MANUFACTURING SEMICONDUCTORS SINCE 1962

UK PRODUCT BROCHURE

Video transmission and distribution

RD ALFA
Microelectronics

CONTENTS

ABOUT THE COMPANY

RD ALFA Microelectronics develops and manufactures certified high reliability and radiation hardened microelectronics components for aerospace and defence equipment as well as video transmission/CCTV components.

The company's production includes:

- Video systems for long distance transmission.
- Operational amplifiers;
- Comparators;
- Analogue switches;
- Circuits for general application in electronics;

Since 2003, our specialists have developed and produced devices for the processing and transmission of video signals over long distances through coaxial cable and twisted pair cable. Such devices are based on microcircuits of our own design, which are in full-scale production at RD ALFA Microelectronics.

Benefits of using RD Alfa

Since 2003, our specialists have developed and produced devices for the processing and transmission of video signals over long distances through coaxial cable and twisted pair cable. Such devices are based on microcircuits of our own design, which are in full-scale production at RD ALFA Microelectronics and produced to the highest quality, supported by our lifetime warranty.

Our aim is to provide you with the highest quality while reducing your cost of installing CCTV systems as a result of using our products.

Benefits of using Unshielded Twisted Pair (UTP) Cables

- **UTP Cables are proven to be easier to run, and save – on average – 25% of installation time; resulting in lower labour costs.**
- **UTP offers a significant rejection of noise and cross-talk compared to Coaxial cable.**
- **UTP is able to transmit distances of 900m, over three times the distance of Coaxial Cable – on average.**
- **UTP is supplied in multiple-pair cables, which means that up to 100 signals can be transmitted on the same cable – taking up less than an inch of containment.**
- **Cat-5 cable enables the technology to be easily upgraded to IP when it is more practical/cost-effective. The use of Cat-5 "future-proofs" any installation.**
- **Cat-5 is able to provide Power, Data and Video for the majority of applications.**

Feature	RD ALFA Advantage	Benefit to You	
Noise & Cross-talk Immunity	All RD Alfa products are designed with exceptional noise rejection and cross-talk immunity	Guarantee of clean video, even in areas that are electrically noisy	
Compatible with all Video Standards	The UTP line is designed for all worldwide video standards	Full PAL bandwidth capability provides excellent image quality for PAL systems	
Ground Loop Isolation	RD Alfa's active solutions are built with ground loop isolation	Eliminates "ground loop" providing clearer and cleaner video	
Support "Up-the-Coax" Signals	Our passive transceivers pass through "Up-the-Coax" signalling	Easy control of PTZ cameras	
Surge & Lightning Protection	RD Alfa offers two types of surge protection: Line-to-line suppression and Line-to-Ground suppression	System is protected against lightning strikes and voltage surges.	
Easy Installation, Auto Adjustment	RD Alfa's active receivers have automatic adjustments	No set-up required	
Compact Design	RD Alfa offer baluns with female or direct mounting options	Direct mounting avoids the use of jumper cables preventing signal loss and reducing installation time	
Lifetime Warranty	All products are guaranteed in line with warranty statement	Any defective product will be replaced free of charge	

APPLICATION CHART

APPLICATION
Passive to Passive (Female BNC)  Coax Twist-P1F **225m UTP Cable** Twist-P1M DVR
Passive to Passive (Direct Fit to Camera)  Twist-P1M **225m UTP Cable** Twist-P1M DVR
Passive to Active (Single Channel)  Twist-P1M **600m UTP Cable** Twist-R-Auto-M DVR
Extending 16 cameras  **16** Coax Twist-P1-URM-16 **600m UTP Cable** Twist-8RC-Auto DVR
Single Camera (Long Distance)  Coax Twist-TA-M **900m UTP Cable** Twist-R-Auto-M DVR
Passive to Passive (Rack-mounted)  Coax Twist-P1M **600m UTP Cable** Twist-P1-URM-16 DVR
Active to Active (8 Cameras)  **8** Coax Twist-TA-M **900m UTP Cable** Twist-8RC-Auto DVR
Passive to Active (8 Channel Receiver)  Twist-P1M **600m UTP Cable** Twist-8RC-Auto DVR

PRODUCT SUMMARY

TWIST-P1-F/TWIST-P1-M
(UTP PASSIVE VIDEO TRANSCEIVERS)

