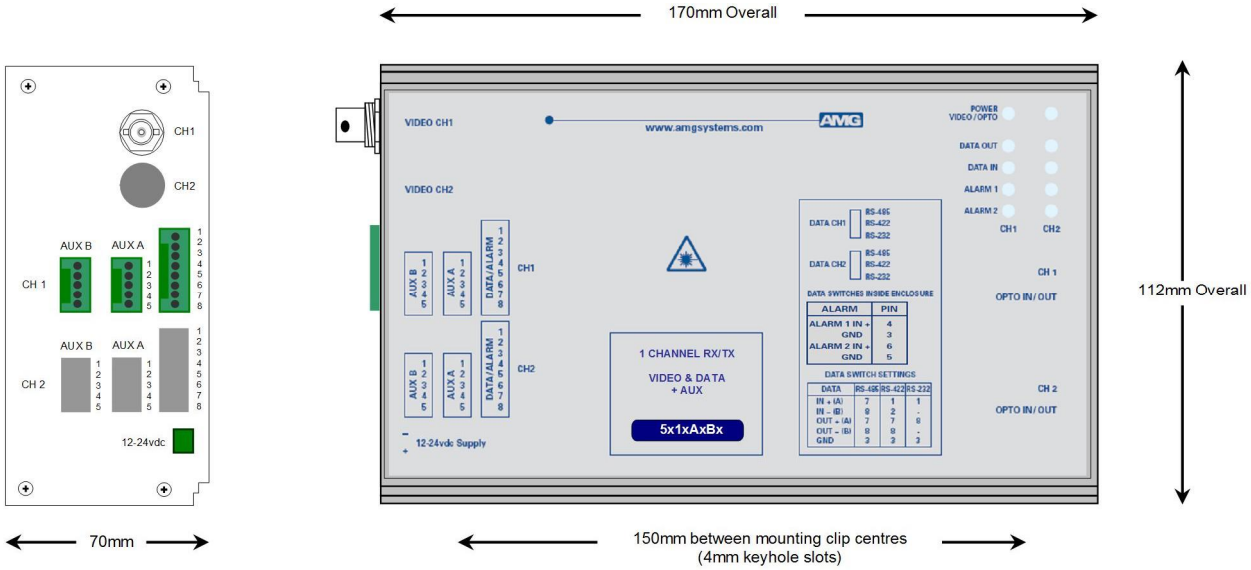
Single Channel Video Transmit Unit with one Bi-directional Data Channel, two Uni-directional Alarms and one Bi-directional Audio Channel for a Singlemode Fibre Link



The **AMG5715A1B9** is a standalone one channel video transmit unit designed to transmit 1 video signal plus 2 Uni-directional alarms, and transmit & receive 2 data signals plus 1 Bi-directional audio channel over a single Singlemode optical fibre.

The **AMG5715A1B9** is designed to be powered using an **AMG2001** standalone power supply.

The **AMG5715A1B9** is designed to operate with an **AMG5716A1B9 / AMG5716A1B9R** single channel video receive unit in a point to point configuration. The R suffix in the partno. indicates a rackmount configuration.

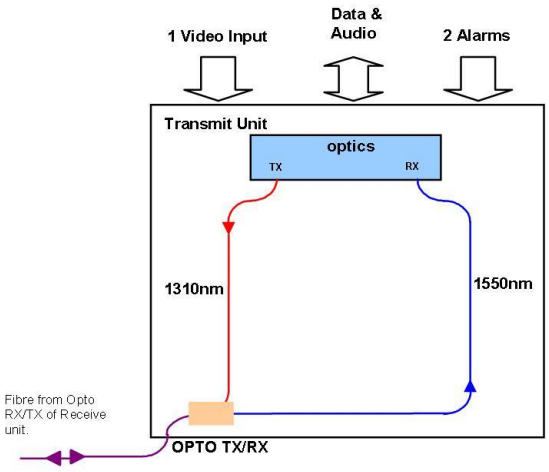
Contents

Introduction

Unit Functional Schematic

The **AMG5715A1B9** transmits 1 video, 2 data, 2 uni-directional alarms and 1 audio signal to the **AMG5716A1B9** receive unit.

