

Welcome to the CWDM MUX/DEMUX!

Thank you for purchasing a CWDM MUX/DEMUX! We appreciate your business, and we think you'll appreciate the many ways that your enhanced Graphic system will save you money, time, and effort.

That's because our CWDM MUX/DEMUX is all about breaking away from the traditional model of using fibre interconnection cables. Using the CWDM MUX/DEMUX, you can send up to four bidirectional data streams simultaneously of a single pair of fibre cables.

Wherever you run low on installed fibres or where you want to save fibres to be installed new, the CWDM MUX/DEMUX is the best way, to solve all your requirements. The available model is suitable for all kind of Singlemode fibre cables. It works in cooperation with matching CDWM transceiver modules with wavelengths of 1531, 1551, 1571 or 1591nm.

This manual will tell you all about your new CWDM MUX/DEMUX, including how to install, operate, and troubleshoot it. For an introduction to the Converter, see **Chapter 2**. The CWDM MUX/DEMUX product codes covered in this manual are:

- K470-CW: CWDM MUX/DEMUX Box**
- K470-31: CWDM MUX/DEMUX Transceiver 1531nm**
- K470-51: CWDM MUX/DEMUX Transceiver 1551nm**
- K470-71: CWDM MUX/DEMUX Transceiver 1571nm**
- K470-91: CWDM MUX/DEMUX Transceiver 1591nm**

Copyrights and Trademarks

©2009. All rights reserved. This information may not be reproduced in any manner without the prior written consent of the manufacturer.

Information in this document is subject to change without notice and the manufacturer shall not be liable for any direct, indirect, special, incidental or consequential damages in connection with the use of this material.

All trademark and trade names mentioned in this document are acknowledged to be the property of their respective owners.

Disclaimer

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, or circuitry of the product without notice.

The manufacturer cannot accept liability for damage due to misuse of the product or due to any other circumstances outside the manufacturer's control (whether environmental or installation related). The manufacturer shall not be responsible for any loss, damage, or injury arising directly, indirectly, or consequently from the use of this product.

Cautions and Notes

The following symbols are used in this guide:



CAUTION: This indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.



NOTE. *This indicates important information to help you make the best use of this product.*

Safety Precautions and Installation Guidelines

To ensure reliable and safe long-term operation, please note the following installation guidelines:

- Only use in dry, indoor environments.
- The Remote unit, Local unit and any power supplies can get warm. Do not locate them in an enclosed space without any airflow.
- Do not place a power supplies directly on top of a unit.
- Do not obstruct a unit's ventilation existing holes.



To safeguard against personal injury and avoid possible damage to equipment or property, please observe the following:

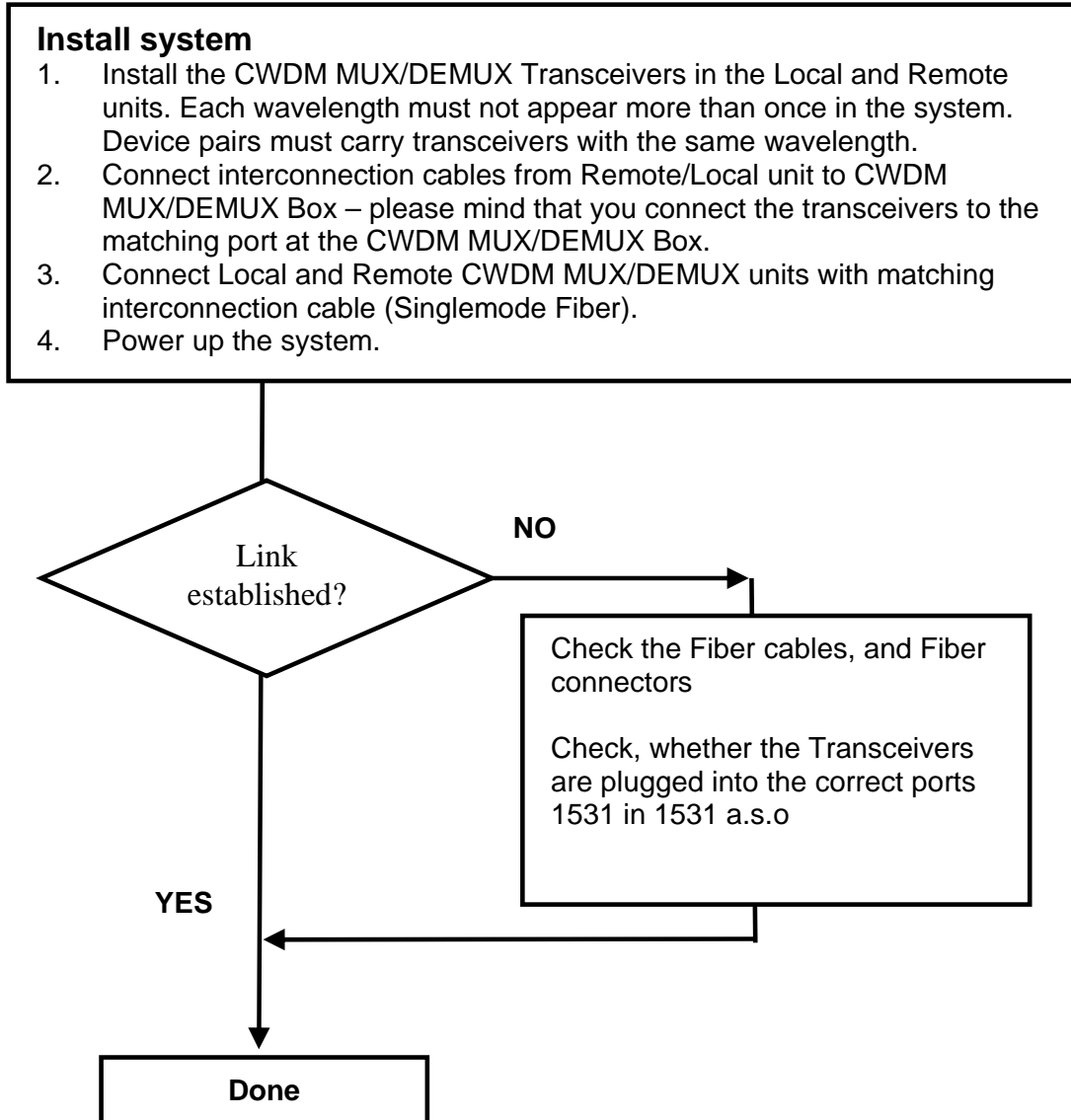
- Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not attempt to dismantle or repair any power supply. Do not use a power supply if it appears to be defective or has a damaged case.
- Connect all power supplies to grounded outlets. In each case, ensure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.
- Do not attempt to modify or repair this product, or make a connection from the interconnection link interface to any other products, especially telecommunications or network equipment.

Contents

1. Quick Setup	6
2. Overview	7
2.1 Introduction	7
2.2 Glossary	7
2.3 Example of a CWDM MUX/DEMUX System	8
2.4 Features	9
2.5 Product Range	9
2.6 Compatibility	9
3. Installation	10
3.1 Package Contents	10
3.2 Interconnection Cable Requirements	10
3.3 System Setup	11
3.4 Diagnostics	11
4. Service Setup	12
5. Troubleshooting	12
Appendix A: Example Applications	13
Appendix B: Rack Mount Options	14
Appendix C: Calling Technical Support	16
Appendix D: Specifications	17

1. Quick Setup

This section briefly describes how to install your CWDM MUX/DEMUX system. Unless you are an experienced user, we recommend that you follow the full procedures described in the rest of this manual.



2. Overview

2.1 Introduction

A CWDM MUX/DEMUX is used, to reduce the number of required fibres for a number of independent data links. The CWDM MUX/DEMUX Box mixes the signals in different wavelengths onto a single fiber and splits it again into the original signals at the end of a link.

