Headend Optics Platform (CH3000)

HT3562H Series

High Performance Double-Density Full Spectrum DWDM Transmitter System

FEATURES

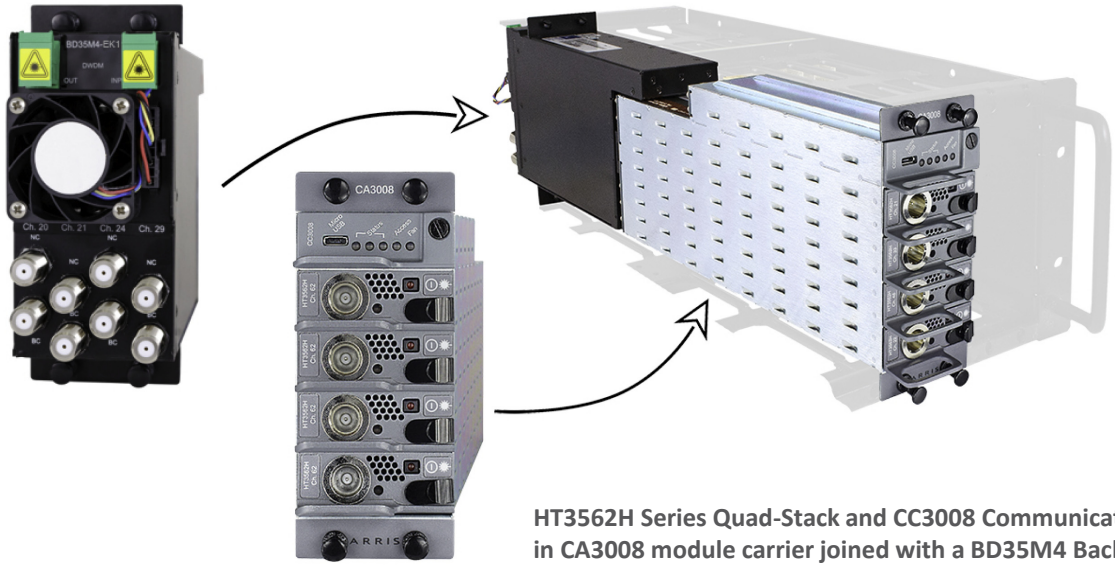
- High MER performance enabled by innovative externally modulated laser technology
- DWDM transmitter: up to 40 ITU grid wavelengths on a single fiber
- Optimized for 1.218 GHz DOCSIS® 3.1 full spectrum loading
- Industry's highest rack density for externally modulated transmitters: 24 transmitters per 3RU chassis with redundant power supplies and optical multiplexing
- Analog loading up to 258 MHz plus QAM loading
- Manual or Automatic Gain Control (AGC) modes
- Low power consumption
- Hot plug-in/out, individually replaceable transmitter modules
- Front access -20 dB input test point
- Front panel laser On/Off switch
- Local and remote status monitoring features

SYSTEM OVERVIEW

The ARRIS HT3562H 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. Its enhanced performance removes transmitter link constraints to enable DOCSIS 3.1 capabilities while maintaining best industry practices and architectures at a low cost.

The high density packaging design allows up to four (4) HT3562H 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.

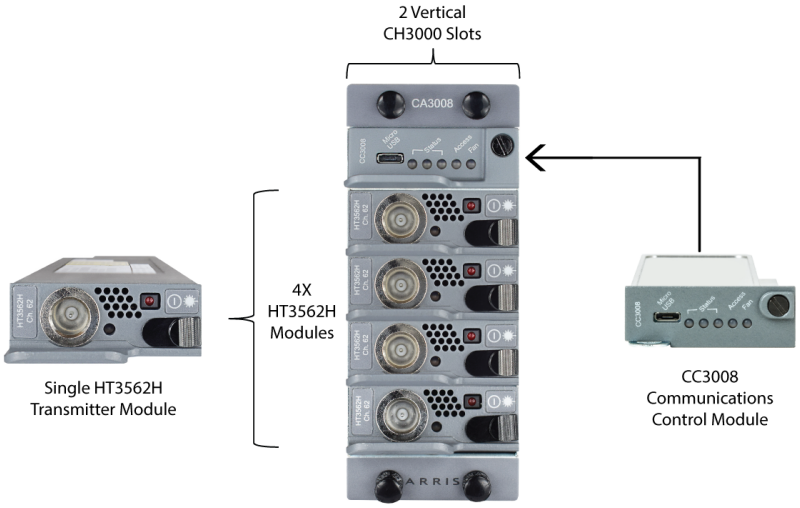
When installed in the chassis, the transmitters interface to a “zero-slot” back plate, providing support for up to four HT3562H series transmitters with no additional rack space required for optical multiplexing. The figure below shows a fully loaded carrier mated to the BD35M4 Double-Density multiplexing back plate that supports optical combining of four DWDM wavelengths in the forward path.



HT3562H Series Quad-Stack and CC3008 Communications Module in CA3008 module carrier joined with a BD35M4 Back Plate

The CC3008 Communications Module installed at the top of a HT3562H 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.

