

HEADEND OPTICS PLATFORM (CH3000)

HT3540H SERIES DOUBLE-DENSITY FULL SPECTRUM DWDM TRANSMITTER SYSTEM



FEATURES

- DWDM transmitter: up to 40 wavelengths on ITU grid
- Hot plug in/out, individually replaceable transmitter modules
- Optimized for full spectrum loading
- Analog loading up to 552 MHz plus QAM loading
- Manual or Automatic Gain Control (AGC) modes
- Low power consumption
- Industry's highest DWDM rack density: 24 transmitters per 3RU chassis, with redundant power supplies and optical multiplexing
- Front access -20 dB input test point
- Front panel laser On/Off switch
- Local and remote status monitoring features

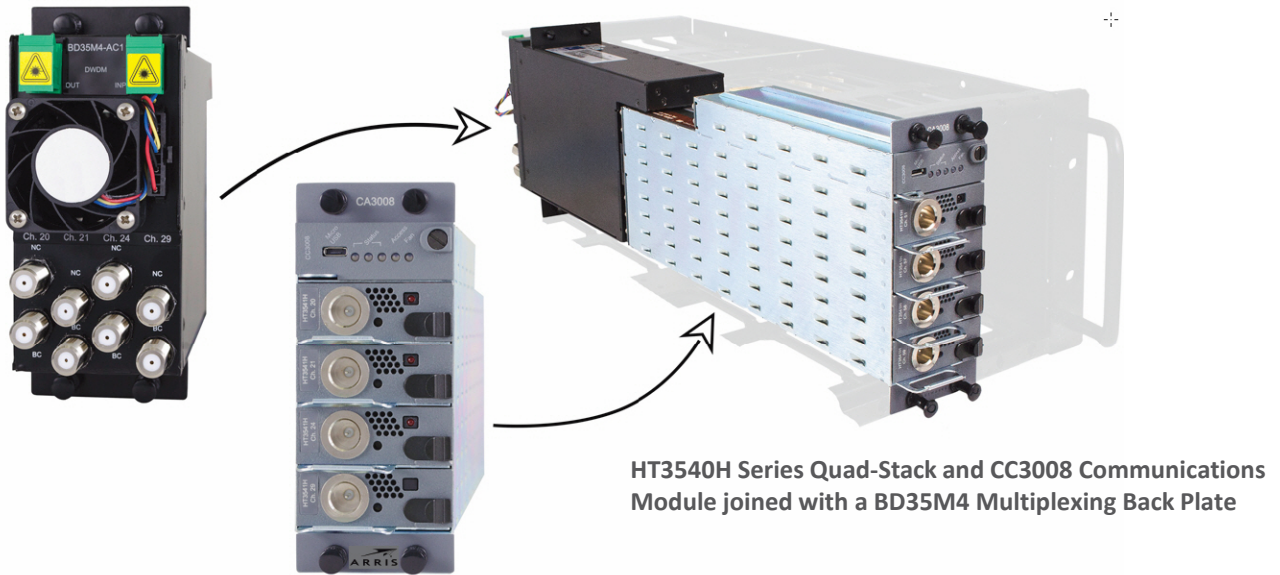


SYSTEM OVERVIEW

The ARRIS HT3540H Series Double-Density Full Spectrum Dense Wave Division Multiplexing (DWDM) Transmitter System provides high performance and a high rack density forward path transmission solution for Cable TV service providers.