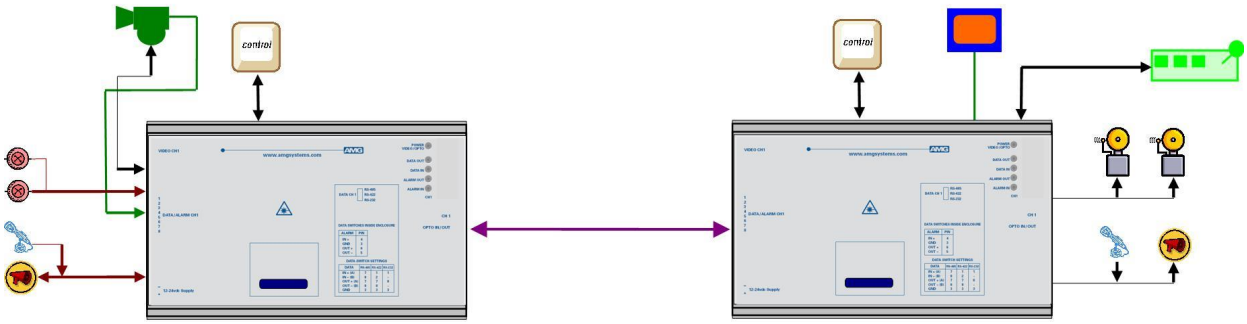
It also receives 2 data and 1 audio signal transmitted from the **AMG5716A1B9**.



Optical Connection

The **AMG5715A1B9** connections are illustrated in the following example which shows an **AMG5715A1B9** transmit unit together with an **AMG5716A1B9** standalone receive unit configured as a single channel point to point system.

1 Channel Video, 2 Data, Uni-directional Alarms & Audio



Connections

Video Input Connections

No. of channels..... 1
Connector..... 75 ohm BNC Socket.
Input Impedance..... 75 ohm terminated.
Input Level..... 1 volt p-p nominal
Frequency Response..... 10Hz to 7MHz.

Optical Connection Singlemode

Optical Fibre ..... Singlemode
Connector..... SC/PC

Primary Optical Launch Power ..... -10dBm
Transmit Wavelength..... 1310nm

Primary Optical Sensitivity..... -30dBm
Receive Wavelength..... 1510nm

Minimum Optical Dynamic Range ..... 20dB.

Power Connection

Connector Type ..... Removable 2-pin, 3.81mm, Screw Terminal
Connector Partno..... Phoenix 1803578
Supply Voltage..... +12 to +15 Volts DC
Maximum Power ..... 5 Watts

Data and Alarm Channel Connections

No. of Data Channels..... One switchable RS-232 / RS-422 / RS-485
No. of Data Channels..... One selectable RS-422 / RS-485
No. of Alarms..... 2

Connectors ..... Removable 5-pin, 8-pin, 2.5mm, Spring Terminal
Connector Partnos. ..... Phoenix 1881354, 1881383

Data Interface 1: ..... RS-232, RS-422 or RS-485. Selected by slide switch inside enclosure. *See appropriate section on how to remove the case for access to the data switches

RS-485 ï Switch Position - Top
RS-422 ï Switch Position - Middle
RS-232 ï Switch Position - Bottom

Data Interface 2: ..... RS-422 or R-S485. Options Selected by DIL switch inside enclosure. *See separate Datasheet for Additional Data Interface Settings with the data switches

Alarm inputs Contact Closure pull-up is 330R to +3V3

Audio Connections

No. of Audio Channels..... 1 per video channel.

Connectors ..... Removable 5-pin, 2.5mm, Spring Terminal
Connector Partno..... Phoenix 1881354

Input level 0dBm
Input overload level..... +6dBm

Input impedance ..... 10kq / 600q
Output impedance..... 600q

Frequency response ..... 10Hz to 20KHz

Audio Input impedance is selected by removable jumper JP1 or JP2 on Audio Expansion board inside enclosure. *See appropriate section on how to remove the case for access to the data/audio switches.