HT3562H Series Double-Density Full Spectrum DWDM Transmitters (1.2 GHz Passband)



ARRIS HT3562H Series Double-Density Full Spectrum DWDM Transmitters enhance ARRIS support of HFC and Fiber Deep architectures and evolution to DOCSIS 3.1 transmission. These high performance transmitters are designed for Dense Wave Division Multiplexing (DWDM) applications for forward path transmission of full spectrum broadcast and narrowcast services.

HT3562H series transmitters are designed for up to 30 analog channels (up to 258 MHz) plus QAM channel loading or for all QAM loading.

The above figure shows a front view of the CA3008 carrier components: a single HT3562H 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: up to 40 ITU grid wavelengths on a single fiber
- Manual or Automatic Gain Control (AGC) modes
- Optimized for full spectrum loading
- Analog loading up to 258 MHz plus QAM loading or all QAM loading
- Low power consumption
- High rack density: 24 transmitters per 3RU chassis with redundant power supplies and optical multiplexing
- Optional RF input equalization controls
- Hot plug-in/out, individually replaceable
- Front access -20 dB input test point
- Front panel laser On/Off interlock switch
- Local and remote status monitoring

HT3562H 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 Temperature	0° to +50°C (32° to 122°F)		
Storage Temperature	-40° to +85°C (-40° to +185°F)		
Humidity	5% to 95% non-condensing		
RF and Optical Interface			
RF Input	F-type male (located on 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	7 W typical, 10 W max, per transmitter including any power for controller and back plate cooling fan		
General			
	Hot plug-in/out		
	Manual gain alignment		
Channel Loading			
	0 to 30 Analog channels (up to 258 MHz), plus QAM channels		
Optical			
Optical Output Power	11.8 ± 0.5 dBm		
Wavelength	43 wavelengths on ITU grid. See ordering information section, DWDM ITU Channel Plans description.		
Electrical			
Passband	46–1218 MHz		
Frequency Response (Including Slope)	• ± 0.75 dB (BC input @ 25°C) • -6 ± 1.0 dB (NC input relative to BC input)		
Nominal RF Input Levels (Input Attenuator = 0 dB)	30 Analog plus 160 QAM loading: • 14.8 dBmV/ch for 30 analog channels into BC input • 8.8 dBmV/ch for 256-QAM channels into BC input or 14.8 dBmv/ch into NC input 190 QAM loading: • 10.5 dBmV/ch for 190 256-QAM channels into BC input or 16.5 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)	-5.0 to +3.0 dB		
RF Input Attenuator Step Size	0.5 dB		
RF Input Equalizer Slope	0 to 3 dB		
AGC Mode	Maintains laser power to within ± 3 dB of the learned RF value		
Level Stability (typical)	± 1.0 dB		
256-QAM or OFDM BER	< 10^{-9} (pre-FEC, ITU-B)		
Link Performance at 60 km			
	Loading	30A + 160 QAM/OFDM	190 QAM/OFDM
	CNR* (dB):	50.5 (52 at 40 km)	
	MER (dB):	> 42	> 44
	CSO (dB):	62	
	CTB (dB):	65	
	*max of 0.5 dB degradations below 100 MHz		
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-EK and BD35M4-A0 Double-Density Back Plates

The ARRIS BD35M4-EK and BD35M4-A0 families of back plates are 100 GHz ITU grid compliant Double-Density Mux Back Plates that multiplex the output of four HT3562H Double-Density Full Spectrum Transmitters.

When combined together:

- The BD35M4-EK family of back plates supports up to 16 wavelengths on a single fiber.
- The BD35M4-A0 family of back plates supports up to 40 wavelengths on a single fiber.

Each back plate provides connections for a group of four HT3562H 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 as described in the Ordering Information section at the end of this data sheet.

BD35M4-EKx-H02F-S-AS Back Plate

BD35M4-EK AND BD35M4-A0 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 Temperature	-20° to +65°C (-4° to 149°F)	
Storage Temperature	-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)	
	• DWDM INP (input from previous mux back plate) • DWDM OUT (output to network or next mux back plate)	
RF Interface		
8 F-Type Connectors	• 4 BC and 4 NC (1 BC/NC pair per transmitter)	
Optical		
Channel Spacing	100 GHz	
Channel Plan	See ordering information and 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

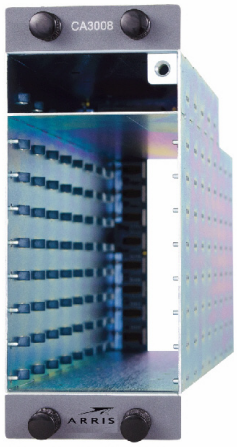
The BD31A4 is a double-density back plate that provides a choice of 4 separate BC and 4 separate NC RF inputs, or 1 common BC and 4 separate NC RF inputs, for four HT3562H Transmitters.

The BD31A4-100 provides RF input and optical connections to or from the HT3562H transmitters.