- Wideband common-mode rejection from extremely low (20 Hz) to high (5 MHz) frequencies
- High interference immunity from ground loop currents
- Quality colour and B&W video signals of up to 300m of UTP cable when used in combination with another passive transceiver TWIST-P1M or TWIST-P1F.
- Quality colour and B&W video signals of up to 600m of UTP cable when used in combination with an active transceiver TWIST-R-AUTO-M.
- No power required
- Limited lifetime warranty

TWIST-P1-URM-16
(16 CHANNEL UNIT - 19'' 1U RACK)

- As above

TWIST-TA-M
(ACTIVE VIDEO TRANSMITTER FOR CAT-5 UTP CABLE)

- High-quality transmission of video signal at a distance of up to 900m using Cat5 UTP cable
- Automatic frequency corrections and automatic adjustment of video signal level
- Transmitter' outputs have a lightning & surge protection
- LED indicators for video signal presence and for automatic operation mode
- Fast black level clamping of the video signal
- Use low-voltage power, + 12 B DC

TWIST-R-AUTO-M
(ACTIVE VIDEO RECEIVER FOR CAT-5 UTP CABLE)

- Wideband common-mode rejection from extremely low (20 Hz) to high (5 MHz) frequencies
- High interference immunity from ground loop currents
- Quality colour and B&W video signals of up to 300m of UTP cable when used in combination with another passive transceiver TWIST-P1M or TWIST-P1F.
- Quality colour and B&W video signals of up to 900m of UTP cable when used in combination with an active transceiver TWIST-R-AUTO-M.
- 12Vdc power
- Limited lifetime warranty

TWIST-8RC-AUTO

(8-CHANNEL UTP ADAPTIVE AUTOMATIC EQUALIZATION RECEIVER HUB)

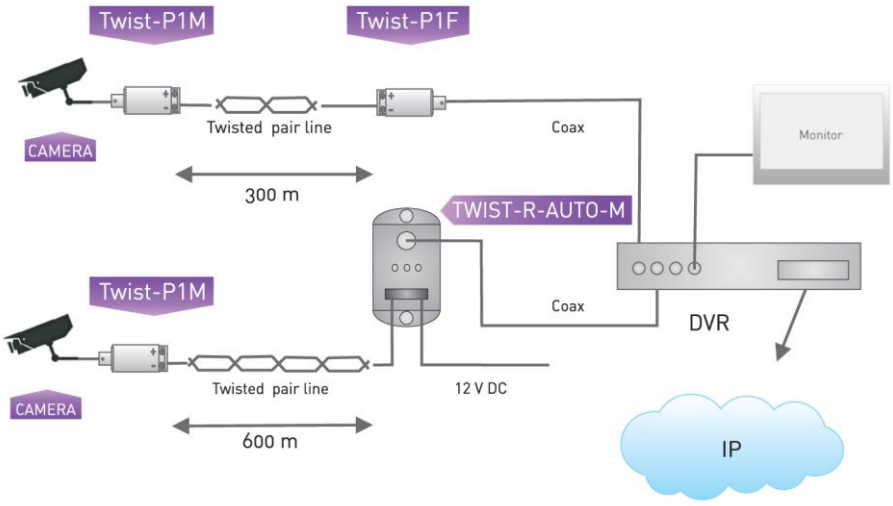
- High-quality reception of video signals at a distances of up to 900 metres (2952 feet) using Cat5 UTP cable
- Automatic frequency correction of video signal to ensure true colour rendition
- Automatic frequency correction of video signal level
- to ensure correct brightness levels
- Receiver has built in LED indicators for video signal presence and automatic operation mode
- Fast black level clamping of the video signal
- Receiver' inputs are galvanically isolated and have built-in ground loop isolation, lightning & surge protection. This protects equipment from damage in harsh industrial applications

