emcore®

Fiber Optic Transport Solutions for Satellite & Microwave Communications

GOVERNMENT, AEROSPACE & DEFENSE, COMMERCIAL

BASEBAND, IF, L, S, C, X, DBS, Ku, K, Ka, Q/V AND ULTRA-WIDEBAND SIGNAL TRANSPORT

EMCORE is a pioneer of innovative RF over fiber solutions for satellite and microwave band communications. EMCORE's products, featuring Genuine Ortel Technology, transport an ultra-broadband frequency range over high-performance fiber optic links. A wide range of high-dynamic-range Aerospace & Defense and Commercial applications are supported including antenna remoting and signal distribution, inter- and intra-facility links, electronic warfare, radar calibration, video over fiber, and much more. EMCORE's complete line of satellite and microwave components, subassemblies and systems eliminate the distance limitations of copper-based coaxial systems.

www.emcore.com

Satellite Communications

MAKO-X C/X-Band RF Over Fiber Transceiver

The MAKO-X C/X-Band RF over Fiber Transceiver is designed for high-speed fiber optic communications applications from 3.4 GHz to 8.4 GHz. Building on EMCORE's 40-years of expertise in RF over fiber links, this new transceiver module combines C/X band transmitter and receiver capability in a single highly ruggedized flange-mount package that is tested to MIL-STD-810G & MIL-STD-461F standards. It features C-Band and X-Band frequency range, full-duplex transceiver, high spurious-free dynamic range of 105 dB-Hz, excellent phase noise of -100 dBc/Hz at 10 KHz, and 1550 nm DWDM laser (1310 nm/1620 nm for WDM).

Highlights

- Frequency range: C-Band and X-Band (3.4 GHz – 8.4 GHz)
- Full duplex transceiver
- High spurious free dynamic range (105 dB-Hz)
- Excellent phase noise (-100 dBc/Hz at 10 KHz)
- 1550 nm DWDM laser (1310 nm / 1620 nm for WDM)
- Transceiver using two fiber cores
- Environmental standard (MIL STD 810G)
- EMI and EMC (MIL STD 461F)
- Laser safety standard (IEC 6085 1)
- DC24V operation (Isolated DC power supply)

EMCORE Commercial Satellite Communications Applications
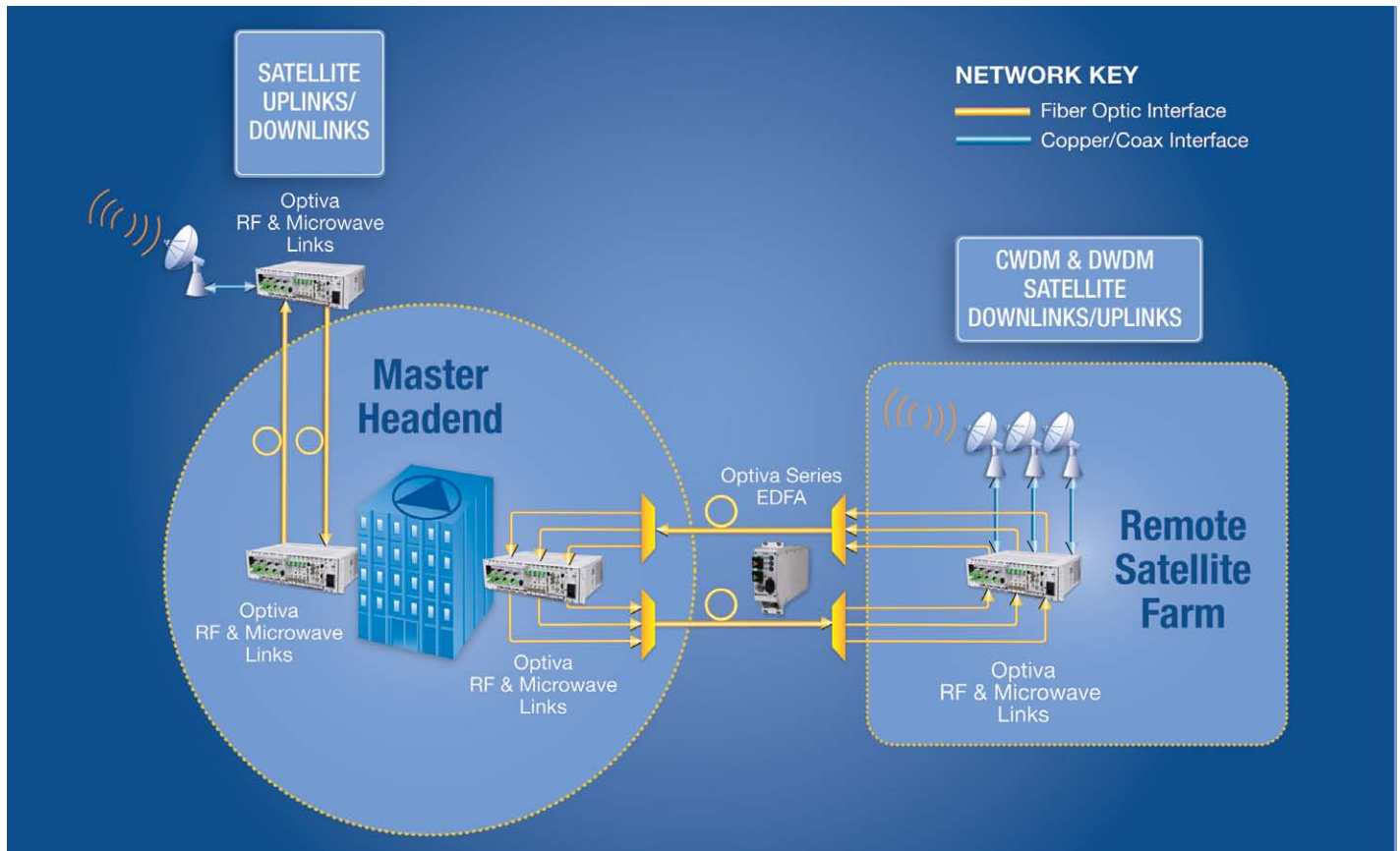
Satellite & Wireless Communications

