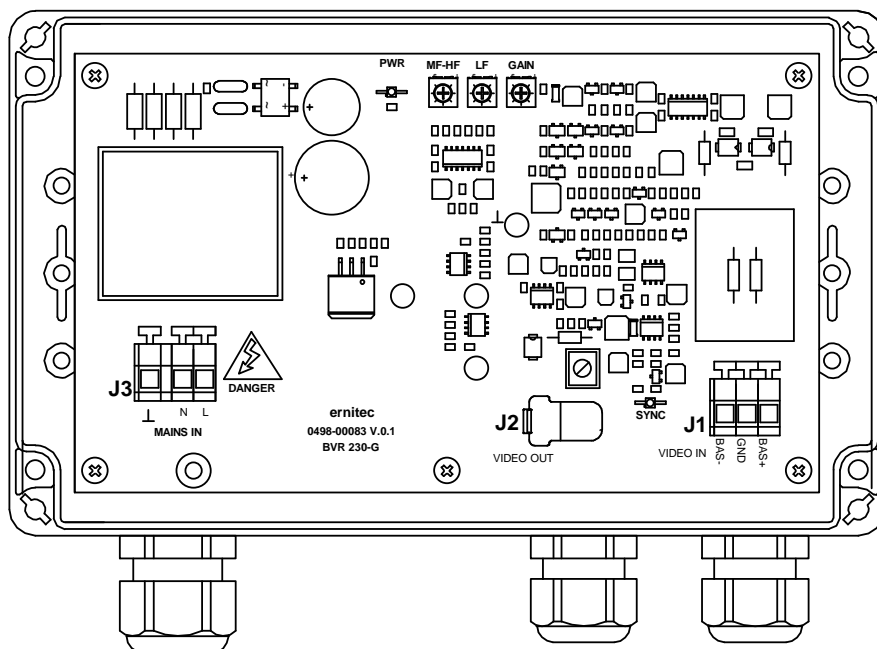




Twisted Pair Video Transmission

Series 230/3

Boxed versions



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Introduction

The following units are covered in this manual:

- Boxed video transmitter BVT-230.
- Boxed video receiver BVR-230-1GV/3.
- Boxed video repeater BVX-230-1GV/3.

All three units are fully compatible with other Ernitec twisted pair video equipment. However, the specified transmission distance, and adjustments, assumes the use of Series 230 equipment only.

Throughout these instructions, reference is made to the drawings which can be found in the back of these instructions.

General

The Series 230 Twisted Pair Video Transmission equipment, is designed for use with standard CAT5e twisted pair cable. It can also be used with standard 120 ohm twisted pair cable, suited for video transmission. Types like the Belden 1872A or 1700A, can also be used.

On the receivers, and repeater, the twisted pair input is galvanically separated to avoid earth loop problems (hum bars).

All boxed types are housed in an IP65 rated enclosure.

The Boxed Series 230 types are mains supplied - 230VAC, but can also be ordered in 115VAC versions.

Coax and twisted pair cables, can be connected/disconnected with power on.

Box Installation

Choose a plane surface to prevent the box from being twisted and thereby becoming leaky when mounted. When mounted outdoor the box should be installed with the cable glands downwards.

Screws and wall plugs are supplied in the mounting kit. Drilling dimensions are shown in the back of this manual.

Mains Installation

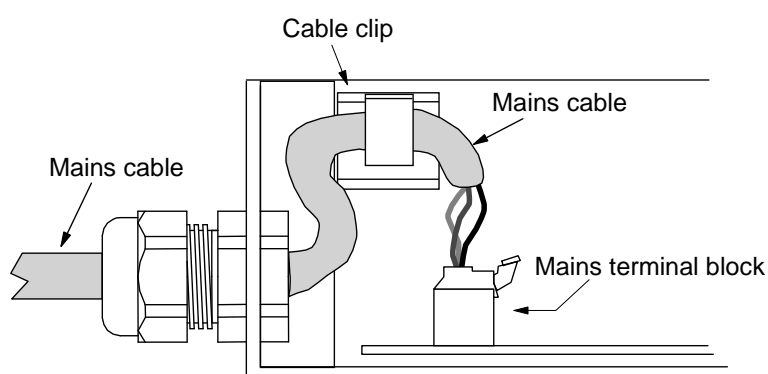
Terminals marked with hazardous live symbol requires installation by an instructed person.

The BVT/R/X-230 must be used with a 3-wire mains connection (2W+PE @ min. 0,75mm²).