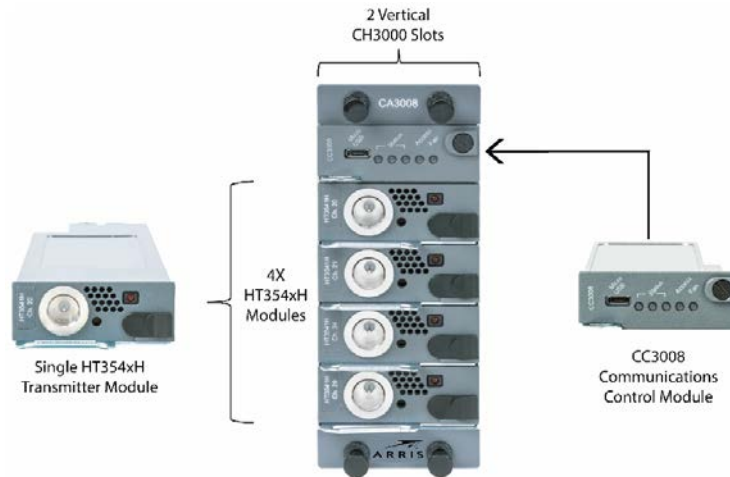
The high density packaging design allows up to four (4) HT3540H series high performance transmitters plus a CC3008 Communications Control Module to be stacked vertically and contained by the CA3008 module carrier, requiring only two chassis slots of a 3RU chassis. The compact solution supports up to 24 transmitters in a CH3000 chassis, including redundant power supplies.

When installed in the chassis, the transmitters interface to a “zero-slot” back plate, providing support for up to four HT3540H series transmitters. The figure below shows a fully loaded carrier mated to the BD35M4 Double-Density multiplexing back plate that supports optical combining of four DWDM wavelengths in the forward path.



The CC3008 Communications Module installed at the top of a HT3540H series transmitter stack provides the communications interface between the transmitters and the CH3000 mid-plane bus, allowing complete configuration and management control of the stack, both local and remote.

HT3540H Series Double Density Full Spectrum DWDM Transmitters (1.2 GHz Passband)



ARRIS HT3540H Series Double-Density Full Spectrum DWDM Transmitters are a key element of the ARRIS HFC and Fiber Deep architectures in support of the evolution to all QAM transmission. These high performance transmitters are designed for Dense Wave Division Multiplexing (DWDM) applications for point-to-point forward path transmission of full spectrum broadcast and narrowcast services.

HT3541H series transmitters are designed for “light” analog channel loading from 0 to 30 analog channels (up to 258 MHz) plus QAM channel loading, or for all QAM loading. They are also designed for QAM-only loading for digital services as part of a BC/NC overlay system.

HT3542H series transmitters are designed for “full” analog channel loading from 0 to 79 analog channels (up to 552 MHz) plus QAM channel loading.

HT3543H series transmitters are designed for all QAM loading.

These transmitters incorporate advanced dispersion compensation circuitry to enable transmission of high quality signals over maximum distances.

The above figure shows a front view of the CA3008 carrier components: a single HT354xH Double-Density Transmitter (left); a single CC3008 Communications Module (right), and a fully loaded “stack” (center) providing four (4) DWDM transmitters, requiring only 2 vertical slots of a CH3000 Chassis. A fully loaded CH3000 chassis supports 24 Double-Density DWDM transmitters and redundant power supplies.

Features

- DWDM transmitter: 40 wavelengths on the ITU grid
- Manual or Automatic Gain Control (AGC) modes
- RF input amplification up to +6 dB
- Optimized for full spectrum loading
- HT3541H: Analog loading up to 258 MHz plus QAM loading, or all QAM loading.
- HT3542H: Analog loading up to 552 MHz, plus QAM loading
- HT3543H: All QAM loading
- Hot plug in/out, individually insertable
- Low power consumption
- Industry’s highest DWDM rack density: 24 transmitters per 3RU chassis, with redundant power supplies
- Front access -20 dB input test point
- Front panel laser On/Off interlock switch
- Local and remote status monitoring

