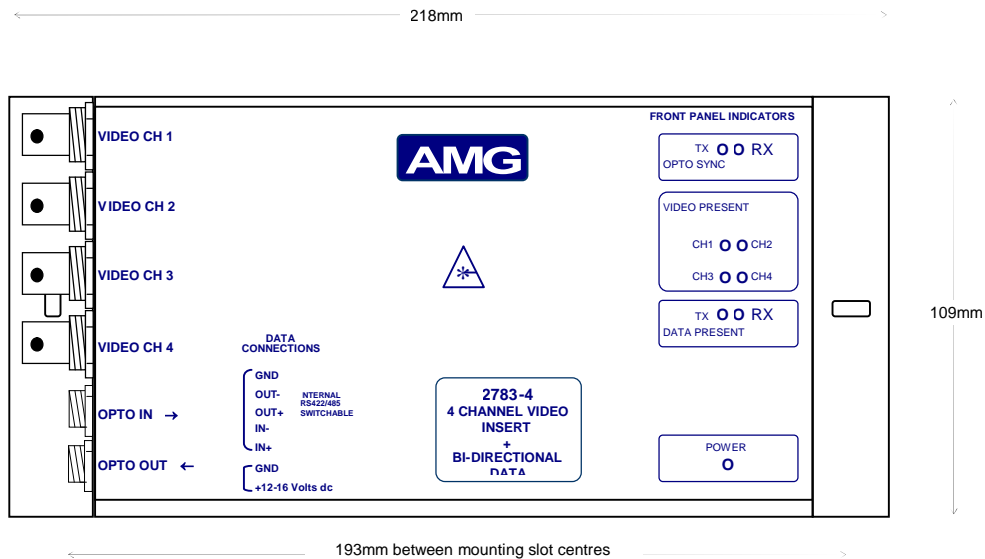




# AMG2783-4 Instruction Manual

## Four Channel Video Insert Unit with Bi-directional Data



The **AMG2783-4** is a standalone four channel video insert unit designed to transmit four video signals on to a single optical fibre ring. It also provides a RS485/RS422 bi-directional data channel. It is designed to be powered from an **AMG2002** power supply. Up to 8 video channels can be attached to the same single fibre optic ring to transmit up to 8 real time high quality video signals.

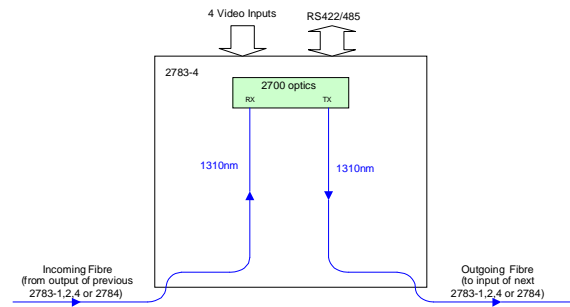
The **AMG2783-4** is designed to operate with the **AMG2784R** eight channel video receiver and data transceiver. Each receiver will 'drop off' up to eight video channels which are being transmitted around the single fibre ring.

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## Introduction

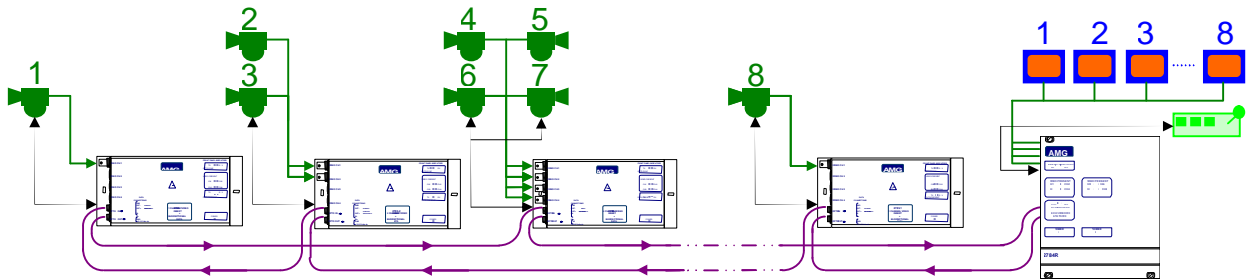
### Unit Functional Schematic

The **AMG2783-4** receives a 1310nm optical signal and drops of data transmitted from a 2784 receiver. It then inserts four video and one data signal onto the outgoing 1310nm optical signal. The video signals are inserted on 4 consecutive channels of the 8 channels available on the optical fibre. The insert channel number of the first video signal is set by SW1 inside the unit (see below). The subsequent video signals are inserted on the subsequent channels. If a video channel is set to a channel that already has a video signal on it, this unit will over-write this in-coming video signal.