optiva|PLATFORM

GENUINE
ORTEL TECHNOLOGY

Optiva Platform RF & Microwave Fiber Optic Transport System

EMCORE's Optiva platform includes a wide range of SNMP managed fiber optic transmitters, receivers, optical amplifiers, RF and optical switches and passive devices, video, audio, data and Ethernet products that provide high-performance fiber optic transmission from 1 MHz to 60 GHz. These units can be used to construct transparent inter- and intra-facility links for short- and long-haul RF satellite and microwave signal transport, antenna remoting, video transport, electronic warfare systems and many other high-dynamic-range applications.

IF, EXTENDED L-BAND, S- AND C-BAND FIBER OPTIC TRANSPORT

Optiva Next-Gen Extended L-Band Fiber Optic Link

NEW!

The Optiva Next-Gen Extended L-Band Fiber Optic Link is optimized to provide transparent IF, L-Band signal transport along with extended bandwidth for native S- and C-Band from 50 MHz to 6 GHz for satellite antenna and inter-facility applications. Features include optically-Isolated uncooled DFB laser, peak optimizer for quick and easy setup, and our patented SmartGain Control for enhanced AGC performance.

Optiva OTS-1L2, 3 GHz Dual Wideband Fiber Optic Links

The Optiva OTS-1L2 is a dual RF fiber optic link that accepts two RF inputs and provides two RF outputs with a single plug-in pair. This dual-density card increases the chassis capacity by a factor of two. OTS-1L2 tranmitters and receivers are optimized to perform in the 50 MHz to 3 GHz frequency range providing transparent signal transportation for satellite antenna applications.

Optiva OTS-1L Series Satcom Band Fiber Optic Links

The Optiva OTS-1L series is optimized to provide transparent IF, L- and S-Band signal transport for a variety of satellite antenna and interfacility link applications. Series options include CWDM, DWDM and 1310/1550 nm models supporting links up to 100 km. The unique features of the OTS-1L series include simple push button peaking for optimum performance and our patented SmartGain Control, which ensures consistent performance over varied signal level conditions.

5200 Series 3 GHz High-Performance Fiber Optic Inter-Facility Links

EMCORE's 5200 Series, 3 GHz Fiber Optic Inter-Facility Links (IFLs) are a high-performance, cost-effective alternative to coaxial cable for 20 MHz to 3000 MHz communications applications. They are a compact, weatherproof fiber optic transmitter and receiver pair for applications where high-performance under demanding conditions is critical.

- 3 RU 19" 16-slot rack-mount enclosure -Supports up to 16 hot-swappable card modules
- 1 RU 19" 6-slot and 1- or 2-slot compact enclosures available
- Outdoor Enclosure available
- Dual-redundant hot-swappable power supplies
- SNMP monitoring and control

Optiva Card Module Options
- IF, Extended L, S, C, X, DBS, Ku, K, Ka and Ultra-Wideband
- 1310 nm, 1550 nm, CWDM, DWDM
- Redundancy switching units & RF splitters
- RF & optical switches and passive devices
- Optical amplifiers (EDFA)
- Ethernet 10/100/1000

Next-Gen L-Band Highlights
- 50 MHz to 6 GHz optimized for IF, extended L-Band, S and C-Band
- 30 dB Tx and Rx adjustable gain

