



TX1500/BBUS-IF
RS232/422/485 Interface



Installation Guide



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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 - Unpack the unit 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.

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 plug top PSU supplied. Refer to operating instructions.

Power connector - This unit is equipped with coaxial power connector mounted at the edge of the PCB for low voltage power input. Do not attempt to alter this connector in any way.

Power cord protection - Power supply cords should be routed so that they are not likely to be trapped, pinched or otherwise damaged by items in close proximity to them, particular attention should be paid to cords at plugs at the rear of the unit.

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.
- (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.

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

Safety during installation or servicing - Particular care should be taken to isolate the Matrix or Pick-a-Point in order to prevent operation while engineering work is being carried out on the BBUS Interface.

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.

Introduction

The TX1500 BBUS Interface allows control of both the TX1500 and the FBM matrices via third party control equipment using the TX1500 or TX1000 keyboard protocol. It also allows the supplied keyboards to be used over a back-to-back remote system when integrating with IP Codecs, Fibre interfaces or radio link installations.

The BBUS Interface has three applications:

- BBUS/IF TX1500 MODE

Supports two main protocols: TX1000 RS232 control protocol
TX1500 control protocol

Allows control of the TX1500 and FBM matrices via third party control equipment. Pick-a-Point uses TX1500 control protocol (when using the BBUS Interface) to control the TX1500 & the FBM.

Note: When the TX1500 & FBM are integrated with DVRs and or video transmission systems, there could be systems that have PTZ cameras with addresses above camera 16. The BBUS Interface supports a 'Specified Camera Range' mode that enables the DVR to control any camera between 17 – 128 in groups of 16 cameras.

- BBUS/IF REMOTE KEYPAD MODE

Allows the keyboards to be used remotely. Supports the use of IP Codecs, Fibre interfaces or a radio link. It reduces potential latency and the introduction of data contention.

- BBUS/IF FBM MODE

Supports the use of all eight keypad addresses on the FBM.

Unpacking

Unpack the unit carefully and check that all the items are present:

TX1500/BBUS-IF x 1
Manual x 1
Mounting brackets x 2
1U metalwork x 1
0.5m Cat 5 cable x 1
9V DC 500mA PSU x 1
Extended warranty card x 1

If any items are missing or damaged, contact your equipment dealer.

Technical Specification

Power requirements: 9V DC 500mA

Features:

- RS232/485/422 input
- Fully dipswitch programmable for ease of installation
- 3 diagnostic LEDs to indicate status
- Fully addressable as keyboard 1 to 4 (1 to 8 when in FBM mode see page 18)
- Programmable default monitor selection from monitors 1 to 8
- Dipswitch selectable speed setting for single speed cameras

Engineering facilities:

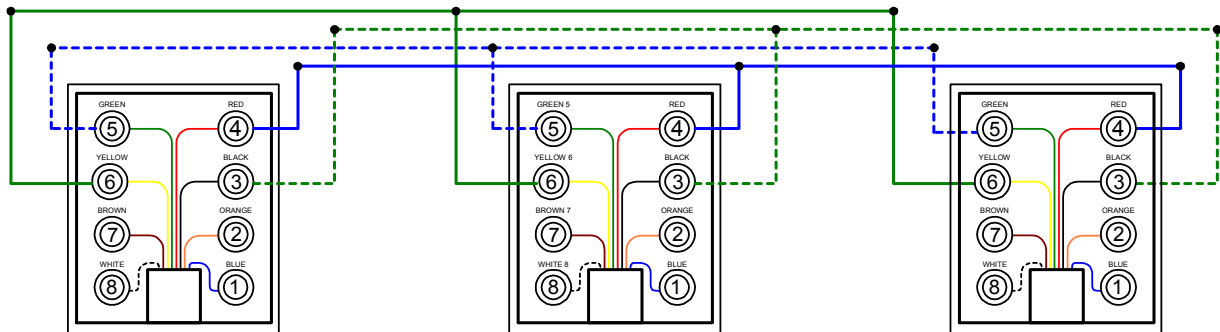
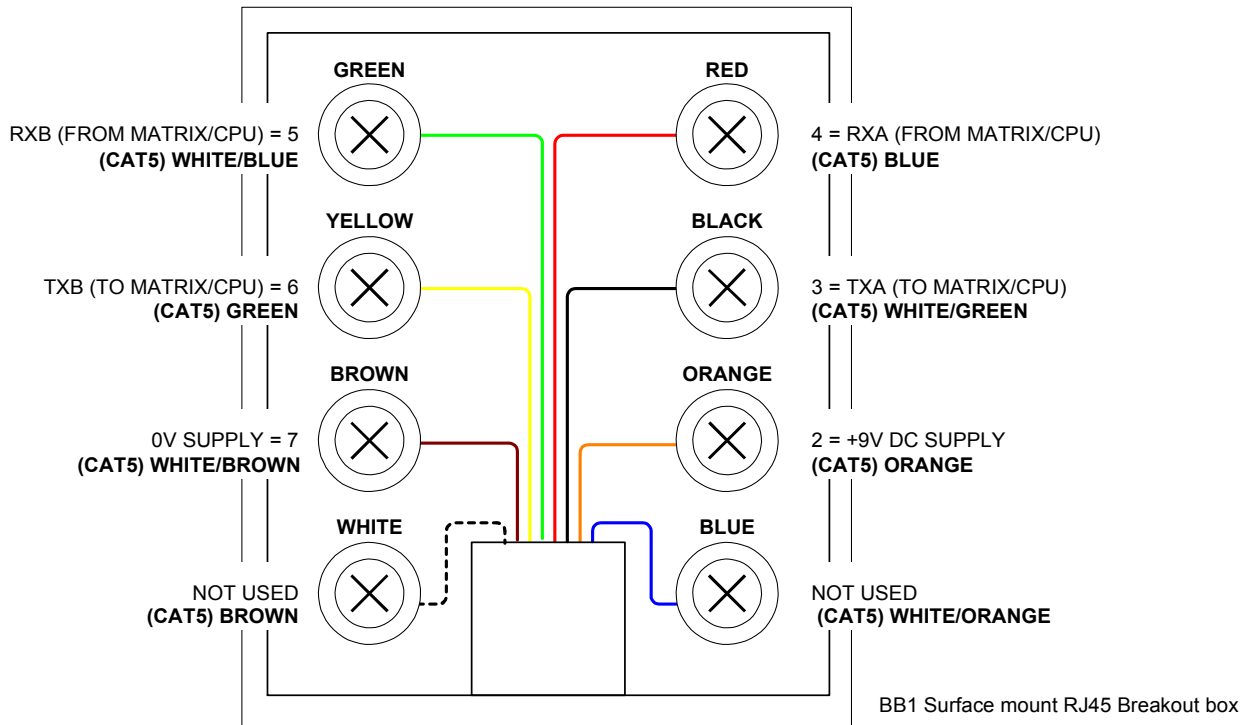
Inputs	1 x 5-way screw terminal 1 x male 9-way D type
Outputs	2 x RJ45 Sockets for BBUS
Input protocols	TX1000 RS232 control protocol TX1500 control protocol
Features	3 x diagnostic LEDs
Dimensions	427mm (w) x 73mm (d) x 45mm (h)
Weight	2.1Kg
Temperature range:	0°C - +40°C

Installation

The TX1500 & FBM communicates with all keyboards, alarm cards and BBUS-IF interfaces via a polled 4 wire multidrop RS422 control bus named BBUS.

