

Guardian

2800

User Guide

AMG Systems

www.amgsystems.co.uk

3 The omega Centre
Stratton Business Park
Biggleswade
Bedfordshire
SG18 8QB
UK
Tel: +44 (0) 1767 600777
Fax: +44 (0) 1767 600077

Guardian is a trademark of AMG Systems.

Microsoft and MS are registered trademarks and windows is a trademark of Microsoft Corp.

All other trademarks are the property of their respective companies.

Copyright © 2001 AMG Systems.

All the rights reserved. No part of this publication may be reproduced, stored in a Retrieval system, or transmitted, in any form or by any means, mechanical, Photocopying, recording or otherwise, without the prior written permission of AMG Systems. While every precaution is taken in the preparation for this Document, AMG assumed no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained here in.

Printed in United Kingdom.

Revision History:

26/10/04 04 Minor layout correction

A Parker

Contents

Chapter 1

Introducing the 2800 Guardian

Introduction	5
What is the 2800 Guardian?	5
Mainframe Overview	6
Motherboard	7
Microprocessor Card	8
Video Banks	8
Video Cards	8
Video Input Cards	9
Video Output Cards	9
Optical Cards	9
High Speed Optical Cards	10
Low Speed Opto Cards	10
Combining Two Optical Card Channels	11
Data and Audio Interfaces	11
Data Card and Data Interface Daughter Boards	11
Audio Interface	12

Chapter 2

Installing and Setting up a 2800

Introduction	13
Unpacking the 2800	13
Inspecting the 2800	13
Configuration Check List	14
Installing the 2800	16
Procedure 1: Rack Mount the 2800	16
Procedure 2: Connecting the 2800	17
Mains Connections	17
Video Connections	17
Data and Audio Connections	18
Optical Connections	19
Procedure 3: powering up the 2800	20
Procedure 4: Verify Proper LED Operation	22
Video Bank	22
Data Bank	23
Power	23
Temperature Alarm	25
Error/Fault	25

Chapter 3

Configuring your 2800 Network

Introduction	26
Configuration Options	26
Point to Point	26
Unidirectional Point to Point Video	27
Bi-directional Point to Point Video	29
Drop, Add and Pass	30
Unidirectional Drop, Add and Pass Video	31
Bi-directional Drop, Add and Pass Video	33
Changing Configuration	34
Removing the 2800's lid	35
Changing a card	35
Changing a High Speed Optical Transmitter or Receiver	35
Changing a Video Card	36
Changing Data Cards, Data interface Daughter Boards And low Speed Opto Transmitter and Receiver Cards	37
Replacing the 2800's Lid	38
The Local Manager Interface	38
AMG MUXcomm Software	38

Chapter 4

Troubleshooting

Introduction	40
Troubleshooting Table	41
Cleaning and Changing Filter	45
Returns Procedure	46

Appendix A

Technical Specifications

Introduction	47
General	47
Connectors	48
Front Panel LED Indicators	48
Configurations Options	49
Interface Specifications	49
Optical	50
Options	50

Appendix B

Part Numbers

Introduction	51
--------------	----

Glossary	52
-----------------	-----------

Index	54
--------------	-----------

Chapter 1

Introducing the 2800 Guardian

Introduction

This chapter introduces you to the appearance, purpose, key features and benefits of the 2800 Guardian (2800). This chapter also familiarises you with the purpose and operation of the cards available in this system.

What is the 2800 Guardian?

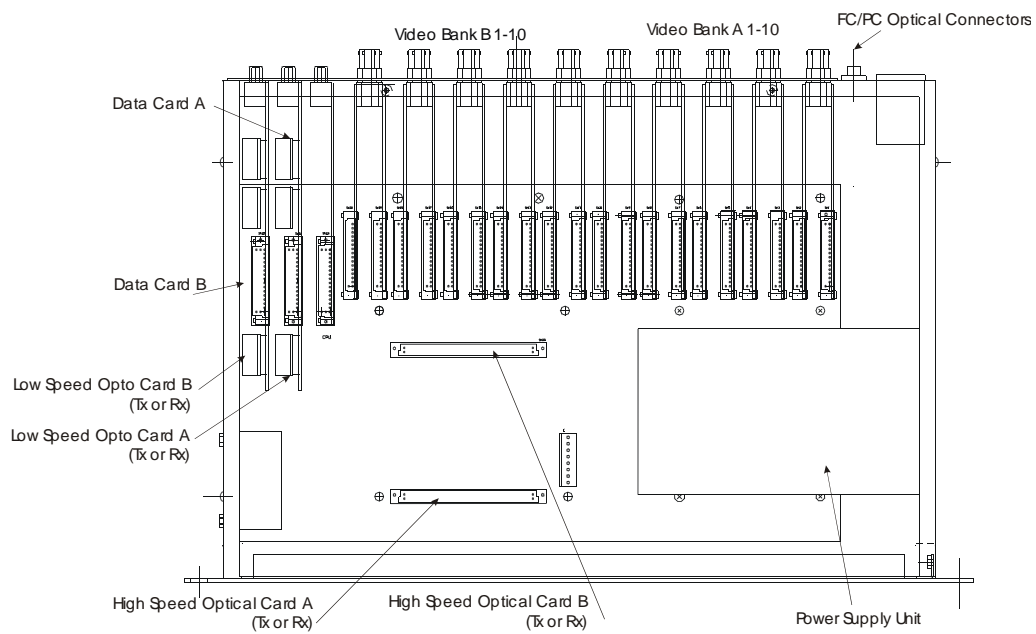
The AMG Systems (after this, AMG) 2800, is a multi-channel digital transmission system that integrates video traffic with data and/or audio traffic over one single mode fibre ring. You may transmit this data using Point to Point (PT-PT) or Drop, Add and Pass configurations. Real time digital transmission enables transmission over virtually unlimited distances, regardless of how many repeaters are incorporated to achieve the required transmission distance. It also provides support for an unlimited number of attached nodes.

The 2800 consists of a 19" 2U mainframe with twenty-five connector slots to holds plug-in cards. The plug-in cards receive, process and transmit video, data and audio traffic. The 2800's plug-in cards include video cards, optical cards, data cards and the Microprocessor Card.

Security and surveillance for road and rail transportation, industrial sites, town centres and campuses are common customer applications for the 2800. In these applications, the 2800 transmits camera-collected video information back to a control centre.

Mainframe Overview

The following is an overview of the 2800 Guardian mainframe.



Motherboard

This large board fills most of the mainframe and carries the connectors for the plug in cards, distributes the power supplies, contains the cross point switch and other basic circuitry.

Two jumpers and rotary switches are provided to set different configurations.

Item	Setting	Comments
Master/ Slave Jumper PL5	Jumper ON: MASTER Jumper OFF : SLAVE	Note: During the power up sequence the 2800 will automatically configure the unit according to the boards which are fitted. The software will only use this jumper setting if it cannot decide on a master/slave setting by itself.
Jumper PL6	Jumper ON: Transparent Jumper OFF: Point to Point	With a jumper the video input cards fitted to slave units are disabled. So do not affect the video signals passing through. Video output cards are always enabled. The only exception is the default setting for a master unit, which is never transparent. Removing the jumper forces a slave unit to insert a video signal where a video input card is fitted.
Rotary HEX Switch SWI	Normally set to A for 10 channel option.	

Microprocessor Card

The microprocessor Card controls the configuration of the 2800 unit locally and communicates with other units in the network. The Microprocessor Card is already installed in your 2800, and has two ports on the back panel of the unit.

Port 1 RS-232	A standard RS-232 9 pin interface for system control and monitoring.
Port 2 Control	A high density 15 way D-type connector containing the following signals: <ul style="list-style-type: none"> • A secondary RS-232 control port • Two alarm inputs • Two relay change over outputs • External 5 volt power supply (250mA)

The alarm inputs and relay change over outputs are monitored and controlled remotely through the 2800 control system.

Video Banks

Twenty of the 2800's connector slots are dedicated video input/output slots, which are configured into two banks labelled Video Bank A and Video Bank B. Each bank accommodates up to ten Video channels. You cannot mix Input and Output cards in the same bank. Each connector slot in Video Bank A and Video Bank B has a corresponding LED indicator on the unit's front panel.

Video Cards

The 2800 is a completely digital transmission system. Video Input Cards digitize the incoming analogue video signals. After transmission along the optical fibre, the Video Output Cards reconstitute the digitized video signal as an analogue video signal. It is helpful to imagine that the fibre carries video signals along 10 or 20 individual fibre channels. At each 2800 unit the channels pass through a cross-point switch (matrix) that is connected to each video bank. For simplicity the default state is chosen whereby fibre channels 1 to 10 onto correspond to video slot positions 1 to 10. A video signal presented to a Video Card in position 1, Bank B is transmitted to any Video Output Card in the same position (slot 1, Bank A) in downstream units. If a downstream unit has a second Video Input card in the same position (slot 1, Bank B), the second video signal "over-writes", or takes the place of the first signal (Dro, Add and Pass).

