

# Rack Solution for CWDM Sigma Links 5000



## 5U Chassis Rack Type

Sigma Links 5000 is a flexible, cost-effective optical transport system, designed to multiplex, demultiplex and switch high-speed data for storage, video and voice applications. Sigma Links 5000 is housed in a standard 5U, 19 or 23 inch rack mountable transport platform for CWDM application, which features 17 universal hot-swappable module slots. Currently supported module line cards include SNMP, Transponders, Mux/ Demux, OADM, Optical protection and optical channel monitors. The Sigma Links 5000 supports optional redundant power and SNMP management. Another unique feature of the Sigma Links 5000 is line card designs, which may be

transformed into standalone units. The use of a common PCB card which may either be placed in the rack or used as a standalone unit reduces manufacturing costs as well as the inventory of spares required by distributors, installers, and end users. The NMS (Network Management System) option includes an SNMP card (agent) and standard MIB file for importation and compilation into network management platforms such as HP OpenView or CA Unicenter. This allows remote configuration and system monitoring via industry standard network management software.

## Features

- 5U high, 19 (or 23) inch Rack with convertible standalone units, rack accommodates up to 17 card modules
- All modules are hot-swappable with AC/DC Power redundant and cooling fans module
- Alarm Relay contacts
- Chassis Cascade up to 6 Chassis
- LED and LCD status indication with keypad control
- TFTP firmware upgrade
- Support Console, Telnet, SNMP, Web management
- Up to 8 CWDM wavelengths in compliance with ITU G.694.2

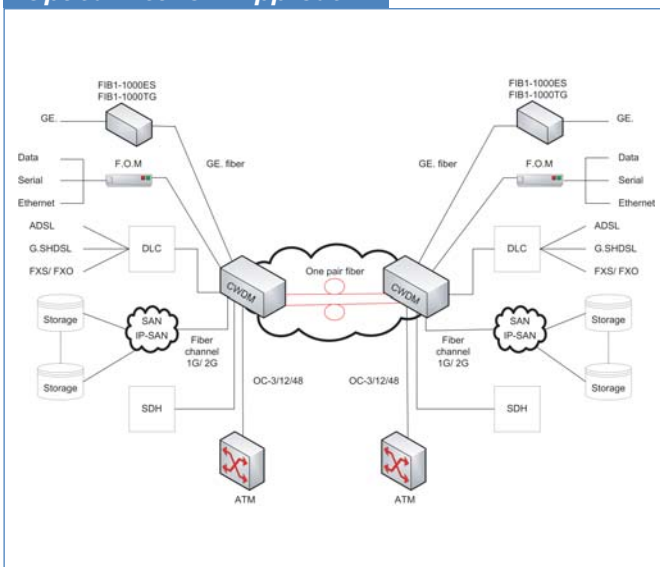
## Specifications

Slots	17 slots in front for slide-in-module
	2 slots in front for power supply module
Power	AC module 90 — 264 VAC; Frequency: 47 — 63 Hz
	DC module -18 — -56 VDC
Environment	Temperature 0 — 50°C (Operating) ; -20 — 70°C (Storage)
	Humidity 10 — 90% (Storage)
Power Consumption	72W
Dimensions(WxDxH)	440mm x 247mm x 219.2mm
Weight	9.5kg (Not including any line-cards)

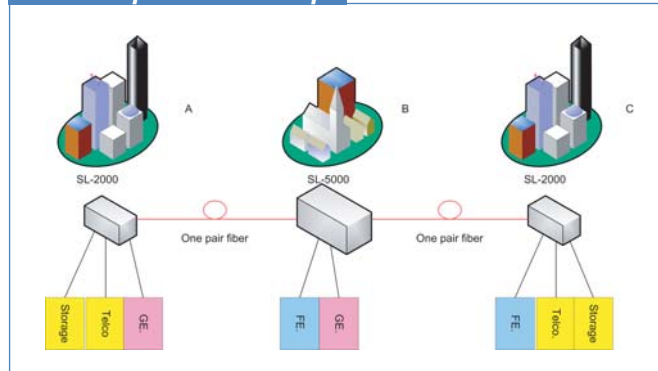
## Ordering Info

<b>Main Chassis</b>	
SML-50-9051-R	19" 5U 17 slots Chassis
<b>Network Management</b>	
SML-50-9210-R	SNMP Card
<b>Power</b>	
SML-50-9110-R	AC power supply (90 to 264 VAC)
SML-50-9120-R	DC power supply (±18 to ±6 VDC)
SML-50-9121-R	DC power supply (±36 to ±72 VDC)

