

# Canary Multi-Rate Transponders

## Featuring:

- **Multi-mode, Single-mode, Single-Fiber & CWDM Optics**
- **Protocol Transparent Interfaces from 10 Mbs to 2.7 Gigabits per second!**
- **Standalone Versions & Modules for CCN-2000 & CCM-1600 Converter Chassis**

Canary's Multi-Rate Transponders (MRT) provide extremely agile, protocol transparent, fiber-to-fiber network interfaces for data rates ranging from less than 100 Mbs (OC-3) to 2.7 Gigabits per second. As Optical Line Drivers, they function as mode and Wavelength Converters.

Our Multi-Rate Transponders are available as individual standalone units and as modules for Canary's SNMP Manageable CCN-2000/0400 20-slot and 4-slot chassis and CCM-1600 16-slot chassis families.

One MRT configuration employs two SFP type fiber connectors, the other uses one SFP and one GBIC type connector. Both provide maximum flexibility with a wide array of hot-swappable optics.

Single-Fiber Bi-Directional and CWDM (Coarse Wavelength Division Multiplexing) interfaces are available for selected data rates. Both increase the data handling capacity of existing fiber infrastructures.

Configured with Single-Fiber Bi-Directional interfaces, a Multi-rate Transponder pair enables two stations to communicate over one strand of optical fiber.

With CWDM interfaces, MRTs enable multiple network users to simultaneously access a single-mode segment linking multiple locations and allow selected user channels to exit and return to a fiber ring at intermediate locations.

Canary Multi-rate Transponders enable Service Providers to economically provision and manage multiple services and protocols over fiber links by using a single board type – minimizing the number of boards needed for spares. Chassis versions are ideal for high-density central locations.

Canary Communications is an industry leader in providing advanced connectivity solutions for the evolving network.



### **Gigabit & Fibre Channel • Fiber-to-Fiber Conversion.**

*Extends transmission distances to 80 Km for 1.0625 & 2.125 MegaBaud (up to 2.7 Gigabits) data traffic.*

### **SONET • Fiber-to-Fiber Conversion.**

Supports OC-1/3/12/48 data rates with associated FEC. Jitter performance is better than minimum SONET requirements. Compatible with DS3, Fast Ethernet and HDTV transmissions.

### **Optional Single Fiber Bi-Directional and CWDM Interfaces.**

Single-Fiber Bi-Directional optics double the capacity of duplex fiber. CWDM allows multiple data channels to be multiplexed and simultaneously transported in parallel, over single-mode fiber.

### **Two Optional Connector Formats.**

One configuration includes two SFP (small form pluggable) LC type connectors, the second includes one SFP plus one GBIC SC type connector for a wider selection of lower cost Gigabit & Fibre Channel connections.

### **Unparalleled network integration and versatility.**

Use Multi-Rate Transponders with variable data rate fiber connectors for mixed protocol installations. Without changing the fiber connector, one Transponder can function as a spare for many different protocol interfaces.

**Specifications**

PRELIMINARY

Multi-Rate Transponders (No Optics)			
Model	Description	Connectors	Notes
MRT-2SFP	Standalone Multi-Rate Transponder	(2) SFP (LC Type) Slots	Data Rates Defined by SFP Connector Ranges
MRT-GBSF	Standalone Multi-Rate Transponder	(1) SFP (LC) + (1) GBIC (SC) Slot	Gigabit Ethernet, Fibre Channel (1.063 - 2.125Gbd)
CN-MT-2SFP	CCN-2000/ 0400 Multi-Rate Transponder Module	(2) SFP (LC Type) Slots	Data Rates Defined by SFP Connector Ranges
CN-MT-GBSF	CCN-2000/ 0400 Multi-Rate Transponder Module	(1) SFP (LC) + (1) GBIC (SC) Slot	Gigabit Ethernet, Fibre Channel (1.063 - 2.125Gbd)
CM-MT-2SFP	CCM-1600 Multi-Rate Transponder Module	(2) SFP (LC Type) Slots	Data Rates Defined by SFP Connector Ranges
CM-MT-GBSF	CCM-1600 Multi-Rate Transponder Module	(1) SFP (LC) + (1) GBIC (SC) Slot	Gigabit Ethernet, Fibre Channel (1.063 - 2.125Gbd)

