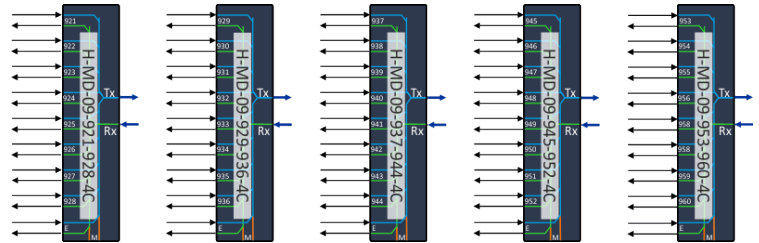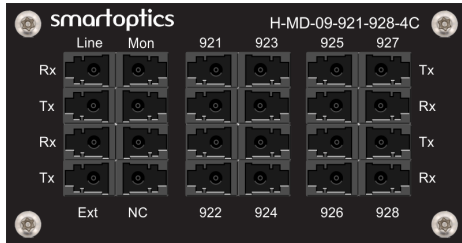# H-MD-09-xxx-yyy-4C

8-channel 16QAM supporting DWDM Mux/Demux with Extension and Monitor ports


OVERVIEW

The H-MD-09-xxx-yyy-4C filters are a range of low-loss, passive 8-channel DWDM protocol transparent Mux/Demux units. The channel passbands are wide enough to support all protocols up to and including 400Gbps 16QAM wavelengths. They operate with 100GHz spacing and have a low-loss Extension port so that additional channels can be seamlessly added to increase capacity. The Extension port is extremely wide, covering 1264 -1630nm which opens for a wide variety of combinations of LANWDM, CWDM, DWDM and OTDR solutions over the same infrastructure. The bandwidth even extends up to 1670, but with a slightly higher loss.

The H-MD-09-xxx-yyy-4C filters have two Monitor ports that tap off 1% of the transmitted and received line signal. This provides the ability to monitor the channel power levels via a connected Optical Channel Monitoring (OCM) device or an optical spectrum analyzer.

The H-MD-09-xxx-yyy-EM-4C filters support the industrial temperature (I-temp) range of -40°C to +85°C (-40°F to +185°F) which gives an extended application range into sites without temperature control. The table with optical parameters below lists values at C-temp and I-temp conditions.

FUNCTIONAL OVERVIEW AND PORT DESCRIPTION
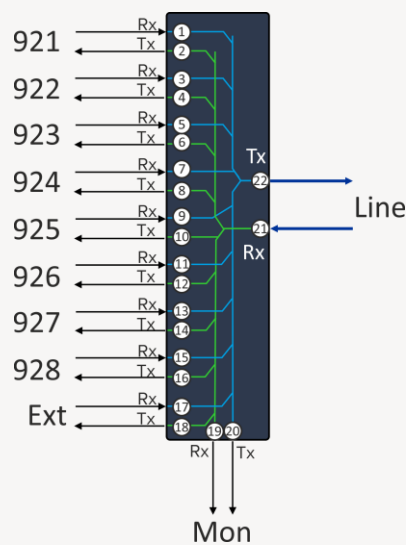
Client and Line signals entering the filter is denoted "Rx".
Client and Line signals exiting the filter is denoted "Tx".

The monitor ports tap off 1% (18 - 22dB) of the line signal.
The monitor port from transmitted line signal is denoted "Tx".
The monitor port from received line signal is denoted "Rx".
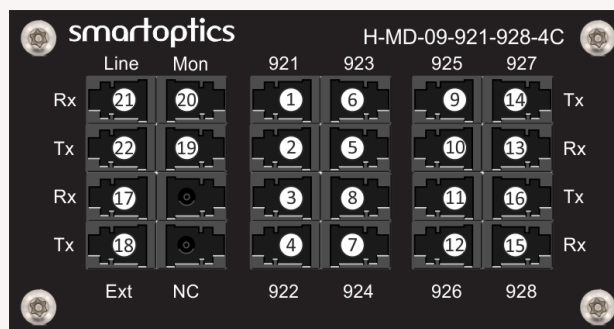
The port allocation and overlay example is for H-MD-09-921-928-4C. Note row dependent location of Tx and Rx ports. This is due to the usage of duplex LC connectors.

