PANAVISION®

RDC

PANAVISION
REMOTE DIGITAL CONTROL
SYSTEM

INSTRUCTION MANUAL

07/24/03 14:49:49

ULTRA PRECISION EQUIPMENT FOR THE MOTION PICTURE INDUSTRY

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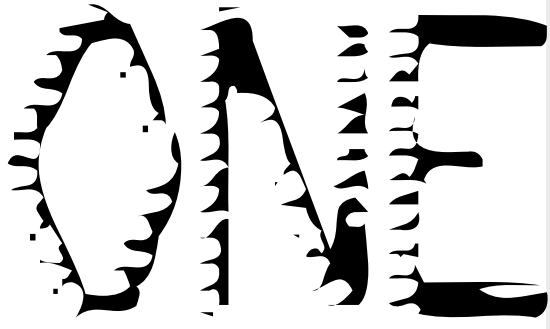
1.0 SYSTEM OVERVIEW




RS232
CAMERA
DIGITAL
OTHER

1.1 INTRODUCTION

The Remote Digital Control [RDC] system is a lens / camera control system for the camera assistant, which operates hardwired or wireless. It controls Panavision's most popular cameras, including the Millennium XL [PFXMXL], and the Arri 435ES.

In its simple configuration, it serves as a remote control for focus, iris and T-stop functions of the lens. For more advanced applications, it can also control camera speed, shutter angle, and speed ramping.

It has a built in LCD screen which can display lens information, lens focus and T-stop scales, camera information [fps, footage, etc.], and video. The LCD screen is also used to configure the RDC settings.

1.2 CAMERA CONTROL CAPABILITIES

- The RDC with the RDMD box will control **Focus, T-stop and Zoom**, and **on/off**, when **powered** from the following cameras:
  - ARRI 435
  - ALL PFX 35 CAMERAS
  - PV HD900F – via HDUC voltage upconverter

- The RDC with the RDMD box will also control speed / **iris** ramps on the following cameras:
  - ARRI 435
  - ALL PFX 35 CAMERAS

- The RDC will also control speed / **shutter** ramps, and speed / iris / shutter on the following cameras:
  - PFXMXL – without RDMD box only
  - 435ES – with RDMD box

- The RDC will ***not*** perform shutter changes on the PFX-M or PFX cameras at this time.

- The RDC has limited functionality [FTZ only, no power or on/off] with:
  - AATON
  - MOVIECAM
  - ARRI 535
  - ARRI SR3
  - ARRI III [12V]

RDC

RDBH

RDB

RDSB

RDMD

PASS

1.3 COMPONENT DESCRIPTION

The Panavision Remote Digital Control [RDC] system is a complete lens / camera control package designed for use on all Panavision and Panavised camera systems. It contains full standard camera controls, video interface, and multiple motor driver interface. The RDC system consists of several elements to accomplish these tasks:

RDC REMOTE DIGITAL CONTROLLER

- 2.5" color LCD
  - Camera control screen
  - Electronic Lens Scale
  - Video / Video & text switching
- Camera on / off
- Focus / T-stop / Zoom control
- Speed ramps using shutter and / or T-stop
- Depth of field control

RDBH / RDB REMOTE DIGITAL BATTERY HANDLE
REMOTE DIGITAL BATTERY

- On board battery for compact wireless operation
- Up to 4+ hours continuous use

RDSB REMOTE DIGITAL STANDARD BACK

- For use when hardwired or using external battery

RDMD REMOTE DIGITAL MOTOR DRIVER

- For use on all cameras [Not required for PFXMXL]
- Multiple Camera Drive System Controller
  - Panaflex
  - Panastar
  - System 65
  - PanArri III [24V]
  - PanArri 435
  - Panavision/Sony HD900F
- Multiple Motor Driver Control
  - All Panavision digital remote motors
  - Preston drive motors [DM1, DM2]

PASS PANAVISION ACCESSORY SHOE SPACER

- Dovetail extension facilitates mounting RDMD on accessory shoe on cameras such as PFX-G and PSTR-P

RDHV

RDM

RDMB / RDRC

RDSC

1.3 COMPONENT DESCRIPTION

RDHV REMOTE DIGITAL HOPPER

- Wireless data transmitter
- Mounts directly into PFXMXL mag/data port
- Mounts into RDMD for other cameras
- Panatape and RS232 input point

RDM REMOTE DIGITAL MOTORS

- Newly designed compact motor units
- Powerful torque will drive most lenses

RDMB / RDRC MOTOR BRACKET / ROD CLAMP

- Mounts in traditional Panaflex position [under camera using RDMP]
- Mounts on 5/8", 15mm, and 19mm diameter rods
- Multiple adjustments to accommodate tight motor configurations

RDSC SINGLE CHANNEL CONTROL UNIT

- Allows separate control of focus or iris
- Can be cable connected to RDC or used by itself wirelessly.
- Available upon request


BNC CONNECTOR
[VIDEO]
ANTENNA CONNECTOR
ON SWITCH
[CAMERA RUN]
LENS BUTTON
TEXT / GRAPHICS
SCREEN
FOCUS KNOB
UP / DOWN
BUTTONS
ZOOM CONTROL
ENTER BUTTON
IRIS KNOB
VIDEO
BUTTONS
24VDC
POWER INPUT
[Alternate power input
for wireless use]
ZAP
SPD
VIDEO
A/B
TEXT
A/B VIDEO
TEXT

1.4 RDC INTERFACE OVERVIEW

The RDC is the Remote Digital Controller. It is the main interface between the camera assistant and the lens and camera controls.

General Description of Operations

1. Holding the ON switch to the left for 2 seconds opens the main setup screen for changing from wired to wireless, sleep mode, unit selection [metric / feet] or resetting the hand unit data.

2. Pressing the LENS button accesses the lens setup pages, used for choosing lenses, calibrating the lens scales, changing motor direction, and limiting motor range [see section 3 for more information].

3. Pressing TEXT button, shown at left, will toggle between the camera data screen and the lens scale screen [see section 5 for more information] .

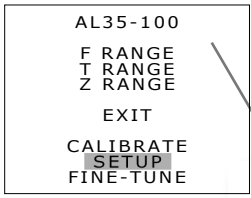
   * The TEXT button also acts a quick EXIT to the LENS SCALE screen from most of the menus. As long as the selection has stopped flashing, it will be saved.

4. Pressing the A/B button, shown at left, activates the video image screen, which displays the output from the camera's video tap, if it is connected using a BNC cable. It will toggle between video only and video with lens/camera data. [see section 5 for more information].

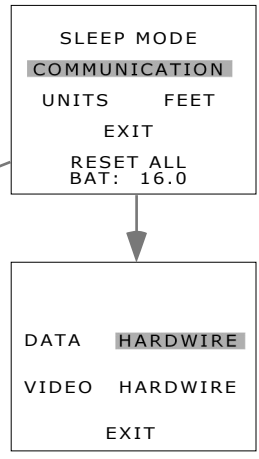
5. To navigate through the menu pages, use the UP and DOWN buttons to move, and the ENTER button to select items.

6. For wireless operation, a battery in the handle provides power. The RDC was designed to be left on all the time, and during normal use the battery should last approximately 4 or more hours.
   No external battery is required for hardwired operation. The RDC receives power through the RS232 cable.

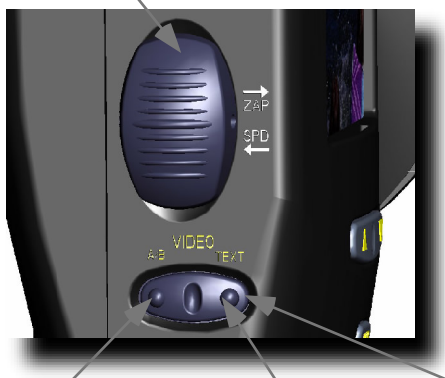
LENS BUTTON:
LENS SELECTION
LENS RANGE LIMITER
LENS CALIBRATION

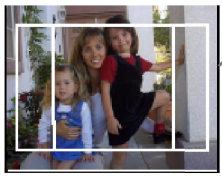


ON [CAM RUN]:
CAMERA RUN [TOGGLE TO RIGHT]
PREFERENCES SCREEN
[HOLD TO LEFT FOR 2 SEC]



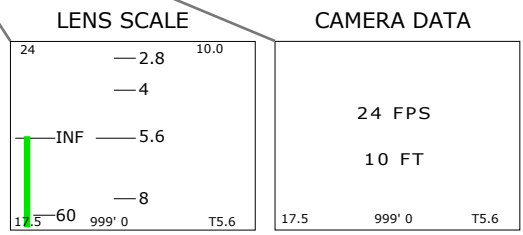
ZOOM CONTROL:
ZOOM IN / OUT
ZOOM SPEED
ZOOM ZAP





VIDEO A/B:
SELECT VIDEO ONLY OR
VIDEO WITH LENS/CAMERA DATA

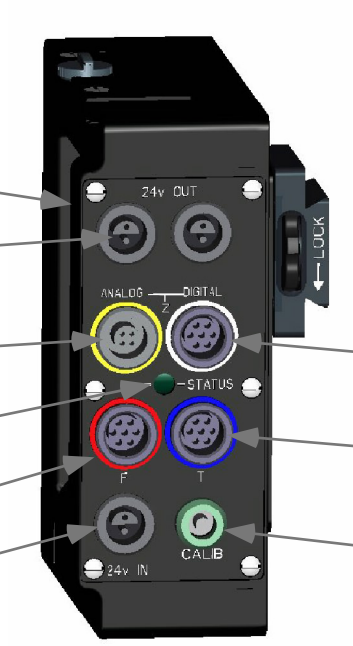
VIDEO TEXT:



1.5 RDC FUNCTION OVERVIEW

UP / DOWN:
CHANGE MENU SELECTION

ENTER:
CHOOSE SELECTION
ACCESS CAMERA SPEED [FROM CAMERA DISPLAY]
ACCESS SCREEN SETUP FUNCTIONS



RDHV PORT

24V OUTPUTS [2]

ANALOG ZOOM MOTOR

STATUS LED

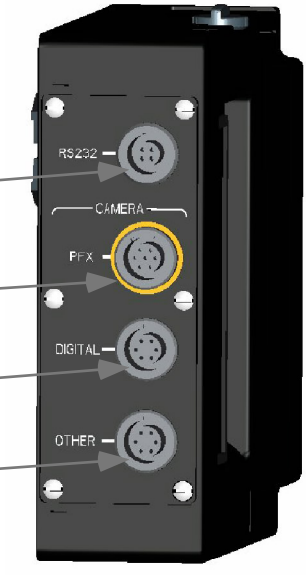
FOCUS MOTOR

24V INPUT

DIGITAL ZOOM MOTOR

T-STOP MOTOR

HD CALIBRATION BUTTON



RS232 CONNECTION

PFX ACCESSORY

DIGITAL [HD900F]

OTHER CAMERAS

1.6 RDMD OVERVIEW

The Remote Digital Motor Driver [RDMD] is required for all cameras except the Millennium XL [PFXMXL], which has the 'brains' built in. The RDMD controls the motors for Focus, T-stop, and zoom, communicates with the camera for speed and shutter settings, and provides 2 additional 24V power outlets.

Usually it will be mounted on the side of the camera using the accessory dovetail. Panavision cameras and the Arri 435 can provide the RDMD with 24V input. On other cameras, the RDMD may require a separate battery source.

The RDMD has connections for either digital or analog zoom motors. The standard Panavision zoom motors mounted on the lenses are analog. The Remote Digital Motors [RDM] included with the RDC system are digital, and can be used interchangeably for zoom, iris, or focus, as long as the proper gear is installed. In addition to RDMs, the RDMD can drive other manufacturers' digital motors.

