



MetroWAVE

Passive Optical Multiplexers

Reference Guide

INTRODUCTION

WAVELENGTH DIVISION MULTIPLEXING

Wavelength Division Multiplexing (WDM) is an optical network technology in which different services are transported via different light wavelengths. From Source equipment, these services are multiplexed together over a regular fibre link, then de-multiplexed back into their separate wavelengths for termination into the Destination equipment.

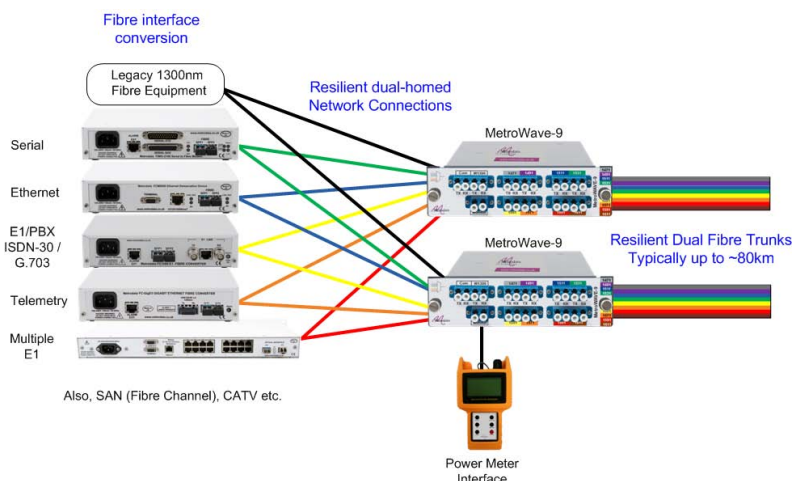
Variations of this approach include both 'Dense' (DWDM) and 'Coarse' (CWDM) wavelength multiplexing. High-end DWDM implementations today offer up to approximately 160 wavelengths, grouped into several 'channel ranges'. This technology is used extensively in the Backbone Networks of both Regional and National Telecoms Carriers. CWDM is defined for just 18 wavelengths in two ranges, the Lower Band centred around 1310nm and the Upper Band centred around 1550nm. As the name implies, Coarse WDM uses more widely dispersed optical signal profiles and therefore requires lower manufacturing tolerances, generally leading to somewhat lower cost products.

MetroWAVE FAMILY

The MetroWAVE product family comprises products for both CWDM and DWDM deployments. In all cases, the multiplexing and de-multiplexing functions are implemented entirely 'passively', i.e. optically, without using any conversions to and from electrical signalling. This means that MetroWAVE products are completely unpowered devices, offered at considerably lower cost than active devices performing similar functions, whilst having the additional benefits of being physically small, light in weight and having excellent physical reliability, having no need for power transformers, electronic components, or any moving parts such as cooling fans. MetroWAVE products are highly suitable for both Metro-area Carrier and Enterprise network applications.

In operation, MetroWAVE multiplexers rely purely on the transmission power and reception sensitivity of the optical interfaces of connected equipment. Today, these typically comprise 'plug-in' Optical Transceivers, available in a number of speeds, power/distance ratings and formats, for both CWDM and DWDM usage. Metrodata offers a wide range of compatible Transceivers in popular formats including 'SFP', 'SFP+' and 'XFP', supporting the transmission of multiple high bandwidth services over distances of up to 50-100km.

The diagram below illustrates one typical application of MetroWAVE devices. Many different signalling protocols are supported, including 1Gbps or 10Gbps Ethernet and Fibre-Channel (SAN). 'Dual-homing' capable input devices are used in this example, combining the transmission of several different services across dual-redundant backbone links. In fact, highly resilient Ring topologies are also possible using dual-homed interfaces.



METROWAVE MULTIPLEXERS

METROWAVE-5:

4-port passive CWDM mux/demux

- 4 x CWDM channels in 'high-band' range 1471nm - 1571nm
- Additional port for connection to standard (1310nm) equipment or to 'low-band' CWDM expansion mux, i.e MetroWAVE-8A
- Expansion port to connect MetroWAVE-4A unit
- Tx/Rx optical Power monitoring port for ease of installation



METROWAVE-4A:

4-port passive CWDM mux/demux or expansion unit

- 4 x CWDM channels in 'high-band' range 1551nm - 1611nm



METROWAVE-9S:

8-port passive CWDM mux/demux

- 8 x CWDM channels in 'high-band' range 1471nm - 1611nm
- Additional port for connection to standard (1310nm) equipment or to 'low-band' CWDM expansion mux, i.e MetroWAVE-8A
- Tx/Rx optical Power monitoring port for ease of installation
- 1550nm CWDM port optimised for minimal insertion loss, to support preferential expansion via DWDM units



