ROVER
OPTICAL CATV & SAT
A STEP AHEAD IN DIGITAL TELEVISION

PROFESSIONAL DWDM OPTICAL LASER TRANSMITTER for HFC & FTTH LARGE CATV & SAT 47-2.800 MHz DISTRIBUTIONS

mod. RLT–D10

DESIGNED for ANALOG & DIGITAL CATV & SAT FULL LOADED CABLE NETWORKS

SINGLE MODE HIGH POWER & HIGH PERFORMANCE ISOLATED DFB LASER

SUPERIOR LINEARITY and THERMALLY STABILIZED BUTTERFLY LASER

Up to 10 dBm/10mW OPTICAL POWER SPLITTED on 1 to 8 OUTPUTS

1.550 nm DWDM - ITU GRID with ACCURATE FINE TUNING

FULL ALARMS & DATA LOGGER SYSTEM ON BOARD

REMOTE CONTROL THROUGH SNMP and WEB

ADVANCED TECHNOLOGY

FOR PROFESSIONAL CABLE & BROADBAND NETWORKS

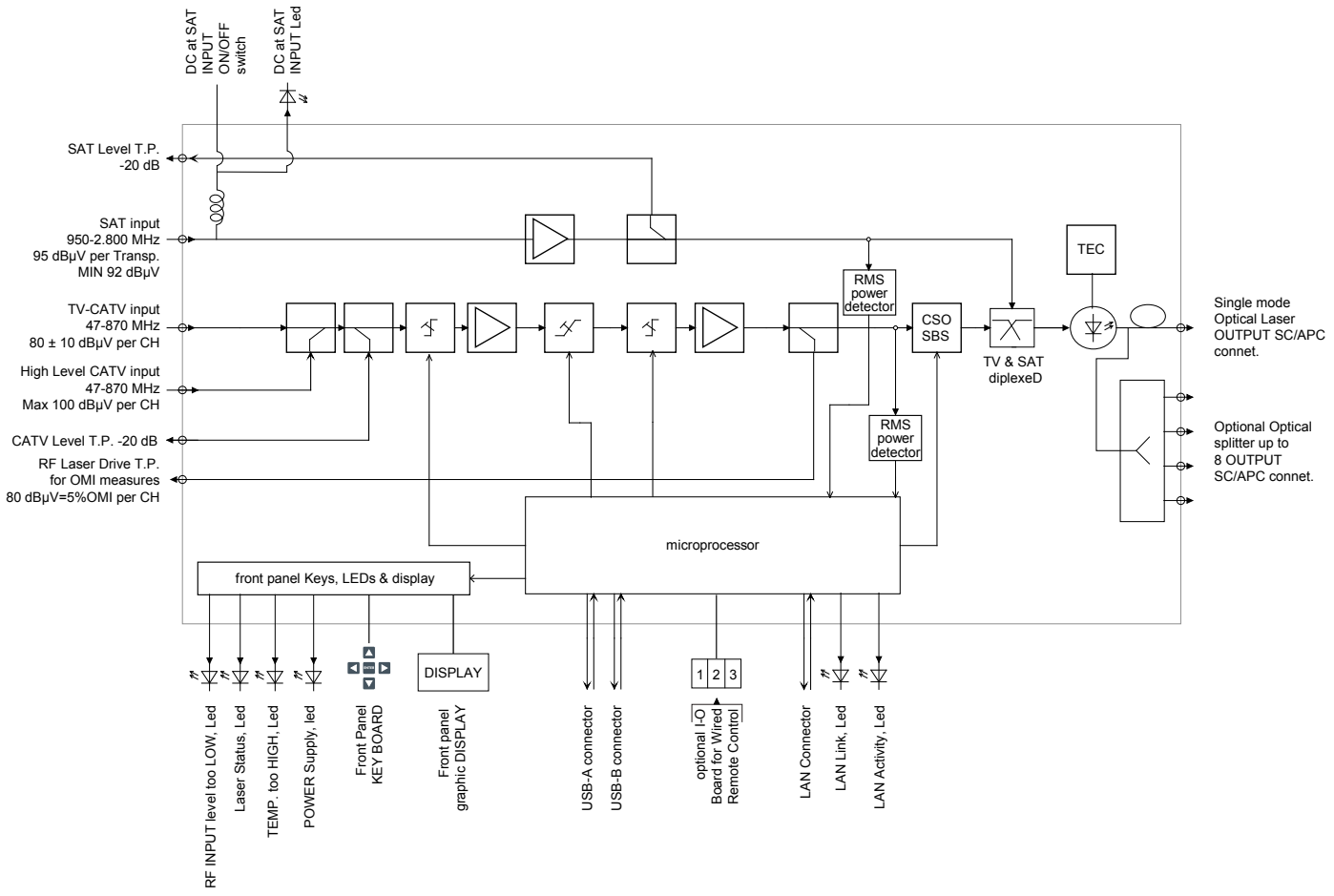
WTA MEMBER

RLT-D10

Professional DWDM High Power LASER OPTICAL TRANSMITTER with PRE-CORRECTION, for HFC & FTTH Large CATV & SAT 47-2.800 MHz Distributions.

