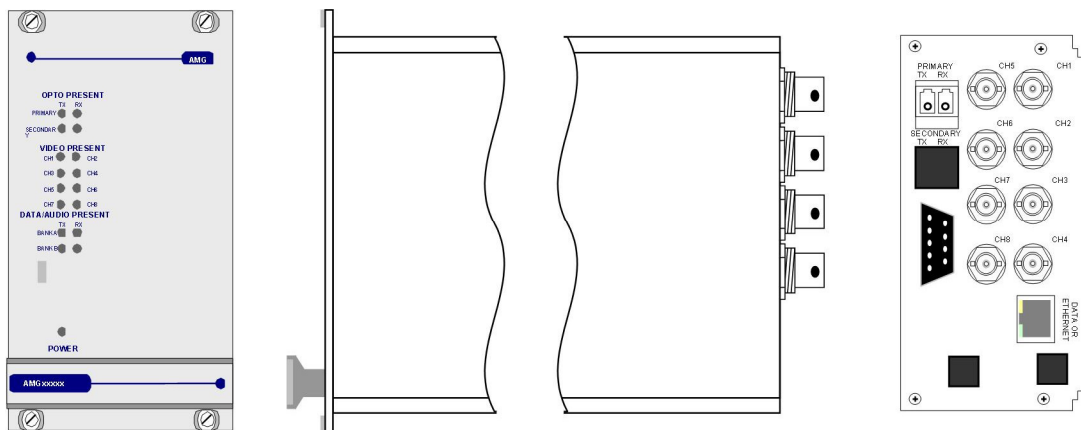


8 Channel Video Receive Unit with Ethernet for a Singlemode Fibre Ring - includes AMG NMS Network Management Interface



The **AMG3782ERN** is a rackmount eight channel video receive unit designed to receive 8 video signals from a singlemode optical fibre ring. It also provides full duplex 100BaseT Ethernet connectivity around the ring.

The **AMG3782ERN** is designed to plug into an **AMG2005** or **AMG2009** subrack, which in turn fits into a 19" rack system. It also includes an AMG Management Interface to allow management of the system using the AMG SNMP enabled Management software.

The **AMG3782ERN** is designed to operate with **AMG3741E** or rackmount equivalent **AMG3741ER** four channel video and data insert units. It may also be used with other combinations of single, dual and four channel video, data and Ethernet insert units.

An **AMG3782ERN** receive unit will 'drop off' up to eight video channels which are being transmitted around the fibre ring from up to eight single channel insert units, or from an equivalent combination of multi-channel insert units.

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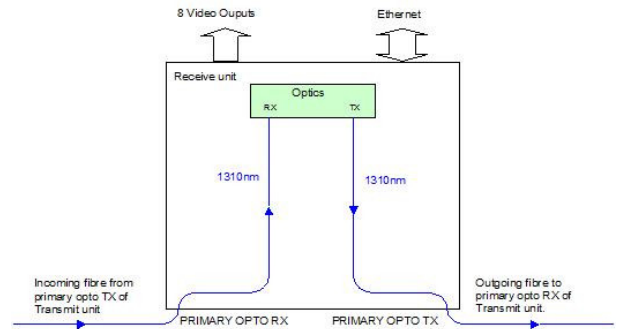
Introduction

Unit Functional Schematic

The **AMG3782ERN** transmits and receives the optical signals to/from a primary optical channel.

The optical channel is transmitted on a single optical fibre around the ring in one direction and operates at a single wavelength.

The primary channel operates on 1310nm.



The **AMG3782ERN** drops off up to 8 video signals and Ethernet data transmitted from the **AMG3741E** insert units. It also transmits the Ethernet data back to the insert units.

As each unit regenerates the optical signal, the optical dynamic range between each optically connected node is 17dB.

Video Input Channel Configuration

At the **AMG3741E** or rackmount **AMG3741ER** insert unit, video signals present at the BNC inputs can be inserted on one to eight video channels transmitted on the optical fibre. The first video channel number of each insert unit is set by the rotary switch on the front panel of the unit.