Video Input Cards

The Video Input Cards accept analogue video inputs in PAL or NTSC formats and linearly digitise the signals into a digital bit stream with eight bit resolution. The video interface is via a standard 75 ohm BNC connector. When the card is seated in the 2800, this connector protrudes for the rear of the unit.

Digitisation is synchronized to the incoming video line rate to avoid any jitter appearing on the resultant video output. There are two different kinds of Video Input Cards: odd and even. The connectors on the odd Video Input cards are in a low position, and plug into odd numbered slots in the Video Banks (i.e., 1,3,5 etc). The connectors on the even Video Input Cards are in the Banks (i.e., 2,4,6 etc). The numbers for the slots are clearly labelled on the back panel of the mainframe, next to the connector holes. There is no functional difference between odd and even Video Input Cards.

Video Output Cards

The Video Output Card accepts the digital bit stream and converts the eight bit digital video signal back into its original PAL or NTSC analogue format.

There are two different kinds of Video Output Cards: Odd and even. The connectors on the odd Video Output Cards are in a low position, and plug into the odd numbered slots in the Video Banks (i.e., 1,3,5 etc). The connectors on the even Video Output Cards are in high position, and plug into the even numbered slots in the Video Banks (i.e., 2,4,6 etc). The numbers of the slots are clearly labelled on the back panel of the main frame, net to the connector holes. There is no functional difference between odd and even Video Output Cards.

Optical Cards

The twenty serial video bit streams from Video Banks A and B connect to two High Speed Optical Card slots via a full cross-point switch. The Optical Card slots accept either a High Speed Optical Transmitter Card or a high Speed Optical Transmitter Card or a High Speed Optical Receiver Card.

High Speed Optical Cards

Each 2800 unit contains two High Speed Optical Cards. The High Speed Optical Transmitter (Hi-Speed OpTx) Card accepts ten serial video bit streams and time division multiplexes them onto the fibre. The high Speed Optical Receiver (Hi-Speed OpRx) Cards does the inverse. Both optical cards operate on a 1310nm or 1550nm wavelength range. You can combine these two wavelengths on a single fibre. The Hi-Speed OpTx operates at either 1310 or 1550nm, and the Hi-Speed OpRx operates at both wavelengths.

Each optical card is primarily associated with one of the Video Banks. If Video Bank A contains Video Input cards, then Optical Card slot A contains a Hi-Speed OpTx. If Video Bank A contains Video Output Cards, then Optical Card slot A contains a Hi-Speed OpRx. The same association exists between Optical Card slot B and Video Bank B.

The High Speed Optical Cards can carry audio and/or data signals, as well as video signals. These auxiliary signals do not displace the video signals.

Low Speed Opto Cards

There are also two Low Speed Opto Card variants: Low Speed Opto Transmitter (Lo-Speed OpTx) card and Low Speed Opto Receiver (Lo-speed OpRx) card. These daughter board interfaces modules connect to the Data Card. Lo-Speed Opto Cards carry the data/audio interfaces but do not have the bandwidth to carry video signal formats, You may not require the Low Speed Opto Cards in your unit.

If, however, the network is carrying video signals in one direction only, a Lo-Speed Opto Card can carry data/audio signals in the reverse direction. Alternatively, a network can use the Low Speed Opto Cards to carry data/audio interfaces only, to provide overall network integrity, to act as back up channel or for network redundancy.

Combining Two Optical Card Channels

To reduce the number of optical fibres required, an Opto Coupler combines the fibres from two Optical Cards into one fibre.

An Opto Coupler requires that the two cards use two separate wavelengths (i.e., 1310nm and 1550 nm).

The same Opto Coupler is used to combine or split the two wavelengths and is used with different combinations of High Speed and Low Speed Optical Cards. Depending on your configuration, you can install the coupler inside the 2800 unit itself or it between units.

Data and Audio Interfaces

The 2800 also contains two card slots for transmission of audio and data signals via the Data Cards A and B.

Each Data Card has five bi-directional data/audio channels that accommodate five bi-directional Data Interface Daughter Boards, providing a total capability of 10 bi-directional auxiliary interfaces. The specific Data Interface Daughter Boards offer a wide variety of standard audio and data interfaces, and complete flexibility on the overall configuration for the Data Cards. The Data Interface Daughter Boards fitted to the Data cards define the data interface.

Data Card and Data Interface Daughter Boards

The following data interfaces are available for the Data Card:

- RS-232 Interface Daughter Board
- RS-422-RS-485 Tx/Rx Daughter Board
- TTL Rx/Tx Interface Daughter Board
- 20mA Current Loop Daughter Board
- Contact Closure Daughter Board
- Audio Card-4 Wire Daughter Board

You set the desired data interface by plugging the Data Interface Daughter Board into the appropriate connector on the Data Card. The Data Interface Daughter Boards provide the appropriate external physical layer signal levels for data interfaces.

Audio Interface

The Data Cards also provide a line level audio interface. For audio signals, there is a 16 bit analogue to digital converter and digital to analogue converter. The audio bandwidth is 20 Hz to 17.5 kHz. The audio interface has a differential 600 ohm input and 600 ohm output impedance.

You set desired audio interface by plugging the Data Interface Daughter Board into the appropriate connector on the Data Card. Two audio interfaces can combine to transmit and receive a single stereo audio signal pair.

Chapter 2

Installing and Setting up a 2800

Introduction

To safely and accurately install a 2800 Guardian (2800) and power it up, perform the procedures in this chapter.

Unpacking the 2800

AMG thoroughly test your 2800 before shipping. AMG ships the 2800 fully assembled and configured to meet your specifications. A carton and packing materials protect the 2800 during shipment.

Before unpacking the equipment, inspect the carton for damage. If any units are damaged, contact the freight carrier immediately to file a liability claim. AMG is not liable for damage caused during shipment. Open the shipping carton containing the 2800 and carefully remove it from its wrapping.

After unpacking keep the carton and protective packing for re-use. If you need to return the 2800 to AMG for any reason, see *Returns Procedure*, in Chapter 4 of this guide.

Inspecting the 2800

A typical 2800 system contains more than one unit, and each unit is likely to have a separate set of cards and options.

On the lid of the 2800 is the “AMG 2800 Configuration Check List”, which lists the cards and options installed in the unit. Use the checklist to assist you in setting up the system. To inspect the contents of your 2800 system and prepare for installation, perform the following steps:

1. Check the “AMG 2800 Configuration Check List” on every 2800 unit within the system against the items ordered. If there are any discrepancies between the items ordered and those delivered, please refer to the *Returns Procedure*, in Chapter 4 of this guide.
2. After checking each unit against the order, check the site Location details on the “AMG 2800 Configuration Check List”. Write in the exact location for each specific unit within the system.
3. Take each unit to its correct location.

AMG 2600 CONFIGURATION CHECK LIST

Unit Serial No. _____ Site _____

Location _____

Hi. Speed Opto A | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Hi. Speed Opto B | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Lo. Speed Opto A | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Lo. Speed Opto B | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Opto Coupler Type _____

Other _____

Video Bank A

Input | Output |

Channel 1 |

Channel 2 |

Channel 3 |

Channel 4 |

Channel 5 |

Channel 6 |

Channel 7 |

Channel 8 |

Channel 9 |

Channel 10 |

Video Bank B

Input | Output |

Channel 1 |

Channel 2 |

Channel 3 |

Channel 4 |

Channel 5 |

Channel 6 |

Channel 7 |

Channel 8 |

Channel 9 |

Channel 10 |

Auxiliary I/O Card A Interface

Interface Module 1 | _____

Interface Module 2 | _____

Interface Module 3 | _____

Interface Module 4 | _____

Interface Module 5 | _____

Auxiliary I/O Card B Interface

Interface Module 1 | _____

Interface Module 2 | _____

Interface Module 3 | _____

Interface Module 4 | _____

Interface Module 5 | _____

AMG 2800 CONFIGURATION CHECK LIST

Unit Serial No. _____ Site _____

Location _____

Hi. Speed Opto A | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Hi. Speed Opto B | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Lo. Speed Opto A | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Lo. Speed Opto B | Tx. | Rx. | 1310nm | 1550nm | Opto Connector No. _____

Opto Coupler Type _____

Other _____

Video Bank A

Input | Output |

Channel 1 |

Channel 2 |

Channel 3 |

Channel 4 |

Channel 5 |

Channel 6 |

Channel 7 |

Channel 8 |

Channel 9 |

Channel 10 |

Video Bank B

Input | Output |

Channel 1 |

Channel 2 |

Channel 3 |

Channel 4 |

Channel 5 |

Channel 6 |

Channel 7 |

Channel 8 |

Channel 9 |

Channel 10 |

Auxiliary I/O Card A Interface

Interface Module 1 | _____

Interface Module 2 | _____

Interface Module 3 | _____

Interface Module 4 | _____

Interface Module 5 | _____

Auxiliary I/O Card B Interface

Interface Module 1 | _____

Interface Module 2 | _____

Interface Module 3 | _____

Interface Module 4 | _____

Interface Module 5 | _____

Installing the 2800

To install and operate a 2800 Guardian, perform all procedures in the proper order.