HT3540H SERIES SPECIFICATIONS

Characteristics		Specification					
Physical							
Dimensions	11.5" D x 0.8" H x 2.0" W (29.2 x 2.0 x 5.1 cm)*						
Weight	0.75 lbs. (0.34 kg)						
* Four (4) transmitter units designed to be vertically stacked, plus a CC3008 Communications Module, and installed inside a CA3008 Module Carrier. The combination occupies two slots in a 3RU CH3000 Chassis.							
Environmental							
Operating	-20° to +65°C (-4° to 149°F)						
Storage	-40° to +85°C (-40° to +185°F)						
Humidity	5% to 95% non-condensing						
RF and Optical Interface							
RF input	F-type male (mates to BD31A4 or BD35M4 Back Plates)						
Input RF test point	G-type male (located at front panel, -20 dB)						
Optical connector	SC/APC (mates to BD31A4 or BD35M4 Back Plates)						
Power Requirements							
Input voltage	12 V _{DC}						
Power consumption	10 W (per transmitter) including controller and back plate cooling fan						
General							
Hot plug-in/out							
Manual gain alignment							
Channel loading							
HT3541H: 0 - 30 Analog channels (up to 258 MHz), plus QAM channels HT3542H: 0 - 79 Analog channels (up to 552 MHz), plus QAM channels HT3543H: All QAM channels							
Optical							
Optical output power	10 ± 0.25 dBm						
Wavelength	See DWDM ITU Channel Plans description						
Fiber length (user-settable, adjustable dispersion compensation)	HT3541H and HT3543H: 60 km (in 5 km steps) HT3542H: 40 km (in 1 km steps) • Additional external dispersion compensation can be supported for some applications.						
Electrical							
Pass band	45–1218 MHz						
Frequency response (including slope)	<ul style="list-style-type: none"> ± 1.0 dB (BC input @ 25°C) - 6 ± 0.5 dB (NC input relative to BC input) 						
Nominal RF input levels (input attenuator = 0 dB)	HT3541H: <ul style="list-style-type: none"> 16.2 dBmV/ch for 30 analog channels into BC input 10.2 dBmV/ch for 256-QAM channels into BC input, or 16.2 dBmV/ch into NC input HT3542H: <ul style="list-style-type: none"> 15 dBmV/ch for 79 analog channels into BC input 9 dBmV/ch for 256-QAM channels into BC input, or 15 dBmV/ch into NC input HT3543H: <ul style="list-style-type: none"> 10.7 dBmV/ch for 154 256-QAM channels into BC input, or 16.7 dBmV/ch into NC input 						
RF input impedance	75 Ω, nom						
RF input return loss	18 dB, min						
RF input attenuator/amplify range (Manual Mode)	-6.0 to +5.0 dB Normal mode. High-gain mode (+5.5, +6.0 dB) supports BC RF input port, NC RF input is terminated.						
RF input attenuator step size	0.5 dB						
AGC Mode	Maintains laser power to within ± 3 dB of the learned RF value						
Level stability (typical)	± 0.5 dB (-1 worst case relative to 25°C)						
256-QAM BER	< 10 ⁻⁵ (pre-FEC, ITU-C)						
MER	> 37 dB to 50°C; > 36 dB to 65°C						
Link performance		HT3541H		HT3542H		HT3543H	
	Loading	30A + 124 QAM		79A + 75 QAM		154 QAM	
	Length (km)	40	60	30	40	40	60
	CNR* (dB):	52	50	51	50	See MER	See MER
	CSO (dB):	61	58	60	58	-	-
	CTB (dB):	65	65	65	65	-	-
* max 1 dB degradation at temperature extremes.							
An HT3541H transmitter can also be used as a narrowcast transmitter. For example, in BC/NC overlay systems, it would have the performance of an AT3535G-xx-1-AS transmitter. For more information about BC/NC overlay system performance and evolution from low NC 256-QAM channel loading to full spectrum 256-QAM channel loading, or for information about full spectrum multiwavelength applications with up to 40 DWDM wavelengths, please contact your ARRIS representative.							
DWDM ITU Channel Plans							
ARRIS supports DWDM network architectures with a variety of products on the standard DWDM ITU Grid (ITU-T G.694.1). For a more complete description, please refer to the ARRIS DWDM ITU Grid Channel Plan data sheet.							

BD35M4-AC Double-Density Back Plates

The ARRIS BD35M4-AC Family of back plates is a 100 GHz grid spacing Double-Density MUX Back Plate that multiplexes the output of four HT3540H Double-Density Full Spectrum Transmitters.

