



PRODUCT INFORMATION

Chassis– CH3000



- 3 RU stackable without spacer requirement
- Passive midplane supports power and management system
- All slots are identical: any combination of modules can be installed in any slot
- Up to 14 active full depth modules and one power supply
- Up to 32 passive half depth modules (unpowered chassis)
- Patented dynamic back plate for plug-and-play
- Supports front and rear module plug-in

Description

The model CH3000 is WISI Network's advanced mid-plane, 3 RU chassis design which offers the network operator a platform featuring maximum flexibility, high packaging density and simplicity of operation. The CH3000 is ideal for all types of optical networks, single wavelength, CWDM or DWDM, and for both Analog and Digital transmission techniques. The CH3000 incorporates the unique combination of two design features, the mid-plane platform concept and a patent pending dynamic back plate on all active modules. The midplane provides the DC power bus, the universal communications bus and facilitates the installation of modules from either the front or the rear of the chassis. Dynamic back plates simplify pre-wiring of the chassis; module replacement can be accomplished from the front of the chassis without disconnecting/reconnecting cables at the back of the chassis. The combination of mid-plane platform design and the dynamic back plate feature on all active modules makes the CH3000 the industry's most flexible and configurable platform for traditional HFC, passive HFC and fiber to the home (FTTH) networks.

The CH3000 also features a very high packaging density design accommodating a wide variety of both active and passive modules. Modules, depending on function performed, are either half platform depth or full platform depth. The CH3000 accepts up to 32 half depth passive modules or 14 full depth active modules and a power supply module or configurations combining the use of both full depth and half depth modules. The high packaging density and configuration flexibility make the CH3000 ideal for both Headend and Hub applications where rack space is at a premium.

The CH3000 is available in 2 configurations; Model CH3000C with top and bottom decorative covers and Model CH3000N without the top and bottom decorative covers.

Specifications

Physical:

- Dimensions:

(3RU) (34 cm x 13.5 cm x 48.5 cm)

D x H x W

- **Weight:**

CH3000N 9.6 lbs (4.5 kg) Chassis without covers

CH3000C 15.6 lbs (7 kg) Chassis with top and bottom covers

- Slot Configuration:

16 full-depth slots

32 half-depth slots (16 front-loaded and 16 rear-loaded)

- **General:**

All slots are identical (no specific slot allocation)

Supports any combinations of modules

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$ (-4° to 149°F)

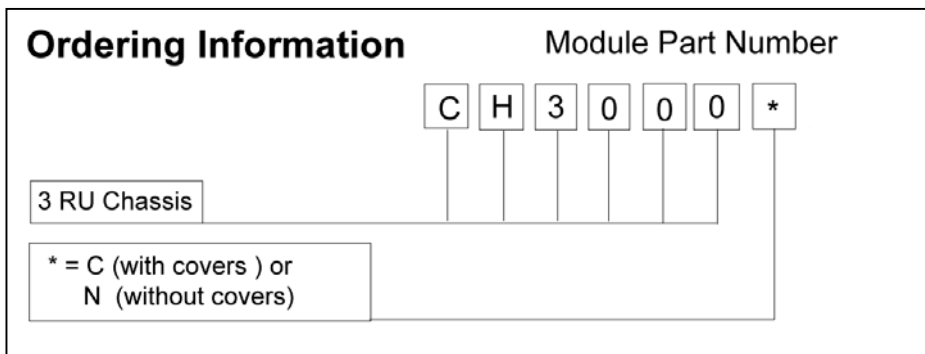
- Storage temperature range: -40° to $+85^{\circ}\text{C}$ (-40° to 185°F)

- Humidity: 5% to 95% non-condensing

Electrical:

- 32 midplane electrical interconnects (16 front and 16 rear), providing contacts for chassis alarm, slot address, RS-485 communication and 12 VDC power bus

- Supports hot plug-in of modules





PRODUCT INFORMATION

216W AC Power Supply - PS 3002



- 216 Watts
- Two packaging options, with or without display:
- Alphanumeric display (D version)
- Auto sensing in the ranges 90–132 VAC and 180–264 VAC
- Hot swap and load sharing functionality
- Thermal shutdown protection
- Bellcore, UL and FCC compliant
- Front panel On/Off switch
- Front or rear plug-in
- Power supply module occupies 2 full-depth slots

Description

The Model PS3002 is a high performance, 216 Watt power supply and controller for the model CH3000 chassis. The PS3002 accepts a nominal AC input voltage of 115 volts or 220-240 volts and either 50 or 60 Hertz, and outputs 12 volts DC to the power bus of the CH3000 mid-plane. Power supply operational features include hot swap capability, load sharing for redundant operation, overvoltage and short circuit protection and thermal shutdown protection.

The PS3002 is available in two configurations, the Model PS3002D with alphanumeric display and the Model PS3002N without display. The PS3002 dual-width module occupies 2 fulldepth chassis slots and is shipped with dynamic Back Plate Model BP-P2 and power cord.

The PS3002 functions as the chassis controller and enables the network operator to set alarm parameters for key functions of all active modules, read status of these key functions and query alarms. On the Model PS3002D this is accomplished with a front panel alphanumeric display and control switch or via a serial communications (craft) port. On the Model PS3002N, which includes alarm LEDs, these functions are performed via a front panel serial communications (craft) port.

To simplify installation, set-up and maintenance of WISI Networks' CH3000 chassis, auto discovery of installation or removal of all active modules is performed by the PS3002.

Specifications

Physical:

- Dimensions:
(3RU) (33 cm x 11 cm x 5 cm)
D X H X W
- Weight:
PS3002N 3.0 lbs (1.4 kg)
PS3002D 3.2 lbs (1.4 kg)
- Space allocation:
Width: Occupies 2 of 16 slots in 3RU Chassis
Depth: 13.00" (full depth)



Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Electrical:

- Input:
115 VAC range from 90 to 132 VRMS
220-240 VAC range from 180 to 264 VRMS
Input line frequency range from 47 to 63 Hz
Input current protection: 5A Fuse (SLO-BLO)
- Output:
Nominal voltage: 12.0 VDC
Nominal power: 216 W
- Efficiency:
Nominal load: 78%
50% load: 75%

Indicator LEDs on Model PS3002N:

Status Indicator LED:

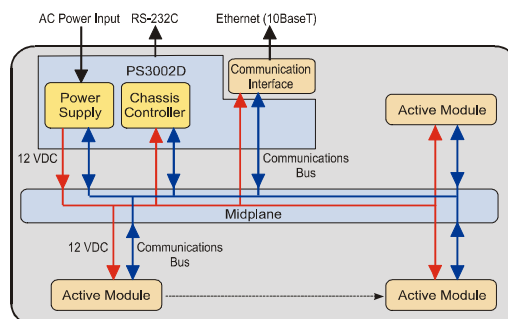
- Green = OK
- Yellow = Non-service-affecting alarm
- Red = Service-affecting alarm

Access Indicator LED:

- Blue = Lighted during communication with chassis modules

Back-Up P/S Indicator LED:

- Green = Lighted if back-up power is present within the chassis



Ordering Information	Module Part Number	Required Module Back Plate
216W AC Power Supply	P S 3 0 0 2 *	B P - P 1
* = D (with Display) or N (without Display)		Back Plate is included with ordered module



PRODUCT INFORMATION

-48 VDC Power Supply – PS3048



- 216 Watts
- Two packaging options, with or without display:
- Alphanumeric display (D version)
- Status LEDs (N version)
- Input voltage –36 to –60 VDC
- Hot swap and accurate load sharing functionality
- Thermal shutdown protection
- Bellcore, UL and FCC compliant
- Front or rear plug-in
- Power supply module occupies 2 full-depth slots

Description

The Model PS3048 is a high performance, 216 Watt power supply and controller for the model CH3000 chassis. The PS3048 accepts a nominal DC input voltage from -36 volts to -60 volts and outputs 12 volts DC to the power bus of the CH3000 mid-plane. Power supply operational features include hot swap capability, load sharing for redundant operation, overvoltage and short circuit protection and thermal shutdown protection.

The PS3048 is available in two configurations, the Model PS3048D with alphanumeric display and the Model PS3048N without display. The PS3048 dual-width module occupies 2 fulldepth chassis slots and is shipped with dynamic Back Plate Model BP-P2 and power cord.

The PS3048 functions as the chassis controller and enables the network operator to set alarm parameters for key functions of all active modules, read status of these key functions and query alarms. On the Model PS3048D this is accomplished with a front panel alphanumeric display and control switch or via a serial communications (craft) port. On the Model PS3048N, which includes alarm LEDs, these functions are performed via a front panel serial communications (craft) port.

To simplify installation, set-up and maintenance of WISI Networks' CH3000 chassis, auto discovery of installation or removal of all active modules is performed by the PS3048.