OTS-1L Series Highlights
- Dual or single density card options
- 6 dBm (CWDM), 9 dBm (DWDM) output
- 30 dB Tx/Rx adjustable gain range
- Optically-isolated uncooled (CWDM), cooled (DWDM) DFB laser
- Peak optimizer for quick, easy setup
- 50 & 75 Ohm BNC or 50 Ohm SMA
- Tx & Rx RF power monitors via LED, SMA & SNMP
- LNB power
- SNMP monitoring and control

Applications
- Satellite antenna signal transport
- Earth stations & headends
- Inter- and Intra-facility signal transport
- VSAT
- Wireless/Cellular (5200 Series)

Satellite Communications

C, X, DIRECT BROADCAST SATELLITE (DBS), KU & KA-BAND FIBER OPTIC TRANSPORT

Optiva OTS-2 Series Satcom Band Fiber Optic Links

The OTS-2 Series Satcom Band Fiber Optic Links are a family of SNMP managed fiber optic transmitters and receivers that provide high-performance downlink and uplink transport within the modular Optiva platform. C, X, DBS, Ku- and Ka-Band modules are available. Optiva satcom band modules utilize EMCORE's high-performance ultra-low Relative Intensity Noise (RIN) source laser technology with high optical input power capable photodiodes, and feature microprocessor-based transmitter and receiver control for laser and modulator bias. Satcom band modules come with variable RF gain to provide consistent microwave link operations.

Block Diagram
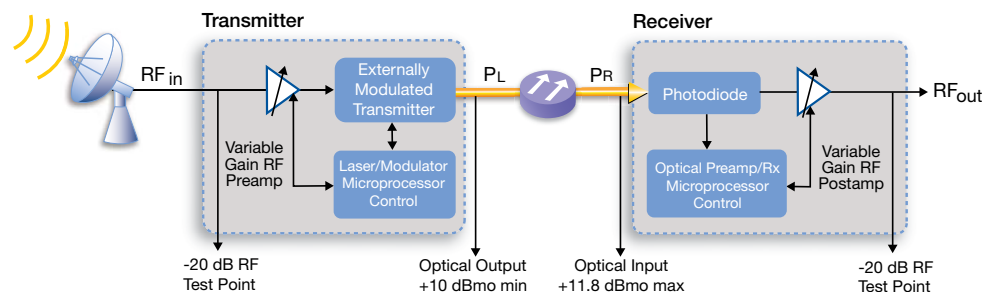
REFERENCE & TIMING

Optiva OTS-1 Ref Series Reference Oscillator Links

Optiva OTS-1 Reference Oscillator Links are optimized for 1, 5, 10 and 100 MHz high-level reference signal input. Each unit comes with a 15 dB adjustable gain range capability to provide ideal level match for signal distribution. The OTS-1 Ref series features low phase noise and high-dynamic-range, with optically-isolated DFB lasers that run cool and have low power consumption requirements.

Optiva OTS-IRIG Fiber Optic Intra-Facility Links

Optiva OTS-IRIG (Inter-Range Instrumentation Group) B000 / 1 PPS (Pulse Per Second) Fiber Optic Intra-Facility Links provide for simultaneous transmission of IRIG-B000 and 1 PPS, or one signal each over fiber. These high-performance links feature low jitter and sharp rise and fall times.

Satcom Band Highlights

- Satellite bands: C, X, DBS, Ku, Ka
- Low RIN source laser
- Microprocessor-based transmitter control for laser bias, modulator bias and link gain
- DWDM cooled DFB laser, 10 dBm output
- SNMP and RS-232 monitoring and control

Satcom Band Applications

- Satcom band antenna signal distribution
- Ground terminal & intra-facility links
- Site diversity systems
- Electronic Warfare (EW) systems
- Broadband delay line and signal processing systems

Reference Oscillator Link and IRIG Highlights

OTS-1 Ref
- 50 Ohm SMA, E2000
- 8 dBmo optical output
- Low electrical power consumption

OTS-IRIG
- 30 ns, rms jitter
- Excellent rise/fall time
- 50 Ohm BNC, dual-LC

Reference & Timing Applications

- Satellite reference signals
- Satellite time code

emcore®

Satellite Communications

RF & FIBER OPTIC SWITCHING, SIGNAL DISTRIBUTION, NETWORK MANAGEMENT & CONTROL

optiva|PLATFORM

GENUINE ORTEL TECHNOLOGY

Optiva OTS-RFS Series Wideband RF Splitters

Optiva OTS-RFS Wideband RF Splitters (RFS) are designed to provide RF signal distribution for satellite antenna applications from 5 MHz to 22 GHz. Band-specific 2.3, 3, 18 and 22 GHz optimized versions are available. The OTS-RFS series provides RF signal distribution to support 1x1 RF fiber link redundancy applications.

Optiva OTS-RSU Series Wideband RF Redundancy Switch Units

Optiva OTS-RSU Wideband RF Redundancy Switch Units (RSU) support satellite signal transport link redundancy applications for 1x1 and 1x4 redundant switch configurations when integrated with Optiva RF fiber optic transmitters and receivers. Band-specific 2.3, 3, 18 and 22 GHz optimized versions are available.

