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Installation Instruction for BDR-510/2 & BDR-514/2 Digital Camera Stations

CE

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1 Introduction

A Digital Camera Station forms the receiver end of a digital remote control system. A digital remote control system is used to control camera functions such as pan, tilt, zoom, focus and iris, light on/off and open/close gates etc..
A digital remote control system has the advantage of long transmission distance and low cable installation cost due to the fact that a standard 2 x 0.6 mm twisted pair cable may be used for the control of up to 12 functions.
The Digital Camera Stations BDR-510/2 and BDR-514/2 is designed with special attention to transmission safety and stability.
The BDR-510/2 and BDR-514/2 camera stations are addressable which means that up to 64 units can be controlled via one twisted pair line.
The BDR-510/2 and BDR-514/2 are delivered as self-contained units with a mains change-over switch for selection between 230 VAC and 115 VAC mains voltage.
The BDR-510/2 and BDR-514/2 is housed in an IP65 rated ABS-box and can be used in connection with SYSTEM 500M and SYSTEM 1000M. Besides the BDR-510/2 and BDR-514/2 can be controlled and programmed directly from the keyboards 1500M, 1501M, 1502M and 1503M.

1.1 ERNA Format:

The BDR-510/2 and BDR-514/2 are controlled via the ERNA protocol (Ernitec Asynchronious Serial One-way Camera Control).
With this camera control protocol it is possible to use standard modems between a system and a camera station (or between two BDR-5XX) if the distance is more than 1200 meter.
The new ERNA protocol can be generated from a PC, which means that camera control can be made via the PC's RS-232-C port.
The format of this protocol is as follows (Version 2.0, Release 961016):

1.1.1 Physical format:

Baudrate =	2400
Parity Bit =	None
Data Bit =	8
Stop Bit =	1

1.1.2 Frame format:

Header	Address	Command	Data 1	Data 2	Checksum
STX	0-255	1-17	0-255	0-255	Sum of previous bytes
02 Hex	255=Broadcast				

1.1.3 Commands:

Command	Function	Data 1	Description	Data 2	Description	CS Type
1	Relays	0-255	Bit 0 Pan right 1 Pan left 2 Tilt up 3 Tilt down 4 Zoom wide 5 Zoom tele 6 Focus near 7 Focus far	0-255	Bit 0 Iris open 1 Iris close 2 AUX1 3 AUX2 4 AUX3 5 AUX4 6 AUX5 7 AUX6	ALL
2	Call preposition	1-128	Prepos number	----	Not used	BDR-55X/575
3	Start Sequence prepos	0		----	Not used	55x/575/ICU
4	Text on/off	0		----	Not used	BDR-55x
5	Save prepos	1-128	Prepos number	----	Not used	55x/575/ICU
6	Insert prepos in stack	1-128	Prepos number	----	Not used	55x/575/ICU
7	Delete prepos from stack	1-128	Prepos number	----	Not used	55x/575/ICU
8	Clear seq. stack	0		----	Not used	55x/575/ICU
9	Show seq. stack	0		----	Not used	BDR-55x
10	Latch AUX	0-255	Bit 2 AUX1 3 AUX 2 4 AUX 3 5 AUX 4 6 AUX 5 7 AUX 6 Low=Latch High=No latch	----	Not used	BDR-55x
11	Sequence dwelltime	0-255	Seconds	----	Not used	55x/575/ICU
12	Homepos	0-255	Prepos number 0=Disabled	0-255	10*1sec time-out	55x/575/ICU
13	AUX on/ off	1-8	Relay number	0-1	0=Off 1=On	55x/575/ICU
14	PT Speed	0-255	Pan Speed	0-255	Tilt Speed	BDR-575/ICU
15	Auto-paning	1	Speed	0-255		BDR-575/ICU
		2	Limits	1/2		
		3	Start	0		
16	Camera Set-up	1	Mode	0-255	Bit 0 Gain Ctrl. remote. 1 White bal. remote. 2 Contour corr. remote. 3 Shutter speed remote. 4 Gain auto. 5 White val. auto.	ICU
		2	Gain control.	0-255	0=low 255=high	
		3	White balance.	0-255	0=Warm 255=Cold	
		4	Contour corr.	0-255	0=Sharp 255=Soft	
		5	Shutter speed	0-255	0=Fast 255=Slow	
		6	Background comp.	0	Not used	

