



RFoG Catalog

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Contact:



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1550 Fiber Transmitters

1550 nm External Modulation



4CHT8500AC (40~1GHz) 4CHT8500A (40~870 MHz)
1550nm External Modulation CATV Optic Transmitter

Product Description

Using External Modulation technology generates a high quality low laser chirp, low dispersion distortion signal . Our External Modulator has excellent CSO and adjustable SBS. It can be followed by a EDFA amplifier for large area coverage.

Product Features

- Low laser chirp, low dispersion distortion,
- Optimized control technology, offers excellent CNR, CTB, CSO & SBS index
- Flexibility: Original SBS critical value 13, 16, 18 adjustable, it can be adjusted for different network, OMI adjustable, AGC mode is optional
- Reliability: build-in double power supplies, switch automatically. • Laser Diode case temperature is controlled automatically.
- High quality: Optic Modulation Identity (OMI) display
- Advanced network management function (each unit has separate IP address)

Model	Output Power (dBm)	SBS (dBm)	System index(59 channels PAL-D)			
			CNR1	CNR2	CTB	CSO
HT8527A	Dual fiber output ≥ 7	19 db (Adj)	≥ 53	≥ 52	≤ -65	≤ -65

Test condition: 59 channels PAL-D, 16dBm EDFA, 65km fiber. 0dBm

Specifications

Parameter		Performance		Addendum	
Optic Specs	Operating wavelength	(nm)	1548-1563		HT8500AC
			ITU-TG.692		HT8500AU
	Wavelength ADJ. range	(nm)	±1.6 (±200GHz)		HT8500AU
	Wavelength ADJ. mode		±0.05nm stepping		HT8500AU
	Linewidth	(MHz)	≤1.0 (typ.=0.65)		FWHM(Δλ)
					(-3dB fullwidth)
	Side mode suppression ratio	(dB)	≥45		SMSR
	Equivalent noise intensity	(dB/Hz)	≤-160		RIN (20~1000MHz)
	Output power	(dBm)	2×7		Optional
					2×5, 2×6, 2×9, 2×10
Return loss	(dB)	≥50			
optical fiber connector		SC/APC		Optional LC/APC,FC/APC	
RF Specs	Bandwidth	(MHz)	47-862		1 GHz available HT8500AC100
	Input level	(dBmV)	18-28		AGC
	Flatness	(dB)	≤±0.75		47~862MHz
	Return loss	(dB)	>16		47~862MHz
	Input impedance	(Ω)	75		
	RF port		F-Female		
Link Specs	Transmit channel		PAL-D/60CH	NTSC 78 CH	
	CNR1	(dB)	≥53	≥52	Back to back
	CNR2	(dB)	≥51.5	≥50	65Km optical fiber, 0dBm receive
	CTB	(dBc)	-65	-65	
	CSO	(dBc)	-65	-65	
	SBS restrain	(dBm)	13, 16, 18		Adjustable
General Specs	SNMP network management interface		RJ45		
	Communication interface		RS232		
	Power supply	(V)	90-265VAC		-48VDC optional
	Power	(W)	≤50		Power used depends on ambient temperature
	Work temp.	(°C)	0-50		Diode temp. controlled automatically
	Storage temp.	(°C)	-40-85		
	Operating relative humidity	(%)	5-95		

Size

(Inches)

19x14.5x1.75

(W)x(D)x(H)

4CHT 85 □ □ □ □ - □ □ □ - □ □ □ - □ □ □ □

Product type	Product series	Number of output port	Output power	Quality	Operating wavelength	Bandwidth	Network management	Connector	Number of power supply	Power supply	ITU Grid Ch. No.												
HT	85	1	Single fiber output	5	5dBm	T	Top-class	C	1548-1563nm	066	47-860MHz	0	No	FA	FC/APC	S	Single PS	22	220WAC	23	1558.98nm		
		2	Dual fiber output	6	6dBm	A	Standard type	U	1528-1563nm ITU wavelength adjustable	100	47-1000MHz	1	Built-in	SA	SC/APC	D	Dual PS	11	110WAC	30	1553.33nm		
	95	1560nm external modulation 47-2700MHz	7	7dBm	B	Utility-type				108	47-1000MHz			LA	LC/APC								
			9	8.5dBm	C	Single output																	
			0	10dBm	E	With EDFA																	
	35	1560nm external modulation 950-27002MHz	1	11dBm																			