- Rover "RLT" Ultra Wide Band 47-2.800 MHz Optical Laser Transmitter series, is equipped with high performance, isolated and thermally-stabilized, DFB Single Mode Butterfly Laser with extreme superior linearity, designed for analog/digital CATV and SAT signals with many channels loading.
- The "RLT" series operates at 1550 nm wavelength, the unit is designed according to DWDM ITU-grid (Dense Wavelength Division Multiplex) at ± 100 GHz step.
- The unit employs superior CSO & CHIRP pre-correction, reducing laser and fiber dispersion effects.
- With front panel Display and Keys we can locally monitor Laser Power, RF CATV & SAT Level, RMS-OMI value, read & set IP & MAC Address and check all the alarm status.
- Laser Transmitters RLT incorporate a LAN for SNMP & WEB remote control system for alarm status, settings and Data Logger monitoring of all laser operating parameters such as: Dc laser bias current, laser output power, OMI, AGC status, RF Level, Fan, etc...
- With the USB A & B we can easily up-grade the SW with a PC or with a memory stick.

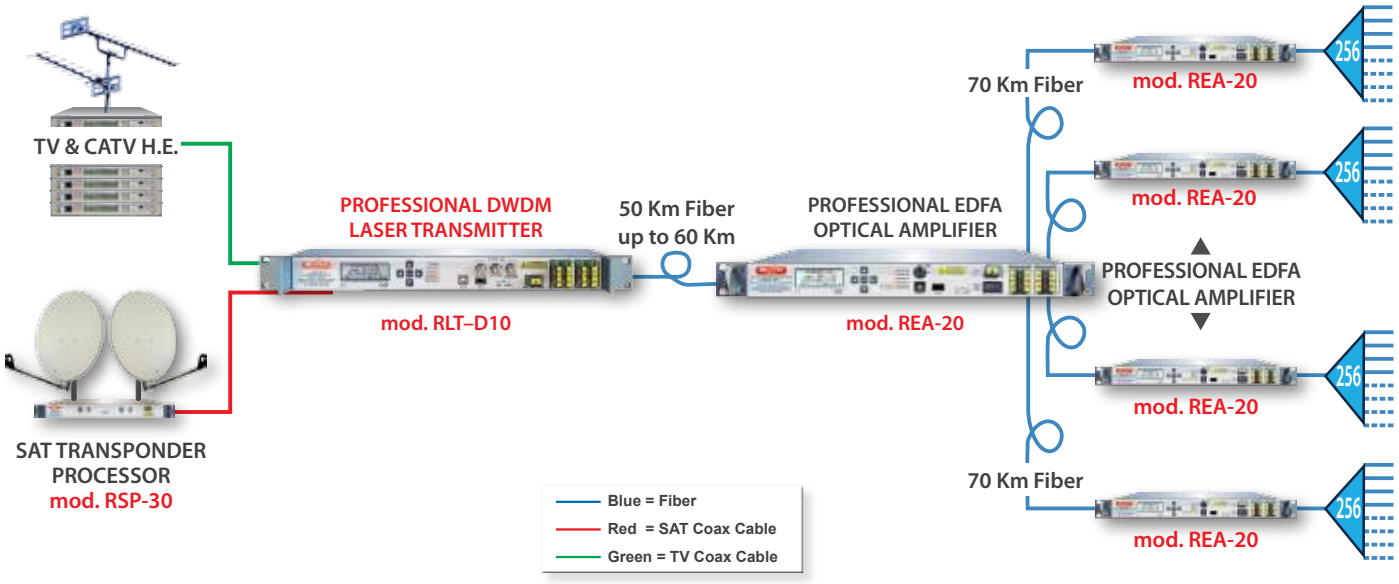
RLT-D10 BLOCK DIAGRAM



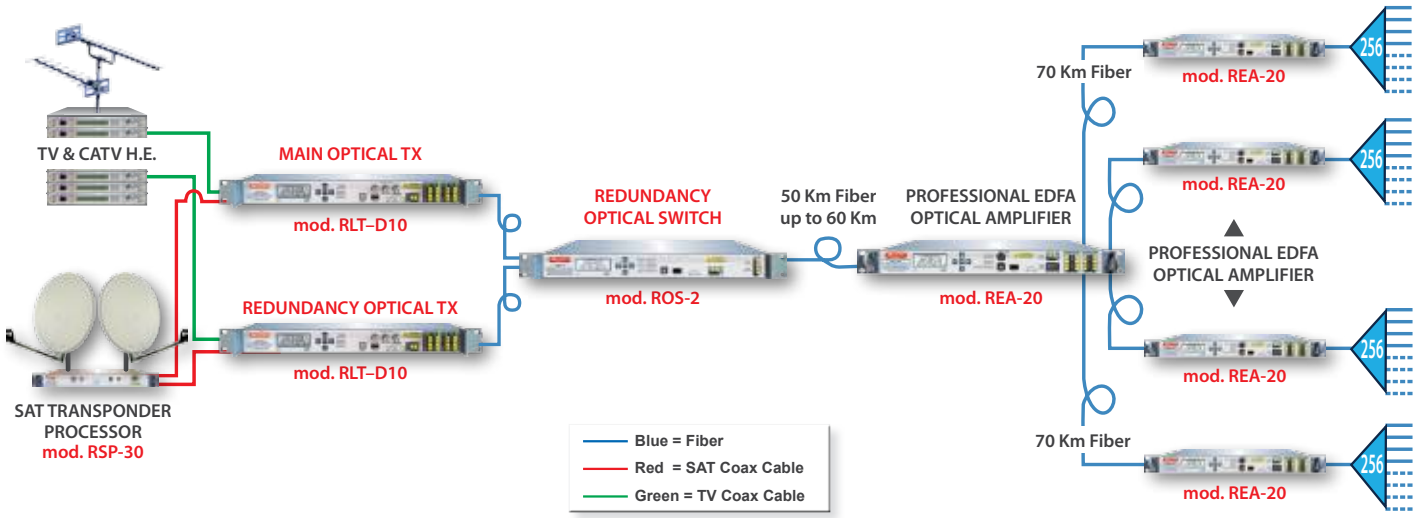
MAIN FEATURES

- Equipped with Single Mode Superior Linearity cooled Butterfly Laser for excellent RIN
- High Power & High performance Isolated Laser
- High stability thermoelectric Laser cooler (TEC)
- DWDM ± 100 GHz spacing, ITU Grid wave lenght CHs
- SC/AP Laser Output connector with shutter
- Built-in 2, 4 or 8 way Optical Splitter (opt.)
- Automatic CHs Load control for stable OMI
- CATV and SAT input Level Signal Test Point on front Panel
- Test Point for OMI measurement on front Panel: 80 dBµV = 5% OMI per CH.
- All settings adjustable via LAN port: Slope, gain, Fiber length, OMI, SBS, CSO, CHIRP, Precorrection, etc.
- Full Alarms & Data Logger System on board
- Full Remote Control through SNMP and WEB
- Leds alarms and LCD Display on front Panel
- Easy SW up-grade with USB A & B Port