Command	Function	Data 1	Description	Data 2	Description	CS Type
17	Alarms	1	Configuration	0-255	Bit 0 Alarm 1 0=NC 1=NO 1 Alarm 2 0=NC 1=NO 2 Alarm 1 relay 0=Off 1=On 3 Alarm 2 0=Off 1=On 4 Alarm 1 priority 0=Low 1=High 5 Alarm 2 0=Low 1=High 6 Alarm 1 0=Disable 1=Enable 7 ALarm 2 0=Disable 1=Enable	ICU
		3	Alarm 1 Set-up	0-255	Bit 0-5 Preposition 6 Relay 1 0=Disable 1=Enable 7 Relay 2 0=Disable 1=Enable	
		2	Alarm 2 Set-up	0-255	Bit 0-5 Preposition 6 Relay 1 0=Disable 1=Enable 7 Relay 2 0=Disable 1=Enable	

2 Installation

2.1 Box Installation

Choose a plain surface to prevent the box from being twisted and thereby becoming leaky while mounted. When mounted out-door the box should be oriented with the cable glands pointing downwards. Screws and wall plugs are supplied in the mounting kit. Drilling dimensions are shown on figure 2.

2.2 Mains installation

The BDR-510/2 or BDR-514/2 should be mounted at a suitable location close to the video camera where mains are available.The BDR-510/2 and the BDR-514/2 can be supplied with either 115 VAC or 230 VAC mains voltage. The mains voltage is selected by the mains voltage change-over switch, refer to figure 2.

Warning: Before connecting the unit to the mains outlet make sure that the mains voltage change-over switch is set for correct mains voltage in order to avoid damage on the equipment.
Warning: Make sure the equipment is earthed; otherwise the over voltage protection will not work!

2.3 Cable connections

It is of utmost importance that all cable connections are carried out, exactly as described, in order to avoid malfunction or damage to the camera station or the connected equipment. All cables to and from the camera station are fed through the cable glands. Choose an appropriate size gland for the actual cable and tighten the glands when all cables are connected. The choice of cable is important to the optimal function of the camera station.

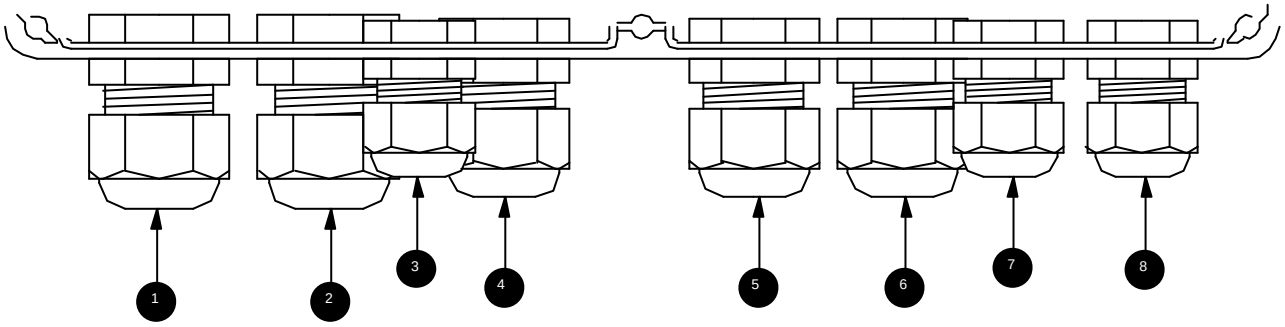

Figure 1, Cable glands lay-out

The following table shows how the cable glands are intended to be used:

No.	Size	Description
1	PG 13.5	Mains input cable
2	PG 13.5	Pan/Tilt connection cable
3	PG9	Mains output cable
4	PG 11	Auxiliary 1 connection cable
5	PG 11	Auxiliary 2 connection cable
6	PG 11	Zoom lens control cable
7	PG 9	ERNA input cable

8	PG 9	ERNA output cable

☹ The BDR-510/2 - BDR-514/2 Digital Camera Stations must be used with a 3 wire mains connection and an earthed power outlet.

