

DB09

Video Receiver

User Manual

Revision 0.1
27th September 2023

Revisions

Date	Revisions	Version
27-09-2023	First draft	0.1

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1. Introduction

DB09 is a standard definition (SD) / high definition (HD) video receiver. It accepts analogue video from either twisted pair (differential) or coaxial cable and compensates for long cable runs using an adjustable matching filter. Its 75MHz video bandwidth means it can accept NTSC, PAL, 960H, AHD, HD-CVI and HD-TVI video. The video is DC restored and two buffered and filtered single ended outputs are provided.

DB09 requires 12VDC which is provided via the supplied AC-DC converter.

2. Quick start guide

Connect the DB09 to the supplied AC/DC adaptor. Fit the appropriate blades to the adaptor for your country. Blades are supplied for North America, Europe, UK, China and Australia. The adaptor accepts AC between 90 and 264VAC – the full specification is provided in Appendix A.

The connections to the DB09 are shown in Figure 1.

Connect the 12VDC jack from the adaptor to the +12VDC ‘Power in’ socket on the DB09. The ‘Power On’ LED should light up blue.

Connect your video input to either the UTP (RJ-45) connector or the coaxial video input (BNC). Switching between the two inputs is by the Coax (switch UP) / UTP (switch DOWN) switch. You can connect both UTP and coaxial inputs at the same time if required.

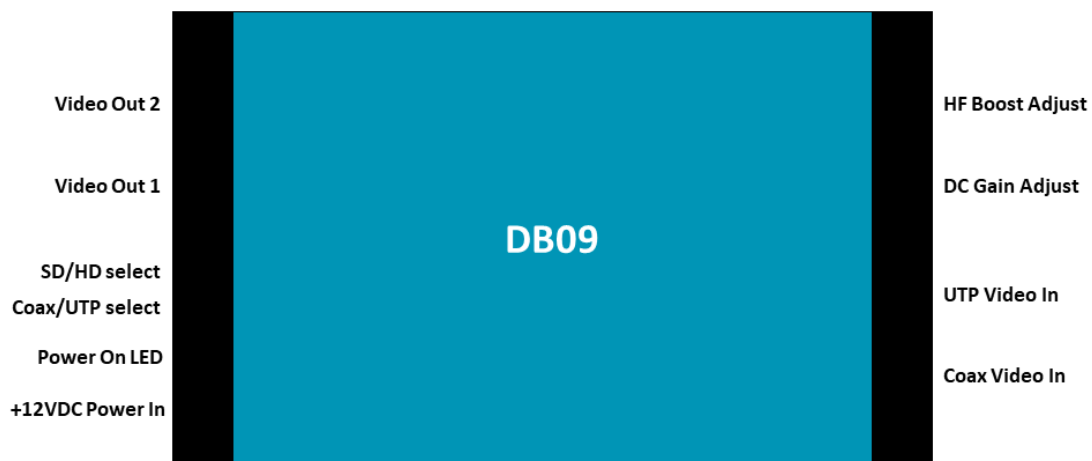


Figure 1 DB09 Connections.

The DB09 provides two independent video outputs. The single ended outputs should be terminated in 75Ω. The outputs are filtered and buffered. The SD/HD switch selects the output filter bandwidth, reducing any out of band noise. The SD selection (switch UP) passes NTSC/PAL or 960H video, the HD selection (switch DOWN) is for analogue HD such as AHD.

Two adjustments are available to compensate for cable loss. The DC Gain control allows an adjustable gain that affects all frequencies equally and is designed to compensate for the DC cable loss. The HF Boost control boosts the high frequencies of the video input using a filter that is the inverse of the cable high frequency loss. The response of this filter is set using the Coax (for coaxial cable) / UTP (for UTP cable) switch. The filter can accurately compensate for up to 300m of UTP cable and 200m of coaxial cable. Longer distances can be compensated for but with less accuracy.

3. DB09 Technical Details

A simplified block diagram of the DB09 is shown in Figure 2.