PRODUCT SELECTION CHART

Number of Cameras	Maximum Distance (metres)	Camera End Transmitter	Receiver/MDF product
1	225	TWIST-P1-F/TWIST-P1-M	TWIST-P1-F/TWIST-P1-M
	600	TWIST-P1-F/TWIST-P1-M	TWIST-R-AUTO-M
	900	TWIST-TA-M	TWIST-R-AUTO-M
1-4	225	TWIST-P1-F/TWIST-P1-M	TWIST-P1-F/TWIST-P1-M (x No. of Cameras)
	600	TWIST-P1-F/TWIST-P1-M	TWIST-R-AUTO-M (x No. of Cameras)
	900	TWIST-TA-M	TWIST-R-AUTO-M (x No. of Cameras)
1-8	225	TWIST-P1-F/TWIST-P1-M	TWIST-P1-URM 16
	600	TWIST-P1-F/TWIST-P1-M	TWIST-8RC-AUTO
	900	TWIST-TA-M (per camera)	TWIST-8RC-AUTO
1-16	225	TWIST-P1-F/TWIST-P1-M	TWIST-P1-URM 16
	600	TWIST-P1-F/TWIST-P1-M	TWIST-8RC-AUTO (x 2)
	900	TWIST-TA-M (per camera)	TWIST-8RC-AUTO (x 2)
8-8	225	TWIST-P1-URM 16	TWIST-P1-URM 16
	600	TWIST-P1-URM 16	TWIST-8RC-AUTO
16-16	225	TWIST-P1-URM 16 (X2)	TWIST-8RC-AUTO (x 2)
	600	TWIST-P1-URM 16 (X2)	TWIST-8RC-AUTO (x 2)

TWIST-P1F AND TWIST-P1M
UTP PASSIVE VIDEO TRANSCEIVERS

Video transceivers **TWIST-P1F** (female BNC) and **TWIST-P1M** (male BNC) are based on a balance-to-unbalanced transformer (video balun).
When installed on the transmitting end of the video line, the **TWIST-P1** series balun converts a signal from the source (video camera) into a differential video signal.
When installed on the receiving end of the video line, the **TWIST-P1** series balun converts a differential video signal into a standard single-ended one.



Quality CCTV video transmission using UTP cable at distances of up to 300 metres (984ft)

KEY FEATURES

- **Wideband common-mode rejection from extremely low (20 Hz) to high (5 MHz) frequencies**
- **High interference immunity from ground loop currents**
- **Quality colour and B&W video signals of up to 300m of UTP cable when used in combination with another passive transceiver TWIST-P1M or TWIST-P1F.**
- **Quality colour and B&W video signals of up to 600m of UTP cable when used in combination with an active transceiver TWIST-R-AUTO-M.**
- **No power required**
- **Limited lifetime warranty**

TWIST-P1 series transceiver transmits quality colour and B&W video signals up to 300m using unshielded twisted pair (UTP) cable when used in combination with another passive transceiver **TWIST-P1F** or **TWIST-P1M.**
TWIST-P1 series transceiver transmits quality colour and B&W video signals up to 600m using UTP cable when used in combination with active receiver **TWIST-R-AUTO-M**

TECHNICAL SPECIFICATION

ELECTRICAL

Total amplitude of input/output video signal	0.5 – 3.0 V
Impedance for coaxial input	75 Ohm
Wave resistance of UTP cable	100 Ohm +/-20
Frequency response	20 Hz – 8 MHz
Common-mode rejection	20Hz - 5
MHz	40 dB
Input–output attenuation	2 dB
Power supply	Not required
Differential signaling voltage, not more	600 V
Peak current, 1 min at most	1 A

ENVIRONMENTAL

Humidity:	0 to 95%, non-condensing
Temperature Operating:	-20°C to +50°C
Storage:	-30°C to +70°C

MECHANICAL

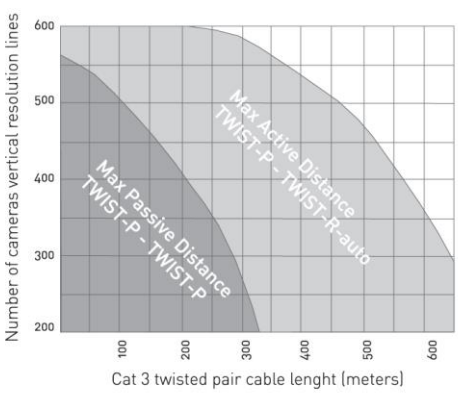
Dimensions:	TWIST-P1M	56 x 21 x 21 mm
	TWIST-P1F	65 x 21 x 21 mm
Weight:	TWIST-P1M	30g
	TWIST-P1F	32g
Material:		ABS

CABLE TYPE RECOMMENDATION

Category type	UTP Cat5
Impedance	100 Ohm
DC loop resistance	18 Ohm per 100m
Differential capacitance	80 pF/m max

TWIST-P1 series transceiver also comes as 16 way unit on 19'' 1U rack; it's called **TWIST-P-1URM16**

VIDEO DISTANCE RECOMMENDATIONS.



