BBV Protocol Document

20mA Twisted Pair & up-the-coax
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Introduction

Each receiver is star-wired from the telemetry transmitter. Multi-drop addressed receivers are not supported with this protocol. The telemetry information frames are identical for both up-the-coax telemetry and twisted pair telemetry.

20mA twisted pair telemetry

Frame Coding
The frame is coded as an asynchronous serial data word, comprising;
1 Start bit
8 Data bits
1 Parity bit (Even)
1 Stop bit

Baud Rate = 1200

Up-the-coax telemetry

Transmission Line Coding
The transmitted telemetry information is coded as a sequence of sequential data frames.

Bit Coding
The individual bits are coded as two FSK frequencies superimposed onto the video signal in the frame blanking period.
Logic 0: 222Khz
Logic 1: 250Khz

Frame Coding
The frame is coded as an asynchronous serial data word, comprising;
1 Start bit @ Logic 0
8 Data bits
1 Parity bit (Even)
1 Stop bit @ Logic 1

The telemetry is inserted on the video signal using a series resistor. With a PIC processor port pin generating the telemetry a value of 2K2 is used.

Approx 110uS after the rising edge of frame sync 250uS of carrier @ Logic 1 (preamble) is transmitted to ensure that the PLL in the FSK decoder has locked. The following bits are then transmitted: 1 start bit - logic 0, 8 data bits, 1 even parity bit, 1 stop bit – logic 1

The data rate is a nominal 19.8Kbit/second (-0.4K + 0.7K). This yields a nominal bit time of 50.5uS.

Telemetry Frame Data
The frame consists of four frame ID bits and four data bits.

7	6	5	4	3	2	1	0
Frame ID				Frame Data			

Transmission Frame Data Formats
The format of each transmitted data frame is as follows:

Frame ID	D3	D2	D1	D0
0	Focus Near = 1 Far = 0	Focus Active = 1	Zoom In = 1 Out = 0	Zoom Active = 1
1	Not used	Lights On = 1 Off = 0	Iris Open = 1 Close = 0	Iris Active = 1
2	Tilt Down = 1 Up = 0	Tilt Active = 1 **When tilt becomes inactive, set tilt speed to 0 in Frame 12**	Pan Right = 1 Left = 0	Pan Active = 1 **When pan becomes inactive, set pan speed to 0 In Frame 13**
3	Wash	Wipe	AutoPan	Not used
4 see note	**FUNCTION 4**	**FUNCTION 3**	**FUNCTION 2**	**FUNCTION 1**
5	Spare 8	Spare 7	Spare 6	Spare 5
6 (Not used)				
7 (Not used)				
8 (Not used)				
9 (Not used)				
10 (Not used)				
11 (Not used)				
12	Tilt Speed			
13	Pan Speed			
14	Select Operation Preset Number			
15	Code Function			

FUNCTION 1 – 4 (Frame 4) Previously known as SPARE 1 - 4
These are very special features that are used to allow access to extended functions with certain BBV receivers. In addition when used with Rx100/dome interface, allows navigation of dome's menu structure. If you are supporting BBV protocol please ensure that you support these commands so that all the features of the RX100 dome interface are supported.

Failing to support these features will only allow basic dome functionality.

Tilt Speed (Frame 12)
The head tilt speed is specified in frame 12, 0 = slowest speed , 15 = fastest speed. Actual speed will depend upon the pan/tilt head and receiver speed settings.
Set to 0 when tilt is inactive.

Pan Speed (Frame 13)
The head pan speed is specified in frame 13. Range is as frame 12.
Set to 0 when pan is inactive.

Preset Number (Frame 14)
Specifies the preset number when a command requires it, see frame 15 below.

Code Function Table (Frame 15)

This table shows the function codes provided to the telemetry receiver using frame 15. When a command from this frame is required it is inserted into the normal transmission sequence for a single cycle.

Function Code (Hex)	Operation
0	No Action
1	Program Iris Level
2 (Note 1)	Goto Preset
3 (Note 1)	Program Preset
4	Initiate Self Test
5 (Note 1)	Erase Preset
6 (Note 1)	Remove Preset from Patrol 1
7 (Note 1)	Remove Preset from Patrol 2
8	Start Patrol 1
9	Start Patrol 2
A (Note 2)	Set Patrol 1 Delay Time
B (Note 2)	Set Patrol 2 Delay Time
C	Unused
D	Unused
E	Unused
F	Unused

Note 1: The preset number is specified in frame 14.

Note 2: The delay time is based on value transmitted in frame 14.
0, delay = random time 0 - 100 seconds
1 - 15, delay = (n - 1) * 12 seconds, i.e. 1 = 12 seconds, 2 = 24 seconds etc

Frame Sequencing

Under idle conditions frames 0, 1, 2, 3, 12 & 13 are transmitted repeatedly. If a function command is required then frames 14 & 15 are inserted into the sequence at the next available slot. These will only be transmitted once before the normal sequence is resumed. Additionally if a 'Spare' command is required then frame 4 or 5 will be transmitted once in the sequence.

When the state of a frame changes then it is elevated to the next frame transmission slot to improve response time.

Notes

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Other BBV products.

Product	Description
TX300	Single camera desktop telemetry transmitter with BBV up-the-coax & 20mA telemetry, Pan/Tilt/Lens & Lights
TX400	As TX300 inc Wash, Wipe, Autopan, 8 presets, preset patrol.
TX400DC	As TX400 including joystick for proportional Pan/Tilt control.
TX1000 MK2	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.
TX1500	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.
FBM range	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.

RX100	Dome Interface with options to drive a large library of dome cameras. BBV up-the-coax and 20mA telemetry.
RX200	AC receiver for Pan only heads or static cameras, Wash/Wipe/Lights. BBV up-the-coax and 20mA telemetry.
RX300	AC receiver for Pan/Tilt/Zoom/Focus/Iris Override and 1 Auxiliary output. BBV up-the-coax and 20mA telemetry.
RX400P	AC full function receiver. PTZFI 4 Auxiliary outputs, 16 presets. BBV up-the-coax and 20mA telemetry.
RX400DC	24Vdc high/variable speed receiver. 16 presets, 8 local alarm inputs,3 Auxiliary outputs. BBV up-the-coax and 20mA telemetry.

RX45X (AC) RX55X (DC) 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

STARCARD STARCARD/CONVERTER	8 * RS485 output, 2 wire simples RS422, 4 wire full-duplex RS422, 2 wire half-duplex RS485. Optional STARCARD/CONVERTER offering protocol conversion to drive an increasing range of 3rd party protocols.

ACCESSORIES	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