

HDBS-4000CW series
4 way SAT-IF CWDM optical
transmitter/optical receiver
950MHz~2400 MHz

Technical Specification

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1.0 PRODUCT DESCRIPTION

HDBS-4000CW series is integrated 4pcs of SAT-IF CWDM standard wavelength optical transmitters with optical receivers in a casing. Through CWDM, Transmitter 4 ways optical multiplex (TX) or demultiplex (RX) through one fiber. It can be well used in transmitting a satellite VL, VH, HL, HH different polarize 4 way SAT-IF signal. It can be easily operated.

CWDM (rough multiplex) adopts 20nm channel isolation. 1270nm~1610nm have 18 wavelength. It can transmit 18 way optical signal in one fiber through WDM. Because of without regular EDFA amplifier, it is used in small range of satellite data optical distribution to transmit satellite L-Band optical link.

HDBS-4000CW1, CWDM built-in. 4 way optical signal be multipleted or de-multipleted in the chassis and then input (RX)or output (TX) through a SC/ APC which in the front panel or back panel.

HDBS-4000CW4, without built-in CWDM, 4 way optical signal through front panel or back panel's 4 SC/APC to input or output

Adopt outside CWDM-16, can transmit 4pcs HDBS-4000CW4's 16 way signal through a fiber. It can be used in transmitting 4 satellite different polarized 16 ways SAT-IF signal.

HDBS-4000CW series optical transmitter, all of them adopt high linear, no cooling DFB laser, direct modulation. Improved laser APC control to guarantee laser's high living and high reliability operation. TG type optical transmitter with built-in high linear AGC amplify. TO type without IF amplify inside, allow high level input.

2.0 PRODUCT FEATURE

- Adopt CWDM standard wavelength, can transmit 18 way SAT-IF signal through one fiber
- 1RU standard casing, integrate 4pcs SAT-IF optical transmitters with optical receiver
- HDBS-4000CW1, built-in CWDM, multiplex 4 way optical signal through optical fiber
- HDBS-4000CW4, without built-in CWDM, 4 way optical outputs (TX) or 4 way optical inputs (RX)
- Adopt built-in CWDM-16, can multiplex 4pcs HDBS-4000CW4's with 4 different polarized satellites'16 way SAT-IF optical signal in one fiber
- HDBS-4100 adopt 1RU standard casing, front panel LCD can provide situation display, standard RS232 communication interface, SNMP network management
- HDBS-4200 adopt small size metal casing, wall-type, easily connected Multi-switch to STB
- High linear, with isolation DFB laser, CWDM standard working wavelength
- 950~2400MHz working bandwidth
- TG type optical transmitter (standard configuration), built-in high linear AGC amplify
- TO type optical transmitter (can choose configuration), without IF amplify inside, allow high level input. It can be used high level output L-Band demodulation
- All the 4 way optical transmitter can supply +13VDC or +18VDC to LNB
- Electromagnetic resistance, RF, high thunderstorm static resistance
- Easy installation and application
- Excellent P/P ratio

3.0 MAIN APPLICATION

- Satellite building optical fiber distribution.
- Ocean steamer optical fiber distribution.
- Satellite L-Band up/ down optical fiber link.

4.0 Related product

- HDBS-5000CW
- HDBS-4000DW、HDBS-5000DW

5.0 Technique index

Performance		Index	Supplement	
TX & RX Optical feature	TX operating wavelength range	(nm)	1270~1610	CWDM, 18CH
	TX standard configuration operating wavelength HDBS-4105CW1-TX-S	(nm)	1310	VL-TX
			1510	VH-TX
			1530	HL-TX
			1550	HH-TX
	RX operating wavelength range	(nm)	1260~1620	CWDM, 18CH
	RX standard configuration operating wavelength HDBS-4105CW1-RX-S	(nm)	1310	VL-TX
			1510	VH-TX
			1530	HL-TX
			1550	HH-TX
	Number of TX output port		1	HDBS-4105CW1-TX
			4	HDBS-4105CW4-TX
	TX output power ¹⁾	(dBm)	5 (≥3mW)	
	Number of RX input port		1	HDBS-4105CW1-RX
4			HDBS-4105CW4-RX	
RX input power ¹⁾	(dBm)	0~-13		
Return loss	(dB)	≥50		
Optical connector		SC/APC	Option FC/APC, LC/APC	
Laser type		Un-cooling DFB	TX with ISO	
Optical receive tube type		PIN	RX	