Optiva OTS-1-OSU / OTS-2-OSU 2x2 Dual-Band Optical Switch Units

The Optiva OTS-1-OSU (single switch) and OTS-2-OSU (double switch) units are optimized to perform in the 1310 nm/1550 nm (dual-band) operating wavelengths. The OSU integrated with EMCORE's family of fiber delay line units provides a wide range of configurable microwave system delay line links for satellite, radar and calibration applications, plus general optical switching for fiber line applications.

Optiva 10/100 & 10/100/1000 Ethernet Network Management Connectivity with EMCOREView Management & Control Suite

The Optiva OTP-1ETR and OTP-1GETR fiber Ethernet links, working together with the Optiva EMCOREView Management & Control Suite (OPV-CTLR-1-IC), enables network connectivity to remotely and locally monitor and control all the Optiva cards with the EMCOREView GUI. They provide fiber transport connectivity for SNMP network management traffic between remote satellites and control rooms with one channel of duplex 10/100 or 10/100/1000 Ethernet over fiber.

OTP-1ETR   OTP-1GETR

OPV-CTLR-1-IC

MULTIPLEXING/DEMULTIPLEXING

Optiva MDM-7001 Series CWDM & DWDM Multiplexer/Demultiplexers

The Optiva MDM-7001C CWDM MUX/DEMUX enables multiplexing or demultiplexing of up to 8 CWDM wavelengths onto, or from a common singlemode optical fiber from 1470 nm to 1610 nm. The Optiva MDM-7001D DWDM MUX/DEMUX supports as many as 16 DWDM wavelengths for applications from 1547 nm to 1559 nm. The MDM-7001D/4 is a 1-slot Optiva plug-in module, while the MDM-7001D/8 and MDM-7001D/16 are 2-slot Optiva plug-in modules.

Splitter & Switching Unit Highlights

- Switching, splitting options to 22 GHz
- 50 & 75 Ohm BNC or 50 Ohm SMA
- 1x1 and 1x4 redundant switch configurations (OTS-RSU)
- Automatic and manual redundancy modes (OTS-RSU)
- Dedicated Comm-link for rapid switch response (OTS-RSU-1 models)
- Single or double 2x2 optical switch units (OTS-OSU)
- SNMP monitoring & control (OTS-RSU, OTS-OSU)

Switch & Splitter Applications
- RF redundant link (OTS-RFS, OTS-RSU)
- Configurable delay system (OTS-1-OSU)
- Optical link switch (OTS-1-OSU)

Ethernet NMS Highlights

- Supports 850/1310/1550 nm, CWDM and DWDM (OTP-1GETR) optics
- Singlemode and multimode options

Ethernet/NMS Applications
- LAN/WAN data transport
- Short and long distance Ethernet
- Temporary data feeds

Multiplexer/Demultiplexer Highlights

- Combine and separate up to 16 different CWDM or DWDM wavelengths onto one singlemode fiber
- Minimal optical fiber use for add/drop applications

MUX/DEMUX Applications
- Nodes in dual-redundant fiber rings
- Fiber capacity expansion

Optiva Platform Rack-Mount, Portable & Outdoor Enclosures and Power Supplies

Optiva OT-CC-16F 16-Slot and OT-CC-6 6-Slot 19" Rack-Mount Fan-Cooled Enclosures

The Optiva OT-CC-16F 3 RU and OT-CC-6 1 RU 19" rack-mount, fan-cooled enclosures are ruggedized aluminum housing units that accept any Optiva insert card. Both the 16-slot 3 RU chassis and the 6-slot 1 RU chassis feature hot-swappable power supplies and insert cards and include options for LED indicators for power and status, as well as reversible rack-mounting ears. These high-capacity enclosures provide a state-of-the-art platform for density and space utilization.

OT-CC-16F

OT-CC-6

Optiva OT-DTCR 1- or 2-Slot Desktop or Wall-Mount Enclosures

The Optiva Desk Top Card Racks (DTCR) are ruggedized portable aluminum housing units that accept any Optiva insert card. The 1-slot (OT-DTCR-1) and 2-slot (OT-DTCR-2) enclosures both use an external PS-9012 wall-mount power supply. These enclosures are perfect for installations that are space constrained, or do not require rackable equipment.

OT-DTCR-1

OT-DTCR-2

Optiva PS-200F 200 Watt, PS-9060 60 Watt Power Supplies

The Optiva PS-200F 200 Watt Universal Power Supply is designed for the Optiva OT-CC-16F 19" 3 RU rack-mountable enclosure. The PS-9060 60 Watt Universal Power Supply is designed for the OT-CC-6 19" 1 RU rack-mountable enclosure. All units are hot-swappable and come in an insert card form-factor. The PS-200F is cooled using an internal fan and its rugged ergonomic design and wide temperature range are geared for industrial applications.

