

# Outdoor CMTS

**JH-F3416B**
**DOCSIS3.0**

## Summary

JH-F3416B is the outdoor version CMTS from D3-B family. It is design to deploy in a harsher environment other than datacenter/headend, such as hanging on the outside wall of the client side building. JH-F3416B has all the core features from D3-B family, plus additional RF ports to support more connection with other optical equipments in the network. JH- F3416B can be connected to GE/EPON/GPON for its upper links. The RF port can have two different options as the applicant vary: 1) DS/US Separate Output Port or 2) 4 Input & 4 Output Port (see 'application topology' part in this document). The JH-F3416B case is water proof, and could provide the cooling for the system. Without the need for cooling fans, JH-F3416B is much quieter.



## About D3-B Series

D3-B family is the upgrade version of D3 family, running DOCSIS 3.0 and C-DOCSIS protocol. The D3-B family includes the following forms of CMTS: compact rack-mountable type (1U), high-density type(3U) and D-node type(outdoor).

The benefits of D3-B family over D3 family are listed as follows:

- Upgrade from Dual core to Quad core processor for data forwarding;
- Upgrade from DDR2 to DDR3 RAM;
- Improved power management;
- Migrate to Linux operating system;

With these changes, the D3-B family provides faster forwarding capabilities and larger throughput for IP packet (especially smaller size packet or fragment packet are optimized).

All D3-B family products implement CMTS channel bonding technology, providing up to 16 QAM channels with total 1Gbps for DS (Down-Stream), and up to 4 QPSK/QAM channels with total 160 Mbps for US (Up-Stream). The DS can be easily configured to run as either data channel or IPQAM channel. It provides both electrical (RJ45) and optical (SFP, 1.25Gbps) connection for data forwarding. D3-B family also implements layer 3 routing function, QoS, DHCP/TFTP services, and DHCP relay. Users have 2 management methods, including CLI with Telnet and Web interface.

- Users can use CLI by login with Telnet (direct connection to the CMTS).
- Users can remote login to the CMTS embedded web interface through internet.

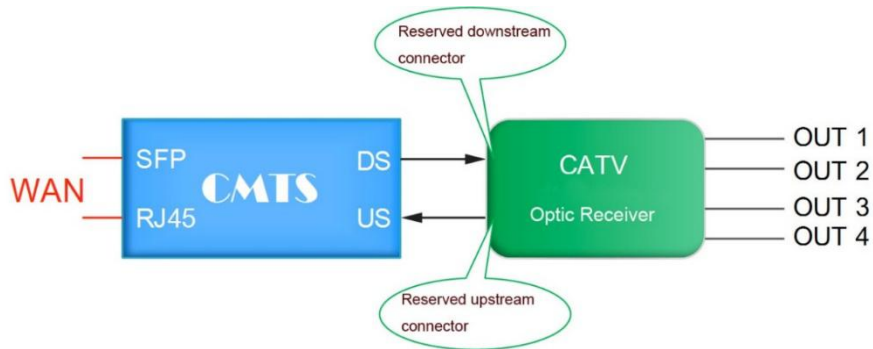
D3-B family is capable to run with DOCSIS 3.0/2.0 client cable modems, set-top boxes (built-in with modems) and eMTA.

## Feature

- Fully compatible with DOCSIS 3.0, C-DOCSIS, supports both EURO-DOCSIS and DOCSIS, works with DOCSIS cable modems
- Users are free to configure the 16 DS channels bonding together, with 64/256/1024 QAM, with maximum 1.0Gbps @ 1024 QAM
- Users are free to configure the 4 US channels bonding together, with QPSK/3~8 orders QAM, with maximum 160Mbps
- Flexible channel bonding option
- Supports maximum 500 clients (Cable modem) online simultaneously
- Supports layer 3 routing, static route, policy route, VLAN, L2VPN, ACL
- Built-in DHCP/TFTP service, supports DHCP relay, CPESubnet arrangement, supports Option 82, Option 60
- Network interface has optical port (SFP) and RJ45 port
- Load balancing mechanic for both DS and US, based on the number of clients (static) or data flow (dynamic)
- Supports IPv6, multicast, remote-query, Flap (DOCSIS signal quality jitter diagnosis), etc
- Uses US and DS service flow Classifier, QoS based on service flow ensures bandwidth and latency needs for various services
- Secures network transmit via BPI+, CM identification, anti-DOS attack, user isolation and IP source checking
- Supports US channel spectrum parameter analysis on web management
- Two management methods, including CLI with Telnet and Web interface
- Automatically updates configuration file, easy for massive deployment.