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 BDR-510/2 - BDR-514/2 are tested and fulfils the following EMC standards:

EN 50081-1 (Emmision)
EN 50130-4 (Immunity)

These standards covers equipment placed in an industrial environment.

The Series BDR-510/2 - BDR-514/2 fulfils the following safety standard:

EN 60950

2.4 BDR-510/2 - BDR-514/2 Layout

The BDR-510/2 and BDR-514/2 have been designed for easy installation and set-up. Figure 2 shows the layout of the camera stations.

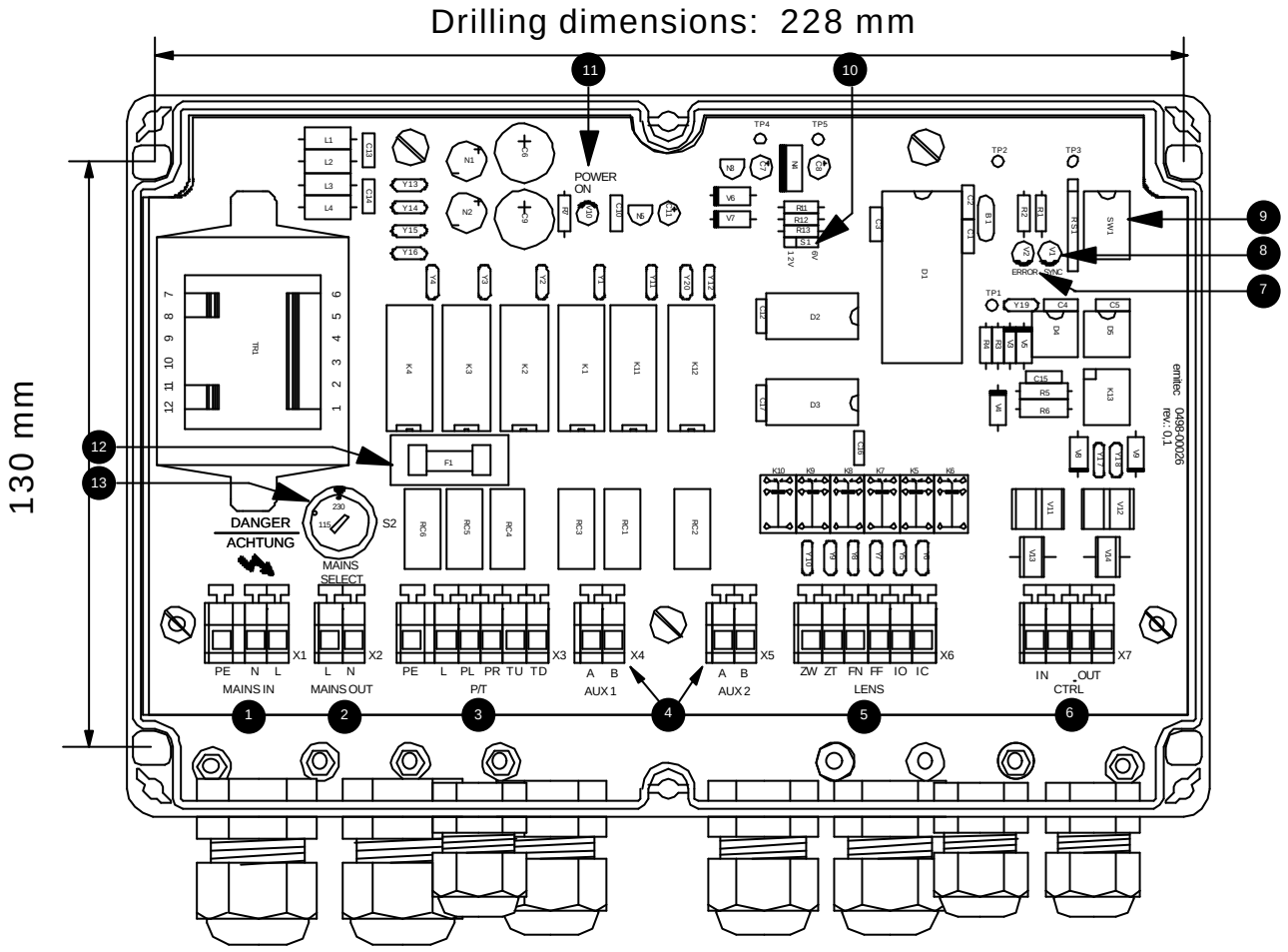

Figure 2, BDR-510/2-BDR-514/2 Layout

	Description	
No.	**BDR-510/2**	**BDR-514/2**
1	Mains input	
2	Mains output	
3	Pan/Tilt connection	Auxiliary connection AUX 3-6 (4)
4	Auxiliary connection AUX 1 & 2 (2)	
5	Lens connection	
6	ERNA Camera control input/output	