PS-200F

Power Supply Options

Model	Description
PS-200F-NA	Power Supply for OT-CC-16F, 12 V, 200 W, 110/220 VAC input, North American AC Cord
PS-200F-DC	Power Supply for OT-CC-16F, 12 V, 200 W, 48 VDC input
PS-9060-NA	Power Supply for OT-CC-6, 12 V, 100 W, 110/220 VAC input, North American AC Cord
PS-9060-DC	Power Supply for OT-CC-6, 12 V, 100 W, 48 VDC input
PS-9012	Power Supply for OT-DTCR-1 & OT-DTCR-2, 12 V

Optiva Enclosure Highlights

- Ruggedized aluminum chassis resists shock and vibration
- Hot-swappable insert cards and redundant power supplies
- Chassis to card grounding protects against electrostatic discharge
- Flexible mounting options:
  - Short mounting ears front and rear
  - Long mounting ears front
- EMI/EMC and safety standards conform to CSA and CSE standards
- Unique Daisy-Chaining design better utilizes fiber bandwidth
- Remote monitoring & control of chassis and module parameters with SNMP management card

PS-9012 Wall Mount Power Supply for OT-DTCR Enclosures

Fiber Optic Amplifiers for Satellite, Microwave & CATV Broadband Applications

ERBIUM DOPED FIBER AMPLIFIERS (EDFA)

Optiva OTS-2O Series EDFA Modules

The Optiva Series Erbium Doped Fiber Amplifier (OTS-2O) and Pre-Amplifier (OTS-2OP) modules are ideal building blocks for system integrators to extend the fiber link for long-haul signal transport. They are designed to meet the most demanding noise performance requirements of fiber optic communications and control systems and perform all the functions required of an optical amplifier for system integration.

The OTS-2O series EDFA provides input and output optical isolation for stable, low noise operation. The input and output optical signal power levels are detected for monitoring and control. The input optical signal is amplified with active gain control for a constant output power level, or with active output power control for constant gain mode operation.

MAFA Series EDFA Gain Modules

EMCORE's MAFA series EDFA gain modules are designed to meet the most demanding noise performance requirements and perform all the functions required of an optical amplifier for system integration. MAFA series EDFA gain modules provide input and output optical isolation for stable, low noise operation. The input and output optical signal power levels are detected for monitoring and control. The input optical signal is amplified with active gain control for a constant output power level, or with active output power control for constant gain mode operation.

EDFA Power Output Options

Model	Output Power
Optiva OTS-2O	14 – 23 dBm
Optiva OTS-2OP Preamplifier	14 dBm (saturated)
MAFA 5000	14 – 24.5 dBm
MAFA 5000-PA Preamplifier	14 – 17 dBm

EDFA Highlights

Optiva Series

- Input level: -6 to 12 dBm (OTS-2O), ≥ -45 dBm (OTS-2OP)
- Output level: 14 / 17 / 20 / 23 dBm (OTS-2O), 14 dBm (OTS-2OP)
- Standard and optional gain flatness
- Input/output isolation > 40/40 dB
- Input/output return loss < -40 dB
- Low electrical power consumption
- SNMP and RS-232 monitoring and control

MAFA Series

- Low noise figure (Typ < 4.5 dB)
- Pin: -10 dBm to +12 dBm
- Pout: +14 dBm to +24.5 dBm
- Input/output isolation > 40/40 dB
- RS-232 monitor & control interface
- Compact size for tight space environments

EDFA Applications

- Long distance RF/microwave fiber optic communication links
- Sensing and control systems
- High power distribution networks
- Long distance microwave and RF optical fiber distribution systems
- CATV systems
- RFoG and RF overlay for FTTx networks

Microwave Communications

50 MHz TO 60 GHz ULTRA-WIDEBAND FIBER OPTIC TRANSPORT

Optiva OTS-2 Series Microwave Band Fiber Optic Links

The OTS-2 Series Unamplified or Amplified (Tx, Rx Fixed Gain) Microwave Band Fiber Optic Links are a family of SNMP managed fiber optic transmitters and receivers that provide high-performance 50 MHz – 40 GHz transport within the Optiva modular platform. 18, 22 and 40 GHz options are available.