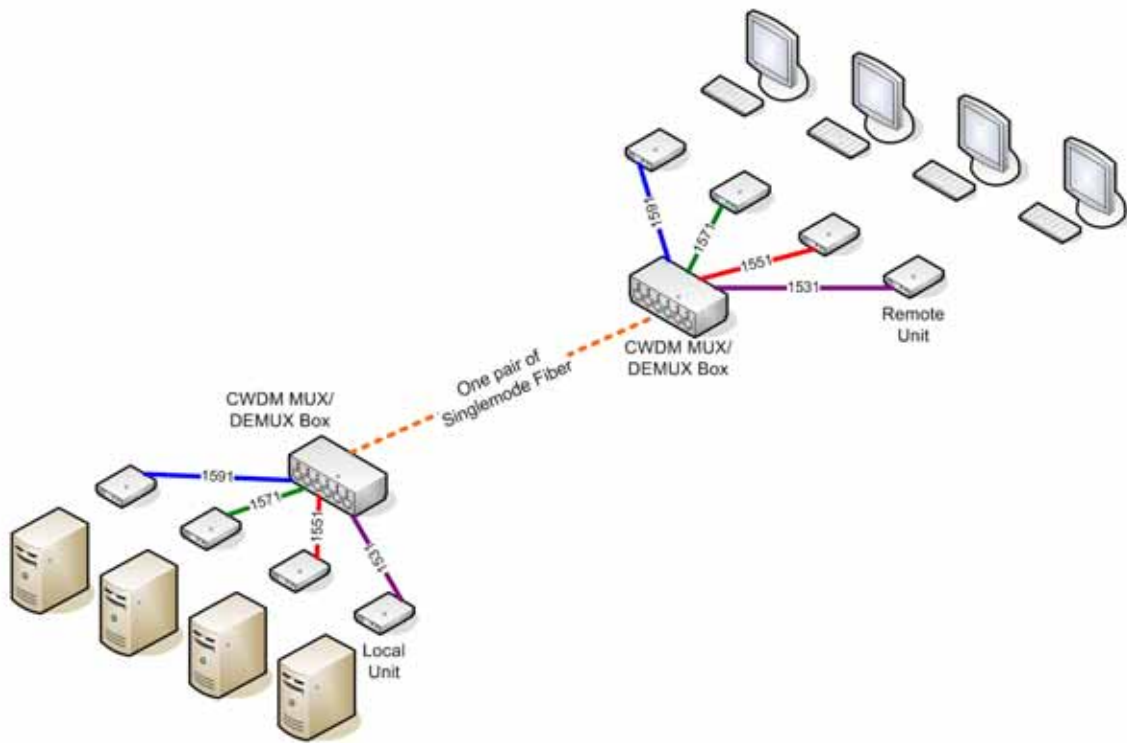
A basic CWDM MUX/DEMUX system comprises a *Local* (KVM-Extender) unit, the CWDM MUX/DEMUX Box and a *Remote* (KVM-Extender) unit.

2.2 Glossary

The following terms are used in this guide:

<i>Fiber</i>	Singlemode or Multimode fiber cable.
<i>Singlemode</i>	9 μ Singlemode-fiber cable
<i>Multimode</i>	62,5 μ Multimode- or 50 μ Multimode-fiber cable
<i>KVM</i>	Keyboard, Video and Mouse.
<i>Console</i>	Keyboard, Mouse and Monitor
<i>Dual Access</i>	A system allowing connection of Local and Remote user consoles.
<i>Single-Head</i>	An extender system that supports one monitor + Keyboard/Mouse
<i>Dual-Head</i>	An extender system that supports two monitors + Keyboard/Mouse
<i>DVI</i>	Digital Video standard, installed by <i>Digital Display Working Group</i> (www.ddwg.org) R, G, B, CLOCK in a data stream with up to 3x 1,6 Gbit/sec. Signals are TMDS Level.
<i>PSU</i>	The desktop power supply connected to the Local/Remote unit.
<i>HID</i>	Human Interface Devices are units, which are used for human access to the CPU. They are a USB-device class of its own (e.g. Memory Devices etc.). Besides of keyboard and mouse also touch screen, light pen, fingerprint sensor, graphic tablets etc. are HID devices.
<i>CWDM</i>	Coarse Wavelength Division Multiplexing is a technology which multiplexes multiple optical carrier signals on a single optical fiber by using different wavelengths (colours) of laser light to carry different signals.