Specifications

Physical:

- Dimensions:
(3RU) (33 cm x 11 cm x 5 cm)
D x H x W
- Weight:
PS3048N 3.0 lbs (1.4 kg)
PS3048D 3.2 lbs (1.4 kg)
- Space allocation:
Width: Occupies 2 of 16 slots in 3RU Chassis
Depth: 13.00" (full depth)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Electrical:

- Input:
-48 VDC (from -36 to -60 VDC)

- Output:
Nominal voltage: 12.0 VDC
Nominal power: 216 W
- Efficiency:
Nominal load: $> 80\%$
50% load: $> 75\%$
- Load sharing accuracy: $\pm 5\%$

Indicator LEDs on Model PS3048N:

Status Indicator LED:

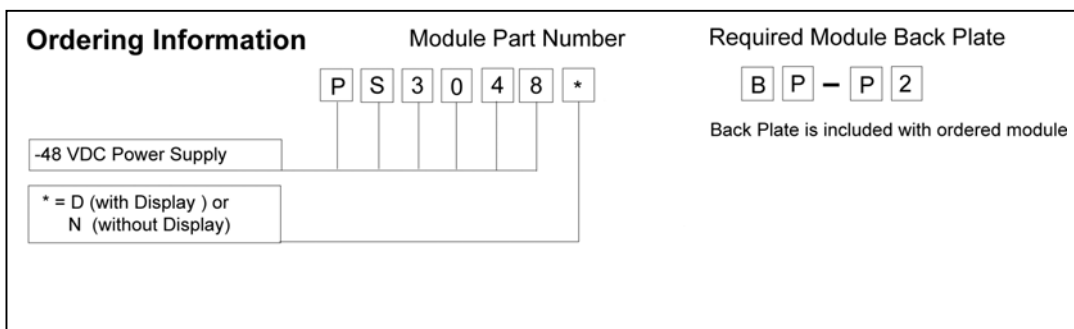
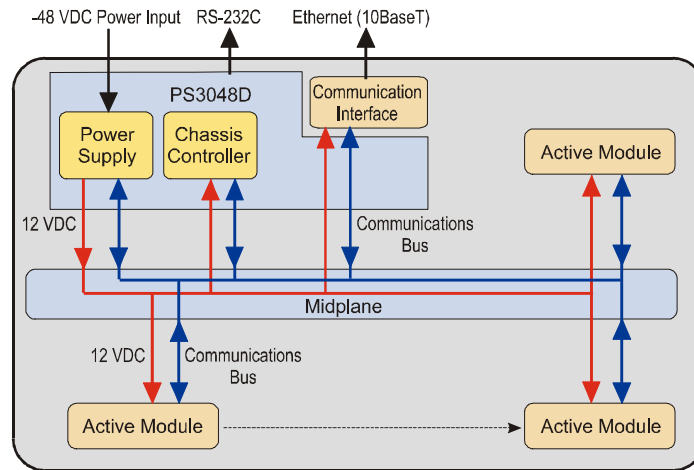
- Green = OK
- Yellow = Non-service-affecting alarm
- Red = Service-affecting alarm

Access Indicator LED:

- Blue = Lighted during communication with chassis modules

Back-Up P/S Indicator LED:

- Green = Lighted if back-up power is present within the chassis





PRODUCT INFORMATION

1310 Analog Transmitter 870 MHz – AT3300



- Link loss budgets available from +4 to +13 dB
- 870 MHz RF Bandwidth
- Industry's highest rack density (14 transmitters per 3RU chassis)
- +15 dBmV/channel RF input drive level
- Superior flatness, ± 0.6 dB
- Front access -20 dB input test point
- Front panel laser On/Off interlock switch
- Hot plug in/out
- Local and remote status monitoring features
- Occupies one full-depth slot

Description

The WISI AT3300 series is a family of high performance 1310nm analog DFB transmitters that provide high performance optical transport over link losses ranging from 4 to 13 dB. High density packaging enables network operators to install up to 14 transmitters per 3RU chassis, all of which can be monitored remotely or locally from the power supply module. Additionally, the compact single-width module design can be plugged in either the front or the rear of the CH3000 3RU chassis.

The compact design minimizes rack space requirements in headends or hubs and enhances deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions:
(3RU) (33 cm x 11 cm x 2.5 cm)
D x H x W
- Weight: 1.6 lbs (0.72 kg)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

General:

- Wavelength: $1310\text{ nm} \pm 10\text{ nm}$
- Hot plug-in/out
- Manual gain alignment

RF and Optical Interface:

- RF input:
- F-type (female connector at Back Plate BP-A1)
- Input RF test point:

G-type (male connector at frontpanel, -20 dB)

- Optical connector:
SC/APC (at Back Plate BP-A1)

Power Requirements:

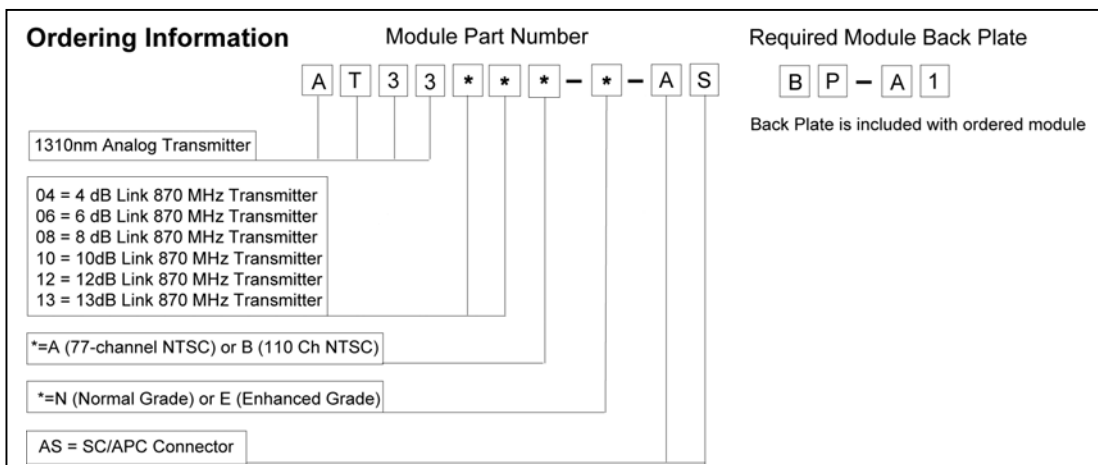
- Input voltage: 12 VDC
- Power consumption: 15 W

Electrical:

- Pass band: 46–870 MHz
- Frequency response (including slope): $\pm 0.6\text{ dB}$
- Nominal RF input level: 15 dBmV/ch
- Gain control range: 0 to -6 dB minimum
- Gain control step: 0.5 dB
- Input impedance: $75\ \Omega$
- Input return loss, minimum:
18 dB (46–550 MHz)
16 dB (550–870 MHz)
- Level stability: $\pm 0.6\text{ dB}$ (over operating temperature range)
- Level repeatability: $\pm 0.5\text{ dB}$

Optical Fiber Loss and Performance			Normal Grade						Enhanced Grade					
			CNR ₁			CSO ₂	CTB ₂	CXMA ₂	CNR ₁			CSO ₂	CTB ₂	CXMA ₂
Link Loss	P out (dBm)	Fiber Loss (min)	77-ch NTSC	110-ch NTSC	42-ch CENELEC	<i>(applicable to all channel plans)</i>			77-ch NTSC	110-ch NTSC	42-ch CENELEC	<i>(applicable to all channel plans)</i>		
4 dB	2-4	3.5 dB	52.0	51.0	53.0	64.0	69.0	65.0	53.0	52.0	54.0	65.0	70.0	65.0
6 dB	4-6	5.5 dB	52.0	51.0	53.0	64.0	69.0	65.0	53.0	52.0	54.0	65.0	70.0	65.0
8 dB	6-8	7.2 dB	52.0	51.0	53.0	64.0	69.0	65.0	53.0	52.0	54.0	65.0	70.0	65.0
10 dB	8-10	9.0 dB	52.0	51.0	53.0	64.0	69.0	65.0	53.0	52.0	54.0	65.0	70.0	65.0
12 dB	10-12	9.0 dB	51.0	51.0	52.0	64.0	69.0	65.0	52.0	52.0	53.0	65.0	70.0	65.0
13 dB	12-13	9.0 dB	51.0	51.0	52.0	64.0	69.0	65.0	52.0	51.5	53.0	65.0	70.0	65.0

¹CNR – measurements with 4 MHz noise bandwidth for 77-channel and 110-channel NTSC channel plans; 5 MHz noise bandwidth for 42-channel CENELEC. ²CSO₂, CTB₂ and XMOD measurements tested within 46-870 MHz.





PRODUCT INFORMATION

1550nm Analog Transmitter 870 MHz – AT1550



- 9.5 dBm output power(min)
- 870 MHz RF bandwidth
- 77–channel and 110-channel NTSC, 42–channel CENELEC
- 65 km and 100 km pathlength options
- Two broadcast wavelength options (1545nm or 1563nm), or optional selection of DWDM ITU grid channel
- OMI adjustment
- AGC Select: CW, Video, Manual (no AGC)
- Front access –20 dB input test point
- LED status indication
- Front panel laser On/Off interlock switch
- AC and DC powering options
-

The WISI AT1550 series high performance 1550nm externally modulated analog transmitters are available in several optional configurations to meet various network requirements and feature minimum output power of 9.5 dBm with 14–16 dBm SBS suppression. The transmitters are packaged in a convenient 1RU 19" housing. Several wavelength options are available, including broadcast center wavelengths at 1545nm or 1563nm, or channel selection on the DWDM ITU grid (ITU-T G.694.1). The characteristics of the transmitter's source laser allow high carrier-to-noise ratio (CNR) while the proprietary predistortion circuit that drives the optical modulator provides excellent CSO and CTB performance, with 300 MHz of digital channel loading 6 dB below the analog channels. This family of transmitters is part of the full complement of products to support and enhance the deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions: 38,5 x 4,5 x 48,5 cm (D x H x W)
- Weight: 5,7 kg

Environmental:

- Operating temperature range: 0 °C to +50 °C
- Storage temperature range: -25 °C bis +70 °C
- Humidity: 20 % to 85 %, non condensing

Power requirement:

- Input voltage: 90 to 260 V_{AC}, 50/60 Hz
- Power consumption: 60 W
- Optional: -48 V_{DC} (-36 bis -60 V_{DC})

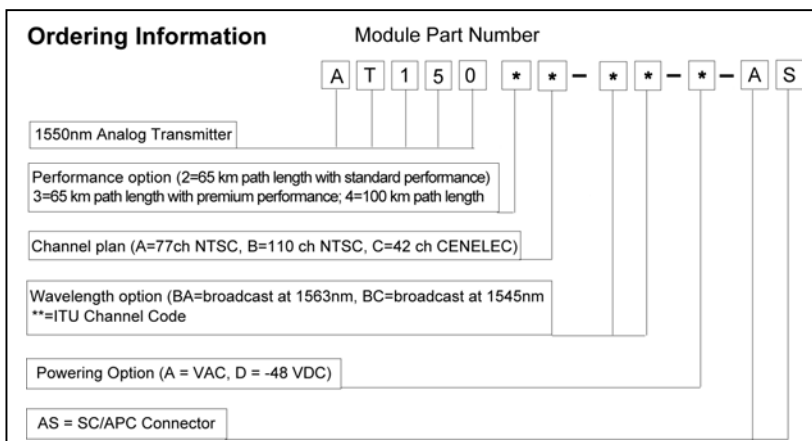
Optical interface:

- 1.545,3 nm ± 0,9 nm (Broadcast „BC“ models)
- 1.563,0 nm ± 0,9 nm (Broadcast „BA“ models)
- (DWDM ITU Grid available by special request)
- Optical connector SC/APC

General:

- Channel plans: 77 ch NTSC, 110 ch NTSC, 42 ch CENELEC
- Specified link length: 65 km or 110 km (options)
- Frequency range: 45 - 870 MHz
- Output power (minimum): 9,5 dBm
- Input power range (dBmV/ch, CW) 17 (manual) / 22 (AGC)
- Frequency range: ± 0,5 dB (45 to 550 MHz) ± 0,75 dB (45 to 870 MHz)
- Input return loss: 16 dB min. (45 to 550 MHz) 14 dB min. (550 to 870 MHz)
- Status monitoring: via interface from RS-232 port on rear panel to CX3001 Communications Modul

Performance over Operating temperature range		Performance option								
		65 km, Standard			65 km, Premium			100 km		
		Channel plan								
		77 ch NTSC AT1502A- **-*-AS)	110 ch NTSC AT1502B- **-*-AS)	42 ch CENELEC AT1502C- **-*-AS)	77 ch NTSC AT1503A- **-*-AS)	110 ch NTSC AT1503B- **-*-AS)	42 ch CENELEC AT1503C- **-*-AS)	77 ch NTSC AT1504A- **-*-AS)	110 ch NTSC AT1504B- **-*-AS)	42 ch CENELEC AT1504C- **-*-AS)
SBS Suppression	dBm	16			16			14		
Carrier-to-noise Ratio (CNR)^{1,2}										
In band (45–550 MHz)	dB	53			53			50.5		
Out of band (550–870 MHz)	dB	50			53			50.5		
Composite Second Order (CSO)²										
In band (45–550 MHz)	dB	67			67			65		
Out of band (550–870 MHz)	dB	64			64			61		
Composite Triple Beat (CTB)²										
In band (45–550 MHz)	dB	66			66			65		
Out of band (550–870 MHz)	dB	63			63			62		
Cross Modulation (XMOD) ²	dB	65			65			65		



¹77 NTSC analog channels (4 MHz NBW), 45–550 MHz. CNR degradation ≤ 1.5 dB with 300 MHz QAM signal loading in 550–870 MHz, 6 dB below analog channels.
²All values are specified with unmodulated carriers of equal power at the input of the transmitter.



PRODUCT INFORMATION

1550nm Analog Transmitter 870 MHz – AT1550 System B/G



- 9.5 dBm output power(min)
- 870 MHz RF bandwidth
- 64–channel System B/G
- 65 km and 100 km pathlength options
- Two broadcast wavelength options (1545nm or 1563nm), or optional selection of DWDM ITU grid channel
- OMI adjustment
- AGC Select: CW, Video, Manual (no AGC)
- Front access –20 dB input test point
- LED status indication and LCD status monitoring and control panel
- Remote management capability via the provided interface cable and the CX3001 SNMP management module for PS3000 series Power Supplies
- Front panel laser On/Off interlock switch
- AC and DC powering options

The WISI AT1550 series high performance 1550nm externally modulated analog transmitters are available in several optional configurations to meet various network requirements and feature minimum output power of 9.5 dBm with 13,5–16 dBm SBS suppression. The transmitters are packaged in a convenient 1RU 19" housing. Several wavelength options are available, including broadcast center wavelengths at 1545nm or 1563nm, or channel selection on the DWDM ITU grid (ITU-T G.694.1). The characteristics of the transmitter's source laser allow high carrier-to-noise ratio (CNR) while the proprietary predistortion circuit that drives the optical modulator provides excellent CSO and CTB performance. This family of transmitters is part of the full complement of products to support and enhance the deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions: 38,5 x 4,5 x 48,5 cm
(D x H x W)
- Weight: 5,7 kg

Environmental:

- Operating temperature range: 0 °C to +50 °C
- Storage temperature range: -25 °C bis +70 °C
- Humidity: 20 % to 85 %, non condensing

Power requirement:

- Input voltage: 90 to 260 V_{AC}, 50/60 Hz
- Power consumption: 60 W
- Optional: -48 V_{DC} (-36 bis -60 V_{DC})

Optical interface:

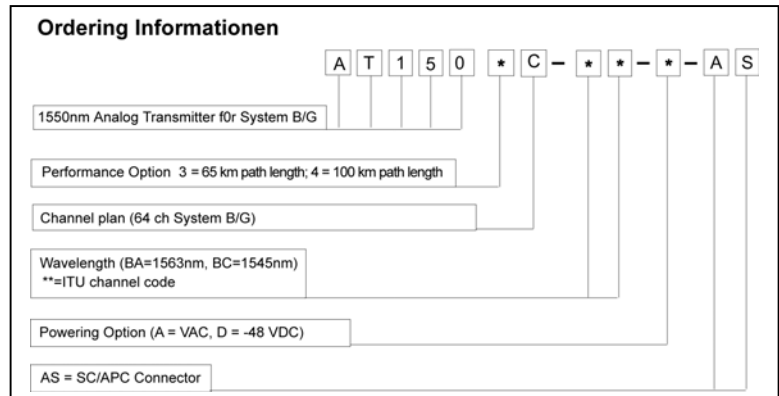
- 1.545,3 nm ± 0,9 nm (Broadcast „BC“ models)
- 1.563,0 nm ± 0,9 nm (Broadcast „BA“ models)
(DWDM ITU Grid available by special request)
- Optical connector SC/APC

General:

- Channel plans: 64 ch B/G
- Specified link length: 65 km or 100 km (options)

- Frequency range: 45 - 870 MHz
- Output power (minimum): 9,5 dBm
- Input power range (dBmV/ch, CW) 17 (manual) / 22 (AGC)
- Frequency range: ± 0,5 dB (45 to 550 MHz)
± 0,75 dB (45 to 870 MHz)
- Input return loss: 16 dB (45 to 550 MHz)
14 dB (550 to 870 MHz)
- Level stability: ± 0.6 dB
- Gain control range: +1.0 to -3.0 dB
- Gain control step size: 0.25 dB
- **Status Indicators, Alarms and Monitoring:**
- Front panel LEDs (Laser On/Off and Alarms)
- LCD display of parametric status and alarm information
- Pushbutton controls for LCD display, mode of operation and modulation adjustment
- External status monitoring via interface from RS-232 port on rear panel to CX3001 Communications Module in PS3000 series Power Supply Modul

Performance over Operating Temperature Range		Performance Option		
		65 km	100km	
		64 ch B/G	64 ch B/G	
		AT1503C-**-AS)	AT1504C-**-AS)	
SBS Suppression	dBm	16,0	13,5	
Carrier-to-noise Ratio (CNR)	dB	52,8	51,3	
Composite Second Order (CSO)	45-552 MHz	dB	67	65
	552-745 MHz	dB	64	62
	745-858 MHz	dB	64	62
Composite Triple Beat (CTB)	45-552 MHz	dB	67	65
	552-745 MHz	dB	64	63
	745-858 MHz	dB	64	63
	Cross Modulation (XMOD) ²	dB	65	65





PRODUCT INFORMATION

Optical Amplifier – FA3500



- High output power level from 14 to 21 dBm
- Low noise figure
- Single and dual amplifier configurations
- Optical path isolation (input and output)
- Output power alignment
- Front panel laser On/Off interlock switch
- Hot plug in/out
- Local and remote status monitoring and control
- Occupies one full-depth slot

Description

The WISI FA3500 series is a family of high-output, extremely compact 1550 nm optical amplifiers. Output powers ranging from 14 to 21 dBm are available in a single-width module designed for use in the CH3000 3RU chassis. Dual amplifier versions, which provide two optically independent amplifiers in a single-width module, are also available with 14 and 17 dBm output power. These high performance amplifiers allow operators to use 1550 nm analog and DWDM transmitters to deliver high-quality broadcast and digital narrowcast content over significant transmission distances. The compact design makes these amplifiers the highest density EDFAs in the market, dramatically reducing rack space requirements in the headend and hubs. This design enhances the deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions: (3RU) (33 cm x 11 cm x 2.5 cm)
D x H x W
- Weight: 2.0 lbs (0.9 kg)

Environmental:

- Operating temperature range: -20° to +65°C
- Storage temperature range: -40° to +85°C
- Humidity: 5% to 95% non-condensing

Optical Interface:

- Optical connector: SC/APC (at Back Plate BP-F2 or BP-F4)

Power Requirements:

- Input voltage: 12 VDC
- Power consumption (Watts):

Model Number	Ambient Temperature		
	+65°C		+25°C
	Startup	Steady-state	Steady-state
FA3514S	10	8	5
FA3514D	16	13	7
FA3517S	10	8	5
FA3517D	16	13	7
FA3520S	15	13	7
FA3521S	17	15	9



Optical:

- Output power and noise figure chart:

Nominal Output Power	dBm 14	17	20	21
Noise Figure, max	dB 5	5	5.2	5.2
Noise Figure, typical	dB 4.5	4.5	4.8	4.6

- Output power stability: ± 0.1 dB
- Input signal wavelength: 1530–1565 nm
- Input power range: -10 to +10 dBm
- Optical signal path isolation: > 30 dB

Ordering Information

Module Part Number

F A 3 5 * * * - A S

Fiber Amplifier (EDFA)

Optical output power (14, 17, 20 or 21 dBm)

Model (S=single output, D = dual output, F = gain-flattened single output1)

AS = SC/APC Connector

Required Module Back Plates

BP-F2

Single Output EDFA

BP-F4

Dual Output EDFA

Back Plate is included with ordered module.

Note 1: Dual outputs are available for 14 and 17 dBm models.



PRODUCT INFORMATION

Analog Dual Return Receiver (225 MHz) – AR3001



- Dynamic optical input range
–12 to +1 dBm at 1550 nm and
–10 to +2 dBm at 1310 nm
- High RF output (–31 dBmV/Hz typ)
- RF output gain control with local or remote status monitoring
- High packaging density (up to 28 receivers per chassis)
- Front access –20dB output test points
- Hot plug in/out
- Local and remote status monitor capability
- Occupies one full-depth slot

Description

The AR3001 is a dual analog return path receiver (RPR). Its compact design (single-width module) makes it the highest density packaging in the market. It allows the operator to install up to 28 return path receivers in one 3RU chassis.