1-2 ï High Impedance 10kq
2-3 ï Balanced 600q

Front Panel Indicators

Power LED

Power / Video / Opto.....	Green	-	Video present & opto sync.
	R/G	-	Opto sync. but no video present.
	G/R	-	Video present but no opto sync.
	Red	-	No opto sync.
	Off	-	No power applied to unit
Data Present IN (RS485 or RS422)....	Green	-	logic zero (+V, -V) present on IN+, IN-
	Red	-	logic one (-V,V+) present on IN+, IN-
	Off	-	tri-state off or no connection on IN+, IN-
Data Present IN (RS232)	Green	-	logic zero (+V) present on input IN+
	Red	-	logic transitions present on input IN+
	Off	-	logic one (-V) present on input IN+

IN corresponds to the data signals being transmitted onto the optical fibre.

Data Present OUT (RS485 or RS422)	Green	-	logic zero (+V,-V) present on OUT+, OUT-
	Red	-	logic one (-V,+V) present on OUT+, OUT-
	Off	-	tri-state off or no connection on OUT+, OUT-
Data Present OUT (RS232)	Green	-	logic zero (+V) present on OUT+
	Red	-	logic transitions present on OUT+
	Off	-	logic one (-V) present on OUT+

OUT corresponds to the data signals being received from the optical fibre.

Auxiliary Data LEDs

Data type depends on AMG system: RS-232, RS-422, RS-485, 20mA,TTL, or FTT-10A

Data Present IN	Green	-	Data channel present but not transmitting
	R/G	-	Data channel transmitting
	Off	-	Data channel not present or no connection

IN corresponds to the data signals being transmitted onto the optical fibre.

Data Present OUT	Green	-	Data channel present but not transmitting
	R/G	-	Data channel receiving
	Off	-	Data channel not present or no connection

OUT corresponds to the data signals being received from the optical fibre.

Alarm LEDs

Channel 1

ALARM 1 IN.....	Green	-	Alarm ON / Contacts closed.
	Off	-	Alarm OFF / Contacts open.
ALARM 2 IN.....	Green	-	Alarm ON / Contacts closed.
	Off	-	Alarm OFF / Contacts open.

Channel 2

ALARM 1 IN.....	Green	-	Alarm ON / Contacts closed.
	Off	-	Alarm OFF / Contacts open.

ALARM 2 IN.....	Green	-	Alarm ON / Contacts closed.
	Off	-	Alarm OFF / Contacts open.

Audio LEDs

Audio Present TX.....	Green	-	audio present > -40dBm
	Red	-	audio present > 0dBm (overload at +6dBm)
	Off	-	audio not present or < -40dBm