Extending cabling

All the units are equipped with standard RJ45 connectors allowing Cat 5 patch cables to be used to connect over short distances. The TX1500/BBUS-IF is supplied with 0.5m Cat 5 cable. On larger sites where the Cat 5 cable is over 2m, BB1 Surface mount RJ45 break out boxes are used to link between Cat 5 cables and good quality screen twin twisted pair data cable. Suitable data cables are the following Belden cables: 9842, 9829, 8162, 8132, 8723. The cable can be extended to a maximum distance of 1200m.



Control of BBV systems via 3rd party equipment

PCB Layout

SW1

1/2 = BBUS termination
Must be ON only when the interface is at the end of line.
Default = OFF

3/4 = RS422 termination
Must be ON only when the interface is at the end of line.
Default = ON.

5/6 = RS232 or RS422 selection.
SW1/5 Input
OFF None
ON OFF RS422
OFF ON RS232 (Default)
ON ON DO NOT USE

7 = MUST BE ON
8 = NOT USED

SW3

Selects the BBUS mode.

SW3/1	SW3/2	SW3/3	SW3/4	MODE
OFF	OFF	OFF	OFF	BBUS mode
ON	OFF	OFF	OFF	Remote Keypad mode
ON	OFF	ON	OFF	FBM mode

TX1000 Camera address selection

SW3/6	SW3/7	SW3/8	camera range
ON	OFF	OFF	17 - 32
OFF	ON	OFF	33 - 48
ON	ON	OFF	49 - 64
OFF	OFF	ON	65 - 80
ON	OFF	ON	81 - 96
OFF	ON	ON	97 - 112
ON	ON	ON	113 - 128

SW4

1/2 = BBUS Address (in BBUS mode)

1	2	Addr	Keyboard No
OFF	OFF	0	1
ON	OFF	1	2 (Default)
OFF	ON	2	3
ON	ON	3	4

3/4/5 = Default Monitor Selection

SW4/3	SW4/4	SW4/5	Monitor
OFF	OFF	OFF	1
ON	OFF	OFF	2 (Default)
OFF	ON	OFF	3
ON	ON	OFF	4
OFF	OFF	ON	5
ON	OFF	ON	6
OFF	ON	ON	7
ON	ON	ON	8

6 = Control Protocol Selection

SW4/6	Protocol
OFF	TX1000 (Default)
ON	TX1500

7/8 Variable/Fixed speed when in normal mode

7	8	Speed
OFF	OFF	Variable speed
ON	OFF	Fixed speed - High Speed (8)
ON	ON	Fixed speed - Low speed (2)

GREEN LD1

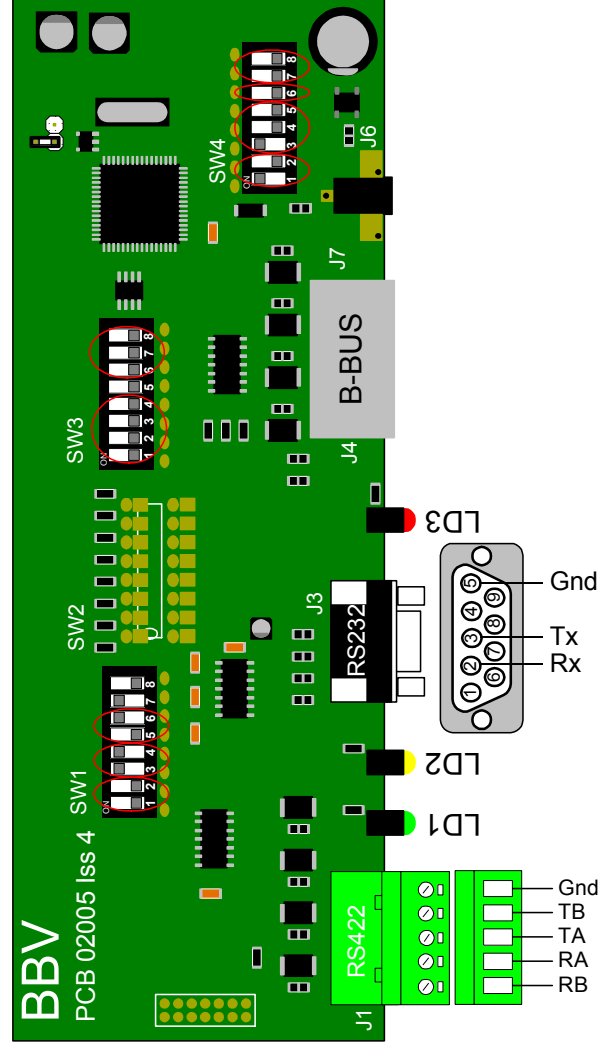
Flashes when the interface sends an LED status to the RS232/422 port.

YELLOW LD2

Flashes when interface receives a command from the RS232/422 port.

RED LD3

BBUS comms status.
OFF = Unit de-powered
ON = Unit Powered but not communicating with the 3rd party system.
Pulsing Very Fast = Communicating correctly.