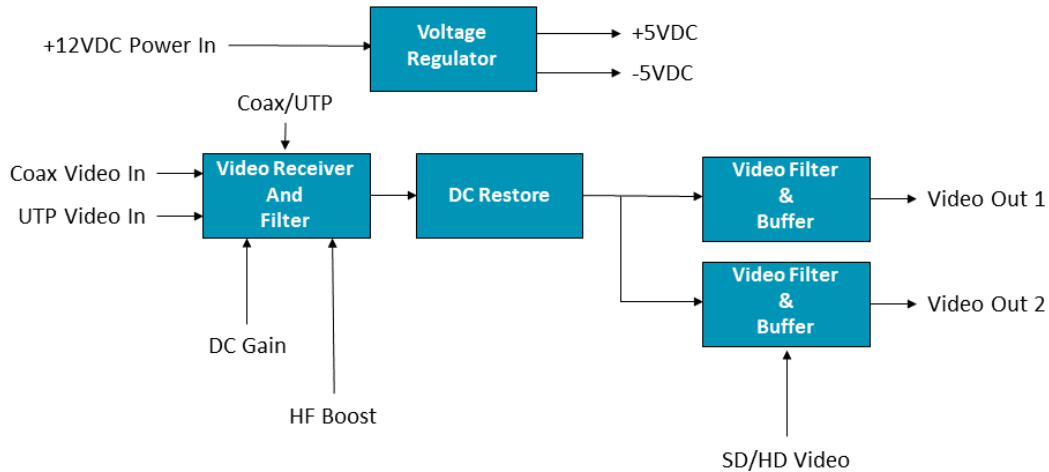


Figure 2 DB09 Block diagram.

The +12VDC from the AC/DC power adaptor is filtered and protected from over-range or reverse polarity inputs. The 12VDC input is then regulated to provide clean ± 5 VDC for the module.

The coaxial video input is pseudo-differentially received which reduces hum pickup over long cable runs. The video input is terminated by 75Ω and is protected from out-of-range inputs or glitches.

The UTP video input is differentially received, terminated in 100Ω and is protected from out-of-range inputs or glitches. Pin 1 of the RJ-45 input is the positive video input and pin 2 is the negative video input. The other pins are not connected.

The selected video input is then passed through the cable compensating filters. The broadband gain and high frequency boost are user adjustable. Figures 3 and 4 show the expected results for different lengths of coaxial and UTP cable.

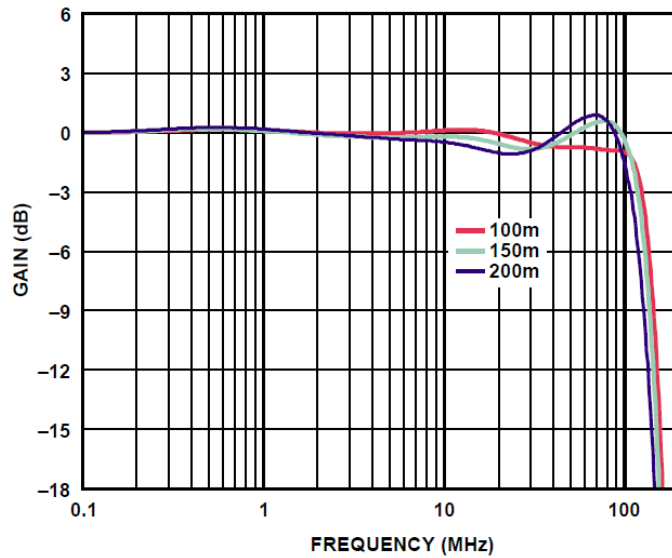


Figure 3 Frequency response for various coaxial cable lengths.