SAT-IF feature	Operating bandwidth	(MHz)	950~2400	
	TX input level	(dBm)	-25~-14	TG type, with IF amplification
			-6~+10	TO type, without IF amplification
	RX output level	(dBm)	-15~-40	
	Flatness	(dB)	0.5	40MHz
			±1.0	950~2400MHz
	Input impedance	(Ω)	75	
	RF return loss	(dB)	12	
	RF connector		F-Female	
	C/IM3 ²⁾	(dB)	≥55	
Equivalent noise intensity	(dB/Hz)	>115		
Link gain ³⁾	(dB)	25		
General feature	Serial interface		RS232	HDBS-4100
	SNMP network management interface		RJ45	HDBS-4100
	Power supply	(V)	95~260VAC	
	Power consume	(W)	<50	
	Operating temp.	(°C)	-5~+65	
	Storage temp.	(°C)	-40~+85	
	Relative humidity	(%)	5~95	
	Size	HDBS-4100	(mm)	483×267×44
HDBS-4200		263×198×35		(W) × (D) × (H)

Comment: 1. no including CWDM insert loss

2. C/IM3 means carrier signal peak value / three order difference peak value when using two way carrier frequency to test it.

3. -40dBm RF input test

6.0 SAT-IF link feature

Optical input(dB)	Link loss (dB)	CNR (dB)	Link gain (dB)	RF output level (dBm/Ch.)
-13	14	30.18	-2	-38
-12	13	32.18	0	-36
-11	12	34.13	2	-34
-10	11	38.59	6	-32
-8	9	40.11	8	-30
-7	8	42.18	10	-28
-6	7	44.24	12	-26
-5	6	45.67	14	-24
-4	5	46.53	16	-22
-3	4	46.76	18	-20
-2	3	46.92	20	-18
-1	2	47.01	22	-16
0	1	47.03	24	-14

Comment: 1、no include CWDM insert loss, TX Output=5dBm。

2、data satellite receiver `s standard input level -60dBm ~ -30dBm

7.0 CWDM-18 technical index (18 channels)

Performance			CWDM-□ 18A	CWDM-□ 18B
CWDM Operating wavelength	(nm)		1270, 1290, 1310, 1330, 1350, 1370	
			1390, 1410, 1430, 1450, 1470, 1490、	
			1510, 1530, 1550, 1570, 1590, 1610	
Center wavelength accuracy	(nm)		±0.5	
Channel spacing	(nm)		20	
Channel passband (@-0.5dB bandwidth)	(nm)		≥13	
Passband insertion loss (without connector)	dB		≤3.8	≤6.0
Channel uniformity	(dB)		≤1.0	≤1.5
Channel ripple	(dB)		≤0.5	
Isolation	Adjacent	(dB)	≥30	
	Non-adjacent		≥40	
Polarization dependence loss	(dB)		≤0.10	
Polarization mode dispersion	(ps)		≤0.1	
Directivity	(dB)		≥50	
Return loss	(dB)		≥45	
Power handing	(mW)		300	
Optical connector			SC/APC, Option LC/APC、 FC/APC	
size	Modulator	(mm)	110 X 95 X 15 (CWDM-M)	
	19" stander	(")	19 X 10 X 1.75 (CWDM-X)	