This represents the audio signals being transmitted on the optical fibre

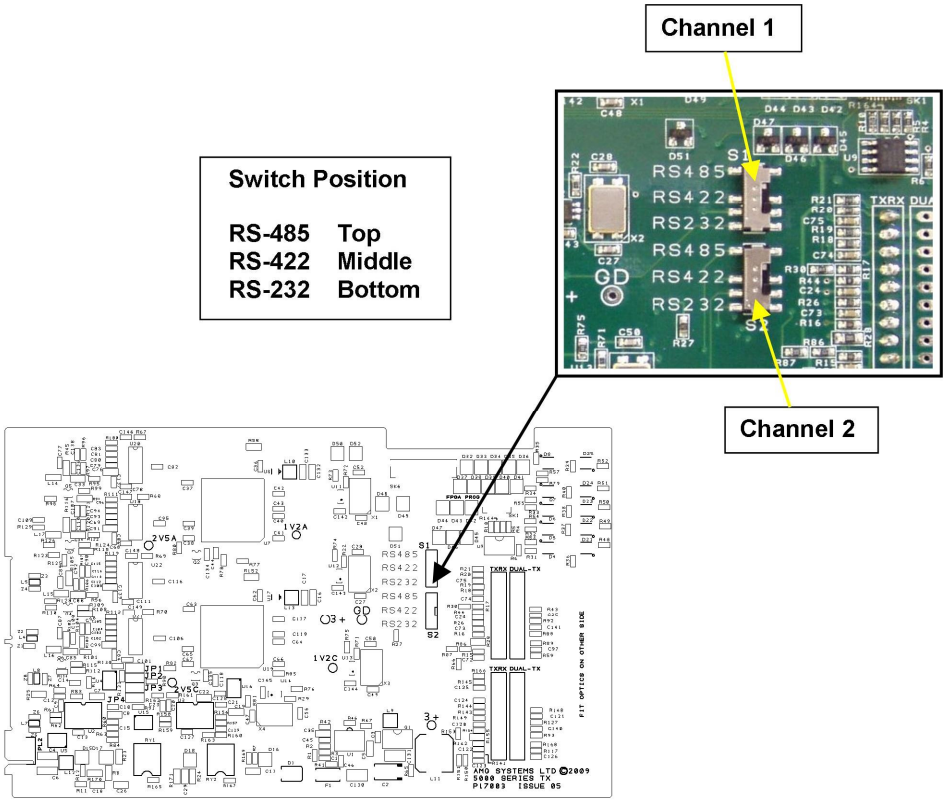
Audio Present RX	Green	-	audio present > -40dBm
	Red	-	audio present > 0dBm (overload at +6dBm)
	Off	-	audio not present or < -40dBm

This represents the audio signals being received from the optical fibre.

Data and Alarm Channel Configuration

The **AMG5715A1B9** transmit unit sends and receives data to/from an **AMG5716A1B9** or rackmount equivalent **AMG5716A1B9R** receive unit. The physical data interface RS-485, RS-422 or RS-232 is selectable by the user with the slide switch mounted on the main PCB inside the enclosure.

There are also 2 uni-directional alarm inputs provided for each video channel. Each alarm input is typically connected to a contact closure switch.



Data Channel Configuration

Each low speed data channel provides an RS-232, RS-422 (full duplex, four wire) or RS-485 (half duplex, two wire) interface defined by the corresponding mode switch inside the enclosure. Every data channel as shipped from the factory is set up for RS-485 operation unless otherwise requested.

The data input for both the RS-485 and the RS-422 modes detects a tri-state input condition by monitoring the differential voltage level across the input. A differential level below 600mV positive or negative will be detected as a tri-state condition. A level above 600mV positive or negative will be detected as a logic 1 or logic 0 respectively. It is important therefore to terminate the RS-485 bus or the RS-422 input bus using 120q if a pre-bias is present on the RS-485 or RS-422 bus.

A large number of third party equipment manufacturers apply a pre-bias on their RS-485 bus. This pre-bias is applied by pulling one arm of the RS-485 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 the AMG equipment detects a tri-state condition, then these resistors should have a value above 5kq. If the third party bias resistors are less the 750q the bus can be multiple terminated as required to ensure that a tri-state level is detected.

The system detects a tri-state input condition on the data channel bus when in RS-485 or RS-422 mode.

Data Interface Connections

Connector Pin No.	Data Channel		
	RS-485 [switch top]	RS-422 [switch middle]	RS-232 [switch bottom]
1		IN + (A)	IN
2		IN - (B)	
3	GND	GND	GND
4			
5			
6			
7	IN/OUT + (A)	OUT + (A)	
8	IN/OUT - (B)	OUT - (B)	OUT

Note: (A) or (B) in brackets in the above table refers to RS-485 / RS-422 data specification.

Alarm Channel Configuration

The **AMG5715A1B9** provides 2 uni-directional alarm / contact closure inputs. Each alarm input is typically connected to a contact closure switch.

Each ALARM IN+ input incorporates a 330R pull-up resistor to the internal +3V3 supply.

Alarm Interface Connections

Connector Pin No.	Alarm Interface	
	Alarm 1	Alarm 2
1		
2		
3	ALARM 1 GND	
4	ALARM 1 IN +	
5		ALARM 2 GND
6		ALARM 2 IN +
7		
8		

Audio Channel Configuration

The **AMG5715A1B9** provides one bi-directional audio channel for each video channel.

