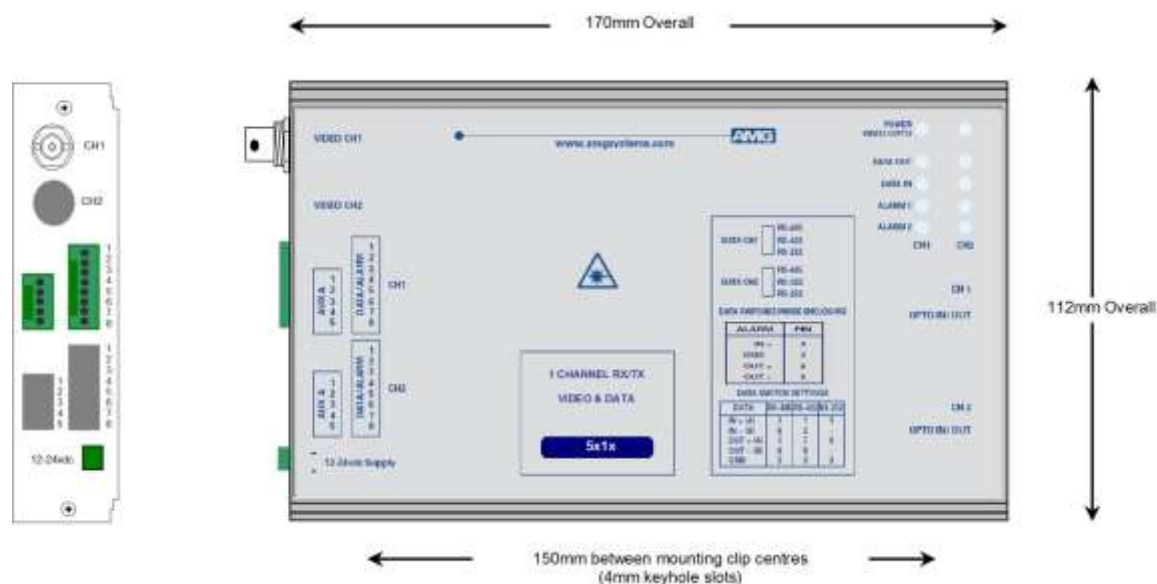## Single Channel Video Receive Unit with one Bi-directional Data Channel, one Bi-directional Alarm and one Bi-directional Audio Channel for a Singlemode Fibre Link



The **AMG5714A9-DIN** is a DIN Rail mountable standalone one channel video receive unit designed to receive 1 video signal and transmit & receive 1 data signal, 1 Bi-directional alarm and 1 Bi-directional audio channel over one Singlemode optical fibre.

The **AMG5714A9-DIN** is designed be powered using an **AMG2001** standalone power supply.

The **AMG5714A9-DIN** is designed to operate with an **AMG5713A9 / AMG5713A9R** single channel video transmit unit in a point to point configuration. The R suffix in the partno. indicates a rackmount configuration.

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Page 1 of 12

AMG5714A9-DIN Instruction Sheet
D17378-00.doc

# Contents

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Page 2 of 12

AMG5714A9-DIN Instruction Sheet
D17378-00.doc

# Introduction

## Unit Functional Schematic

The **AMG5714A9-DIN** receives 1 video, 1 data, 1 uni-directional alarm and 1 audio signals from the **AMG5713A9** transmit unit.

It also receives 1 data, 1 Bi-directional alarm and 1 audio signal transmitted from the **AMG5713A9**.
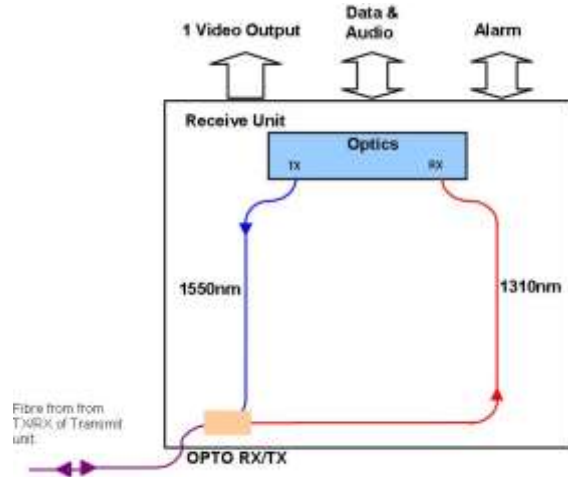


## Optical Connection

The **AMG5714A9-DIN** connections are illustrated in the following example which shows an **AMG5713A9-DIN** transmit unit together with an **AMG5714A9-DIN** standalone receive unit configured as a single channel point to point system..