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TWIST-R-AUTO-M and TWIST-TA-M

Active Video Receiver and Active Video Transmitter for Category 5 Unshielded Twisted-Pair cable (UTP)

TWIST-R-AUTO-M - Active Video Receiver converts a differential video signal into a standard one and is installed on the receiving end of the video line.
TWIST-TA-M - Active Video Transmitter converts a signal from the source (video camera) into a differential video signal and is installed on the transmitting end of the video line.
When the TWIST-TA-M transmitter on the transmitting end of the video line and TWIST-R-AUTO-M receiver on the receiving end of the video line are connected in series, a high-quality colour video signal is transmitted through the unshielded twisted pair (UTP) cable at a distance of up to 900 metres (2952 feet).

High quality CCTV signal videotransmission at distances up to to 900 metres (2952 feet).

KEY FEATURES

High-quality transmission of video signal at a distance of up to 900 using (2952 feet) using Cat5 UTP cable

Automatic frequency corrections and automatic adjustment of video signal level

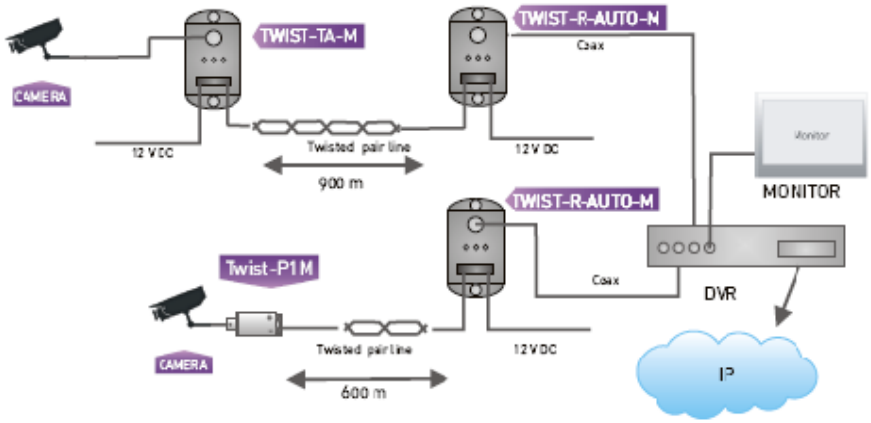
Receiver' inputs are galvanically isolated and have a lightning & surge protection, which is particularly suitable for harsh industrial applications

Transmitter' outputs have a lightning & surge protection

The receiver and the transmitter have LED indicators for video signal presence and for automatic operation mode

Fast black level clamping of the video signal

Use low-voltage power, + 12 B DC



TWIST-R-AUTO-M Receiver has a line length automatic correction system, which compensates high-frequency signal losses in the line and automatically controls the video signal level. The receiver has an indicator of video signal presence and automated operation. The inputs of the receiver have galvanic isolation from the signal line as well as lighting protection.
The receiver has galvanic protection from lighting and current surges with amplitude of up to 5 kA and a pulse width of up to 8/20µs, and also protection from constant differential voltage of up to 24 V or common voltages between the earth wire and cable wires of up to ±12 V.
TWIST-TA-M Transmitter has discrete adjusting of frequency equalization in order to compensate high-frequency losses of video signal in the long line. The transmitter has output protection from impulse current surges with amplitudes of up to 5 kA and pulse width of up to 8/20µs, as well as protection from constant differential voltage of up to 24 V or common voltage between the earth wire and cable wires of up to ±12 V

TECHNICAL SPECIFICATION

ELECTRICAL

Parameters	TWIST-TA-M	TWIST-R-AUTO-M
Amplitude of input/output video signal	0.7-10 V	0.5-2.5 V
Impedance for coaxial input	75 Ohm	75 Ohm
Wave resistance of twisted pair of wires	100 Ohm	100 Ohm
Frequency band	7 MHz	7 MHz
Transmission gain	1.0	1.2
Range of differential amplitude – frequency equalization at frequency 5.0 MHz	0-12-18-22 dB	-
Range of differential amplitude – frequency equalization at frequency 4.43 MHz (adjustable automatically)	-	18 dB
Range of gain control (adjustable automatically)	-	9 dB
Common-mode signal rejection rate	-	40 dB
Signal/noise ratio	50 dB	-
Max. supply transmitter current	40 mA	70 mA
Supply Voltage (DC Voltage)	+12 V	7-12 V