Procedure 1: Rack Mount the 2800

The 2800 mounts into a standard 19" (482.6mm) racking system. It is 2U high.

1. Ensure all ventilation holes in the top, bottom and sides of the 2800 are clear.

Notes 1: You can stack 2800 units next to each other within the rack. No clearance is required between 2800 units.

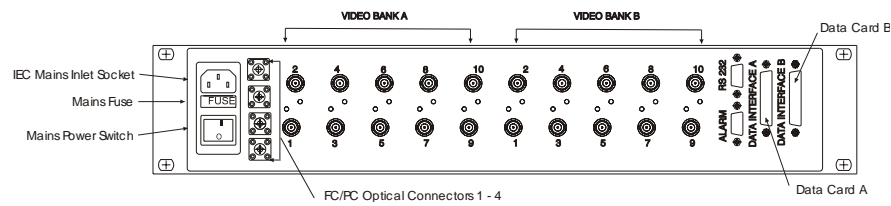
Notes 2: 1U clearance is required between a 2800 unit and any other item (other than 2800 units) mounted within the racking system.

2. Position the 2800 in the rack. Use four rack fixing screws with washers, to secure the unit to the rack.
3. Fit four fixing screws, with washers, on the front of the unit. Ensure that the unit is firmly fixed to the rack.

The 2800 dissipates 75W of heat. Use standard rack thermal management techniques to ensure the case temperature of the 2800 is kept below a maximum of 50 degrees at all times.

Procedure 2: Connecting the 2800

All connections to the 2800 unit are made at the rear of the unit.



Mains Connections

Notes: After plugging the 2800 unit in, do not switch the 2800 on at this stage.

An IEC power cord is supplied with the 2800.

1. Connect the power cord to the unit
2. Ensure that the power cord is connected to the Mains Supply for the rack.

Video Connections

Make the video connections with BNC connectors. Video Input Cards receive a signal from a camera. Video Output Cards send a signal to a video monitor.

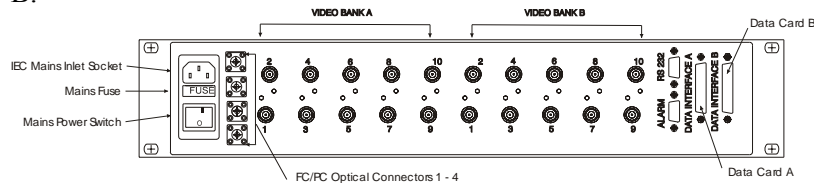
All Video Input Cards terminate with 75Ω at the 2800. This termination is not switchable. If you want to monitor a camera locally, feed the signal through the monitor before attaching to the 2800 unit. In this instance, ensure that the video signal does not terminate at the monitor.

All Video Outputs from the 2800 unit terminate with 75Ω at the monitor.

Data and Audio Connections

The data and audio interfaces connect through one of the 25 way standard female D-type connector(s). These connectors are labelled on the rear panel as Data Interface A and Data Interface B.

For between 1 and 5 data/audio interface, the 5 Channel Data I/O Motherboard (Data Card) is in slot A. Therefore, connect to connector A. For between 6 and 10 data/audio interfaces, there is a Data Card in both Data/Audio Interface Card slots. Therefore, you use both connectors A and B.



The following table lists the connections to the Data Interface connectors.

Data Interface Connections (25 way D-type Connector)

Interface 1		Interface 2		Interface 3	
Input +	1	Input +	6	Input +	11
Input -	2	Input -	7	Input -	12
Output +	3	Output +	8	Output +	13
Output -	4	Output -	9	Output -	14
Ground	5	Ground	10	Ground	15
Interface 4		Interface 5			
Input +	16	Input +	21		
Input -	17	Input -	22		
Output +	18	Output +	23		
Output -	19	Output -	24		
Ground	20	Ground	25		

Each Data Card (A and B), contain five connectors for Data Interface Daughter Boards. You set the data or audio interfaces by plugging the desired Data Interface Daughter Board onto the appropriate connectors. There are several specific data/audio format alternatives, provided by the following Data Interface Daughter Board.

- RS-232 Interface Daughter Board
- RS-422-RS-485 Tx/Rx Daughter Board
- TTL Rx/Tx Interface Daughter Board
- 20mA Current Loop Daughter Board
- Contact Closure Daughter Board
- Audio Card-4 Wire Daughter Board

Please refer to the “AMG 2800 Configuration Check List” for which Data Interface Daughter Boards are fitted to which Data Card.

Optical Connections

Caution: This product contains laser diodes operating at wavelengths of 1310nm to 1550nm, which are invisible to the human eye. Avoid direct exposure to the laser beam. Do not look directly into the fibre optic cable or down the fibre.

The optical fibre(s) connect to the 2800 using FC/PC connectors and single mode, 9µm core fibre optic cable.

Depending on the specific configuration of each 2800 unit, there are up to four optical connectors on the back of the 2800 unit. Each connector is clearly labelled as a transmitter output, receiver input, or a combined input/output signal to an optical coupler. To make your optical connections:

1. Review the system schematic or connection list.
2. Make the connection in step a or b, depending on your system configuration:
 - a) In a unidirectional point-to-point system, connect the High Speed Optical Receiver of one 2800 unit to the High Speed Optical Transmitter of the second 2800 unit.
 - b) In a bi-directional system, connect the High Speed Optical Transmitter/Receiver of one 2800 unit to the High Speed Optical Transmitter/Receiver of the second 2800 unit.

Note: All video, audio and data input signals connect to an Optical Transmitter. All video, audio and data output signals connect to an Optical Receiver.

Procedure 3: Powering up the 2800

The power switch is located above the IEC inlet socket on the back of the unit.

1. Apply power to the unit by pressing the switch to the on position.
2. All the front panel indicators (LED's) light in sequence Immediately, from left to right, and remain on for approximately 5 seconds.
3. The indicators provide the Configuration Check as shown in the following

Indicator	Colour	State	Notes
Video Bank A 1-10	Green	On	Card is present
Video Bank B 1-10		Off	No card present
VIDEO BANK A Tx	Green	On	Bank connected to a Hi-Speed OpTx
VIDEO BANK B Tx		Off	Bank not connected to a Hi-Speed OpTx
VIDEO BANK A Rx	Green	On	Bank is connected to a Hi-Speed OpRx
VIDEO BANK B Rx		Off	Bank not connected to a Hi-Speed OpRx
DATA BANK A IN 1-5	Green	On	Data Interface Daughter Board present
DATA BANK B IN 1-5		Off	No Data Interface Daughter Board present
DATA BANK A OUT 1-5	Green	On	LED 1: Lo Speed OpTx card present. LED 2-4: Data Card present. LED 5: Lo Speed OpRx present.
DATA BANK B OUT 1-5		Off	No Data Interface Daughter Board present, no Lo Speed OpTx or OpRx present.

POWER	Green	On	When power is connected
OPTO SYNC A	Green	On	If Optical Card slot A contains a Hi-Speed OpTx Card
	Orange	On	If Optical Card slot A contains a Hi-Speed OpRx Card
		Off	Optical Card slot A is empty
OPTO SYNC B	Green	On	If Optical Card slot B contains a Hi-Speed OpTx Card
	Orange	On	If Optical Card slot B contains a Hi-Speed OpRx
		Off	Optical Card slot B is empty
TEMPERATURE ALARM		Off	
ERROR/FAULT		Off	

1. After the Configuration Check is complete, the indicators perform the Load Status Check as follows:
A Green LED appears for each card that is initialized. If the ERROR/FAULT LED lights (red) and a Green card LED blinks off, the corresponding card is faulty. Replace the faulty card in the unit. See *Changing a Card*, in Chapter 3 of this guide for further assistance.
2. Following the Load Status Check, the LED's revert to normal operation. See ***Error! Reference source not found.***, in this Chapter.
3. On the rear panel, indicators on the Video Cards light when a video signal is inserted. A green indicator signifies a Video Input Card; a yellow indicator signifies a Video Output Card.
4. The 2800 is now fully connected and powered up.

Note: If either of the OPTO SYNC indicators is red, it does not necessarily signify a fault. A red indicator may signify that the Hi-Speed OpRx is not receiving a signal, possibly because the upstream unit is not yet connected and powered up.

