Televes®

FIBRE OPTIC RANGE

PRODUCT GUIDE **2016**

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FIBRE OPTIC RANGE

PRODUCT GUIDE 2016

Over the years, fibre optic has gradually become a more cost effective alternative to our traditional coaxial systems. Fibre helps overcome limitations in terms of covering great distances not possible with coaxial systems.

The experience gained throughout these years and our constant drive to innovate, has allowed Televes to bring you one of the most comprehensive ranges of products that will allow you to build your TV systems or even data systems over fibre. From point to point 1310nm or 1550nm transmitters and receivers to multipoint integrated reception systems over fibre, Televes offers a one stop shop when it comes to fibre optics.

IRS FIBRE

RF/FO CONVERTERS

MDU Converters

Located at each of the end points of at IRS Fibre Optic distribution network, these MDUs convert the FO signal back to RF form.

Ref. 236903 works as a QUAD LNB and Ref. 237002 works as a QUATTRO LNB and it also can convert DTT, DAB and FM signals back to RF.

▲ 236903

▲ 237002

MAIN FEATURES

- ☑ FC/PC input connector
- ☑ Direct or remote powering through any output

Ref.	Description
236903	Quad Terrestrial MDU Version II
237002	Quattro Terrestrial MDU Version II

Reference					236903	237002	
OPTICAL	Wavelength			nm	1100 to 1650		
	Return losses			dB	45		
	Input power range			dBm	-15...0		
RF OUTPUT FM / DAB / DTT	RF Frequency Range			MHz	88 - 790	47 - 862	
					FM 88 - 108		
					DAB 174 - 240		
					DTT 470 - 790	DTT 470 - 862	
	Return loss			dB	≥ 10		
	Nominal Impedance			ohm	75		
	Typical Output levels	No of Multiplexes		dBµV	FM/DTT	DAB	FM/DTT
			1 channel		76	62	74
			6 channels		72	56	68
			8 channels			54	66
	Gain Variation Across Band			dB	≤ 5		
	Satellite Rejection			dB	20		
RF OUTPUT SATELLITE	Horizontal High Band			MHz	1100-2150 ≥15.5.V + 22KHz		
	Vertical High Band			MHz	1100-2150 ≤14.5.V + 22KHz		
	Horizontal Low Band			MHz	950-1950 ≥15.5V		
	Vertical Low Band			MHz	950-1950 ≤14.5V		
	Return Loss			dB	≥10		
	Nominal Impedance			ohm	75		
	Gain Variation Across Band			dB	≤7		
	Terrestrial Rejection			dB	30		
	OIP3 [1]			dBµV	70	75	
ELECTRICAL	Powering voltage			V	10 to 20 by AC/DC adaptor or Set Top Box		
	Current consumption			mA	230 @ 10V (STB1 and STB2) 230 @ 10V (STB3 and STB4)	210 @ 10V	
MECHANICAL	Connectors	Optical output		Type	FC/PC		
		DVB-T/DAB input			4 x F-female	5 x F -female	
	Operating temperature			ºC	-15 to +55	-5 to +45	
	Weight			g	330	605	
	Dimensions			mm	129 × 117 × 27	109 × 136 × 50	

1 The theoretical output level at which the third-order two-tone distortion products are equal in power to the desired signals.

ODU Kit

Stack the 4 satellite polarities and combine DTT, DAB and FM signals into one fibre.

▲ 236801

MAIN FEATURES

- ☑ 2 optical outputs
- ☑ Optic Power Level from 6 to 8 dBm

Ref.	Description
236801	RF/Optical Converter ODU32 "F"-"N"-"FC/PC": DAB/UHF-SAT + Offset LNB + AC/DC Adapter + Interconnection Accessories

Reference					236801 RF/FO Converter
OPTICAL	Wavelength			nm	1310
	Optical power per output connector			dBm	6 to 8
DAB / DVB-T	Input frequency	DAB / DTT		MHz	217...230 / 470...862
	Impedance			Ohm	75
	Input levels (1)	No of Multiplexes	1 channel	dBµV	95
			4 channels		90
			8 channels		85
	Gain			dB	15...45
	AGC range				25
	Noise figure at max gain				10
	OIP3(1)			dBµV	134
	Rejection (950-2150 MHz)			dB	20
SAT	Input frequency	Vertical/Horizontal polarisations		MHz	950...3000 / 3400...5450
	Impedance			Ohm	50
	Input level			dBµV	96 to 111
	AGC range (min)				15
	Noise figure at max gain				12
	OIP3 (min) (2)			dBµV	129
	Rejection (217-862 MHz) (min)			dB	20
ELECTRICAL	Powering voltage (through F connector)			Vdc	12
	LNB powering voltage (through F connector)			Vdc	6,2
	Current consumption (including optical LNB)			mA	500
MECHANICAL	Connectors	Optical output		Type	FC/PC
		Satellite input			N female
		DVB-T/DAB input			F female
		Power input			F female
	Operating temperature			ºC	-30 to +60
	Weight			g	545
	ODU Dimensions (W x H x D)			mm	168 × 160 × 30

1 DAB must be 15 dB below DTT.

2 The theoretical output level at which the third-order two-tone distortion products are equal in power to the desired signals.

IRS FIBRE

OPTICAL RECEPTION

Optical LNBs

Stack both horizontal and vertical polarities into a single IF frequency.

▲ 2353

MAIN FEATURES

- ☑ Noise figure of 0.5 dB
- ☑ Average gain of 72 dB

Ref.	Description
2353	Optical LNB 1310nm "FC/PC" G 72dB, Offset feedhorn

Reference				2353
Description				Optical LNB (offset focus dish) Feedhorn Ø 40mm
Input frequency			GHz	10.7...12.75
Output frequency			GHz	0.95...5.45
Wavelength			nm	1310
Local oscillators			GHz	9.75(Vertical) / 7.3 (Horizontal)
Optical output power	from -30 to +60 ºC		dBm	7±2
Noise figure			dB	0.5 typ.
Gain	from -30 to +60 ºC		dB	72±2
Phase noise maximum limit	offset frequency (KHz)	1	dBc/Hz	-55
		10	dBc/Hz	-80
		100	dBc/Hz	-100
		1000	dBc/Hz	-110
Local oscillator stability			MHz	±2
Crossed polarization rejection			dB	30 typ.
Powering			Vdc	12
Current consumption			mA	<250
Operating temperature			ºC	-30 to +60
Connectors		DC input	Type	F-female
		Optical output	Type	FC/PC
Weight			g	435
Dimensions			mm	68 x 98 x 170
Accessories				
FC/PC connector protection			Units	1
Female F to Female F connector			Units	1
Stand alone AC PSU	mains input	voltage	Vac	100-240
		frequency	Hz	50/60
	output	voltage	Vdc	12
		current	mA	500

T.OX
FO TRANSMITTERS

T.OX SERIES Range

Comprehensive range of Point to Point FO transmitters that convert the RF signal processed by a headend (54 - 2150 MHz) into a distortion-free optical signal for distribution over fibre (1310 or 1550 nm).

