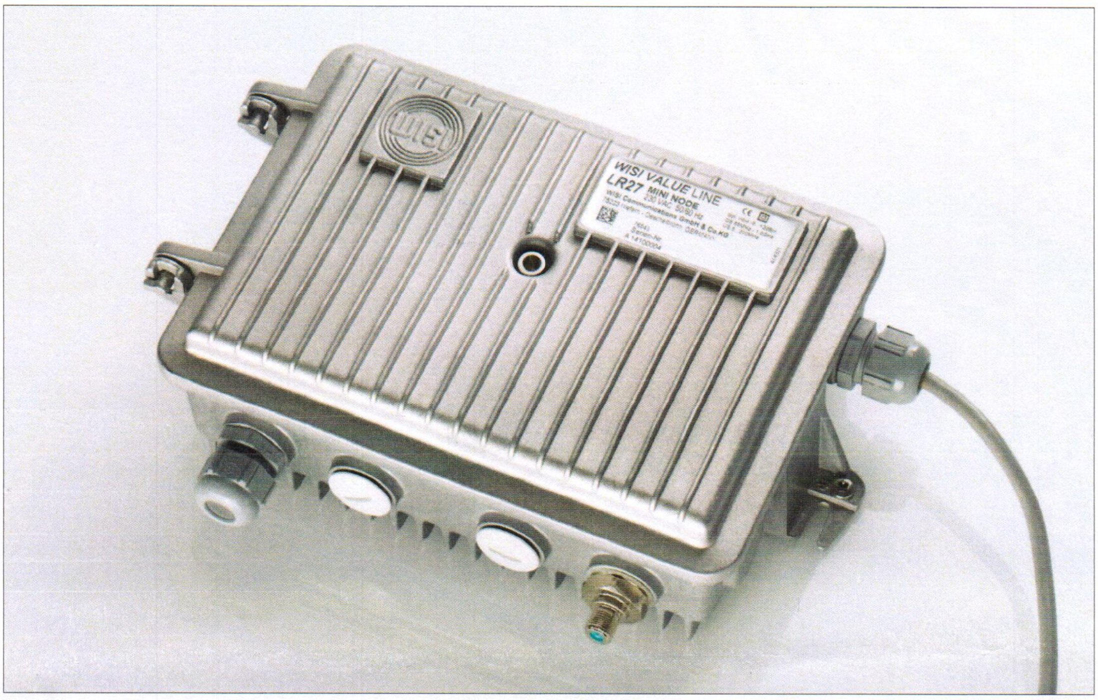
WISI VALUE LINE

User manual LR 2x series fiber nodes for HFC/RFoG & RF Overlay



The LR 2x series of fiber nodes are optical nodes for HFC, RFoG or RF Overlay applications.

They can be operated in RFoG (burst-mode) and HFC (continuous wave) mode.

- High RF output level of 117 dBμV for coaxial distribution of FTTC or FTTB signals
- DOCSIS-3.1-compliant frequency range: Downstream up to 1.2 GHz, Upstream up to 200 MHz
- Pluggable diplexers enable migration towards DOCSIS 3.1 upstream
- Pluggable output splitters / taps for flexible configuration of the two RF outputs
- Device control via bluetooth app or via handset OH 41
- Optional: Remote control compliant to IEC 60728-14 via FSK receiver module
- Compact housing for outdoor deployment (IP66)
- Powered locally (LR 2x 2xxx) or remotely (LR 2x 6xxx)
- Optical ALC for regulated output levels

EN 50 083-1ff
Services and repairs should only be carried out by experts.
Pay attention to live parts or wires! Switch off power supply.