The high output power of the AR3001 allows passive RF splitting, saving rack space and increasing reliability.

This compact design minimizes rack space requirements in the headend and hubs, and enhances deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions:
(3RU) (33 cm x 11 cm x 2.5 cm)
W x D x H
- Weight: 1.6 lbs (0.72 kg)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

RF and Optical Interface:

- 2 RF outputs: F-type (female connectors at Back Plate BP-A2)
- 2 RF output test points: G-type (male connectors at front panel, -20 dB)
- Optical connector: SC/APC (at Back Plate BP-A2)

Power Requirements:

- Input voltage: 12 VDC
- Power consumption: 12 W

General:

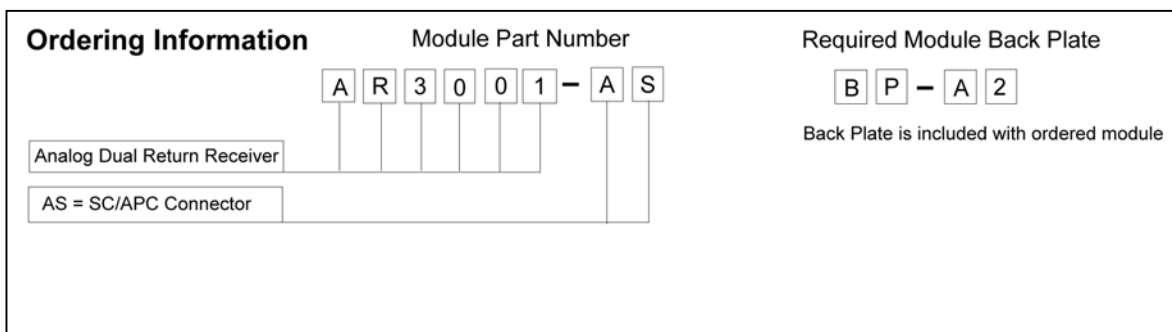
- Hot plug-in/out
- Manual gain alignment

Electrical:

- Pass band: 5–225 MHz
- Frequency response: ± 0.25 dB / 50 MHz
(5 – 200 MHz)
- Nominal output level: -31 dBmV/Hz (45 dBmV total)
- Output return loss: Minimum 18 dB
- Level stability: ± 0.5 dB
- Gain control range: 26 dB minimum
- Gain control step: 1.0 dB nominal

Optical:

- Wavelength: 1300nm – 1600nm
- Input return loss: 45 dB
- Optical power input range:
PIN min 1310/1550 nm : $-10/-12$ dBm
PIN max 1310/1550 nm: 2/1 dBm





PRODUCT INFORMATION

Analog Forward Receiver (870 MHz) – AR3002



- Optical power input range from -6 to $+3$ dBm
- High RF output (28 dBmV at 0dBm input, 4% OMI) with excellent distortion performance
- Demultiplexing back plates available for DWDM applications (up to four receivers per cascable back plate)
- High packaging density (up to 14 receivers per chassis)
- Front access -20 dB output test point
- Hot plug in/out
- Local and remote status monitoring capability
- Occupies one full-depth slot

Description

The AR3002 is an analog receiver that supports a forward path passband from 46 to 870 MHz. Its compact design (single-width module) makes it the highest density packaging FPR in the market, and allows the operator to install up to 14 receivers in one 3RU chassis. The high output power of the AR3002 allows passive RF splitting, saving rack space and increasing reliability.

Alternate network fiber routing is supported via use of two AR3002 receivers and a userprogrammable A/B switch (the Model AB32S1S-0-00 Alternate Routing Switch that also occupies one slot in the chassis).

For DWDM applications, the Model AR3002-1 version of the receiver can be used with integrated demultiplexing back plates, providing a dramatic reduction in rack space and fiber jumper requirements. Each Model BP-35D4x back plate provides a common DWDM optical input with individual RF outputs for up to four adjacent receivers in the chassis, and DWDM optical output ports permit cascading of additional back plates.

The compact design of the AR3002 receiver minimizes rack space requirements and enhances deployment of traditional HFC, passive HFC and fiber to the home (FTTH) networks.

Specifications

Physical:

- Dimensions:
(3RU) (33 cm x 11 cm x 2.5 cm)
D x H x W
- Weight:
1.5 lbs (0.68 kg)

Environmental:

- Operating temperature range: -20° to +65°C
- Storage temperature range: -40° to +85°C
- Humidity: 5% to 95% non-condensing

RF and Optical Interface:

- RF output: F-type (female connector at Back Plate)
- RF output test point: G-type (male connector at front panel, -20 dB)
- Optical connector:
SC/APC (at Back Plate BP-A3, or connector at mid-plane mates to BP-A5 or BP-35D4x, see Notes in Ordering Information)

Power Requirements:

- Input voltage: 12 VDC
- Power consumption: 10 W

General:

- Hot plug-in/out

- MTBF (full load at 40°C, MIL-HDBK-217E): 200,000 hrs

Optical:

- Wavelength: 1300nm – 1600nm
- Input return loss: 45 dB
- Optical power input range:
PIN (1310/1550 nm), typ: -6 to +3 dBm
PIN (1310/1550 nm), max: +6 dBm (*damage level*)
- Responsivity (1310/1550 nm), nominal: 0.85 / 0.95 A/W

Electrical:

- Passband: 46–870 MHz
- Frequency response: ±0.75 dB
- Nominal output level: 28 dBmV (@ 0 dBm input, 4% OMI)
- Output return loss, min: 18 dB
- Level stability: ±0.5 dB
- Level repeatability: ±0.75 dB

Distortions (at nominal 28 dBmV output level):

Channel Loading

	77 CW		110 CW	
	typ	min	typ	min
C/CSO (dB)	76	71	76	71
C/CTB (dB)	82	78	80	76
C/XMOD (dB)	81	74	77	70

Ordering Information

Module Part Number

Analog Forward Receiver

A

R

3

0

0

2

*

-

A

S

* = 0 (optical input at Back Plate BP-A3, included with order) or 1 optical input interconnected to mid-plane connector;

AS = SC/APC Connector

Back Plate Options

* When ordering an AR3002 with option 0, Back Plate BP-A3 is provided with the module.

B

P

-

A

3

* When ordering an AR3002 with option 1, the Back Plate must be separately ordered. Two different styles of back plate are available in this case, depending on the application. One style provides connection for a single receiver. This single-width back plate may be ordered as:

B

P

-

A

5

The second style provides connections for a group of four receivers installed in adjacent chassis slots. These 4-channel demux back plates (for which the DWDM inputs can be cascaded from one back plate to another) may be ordered for the following channel groups:
 BP-35D4B für ITU Ch 21-27, BP-35D4C für ITU Ch 29-35, BP-35D4D für ITU Ch 37-43, BP-35D4E für ITU Ch 45-51, BP-35D4F für ITU Ch 53-59.

B

P

-

3

5

D

4

*

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0

0

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A

S



PRODUCT INFORMATION

Communications module – CX3001



- SNMPv1 proxy agent monitors modules in CH3000 Chassis and external equipment
- Easy integration with any standard SNMPv1-compliant NMS
- Provides status, alarms, configuration and SNMP traps
- Supports WISI's Opti-Trace family of management software over a standard IP network
- Two 10BaseT ports; second port supports daisy-chaining of CX3001 modules in multiple chassis
- RS-232 port for external device monitoring (with autodetection of AT1550 Series Transmitters)
- Normally closed, normally open and common contacts for driving an external alarm
- Connector for external +12Vdc chassis backup power
- No additional chassis slot required (mounts on top of any power supply module from rear of chassis)
- Hot plug in/out

Description

The CX3001 Communication Module supports the configuration and monitoring of modules in the CH3000 Chassis, monitors the chassis mid-plane alarm line (and provides contacts for connection of external alarm equipment) and provides contacts for connection of external chassis backup power. Mounted on top of any power supply module, it does not require a dedicated slot in the chassis.

In addition to compatibility with WISI's Opti-Trace software, the module's standard SNMPv1 proxy agent enables equipment monitoring and integration with other NMS solutions. The CX3001 maintains a separate cache of status and configuration information for each active CH3000 module during runtime.

One of the CX3001's two 10BaseT ports is used to interface with WISI's Opti-Trace family of management software over a standard IP network. The second 10BaseT port can be used to daisy-chain additional CX3001 modules to support monitoring of multiple chassis per site, thus reducing requirements for external hubs. An RS-232 port provides an interface for monitoring of externally connected equipment.

The CX3001 also provides automatic healing so that power-down failure will not affect communications within a daisy-chain of remaining CX3001s; in this scenario, management traffic will simply loop through the failed module.