This back plate provides connections for a group of four HT3540H Series Transmitters installed in the same CA3008 Module Carrier, along with the CC3008 Communications Control Module.

These 4-channel mux back plates (for which outputs can be cascaded from one back plate to another) may be ordered for various channel groups.



BD35M4-ACX-H02F-Y-AS Back Plate

BD35M4-AC BACK PLATE SPECIFICATIONS

Characteristics	Specification	
Physical		
Dimensions	7.2" D x 5.2" H x 2.0" W* (18.2 x 13.2 x 5.1 cm)	
Weight	2.0 lb. (0.91 kg)	
Environmental		
Operating	-20° to +65°C (-4° to 149°F)	
Storage	-40° to +85°C (-40° to +185°F)	
Humidity	5% to 95% non-condensing	
Power Requirements		
Input voltage	12 V _{DC}	
Power consumption	5 W max (2.5 W Typ), including the replaceable cooling fan	
Optical Interface		
Optical Connectors	SC/APC (2)	
	<ul style="list-style-type: none"> DWDM INP (input from previous mux back plate) DWDM OUT (output to network or next mux back plate) 	
RF Interface		
8 F-Type Connectors	<ul style="list-style-type: none"> 4 BC and 4 NC (1 BC/NC pair per transmitter) 	
Optical		
Channel spacing	100 GHz	
Channel plan	See ITU Channel Plans description	
Insertion Losses, including connectors:		
	Typ	Max
• DWDM input to DWDM output	1.0 dB	1.2 dB
• Ch. yy input to DWDM output	1.4 dB	1.6 dB
Uniformity, including connectors:		
• Module Uniformity	0.7 dB	1.0 dB
• Paired Uniformity	0.4 dB	0.6 dB
Return loss, min	45 dB	
Directivity, min	55 dB	
Passband @ 0.2 dB		
• Ch. yy input to DWDM output	± 0.125 nm	
• DWDM input to DWDM output	passes 1423.5 through 1617.5 with a notch at the channel add/drop band. WDL for the passband is within ± 0.15 dB	
Ripple within passband	0.5 dB max	
Polarization dependent loss, max	0.1 dB (typically < 0.05 dB)	
Power handling, max (any input port)	21.8 dBm	

BD31A4-100 Double-Density Back Plates

The BD31A4 is a double-density back plate that provides a choice of 4 separate BC and 4 separate NC RF inputs, or 1 common BC and 4 separate NC RF inputs, for four HT3541H Transmitters.

The BD31A4-100 provides RF input and optical connections to or from the HT3541H transmitters.

BD31A4-100-H12F-0-AS is a double density back plate that provides 4 separate BC inputs and 4 separate NC RF inputs for four HT3541H Transmitters. Also supports four separate optical output SC/APC connectors.

BD31A4-100-H10F-0-AS is a double density back plate that provides 1 common BC input and 4 separate NC RF inputs for four HT3541H Transmitters. Also supports four separate optical output SC/APC connectors.