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CE

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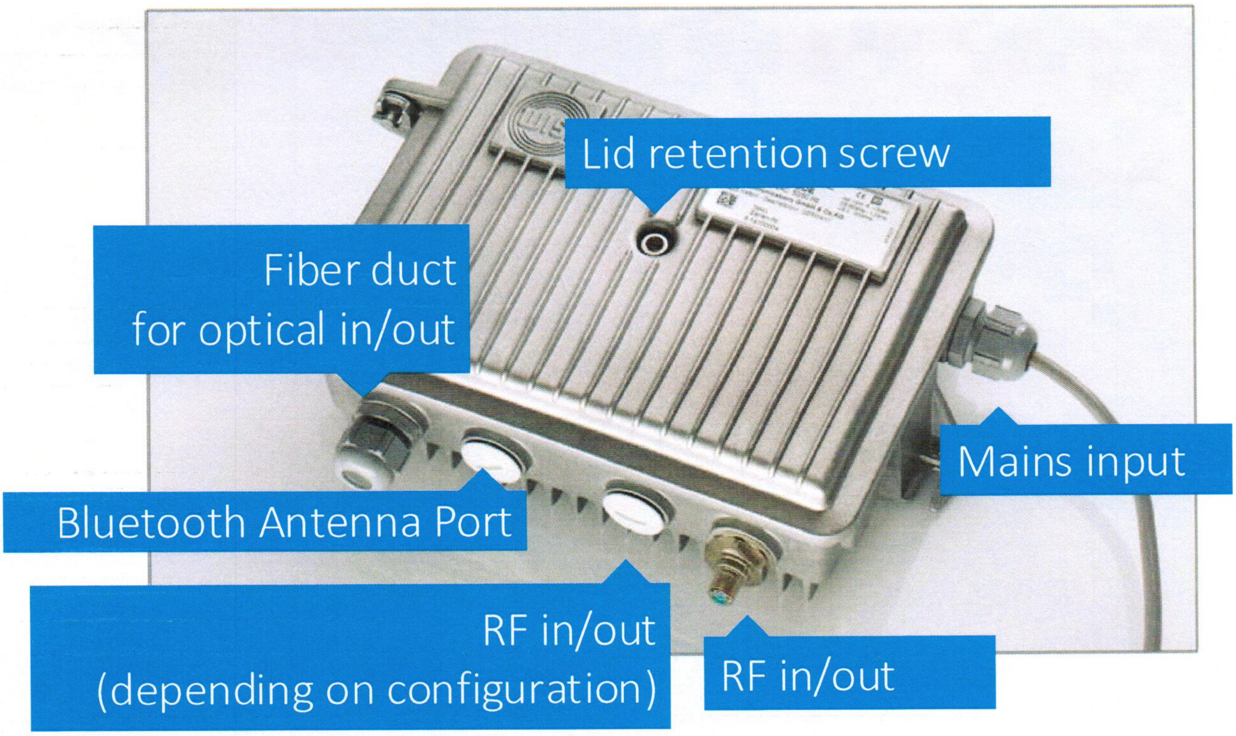
Laser class 1
Keep connector interfaces clean. Always use protection caps on unused connectors.
Avoid mechanical stress for optical fibers. Minimum bending radius is 15 mm.

Accessories	
OH 41	Handset for local device control
XE 50B 0650	RF diplexer module, 65/85 MHz
XE 50B 0850	RF diplexer module, 85/105 MHz
XE 50B 2000	RF diplexer module, 204 / 256 MHz
XM 25B 0044	Output tap 4 dB / 4 dB
XM 25B 0082	Output tap 8 dB / 2 dB
XM 25B 0131	Output tap 13 dB / 1 dB
tbd	Bluetooth Antenna
LT 22 3xx1	LT 22 Upstream Modules (see section 4 for details)
tbd	FSK Module

1 Mechanical overview



2 Configuration and maintenance

2.1 Configuration via handset OH 41

2.1.1 Handset basics

Parameter menu	
▲▼ keys	Select parameter
► key	Open parameter sub-menu
◄ key	Back
Parameter sub-menu	
◄► keys	Select display or value to be changed Cursor blinks under the active digit
▲▼ keys	Change the value
Saving: after completion of all settings, press the key ◄ several times until "Saving data to EEPROM" is displayed. All settings are now saved.	

2.1.2 Menu structure and parameters

WISI LR 2x
Vnn.nnnn

Downstream	Opt.Rec.Power	Opt.Rec.Power X.XX dBm
	Opt.ALC Mode	Opt.ALC Mode On/Off
	RF Level Offs.	RF Level Offs. -2 ... +2 dB
	Opt. Rec. Att.	Opt. Rec Att. 0 ... 24 dB
	DS Attenuator	DS Attenuator 0 ... 20 dB
	DS Slope	DS Slope 0 ... 15 dB
Upstream	Opt.Tran.Power	Opt.Tran.Power 3 dBm
	ICS	ICS 0/-6/-45 dB
	US Attenuator	US Attenuator 0 ... 30 dB
	US OMI	US OMI 3 ... 10 %
	RFoG Mode	RFoG Mode On/Off
Remote Control	Downstream	Downstream On/Off
	Upstream	Upstream On/Off
System	SW-Version	SW-Version VX.XXXX
	HW-Version	HW-Version VX.XXXX
	Serial Number	Serial Number XXXXXXXXXXXX
Bluetooth	Bluetooth	Bluetooth On/Off
	Initial Passphrase	Initial Passphrase abcd