4C1550A-x-xx 1550nm Direct Modulated AGC Optical Transmitter



Direct modulation will lead to high laser chirp (Laser's bias current is modulated by signal and the optical spectrum shifts and shakes). Laser chirp will interact with dispersion effect caused by standard single mode fiber (SMF-28), which will generate serious distortion at 1550nm. This type of distortion will become more serious with the increase of transmission distance, bandwidth and channel number.

Our 1550nm direct modulation has no performance degradation while transmitting an analog and digital full spectrum channel signal with transmission distance $\leq 15\text{Km}$ or transmitting digital load with transmission distance $\leq 40\text{Km}$.

4Cable's 4C1500A is a 1550nm direct modulation optical transmitter with high index and AGC function. It adopts a high linearity and low chirp DFB laser, built-in pre-distortion compensation and AGC, APC, ATC closed loop control, which improves the system index. It can be used in FTTx (RFoG) of $\leq 10\text{Km}$ and it can also be used in WDM narrow-band multiplexing and IP/QAM.

Technical Specs

Parameter		Value	Option
Optic Specs	Wavelength	(nm)	1548~1563 HT1500AC: CATV wavelength
			1530~1563 HT1500AU: ITU standard wavelength
	Line width	(MHz)	≤ 1 FWHM($\square\lambda$)
	Side mode suppression ratio	(dB)	≥ 45 SMSR
	Extinction ratio	(dB)	≥ 20 XP
	Equivalent noise intensity	(dB/Hz)	≤ -160 RIN (20~1000MHz)
	Output power	(dBm)	6 3, 10 Options
	Return loss	(dB)	≥ 55
optical fiber connector		FC/APC	Optional SC/APC
RF Specs	Work bandwidth	(MHz)	45-862
	Input level	(dBmV)	20 \pm 2 MGC
	Flatness	(dB)	$\leq \pm 0.75$ 45~862MHz
	Return loss	(dB)	>16
	Input impedance	(Ω)	75 RF/INPUT
	RF test	(dB)	0 \pm 1
Link Specs	Transmit channel		NTSC/78CH
	CNR	(dB)	≥ 50 -1dBm receive
	CTB	(dB)	≤ -63

	CSO	(dB)	≤-57	
	SBS restrain	(dBm)	≥17	
General Specs	Network management interface		RJ45, RS232	Support I.E. & SNMP
	Power supply	(V)	90~25 VAC	-48VDC optional
	Power	(W)	≤50	Single power works
	Work temp.	(□)	-5~65	Machine temp. control automatically
	Storage temp.	(□)	-40~85	
	Operating relative humidity	(%)	5~95	
	Size	(")	19×10×1.75	(W)x(D)x(H)

Product series

Model	Distance(Km)	Output power(dBm)	CNR(dB)	CTB(dB)	CSO(dB)	SBS(dBm)
4C1503A-05	5	3	50	-63	-57	17
4C1506A-05		6	50	-63	-57	17
4C1510A-05		10	50	-63	-57	17
HT1503A-10	10	3	50	-63	-57	17
4C1506A-10		6	50	-63	-57	17
4C1510A-10		10	50	-63	-57	17
4C1503A-15	15	3	50	-63	-57	17
4C1506A-15		6	50	-63	-57	17
4C1510A-15		10	50	-63	-57	17



EDFA

Rack Mount

1550 nm

Our EDFA's are used at the Naval Research Lab and at Chapman University's Advanced Physics Laboratory in Addition to many Cable and RFoG Systems