GBIC Optical Transceivers		Multi-Mode		Single-Fiber Bi-Direct.		Single-Mode		CWDM		
Protocol	Data Rate (Gbps)	Model	Transmit Distance	Model	Transmit Distance	Model	Transmit Distance	Model	Transmit Distance	Wave-length (nano-meters)
Gigabit Ethernet & Fibre Channel -1	1.250	G-55SX	220/550m	N/A	N/A	G-31LX	10 Km	.	.	.
	1.0625 Gbd	G-55SX	220/550m	.	.	G-31L-2	20 Km	.	.	.
Fibre Channel -1 & Fibre Channel -2	1.0625 Gbd To 2.125 Gbd	GD-55SX	150/300m**	.	.	G-31L-3	30 Km	* G-CXX-4	40 Km	1430-1610 nm
						GD-31L-4	40 Km **	GD-CXX-4	40 Km **	1430-1610 nm
						G-31L-45	40 Km	G-CXX-5	50 Km	1430-1610 nm
						G-31Z-7	70 Km	G-CXX-7	70 Km	1430-1610 nm
Fibre Channel -1 & Fibre Channel -2	1.0625 Gbd To 2.125 Gbd	GD-55SX	150/300m**	.	.	GD-31Z-8	80 Km **	G-CXX-8	80 Km	1430-1610 nm
						G-31Z-12	120 Km	G-CXX-12	120 Km	1430-1610 nm

< Optical Transceivers are Special Order With 2 to 4 Week Lead Times >

SFP Optical Transceivers		Multi-Mode		Single-Fiber Bi-Direct		Single-Mode		CWDM		
Protocol	Data Rate (Mbps)	Model	Transmit Distance	Model	Transmit Distance	Model	Transmit Distance	Model	Transmit Distance	Wave-length (nano-meters)
DS3	44.73									
OC-1	51.84									
Fast Ethernet & OC-3 / STM-1	125.00 & 155.52	SF-M13	2000 m	SF-53MA	2000 m	SM-S13	2 Km ^			
				SF-35MB	2000 m	SM-S13-1	15 Km ^			
				SF-53SA	20 Km	SM-S13-4	40 Km ^			
				SF-35SB	20 Km	SM-S15-4	40 Km ^	* SM-CXX	40 Km ^	1430-1610 nm
				SF-53SA-4	40 Km	SM-S15-5	50 Km ^	SM-CXX-6	60 Km ^	1430-1610 nm
				SF-35SB-4	40 Km	SM-S15-8	80 Km ^	SM-CXX-10	100 Km ^	1430-1610 nm
				SF-53SA-6	60 Km					
SF-35SB-6	60 Km									
OC-12 / STM-4	622.08	SA -M13	1000 m	SA -53MA	1000 m	SM-S13	2 Km ^			
				SA -35MB	1000 m	SM-S13-1	15 Km ^			
				SA -53SA	20 Km	SM-S13-4	40 Km ^			
				SA -35SB	20 Km	SM-S15-4	40 Km ^	* SM-CXX	40 Km ^	1430-1610 nm
				SA -53SA-4	40 Km	SM-S15-5	50 Km ^	SM-CXX-6	60 Km ^	1430-1610 nm
				SA -35SB-4	40 Km	SM-S15-8	80 Km ^	SM-CXX-10	100 Km ^	1430-1610 nm
Gigabit Ethernet & Fibre Channel -1	1250.00 & 1.0625 Gbd	SD-M85	300/500m**	SG-53MA	300/500m	SM-S13	2 Km ^			
				SG-35MB	300/500m	SM-S13-1	15 Km ^			
				SG-53SA	10 Km	SM-S13-4	40 Km ^			
				SG-35SB	10 Km	SM-S15-4	40 Km ^	* SM-CXX	40 Km ^	1430-1610 nm
				SG-53SA-2	20 Km	SM-S15-5	50 Km ^	SM-CXX-6	60 Km ^	1430-1610 nm
				SG-35SB-2	20 Km	SM-S15-8	80 Km ^	SM-CXX-10	100 Km ^	1430-1610 nm
				SG-53SA-4	40 Km					
				SG-35SB-4	40 Km					
				SG-53SA-6	60 Km					
				SG-35SB-6	60 Km					
Fibre Channel -2	2.125 Gbd	SD-M85	150/300m**	NA	NA	SM-S13	2 Km ^			
						SM-S13-1	15 Km ^			
						SM-S13-4	40 Km ^			
						SM-S15-4	40 Km ^	* SM-CXX	40 Km ^	1430-1610 nm
						SM-S15-5	50 Km ^	SM-CXX-6	60 Km ^	1430-1610 nm
						SM-S15-8	80 Km ^	SM-CXX-10	100 Km ^	1430-1610 nm
OC-48 / STM-16	2488.32	SD-M85	150/300m**	NA	NA	Same As Above Grp.	Same As Above	Same As Above Grp.	Same As Above	Same As Above