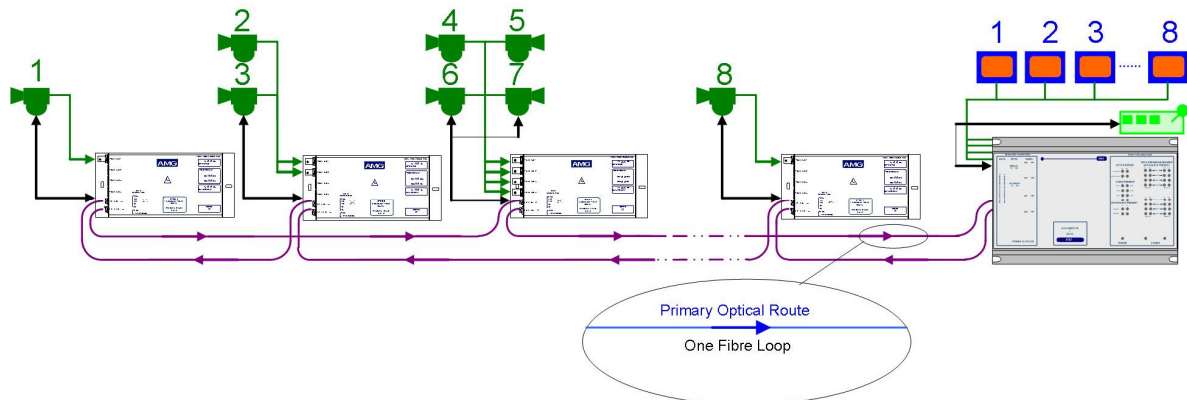
It is normal to set each insert unit to a different channel number. If the same number is used twice, an insert unit connected 'down stream' on the primary optical route will 'over-write' any coincident video channels coming from the previous insert unit and those video signals will be lost.

The switch channel numbers 1 to 8, correspond to video channels 1-8. Unused switch channel numbers 0 & 9 duplicate video channel selections 1 & 8 respectively. i.e. setting switch to position 0 or 1 selects video channel 1 and setting switch to position 8 or 9 selects channel 8.

Optical Connection

The **AMG3782EN** or rackmount **AMG3782ERN** is designed to be connected in a ring or point to point system.

In a ring system, single, dual and four channel insert units respectively can be combined to make up an 8 channel video transmission system as illustrated below.



Connections

Video Output Connections

No. of channels8
Connectors75 ohm BNC Socket.
Output Impedance75 ohm terminated.
Output Level1 Volt p-p nominal
Frequency Response.....10Hz to 7MHz.

Optical Connections

PRIMARY OPTO OUT

ConnectorLC/PC
Primary Optical Launch Power-5dBm
Wavelength1310nm
Optical FibreSinglemode

PRIMARY OPTO IN

ConnectorLC/PC
Primary Optical Sensitivity-22dBm
Wavelength1310nm
Optical FibreSinglemode

Power Connection

Power supplyfrom plug in connection on the AMG2009 / AMG2015 subrack
Power consumption10 Watts max.

Ethernet Connection

Ethernet Data ConnectorRJ45
InterfaceAuto-negotiation up to 100BASE-TX full duplex
Ethernet Data RateMaximum 100Mb/s total Ethernet traffic on fibre

Front Panel Indicators

Power LED

Power	Green	-	unit powered
	Off	-	no power applied to unit

Video Output LED's

Video Present CH1-8	Green	-	video signal present on output BNC
	Org	-	channel present but no video on O/P BNC
	Off	-	no video channel present

Fibre Optic LED's

Primary Opto Sync TX.....	Green	-	optical channel transmitting
	Off	-	optical channel not transmitting
Primary Opto Sync RX	Green	-	optical channel receiving
	Org	-	optical channel receiving but not sync.
	Off	-	optical channel not transmitting

Low Speed Data LEDs

Ethernet Data LED's

BANK A

Data Present TX (Ethernet).....	Green	-	data present on the Ethernet input
	Off	-	no data present on the Ethernet input

This represents the Ethernet signals being transmitted onto the optical fibre

Data Present RX (Ethernet)	Green	-	data present on the Ethernet input
	Off	-	no data present on the Ethernet input

This represents the Ethernet signals being received from the optical fibre

BANK B

Data Present TX	Green	-	RJ45 Ethernet port operating at 100Mbit/s
	Red	-	RJ45 Ethernet port operating at 10Mbit/s

Data Present RX.....	Green	-	RJ45 Ethernet port operating full duplex
	Off	-	RJ45 Ethernet port operating half duplex

Note: the RJ45 Ethernet auto-negotiates up to 100Mbit/s full duplex.