### Optical System Connection

The **AMG2783-n** units are designed to be connected in a ring. Up to 2 **AMG2783-4** four channel units can be connected on the same ring. Alternatively the **AMG2783-4** can be combined with **AMG2783-1** and **AMG2783-2**, single and dual channel insert unit respectively, to make up the eight video channels on the fibre. The schematic below illustrates a system combining **AMG2783-1**, **AMG2783-2** and **AMG2783-4** units. As each unit regenerates the optical signal, the optical dynamic range between each optically connected node is 17dB.



Note that where necessary repeaters can be added at nodes to increase the average distance between nodes.

## Connections

### Video Input Connection

Connector ..... 75 ohm BNC Socket.  
 Input Impedance ..... 75 ohm terminated.  
 Input Level ..... 1 volt p-p nominal  
 Frequency Response ..... 10Hz to 5.75MHz min.  
 No of insert channels ..... 4  
 See below for **video input channel configuration**

### Optical Connections

#### OPTO OUT

Connector ..... FC/PC  
 Optical Launch Power ..... -5dBm  
 Wavelength ..... 1310nm

#### OPTO IN

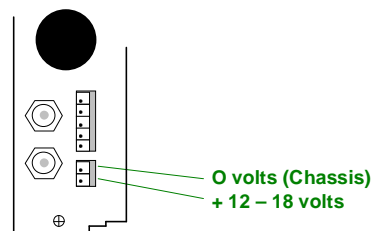
Connector ..... FC/PC  
 Optical Sensitivity ..... -22dBm  
 Wavelength ..... 1310nm

**Power Connection**

Connector .....removable screw terminal connector (3.5mm spacing)  
 Manufacturers Part No. Phoenix/Combicom MC1-5/2-ST-3.5  
 AMG Part No.G00047-00

Power requirement ..... 12 volts to 16 volt DC @  
 700mA (1 amp turn on  
 current)

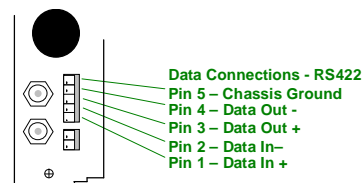
Connections..... See schematic  
 +12 – 16 Volts on lower pin  
 0 Volts on upper pin



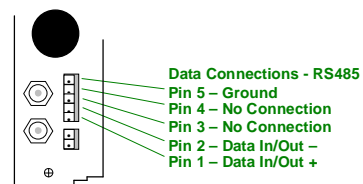
**Data Connections**

Data Connector ..... 5 way removable spring terminal connector (2.5mm spacing)  
 Manufacturers Part No. Phoenix/Combicom FK-MC-0.5/5-ST-  
 2.5  
 AMG Part No G15098-00

Connections RS422 4 wire ..... See schematic



Connections RS485 4 wire ..... See schematic



Protocol..... RS485 2wire (switch selectable SW2)  
 RS422 4 wire Bus'ed or point to point (switch selectable SW2)

See below for **Configuration of the RS485 / RS422 data channel** and description of tristate operation

**Indicators**

Power .....	Green	- unit powered
	Off	- no power applied to unit
Opto Sync TX .....	Green	- optical channel transmitting
	Off	- optical channel not transmitting
Opto Sync RX .....	Green	- optical channel receiving
	Off	- optical channel not receiving
Video Present CH1 .....	Green	- video signal present on video CH1 input BNC
	Off	- no video present on video CH1 input BNC
Video Present CH2 .....	Green	- video signal present on video CH2 input BNC
	Off	- no video present on video CH2 input BNC
Video Present CH3 .....	Green	- video signal present on video CH3 input BNC
	Off	- no video present on video CH3 input BNC
Video Present CH4 .....	Green	- video signal present on video CH4 input BNC
	Off	- no video present on video CH4 input BNC

Data Present TX ..... Green – logic one present on the data input  
 Red – logic zero present on the data input  
 Off – tri-state off or no connection on the data input

This represents the data signals being transmitted on the optical fibre

Data Present RX ..... Green – logic one present on the corresponding data  
 output  
 Red – logic zero present on the data output  
 Off – tri-state off on the data output

This represents the data signals being received on the optical fibre

## Physical Information

### Dimensions

Height ..... 109mm  
 Width..... 218mm  
 Depth ..... 39mm  
 Weight..... 500grams

### Mounting Details

The unit is designed to mount into a panel via the two mounting slots of 4.5mm x 10mm.