MAIN FEATURES

- ☑ Optical output power up to 10 dBm
- ☑ High energy efficiency
- ☑ State LED of the optical output signal
- ☑ Alarm (optical level below the minimum input level)

Ref.	Description
233306	FO Transmitter - 1310nm - FM/DAB/UHF/SAT - 6dBm
233311	FO Transmitter - 1310nm - FM/DAB/UHF/SAT - 10dBm
234305	FO Transmitter - 1550nm - FM/DAB/UHF/SAT - 4dBm

Reference					233306	233311	234305
INPUT	RF	Frequency range		MHz	54...2150		
		Max. input level for CSO & CTB ≥ 60 dB[1]	54 - 870 MHz	dBmV	31	27	25
			950 - 2150 MHz		20		
		Equivalent input noise figure @ 850 MHz		dBm/Hz	- 150		
		Equivalent input noise figure @ 2 GHz			- 146		
		Regulation margin		dB	0 - 18		
		Return losses			≥ 10		
		Impedance		Ω	75		
OUTPUT	FO Forward path	Wavelength		nm	1310 ±20		1550 ±20
		Optical power transmitted (max)		mW/dBm	4/6	10/10	2.5/4
		Optical connector			SC/APC		
GENERAL		Powering voltage		Vdc	12 - 24		
		Consumption 24Vdc		mA	104	140	140
		RF connectors			female F		
		Dimensions (W x H x D)		mm	50 x 216 x 175		

1 *Input: 41 TV CH CENELEC and 1 complete satellite transponder. The input attenuator in 0 dB position.*

T.OX
FO RECEIVERS

T.OX SERIES Range

Convert the FO signal back to RF form to distribute over a coaxial distribution system. Ref. 2336 also allows FO transmission through the return channel.

MAIN FEATURES

- ☑ Multi-window input (1200 to 1600 nm)
- ☑ Wide input dynamic range (from -10 to 6 dBm)
- ☑ Maximum level of the RF output: 114 dBuV for MATV/117 dBuV for SAT IF
- ☑ Regulator to adjust the optical signal and prevent it from degrading the RF output (in case of a excessive optical power level)
- ☑ State LED of the optical input signal
- ☑ Alarm relay (if the optical level go down the minimum level)

Ref.	Description
2335	FO Receiver - 1200...1600nm - FM/DAB/UHF/SAT
2336	FO Receiver - 1200...1600nm - FM/DAB/UHF/SAT with Return Channel (1310 nm 3 dBm

Reference					2335	2336
INPUT	FO Forward path	Wavelength		nm	1200...1600	
		Detection bandwidth		MHz	1...3000	
		Optical power received (max)		dBm	4/6	
		Optical connector			SC/APC	
	FO Return path	Frequency range		MHz	-	
		Return path input level DIN45004B		dBµV	-	95
		Equivalent input noise figure @ 30 MHz		dBm/Hz	-152.5	
		Return losses		dB	-	≥ 11
		Impedance		Ω	-	75
OUTPUT	RF Forward path	Frequency range		MHz		
		Max. output level for CSO & CTB ≥ 60 dB [1]	MATV	dBµV/dBmV	93 / 33	
			SAT IF		90 / 30	
		Regulation margin		dB	0 - 18	
		Return losses			≥ 11	
		Impedance		Ω	75	
	FO Return path	Wavelength		nm	-	1310
		Optical power transmitted (max)		dBm	-	
		Optical connector			-	SC/APC
GENERAL		Powering voltage		Vdc	12 - 24	
		Consumption 24Vdc		mA	155	175
		Ingress protection		IP	20	
		Dimensions (W x H x D)		mm	50 x 216 x 175	

1 *Input: 42 TV CH CENELEC and 1 complete satellite transponder. The output attenuator in 0 dB position.*

FO AMPLIFIERS

T.OX SERIES Optical amplifiers

20dBm EDFA rack-mounted amplifier to use with 1550 nm wavelength signals.

Erbium-Doped Fibre Amplifiers (EDFA) make use of a relatively high-powered beam of light that is combined with the input signal and then guided into a section of fibre with erbium ions in the core, where this high-powered beam excites the ions to release some of their energy, in the same phase and direction, to the input signal.

