ASCENT
Communication Technology

RON1512
RFoG_ONU

Quick Reference Guide

Revision C

ACT RON1512 RFoG ONU

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ACT Document Number: ACT RON1512 RFoG ONU QRG

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This document is produced to assist professional and properly trained personnel with installation and maintenance issues for the product. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

For more information, contact ACT: support@ascentcomtec.com

Revision History

Revision	Date	Reason for Change
A	10/27/2023	Initial release
B	09/20/2025	Update format
C	11/04/2025	Add block diagram

Table of Contents

1 Overview

1.1. Summary

Ascent RON1512 is a compact, high-performance 1.2 GHz two-way optical node designed for DOCSIS FTTH architectures. Engineered for superior forward and return path performance, it combines high reliability, simplified installation, and a user-friendly layout. The integrated optical AGC automatically maintains a consistent RF output level in every home, while the burst-mode return transmitter activates the laser only when a return signal is detected.

As part of ACT's FTTx solution suite, the RON1512 supports 1550 nm forward-path RF transmission and 1610 nm return-path upstream signals. It integrates a low-noise optical receiver and an isolated DFB laser to modulate return-path signals from set-top boxes (STBs) or DOCSIS modems onto the fiber.

Utilizing single-fiber WDM transmission, the RON1512 supports both data and analog signal transport, ensuring seamless operation within existing HFC network infrastructures. Its simplified network structure reduces active components, enhances overall reliability, and lowers operational costs. Fully compliant with the SCTE 174 2010 standard, the RON1512 delivers a cost-effective, standards-based solution for next-generation RFoG and FTTH deployments.

2 Features

- Supports 1.2GHz RF pass band
- Single fiber WDM for forward and return path
- 1550nm forward, 1610nm return
- AGC optical input range of -8dBm to 0dBm
- 32dBmV RF output level
- RF test points for forward and reverse path
- Easy installation
- LED indicators for optical input, output and power
- Compact form factor
- Low power consumption

3 Specifications

Downlink Characteristics

Parameter	Technical Parameters	Condition
Wavelength	1550nm to 1560nm	
Responsivity	0.8A/W	VR=5V, λ=1550nm
Optical Received	-8dBm to +2dBm	
RF Output Power @ 550 MHz	90dBmV to 92dBmV	-8 to 0 dBm opticalInput, (AGC) OMI 3.5%
Optical AGC Time Constant	1sec	
RF Response Tilt (54 to 1002MHz)	3.0dB to 4.0 dB(Typical 3.5dB)	54 to 1002
RF Flatness(Fit to Linear slope)	-1.0dB to +1.0dB	54 to 1002
RF Return Loss, 75 ohm	15dB(Typical 16dB)	
CNR @ -6 dBm	48dB	Note 1
CSO @ 0 dBm	-60dBc	
CTB @ 0 dBm	-60dBc	

Uplink Characteristics

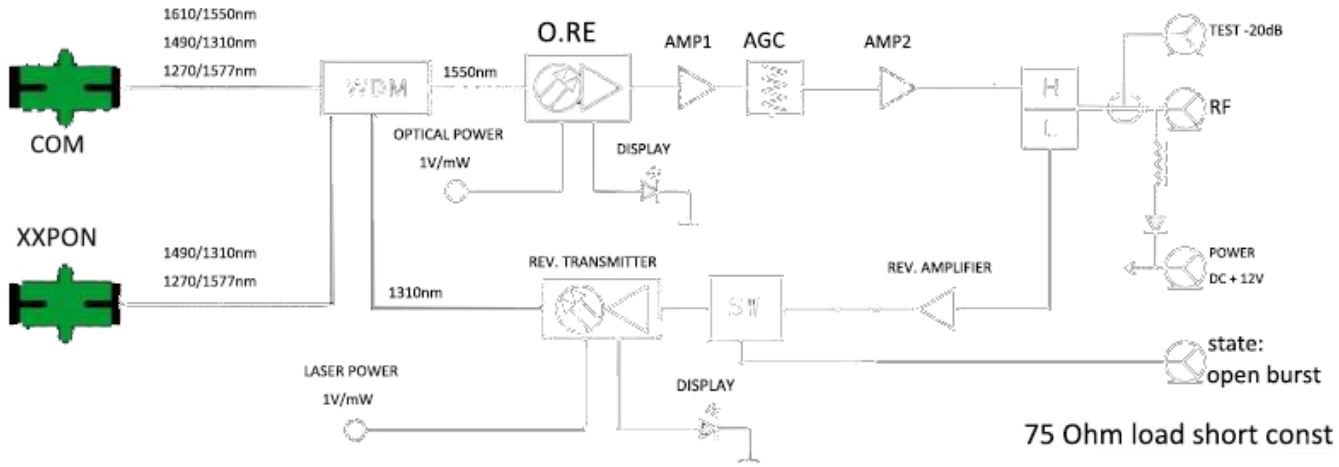
Parameter	Technical Parameters	Condition
Wavelength (1610nm Option)	1610nm	CW, Tc=0 to +20
RF Operating Frequency	5MHz to 42MHz	42/54Mhz; 65/85MHz(Optional)
RF Flatness	-1dB to +1dB	
RF Return Loss, 75ohm	15dB(Typical 16dB)	
Input Dynamic Range	15dBmV to 40dBmV	
Power at Which Optical Turn On / Off		Double threshold, accord with the latest SCTE 174 2010 standard.
NPR Dynamic Range	20	
Tx Optical Power, High	0dBm(Typical 1dBm)	RF input power>RF Threshold power
Tx Optical Power, Off	-20dBm	RF input power<RF Threshold power
Turn-on Time	<700ns	
Turn-off Time	<700ns	