## RF port & Connection

### TYPE I DS/US Separate Output Port

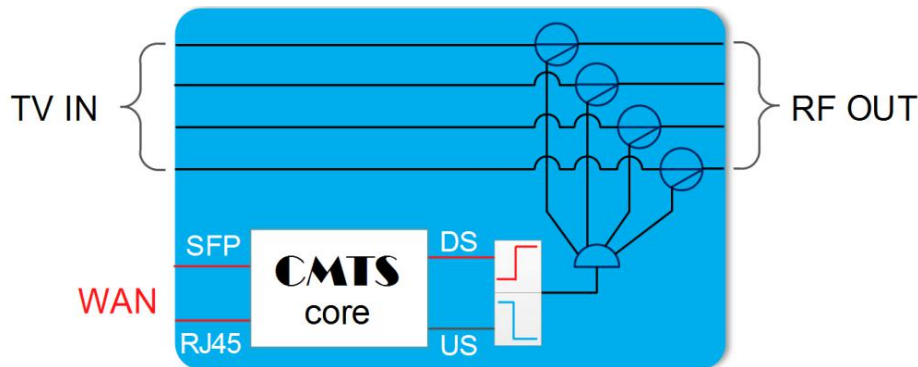


This mode is suitable for having optical receiver (or fiber optic node) of reserving descending Downstream input port and upstream output port.

**Advantage:** The least cable change, the minimum cost, no affection on output level.

**Disadvantage:** The optical receiver or fiber optic node has to reserve US and DS mixed port.

### TYPE II 4 Input & 4 Output Ports



It's suitable to retain the original optical receiver while there is no reserving upstream and downstream port.

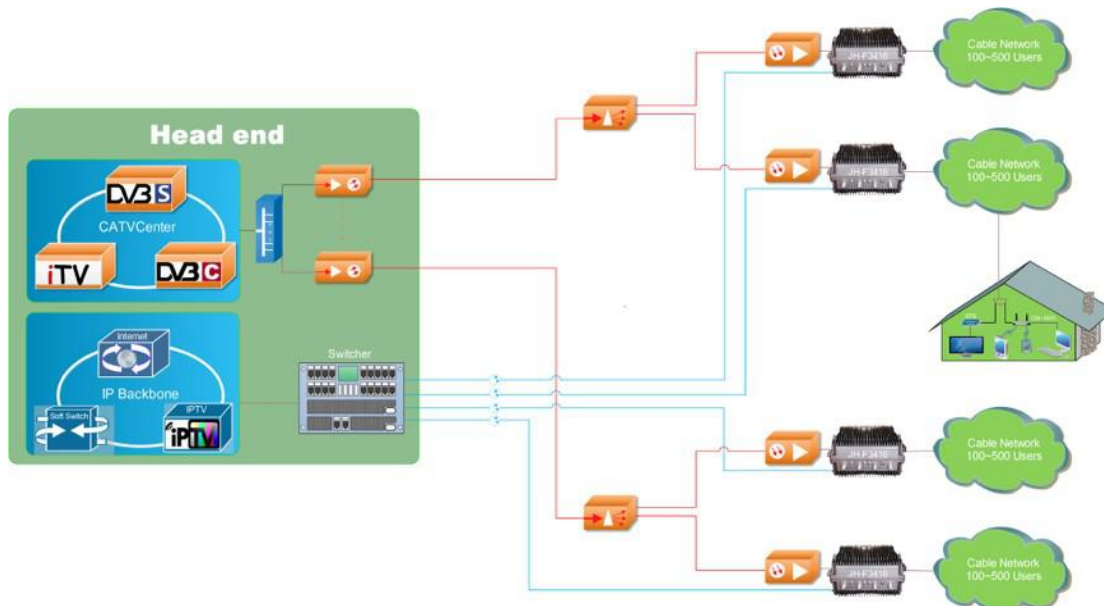
**Advantage:** Retains the original optical receiver, saves existing resources. The cable connection is simpler, more intuitive, less change.