Procedure 4: Verify Proper LED Operation

Check the following tables to ensure that your LED's indicate that your 2800 is operating properly.

Video Bank

The Video Bank LED's look like this:

LED	Colour	State	Notes
VIDEO BANK A 1 – 10	Green	On	Video Card is fitted and video signal is present
VIDEO BANK B 1 - 10		Off	No Video Card is fitted
VIDEO BANK A Tx	Green	On	Bank is connected to a Hi-Speed OpTx
VIDEO BANK B Tx		Off	Bank is not connected to a Hi-Speed OpTx
VIDEO BANK A Rx.	Green	On	Bank is connected to a Hi-Speed OpRx
VIDEO BANK B Rx			

Data Bank

The Data Bank LED's look like this:

LED	Colour	State	Notes
DATA BANK A IN 1 – 5 DATA BANK B IN 1 - 5	Green	On	Data Card, Data Interface Daughter Board, Hi-Speed OpTx, and audio/data stream present
		Burst	Data Card, Data Interface Daughter Board, Hi-Speed OpTx, and audio/data stream burst
		Off	No Data Card or no Data Interface Daughter Board or no Hi-Speed OpTx present
DATA BANK A OUT 1 – 5 DATA BANK B OUT 1 - 5	Green	On	Data Card, Data Interface Daughter Board, Hi-Speed OpRx and audio/data stream present
		Burst	Data Card, Data Interface Daughter Board, Hi-Speed OpRx and audio/data stream burst
		Off	No Data Card or no Data Interface Daughter Board or no Hi-Speed OpRx present

Power

The Power LED looks like this:

LED	Colour	State	Notes
POWER	Green	On	Power is connected

Opto Sync.

The Opto Sync LED's look like this:

LED	State	Notes	
OPTO SYNC. A	Green	Hi-Speed OpTx	Hi-Speed OpRx
		Opto Sync. pulse present and transmitting communications control signals.	Opto Sync. pulse present and receiving communications control signals.
	Orange	Opto Sync. pulse present but not transmitting communications control signals.	Opto Sync. pulse present but not receiving communications control signals.
	Red	Fault in transmitter	No Opto Sync. pulse present; no communications control signals. Due to insufficient optical power level.
	Off	No Optical Card present in Optical Card slot A	
OPTO SYNC. B	Green	Opto Sync. pulse present and transmitting communications control signals.	Opto Sync. pulse present and receiving communications control signals.
	Orange	Opto Sync. pulse present but not transmitting communications control signals	Opto Sync. pulse present but not receiving communications control signals
	Red	A fault in the transmitter	No Opto Sync. pulse present; no communications control signals. Due to insufficient optical power level.
	Off	No Optical Card present in Optical Card slot B	

Temperature Alarm

The Temperature Alarm LED looks like this:

LED	Colour	State	Notes
TEMPERATURE ALARM	Red	Off	Laser and internal temperatures are within acceptable range.
		On	Laser and/or internal temperatures are out of acceptable range.

Error/Fault

The Error/Fault LED looks like this:

LED	Colour	State	Notes
ERROR/FAULT	Red	Off	No system errors

Chapter 3

Configuring your 2800 Network

Introduction

The 2800 is a high flexible unit that integrates video traffic with data and/or audio traffic over one single mode fibre ring. You may transmit this data using Point-to-Point (PT-PT) or Drop, Add and Pass network configurations. Each 2800 arrives fully configured to your specifications. Since it arrives with configurations set, it is ready to be incorporated into your network immediately after installation and powering up. See Chapter 2 of this guide, *Installing and Setting up a 2800*, for further information.

The following section describes some of the configurations that are possible within your 2800 network.

Configuration Options

The 2800 configurations vary according to their applications, and the card combinations installed in your mainframes. The following section describes some of the typical network topologies.

- Point-to-Point
- Unidirectional Point-to-Point Video
- Bi-directional Point-to-Point
- Drop, Add and Pass
- Unidirectional Drop, Add and Pass Video
- Bi-directional Drop, Add and Pass Video

Point-to-Point

A Point-to-Point (PT-PT) topology transports a transmission directly between two 2800 units. The signal originates at one single point (transmitting unit) and arrives at a single destination (receiving unit). PT-PT networks can be set up as unidirectional or bi-directional links for video transmission. The network may contain repeater units to extend transmission distance.

Note: If you wish to have signals dropped off an added at Repeater units, see the section *Drop, Add and Pass*, in this chapter.

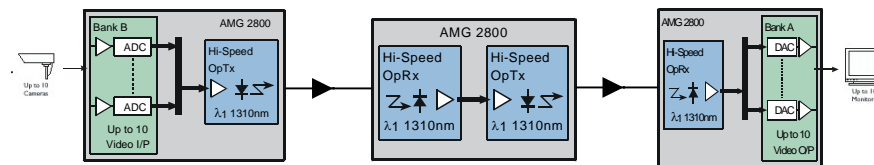
Unidirectional Point-to-Point Video

Unidirectional networks consist of one-way transportation of information to one final destination. Unidirectional PT-PT Video topologies are configured to contain one to ten video channels or eleven to twenty video channels, and to transport video only, or bi-directional data/audio as well as video transmission.

Unidirectional Video Only

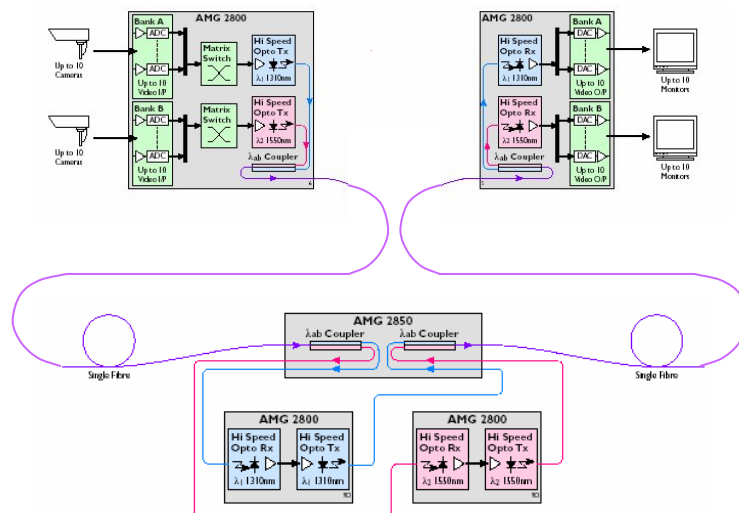
- One to Ten Video Channels

Following is an example of a standard Point-to-point, unidirectional video only configuration with one to ten channels.



- Eleven to Twenty Video Channels

You can alter the above configuration to contain eleven to twenty video channels. In this case, the transmitting unit contains two Hi-Speed OpTx Cards and up to twenty Video Input Cards. The receiving unit contains two Hi-Speed OpRx Cards and up to twenty Video Output Cards. Insert a Repeater unit configured like the one shown below, at as many locations as are required. Repeater units boost the signal to send it on to the receiving location.



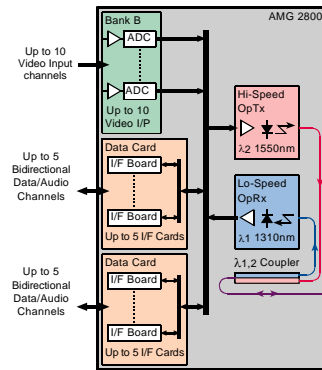
Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

This network configuration is locally manageable through MUXcomm software, not through the fibre network.

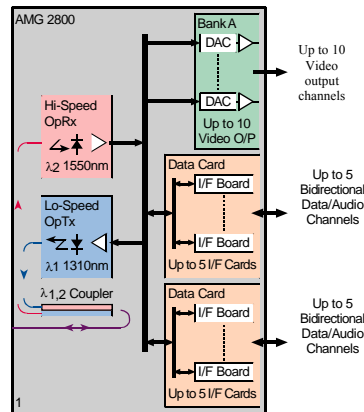
Unidirectional Video and Bi-directional Data/Audio

- One to Ten Video Channels:

The transmitting unit contains one Hi-Speed OpTx Card, a Lo-Speed OpTx Card (optional) and up to ten Video Input Cards.



The receiving unit contains one Hi-Speed OpRx Card, a Lo-Speed OpTx (optional) and up to ten Video Output Cards.



Each unit also contains up to ten bi-directional data/audio channels, on Data Cards A and B. Inserting Repeater units at as many locations as are required boosts the signal to send it to the destination (receiving) unit.

Note: Ensure that you fill the data channels on Data Card A first before plugging any Data Interface Daughter Boards onto Data Interface Card B.

Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

This network configuration is remotely manageable from any node attached to MUXcomm software, through the fibre network.