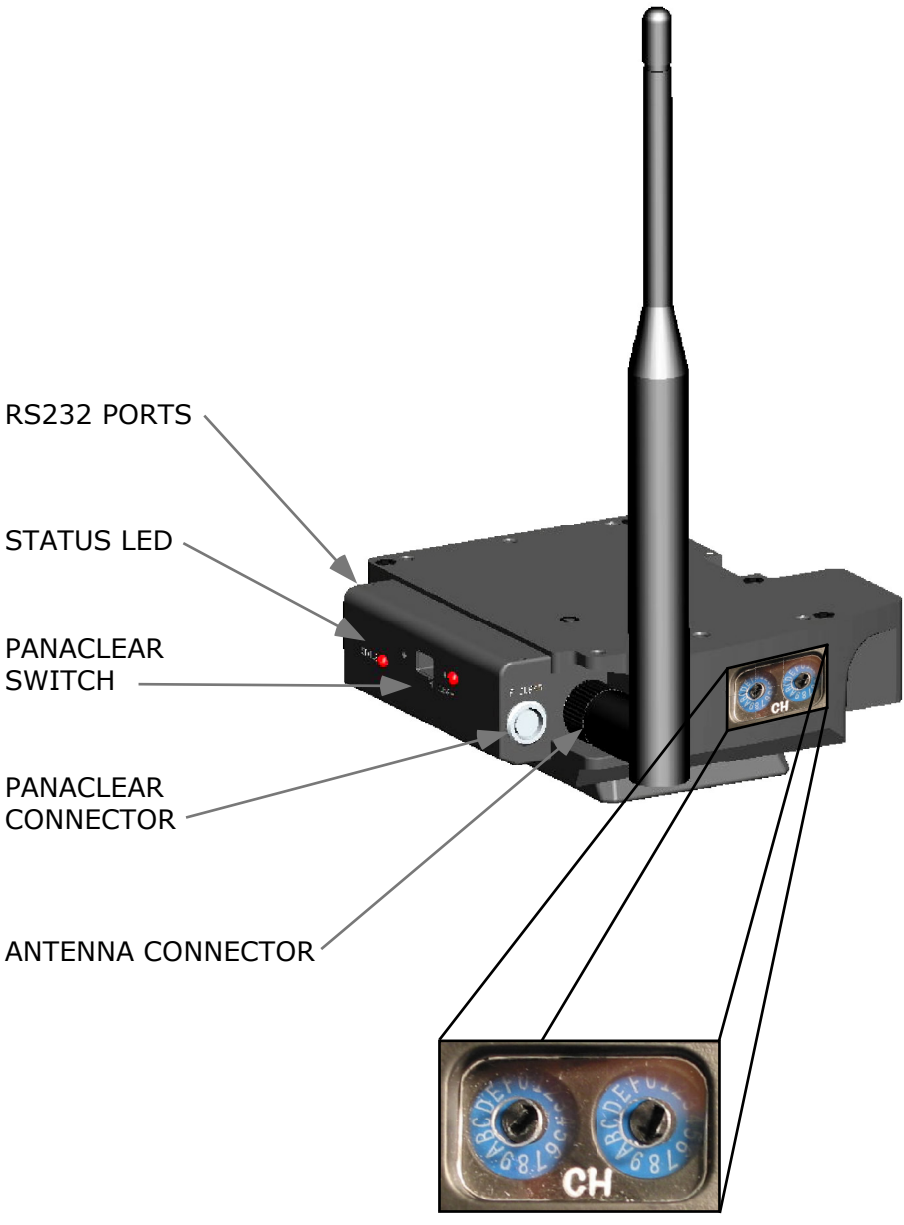
The STATUS light will blink green during calibration. It will become solid green when calibration is completed. A yellow LED indicates a communication error. Red indicates low battery.

For camera on/off and communication, connect a cable from the camera accessory port to the appropriate RDMD connector: PFX, DIGITAL, or OTHER [see diagram at left].

Use the RS232 port for hardwired connection to the RDC hand control. For wireless operation, attach the Remote Digital Hopper [RDHV] to the side of the RDMD. Line up the pogo contacts and place the RDHV onto the RDMD. Tighten with the LOCK thumbwheel. The antenna should be pointing up. `On the PFXMXL the RDHV can be mounted directly to a magazine port.

The HD Calibration [CALIB] button is only used with the Sony MSU Master Controller. To relinquish control, set the camera speed to 00.00 on the RDC.

See chapter 2 for complete camera setup information.


RS232 PORTS
STATUS LED
PANACLEAR SWITCH
PANACLEAR CONNECTOR
ANTENNA CONNECTOR
CH
CHANNEL SELECTORS

1.7 RDHV OVERVIEW

The Remote Digital Hopper [RDHV] provides wireless data communication between the RDC and the RDMD [or to the PFXMXL camera]. It piggybacks onto the side of the RDMD or mounts on a magazine port of the PFXMXL camera.

The RDHV has a Panaclear switch and connector for heating the camera eyepiece. The P CLEAR light will illuminate when the circuit is on.

An antenna mounts to the threaded connector which is labelled ANT. The amber STATUS light will flicker when communication is established.

There are 2 rotary switches under a plastic cover labelled CH. Use a small flathead screwdriver to select the wireless communication channel. There are 76 possible channels [01-76]. The RDC and RDHV must be set to the same channel. If you have multiple RDC systems in use, set them to different channels. If you experience interference when operating wirelessly, try another channel. For optimal range, the antennas should be parallel to each other.

The two RS232 ports connect to modified Panatape units to enable Panatape distance readout on the RDC screen.


RS232 CONNECTOR
ON [CAM RUN] SWITCH
LENS CALIBRATION BUTTON
RS232 CONNECTOR
MOTOR FWD/REV SWITCH
CH
CHANNEL SELECTORS
F
T
FOCUS / T-STOP SWITCH

1.8 RDSC OVERVIEW

The Single Channel Controller [RDSC] provides separate control of either T-stop or Focus. It can operate hardwired in tandem with the RDC or wirelessly as a totally separate, more compact unit.

Wireless operation:
- Do not use RDC at the same time. Power down RDC.
- Set RDSC channel to match RDHV.
- RDSC antenna is internal. No extra antenna required.
- Set switch on RDSC to F or T as applicable.

Hardwired operation:

With RDC:
- Connect RDSC RS232 top connector to RDC RS232 REMOTE [side] connector using CBLE-RS20.
- Set switch on RDSC to F or T as applicable.
- Set channel selector switches to F F.

Without RDC:
- Connect RDSC RS232 connector to RDMD RS232 connector using CBLE-RS20.
- Set switch on RDSC to F or T as applicable.

NOTE: Lens scale range can be limited using the lens button, just as with the RDC. [see section 3.2]

RDM

RDMB / RDRC

RDMP

RDMD

PASS

RDHV

RDB

RDSB

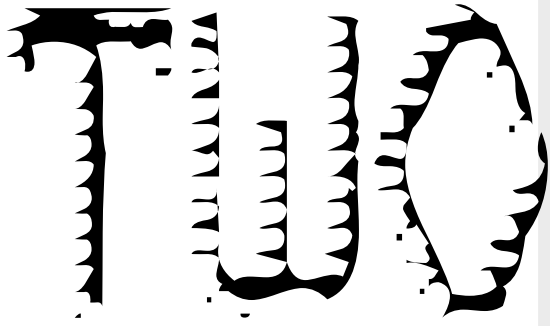
RDBH

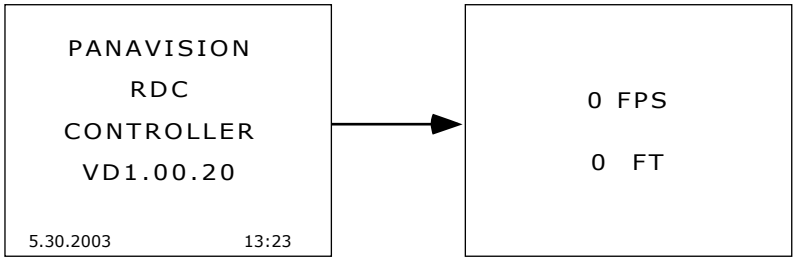
RDC

1.9 CASE CONTENTS

QTY	Product Type	Description
3	RDMB	Motor Bracket, Iris Rod Mount
1	RDMP	Motor Bracket, Panavision Mount
3	RDM	Motor
1		Sunshade
1	RDC	Main Control Unit
1	RDSB	Standard Back Cover
1	RDBH	Battery Handle
3	RDB	LiON Batteries
1	RDBC	Battery Charger
1	RDMD	Motor Drive Unit
1	RDHV	Hopper Transmitter/Receiver
2		Antennae
4		Marking Ring - T-stop
4		Marking Ring - Focus
1	PASS	PV Accessory Shoe Spacer
2	CBLE-24HP	24V Power [XLR3/L2]
2	CBLE-ZLP	24V Power [L2]
2	CBLE-RS20	RS232 20FT [L4]
2	CBLE-RFM	Motor Cable, 18" [L7]
2	CBLE-RFMS	Motor Cable, 10" [L7]
2	CBLE-RFMA	Motor Cable Right Angle [L7]
2	CBLE-FTZZ	Motor Cable, PV zoom [L4/L6]
2	CBLE-SSACC	ACC cable, PFX [L10/L7]
2	CBLE-RD435	435 RDMD Interface [F8/L6]
2	CBLE-HDLI	HD Lens Interface [H12/L7]
2	CBLE-BNC20	Video 20FT [BNC]
1	CBLE-IECNA	US IEC Power Cable
1	RDMG	Large 32P gear
1	RDMG	Large 48P gear
1	RDMG	Large 64P gear
2	RDMG	Wide 32P gears

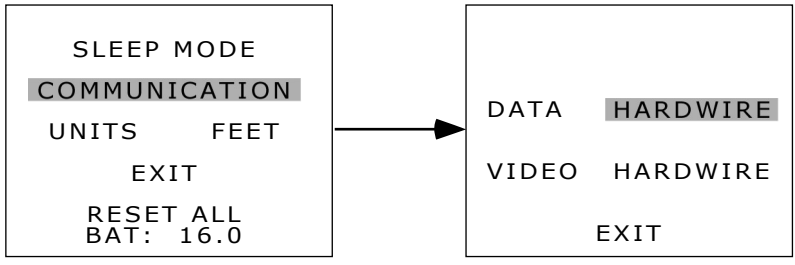
2.0 CAMERA SETUP





STARTUP SCREEN

CAMERA DATA



PREFERENCES SCREEN

COMMUNICATION SCREEN

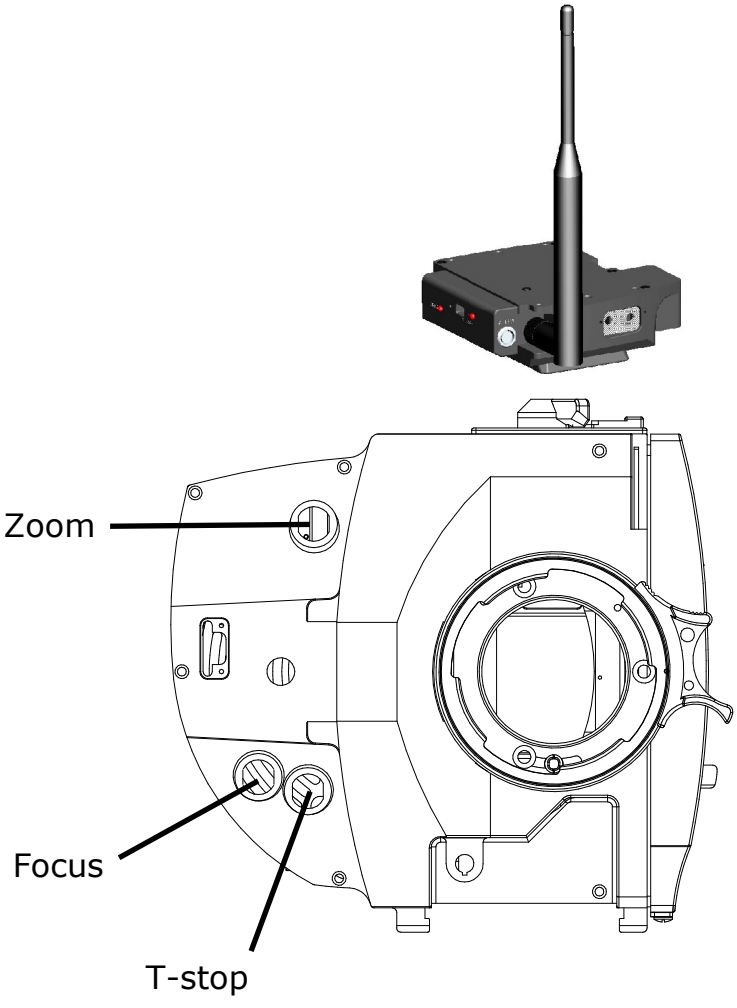
2.1 GETTING STARTED

When the RDC is first powered up [either by the battery RDB or via the RS232 cable] it will display the startup screen, which shows software version number and date. After several seconds the screen will switch to the Camera Data screen, which shows camera speed and footage.

