Installation Guide

Models covered

RS485 StarCard including optional Telemetry Protocol Converter

This manual covers software version CONV1_V15. Refer to addendum if using different software.

BBV RX450/550, CBC SMD20/Star MD2000/Sanyo VCC9200P, Chugai/Ganz ZC-S122/123, Dennard 2050, JVC 676, Mark Mercer, Molynx 250/260, Panasonic CS850/860, Pelco P , Pelco D, 360 Vision, VCL, Vicon Surveyor, Vista PowerDome, Samsung 641/643 dome 421P camera, Meyertech ZVR510 VICTA protocol, Philips RS232/485 (bi-phase via Philips LTC8780/50)

Building Block Video Ltd.,
17 Apex Park,
Diplocks Industrial Estate,
Hailsham, East Sussex, BN27 3JU UK.
Tel: +44(0)1323 842727
Fax: +44(0)1323 842728
Support: +44(0)1323 444600
www.bbvcctv.com

1. PRE-INSTALLATION CHECKS AND SAFETY PROCEDURES

UNPACKING

Check Packaging - Upon taking delivery of the unit, inspect the packaging for signs of damage. If damage has occurred, advise the carriers and/or the suppliers immediately.

Check Contents - Upon taking delivery of the unit, unpack the receiver carefully and check that all the items are present and correct. If any items are missing or damaged, contact your equipment dealer.

Retain Packaging - The shipping carton is the safest container in which to transport the unit. Retain undamaged packaging for possible future use.

IMPORTANT SAFETY PRECAUTIONS

Read Instructions - All relevant safety, installation and operating instructions should be read before attempting to install, connect or operate the unit.

Retain Instructions - All safety, installation and operating instructions should be retained for future reference.

Heed Warnings - All warnings on the unit and in any relevant safety, installation or operating instructions should be adhered to.

Cleaning - Unplug the unit from the power outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.

Water and Moisture - Do not expose the internal electronics of this unit to water or dampness; for example, in an unprotected outdoor installation, or in any area classified as a wet location. The unit as supplied conforms to ingress protection rating IP 67. This rating will be affected by any holes made in the enclosure. Cable entry points should be protected by the use of suitably rated glands and/or flexible conduit. It is not necessary to make further holes in the enclosure for mounting purposes, as mounting holes are provided at the corners of the enclosure outboard of the seal between enclosure and lid.

Accessories - Do not attach this unit to an unstable stand, bracket or mount. The unit may fall, causing serious injury to a person and serious damage to the unit.

Power Sources - This unit should be operated only from the type of power source indicated on the manufacturer's label. If you are not sure of the type of power supply you intend to use, consult your equipment dealer or local power company. For units intended to operate from battery power or other sources, refer to operating instructions.

Overloading - Do not overload outlets and extension cords, as this can result in fire or electric shock.

Object and Liquid Entry - Never push objects of any kind into the unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on or inside the unit.

Servicing - Servicing of the unit should only be undertaken by qualified service personnel, as opening or removing covers may expose you to dangerous voltages or other hazards.

Damage Requiring Service - Servicing by qualified personnel should be carried out under the following conditions:

(a) When the power-supply cord or plug is damaged;
(b) If liquid has been spilled, or objects have fallen into, the unit;
(c) If the internal electronics of the unit have been exposed to rain or water;
(d) If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to normal operation;
(e) If the unit has been dropped or the enclosure is damaged;
(f) If the unit exhibits a distinct change in performance. This indicates a need for service.

Replacement Parts - If replacement parts are required, ensure that only replacement parts recommended by the product manufacturer are used.

Safety Check - Upon completion of any service or repairs to the unit, safety checks should be performed to ensure that the unit is in proper operating condition.

Coax Grounding - If an outside cable system is connected to the unit, be sure the cable system is grounded.

Pre-installation Checks - It is recommended that the unit be bench-tested prior to installation on the site.

Adhere to Safety Standards - All normal safety precautions as laid down by British Standards and the Health and Safety at Work Act should be observed.

WARNING
TO PREVENT DANGER OF FIRE OR SHOCK, DO NOT EXPOSE THE INTERNAL COMPONENTS OF THIS EQUIPMENT TO RAIN OR MOISTURE.

The “lightning flash with arrowhead” symbol inside an equilateral triangle is used to warn the user of this equipment that there are sufficiently high voltages within the enclosure to constitute a risk of electric shock.

The “exclamation point” symbol inside an equilateral triangle is used to alert the user of this equipment to important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Technical Specification

Power Requirements	9Vdc 500mA
Inputs	2 or 4 wire RS485 (switch selectable)
Outputs	8 * 2 or 4 wire RS485 (switch selectable – DEFAULT 4 WIRE) Maximum cable run approx. 4000 Feet/1200M
Facilities	LED as power and data indication
Other Outputs	RS232 monitor output via chassis mounted DB9 connector.
Boxed Dimensions	Available to mount in BBV TX1500 sub rack or fitted in 19" 1 U rack 100mm deep rack mountable case.
Options	**STARCARD/CONVERTER** Internally fitted Telemetry Protocol Conversion board

Starcard/Converter Software Version History

V15 20 Feb 2004	1. Added support for Philips RS232 protocol (bi-phase via LTC8780/50)
V14 4 Jan 2004	1. Added support for Meyertech VICTA output protocol. 2. Bug fix to allow tri-state output to work correctly with a 02005 PCB. 3. Couple of changes to Molynx protocol to correctly drive focus with RX318
V13 7 Nov 2003	1. SW2 output protocol switch settings changed to support additional protocols. 2. Added support for Vista PowerDome 3. Added support for Samsung SCC-641/643 dome and zoom/focus with SCC421P static camera. 4. 4# now performs a remote reset with VCL dome output protocol.
V12 10 Sept 2003	1. Added support for CBC SMD20/Star MD2000/Sanyo VCC9200P from BBV. 2. Added support for Vicon Surveyor from BBV. 3. VCL output protocol additional features added. 4. Fix to 360 Vision checksum routine. 5. Ganz ZC-S122/123 camera sync now set for Line Lock.
V10 11 June 2003	1. Added support for 360 Vision output protocol controlled from BBV 2. Added support for 360 Vision output protocol from VCL protocol.
V9 13 May 2003	1. Added support for Pelco P and Pelco D output protocol 2. BBV, VCL, DENNARD and MARK MERCER output protocols fixed at 9600,N,8,1 3. BBV input protocol is now fixed at 9600,N,8,1
V8 20 Mar 2003	1. Added support to control Molynx 250/260 telemetry receivers
V7 27 Feb 2003	1. Added support to control BBV RX450 AC & RX550 DC receivers 2. Added support to control Chugai/Ganz ZC-S122/123 dome
V6 12 Feb 2003	1. Improved control of Panasonic WV-CS850/860 dome. 2. 2 Patrol will now start ALL domes patrolling 3. Added support for BW mode selection
V5 11 Feb 2003	1. Added support for BBV RS485 output 2. Added support for JVC TK-C676 protocol
V4 5 Feb 2003	1. Added support for Panasonic WV-CS850/860 RS485 dome protocol from BBV. 2. DM connection details were incorrect, diagram now corrected.
V3 4 Dec 2002	1. Addition of protocol conversion module.

2. INTRODUCTION

GENERAL

The RS485 Star Card is designed to simplify the installation of RS485 telemetry systems.

Eight individual outputs are provided. Each output can be connected to a single dome/receiver or up to 32 domes/receivers wired as a daisy chain. When the domes/receivers are wired as a daisy chain, the last unit's RS485 must be terminated and the intermediate units must be un-terminated. With a single dome connected to each output, the RS485 must be terminated.

The Star Card can be used with either 2 wire, half duplex; or 4 wire, full duplex systems.

It has been tested with the Panasonic FS616 multiplexer in 2 and 4 wire modes and with the SX350 video matrix in 2 wire mode.

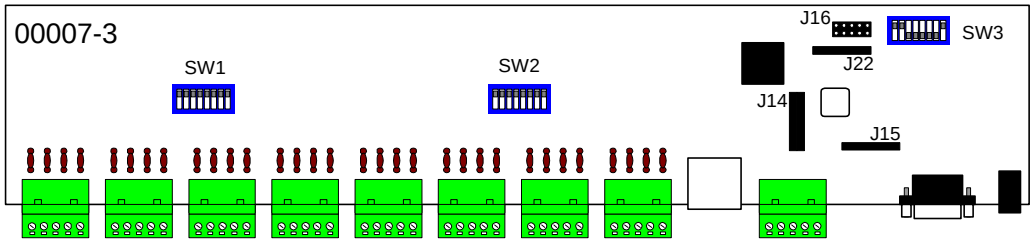
The Star Card can also be used with single direction RS485 links, for example the RS485 output of DM Systems Sprite and Digital Sprite range of multiplexers and Integral Technologies DVX range.

The Star Card is protocol independent and will work at up to 19200 baud. It is recommended that when used with extended cable distances and/or noisy environments 9600 baud is used to prevent control problems.

A RS232 serial output is provided via a DB9F to aid with diagnostic and trouble shooting.

The following pages showing wiring details when used in 2 and 4 wire systems.