Model	Power	Price
4CHA5113	≥13(20mw)	\$1300
4CHA5114	≥14(25mw)	\$1400
4CHA5115	≥15(32mw)	\$1500
4CHA5116	≥16(40mw)	\$1600
4CHA5117	≥17(50mw)	\$1700
4CHA5118	≥18(63mw)	\$1800
4CHA5119	≥19(80mw)	\$1900
4CHA5120	≥20(100mw)	\$2000
4CHA5121	≥21(125mw)	CALL
4CHA5122	≥22(160mw)	CALL
4CHA5123	≥23(200mw)	CALL
4CHA5124	≥24(250mw)	CALL
4CHA5125	≥25(320mw)	CALL
4CHA5126	≥26(400mw)	CALL

For Low Power Input ADD \$200.00

Deposit Required

4CHA5100

1550nm CATV EDFA

Product Description

4Cable's EDFA works with single wavelength in a CATV system. In order to avoid distortion, the operation wavelength of External Modulation Optic Transmitter is usually $1555\pm 5\text{nm}$. Our EDFA's features low NF, large saturated output power.

Specifications

Performance			Index			Supplement
			Min	Typ	Max	
Optic features	Operation Wavelength (λ)	(nm)	1540		1560	
	Input power	(dBm)	-10	3		
	Total output power	(dBm)	13		30	
	Each port output power	(dBm)	10		22	
	Number of output port		1		8	
	Difference of each output power	(dB)	-0.5		+0.5	
	Noise figure	(dB)	4.5		6.5	Pin: 0dBm
	System CNR deterioration	(dB)			1.0	Pin: 6dBm
	Polarization dependence gain	(dB)			0.4	
	Polarization mode dispersion	(ps)			0.4	
	Pump power leakage	(dBm)			-40	
	Echo loss	(dB)	50			
	Connectors		SC/APC			
General feature	Network management		RJ45,R232		Support I.E. & SNMP	
	Power supply	(V)	90~265 VAC		Option -48VDC	
	Power	(W)	≤ 50			
	Working Temp.	($^{\circ}\text{C}$)	-5~65 $^{\circ}\text{C}$		automatic temp. control	
	Storage Temp.	($^{\circ}\text{C}$)	-40~85 $^{\circ}\text{C}$			
	Work relative humidity	(%)	5~95%			
	Size	(")	19x10x1.75		(W)x(D)x(H)	
Model	Output Power (dBm)	Input Power (dBm)		Noise figure (dB)		
		Input range	Typical			
4CHA5113	$\geq 13(20\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5114	$\geq 14(25\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5115	$\geq 15(32\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5116	$\geq 16(40\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5117	$\geq 17(50\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5118	$\geq 18(63\text{mw})$	0~+10	>+3dBm	<4.5		
4CHA5119	$\geq 19(80\text{mw})$	0~+10	>+3dBm	<5.0		
4CHA5120	$\geq 20(100\text{mw})$	0~+10	>+3dBm	<5.0		
4CHA5121	$\geq 21(125\text{mw})$	0~+10	>+3dBm	<5.0		
4CHA5122	$\geq 22(160\text{mw})$	0~+10	>+3dBm	<5.0		
4CHA5123	$\geq 23(200\text{mw})$	0~+10	>+3dBm	<5.5		
4CHA5124	$\geq 24(250\text{mw})$	0~+10	>+3dBm	<5.5		
4CHA5125	$\geq 25(320\text{mw})$	0~+10	>+3dBm	<5.5		
4CHA5126	$\geq 26(400\text{mw})$	0~+10	>+3dBm	<5.5		

EDFA

High Power Rack Mount

1550 nm



4C5400 1550nm CATV High Power EDFA

4Cable's, 4C5400 series high power single mode EDFA is characterized with low noise, high linearity. It offers a flexible, low-cost solution for large area coverage, RFoG and FTTH. The 4C5400 series is equipped with completed APC, AGC, ATC control, an excellent design for heat-dispersion which guarantees long life and stable operation of the PUMP laser. RS232 and RJ45 on the front panel offers serial communication and SNMP network interface. The wide LCD displays all the parameters of the unit and any alarms. The laser will be automatically switched off if optical power is missing. All of the optical outputs are located on the front panel (can be on the back panel if desired).