LR 22 only

LR 23 & LR 27 only

2.2 Configuration via Bluetooth

2.2.1 Connection parameters

2.2.2 The WISI BLE app

The functional units of the node are represented by the block diagram. Tapping on each of the diagram's components leads to the related device parameters for monitoring and control.

Tab "Downstream"		
	Monitoring of optical input power	[dBm]
ALC	ALC status control RF level offset control	on / off [dB]
	Slope control	[dB]
	Downstream attenuation control	[dB]

Tab "Upstream"		
	Upstream attenuation control	[dB]
ICS	ICS status control	0 dB, -6 dB, -45 dB
	Monitoring of optical output power	[dBm]

Tab "Remote control" (only with FSK-receiver plugged in)		
	Downstream control	on / off
	Upstream control	on / off
	FSK carrier frequency control	[MHz]

Tab "System"		
tbd	Software version	Vn.nnnn
tbd	Hardware version	Vn.nnnn
tbd	Serial number	nnnnnnnnn

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3 Technical data

	LR 22 (incl. LT 22)	LR 23	LR 27
Downstream			
Optical input power	-8 ... +2 dBm		
Wavelength range for downstream	1260 ... 1610 nm	1303 ... 1317 nm	1543.5 ... 1556.5 nm
Frequency range downstream	47 ... 1218 MHz (depending on diplexer)	85 ... 1218 MHz (depending on diplexer)	85 ... 1218 MHz (depending on diplexer)
Equivalent input noise density	< 4.5 pA/√Hz		
Attenuator downstream	0 ... 20 dB (0,5 dB-steps)		
Equalizer downstream	0 ... 15 dB (0,5 dB-steps)		
RF output level, sloped	117 dBµV (CENELEC42, CSO&CTB >60dB, 1 output, 6dB slope)		
RF output level, flat	114 dBµV (CENELEC42, CSO&CTB >60 dB, 1 output)		
Output test point	-20 dB		
RF return loss	> 18 dB (-1dB/Octave min 14dB)		
Optical return loss	> 40 dB		

	LR 22 (incl. LT 22)	LR 23	LR 27
Upstream			
Optical output power	+3 dBm		
Wavelength upstream	1270 ... 1610 nm (CWDM grid, corresponding to order code)	1270 ... 1610 nm (CWDM grid, corresponding to order code)[1]	1270 ... 1610 nm (CWDM grid, corresponding to order code)[2]
Frequency range upstream	5 ... 204 MHz (depending on diplexer)		
RF input level	75 dBµV (5% OMI)	70 dBµV (15% OMI)	70 dBµV (15% OMI)
Attenuator Range	3% ... 10% OMI Attenuation	0 ... 30 dB Input Attenuation	0 ... 30 dB Input Attenuation
Upstream test point	75 dBµV (for 5% OMI per channel)	70 dBµV (for 15% OMI per channel)	70 dBµV (for 15% OMI per channel)
Ingress Control Switch (ICS)	0 / -6 / -45 dB		
RF return loss	> 18 dB (-1dB/Octave min 14dB)		

