Installation Guide RX45X RX55X

RX55X (DC version) shown

Multi protocol RS485 and up-the-coax telemetry

RX45X 230Vac

(24Vac or supply output – link selectable)

RX55X 24Vdc

Firmware Version 21

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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 - 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.

Power Connector - This unit is equipped with connector mounted at the edge of the PCB for mains 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, whether inside the unit or outside it. Particular attention should be paid to cords at plugs, connection units and the point of exit from 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 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.

Safety During Installation or Servicing - Particular care should be taken to isolate the pan/tilt head in order to prevent operation while engineering work is being carried out on the receiver.

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.

DO NOT OPERATE THE UNIT WITH ANY INTERNAL COVERS REMOVED. DANGEROUS VOLTAGES ARE PRESENT ON THE POWER SUPPLY. THE UNIT MUST ONLY BE SERVICED BY QUALIFIED PERSONNEL.

RX45X TECHNICAL SPECIFICATION

Power Requirements 230Vac or (24Vac or 110Vac as special order)

Max Load 5A @ 230V (1150 W)

Receiver Current Draw 24VA max

Fuses Auxiliary fuse F2 5A T (20mm ceramic cartridge)

Outputs Motor and auxiliary outputs supply voltage or 24Vac selectable with link J3

8 single pole relays (snubbed)

1. Left Motor
2. Right Motor
3. Up Motor
4. Down Motor
5. Autopan (Interlocked with Pan)
6. Lights (1000W max)
7. Wash
8. Wipe

Facilities LED readout for continual system status.
Programming menu with On Screen Display.

REMOTELY ADJUSTABLE

Video launch amplifier provided with cable length adjustment
12Vdc/500mA camera power provided.
Colour coded outlets – live, neutral, earth and low voltage.

Telemetry Signal BBV and Baxall standard and alternate up-the-coax telemetry,
BBV RS422, Dennard RS485, Pelco P/D RS485,
Philips/Bosch RS485 (optional BI-PHASE), Sensormatic/AD RS422,
Molynx "D" Type, VCL RS485

Auto Iris Output Returns to original setting 15 seconds after key release. Level programmable from controller.

Video Input 1v p-p 75Ω terminated input via BNC socket.

Video Output 1v to 4v p-p 75Ω impedance via BNC socket.

Lens Drive
REMOTELY ADJUSTABLE

Adjustable via menu between 6 – 12Vdc. Inching speed selectable via menu between 0 – 12Vdc. 1 second inching built in. Provides drive for Zoom & Focus. Each lens drive carries red and green LEDs to indicate direction and drive voltage.

Presets Inputs are provided for pan, tilt, zoom & focus preset feedback pots with 10 bit resolution. Optional sin/cos pan input for continuous rotation heads. Up to 32 full-scene presets can be stored within the receiver, i.e. pan, tilt, zoom, focus. (16 with BBV up-the-coax & 8 with Baxall)

Additional Information Autopan auxiliary output or software Random Pan
Sequential preset patrol. The preset dwell is programmable individually.
Datum - return to preset 1, start preset patrol or random pan after menu programmable duration of inactivity.
Iris output - either direct drive for 3 motor lens or Autoiris override voltage for Seiko/Cosmicar lenses etc.
8 alarm inputs, volts free normally closed contacts. A single opening volts free contact sums the alarms either immediately or as the preset is approached. If a video transmission system is activated with the alarm output, then setting the alarm to delayed prevents unwanted frames being transmitted.

Boxed Dimensions Width: 380mm, Length: 190mm, Height: 130mm

Weight 3.43kg

RX55X TECHNICAL SPECIFICATION

Power Requirements	230Vac or (24Vac or 110Vac as special order)
Max Load	5A @ 230V (1150 W)
Receiver Current Draw	Maximum of 100VA max
Fuses	Auxiliary fuse F2 5A T (20mm ceramic cartridge)
Outputs	Linear 0-24Vdc output for pan & tilt motor drive Switched 24Vdc output to drive motor brakes. Total maximum of pan/tilt/lens and 24Vac auxiliary is 100VA. 24Vac/230Vac auxiliary outputs are link selectable with link J3 Wash/Wipe/Lights(1000W max)
Facilities	LED readout for continual system status. Programming menu with On Screen Display.
Gain	***REMOTELY ADJUSTABLE*** Video launch amplifier provided with cable length adjustment 12Vdc/500mA camera power provided. Colour coded outlets – live, neutral, earth and low voltage.
Telemetry Signal	BBV and Baxall standard and alternate up-the-coax telemetry, BBV RS422, Dennard RS485, Pelco P/D RS485, Philips/Bosch RS485 (optional BI-PHASE), Sensormatic/AD RS422, Molynx "D" Type, VCL RS485
Auto Iris Output	Returns to original setting 15 seconds after key release. Level programmable from controller.
Video Input	1v p-p 75Ω terminated input via BNC socket.
Video Output	1v to 4v p-p 75Ω impedance via BNC socket.
Lens Drive	***REMOTELY ADJUSTABLE*** Adjustable via menu between 6 – 12Vdc. Inching speed selectable via menu between 0 – 12Vdc. 1 second inching built in. Provides drive for Zoom & Focus. Each lens drive carries red and green LEDs to indicate direction and drive voltage.
Presets	Inputs are provided for pan, tilt, zoom & focus preset feedback pots with 10 bit resolution. Optional sin/cos pan input for continuous rotation heads. Up to 32 full-scene presets can be stored within the receiver, i.e. pan, tilt, zoom, focus. (16 with BBV up-the-coax & 8 with Baxall)
Additional Information	Software Random Pan Sequential preset patrol. The preset dwell is programmable individually. Datum - return to preset 1, start preset patrol or random pan after menu programmable duration of inactivity. Iris output - either direct drive for 3 motor lens or Autoiris override voltage for Seiko/Cosmicar lenses etc. 8 alarm inputs, volts free normally closed contacts. A single opening volts free contact sums the alarms either immediately or as the preset is approached. If a video transmission system is activated with the alarm output, then setting the alarm to delayed prevents unwanted frames being transmitted.
Boxed Dimensions	Width: 380mm, Length: 190mm, Height: 130mm
Weight	3.43kg

INTRODUCTION

GENERAL

The RX45X is designed to control 24Vac/230Vac operated fixed speed pan/tilt heads and the RX55X is designed to control 24Vdc high/variable speed heads.

Receivers can be connected using either a daisy chained or star wired RS422/RS485 network depending upon the site and specific controller used. If the control system has only a single telemetry output a BBV STARCARD or STARCARD/CONVERTER may be used to allow star wiring of the site.

The receiver is supplied in an IP65 rated polycarbonate external weatherproof enclosure. It will be necessary to make suitable holes in the enclosure to permit cable entry and exit. Adequately rated cable glands and or flexible conduit should be used at all times to avoid compromising the protection afforded by the enclosure as supplied. Any holes made in the enclosure should be sealed with a non-hardening waterproof sealant, taking care to ensure that the internal electronics are not contaminated.

Enclosure mounting holes are provided at the corners of the enclosure outboard of the seal between enclosure and lid.

QUICK INSTALLATION STEPS

AUXILIARY OUTPUT AND HEAD VOLTAGE WITH RX45X

As shipped the receiver's auxiliary outputs are 24Vac. If mains voltage is required remove the plug with RED wires from J3 on the lower board, adjacent to the fuse and replace with the plug with the BLUE and BROWN wires.
Ensure that the receiver is not powered before changing the plug.

TELEMETRY TYPE AND UNIT ADDRESS

The receiver can be controlled from a range of telemetry protocols. As shipped BBV up-the-coax protocol is selected. For other protocols use this simple procedure.

Mains voltages are present within the receiver. Make sure that you understand electrical safety procedures before operating the receiver with the cover removed. Do not operate the receiver with the covers removed if there is chance of water ingress.

1) Connect a video monitor to the output BNC marked J1-TO MATRIX.
Press and hold SW2 (MENU/SET) whilst powering on the receiver and a menu will be shown on the monitor with COMMUNICATIONS flashing.

2) Release SW2 and press SW2 again to select COMMUNICATIONS.
The next screen shows the currently telemetry type and receiver address. If these are correct simple power off the receiver.

3) To change the telemetry type or address use SW1/SW3 to highlight MENU UNLOCK and press SW2 to toggle to UNLOCK.

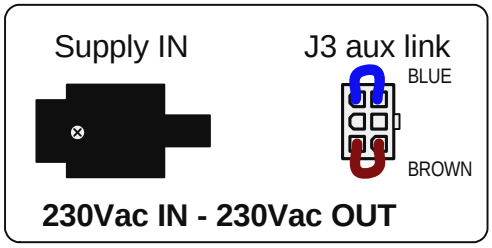
4) Use SW1/3 to select TELEMETRY TYPE or UNIT ADDRESS and press SW2 to change screens. SW1/SW3 until the required choice is shown then press SW2 to select.

5) Once the telemetry type and unit address is set correctly use SW1/SW3 to highlight SAVE CHANGES AND EXIT and press SW2.

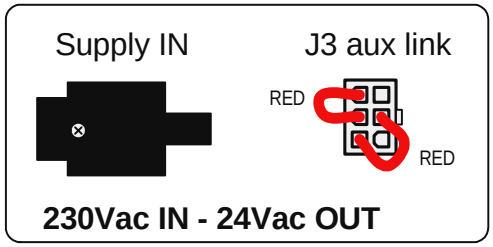
6) The receiver then re-starts. Power off and continue with the physical installation.

7) If using Pelco P or Pelco D telemetry check that the baud and parity settings are correct and if not repeat and alter the baud and parity as required. Note, Pelco P is generally 9600 baud, No parity and Pelco D is 2400 baud, Even parity. Check in your specific controller manual.