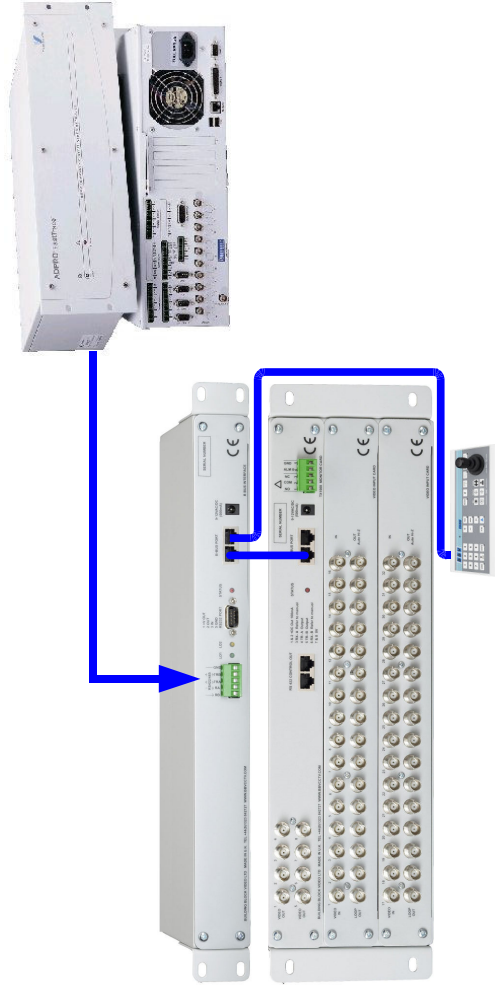
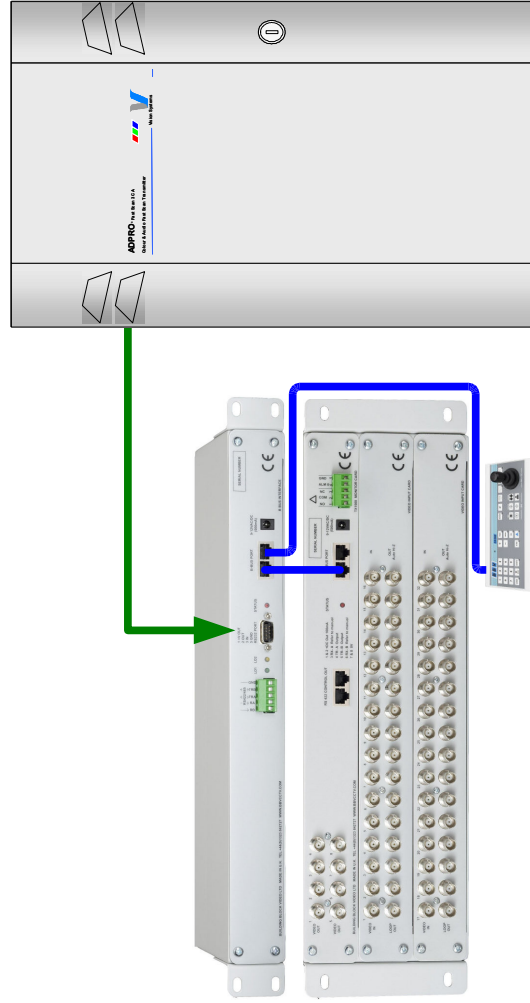
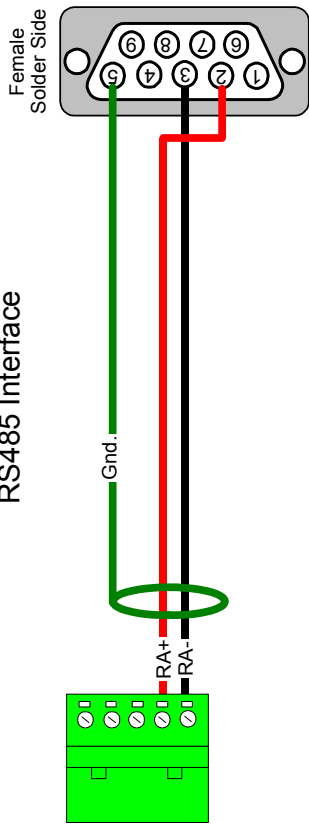
Integration with TX1500 matrix

The BBUS Interface allows integration of 3rd party system & the TX1500. Below are 2 examples of Vision Systems products controlling a TX1500 via a BBUS Interface.

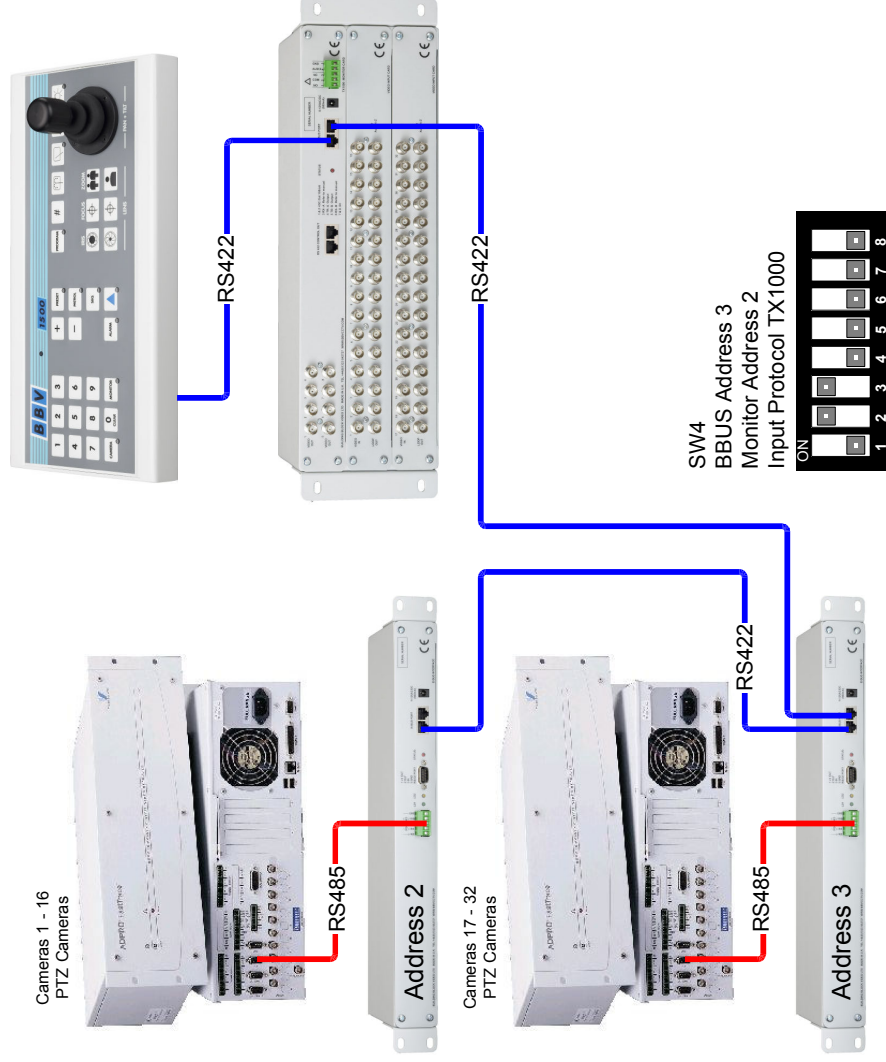
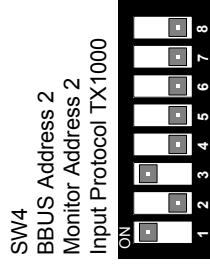
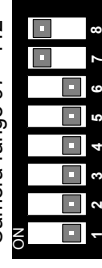
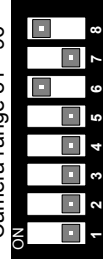
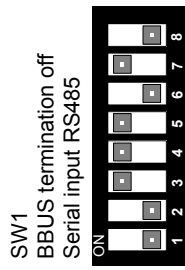
An Adpro Fast Scan 3 using RS232 Interface



A FastTrace using RS485 Interface



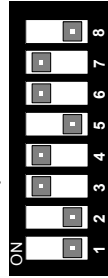
Integration with TX1500 matrix using RS485 – Specifying the camera range