[1] except LR 23 downstream wavelength
[2] except LR 27 downstream wavelength

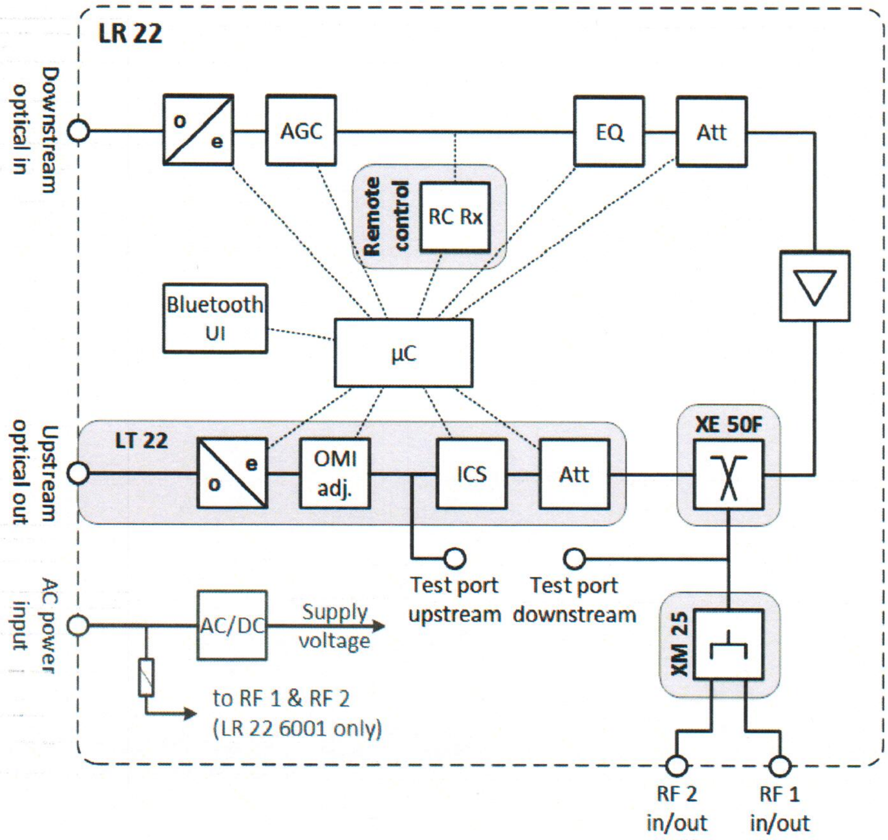
Optical return loss	> 40 dB		

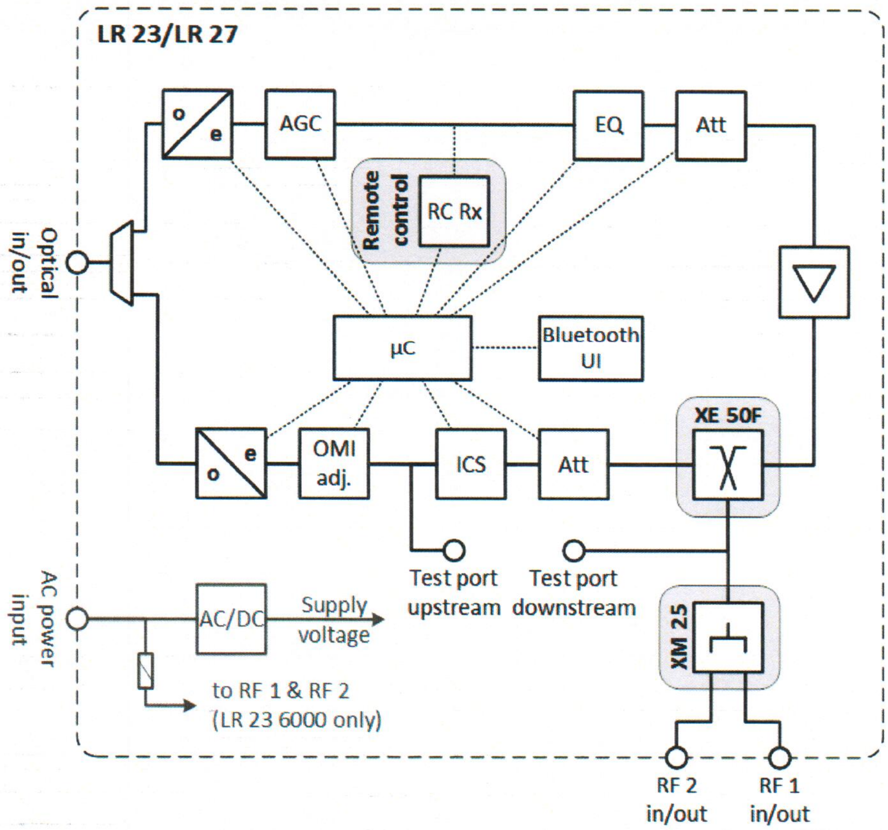
	LR 22 (incl. LT 22)	LR 23	LR 27
Interfaces			
SC/APC connectors	2 pcs. (Downstream input & upstream output separated)	1 pcs. (Downstream input & upstream output)	1 pcs. (Downstream input & upstream output)
PG11 connectors	4 pcs. (2x RF input/output)		

