

# WISI LR 93 x xxxx

RFoG Node

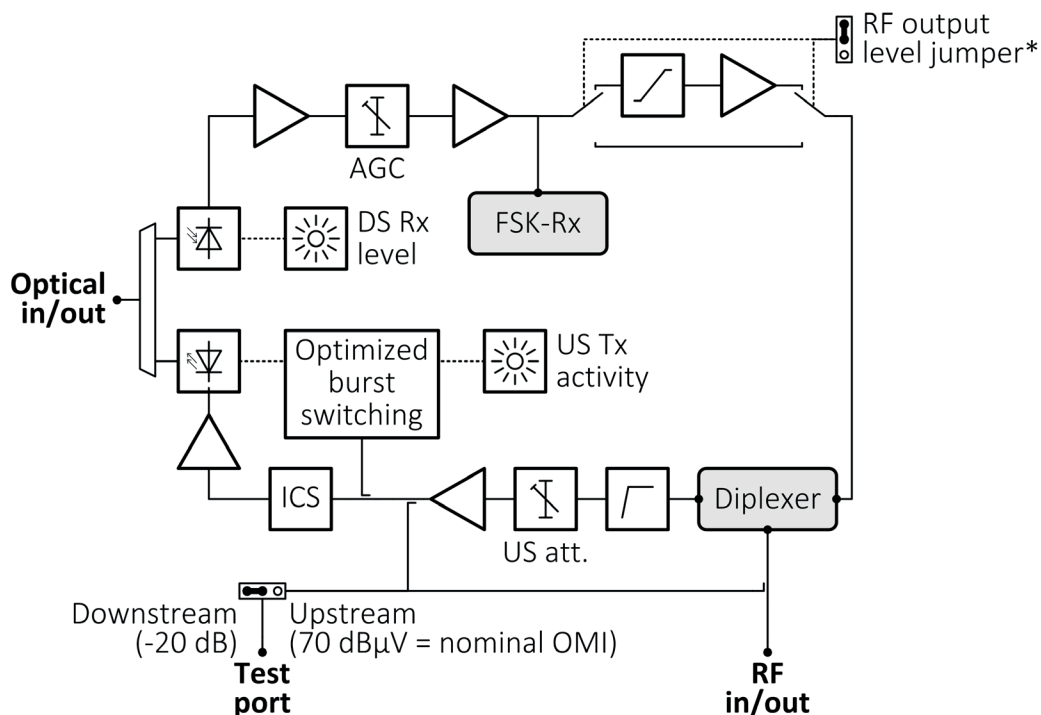


## At a glance:

- Compact node for RFoG-systems
- DFB laser for upstream transmission with high signal quality
- According to SCTE ISP SP 910
- Extremely low-noise receiver
- Optical ALC for automatic control of downstream output level
- Optimized Burst-Switching to comply with DOCSIS 3.1
- Pluggable RF diplexers enable step-by-step migration towards DOCSIS 3.1

## Description

The LR93 x xxxx is a fully DOCSIS 3.1-compliant RFoG transceiver for use in Passive Optical Networks (PON). For an easy migration towards DOCSIS 3.1, the diplex filters are pluggable. A LED displays whether the optical input power is within the target range (green) or outside (red). Within that range, the included Automatic Level Control (ALC) provides a constant RF output level, which is either 80 dB $\mu$ V flat or 97 dB $\mu$ V at 5 dB slope. The return path transmitter operates in „Burst Mode“ which activates the optical transmitter only when data is sent. In the remaining time, the transmission power remains at minimum level, to connect many nodes to the same upstream receiver without noise accumulation.