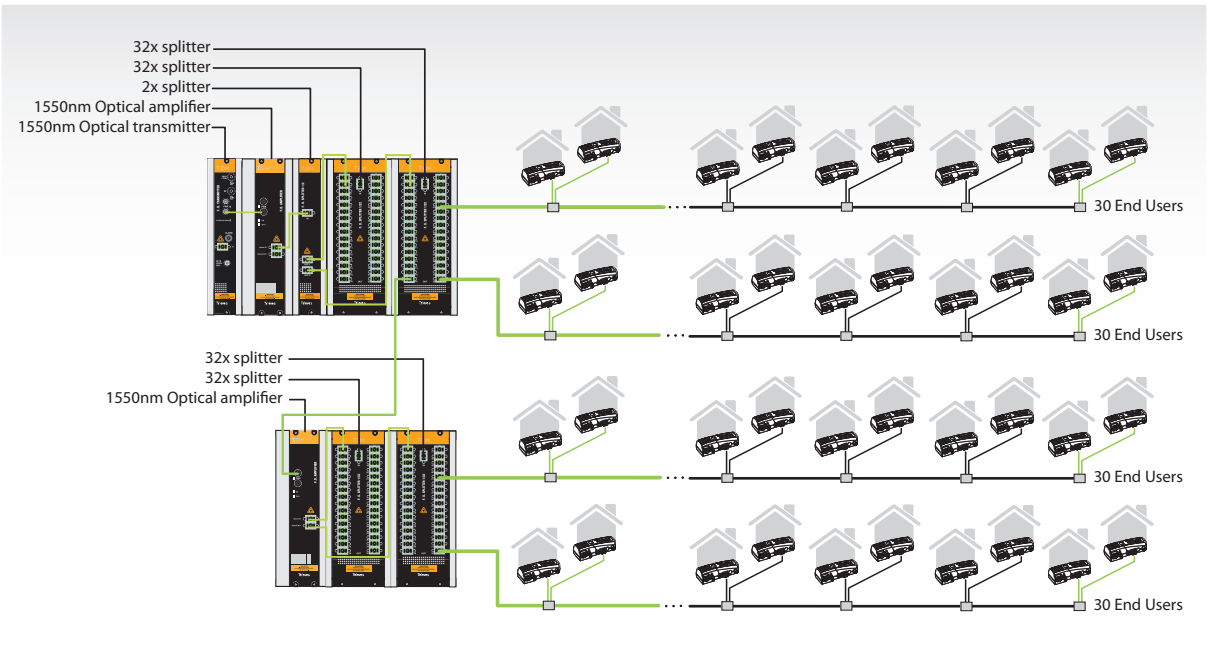
MAIN FEATURES

- ☑ High output power
- ☑ Wide input range
- ☑ Low noise figure

Reference			234220
OPTICAL INPUT	Input optical power range	dBm	-3 ~ +10
	Input connector	Type	SC/APC
OPTICAL OUTPUT	Output optical power	dBm	20 ± 0,8
	Output connector	Type	SC/APC
	Noise figure	dB	≤ 5 (for 0 dBm)
	Optical return losses	dB	≥ 50
GENERAL	Wavelength	nm	1550
	Powering	Vdc	24
	Consumption @ 24 Vdc	mA	410 max.
	Ingress protection level	IP	20
	Dimensions (WxHxD)	mm	75 x 216 x 175

Ref.	Description
234220	Optical amplifier 1550nm "SC/APC" 20dBm

Application example: Use of optical amplifiers to feed more than 32 end users.



T.OX

FO DOMESTIC RECEIVERS

Domestic receivers

Ref. 2311,231110 and 231111 have been designed as compact domestic devices tor MATV and SMATV over FO systems.

Ref. 2311 is prepared to be used as a receiver in SMATV systems and provides a stable RF output signal thanks to its Automatic Gain Control.

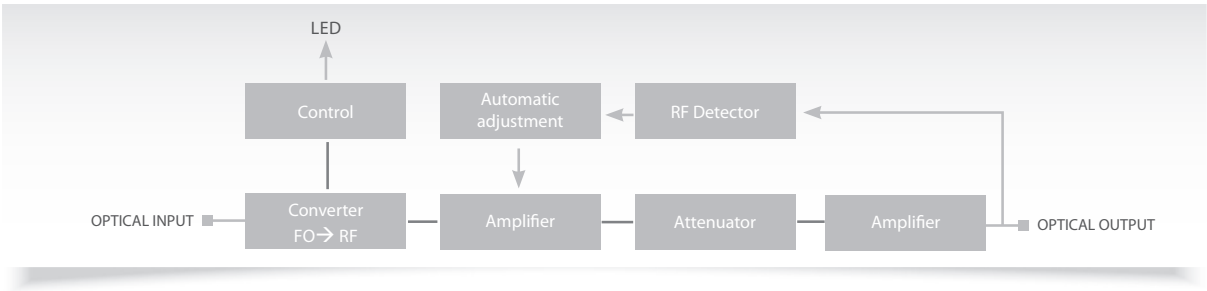
Ref. 231110 has been designed to MATV systems and provides a stable RF output regardless of the optical input power* using its OLC feature (Optical Losses Control) at the optical input. It also provides a C/N over 50 dB and an average consumption of only 1.7W.

Ref. 231111 converts into its oiginal RF format the TV signal which was previously converted into optical for the transmission through an optical network. . Due to OLC it will balance the output signal regardless of the number of channels.

Ref.	Description
2311	Optic receiver with automatic gain output level
231110	Domestic FO Rx MATV "SC/APC" OLC (Optical Level Control)
231111	Domestic FO Rx MATV "SC/APC" OLC (Optical Level Control)

** Levels within specifications margin.*

BLOCK DIAGRAM



Reference			2311	231110	231111
OPTICAL INPUT	Optical device	Type	InGaAs pin photodiode		
	Wavelength	nm	1200...1600		1550
	Detection bandwidth	MHz	1...3000		
	Optical input power range	dBm	-10 ~ +2		
	Optical return losses	dB	<-40	> 40	> 40
RF OUTPUT	Frequency range	MHz	47...2150	47...1006	
	Impedance	ohm	75		
	Output return losses	dB	> 11		
	Optical AGC operating range	dB	0 ...18		
	Max. output level [1] (2 tone, IMD ≥ 60 dB)	dBµV	84	80	80
GENERAL	Mains voltage	V~	196 - 264		
	Current consumption	mA	30 max.	19 max.	
	Power consumption	W	3	1.7	
	RF connector	Type	F female		
	Optical connector		SC/APC		
	Operating temperature	ºC	-5 ... +45		
	Weight	g	230		
	Ingress protection level	IP	20		
	Dimensions (WxHxD)	mm	145 × 60 × 35		

1 Max. output level for CSO and CTB ≥ 60dB.

OPTICAL SPLITTERS

FO SPLITTERS

FO Splitters T.BOX SERIES

Comprehensive range of rack-mounted optical splitters, available in 2,4,8, 16 and 32 ways.

Increase the number of FO links with this range, or use them as attenuators to fit the FO network's requirements. Comprise SC/APC connectors.

Reference			2337	2339	234401	234501	234601
No. of outputs			2	4	8	16	32
INPUT / OUTPUT	Wavelength	nm	1310 - 1550				
	Optical connector		SC/APC				
	Insertion losses 1310/1550 nm	dB	≤ 4.1	≤ 7.5	≤ 11	≤ 13.7	≤ 17.5
	Uniformity		≥55				
	Directivity		≥55				
	Return losses		≤ 0.6	≤ 0.8	≤ 0.8	≤ 1.2	≤ 2
GENERAL	Ingress protection level	IP	20				
	Dimensions (W x H x D)	mm	50 x 216 x 175		73 x 216 x 175		

Ref.	Description	
2337	Optical Splitter 1310/1550nm SC/APC 2W	4dB
2339	Optical Splitter 1310/1550nm SC/APC 4W	7dB
234401	Optical Splitter 1310/1550nm SC/APC 8W	10dB
234501	Optical Splitter 1310/1550nm SC/APC 16W	14dB
234601	Optical Splitter 1310/1550nm SC/APC 32W	17dB

FO Splitters

MAIN FEATURES

- ☑ Range of wall mounted optical splitters
- ☑ Available in 2,3,4 and 8 ways
- ☑ Comprise FC/PC connectors

Ref.	Description
235701	Optical Splitter 1310/1550nm FC/PC 2W 4dB
235801	Optical Splitter 1310/1550nm FC/PC 3W 5.5dB
235901	Optical Splitter 1310/1550nm FC/PC 4W 7dB
236001	Optical Splitter 1310/1550nm FC/PC 8W 10dB

Reference		235701	235801	235901	236001
Outputs		2	3	4	8
Connectors	Type	FC/PC			
Wavelength	nm	1310 / 1550			
Insertion losses	dB	4	5.5	7	10
Fibre type		Monomode (SM)			
Dimensions (W x H x D)	mm	115 x 151 x 23			

FIBRE OPTIC SPLICERS

FUSION SPLICER KITS

Fusion Splicer
and Mini Fusion Splicer

The Electric Arc fusion splicers (Ref. 232101 and 232110) joint together two sections of fibre (monomode or multimode) and guarantee a perfect cutting, cleaning and alignment per core.