2.3 Example of a CWDM MUX/DEMUX System



CWDM MUX/DEMUX system (example)

2.4 Features

The CWDM MUX/DEMUX offers the following features:

- Support for up to 4 data streams
- Support for 9 μ Singlemode fibers
- NO p.s.u. required
- Small footprint chassis.
- Rack mount options available.

2.5 Product Range

<i>CWDM MUX/DEMUX Box</i>	
K470-CW	CWDM Multiplex/Demultiplex Device Box Pair
K470-31	CWDM MUX/DEMUX Transceiver 1531nm
K470-51	CWDM MUX/DEMUX Transceiver 1551nm
K470-71	CWDM MUX/DEMUX Transceiver 1571nm
K470-91	CWDM MUX/DEMUX Transceiver 1591nm
<i>Accessories</i>	
455-8G	19"/1HE Rack mount- Kit to mount up to 2 CWDM MUX/DEMUX devices

2.6 Compatibility

Interface Compatibility

- **Singlemode Fiber Data:** The system works barely optical. The incoming light signals are multiplexed onto the Singlemode Fiber and de-multiplexed at the remote end.

3. Installation

For first-time users, we recommend that you carry out a test placement, confined to a single room, before commencing full installation. This will allow you to identify and solve any cabling problems, and experiment with the KVM extender system more conveniently.

3.1 Package Contents

You should receive the following items in your extender package (all types):

- CWDM MUX/DEMUX- pair (Local Unit + Remote Unit which are identical)
- User manual (Quick Setup)

If anything is missing, please contact Technical Support (see **Appendix F – Calling Technical Support**).

3.2 Interconnection Cable Requirements

To connect the Local and Remote units to the CWDM MUX/DEMUX box and to interconnect the both CWDM MUX/DEMUX Boxes you will need:

- **Fiber Cable:** Two strands of fiber are required for connecting the Local and Remote units to the CWDM MUX/DEMUX box and to interconnect the both CWDM MUX/DEMUX Boxes
- Recommended cables:
Singlemode type 9/125 μ allowed distance app. 40km (approx. 25 miles)

3.3 System Setup

To install your CWDM MUX/DEMUX –system:

1. Switch off all devices.
2. Install the CWDM MUX/DEMUX Transceivers in the Local and Remote units. Each wavelength must not appear more than once in the system. Device pairs must carry transceivers with the same wavelength.



Each wavelength (1531, 1551, 1571, 1591nm) must not be used more than once at each side! For 4 links, please use 4 different wavelengths, for 3 – 3 different wavelengths and for 2- 2 different wavelengths.