METROWAVE-8A:

8-port passive CWDM mux/demux or expansion unit

- 8 x CWDM channels in 'low-band' range 1271nm - 1411nm



METROWAVE-D9-25:

8-port passive DWDM Mux

- DWDM 100GHz, C-Band, 25-32

METROWAVE-D9-33:

8-port passive DWDM Mux

- DWDM 100GHz, C-Band, 33-40



METROWAVE-D16-25:

16-port passive DWDM Mux

- DWDM 100GHz, C-Band, 25-40



EXTENDED FAMILY

OPTICAL TRANCEIVERS

Extensive CWDM, DWDM and standard wavelength ranges available, for different transmission distances.

- SFP, SFP+ and XFP types available
- Suitable for various speed & protocol applications including 1 Gbps and 10Gbps Ethernet
- 'MSA' (Multi-Source Agreement) or specific-vendor coded types can be supplied



OPTICAL POWER METERS

Invaluable for installation and troubleshooting of CWDM and DWDM networks. These meters indicate received optical power for multiple wavelengths simultaneously.

- Hand-held 18 channel CWDM Optical Power Meter
- Hand-held 40-channel DWDM Optical Power Meter



OPTICAL INTERFACE CONVERTERS & OPTICAL EXTENDERS

Wide range available for applications including:

- ISDN-30 (e.g. for conventional PBX 'Voice Trunks')
- E1 and other PDH/SDH standards
- 100Mbps, 1 Gbps and 10Gbps Ethernet



EXPANSION OPTIONS

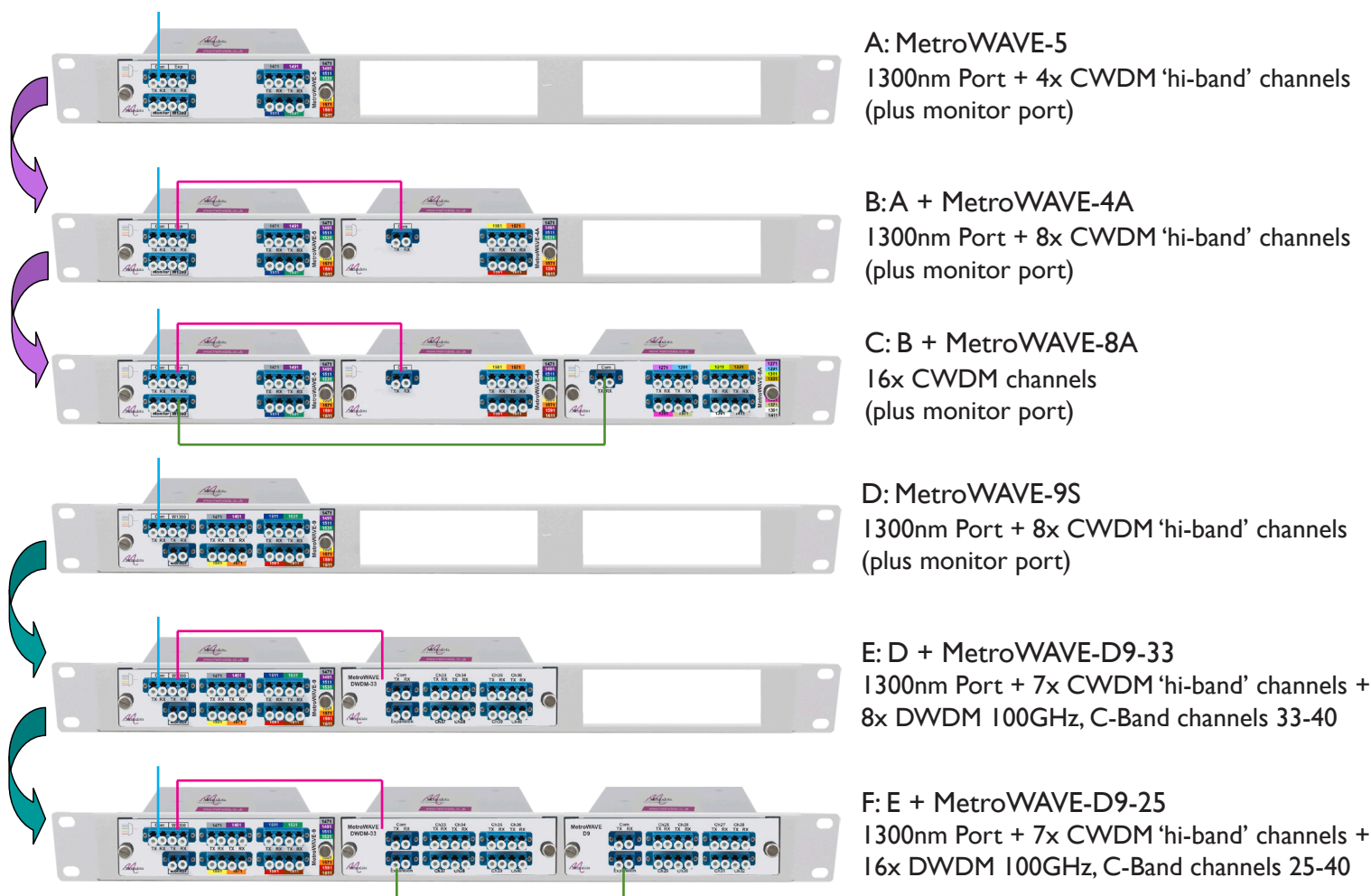
The MetroWAVE family offers not only a low cost-of-entry to optical multiplexing for service expansion or convergence applications, but also cost-effective incremental growth options.