Once the fibres have been fused together, a tensile strength test is conducted to estimate the resulting optical losses.

The electric ark fusion is the most widely used method of splicing, as it provides not also the lowest losses and least reflectance, but the strongest and most reliable joint between fibres.

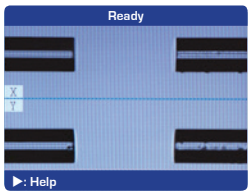
232101

MAIN FEATURES

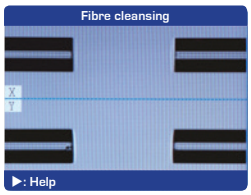
- 3 Axis alignment per core (PAS: Profile Alignment System)
- Estimation resulting optical losses
- Verification of the quality of the splice performing a voltage tension test
- Splicing of connectors
- Less than 9 seconds per splicing
- Heat-shink protection installation (heat in less than 30 seconds)
- User friendly setting menus
- Pre-configured and user-configurable splice modes
- Data logger
- Small size and weight
- USB interface and 5.7" screen
- Li-Ion battery

Ref.	Description
232101	Kit: Electric Arc Splicer.
232110	Kit: Electric Arc Splicer Mini.
	Includes: Fusion splicer (3Axis + PAS), Fibre stripper, 1 replacement set of electrodes, 1 clip, 1 carrying case.

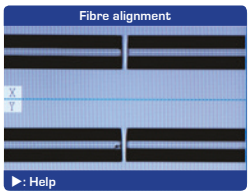
Fusion splicer detail



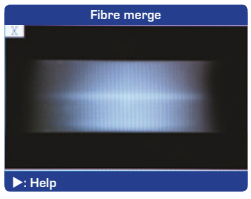
Ready (correct alignment)



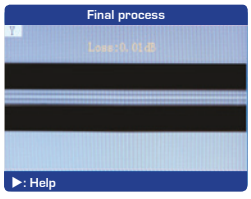
Fibre cleansing



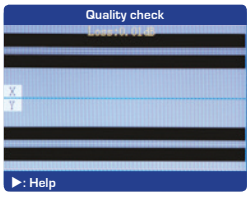
Fibre alignment



Fibre merge



Final process



Quality check
(estimated optic losses)

FO SPLICERS KITS

Comparison between the two kits
(Ref 232101 and 232110)

232110

Reference		232101	232110
Main characteristics			
Average splice loss	dB	0.02 (SM) / 0.01 (MM) / 0.04 (DS/NZDS)	
Average splicing time	sg	9 (SM)	
Average heating time		30	
Fibre aligning method		X, Y, Z: Auto-Core	X, Y, Z: Auto-Core, Auto-Clad, Manual & Meticulous
Fibre diameter	µm	125	
Coating diameter		0.2-1.5	
Fibre cleaved length	mm	16 ~ 17	
Datalog capacity		4.000	
Screen			
LCD size	inch	5"	3.5"
Zoom		300x H / 150x V	200x H & V / 50x H & V
Display		X & Y simultaneously	X, Y and X & Y simultaneously
Adjustable parameters			
Heating time		✓	✓
Fibre offset angle		✓	✓
Tension test		✓	✓
Fibre type		SM (G.652 / G.657); MM (G.651); DS (G.653); NZDS (G.655)	
Program		Pre-arc power, Pre-arc distance, Arc power, Speed, Overlap	
Maintenance		Electrode clean-up, Electrode aged, Image back	
		Time & date, Partial counter, Arc counter, Splice memory	
		Languages: English, Spanish, German, Portuguese, Russian, Chinese, Corean	Languages: English, Spanish, German, Portuguese, Russian, Chinese, Corean, French, Italian
Power			
Battery		Li-battery (10.8V / 7,800mA)	Li-battery (10.8V / 5,200mA)
Voltage	Vac	100-240 Vac / 50-60Hz	
Weight	g	3,500	1,460
Dimensions (W x H x D)	mm	180 x 190 x 150	105 x 113 x 125

Menu Lock	✗	✓
Dust Check	✗	✓
Sleep	✗	✓
Auto shut-down	✗	✓
Sensor value: Inside and Outside Temperature, Heater Temperature, Air pressure, Remaining power	✗	✓

FIBRE OPTIC SPLICERS

MECHANICAL SPLICER AND LIGHT GENERATOR

Mechanical Splicer

Mechanical splicer tool with accessories (Ref. 2341). Typically used for emergency repairs and fibre testing.

Mechanical splices are fast, widely used as temporary restoration or for splicing multimode fibres in a premises installation.

2341

MAIN FEATURES

- Fibre Optic mechanical splicer (Ref. 2322)
- Mechanical Splicer: 5 units (2328)
- SC/APC connectors: 10 units. (Ref 2329)
- Fibre Optic cleaver (Ref 2323)
- Fibre Optic stripper (Ref 2324)
- FO connector cleaning tape
- 10 isopropyl alcohol wet towels
- 10 cleaning pens and carrying case

OPS - 3L Optical Light Source

Rugged, hand-held device to generate an optical output at three different wavelengths and perform measurements of the insertion losses over a FO link.

Ref.	Description
2340	OPS-3L Optical Light Source (1310, 1490 and 1550 nm).

Reference		2340
Screen		LCD 128×64 px
Languages		Universal
Wavelengths	nm	1310, 1490, 1550
Modulation		270Hz, 1kHz, 2kHz Automatic ID (H-Series)
Tolerance	nm	±20
Laser		Fabry Pérot
Power	dBm	0 to -8 (in 1dBm steps)
Short term stability (15 min.)	dB	± 0.1
Long term stability (2 hours)		± 0.3
Power		
Battery	Type	Li-Ion 7.4 V
External power	Vdc	12
Consumption (max.)	W	12
Autonomy	h	26

▲ 2340

MAIN FEATURES

- 3 different wavelengths (1310, 1490 and 1550 nm)
- User-selectable power level (0 to 8 dBm)
- Option to disable the laser for maintenance work
- Signal modulation
- Power-saving mode with automatic shut-down
- Automatic detection of the wavelength when using H-Series Analyzers

GPON SOLUTIONS

TV OVER GPON *(Gigabit-capable Passive Optical Network)*

Generally used over fibre optics infraestructures that make use of a device (called OLT) that multiplexes the data traffic between the user and services. Users are linked to this network by single wavelength channels, or lambdas, which represent a better service/cost ratio than other FTTH technologies.