HFC & FTTH LARGE REGIONAL CATV & SAT DISTRIBUTION EXAMPLE up to 120 Km SINGLE MODE FIBER G652 C&D



OPTICAL TX & FIBER REDUNDANCY SWITCH EXAMPLE



RLT-D10 TECHNICAL SPECIFICATIONS

SMATV, CATV & SAT

SMATV/CATV frequency range	47-870 MHz (opt. 5-1.200 MHz, CATV only, no SAT)
SAT frequency range	950-2.800 MHz
RF connectors	75 ohm type "F"
RF Return Loss	TV = > 16 dB SAT = > 12 dB
Typical level for TV/CATV input	80 dbuV +/– 10 dB per Channel
Test point TV/CATV input	Input level - 20 dB
TV-CATV Gain mode adjust	CATV: AGC (or Manual, not recommended)
Gain adjustment CATV range	Manual +11/-11 dB, AGC 30 dB Max
Slope adjustment CATV range	-3 / +15 dB
Nominal level for SAT input	95 dbuV per Trasp. (92 minimum), (terminate with 75 Ω load if not used)
Test point for SAT input	Input level - 20 dB
SAT Gain mode	Fixed, must be 12 dB below analog CATV chs (normally adjusted in the SAT Rover Transponder Processor)
LASER	
Laser type	DFB cooled Butterfly single mode
Laser optical power	+ 10 dBm/10 mW
Optical power stability	typ. ± 0,5 dB, 1dB Max
TEC Temp. Resolution	± 0,2°
Optical wavelength	1.550 nm (DWDM ITU-Grid), 100 GHz CHs spacing, form CHs 20 to 60, approx 1.530 to 1.560 nm
RIN	–155 dB/Hz worst case
Optical insulation	30 dB min
Optical return loss	> 45 dB
Optical connector	SC/APC with shutter (other on request)
PERIPHERALS	
LAN/ETHERNET 10/100 port	HTML WEB Browser & SNMP for settings, alarm and Remote Control Monitoring
USB A & B port	For easy SW UP-DATE
Wired Remote Control via insulated contact	1 IN and 2 OUT, for Remote Control and Alarm Monitoring (opt. Board)
POWER SUPPLIES	
Main power supply	230 Vac 50 Hz
Redundancy power supply optional	48 Vdc or 2nd 230 Vac
Power consumption	< 40 W
MECHANICAL	
Case	Slim, 19" rack, one unit,
Weight	5 kg
SAFETY, EMC, INSTALLATION ENVIRONMENT	
Safety	EN 50 083-1 and EN 60 950 See yellow label on the equipment.
Laser Safety	Class 1M acc. IEC 60 825-1 (eye safe for normal viewing). During normal operations the laser beam is confined within optical fiber. Optical transmitter is intended to work ONLY connected to the proper optical network
Installation environment	Temperature range: –5° / + 45° (max 55°) According to ETS 300 019-1-3 Class 3,1 Controlled Temp. Loc.
Relative humidity	90 % (95 max)
EMC	EN 50 083-2

RLT-D10 FULL LOAD CATV & SAT NETWORK PERFORMANCE

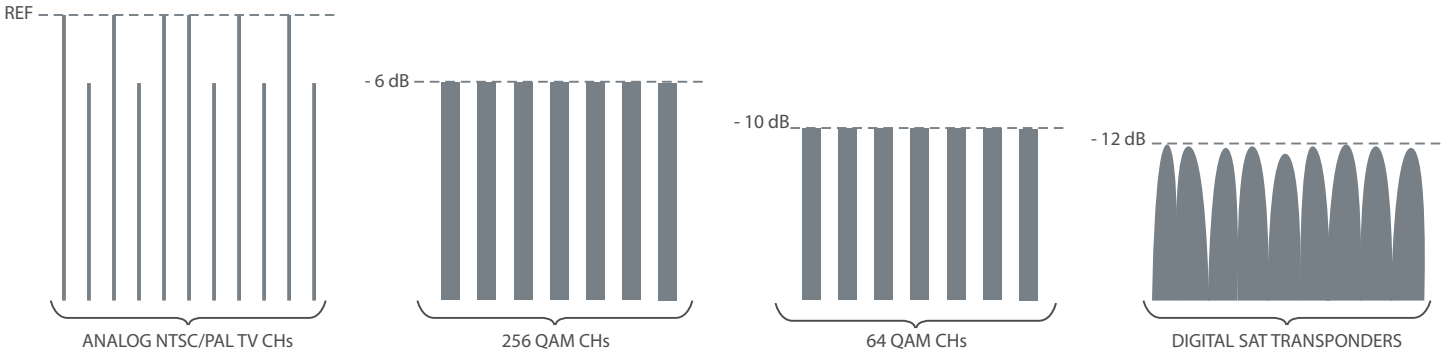
	Channel allocation plan: - CENELEC 42 CHs, all channels Flat	* Channel allocation plan: - USA NTSC 77 CHs all NTSC Analog CHs Flat - USA QAM 75 CHs all QAM at –6 dB and Flat
OMI	**1** 4,1 % **2** 4,1 %	**1** 3,3 % **2** 3,3 %
CNR	**1** 53 dB **2** 51,5 dB	**1** 52 dB **2** 51 dB
CSO	**2** > 60 dB	**2** > 60 dB
CTB	**2** > 63 dB	**2** > 62,5 dB
CXM	**2** > 58 dB	**2** > 57 dB
MER	**2** > 36 dB 64 QAM	**2** > 34 dB 256 QAM

* All channels FLAT, Analog Channels Below 550 MHz, Digital QAM Channels abve 550 MHz at 6 dB level less that Analog.

TEST OPTICAL LINK TYPE:

- TYPE **1** = TX + 0 Km Fiber + Optical Attenuator + RX
- TYPE **2** = TX + 20 Km Fiber G 652 + Optical Attenuator + RX
- RX Received Power = -3 dBm, noise current = 7pA/√Hz

ANALOG & DIGITAL TV & SAT LEVELS CONFIGURATION SUGGESTED



SAFETY NOTICE

THE EQUIPMENT MAY ONLY BE INSTALLED BY QUALIFIED PERSONNEL, WHO HAVE RECEIVED THE NECESSARY TRAINING IN HANDLING OPTICAL AND ELECTRICAL EQUIPMENT AND HAVE BEEN INSTRUCTED IN LASER SAFETY.