Subject to change without notice.

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TECHNICAL SPECIFICATIONS

Parameter	C-temp Conditions	I-temp conditions	
Channels H-MD-09-921-928-4C	192.1 to 192.8 THz	⇐ (same as C-temp)	
H-MD-09-929-936-4C	192.9 to 193.6 THz	⇐	
H-MD-09-937-944-4C	193.7 to 194.4 THz	⇐	
H-MD-09-945-952-4C	194.5 to 195.2 THz	⇐	
H-MD-09-953-960-4C	195.3 to 196.0 THz	⇐	
Channel spacing	100GHz ITU G.694.1	⇐	
Channel passband -3dB	≥ 72.5GHz	⇐	
Passband Ext-port	1264 -1630nm / 183.9 to 237.2THz excl. ch passband	⇐	
Link loss, per channel (A)	≤ 4.6dB	≤ 5.2dB	
Insertion loss, per channel (B)	≤ 3.0dB	≤ 3.5dB	
Insertion loss, extension port (C)	≤ 0.9dB[1]	≤ 1.0dB[1]	[1] The bandwidth extends up to 1670nm. Add 0.3dB insertion loss for wavelengths between 1630 – 1670nm
Link loss, extension port (D)	≤ 1.8dB	≤ 2.0dB	
Insertion loss, monitor	18-22dB without including the mux, demux or passband loss	⇐	
Isolation, adjacent channel	≥ 28dB	⇐	
Isolation, non-adjacent channel	≥ 40dB	⇐	
Ripple, passband	≤ 0.5dB	⇐	
Directivity	≥ 45dB	⇐	
Return loss	≥ 40dB	⇐	
Max power handling	Max 500mW	⇐	
Operating temperature	0ºC to +70 ºC	-40ºC to +85 ºC	
Storage temperature	-40ºC to +85 ºC	⇐	
Connector type	LC/UPC	⇐	
Module width	84mm	⇐	

The I-temp column only shows values that differ from C-temp conditions.
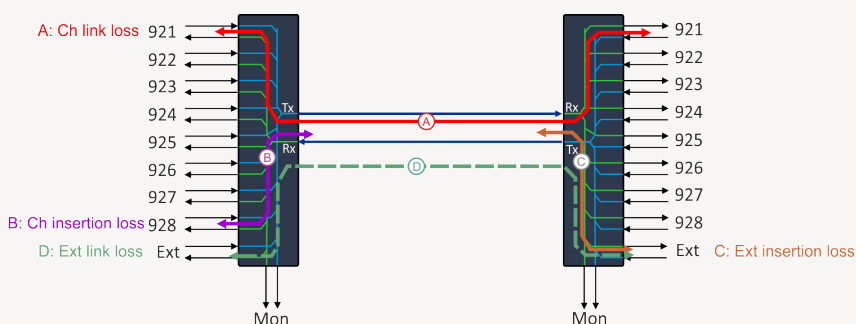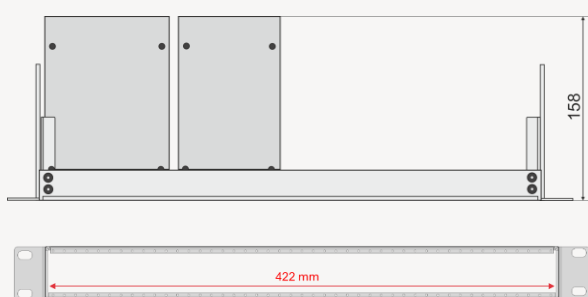
ORDER INFORMATION

The H-MD-09-xxx-yyy-4C is available in 5 different versions depending on desired channel plan. The table below shows the part numbers and a short description.

Part number	Description
H-MD-09-921-928-4C	8ch DWDM 400G Mux/Demux, Ext+Mon 921-928
H-MD-09-929-936-4C	8ch DWDM 400G Mux/Demux, Ext+Mon 929-936
H-MD-09-937-944-4C	8ch DWDM 400G Mux/Demux, Ext+Mon 937-944
H-MD-09-945-952-4C	8ch DWDM 400G Mux/Demux, Ext+Mon 945-952
H-MD-09-953-960-4C	8ch DWDM 400G Mux/Demux, Ext+Mon 953-960

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