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## Technical data

| Downstream                             |   |
|--|---|
| Wavelength                             | 1535...1565 nm  |
| Output level L/H (4% OMI)              | 80 dB $\mu$ V (flat)/<br>97 dB $\mu$ V (5 dB slope)/<br>95 dB $\mu$ V (5 dB slope, „v“ option only) |
| Signal Quality (all QAM)<br>121 QAM CH | MER >41dB,<br>BER < 1e-9<br>(measured @ 2,5% OMI, 35 km fiber, -3 dBm @ receiver input)             |
| Optical input power                    | -6...+3 dBm   |
| Frequency range                        | 85...1218 MHz<br>(depending on diplexer)  |
| Return loss                            | $\geq$ 18 dB (-1dB/Octave, min. 14 dB)  |
| Frequency Response (O-E)               | $\pm$ 0,75 dB   |
| Equivalent input noise density         | <4 pA/ $\sqrt$ Hz   |
| Test point                             | -20 dB  |
| Upstream                               |   |
| Optical output power                   | 3 dBm ( $\pm$ 1 dB)   |
| Wavelengths                            | 1270...1610 nm<br>(except 1550 nm) ( CWDM grid)   |
| Wavelengths incl. xPON WDM filter      | 1610 nm   |
| Frequency range                        | 15...204 MHz<br>(depending on diplexer)   |
| Return loss                            | $\geq$ 18 dB (-1dB/Octave, min. 14 dB)  |
| Frequency Response (O-E)               | $\pm$ 0,75 dB   |
| Attenuator range                       | 0...30 (2 dB-steps)   |
| RF input level                         | 70...100 dB $\mu$ V/<br>75...100 dB $\mu$ V („v“ option only)                                       |
| Upstream test point (default)          | 70 dB $\mu$ V (nominal OMI),<br>75 dB $\mu$ V (nominal OMI, „v“ option only)                        |
| PON-WDM                                |   |
| PON wavelengths                        | 1260...1500 nm  |
| Insertion loss                         | <1 dB   |
| Isolation COM -> RF downstream         | >30 dB  |
| Isolation COM -> PON                   | >15 dB  |
| Isolation PON -> RF-Downstream         | >50 dB  |
| Connectors                             |   |
| SC/APC connectors                      | 1/2 pcs. (Simplex),(2 pcs. if WDM Filter incl.)   |
| LC/APC connector                       | 1 pcs. (Duplex)   |
| F-connectors                           | 2 pcs. (RF in/output, test port)  |
| General data                           |   |
| Supply voltage                         | 230 V AC (50/60 Hz)   |
| Power consumption                      | max. <6 W   |
| Dimensions<br>(width x height x depth) | 163 x 90 x 47 mm  |
| Ambient temperature                    | -10...+50 °C  |
| Protection class                       | IP 20   |
| EMC                                    | EN 50083-2  |
| Impedance                              | 75 $\Omega$   |

## Technical data

| Monitoring                  |  |
|-----------------------------|--|
| Optical RX Level LED colour | red: < -6 dBm / > +3 dBm;<br>green: -6 dBm ...+3 dBm                                 |
| TX activity LED             | off: laser off;<br>static: laser permanently on;<br>flashing green: traffic detected |
| Accessories                 | XE 50 B 0650, XE 50 B 0850,<br>XE 50 B 2040, XE 50 B 1170                            |

## LR 9X X XXXX

### Options:

- 1 – 15% OMI, default (no VT21 module socket)
- 5 – 8% OMI (no VT21 module socket)
- 6 – 8% OMI, VT21 module socket (empty)
- 7 – 8% OMI, VT21B 862 MHz FSK module incl.
- A – 15% OMI, VT21 module socket (empty)
- B – 15% OMI, VT21T - tunable FSK module incl.
- V – 15% OMI, VT21 module socket (empty)

### Diplexer:

- 1 – default (without)
- 2 – XE50B0650 - 65/85
- 3 – XE50B0850 - 85/105
- 4 – XE50B1170 - 117/149
- 5 – XE50B2040 - 204/258

### Upstream Wavelength:

- 1 – 1270 nm
- 2 – 1290 nm
- 3 – 1310 nm
- 4 – 1330 nm
- 5 – 1350 nm
- 6 – 1370 nm
- 7 – 1390 nm
- 8 – 1410 nm
- 9 – 1430 nm
- A – 1450 nm
- B – 1470 nm
- C – 1490 nm
- D – 1510 nm
- E – 1530 nm (on request only)
- F – 1570 nm (on request only)
- G – 1590 nm
- H – 1610 nm

- U – 1510 nm (incl. WDM filter)
- V – 1530 nm (incl. WDM filter, on request only)
- W – 1570 nm (incl. WDM filter, on request only)
- X – 1590 nm (incl. WDM filter)
- Y – 1610 nm (incl. WDM filter)

### Power Supply:

- 2 – local powered 230V AC EU
- 3 – local powered 230V AC UK
- 6 – local powered (230V AC, req. LR PS x230)  
flat housing (only on special request)
- C – coax remote feeding 12V DC  
(requires DL01A & LR PS x230)
- D – coax remote feeding 12V DC  
(requires DL01A & LR PS x230)  
flat housing (only on special request)

### Output Power Level:

- \_ – default (switchable L/H SC/APC)
- U – switchable L/H (LC/APC)
- L – low output power (SC/APC)
- H – high output power (SC/APC)
- K – low output power (LC/APC)
- G – high output power (LC/APC)

### Typ of Node:

- 3 – Single Fiber RFoG Node