Each audio channel input can be configured as a single-ended high impedance 10kq input with GND reference or alternativly as a balanced 600q input pair. The input impedance is selected using jumpers on the audio expansion board JP1 (Channel 1) or JP2 (Channel 2), the default setting is balanced 600q.

JP1/JP2 1-2 ï High Impedance 10kq
JP1/JP2 2-3 ï Balanced 600q

Audio Interface Connections

Connector Pin No.	Balanced Input 600Ω	High Z input 10kΩ
1	OUT -	OUT -
2	OUT +	OUT +
3	GND	GND
4	IN +	IN
5	IN -	GND

Auxiliary RS-422/RS-485 Data Channel Configuration

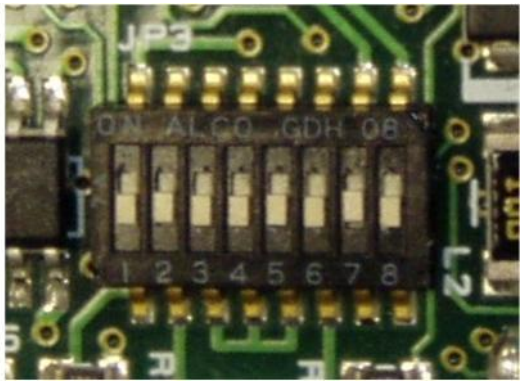
The **AMG5715A1B9** transmit unit sends and receives Echelon FTT-10A data to/from an **AMG5716A1B9** or rackmount equivalent **AMG5716A1B9R** receive unit.

The auxiliary data channel is provided by an X04057 RS-422/RS-485 Daughter Board. It is used when an additional RS-422 or RS-485 data interface is required and provides one bi-directional RS-422 or RS-485 data channel.

The X04057 daughter board is pre-configured at manufacture using the multiway 8-way DIP switch JP3. It is set to RS-485 mode by default. This switch is not usually accessable by the user, and the following instructions are for INFORMATION only.

ON

OFF



The switch functions are as follows: Default (RS-485) settings are shown in the last column.

SW. No.	Function	RS-422	RS-485	DEFAULT
1.	Mode Selection - PCB Identification	Off	On	**On**
2.	390q RX- Pre-bias to +5V. Note when off, the pre-bias is set at 10kq to +5V.	Off	On	Off
3.	390q RX+ Pre-bias to gnd. (note when off pre-bias set at 10kq to GND)	Off	On	Off
4.	120q RX termination	Off	On	Off
5.	RX+ connected to TX+	Off	On	**On**
6.	RX- connected to TX-	Off	On	**On**
7.	TX data enabled from logic one on the data stream. TX output tri-state after 5µs of a logic zero. See Note 1.	Off	On	**On**
8.	RX data disabled when TX enabled	Off	On	**On**

Note 1: Resistor R7 = 1kq for 5µS Tx dwell time. (10kq for 50µs)

The switches are used as follows:

SW. No.	4 Wire RS-422 Point to Point	4 Wire RS-422 Bussed	DEFAULT 2 wire RS-485
1.			On
2.			
3.			
4.			
5.			On
6.			On
7.		On	On
8.			On

Additional 120Ω Termination	Additional High Bias
	On
	On
On	

Data Interface Connections

Connecter Pin No	RS-422	RS-485
1	OUT + (A)	IN/OUT + (A)
2	OUT - (B)	IN/OUT - (B)
3	GND	GND
4	IN + (A)	IN/OUT + (A)
5	IN - (B)	IN/OUT - (B)

Physical Information

Dimensions

Height 112mm
Width ..... 170mm (excluding connectors)
Depth 70mm
Weight 600grams

Mounting Details

The AMG unit is supplied with a clip-on mounting bracket which should be attached to a panel or wall using 2 off 4.0mm screws, see diagram on page 1 for dimensions. The unit is clipped into the mounting bracket, and is then held firmly in position.

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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