4C5400A: 1RU chassis, total output power >1000mW, offers maximum 16 optical outputs.
4C5400B: 2RU chassis, total output power >4000mW, offers maximum 64 optical outputs

Specifications

Performance						Options
			Min.	Typ.	Max.	
Optical Specs	Wavelength	(nm)	1540		1560	
	Input power	(dBm)	0	3	10	
	Total output power	(dBm)	26		36	
	Each port output power	(dBm)	10		22	
	Number of output ports		8		64	
	Difference between each output port	(dB)	-0.5		+0.5	

	Noise figure	(dB)	4.5		6.5	
	System CNR deterioration	(dB)			1.0	Pin=6dBm
	Polarization dependence gain	(dB)			0.4	
	Polarization mode dispersion	(ps/nm)			0.3	
	Pump power leakage	(dBm)			-30	
	Echo loss	(dB)	50			
	Optical connectors		SC/APC, LC/APC			
General Specs	Serial interface		RS232			
	SNMP network management interface		RJ45			
	Power supply (220VAC)	(V)	100		250	Optional - 48VDC
	Power	(W)	50		170	
	Work temp.	(°C)	-10		65	
	Storage temp.	(°C)	-40		80	
	Relative humidity	(%)	5		95	
	Size (W) × (D) × (H)	(")	19 × 14.5 × 1.75			1RU: 4C5400A
		19 × 14.5 × 3.5			2RU: 4C5400B	

Models

Model	Total output power	Number of output port	Each port output power	Connector
4C5426A-08	≥26dBm(400mw)	8	≥15.5dBm	SC/APC, LC/APC
4C5426A-16		16	≥12.0dBm	SC/APC, LC/APC
4C5427A-08	≥27dBm(500mw)	8	≥16.5dBm	SC/APC, LC/APC
4C5427A-16		16	≥13.0dBm	SC/APC, LC/APC
4C5428A-08	≥28dBm(630mw)	8	≥17.5dBm	SC/APC, LC/APC
4C5428A-16		16	≥14.0dBm	SC/APC, LC/APC
4C5429A-08	≥29dBm(800mw)	8	≥18.5dBm	SC/APC, LC/APC
4C5429A-16		16	≥15.0dBm	SC/APC, LC/APC
4C5430B-08	≥30dBm(1000mw)	8	≥19.5dBm	SC/APC, LC/APC
4C5430B-16		16	≥16.0dBm	SC/APC, LC/APC
4C5431B-08	≥31dBm(1260mW)	8	≥20.5dBm	SC/APC, LC/APC
4C5431B-16		16	≥17.0dBm	SC/APC, LC/APC
4C5431B-32		32	≥13.5dBm	LC/APC
4C5432B-08		8	≥21.5dBm	SC/APC, LC/APC
4C5432B-16	≥32dBm(1580mW)	16	≥18.0dBm	SC/APC, LC/APC
4C5432B-32		32	≥14.5dBm	LC/APC
4C5433B-08	≥33dBm(2000mW)	8	≥22.5dBm	SC/APC, LC/APC
4C5433B-16		16	≥19.0dBm	SC/APC, LC/APC
4C5433B-32		32	≥15.5dBm	LC/APC
4C5433B-64		64	≥12.0dBm	LC/APC