Specifications

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Power Requirements:

- Input voltage: 12 VDC (400 mA)
- Power consumption: 5 W

General:

- Hot plug-in/out
- Management interface: RJ45 (2 10BaseT ports)

Ethernet Ports:

- Connector type: 8-pin RJ45 (2 connectors, IN and OUT)
- Cable length: 328 ft (100 m), CAT-5 compliant
- Speed supported: 10 Mbps (full duplex)

Front Panel:

- RS-232 Port: external device monitoring with auto-detection of

externally connected AT1550 Series transmitter

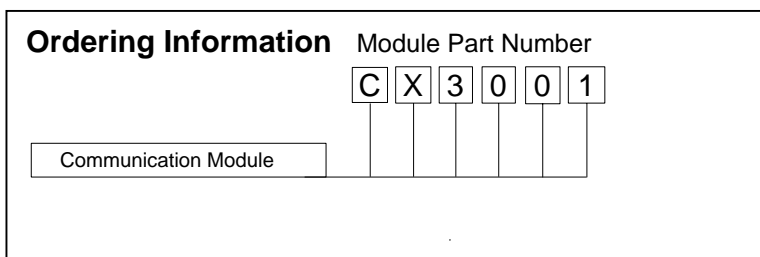
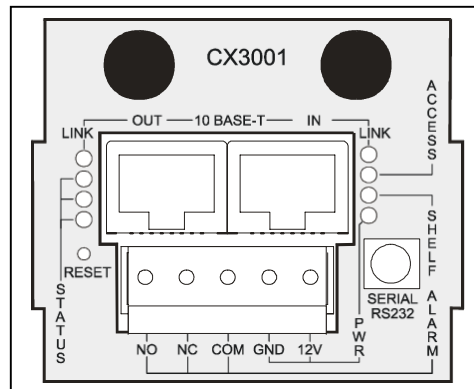
- Shelf Alarms: NC/NO/COM contacts (100 mA)
- Backup Power: 12V and GND contacts (18.0 A)
- RESET pushbutton: resets module circuitry

Status Indicator LEDs (left side):

- LINK = Green (Ethernet OUT port link present)
- ALARMS: Green = OK
Yellow = non-service-affecting alarm
Red = service-affecting alarm

Status Indicator LEDs (right side):

- LINK = Green (Ethernet IN port link present)
- ACCESS = Blue (communications active with chassis mid-plane)
- SHELF = Red (chassis mid-plane shelf alarm present)
- PWR = Green (backup power connected to power connector)





PRODUCT INFORMATION

Optical Splitters / Combiners –OP3xSx



- Low insertion loss
- Dual operating wavelength windows (1310nm and 1550nm)
- High port-to-port uniformity
- SC/APC connectors ensure performance repeatability, compatibility and easy installation and maintenance
- Removable connectors for easy cleaning
- Industry's highest packaging density (up to 32 modules per chassis)
- Occupies one half-depth slot for most modules (two halfdepth slots for 1x16 module)

Description

WISI Networks' OP family of splitters and combiners have been designed with high uniformity, low insertion loss and polarization dependent loss. The product family of modules includes 1x4, 2x4, 1x8 and 1x16 splitters/combiners; dual 1x2, 1x3 and 2x2 splitters/combiners; and a family of dual 1x2 splitters/combiners having unbalanced outputs with split ratios ranging from 55/45 to 99/1. A unique scalable 8x8 splitter/combiner is also available from WISI Networks and described in a separate data sheet. All modules utilize SC/APC type connectors that can be removed for easy cleaning.

WISI Networks' single mode, multiband splitters and combiners are packaged in WISI's very compact half-depth module for mounting in the CH3000 chassis. The packaging concept for WISI's family of optical passives is similar to the well recognized LGX package; and, although WISI's version of the LGX module is slightly narrower (for higher packaging density), it will also mount in any standard LGX chassis. WISI's implementation maintains the advantages of the LGX concept (which enables easy, snap-in installation) while providing higher packaging density, greater flexibility and scalability to the network operator.

Specifications

Physical:

- Dimensions: (3RU) (17 cm x 11 cm x 2.5 cm)
D x H x W
- Weight: 0.8 lbs (0.36 kg)

Environmental:

- Operating temperature range: -20° to +65°C
- Storage temperature range: -40° to +85°C
- Humidity: 5% to 95% non-condensing

Optical:

- Optical connectors: SC/APC
- Operating wavelength: Dual windows (1310 ± 30 nm and 1550 ± 30 nm)
- Directivity: 55 dB
- Return loss, min: 55 dB
- Input power handling, min: > 30 dBm

Ordering Information		Module Part Number															
		O	P	3	*	S	*	*	-	*	*	-	0	0	-	A	S
Optical Passive Module																	
Number of Inputs per Splitter/Combiner /1 or 2)																	
Splitter (Combiner)																	
Number of outputs per Splitter/Combiner ¹ (2, 3, 4, 8, or 16)																	
Splitter Packages per Module (S = Single, D = Dual)																	
Split Ratio ²																	
Growth Fields (code "00" when ordering)																	
AS = SC/APC Connector																	

Notes

¹ Not all combinations of numbers of inputs and outputs are valid. Reference above table for available combinations.

² Specify split ratio for higher percentage value of two unbalanced outputs (55, 60,...95 or 99). Encode "EQ" for models with balanced outputs. Split ratios are identical for moduls with dual splitter packages.



PRODUCT INFORMATION

Optical Mux - and Demux modules – OP35Mx / OP35Dx



- Both mux and demux modules available in 4-, 8- and 16-channel versions
- Channels spaced on standard 200 GHz ITU grid
- Supports both forward and return path transmission of analog and digital signals
- Mux and demux pairs optimized for minimum combined insertion loss across all channels
- SC/APC connectors ensure performance repeatability, compatibility and easy installation and maintenance
- Industry's highest packaging density (up to 32 modules per chassis)
- Occupies one half-depth slot for 4- and 8-channel modules, two half-depth slots for 16- channel modules

Description

WISI's OP family of multiplexers and demultiplexers facilitate implementation of Dense Wave Division Multiplexing (DWDM) architectures. DWDM technology can dramatically increase network capacity without requiring that additional fiber be deployed for supertrunking or narrowcasting applications. WISI's family includes 4-, 8- and 16-channel packaging configurations that are designed to minimize the combined insertion loss of the multiplexing and demultiplexing process.

WISI Networks' multiplexers and demultiplexers are packaged in WISI's very compact half-depth module for mounting in the CH3000 chassis. The packaging concept for WISI's family of optical passives is similar to the well recognized LGX package; and, although WISI's version of the LGX module is slightly narrower (for higher packaging density), it will also mount in any standard LGX chassis. WISI's implementation maintains the advantages of the LGX concept (which enables easy, snap-in installation) while providing higher packaging density, greater flexibility and scalability to the network operator. When fully loaded, WISI's CH3000 chassis holds 32 single-width, half-depth optical passive modules.

Specifications

Physical:

- Dimensions: (3RU) (17 cm x 11 cm x 2.5 cm)
D x H x W
- Weight: 0.8 lbs (0.36 kg)

Environmental:

- Operating temperature range: -5° to $+65^{\circ}\text{C}$

- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Optical:

- Optical connectors: SC/APC
- Channel spacing: 200 GHz
- Channel plan: See ITU Channel Plans description, at right.

ITU Channel Plans:

WISI Networks supports DWDM network architectures with a variety of products having 200 GHz center frequency spacing on the standard ITU grid for 20 channels from Ch. 21 (1560.606 nm) to Ch.59 (1530.334 nm).

For more complete description of available ITU channels and WISI's partitioning into convenient logical groups of 4, 8 and 16 channels in products for DWDM mux and demux applications, please refer to the WISI Networks ITU Channel Plan data sheet.

When ordering modules on the ITU grid please note, for network planning purposes, that AT1550 series broadcast transmitters operate at $1545.3\text{ nm} \pm 0.9\text{ nm}$, occupying the approximate region of ITU channels 39 through 41 (Group D).

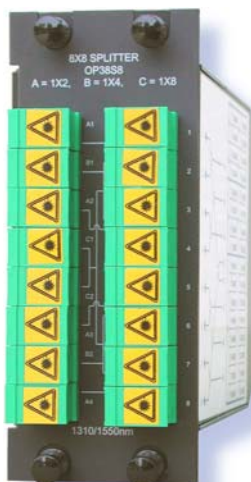
	Mux Model			Demux Model		
	OP35M4x	OP35M8x	OP35M16x	OP35D4x	OP35D8x	OP35D16x
Transmit insertion loss (dB)						
Typical	2.0	2.9	4.8	2.0	2.9	4.8
Maximum	2.3	3.2	5.1	2.3	3.2	5.1
Mux-demux paired insertion loss (dB)						
Typical	2.8	4.2	5.6	2.8	4.2	5.6
Maximum	3.3	4.7	6.1	3.3	4.7	6.1
Pass band @ 0.5 dB, min (nm)	± 0.25	± 0.25	± 0.25	± 0.25	± 0.25	± 0.25
Directivity (dB)	45	45	45	45	45	45
Return loss (dB)	45	45	45	45	45	45
Input power handling, min (dBm)	21.8	21.8	21.8	24.8	24.8	24.8
Adjacent channel isolation, min (dB)	N/A	N/A	N/A	30	30	30
Non-adjacent channel isolation, min (dB)	N/A	N/A	N/A	45	45	45

Ordering Information	Module Part Number	Required Module Back Plates																																								
<p>Optical Passive Module</p> <p>* = M (Mux) or D (Demux)</p> <p>* = Number of Channels (4, 8 or 16¹)</p> <p>* = ITU Channel Plan Group (B, C, D, E, or F)</p> <p>AS = SC/APC Connector</p> <p>¹ Encode as 2-character field for 16-channel modules.</p>	<p>O P 3 5 * * * - A S</p>	<table border="1"> <thead> <tr> <th>Number of Channels per Module</th> <th>Module Type Mux</th> <th>Module Type Demux</th> <th>ITU Channel Numbers</th> </tr> </thead> <tbody> <tr> <td rowspan="5">4</td> <td>OP35M4B</td> <td>OP35D4B</td> <td>21-27</td> </tr> <tr> <td>OP35M4C</td> <td>OP35D4C</td> <td>29-35</td> </tr> <tr> <td>OP35M4D</td> <td>OP35D4D</td> <td>37-43</td> </tr> <tr> <td>OP35M4E</td> <td>OP35D4E</td> <td>45-51</td> </tr> <tr> <td>OP35M4F</td> <td>OP35D4F</td> <td>53-59</td> </tr> <tr> <td rowspan="4">8</td> <td>OP35M8C</td> <td>OP35D8C</td> <td>21-35</td> </tr> <tr> <td>OP35M8D</td> <td>OP35D8D</td> <td>29-43</td> </tr> <tr> <td>OP35M8E</td> <td>OP35D8E</td> <td>37-51</td> </tr> <tr> <td>OP35M8F</td> <td>OP35D8F</td> <td>45-59</td> </tr> <tr> <td rowspan="2">16</td> <td>OP35M16E</td> <td>OP35D16E</td> <td>21-51</td> </tr> <tr> <td>OP35M16F</td> <td>OP35D16F</td> <td>21-35 & 45-59</td> </tr> </tbody> </table>	Number of Channels per Module	Module Type Mux	Module Type Demux	ITU Channel Numbers	4	OP35M4B	OP35D4B	21-27	OP35M4C	OP35D4C	29-35	OP35M4D	OP35D4D	37-43	OP35M4E	OP35D4E	45-51	OP35M4F	OP35D4F	53-59	8	OP35M8C	OP35D8C	21-35	OP35M8D	OP35D8D	29-43	OP35M8E	OP35D8E	37-51	OP35M8F	OP35D8F	45-59	16	OP35M16E	OP35D16E	21-51	OP35M16F	OP35D16F	21-35 & 45-59
Number of Channels per Module	Module Type Mux	Module Type Demux	ITU Channel Numbers																																							
4	OP35M4B	OP35D4B	21-27																																							
	OP35M4C	OP35D4C	29-35																																							
	OP35M4D	OP35D4D	37-43																																							
	OP35M4E	OP35D4E	45-51																																							
	OP35M4F	OP35D4F	53-59																																							
8	OP35M8C	OP35D8C	21-35																																							
	OP35M8D	OP35D8D	29-43																																							
	OP35M8E	OP35D8E	37-51																																							
	OP35M8F	OP35D8F	45-59																																							
16	OP35M16E	OP35D16E	21-51																																							
	OP35M16F	OP35D16F	21-35 & 45-59																																							