Optiva microwave units are tailored to the requirements of higher frequency applications such as microwave antenna signal distribution, electronic warfare systems, broadband delay lines, signal processing, and phased array antennas. Utilizing EMCORE's high-performance, ultra-low Relative Intensity Noise (RIN) source laser and high optical input power capable photodiodes, these modules provide high-dynamic-range. The system operates at a nominal wavelength of 1550 nm. Wavelength selected lasers on the ITU grid are also available to support multichannel DWDM applications.
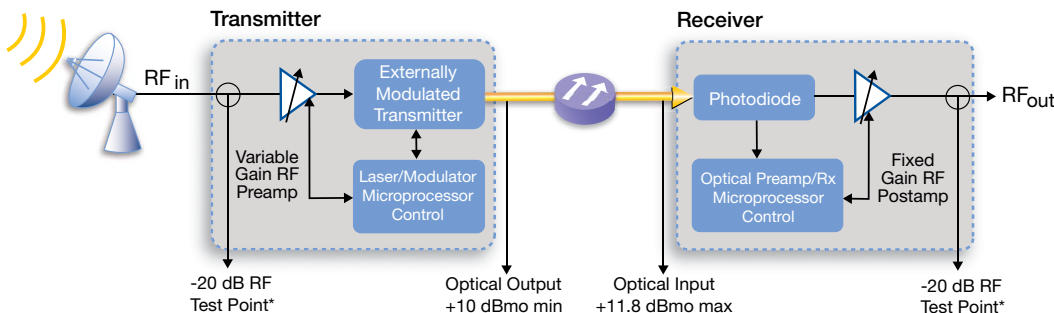
NEW!

Optiva OTS-2 Q/V-Band 60 GHz Unamplified Microwave Band Fiber Optic Links

The Optiva OTS-2 Q/V-Band 60 GHz Microwave Band transmitter and receiver are ideal to construct transparent fiber optic links in the 50 MHz to 60 GHz frequency range for antenna remoting, electronic warfare systems, broadband delay lines, signal processing systems and other high-dynamic-range applications. They feature EMCORE's high-performance, ultra-low RIN (Relative Intensity Noise) source laser technology and high optical input power capable photodiodes.

Microwave Transport Highlights

- Low RIN source laser
- High-dynamic-range of >110 dB-Hz$^{2/3}$
- Microprocessor-based transmitter control for laser bias, modulator bias and link gain
- DWDM cooled DFB laser, 10 dBm output
- SNMP and RS-232 monitoring and control

Microwave Band Applications

- Microwave antenna signal distribution
- Electronic Warfare (EW) systems
- Broadband delay line and signal processing systems
- Frequency distribution systems
- Radar system calibration
- Phased array antenna systems, interferometric antenna arrays

Block Diagram

Transmitter
RF in
Variable Gain RF Preamp
Externally Modulated Transmitter
Laser/Modulator Microprocessor Control
-20 dB RF Test Point*
Optical Output +10 dBmo min

Receiver
Photodiode
Optical Preamp/Rx Microprocessor Control
Fixed Gain RF Postamp
RF out
Optical Input +11.8 dBmo max
-20 dB RF Test Point*

*50 Ohm SMA female connectors

Microwave Communications

RUGGEDIZED MICROWAVE FLANGE-MOUNT TRANSMITTERS & RECEIVERS

Small Integrated Transmitter (SITU) and Receiver (SIRU) Units

SITU

EMCORE's Small Integrated Transmitter Units (SITU) are high-performance directly-modulated and externally-modulated transmitters available from 0.05 – 40 GHz. They can be used to construct transparent links for microwave antenna signal distribution, Electronic Warfare (EW) and Ka-Band systems. Other applications include delay lines, signal processing, radar system calibration, phased array antennas and interferometric antenna arrays.

EMCORE's PIN photodiode-based Small Integrated Receivers Units (SIRU) work with their companion SITU units and are available in 3, 7, 13, 18, 22 and 40 GHz optimized options.

SIRU

SITU/SIRU Frequency Options

Frequency Range / Wavelength	Optical Output Power	Frequency Range / Wavelength	Optical Output Power
0.05 – 3 GHz, 1550 nm	+7 or +10 dBm	0.05 – 22 GHz, 1550 nm	+7 or +10 dBm
0.05 – 7 GHz, 1550 nm	+7 or +10 dBm	0.05 – 40 GHz, 1550 nm	+7 or +10 dBm
0.05 – 13 GHz, 1550 nm	+7 or +10 dBm		
0.05 – 18 GHz, 1550 nm	+7 or +10 dBm		

5021T and TR Series DFB Transmitters and Transceivers

The 5021T and TR Series DFB transmitters and transceivers deliver unmatched performance for radar testing, signal processing, phased array antennas and phase noise testing. These rugged devices eliminate many of the problems that are inherent in alternative transceiver technologies. The 5021T, when used in conjunction with an EMCORE fiber optic receivers, offers superior performance. 5021TR series transceivers are designed for use with EMCORE fiber optic delay spools and deliver performance that is superior to acoustic wave and coaxial delay lines.