Integration with TX1500 matrix using RS232 – Specifying the camera range

SW1

BBUS termination off
Serial input RS232



SW3

Standard TX1000
keyboard functionality



Camera range 17 - 32



Camera range 33 - 48



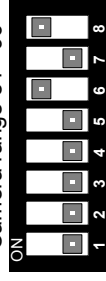
Camera range 49 - 64



Camera range 64 - 80



Camera range 81 - 96



Camera range 97 - 112

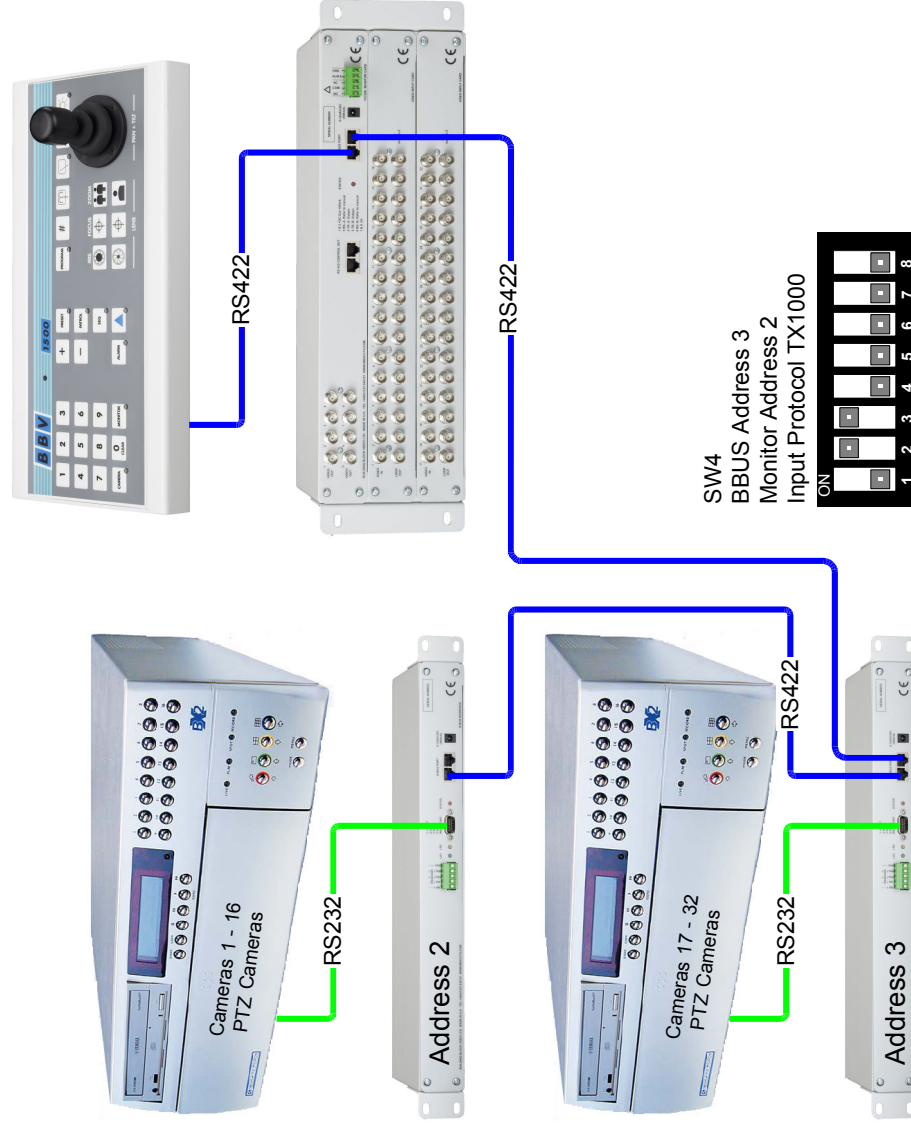
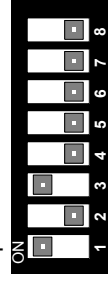


Camera range 113 - 128

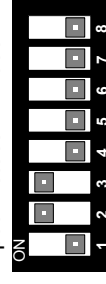


SW4

BBUS Address 2
Monitor Address 2
Input Protocol TX1000



SW4
BBUS Address 3
Monitor Address 2
Input Protocol TX1000

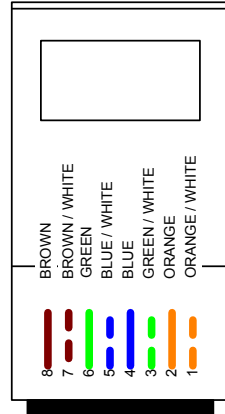
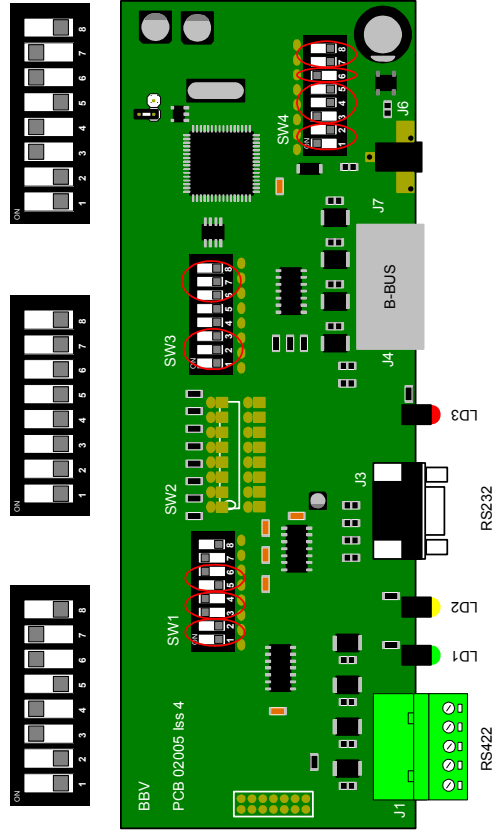