## Application - Optical Network Approach



## Application - Point to point add/ drop



# Rack Solution for CWDM Sigma Links 2000



## 2U Chassis Rack Type

Sigma Links 2000 is a flexible, cost-effective optical transport system, designed to multiplex, demultiplex and switch high-speed data for storage, video and voice applications. Sigma Links 2000 is housed in a standard 2U, 19 or 23 inch rack mountable transport platform for CWDM application, which features 6 universal hot-swappable module slots. Currently supported module line cards include SNMP, Transponders, OADM, Mux/Demux, Optical protection and optical channel monitors. The Sigma Links 2000 supports optional redundant power and SNMP management. Another unique feature of the Sigma Links 2000 is line card designs which may be transformed

into standalone units. The use of a common PCB card which may either be placed in the rack or used as a standalone unit reduces manufacturing costs as well as the inventory of spares required by distributors, installers, and end users. The NMS (Network Management System) option includes an SNMP card (agent) and standard MIB file for importation and compilation into network management platforms such as HP OpenView or CA Unicenter. This allows remote configuration and system monitoring via industry standard network management software.

## Features

- 2U high, 19 (or 23) inch Rack with convertible standalone units, rack accommodates up to 6 card modules
- All modules are hot-swappable with AC/DC Power redundant and cooling fans module
- Alarm Relay contacts
- LED status indication
- TFTP firmware upgrade
- Support Console, Telnet, SNMP, Web management
- Up to 8 CWDM wavelengths in compliance with ITU G.694.2

## Specifications

Slots	6 slots in front for slide-in-module	
	2 slots in back for power supply module	
Power	AC module	90 — 264 VAC; Frequency: 47 — 63 Hz
	DC module	-18 — -56 VDC
Environment	Temperature	0 — 50°C (Operating); -20 — 70°C (Storage)
	Humidity	10 — 90% (Storage)
Power Consumption	25W	
Dimensions(WxDxH)	440mm x 260mm x 89mm	
Weight	4.8kg (Not including any line-cards)	

## Ordering Info

<b>Main Chassis</b>	
SML-20-9021-R	19" 2U 6 slots Chassis
<b>Network Management</b>	
SML-20-9210-R	SNMP Card
<b>Power</b>	
SML-20-9110-R	AC power supply (90 to 264 VAC)
SML-20-9120-R	DC power supply (±18 to ±56 VDC)
SML-20-9121-R	DC power supply (±36 to ±72 VDC)

# SNMP

Communicates with single or multiple chassis's control card via RS-485 serial protocol.



## Specifications

Power	12VDC, 1.2A	
Environment	Temperature	0-50°C (Operating) ; -20-70°C (Storage)
	Humidity	10 — 90% (Storage)
Power Consumption	5W	
Dimensions(WxDxH)	162mm x 220mm x 25mm	
Weight	0.9kg	
Compliance	FCC part 15 class A, CE Mark	

## Features

- 2 x 100 Base-FX (SFP) ports
- 3 x 10/100M Base-TX ports
- In chassis cascade mode, the SNMP option is required only in chassis #0, the master chassis
- Management control to Mux/Demux card, Protection card & Transponder Card, OADM Card, SNMP v1 Trap, MIB file
- Real-Time Clock feature
- Supports Telnet access control
- Supports web browser control feature
- TFTP SNMP F/W upgradeable

# Transponder



The transponder card converts a data signal to the correct wavelength for transmission on a specific channel. By supporting SFP optics on both line side and client side interfaces, which provides a truly flexible and easy to deploy solution for all applications. The transponder supports 2R regeneration, which consists of re-amplification and reshaping.