INVISIBLE LASER RADIATION, DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS, CLASS 1M LASER PRODUCT. MAXIMUM OUTPUT POWER: 10 mW, WAVELENGTH: 1550 nm, IEC 60825-1:2007 (EN 60825-1:2007, DIN EN 60825:2008-05).

NOTICE

Laser equipment installation, operation and maintenance must only be carried out by people who have received adequate training in laser safety.

Optical transmitters and amplifiers emit optical power in the invisible infra–red spectrum range. Under normal operating conditions, the optical power is transferred in the fibers and is not accessible.

Each optical transmitter and each optical amplifier is assigned to a laser class according to IEC 60825–2 and a hazard level according to IEC 60825–2.

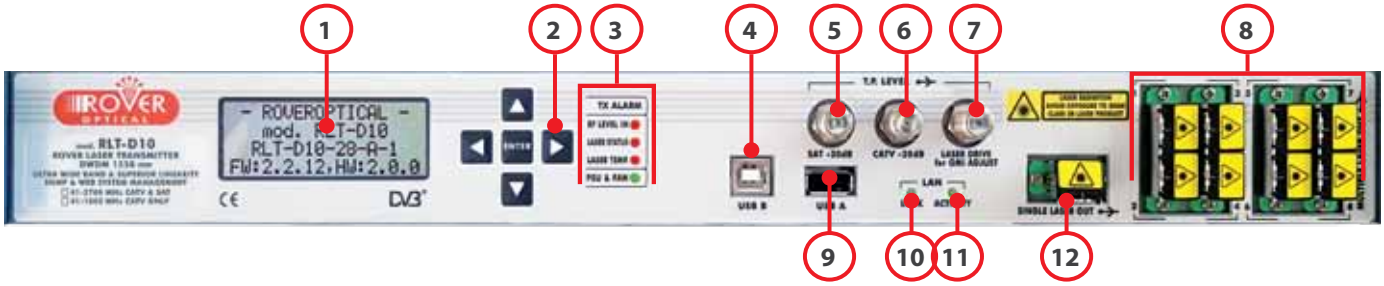
The hazard level is based on radiation that could become accessible under reasonable foreseeable circumstances, e.g. disconnected fiber connector, fiber cable break.

Both levels are documented in the according operating manual of the device and with a laser safety label on the device.

The device may be integrated in an optical fiber communication system (OFCS) complying with IEC 60825-2.

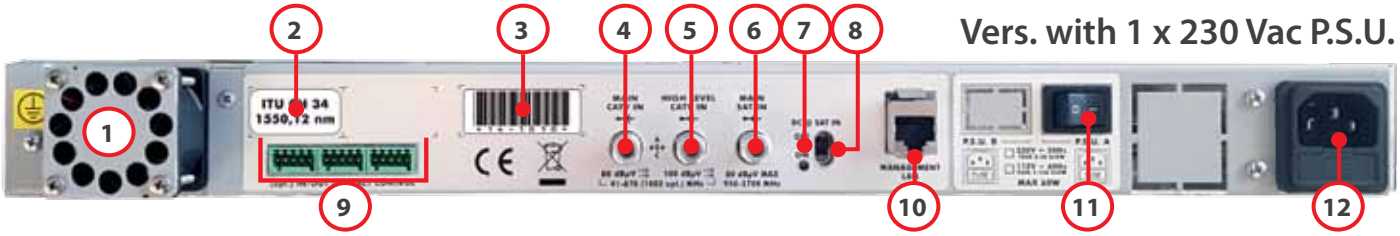
For subsequent accessible locations within the OFCS, the operator of the OFCS is obliged to assign appropriate hazard levels and to install applicable laser safety measures according to IEC 60825-2.