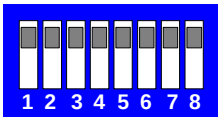
Internal view of starcard showing switch settings



Starcard PCB Switches

SW1 - RS485 line termination for outputs 1 - 4 ON = termination ON (Default)

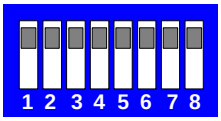
SW1/1 & 1/2 = Output 1 termination
SW1/3 & 1/4 = Output 2 termination
SW1/5 & 1/6 = Output 3 termination
SW1/7 & 1/8 = Output 4 termination



SW1 setting showing termination ON

SW2 - RS485 line termination for outptus 5 - 8 ON = termination ON (Default)

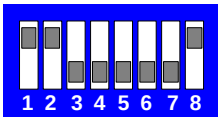
SW2/1 & 2/2 = Output 5 termination
SW2/3 & 2/4 = Output 6 termination
SW2/5 & 2/6 = Output 7 termination
SW2/7 & 2/8 = Output 8 termination



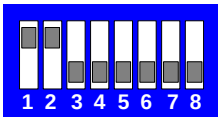
SW2 setting showing termination ON

SW3 - Option selection.
SW3/1 and SW3/2 - RS485 input line termination ON = termination ON (Default)
SW3/3-7 MUST BE OFF
SW3/8 - 2 or 4 wire selection. ON = 2 WIRE, OFF = 4 WIRE

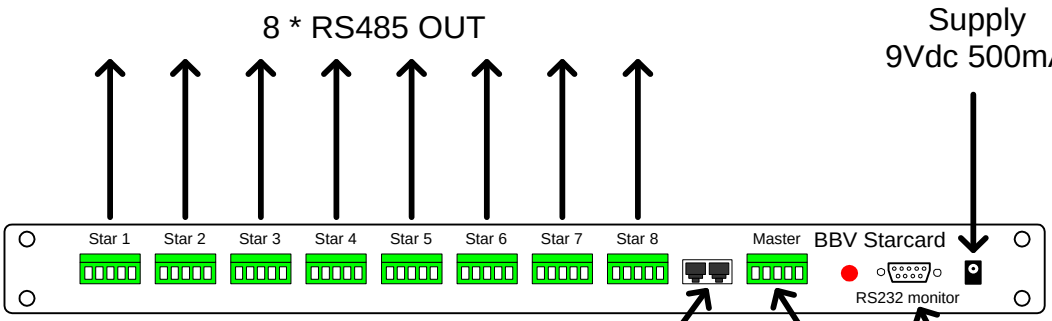
SW3 setting showing 2 wire mode selected and RS485 input termination ON



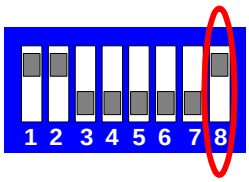
SW3 setting showing 4 wire mode selected and RS485 input termination ON



2 wire half-duplex mode

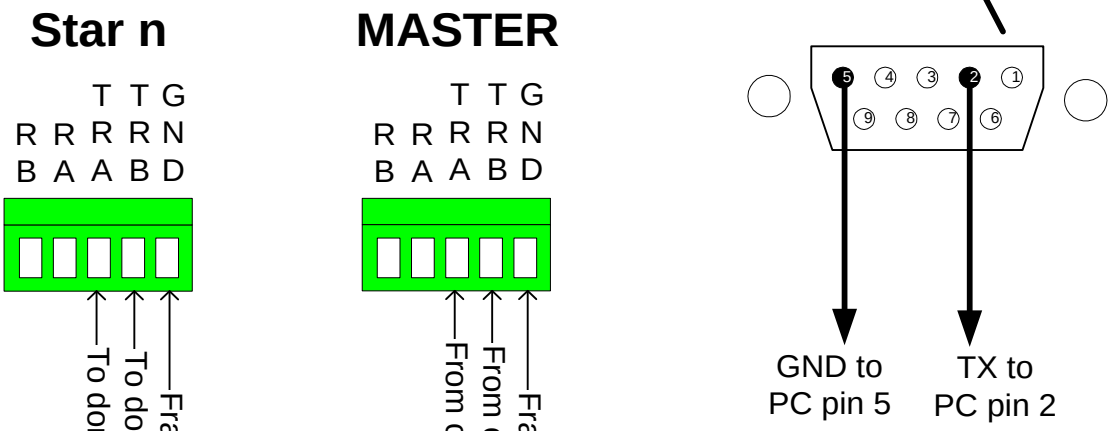


SW3 must be configured for 2 Wire as below: SWITCH 8 ON



BBV RS485 or RS485 IN

Close up view showing RS485 connection into and out of the Star Card.



RS485 network length maximum 1200M per output.

Please remember to terminate the last dome of each output.

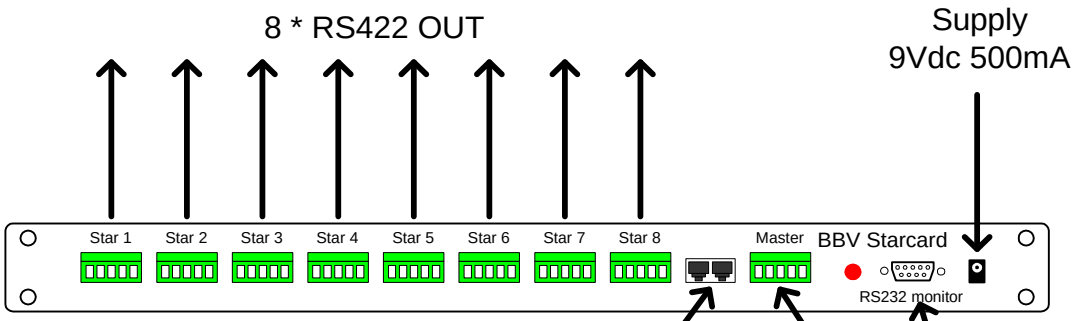
The RS232 output can be taken into a PC/laptop to allow the Starcard output to be displayed using Hyperterminal, Telix or other comms program.

The baud and parity settings should match the values chosen with SW2.

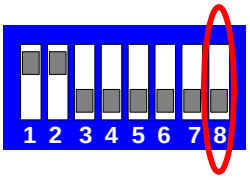
2 wire RS485 notes.
1. Ensure that the dome/receiver is set for 2 wire telemetry, half-duplex.
2. The controller must be set for 2 wire using either a rear panel switch or menu access. Half duplex must be selected from within the setup menu.
3. Baud rates for the controller and dome/receivers must be the same. It is advisable to use 9600 baud to reduce the possibility of corrupted data causing intermittent control.

Panasonic Specific notes:
FS616 - A single RS485 output is available. Connect the RS485 output to the star card as shown.
SX350 - Two RS485 outputs are available.
SX550/850 - Not required as each matrix RS485 output card has eight individual outputs.

4 wire full-duplex mode

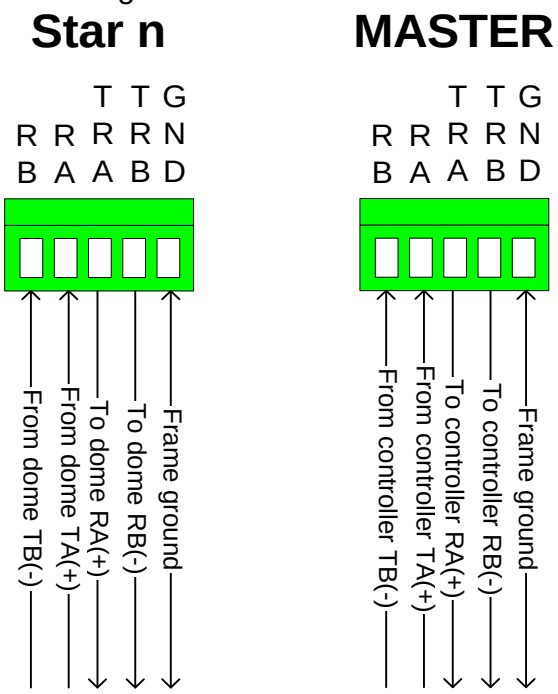


SW3 must be configured for 4 Wire as below: SWITCH 8 OFF



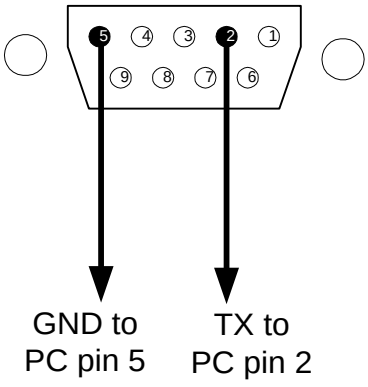
BBV RS422 or RS422 IN

Close up view showing RS422 connection into and out of the Star Card.



RS422 network length maximum 1200M per output.

Please remember to terminate the last dome of each output.



The RS232 output can be taken into a PC/laptop to allow the Starcard output to be displayed using Hyperterminal, Telix or other comms program.

The baud and parity settings should match the values chosen with SW2.