Integrating with Pick-A-Point CPU

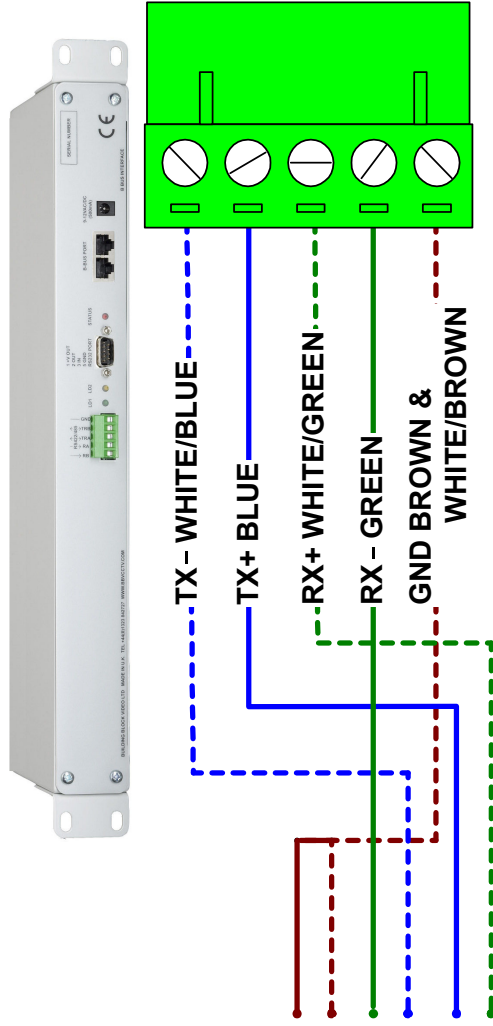
PICK-A-POINT CPU



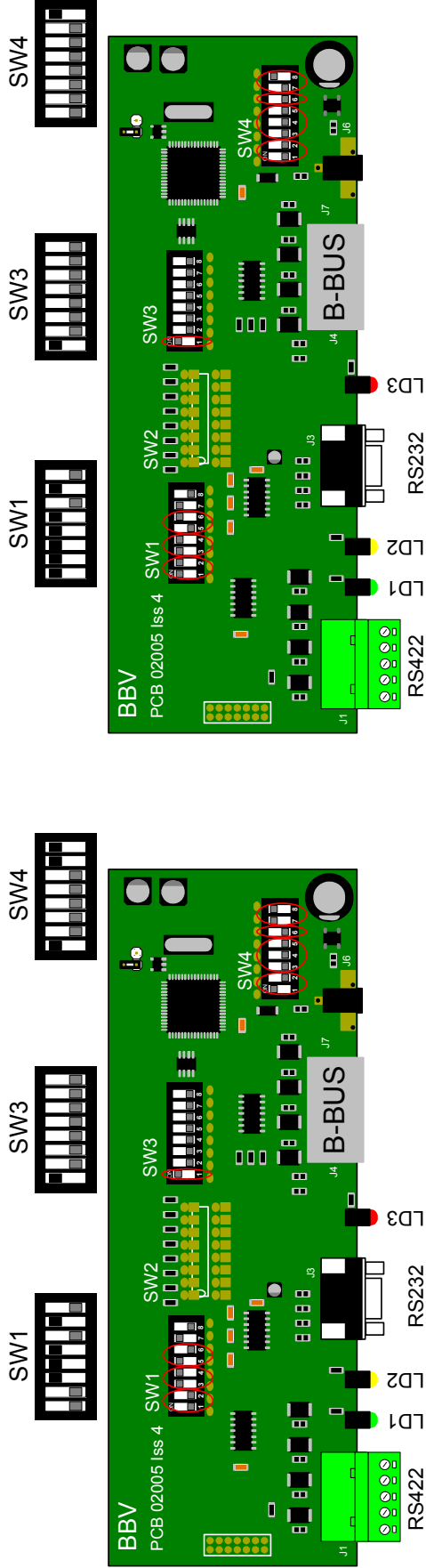
BBUS INTERFACE



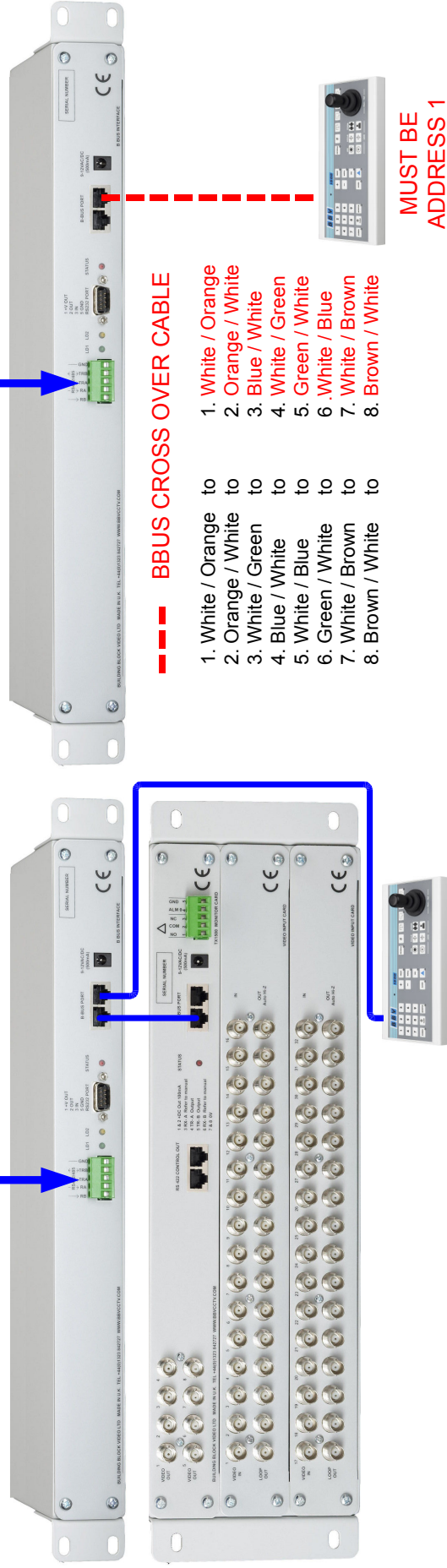
- PIN 8 BROWN
- PIN 7 WHITE/BROWN
- PIN 6 GREEN
- PIN 5 WHITE/BLUE
- PIN 4 BLUE
- PIN 3 WHITE/GREEN
- PIN 2 ORANGE
- PIN 1 WHITE/ORANGE



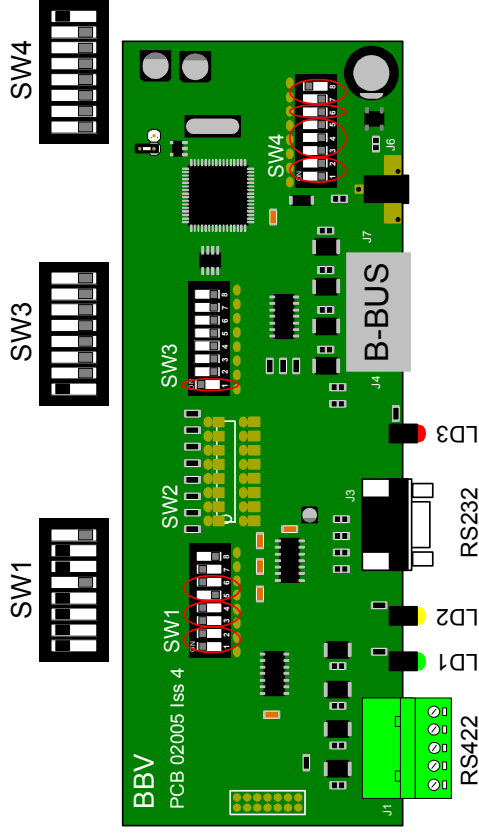
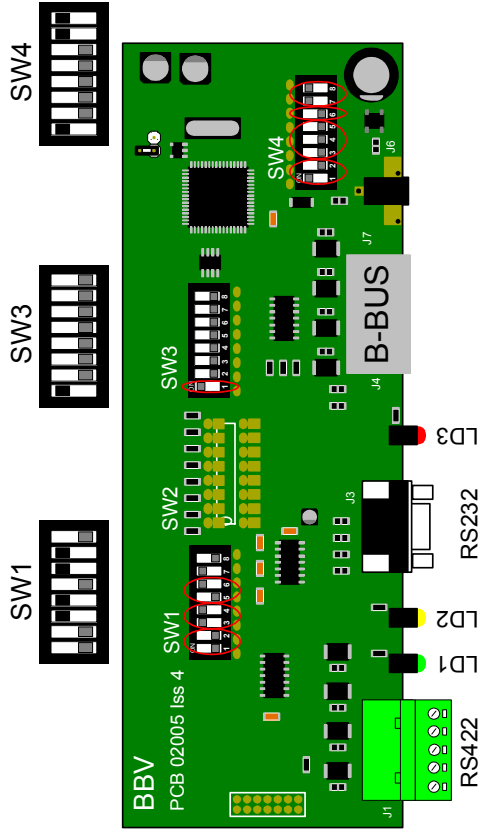
RS422 Interconnection



