MT-CONVPDB Pelco/RS485 <-> Biphase
Bosch biphase code translator
USER MANUAL

The MT-CONVPDB Pelco/RS485 <-> Biphase is microprocessor based device, designed to integrate CCTV equipment of Bosch BiPhase with other devices using Pelco-P/Pelco-D or Bosch/ Philips RS485 code. Translation is possible in both directions, depending on the configuration settings.

The software of translator is written in accordance with the principles of multitasking, so that a high-performance configuration while receiving, processing and sending data.

For RS-485 port were implemented support of Pelco D / Pelco P code and 4 protocols of Bosch / Philips and for Biphase port were implemented 4 protocols of Bosch / Philips + command protocol. Device gives the possibility of 2-way work hereby provides 50 different cases of conversion.

Supported protocols Bosch/Philips

For RS-485 and BiPhase are implemented 4 different protocols, which are defined for the output data. Input protocol is detected automatically.

Fixed-Start-Stop (optocode 0x02) – The protocol sends START and STOP commands, with no information about the speed of movement. Commands used in old type PTZ telemetry receivers and heads.

Fixed-Repetive (optocode 0x04) – The protocol sending only the START command at intervals up to every 50ms (20Hz), with no information about the speed of rotation. Commands used in old type PTZ telemetry receivers and heads. This protocol does not support **Iris Close and Iris Open** commands.

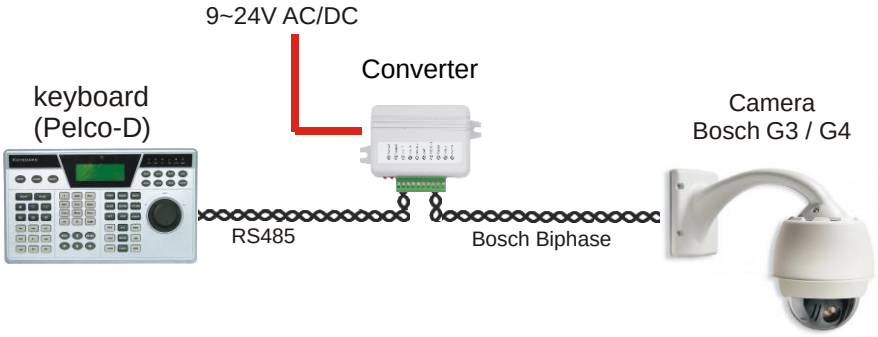
Variable-Start-Stop (optocode 0x05) - The protocol sending START and STOP commands, including information about the speed of rotation. Commands used in new type PTZ telemetry receivers and speed-dome cameras. Often also used in cameras from other manufacturers with support of Bosch or Philips code.

Variable-Start-Stop (optocode 0x08) - The protocol sending only the START command at intervals up to every 50ms (20Hz), with information about the speed of movement. Mainly used in cameras using the Speed-Dome Bosch. It is not recommended to radio transmission and LAN network using the LAN to RS-485 converters.

Commands (optocode 0x07) – Special commands: Presets, Auxilary ON/OFF commands. Compatible with all systems.

Basic examples of configuration

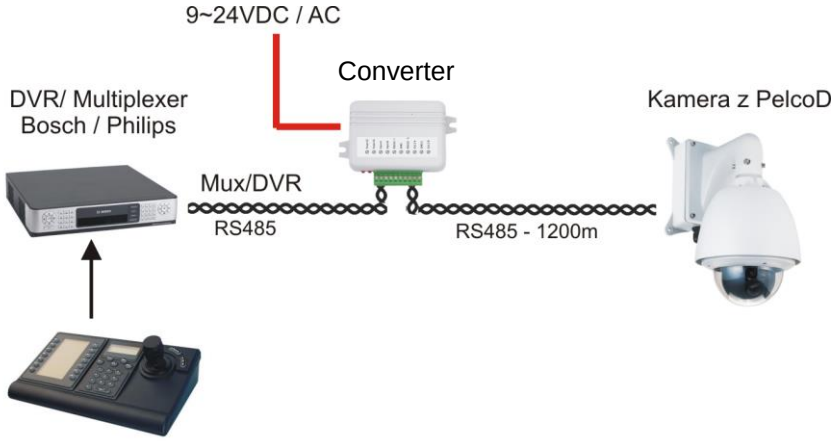
1. Translation from RS-485 to Biphase (Switch No.7 at ON position)
Translation from PelcoP / PelcoD / Bosch (Philips) RS485 code to Biphase code.