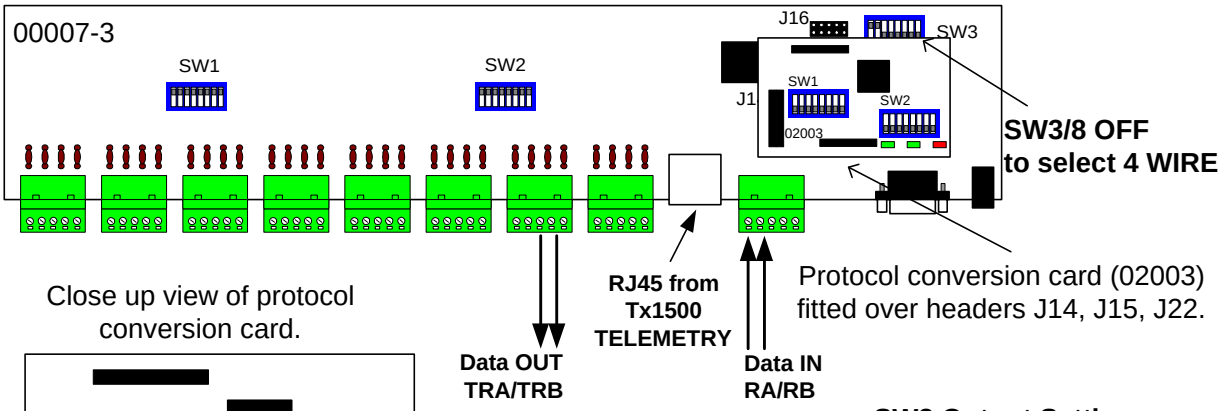
4 wire RS422 notes.
1. Ensure that the dome/receiver is set for 4 wire telemetry, full-duplex.
2. The controller must be set for 4 wire using either a rear panel switch or menu access. Full duplex must be selected from within the setup menu.
3. Baud rates for the controller and dome/receivers must be the same. It is advisable to use 9600 baud to reduce the possibility of corrupted data causing intermittent control.

Panasonic Specific Notes:
FS616 - A single RS485 output is available. Connect the RS485 output to the star card as shown.
SX350 - Not compatible with 4 wire telemetry.
SX550/850 - Not required as each matrix RS485 output card has eight individual outputs.

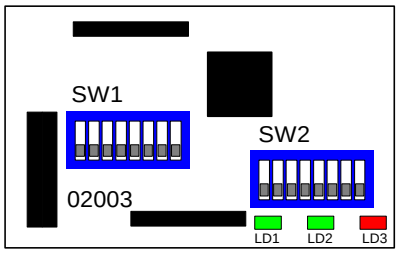
Internal view showing optional protocol converter

IMPORTANT NOTE.

When using the protocol converter, ensure that the starcard is set for 4 wire telemetry using **SW3/8 OFF**. RS485 data IN to **MASTER RA/RB** or BBV TELEMETRY IN with a TX1500 and data OUT to domes on **STAR TRA/TRB**.

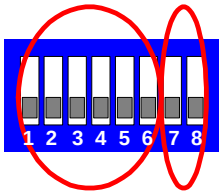


Close up view of protocol conversion card.

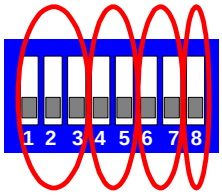


LD1 = RS485 out
LD2 = RS485 in
LD3 = Checksum ERROR

SW2 Output Settings



SW1 Input Settings



1 - 3 Protocol Selection

1	2	3	Protocol
OFF	OFF	OFF	BBV RS485 (TX1500)
ON	OFF	OFF	PELCO P
OFF	ON	OFF	PELCO D
ON	ON	OFF	VCL TP

4 - 5 Baud

4	5	Baud
OFF	OFF	2400
ON	OFF	4800
OFF	ON	9600
ON	ON	19200

6 - 7 Parity

6	7	Parity
OFF	OFF	NONE
ON	OFF	EVEN
OFF	ON	ODD
ON	ON	NONE

8 Data bits

OFF	8 BITS
ON	7 BITS

SW2(1-6) Output Protol Selection

1	2	3	4	5	6	PROTOCOL	BAUD
OFF	OFF	OFF	OFF	OFF	OFF	SELF TEST	9600,N,8,1
ON	OFF	OFF	OFF	OFF	OFF	DEBUG MODE	19200,N,8,1
OFF	ON	OFF	OFF	OFF	OFF	DENNARD 2050	9600,N,8,1
ON	ON	OFF	OFF	OFF	OFF	MARK MERCER	9600,N,8,1
OFF	OFF	ON	OFF	OFF	OFF	VCL	9600,N,8,1
ON	OFF	ON	OFF	OFF	OFF	PANASONIC 850	9600,N,8,1
OFF	ON	ON	OFF	OFF	OFF	PANASONIC 850	19200,N,8,1
ON	ON	ON	OFF	OFF	OFF	BBV RS485	9600,N,8,1
OFF	OFF	OFF	ON	OFF	OFF	JVC TK-C676	9600,E,8,1
ON	OFF	OFF	ON	OFF	OFF	BBV RX450/RX550	9600,N,8,1
OFF	ON	OFF	ON	OFF	OFF	CHUGAI ZC-S122	9600,E,8,1
ON	ON	OFF	ON	OFF	OFF	MOLYNX	9600,E,8,1
OFF	OFF	ON	ON	OFF	OFF	PELCO P	9600,N,8,1
ON	OFF	ON	ON	OFF	OFF	PELCO P	9600,O,8,1
OFF	ON	ON	ON	OFF	OFF	PELCO P	9600,E,8,1
ON	ON	ON	ON	OFF	OFF	PELCO P	2400,N,8,1
OFF	OFF	OFF	OFF	ON	OFF	PELCO P	2400,O,8,1
ON	OFF	OFF	OFF	ON	OFF	PELCO P	2400,E,8,1
OFF	ON	OFF	OFF	ON	OFF	PELCO D	9600,N,8,1
ON	ON	OFF	OFF	ON	OFF	PELCO D	9600,O,8,1
OFF	OFF	ON	OFF	ON	OFF	PELCO D	9600,E,8,1
ON	OFF	ON	OFF	ON	OFF	PELCO D	2400,N,8,1
OFF	ON	ON	OFF	ON	OFF	PELCO D	2400,O,8,1
ON	ON	ON	OFF	ON	OFF	PELCO D	2400,E,8,1
OFF	OFF	OFF	ON	ON	OFF	360 VISION	9600,N,8,1
ON	OFF	OFF	ON	ON	OFF	CHUGAI SMD20	9600,N,8,1
OFF	ON	OFF	ON	ON	OFF	VICON	9600,N,8,1
ON	ON	OFF	ON	ON	OFF	VISTA POWERDOME	9600,N,8,1
OFF	OFF	ON	ON	ON	OFF	SAMSUNG SCC641/643	9600,N,8,1
ON	OFF	ON	ON	ON	OFF	MEYERTECH VICTA	9600,N,8,1
OFF	ON	ON	ON	ON	OFF	PHILIPS RS232	9600,N,8,1

RS232 serial port.

The DB9F connector provides the ability to use a Laptop PC to monitor the data being sent out of the StarCard via RS232.

With the optional protocol converter fitted, on power up or if SW1 or SW2 switches are altered the unit sends the current protocol, baud rate and parity settings. Please be aware that the laptop baud rate and parity must match the settings selected with SW2. If the settings do not match then the laptop display will have no meaning.

An power up message example is shown below :

```
BBV Protocol Converter V15
www.bbvcctv.com
SW1(IN)  = 10 BBV:9600,N,8,1
SW2(OUT) = A3 MARK MERCER V7.3:9600,N,8,1
```

A debug mode can also be selected which provides detailed information for each command received. Whilst trouble shooting BBV engineers may ask you to use this mode with a laptop or other PC.

```
BBV Protocol Converter V15
www.bbvcctv.com
SW1(IN)  = 10 BBV:9600,N,8,1
SW2(OUT) = 21 DEBUG MODE:19200,N,8,1

CAM=00 W3=00 W4=14 W5=40 W6=24 PL 064TD 036
CAM=00 W3=00 W4=14 W5=06 W6=3C PL 006TD 060
CAM=00 W3=00 W4=12 W5=2E W6=38 PR 046TD 056
CAM=00 W3=00 W4=12 W5=40 W6=08 PR 064TD 008
CAM=00 W3=00 W4=08 W5=00 W6=0C TU 012
CAM=00 W3=00 W4=04 W5=40 W6=00 PL 064
CAM=00 W3=00 W4=14 W5=32 W6=34 PL 050TD 052
CAM=00 W3=00 W4=12 W5=2A W6=38 PR 042TD 056
CAM=00 W3=00 W4=04 W5=36 W6=00 PL 054
CAM=00 W3=00 W4=00 W5=00 W6=00 Cam 00 stop
```

The example above shows the debug output for camera 1. Driving pan/tilt followed by a stop command.

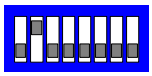
The following table shows the possible input and output protocols that are supported with this version of software.

	Input Protocol			Page
Output Protocol	BBV/TX1500	PELCO D/P	VCL	
DENNARD 2050	X	X		12
MARK MERCER	X	X		12
VCL TP	X	X		13/14
PANASONIC CS850/860	X			15
BBV RS485 (RX457/557)	X	X		
JVC TKC676	X	X		16
BBV RX450/550	X	X		
GANZ ZCS122/123	X			17
MOLYNX 250/260	X			18
PELCO D/P	X			19
360 VISION	X		X	20/21
CBC SMD20	X			22
VICON	X			23
VISTA POWERDOME	X			24
SAMSUNG SCC641/643	X			25
MEYERTECH VICTA	X			26
PHILIPS RS232	X			27

Protocol specific information

SW2

DENNARD 2050 – Fixed at 9600,N,8,1 (adjust SW1 to suit input protocol)

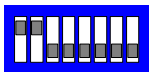


Function	TX1500 Procedure	Pelco Procedure
Display Dome Menu	**1 #**	SAVE PRESET 95
Display User Menu	**2 #**	GOTO PRESET 33
Display Technicians Menu	**3 #**	GOTO PRESET 94
Start current dome's Sequence 001	**1 PATROL**	GOTO PRESET 97
Start ALL DOMES Sequence 001	**2 PATROL**	GOTO PRESET 98

Navigate through the dome menu using pan/tilt and issue GOTO PRESET 1 to select current line.