4C5434B-08	≥34dBm(2150mW)	8	≥23.5dBm	SC/APC, LC/APC
4C5434B-16		16	≥20.0dBm	SC/APC, LC/APC
4C5434B-32		32	≥16.5dBm	LC/APC
4C5434B-64		64	≥13.0dBm	LC/APC
4C5435B-16	≥35dBm(3160mW)	16	≥21dBm	SC/APC, LC/APC
4C5435B-32		32	≥17.5dBm	LC/APC
4C5435B-64		64	≥14.0dBm	LC/APC
4C5436B-16	≥36dBm(4000mW)	16	≥22dBm	SC/APC, LC/APC
4C5436B-32		32	≥18.5dBm	LC/APC
4C5436B-64		64	≥15.0dBm	LC/APC

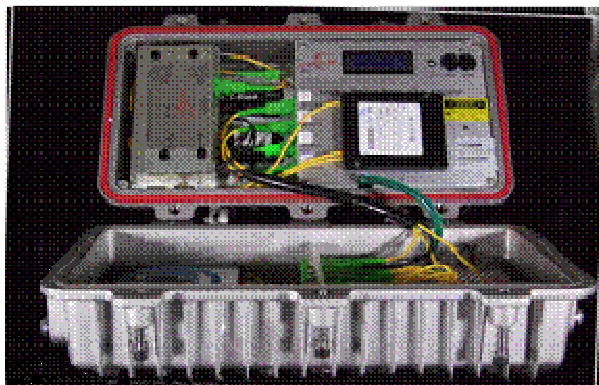


**2 Year
Warranty**

RFoG Extender

Outdoor Mounted EDFA with Return Receiver and Transmitter

Extend the Reach of your RFoG system



- 13 to 26 dB gain Outdoor EDFA
- Up to an 8 way Optical Split
- Dual Return Receivers each servicing 4 (1310) Return Paths
- Receivers accept up to a -26 dBm return signal for 30 dB C/N
- Automatic return level adjustment

Specifications in Housing

Parameter	Test Conditions	Units	Notes	EDFA
Output Power		dBm	-	13 to 26
Wavelength		nm	-	1530-1560
Max Input		dBm	-	10
Minimum Input		dBm		-12
Noise Figure @ Power Level	13-16 dBm out		17to 21 dBm out	22 to 26 dBm out
@ 0 dBm input	≤ 4.5		≤ 5	≤ 5.3
@ 6 dBm input	≤ 5.5		≤ 6	≤ 6.5
Output Stability 0-65°C		dB		±0.3
Output Stability -40-65°C		dB		±0.6
Polarization		dB		<0.2
Polarization Mode Dispersion		dB		<0.5
Reflection Loss		dB	-	> 40
Power		Watts		> 50
Voltage		VAC		40-90
Working Temperature		°C	-	-40 to +60
LCD Display Temperature		°C	1	0 to +60
1310/1550 Isolation		dB		≥ 60

Return Receiver and Transmitter

Reference Frequencies		MHz		5-40
Output Light Level		dBm	-	3
Input Light	For 30 dB C/N minimum	dBm		-26
AGC	10 dB input change	dB	-	± 1
Crosstalk between Receivers		dB	-	≥ 60
Indicator Light Red		dBm	2	-28
Test Point Transmitter	1 mW	V		1

Test Point Receiver

-20 dBm input

V

-

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Notes:

1. The LCD readout for the EDFA operational parameters only works above 0° C
2. The red alarm light will turn on at -28 dBm. It will return to Green after the level has increased to -26 dBm. There is approximately a 3 second delay to enable capture of the bursting nature of the incoming light. If there is no data transmitted in over 3 seconds the red light will come on.