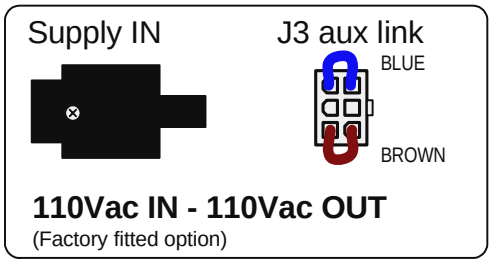
RECEIVER SUPPLY AND OUTPUT OPTIONS



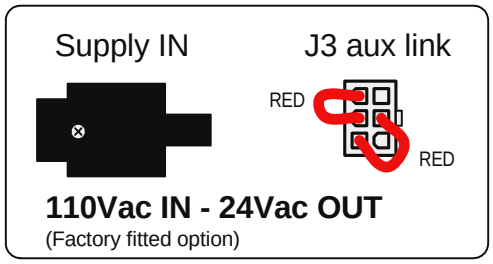
230Vac IN - 230Vac OUT



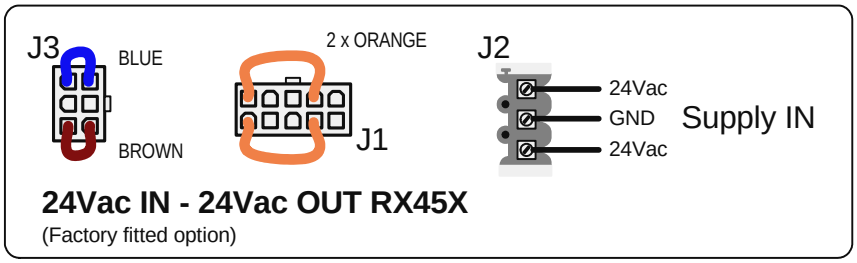
230Vac IN - 24Vac OUT



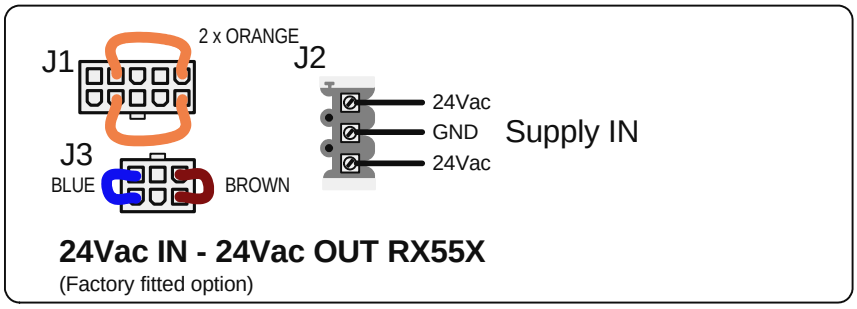
110Vac IN - 110Vac OUT
(Factory fitted option)



110Vac IN - 24Vac OUT
(Factory fitted option)



24Vac IN - 24Vac OUT RX45X
(Factory fitted option)



24Vac IN - 24Vac OUT RX55X
(Factory fitted option)

RX45X (AC) connection details

Local Self Test
Press SW1 & SW3 together.
Left, Right, Down, Up, Zoom In, Out,
Focus Near, Far, Iris Open, Close,
Lights, AutoPan, Wash, Wipe

UP MENU/SET DOWN

LOGIC/UPPER BOARD CONNECTIONS

POWER LED
ON = Power Present.
FLASH OFF = Telemetry Received.

IRIS FOCUS ZOOM

RS485 Termination links
= Terminated. End Of Line.
= Un-Terminated. Daisy Chained.

J9-ALARMS J11 J7-PRESET J10-LENS J4 J1-VIDEO

J11
CAMERA DATA

1	2	3	4	5
TRA	TRB	GND	RA	RB

Expanded View

Camera	Rx-J11
2 WIRE CONNECTION	
A	1-TRA
B	2-TRB
GND	3-GND
4 WIRE CONNECTION	
RA	1-TRA
RB	2-TRB
GND	3-GND
TA	4-RA
TB	5-RB

ALARM OUT
Volts Free
N/C Contact

8 7 6 5 4 3 2 1

ALARM IN
Volts Free
N/C Contatcs

Alarm I/P 8

Alarm I/P 7

RS485 Camera Data

FOCUS ZOOM PAN TILT

12Vdc Out 500mA

IRIS* FOCUS ZOOM

FROM CAMERA
TO CONTROLLER

TELEMETRY

MATRIX	RX-J4
TX+/A	4-RA
TX-/B	5-RB

RESPONSE REQUIRED WITH AD RS422 ONLY.

RX+/A	1-TRA
RX-/B	2-TRB

MOLYNX "D" TYPE

+VE/A	1-TRA
-VE/B	2-TRB

J4
RS422/485 Telemetry

1	2	3	4	5
TRA	TRB	GND	RA	RB

Expanded View

The IRIS output can be configured as motor drive or AutoIris Override voltage.

TELEMETRY TYPE AND ADDRESS

The telemetry protocol type and receiver address is set from the COMMUNICATIONS menu.

Connect a video monitor to the receiver TO MATRIX BNC J1 and power up with SW2 (MENU/SET) pressed.

The menu will be displayed with COMMUNICATIONS flashing. Release SW2 and press again to display the COMMUNICATIONS menu.

Use SW1/SW3 to highlight MENU UNLOCK and toggle to UNLOCK with SW2.

SW1/SW3 can now be used to alter the TELEMETRY TYPE and UNIT ADDRESS. When the telemetry type is changed the unit address is always set to 1.

97005 iss 4

PSU/LOWER BOARD CONNECTIONS

F2 PSU FUSE - 3.15A

MAINS SUPPLY

F3 AUX SUPPLY FUSE 5AT

J6 J4

WASH: NEUTRAL EARTH LIVE
WIPE: NEUTRAL EARTH LIVE
PAN/TILT HEAD: NEUTRAL EARTH LEFT RIGHT UP DOWN
AUTO PAN: NEUTRAL EARTH LIVE
LIGHTS: NEUTRAL EARTH LIVE
UNSWITCHED OUTPUT: NEUTRAL EARTH LIVE

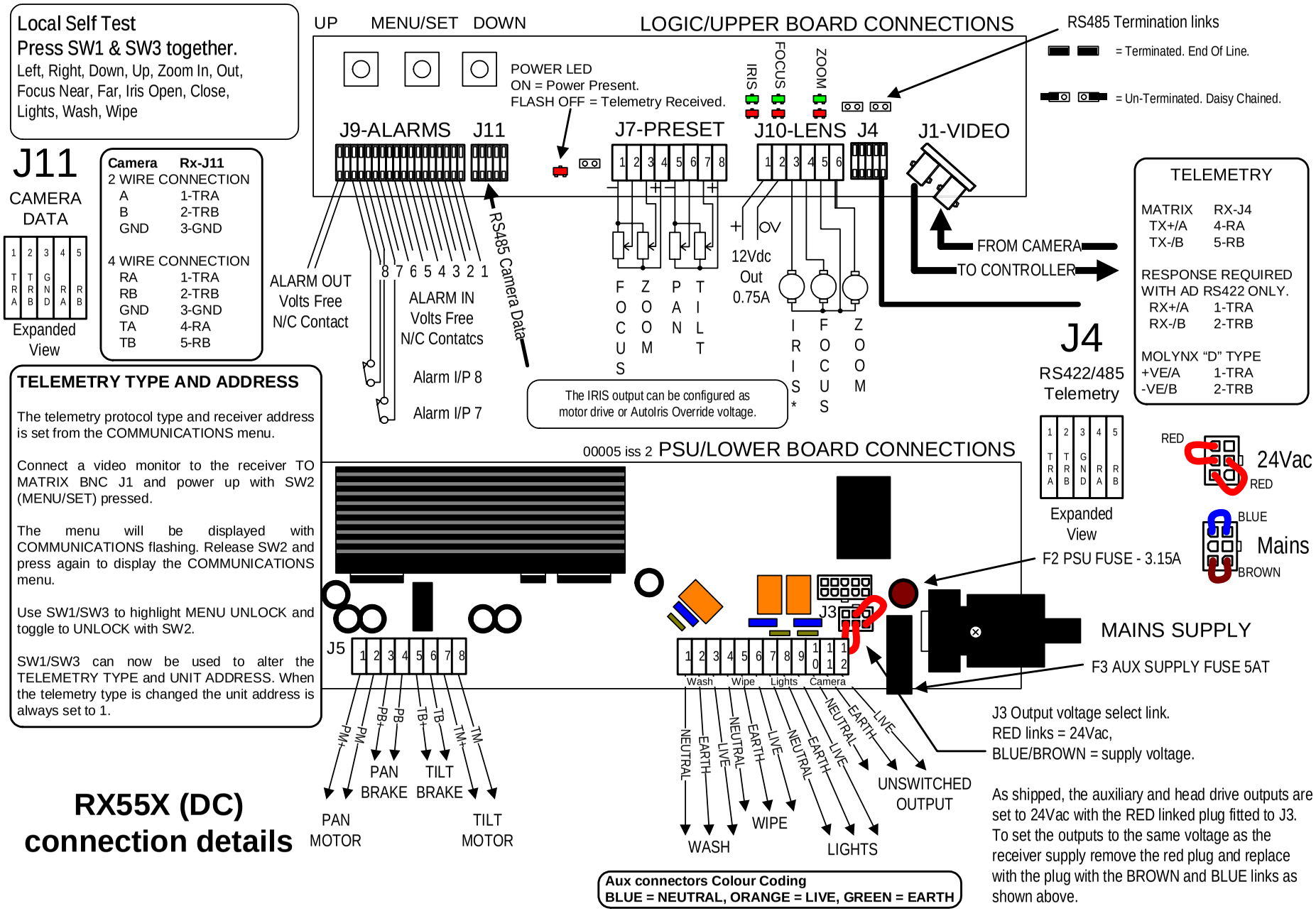
J6 and J4 Aux connectors Colour Coding
BLUE = NEUTRAL, ORANGE = LIVE, GREEN = EARTH

J3 Output voltage select link.
RED links = 24Vac,
BLUE/BROWN = supply voltage.

RED — 24Vac — RED

BLUE — Mains — BROWN

As shipped, the auxiliary and head drive outputs are set to 24Vac with the RED linked plug fitted to J3. To set the outputs to the same voltage as the receiver supply remove the red plug and replace with the plug with the BROWN and BLUE links as shown above.



RX55X (DC) connection details

This table shows the polarity of the pan/tilt motor and brake drive outputs with RX55X and lens drive outputs with RX45X and RX55X. This is to be used in conjunction with the head and lens manual to determine correct wiring.

Ensure that brake and motor drive outputs are NOT cross wired as this could cause damage to the receiver.

The lens outputs can be reversed from within the OPTIONS menu of the receiver menu instead of swapping the lens wiring.