7	ERNA error detection	
8	ERNA sync. detection	
9	Address switch	
10	6 or 12VDC lens voltage selection	
11	Power on indication	
12	Fuse for Pan/Tilt	Fuse for AUX 3-6
13	Mains voltage change-over switch 115/230 VAC	

2.4.1 Mains connection

Connect the mains lead to the terminal block X1. Refer to figure 3.

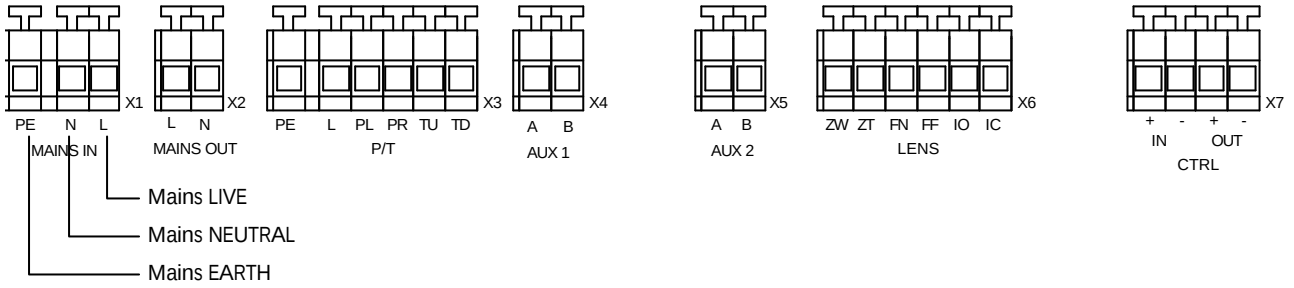

Figure 3, Mains connection

Make sure that each terminal is connected to the corresponding terminal of the mains outlet (i.e. Phase to Phase, Neutral to Neutral and Ground to Ground). Otherwise malfunction or even damage to the camera station will occur.
For specification of mains, refer to *Specifications*

2.4.2 Pan/Tilt connection (Only BDR-510/2)

A high voltage Pan/Tilt is connected to the terminal blocks X2, and X3. Refer to figure 4.