PRODUCT INFORMATION

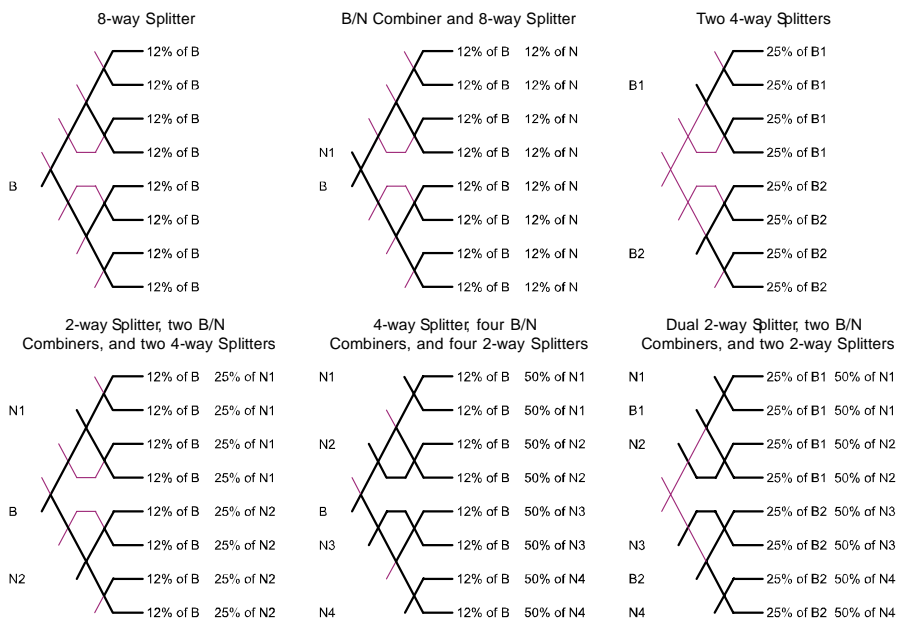
Skalable 8x8 Optical Splitter / Combiner - OP38S8D



- Maximum flexibility for configuration of splitter / combiner functions
- Low insertion loss
- Dual operating wavelength windows (1310nm and 1550nm)
- High port-to-port uniformity
- SC/APC connectors ensure performance repeatability, compatibility and easy installation and maintenance
- Removable connectors for easy cleaning
- High packaging density (up to 16 modules per chassis)

Description

WISI FIBER LINE unique scalable 8x8 splitter / combiner module provides optimum versatility in minimum rack space to meet a variety of network configuration requirements for optical splitting and combining functions. When fully loaded, WISI's CH3000 chassis holds 16 half-depth modules; its packaging concept also permits mounting in any standard LGX chassis. Several examples of how the module can be configured for the combining and splitting of broadcast and narrowcast signals are shown below.



Specifications

Physical:

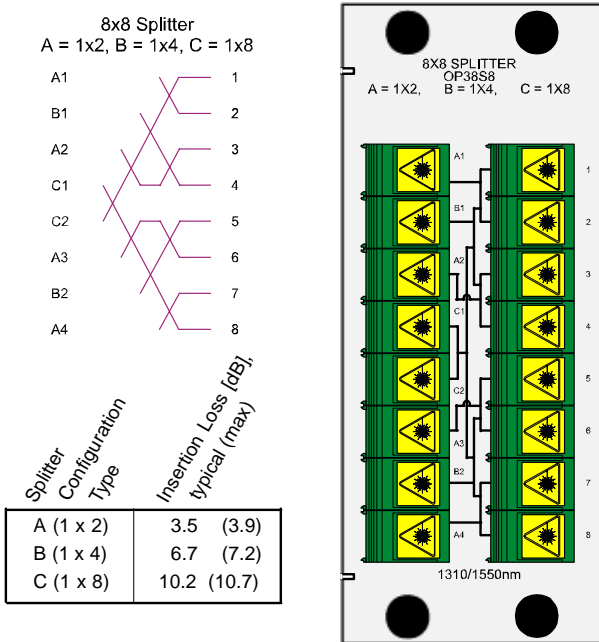
- Dimensions:
(3RU) (17 cm x 11 cm x 5.1 cm)
D x H x W
- Weight: 1.5 lbs (0.68 kg)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Optical:

- Optical connectors: SC/APC
- Operating wavelength: Dual windows ($1310 \pm 30 \text{ nm}$ and $1550 \pm 30 \text{ nm}$)
- Directivity, min: 55 dB
- Return loss, min: 55 dB (including connectors)
- Power handling at input port, max: 27 dBm
- Uniformity: 0.8 dB max, $< 0.4 \text{ dB}$ typical (including connectors)
- Spectral flatness: 0.8 dB max, $< 0.5 \text{ dB}$ typical (1530–1572 nm)
- Polarization dependent loss: 0.3 dB max



Ordering Information

Module Part Number

OP38S8D-EQ-00-AS

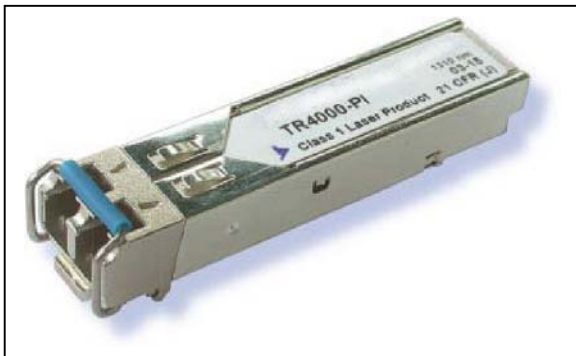
Scalable 8x8 optical Splitter / Combiner

AS = SC/APC Connector



PRODUCT INFORMATION

Plug-in Optical Transceiver Module TR 4000



- Enables Ethernet drops from NC4000 and NC5000 series optical nodes
- Up to 2.125 Gbps bi-directional data links
- Pluggable RJ-45 footprint
- Duplex LC connector
- Very low jitter
- Metal enclosure for lower EMI
- 3.3 V power supply with low power dissipation
- Extended operating temperature range

Description

The TR4000-PI Optical Transceiver Module enables additional capabilities for high-speed bidirectional communications required for digital networking products. These modules are functionally identical to the transceivers already built into many products (e.g., DT4000 and DT5000 series optical node transceivers), but provide a flexible, plug-in means of enabling additional optional secondary ports in several of those products.

Conforming to the Small Form Factor Pluggable (SFP) Multisource Agreement, these state-of-the-art components are designed expressly for high-speed bi-directional communication applications that require rates of up to 2.125 Gbps, with the laser transmission portion of the device operating at a wavelength of 1310 nm.

The TR4000-PI features a very low jitter contribution, resulting in extremely clean, high-quality eye patterns. And the modules' metal enclosure not only makes them sturdier, but also improves their FCC test margins. This emission and ESD control is particularly important in applications with sensitive multiport hubs and switches. The module operates at extended voltage (3.15 to 3.6 V) and temperature (-20° to $+70^{\circ}\text{C}$) ranges, and dissipate less than 700 mW. The modules are supplied with a duplex LC connector.

The TR4000-PI can be ordered as an optional second plug-in transceiver module to activate the dual ring (10 km) capabilities of transceiver units in NC4000 series nodes (e.g., models DT4010D, DT4011D, DT4040D, DT4041D) and NC5000 series nodes (e.g., model DT5040D). The TR4000-PI is also used to populate the primary network and local ports of the DS4008 EtherMux module for NC4000 series nodes.

Specifications

Physical:

- Dimensions: L x H x W
(5.6 cm x 1.0 cm x 1.3 cm)
- Weight: (0.05 kg)

Environmental:

- Operating temperature range: -20° to $+70^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Optical Interface:

- Optical connectors: Duplex LC

Power Requirements:

- Input voltage: 3.3 VDC (240 mA max)
- Power consumption: 700 mW max

General:

- Supported link length: 10 km (on SMF-28 or equivalent)

- Data rate: 2.125 Gb/s
- BER: 10⁻¹² max
- Hot plug-in/out

Optical Interface:

Output:

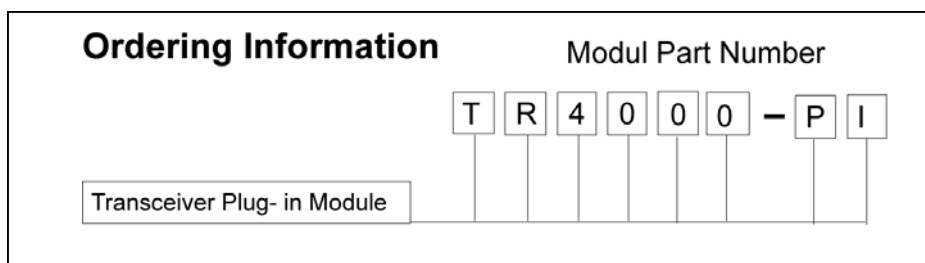
- Transmitter type: 1310 nm DFB
- Average launch power: -9.5 dBm min, -3 dBm max
- Optical modulation amplitude: 174 μW min

Input:

- Receiver sensitivity: -22 dBm typ, -20.5 dBm max
- Return loss: 12 dB min
- Receive LOS assert level: -24 dBm

Regulatory:

Class 1 devices per FDA/CDRH and IEC-825-1 laser safety regulations





PRODUCT INFORMATION

Digital Transponder (2.125 Gb/s ITU) DX 3505



- Bit rate range 155 Mb/s to 2.125 Gb/s
- Protocol transparent supports:
- Single and dual Gigabit Ethernet
- Single and dual fiber channel
- Optical wavelength converter
- Any communications wavelength input
- 1550nm ITU-grid output
- Receiver type 2R (receive and retransmit)
- Front panel laser On/Off interlock switch
- Hot plug in/out
- Local and remote status monitoring
- Occupies one full-depth slot

Description

The DX3505 Digital Transponder is a high bit rate capacity (2.125 Gb/s) optical converter. This device allows a non-wavelength specific (1300 to 1600 nm) optical transmission to be shifted to an ITU-grid wavelength.