FRONT VIEW



1. LCD Display
2. Keys
3. LEDs, TX Alarm
4. USB-B port
5. SAT Input Level Test Point: 950-2.800 MHz at -20 dB
6. CATV Input Level Test Point: 47-870 MHz at -20 dB
7. CATV Test Point for OMI Measurement: 80 dBµV = 5% OMI per Single CH
8. Up to 8 Splitted Optical Outputs (opt.)
9. USB-A port
10. Led LAN link
11. Led LAN activity
12. Single Optical Laser Out

REAR VIEW



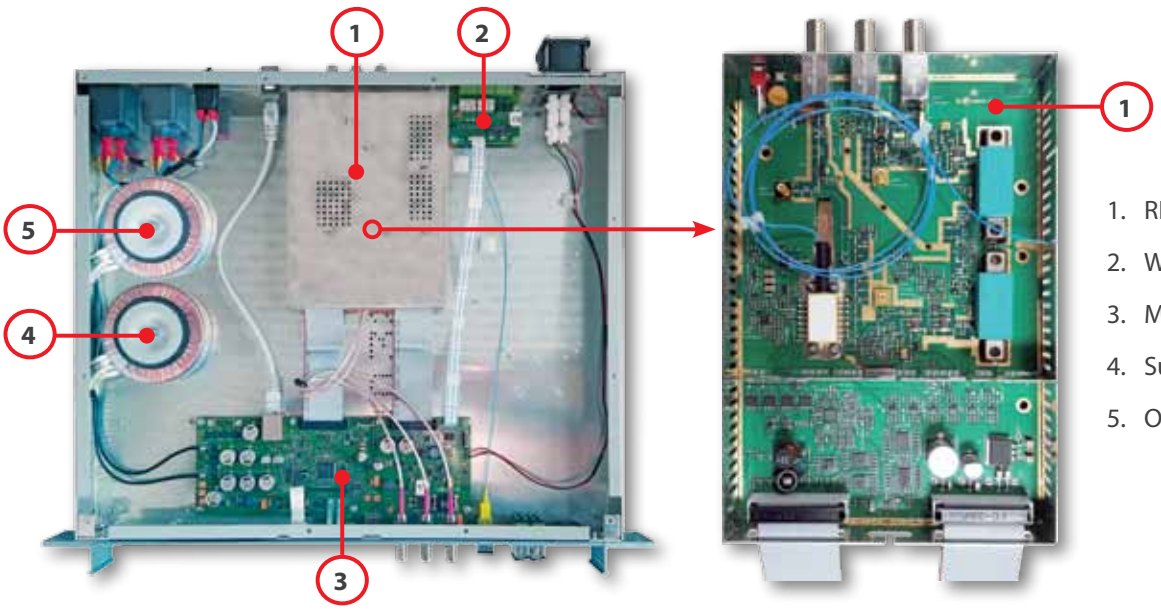
Vers. with 1 x 230 Vac P.S.U.

1. Hot swap fan
2. Optical ITU CH. N. label
3. Serial N. and config. label
4. Main CATV INPUT
5. High Level CATV INPUT
6. Main SAT INPUT
7. Led, DC@SAT IN for LNB
8. ON/OFF switch to DC@SAT IN for LNB
9. I-O wired Remote Control (opt.)
   Connect. = "FK-MC 0,5/5-ST-2,5" by PHOENIX CONTACT
10. LAN management port
11. P.S.U. A ON-OFF switch
12. AC MAINS A and FUSE
13. P.S.U. B ON-OFF switch (opt.)
14. AC MAINS B and FUSE (opt.)
15. DC P.S.U. 48 V INPUT (opt.)
16. DC P.S.U. 48 ON-OFF switch (opt.)

Opt. Vers. with 2 x 230 Vac P.S.U.

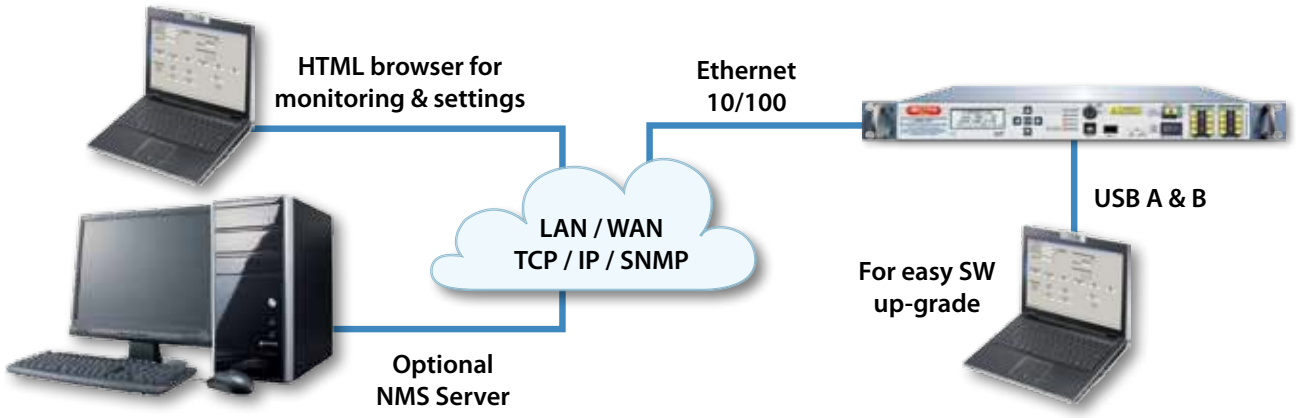
Opt. Vers. with 1 x 230 Vac and 1 x 48 Vdc P.S.U.