RX55X PAN/TILT OUTPUTS					
Pin J5	Pan LEFT RED	Pan RIGHT GREEN	Pin J5	Tilt UP RED	Tilt DOWN GREEN
PM+	+ve	0v	TM+	+ve	0v
PM-	0v	+ve	TM-	0v	+ve
PB+	+ve	0v	TB+	+ve	0v
PB-	0v	+ve	TB-	0v	+ve

RX45X and RX55X LENS		
Pin J10	Zoom IN RED	Zoom OUT GREEN
ZM	-ve	+ve

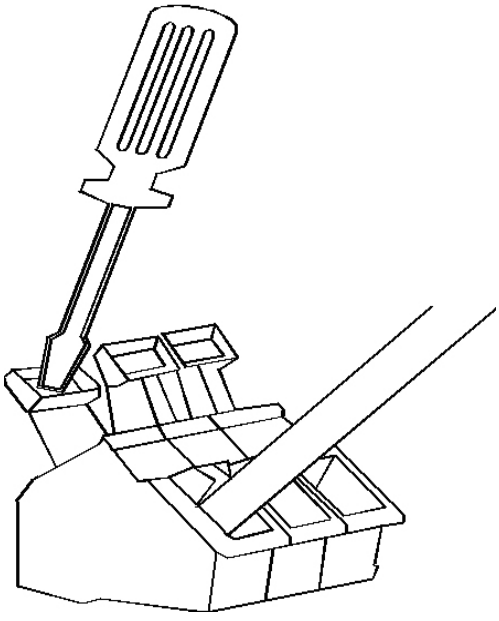
Pin J10	Focus FAR GREEN	Focus NEAR RED
FC	-ve	+ve

Pin J10	Iris OPEN	Iris CLOSE
IR	-ve	+ve

CABLE CONNECTIONS

The receiver comprises of two pcbs mounted one above the other. The lower board contains the power supply and output connectors for the pan/tilt head and auxiliary outputs. The top board has the microprocessor and the low voltage connectors including lens, presets, local alarms, telemetry etc.

Cage clamp connectors are used for all wired connections with the receiver apart from supply and video. The diagram below shows how the cage clamp connectors should be used.



Disconnected power BEFORE connecting and disconnecting cables.

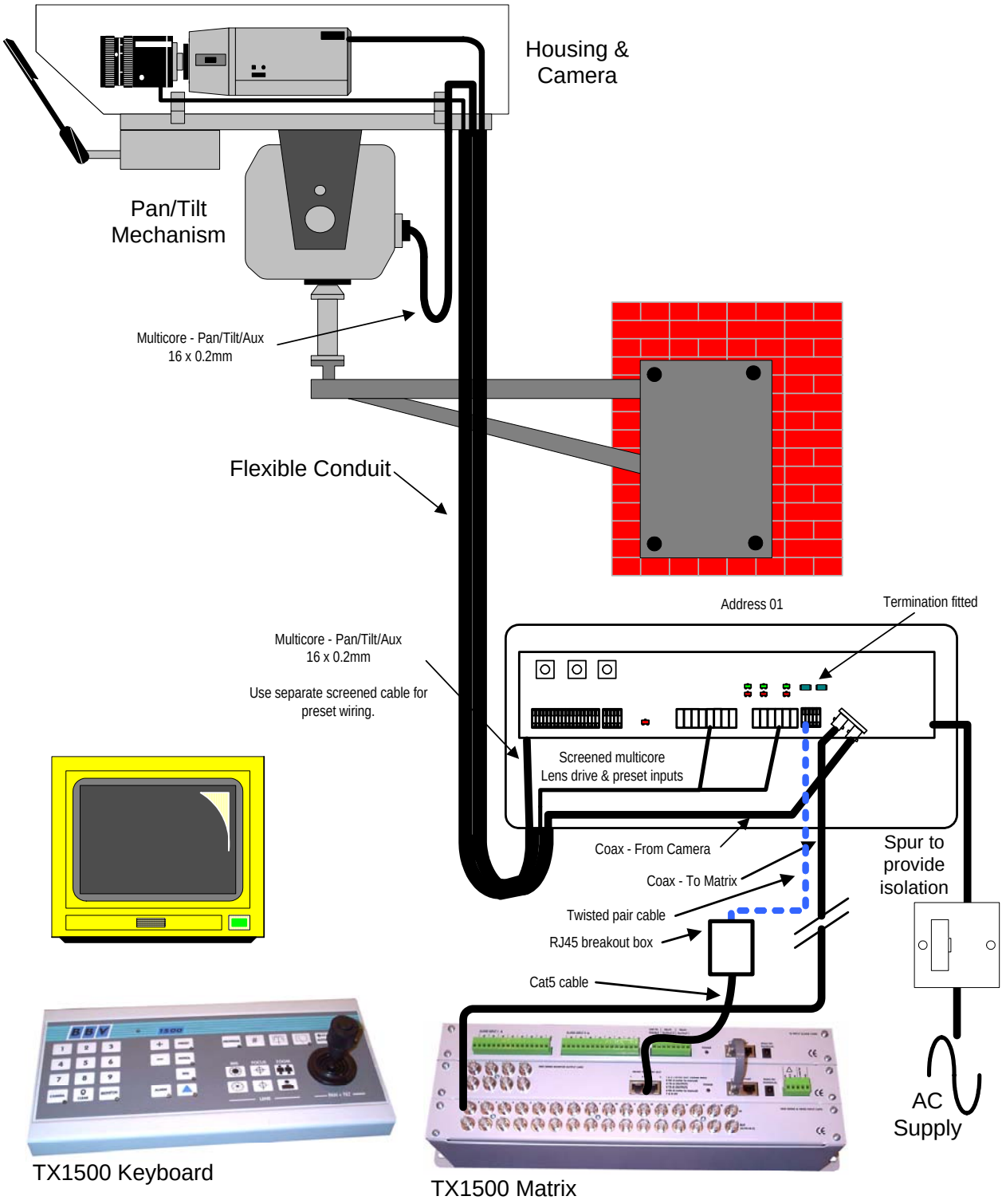
The cage clamp connector is a simple-to-use method of attaching cables to PCBs quickly and easily. Prepare cables as follows:

Use only cable between 0.08 and 2.5 mm²
Strip the cable to a length of 5 to 6 mm (0.23 in)

The correct method of attachment is as follows:
1. Press down the relevant terminal block lever with a suitable screwdriver.
2. Insert wire.
3. Remove screwdriver.

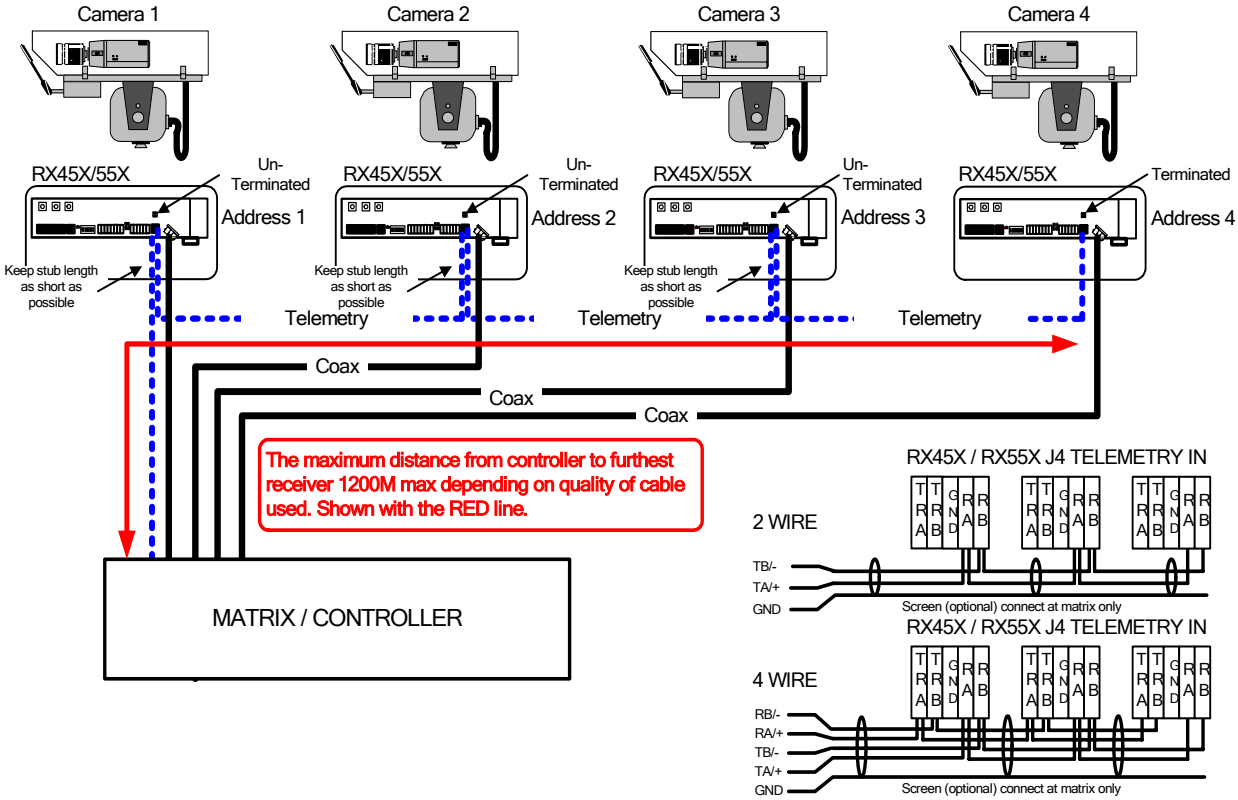
The procedure for detaching wires is the reverse of the 3 attachment steps.

HEAD & LENS WIRING EXAMPLE



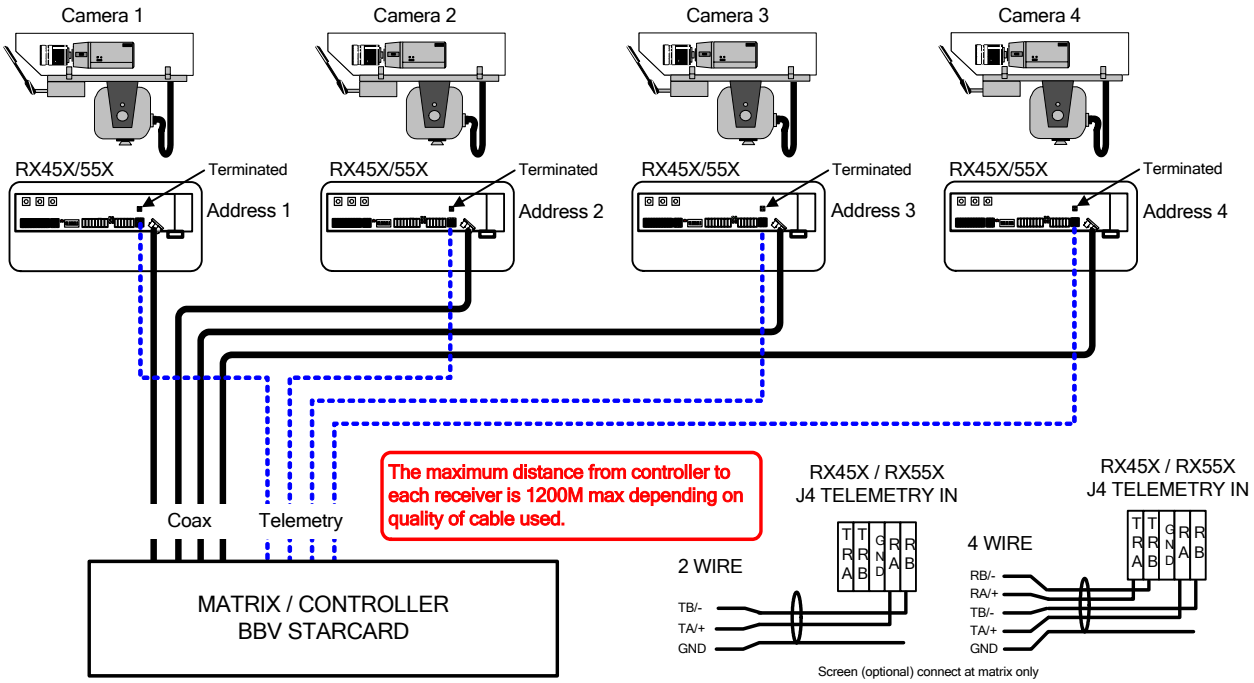
The diagram shows a simple single camera system using a BBV TX1500 matrix and BBV RS422 twisted pair telemetry.