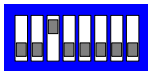
SW2

MARK MERCER – Fixed at 9600,N,8,1 (adjust SW1 to suit input protocol)



Function	TX1500 Procedure	Pelco Procedure
180 Pan U turn	**1 # or WASH**	SAVE PRESET 95
Start current dome's patrol	**1 PATROL**	GOTO PRESET 97
Start ALL DOMES patrol	**2 PATROL**	GOTO PRESET 98

SW2



VCL TP – Fixed at 9600,N,8,1 (adjust SW1 to suit input protocol)

Connect dome D+ to Starcard/Converter TRA and dome D- to Starcard/Converter TRB. Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that any dome at the end of a daisy chained RS485 run are have the RS485 terminated and the intermediate domes have the RS485 determinated.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps from 1 to 127, (slowest to fastest)
Zoom with Manual Iris and Focus override.
Operating the Zoom will re-enable auto focus and iris after manual adjustment
32 preset positions.
2 sequential preset tours of preset positions 1 - 16, tour 1 maximum speed and tour 2 speed 32. The dwell time is fixed at 10 seconds per preset position. Preset positions can be removed from the tours.
All 28 privacy zones can be programmed and disabled if required.

Advanced Function	**TX1500 Procedure**
Manual 180 degree pan flip (U turn)	**1 #**
Program a privacy zone	**2 #** followed by **PROGRAM 1-28 PRESET**
Clear a privacy zone	**3 #** followed by **PROGRAM 1-28 PRESET**
Dome remote reset (power cycle)	**4 #**
Add preset position to the tours	programming a preset position adds the preset into the tour. (1 – 16 only)
Remove a preset from the tours	**PROGRAM 50 PRESET** followed by **1-16 PRESET**
Start preset tour 1 – high speed	**1 PATROL** (max speed with 10 second dwell)
Start preset tour 2 – slow speed	**2 PATROL** (speed 32 with 10 second dwell)
Start Learned tour 5	**AUTOPAN** (must be defined with PROGRAM 56 PRESET as below)

Set Home functions (fixed at 5 minutes)	**PROGRAM 54 PRESET** followed by **1 PRESET** = Enable to preset 1 **2 PRESET** = Enable to tour 1 (fast) **3 PRESET** = Enable to tour 2 (slow) **4 PRESET** = Enable to learned tour (autopan) **5 PRESET** = Disable home
Reset dome to factory. USE CAUTION!! This command will clear all dome configuration including preset positions.	**PROGRAM 55 PRESET** followed by **PROGRAM 55 PRESET**
Define learned tour 5 – START	**PROGRAM 56 PRESET**
Define learned tour 5 – STOP	**PROGRAM 57 PRESET**
Enable AUTO180 pan flip	**PROGRAM 58 PRESET**

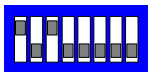
VCL TP – When using Pelco input protocol

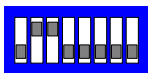
Advanced Function	**Pelco procedure**
180 degree pan flip (U turn)	SAVE PRESET 95
Program a privacy zone	GOTO PRESET 33 followed by PROGRAM 1-28 PRESET
Clear a privacy zone	GOTO PRESET 94 followed by PROGRAM 1-28 PRESET
Dome remote reset (power cycle)	Head reset
Add preset position to the tours	Saving a preset position adds the preset into the tour. (1 – 16 only)
Remove a preset from the tours	PROGRAM 50 PRESET followed by GOTO PRESET 1-16
Start preset tour 1 – high speed	GOTO PRESET 97 (max speed with 10 second dwell)
Start preset tour 2 – slow speed	GOTO PRESET 98 (speed 32 with 10 second dwell)
Start Learned tour 5	GOTO PRESET 99 (must be defined with SAVE PRESET 56 as below)

Set Home functions (fixed at 5 minutes)	PROGRAM 54 PRESET followed by GOTO PRESET 1 = Enable to preset 1 GOTO PRESET 2 = Enable to tour 1 (fast) GOTO PRESET 3 = Enable to tour 2 (slow) GOTO PRESET 4 = Enable to learned tour (PRESET 99) GOTO PRESET 5 = Disable home
Reset dome to factory. USE CAUTION!! This command will clear all dome configuration including preset positions.	SAVE PRESET 55 followed by SAVE PRESET 55
Define learned tour 5 – START	SAVE PRESET 56
Define learned tour 5 – STOP	SAVE PRESET 57
Enable AUTO180 pan flip	SAVE PRESET 58

PANASONIC WV-CS850/860 (Added in V 4 software)
Control from BBV protocol only.

9600,N,8,1 or 19200,N,8,1





Function	TX1500 Procedure
Show/Hide dome Menu	**1 #**
ENTER (whilst in menu)	**2 #**
ESCAPE (whilst in menu)	**3 #**
SPECIAL2 (whilst in menu)	**4 #**
Send PATROL RUN	**1 PATROL**
Send PATROL RUN to ALL DOMES	**2 PATROL**
Send AUTOPAN	**AUTOPAN**
BW MODE ON	**89 PRESET**
BW MODE OFF	**88 PRESET**
BW MODE AUTO	**87 PRESET**

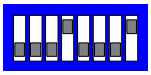
Switch and dome settings:
VERY IMPORTANT! Ensure that each dome is configured BEFORE installation.
Output baud rate must be set to 19200,N,8,1 with SW2.
The dome must be set to Panasonic CONVENTIONAL protocol and the address set accordingly.
The 4 way dome switch must be set to 4 wire telemetry with switches 2,3,4 OFF.
The RS485 cable requires termination at the end of the run by setting switch 1 ON.

The Panasonic CS850/860 protocol conversion is only available when controlled using BBV RS485 telemetry. If another input protocol is selected using SW1 then the unit will not function and all the LEDs will flash until BBV protocol is selected again.

Due to protocol issues, the response of an individual dome may become sluggish if several domes are controlled simultaneously.

Connect TRA to RA(green) and TRB to RB(yellow).

SW2



JVC TK-C676 – Fixed at 9600,E,8,1 (adjust SW1 to suit input protocol)

Function	TX1500 Procedure	Pelco Procedure
Display menu and EXIT	**1 #**	SAVE PRESET 95
SET (whilst in menu)	**2 #**	GOTO PRESET 33
Toggle Extended Dynamic Range	**3 #**	GOTO PRESET 94
Cycle BW mode, ON/OFF/AUTO	**4 #**	
Start dome AUTO PATROL	**1 PATROL**	GOTO PRESET 97
As above for ALL DOMES	**2 PATROL**	GOTO PRESET 98
Start dome AUTOPAN	**AUTOPAN**	GOTO PRESET 99

Notes:
Connect dome RX- to Starcard TRB and dome RX+ to Starcard TRA.
Each dome must be set to Multi-drop, Simplex mode by setting dome switch 4 & 5 ON. Set each dome address using the dome rotary switches. This address must match the number of the camera input of the telemetry controller.

A total of up to 96 domes are supported with a maximum of 32 domes per star output.

To display the current dome's menu, press either 1# with the BBV Tx1500 or SAVE PRESET 95 using Pelco-P or Pelco-D protocol. Use standard PAN/TILT and where required ZOOM to navigate through the menus. To simulate the SET key to navigate into sub-menus press 2# with a TX1500 or GOTO PRESET 33 when using Pelco protocols. To exit the current menu press 1# for the TX1500 or SAVE PRESET 95 with Pelco.

Addition functions.
Pressing AUTOPAN with a TX1500 or GOTO PRESET 99 with Pelco will cause the current dome to start an AUTOPAN.
Pressing 1 PATROL with a TX1500 or GOTO PRESET 97 with Pelco will cause the current dome to start an AUTOPATROL.
Pressing 2 PATROL with a TX1500 or GOTO PRESET 98 with Pelco will cause ALL the domes to start an AUTOPATROL.

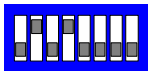
Extended Dynamic Range can be toggled ON/OFF using 3# with the TX1500 or GOTO PRESET 94 with Pelco.
B/W Mode can be cycled between ON/OFF/AUTO using 4# with the TX1500.

Camera mode display. Protocol Converter SW2/8
If protocol converter switch SW2/8 is set to ON then each time the Extended Dynamic Range or BW mode is changed or AUTOPATROL is selected then the dome title is altered to display these settings. If it is preferred to use the dome camera title for titling then set switch SW2/8 OFF. The settings will still be changed but will not be shown.

Presets
The dome home preset position is preset 0. As most control systems do not directly support preset 0, preset 1 is used instead. This means that in practice, preset 1 is home, preset 2-32 are preset 2-32 and the dome's preset 1 is not used. This could only be an issue when programming alarms directly into the dome. Do not use preset position 1 unless this is programmed from within the dome menu.

Chugai/Ganz ZC-S122/123 – Fixed at 9600,E,8,1 Control from BBV protocol only.