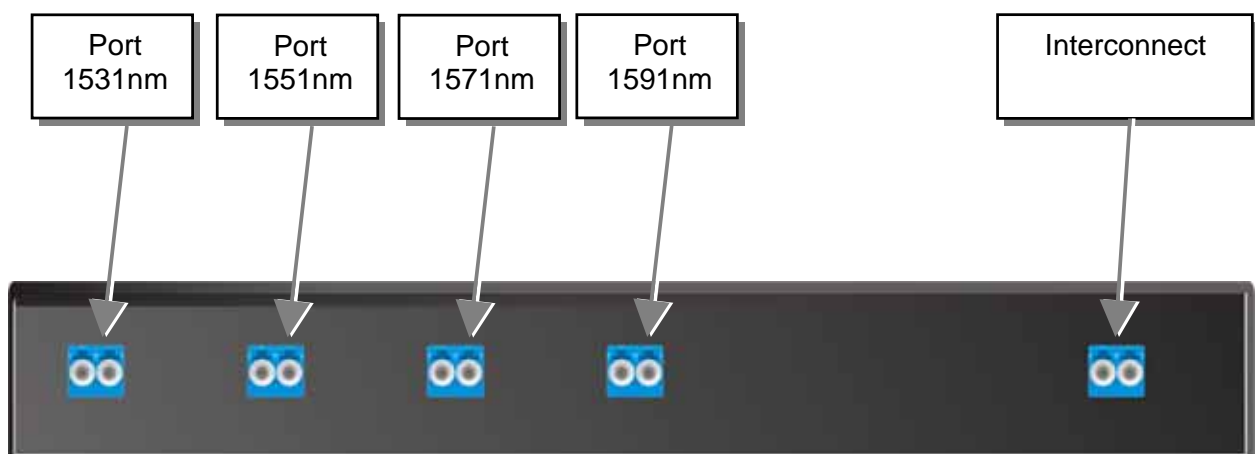


Each transceiver will work only at the appropriate port



The data will always flow between devices with the same wavelengths

3. Connect interconnection cables from Remote/Local unit to CWDM MUX/DEMUX Box – please mind that you connect the transceivers to the matching port at the CWDM MUX/DEMUX Box.
4. Connect Local and Remote CWDM MUX/DEMUX units with matching interconnection cable (Singlemode Fiber).
5. Power up the system.



CWDM MUX/DEMUX Type K470-CW Unit

3.4 Diagnostics

There are no diagnostic possibilities at the CWDM MUX/DEMUX box. Please use the diagnostic possibilities of the attached units

4. Service Setup

There are no service possibilities at the CWDM MUX/DEMUX box.

5. Troubleshooting

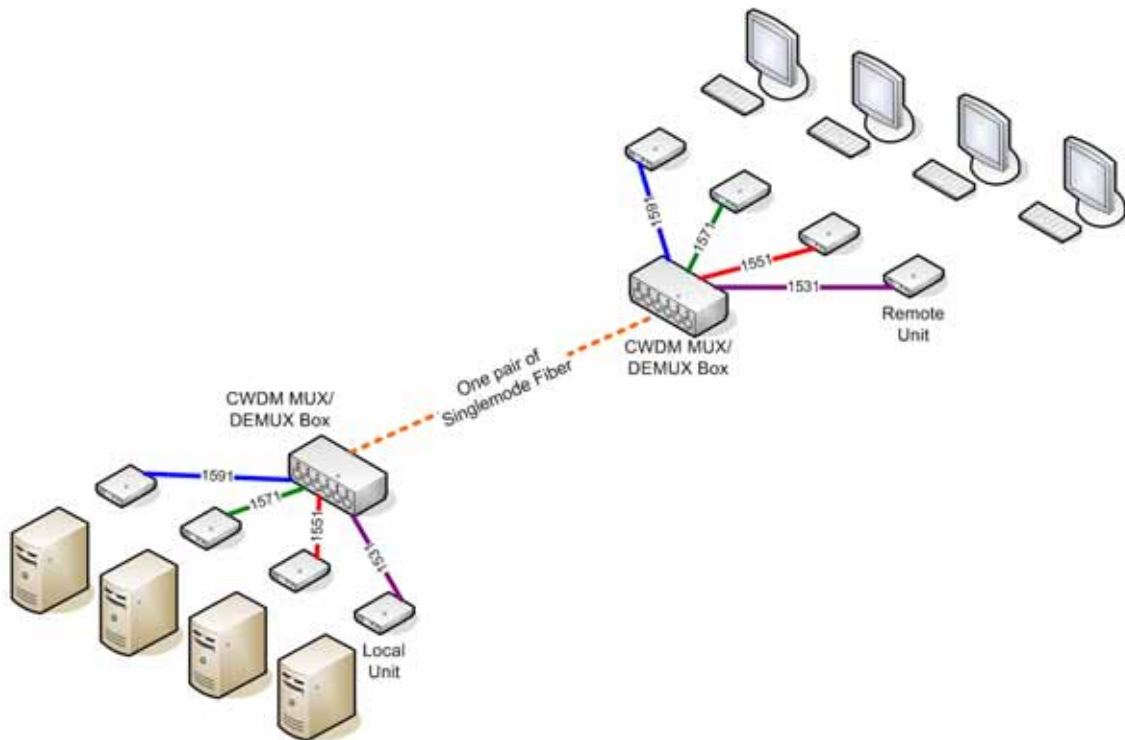
There isn't a data link.