From this screen the user can use the TEXT button to switch to the lens scale screen, or the LENS button to access all lens functions. Holding the ON switch to the left for 2 seconds will turn on the Preferences screen, where one can enter SLEEP mode, choose wired or wireless data communication, select units, RESET ALL the controller settings, and check battery voltage.

This chapter explains how to setup the motors, cables, and interfaces for various cameras. Chapter 3 then goes in to further detail on lens calibration. Chapter 4 explains the various screen modes, and chapter 5 discusses camera control such as speed ramping with iris and / or shutter changes.

WARNING:	RESET ALL will completely reset the RDC to its factory defaults, including clearing out all saved LENS information.


Zoom
Focus
T-stop

2.2 PFXMXL HARDWARE SETUP

The Remote Digital Control [RDC] system includes 3 digital motors [RDM] which can be configured for any camera system. Each motor has a multi-position bracket [RDMB] which can clamp on any diameter irisrod and position the motor wherever needed. If the motor is mounted from the opposite side, the motor direction can be reversed using the controller [RDC] menus. The motors have interchangeable gears: 32, 48, and 64 pitch.

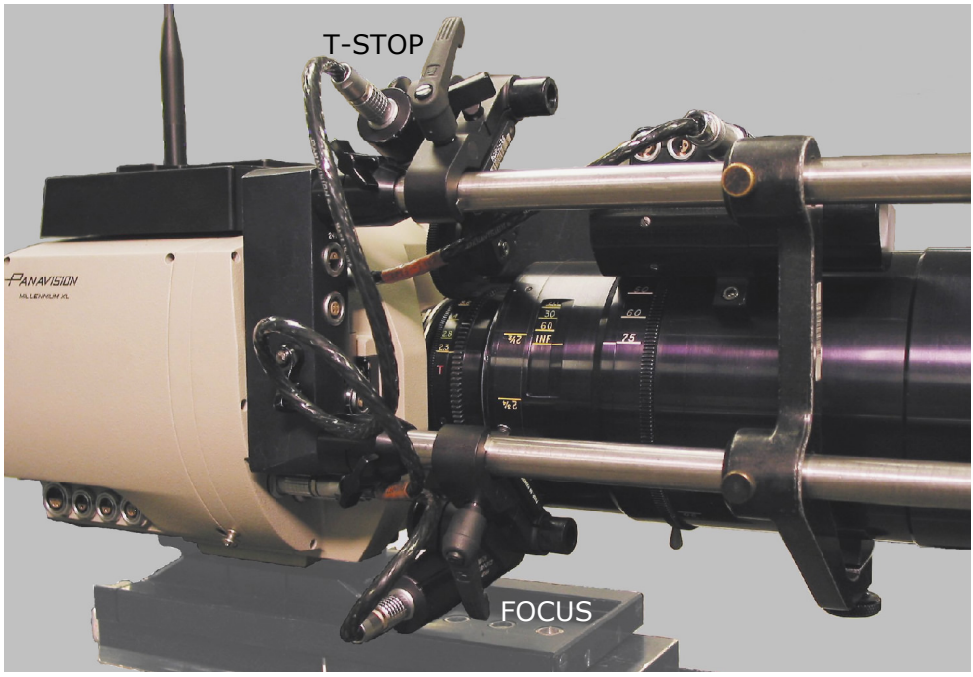
On the Millennium XL [PFXMXL] camera, the digital focus, T-stop, and analog zoom motors can be connected directly to the ports on the camera faceplate [see diagram].

Alternately a digital motor can be used for the zoom. This requires the Remote Digital Motor Driver [RDMD]. A digital zoom motor allows the use of the depth of field display on the lens scale display screen. Please note that shutter ramping is disabled when using a digital zoom motor with the RDMD.

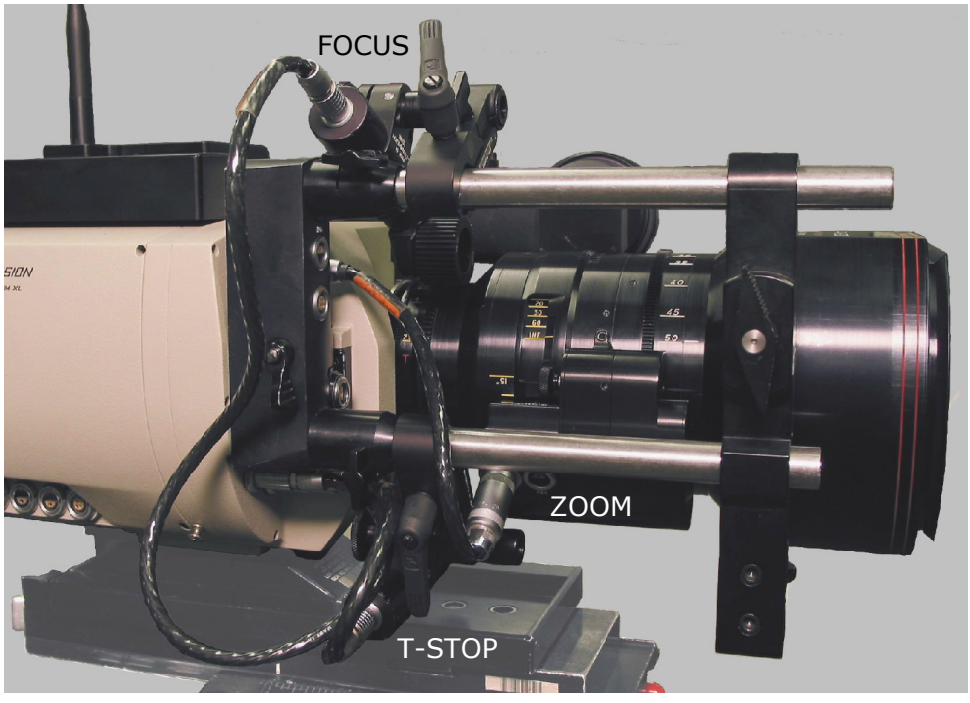
PFXMXL / RDC CAPABILITIES:

- POWER
- CAMERA ON / OFF
- FOCUS / T-STOP / ZOOM CONTROL
- SPEED change with IRIS and/or SHUTTER compensation
- D.O.F. [DEPTH OF FIELD] change

PFXMXL with 4:1 Primo Zoom



PFXMXL with Primo Macro Zoom

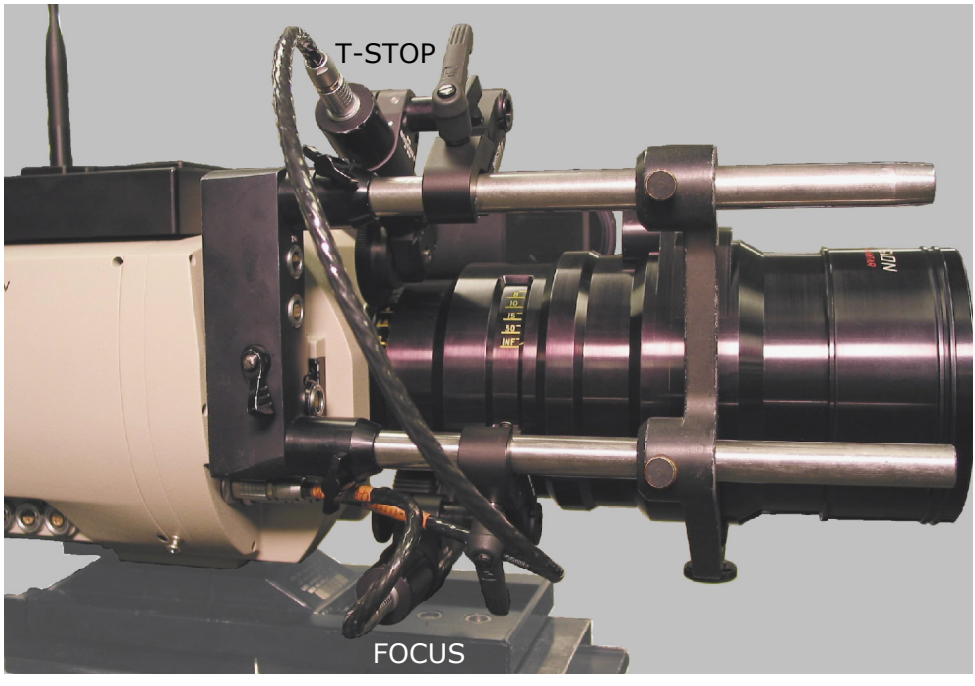


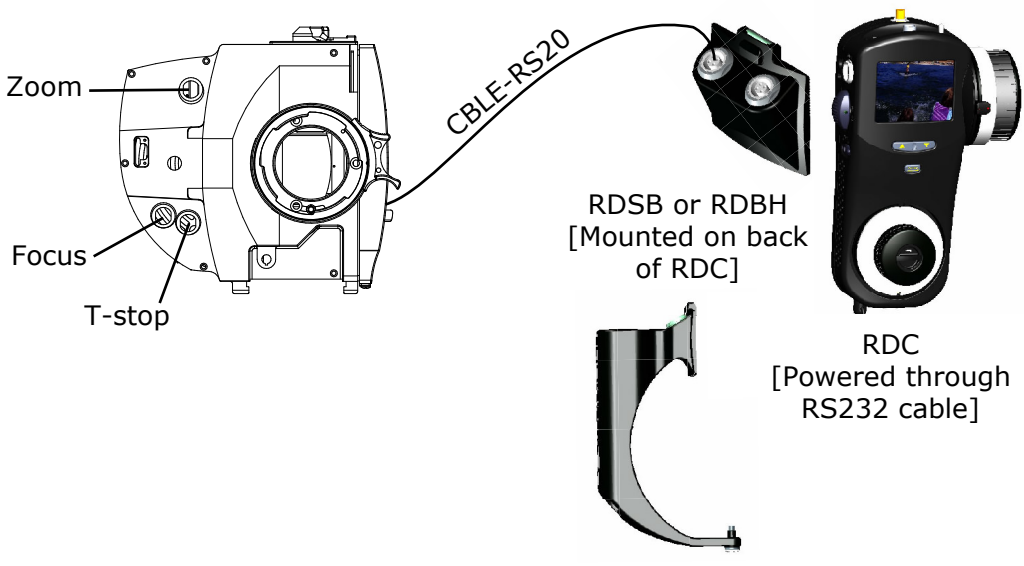
2.3 PFXMXL LENS / MOTOR SETUP

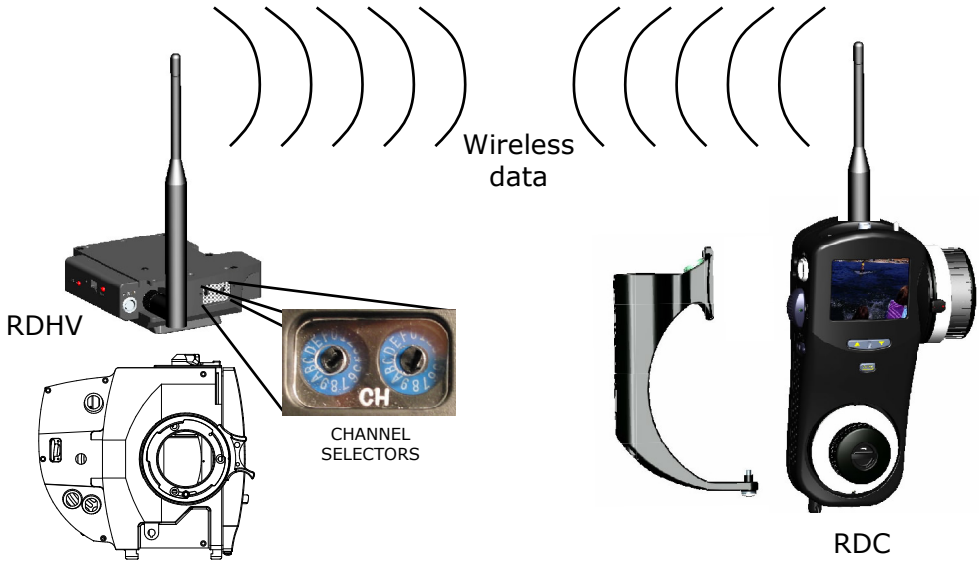
General Tips:

- Start near the camera with the iris motor first, and work forwards.
- Use the smaller diameter focus gear whenever possible to maximize motor torque.
- Keep bracketry slightly loose until the motor is placed on the gear.
- Tighten the bracket at the irisrod first and work towards the motor, tightening the motor clamp last, to avoid twist.
- Keep the RDMB as close to the gear end of the motor as possible to reduce lever action.
- Ensure proper gear mesh.