SW2



Function	TX1500 Procedure
Menu ON/OFF	**1 #**
SET (whilst in menu)	**2 #**
CLR (whilst in menu)	**3 #**
PRESET SEQUENCE	**1 PATROL**
PLAYBACK TRACE	**2 PATROL**
AUTOPAN	**AUTOPAN**
AUX 1 OUTPUT ON/OFF	**LIGHTS**
AUX 2 OUTPUT ON/OFF	**WIPER**

Notes:
Connect dome A/+(pin 1, BROWN) to Starcard TRA and dome B/- to Starcard TRB.
Each dome must be set to 9600 Baud with switch 5 OFF, switch 6 ON. Set the dome address using the dome rotary switches to match the number of the camera input of the TX1500. Ensure that domes at the end of the RS485 run are terminated by turning switch 8 ON and the intermediate domes have the switch 8 OFF.

A total of up to 96 domes are supported with a maximum of 32 domes per star output.

Menu access.
Press 1# will toggle the Menu display ON/OFF.
Whilst the menu is displayed the joystick is used to navigate.
2# is used as SET to access a menu option and
3# is used as CLR to go back.

Addition functions are available for the currently displayed dome.
AUTOPAN is started by pressing the AUTOPAN key.
PRESET SEQUENCE is started by pressing 1 PATROL.
TRACE playback is started by preseding 2 PATROL

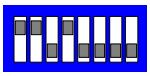
The protocol converter can directly access preset 1 – 64 by pressing the preset number followed by the PRESET key.

To program a preset position, press PROGRAM followed by the preset number and the PRESET key. See the TX1500 manual for detailed information.

Molynx 250/260 – Fixed at 9600,E,8,1 Control from BBV protocol only.

Function	**TX1500 Procedure**
PRESET 1 – 32	As manual
WASH, WIPE, LIGHTS	
AUX1 TOGGLE	**1 #**
AUX2 TOGGLE	**2 #**
RECEIVER INITIALISE	**4 #**

SW2



Notes:
Connect receiver + to Starcard TRA and receiver - to Starcard TRB.
Set the receiver address switches to match the number of the camera input of the TX1500.

Molynx receivers can only be controlled when using BBV telemetry into the StarCard ie from the BBV Tx1500 matrix.

Control of the receiver auxiliary relays is possible using the Tx1500 Wash, Wipe and Lights keys. Additionally the AUX1 and AUX2 outputs can be toggled using 1# and 2# respectively.

Up to 32 preset positions can be programmed and recalled.

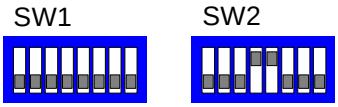
A preset patrol is not supported.

PELCO P and PELCO D.

Function	TX1500 Procedure	Pelco Procedure
Display Dome Menu	**1 #**	SAVE PRESET 95
180 degree pan flip (U turn)	**2 #**	GOTO PRESET 33
Display Technicians Menu	**3 #**	GOTO PRESET 94
Start Random Scanning	**PATROL 1**	GOTO PRESET 97
Start Frame Scanning	**PATROL 2**	GOTO PRESET 98

This allows control of Pelco P and Pelco D units. Please ensure that the baud rate and parity are set correctly. Generally Pelco P uses 9600,N,8,1 and Pelco D uses 2400,N,8,1.

360 VISION from BBV telemetry.



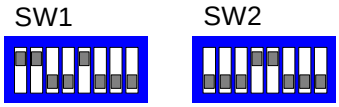
Connect dome D+ to Starcard/Converter TRA and dome D- to Starcard/Converter TRB. Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that the dome at the end of a daisy chained RS485 run has the RS485 terminated and the intermediate domes have the RS485 de-terminated.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps from 1 to 127, (slowest to fastest)
Zoom with Manual Iris and Focus override.
Operating the Zoom will re-enable auto focus and iris after manual adjustment
32 preset positions.
2 sequential preset tours of preset positions 1 - 16, tour 1 high speed and tour 2 slow speed. The dwell time is fixed at 10 seconds per preset position. Preset positions can be removed from the tours.
All 32 privacy zones can be programmed and disabled if required.

Advanced Function	**TX1500 Procedure**
180 degree pan flip (U turn)	**1 #**
Program a privacy zone	**2 #** followed by **PROGRAM 1-32 PRESET**
Clear a privacy zone	**3 #** followed by **PROGRAM 1-32 PRESET**
Add preset position to the tours	Programming a preset position adds the preset into the tour. (1 – 16 only)
Remove a preset from the tours	**PROGRAM 50 PRESET** followed by **1-16 PRESET**
Start preset tour 1 – high speed	**1 PATROL** (max speed with 10 second dwell)
Start preset tour 2 – slow speed	**2 PATROL** (speed 32 with 10 second dwell)

Set autoflip mode	**PROGRAM 51 PRESET** followed by **1 PRESET** = autoflip OFF **2 PRESET** = ON tilt at down limit **3 PRESET** = ON when at limit
Set Video Gain/Lift and Sync timing	**PROGRAM 52 PRESET** followed by **IRIS CLOSE/OPEN** to increase/decrease GAIN **FOCUS NEAR/FAR** to increase/decrease LIFT **ZOOM IN/OUT** to advance/retard timing Move joystick when finished.
Set IR Filter mode	**PROGRAM 53 PRESET** followed by **1 PRESET** = mono mode/auto off **2 PRESET** = colour mode/auto off **3 PRESET** = auto/kill colour **4 PRESET** = auto/don't kill colour
Set Home functions (fixed at 5 minutes)	**PROGRAM 54 PRESET** followed by **1 PRESET** = Enable to preset 1 **2 PRESET** = Enable to patrol 1 (fast) **3 PRESET** = Enable to patrol 2 (slow) **4 PRESET** = Disable home
Reset dome to factory. USE CAUTION!! This command will clear all dome configuration including preset positions.	**PROGRAM 55 PRESET** followed by **PROGRAM 55 PRESET**

360 VISION from VCL telemetry.



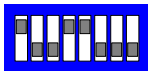
Connect dome D+ to Starcard/Converter TRA and dome D- to Starcard/Converter TRB.
Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that the dome at the end of a daisy chained RS485 run has the RS485 terminated and the intermediate domes have the RS485 de-terminated.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps from 1 to 127, (slowest to fastest)
Zoom with Manual Iris and Focus override.
Operating the Zoom will re-enable auto focus and iris after manual adjustment
32 preset positions.
Preset 100 – 127 will program the dome privacy zone 1 – 27. These can be disabled within the VCL privacy menu by setting the appropriate preset to PRESET. The dome will move to show the privacy scene to allow toggling the privacy back on by selecting PRIVATE.
Tour definitions are compatible with the VCL programming method 2 including dwell time and speed per tour point.
The dome home feature can be programmed using the standard VCL control menu.

In addition to the standard functions offered by the VCL control system the following features are available.

Set autoflip mode	program preset 51 followed by goto preset 1 = autoflip OFF goto preset 2 = ON tilt at down limit goto preset 3 = ON when at limit
Set Video Gain/Lift and Sync timing	program preset 52 followed by iris close/open to increase/decrease GAIN focus near/far to increase/decrease LIFT zoom in/out to advance/retard timing Move joystick when finished.
Set IR Filter mode	program preset 53 followed by goto preset 1 = mono mode/auto off goto preset 2 = colour mode/auto off goto preset 3 = auto/kill colour goto preset 4 = auto/don't kill colour
Set Home functions (fixed at 5 minutes)	program preset 54 followed by goto preset 1 = Enable to preset 1 goto preset 2 = Enable to patrol 1 (fast) goto preset 3 = Enable to patrol 2 (slow) goto preset 4 = Disable home
Reset dome to factory. CAUTION!!!	program preset 55 twice

SW2



CBC SMD20, STAR MD2000, SANYO VCC9200P from BBV telemetry.

Connect dome DATA+ to Converter TRA and dome DATA- to Converter TRB.
Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that the dome at the end of a daisy chained RS485 run has the RS485 terminated and the intermediate domes have the RS485 de-terminated.
This type of dome can be addressed from 1 – 31. To allow use of more that 31 domes on a Tx1500 system the converter can be adjusted to select banks of cameras as follows:

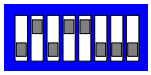
Camera Range	SW2/7	SW2/8
1 – 31	OFF	OFF (This is the default setting)
32 – 62	ON	OFF
63 – 93	OFF	ON
94 – 124	ON	ON

When the converter is set for camera range 32 – 62, the dome connected into video input 32 must have the address set for 1 and video input 33 must have the address set to 2 etc up to video input 62 with the address set to 31. Multiple Starcard/Converter must be used when controlling more that 31 cameras with SW2/7 and SW/8 set appropriately.

i) Because of the nature of the dome protocol which uses half duplex command and response commands timing to the dome is critical. If a command is sent to the dome before it has finished executing the previous command, the new command is ignore!!! Even if this is another goto preset command whilst the dome is searching for another preset, say if get multiple alarm occurrences in quick succession. This would appear that the controller hasn't sent the command to the dome... not the case.
ii) The converter is limited to control ONE dome at a time because of this timing. A lockout period prevents other cameras on a single starcard from being controlled until 5 seconds after the last command has been sent to the current camera.
THIS INCLUDES PRESET COMMANDS...
iii) Supported manual ptz with manual focus which reverts back to auto focus on a pan/tilt or zoom.
iv) 64 preset positions are supported
v) The AUTOPAN key is used to start patrol 2.
vi) 2 preset patrols are provided and the preset positions in each patrol are programmable. Patrol 1 is has a fixed full speed movement to each preset and a dwell of 10 seconds. To define patrol 1, first PROGRAM 65 PRESET, followed by GOTO preset for each of the presets to be patrolled. Up to 64 presets can be programmed. Obviously each preset position must be programmed prior to defining the patrol. To end the definition PROGRAM 66 PRESET.
Patrol 2 has a fixed slow speed movement between preset positions and again a 10 second dwell at each position. Programming follows the same idea as patrol 1. PROGRAM 67 PRESET to start definition, goto preset ... followed by PROGRAM 68 PRESET to end the definition. Patrol 2 can also be started by pressing the AUTOPAN key.
vii) LEDS, LD3 flashes when commands are received for domes that lie outside of the 31 camera range set by SW2/7 and SW2/8.