Check the attached devices by directly connecting Local to Remote unit using a short fiber cable..

Check that each wavelength does not occurs more than once at the local side and at the remote side.

Check that the transceivers are routed to the correct ports at the CWDM MUX/DEMUX box.

Appendix A: Example Applications



- CWDM MUX/DEMUX system.

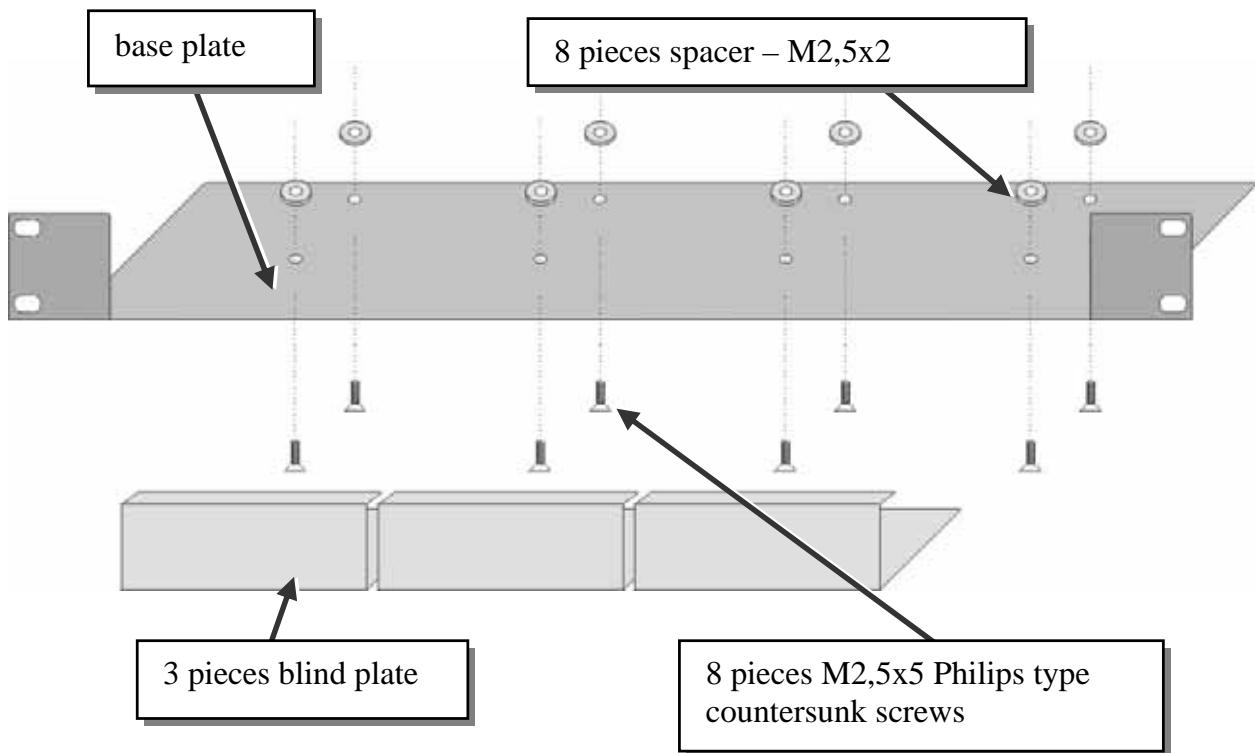
Appendix B: Rack Mount Options

CWDM MUX/DEMUX units can be mounted in a 19" rack using the mounting kit

Mounting Instruction Rackmount-Kit 455-8G

Using the Rackmount-Kit 455-8G, up to 4 devices of the device size 103x143x42mm (Dual-Head Devices) can be mounted into a 19"-Server Rack. The Rackmount Kit requires 1U Rack space. Blind plates (in the list of parts delivered) allow covering unused device positions.

