Data Sheet
October 2001

3970-Type 1550 nm Transmitter

Features

- Extremely fast time to market and very low engineering investment
- Superior CNR, CSO, and CTB performance on two high-power optical outputs
- Mobile field-tuning application provides real-time performance optimization
- High SBS suppression capabilities enhance architectural options and coverage
- Multiple programmable tuning optimizations per transmitter facilitate inventory management and performance across architectures

Applications

- High-performance supertrunking links
- High-launch power distribution networks
- Redundant analog ring architectures

Description

The 3970-type, externally modulated 1550 nm transmitter provides CATV systems integrators one of the fastest and easiest paths to customer value-added, high-performance solutions.

The 1550 nm transmitter engine incorporates a source laser optimized to improve transmitter and link performance with high specifications and better signal quality. This advantage drives superior control of RIN through fiber and management of dispersion, stimulated brillouin scattering, and self-phase modulation for better noise and distortion performance over long-distance applications.

The transmitter embedded system software also provides the ability to load and store multiple configurations of the transmitter tuning parameters. In this way, a single transmitter can be optimized for more than one set of link characteristics. This feature simplifies inventory and reduces multiple device management.

The software controls, monitors, generates/processes alarms, and handles faults for transmitter subsystems. The system software also accommodates three interfaces for two-way communication with the transmitter. A two-line front panel user interface provides system status and telemetry, and accepts user commands. Fine tuning can be accomplished in the field through an RS-232 serial interface. System software upgrades can be downloaded on-the-fly into the transmitter via this interface. A well-defined API at the RS-485 network interface will enable custom applications and network management systems to communicate with and control the transmitter.

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Operating Temperature Range	TOP	0	50	°C
Storage Case Temperature Range	Tstg	–20	65	°C

Characteristics

Table 1. Optical/Electrical Characteristics

Parameter	Device Code						Unit
	3970A	3970B	3970C	3970D	3970E	3970F	
Channel Plan	79 NTSC	40 NTSC Low	39 NTSC High	112 NTSC	60 PAL-D	42 Cenelec	—
Optical Output (min)	7 Each	7 Each	7 Each	7 Each	7 Each	7 Each	dBm
Wavelength Range	1540—1560	1540—1560	1540—1560	1540—1560	1540—1560	1540—1560	nm
Flatness (max) 42 MHz—750 MHz 42 MHz—870 MHz	 1.0 1.5	 1.0 1.5	 1.0 1.5	 1.0 1.5	 1.0 1.5	 1.0 1.5	 dBp-p dBp-p
RF Return Loss (min), 42 MHz—870 MHz	16	16	16	16	16	16	dB
RF Input Level, CW[1]	17—27	20—30	20—30	15.5—25.5	18—28	22—32	dBmV/channel
Carrier-to-Noise Ratio (min), 65 km[2, 3]	52	55	55	49	52	52	dB
Composite Second Order (min)[2, 3,]	–65	–70	–70	–60	–65	–65	dBc
Composite Triple Beat (min)[2, 3,]	–65	–67	–67	–62	–65	–65	dBc
Cross Modulation (min)[2, 3, 4,]	–65	–65	–65	–60	–65	–65	dBc
Number of Outputs[5]	2	2	2	2	2	2	—

1. Input range over which specifications are met.
2. Received power is 0 dBm. Receiver responsivity is assumed to be 1.0 mA/mW, and receiver equivalent noise current is 8 pA/(Hz)$^{1/2}$.
3. For link consisting of transmitter, EDFA, 65 km of SMF-28 fiber, and receiver. EDFA noise figure is 5 dB minimum. Launch power from EDFA is 16 dBm minimum. Noise bandwidth is 4 MHz for NTSC, 5 MHz for PAL and Cenelec.
4. Measured per NCTA recommended practice, except when measured with appropriate adjustments to the transmitter to prevent AGC-induced gain change, which corrupts XMOD measurement.
5. All specifications apply to both outputs.

Electrical/Optical Characteristics (continued)