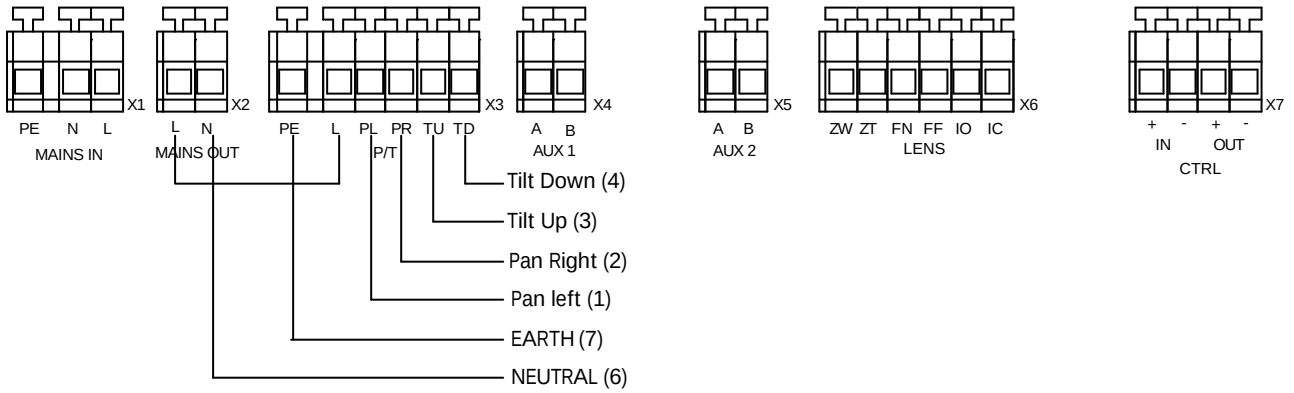

Figure 4, Pan/Tilt connection

The numbers in () indicates the pin number of the MPT-1/10 Pan/Tilt. For further information, refer to the Pan/Tilt installation instruction.
When using high voltage Pan/Tilt always connect the GROUND or EARTH wire.

2.4.3 Auxiliary connection

The auxiliary functions connected to terminal X4 and X5, allows control of mains supplied equipment or equipment supplied with an external voltage, like 24 VDC etc. refer to *Specifications* for maximum load of the relay contacts.