If permanently connected to mains, a readily accessible disconnect device shall be incorporated in the building installation wiring.

If pluggable connection to mains, the socket-outlet shall be installed near the equipment and shall be easily accessible.

In order to fulfil the safety standard (EN60950), the mains cable must be routed via the provided cable clip inside the Series 230 box. The figure below shows how the mains cable should be routed.



WARNING: Make sure the equipment is earthed; otherwise the over voltage protection will not work! Although both the transmitter and the receiver are earthed no hum bar problems will occur due to the galvanic separation of the video signal in the receiver.

Cable Connections

Please refer to the drawings in the back, for details on cable connections.

At the receiver end, **do not in any way connect the twisted pair shield**. If the shield is connected to the receiver, the galvanic separation will not work!

The shield should be connected at the transmitter end only.

Adjustment

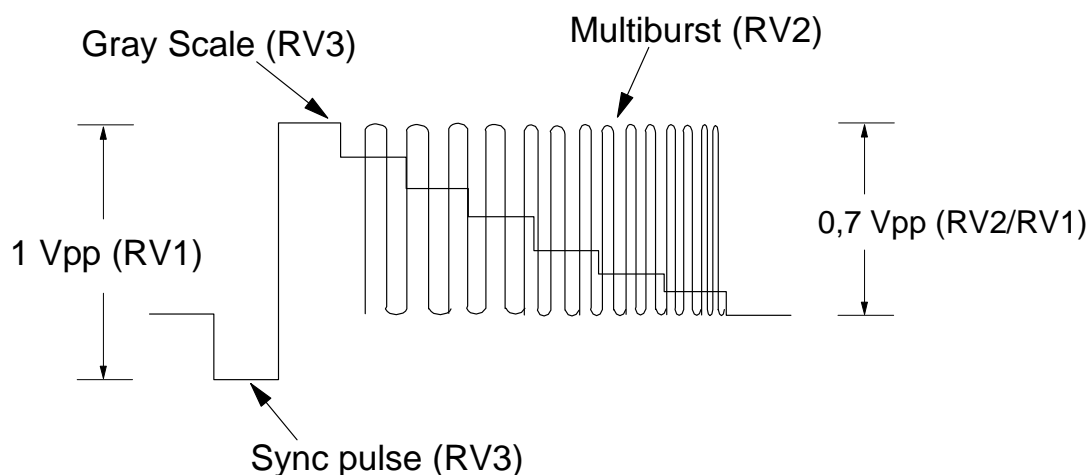
For optimum performance, under all lighting conditions, it is highly recommended to use a Grey scale/Multiburst *Video Generator*, and an *Oscilloscope* for the adjustment.

Especially when using digital video equipment - like DVR's - it is important to adjust for best possible video performance.

1. Connect the *Video Generator* to the camera input of the BVT-230, and select the Grey scale/Multiburst signal. Output must be 1Vpp. It is not mandatory to have a colour signal.
2. Set the links on the BVT-230, according to cable length and type.
3. Connect an *Oscilloscope* and monitor, to the video output of the BVR-230-1GV (or local monitor output on the BVX-230-1GV/3). To connect both *Oscilloscope* and monitor to the receiver, use a BNC T-connector, or the loop output of the monitor. Remember to set the monitor termination to 75 ohm.
4. If a negative, or turned over, picture is displayed, swap the +/- twisted pair input on the receiver.
5. Check that the green SYNC LED on the receiver is flashing, indicating that a valid video signal is received.
6. On the receiver, turn pots RV1, RV2 and RV3 fully counter clockwise.
7. Adjust RV1 (Gain) to an output of 1Vpp.
8. Adjust RV3 (LF) to get the sync pulse as well defined as possible.
9. Adjust RV2 (MF/HF) to get as much MF/HF signal (max. 0,7Vpp) as possible.
10. Readjust RV3 and RV2 to get the signal as identical as possible to the original signal, *see drawing below*.
11. Readjust RV1 to exactly 1Vpp.
12. Check that the picture looks OK on the monitor.

Please note that adjustments RV2 and RV3 has a certain overlap, and will influence on each other. The trick is to fine tune both for optimum signal.

Grey Scale/Multiburst Signal



Twisted Pair Cable Specifications

The cables are the most important part of a Twisted Pair Video installation, and the overall performance and transmission distance, depends on the selected twisted pair cable.

Please note, that twisted pair cables with stranded conductors are NOT suitable - the conductors must be solid.