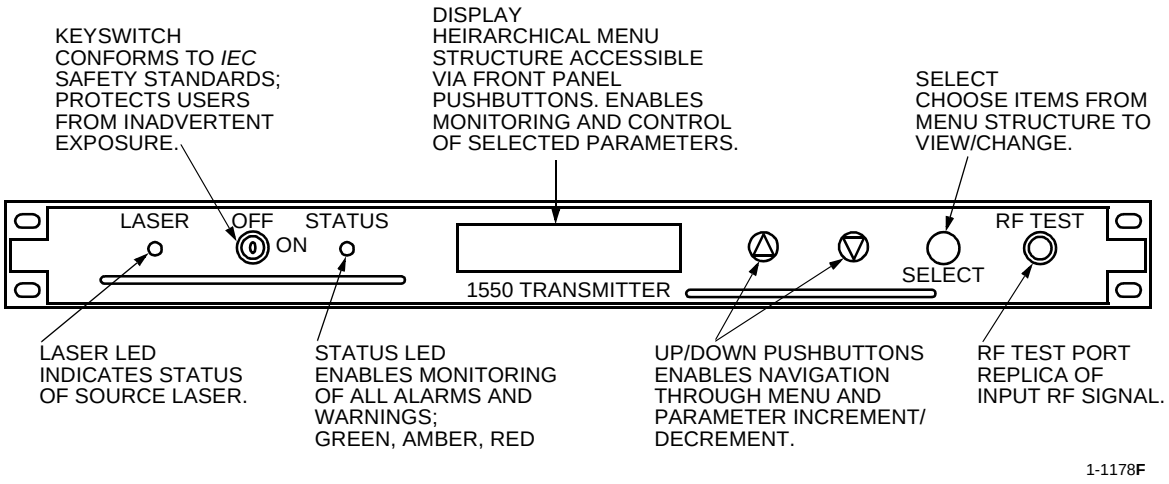
Table 2. Power Requirements

Parameter	Min	Max	Unit
ac Input Range	94 50	245 60	Vac Hz
dc Input Range, Floating	36	60	Vdc
Power	—	50	W

Table 3. Package Characteristics

Parameter	Dimension	unit
Height	1.72 (44), 1U	in. (mm)
Width	19 (483)	in. (mm)
Depth	13.16 (334) with fans	in. (mm)
Weight	9.0 (4)	lbs. (kg)

Outline Diagram



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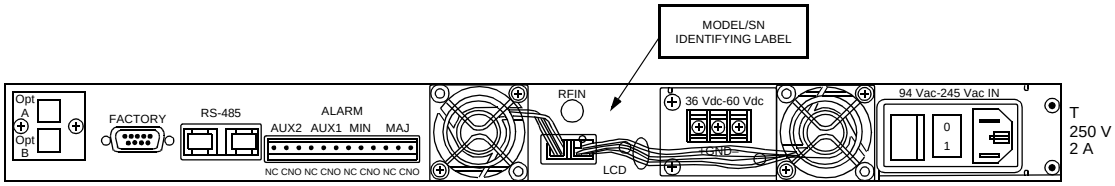

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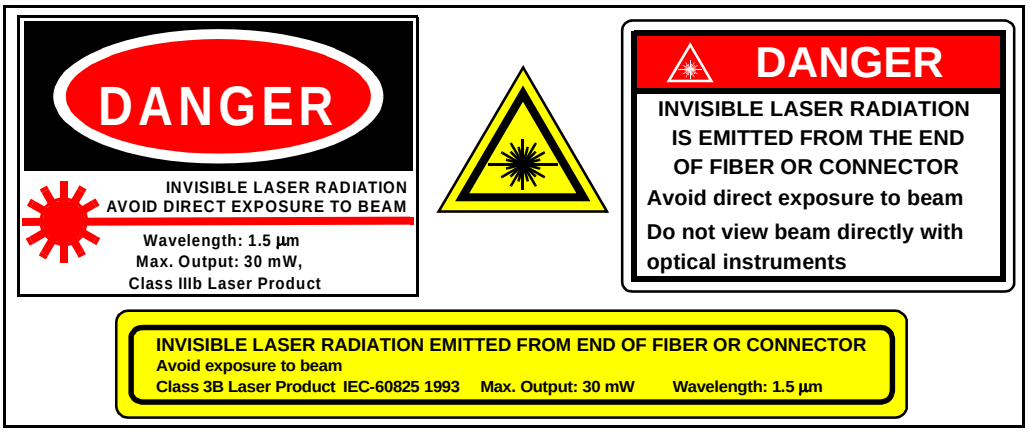
Laser Safety Information

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All versions are Class IIIb laser products per CDRH, 21 CFR 1040 Laser Safety requirements. All versions are Class 3B laser products per *IEC*® 60825-1:1993. The device has been classified with the FDA under an accession number to be determined.

This product complies with 21 CFR 1040.10 and 1040.11.
Single-mode fiber pigtail and connector options (see Ordering Information, Table 4.)
Wavelength = 1500 nm
Maximum power = 30 mW
Caution: **Use of controls, adjustments, and procedures other than those specified herein may result in hazardous laser radiation exposure.**



Ordering Information

Table 4. Ordering Information

Device Code	Description	Connector Options	Comcode
3970-Type	1550 nm Transmitter	FC/APC bulkhead, tight key; SC/APC bulkhead; E-2000/APC bulkhead	TBD

* For additional ordering information, please contact an account manager at OPTO West, Agere Systems Inc., 1-800-362-3891 (for sales staff, please press option 2).

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For additional information, contact your Agere Systems Account Manager or the following:
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