On the other hand, over the last decade Triple Play services (TV, data and voice services offered altogether) have been largely deployed over broadband. These services travel through the physical layer as an unique high speed data stream.

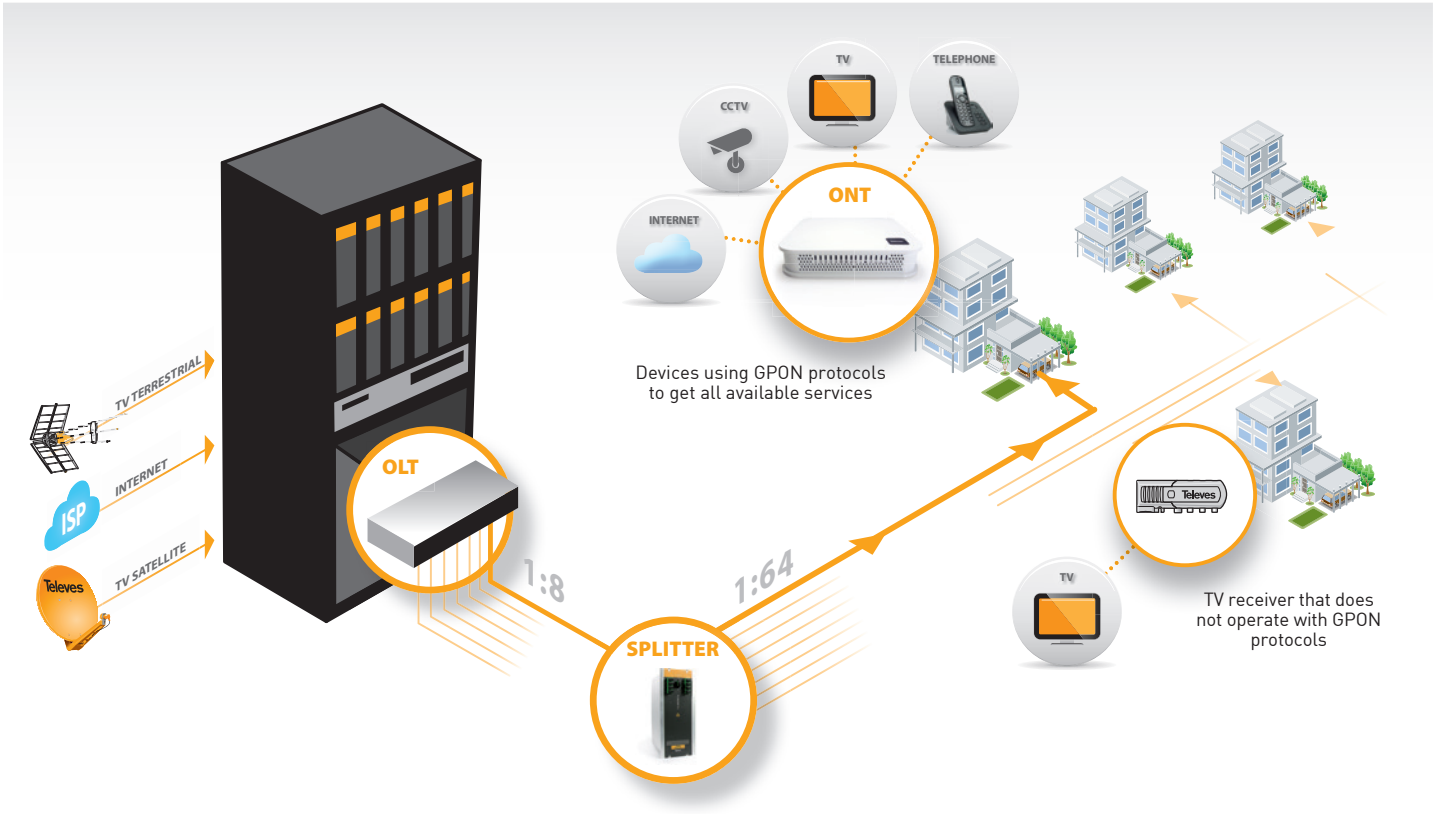
The novelty of these two concepts can cause the wrong assumption that GPON and Triple Play are inevitably linked to each other.

Shall be highlighted that GPON refers not only to a specficic type of network architecture down to the physical layer but to the definition of how the services are packed and configured. In a typical scenario, three lambdas at 1310, 1490 and 1550nm are assigned to downstream/upstream and CATV, respectively.

Therefore, **a GPON network is not required to include IPTV services through the data streams**, since TV services can be sent over the third lambda (1550nm), freeing the other two to send broadband data and voice services only.

It is a clear advantage for those users that own the network and want to remain independent from the specific operator conditions on TV services offer.

Typical architecture of a GPON network



GPON SOLUTIONS

OLT512 SERIES

OLT *(Optical Line Terminal)*

OLT512 is the service provider compact end point for customers willing to deploy an FTTX infrastructure using GPON technology.

Specially designed for medium/small residential environments and compatible with ITU-T G.984X, OLT512 is a cost-effective solution that enables triple play services (Data, TV, telephone) for up to 512 subscribers with 2.5Gbps/1.25Gbps downstream/upstream bandwidth.

