



## BBV RS422 Telemetry Control Protocol V2 Jan 08



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## **BBV RS422 Telemetry Control Protocol**

This document describes the protocol used to drive RX457, RX557 and BBV StarCard Converters.

Baud Rate: 9600  
Parity: None  
Data Bits: 8  
Stop Bits: 1

The protocol is designed as a single direction, multi-drop RS422 protocol. The RX457, AC telemetry receiver and RX557, DC telemetry receiver will be able to provide positional information that will require a separate data pair.

Each command comprises of 8 bytes as follows:

Byte 1 - BBV STX (0xB0)  
Byte 2 - Address (0 - 95) 0 = address 1, 95 = address 96  
Byte 3 - Described Below  
Byte 4 - Described Below  
Byte 5 - Described Below  
Byte 6 - Described Below  
Byte 7 - BBV ETX (0xBF)  
Byte 8 - Checksum (XOR of Bytes 1, 2, 3, 4, 5, 6 & 7)

There are two types of command; manual movement commands and additional commands. Byte 4 bit 0 is used to select the command type. Manual commands are selected when Byte 4 bit 0 is 0 and additional commands are selected when Byte 4 bit 0 is 1.

### **Manual Movement Commands – Byte 4 bit 0 = 0**

Byte 3 Bit 7 – ALWAYS 0  
Bit 6 – Future Expansion  
Bit 5 – Future Expansion  
Bit 4 – Future Expansion  
Bit 3 – IRIS CLOSE  
Bit 2 – IRIS OPEN  
Bit 1 – FOCUS FAR  
Bit 0 – FOCUS NEAR

Byte 4 Bit 7 – ALWAYS 0  
Bit 6 – ZOOM OUT (WIDE)  
Bit 5 – ZOOM IN (TELE)  
Bit 4 – TILT DOWN  
Bit 3 – TILT UP  
Bit 2 – PAN LEFT  
Bit 1 – PAN RIGHT  
Bit 0 – ALWAYS 0 FOR MANUAL COMMANDS

Byte 5 Pan Speed, 0x00 – 0x40, 0x00 = SLOWEST, 0x40 = FASTEST

Byte 6 Tilt Speed, 0x00 – 0x3F, 0x00 = SLOWEST, 0x3F = FASTEST

Additional Commands – Byte 4 bit 0 = 1

To select an additional command instead of a manual command Byte 4 bit 0 must be set to 1. The following table indicates the commands possible and the Byte values.

COMMAND	BYTE 3	BYTE 4	BYTE 5	BYTE 6
SAVE PRESET	0x00	0x03	0x00	0x01 – 0x20 (1 – 32)
ERASE PRESET	0x00	0x05	0x00	0x01 – 0x20 (1 – 32)
GO TO PRESET	0x00	0x07	0x00	0x01 – 0x20 (1 – 32)
LIGHTS RELAY ON	0x00	0x09	0x00	0x01 (auxiliary 1 ON) (see notes for 24June04 on page 3)
LIGHTS RELAY OFF	0x00	0x0B	0x00	0x01 (auxiliary 1 OFF) (see notes for 24June04 on page 3)
WIPER RELAY ON	0x00	0x09	0x00	0x02 (auxiliary 2 ON)
WIPER RELAY OFF	0x00	0x0B	0x00	0x02 (auxiliary 2 OFF)
WASH RELAY ON	0x00	0x09	0x00	0x03 (auxiliary 3 ON) (see notes for 24June04 on page 3)
WASH RELAY OFF	0x00	0x0B	0x00	0x03 (auxiliary 3 OFF) (see notes for 24June04 on page 3)
AUTOPAN ON	0x00	0x07	0x00	0x63 (goto preset 99)
AUXILIARY ON	0x00	0x09	0x00	0x01 – 0x08
AUXILIARY OFF	0x00	0x0B	0x00	0x01 – 0x08
ZOOM LENS SPEED	0x00	0x25	0x00	0x00 – 0x03
DISPLAY MENU TX1500 1 #	0x00	0x03	0x00	0x5F (SAVE PRESET 95)
TX1500 2 #	0x00	0x07	0x00	0x21 (GO TO PRESET 33)
TX1500 3 #	0x00	0x07	0x00	0x5E (GO TO PRESET 94)
TX1500 4 #	0x00	0x0F	0x00	0x00
RUN PATROL 1	0x00	0x07	0x00	0x61 (GO TO PRESET 97)
RUN PATROL 2	0x00	0x07	0x00	0x62 (GO TO PRESET 98)
AUTOPAN	0x00	0x07	0x00	0x63 (GO TO PRESET 99)
*REPORT POSITION	0x00	0x03	0x00	0x63 (SAVE PRESET 99)

The REPORT POSITION command is intended to be used to allow the RX457 or RX557 to report back the current pan/tilt/zoom and focus preset positions when installed with a preset pan/tilt head and lens. Each position will give a value between 0 and 1023 depending on the limit stop positions and pan/tilt and lens type.