DAISY CHAINED TELEMETRY EXAMPLE



When using a daisy chained RS422/485 system, the stubs must be kept as short as possible and no longer than 25cm. Intermittent and/or sluggish control can be the result of excessive stub lengths.

STAR WIRED TELEMETRY EXAMPLE



SELF-TEST

After wiring the head and lens to the receiver carry out a self test by pressing both UP(SW1) and DOWN(SW3) buttons on the receiver top pcb simultaneously. All receiver outputs will activate in turn for 2-3 seconds.

Obviously ensure that the head is not going to cause damage when it moves.

The self test can also be started remotely from within the receiver menu which is described later in this manual.

The receiver OSD displays the self test progress with two status lines as shown below.

FUNCTION ← this line will show the current function being driven.
Pxxxx Txxxx Zxxxx Fxxxx ←

Each **XXXX** indicate the preset feedback voltage for pan, tilt, zoom and focus. Each value should change smoothly as the corresponding function is driven.

The value shown is in the range 0000 - 1023. 0000 = 0V and 1023 = 5V.

Function	Active output RX55X	Active output RX45X
PAN LEFT	J7/PM+/- PB+/-	J4/3
PAN RIGHT	J7/PM+/- PB+/-	J4/4
TILT DOWN	J7/TM+/- TB+/-	J4/6
TILT UP	J7/TM+/- TB+/-	J4/5
ZOOM IN/TELE (to end stop)	J10/ZM	J10/ZM
ZOOM OUT/WIDE (to end stop)	J10/ZM	J10/ZM
FOCUS NEAR	J10/FC	J10/FC
FOCUS FAR	J10/FC	J10/FC
IRIS OPEN	J10/IR	J10/IR
IRIS CLOSE	J10/IR	J10/IR
AUX LIGHTS	J6/LAMPS	J4/12
AUX AUTOPAN (RX45X ONLY)	NO OUTPUT	J4/9
AUX WASHER	J6/WASH	J6/3
AUX WIPER	J6/WIPE	J6/6

During the self test, the presence and sense of each preset input is recorded. Following the self test the display shows if the preset inputs for pan, tilt, zoom and focus were detected.

The pan/tilt head and lens outputs are driven for approx 5 seconds to indicate the results. If the drive led is GREEN then preset for this output is ok and if RED then not ok.

TELEMETRY PROTOCOL SPECIFIC INFORMATION

As shipped the receiver is configured for BBV up-the-coax telemetry allowing simple installation using a single coaxial cable from the controller to the receiver. The maximum recommended coaxial cable distances are 250M of RG59 and 500M of CT125.

If longer distances are required solutions are available using fibre optic transmission or RS485/422 telemetry. The receiver has support for either SIMPLEX RS422/RS485 telemetry using a single twisted pair or FULL-DUPLEX RS422 telemetry using twin twisted pair depending on the type of telemetry protocol.

The following pages illustrate example telemetry wiring for each telemetry type along with features that are provided with each protocol.

BBV UP-THE-COAX TELEMETRY

Up-the-coax telemetry uses one coaxial cable to carry both the video signal from camera to the controller and telemetry from the controller to the camera. Please remember that using RG59 the maximum cable distance is 250M and using CT125 it is 500M.

The receiver supports 16 preset positions with BBV up-the-coax telemetry.

In addition the following menus can be accessed.

FEATURE	TX400	TX1000	TX1500
DISPLAY MAIN MENU	'#' 1	'#' WASH	1 '#'
FEATURE MENU	'#' 3	'#' AUTOPAN	3 '#'

Use the joystick during menu navigation. Up & Down to move the highlighted item and Right or Left for enter or to change the selected value.

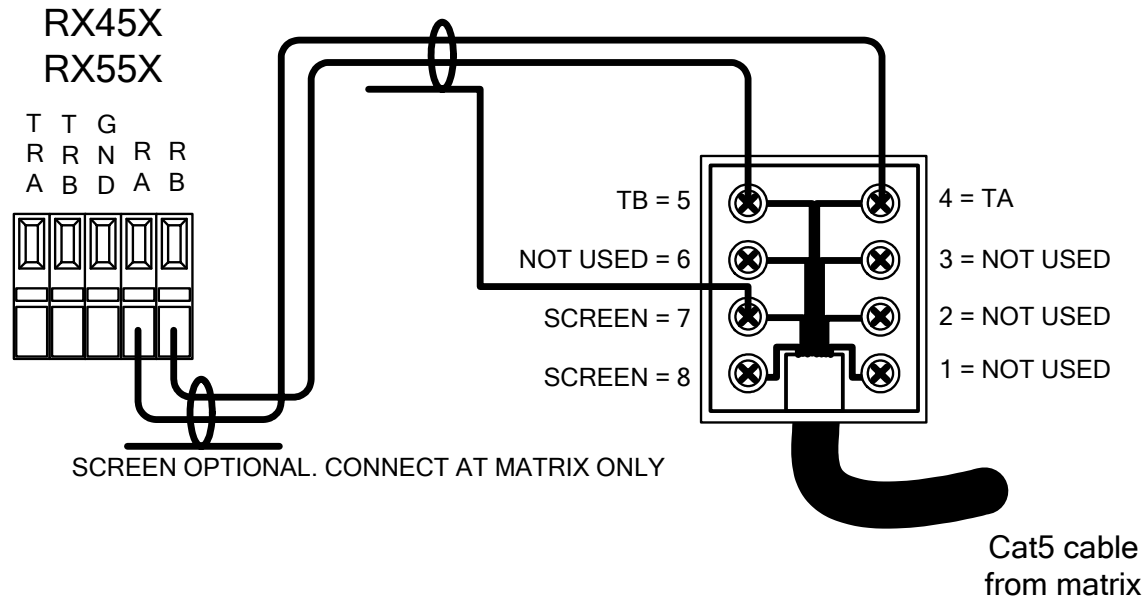
Each menu is detailed later in this manual.

When the receiver is set to BBV or BAXALL up-the-coax telemetry the red power led will show the status of the telemetry signal as follows:

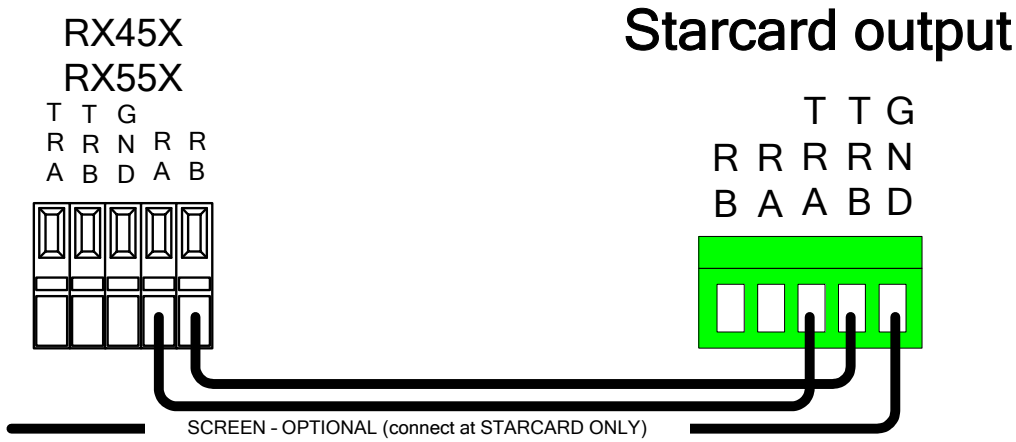
Very slow flash – No video and No telemetry.
1 second flash but mainly ON – video ok, No telemetry.
1 second flash equal OFF and ON – video ok, telemetry ok

BBV RS422 TELEMETRY

BBV RS422 uses a single twisted pair for simplex telemetry control. These two examples illustrate connections directly to a matrix and when using a BBV STARCARD.



Using a BBV STARCARD with star wired telemetry.



Address range is 1 – 128.
The receiver supports 32 preset positions with BBV RS422 telemetry.

In addition the following menus can be accessed.

FEATURE	TX1000/MK2	TX1500
DISPLAY MAIN MENU	'#' WASH	1 '#'
FEATURE MENU	'#' AUTOPAN	3 '#'

Use the joystick during menu navigation. Up & Down to move the highlighted item and Right or Left for enter or to change the selected value.

Each menu is detailed later in this manual.

The red power led flashes off when a valid telemetry command is received.

DENNARD RS485 (2050/2055/2060 etc dome compatible)

DENNARD RS485 uses a single twisted pair for simplex telemetry control. Using this protocol allows a mix of 2050/2055/2060 etc Dennard domes and conventional pan/tilt heads from a single control system

Address range 1 – 64.
The receiver supports 32 preset position with Dennard RS485 telemetry.

The receiver auxiliary outputs can be driven using the following AUX numbers.
AUX 1 = WASH
AUX 2 = WIPE
AUX 3 = LIGHTS

Autopan is started with START SEQUENCE 1 (AUX 46)
Preset PATROL is started using GOTO/CALL PRESET 98
Random Pan is started with GOTO/CALL PRESET 99

In addition the following menus can be accessed.

MAIN MENU - GOTO/CALL PRESET 93 (or NORMAL DOME MENU COMMAND)
FEATURE MENU – GOTO/CALL PRESET 94

Use the joystick during menu navigation. Up & Down to move the highlighted item and goto preset 1 or iris open for enter or to change the selected value. Each menu is detailed later in this manual.

The red power led flashes off when a valid telemetry command is received.

BAXALL STANDARD & ALTERNATE UP-THE-COAX TELEMETRY

Up-the-coax telemetry uses one coaxial cable to carry both the video signal from camera to the controller and telemetry from the controller to the camera. Please remember that using RG59 the maximum cable distance is 250M and using CT125 it is 500M.