Ethernet Operation

In order for the AMG system to transmit Ethernet signals, an onboard RJ45 Ethernet interface or X16003 Ethernet interface adaptor should be fitted to all units in the ring.

The Ethernet interface can operate at either 10Mbits/s half duplex, or 100Mbit/s full duplex. When all the Ethernet interfaces around the ring are operating at 100Mbit/s full duplex the system behaves as a multi-port repeater. Data transmitted on any one port is transmitted out on all other ports with the minimum of delay or buffering. The nominal bandwidth available for Ethernet transmission within the ring is 100Mbit/s when Ethernet only, or 50MBit/s when the low speed data option is also used. If one node is transmitting, the entire bandwidth is available for this traffic. If multiple nodes transmit simultaneously on the ring, then the bandwidth is shared between each node as required. With similar traffic at each node the sharing would be nominally equal.

Although the limit for the number of video channels which can be transmitted around the ring is eight, up to 64 nodes can be attached for distributing Ethernet signals with the bandwidth sharing implemented. The units use Flow Control (Pause Frames) to limit the access to the ring to share the bandwidth and to ensure that no data is lost. When an Ethernet port is operating at 10Mbits/s half duplex, this port will now only receive data from a receive unit rather than all ports as when operating at 100Mbits/s full duplex.

The 100BaseT port does not implement MDI/MDIX; it should be connected with a straight though cable to an external switch port and with a cross over cable when connected directly to a PC or DTE.

Network Management

Network Management of the system is provided by the AMG Management Interface which allows Management using the AMG SNMP enabled Management software.

NMS Operation

Requires Network Management "N" option in each Rx (Receive) or Tx (Transmit) unit.
Recommended for Dual Redundant Options to give knowledge of failure
Rx collects information regarding all attached Tx units

Interface

- 9 Way D-type management port on each Rx or Tx
- RS-232 or RS-485 on Management Port
- Multiple Rx/Tx units use RS-485 and effectively parallel all the RS-485 ports together
- Connect to PC RS-232 Port via RS-485/RS-232 convertor

Proprietary GUI

- Loss of unit
- Loss of Optical Input
- Loss of Video Input

SNMP

SMNP Compatibility: SMNP Version 1
AMG3700 Device do NOT act as SNMP Agents

PC running AMG NMS software is the only 'true' SNMP Agent

- Provides Proxy access to all AMG devices
- SNMP Community String used to differentiate between AMG devices

Network Alarm Port

Alarm Output: Normally Closed

Opens when loss of :

- Video at any insert node
- Primary optical input at any node
- Secondary optical input at any node
- Any node through a power down
- Power at the receiver

Closed by: Reset

The Management Interface

The Management Interface is fitted to AMG receivers / transmitters and is signified by a 'N' in the part number

Each management interface, thus each receiver or transmitter, has an ID number with is identified below the management port. This ID number is used by the AMG Network Management System (NMS) to identify the unit.

The physical interface is a 9 way female D-type connector. It supports either RS-232 or RS-485.

Management Port Pin-out:

Pin Number	RS-232 Connection	RS-485 Connection
1	-	Data B (+)
2	RD (data out of port)	Data A (-)
3	TD (data into port)	-
4	Connect to DTR held -ve or shorted to ground	-
5	SG (signal ground)	SG (signal Ground)
6	Alarm Output	Alarm Output
7	Alarm Output	Alarm Output
8	Alarm reset (Gnd)	Alarm reset (Gnd)
9	Alarm reset	Alarm reset

For multiple Management Ports it is recommended that the RS-485 interface is used with each RS-485 pair connected in parallel. In this case an RS-485 to RS-232 / USB converter is required in order to connect to a standard PC Comms. Port.