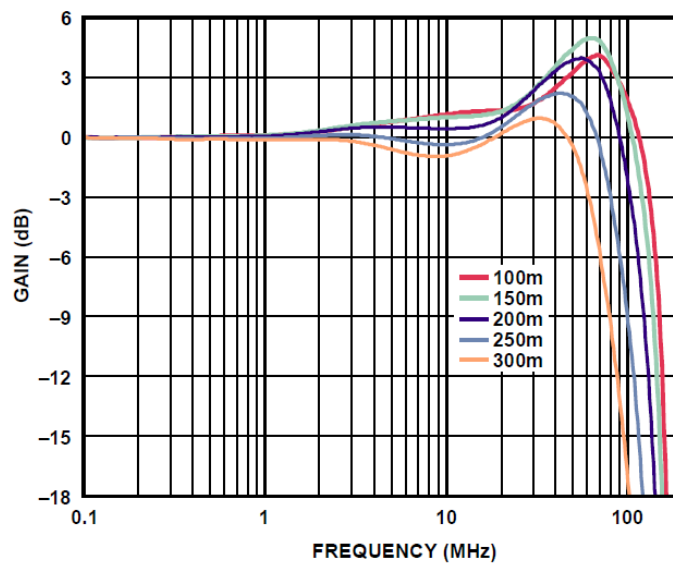


Figure 4 Frequency response for various UTP cable lengths.

The output from the compensating filter is then DC restored and filtered and buffered. The output filter helps to reduce noise and can be set to either SD or HD video. The filter responses are shown in Figures 5 and 6. This output filter sets the overall frequency response of the DB09.

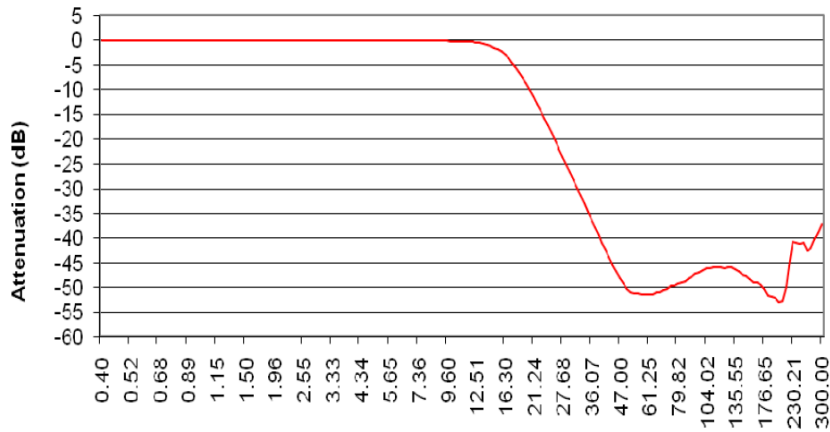


Figure 5 Output filter frequency response (SD setting).

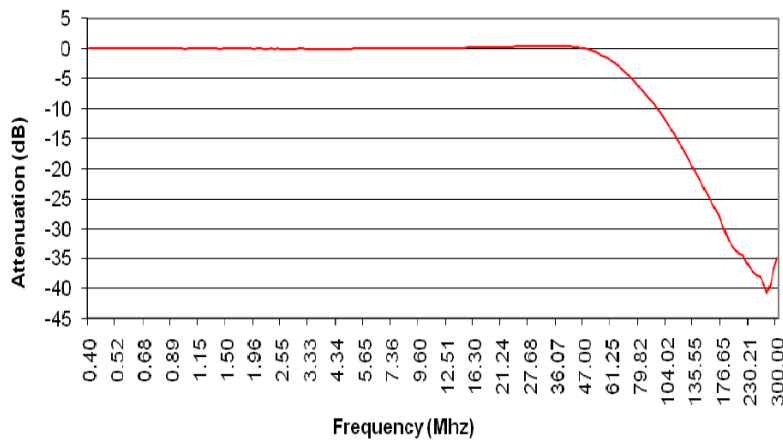


Figure 6 Output filter frequency response (HD setting).

The buffer amplifies the video by a gain x2 (6dB) so that it can drive a series 75Ω resistor. Each output must be terminated in 75Ω for the DB09 to have the correct gain. Because each output is individually buffered either or both outputs maybe be connected – any unused output may be left unconnected.