INTERNAL VIEW

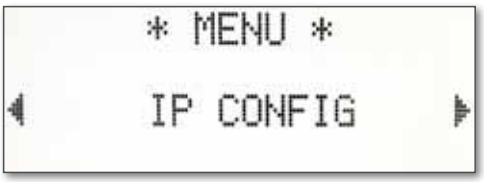


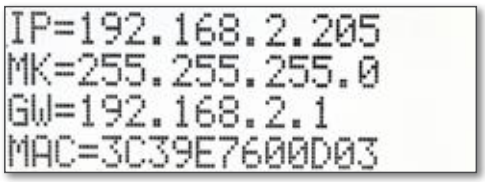
1. RF & LASER Module
2. Wired Remote Control Board
3. Microprocessor Board & PSU
4. Supplyed AC Transformer
5. Optional AC Transformer

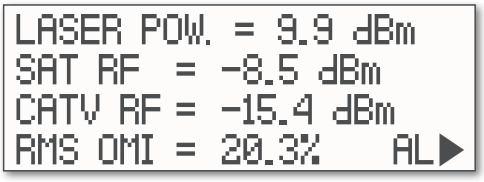
USB-LAN SNMP & WEB CONNECTIVITY



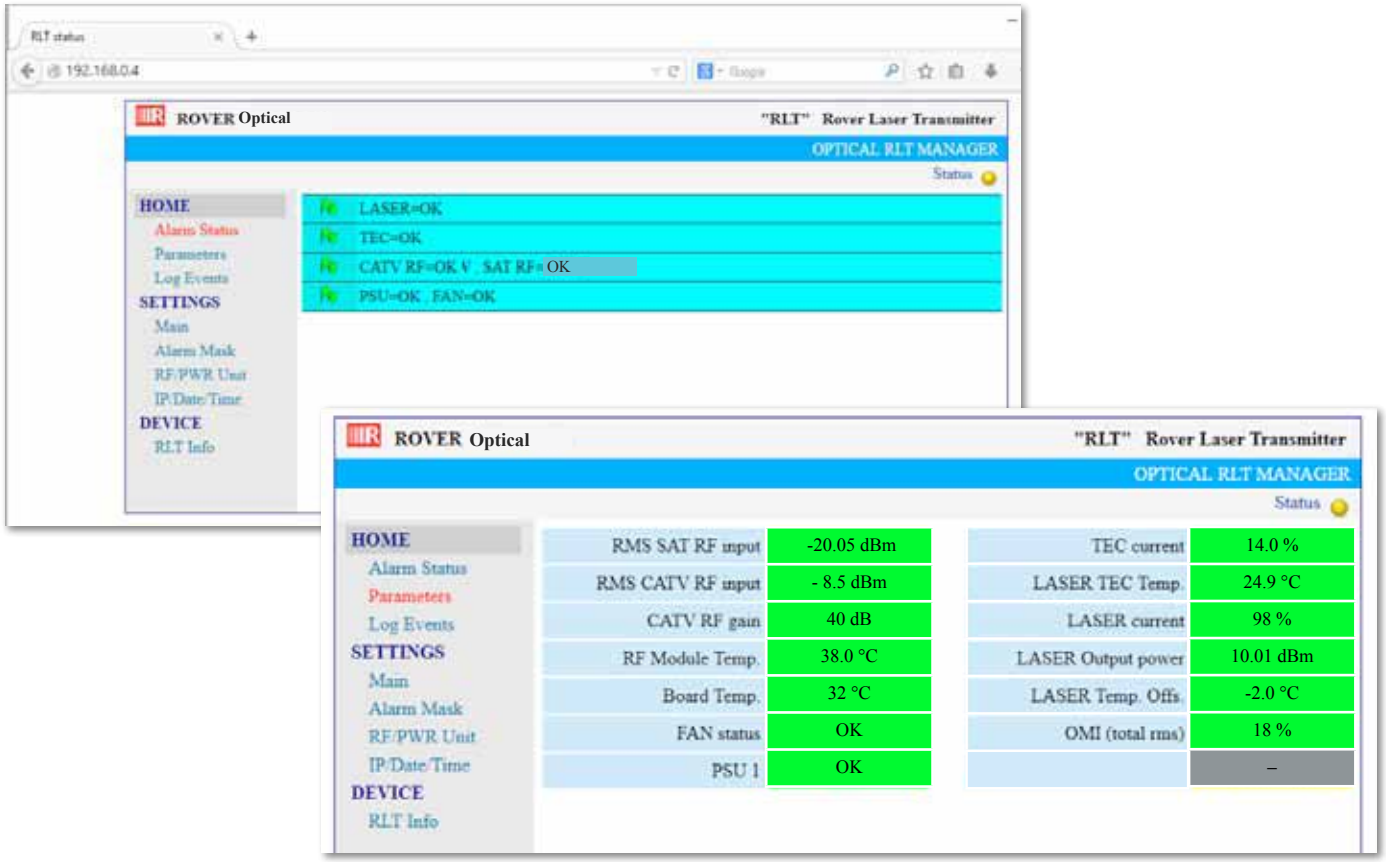
LOCAL DISPLAYS EXAMPLES







LAN REMOTE CONTROL PC SCREEN DISPLAYS EXAMPLES



ORDERING CODE DEFINITION

LASER CLASS
D = cooled DWDM butterfly

OPTICAL CH. N.
34 = channel 34, 1550.12 nm

NUMBER OF LASER OUTPUTS
4 = N. 4

TV & CATV/SAT INPUT FREQ. RANGE
S = 48-870/950-2.400 MHz
T = 47-1.002 MHz (no SAT)

RLT - D - 10 - 34 - A - 4 - AC - S - I-O

RLT SERIES =
ROVER Laser Transmitter

LASER OUTPUT POWER
10 = 10 dBm/10mW

OPTICAL CONNECTOR

P.S.U. redundancy
DC = 48 V+230 V
AC = 230 V+230 V
XX = 230 V only

I-O Board for Wired Remote Control (opt.)

ORDERING MODEL / CODE EXAMPLE

MODEL / CODE	DESCRIPTION	APPLICATION
RLT-D-10-34-A-4-DC-S	DWDM Laser TX, 10 dBm PWR, CH34 ITU, SC/APC connector, n° 4 Optic Output, opt. 48VDC PSU + 230 VAC, CATV & SAT Band	Large CATV and SAT distribution

ACCESSORIES

MODEL / CODE	DESCRIPTION	APPLICATION

OPTIONS

ITEM	DESCRIPTION	CODE DEFINITION