**2 Year
Warranty**

4CRTR Rack Mount Return Receiver

Single or Dual RFoG Receivers



- Only 2 RU of Rack Space
- With Dual Units 24 Receivers in 2 RU
- Single Units 12 Receivers in 2 RU
- Usable down to -26 dBm
- Designed for RFoG
- Dual Power Supply Option
- Dual Units uses Digital Potentiometers
- Designed for RFoG low input levels

Specifications

Para Parameter	Test Conditions	Units	Notes	Forward	
Tech Technology	-	-	-	GaAs	
Band Bandwidth	-	MHz	-	5-80/ 5-200	
Optic Wavelength	-	nm	1	1290-1620	
Response	With respect to Gain Slope	dB	-	+/-0.5	
Minimum Output	-27 dBm light input 1310 nm	dBmV		10 dBmv	
Slope	-	dB	-	±1	
Out Test Points	-	dB	4	-20 ±1	
Output RTL	Freq 5-200MHz	dB		16	
Minimum Light In	30 dB C/N	dBm		-26	

Single Receiver	4CRT	\$299.00
Dual Receiver	4CRT-2	\$550.00
Rack	4CRAC-2U	\$ 75.00
Power Supply	4CRSMPS12	\$100.00



Fiber Splitter with built in 1310

**2 Year
Warranty**

WDM

4, 8 and 16 Way



- 4, 8 or 16 Way Splitter
- Built in 1310 WDM
- 1 RU Rack Mount

4 Way	\$300.00
8 Way	\$500.00
16 Way	\$800.00

WDM

1310/1550 WDM	\$ 66.00
1550/1610 WDM	\$110.00



RF2F RFoG Transmitter

2 Year Warranty

Outdoor Mounted 1550 Transmitter with Return Receiver

Generate a RFoG system anywhere

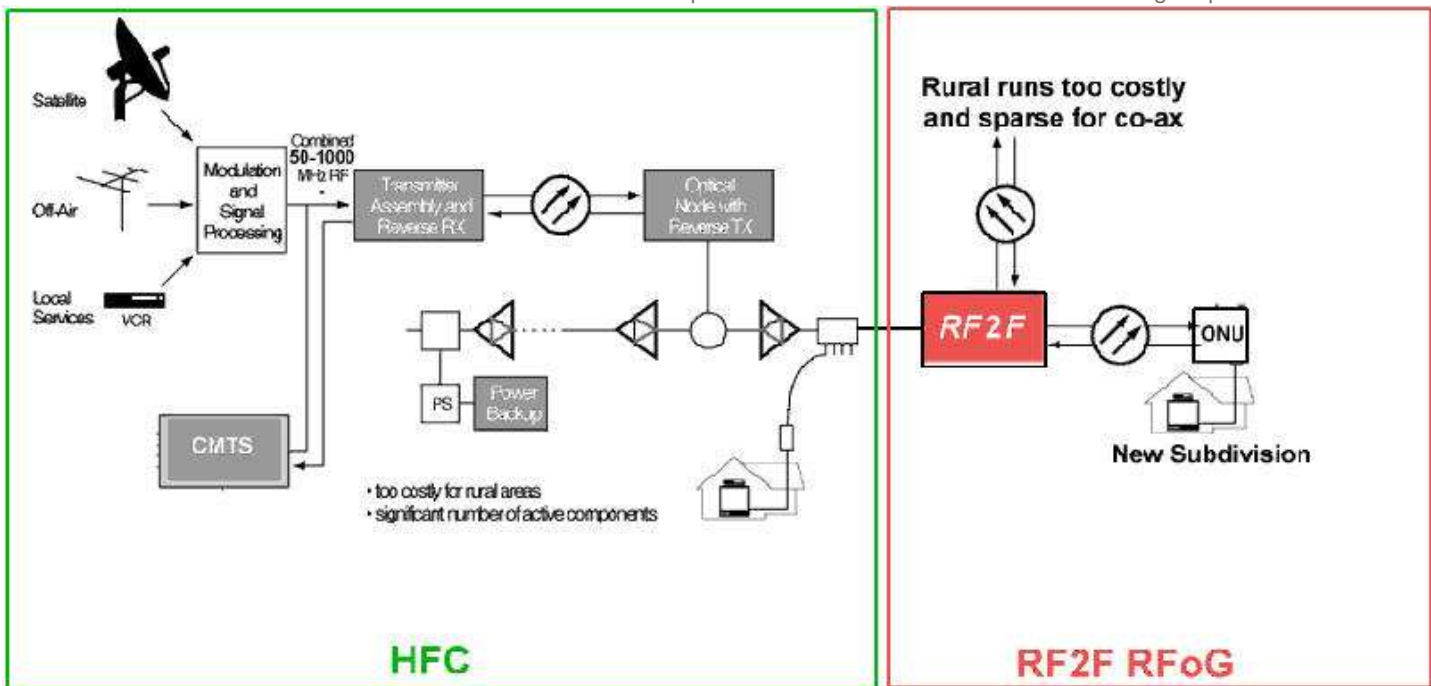
Outdoor Mounted Transmitter for RFoG with a Two-Way 1310 nm Return