PFXMXL with AL100 Anamorphic




Zoom
Focus
T-stop
CBLE-RS20
RDSB or RDBH
[Mounted on back
of RDC]
RDC
[Powered through
RS232 cable]


Wireless
data
RDHV
CH
CHANNEL
SELECTORS
RDHV on mag port
[RS232 communication]
RDC
Powered through
RDBH or standard
24V source

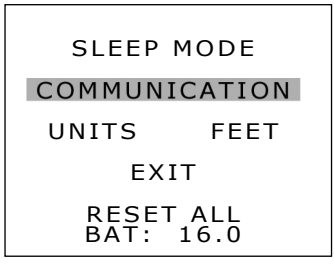
2.4 PFXMXL COMMUNICATION SETUP

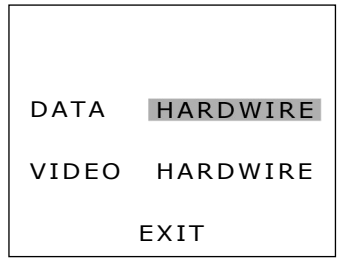
To change RDC from hardwired to wireless, hold the ON switch on top of controller to the left for 2 seconds. The Preferences screen will appear. Choose COMMUNICATION. Choose HARDWIRE or WIRELESS as applicable. Choose the data communication channel which matches the RDHV. [see screenshots below].

Hardwire direct connection

1. Connect RS232 cable [CBLE-RS20] from RDC [RDSB or RDBH] RS232 connector to camera RS232 connector.

2. Select Hardwired from the Preferences menus.





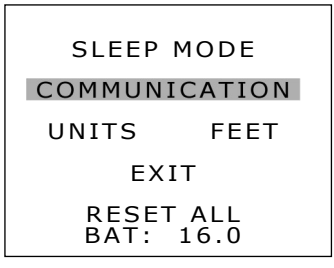
3. Connect BNC cable from video output to RDC if desired.

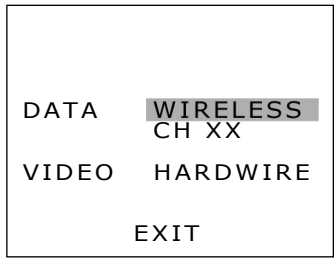
Wireless data connection

1. Attach Hopper [RDHV] to camera mag port. Power RDC using an on-board battery [RDB] in the handle [RDBH] or an external battery.

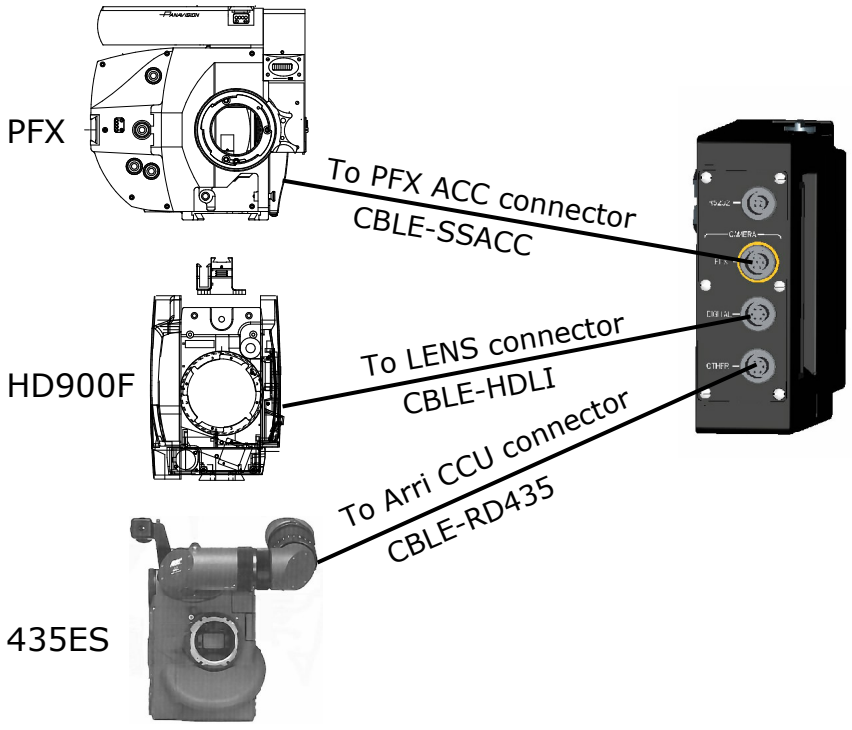
2. Attach antennas to RDHV and RDC. No RS232 cable is needed.

3. Select Wireless and the proper channel from the Preferences menus.





4. Connect BNC cable from video output to RDC is desired.


PFX
HD900F
435ES
To PFX ACC connector
CBLE-SSACC
To LENS connector
CBLE-HDLI
To Arri CCU connector
CBLE-RD435

2.5 ALL OTHER CAMERAS HARDWARE SETUP [PFX, PSTR, HD900F, 435ES]

The Remote Digital Control [RDC] system includes 3 digital motors [RDM] which can be configured for any camera system. Each motor has a multi-position bracket [RDMB] which can clamp on any diameter irisrod and position the motor wherever needed. If the motor is mounted from the opposite side, the motor direction can be reversed using the controller [RDC] menus. The motors have interchangeable gears: 32, 48, and 64 pitch.

The RDC supports both analog and digital zoom motors. Digital zoom motors [RDM] allow the use of the depth of field display on the lens scale display screen.

On all cameras except for the Millennium XL [PFXMXL], motor communication is controlled via the Remote Digital Motor Driver [RDMD]. Shutter control of the Millennium [PFX-M] is not currently provided through the RDMD.

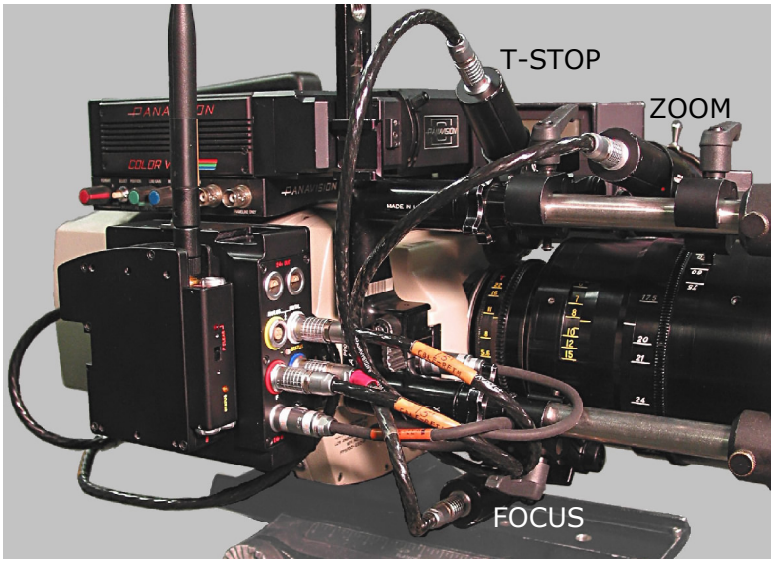
PFX, PSTR / RDC CAPABILITIES:
- POWER
- CAMERA ON / OFF
- FOCUS / T-STOP / ZOOM CONTROL
- SPEED change with IRIS compensation

435ES / RDC CAPABILITIES
- POWER
- CAMERA ON / OFF
- FOCUS / T-STOP / ZOOM CONTROL
- SPEED change with IRIS and/or SHUTTER compensation
- D.O.F. [DEPTH OF FIELD] change

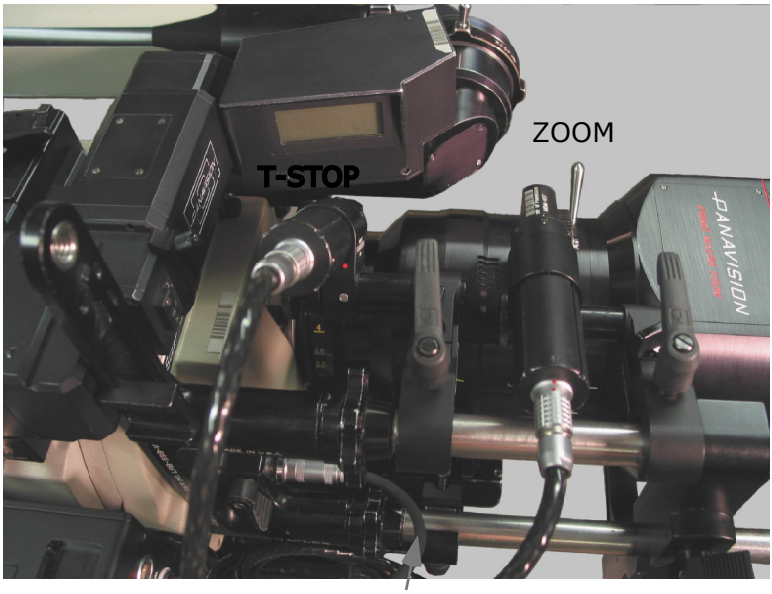
HD900F / RDC CAPABILITIES:
- POWER [via HDUC]
- CAMERA ON / OFF
- FOCUS / T-STOP / ZOOM CONTROL

OTHER CAMERAS / RDC CAPABILITIES:
- FOCUS / T-STOP / ZOOM CONTROL
- POWER via separate source

PFX-P with Primo 4:1 Zoom



PFX-P with Primo Macro Zoom



FOCUS motor underneath [same as Anamorphic picture, right]

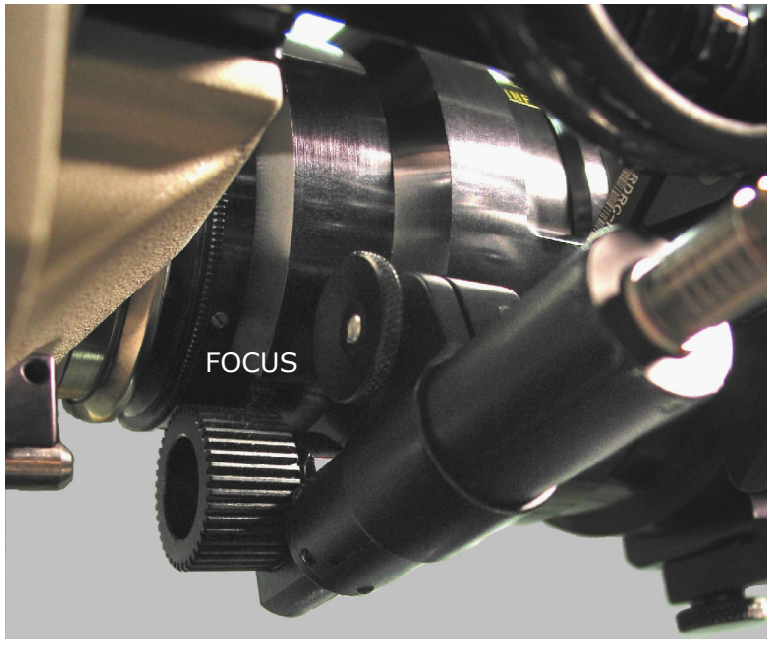
2.6 PFX LENS / MOTOR SETUP

These sample configurations apply for all the PFX-35 cameras, including the PFX-M

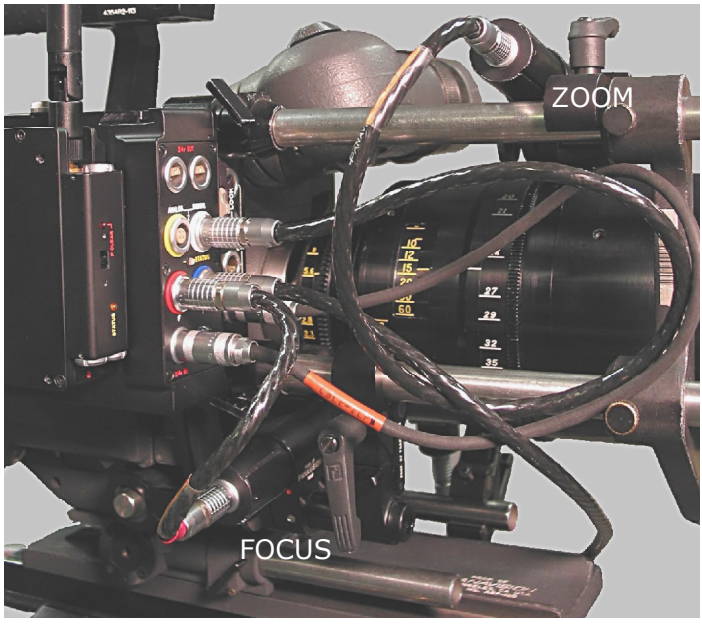
General Tips:

- Start near the camera with the iris motor first, and work forwards.
- Use the smaller diameter focus gear whenever possible to maximize motor torque.
- Keep bracketry slightly loose until the motor is placed on the gear.
- Tighten the bracket at the irisrod first and work towards the motor, tightening the motor clamp last, to avoid twist.
- Keep the RDMB as close to the gear end of the motor as possible to reduce lever action.
- Ensure proper gear mesh.