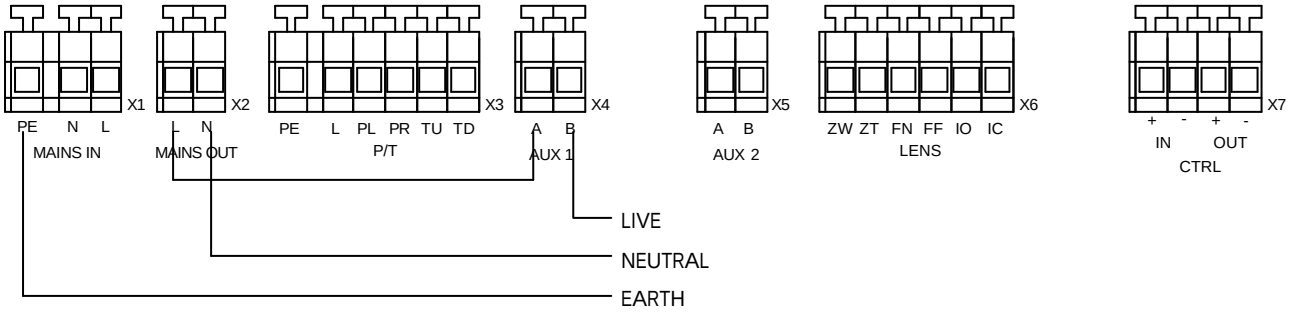

Figure 5, Connection of Mains supplied Auxiliary Equipment

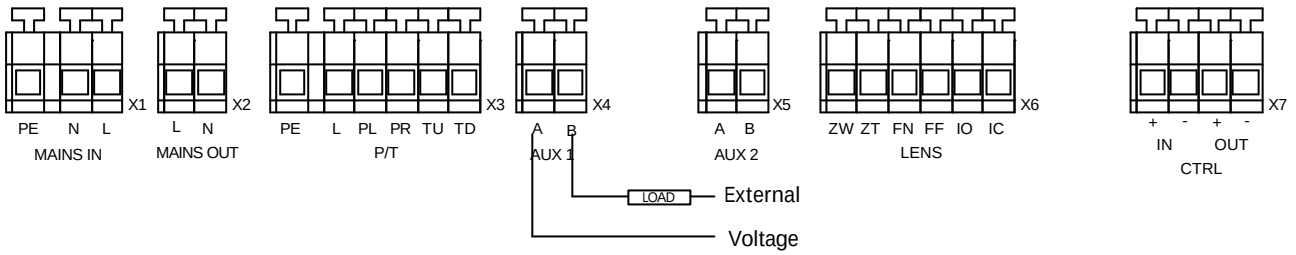

Figure 6, Connection of external supplied Auxiliary Equipment

Be careful not to exceed the maximum rating of the relays, refer to *Specifications* for maximum load of the relay contacts.

2.4.4 Auxiliary connection AUX 3-6 (Only BDR-914/2)

The pan/tilt relays are used as auxiliary relay contacts, having the *L P/T* terminal located at X3 as a common point. The *PL* relay is activated by the AUX 3 function, *PR* by AUX 4, *TU* by AUX 5 and *TD* by AUX 6.

2.4.5 Motorised Lens connection

The Motorised lens is connected to terminal X6, see figure 7

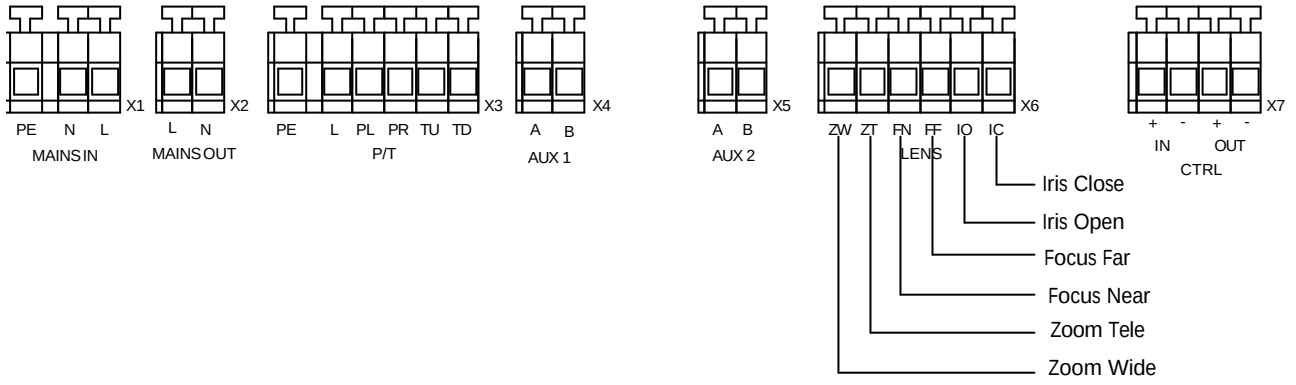

Figure 7, Connection of motorised lens

2.4.6 ERNA Camera control input connection

The ERNA signal is connected to terminal X7, refer to figure 8.
It is important that the polarity of the connection is correct, otherwise it will not be possible to get control.
Note, the ERNA input is galvanic separated from the rest of the circuit in order to avoid ground loop problems.

DO NOT CONNECT THE SCREEN FROM THE CABLE TO THE CAMERA STATION GROUND.

2.4.7 ERNA Camera control output connection

The ERNA output signal is connected to terminal X7, refer to figure 8. In case of power failure the ERNA signal will be routed to the next camera station via a by-pass relay.

