cycles with BTR-11* ²
Electrode life	Typical 5000 splices
Size / weight	131W x 201D x 79H mm / 1300g (including battery)
Operating condition	Altitude : 0 to 5,000m above sea level, Wind : 15m/sec* ³ Temperature : -10 to 50deg C, Humidity : 0 to 95%RH, non-dew
Resistance feature* ⁴	Shock resistance : 76cm (30inch) bottom surface drop Dust resistance : Exposure to dust (0.1 to 500 μ m dia. Alumina Silicate) ,IP5X Rain resistance : H=10mm/hr for 10min ,IPX2
Other features	PC software upgrade / data management
Terminals	USB 2.0 (Mini-B type) connector for PC communication.

*¹:Typical value of the inspection with Fujikura identical fiber. Measured by cut-back method relevant to ITU-T and IEC standards.

*²:one(1) splicing and heating cycle per two(2) min. under room temperature condition.

*³:Under strong wind, it is necessary to lengthen the heating time setting.

*⁴:The shock, dust and rain resistance test do not guarantee the product will not be damaged under these conditions.

 Fujikura

(SL-3)

MaxTester 730C PON/metro OTDR

OPTIMIZED FOR FTTx/MDU FIBER DEPLOYMENTS AND TROUBLESHOOTING, SUITABLE FOR METRO



Fully featured, entry-level, dedicated OTDR with tablet-inspired design, suitable for metro and optimized to test through optical splitters, for seamless end-to-end FTTH characterization and troubleshooting.



KEY FEATURES

- Handy, lightweight, powerful, tablet-inspired design
- Rugged design built for outside plant
- 7-inch, outdoor-enhanced touchscreen—the biggest in the handheld industry
- 12-hour battery life
- Tamper-proof password protection
- Dynamic range up to 39 dB for up to 132 km point-to-point (P2P)
- Short dead zones: event dead zone (EDZ) = 0.5 m; attenuation dead zone (ADZ) = 2.5 m; PON dead zone = 30 m
- Single port for in-service troubleshooting with in-line 1490/1550 nm PON power meter (optional)
- Supports high port count PON splitters (up to 1x128)
- iOLM-ready: one-touch multiple acquisitions, with clear go/no-go results presented in a straightforward visual format
- Market-leading onboard PDF reporting solution and essential PC-based post-processing included for all users
- Live fiber testing at 1625 nm or 1650 nm

APPLICATIONS

- FTTx/PON testing through splitters
- Access network testing (P2P)
- Metro links testing (P2P)
- Live fiber troubleshooting
- Passive optical LAN (POL)

COMPLEMENTARY PRODUCTS AND OPTIONS



Fiber inspection scope FIP-400B (WiFi or USB)

FastReporter

Advanced data post-processing software FastReporter



Soft pulse suppressor bag SPSB



Handwritten signature or initials.

THE HANDHELD OTDR... REINVENTED.

The MaxTester 700B/C Series is the first tablet-inspired OTDR line that is handy, lightweight and rugged enough for any outside plant environment. With a 7-inch, outdoor-enhanced touchscreen—the most efficient handheld display in the industry—it delivers an unprecedented user experience. Its intuitive Windows-like GUI ensures a fast learning curve. Plus, its new and improved OTDR 2 environment offers icon-based functions, instant boot-up, automatic macrobend finders as well as improved auto and real-time modes.

The MaxTester 700B/C Series is a line of genuine high-performance OTDRs from the world's leading manufacturer. It delivers EXFO's tried and true OTDR quality and accuracy along with the best optical performance for right-first-time results, every time.

The amazing 12-hour battery life will never let a technician down, and the plug-and-play hardware options, like the VFL, power meter and USB tools, make every technician's job easier.

Most importantly, the MaxTester 700B/C Series is finally bringing the intelligent Optical Link Mapper (iOLM), an intelligent OTDR-based application, to the handheld market. This advanced software turns even the most complex trace analysis into a simple, one-touch task.

Ultimately, the MaxTester 700B/C Series is small enough to fit in your hand and big enough to fit all your needs!

THE ENTRY-LEVEL SOLUTION DESIGNED FOR ALL YOUR TESTING NEEDS

The MaxTester 730C PON/metro OTDR is optimized to test through optical splitters up to 1x128, ensuring complete end-to-end FTTH characterization. The 1625-nm or 1650-nm, out-of-band, live testing port enables the efficient troubleshooting of active networks without affecting the signal of other clients. Plus, the high dynamic range makes it suitable for metro P2P testing.