## Appearance

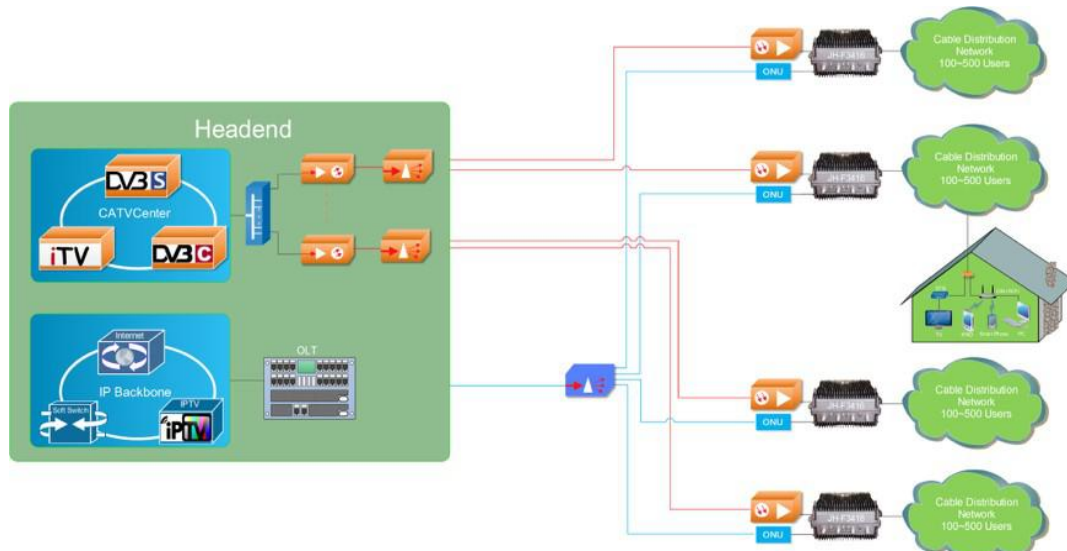


## Application Scenarios

### HFC+GE



### HFC+EPO



## Model Name

JH-F3416B-x-x

w: AC220V external power supply

n: AC60V internal power supply

I : DS/US separate output

II : 4 in & 4 out

## Specification

		Down Stream		Up Stream				
		Euro-DOCSIS	DOCSIS	ATDMA/S-CDMA				
Modulation Mode		64/256/1024QAM*		8~256QAM/QPSK				
Frequency Range(MHz)		88~1002	88~1002	5~65				
Channel Bandwidth(MHz)		8	6	Single Channel Bandwidth(MHz)	6.4	3.2	1.6	
Bonding Channel Quantity		16		4				
Max. Total Data Rate (Mbps)		1000	858	160				
Single Channel Data Rate (Mbps)	64QAM	41.7	30.3	Single Channel Data Rate (Mbps)	256QAM	40.96	20.48	10.24
	256QAM	55.6	42.9		128QAM	35.84	17.92	8.96
					64QAM	30.72	15.36	7.68
					32QAM	25.60	12.80	6.40
					16QAM	20.48	10.24	5.12
	1024QAM*	69.5	53.6		8QAM	15.36	7.68	3.84
Single Channel Symbol Rate (Msyms)	64QAM	6.952	5.056941	Single Channel Symbol Rate (Msyms)	QPSK	10.24	5.12	2.56
	256QAM	6.952	5.360537		5.12	2.56	1.28	
	1024QAM*	6.952	5.360537					
Output Level (dBmV)		10~48 (1dB step)		Receive Level(dBmV)		-13~+23		
Return Loss (dB)		> 12		> 14				
Output Impedance (Ω)		75		Input Imedance(Ω)		75		
Management Methods		CLI: after log in by telnet; NMS: based SNMP from third part; Embeded Web: by remote log in						
Supported Protocols		Euro-DOCSIS/DOCSIS3.0/2.0, CDOCSIS, TCP/IP, ARP, L2VPN, ICMP, ACL, VLAN, Multicast, DHCP-rely, SNMP, etc.						
Interface Parameter								
WAN Port	Fiber	1.25G SFP ×1 SC/FC		Uplink Data Rate		1.0Gbps		
	Electronic	1000/100/10Base-T		Console		RJ45		
RF Port	Type I	F type Socket (metric) ×2						
	Type II	F type Socket (metric) ×8						
Physics Parameter								
Input Votage	External	AC220/110V 50/60Hz		Consumed Power		<40w		
	Internal	AC60V by Cable		Working Environment		Temp. -40~55℃; Hum. <90%		
Net Weight		6.5Kg		Dimension (mm)		L380×W260×H140		

\*Request CM support 1024QAM

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