Example of connection

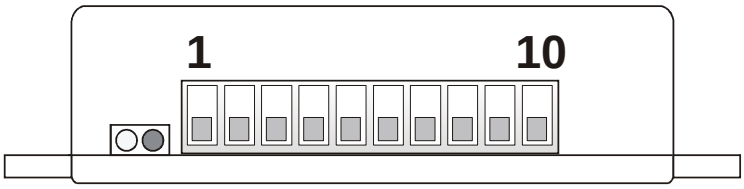
2. Translation from Biphase to RS-485 (Switch No.8 at OFF position)

Translation from BiPhase code to PelcoP / PelcoD / Bosch (Philips) RS485.

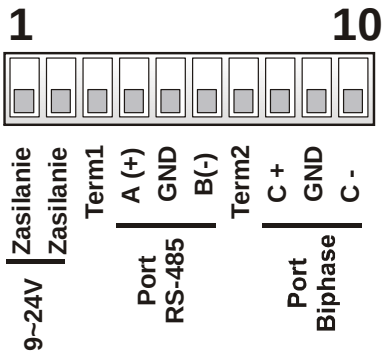


Example of connection

Description of connection terminals



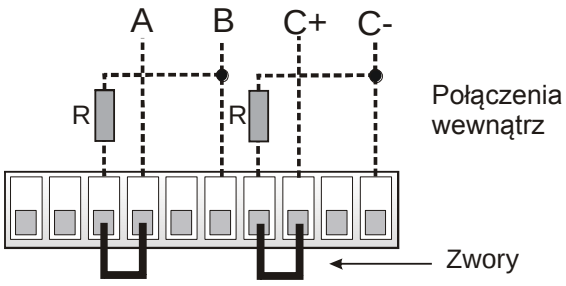
- **LED1** – Indication of receiving data
- **LED2 –** Indication of translating and sending data



Power Supply: 9~24V DC / AC
RS-485 A/B: RS-485 port, designed to other device with RS-485 port
Term1: End-of line resistor 120Ω for RS-485 port
Biphase +/-: Bi-Phase port, designed to connect other device with BiPhase port.
Term2: End-of line resistor 120Ω for Bi-Phase port
GND: Power ground terminals (cable shield)

RS-485 interface always must beconnect with respond rules **A** to **A** and **B** to **B**.

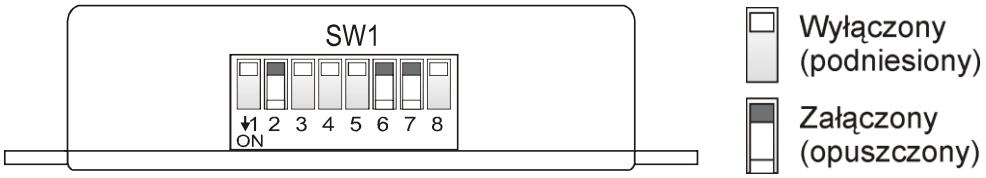
Biphase port must be connected to the terminals C + and C- in the Bosch camera or Divar /Video matrix - depend for configuration.



For longer cables of bus, both RS-485 and Biphase port should have closed End-of resistor. This will prevent wave reflections in cables, which are cause of transmission errors.
End-of resistors should be connected only in devices, which are of two ends of the bus. Too many resistors will cause an excessive burden of transmission.

End-of- line resistors are build in the code translator. To close the resistor connect wire links TERM1 with A+ and TERM2 with C+, respectively for the RS-485 and Bi-phase interface.

DIP Switches description



Switches destiny varies depending on the type of the selected conversion. DIP switch 7 defines the direction of the data conversion. **Switches must be set with the power off.**

Conversion BiPhase -> RS485 (Switch 7 – TURNED OFF)

Baud rate for RS-485	2400baud	4800baud	9600baud	19200baud
DIP 1	OFF	ON	OFF	ON
DIP 2	OFF	OFF	ON	ON

The baud rate is defined only for the RS-485 baud rate of the Bi-Phase is not changed.

Output protocol	Pelco-D	Pelco P without incrementing	Pelco P with incrementing address	Bosch / Philips RS485
DIP 3	OFF	ON	OFF	ON
DIP 4	OFF	OFF	ON	ON

Switch No. 3, is used to select the output protocol for RS-485 port. Biphase input protocol type is automatically detected. Increment address is the starting address of the camera to increase the value of 1 in relation to the input address. It is used for some cameras with Pelco-P protocol, which addressing range is possible from 1 rather than 0.