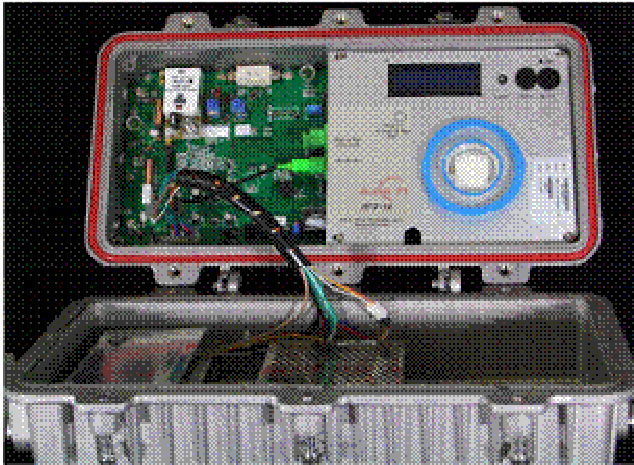
4Cable TV's RF2F (RF to Fiber) field mounted transmitter is designed to accept a RF feed from the HFC coax plant and then output a 1550 nm signal on fiber. The unit has an integrated 1310 return receiver that accepts the return light from the ONU and converts it back to RF and then sends it back on the traditional HFC plant. The receiver is capable of producing a signal with a 30 dB CN with a light input of -26 dBm.

Because of the degradation caused by the interaction of the laser Chirp and the dispersion characteristic of the fiber the RF2F can be order pre-configured for a fiber length of 5, 10 or 15 km. It has a nominal output of 10 dBm with an option to increase it to 18 dBm.

This RF2F is the perfect choice to feed a new subdivision, when fiber is not available, or an extension into a new area. Because of the lower cost of deployment it is perfect choice to use to deploy fiber into a sparsely populated rural area.

It will also be available in a low power 3 dBm version to be used to feed long drops to 2 or 3 homes.





- 10 dBm output
- 18 dBm optional
- 5, 10, or 15 km options
- Built in return receiver