4. Specification

Power:	+9-14V (+12VDC nominal) @ ~120mA (all outputs driven).
Dimensions:	120mm x 78mm x 27mm.
Video input:	NTSC-M / PAL /SECAM, NTSC / PAL 960H, AHD, HD-CVI, HD-TVI. 75Ω input impedance (coaxial). 100Ω input Impedance (UTP). 1V pk-pk nominal input. Maximum input before clipping 1.6V pk-pk.
Luma bandwidth:	9.0MHz ± 0.5dB (SD mode). 50.0MHz ± 0.5dB (HD mode). Gain controls set to minimum.
Gain:	0dB ± 0.5dB. Gain controls set to minimum.
Differential gain/phase:	<1%, <1°. (NTSC/PAL). Gain controls set to minimum.
K-factor:	<1%. (NTSC/PAL). Gain controls set to minimum.
Group delay:	±10ns.
Operating temperature:	-10 – +40 degC.

Appendix A: AC-DC adaptor

The specification for the supplied AC-DC adaptor is shown in Figures 7 and 8.

CUI Inc | SERIES: SM136 | DESCRIPTION: AC-DC POWER SUPPLY date 06/23/2022 | page 2 of 5

INPUT

parameter	conditions/description	min	typ	max	units
voltage		90		264	Vac
frequency		47		63	Hz
current				1	A
inrush current	at 230 Vac, full load, 25°C, cold start			70	A
leakage current				0.25	mA
no load power consumption	at 115/230 Vac			0.075	W

OUTPUT

parameter	conditions/description	min	typ	max	units
regulation			±5		%
hold-up time	at full load	10			ms

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	output shut down			180	%
over current protection	output shut down, auto recovery			170	%
short circuit protection	output shut down, auto recovery				

SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output at 10 mA for 1 minute		3,000		Vac
isolation resistance	input to output at 500 Vdc	10			MΩ
safety approvals	UL/cUL (60950-1, 62368-1), RCM, CCC, PSE, UKCA				
EMI/EMC	FCC Part 15B Class B, CE				
MTBF	as per Telcordia SR-332, 25°C	300,000			hours
RoHS	yes				

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature		0		40	°C
storage temperature		-20		80	°C
operating humidity	non-condensing	20		80	%
storage humidity	non-condensing	10		90	%

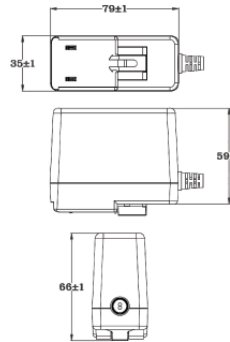
Figure 7 Power supply specification: electrical.

MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	79 x 35 x 66				mm
inlet plug	interchangeable blades (North America, Europe, UK, Australia, China)				
ac blade clip type	pinch clip				
weight	without blades		160		g

MECHANICAL DRAWING

units: mm
tolerance: ±1.0 mm



INTERCHANGEABLE BLADES					
BLADE DESIGNATOR	N	E	B	A	C
REGION	North America	Europe	UK	Australia	China
BLADE ACCESSORY	SMI-US-2	SMI-EU-2	SMI-UK-2	SMI-AU-2	SMI-CN-2
BLADE	US (N)	Europe (E)	UK (B)	Australia (A)	China (C)

DC CORD

units: mm

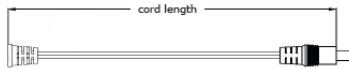


Table 1

MODEL NO.	CABLE	CORD LENGTH
SMI36-5	UL2468, 16 AWG	1,000 mm ±30
SMI36-9	UL2468, 18 AWG	1,500 mm ±30
SMI36-12	UL2468, 16 AWG	1,500 mm ±30
SMI36-15	UL2468, 18 AWG	1,500 mm ±30
SMI36-24	UL2468, 20 AWG	1,500 mm ±30
SMI36-48	UL2468, 22 AWG	1,500 mm ±30

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Figure 8 Power supply specification: mechanical.