Other models available:

- MaxTester 715B short access and FTTx last-mile installation and troubleshooting
- MaxTester 720C LAN/WAN access OTDR—optimized for multimode and singlemode access network construction and troubleshooting

SECURE YOUR INVESTMENT AGAINST THEFT

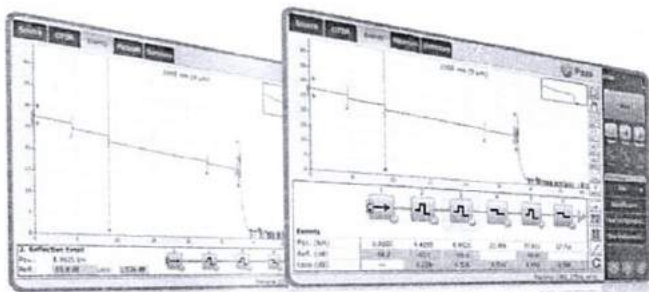
Protected instruments have no value on the black market making them completely unappealing to thieves. With our security management option, administrators can define and load a tamper-proof security profile on the MaxTester, displaying a property message on the home screen and securing it with a user password (permanent or renewable).



LOOKING FOR ICON-BASED MAPPING?

Linear view (included on all EXFO OTDRs)

Available on our OTDRs since 2006, the linear view simplifies the reading of an OTDR trace by displaying icons in a linear way for each wavelength. This view converts the graph data points obtained from a traditional single pulse trace into reflective, non-reflective or splitter icons. With applied pass/fail thresholds, it becomes easier to pinpoint faults on your link.



This improved linear view offers you the flexibility to display both the OTDR graph and its linear view without having to perform a toggle to analyze your fiber link.

Although this linear view simplifies OTDR interpretation of a single pulse-width trace, the user must still set the OTDR parameters. In addition, multiple traces must often be performed in order to fully characterize the fiber links. See the section below to learn about how the iOLM can perform this automatically and with more accurate results.

Handwritten mark

Handwritten mark

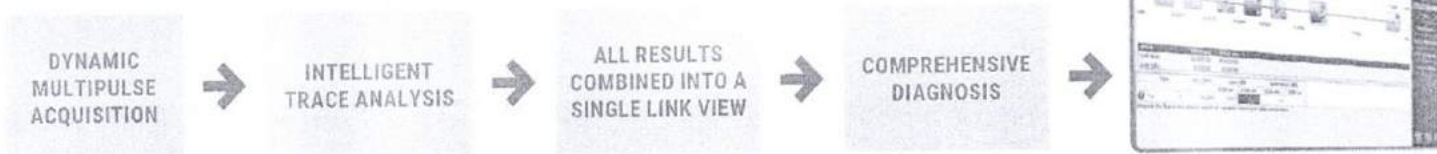
iOLM—REMOVING THE COMPLEXITY FROM OTDR TESTING

OTDR testing comes with its load of challenges...



In response to these challenges, EXFO developed a better way to test fiber optics: The iOLM is an OTDR-based application designed to simplify OTDR testing by eliminating the need to configure parameters, and/or analyze and interpret multiple complex OTDR traces. Its advanced algorithms dynamically define the testing parameters, as well as the number of acquisitions that best fit the network under test. By correlating multipulse widths on multiple wavelengths, the iOLM locates and identifies faults with maximum resolution—all at the push of a single button.

How does it work?



Turning traditional OTDR testing into clear, automated, first-time-right results for technicians of any skill level.

Three ways to benefit from the iOLM

COMBO

Run both iOLM and OTDR applications (Oi code)

UPGRADE

Add the iOLM software option to your iOLM-ready unit, even while in the field

iOLM ONLY

Order a unit with the iOLM application only

iOLM features value pack and options

In addition to the standard iOLM feature set, you can select added-value features as part of the **Advanced** packages or standalone options. Please refer to the [iOLM specification sheet](#) for the complete and most recent description of these features.

iOLM Standard

- Dynamic multipulse multiwavelength acquisition
- Intelligent traces analysis and diagnostics
- Single link view and event table
- SOR trace generation
- Single iOLM file per link for easy reporting
- Unbalanced/tapered PON characterization and troubleshooting
- **Optimode:** Short-link close events, fast short link, fast medium range

iOLM Advanced (iADV)^a

- Real-time OTDR
- SOR pulse and wavelength editor
- SOR trace view
- Custom elements
- Advanced link edition and re-analysis
- 2:N splitter characterization
- **Optimode:** SFP-Safe Troubleshooting^b, PON last-mile certification

iLOOP^a

- iOLM loopback
- iOLM automated bidirectional analysis over TestFlow^{b,c}

iCERT^a

- Cabling certification option

a. Require enabling iOLM standard.

b. Singlemode only, configuration without splitter.

c. Requires TestFlow subscription.