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Page 3 of 12

AMG5714A9-DIN Instruction Sheet D17378-00.doc
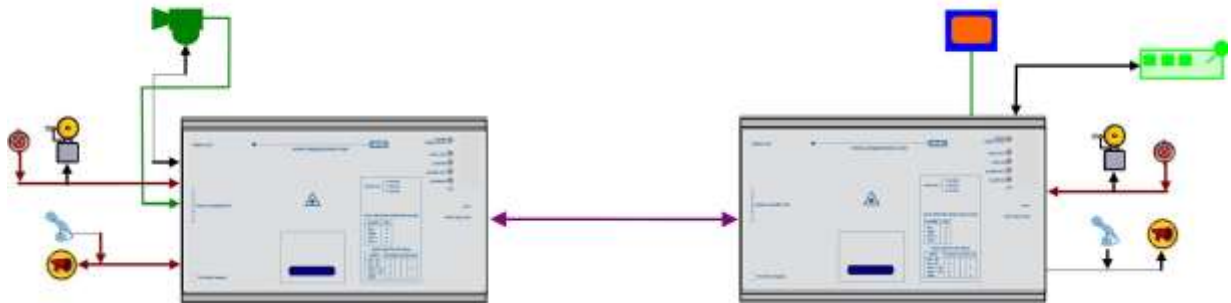
# Connections

### Video Output Connections

No. of channels ....................................1
Connectors .........................................75 ohm BNC Socket.
Output Impedance ..............................75 ohm terminated.
Output Level .......................................1 Volt p-p nominal
Frequency Response...........................10Hz to 7MHz.

### Optical Connections Singlemode

No. of Optical Connections..................1 per video channel
Optical Fibre ......................................Singlemode
Connector ..........................................SC/PC

Primary Optical Launch Power ............-10dBm
Transmit Wavelength...........................1550nm

Primary Optical Sensitivity ...................-30dBm
Receive Wavelength............................1310nm

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

### Power Connection

Power supply ......................................From plug in connection on the AMG2009 or AMG2015 subrack
Power consumption .............................1.5 Watts max.

### Data and Alarm Channel Connections

No. of Data Channels ..........................1
No. of Alarms .....................................1

Connectors .........................................Removable 8-pin, 2.5mm, Screw Terminal
Connector Partno................................Phoenix 1881383

Data Interfaces ...................................RS-232, RS-422 or R-S485. Selected by slide switch inside
enclosure. *See appropriate section on how to remove the case
for access to the data switches

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

Alarm Input ........................................Contact Closure pull-up is 330R to +3V3
Alarm Output......................................Solid-state Relay, maximum 150mA at 125Vac/dc, Ron < 6.5Ω

### 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 .................................10kΩ / 600Ω

Output impedance ............................... 600Ω

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 – High Impedance 10kΩ
  2-3 – Balanced 600Ω

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Page 5 of 12    AMG5714A9-DIN Instruction Sheet
D17378-00.doc

## Front Panel Indicators

### Power LED

| Power / Video / Opto | Green | - | Video present & opto sync. |
|---|---|---|---|
| | R/G | - | Opto sync. but no video present. |
| | Red | - | No opto sync. |
| | Off | - | No power applied to unit. |

### Low Speed Data LEDs

| 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.

### Alarm LEDs

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

| ALARM OUT | 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.

AMG5714A9-DIN Instruction Sheet
D17378-00.doc

# Data and Alarm Channel Configuration

The **AMG5714A9-DIN** sends and receives data to/from a **AMG5713A9** single channel standalone transmit unit. The physical data interface RS-485, RS-422 or RS-232 is individually selectable by the user with the corresponding slide switch mounted on the main PCB inside the enclosure.

One bi-directional alarm is also provided. The alarm input is typically connected to a contact closure switch. The alarm output can receive an on/off signal from an **AMG5713A9** and is typically used to convey contact closure status.