- Eleven to Twenty Video Channels

You can alter the above configuration to contain eleven to twenty video channels. In this case, the transmitting unit contains two Hi-Speed OpTx Cards and up to twenty Video Input Cards. The receiving unit contains two Hi-Speed OpRx Cards and up to twenty Video Output Cards. Each unit also contains up to ten bi-directional data/audio channels, on Data Cards A and B.

Note: Ensure that you fill the channels on Data Card A first before plugging and Data Interface Daughter Boards onto Data Card B.

Insert a Repeater at as many locations as are required boosts the signal and sends it to the receiving locations.

Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

This network configuration is remotely manageable from any node attached to MUXcomm software, through the fibre network.

Bi-directional Point-to-Point

A bi-directional network is a two-way transportation of information to and from the final destination. Bi-directional PT-PT Video topologies are configured to contain one to ten video channels, and transport video only, or bi-directional data/audio as well as video transmission.

Bi-directional Video Only

- One to Ten Video Channels

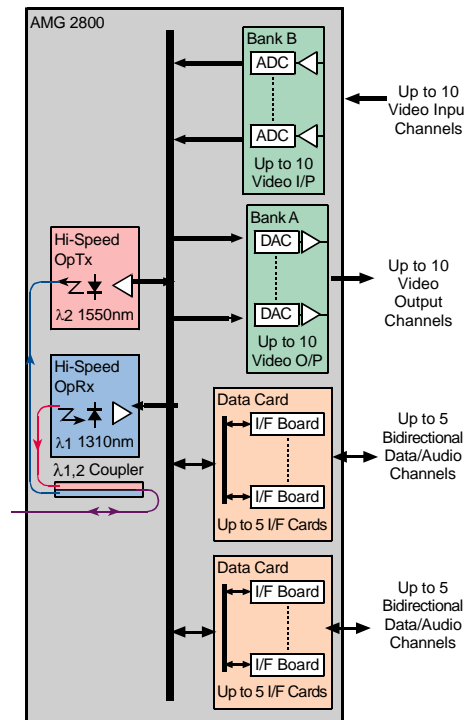
Each unit in the point-to-point network contains one Hi-Speed OpTx Card, one Hi0Speed OpTx Card and up to ten Video Input Cards and up to ten Video Output Cards. Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

The signal travels along the network through the entire network. Inset a Repeater at as many locations as are required to boost the signal and send it to the receiving location.

Bi-directional Video and Bi-directional Data/Audio

- One to Ten Video Channels

Each unit contains one Hi-Speed OpTx, one Hi-Speed OpRx Card and up to ten Video Input Cards and up to ten Video Output Cards. Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over on fibre



Each unit also contains up to ten bi-directional data/audio channels, on Data Cards A and B.

Note: Ensure that you fill the channels on Data Card A first before plugging any Data Interface Daughter Boards onto Data Card B.

The signal travels along the network through as many units as are in the network. Inset a Repeater at as many locations as are required to boost the signal and send it on to the destination (receiving) unit.

Drop, Add and Pass

The Drop, Add and Pass network topology transports information from various nodes and passes it along with the information it gathers on its way to the end destinations. It adds video at nodes containing a Video Input Card in the same channel and passes video at nodes that do not contain a Video Card in the same channel. Video drops at nodes where there is a Video Output Card present in the channel and existing video is overwritten at nodes where there is a Video Input Card present in the slot corresponding to the channel, blocking the video from passing. Drop, Add and Pass networks can be set up as unidirectional or bi-directional links, in a liner or ring topology, for video transmission.

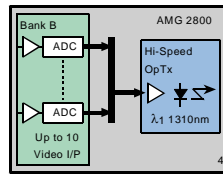
Unidirectional Drop, Add and Pass Video

Unidirectional networks consist of one-way transportation of information to several destinations. Unidirectional Drop, Add and Pass Video topologies can be configured to contain one to ten video channels or eleven to twenty video channels, and to transport video only, or bi-directional data/audio as well as video transmissions.

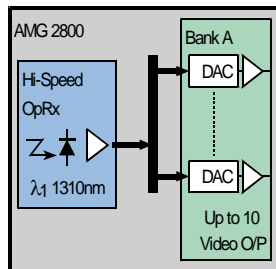
Unidirectional Video Only

- One to ten Video Channels

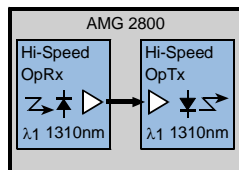
The transmitting unit contains one Hi-Speed OpTx Card and up to ten Video Input Cards.



The receiving unit contains one Hi-Speed OpRx Card and up to ten Video Output Cards.



Insert Repeater units at as many locations as required boosts the signal to extend transmission distance to the receiving unit.



Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

- Eleven to Twenty Video Channels

This network topology eliminates the need for extra units by utilising one Hi-Speed OpTx in the transmitting unit and one Hi-Speed OpRx in the receiving unit, and passing the fibre through both in a loop. Insert Repeaters at as many locations as required to boost the signal and extend transmission distance.

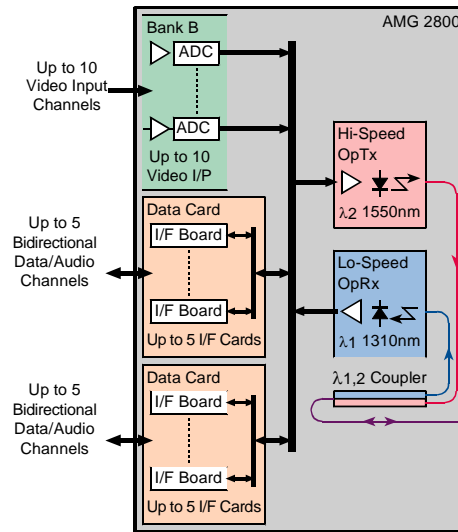
Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre

This network configuration is locally managed through MUXcomm software, not through the fibre network.

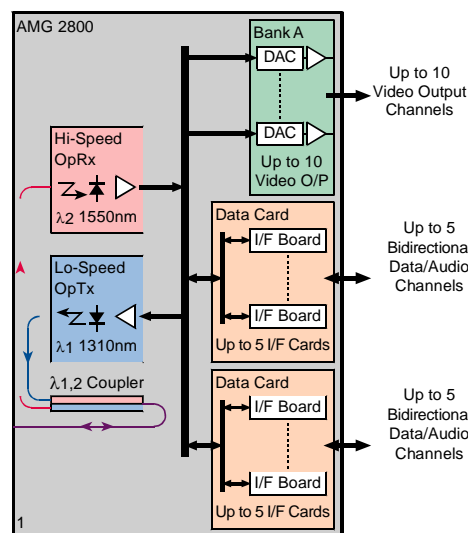
Unidirectional Video and Bi-directional Data/Audio

- One to Ten Video Channels

The transmitting unit contains one Hi-Speed OptX Card and one Lo-Speed OpRx Card, up to ten Video Input Cards and up to ten Video Input Cards and up to ten Data/Audio channels on Data Cards A and B.



The receiving unit contains one Hi-Speed OpRx Card, one Lo-Speed OpTx Card, up to ten Video Output Cards and up to ten Data Channels on Data Cards A and B.



Note: Ensure that you fill the channels on Data Card A first before plugging and Data Interface Daughter Boards onto Data Card B.

Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

This network configuration is remotely manageable from any node attached to MUXcomm software.

- Eleven to Twenty Video Channels

You can alter the above topology to contain up to twenty video channels. The transmitting unit contains two Hi-Speed OpTx Cards and up to twenty Video Input Cards. The receiving unit contains two Hi-Speed OpRx Cards and up to ten bi-directional data/audio channels, on Data Cards A and B. Insert a Repeater unit at as many locations as are required to boost the signal and send it on to the destination (receiving) unit.

Note: Ensure that you fill the channels on the Data Card A first before plugging any Data Interface Daughter Boards onto Data Card B.

Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

This network configuration is remotely manageable from any node attached to MUXcomm software, through the fibre network.

Bi-directional Drop, Add and Pass Video

A bi-directional network is a two-way transportation of information to and from the node locations, dropping information off at selected nodes and picking up new information to carry forward. Bi-directional Drop, Add and Pass Video topologies are configured to contain one to ten video channels, and to transport video only, or bi-directional data/audio as well as video transmissions. The information travels in a loop, coming back to the originating unit. This loop configuration allows for use of the MUXcomm software for diagnostic purposes.