You must ensure that the correct telemetry type is selected depending on the controller used. Standard telemetry was used with the original ZT3, ZT4 and ZT5 and later controllers may have options to select between the two types.

The receiver supports 8 preset positions with Baxall up-the-coax telemetry.

In addition the following menus can be accessed.

DISPLAY MAIN MENU	CAMERA ON/OFF
FEATURE MENU	AUTOPAN

Use the joystick during menu navigation. Up & Down to move the highlighted item and Right or Left for enter or to change the selected value.

Each menu is detailed later in this manual.

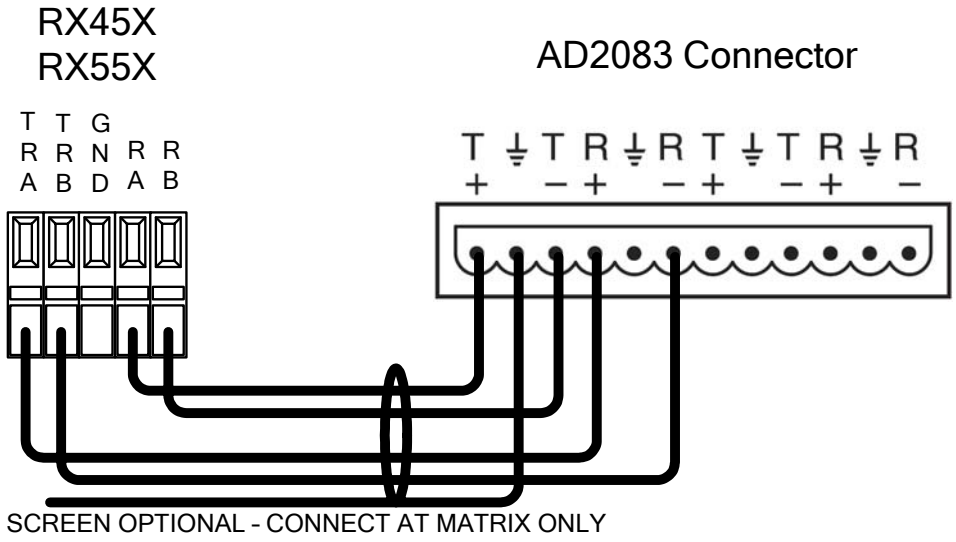
When the receiver is set to BAXALL up-the-coax telemetry the red power led will show the status of the telemetry signal as follows:

Very slow flash – No video and No telemetry.
1 second flash but mainly ON – video ok, No telemetry.
1 second flash equal OFF and ON – video ok, telemetry ok

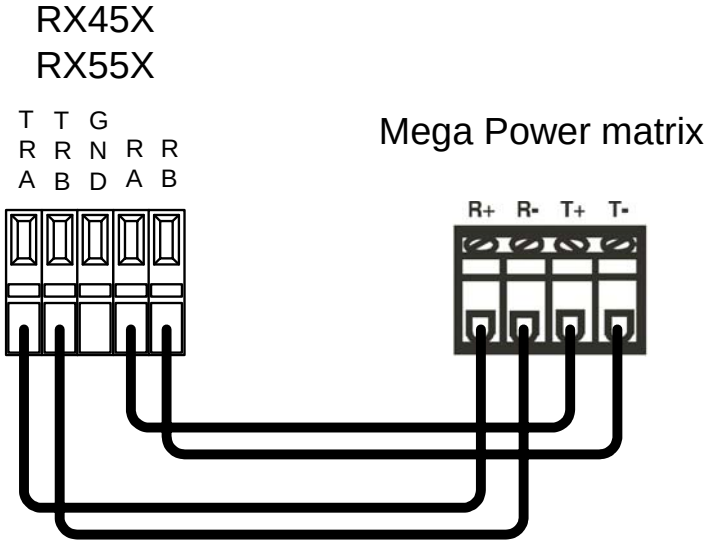
SENSORMATIC/AMERICAN DYNAMICS RS422 TELEMETRY

This is a full duplex RS422 telemetry using twin twisted pair for control and response. These examples illustrate the connections with both the AD2083 protocol distributor and Mega Power matrix.

AMERICAN DYNAMICS AD2083 PROTOCOL DISTRIBUTOR



AMERICAN DYNAMICS/SENSORMATIC MEGAPOWER MATRIX



Address range is 1 – 99.

The receiver supports 32 direct preset position and absolute preset positioning depending on the controller type. For example a current model of Mega Power 48 matrix supports 96 presets per camera.

The receiver auxiliary outputs can be driven using the following AUX numbers.
AUX 1 = WASH
AUX 2 = WIPE
AUX 3 = LIGHTS

In addition the following menus can be accessed.

MAIN MENU - PRESS IRIS OPEN & FOCUS & ZOOM OUT
FEATURE MENU – PRESS IRIS OPEN & FOCUS & ZOOM IN

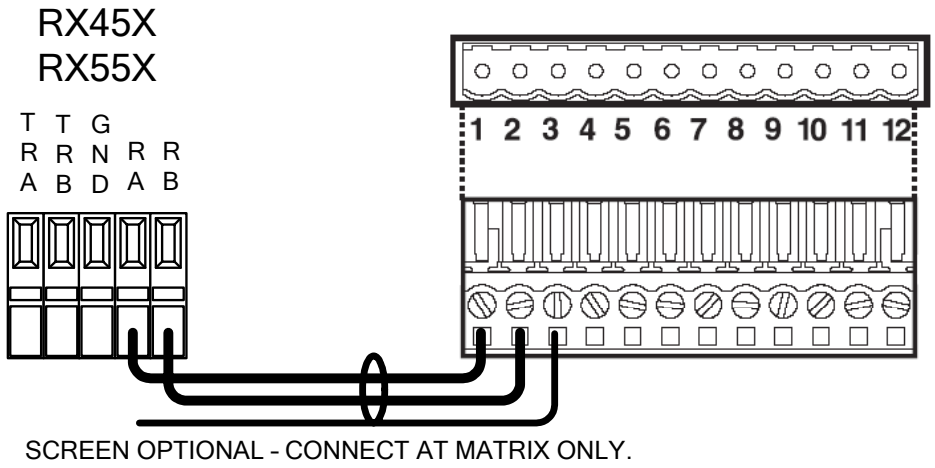
Use the joystick during menu navigation. Up & Down to move the highlighted item and Right or Left for enter or to change the selected value. Each menu is detailed later in this manual.

The red power led flashes off when a valid telemetry command is received.

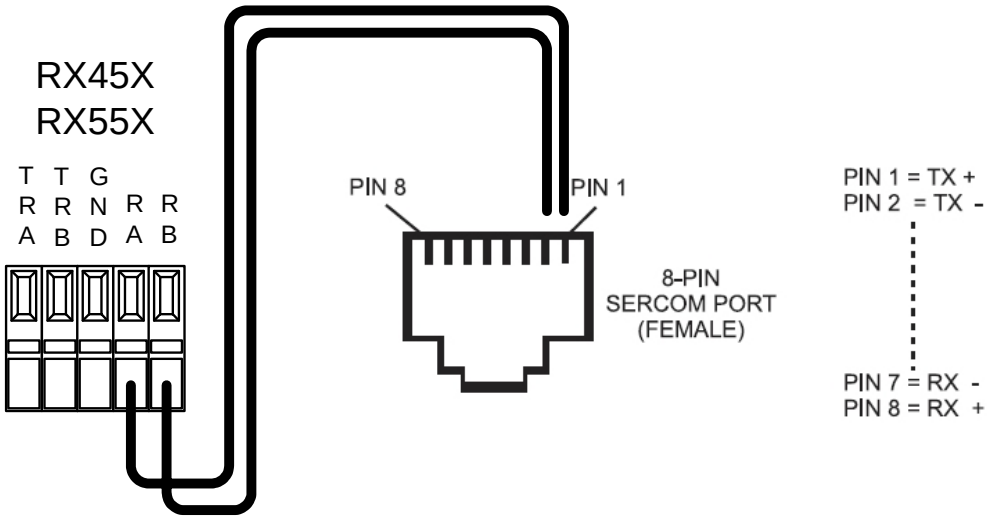
PELCO P & PELCO D TELEMETRY

This telemetry uses a single twisted pair for simplex control.

PELCO P & D WITH CM6700/6800 MATRIX



PELCO P & D WITH CM9740/9760/9780 MATRIX



Pelco P address range is 1 – 32 and Pelco D address range is 1 – 254.

The receiver supports up to 32 preset positions.

The receiver auxiliary outputs can be driven using the following AUX numbers.
AUX 1 = LIGHTS
AUX 2 = WIPE
AUX 3 = WASH

Selecting PELCO P <DM AUX NUMBERS> allows the DM keyboard buttons to correctly drive the receiver auxiliary outputs.
AUX 0 = WASH
AUX 1 = WIPE
AUX 2 = LIGHTS

Autopan is started with GOTO/CALL PRESET 97
Preset PATROL is started using GOTO/CALL PRESET 98
Random Pan is started with GOTO/CALL PRESET 99

In addition the following menus can be accessed.

MAIN MENU - GOTO/CALL PRESET 95
FEATURE MENU – GOTO/CALL PRESET 94

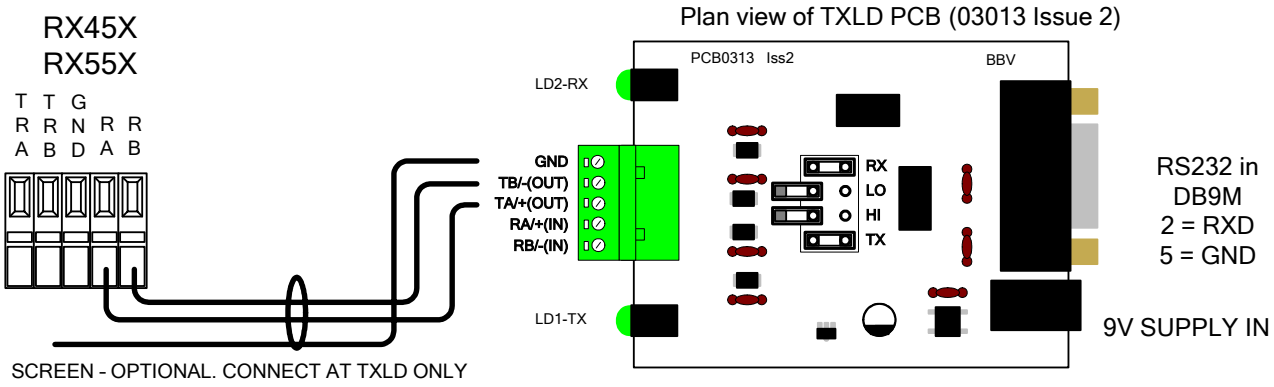
Use the joystick during menu navigation. Up & Down to move the highlighted item and IRIS OPEN for enter or to change the selected value. Each menu is detailed later in this manual.