IMPORTANT... IF THE DOME IS MOVING TO A PRESET POSITION THE DOME WILL IGNORE ALL COMMANDS THAT ARE SENT FROM THE CONVERTER UNTIL THE PRESET POSITION HAS BEEN REACHED. THIS RELATES TO MANUAL PRESET OR DURING A PATROL.

SW2



Vicon Surveyor from BBV

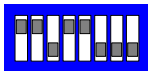
Connect dome COMM_IN+ to Starcard/Converter TRA and dome COMM_IN- to Starcard/Converter TRB.
Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that any dome at the end of a daisy chained RS485 run are have the RS485 terminated and the intermediate domes have the RS485 de-terminated.
Select VPS telemetry using dome DIP DIL.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps.
Zoom with Manual Focus override.
Operating the Zoom will re-enable auto focus after manual adjustment
64 preset positions.
3 tours can be started, tour 81 and 82 using 1 PATROL and 2 PATROL and tour 80 with AUTOPAN.
The tours are defined from the dome menu

Advanced Function	**TX1500 Procedure**
Display dome menu	**1 #**
MENU AP – ENTER	**IRIS OPEN**
MENU AI – ESCAPE	**IRIS CLOSE**
MENU AUX1	**WASH**
MENU AUX2	**WIPE**
Start TOUR 81	**1 PATROL**
Start TOUR 82	**2 PATROL**
Start TOUR 80	**AUTOPAN**

It is very important that once you have exited the dome menu you send a 1 PRESET to inform the starcard that you are out of the dome menu.

SW2



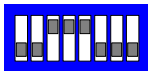
Vista PowerDome from BBV

Connect dome DATA IN A/+ to Starcard/Converter TRA and dome DATA IN B/- to Starcard/Converter TRB.
Set the dome address using the DIL switch to match the number of the camera input of the TX1500. Ensure that any dome at the end of a daisy chained RS485 run are have the RS485 terminated and the intermediate domes have the RS485 de-terminated.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps.
Zoom with Manual Focus override.
Operating the Zoom will re-enable auto focus after manual adjustment
64 preset positions.
3 tours can be started, TOUR 1 and 2 using 1 PATROL and 2 PATROL and LEARN TOUR 1 with AUTOPAN.
The tours are defined from the dome menu which is accessed using 1 # as below.

Advanced Function	**TX1500 Procedure**
Display dome menu	**1 #**
Menu – ENTER	**2 #**
Menu – ESCAPE	**3 #**
Start TOUR 1	**1 PATROL**
Start TOUR 2	**2 PATROL**
Learn 1 playback	**AUTOPAN**

SW2



Samsung SCC641/643 dome and SCC421 camera from BBV

SCC641/643 dome

Connect dome RXD/+ to Converter TRA and dome RXD/- to Converter TRB.
Set the dome address using the SW500 switch to match the number of the camera input of the TX1500. SW501 all off apart from 3 and 5 to select 9600 BAUD, SAMSUNG protocol and FULL duplex. Ensure that any dome at the end of a daisy chained RS485 run are have switches SW501/1 and SW501/2 ON to terminate the RS485 terminated and the intermediate domes have the SW501/1 and SW501/2 OFF.

The following functionality is provided.
Manual pan/tilt control with 16 speed steps.
Zoom with Manual Focus override.
Operating the Zoom will re-enable auto focus after manual adjustment
64 preset positions.
AUTOPAN can be started with the AUTOPAN key.
PRESET SCAN can be started using 1 PATROL.
PATTERN 2 can be started using 2 PATROL.
The patterns are defined from the dome menu which is accessed using 1 # as below.

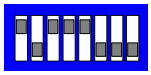
Advanced Function	**TX1500 Procedure**
Dome Menu ON	**1 #**
Dome Menu OFF	**2 #**
Dome Menu ENTER	**3 #**
Start PRESET SCAN	**1 PATROL**
Start PATTERN 2	**2 PATROL**
Start AUTOPAN	**AUTOPAN**

SCC421P Static camera

Connect the camera RS485 Data+ to Converter TRA and Data- to Converter TRB.
Ensure that BAUD RATE is set to 9600 and RS485 ADDR is set to match the video input on the Tx1500 matrix. The buttons on the rear of the camera allow menu access.
Ensure that any camera at the end of a daisy chained RS485 run has the TERMINATION switch ON and the intermediate camera have the TERMINATION switch OFF.

The following functionality is provided.
Zoom with Manual Focus override.
To allow manual focus set AUTO FOCUS in the menu to either ONEAF for MF.
ONEAF will cause an AUTOFOCUS after a zoom and MF is permanently in manual focus mode.
Iris Open/Close.

SW2



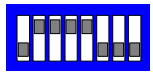
Meyertech ZVR-510 receiver with VICTA protocol from BBV telemetry only.

Connect receiver 422 RX+ to Converter TRA and 422 RS- to Converter TRB.
Set the receiver address to match the number of the camera input of the TX1500.

The following functionality is provided.
Variable speed Pan/Tilt – 8 speeds
Zoom/Focus
WASH, WIPE, LIGHTS auxiliary outputs
32 preset positions.

The Meyertech protocol supports 8 speeds for pan and tilt. If the head is to pan and tilt simultaneously then the same speed is used for both axis. For example if the head is moving left at say speed 4 and then the joystick is moved up the head will now move left at the new tilt speed. This is not a problem with the converter but a limitation of the Meyertech protocol.

SW2

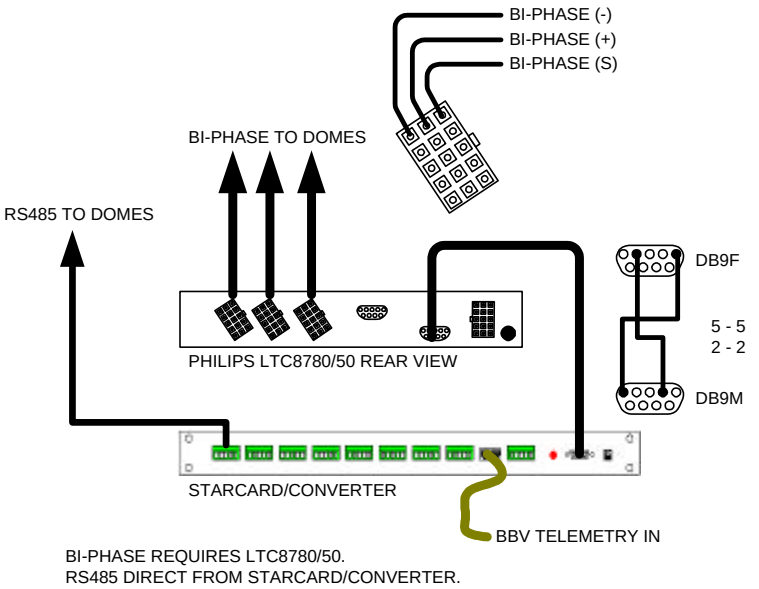


Philips RS232/485 from BBV telemetry only (bi-phase via LTC8780/50)

Depending on the exact model type, Philips domes can be controlled using RS232 or RS485 and bi-phase telemetry.

Bi-phase telemetry is a proprietary twisted pair protocol that allows several domes to be daisy chained. A Philips LTC8780/50 converter is required in addition to the STARCARD/CONVERTER when driving bi-phase telemetry.

Later domes with RS485 inputs can be driven directly from the starcard/converter outputs without the need for a Philips LTC8780/50 converter as shown below.