MAIN FEATURES

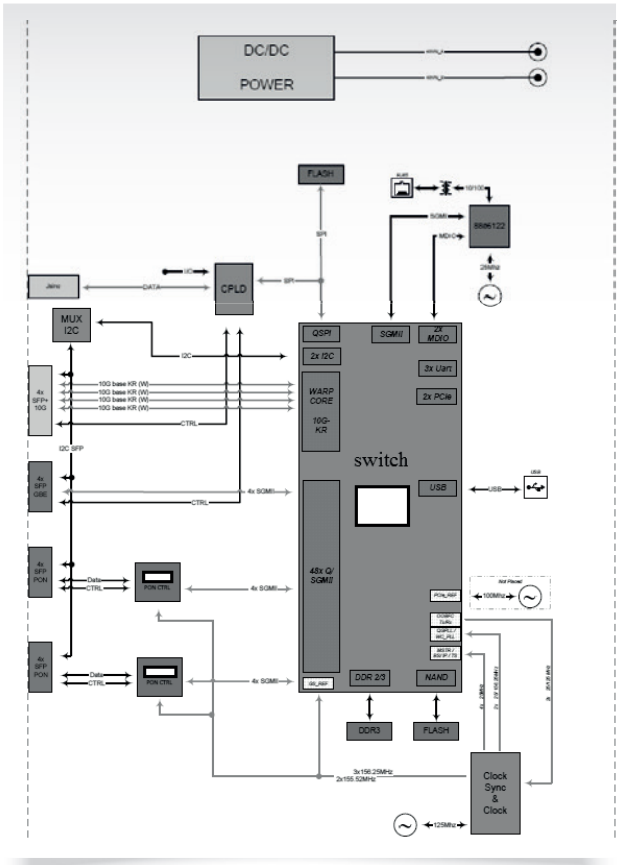
- ☑ Range up to 60km
- ☑ Standard Gigabit Ethernet Uplinks 4x1GbE / 4x10GbE
- ☑ Equipped with test output
- ☑ Remote operation and monitoring

▲ 769410

▲ 769411

Ref.	Description
769401	OLT512
769410	SFP GPON
769411	SFP Gbe

Reference		769401
GPON		
Downstream / Upstream bit rate	Gbps	2.5 / 1.25
AES Encryption		
ONT per PON (512 subscribers)		>64
Logical Range	km	60
Maximun Differential Distance	km	20
GPON Type B redundancy		
L2 layer		
IEEE 802.1Q VLAN tagging and Q-in-Q VLAN stacking		
VLAN-ID conversion to GEM port-ID		
Load balancing		
Priority management		
Full wire speed GPON Performance		
IPTV Features		
IGMP v2 / v3		
Multicast		
IPTV streams		>1024
Management		
Local management by CLI and HTTP/HTTPS browser		
Remote management using SSH, Telnet and SNMTP protocols		
General		
Temperature conditions	ºC	5 to +45
Relative Humidity Range	%	95
Power supply	Vdc	-40.5 to -57.0



OLT512 SERIES

ONT *(Optical Network Terminal)*

Televes ONT solutions are the right choice for those who implement a GPON optical network at the subscriber's home.

Compliant with recommendation ITUG.984.x, supports multiple-play service enabling data High Speed Internet (HSI), VoIP , WiFi, TV (IPTV and RF Overlay).

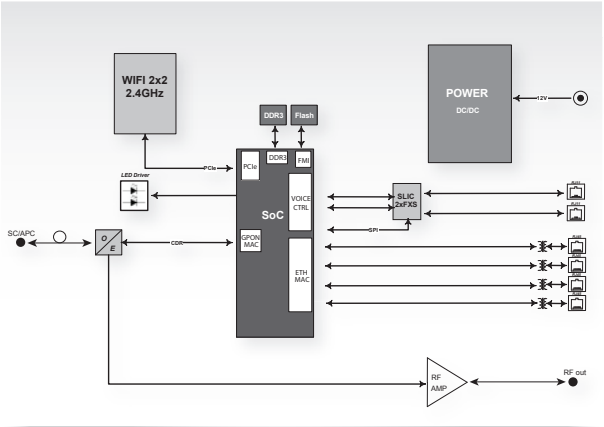
MAIN FEATURES

- Broadband data rates 2.5Gbps/1.25Gbps (downstream/upstream)
- Legacy nx64 Kbps and E1 business services support
- Mass remote management / full remote control without user intervention
- Reliable and long live equipment solution with several Indoor/Outdoor mount options

Art.number		769501	769502	769503
RF-Overlay			✓	✓
WiFi (802.11 b/g/n)	GHz	2.4 (2x2)	2.4 (2x2)	
USB		1	2xHost	
FXS Ports		2	2	
ETH Ports 10/100/1000BASE-T		4	4	1
NAT/NAPT		✓	✓	
Firewall		✓	✓	
VPN pass-through		✓	✓	
PPPoE termination		✓	✓	
OMCI		✓	✓	✓
TR-069		✓	✓	
CLI		✓	✓	
WebGUI			✓	
General				
Temperature conditions	ºC	-5... 65		
Relative Humidity Range	%	0...95		
Power supply	W	15	19	7

Ref.	Description
769501	GPON ONT OFFICE (4xGbE, 2xFXS, 2xUSB, WLAN)
769502	GPON ONT HOME (4xGbE, 2xFXS, 2xUSB, WLAN, RF)
769503	GPON ONT STANDARD (1xGbE, RF)

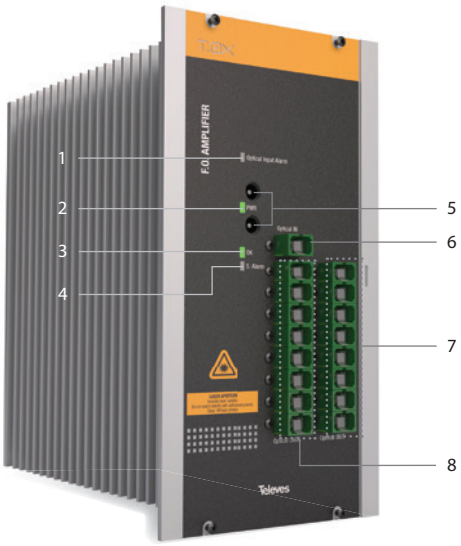
BLOCK DIAGRAM



GPON SOLUTIONS

OPTICAL AMPLIFIER

High power 1550nm
Optical Amplifier 8 CH with WDM



Based on **YEDFA technology**, High power amp-8CH with WDM is a stand alone unit designed to support the demands of the next PON Technologies.

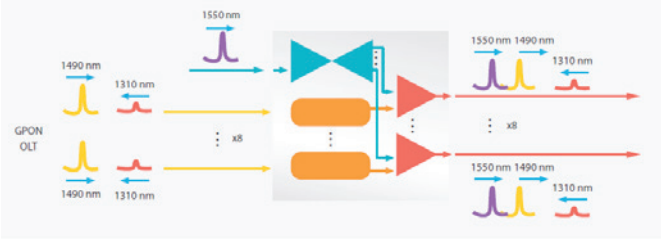
The high power amp-8CH with WDM is a unit that complements FibreData OLT512, 769401, for the reduced GPON scenarios, providing with two compact solutions 8 GPON interfaces, amplification of the RF Overlay channel and its multiplexing.