Protocol type Bosch / Philips RS485	Variable - Repetive	Variable Start / Stop	Fixed - Repetive	Fixed - Start/Stop
DIP 5	OFF	ON	OFF	ON
DIP 6	OFF	OFF	ON	ON

These switches are important if DIP3 and DIP4 switches are set to ON. Define one type of protocol Bosch / Philips. The description of each of the protocols has been described at the beginning of this manual.

Translation direction	BIPHASE TO RS-485	
DIP 7	OFF	

Address setting	Address programming mode	Normal operation mode
DIP 8	ON	OFF

List of commands for translation BiPhase to Pelco

Nr	Function of Bosch keyboard	Command of Pelco camera
1	Movement up / down / left / right	Movement up / down / left / right
2	Zoom in / Zoom out	Zoom + / Zoom -
3	Focus Far / Focus Near	Focus Far / Focus Near
4	Iris open / Iris close (not applicable for Fixed-Repetive protocol)	Iris + / Iris -
5	Call SHOT 1~100 / Set SHOT 1~100	Call Preset 1~100 / Set preset 1~100
6	Aux ON 1 ENTER	Start Auto-Scan Left-Right
7	Aux ON 2 ENTER	Auto-Pan
8	Recording A (Aux ON 100 ENTER)	Recording pattern
9	Stop recording (Aux OFF 100 ENTER)	Stop recording of pattern
10	Continous playback A (Aux ON 50 ENTER)	Playback of pattern
11	SET SHOT 101	Setting the left limit of the scan
12	SET SHOT 102	Setting the right limit of the scan

List of commands for translation BiPhase to Bosch RS-485 or Pelco

Protocols type Fixed-Start-Stop and Fixed-Repetive (Bi-Phase) do not contain information about the speed of traffic, so the conversion to Variable type of Bosch commands (RS-485) or on the Pelco command, the movement speed will always be constant. It is possible to change speed separately for horizontal and vertical movement in the range of 0-15 and is stored in non-volatile memory of the converter. Default speed is set to value 7.

Nr	Function of Bosch keyboard	Function
1	SET SHOT 98	Speed of horizontal movement **+1**
2	RUN SHOT 98	Speed of horizontal movement **-1**
3	SET SHOT 99	Speed of vertical movement **+1**
4	RUN SHOT 99	Speed of vertical movement **-1**

Translation RS485 -> BiPhase (Switch 7 – TURNED ON)

Transmission speed RS-485	2400baud	4800baud	9600baud	19200baud
DIP 1	OFF	ON	OFF	ON
DIP 2	OFF	OFF	ON	ON

The baud rate is defined only for the RS-485 baud rate of the Bi-Phase constant.

Input protocol	Pelco-D / Pelco P (autodetection)	Bosch / Philips RS485 (autodetection)
DIP 3	OFF	ON

Switch No. 3, is used to select the input protocol. Pelco P and Pelco D protocol are detected automatically. Bosch / Philips protocol type is also detected automatically after turn on switch DIP3.

Address decrement for Pelco P	Without decrement	Decrement included
DIP 4	OFF	ON

Decrement means reducing the camera address with a value of 1 after the conversion. This option is used for keyboards, which Pelco P protocol addresses can not start with a value of 0, but from 1.

Protocol type Bosch / Philips RS485	Variable - Repetive	Variable Start / Stop	Fixed - Repetive	Fixed - Start/Stop
DIP 5	OFF	ON	OFF	ON
DIP 6	OFF	OFF	ON	ON

Switches 5 and 6 determine the output protocol type for the Biphase port. The description of each of the protocols has been described at the beginning of this manual.