Dual Speed \*\*      Multi-Rate ^      A = Tx1550 / Rx1310 nm and B = Tx1310 / Rx1550 nm      \* SM-CXX with XX = 43 to 61 = (1430 to 1610 nm)

## Mechanical Specifications

PRELIMINARY

### Chassis Modules for CCN-2000 & CCN-0400

#### **CN-MT-2SFP**

- Two SFP (LC Type) Receptacles
- Six Diagnostic LED Indicators

#### **CN-MT-GBSF**

- One SFP (LC) + One GBIC (SC) Receptacle
- Six Diagnostic LED Indicators:

### Chassis Modules for CCM-1600

#### **CM-MT-2SFP**

- Two SFP (LC Type) Receptacles
- Six Diagnostic LED Indicators

#### **CM-MT-GBSF**

- One SFP (LC) + One GBIC (SC) Receptacle
- Six Diagnostic LED Indicators:

### Standalone Multi-Rate Converters

#### **MRT-2SFP**

- Two SFP (LC Type) Receptacles
- Six Diagnostic LED Indicators

#### **MRT-GBSF**

- One SFP (LC) + One GBIC (SC) Receptacle
- Six Diagnostic LED Indicators:

#### **LED Indicators (all versions):**

- Six Diagnostic LED Indicators:
- Fiber Link, Port 1
- Fiber Link, Port 2
- Loss Lock, Port 1\*
- Loss Lock, Port 2\*
- LFS (Disabled)
- Status (PCB Temp. & Voltage within Specifications)

\* Loss Lock ~ Internal processor has lost its Lock on the transported protocol's reference timing signal.

#### **Power Supply:**

- External Switching Power Supply
- 100/240 VAC, 50/ 60 Hz, 0.4 Amp max

#### **Environmental:**

- Operating Temp.: 0 to 50 °C
- Storage Temp.: -10 to 66 °C
- Relative Humidity: 5% to 95%, non-condensing

#### **Mechanical:**

- Length: 5.75" (14.61 cm)
- Width: 2.82" ( 7.16 cm)
- Height: 1.00" ( 2.54 cm)
- Single Unit Weight: 1.5 lb ( 0.68 Kg)
- Shipping Weight 2.5 lb ( 1.14 Kg)



#### **Notes on CWDM Usage:**

Group (A) Wavelengths ( $\lambda_s$ ) = 1470, 1510, 1550, 1590 nm  
Group (B) Wavelengths ( $\lambda_s$ ) = 1490, 1530, 1570, 1610 nm

Transponders use CWDM transceivers that are specified to use wavelengths from the above Groups in order to be compatible with Canary Passive Multiplexer/De-multiplexers and OADMs (Optical Add - Drop Multiplexers) as well as other vendor's products.

Each optical CWDM transceiver or module includes two characters that exactly specify its working wavelength. That is, where XX = the middle characters of the wavelength e.g. XX= 47 ~ 1470 nm. Thus a G-L-47 and G-L-55 operate at 1470 nm or 1550 nm respectively.

ITU G-652.C compliant, single-mode fiber or better is recommended for CWDM applications.

#### **Regulatory: (compliant or pending)**

- IEEE 802.3u, z, A/B, ANSI X3T1 FC-AL compliant
- Designed in compliance with CE, UL, CSA and TUV Safety Standards (certifications pending)
- Class 1 lasers conform to US 21 CFR (J), EN 60825-1 and UL 1950 applications
- FCC Part 15, Class A and EN 55022 (Radiated Emissions) (certifications pending)
- EN 55024:1998 (Immunity)
- ISO 9001:2000 Certified

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