### Configuration of the RS422/485 Data Channel

The RS422/485 data channel can operate in two modes that are set by SW2 on the main PCB. (See below for **removal of the PCB** and access to SW2)

- Mode 1 – RS485 two wire half duplex transmission.
- Mode 2 – RS422 four wire full duplex transmission. In this mode the RS422 output will transmit a tristate condition as well as logic high and logic low for systems which require bus-ing of the RS422 four-wire connection.

MODE	Configuration Details	SW2 position 1	SW2 position 2	SW2 position 3	SW2 position 4
1	RS-422 4 wire Point-to-Point - and RS-422 BUS system	OFF	OFF	OFF	OFF
2	RS-485 2 wire BUS systems	OFF	ON	ON	ON

The data input for both the RS485 and the RS422 modes detects a tri-state input condition by monitoring the differential voltage level across the input. A differential level below 500mV positive or negative will be detected as a tristate condition. A level above 500mV positive or negative will be detected as a logic 1 or logic zero respectively. **It is important therefore to terminate the RS485 bus or the RS422 input bus using 120ohms if a pre-bias is present on the RS485 or RS422 bus.** A large number of third party equipment manufacturers apply a pre-bias on their RS485 bus. This pre-bias is applied by pulling one arm of the RS485 bus high (+5 volts) and the other arm low (0 volts) using high value resistors within the third party equipment. In order to ensure that a tri-state condition is detected by the AMG2700 equipment, then these resistors should have a value above 1kohm.

### Video input channel configuration

The video present on the video inputs can be inserted on four consecutive channels of the eight video channels transmitted on the optical fibre. The input channel number of the first video channels is set by SW1 on the main PCB. (See below for **removal of the PCB** and access to SW1)

The channel number is set by the SW1 switch positions 1 to 3 – see below.

First Video Input Channel Number	SW1 position 1	SW1 position 2	SW1 position 3
1	OFF	OFF	OFF
2	ON	OFF	OFF
3	OFF	ON	OFF
4	ON	ON	OFF
5	OFF	OFF	ON
6	ON	OFF	ON
7	OFF	ON	ON
8	ON	ON	ON

It is normal to set each AMG2700 insert units to a different optical channel numbers. If an optical channel is used twice the second unit connected 'down stream' on the optical route will 'over-write' the first unit and the video signal from the first unit will be lost.

**The units are set to channel 1 at the factory – the channels should be set prior to installation**

### **SW1 Switch Settings**

Only switch positions 1 to 3 should be set by the user, all other switch settings are set at the factory as follows:

Switch Position	Description	Setting
1	Video channel configuration	See above
2	Video channel configuration	See above
3	Video channel configuration	See above
4	Primary / Secondary Board Setting	ON
5	Dual Redundant / Not dual redundant	OFF
6	Not Used	OFF
7	Not Used	OFF
8	On board data / Separate data card	ON

### **Removal From the Case**

**Note:** - The 2700 PCB's are static sensitive. Handle with proper care and use normal electrostatic discharge (ESD) procedures. Use properly grounded protection (for example, wrist stamps) when handling the PCB.

In order to remove the case (to access SW1 and SW2)

- 1.1. Loosen and remove the two screws on the top and bottom of the unit's rear panel.
- 1.2. Slide the PCB assembly connected to the rear panel out of the case.
- 1.3. Ensure that the optical fibre is not trapped.

**(in order to access SW1 and SW2 it is only necessary to slide out the PCB by 25mm. This has the advantage of ensuring the ensuring the fibre does not trap and the PCB remains protected form any EMC damage.)**

SW1 and SW2 can be found on the bottom right hand corner of each board and are labelled, close to the rear panel. The switch position are labelled on the switch, switch position 1 is always the furthest from the edge of the PCB.

When re-inserting the main PCB into the housing take care not to trap the optical fibre or the board interconnection cables.

Fasten the rear panel with the screws.

### **Safety**

The 2700 series of products uses a Class 1 laser system in accordance with EN 60825-2:2000.

However 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 the optical fibres systems see EN 60825-2:2000 or your local safety officer.

### **Maintenance**

There are no user serviceable parts within the AMG2700 products.

In case of problem or failure contact your local support centre or AMG Systems Ltd, Technical Support Department on tel. +44 (0) 1767 600777.

See unit data sheet for full specification.