8.0 Product series

8.1 TX & RX

Model	Optical power (dBm)		Number of optical port		Wavelength configuration	Connector
	Output (TX)	Input (RX)	Output (TX)	Input (RX)		
HDBS-4105CW1-TG/S-SA	5	-	1	-	Standard	SC/APC
HDBS-4105CW4-TG/C-SA	5	-	4	-	Optional	SC/APC
HDBS-4113CW1-RX/S-SA	-	>-13	-	1	Standard	SC/APC
HDBS-4113CW4-RX/C-SA			-	4	Optional	SC/APC
HDBS-4213CW1-RX/S-SC	-	>-13	-	1	Standard	SC/APC
HDBS-4213CW4-RX/C-SC			-	4	Optional	SC/APC

Comment: 1. no including CWDM insert loss

2. TX can choose TO type、no IF amplify

8.2 CWDM

Model	Exterior	Insertion loss (dB)	Number of optical port		Wavelength configuration	Connector
			Output (TX)	Input (RX)		
CWDM-04A-T-C/SA	1RU	≤ 3.8	1	4	Optional	SC/APC
CWDM-08A-T-C/SA	1RU	≤ 3.8	1	8	Optional	SC/APC
CWDM-16A-T-C/SA	1RU	≤ 3.8	1	16	Optional	SC/APC
CWDM-17A-T-C/SA	1RU	≤ 3.8	1	17	Optional	SC/APC
CWDM-04A-R-C/SA	1RU	≤ 3.8	4	1	Optional	SC/APC
CWDM-08A-R-C/SA	1RU	≤ 3.8	8	1	Optional	SC/APC
CWDM-16A-R-C/SA	1RU	≤ 3.8	16	1	Optional	SC/APC
CWDM-17A-R-C/SA	1RU	≤ 3.8	17	1	Optional	SC/APC

Note: 1. can choose module type

2. Both of Channel amount and channel wavelength can be selected

3. can select B type、insert loss ≤ 6.0

9.0 Model explanation

9.1 TX & RX

HDBS - 4 □ □ □ - CW □ - □ □ / □ - □ / □ □ - □ □

Satellite broadcast L-Band fiber link products (DBS)	Product type		Product feature		SAT-IF output power		Multiplex mode		Number of output port		Type		Wavelength configuration		Optical port position		Connector		Power supply	
	1	5~2700MHz		1	19" standered type	05	5dBm	CW	CWDM 1270~1610nm 18 wavelenghts	1	Built-in CWDM 1 output port	TG	TX with IF amplification	S	Standard layout	F	Front panel	SA	SC/APC	48
2	CATV-RF(47~862MHz)& SAT-IF(950~2200MHz)		2	RX small ferrous box	13	-13dBm	DW	DWDM 1528~1563nm ITU wavelenght	4	Without CWDM 4 output ports	TO	TX without IF amplification	C	Customer specified	B	Back panel	FA	FC/APC	22	220VAC
3	SAT-IF 950~2400MHz																			
4	4×SAT-IF assemble																			
5	4×SAT-IF or 1×CATV assemble																			
6	950~6000MHz																			

COMMENT: WAVELENGTH CONFIGURATION

	S (standard layout)	C (Customer specified)
TX1 (VL)	1310nm	
TX2 (VH)	1510nm	
TX3 (HL)	1530nm	
TX4 (HH)	1550nm	

9.2 CWDM

CWDM - □ □ - □ - □ - □ - □ / □ □

DWDM wavelength division multiplexer	Number of channel		Insert loss class		Mode		Type		Optical port position		Connector	
	04	4CH	A	<3.8dBm	TX	Multiplexer	M	Mode	F	Front panel	00	Without
06	6CH	B	<6.0dBm	RX	Division	C	19" stander	B	Back panel	SA	SC/APC	
16	16CH									FA	FC/APC	
18	18CH									LA	LC/APC	

COMMENT: CHANNEL WAVELENGTH CONFIGURATION

1	1270	4	1310	7	1390	10	1450	13	1510	16	1570
2	1290	5	1350	8	1410	11	1470	14	1530	17	1590
3	1310	6	1370	9	1430	12	1490	15	1550	18	1610

The parts marked in gray color belongs to other varieties of this product series, the options marked in gray color in this products series can not be specified.