The time delay between receiving a data request and sending out a response from the port is 625µs. Therefore any RS-485 converter should have a 'turn around' time or 'transmit dwell' time equal to or less than 625µs.

Recommended RS-485 Converter's are:

RS-485 to RS-232

Dataforth DCP485-S: Available in the UK from <http://uk.farnell.com/> Order No. 300-9348

Settings on the DCP485-S:

- RS-485 Switch Settings: 1-UP, 2-DOWN, 3-DOWN, 4-UP, 5-DOWN, 6-DOWN, 7-DOWN, 8-UP
- RS-232 Switch Settings: 1-DOWN, 2-UP, 3-DOWN, 4-UP
- DCE/DTE set to DCE.

RS-485 to USB

B&B 485USBTB-2W: Available in Europe from <http://www.bb-europe.com/> Order No. 485USBTB-2W

Connections to management port:

Management Port	DCP485-S	485USBTB-2W
1	2 or 4	B+
2	3 or 5	A-
5	GND	GND

NOTES:

On the DCP485-S, pins 3 and 5 are connected together and pins 2 and 4 are connected together. On the 485USBTB-2W, there are 2 pairs of terminals both labeled A-, B+, either pair may be used.

Alarm Output and Reset Operation

The alarm output and reset is designed to indicate a change of state of the fibre loop or spur attached to the receiver. The Alarm output is a volts free contact relay output (rating: 0.5A at 125VAC or 1A at 24VDC). It normally open, which means that when not powered the contacts will be open circuit.

On power up the contacts will close and will remain closed for up to 5 seconds. During this time the receiver will monitor and record the state of the AMG transmit units connected to the receiver.

The contacts will then remain closed until there is a change from this recorded state. A change of state would be:

- Addition or loss of video at any insert node
- Addition or loss of primary optical input at any node
- Addition or loss of secondary optical input at any node
- Power up or down of any node
- Loss of power at the receiver

Following a change of state the contacts will remain open, regardless of whether the alarm condition reverts back to its previous state, until the a reset signal is presented to the alarm input connections. The alarm reset input is biased at 5V via a 1k Ω resistor. To reset the alarm, the alarm reset is required to be pulled to ground, either by a volt-free contact or an open collector output. The alarm output will be held in a closed state whilst the alarm reset is connected to ground.

On release of the alarm reset, the alarm output will remain in a closed state until the next change of state to the AMG transmit unit connected to the receiver. The alarm output may not register a change of state which happens within 5 seconds of release of the alarm reset.

Physical Information

Dimensions

Height.....3U Plug-in
Width.....14HP
Depth170mm excluding connectors
Weight.....1000grams

Mounting Details

The unit is designed to be mounted within an AMG2009 or AMG2015 Subrack on standard card guides.

Removal / replacement from / to the Case

Note: - The AMG unit PCB's are static sensitive. Handle with proper care and use normal electrostatic discharge (ESD) procedures. Use properly grounded protection (for example, wrist straps) when handling the PCB.

To remove units from the case to access the data expansion boards and the daughter boards, remove the 2 or 4 fixing screws on the rear panel and slide the PCB's out of the case. Ensure that the fibres do not snag or get trapped.

To replace the PCB's into the case, slide the PCB's gently into the case aligning the boards with the appropriate slots. Ensure that the fibre do not snag or get trapped.

Safety

AMG Optical Fibre Products use Class 1 laser systems in accordance with EN 60825-2:2000.

It is always advisable to follow good practice when working with optical fibre systems. This includes:

- Do not stare with unprotected eyes or with any unapproved collimating device at fibre ends or connector faces, or point them at other people.
- Use only approved filtered or attenuating viewing aids

For other safety issues and advice on good practice associated with optical fibre systems, please see EN 60825-2:2000 or your local safety officer.

Maintenance and Repair

There are no user serviceable parts within AMG products. See unit data sheet for full specification. In case of problem or failure, please call your local support centre or contact: **AMG Systems Ltd.** at 3 The Omega Centre, Stratton Business Park, Biggleswade, Beds., SG18 8QB, UK.

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