This feature is not currently supported however the proposed response would be.

0xB0, ADDRESS, PAN HIGH, PAN LOW, TILT HIGH, TILT LOW, ZOOM HIGH, ZOOM LOW, FOCUS HIGH, FOCUS LOW, 0xBF, CHECKSUM

Each value will be sent as two bytes with bit 7 = 0 as shown in the example for Pan Positions.

PAN LOW      Bit 7 = 0  
                  Bit 0 – 6 = bits 0 – 6 of value

PAN HIGH     Bit 7 = 0  
                  Bit 0 – 2 = bits 7 – 9 of value

The Checksum will be the XOR of all bytes from 0xB0 to 0xBF

Revision changes:

24June04 – WASH and LIGHTS auxiliary numbers have been swapped as the previous document was in error. LIGHTS should be auxiliary 1 and WASH should be auxiliary 3.







## Other BBV products.

Product	Description
<b>TX300</b>	Single camera desktop telemetry transmitter with BBV up-the-coax & 20mA telemetry, Pan/Tilt/Lens & Lights
<b>TX400</b>	As TX300 inc Wash, Wipe, Autopan, 8 presets, preset patrol.
<b>TX400DC</b>	As TX400 including joystick for proportional Pan/Tilt control.
<b>TX1000 MK2</b>	8 or 16 camera, 2 monitor telemetry transmitter. Up to 2 keyboards. BBV up-the-coax and RS422 standard with options for alarm inputs and 20mA telemetry.
<b>TX1500</b>	Mid size matrix 16 – 96 camera, 8 monitor. Up to 4 control positions (keyboard & remote control) options for alarms, remote control, BBV up-the-coax and RS485 telemetry.
<b>FBM range</b>	Large size matrix. Configurable up to 4096 cameras and 64 monitor outputs. Up to 8 control positions (keyboard & remote control) options for alarms, remote control RS485 telemetry with various options. Please call to discuss requirements.
<b>RX100</b>	Dome Interface with options to drive a large library of dome cameras. BBV up-the-coax and 20mA telemetry.
<b>RX200</b>	AC receiver for Pan only heads or static cameras, Wash/Wipe/Lights. BBV up-the-coax and 20mA telemetry.
<b>RX300</b>	AC receiver for Pan/Tilt/Zoom/Focus/Iris Override and 1 Auxiliary output. BBV up-the-coax and 20mA telemetry.
<b>RX400P</b>	AC full function receiver. PTZFI 4 Auxiliary outputs, 16 presets. BBV up-the-coax and 20mA telemetry.
<b>RX400DC</b>	24Vdc high/variable speed receiver. 16 presets, 8 local alarm inputs, 3 Auxiliary outputs. BBV up-the-coax and 20mA telemetry.
<b>RX45X (AC)</b> <b>RX55X (DC)</b>  Multi RS485 protocol and BBV up-the-coax telemetry receivers	Multiple RS485/422 and BBV up-the-coax controllable AC and DC receivers. These receivers are controlled from an expanding range of serial protocols as listed below. 110/230Vac supply. PTZFI, 64 presets, preset patrol, 8 local alarm inputs, 12V 500mA supply output. OSD for remote diagnostics. 3 Aux. outputs RX55X or 4 Aux. outputs RX45X. Optional Privacy board. BBV RS485, COAX & 20mA, BAXALL COAX, DENNARD RS485, MOLYNX PELCO P/D RS485, VCL/HONEYWELL RS485, PHILIPS/BOSCH RS485 (OPTIONAL BI-PHASE INPUT), SENSORMATIC/AD RS422 VICON RS422 CIRRUS AUDIO MONITORING
<b>STARCARD</b> STARCARD/CONVERTER	8 * RS485 output, 2 wire simplex RS422, 4 wire full-duplex RS422, 2 wire half-duplex RS485. Optional STARCARD/CONVERTER offering protocol conversion to drive an increasing range of 3 <sup>rd</sup> party protocols.
<b>ACCESSORIES</b>	CTI/16 16 camera, RS422 to up-the-coax converter TxLD (bidirectional RS422-RS232 converter) 98005 (bidirectional 20mA-RS232 converter) AD RS422 (American Dynamics) protocol converters