Bi-directional Video Only

- One to Ten Video Channels

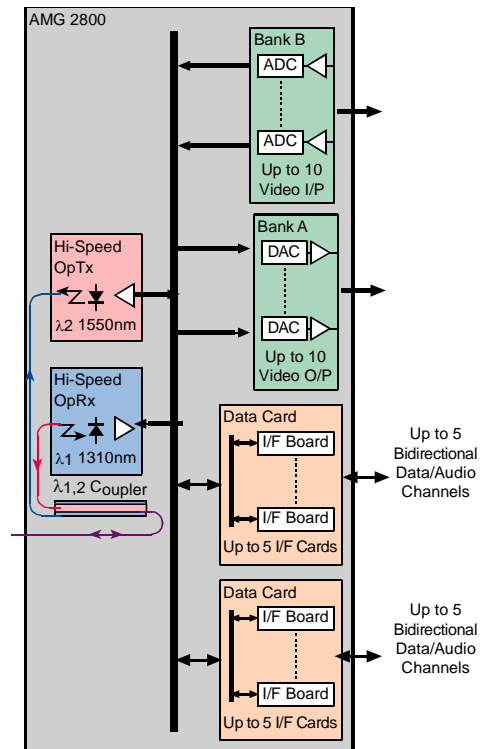
Each unit in the point-to-point network contains one Hi-Speed OpTx Card, one Hi-Speed OpRx Card and up to ten Video Input Cards and up to ten Video Output Cards. Insert a Repeater unit at as many locations as are required to boost the signal and send it on to the destination (receiving) unit.

Each optical signal can transmit on its own fibre, or, on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.

Bi-directional Video and Bi-directional Data/Audio

- One to Ten Video Channels

Each unit contains one Hi-Speed OpTx Card, one Hi-Speed OpRx Card and up to ten Video Input Cards and up to ten Video Output Cards. Each optical signal can transmit on its own fibre, or on two different wavelengths (i.e., 1310nm and 1550nm) over one fibre.



Each unit also contains up to ten bi-directional data/audio channels, on Data Cards A and B. Insert a Repeater unit at as many locations as are required to boost the signal and send it on to the destination (receiving) unit.

Note: Ensure that you fill the channels on Data Card A first before plugging and Data Interface Daughter Boards onto Data Card B.

Changing Configuration

If your 2800 Guardian is pre-set to a dynamic configuration, it is possible to change the internal configuration of the 2800 after you set it up. Changing the configuration of the 2800 after you set it up. Changing the configuration alters the nature of the 2800.

The High Speed Optical Transmitter and Receiver Cards, Low Speed Opto transmitter and Receiver modules, Video Cards, Data Cards and Data Interface Daughter Boards are all field serviceable and replaceable.

To change the internal configuration of your 2800, you change the combination of option cards installed inside the unit.

Removing the 2800's Lid

Note: The 2800 contains static-sensitive components. Handle the unit with proper Electrostatic Discharge (ESD) procedures. Use properly grounded protection (for example, wrist straps) when handling the cards.

To remove the lid, perform the following procedures:

- 1) Remove the power cord from the 2800 unit.
- 2) Undo the 3 screws along the rear edge of the lid, and the 2 screws on each side of the lid, using a crosshead screwdriver.
- 3) Lift up the rear edge of the top lid a short distance and slid it backwards. The front edge of the top lid has a lip that engages with a rail along the top of the front panel. Be carefull not to dislodge the FMC strip.

Changing a Card

After removing the 2800's top lid, you can change internal configuration by altering the combination of cards inside the unit.

Changing a High Speed Optical Transmitter or Receiver.

To remove a High Speed Optical Transmitter or Receiver Card:

- 1) Unfasten the optical fibre from the FC/PC socket on the inside of the rear panel.
- 2) If necessary remove the transit tape from the transmitter or receiver connector.
- 3) Firmly grasp both edges of the transmitter or receiver card and remove it from the motherboard.

To re-insert a High Speed Optical Transmitter or Receiver Card:

- 1) Align the card with the connectors on the motherboard.
- 2) Grasp both edges of the card and push firmly downward. The optical fibre points towards the back panel FC/PC connector. The connectors are polarised, so you cannot plug the card in the wrong way.
- 3) Replace the optical fibre on the FC/PC socket on the inside of the rear panel.
- 4) The tape doesn't need replacing.

Changing a Video Card

There are 5 chassis plates along the rear of the 2800 unit. One chassis plate is used to hold up to cards in place.

To remove a Video Card:

- 1) Using a BNC nut-driver, remove the nuts around all the BNC sockets associated with the particular chassis plate. There are up to 4 BNC sockets associated with s chassis plate.
- 2) Using a crosshead screwdriver, remove the 4 crosshead screws holding the chassis plate to the rear panel.
- 3) Remove the chassis plate
- 4) Remove the Video card from the 2800 unit by carefully lifting it up at the rear.

There are two different kinds of Video Input and Output Cards: odd and even. The BNC connectors on the odd Video Cards are in a low position, and plug into the odd numbered slots in the Video Banks (i.e., 2,4,6 etc). The numbers for the slots are found on the back panel of the mainframe, next to the connector holes. There is no functional difference between odd and even Video Cards.

Note: When ordering spare or replacement cards, please ensure that the specific odd or even card(s) are ordered.

To re-insert a Video Card

Note: When filling the Video Banks, start by filling Video Bank B with Video Input Cards beginning at slot B1. Then fill Video Bank A with Video Output Cards, beginning at slot A1.

- 1) Align the card with the connectors on the motherboard.
- 2) Grasp both edges of the card and push firmly downward.
- 3) Ensure all cards are firmly connected to the motherboard before replacing the rear chassis plate.
- 4) After replacing the rear chassis plate, replace the 4 crosshead screws and the nuts around the BNC sockets.

Changing Data Cards, Data Interface Daughter Boards and Low Speed Opto Transmitter and Receiver Cards

To remove a Data Card, Data Interface Daughter Board or Low Speed Opto Transmitter or Receiver Card:

- 1) Remove the 4-crosshead screws around the chassis plate to the right hand end of the rear panel.
- 2) Remove the 2 or 44-40 UNC connector studs at either end of the 25 way D-type connector(s).
- 3) Remove the chassis plate.
- 4) If a Lo-Speed OpTx or OpRx Card is attached to the Data Card, undo the optical fibre from the FC/PC connector on the inside of the rear panel.
- 5) Remove the Data Card from the 2800 unit by carefully lifting it up at the rear.
- 6) Simply lift the Data Interface Daughter Board(s) and optional Lo-Speed OpTx or OpRx off of the Data Card.

To re-insert a Data Card, Data Interface Daughter Board or Low Speed Opto Transmitter or Receiver Card:

Note: When installing Data Interface Daughter Boards, fill Data Card A first, beginning with the first connector, before using Data Card B. Ensure that you are using the correct type of Data Interface Daughter Board, and that it is in the same position on the Data Card as its partner at the other end of the optical link. Data Interface Daughter Boards are numbered from 1 to 5 starting from the D-type connector.

- 1) Connect the selected Data Interface Daughter Boards to the Data Card by aligning the Daughter Board with the connectors on the card and pressing downward firmly.
- 2) Align the card with the connectors on the motherboard
- 3) Grasp both edges of the card and push firmly downwards.
- 4) If a Lo-Speed OpTx or OpRx Card is attached to the Data Card, refasten the optical fibre to the FC/PC connector on the inside of the rear panel.
- 5) Ensure all cards are firmly connected to the motherboard before replacing the rear chassis plate.
- 6) After replacing the rear chassis plate, replace the 4 crosshead screws and the 4-40 UNC connector stubs at either end of the D-type connector(s).

Replacing 2800's Lid

- 1) Ensure that all optical fibres are contained inside the unit.
- 2) Ensure the lid on the front edge of the lid engages with the rail along the top of the front panel.
- 3) Slide the lid into place
- 4) Replace the seven crosshead screws.

The Local Manager Interface

Each 2800 network contains master and slave multiplexers. A master multiplexer controls the information flow out to and in from the various branches (slaves) of the network. A slave multiplexer is a multiplexer that receives information and passes it along to the next multiplexer in the network. A slave receives instructions from the master.

AMG Configuration Manager Software

The Configuration Manager allows the user to describe the system's video configuration graphically and save the information as a configuration file. Each camera and monitor is assigned a unique number and each 2800 Guardian unit is defined uniquely with its unit address.

The manager generates data that is downloaded into the master unit via the RS232 serial port. This allows an external keyboard from a standard CCTV control system (i.e. Baxall or Molyx) to be connected to the Guardian (User port) and the user can then switch camera inputs to monitor outputs using simple key instructions. A software keyboard simulation is also available in MUXcomm. The master unit interprets the keyboard's commands and issues switching instructions around the loop to other slave units. This results in full control of the selected camera via the same keyboard. Multiple keyboards can be attached to a slave unit; the keyboard instructions are transmitted directly around the fibre loop to the master unit where they are appropriately interpreted and executed.

Furthermore, the configuration file is used by the MUXcomm program to extract the unit names and unit address information to allow it to locate the unit in a ring system.

AMG MUXcomm Software

The MUXcomm program allows the user to monitor the internal status of any unit in a ring network, after the configuration, change operating settings, switch video and data signals etc. The software operates on a PC using a windows 95/98 operating system.