## Features

- 2R regeneration (Re-amplification and reshaping)
- Line rate support from 100Mbps up to 2.5Gbps
- Client Side Wavelength: 850/ 1310/ 1550nm
- Line Side CWDM Wavelength 1471/ 1491/ 1511/ 1531/ 1551/ 1571/ 1591/ 1611nm
- Optical Connector: SFP-LC Type (Line Side), SFP-LC Type (Client Side)

## Specifications

Wavelength	Client Side	850/1310/ 1550nm
	Line Side	1471/ 1491/ 1511/ 1531/ 1551/ 1571/ 1591/ 1611 nm
Power	12VDC, 1.2A	
Environment	Temperature	0 — 50°C (Operating) ; -20 — 70°C(Storage)
	Humidity	10 — 90% (Storage)
Power Consumption	5W	
Dimensions(WxDxH)	162mm x 220mm x 25mm	
Weight	0.9kg	
Compliance	FCC part 15 class A, CE Mark	

# Mux/ Demux



Optical Mux/Demux (Multiplexes/Demultiplexes) cards are available in 4-channel or 8-channel models and are used to combine signals from one-channel or two-channel transponder cards on to a single pair of fiber. A 1311nm non-CWDM channel is accessible separately. The MUX/DEMUX cards provide the primary wave division and combination functions. Line side wave lengths require translation to client side equipment via the transponder card.

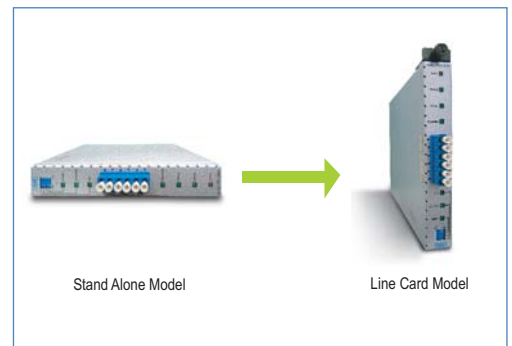
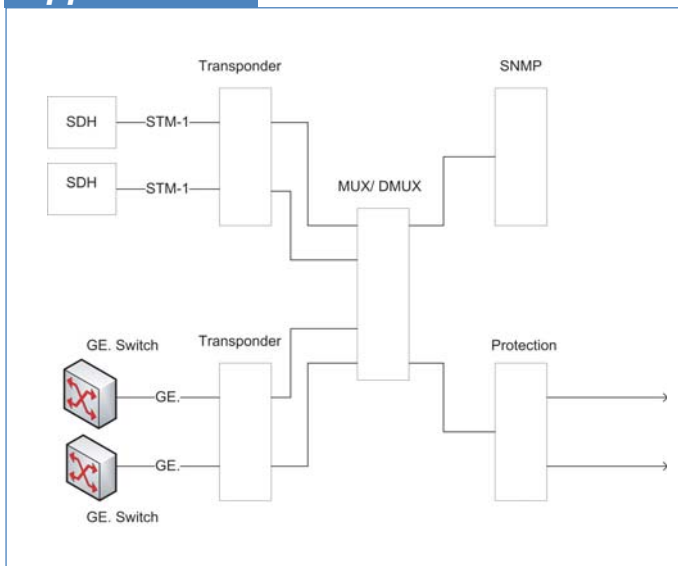
## Features

- Four different CWDM Mux/ Demux are available: 4 channels, 4+1channels, 8 channels, 8+1 channels
- Full native mode performance
- Optical connectors: LC connectors, SMF 9/ 125mm
- Optical input/ output monitoring port
- Passive model requires no power
- Protocol transparent, no limitation
- Utilizes industry standard ITU CWDM wavelengths

## Specifications

Wavelength (according to ITU-T G.694.2)	4 channels	1531/ 1551/ 1571/ 1591 nm
	4+1 channels	1531/ 1551/ 1571/ 1591nm + 1311 nm
	8 channels	1471/ 1491/ 1511/ 1531/ 1551/ 1571 /1591/1611 nm
	8+1 channels	1471/ 1491/ 1511/ 1531/ 1551/ 1571/ 1591/ 1611nm +1311 nm
Environment	Temperature	0 — 50°C (Operating) ; -20 — 70°C (Storage)
	Humidity	10 — 90% (Storage)
Dimensions(WxDxH)	162mm x 220mm x 25mm	
Weight	0.9kg	
Compliance	FCC part 15 class A, CE Mark	

## Application



# Protection

CTCU offers an optical protection unit that is able to fiber path redundancy on a channel by channel basis. These unit are particularly well suited for protection in fiber data transmission. The solution includes monitoring capabilities for both working and protection paths. The monitoring is available through the SNMP Management unit. In case of a fiber cut in the protecting path, traffic will be switched over to the protecting path in less than 50 ms.