PSU Redundancy	230 VAC PSU Redundancy	AD
	48 VDC PSU Redundancy	DC
Optical Splitter	2 way built-in Optical splitter	2
	4 way built-in Optical splitter	4
	8 way built-in Optical splitter	8
RF INPUT	CATV & SAT 47-870 MHz & 950-2.800 MHz	S
	CATV only 47-1.002 (no SAT)	T
I-O Board	Wired Remote Control Via insulated Contact	I-O

ROVER OPTICAL PRODUCTS RANGE

TX **RLT-C9**

CWDM HIGH POWER, ULTRA WIDE BAND CATV & SAT 47-2.700 MHZ OPTICAL LASER TRANSMITTER 9 dBm

TX **RLT-D10**

DWDM HIGH POWER, ULTRA WIDE BAND CATV & SAT 47-2.800 MHZ OPTICAL LASER TRANSMITTER 10 dBm

EDFA **REA-20**

EDFA OPTICAL AMPLIFIER 20 dBm, FROM 1 TO 8 OUTPUT

SWITCH **ROS-2**

REDUNDANCY OPTICAL SWITCH

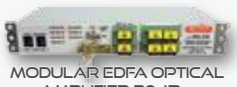
SAT PROC. **RSP-30-4/8**

WIDE BAND SATELLITE TRANSPONDER PROCESSOR FOR NEW EXTENDED BAND LNB WITH 8 INPUT FROM 250 TO 2.350 MHZ

RLT-C7

MODULAR OPTICAL LASER TRANSMITTER 7 dBm

REA-C20

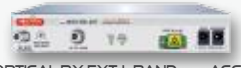


MODULAR EDFA OPTICAL AMPLIFIER 20 dBm

RLT-C7-WB-SAT

OPTICAL TX EXT. L-BAND

MOR-WB-SAT



OPTICAL RX EXT. L-BAND WITH AGC

AOT-STC
APARTMENT OPTICAL RECEIVER/TERMINATION
CATV & SAT WITH AGC

RX

COR-STC
CONDOMINIUM OPTICAL FIBER NODE RECEIVER
CATV & SAT WITH AGC

RX

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