After installing your 2800 network system, to set up the configuration, connect a PC to any one of the units by plugging a standard cable into the communications port on the back of the PC and connecting it to the RS-232 port on the back of the 2800. You can monitor any 2800 connected to the PC, whether local or remote. There are two possible methods of connection:

- Locally, directly via the RS-232 port on the rear of the 2800. You can also achieve this connection remotely through a modem.
- Remotely to any 2800 connected in a loop configuration, provided that one of the units in that loop is connected through its own RS-232 port to the PC running the software.

Chapter 4

Troubleshooting the 2800

Introduction

This chapter assists you in determining the cause of faults in the 2800 unit, and provides some suggested solutions to problems. If the suggested solutions do not resolve the problem, please contact AMG for assistance.

The 2800 does not require regularly scheduled maintenance. This chapter contains the procedure steps required to change the filter on the 2800 unit, the only maintenance task that you may need to perform occasionally, when the filter appears clogged. How often the filter requires changing depends on the type of environment that unit is operating in.

Ensure that you regularly monitor the front and rear panel LED's on the unit to check for faults or abnormalities.

Troubleshooting Table

The following table lists possible problems you may encounter with the 2800. Where there is more than one possible cause, the possibilities are numbered either (1) or (2) to denote primary and secondary causes. The suggested Solutions column contains several possible fixes for resolving faults. Make sure to proceed in order through the suggested solutions, beginning with the first bullet. If a solution does not work, move on to the next one.

Problem	Cause	Suggested Solutions
Unit Fails to operate	(1) Power failure (2) Power Supply protection circuitry failure	<ul style="list-style-type: none"> • Check the Mains Power supply to the unit. • Power Supply protection circuitry may require time to recover. Switch the unit off and remove the mains cord. Leave the unit off for five minutes, then reconnect the mains cord and turn the unit on again.
	(3) Fuse failure	<ul style="list-style-type: none"> • Switch the unit off and remove the mains cord. • Check the rear panel fuse located on the IEC Mains inlet socket. • Check the second fuse on the Power Supply inside the unit (Ensure that the unit is off and the mains cord disconnected). • Replace either fuse if necessary. Power the unit up again.
ERROR/FAULT indicator is red	Unit fault	<ul style="list-style-type: none"> • Fault finding relies upon the front panel indicators. During the power up indicator test, if the ERROR/FAULT LED lights, or any indicator fails to function properly, refer to the <i>Returns Procedure</i> found at the end of this chapter.

Problem	Cause	Suggested Solutions
An OPTO SYNC LED corresponding to a Hi-Speed OpTx is red	(1) Incorrect connection to fibre network	<ul style="list-style-type: none"> • Ensure that Hi-Speed OpRx Card is connected via optical fibre to the Hi-Speed OpTx output from an upstream unit. • Ensure that upstream Hi-Speed OpTx Card is connected correctly. To test this connection, temporarily connect the Hi-Speed OpTx output and Hi-Speed OpTx input together on the same unit to verify that the two Optical Cards are OK.
	(2) Faulty optical fibre network	<ul style="list-style-type: none"> • Check fibre connections are OK (see above). Use an optical power metre to ensure that the optical power level to the Hi-Speed OpRx card is within the range of 0-20 dBm.
	(3) Faulty Hi-Speed OpTx laser transmitter in upstream unit	<ul style="list-style-type: none"> • Check for specified laser transmitter power level.
	(4) Faulty Hi-Speed OpRx	<ul style="list-style-type: none"> • Replace card. Refer to <i>Returns Procedure</i>.
An OPTO SYNC LED corresponding to a Hi-Speed OpRx is red	(1) Card is not receiving an optical pulse	<ul style="list-style-type: none"> • Ensure that Hi-Speed OpRx card is connected via optical fibre to a Hi-Speed OpTx card. • Ensure that upstream Hi-Speed OpTx card is functioning. • If Hi-Speed OpRx Card is connected and Hi-Speed OpTx card is connected, but LED remains red, refer to the <i>Returns Procedure</i>.
	(2) Faulty optical network or faulty transmitter	<ul style="list-style-type: none"> • Ensure that optical power level Rx Card is receiving is within -7dBm to 0dBm. If power level is outside this range, refer to the <i>Returns Procedure</i>.

Problem	Cause	Suggested Solutions
TEMPERATURE ALARM LED is red	(1) Case temperature is too high	<ul style="list-style-type: none"> • Ensure that the case temperature does not exceed 50 degrees C. • Ensure that ventilation holes are clear. Ensure that 1U clearance is left between the 2800 unit and any other unit in the rack (excepting other 2800 units, which may be stacked next to each other).
	(2) Fault condition	<ul style="list-style-type: none"> • If the LED remains red, this indicates a fault condition. Please refer to the <i>Returns Procedure</i>.

Problem	Cause	Suggested Solutions
Received Optical Power level on Low-Speed Opto Card out of functioning range	Faulty Optical network or faulty Optical Transmitter Card	<ul style="list-style-type: none"> • Measure the Optical Power level. It should be at -27dBm. If power level is out of range, please refer to the <i>Returns Procedure</i>.

Problem	Cause	Suggested Solutions
Video Card is not working properly	Card fault	<ul style="list-style-type: none"> • Swap the Video signal from the camera to a different input channel, transferring the signal to a second Video Input/Output Card pair. If the signal transmits normally, swapping the Video Input Cards and then the Video Output Cards within the bank determines the faulty card. See <i>Changing a Video Card</i>, in Chapter 3 of this guide. • If the card still malfunctions, Refer to the <i>Returns Procedure</i>.

Problem	Cause	Suggested Solutions
Data Card is malfunctioning	(1) Card is installed incorrectly	Ensure the following circumstances: <ul style="list-style-type: none"> • The Hi- and/or Lo-Speed OpTx and OpRx are in the correct power level range. • An OpTx Card is available for input signals and an OpRx Card for output signals. • Card Slot A is filled with a Data Card prior to inserting a card in Card Slot B. • The correct Data Interface Daughter Board is fitted in the same position on both Data Cards at both ends of the link. • The 25 way D type connector on the Data Card is wired correctly. • Electrical input signals are at the required level for the specific Interface. • The output load is within the limits of the specific interface.
	(2) Card failure	<ul style="list-style-type: none"> • Refer to the <i>Returns Procedure</i>.

Cleaning and Changing the Filter

Cleaning and changing the filter on the 2800 unit is the only maintenance task you may have to perform occasionally, when the filter appears clogged. How often the filter requires changing depends on the type of environment that unit is operating in.

The filter is located on the left panel of the 2800 unit, towards the front.

To change the filter:

- 1) Unscrew and remove the four nuts and washers holding the finger guard and filter in place.
- 2) Remove the finger guard by grasping the edges and pulling it straight off.
- 3) If you wish to reuse the same filter, perform step 4. If you wish to use a new filter, skip to step 5.
- 4) Clean the filter using warm, soapy water to remove all particles and dirt.
- 5) Put the new filter or the cleaned filter back in place, and position the finger guard over top of it.
- 6) Refasten the three nuts and washers to hold the filter in place.

Returns Procedure

If you experience a problem with your 2800, and cannot resolve it using the solutions in the troubleshooting table or anywhere else in this guide, follow the procedure below to return the 2800 Guardian.

- 1) If you detect a fault in the 2800, please contact AMG Systems Ltd., at 01767 600777 or +44 1767 600777 before returning any units.
- 2) AMG Systems Ltd. (AMG) needs the following information before accepting a returned unit:
 - Serial number
 - Unit location details
 - Full description of the fault
- 3) It is possible that the cause of the fault can be determined over the telephone and replacement units sent out immediately.
- 4) If the cause cannot be determined over the phone, AMG will issue a Returns Number, to authorise the return of the AMG 2800 unit. A unit will not be accepted by AMG without a Returns Number.
- 5) Individual cards, and optical units or modules are not accepted on their own. The complete 2800 unit must be returned for a diagnostic.
- 6) Disconnect and remove the entire unit from the rack fixture.
- 7) Using the original packing materials, carefully repackaging the 2800 and return to AMG with Returns Number displayed prominently on the outside of the packaging. Send to this address:

3 The Omega Centre, Stratton Business Park
Biggleswade, Beds. U.K.
SG18 8QB
- 8) Quote the Returns Number in any and all correspondence with AMG.
- 9) AMG will advise any repair work which is needed, and whether or not the work is covered by warranty. This is prior to any work being undertaken.

Appendix A

Technical Specifications

Introduction

This appendix lists the technical specifications for the 2800 Guardian.

General

Physical

Size 2U High, 280mm deep

Rack Mounting 19" Rack Mount

Power

Requirement 100-240 VAC, 47-400 Hz,
Connection via switched IEC
Socket

Environmental

Operating Temperature 0 to +50 degrees C.