5021T

5021TR

5021T Transmitter Frequency Options

Model	Frequency	Description
5021T-A	3 GHz	DFB Transmitter
5021T-B	7 GHz	DFB Transmitter
5021T-C	13 GHz	DFB Transmitter
5021T-D	18 GHz	DFB Transmitter
5021T-E	22 GHz	DFB Transmitter

5021TR Transceiver Frequency Options

Model	Frequency	Description
5021TR-A	3 GHz	DFB Transceiver
5021TR-B	7 GHz	DFB Transceiver
5021TR-C	13 GHz	DFB Transceiver
5021TR-D	18 GHz	DFB Transceiver
5021TR-E	22 GHz	DFB Transceiver

Flange-Mount Transmitter and Receiver Highlights

SITU SIRU

- Low RIN Source laser, laser and modulator bias control circuit, high optical input power photodiode
- High-dynamic-range of >110 dB-Hz$^{2/3}$
- Multiple optical output power options
- DWDM operation
- Fully-integrated unit

SITU SIRU Applications

- Microwave antenna signal distribution
- Broadband delay line and signal processing systems
- Frequency distribution systems
- Phased array antenna systems, interferometric antenna arrays

5021T and TR Series

- Bandwidth from 3 GHz to 22 GHz
- Cooled, isolated direct-mod DFB laser
- High-dynamic-range
- -40 to +65 °C operating temperature range
- Flat frequency response and low phase noise

5021T Series Applications

- Radar testing
- Signal processing
- Phased array antenna systems
- Antenna remoting
- Phase noise processing
- Military communications

Radar Testing, Signal Processing & Phased Array Antennas

FIBER OPTIC DELAY LINES

EMCORE's fiber optic delay lines offer superior performance and provide highly-accurate, repeatable and adjustable electrical time delays. They are available in a variety of ruggedized form-factors and delay lengths of greater than 2,000 μsec are available.

Optiva OTS-ODLS Internal Fiber Delay Line System

optiva PLATFORM

The Optiva OTS-ODLS Internal Fiber Delay Line System is designed for use with Optiva transmitters, receivers, optical switches and EDFAs within the modular Optiva platform. The optical switches (OTS-1-OSU, OTS-2-OSU) allow for up to four separate delays to be combined and switched with a maximum delay time of 40 μs.

DLS (Delay Line System)

EMCORE's DLS provides convenient RF input/outputs that connect to an internal RF transmitter and RF receiver. Frequency range, delay length and link performance requirements can be tailored over a wide range of performance levels to meet specific requirements. The system is supplied as a complete solution with all modules mounted in 19" racks that use standard AC power.

5021D Internal and External Fiber Delay Line Systems

Internal System

The 5021D Internal and External Fiber Delay Lines are rugged devices that eliminate many of the problems that are inherent in alternative transceiver technologies. The small size allows for a long delay in a compact package with the superior temperature stability of fiber.

External System

Delay Lines Frequency and Delay Options

Model	Description	Frequency	Delay
OTS-ODLS 18GHz	Optiva 18 GHz – 40 μs max Internal Fiber Delay Line System	.05 – 18 GHz	3 – 40 μs
OTS-ODLS 22GHz	Optiva 22 GHz – 40 μs max Internal Fiber Delay Line System	.05 – 22 GHz	3 – 40 μs
OTS-ODLS 40GHz	Optiva 40 GHz – 40 μs max Internal Fiber Delay Line System	.05 – 40 GHz	3 – 40 μs
DLS	Delay Line System – Delay Spool and Optical Transceiver	.05 – 40 GHz	3 – > 2,000 μs
5021D-A11	Internal Delay Line System – Delay Spool & Optical Transceiver	.05 – 3 GHz	1 ns – 250 ns
5021D-B11	Internal Delay Line System – Delay Spool & Optical Transceiver	.05 – 7 GHz	1 ns – 250 ns
5021D-C11	Internal Delay Line System – Delay Spool & Optical Transceiver	.05 – 13 GHz	1 ns – 250 ns
5021D-D11	Internal Delay Line System – Delay Spool & Optical Transceiver	.05 – 18 GHz	1 ns – 250 ns
5021D-A13	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 3 GHz	1 ns – 35 μs
5021D-B13	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 7 GHz	1 ns – 35 μs
5021D-C13	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 13 GHz	1 ns – 35 μs
5021D-D13	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 18 GHz	1 ns – 35 μs
5021D-A15	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 3 GHz	1 ns – 65 μs
5021D-B15	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 7 GHz	1 ns – 65 μs
5021D-C15	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 13 GHz	1 ns – 65 μs
5021D-D15	External Delay Line System – Delay Spool & Optical Transceiver	.05 – 18 GHz	1 ns – 65 μs

Delay Lines Highlights

Optiva Delay Line System

- 40 μsec delays max
- Smaller size and less weight - conserves rack space
- Flat phase response
- Minimal triple-transit echoes
- Low temperature sensitivity