FlexScan® FS200 OTDR (SL-3)



FlexScan® FS200 pocket-sized series of OTDRs offer fast, accurate, singlemode fiber characterization and fault location with Smart Auto® and FleXpress™ test modes. Weighing in at less than a pound (0.4kg) FlexScan OTDRs are designed to deliver high-performance testing on LAN structured cabling and data center networks. Using AFL's SmartAuto™ multi-pulse acquisition, users are able to detect short patchords hidden in data center cross connects and faulty connectors causing system failures.

FEATURES/BENEFITS

- High-resolution dual wavelength singlemode testing
- Easy-to-understand LinkMap® results with pass/fail indications
- FleXpress™ mode completes OTDR test in <5 seconds
- 12F MPO testing with optional Multi Fiber Switch (MFS)
- Integrated VFI with optional source and power meter
- Large 4.3 inch, bright indoor/outdoor touchscreen
- Bluetooth, WiFi and USB communications
- Rugged & pocket sized; weighs less than 1 pound (0.4kg)

APPLICATIONS

- High-resolution singlemode network verification using OTDR
- Fast, accurate singlemode fiber fault location using OTDR and VFI
- Singlemode loss testing using optional integrated source and power meter

SL-3

SPECIFICATIONS

OTDR	MODEL: FS200-100
Emitter Type	Laser
Safety Class	Class I
Fiber Type	Single-mode
Wavelengths (nm)	1310/1550
Center λ Tolerance	± 20 nm (CW mode)
Dynamic Range (dB)	32/30
Event Dead Zone (m)	0.8
Atten. Dead Zone (m)	3.6
PON Dead Zone (m)	N/A
Pulse Widths	3, 5, 10, 20, 30, 50, 100, 200, 300, 500 ns; 1, 2, 3, 10, 20 μ s
Range Settings	250 m to 240 km
Data Points	Up to 300,000 (Expert mode .SOR file)
Data Spacing	5 cm to 16 m
Group Index of Refraction	1.3000 to 1.7000
Distance Uncertainty (m)	$\pm(1 + 0.003\% \times \text{distance} + \text{data point spacing})$
Linearity (dB/dB)	± 0.05
Trace File Format	Telcordia SR-4731 Issue 2
Trace File Storage Medium	4 GB internal memory (>1000 traces); External USB memory stick
Data Transfer to PC	USB cable or Bluetooth® or WiFi (option)
Standard OTDR Modes	SmartAuto, Expert, Real Time
Display Modes	LinkMap Summary, LinkMap Events, Trace
FleXpress Fast Test	No
Real-time Refresh Rate	Up to 4 Hz
Live Fiber Protection	No OTDR damage with input power $\leq +3$ dBm for wavelength(s) in range 1260 to 1675 nm
Live Fiber Detection	Reports live fiber with input signal ≥ -35 dBm for wavelength(s) in range 1260 to 1675 nm

OTDR	MODEL: FS200-300
Emitter Type	Laser
Safety Class	Class I
Fiber Type	Single-mode
Wavelengths (nm)	1310/1550
Center λ Tolerance	± 20 nm (CW mode)
Dynamic Range (dB)	37/36
Event Dead Zone (m)	0.8
Atten. Dead Zone (m)	3.5
PON Dead Zone (m)	20
Pulse Widths	3, 5, 10, 20, 30, 50, 100, 200, 300, 500 ns; 1, 2, 3, 10, 20 μ s
Range Settings	250 m to 240 km
Data Points	Up to 300,000 (Expert mode .SOR file)
Data Spacing	5 cm to 16 m
Group Index of Refraction	1.3000 to 1.7000
Distance Uncertainty (m)	$\pm(1 + 0.003\% \times \text{distance} + \text{data point spacing})$
Linearity (dB/dB)	± 0.05
Trace File Format	Telcordia SR-4731 Issue 2
Trace File Storage Medium	4 GB internal memory (>1000 traces); External USB memory stick
Data Transfer to PC	USB cable or Bluetooth® or WiFi (option)
Standard OTDR Modes	SmartAuto, Expert, Real Time
Display Modes	LinkMap Summary, LinkMap Events, Trace
FleXpress Fast Test	Yes
Real-time Refresh Rate	Up to 4 Hz
Live Fiber Protection	No OTDR damage with input power $\leq +3$ dBm for wavelength(s) in range 1260 to 1675 nm
Live Fiber Detection	Reports live fiber with input signal ≥ -35 dBm for wavelength(s) in range 1260 to 1675 nm