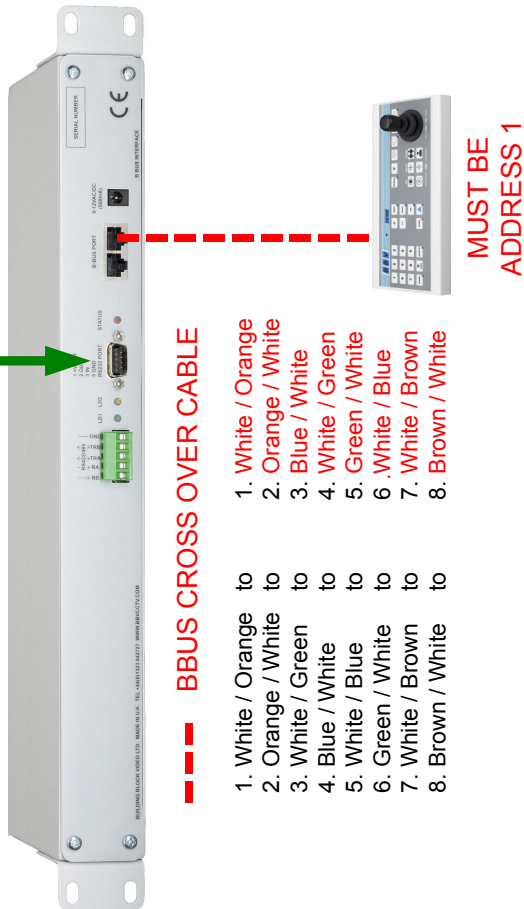
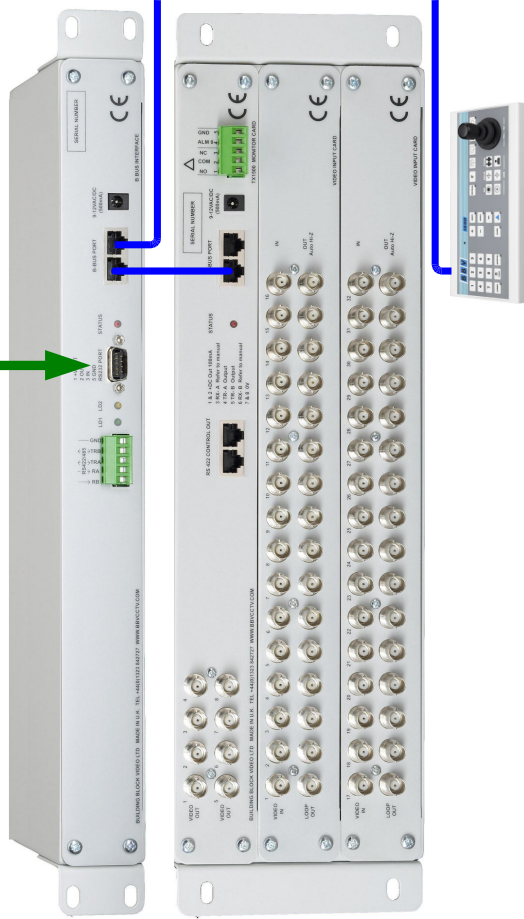
3rd Party transmission equipment



RS232 Interconnection



3rd Party transmission equipment



BBUS CROSS OVER CABLE

1. White / Orange to
2. Orange / White to
3. White / Green to
4. Blue / White to
5. White / Blue to
6. Green / White to
7. White / Brown to
8. Brown / White to

MUST BE ADDRESS 1

FBM Mode

SW1

1&2 = BBUS termination

Must be ON only when the interface is at the end of line.
Default = OFF

3&4 = RS422 termination

Must be ON only when the interface is at the end of line.
Default = ON.

5/6 = RS232 or RS422 selection.

SW1/5 Input

OFF OFF

ON OFF

OFF RS422

OFF ON RS232 (Default)

ON ON DO NOT USE

7 = MUST BE ON

8 = NOT USED

SW3

Selects the BBUS mode.

SW3/1	SW3/2	SW3/3	SW3/4	MODE	FBM mode
ON	OFF	ON	OFF		

TX1000 Camera address selection

SW3/6	SW3/7	SW3/8	camera range
ON	OFF	OFF	17 - 32
OFF	ON	OFF	33 - 48
ON	ON	OFF	49 - 64
OFF	OFF	ON	65 - 80
ON	OFF	ON	81 - 96
OFF	ON	ON	97 - 112
ON	ON	ON	113 - 128

ON OFF OFF ON ON ON

OFF ON OFF ON OFF ON

ON ON OFF ON OFF ON

OFF ON OFF ON OFF ON

ON ON OFF ON OFF ON

OFF ON OFF ON OFF ON

ON ON OFF ON OFF ON

SW4

1/2/3 = BBUS Address

1	2	3	Addr	Keyboard No
OFF	OFF	OFF	0	1
ON	OFF	OFF	1	2
OFF	ON	OFF	2	3
ON	ON	OFF	3	4
OFF	OFF	ON	4	5
ON	OFF	ON	5	6
OFF	ON	ON	6	7
ON	ON	ON	7	8

ON OFF OFF ON ON ON

OFF ON OFF ON ON ON

ON ON OFF ON ON ON

OFF ON OFF ON ON ON

ON ON OFF ON ON ON

OFF ON OFF ON ON ON

ON ON OFF ON ON ON

OFF ON OFF ON ON ON

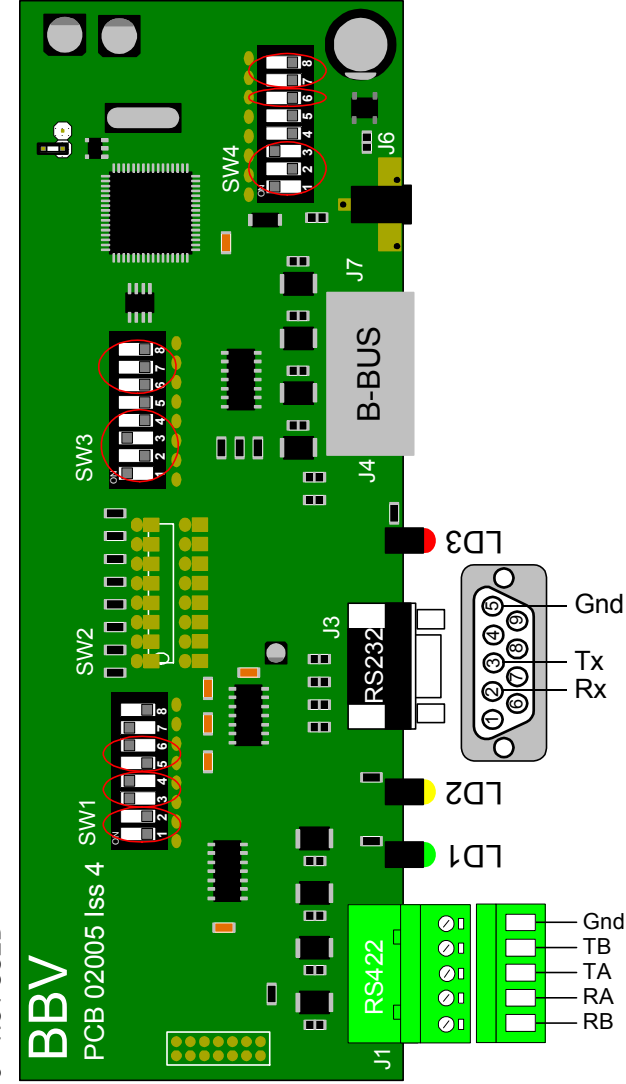
4/5 = OFF

6 = Control Protocol Selection

SW4/6 Protocol

OFF TX1000 (Default)