## Features

- 1+1 full optic protection
- Low channel cross talk (< -55dB)
- Low insertion loss (< 6.5dB)
- The switch has "Latching" possibility, if power is lost, the switch remains in its current position
- Time from line failure to restored traffic is less than 50 ms
- The unit works for any combination of 1 ~16 wavelengths
- Traffic is switched under three mode Auto, Semi-Auto, Manual
- Optical Interface Type : LC connectors
- Working and protecting lines are physically separated fiber stretches that can be regarded as individual transmission links

## Specifications

Power	12VDC, 1.2A	
Environment	Temperature	0 — 50°C (Operating); -20 — 70°C(Storage)
	Humidity	10 — 90% (Storage)
Power Consumption	10W	
Dimensions(WxDxH)	162mm x 220mm x 25mm	
Weight	0.9kg	
Compliance	FCC part 15 class A, CE Mark	

# OADM

An Optical Add/Drop Multiplexer takes a single wavelength from a trunk, pulls the signal out, and allows a new signal at the same wavelength to be inserted into the trunk at roughly the same spot. All the other wavelengths pass through the Add/Drop Multiplexer with only a small loss of power (usually < 2.5dB including connectors and adapters). An Optical Add/Drop Multiplexer (OADM) is available allowing a single wavelength to be dropped or added at specific sites in linear Add/Drop topology.



## Optical Performance

Number of channels	CWDM: 1 add/drop channel, 2 add/drop channels
Operating Channel CWDM add & drop channel	Any channels out of 1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611, 1311 nm (to be defined via order information)
Channel width: CWDM channels	> =13nm (around center wavelength)
Insertion Loss	IN-OUT >= 2.5 dB
	Add to Drop < 2.0 dB
Isolation	CWDM adjacent channel Isolation >= 30dB
	CWDM non-adjacent ch's at CWDM drop port >= 35dB
Optical Return Loss	>= 50dB
PDL	>= 0.1dB

## Specifications

Environment	Temperature	0 — 50°C (Operating); -20 — 70°C (Storage)
	Humidity	10 — 90% (Storage)
Fiber Type	9 / 125 / 250um	
Dimensions(WxDxH)	162mm x 220mm x 25mm	
Weight	0.9kg	
Compliance	FCC part 15 class A, CE Mark	

## Ordering Info

Transponder	
SML-50-8011-L/S	1.25G, 1-Channel Transponder card, Line rates support 100Mbps to 1.25Gbps (without SFP Fiber Transceiver)
SML-50-8012-L/S	1.25G, 2-Channel Transponder card, Line rates support 100Mbps to 1.25Gbps (without SFP Fiber Transceiver)
SML-50-8021-L/S	2.5G, 1-Channel Transponder, Line rates support 100Mbps to 2.5Gbps (without SFP Fiber Transceiver)
SML-50-8022-L/S	2.5G, 2-Channel Transponder, Line rates support 100Mbps to 1.25Gbps (without SFP Fiber Transceiver)

Protection	
SML-50-8210-L/S	Optical Line Protection Switch

L: Line Card  
S: Standalone

OADM	
SML-50-831X-L/S	1 channel, OADM Drop/Insert card X= 0:(1311),X=1:(1471),X=2:(1491), X=3:(1511),X=4:(1531),X=5:(1551), X=6:(1571),X=7:(1591),X= 8:(1611)nm
SML-50-832X-L/S	2 channels, OADM Drop/Insert card, LC X=1:(1471& 1491), X=2:(1551& 1571), X=3:(1551& 1571), X=4:(1591& 1611)nm

Mux/ Demux	
SML-50-8140-L/S	4 channel Mux/Demux unit (1531, 1551, 1571, 1591)nm
SML-50-8141-L/S	4+1 channel Mux/Demux unit (1311,1531 , 1551, 1571, 1591)nm
SML-50-8180-L/S	8 channel Mux/Demux unit(1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611)nm
SML-50-8181-L/S	8+1 channel Mux/Demux unit (1311,1471 , 1491, 1511, 1531, 1551, 1571, 1591, 1611)nm