The red power led flashes off when a valid telemetry command is received.

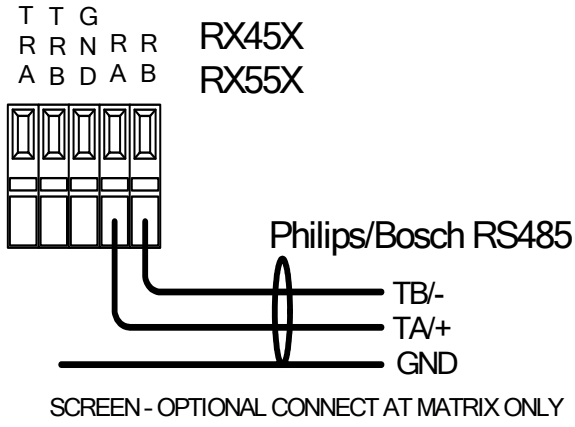
BURLE/PHILIPS/BOSCH TELEMETRY

Several methods of connecting Burle/Philips/Bosch telemetry are available; BI-PHASE, RS232 and RS485. BI-PHASE and RS485 allow long cable runs between the controller and telemetry receiver. RS232 is only for short lengths and requires a RS232 to RS422/485 converter to drive the RX45X and RX55X receivers. A BBV TxLD installed at the controller end is an ideal solution.

RS232 TELEMETRY USING TXLD LINE DRIVER



RS485 telemetry is supported by some equipment manufacturers and should connect directly into J4 RA and RB.



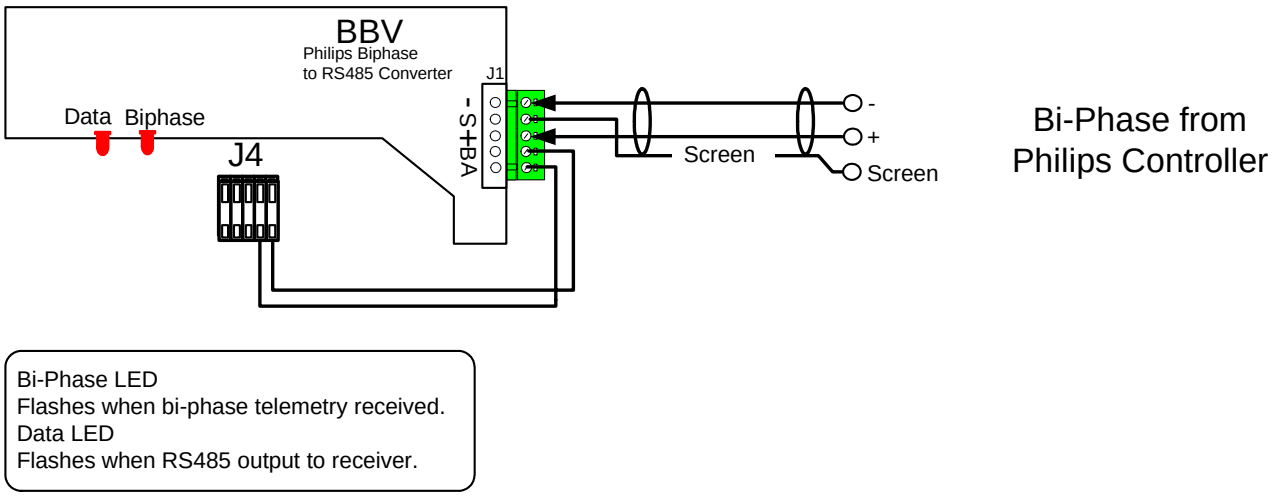
BURLE/PHILIPS/BOSCH BI-PHASE TELEMETRY

Single screened twisted pair cable is used when controlling from BI-PHASE telemetry.

BI-PHASE telemetry requires an optional BBV BI-PHASE CARD to be used with the RX45X/RX55X. This card converts the telemetry into RS485 which is then connected to J4 as shown below.

The card would generally be fitted to the receiver from new when a receiver with BI-PHASE OPTION is ordered. It is however possible to fit the BI-PHASE board to existing receivers however a small connector will need to be soldered on to the receiver top board in position J3 marked ‘expansion’.

Optional BBV BI-PHASE board.



Bi-Phase LED
Flashes when bi-phase telemetry received.
Data LED
Flashes when RS485 output to receiver.

Address range is 1 – 16385.

The receiver supports up to 32 preset positions.

The receiver auxiliary outputs can be driven using the following AUX numbers.
AUX 1 = LIGHTS
AUX 2 = WIPE
AUX 3 = WASH

Preset PATROL is started using AUX 8 ON or GOTO/CALL PRESET 98
Random pan/Autopan is started with GOTO/CALL PRESET 97

In addition the following menus can be accessed.

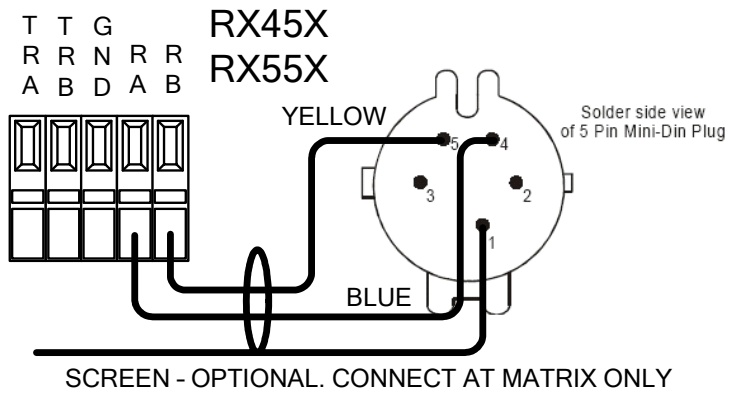
MAIN MENU - AUX 46 ON
FEATURE MENU – GOTO/CALL PRESET 94

Use the joystick during menu navigation. Up & Down to move the highlighted item and either Left or Right for enter or to change the selected value. Each menu is detailed later in this manual.

VCL/HONEYWELL TP TELEMETRY

A single twisted pair is needed with for simplex telemetry.

VCL/HONEYWELL MAXCOM MATRIX



Address range is 1 – 128

The receiver supports up to 32 preset positions.

The receiver auxiliary outputs can be driven using the following keyboard functions.
AUX 1 = LIGHTS (PRESET 85 = LIGHTS ON, PRESET 86 = LIGHTS OFF)
WIPE = WIPE (PRESET 83 = WIPE ON, PRESET 84 = WIPE OFF)
WASH = WASH (PRESET 81 = WASH ON, PRESET 82 = WASH OFF)

0 AUTOPAN or AUTOPAN will start Random/Auto Pan.
1 AUTOPAN will start PATROL 1
2 AUTOPAN will start a random patrol

In addition the following menus can be accessed.

MAIN MENU - GOTO/CALL PRESET 95
FEATURE MENU – GOTO/CALL PRESET 96

Use the joystick during menu navigation. Up & Down to move the highlighted item and either Left or Right for enter or to change the selected value. Each menu is detailed later in this manual.

MOLYNX “D” TYPE TELEMETRY

A single twisted pair is used for half-duplex telemetry control.

Please note that this telemetry uses half duplex connecting to TRA/TRB.

Address range is 1 – 256

The receiver supports up to 32 preset positions.

The receiver auxiliary outputs can be driven using the following keyboard functions.
AUX = LIGHTS
WIPE = WIPE
WASH = WASH

In addition the following menus can be accessed.

MAIN MEN – AUX 2
FEATURE MENU –

Use the joystick during menu navigation. Up & Down to move the highlighted item and either Left or Right for enter or to change the selected value. Each menu is detailed later in this manual.

RECEIVER SETUP

Set the lens direction.

After wiring the pan/tilt head and lens it is possible that the lens will drive in the opposite direction, ie pressing ZOOM TELE will cause the lens to drive out and show a wider scene. The standard method to cure this would be to swap the lens motor wiring at the receiver or in the camera housing however it is now possible to reverse the lens by using the receiver's MAIN/OPTIONS/ZOOM FOCUS IRIS menu. It is recommended that another self test is performed after changing the lens direction otherwise preset positioning will not work.

SET PAN/TILT SPEED WITH RX55X.

The receiver can be tailored to each pan/tilt head's motor characteristics. Navigate to MAIN/MOTOR OPTIONS menu. Use the lowest speed settings for MIN PAN and MIN TILT that allows the head to move slowly without stalling as soon as the joystick is moved. If the value is too low then the head will require move joystick movement before moving which reduces the effective speed range.

The maximum pan and tilt speeds can be reduced to prolong head life if required. The factory set speed is maximum, 255 which can be reduced to the minimum speed settings.

DIAGNOSTIC AIDS

A single diagnostic LED labelled POWER provides indication of presence of power and also data from the multiplexer.

When the receiver is powered, the LED illuminates.

The LED will flash off when the receiver has received correct telemetry data with the same address as the receiver address. If the telemetry data is invalid or the data is addressed to another device, the LED will not flash.

Additional diagnostic aids are available in the receiver's MAIN/DIAGNOSTICS menu.

CABLE LENGTH COMPENSATION

The receiver incorporates a remotely adjustable high quality launch amplifier to compensate for video cable losses over extended cable distances.

The gain of the launch amplifier can be adjusted in the receiver LAUNCH AMP GAIN line of the MAIN/OPTIONS menu. The gain can be varied from 0 - 255, the higher the number, the higher the gain. The default value is 0. As the amplifier gain is increased, high frequency lift is also increased.