This unit is a bit-rate and protocol transparent device that supports any digital optical communications signal from 155 Mbps to 2.125 Gbps, including single and dual fiber channel, and single and dual Gigabit Ethernet.

Specifications

Physical:

- Dimensions: D x H x W
(3RU) (33 cm x 11 cm x 2.5 cm)
- Weight: (0.68 kg)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

Optical Interface:

- Optical connector: SC/APC (at Back Plate BP-F2 or connector at mid-plane mates to BP35M4x)

Input:

- Wavelength: 1300 nm–1600 nm
- Optical power input range:
PIN min: -15 dBm
PIN max: -3 dBm

Output:

- Wavelength: See ITU Channel Plan
- Output power: 5 dBm \pm 0.5 dBm
- Dispersion limit: 100 km (SMF-28)

Power Requirements:

- Input voltage: 12 VDC
- Power consumption: 8 W

General:

- Hot plug-in/out
- Transponder type: 2R (receive and retransmit)
- Transponder bitrate range: 155 to 2125 Mb/s

ITU Channel Plans:

WISI supports DWDM network architectures with a variety of products having 200 GHz center frequency spacing on the standard ITU grid for 20 channels from Ch. 21 (1560.606 nm) to Ch. 59 (1530.334 nm).

For more complete description of available ITU channels and partitioning into convenient logical groups of 4, 8 and 16 channels in products for DWDM mux and demux applications, please refer to the ITU Channel Plan data sheet.

When ordering transponders on the ITU grid please note, for network planning purposes, that AT1550 series broadcast transmitters operate at 1545.3 nm \pm 0.9 nm, occupying the approximate region of ITU channels 39 through 41 (Group D).

Ordering Information	Module Part Number	Module Back Plates
Digital Transponder 2.5 Gb/s	D X 3 5 0 5 - * - * - * - A S	When ordering a DX 3505 series transponder with optical interconnection Option 1, the back plate must be separately ordered. Two different styles of back plate are available, depending on the application. One style provides connections for a single transponder. This single-width back plate may be ordered as:
**= ITU Channel Number (21, 23, 25,...or 59) ITU Channel Plan Data Sheet		B P - A 4
* = 0 (Optical output at back plate BP-F2, included with order) or 1 (Optical output interconnect to mid-plane connector; see notes)		The second style provides connections for a group of four transponders installed in adjacent chassis slots. These 4-channel mux back plates (for which outputs can be cascaded from one back plate to another) may be ordered for the following channel groups: BP-35M4B for ITU Ch 21-27, BP-35M4C for ITU Ch 29-35, BP-35M4D for ITU Ch 37-43, BP-35M4E for ITU Ch 45-51, BP-35M4F for ITU Ch 53-59
AS = SC/APC Connector		B P - 3 5 M 4 *



PRODUCT INFORMATION

Digital Transceiver (5-65 MHz RF Input) DT 3032



- Digitizes 5–65 MHz analog RF return
- Available with integrated 100 Mbps Ethernet transport interface
- Optical output port accepts TR3310-PI SFP pluggable transceiver
- Multiple digital outputs can be concatenated or "daisy-chained" to minimize transport fiber requirements
- Multiple optical outputs can be multiplexed onto a common fiber with DX3505 series digital DWDM transponders and multiplexers
- Transport over distances up to 200 km without external dispersion compensation
- Hot plug in/out
- Occupies one half-depth slot
- Compliant with IEEE 802.1P, 802.1Q, 802.3u, VLAN, ToS

Description

Model DT3032 series Digital Transceivers combine two major functions into one compact package: analog RF return path digitization and an Ethernet Access Device. DT3032 series transceivers digitize the analog RF return path (5-65 MHz) and multiplex native Ethernet from a second optical port into the return transport system. By providing virtual pipes for Fast Ethernet services and legacy RF return on a single fiber, DT3032 series transceivers alleviate fiber exhaustion, greatly simplify the network and provide distinct time-to-market advantages in turning up new revenue bearing services, including voice, video and data services.

DT3032 series transceivers provide a flexible platform that supports different network configurations with both point-to-point and concatenated applications. For concatenated applications, multiple transceivers can be designed into a daisy-chained configuration. The various configurations are supported for distances up to 10 kilometers, and even longer spans are supported by using DX3505 Digital Transponders.

Specifications

Physical:

- Dimensions (without connectors): L x W x H (17 cm x 11 cm x 2.5 cm)
- Weight: (0.5 kg)

Environmental:

- Operating temperature range: -20° to $+65^{\circ}\text{C}$
- Storage temperature range: -40° to $+85^{\circ}\text{C}$
- Humidity: 5% to 95% non-condensing

General:

- Optical transmission bit rate: 2.125 Gbps
- Optical interface: LC duplex (on plug-in TR3310-PI SFP transceiver, available by separate order)
- Number of RF channels: 1
- RF connectors, front panel: RF input, F-type, RF input test point, G-type
- Optional RJ-45 Fast Ethernet Port (Model DT3032E-65-0)
- Hot plug in/out

Power Requirements:

- Input voltage: 12 VDC
- Power consumption: 7.7 W

RF Path:

- Pass band: 5–65 MHz
- Frequency response: ± 0.5 dB
- Input return loss, minimum: 18 dB
- Level stability: ± 0.5 dB
- Gain control range: 16 dB (in 2 dB steps)

- System nominal gain: 28 dB (with DR3402 Digital Receiver at full gain)
- Input level RF test point: -20 ± 0.5 dB
- Test point return loss, minimum: 18 dB

Distortions:

- Nominal loading: 5–65 MHz (QPSK carriers or equivalent Gaussian noise)
- Nominal input: -58 dBmV/Hz
- Dynamic range at 41 dB CNR, minimum: 11 dB
- Peak NPR: 49 dB

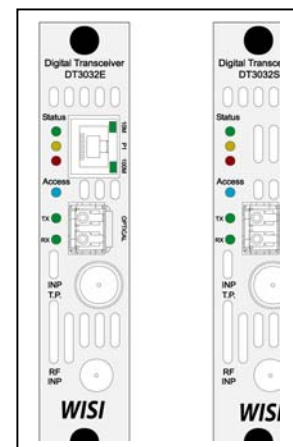
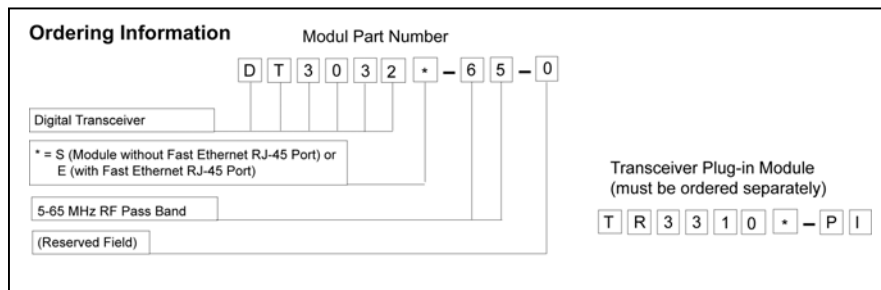
Front Panel LED Indicators:

- Module status indicators:
Alarms: 3 separate LEDs (green, yellow and red) of which one is illuminated to indicate status (OK, non-service-affecting alarm and service-affecting alarm, respectively)
Access: Illuminated blue during SM communication with module
- Plug-in TR3310-PI SFP transceiver status indicators:
Transmission OK: green
Receiving signal OK: green

Alarms and Locally

Monitored Parameters:

Service-affecting and nonservice-affecting alarms;
monitoring of chassis slot number, internal temperature, fan status and self-monitored parameters (reported via optical fiber to the associated digital receiver)





PRODUCT INFORMATION

Dual Digital Receiver (5-65 MHz Passband) DR 3402



- High packaging density, two receivers per singlewidth, full-depth module
- 8 to 12 bit dynamic range for digital return
- High RF output (-32 dBmV/Hz typical)
- Superior noise performance
- RF output level independent of optical input power provides output level stability in alternate routing applications
- Front access -20 dB test points
- Hot plug in/out
- Local and remote status monitoring
- Occupies one full-depth slot

Description

The DR3402 Dual Digital Receiver utilizes WISI's state-of-the-art digital reverse technology to receive both 5–65 MHz legacy RF signals and data communications for Ethernet services and element management.

WISI's DR3402 receiver interfaces with the BP-3108-AS Optical Receiver Back Plate, enabling up to eight digital receivers to be installed in four adjacent module slots of 3RU CH3000 chassis. A total 24 receivers (and three associated BP-3108 back plates), with provision for redundant chassis power supplies, can therefore be accommodated in each chassis.

Each receiver module can terminate two node clusters through two SC/APC-type optical connectors. The major portion of data extracted from each optical link is converted through a high speed digital-to-analog converter (DAC) to an analog RF signal output. The remaining portion of the data is multiplexed with data received from the adjacent channel of the same receiver, as well as from the adjacent receiver module in the chassis, and forwarded to the next receiver module sharing a common interface with the BP-3108 back plate.