When shielded cables are used the transmission distance might be considerably lowered, due to the higher capacitance introduced by the shield - carefully study the specification on the actual cable and compare them with the table below. The choice between shielded and unshielded cable will always be a compromise between transmission distance and immunity towards noise and crosstalk.

Description	Min.	Typ.	Max.	Unit
Solid conductors, diameter (ø)	0,5	0,6-0,8	1	mm
Characteristic impedance @ <1 MHz	100	120	130	Ω
Capacitance			90	nF/km
Attenuation @ approx. 5 MHz			30-36	dB/km
Twists	5			pcs./m

Suitable cable types:

- Standard Category 5e.
- Belden 1700A.
- Belden 1872A.
- Mödinger A-2Y(L)2Y / 2x2x0,6 (2 pairs).

Note: When using cables including several not individually screened pairs, it is, as a general rule, not recommended to use more than one pair per cable, in order to avoid possible crosstalk.

Note: When using cables including several not individually screened pairs, do not mix long and short cable distances, in order to avoid possible crosstalk.

Note: Avoid locating unscreened twisted pair cables parallel to high speed data cables, mains cables, or other cables with high energy and/or high frequency signals.

EMC/EMI

All electronic equipment can emit, or be sensitive to, induced electromagnetic noise which can be conducted by the connected wires, or transmitted as electromagnetic fields.

Electromagnetic noise can cause malfunction or damage to the equipment.

The Series 230 fulfils the relevant EMC standard (refer to specifications) and is therefore CE labelled.

WARNING: The stated approvals, and other specifications are valid only if the equipment is installed according to the instructions in this manual.

Specifications

BVT-230		Min.	Typ.	Max.	Unit	Comments
Video Input	Voltage		1	1,5	Vpp	Unbalanced 75 Ω

BVT-230 & BVX-230-1GV/3 (transmitter part)

Video Output @1Vpp in	Voltage	2		4	Vpp	Balanced 110 Ω
	Frequency response	25		10 M	Hz	+/- 2dB
	Equalisation	0	3	6	dB	@ 5 MHz
	Signal/noise ratio	66			dB	Weighted
	CMMR	36			dB	

BVR-230-1GV/3 & BVX-230-1GV/3 (receiver part)

Video Input	Voltage			2	Vpp	Balanced 110 Ω
	Equalisation	70			dB	@ 5MHz
Unbalanced video outputs	Voltage, adjustable	0,8	1	1,2	Vpp	Unbalanced 75 Ω
	Frequency response	25		10 M	Hz	+/- 2dB
	Signal/noise ratio	66			dB	Weighted
	CMMR	50			dB	

Common Specifications

Power supply	230VAC	207	230	253	VAC	45-60 Hz
	115VAC (optional)	104	115	126	VAC	45-60Hz
	Power consumption	BVT Max. 25	BVR Max. 30	BVX Max. 45	mA	@ 230VAC
		BVT Max. 50	BVR Max. 60	BVX Max. 90	mA	@ 115VAC
Environment	Temperature	- 25		50	°C	
	Humidity			85	%	@ 86-106 KPa
Enclosure	Dimensions, L x W x H	220	145	60	mm	excl. cable glands
	Weight	0,8			kg	
	Protection	IP 65				
Approvals	EMC/EMI	Immunity: EN50130-4, Emission: EN6000-6-3				
	Safety	EN60950				

Transmission distances

CAT5E 0.5mm: 1700 m.

Mödinge A-2Y(L)2Y 0,6mm: 2200 m.

To obtain the above distances, it is important that the correct type of cable is used, and that the cable is an uninterrupted run, without the use of junctions and cross-fields.

It is also required to use a *Video Pattern Generator* and *Oscilloscope* for the adjustment.

When using BVX-230-1GV to extend the distance, it is not recommended to use more than two BVX-230-1GV, giving a total distance of 5100/6600 m. At these distance, a certian decrease in performance, must be expected.

BVX-230-1GV/3

P1: Bal. output voltage TWP 120 ohm (0.6mm)			
2 Vpp	+3 dB @5MHz	3 Vpp	4 Vpp
+6 dB @5MHz			
<div> <div></div> <div></div> </div>			
<1000 m		>1500 m	
P1: Bal. output voltage CAT5E 24AWG (0.5mm)			
2 Vpp	+3 dB @5MHz	3 Vpp	4 Vpp
+6 dB @5MHz			
<div> <div></div> <div></div> </div>			
<600 m		>900 m	
<1500 m		>900 m	

Drilling dimensions: 188,3 mm