ON TX1500



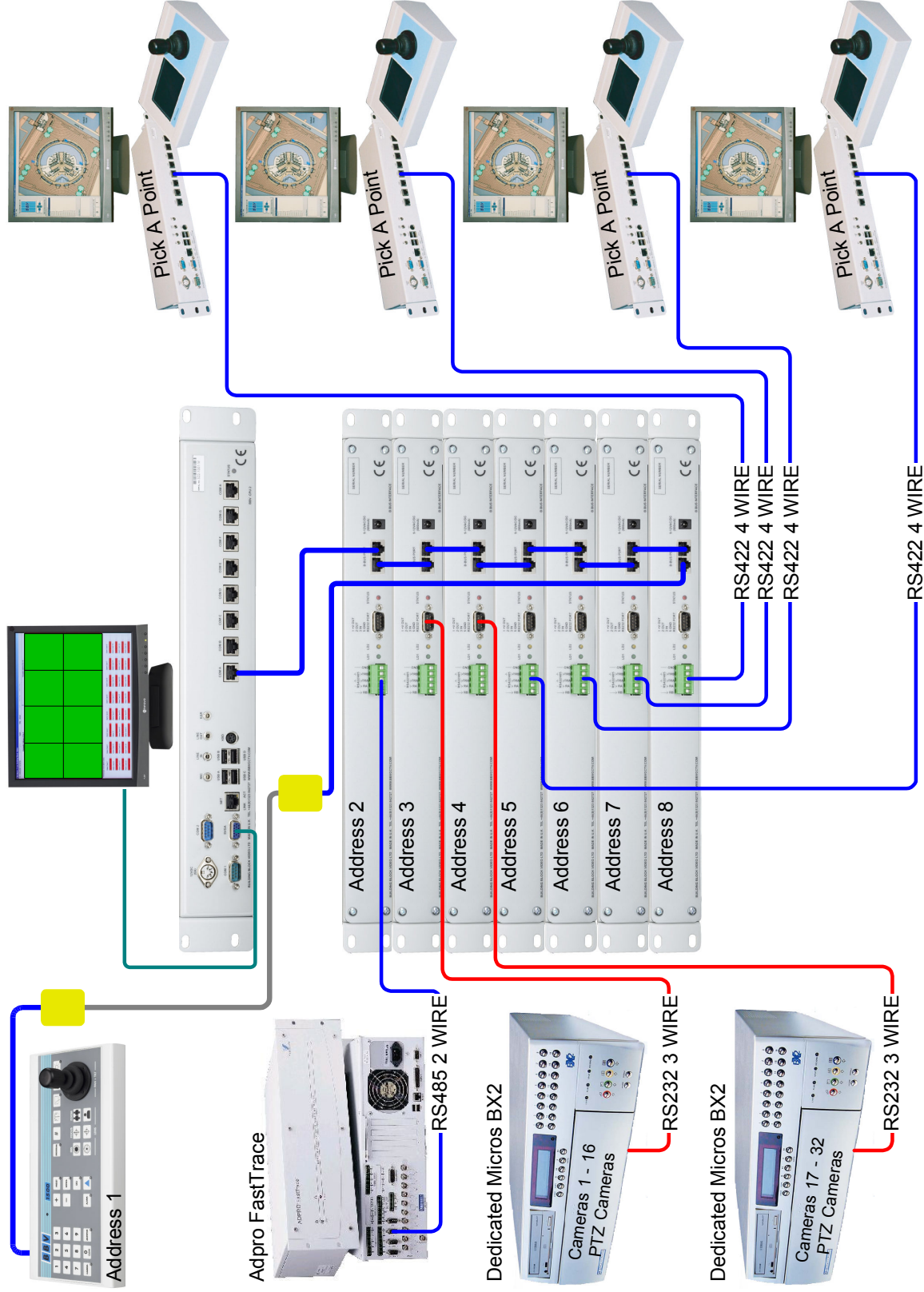
7/8 Variable/Fixed speed when in normal mode

OFF OFF Variable speed

ON OFF Fixed speed - High Speed (8)

ON ON Fixed speed - Low speed (2)

FBM Example – Connecting 3rd party equipment



TX1500 control protocol

This is the TX1500 control protocol when using the BBUS Interface & this simple serial protocol the TX1500 matrix & FBM can be controlled. The protocol is described on the following pages.

Baud settings: 9600,N,8,1. Timing is not critical.

Function	String	Notes
SELECT MONITOR	@2,M <CR>	M = monitor number (1 - 8)
SELECT CAMERA	@3,C <CR>	C = camera number (1 - 96)
PAN RIGHT	@5,2 <CR>	
PAN LEFT	@5,3 <CR>	
TILT UP	@5,4 <CR>	
TILT DOWN	@5,5 <CR>	
ZOOM IN	@5,6 <CR>	
ZOOM OUT	@5,7 <CR>	
FOCUS FAR	@5,8 <CR>	
FOCUS NEAR	@5,9 <CR>	
IRIS CLOSE	@5,10 <CR>	
IRIS OPEN	@5,11 <CR>	
WASH ON	@5,12 <CR>	
WIPER ON	@5,19 <CR>	
LAMPS ON	@5,21 <CR>	
STOP PAN RIGHT	@6,2 <CR>	
STOP PAN LEFT	@6,3 <CR>	
STOP TILT UP	@6,4 <CR>	
STOP TILT DOWN	@6,5 <CR>	
STOP ZOOM IN	@6,6 <CR>	
STOP ZOOM OUT	@6,7 <CR>	
STOP FOCUS FAR	@6,8 <CR>	
STOP FOCUS NEAR	@6,9 <CR>	
STOP IRIS CLOSE	@6,10 <CR>	
STOP IRIS OPEN	@6,11 <CR>	
STOP WASH ON	@6,12 <CR>	
STOP WIPER ON	@6,19 <CR>	
STOP LAMPS ON	@6,21 <CR>	
STOP PAN/TILT/LENS	@6,22	Stops all pan/tilt and lens movement
PAN/TILT SPEED	@7,P,T <CR>	P=Pan & T=Tilt speed in the range 0 - 15 0 = slowest, 15 = fastest
GOTO PRESET	@8,P <CR>	P = preset number (1-99)
PROGRAM PRESET	@9,P <CR>	P = preset number (1-99)
START PATROL 1	@10 <CR>	
START AUTOPAN	@12 <CR>	
START MONITOR SEQUENCE	@25,0 <CR>	Same as hold off
STOP MONITOR SEQUENCE	@25,1 <CR>	Same as hold on