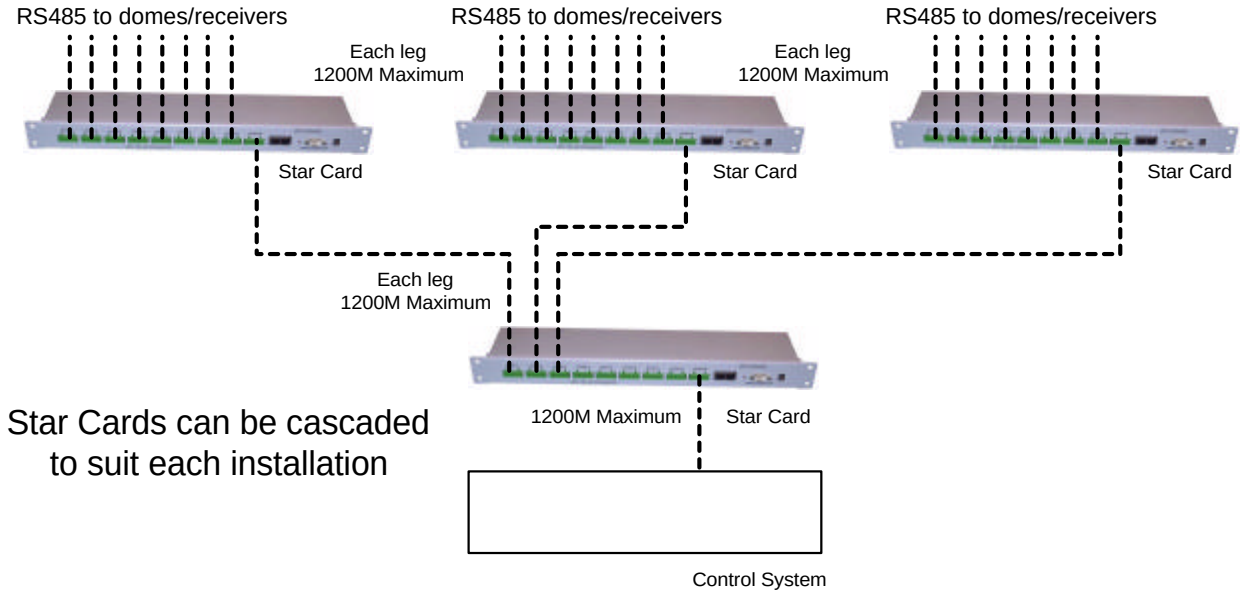


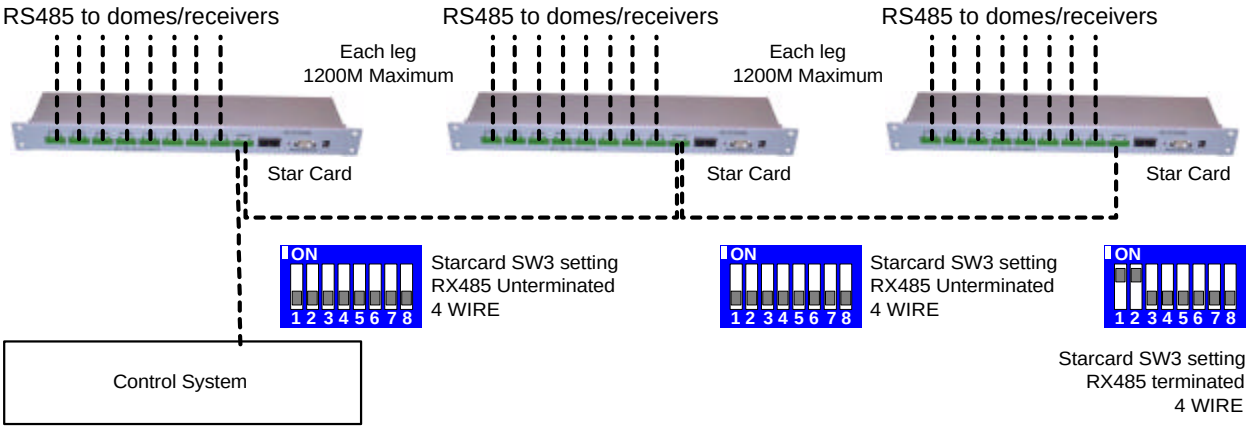
Set the dome address using the rotary switches to match the number of the camera input of the TX1500. Ensure that any dome at the end of a daisy chained RS485 run has the RS485 terminated and the intermediate domes have the RS485 de-terminated.
If the dome only supports FastAddress™, a Philips controller must be used to set the dome address before installation. The starcard/converter will not set the FastAddress ™.

Dome Function	**TX1500 Procedure**
SET/SAVE PRESET (1-64)	**PROGRAM NUMBER PRESET**
SHOW/GOTO PRESET (1-64)	**NUMBER PRESET**
DISPLAY DOME MENU (AUX 46 ON)	**1 #**
PROGRAM ZONE TITLE (AUX 63 ON)	**2 #**
AUTOPLAY RECORD (AUX 100 ON/OFF)	**3 # to start recording followed by either 3 # or AUTOPAN to stop recording.**
DISPLAY SOFTWARE VERSION (AUX 66 ON)	**4 # TWO times**
RESET DOME (SET 899)	**4 # FOUR times** ***(This will erase all preset positions and load default dome settings – use with care!)***

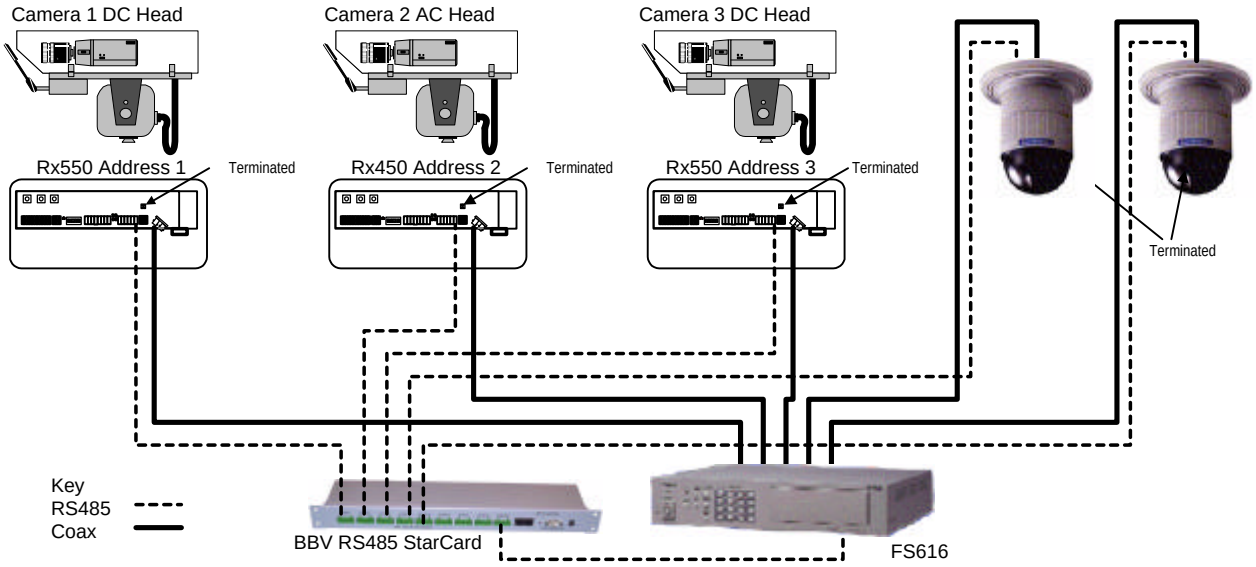
START DOME PRESET TOUR (AUX 8 ON)	**1 PATROL**
START AUTOPLAY PLAYBACK (AUX 50 ON)	**AUTOPAN**

DISPLAY PRESET TOUR MENU (SET 900)	**PROGRAM 99 PRESET**
DISPLAY PRESET TOUR PERIOD (AUX 15 ON)	**PROGRAM 98 PRESET**
DISPLAY PRESET MENU (SET 100)	**PROGRAM 97 PRESET**

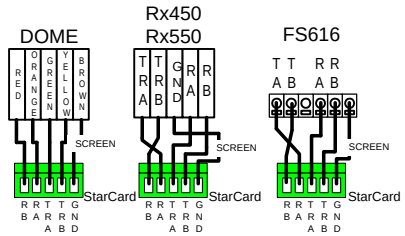




On single direction RS485, multiple StarCards can be daisy chained to provide multiple outputs.