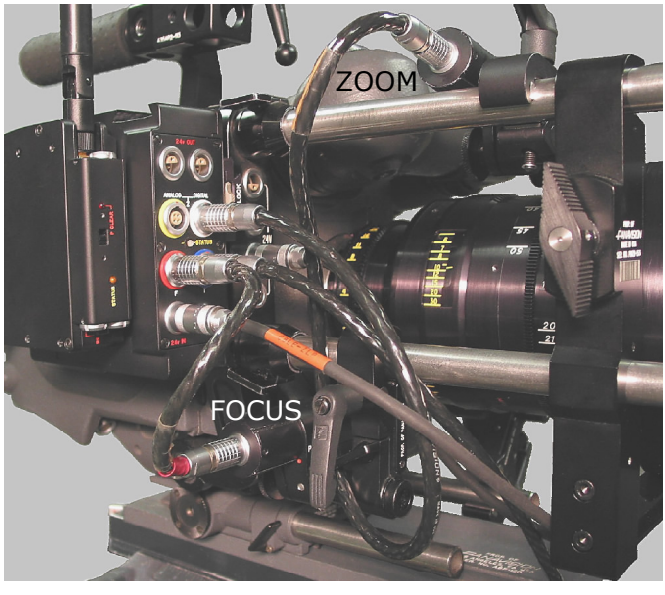
PFX-P with Primo 100mm Anamorphic



435ES with Primo 4:1 Zoom



435ES with Primo Macro Zoom



2.7 435 LENS / MOTOR SETUP

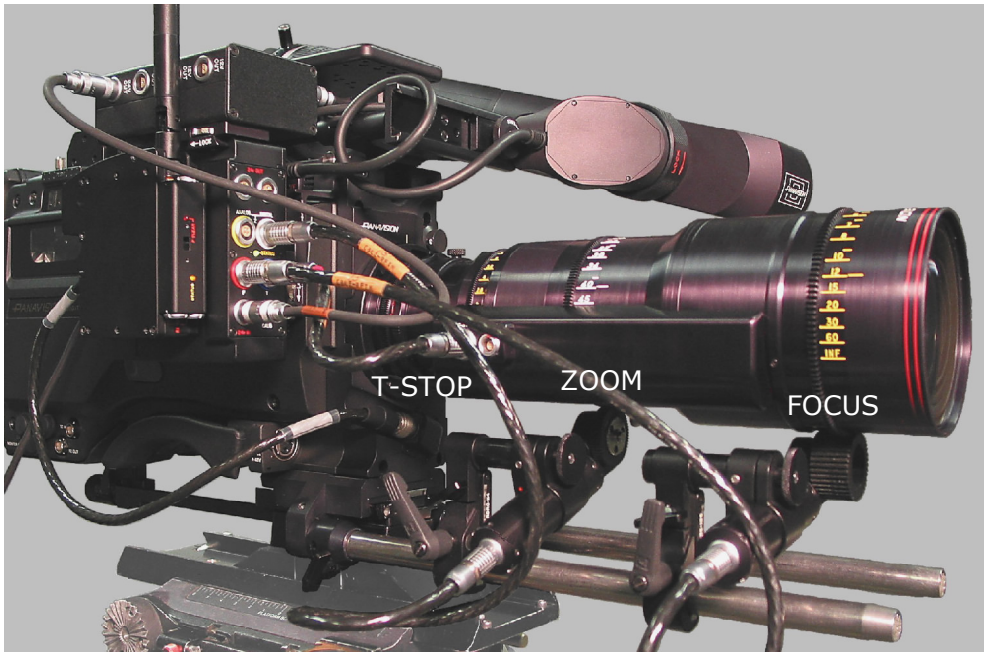
CAMERA CONTROL:
Connect the CBLE-RD435 from the OTHER connector on the RDMD to the CCU connector on the camera. Also see section 2.9.

General Tips:

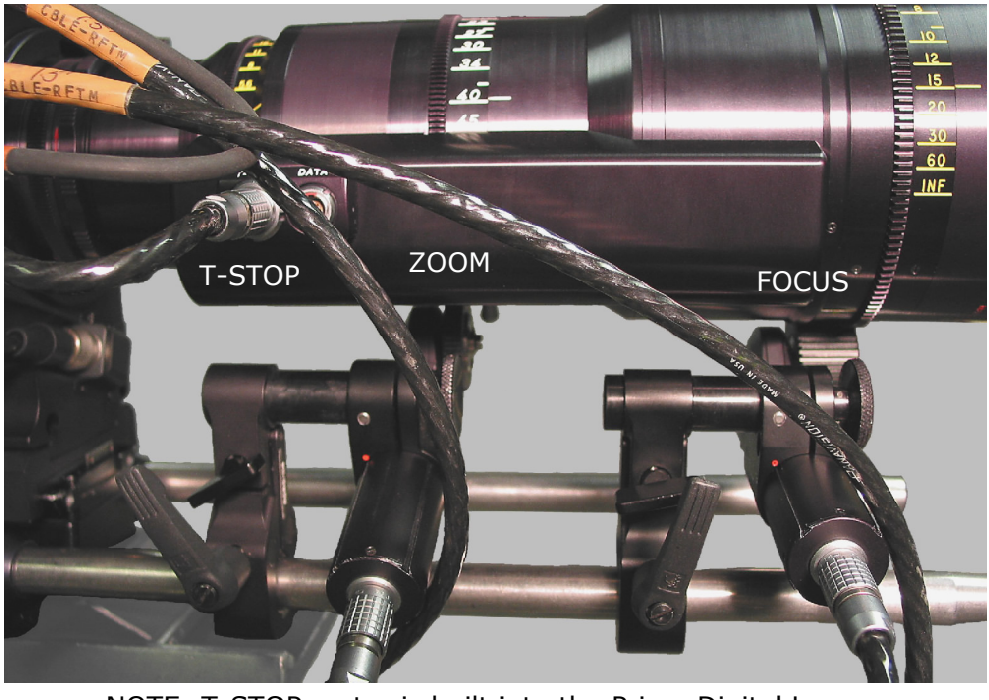
- Start near the camera with the iris motor first, and work forwards.
- Use the smaller diameter focus gear whenever possible to maximize motor torque.
- Keep bracketry slightly loose until the motor is placed on the gear.
- Tighten the bracket at the irisrod first and work towards the motor, tightening the motor clamp last, to avoid twist.
- Keep the RDMB as close to the gear end of the motor as possible to reduce lever action.
- Ensure proper gear mesh.
- Mount the motors first, then the RDMD.
- Using all 3 motors on one side will block power ports on the IRB-A2 and the RDMD mounting shoe [see picture]. One option is to put the T-stop motor on the operator side of the camera.

435ES with Primo 100mm Anamorphic

HD900F with Primo Digital 8-72mm Zoom



HD900F with Primo Digital 8-72mm Zoom



NOTE: T-STOP motor is built into the Primo Digital Lenses

2.8 HD900F LENS / MOTOR SETUP

CAMERA RUN:
Connect the CBLE-HDLI from the DIGITAL connector on the RDMD to the LENS connector on the camera. Also see section 2.9.

MOTORS:
Mount Focus and Zoom motors as appropriate. A suggested setup is pictured at left. An analog or digital zoom motor [RDC] can be used.

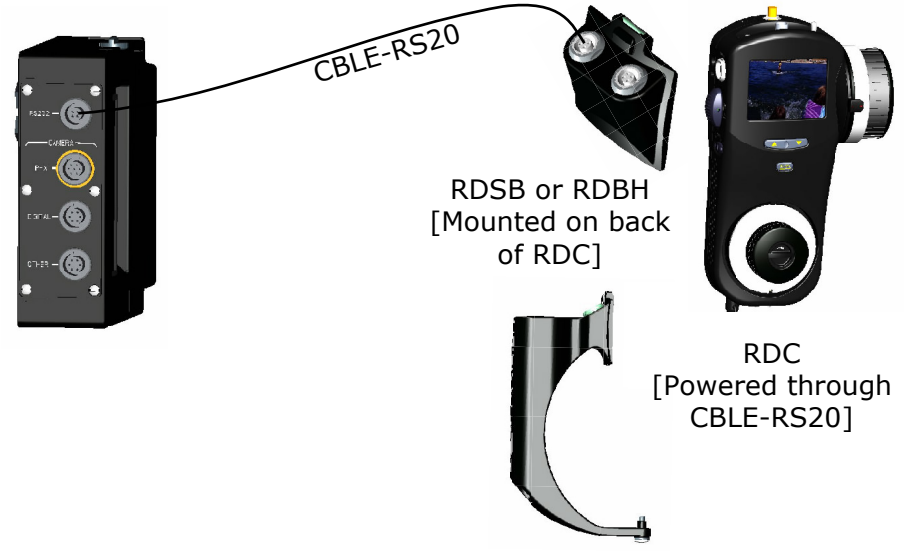
DIGITAL PRIMO lenses have built in iris motors which can be controlled by the RDC system.

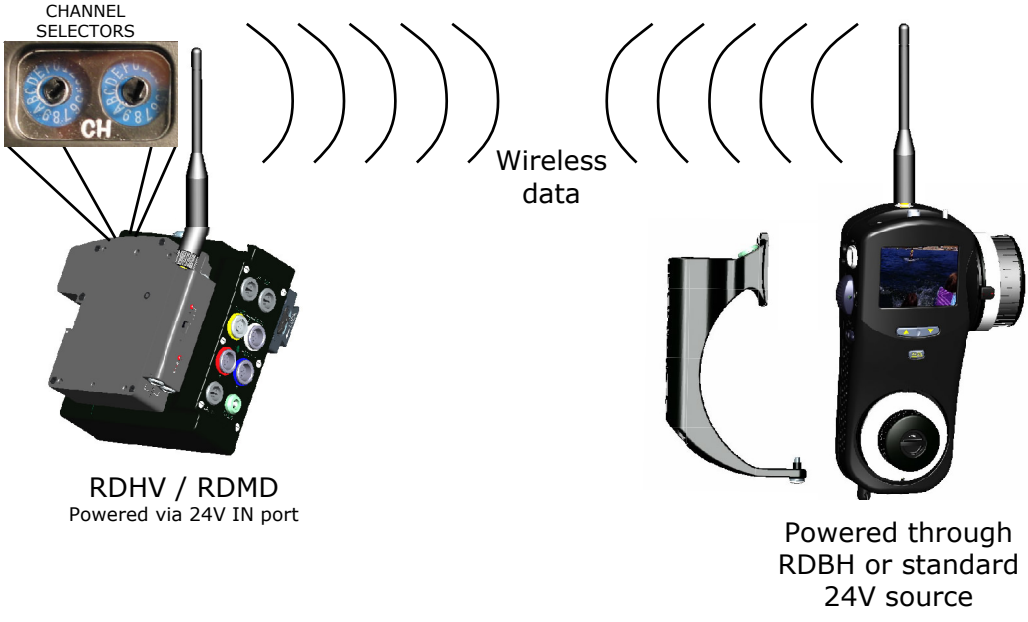
Connect a motor cable [CBLE-RFM] from the T connector on the RDMD to the IRIS connector on the side of the Digital Primo Lens.