PROGRAMMING THE RECEIVER

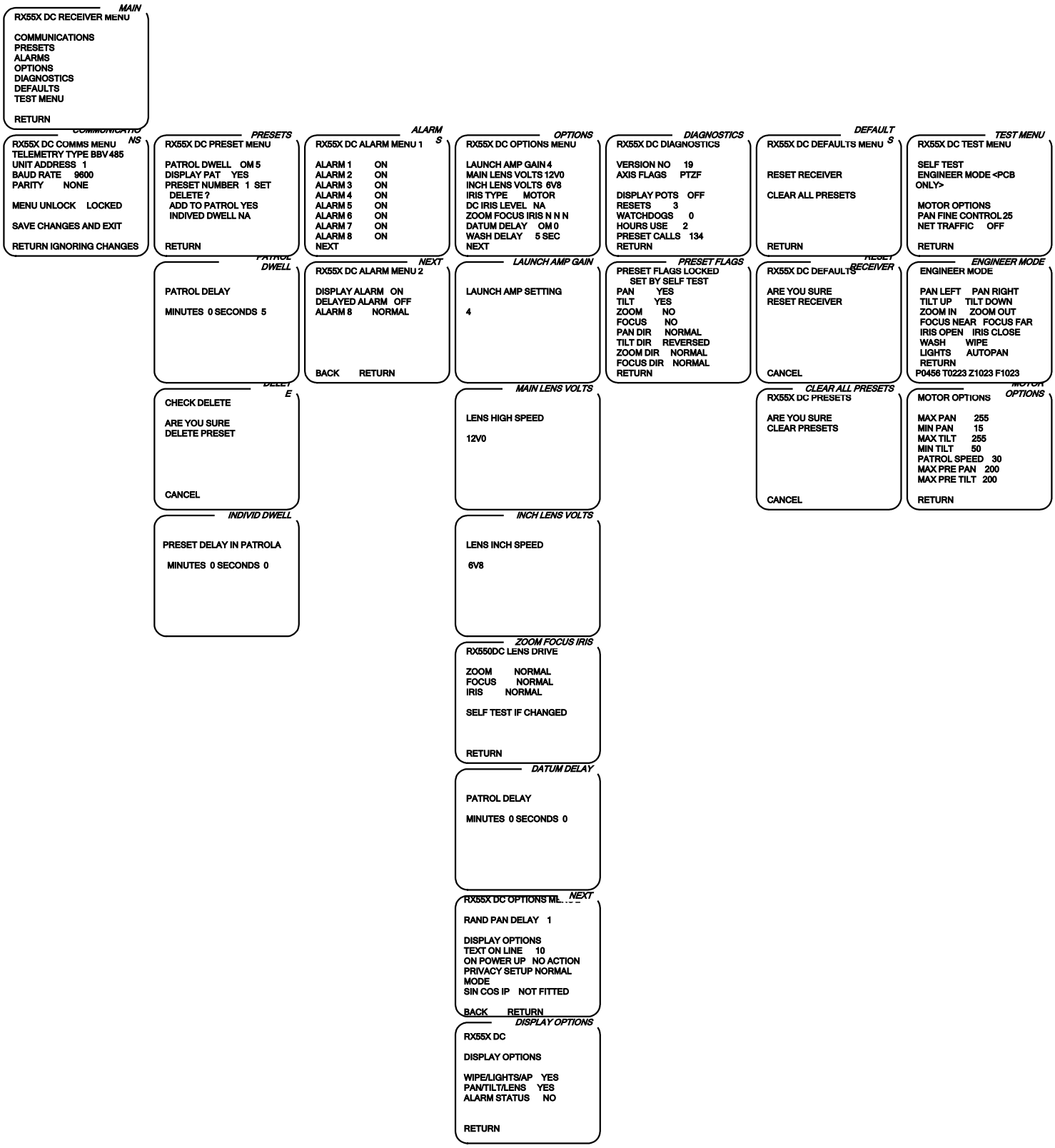
An easy to use menu structure allows programming of the receiver's advanced features. The menu can be accessed either local to the receiver using the three push buttons on the receiver logic pcb or remotely using the telemetry controller.

The three buttons on the receiver logic board allow navigation through the menu structure. Pressing the MENU/SET(SW2) button displays the **MAIN** menu. Pressing the UP(SW1) and DOWN(SW3) buttons move the flashing highlight up or down. Pressing MENU/SET(SW2) again allows the selected sub menu to be displayed or a value to be changed. To exit the menu structure, select **EXIT** from the **MAIN** menu. The receiver will now reset and resume normal operation.

It is possible to display the receiver menu remotely from most controllers.
Please refer to the protocol specific part of the menu after the menu structure.

The receiver menu structure is shown on the following pages.

RECEIVER MENU STRUCTURE OVERVIEW



THE RECEIVER MENU SYSTEM IN DETAIL

Please refer to the menu structure on the previous page to help navigation through the menu structure.

COMMUNICATIONS

RX55X DC COMMS MENU	
TELEMETRY TYPE PELCO P	This is the telemetry type
UNIT ADDRESS 1	Unit address must be unique and match camera number
BAUD RATE 9600	RS485 baud rate 2400/4800/9600 (PELCO ONLY)
PARITY NONE	Parity NONE/EVEN/ODD (PELCO ONLY)
MENU UNLOCK LOCKED	Must be set to UNLOCKED to allow setting of above
SAVE CHANGES AND EXIT	All settings are saved and receiver is reset
RETURN IGNORING CHANGES	Return to RECEIVER menu

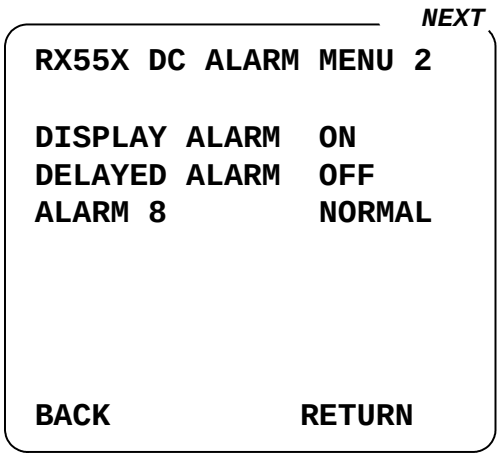
The BAUD RATE and PARITY options are only shown with Pelco P and Pelco D telemetry as the other telemetry types have fixed baud and parity settings.

PRESETS

RX55X DC PRESET MENU	
PATROL DWELL OM 5	Dwell in minutes & seconds during preset patrol
DISPLAY PAT YES	Display preset number during patrol (**YES**/NO)
PRESET NUMBER 1 SET	Select preset (1-32) SET = preset programmed
DELETE ?	Delete current preset (if SET above)
ADD TO PATROL YES	YES = is in preset patrol.
INDIVED DWELL NA	Override patrol dwell for this preset minutes & seconds
RETURN	Return to RECEIVER menu

ALARMS

RX55X DC ALARM MENU 1	
ALARM 1 ON	Each local alarm input can be disable or enabled
ALARM 2 ON	individually.
ALARM 3 ON	Setting to OFF disables the alarm input
ALARM 4 ON	and setting to ON enables the alarm input
ALARM 5 ON	
ALARM 6 ON	
ALARM 7 ON	
ALARM 8 ON	
NEXT	Display the ALARM MENU 2



Receiver displays ALARM message when alarm active if ON

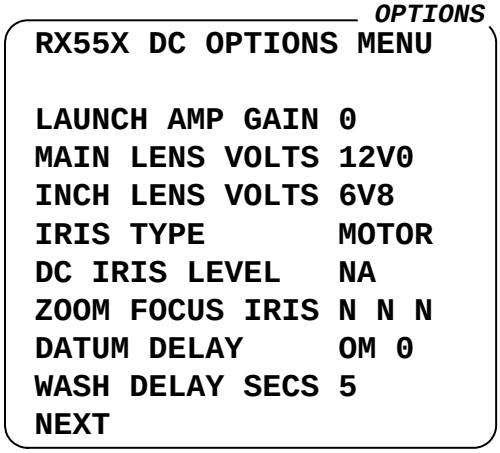
OFF/ON. When set to ON, the alarm message is generated as the head approaches it's preset position to prevent a triggered video transmission system from sending 'blurred' frames. When set to OFF, the alarm output is active as soon as an alarm occurs.

Alarm 8 can be set to GLOBAL to disable alarm 1-7 When alarm input 8 is shorted to ground.

BACK displays ALARM 1 and RETURN displays RECEIVER menu

DELAYED ALARM

When set to ON, the receiver generates an alarm message and opens the alarm output contacts when the head slows down as a preset position is approached. This is useful when used with video transmission or other event driven recording to prevent recording of 'blurred' images. Setting to OFF generates the alarm output as the alarm input is generated.



Coax cable compensation 0-255, 255 = maximum gain

Lens drive voltage 3-12V, set to suite lens

Set the drive voltage for first second of travel.

Set lens iris type for autoiris override or 3 motor lens

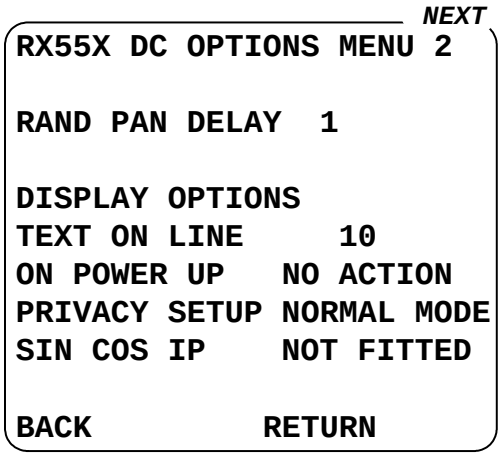
Sets iris voltage range for Seiko or Cosmicar lens

Allow each lens function to be reversed

Time in minutes/seconds to return to preset 1, 0=never

Seconds that WASH output is active following WIPE

Display the OPTIONS MENU 2



Random pan delay,1=fast,10=slow,0=AUTOPAN which requires an optional card within the pan/tilt head.
Show the DISPLAY OPTIONS screen.
1-10. Position of status on screen, 1=top,10=bottom
Select either PRESET 1/RANDOM PAN/PATROL 1/NO ACTION
NORMAL/SETUP SETUP=SETUP PRIVACY BOARD
FITTED using continuous rotation pan with sin/cos pots

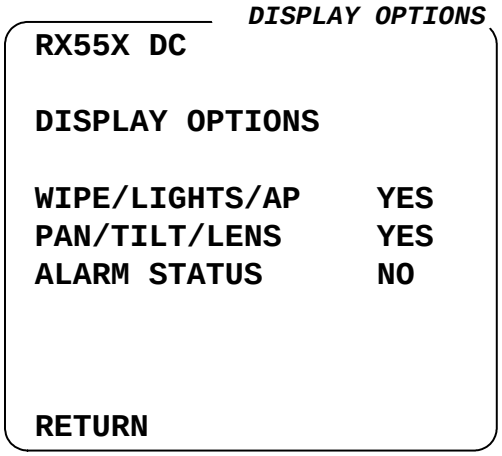
BACK to OPTIONS 1 or RETURN to RECEIVER MENU

ON POWER UP

This setting determines the receiver operation following power up and also after the DATUM time, if this has been set in the OPTIONS menu. Choices are: NO ACTION – don't move, PRESET 1 – goto preset position 1, RANDOM PAN – start random panning, PATROL 1 – start preset patrol 1

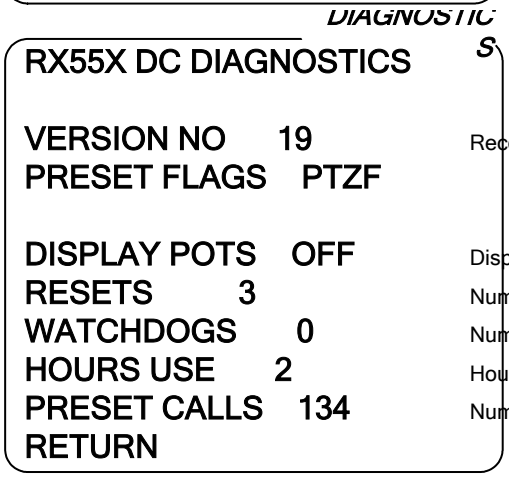
PRIVACY SETUP

The privacy setup requires the optional BBV privacy board to be fitted to the receiver. Please refer to the privacy board manual for more details.