Relay ON (Triangle Key)	@50,X<CR>	X = 0 – 12 0 = Tx1500 relay 1 – 2 = relays 1 & 2 of alarm card 1 3 – 4 = relays 1 & 2 of alarm card 2 5 – 6 = relays 1 & 2 of alarm card 3 7 – 8 = relays 1 & 2 of alarm card 4 9 – 10 = relays 1 & 2 of alarm card 5 11 – 12 = relays 1 & 2 of alarm card 6
Relay OFF	@51,X<CR>	X = As above
HASH command	@52,X<CR>	X = hash number – see Tx1500 for specific hash commands.
Send Single Key Press	@53,0<CR>	'0' Key
	@53,1<CR>	'1' Key
	@53,2<CR>	'2' Key
	@53,3<CR>	'3' Key
	@53,4<CR>	'4' Key
	@53,5<CR>	'5' Key
	@53,6<CR>	'6' Key
	@53,7<CR>	'7' Key
	@53,8<CR>	'8' Key
	@53,9<CR>	'9' Key
	@53,10<CR>	'CAMERA' key
	@53,11<CR>	'MONITOR' key
	@53,12<CR>	'CLEAR' key
	@53,13<CR>	'+' key
	@53,14<CR>	'-' key
	@53,15<CR>	'PRESET' key
	@53,16<CR>	'PATROL' key
	@53,17<CR>	'SEQ' key
	@53,18<CR>	'RELAY/TRIANGLE' key
	@53,19<CR>	'ALARM' key
	@53,21<CR>	'PROGRAM' key
	@53,22<CR>	TX1500 MENU ACCESS
Display current Info	@54<CR>	Output current camera, monitor & lights status

All characters shown are the actual ASCII characters that should be sent. Two or three digit numbers will be sent using either two or three characters.

All commands are terminated with a <CR> = 0x0d or decimal 13

Examples

Select camera 1 onto monitor 4

```
@2,4 <CR>      Complete HEX byte string      0x40 0x32 0x2c 0x34 0x0d
@3,1 <CR>      0x40 0x31 0x2c 0x31 0x0d
```

Once the monitor is selected, any subsequent camera selects relate to this monitor ie to now select camera 16 send the following:

```
@3,16 <CR>
```

The current camera can then be controlled using the @5 and @6 commands.

@5 commands are used to start a function and @6 commands are used to stop a function. Only a single function can be controlled with each command

To Pan Left, Tilt Up and Zoom in, send the following:

```
@5,3 <CR>
```

```
@5,4 <CR>
```

```
@5,6 <CR>
```

Pan and Tilt speeds are sent using the @7 command. 16 speed are supported, 0 being the slowest speed up to 15 as the fastest.

If no speed command is sent following a @5 command then a speed of 1 will be assumed. This prevents the head from 'jerking' on movement start.

Speed Examples

Move Left at increasing speeds

```
@5,3 <CR>      Start Panning Left
```

```
@7,1,1 <CR>    Slow Pan Speed
```

```
@7,5,1 <CR>    Increased Pan Speed
```

```
@7,10,1 <CR>   Even Higher Pan Speed
```

```
@7,15,1 <CR>   Full Pan Speed
```

To stop movement in a direction send a @6 command followed by pan/tilt speed 0

To stop moving left send

```
@6,3 <CR>
```

```
@7,0,0 <CR>
```

Selecting a new camera whilst the current camera is moving will cause the current camera to stop moving before selecting the new camera.

Responses sent from the TX1500 BBUS Interface

Each response is followed by CR/LF.

On power up the following message is sent:: TX1500 BBUS I-F V6

After each successfully received command the interface responds with OK and ERR followed by reason if the command or a parameter is invalid.

After a @54<CR> command or if the current monitor, camera or LED status changes the following message is send. M1,C01 0000000

M = The monitor number, 1-8

C = The camera number, 1-96

The next 7 characters represent the LED status, 1 if the LED is ON, 0 is OFF as shown left to right.

LIGHTS, AUTOPAN, WIPE, ALARM, TRIANGLE, SEQ, PATROL

EG monitor 2 showing camera 45 which is running a patrol with the lights on.

```
M02,C45 1000010
```

If implementing software to control the TX1500 please check for a later version of the control protocol first.

www.support.bbvctv.com

Notes

Extend your BBV Warranty from 12 months to 3 years

As of the 1st September 2008 BBV have offered our customers the opportunity to extend the standard 12 month warranty to 3 years.

You must register for the extended warranty within 12 months of the date of manufacture.

How to register for the 3 year warranty

Registering for the new, longer 3 year warranty term is quick and easy.

Either:

Complete the warranty application card that comes in the box with your BBV product, and return it FREEPOST to BBV:

BBV 3 Year Warranty

If this card is returned with the serial number of the product and the installation company details BBV will extend the warranty period from 12 Months to 36 Months.

Number of Units, Start Serial No. Final Serial No.

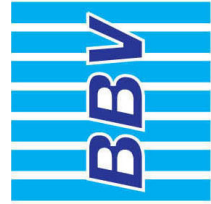
Contact Name _____ Please could you send me information especially on: _____
 Company Name _____
 Phone Number: _____
 Site Name _____
 Address 1 _____
 Address 2 _____
 Address 3 _____
 Post Code _____
 e-mail address: _____

Do you read: **PSI MAGAZINE** **PSI MAGAZINE** **PSI MAGAZINE**

I do not require any further product information.
 Please refer to WWW.BBVCTV.COM for terms, conditions & exclusions
VAT Reg. No. 02 1756283 Registered in England No. 2820321 Registered office: 17 Alex Park, Dorking, Surrey, GU24 0JH

Or alternatively:

Register online at: www.bbvctv.com
 Simply enter your details on the 'Warranty Cover' page.



Building Block Video Ltd

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 Support: + 44 (0) 1323 444600
www.bbvctv.com

The screenshot shows a web browser window with the following elements:

- Browser Title:** Building Block Video CCTV - Microsoft Internet Explorer
- Address Bar:** http://www.bbvctv.com/customer_support/warranty.html
- Page Header:** Warranty
- Navigation:** SEARCH PRODUCTS (with a search input field and a Search button), WARRANTY COVER (with a button and a circuit board image), REGISTER ONLINE (with a button).
- Main Content:**
 - Text: "Read more about our warranty cover"
 - Text: "To extend the warranty period from 12 Months to 36 Months FREE of charge complete the form below:"
 - Form fields: Number of units, Start Serial, Finish Serial, Contact Name, Company Name, Site Name, Address, Town/City, County, Postcode, Phone Number, Email, Confirm E-mail, Installation Company.
 - Text: "Do you read (please tick):"
 - Checkboxes: Professional Security, International Security, PSI Magazine, SC Magazine.
- Footer:** Done, Internet