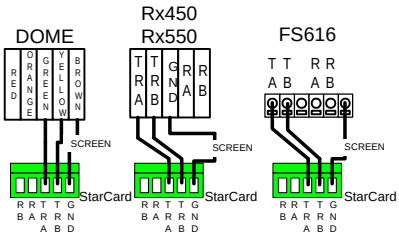


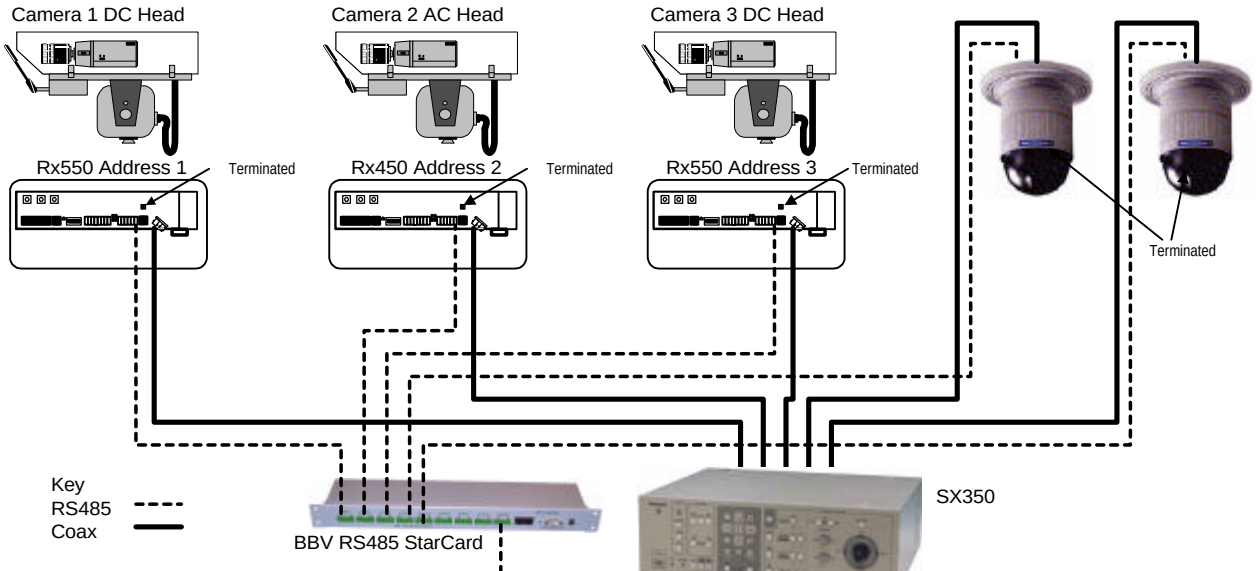
4 Wire connection details



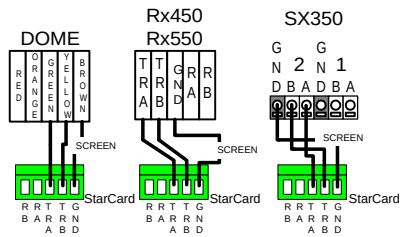
Panasonic FS-616
Wiring Details

2 Wire connection details



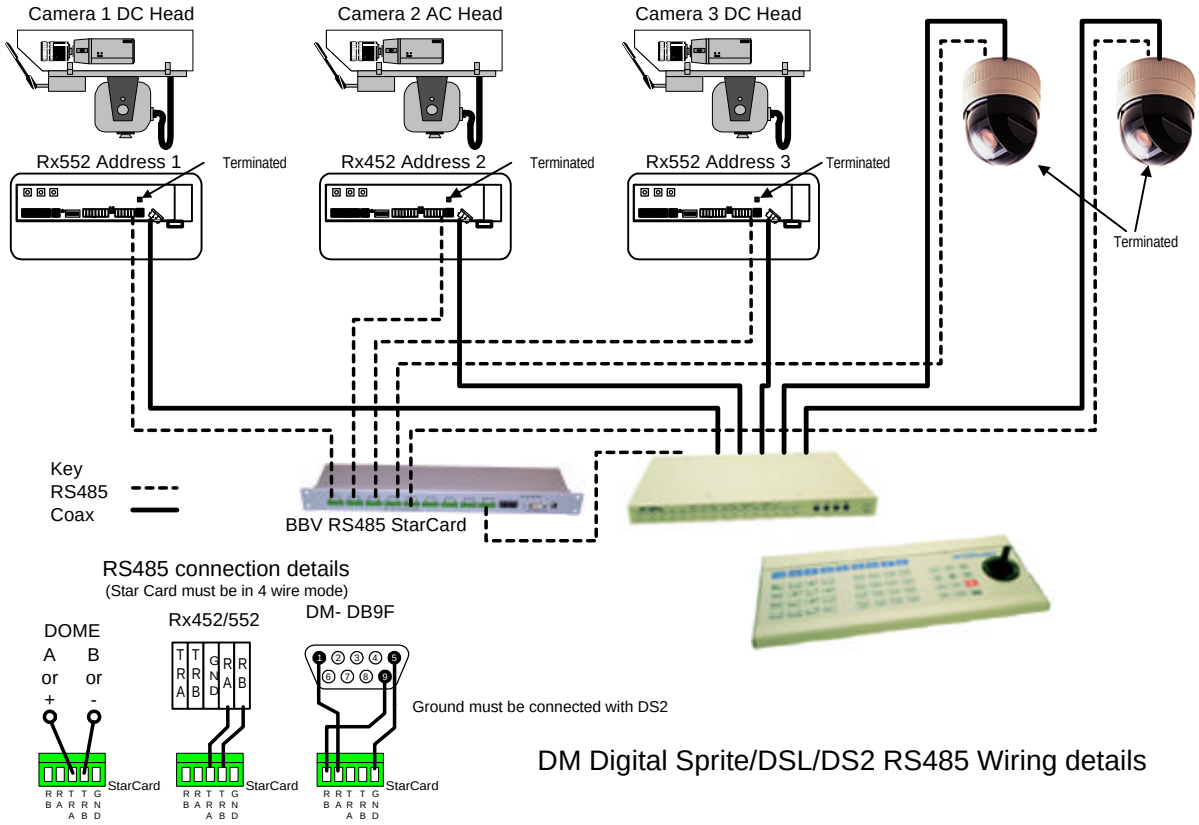


2 Wire connection details

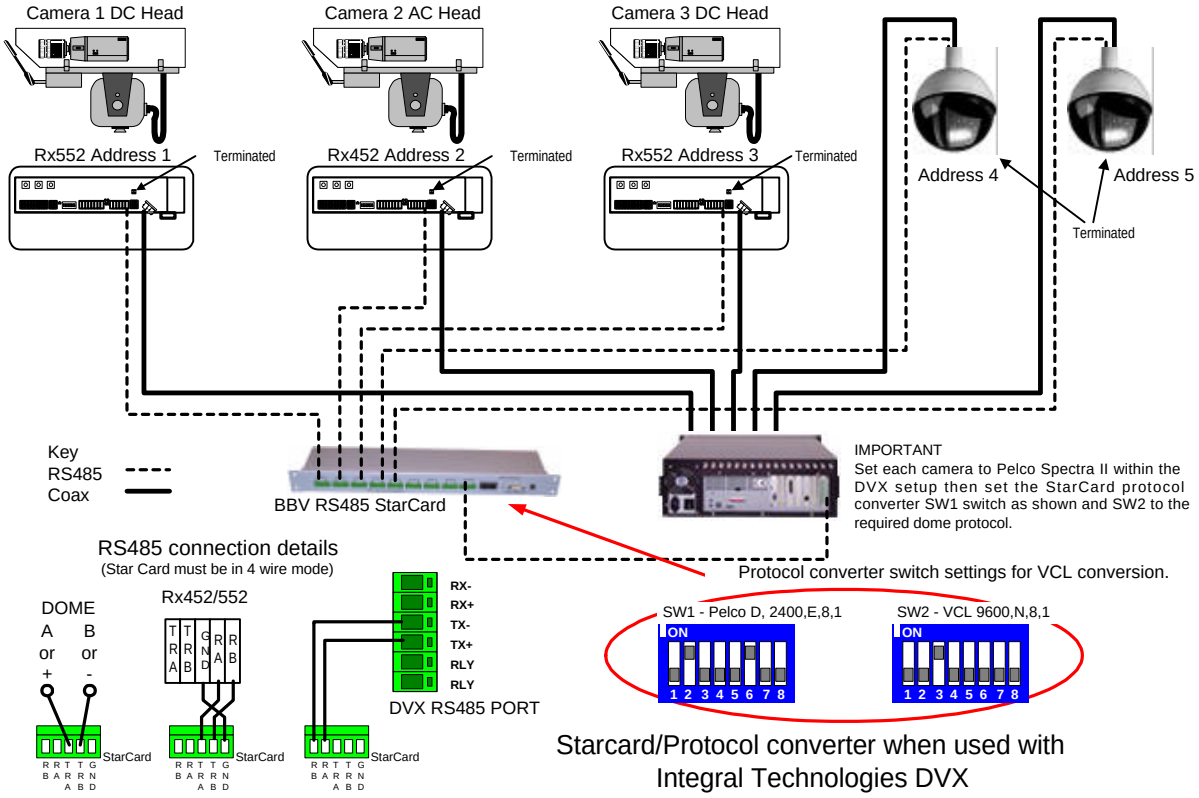


Panasonic SX-350
Wiring Details

The SX350 has two individual RS485 ports. Each port may be connected to a seperate StarCard. The diagram on the left shows a connection to port 2.



DM Digital Sprite/DSL/DS2 RS485 Wiring details



Starcard/Protocol converter when used with Integral Technologies DVX

BBV product range.

Product	Description
TX300	Single camera desktop telemetry transmitter with 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	8 or 16 camera, 2 monitor telemetry transmitter. Upto 2 keyboards and 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, coax and RS485 telemetry.

RX100	Dome Interface with options to drive a large library of dome cameras. Coaxial and 20mA telemetry.
RX200	AC receiver for Panner only heads or static cameras, Wash/Wipe/Lights. Coaxial and 20mA telemetry.
RX300	AC receiver for Pan/Tilt/Zoom/Focus/Iris Override and 1 Auxiliary output. Coaxial and 20mA telemetry.
RX400P	AC full function receiver. PTZFI 4 Auxiliary outputs, 16 presets. Coaxial and 20mA telemetry.
RX400DC	24Vdc high/variable speed receiver. 16 presets, 8 local alarm inputs, 3 Auxiliary outputs, options to drive JVC TK-C1360 and Mitsi CCD400 cameras. Coaxial and 20mA telemetry.

RX450-550 range	RS485 controllable AC and DC receivers. These receivers are controlled using RS485 protocols as listed below. 100 – 240Vac supply. PTZFI, 32 presets, preset patrol, 8 local alarm inputs, 12V 500mA supply output. OSD for remote diagnostics. 3 Auxiliary outputs.
RX450/550	Panasonic RS485 Protocol
RX451/551	Pelco P RS485 Protocol
RX452/552	VCL TP RS485 Protocol
RX453/553	Philips BI-PHASE Protocol
RX457/557	BBV RS485 Protocol