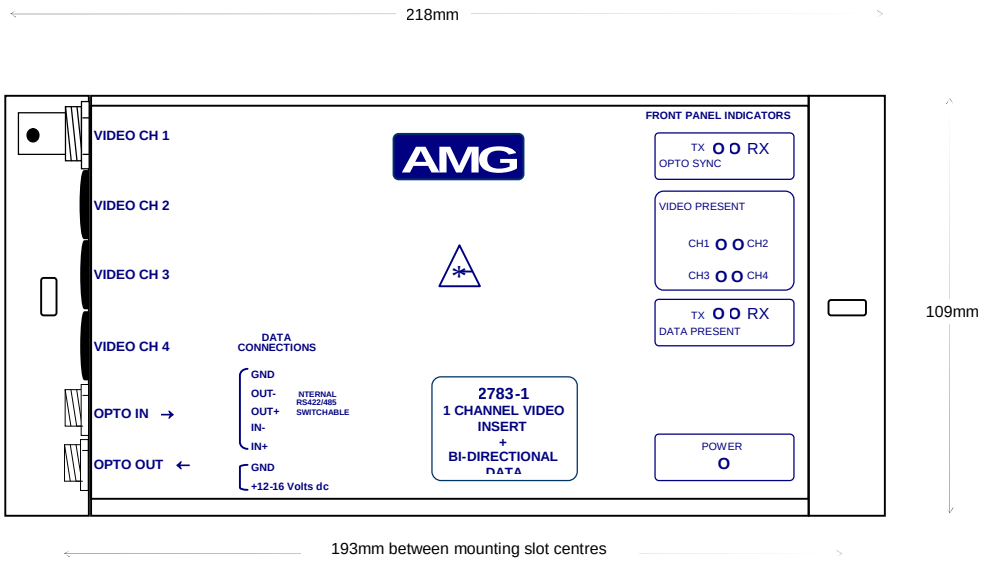
AMG2783-1
Instruction Manual

Single Channel Video Insert Unit with Bi-directional Data



The **AMG2783-1** is a standalone single channel video insert unit designed to transmit a video signal 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 units can be attached to the same single fibre optic ring to transmit up to 8 real time high quality video signals.

The **AMG2783-1** 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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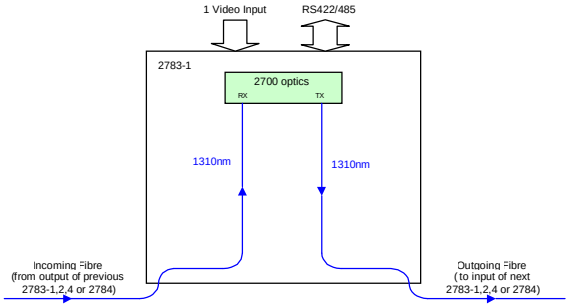
Introduction

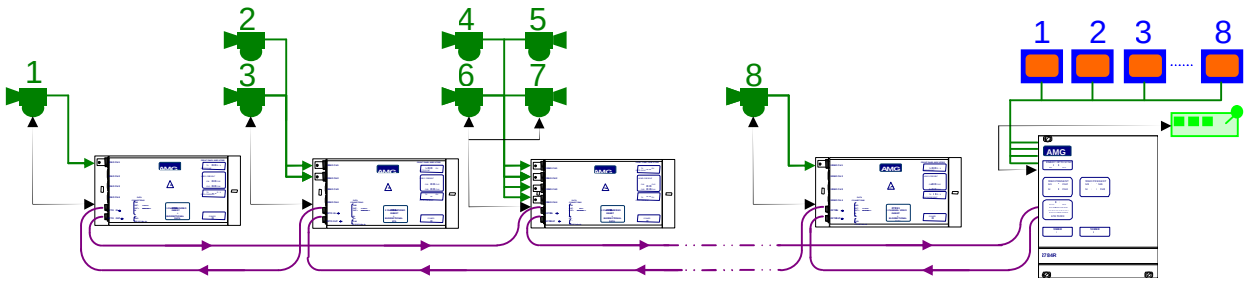
Unit Functional Schematic

The **AMG2783-1** receives a 1310nm optical signal and drops of data transmitted from a 2784 receiver. It then inserts a video and data signal onto the outgoing 1310nm optical signal. The video signal is inserted on 1 of 8 channels available on the optical signal. The insert channel number is set by SW1 inside the unit (see below). If the 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 8 single video channels can be connected on the same ring. Alternatively the **AMG2783-1** can be combined with **AMG2783-2** and **AMG2783-4**, dual and four 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 1
See below for **video input channel configuration**

Optical Connections

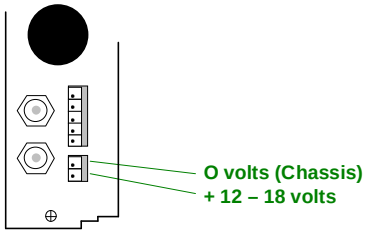
OPTO OUT
Connector ..... FC/PC
Optical Launch Power ..... -5dBm
Wavelength 1310nm

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 @ 500mA (1 amp turn on current)

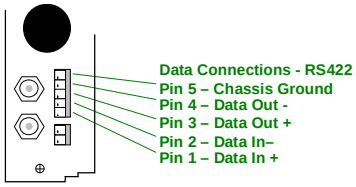


Connections..... See schematic
+12 – 16 Volts on lower pin
0 Volts on upper pin

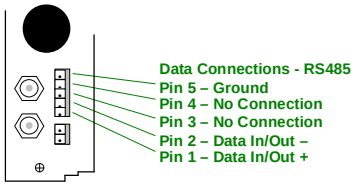
Data Connections

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

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 input can be inserted on one of eight video channels transmitted on the optical fibre. The input channel number 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.

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.