MAIN FEATURES

- ☑ Video Overlay multiplexing with GPON signals
- ☑ Amplification of the Video Overlay
- ☑ Typical output power of 20 dBm

Ref.	Description
234228	High Power 1550nm Optical Amplifier 8CH with WDM

OPERATION METHOD

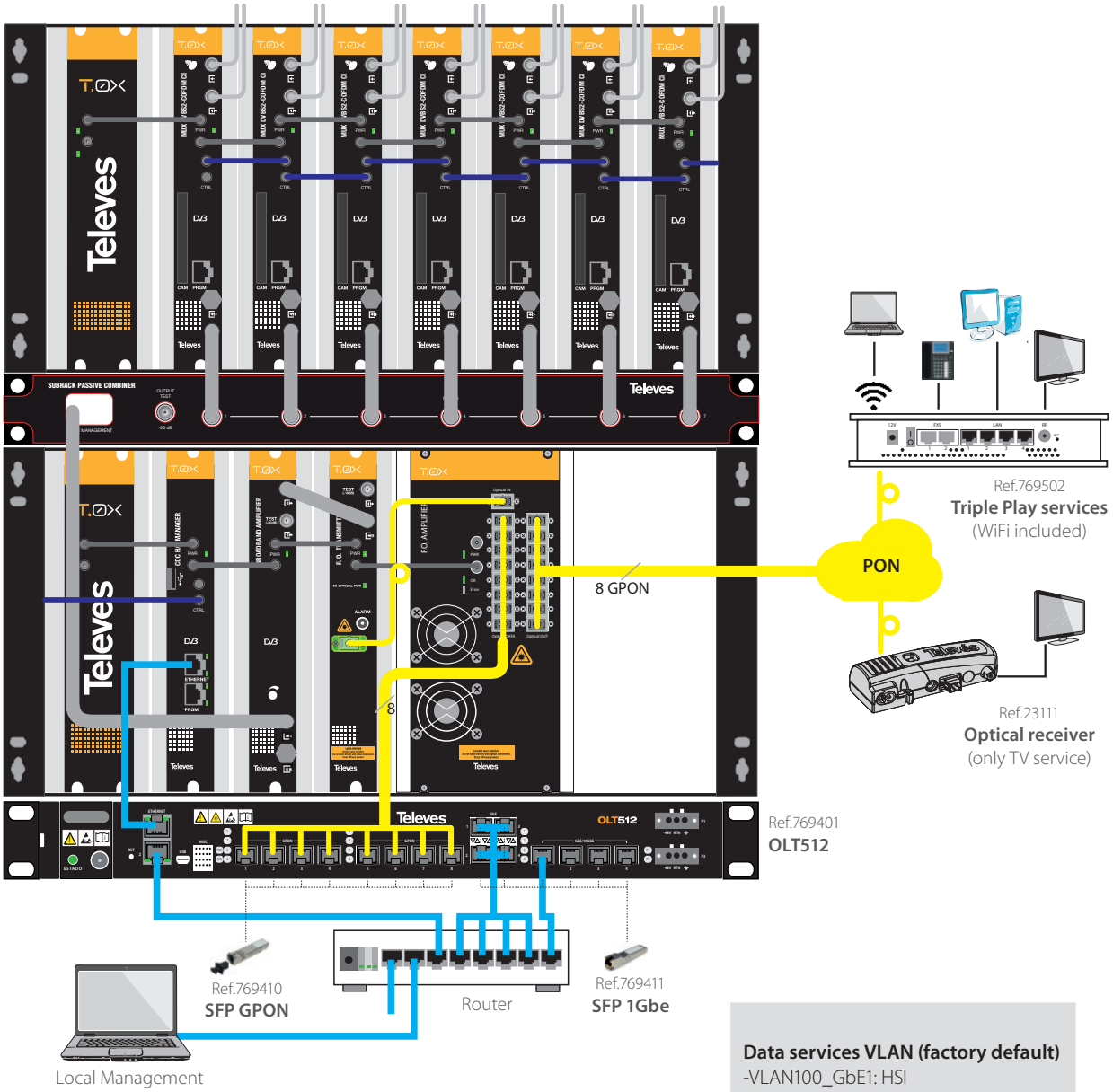


CONNECTIONS	
1	Led optical input alarm
2	Power led
3	Led status OK
4	Led system error indication
5	Power, 24Vdc
6	1550nm input RF overlay
7	1310/1490/1550nm input/output to PON network
8	1310nm/1490nm input/output to/from OLT

Reference			234228
OPTICAL Video Overlay INPUT	Input RF Overlay	dBm	-10...+10
	Input connector	Type	1 x SC/APC
	Operating wavelenght	nm	1543...1565
OPTICAL GPON INPUT	Insertion Loss (1310nm & 1490nm)	dB	<1
	Input connector	Type	8 x SC/APC
	Operating wavelenght	nm	1270 ± 20 / 1490 ± 20/ 1543...1565
OPTICAL OUTPUT	Output optical power per port (1550nm)	dBm	20 ± 0.5 @ 1550nm
	Uniformity	dB	0.5
	Output connector	Type	SC/APC
	Noise figure	dB	Typ 5 (Pin=0 dBm 1550nm) Max 7
	Optical return losses	dB	≥ 40
GENERAL	Powering	Vdc	24
	Consumption @ 24 Vdc	A	0.7
	Ingress protection level	IP	20
	Opertating temperature	ºC / ºF	-5...45 / 23...113
	Weight	g	2,700
	Dimensions (WxHxD)	mm	111 x 218 x 194

EXAMPLE

T.0X Video Overlay Headend



Data services VLAN (factory default)
-VLAN100_GbE1: HSI
-VLAN200_GbE2: VoIP
-VLAN500_GbE3: Remote Management

Fibre Cables

Pre-connectorized patch cords, made of bending loss insensitive single-mode optical fibre (ITU-T G.657-A2 Recommendation).

MAIN FEATURES

- ☑ High transmission speed and low attenuation
- ☑ Low Smoke and Halogen Free (LSFH)
- ☑ Min. bending radius: 30 mm
- ☑ Ø 3mm cable terminated with connectors FC/PC (9mm)
- ☑ Flexible inner shielding (1.3 mm diameter) consisting of a stainless steel fold and aramid yarns

Ref.	Description
2361	3m FC/PC preterminated - Monomode - LSFH G657A
236101	5m FC/PC preterminated - Monomode - LSFH G657A
236102	10m FC/PC preterminated - Monomode - LSFH G657A
236103	20m FC/PC preterminated - Monomode - LSFH G657A
236104	30m FC/PC preterminated - Monomode - LSFH G657A
236105	40m FC/PC preterminated - Monomode - LSFH G657A
236106	50m FC/PC preterminated - Monomode - LSFH G657A
236107	75m FC/PC Drum preterminated - Monomode - LSFH G657A
236108	100m FC/PC Drum preterminated - Monomode - LSFH G657A
236109	200m FC/PC Drum preterminated - Monomode - LSFH G657A

Reference			2361	236101	236102	236103	236104	236105	236106	236107	236108	236109
Insertion losses	A1, A2	dB	≤ 0.2									
Return losses	A1, A2	dB	≥ 45									
Attenuation		dB/Km	0.3									
Connectors		Type	FC/PC									
Fibre		Type	Monomode (SM) G657A									
Outer sheath		Material	LSFH PVC									
Outer sheath		Ø mm	3									
Outer sheath		Colour	grey									
Available lengths		m	3	5	10	20	30	40	50	75	100	200

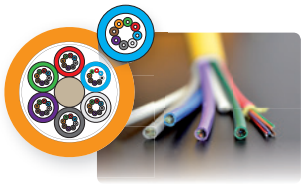
Multi Strand Monomode Fibre Cables

Televes' multi-strand range is made up by 2, 12, 24 and 48 G.657-A2 fibres, with low bending sensibility.