BD31A4-100-H12F-0-AS Back Plate



CA3008 Module Carrier

BD31A4-100 BACK PLATE SPECIFICATIONS

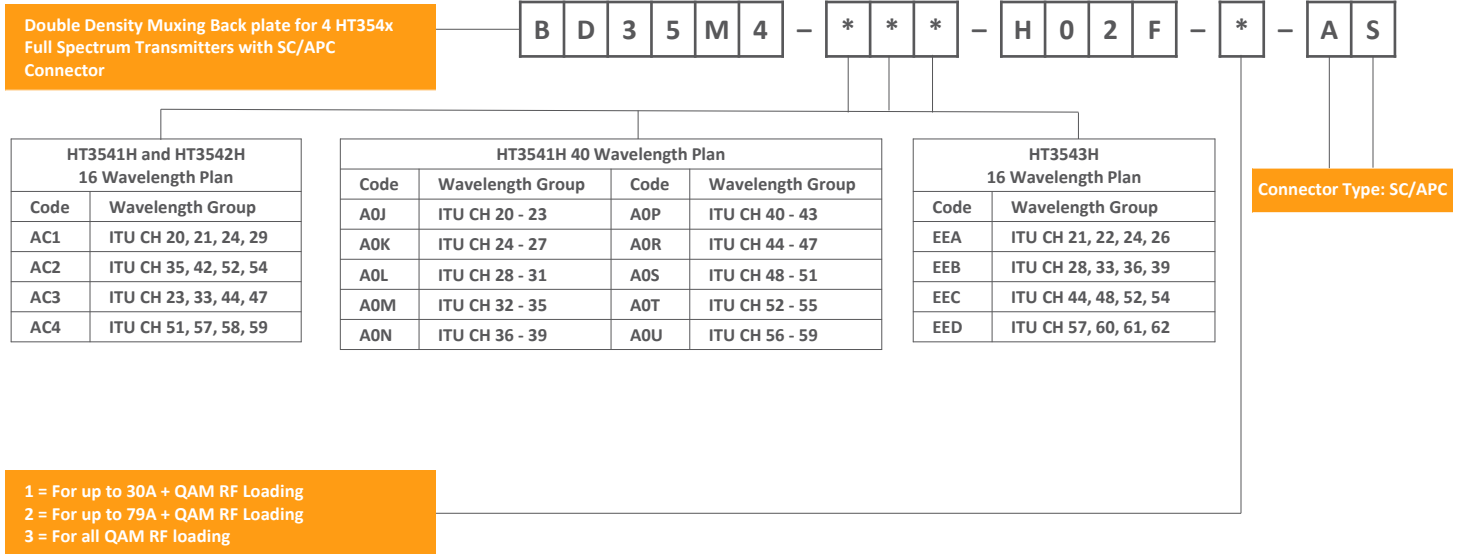
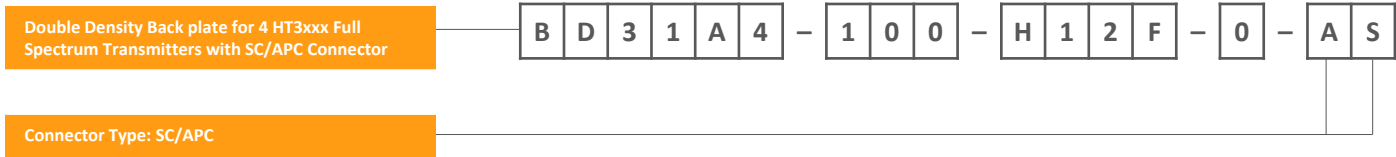
Characteristics	Specification
Physical	
Dimensions	7.2" D x 5.2" H x 2.0" W* (18.2 x 13.2 x 5.1 cm)
Weight	2.0 lb. (0.91 kg)
Environmental	
Operating	-20° to +65°C (-4° to 149°F)
Storage	-40° to +85°C (-40° to +185°F)
Humidity	5% to 95% non-condensing
Power Requirements	
Input voltage	12 V _{DC}
Power consumption	5 W max (2.5 W Typ), including the replaceable cooling fan
Optical	
Through 4 SC/APC connectors, the BD31A4-100 provides optical pass-through from the HT354xH transmitter.	
Optical Insertion Loss	0.2 dB Typ; 0.4 dB Max Refer to the HT354xH product specifications for more information.
RF Interface	
Through 8 (eight) F-type RF connectors, the BD31A4-100 provides RF pass-through to the HT354xH transmitter:	<ul style="list-style-type: none"> 4 BC and 4 NC (1 BC/NC pair per transmitter)

ORDERING INFORMATION

HT354xH Transmitter



Back Plates



ORDERING INFORMATION

System Accessories

Communications Control Module

C C 3 0 0 8

Module Carrier

C A 3 0 0 8

Filler Module for Double-Density Slots

H T 3 F I L D



RELATED PRODUCTS

CH3000 Chassis	Optical Patch Cords
Optical Transmitters	Optical Passives
Digital Return	Installation Services

Note: Specifications are subject to change without notice.

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