DLS

- Fiber-based: Longer delays possible than with coax/waveguide/SAW technology
  - Delays > 2,000 μsec available
- RF in – RF out: Requires no user expertise in fiber
- Unity RF link gain: Preserves RF signal levels
- 0.05 - 40 GHz bandwidth
  - Replaces multiple waveguide systems with a single link
- Lightweight: Enables airborne and mobile solutions

5021D

- Internal and external delay system options
- -40 to +65 °C operation
- Flat frequency response
- High-dynamic-range

Delay Line Applications

- Radar system manufacturing, calibration and testing
- Signal processing
- Phase noise processing
- Phased array antenna systems
- Electronic Warfare (EW) systems
- Military aircraft

Optiva EMCOREView *NextGEN* Network Management System (NMS) & EMCORE-API

The Optiva EMCOREView Management & Contol Suite makes remote monitoring and control of Optiva enclosures and modules simple. Through the utilization of Simple Network Management Protocol (SNMP), EMCOREView works the Optiva EMCOREView Controller Card (Model OPV-CTLR-IC) occupying a single slot in any Optiva enclosure and can monitor all cards operating in the chassis while operating under a uniform software platform which allows for efficient integration with other devices. It collects data coming from any Optiva enclosure and the Optiva EMCOREView Network Management System (NMS) software analyzes and displays the data to the user. It can display transmitter optical output, receiver optical input power, chassis alarm, status in real-time, and more. In addition, Optiva EMCOREView monitors and displays card status such as laser and photodiode current, as well as module temperature.

EMCORE-API (Application Programming Interface) for Optiva Platform

NEW! EMCORE-API is an application programming interface that can communicate with EMCORE's Optiva Platform via NMS Card pulling data into a customer's (or 3rd party) IT system. It is compatible with a variety of programming languages including C++, Java, Java Script, Python and Node, and allows the link of multiple of equipment suppliers under one platform for lower IT and maintenance cost. There is no additional charge with Optiva-based systems and EMCORE assistance on implementation is available as part of the **EMCORE-*Advance* Partnership Plan** which provides many advantages including expedited RMA/repair services, extended warranty to 18 months,expedited spares program, preferential pricing, enhanced customer support, future roadmap visibility, and more.

EMCOREView Highlights

- Real-time chassis/card updates
- Three different user level access with password protection
- NEW User-friendly GUI
- 10/100/1000 Ethernet monitoring
- Auto detection of signals
- Optical bandwidth system diagnostics
- Supports SNMP V1 V2c and V3
- Supports Android, IOS, MAC OSX, Windows, Linux

EMCORE-API Highlights

- Optiva NMS-based API integrated to your IT system
- EMCORE product functions across any IT system with uniform look and feel
- Remote back-up control & optical switching from a central location
- Schedule switching and maintenance options remotely for increased uptime

Screen Examples from NEW EMCOREView Graphical User Interface

emcore®

EMCORE Satellite & Microwave Communications

EMCORE is a vertically-integrated manufacturer that pioneered the MOCVD (Metal-Organic Chemical Vapor Deposition) process for both development and production of many of the compound semiconductor-based materials and devices in use today. EMCORE owns and operates a 7,000 square foot semiconductor wafer fabrication plant at our corporate headquarters in Alhambra, California.

EMCORE's vertical integration and differentiated laser platform, based on Genuine Ortel linear fiber optic technology, allows us to achieve many variants in optical design. Key elements can be independently optimized supporting customization and faster product design cycles. EMCORE has development, qualification and production capabilities in advanced photonics from prototyping to volume manufacturing. EMCORE's combination of semiconductor manufacturing expertise and advanced photonics design capability has enabled us to achieve strong penetration in the government, aerospace & defense, and commercial satellite and microwave communications markets.

Quality Management - ISO 9001 Certified

EMCORE's various manufacturing processes involve extensive quality assurance systems and performance testing. Our manufacturing facilities have all acquired and maintain ISO 9001 certification.

Ask Us About the EMCORE-*Advance* Partnership Plan

EMCORE-*Advance* is an Integrator Development & Branding Program designed to *Advance* a systems integrator's ability to win business, maximize profits, and improve customer satisfaction.

Program Highlights

- EMCORE's state of the art technology offered as OEM friendly products to *Advance* the technology available to systems integrators
- Easily customized Web based tools and Private/OEM branding to *Advance* and unify integrator brand image a presence
- Preferential pricing, warranty, and RMA to *Advance* integrator profits

How To Contact

For more information about EMCORE solutions for Satellite & Microwave Communications, visit **www.emcore.com**, or contact us below.

EMCORE Corporation

North America

2015 Chestnut Street
Alhambra, CA 91803 USA
P +1 626-293-3400
F +1 626-293-3428

Europe, Middle East, Africa, Russia

P +44 7775 560 677

Email

For EMCORE Satellite & Microwave Communications products, email **satcom-sales@emcore.com**.

GENUINE ORTEL TECHNOLOGY

CE MADE IN USA