Specifications

Physical:

- Dimensions: D x H x W (3RU) (33 cm x 11 cm x 2.5 cm)
- Weight: (0.72 kg)

Environmental:

- Operating temperature range: -20° .to.+65°C
- Storage temperature range: -40° to +85°C
- Humidity: 5% to 95% non-condensing

Optical Interface:

- Optical connectors: SC/APC (on Back Plate BP-3108-AS)

Electrical Interface:

- Main RF outputs (each channel): F-type female connector (on Back Plate BP-3108-AS)
- Output test points (each channel): G-type female connector (front panel, -20 dB)

Power Requirements:

- Input voltage: 12 VDC (provided via chassis mid-plane connection)
- Power consumption: 20 W (excluding 1.5 W power feed to BP-3108-AS)

General:

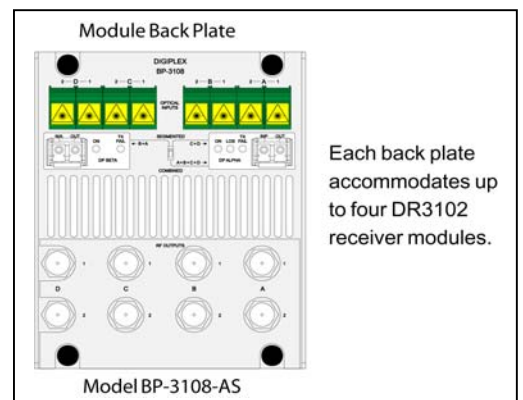
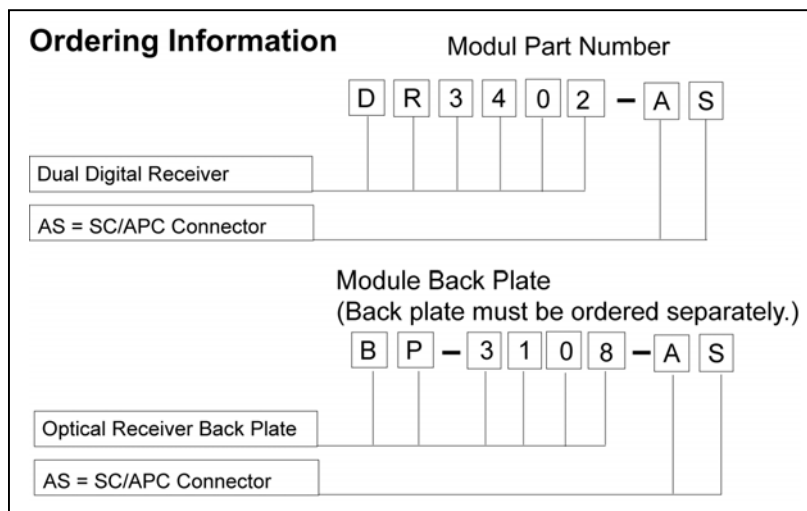
- Hot plug-in/out
- Manual gain alignment

Electrical (RF path - each channel):

- Passband: 5–65 MHz
- Frequency response: ±0.5 dB
- Nominal output level: -32 dBmV/Hz with 5-40 MHz loading and -60 dBmV/Hz input to digital transceiver
- Output RF level adjustment range: 0–26 dB (1 dB increments)
- Output return loss: 18 dB min

Optical:

- Wavelength: 1300nm – 1600nm
- Input return loss: 30 dB
- Optical power input range: PIN min : -18 dBm
PIN max: -3 dBm





PRODUCT INFORMATION

Ethernet Switch – EX3005



- Ideally suited for backhauling Ethernet data from remote locations
- Works out of the box with no configuration required
- Most compact Ethernet switch in the industry
- Four auto-negotiating 10/100 BaseT ports provide direct interface to the CX3001 for remote hub monitoring
- Two 100BaseFX optical ports (enabled with SFP plug-in transceivers) provide flexibility for daisy chaining over long distances
- Extended operating temperature range
- Occupies one half-depth slot
- Hot plug in/out

Description

WISI's EX3005 managed Ethernet Switch is a five-port, single-width, half-depth module for the CH3000 Chassis. With an enhanced operating temperature range, this module is ideally suited for backhauling Ethernet data from non-temperature controlled locations such as an OTN. Four auto-negotiating 10/100BaseT interfaces (via RJ-45 ports) provide a direct interface to the CX3001 Communications Module for remote hub monitoring as well as other third party monitoring equipment. Two 100 Mbps optical links (via LC-connectorized model TR3100 series plug-in transceivers) provide flexibility for daisy-chaining over long distances. (The fourth Fast Ethernet RJ-45 port is disabled whenever the first of the two optical ports is populated with a plug-in transceiver.)

One application of the EX3005 is for backhauling Ethernet management traffic from a remote hub site to the headend location for complete network visibility. Additional benefits include an Ethernet point of presence at each EX3005 location, providing the capability of a 5-port Fast Ethernet managed switch as well as possible long haul extension using the secondary fiber port. Utilizing WISI's extensive optical WDM product line, it is possible to share an existing fiber to transport this Ethernet traffic.

To simplify installation, the EX3005 will work immediately out of the box with no configuration required. Additional configuration may be applied to unlock the advanced management features of the module.

Specifications

Physical:

- Dimensions:
(3RU) (16.5 cm x 10.9 cm x 2.5 cm)

D x H x W

- Weight: 1.0 lbs (0.45 kg)

Environmental:

- Operating temperature range: -20° to +65°C
- Storage temperature range: -40° to +85°C
- Humidity: 5% to 95% non-condensing

Power Requirements:

- Input voltage (from chassis mid-plane): 12 VDC (450 mA)
- Power consumption: 5.4 W

General:

- Hot plug-in/out
- Optical interface: LC duplex (on pluggable SFP transceivers)
- Optical transmission bit rate: 125 Mbps

Switch Ports:

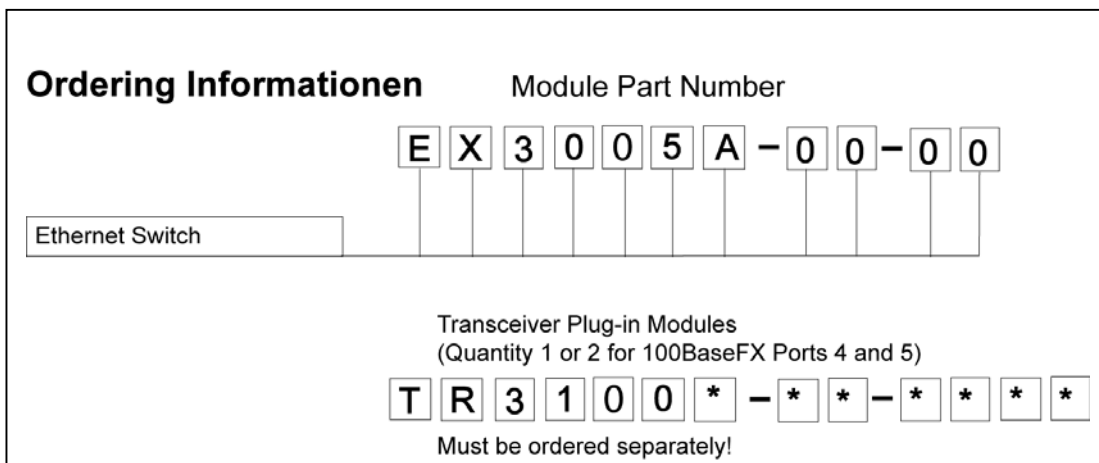
- Ports 1 – 3: Auto-negotiating 10/100BaseT or 10/100 configurable, full duplex, with RJ-45 connectors
- Port 5: Forced 100BaseFX with LC duplex connectors on SFP plug-in transceiver
- Port 4: Same as Ports 1–3 if no plug-in transceiver populates first optical port; same as Port 5 if plug-in transceiver populates first optical port

Note

“Port 4” is logically or'd between the last of the four RJ-45 ports and the first of two plug-in transceiver optical ports. Detection of the presence of a transceiver will normally cause allocation of this port to the optical transceiver, although the assignment can be manually forced to either a 10/100BaseT connection at the fourth RJ-45 connector or a 100BaseFX connection at the first transceiver location.

Front Panel Status Indicators and Controls:

- “Status” LEDs:
 - Green = OK
 - Yellow = non-service-affecting alarm (or alarm history present)
 - Red = service-affecting alarm
- Blue “Access” LED: Communications with chassis mid-plane
- RJ-45 port status indicators (2 green LEDs per port): 10M / Activity: Illuminated if active link, blinks on activity 100M / Activity: Illuminated if active link, blinks on activity
- Plug-in transceiver port status indicators (separate TX and RX LEDs for each port):
 - TX: Illuminated if valid SFP ID detected and transmission OK
 - Blinks if invalid SFP
 - Off if transmission fails
 - RX: Illuminated if local and remote reception OK
 - Blinks if remote reception fails
 - Off if LOS condition occurs
- Recessed RESET pushbutton: Resets the module if depressed 8–15 seconds; restores default factory configuration if depressed >15 seconds





PRODUCT INFORMATION

DWDM Products ITU Channel Plan



- 20 different channels on the standard ITU grid (200 GHz spacing)
- Convenient logical channel groupings ease network design
- Multi-channel (mux and demux) products available in 4-, 8- and 16-channel configurations
- Products designed to enable cascading of DWDM signals from module to module

Description

WISI FIBERLINE provides a wide variety of products for installation in both 3RU chassis and optical nodes that support DWDM network architectures, including active QAM transmitters and transponders, passive mux and demux modules and our unique Optiplex modules, which integrate narrowcast demultiplexing functions with broadcast / narrowcast combiners and power level monitoring capability.

All of WISI's DWDM products support an extended range of channels on the standard ITU grid (with 200 GHz channel spacing), from ITU Channel 21 (1560.606 nm) to Channel 59 (1530.334 nm), to provide both capacity for up to 20 channels and flexibility for network designs.

For multi-channel products (mux / demux and Optiplex modules), WISI has defined a convenient set of logical channel "groupings" used for identification and product packaging. These groups (identified with letters from "B" through "F") sequentially partition the set of 20 available ITU channels into five groups of four channels each. This schema is detailed on the reverse side.

In the case of passive mux and demux modules, models are also available which further aggregate these groups into sets of 8 or 16 channels in a single package. Modules with 8-channel groupings are

ITU Channel Plan schema and Specifications