VISUAL FAULT IDENTIFIER (VFI)

Emitter Type	Visible red laser, 650 ±20 nm
Safety Class	Class II
Output Power (nominal)	0.8 mW into single-mode fiber
Modes	CW, 2 Hz flashing

OPTICAL LASER SOURCE - OLS (OPTIONAL)

Emitter Type	Laser
Safety Class	Class I
Fiber Type	Singlemode
Wavelengths (nm)	1310/1550
Center λ Tolerance	±20 nm (CW mode)
Spectral Width (FWHM)	5 nm (maximum)
Internal Modulation	270 Hz, 330 Hz, 1 kHz, 2 kHz, CW, Wave ID
Wave ID	Compatible with AFL OPM/OLS
Output Power Stability	≤ ±0.1 dB (15 minutes); ≤ ±0.15 dB (8 hours)
Output Power	-3 dBm ±1.5 dB

OPTICAL POWER METER -OPM (OPTIONAL)

Calibrated Wavelengths	1310, 1490, 1550, 1625, 1650 nm
Detector Type	InGaAs, 1 mm diameter
Measurement Range	+23 to -50 dBm
Tone Detect Range	+3 to -35 dBm
Wavelength ID Range	+3 to -35 dBm
Accuracy	±0.25 dB
Resolution	0.01 dB
Measurement Units	dB, dBm or Watts (nW, μW, mW)

GENERAL

Size (in boot)	86 x 160 x 43 mm
Weight	0.4 kg
Operational Temperature	-10 °C to +50 °C, 0 to 95 % RH (non-condensing)
Storage Temperature	-40 °C to +70 °C, 0 to 95 % RH (non-condensing)
Power	Rechargeable Li-Pol or AC adapter
Battery Life	>12 hours, Telcordia test conditions
Display	Color touchscreen 4.3 in LCD, 480 x 272, backlight
USB Ports	1 host; 1 micro-USB function
Bluetooth (optional)	Compatible with Windows PC, Android
WiFi (optional)	IEEE 802.11 / WLAN

ADDITIONAL INFORMATION

FlexScan automates test setup, shortens test time and simplifies results interpretation, improving efficiency and reducing the cost of test. Featuring a large 4.3-inch indoor/outdoor touchscreen display providing excellent visibility results can be viewed in both AFL's icon-based LinkMap® view and OTDR trace view, allowing users to quickly and easily locate faults and identify necessary corrective action supported by PASS & FAIL indicators. FlexScan comes integrated with a visual fault identifier (VFI) with options to add an optical power meter (OPM) and optical light source (OLS).

FlexExpress™ high speed test mode completes dual-wavelength tests in <5 seconds - 10 x faster than conventional OTDRs! For multi-fiber testing, FlexExpress mode automatically controls 12-fiber MPO switch to further reduce multi-fiber test time.



ORDERING INFORMATION

PART NUMBER	DESCRIPTION
FS200-100-BAS-P1-W1	FlexScan® FS200 1310/1550nm OTDR with OPM/OLS/VFI
FS200-300-BAS-P1-W1	FlexScan® FS200 1310/1550nm OTDR with OPM/OLS/VFI & FleXpress™

All kits include FlexScan with AC charger, battery, carry strap, SC/2.5 mm connector adapters, TRM® 2.0, quick reference guide, USB cable and carry case.



SCAN QR FOR PRODUCT PAGE

FURTHER INFORMATION

- For additional information please contact your sales representative
- To view the product 360 visit the product page (Scan the QR code or visit the link below)
- Downloaded from <https://www.fujikura-telecom.com/product/flexscan-fs200-otdr>
- Fujikura reserves the right to make changes in this datasheet at any time without notice
- Information in this document is correct as of March 19, 2020

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