General Tips:

- Start near the camera with the iris motor first, and work forwards.
- Use the smaller diameter focus gear whenever possible to maximize motor torque.
- Keep bracketry slightly loose until the motor is placed on the gear.
- Tighten the bracket at the irisrod first and work towards the motor, tightening the motor clamp last, to avoid twist.
- Keep the RDMB as close to the gear end of the motor as possible to reduce lever action.
- Ensure proper gear mesh.

NOTE: Depth of Field is calculated using .001" circle of confusion. Digital Cinematography requires a smaller c. of c. Therefore the depth of field display should be turned off when using digital lenses.





NOTE: On Panastar [PSTR-P] camera, set speed to 000 on back of camera for external speed control.

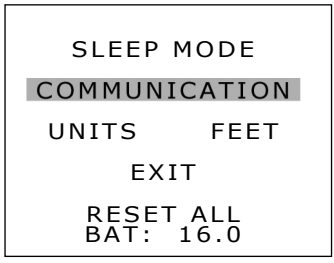
2.9 OTHER CAMERAS COMMUNICATION SETUP [PFX, PSTR, HD900F, 435ES]

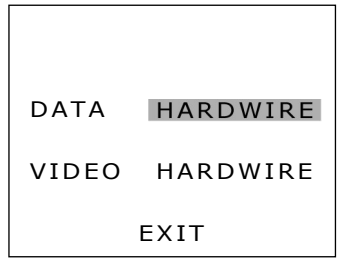
To change RDC from hardwired to wireless, hold the ON switch on top of controller to the left for 2 seconds. The Preferences screen will appear. Choose COMMUNICATION. Choose HARDWIRE or WIRELESS as applicable. Choose the data communication channel which matches the RDHV. [see screenshots below].

Hardwire direct connection

1. Connect RS232 cable [CBLE-RS20] from RDC [RDSB or RDBH] RS232 connector to RDMD RS232 connector.

2. Select Hardwired from the Preferences menus.





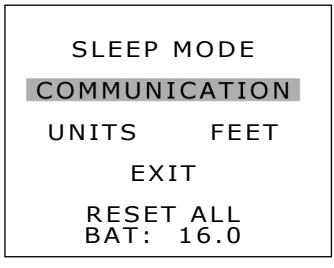
3. Connect BNC cable from video output to RDC if desired.

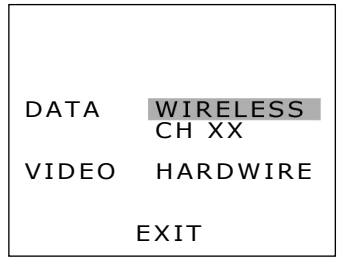
Wireless data connection

1. Attach Hopper [RDHV] to RDMD mag port. Power RDC using an on-board battery [RDB] in the handle [RDBH] or an external battery.

2. Attach antennas to RDHV and RDC. No RS232 cable is needed.

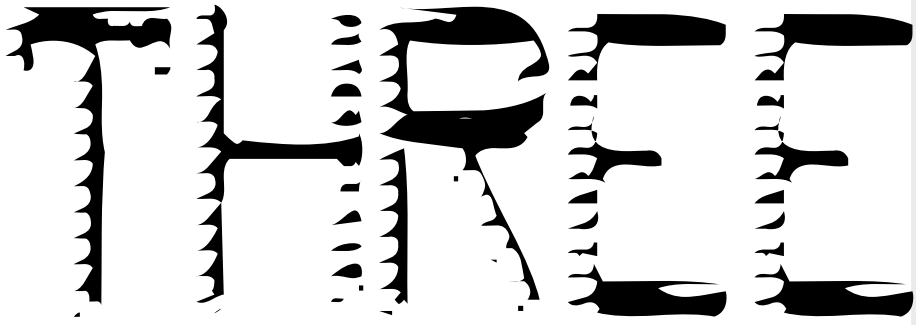
3. Select Wireless and the proper channel from the Preferences menus.



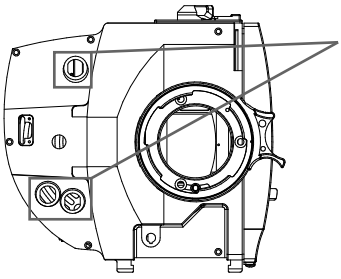


4. Connect BNC cable from video output to RDC is desired.

3.0 LENS CALIBRATION



motor connectors

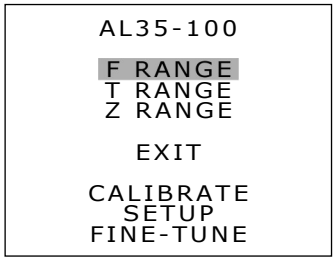


PFXMXL

RDMD

RDHV

Note: RDHV STATUS light will flicker yellow when communicating with RDC.



LENS CALIBRATION BUTTON

3.1 BASIC LENS SETUP

1 Plug lens motors into:

a] Faceplate [PFXMXL] OR

b] Motor Drive Unit [RDMD]

2 Power up Controller

3 Power up:

a] Camera OR

b] Motor Drive Unit

- *Motor[s] will calibrate lens FOCUS and T-STOP [& ZOOM if digital motor is used]*
- *RDMD status light will blink green during calibration stage. When lens finishes calibration and full control by the controller is established, the light will turn solid green. A yellow light on the RDMD indicates a communication error. A red light indicates low battery.*

3.2 LIMITING RANGE / REESTABLISHING FULL RANGE

1 Push lens calibration button [on top of RDC].
Lens calibration menu comes on.

2 Use up/down buttons to highlight desired function to change.

3 Push enter button.
Item will blink on screen, Status light on RDMD will blink green.

4 Push and hold lens calibration button.

5 Turn knob to first desired footage mark [T-Stop].
All the way to one end for full range.

6 Release lens calibration button.

7 Push and hold lens calibration button.

8 Turn knob to second position [or other full end].

9 Release lens calibration button. Function set.

10 Use up/down buttons to calibrate next function or EXIT.

11 When finished, the status LED on RDMD will turn solid green.

12 Unit is ready for use.

SLZ4-101

F RANGE
T RANGE
Z RANGE

EXIT

CALIBRATE
SETUP
FINE-TUNE

LENS
MOTORS
POSITIONS

EXIT

DIR FOCUS RV
TSTOP NM
ZOOM RV

BACK
EXIT

3.3 CHANGING MOTOR DIRECTION

The RDC Main Controller can drive various motor units [all Panavision motors, Preston motors etc.].

The Remote Motor Drive Unit [RDMD] will automatically determine the motor type. Preston motors require special cables. The user can change directions of the motors.

NOTE: The Millennium XL camera does not need the RDMD unit; the motor brains are in the camera. If the user desires to use non-Panavision motors on this cameras, the RDMD must be used [bypassing the internal brains].

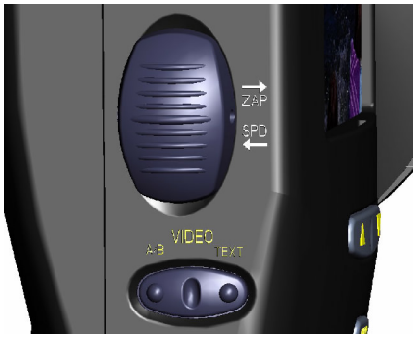
Using a digital motor [RDM] for the zoom enables the Depth of Field display. [see section 4.3].

1 Push lens calibration button [on top of unit].
2 Use down button to highlight SETUP.
3 Push ENTER button.

4 Use up/down buttons to highlight MOTORS.
5 Push ENTER button.

6 Use up/down buttons to highlight item to change.
Motor[s] direction normal [NM] or reverse [RV].
7 Push ENTER button.
8 Use up/down buttons to toggle between selections.
9 Push ENTER button.
10 Use up/down buttons to select BACK and go back one menu page, or select EXIT to go to main lens screen.

Zoom Speed Zap



Telephoto
Fast speed

Slow speed
Wide

ZOOM SPEED
1-10

04

SLOW <--> FAST
1 <--> 10

3.4 ZOOM CONTROL

The zoom control function on the RDC main controller is controlled by a pressure sensitive, multidirectional joy stick [trigger]. All zoom control functions [zoom in/out, zoom speed and zap] are controlled here.

Zoom Control

Move zoom trigger up [telephoto] or down [wide] to activate.

Zoom Speed

1. Hold zoom trigger in zoom speed position [left] then release when *Zoom speed menu turns on.*
2. Use up / down buttons to increase / decrease zoom speed.
3. Push ENTER button.
4. Hold trigger in zoom speed position again until zoom speed menu disappears, then release.

Zoom Zap

1. Hold zoom trigger in zap position [right] and release when ZAP appears.
2. Hold trigger in desired direction, then release.
3. Hold zoom trigger in zap position again until zap menu disappears, then release.

LENS CALIBRATION button

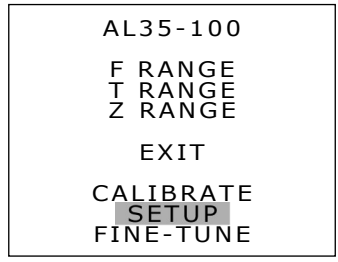
ENTER button

3.5 BUILDING THE LENS PACKAGE

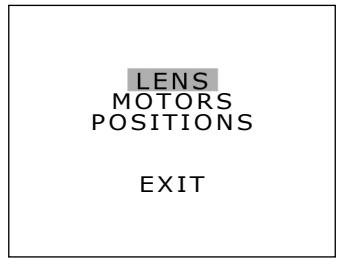
The RDC Main Controller has stored in it multiple lens designs. The user can pick their specific lens type and pre-program the unit during prep time. The user will then recall the lens when desired; a lens scale for that lens will appear on screen with the depth of field characteristics. The scale will move dynamically.

1 Push lens calibration button [on top of unit].

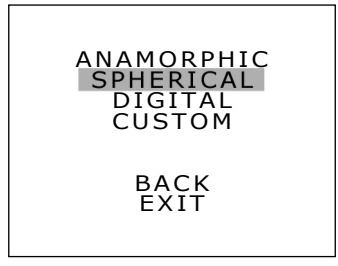
2 Use down button to highlight SETUP.
3 Push ENTER button.



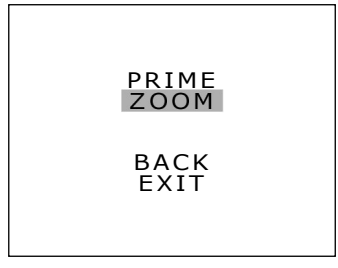
4 Use up/down buttons to highlight LENS.
5 Push ENTER button.



6 Use up/down buttons to highlight lens format.
7 Push ENTER button.



8 Use up/down buttons to highlight lens type.
9 Push ENTER button.



Continued on next page.

ENTER button

The first line indicates the current lens in use

SLZ4-101
F RANGE
T RANGE
Z RANGE
EXIT
CALIBRATE
SETUP
FINE-TUNE

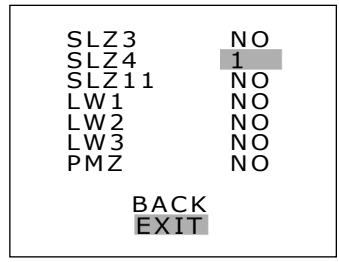
SL40-101
F RANGE
T RANGE
EXIT
CALIBRATE
SETUP
FINE-TUNE

Highlight serial number and use up/down buttons to change it.

3.5 BUILDING THE LENS PACKAGE continued

10 Use up/down buttons to highlight lens product type in prep package.

11 Push ENTER button.



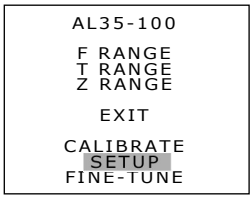
12 Use up/down buttons to toggle between NO [default] and 1, 2, OR 3.

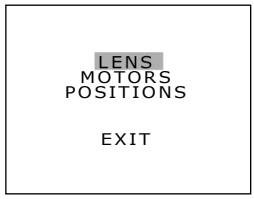
1,2, OR 3 corresponds to the total number of lenses of a specific focal length in package.

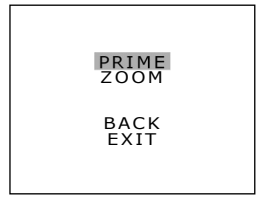
13 Push ENTER button.