Within a simple 1U 19" rack mounting frame, one starting point could be the MetroWAVE-5 unit, offering 4 CWDM wavelengths in the 'upper' band range, plus a conventional 'wideband' 1310nm port, typically used by non-WDM optical interfaces such as those of standard Ethernet switches. The Metrowave-5 also offers an expansion port and a low-power monitor port for installation and/or in-service link verification.

Cost-effective expansion could then be achieved by the addition of the MetroWAVE-4A unit, offering 4 CWDM wavelengths and/or by the addition of the MetroWAVE-8A unit, providing a further 8 CWDM wavelengths in the 'lower' band range.

Alternatively, expansion can be achieved by the addition of DWDM channels. In this case, a single CWDM channel (say 1550nm) can be 'broken out' into multiple, higher-density DWDM channels using, for example, the MetroWAVE-D9 units. This approach is in fact preferable for 10Gbps applications, due to greater availability of 10Gbps transceivers for DWDM wavelengths compared with low-band CWDM.

Some typical expansion pathways are illustrated below:



ABOUT Us

WHO ARE WE?

Metrodata Ltd. (www.metrodata.co.uk) is a long-standing UK designer and manufacturer of Telecoms Equipment. Based near London's Heathrow Airport, the company has been a supplier to Telecoms Service Providers, Corporates and Governmental organisations worldwide since 1989. The company's products are manufactured in the UK using high quality components and processes, with 100% of devices individually functionally tested prior to dispatch. Typically, some 50% of our production is destined for markets outside the U.K.

WHAT DO WE DO?

Metrodata offers a wide range of connectivity solutions for Local and Wide-Area Networking, with a particular focus on Network Access and Interface Conversion technologies. Our portfolio today extends from simple 'plug-and-play' connectivity products through to Multiplexers and Managed Service Delivery Solutions for the Telecoms Carrier market.

The company has a unique expertise in bespoke solution development, addressing both the Telecoms Service Provider and Government (primarily Defence) markets. Typical recent projects have involved media conversion, service convergence and multiplexing of Network Transport protocols including Ethernet, SDH/PDH, Fibre, Serial and ATM, all areas in which the company has many man-years of design and implementation experience.

OUR CUSTOMERS AND MARKETS

Metrodata's customer base is truly Global. In recent years, some of our largest Telecoms Service Provider customers have been in LATAM and the Middle East, in addition to our home market of the UK. Our multi-service convergence and satellite communications 'backhaul' capabilities, allied with extensive expertise in interfacing military-grade serial Cryptos, has given us a significant market amongst Defence organisations.

Metrodata supplies both directly (in the UK) and via Integration Partners in Europe, the USA, LATAM, the Middle East and Africa.

WHY METRODATA?

Metrodata's product quality and design expertise make us the 'gold standard' for many of the world's Telecoms Service Providers for interface conversion and service demarcation applications.

Metrodata is a highly expert company, but one small enough to be responsive to our customers' needs. Our willingness to meet customers' precise requirements, through close consultation and our abilities with respect to bespoke hardware and software development, differentiates Metrodata from larger, less agile equipment manufacturers.

MORE INFORMATION

For more in-depth information regarding metrodata Products and Solutions, follow the links to our Web Site or contact us by phone or e-mail as below..

METROWAVE WDM OPTICAL MULTIPLEXING:

<http://www.metrodata.co.uk/PassiveWDM>



METROCONNECT MC12000 FIBRE ETHERNET SERVICE DELIVERY SYSTEM:

<http://www.metrodata.co.uk/MC12000>



METROCONNECT MANAGED ETHERNET DEMARCATION DEVICE:

<http://www.metrodata.co.uk/CarrierEthernet>



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