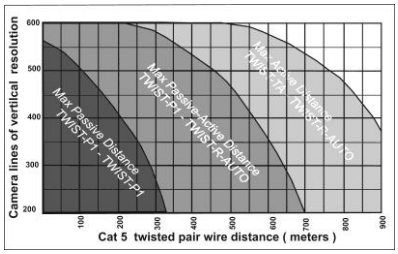
MECHANICAL

Dimensions:	TWIST-TA-M	502x48x38 mm
	TWIST-R-AUTO-M	502x48x38 mm
Weight:	TWIST-TA-M	60g
	TWIST-R-AUTO-M	60g
Material:	TWIST-TA-M	Black ABS
	TWIST-R-AUTO-M	Black ABS

CABLE TYPE RECOMMENDATIONS

Category Type:	TWIST-TA-M	CAT3,CAT5, CAT5e
	TWIST-R-AUTO-M	CAT3,CAT5, CAT5e
Impedance	TWIST-TA-M	100 Ohm
	TWIST-R-AUTO-M	100 Ohm
DC Loop Resistance:	TWIST-TA-M	Not more than 18 Ohm/m
	TWIST-R-AUTO-M	Not more than 18 Ohm/m
Differential capacitance:	TWIST-TA-M	Not more than 80 pF/m
	TWIST-R-AUTO-M	Not more than 80 pF/m

VIDEO DISTANCE RECOMMENDATIONS



ENVIRONMENTAL

Humidity:	0 to 95%
Operating Temperature:	-15 to +50 °C

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TWIST-8RC-AUTO
Eight Channel UTP Adaptive Automatic Equalization Receiver Hub

TWIST-8RC-AUTO - Automatically converts a differential video signal into a balanced signal when installed on the receiving end of a UTP cable run from RDALFA transmitters. The unit is rack mountable into a 1U high rack and has eight independent video receiver channels.
TWIST-8RC-AUTO receives colour or monochrome PAL video at distances up to 900m (2952ft) when combined with RDALAF transmitters over compatible UTP cable (CAT5)

High quality CCTV signal conditioning at distances up to 900 metres (3000 feet).

KEY FEATURES

High-quality reception of video signals at a distances of up to 900 metres (2952 feet) using Cat5 UTP cable

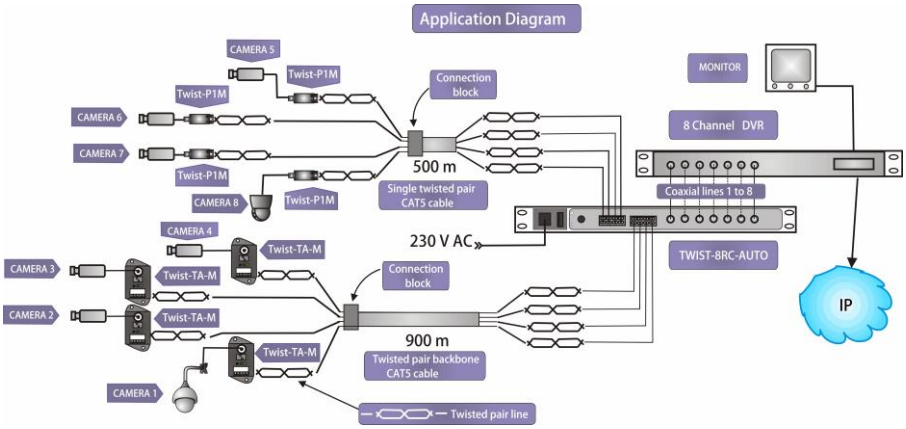
Automatic frequency correction of video signal to ensure true colour rendition

Automatic frequency correction of video signal level to ensure correct brightness levels

Receiver has built in LED indicators for video signal presence and automatic operation mode

Fast black level clamping of the video signal

Receiver' inputs are galvanically isolated and have built-in ground loop isolation, lightning & surge protection. This protects equipment from damage in harsh industrial applications



TWIST-8RC-AUTO Receiver Hub automatically conditions the video signal, compensating for cable attenuation and ground loops.
TWIST-8RC-AUTO Receiver Hub compensates for high-frequency loses in the video-transmission line and has automatic adjustment of the video signal level.
Each receiver input is galvanically isolated and has bult in lightning & surge protection.