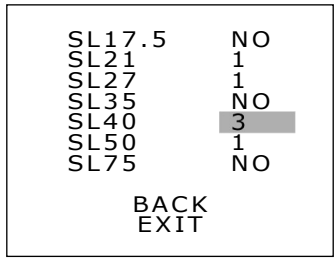
14 Continue this procedure until all lenses in the prep package are stored.

15 Use up/down buttons to highlight EXIT.

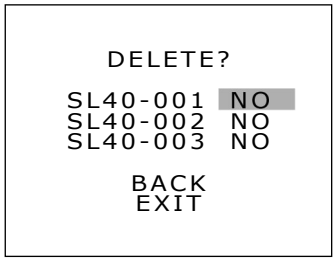


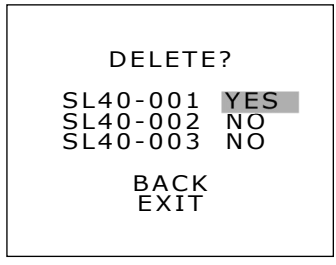


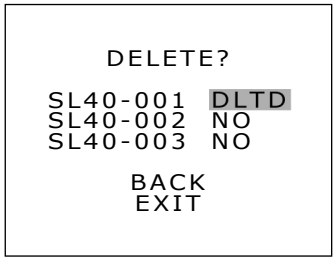


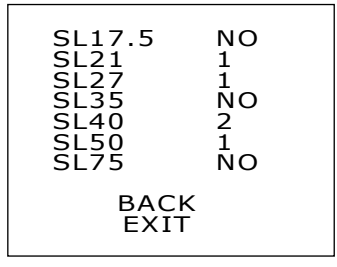


Using SL40 as example
Change QTY from 3 to 2









3.6 REMOVING LENS FROM SETUP

After inputting the lens type and lenses to be used, specific lenses can be removed from the package list

1 Follow steps in section 3.3 to get to lens selection screen. [Press Lens Calibration button. Choose SETUP -> LENS -> FORMAT -> TYPE].

2 Use up/down buttons to select desired lens. Press ENTER.

3 Push down button.
Deletion screen turns on.

4 Use up/down buttons to highlight lens serial number to be deleted.

5 Push ENTER button. *NO will blink.*

6 Use up/down buttons to toggle NO to YES. Push ENTER button.
Cursor will display DLTD.

7 Use down button to select BACK and press ENTER to go back to lens list.

8 Repeat above steps to remove all unwanted lenses.

LENS CALIBRATION button

```
SLZ4-101

F RANGE
T RANGE
Z RANGE

EXIT

CALIBRATE
SETUP
FINE-TUNE
```

```
CAL    SLZ4-101

FOCUS


INF
60
30
20
```

Scroll through FOCUS / T-STOP / ZOOM / S/N

```
CAL    SLZ4-101

S/N

238

EXIT
```

```
CAL    SLZ4-238

FOCUS


INF
60
30
20
```

```
CAL    SLZ4-238

FOCUS


INF
60
30
20
```

Move lens to each mark as indicated. Press ENTER twice to set mark.

```
CAL    SLZ4-238

FOCUS

3
2 3/4
2 1/2
DONE
```

Finished with FOCUS. Repeat for T-Stop and Zoom

3.7 LENS SCALE CALIBRATION

After inputting the lens type and lenses to be used, the specific lens will be fine-tuned for optimal calibration. This will ensure that the footage / T-stop marks and the electronic representation of the lens scale completely coincides with the actual lens calibration. Also, you may add the serial number of a specific lens into memory.

***** Section 3.1 BASIC LENS SETUP must be completed before proceeding *****

1 Push lens calibration button [on top of unit]

2 Push ENTER button.

3 Use up/down buttons to choose desired lens to be calibrated. Push ENTER button.

4 Use up/down buttons to highlight CALIBRATE

5 Push ENTER button. *Calibration screen appears.*

6 Lens to be calibrated will be on top line of screen. Press ENTER and use up/down buttons to toggle between FOCUS, T-STOP, ZOOM, and S/N.

7 Push ENTER button when desired selection flashes. *Scale appears.*

8 Use down button to highlight first mark to be set
Turn focus knob until lens matches highlighted focus mark setting.
Push ENTER button. Setting blinks.
Push ENTER button again to set. Cursor moves to next mark.
Turn focus knob until lens matches highlighted focus mark setting.
Push ENTER button. Setting blinks.
Push ENTER button again to set. Cursor moves to next mark.
Continue procedure until all marks are set.
Use up/down buttons to highlight DONE.
"IN PROCESS..." will flash.

9 Repeat step 8 for T-stop and Zoom [if applicable]

10 Change serial number if desired using up/down buttons & ENTER.

SLZ4-101

F RANGE
T RANGE
Z RANGE

EXIT

CALIBRATE
SETUP
FINE-TUNE

TUNE SLZ4-101

FOCUS

INF
60
30
20

TUNE SLZ4-101

S/N

238

EXIT

TUNE SLZ4-238

FOCUS

INF
60
30
20

TUNE SLZ4-238

FOCUS

INF
60
30
20

TUNE SLZ4-238

FOCUS

3
▶2 3/4
▶2 1/2
DONE

3.8 FINE-TUNING LENS CALIBRATIONS

If a lens does not have all the scale markings listed in the CALIBRATE menus, the extra marks can be removed in the FINE-TUNE menus.

***** Section 3.1 BASIC LENS SETUP must be completed before proceeding *****

1 Push lens calibration button [on top of unit]

2 Push ENTER button.

3 Use up/down buttons to choose desired lens to be calibrated. Push ENTER button.

4 Use up/down buttons to highlight FINE-TUNE

5 Push ENTER button. *Fine-Tuning screen appears.*

6 Lens to be fine-tuned will be on top line of screen. Press ENTER and use up/down buttons to toggle between FOCUS, T-STOP, ZOOM, and S/N.

7 Push ENTER button when desired selection flashes. S*cale appears.*

8 Use down button to highlight first mark to be removed

Push ENTER button. Setting blinks.

Push ENTER button again to set. Cursor moves to next mark. An arrow appears next to the number to be removed.

Continue procedure until all marks are set.

Use up/down buttons to highlight DONE.

9 RDC will switch to calibration mode for that lens scale [See section 3.5 for details].

10 Return to the FINE-TUNE menu if more lens scales need to be altered [follow above procedure].

TO RESTORE DELETED MARKS:

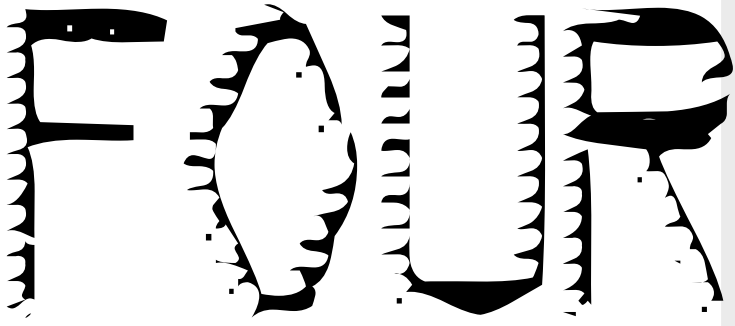
1 Follow steps 1-7 above.

2 Use arrow keys to highlight deleted mark. It will have an arrow next to it, and once highlighted the number will change to DELETED.

Push ENTER. *"DELETED" will flash*

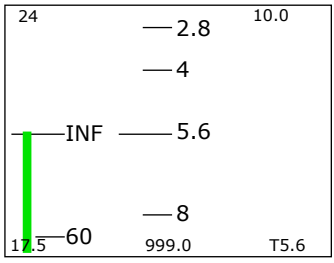
Push ENTER again. Number will be restored, and arrow will disappear.

4.0 LCD SCREEN



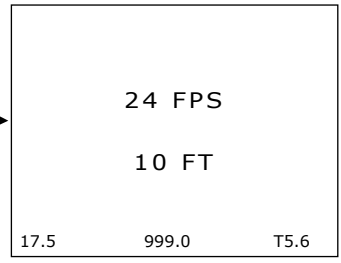
SCREENS

LENS SCALE SCREEN

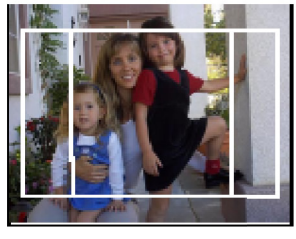


Green bar indicates Depth of Field.

CAMERA SCREEN



Press ENTER to access speed / ramp menu and display SETUP options.



CLR: 8 possible mark colors
STL: 2 possible mark styles

VIDEO SCREEN

4.1 LCD SCREEN MODES

The RDC Main Controller can individually display one video source via BNC cable, multiple text, and lens scale screens. This section will describe the various viewing options and how these features are accessed.

Screen Modes

1 CAMERA Screen [Default]: Displays camera speed/shutter status and setup.

2 LENS SCALE Screen: Displays lens scale.

3 VIDEO Screen: Displays video with or without informational text.

Switching Video Source

Push button [position 1] to turn on video feed.

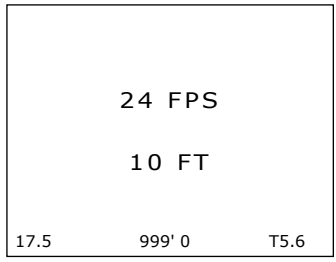
Push again to toggle video between video and video + text.

Switching Video to Text and Back

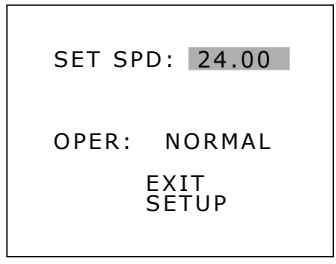
Push button [position 2] to turn on CAMERA screen.

Push again for LENS SCALE screen.

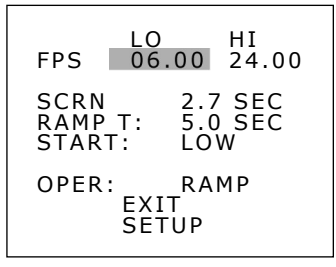
NOTE: The TEXT button also serves as a quick EXIT to the LENS SCALE screen from most menus.



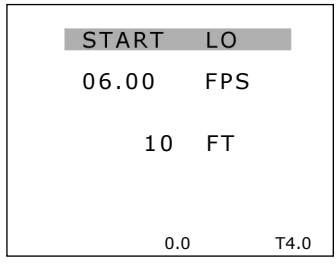
SPEED & FOOTAGE W/ LENS INFO



CHANGING THE FRAME RATE
[see section 5.1]



RAMP SETUP SCREEN
[see section 5.2]



