

## 6 ERNA protocol

### 6.1 Design

The ERNA protocol is a simple asynchronous serial one way protocol, designed for camera control (PTZ-control). The protocol is used as interface between the SYSTEM 500M/1000M/X and Telemetry Receivers/Domes compatible with the ERNA protocol.

It is IMPORTANT that the ERNA protocol is implemented EXACTLY as described.

### 6.2 Data Format

The physical data format for the ERNA protocol is:

1. Baud Rate 2400
2. Data Bits 8
3. Parity None
4. Stop Bits 1

### 6.3 Frame Format

Figure 6 shows the format of the ERNA protocol:

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				

Figure 6.

#### Header

Always ASCII STX (02 Hex).

#### Address

Receiver/Dome Address 0-254. 255 (FF Hex) is broadcast address.

The ERNA address must match the address set in the Receiver/Dome. I.e. if the Receiver/Dome starts with address '1', ERNA address '1' must also be used, even though the ERNA address range starts with '0'.

#### Command

Receiver/Dome Command. Figure 7 shows all the commands.

#### Data

Depending on the Command there will be one or 2 data bytes, see figure 7.

#### Checksum

A simple sum of all the previous bytes including STX.

## 6.4 Commands

Figure 7 shows all the commands and description of Data 1 and Data 2.

Command	Function	Data 1	Description	Data 2	Description	Notes
1	Relays	1-255	Bit 0: Pan right Bit 1: Pan left Bit 2: Tilt up Bit 3: Tilt down Bit 4: Zoom wide Bit 5: Zoom tele Bit 6: Focus near Bit 7: Focus far Bit 6+7: Auto Focus	1-255	Bit 0: Iris open Bit 1: Iris close Bit 2: AUX1 Bit 3: AUX2 Bit 4: AUX3 Bit 5: AUX4 Bit 6: AUX5 Bit 7: AUX6 Bit 0+1: Auto Iris	
1	Relays	0	STOP	0	STOP	
2	Call preset	1-100	Preset number	----	Not used	
3	Start preset tour	0		----	Not used	
4	Text on/off	0	Toggle on/off	----	Not used	
5	Save preset	1-100	Preset number	----	Not used	
6	Insert preset in tour stack	1-100	Preset number	----	Not used	
7	Delete preset from stack	1-100	Preset number	----	Not used	
8	Clear preset tour stack	0		----	Not used	
9	Display preset tour stack	0		----	Not used	
10	Latch AUX	0-255	Bit 2: AUX1 Bit 3: AUX 2 Bit 4: AUX 3 Bit 5: AUX 4 Bit 6: AUX 5 Bit 7: AUX 6 Low=Latch High=No latch	----	Not used	
11	Prest tour dwelltime	0-255	Seconds	----	Not used	Global time
12	Homefunction	0-253	Preset number 0=Disabled	0-255	10x 1sec time-out	
		254	Auto Pan	----	Not used	
		255	Preset tour	----	Not used	
13	AUX on/off	1-8	Relay number	0-1	0=Off 1=On	
14	Pan/Tilt Speed	0-255	Pan Speed	0-255	Tilt Speed	
15	Auto Pan	1	Speed	0-255		
		2	Set limits	1/2	1=left limit, 2=right limit	
		3	Start	----	Not used	
16	Camera Setup	1	Mode	0-255	Bit 0: Internal Bit 1: Remote	
		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	Backlight comp.	----	Not used	

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Command	Function	Data 1	Description	Data 2	Description	Notes
16	Camera Setup	7	Auto iris	0-255	Bit 0-3: ALC 0=Peak 8=Normal F=Average Bit 4-7: Level 0=Low 8=Normal F=High	
17	Alarms	1	Configuration	0-255	Bit 0: Alarm contact 1 0=NC 1=NO Bit 1: Alarm contact 2 0=NC 1=NO Bit 2: Alarm 1 relay 0=Off 1=On Bit 3: Alarm 2 relay 0=Off 1=On Bit 4: Alarm 1 priority 0=Low 1=High Bit 5: Alarm 2 priority 0=Low 1=High Bit 6: Alarm 1 0=Disable 1=Enable Bit 7: Alarm 2 0=Disable 1=Enable	
		3	Alarm 1 Set-up	0-255	Bit 0-5: Preset Bit 6: Relay 1 0=Disable 1=Enable Bit 7: Relay 2 0=Disable 1=Enable	
		2	Alarm 2 Set-up	0-255	Bit 0-5: Preset Bit 6: Relay 1 0=Disable 1=Enable Bit 7: Relay 2 0=Disable 1=Enable	
<b>Special functions:</b>						
Command	Function	Data 1	Description	Data 2	Description	Notes
5	MENU access	128		---	Not used	
2	Start preset tour 'n'	101-110	Tour 1-10	---	Not used	
2	Start Cruise Tour 'n'	111-114	Cruise Tour 1-4	---	Not used	
2	Start Cruise Tour 1 rec.	115	Recording start	---	Not used	
5	Stop Cruise Tour 1 rec.	115	Recording stop	---	Not used	
5	Save Cruise Tour 1	111		---	Not used	
2	Colour/mono switch	116	Selects colour mode	---	Not used	
5	Colour/mono switch	116	Selects mono mode	---	Not used	
2	Colour/mono switch	117	Selects Auto mode	---	Not used	
2	Call Home Position	118		---	Not used	
2	Zoom speed	119	High speed	---	Not used	
5	Zoom speed	119	Low speed	---	Not used	
2	Digital Zoom	120	ON	---	Not used	
5	Digital Zoom	120	OFF	---	Not used	
1	ENTER/SELECT	---	Not used	1	For Menu navigation	

**Figure 7.**

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## Frame Length

Depending on the number of data bytes (1 or 2), the frame length can be 5 or 6 bytes.

## Command 1

In order to keep the relay(s) activated, the Command 1 is repeated every 1 second. If the command is not repeated the relay(s) must be de-activated by the Receiver/Dome, after 1.5 second.

This is a safety function to ensure that pan/tilt motion is stopped, in case of corrupted communication, or if a STOP command is lost.

Stop is send as: Data1=0 and Data2=0.

If both bit 6 and 7 are set (data 1), Auto Focus mode is selected.

If both bit 0 and 1 are set (data 2), Auto Iris mode is selected.

## Example

Command 1 (Pan Left - Receiver #16):

STX	Adr.	Cmd	Data1	Data2	Checksum
0x02	0x10	0x01	0x02	0x00	0x15

Command 2 (Call Preposition 7 - Receiver #16):

STX	Adr.	Cmd.	Data1	Checksum
0x02	0x10	0x02	0x07	0x1B

Command 5 (Access MENU system - Receiver #16):

STX	Adr.	Cmd	Data1	Data2	Checksum
0x02	0x10	0x05	0x80	0x01	0x98

## 6.5 SYSTEM 500M/1000M Setup

To use the ERNA protocol the SYSTEM needs to have the following setup:

### **Serial Port 1 Setup**(or Port 2)

Type:	RS-485	
Device:	PTZ	
BaudRate	2400	
Retrans:	2	(Don't care)
Rtx Time:	0.5 sec	(Don't care)