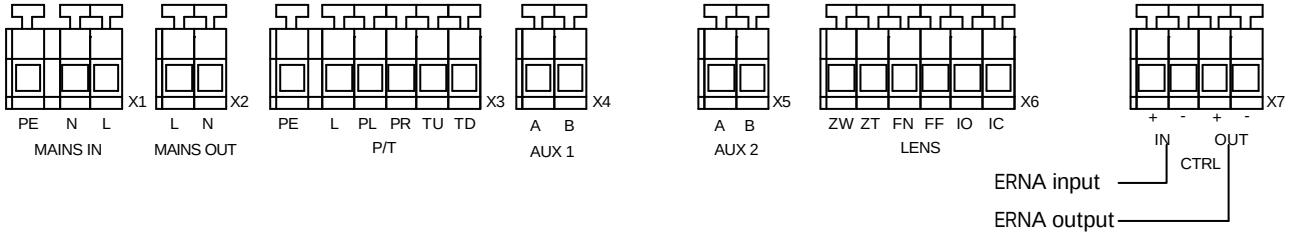

Figure 8, ERNA Camera control input and output

3 Adjustment and Settings

The BDR-510/2 series has been designed for easy installation and set-up. All settings is made via switches or jumpers. Figure 9 shows where the different switches and jumpers are located:

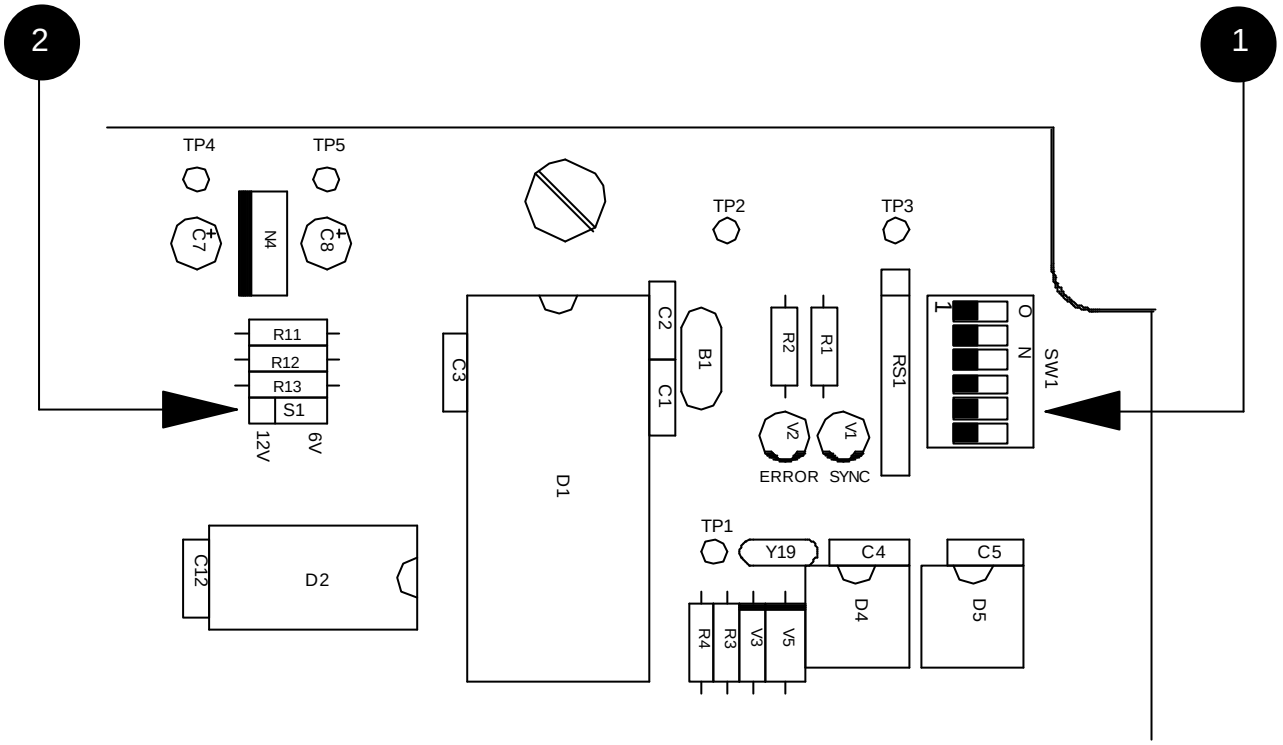

Figure 9, Jumper and switch lay-out.