For best video quality it is recommended to use the RDALAF passive transceiver balun (TWIST-P1) or active transmitter (TWIST-TA-M).
Maximum video line length (CAT5e) when using **TWIST8RC-AUTO** Receiver Hub with a passive transceiver balun TWIST-P1 is 500 meters (1640 feet).
Maximum video line length (CAT5e) when using **TWIST8RC-AUTO** Receiver Hub with an active transmitter TWIST-TA-M is 900 meters (2952 feet).

TECHNICAL SPECIFICATION

Parameters	*TWIST-8RC-AUTO*
Amplitude of input/output video signal	1.0-1.5 V
Resistance for coaxial input	75 Ohm
Wave resistance of twisted pair of wires	100 +/-20 Ohm
Frequency band	7 Mhz
Minimum sync pulse range for automated mode	0.08 V
Minimum colour burst pulse range for automated mode	0.05 V
Range of differential amplitude – frequency equalization at frequency 4.43 Mhz (adjustable automatically)	14 dB
Range of gain control (adjustable automatically)	9 dB
Common-mode signal rejection rate	60 dB
Max. supply transmitter current	50 mA
Supply Voltage	230 V AC

MECHANICAL

Dimensions:	480x95x44 mm
Weight:	1600g
Material:	Metal

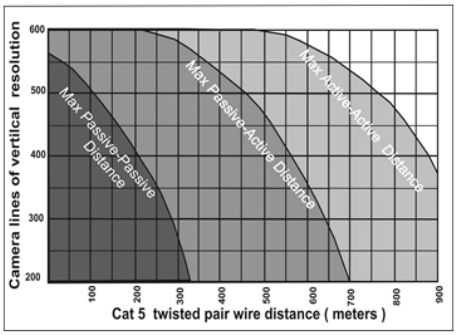
CABLE TYPE RECOMMENDATIONS

Category Type:	CAT5e
Impedance (Ohms)	100
DC Loop Resistance:	18 Ohm per 100 m
Differential capacitance:	80 pF/ m

ENVIRONMENTAL

Humidity:	20 -80 %
Operating Temperature:	-30°C to 50°C

VIDEO DISTANCE RECOMMENDATIONS



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Compatible Cable	
Cat-5 Cable:	Cat-5e – 25pr - LSOH
Cat-5e – 4pr - PVC	Cat-5e – 25pr - PE
Cat-5e – 4pr - LSOH	
Cat-5e – 4pr - PE	Cat-6 Cable:
Cat-5e – 12pr - PVC	Cat-6 – 4pr - PVC
Cat-5e – 12pr - LSOH	Cat-6 – 4pr - LSOH
Cat-5e – 12pr - PE	Cat-6 – 4pr - PE
Cat-5e – 25pr - PVC	

Independent Testing

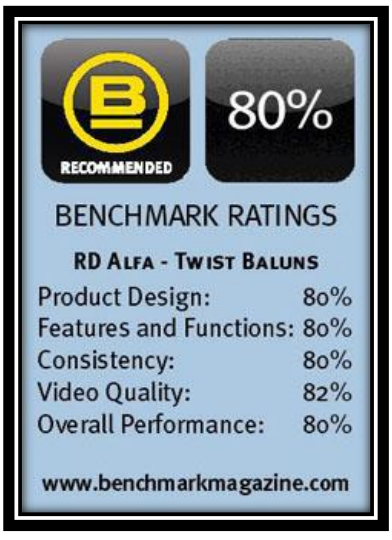
Baluns do introduce an additional cost, but the total savings and benefits combined make those costs negligible. Whilst there are some poor quality low-cost baluns out there, there are also many good products on offer such as the RD Alfa baluns.

The RD Alfa TWIST-P1 baluns are equal with other more expensive baluns when it comes to build quality and performance.

The units offer immunity to ground loops, helping to eradicate hum bars and other interference, and eliminate issues with other cross-talk and low frequency issues.
Even with sources of low-frequency interference introduced, the video transmitted across the TWIST UTP link remains cleaner, consistent and more stable.

The TWIST set-up worked well and clearly delivered transmission that was superior to that achievable with coax and was equal to the leading (and more expensive) brands tested. Comparing the RD Alfa baluns to the established market leaders showed no difference between the RD Alfa units and others. Both performed as expected, but with a 25% cost saving it may be worth using the RD Alfa baluns in order to reduce cost.

The TWIST baluns have already been recommended by Benchmark with an overall rating of 80%. The baluns comfortably achieve a level of performance on par with some of the leading brands on the market, but for a fraction of the price, RD Alfa is a low-cost alternative to be considered.



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