Rackmount-Kit 455-8G – List of parts delivered:



The CWDM MUX/DEMUX units require the rack space of two regular devices. So far you can mount up to 2 CWDM MUX/DEMUX units into a 1U rack space.

Mounting instruction:

- Align the holes on the base plate with the vacant screw holes on the base of the device.
- Fasten the base of the unit to the plate of the mounting kit



Only use the supplied, short screws, to prevent damages on the PCB's

- Close the remaining gaps with blanking plates.

APPENDIX B: RACK MOUNT OPTIONS

The Rackmount-Kit 455-8G allows, mounting a different count of devices (1...4 pieces):



Einbau 1 Gerät
mounting 1 device



Einbau 2 Geräte
mounting 2 devices

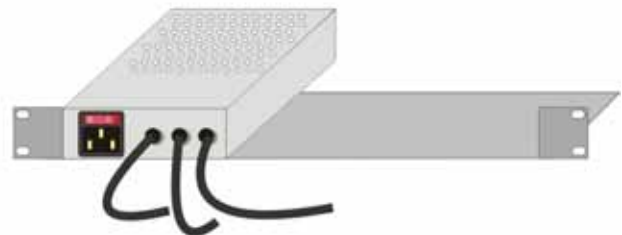
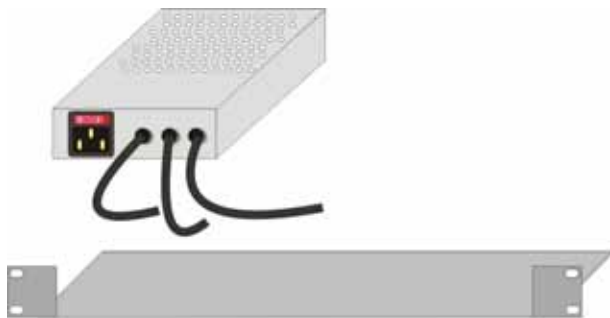


Einbau 3 Geräte
mounting 3 devices



Einbau 4 Geräte
mounting 4 devices

In the most left position you can mount a rack mountable p.s.u. type 455-PS instead of a regular device. This p.s.u. is capable to power up to three devices.



Appendix C: Calling Technical Support

If you determine that your CWDM MUX/DEMUX unit is malfunctioning, *do not attempt to alter or repair it*. It contains no user-serviceable parts. Contact Technical Support at your local dealer.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem—that is, what type of computers, what type of keyboard, brand of mouse, make and model of monitor, type and make of cable, etc.
- Any particular application that, when used, appears to create the problem or make it worse.
- The results of any testing you've already done.

To solve some problems, it might be necessary to upgrade the Extender's firmware. If this turns out to be the case for your difficulty, our Technical Support technicians will arrange for you to receive the new firmware and will tell you how to install it.

Shipping and Packaging

If you need to transport or ship your CWDM MUX/DEMUX unit:

- Package it carefully. We recommend that you use the original container.
- If you are shipping it for repair, please include the Unit's external power supplies. If you are returning it, please include everything you received with it. Before you ship the Extender back to your dealer for repair or return, contact him to get a Return Authorization (RA) number.

Appendix D: Specifications

Power supply

NO Power required

Interface

Fiber Connectors LC duplex

Maximum Length of Interconnection Cable (Fiber - LC Connectors)

Singlemode 9 μm 40.000m (approx. 25 miles)

Size and Shipping Weight

CWDM MUX/DEMUX units 206 x 143 x 42mm (8"x5.6"x1.7") (2 Geräte)
Weight Local/Remote Unit: 1,0kg (2.2lb)

Shipping box 460x250x120mm (18.1"x9.8"x4.7")
Weight: 1,6 kg (3.5lb)

Environmental

Operating Temperature 41 to 113°F (5 to 45 °C)

Storage Temperature -13 to 140°F (-25 to 60 °C)

Relative Humidity max. 80% non-condensing

NOTES