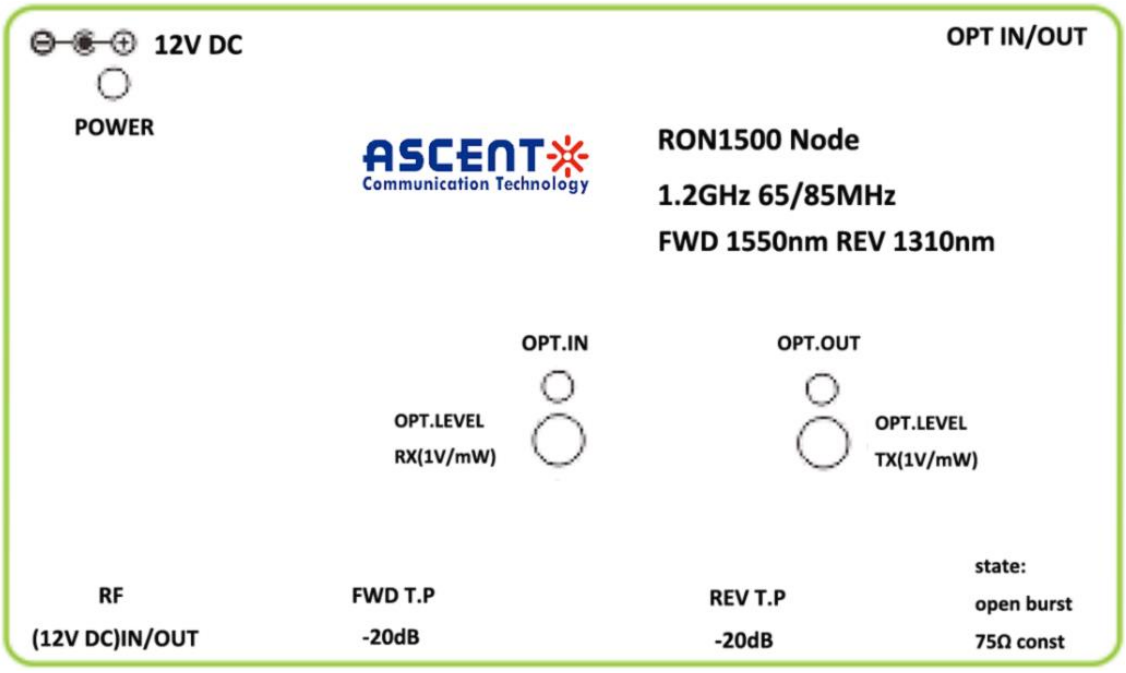
General Characteristics

Parameter	Technical Parameters
Optical Connector	SC/APC, FC/APC, SC/UPC
Operating Temperature	-20°C to 55°C
Storage Temperature	-40°C to 85°C
Power Supply	100VAC to 240VAC
Operating Relative Humidity	5% to 95%
Power Consumption	7W
Dimensions (W × D × H)	210mm x 156mm x 50mm
Weight	0.93kg

Note1: 1.79PAL-D/K (-6dB)channel loading up to 1 GHz, 20 Km fiber + passive loss; tested within the full temperature range and specified received optical power range.