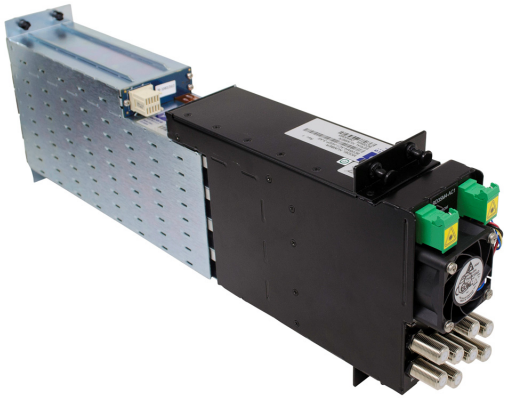
BD31A4-100-H12F-0-AS is a double-density back plate that provides 4 separate BC inputs and 4 separate NC RF inputs for four HT3562H Transmitters. Also supports four separate optical output SC/APC connectors.

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 HT3562H 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 Temperature	-20° to +65°C (-4° to 149°F)
Storage Temperature	-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 HT3562H transmitter.
Optical Insertion Loss	0.2 dB typ; 0.4 dB max
	Refer to the HT3562H product specifications for more information.
RF Interface	
The BD31A8-100 provides RF to the HT3562H transmitter through F-type RF connectors	• 4 BC and 4 NC (BD31A4-100-H12F-0-AS) • 1 BC and 4 NC (BD31A4-100-H10F-0-AS)

ORDERING INFORMATION

HT3562H Transmitter

	H	T	3	5	6	2	H	–	D	–	K	*	*	0	–	2	–	A	S

- High Performance Double-Density, Full Spectrum DWDM Transmitter (1.2 GHz)
- ITU Channel Number (20 through 62; reference ARRIS DWDM ITU Grid Channel Plan Data Sheet)
- Connector Type: SC/APC

Back Plates

	B	D	3	1	A	4	–	1	0	0	–	H	1	*	F	–	0	–	A	S

- Double Density Back Plate for 4 HT3xxx Full Spectrum Transmitters with SC/APC Connector
- 0 = 1 common BC input and 4 NC RF Inputs
  2 = 4 BC inputs and 4 NC RF Inputs
- Connector Type: SC/APC

	B	D	3	5	M	4	–	*	*	*	–	H	0	2	F	–	*	–	A	S

- Double-Density Multiplexing Back Plate for 4 HT3562 Full Spectrum Transmitters with SC/APC Connector

40 Wavelength Plan			
Code	Wavelength Group	Code	Wavelength Group
A0J	ITU CH 20 - 23	A0P	ITU CH 40 - 43
A0K	ITU CH 24 - 27	A0R	ITU CH 44 - 47
A0L	ITU CH 28 - 31	A0S	ITU CH 48 - 51
A0M	ITU CH 32 - 35	A0T	ITU CH 52 - 55
A0N	ITU CH 36 - 39	A0U	ITU CH 56 - 59

16 and 4 Wavelength Plans	
Code	Wavelength Group
EK1	ITU CH 21, 28, 33, 39
EK2	ITU CH 44, 52, 57, 62
EK3	ITU CH 22, 24, 26, 36
EK4	ITU CH 48, 54, 60, 61
EK5	ITU CH 21, 33, 44, 57

- S = EK* Series
  3 = A0* Series
- Connector Type: SC/APC

Passives

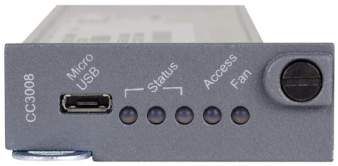
- Optical Passives for HT3562 Full Spectrum Transmitters, see associated Data Sheets

Passive	Description
NP35C01S0EZ0S-0LD-AS	LGX Package Red/Blue Single Filter for ITU Channels 19-39, 44-63 with SC/APC connector
NP95D04SK1A0S-1FE-00	F-Case Demux for ITU Channels 21, 28, 33, 39 0.9-mm fibers with no connector
NP95D04SK2A0S-1FE-00	F-Case Demux for ITU Channels 44, 52, 57, 62 0.9-mm fibers with no connector
NP95D04SK3A0S-1FE-00	F-Case Demux for ITU Channels 22, 24, 26, 36 0.9-mm fibers with no connector
NP95D04SK4A0S-1FE-00	F-Case Demux for ITU Channels 48, 54, 60, 61 0.9-mm fibers with no connector
NP95D04SK5A0S-1FE-00	F-Case Demux for ITU Channels 21, 33, 44, 57 0.9-mm fibers with no connector
NP95C01S0EZ0S-1SD-00	S-Case Single Filter for ITU Channels 19-39, 44-63 0.9-mm fibers with no connector
NP95C01S0EZ0S-2SD-AS	S-Case Single Filter for ITU Channels 19-39, 44-63 1.6-mm fibers with SC/APC connector

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

Customer Care

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

Note: Specifications are subject to change without notice.

1512351-RevH_HT3562_Double-Density-Transmitter-System

11/2020 EA-32293