Translation direction		RS-485 TO BIPHASE
DIP 7		ON

Address setting	Address programming mode	Normal operation mode
DIP 8	ON	OFF

List of commands for translation Pelco to BiPhase

Nr	Function of Bosch keyboard	Command of Pelco camera
1	Move up / down / left / right	Move up / down / left / right
2	Zoom in / Zoom out	Zoom + / Zoom -
3	Focus Far / Focus Near	Focus Far / Focus Near
4	Iris open / Iris close (Nie dotyczy protokołu Fixed-Repetive)	Iris + / Iris -
5	Call Preset 1~100 / Set preset 1~100	Call SHOT 1~100 / Set SHOT 1~100
6	Learn Pattern	Start recording (ON 100 ENTER)
7	Stop learn pattern	Stop recording A (OFF 100 ENTER)
8	Run pattern	Continuous playback A (ON 50 ENTER)
9	Set left limit	Set the left limit of the scan (SET 101 ENTER)
10	Set right limit	Set the right limit of the scan (SET 102 ENTER)
11	Autopan Start	Start-up Auto-Pan (ON 2 ENTER)
12	Auto-scan start	Start-up Auto-scan (ON 1 ENTER)
13	Run preset 95	Access the menu (ON 46 ENTER)
	Run preset 100	Home route (ON 52 ENTER)
14	Run preset 101	Start-up Autotracking (ON 78 ENTER)
15	Run preset 102	Continuous playback B (ON 52 ENTER)
16	Run preset 103	Clear alarm (OFF 65 ENTER)
17	Run preset 115	Stop recording B (OFF 101 ENTER)
18	Run preset 123	Turn off OSD (OFF 6- ENTER)
19	Run preset 124	Home position – calibration (SET 110 ENTER)
20	Run preset 126	Display fast address (ON 997 ENTER)
21	Run preset 127	Lock menu (OFF 90 ENTER)
22	Run preset 128	**Start-up procedure AUX OFF**
23	Set Preset 115	Start recording B (ON 101 ENTER)
24	Set Preset 116	Edit scene names (ON 62 ENTER)
25	Set Preset 117	Edit presets (SET 100 ENTER)
26	Set Preset 118	Edit route (SET 900 ENTER)
27	Set Preset 119	Inactivity (ON 9 ENTER)
28	Set Preset 120	Edit password (SET 802 ENTER)
29	Set Preset 121	Rate of route (ON 15 ENTER)
30	Set Preset 122	Rate of scan (ON 14 ENTER)
31	Set Preset 123	Switchin OSD (ON 6- ENTER)
32	Set Preset 125	Edit zones names (ON 63 ENTER)
33	Set Preset 127	Unlock menu (ON 90 ENTER)
34	Set preset 128	**Start-up procedure AUX ON**

List of commands for conversion Bosch RS-485 to Biphase

Protocols commands of Bosch, Philips type Fixed-Start-Stop and Fixed-Repetive (RS-485) type do not contain information about the speed of traffic, so the conversion to commands of Variable type (sent by the port Biphase) movement speed will always be constant, it is possible, however, the change separately for vertical and horizontal movements. The adjustment range is 0-15 and is stored in the nonvolatile memory. Default speed is set to value 7.
The following operations are effective only for protocol RS-485 input Bosch / Philips.

Nr	Function of Bosch keyboard	Function
1	SET SHOT 98	Speed of horizontal movement **+1**
2	RUN SHOT 98	Speed of horizontal movement **-1**
3	SET SHOT 99	Speed of vertical movement **+1**
4	RUN SHOT 99	Speed of vertical movement **-1**

AUX FUNCTION support

Bosch camera supports 1023 AUX special commands that are designed to perform a specific function, among other things, of remote addressing (Fast-address).
Because Pelco does not provide transmission of such commands, the translator has the AUX function activation by a combination of functions Set Preset / Call Preset. The following describes the principles and examples AUX send commands and examples.
Moving the joystick between steps to cancel the procedure AUX. Entering a value outside the scope of the procedure to cancel the AUX.

NOTE! The described procedure works correctly only with keyboards that send preset commands only one time when you call. Some keyboards may overlap with each PRESET command, in which case use the AUX function becomes impossible.

SENDING AUX ON 1~99

[SET PRESET 128] + [SET PRESET 1~99] + [SET PRESET 128]
Command type *Value* *Acceptance*

SENDING AUX ON 101 – 1023

[SET PRESET 128] + [SET PRESET 1~10] + [SET PRESET 1~99]*
Command type *value * 100* *value *1*

* because it does not provide Pelco preset No. 00 to enter this value as the second digit, enter a value of 100. The same principle applies to the AUX 200, 300, 400 ... etc

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SENDING AUX OFF 1~99

[CALL PRESET 128] + [CALL PRESET 1~99] + [CALL PRESET 128]

SENDING AUX OFF 101 - 1023

[CALL PRESET 128] + [CALL PRESET 1~10] + [CALL PRESET 1~99]*

* because it does not provide Pelco preset No. 00 to enter the value as a second position, enter a value of 100. The same principle applies to the AUX 200, 300, 400 ... etc