F.O. CABLES

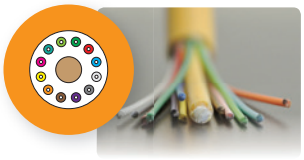
Fibre's tight buffer Ø 900µm

Ref.	Description
2 MONOMODE FIBRE	
231901	2 Monomode ITU-T G.657-A2 Fibre LSFH (300m)
231902	2 Monomode ITU-T G.657-A2 Fibre (750m)
232001	2 Monomode ITU-T G.657-A2 Fibre LSFH (200m)
232002	2 Monomode ITU-T G.657-A2 Fibre LSFH (500m)
12 MONOMODE FIBRE	
231801	12 Monomode ITU-T G.657-A2 Fibre LSFH (2km)
231802	12 Monomode ITU-T G.657-A2 Fibre LSFH (cut to length)



▲ 48 fibres
231701 / 231702

▲ 24 fibres
231601 / 231603



▲ 12 fibres
231801 / 231802

▲ 2 fibres - Indoor
231901 / 231902

▲ 2 fibres - Outdoor
232001 / 232002

Fibre's tight buffer Ø 250µm

Ref.	Description
24 MONOMODE FIBRE	
231601	24 Monomode ITU-T G.657-A2 Fibre LSFH (2km)
231603	24 Monomode ITU-T G.657-A2 Fibre LSFH (cut to length)
48 MONOMODE FIBRE	
231701	48 Monomode ITU-T G.657-A2 Fibre LSFH (800m)
231702	48 Monomode ITU-T G.657-A2 Fibre LSFH (cut to length)

▲ 48 fibres
231711 / 231712

▲ 24 fibres
231611 / 231612

Reference		231701	231702	231601	231603	231801	231802	231901	231902	232001	232002
Number of Fibres		48		24		12		2			
Fibre type		9/125 (G657A2)									
Attenuation	dB/Km	≤ 0.4 (1310 nm); ≤ 0.3 (1550 nm)									
Fibre tight sheath	Material	LSFH and flame retardant									
	Ø mm	0.9 ± 0.05									
Cable sheath	Material	LSFH and flame retardant									
	Ø mm	17.7 ± 0.4		8.0 ± 0.2		7.5 ± 0.3		3.5 ± 0.2		4.8 ± 0.2	
	colour	orange								black	
Minimum bending radius		10 x Ø				10 x Ø		5 x Ø		10 x Ø	
Tensile strength	N	1320				1000		500		1200	
Shape recovery	N/100mm	1000				1000		500		1000	
Work temperature	ºC	-20...+70									
Pack		800 m	cut to length	2 km	cut to length	2 km	cut to length	300 m	750 m	200 m	500 m

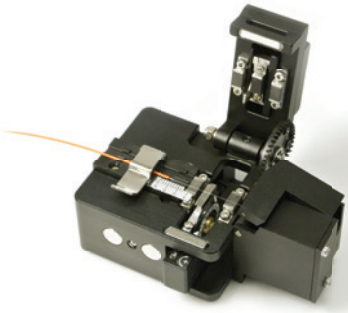
CABLES, TOOLS & ACCESSORIES

FO TOOLS, CONNECTORS AND ACCESSORIES

Tools

Ref.	Description
2322	Mechanical Fibre Optics
2323	Cleaver Fibre Optics
232310	Kevlar scissors Fibre Optics
2324	Precision Stripper
2325	MultiFibre stripper
232910	Cleaning tape for FO connectors

FO Mechanical splicer
(Ref. 2322)



FO cleaver
(Ref.2323)

Cleaning tape for FO connectors
(Ref. 232910)

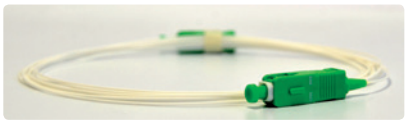
FO Kevlar scissors
(Ref. 232310)

FO precision stripper
(Ref. 2324)

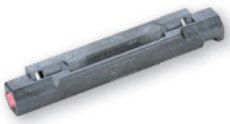
MultiFibre stripper
(Ref. 2325)

Connectors and Accessories

Ref.	Description
2354	FO Connector for 2"FC-FC" pre-terminated patch cords interconnection
2356	FO Connector for a "FC-SC" connector change of 2 pre-terminated patch cords
2327	Splicing protection sleeve. Splicer Ref. 2321
2328	Mechanical splice. Splicers Ref. 2322 & 2341
2329	SC/APC connectors (with mounting tool)
232601	Single-mode pigtail SC/APC(m)-SC/APC(m)
233202	Adapter SC/APC(f)-SC/APC(f)
2364	1310/1550nm, FC/PC, 5 dB Attenuator
2365	1310/1550nm, FC/PC, 10 dB Attenuator
2366	1310/1550nm, FC/PC, 15 dB Attenuator



4m monomode pigtail.
SC/APC (m) - SC/APC (m) (Ref.232601)



Mechanical splicer (Ref. 2328)
(Splicer Ref. 2322 or 2341)

Splicing protective sleeve (Ref.2327)
(Splicer Ref. 2331 or 232101)

SC/APC connectors (mounting tool)
(Ref.2329)

SC/APC(f) - SC/APC(f) adapter (Ref.233202)

FO Connector for 2 "FC-FC" pre-terminated patch cords in termination (Ref.2354)
(Splicer Ref. 2331 or 232101)

FO Connector for a "FS-SC" connector change of 2 pre-terminated patch cords (Ref.2356)
(Splicer Ref. 2331 or 232101)

Attenuator
(Ref.2364)

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Televes®

FIBRE OPTIC RANGE

PRODUCT GUIDE **2016**

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