**Switch Position**

| RS-485 | Top |
| RS-422 | Middle |
| RS-232 | Bottom |
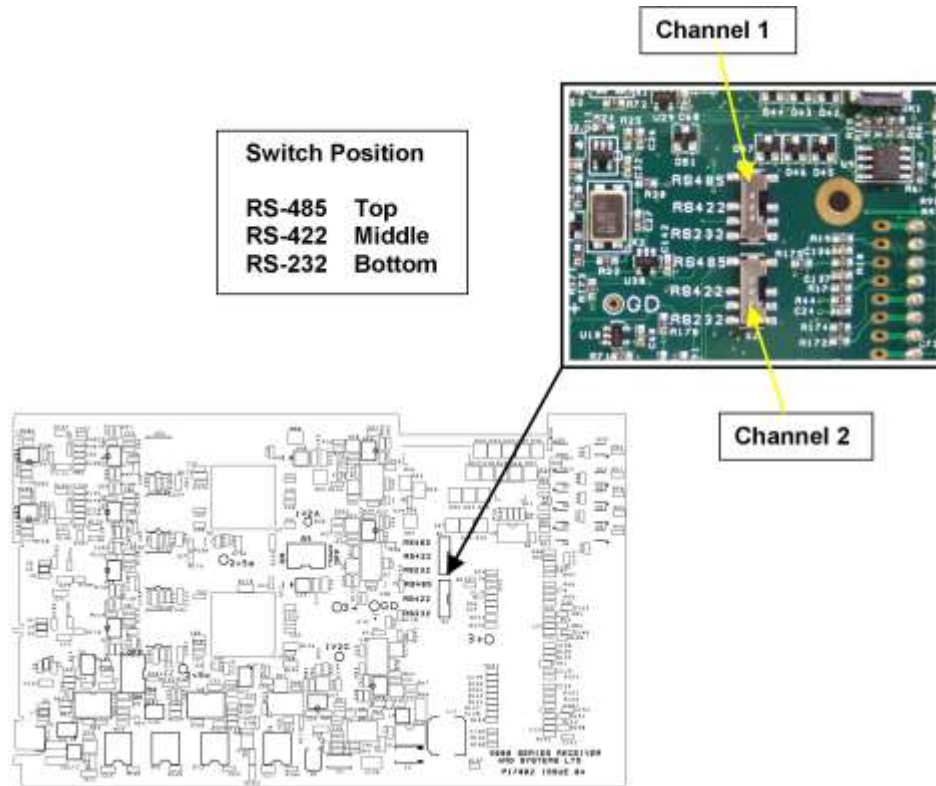
## Data Channel Configuration

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 120Ω 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 5kΩ. If the third party bias resistors are less the 750Ω the bus can be multiple terminated as required to ensure that a tri-state level is detected.

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Page 7 of 12

AMG5714A9-DIN Instruction Sheet
D17378-00.doc

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 **AMG5714A9R** provides one bi-directional alarm output / contact closure input.

The alarm input is typically connected to a contact closure switch. An ALARM IN+ input incorporates a 330R pull-up resistor to the internal +3V3 supply.

The alarm output can receive an on/off signal from an **AMG5713A9** and is typically used to convey contact closure status. An alarm output uses a solid-state relay, with a maximum load current of 150mA at 125Vac/dc and Ron < 6.5Ω.

## *Alarm Interface Connections*

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

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Page 8 of 12

AMG5714A9-DIN Instruction Sheet D17378-00.doc

## Audio Channel Configuration

The **AMG5714A9-DIN** provides one bi-directional audio channel for each video channel.

Each audio channel input can be configured as a single-ended high impedance 10kΩ input with GND reference or alternativly as a balanced 600Ω 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 600Ω.

JP1/JP2        1-2 – High Impedance 10kΩ
JP1/JP2        2-3 – Balanced 600Ω

## 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 |

AMG5714A9-DIN Instruction Sheet
D17378-00.doc

## Physical Information

### Dimensions

Height...................................................112mm
Width...................................................170mm (excluding connectors)
Depth ..................................................35mm
Weight.................................................600grams

### Mounting Details

The AMG unit is supplied with a clip-on mounting bracket which is able to mount onto a DIN rail. 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.

Phone                       +44 (0) 1767 600 777
Technical Support   +44 (0) 1767 604 491
Email                        techsupport@amgsystems.com

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Page 10 of 12

AMG5714A9-DIN Instruction Sheet D17378-00.doc

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AMG5714A9-DIN Instruction Sheet
D17378-00.doc

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Page 12 of 12

AMG5714A9-DIN Instruction Sheet
D17378-00.doc