4 Block Diagram

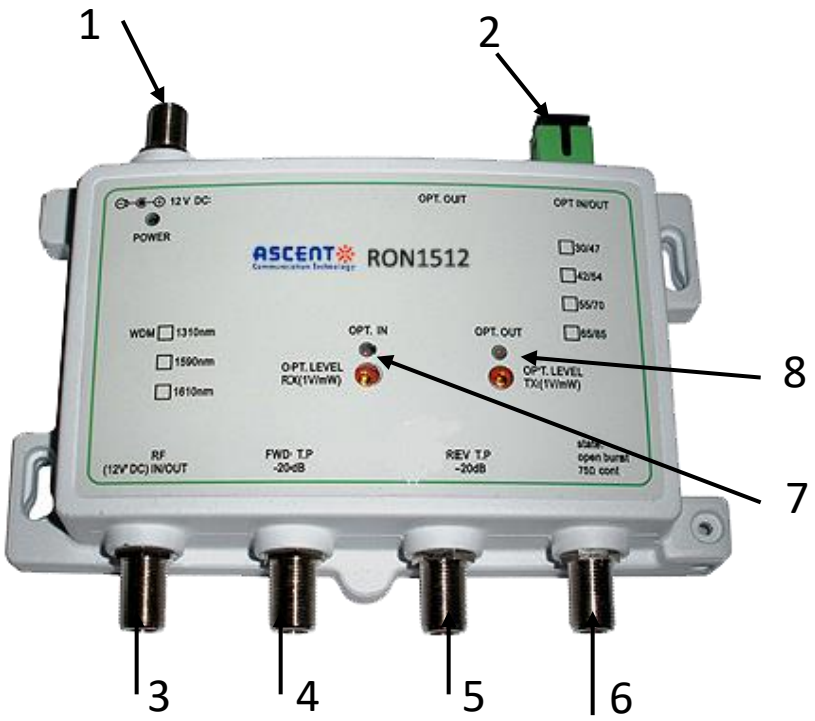




Note: 12V DC can be powered through coaxial cable and inserted with a power plug.

5 Operation Instruction

5.1. Structure Description



1 Power input port 11 to 16VDC

2 Optical fiber input port

3 RF output and REV input port

4 RF positive output test mouth -20dB

5 RF reverse test mouth (OMI) -20dB

6 State Settings (75 ohm load short sub, even the state for emergency mode. Open.)

7 Optical power receive display (orange:PIN < -9dBm, green:-8 < PIN < 1.5dBm, red:PIN > 2dBm)

8 Reverse laser display (laser open: green, not open: red laser)

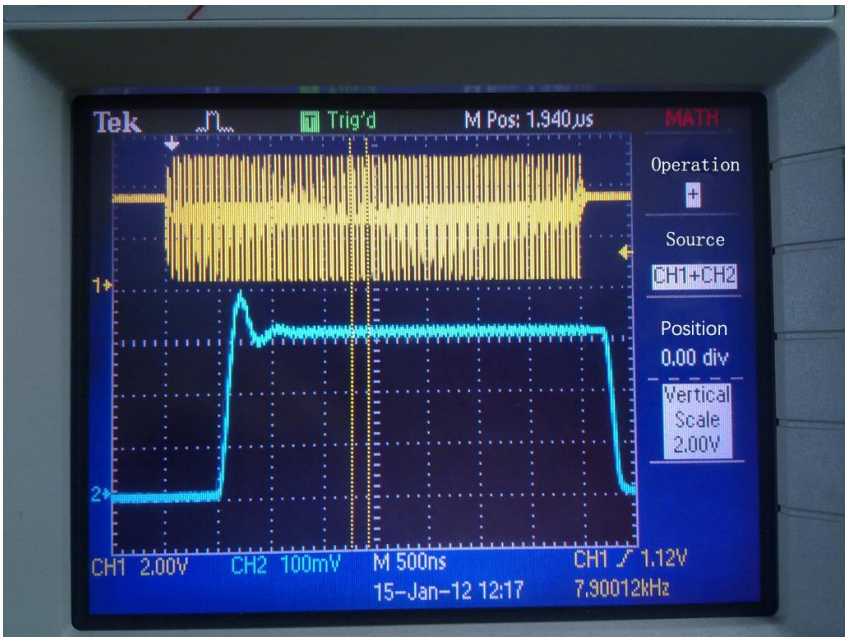
5.2. Burst-Mode Return Laser Operation

Below figure: Burst-Mode Upstream Transmission Waveform (Yellow – RF input; Blue – Optical output power)

This oscilloscope capture illustrates the burst-mode operation of the RON1512's 1610 nm return-path DFB laser. When an upstream RF signal is present (yellow trace), the laser quickly activates, producing the corresponding optical output (blue trace). Once the RF input ceases, the laser shuts off almost immediately, with a turn-on and

turn-off time of less than 700 ns as specified.

This fast, on-demand modulation prevents continuous optical emission and significantly reduces noise accumulation on the shared return fiber. The burst-mode mechanism enables multiple RFoG nodes to transmit upstream on a single wavelength without interference, improving signal-to-noise ratio, maintaining network stability, and ensuring efficient fiber utilization in DOCSIS 3.1 FTTH deployments.



6 Warnings

1. All electric power components and optical transmitter should be given a good grounding connection.

2. The RF signal should not be connected until the optical transmitter arrives at its normal working point. The amplitude of the RF signal should follow the instructions in the test report of the optical transmitter. An abnormal RF signal power will overload the laser and damage it.

3. RON1512 should be stored in ESD protected conditions (such as within an ESD protection container) and cannot be stored with corrosive cargo. The storage temperature should be kept within -20 °C to +55 °C.

4. Forced cooling should be added when multiple RON1512 units are mounted on the same rack.

5. Do not open or repair any part of RON1512. Doing so will void the warrantee.

6. RON1512 requires good ventilation to work properly.

7. The optical output should be covered with a dustproof cover if the transmitter won't be used for an extended period of time. When failure occurs, RON1512 should be sent to the manufacturer in a timely manner. Do not open or attempt to repair any part of the transmitter by yourself, doing so will void the warrantee.

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Specifications and product availability are subject to change without notice.

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