3.1 Address settings (1)

With the BDR-510/2 series it is possible to address up to 64 units on one twisted pair line:

	Switch SW1					
Description	**1**	**2**	**3**	**4**	**5**	**6**
Address number "0"	ON	ON	ON	ON	ON	ON
Address number "1"	ON	ON	ON	ON	ON	OFF
Address number "2"	ON	ON	ON	ON	OFF	ON
Address number "3"	ON	ON	ON	ON	OFF	OFF
Address number "4"	ON	ON	ON	OFF	ON	ON
Address number "5"	ON	ON	ON	OFF	ON	OFF
Address number "6"	ON	ON	ON	OFF	OFF	ON
Address number "7"	ON	ON	ON	OFF	OFF	OFF
Address number "8"	ON	ON	OFF	ON	ON	ON
Address number "9"	ON	ON	OFF	ON	ON	OFF
Address number "10"	ON	ON	OFF	ON	OFF	ON
Address number "11"	ON	ON	OFF	ON	OFF	OFF
Address number "12"	ON	ON	OFF	OFF	ON	ON
Address number "13"	ON	ON	OFF	OFF	ON	OFF
Address number "14"	ON	ON	OFF	OFF	OFF	ON
Address number "15"	ON	ON	OFF	OFF	OFF	OFF
Address number "16"	ON	OFF	ON	ON	ON	ON

Address number "17"	ON	OFF	ON	ON	ON	OFF
Address number "18"	ON	OFF	ON	ON	OFF	ON
Address number "19"	ON	OFF	ON	ON	OFF	OFF
Address number "20"	ON	OFF	ON	OFF	ON	ON
Address number "21"	ON	OFF	ON	OFF	ON	OFF
Address number "22"	ON	OFF	ON	OFF	OFF	ON
Address number "23"	ON	OFF	ON	OFF	OFF	OFF
Address number "24"	ON	OFF	OFF	ON	ON	ON
Address number "25"	ON	OFF	OFF	ON	ON	OFF
Address number "26"	ON	OFF	OFF	ON	OFF	ON
Address number "27"	ON	OFF	OFF	ON	OFF	OFF
Address number "28"	ON	OFF	OFF	OFF	ON	ON
Address number "29"	ON	OFF	OFF	OFF	ON	OFF
Address number "30"	ON	OFF	OFF	OFF	OFF	ON
Address number "31"	ON	OFF	OFF	OFF	OFF	OFF
.....						
Address number "62"	OFF	OFF	OFF	OFF	OFF	ON
Address number "63"	OFF	OFF	OFF	OFF	OFF	OFF

3.2 12 V or 6V Lens voltage (2)

The voltage to the motorised zoom lens can be set with Jumper S1.

- Jumper on Pin 1 and 2 = 12 VDC
- Jumper on Pin 2 and 3 = 6 VDC

4 Specifications

Specifications						
Description	**Parameter**	**Min.**	**Typ**	**Max.**	**Unit**	**Note**
Inputs	Mains	207	230	253	VAC	
		104	115	126	VAC	
	Control (ERNA)	2,5		12	V_{pp}	
Outputs	Control (ERNA)		6		V_{pp}	
	Lens Voltage	6		12	VDC	
	Lens Current			150	mA	per function.
	Pan/tilt Voltage			250	VAC	
	Pan/tilt Current, total consumption			2	A	total, fused.
	AUX 1 - AUX 2 voltage			250 24	VAC VDC	
	AUX 1 - AUX 2, max. current			5	A	NOT fused.
General	Power consumption,			5	VA	
	Temperature range	-15		55	°C	
	Relative humidity			95	%	
	Comply to	EN 50081-1 EN 50130-4 EN 60950				EMC Safety
	Enclosure	IP 65				ABS box.
	Dimensions excl. cable glands	250 x 160 x 90			mm	
	Weight			1,2	Kg	

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