Operating Humidity 0 to 95% non-condensing

Emissions CE Approved

Connectors

Interface Connectors

Video Connector	BNC
Data/Audio Connector	25 pin “D” female connector

Port Connections

RS232 PC Port Connection	On rear panel. 9 pin “D” female Connector. Connect to a PC for service set up to remote station monitoring.
--------------------------	---

Alarm Port Connection	On rear panel. 15 pin “D” female Connector. Contact closure alarm input and ++5V ancillary output.
-----------------------	--

Front Panel LED Indicators

Red and Green LED Indicators Show

Video	Video channel transmit/receive selection and activity status.
Data	Data channel transmit/receive selection and activity status.
System Status	Power level, optical channel activity status, over temperature alarm, system error/fault.

Configuration Options

Channel Options

Video	User defined up to 10 bi-directional video channels per station.
Data/Audio	User defined up to 10 bi-directional channels for audio or data per station.
Data Interface Daughter Board Selection	User defined data or audio on each channel. Select each channel from: Data: RS-232, RS-485, TTL, 20mA current Closure Audio: 600, +0dBm nominal. Stereo audio requires two audio channels.

Note: User definitions are made when ordering, and are configured at the factory

Interface Specifications

Video

Input / Output Level	1V pk. To pk. Nominal
Input / Output Impedance	75 ohms
Frequency Response	10 Hz to 5.75 MHz minimum
Ripple	± 1 dB
Digital Resolution	8 Bits per video channel. A 10 bit system is available for broadcast applications.
Differential Gain	2%
Differential Phase	1°
Signal to Noise Ratio	56 dB Weighted

Audio

Input / Output Impedance	600 ohms
Input / Output Level	+0dBm nominal, 16 Bit
Input Overload Level	+6 dBm
Frequency Response	20Hz to 17.5 kHz
Total harmonic Distortion	5% maximum

Data

Data Rates	Up to 128 kB/s.
Data Interface Options	RS-232, RS-422, RS-485, TTL, 20mA current loop, Contact Closure

Optical

Wavelength	1310nm and/or 1550nm.
Fibre Dimensions	Single Mode
Fibre Core Quantity	Single fibre ring system in “daisy chain” configuration.
Optical Connector	FC/PC
Path Loss	24 dB

Options

Optical Node Bypass Switch	19” by 1U Rack mount unit, insertion loss 3dB, \pm 1 dB
Local Station Video Input Sensing and Transmission	Enables interfacing with existing video selection systems with no further control software or Sensing and Transmission hardware required.

Appendix B

Part Numbers

Introduction

The following list contains the part numbers of the components in the 2800 Guardian unit:

Part Number	Description
AMG2800MF	2800 Guardian Mainframe
HSORCA	High Speed Optical Rx 1310/1550
HSOTCB	High Speed Optical Tx 1550 nm
HSOTCA	High Speed Optical Tx 1310 nm
HSOTCC	High Speed Optical Tx 1550 nm Long Distance
VICAE	Video Input Card - Even
VICAO	Video Input Card - Odd
VOCAE	Video Output Card - Even
VOCAO	Video Output Card - Odd
DIOCA	Five Channel Data I/O Motherboard (Data Card)
X 04049	RS-232 Interface Daughter Board
X 04057	RS-222/485 Tx/Rx Daughter Board
X 04058	20mA Current Loop Daughter Board
X 12579	TTL Rx/Tx Interface Daughter Board
X 12542	Audio Card – 4 Wire Daughter Board
X 12578	Contact Closure Daughter Board
LSOTCA	Low Speed Opto Tx 1300nm
LSOTCB	Low Speed Opto Tx 1550nm
LSORCA	Low Speed Opto Rx
OBPSA	Optical Bypass Switch
WDMOC	1300/1550nm Optical Coupler
K300013	North American Mains Lead

Glossary

µm	Micrometer (10^{-6} m)
2800 Guardian	An AMG multiplexer
AC	Alternating Current
BNC	A type of RF coaxial connector
Bps	Bits peer second
BSL	Bus status Link
CCTV	Closed Circuit Television
COMM	Serial Communications port on a PC
DBm	Power measurement is decibels relative to 1mW; 0dBm = 1mW
DWDM	Dense Wavelength Domain Multiplexing
FC	A type of optical connector
FDM	Frequency Division Multiplexing
Hz	Hertz
IEC	International Elector-technical Commission
ISL	Inter-multiplexer Service Link
ITS	Intelligent Transportation System
Kbps	Kilobits per second
LED	Light Emitting Diode
MHz	Megahertz
Nm	Nanometre (10^{-9})

Glossary

NTSC	National Television System Committee; video standard in North America and Japan
OpRx	Optical Receiver
OpTx	Optical Transmitter
PAL	Phase Alteration Line; video standard used in United Kingdom, most of Europe, South America and Asia.
PC	Personal Computer
PT-PT	Point -to- point
RF	Radio Frequency
Rx	Receive
TDM	Time Division Multiplexing
Tx	Transmit
V	Volts
W	Watts
WDM	Wavelength Division Multiplxing

Index

2800	
Powering Up	20/21
Rack Mounting	16
Unpacking	13
A	
Audio	
Connecting	18
Interfaces	12
Auxiliary Interfaces	11
B	
Banks	
Video	8
Bi-directional	
Drop, Add and Pass Video and Data / Audio	33
Drop, Add and Pass Video Only	33
Point to point Video and Data / Audio	27/28
Point to Point Video Only	27/28
Video Only	27/28
Bi-directional Drop, Add and Pass Video	33
Bi-directional Point to Point Video	29
C	
Cards	
Changing	35
Data	11
High Speed Optical Transmitter	35
Microprocessor	8
Optical	9/10
Video	8/9/35
Video Banks	8
Changing	
A Card	35
Cards	35/36
Configuration	32/33
Filter	45
High Speed Optical Transmitter	35
Video Cards	36
Cleaning	
Filter	45
Combining	
Optical Card Channel	10/11
Configuration	
Changing	35/35
Drop, Add and Pass	30/31
Network	24
Options	26/27
Point to Point	26/27

Configuration Checks	
LED's	20
Configuring the 2800	26
Connections	17
Audio	18
Data	18
Data Interface	18
Mains	17
Optical	19
Video	17
D	
Data	
Connecting	18
Interface Cards	11
Modules	11
Data Banks	
LED's	23
Data Cards	
Changing	36/37
Data Interface	
Connecting	18
Data Interface Card	11
Data Interface Connections	18
Data Interface Daughter Boards	
Changing	36/37
Drop, Add and Pass	30/31
Data Interface Modules	11
Bi-directional	33
Drop, Add and Pass Video	
Unidirectional	30/31
E	
Error / Fault	
LED's	25
F	
Filter	
Changing	45
Cleaning	45
Front Panel	
LED's	20/21
H	
High Speed Optical Cards	9/10

I

Inspection	
2800	13
Installation	13
Installing the 2800	14
Interfaces	
Audio	12
Auxiliary	11
Data / Audio	11

L

LED Configuration Check	
LED's	
Correct Operation	22
Error / Fault	25
Front Panel	20/22
Opto Sync	23/24
Power	23/24
Temperature Alarm	24/25
Verify	22
Video Banks	22/23
Lid	
Removing	35/36
Replacing	38
Local Manager Interface	38
Low Speed Optical Card	10/11
Low Speed Opto Cards	
Changing	36/37

M

Mainframe	
Overview	8
Mains	
Connecting	15
Microprocessor Card	8
MUXcomm Software	38

N

Network	
Configuration	26

O

Optical	
Connecting	19
Optical Card Channels	10/11
Optical Cards	9/10
High Speed	9/10
Low Speed	10/11
Optical Coupler	10/11
Opto Coupler	10/11

Opto Sync LED's	23/24
Overview	
Mainframe	8
P	
Point to Point Configuration	26/27
Point to Point Video	
Bi-directional	29
Unidirectional	24/25
Power	
LED's	23/25
Powering Up	19/20
PT-PT	26/27
R	
Rack Mounting the 2800	16
Removing Lid	34/35
Replacing Lid	38
Returns Procedure	46
S	
Setting Up	13
System Description	
Introduction	5
T	
Temperature Alarm	
LED's	24/25
Troubleshooting	40
Troubleshooting Table	41
U	
Unidirectional	
Drop, Add and Pass Video	30/31
Drop, Add and Pass Video and Data/Audio	30/31
Drop, Add and Pass Video only Point to Point Video	26/27
Point to Point Video and Data/Audio	28
Point to Point Video and Only	27
Unpacking the 2800	13

Index

V

Video	
Connecting	17
Video Banks	
LED's	22
Video Card	
Changing	37
Video Cards	8/9
Input	8/9
Output	9/10
Video Banks	8
Video Input Cards	8/9
Video Output Cards	9/10

W

What is the 2800 Guardian	5
---------------------------	---