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Examples:

SENDING AUX ON 50

[SET PRESET 128] + [SET PRESET 50] + [SET PRESET 128]

SENDING AUX OFF 101

[CALL PRESET 128] + [CALL PRESET 1] + [CALL PRESET 1]

SENDING AUX ON 100

[SET PRESET 128] + [SET PRESET 1] + [SET PRESET 100]

SENDING AUX ON 997

[SET PRESET 128] + [SET PRESET 9] + [SET PRESET 97]

Example of remote change of FastAddress for camera G4 series

Step	Operation	Sequence from Pelco keyboard	The message on the screen after the operation
1	**Select from the keyboard camera target number for which you want to change the address of one of any cameras.** Exactly follow the messages on the screen, they will appear on all Bosch cameras at the same time, however, some of them may be different than shown below; depending on their current address and model.		
	ON-999-ENTER	[Set preset 128]+ [Set preset 9] + [Set preset 99]	To change or delete an address, press the ON-224-ENTER
2	ON-224-ENTER	[Set preset 128] + [Set preset 2] + [Set preset 24]	To continue FastAddressing, press the ON-240-ENTER
3	ON-240-ENTER	[Set preset 128] + [Set preset 2] + [Set preset 40]	To enter a new address, press the ON-1-ENTER
4	ON-1-ENTER	[Set preset 128]+ [Set preset 1] + [Set preset 128]	New Fastaddress: (new address)

Known Problems and Solutions

Conversion from Pelco-D or Bosch RS485 to BiPhase - no control of Bosch camera - Green LED flashes while controlling, red LED does not blink.

1. Check the regularity of connection of the RS-485 to the keyboard and the converter.
2. Check the baud RS-485 in converter and keyboard, both should be consistent.
3. Check that in the keyboard was definitely selected PelcoD or PelcoP protocol.

Conversion from Pelco-D or Bosch RS485 to BiPhase - no control of Bosch camera - Green LED flashes while controlling, red LED flashes from time to time.

1. Check the regularity of connection of the RS-485 to the keyboard and the converter.
2. Check that the RS-485 termination resistors are included in the keyboard and the converter, if the distance between the converter and the keyboard are above 100mm.
3. Check the stability of the power converter.

Conversion from Pelco-D or Bosch RS485 to BiPhase - no control of Bosch camera - the green LED is constantly on, red LED blinking.

1. Check the regularity of connection of the RS-485 to the keyboard and the converter.
2. Check the stability of the power converter.
3. Check that between the keyboard and the converter there are no potential differences may be necessary to connect the GND terminal of the converter and keyboard.

Conversion from Pelco-D or Bosch RS485 to BiPhase - no camera control Bosch - the green LED is constantly lit, red LED flashes during the control.

1. Check the regularity of connection of the BiPhase to Bosch camera.
2. Some cameras (G4 series) require a termination resistor switch for Biphase in the converter.
3. In extreme circumstances, you may need to connect the resistors 150 ~ 220OHM series to line C + and C-.
4. Check that the camera is set to the correct address.
5. Check the switch DIP4 setting in the converter.

Conversion from BiPhase to Pelco or RS-485 Bosch - no control Pelco or Bosch - the green LED is constantly on, red LED flashes during operation.

1. Check the correctness of wiring BiPhase to the keyboard, or matrix Divar'a Bosch / Philips.

Conversion from BiPhase on Pelco or RS-485 Bosch - no control Pelco or Bosch - the green LED is constantly on, red LED flashes irregularly or when controlling lights up permanently.

1. Check the correctness of wiring BiPhase to the keyboard, or matrix Divar'a Bosch / Philips.
2. There may be strong interference on the bus or potential differences, connect the GND terminal to ground converter recorder / matrix / keyboard.
3. Attach a termination resistor for the output of the converter BiPhase.

Conversion from BiPhase to Pelco or RS-485 Bosch - no control Pelco or Bosch - Green LED flashes, red LED flashes during operation.

1. Check the regularity of connection of the RS-485 cables to the camera, baud rate and address of the camera.
2. Check the connection of termination resistors for RS-485 and bus topology. Test the system by connecting only one camera.
3. Check the camera protocol. Some cameras are compatible with the Bosch / Philips but only with repetive start-stop type. You should change the converter setting.

Failed to start the unit in spite of these tips? Contact Technical Service of Mtechnology