	LR 22 (incl. LT 22)	LR 23	LR 27
User interfaces			
Status LED downstream	Optical input power		
Status LED upstream	Laser activity		
Management ports RJ11	1 pcs. (for handset OH 41)		
Bluetooth version	4.0 / LE		
Bluetooth profiles	GATT		
Bluetooth app compatibility	Android 4.3 or higher		
Remotely controlled via FSK	DS on/off, US on/off, ICS 0/-6/-45. (with optional Rx module)		

	LR 22 (incl. LT 22)	LR 23	LR 27
Power supply			
Supply voltage range, locally powered	180 ... 264 V AC (LR 22 2xx1)	180 ... 264 V AC (LR 23 2xx1)	180 ... 264 V AC (LR 27 2xx1)
Supply voltage range, remotely powered	27 ... 65 V AC (LR 22 6xx1)	27 ... 65 V AC (LR 23 6xx1)	27 ... 65 V AC (LR 27 6xx1)
Power consumption max.	16 W		

	LR 22 (incl. LT 22)	LR 23	LR 27
General data			
Dimensions (width x height x depth)	232 x 145 x 86 mm		
Protection against overvoltage and surge	EN 61000-4-5 (6 kV, 1.2/50 µs pulse)		
Protection against electrical hazard	EN 60065 (class I)		
Electro Magnetic Compatibility (EMC)	EN 50083-2		
Weight	2 kg		


LR 22
Downstream optical in
AGC
EQ
Att
Remote control
RC Rx
Bluetooth UI
µC
LT 22
Upstream optical out
OMI adj.
ICS
Att
XE 50F
Test port upstream
Test port downstream
AC power input
AC/DC
Supply voltage
to RF 1 & RF 2
(LR 22 6001 only)
XM 25
RF 2 in/out
RF 1 in/out


LR 23/LR 27
Optical in/out
AGC
EQ
Att
Remote control
RC Rx
µC
Bluetooth UI
OMI adj.
ICS
Att
XE 50F
Test port upstream
Test port downstream
AC power input
AC/DC
Supply voltage
to RF 1 & RF 2
(LR 23 6000 only)
XM 25
RF 2 in/out
RF 1 in/out

4 Ordering Information

LR 2X XXX1

Upstream Wavelength:
- 00 – LR 22 (see LT 22)
- 27 – 1270 nm
- 29 – 1290 nm
- 31 – 1310 nm (LR 27 only)
- 33 – 1330 nm
- 35 – 1350 nm
- 37 – 1370 nm
- 39 – 1390 nm
- 41 – 1410 nm
- 43 – 1430 nm
- 45 – 1450 nm
- 47 – 1470 nm
- 49 – 1490 nm
- 51 – 1510 nm
- 53 – 1530 nm
- 55 – 1550 nm (LR 23 only)
- 57 – 1570 nm
- 59 – 1590 nm
- 61 – 1610 nm

Power Supply:
- 2 – 230V local powered
- 6 – 65V remote powered

Typ of Node:
- 2 – Dual Fiber HFC Node (with LT 22)
- 3 – Single Fiber RFoG Node (DS 1310 nm)
- 7 – Single Fiber RFoG Node (Standard)

LT 22 3XX1

Upstream Wavelength:
- 27 – 1270 nm
- 29 – 1290 nm
- 31 – 1310 nm
- 33 – 1330 nm
- 35 – 1350 nm
- 37 – 1370 nm
- 39 – 1390 nm
- 41 – 1410 nm
- 43 – 1430 nm
- 45 – 1450 nm
- 47 – 1470 nm
- 49 – 1490 nm
- 51 – 1510 nm
- 53 – 1530 nm
- 55 – 1550 nm
- 57 – 1570 nm
- 59 – 1590 nm
- 61 – 1610 nm

Output Power:
- 3 – 3 dBm

5 Service and Support

For further information and help, please contact our support organization support@wisiconnect.tv. Visit www.wisiconnect.tv for more information about configuration, firmware downloads and the Optopus product range.

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