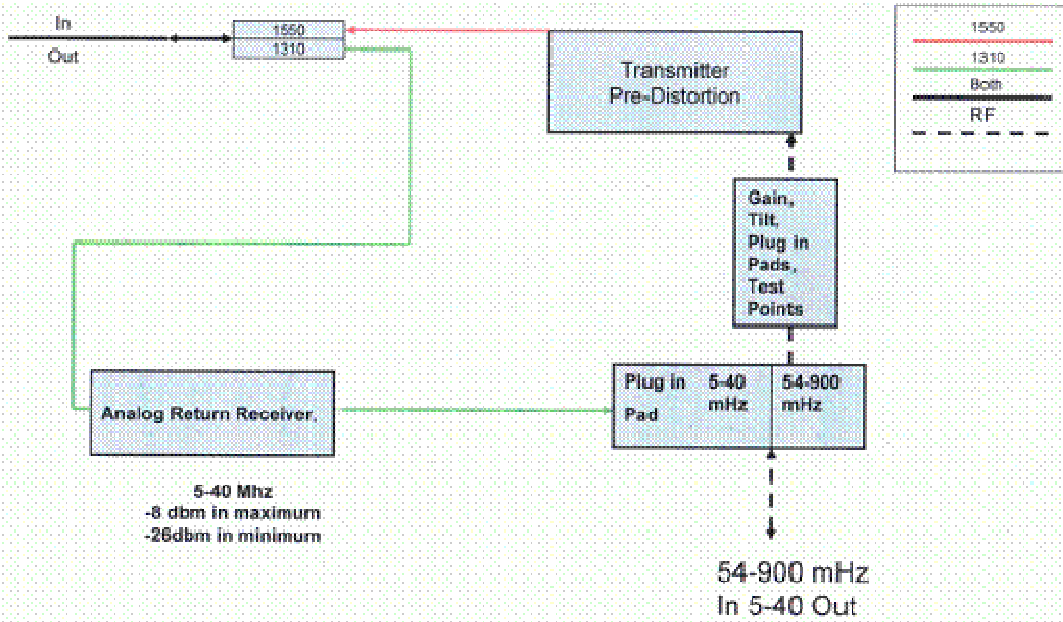
Specifications in Housing

Parameter	Test Conditions	Units	Notes	
Optic Specs	Wavelength	(nm)	1548~1563	HT1500AC: CATV wavelength
			1530~1563	HT1500AU: ITU standard wavelength
	Line width	(MHz)	≤1	FWHM(Δλ)
	Side mode suppression ratio	(dB)	≥45	SMSR
	Extinction ratio	(dB)	≥20	XP
	Equivalent noise intensity	(dB/Hz)	≤-160	RIN (20~1000MHz)
	Output power	(dBm)	6	3, 10 Options
	Return loss	(dB)	≥55	
optical fiber connector			FC/APC	Optional SC/APC
RF Specs	Work bandwidth	(MHz)	45-862	Option 45- 1005 mHz
	Input level	(dBmV)	13 dBmv	MGC
	Flatness	(dB)	≤±0.75	45~862MHz
	Return loss	(dB)	>16	
	Noise Figure	(dB)	10	Min Tilt Max Gain
	Input impedance	(Ω)	75	RF/INPUT
	RF test	(dB)	-20 dB 0±1	
Link Specs	Transmit channel		NTSC/78CH	
	CNR	(dB)	≥50	-1dBm receive

	CTB	(dBc)	≤-63	
	CSO	(dBc)	≤-63	
	SBS restrain	(dBm)	≥17	
General Specs	Network management interface		RJ45, RS232	Support I.E. & SNMP
	Power supply	(V)	90~25 VAC	-48VDC optional
	Power	(W)	≤50	Single power works
	Work temp.	(C)	-40 ~ +65	Machine temp. control automatically
	Storage temp.	(V)	-40~ 85	
	Operating relative humidity	(%)	5~95	
	Size	(")	19×10×1.75	(W)×(D)×(H)

Model	Distance(Km)	Output power(dBm)	CNR(dB)	CTB(dBc)	CSO(dBc)	SBS(dBm)
4C1503A-05	5	3	50	-63	-57	17
4C1506A-05		6	50	-63	-57	17
4C1510A-05		10	50	-63	-57	17
HT1503A-10	10	3	50	-63	-57	17
4C1506A-10		6	50	-63	-57	17
4C1510A-10		10	50	-63	-57	17
4C1503A-15	15	3	50	-63	-57	17
4C1506A-15		6	50	-63	-57	17
4C1510A-15		10	50	-63	-57	17

Return Receiver					
Reference Frequencies	-	MHz		5-40	
Input Light	For 30 dB C/N minimum	dBm		-26	
Crosstalk between Receivers		dB	-	≥ 60	If Dual
Indicator Light Red		dBm	2	-28	
Test Point	-20	dB		Optimal Output is 30 dBmv	



4Cable TV *RF2F* Transmitter Receiver