YES/NO YES=dispay auxiliary status
YES/NO YES=show pan/tilt/zoom/focus/iris status
YES/NO YES=display local alarm input open circuit

RETURN to OPTIONS 2 MENU



Receiver software version
Indication of preset input status see PRESET FLAGS below
Display preset pot values. Useful during diagnosis work
Number of receiver power-ups. Useful diagnosis tool
Number of processor watchdogs (supply glitches)
Hours receiver powered
Number of preset calls
RETURN to RECEIVER MENU

PRESET FLAGS

```
PRESET FLAGS LOCKED
      SET BY SELF TEST
PAN          YES
TILT         YES
ZOOM         NO
FOCUS        NO
PAN DIR      NORMAL
TILT DIR     REVERSED
ZOOM DIR     NORMAL
FOCUS DIR    NORMAL
RETURN  DO NOT ALTER
```

Toggle to UNLOCK to alter settings.
During a self test, the receiver senses the presence and direction of preset input voltages. Should the receiver incorrectly sense the presence or direction then this menu allows manual setting. Toggle between YES/NO to enable/disable presets for each movement axis. The direction can be toggled between NORMAL or REVERSED if the head/lens drives in the wrong direction during a preset call.
Please use with caution to prevent mis-operation.
RETURN to DIAGNOSIS MENU

DEFAULTS

```
RX55X DC DEFAULTS MENU


RESET RECEIVER

CLEAR ALL PRESETS




RETURN
```

These two items should be used with caution!

Set receiver to factory defaults. All preset/patrol settings etc will be cleared.
Erase ALL preset positions only.

A second menu will be displayed to display an ARE YOU SURE message!

RETURN to RECEIVER MENU

TEST MENU

```
RX55X DC TEST MENU

SELF TEST
ENGINEER MODE <PCB ONLY>


MOTOR OPTIONS
PAN FINE CONTROL 25
NET TRAFFIC      OFF

RETURN
```

Starts receiver self test procedure
displays the ENGINEER MODE screen

Displays various pan/tilt speed options
25-100 lower figure slower pan/tilt when zoomed in
BBV use to display RS485 telemetry commands when ON

RETURN to RECEIVER MENU

Engineer mode can only be selected when using the PCB buttons on the receiver board.

ENGINEER MODE

```
ENGINEER MODE

PAN LEFT     PAN RIGHT
TILT UP      TILT DOWN
ZOOM IN      ZOOM OUT
FOCUS NEAR   FOCUS FAR
IRIS OPEN    IRIS CLOSE
WASH         WIPE
LIGHTS       AUTOPAN
RETURN
P0456 T0223 Z1023 F1023
```

used to allow each output to be tested individually
Select the desired output and press SW2.
The output will drive until SW2 is released.
if ZOOM/FOCUS/IRIS are driving in reverse
use the OPTIONS menu and toggle between REVERSE/NORMAL

AUTOPAN only functons with RX45X
RETURN to TEST MENU
Preset feedback voltages. 0000=0V, 1023=5V

MOTOR OPTIONS

```
RX55XDC MOTOR OPTIONS

MAX PAN        255
MIN PAN         15
MAX TILT       255
MIN TILT        50
PATROL SPEED    30
MAX PRE PAN    255
MAX PRE TILT   255

RETURN
```

These settings allow the receiver to be tailored to different pan/tilt motors. The MIN/MAX values set the minimum and maximum speeds during manual control
255 is maximum speed and 0 is minimum
If the minimum is too low, the head may stall at low speeds.
Pan speed during random pan, RX55X only.
To increase head life, the pan and tilt speeds can be reduced during presets. Too low and head will stall.

RETURN to TEST MENU

USER GUIDE

Select the camera to control using the telemetry controller.

Manual control of the pan/tilt head and lens is accomplished by pressing the relevant key or moving the joystick. Multiple functions can be controlled simultaneously. E.g. Pan Left and Tilt Down.

To move the pan/tilt head to a preset position, refer to the controller manual.
If this preset has been programmed, the head/lens will move to show the preset position.

Note: preset functions require a preset head for pan/tilt positioning and a preset lens for zoom/focus positioning.

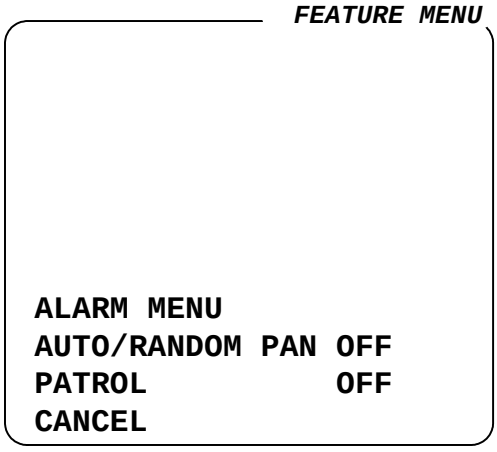
Receiver OSD displayed.

W Wipe auxiliary output is active

* Lights auxiliary output is active

 Random Pan is running

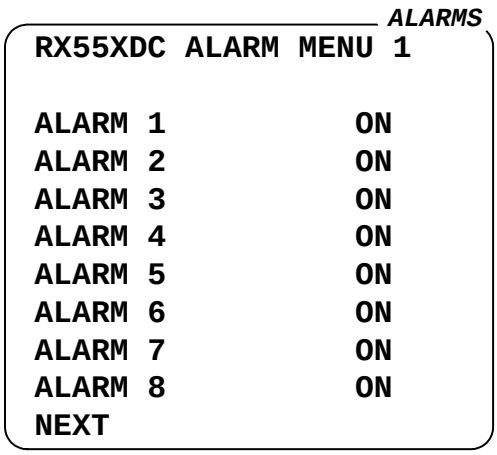
This is the FEATURE MENU which is displayed after pressing the relevant keys shown in the protocol specific pages.



When RANDOM PAN is selected, the head starts a random panning sequence until either a manual command or a local alarm occurs. If DISPLAY AUX OSD is set to DISP in the OPTIONS 2 menu then an arrow is displayed showing the direction of pan travel.

PATROL: Starts the preset patrol. If DISPLAY PAT is set to YES the receiver displays P and the current preset number. Pressing one of the pan/tilt keys will stop the patrol and manual control is resumed.

ALARM MENU: This item displays the ALARM MENU allowing the local alarms to be enabled/disabled individually.



Use the UP and DOWN keys to select an alarm input. The Left or Right key will toggle the state from ON/OFF. When the alarms have are configured correctly, select the NEXT line to resume normal operation.

Alarm inputs are normally closed. The alarm is activated when contact open and the receiver drives the head to the preset position corresponding to the alarm input.

PROG PRESETS: Allows preset positions to be programmed. The receiver will display PROGRAM after the menu disappears. In this mode 'goto preset' commands are used to program a preset position. Move the pan/tilt head and lens to the scene to be saved.

Please ensure that all the directions ARE NOT AT A LIMIT STOP as intermittent preset operation could occur. Press PRE-POSI on the CURSOR/CAMERA CONTROL keypad followed by the preset number required on the CAMERA/PRESET POSITION keypad. Several preset positions can be programmed whilst PROGRAM is displayed. To return to normal operation, go into the menu and set PROG PRESET to OFF. The receiver no longer displays PROGRAM and normal control is resumed.

Note: preset functions require a preset head for pan/tilt positioning and a preset lens for zoom/focus positioning.

How to program a RX45X/RX55X multi protocol receiver

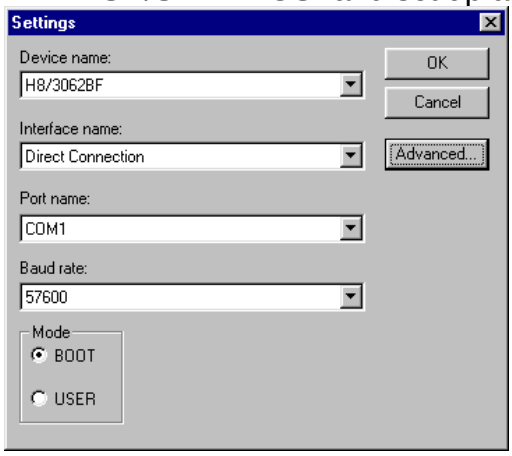
The software within the RX45X/RX55X can be updated using a RS232-RS422 converter such as the BBV TXLD along with programming software, flashsimple, that can be found on our web site – www.bbvcctv.com/utils.htm

Steps to follow:

1. How to program the receiver
    a. Power off receiver.
    b. Connect full duplex RS232-RS422 converter between PC COM port and the receiver camera connector.

TXLD	RX45X/RX55X J11 (CAMERA)
TX A(+)	RA
TX B(-)	RB
RX A(+)	TRA
RX B(-)	TRB

    c. Fit link across received PROG LINK next to camera connector.
    d. Run flashsimple.exe
    e. Click on “FLASH/SETTINGS” and set up as follows.



    f. Click OK.
    g. Click BROWSE and navigate to RX55X_V21.MOT
    h. Power on the receiver and click “FLASH program”

If all is well a status bar is displayed showing the progress. When it has finished with successful verification power off the receiver and remove the link from the PROG LINK pins.

Notes

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 serial protocol and up-the-coax telemetry receivers	Multiple RS485/422 and up-the-coax controllable AC and DC receivers. These receivers are controlled from an expanding range of serial protocols as listed below. 230Vac and optional 24Vac or 110Vac supply. PTZFI, 32 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 RS422 and UP-THE-COAX, BAXALL STANDARD & ALTERNATE UP-THE-COAX, DENNARD RS422/485, PELCO P/D RS422/485, PHILIPS/BOSCH RS422/485 (OPTIONAL BI-PHASE INPUT), MOLYNX RS422/485, SENSORMATIC/AD RS422, VCL/HONEYWELL RS422/485
RX450/550	PANASONIC RS485 Protocol only version of RX45X/55X.
STARCARD STARCARD/CONVERTER	8 * RS485 output, 2 wire simples RS422, 4 wire full-duplex RS422, 2 wire half-duplex RS485. Option STARCARD/CONVERTER offering protocol conversion to drive an increasing range of 3rd party protocols.
ACCESSORIES	TxLD (bidirectional RS422-RS232 converter) 98005 (bidirectional 20mA-RS232 converter)