RAMP RUN SCREEN

4.2 TEXT SCREEN

TEXT Screen: Main screen setup

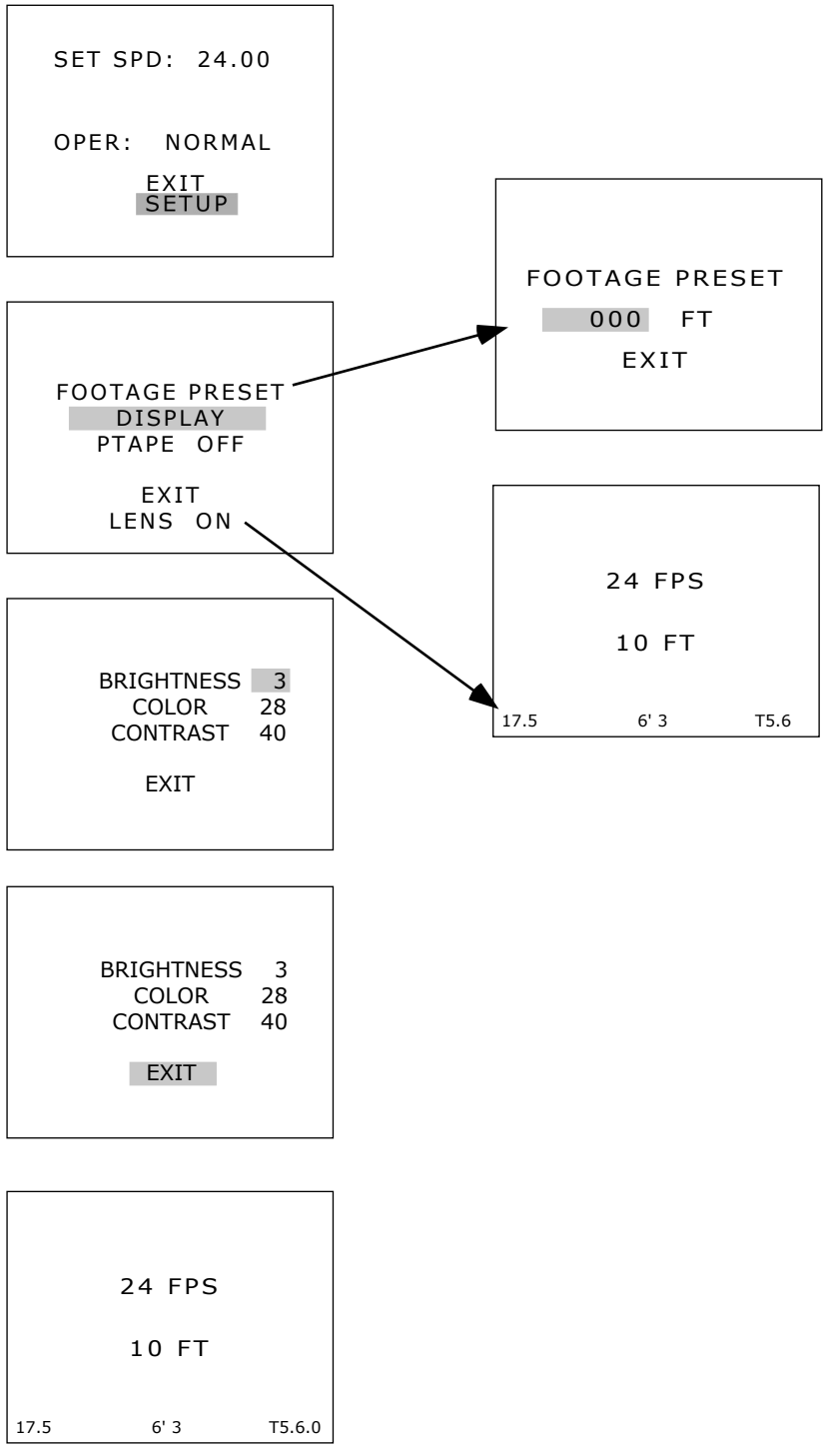
1 Push ENTER Button.

2 Use up/down buttons to highlight Item to change [speed, operation mode, shutter angle, ramp time, screen setup, etc.].

3 Push ENTER Button.

4 Use up/down buttons to adjust item.

5 Push ENTER Button.


SET SPD: 24.00
OPER: NORMAL
EXIT
SETUP
FOOTAGE PRESET
DISPLAY
PTAPE OFF
EXIT
LENS ON
FOOTAGE PRESET
000 FT
EXIT
24 FPS
10 FT
17.5 6' 3 T5.6
BRIGHTNESS 3
COLOR 28
CONTRAST 40
EXIT
BRIGHTNESS 3
COLOR 28
CONTRAST 40
EXIT
24 FPS
10 FT
17.5 6' 3 T5.6.0

4.2 TEXT SCREEN CONTINUED

TEXT Screen: DISPLAY SETUP

1 Push ENTER button.
2 Use down button to highlight SETUP.
3 Push ENTER button.
4 Use up/down buttons to select item to change [FOOTAGE PRESET, DISPLAY, PTAPE, LENS].
5 Push ENTER button.
Selecting DISPLAY will open BRIGHTNESS, COLOR, CONTRAST menu.
6 Use up/down buttons and ENTER to select EXIT and return to main TEXT screen.

FOOTAGE PRESET

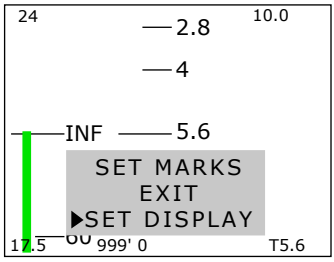
1 Choose FOOTAGE PRESET from Display setup menu.
2 Use up/down buttons to set footage to 000 or any other starting value.
3 Choose EXIT.

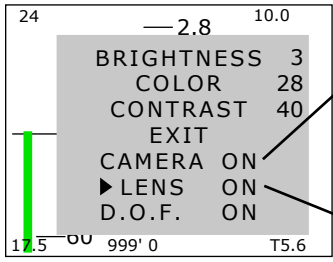
Note: with the PFXMXL camera, the RDC footage counter resets automatically when the camera counter is reset. No additional steps are necessary.

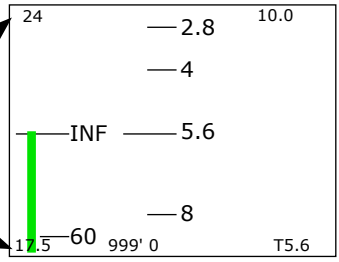
LENS DATA

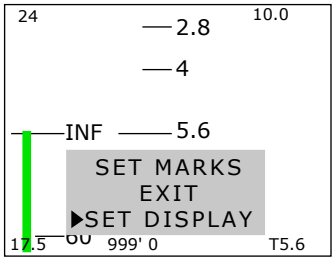
1 Choose LENS from Display setup menu.
2 Select OFF or ON as desired.
3 Lens data will be displayed at the bottom of the TEXT screen.

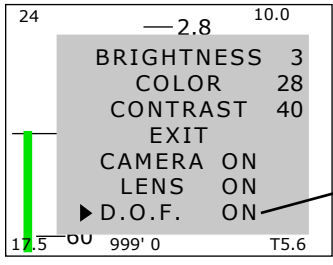
Note: The TEXT screen SETUP is separate from the LENS SCALE screen SETUP.

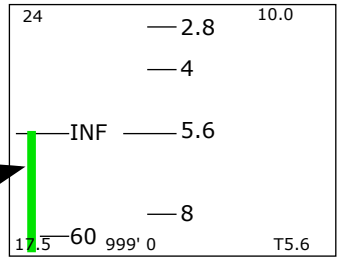

24
10.0
2.8
4
INF
5.6
SET MARKS
EXIT
▶SET DISPLAY
17.5
60
999' 0
T5.6

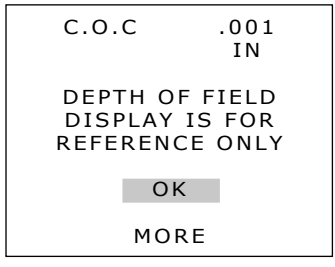

24
10.0
2.8
BRIGHTNESS 3
COLOR 28
CONTRAST 40
EXIT
CAMERA ON
▶LENS ON
D.O.F. ON
17.5
60
999' 0
T5.6


24
10.0
2.8
4
INF
5.6
8
17.5
60
999' 0
T5.6


24
10.0
2.8
4
INF
5.6
SET MARKS
EXIT
▶SET DISPLAY
17.5
60
999' 0
T5.6


24
10.0
2.8
BRIGHTNESS 3
COLOR 28
CONTRAST 40
EXIT
CAMERA ON
LENS ON
▶D.O.F. ON
17.5
60
999' 0
T5.6


24
10.0
2.8
4
INF
5.6
8
17.5
60
999' 0
T5.6


C.O.C .001
IN
DEPTH OF FIELD
DISPLAY IS FOR
REFERENCE ONLY
OK
MORE

4.3 LENS SCALE SCREEN

Screen Setup: Basic

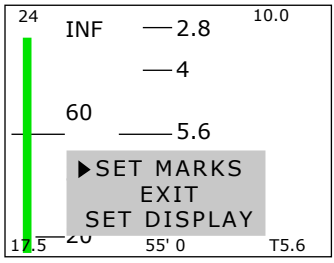
1 Push Video Text Button 2 to display lens scale.
2 Push ENTER Button.
3 Use up/down buttons to highlight SET DISPLAY.
4 Push ENTER Button.
5 Use up/down buttons to highlight Item to change.
6 Push ENTER Button.
7 Use up/down buttons to adjust/toggle item.
8 Push ENTER Button.

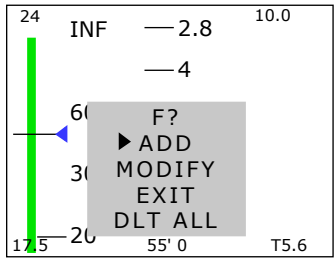
Note: The LENS SCALE screen SETUP is separate from the TEXT screen SETUP.

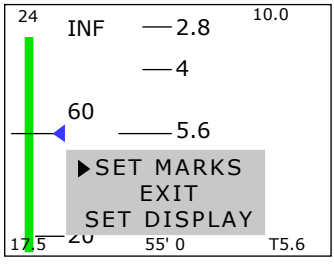
Screen Setup: Depth of Field

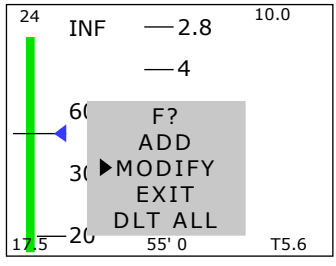
The D.O.F. is calculated using standard A.S.C. algorithm. It is to be used for reference only. Several factors influence the D.O.F. including but not limited to: lens focal length, T-stop, lighting conditions, subject distance, image magnification, filtration, etc.

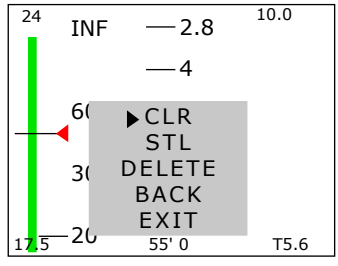
Depth of field is calculated using .001" as the circle of confusion.











CLR: 8 possible mark colors
STL: 2 possible mark styles

4.3 LENS SCALE SCREEN - CONTINUED

ADDING INDEX MARKS

Various reference marks can be added to the Focus/T-Stop//Zoom scales.

1 Push Video Text Button 2 to display lens scale.
2 Push ENTER Button.
3 Use up/down buttons to highlight SET MARKS.
4 Push ENTER Button.
5 Use up/down buttons to highlight F?
6 Push ENTER Button.
7 Use up/down buttons to adjust/toggle item [F? —> T? —> Z?].
8 Push ENTER Button.
9 Use up/down buttons to highlight ADD.
10 Push ENTER Button.
11 Turn focus knob to position where mark is needed.
12 Push ENTER Button.
13 Repeat until all requested marks are input.

MODIFYING MARKS

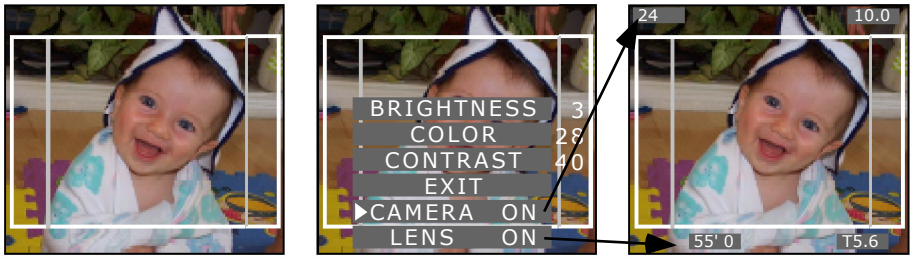
Added marks can be modified by color [up to 8] and style [◀, —].

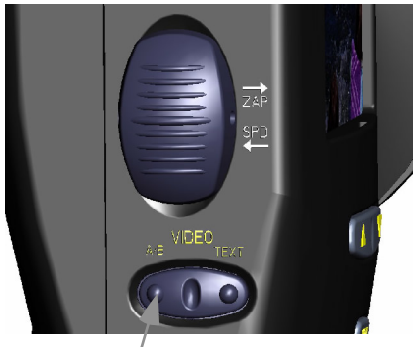
1 Line up index line and mark to be modified. Push ENTER Button.
2 Use up/down buttons to highlight MARKS.
3 Push ENTER Button.
4 Use up/down buttons to highlight MODIFY.
5 Push ENTER Button.
6 Use up/down buttons to highlight Item to change.
7 Push ENTER Button.
8 Use up/down buttons to adjust/toggle item.
9 Push ENTER Button.

DELETING MARKS

Definition: Added marks can be deleted as a group or individually.

1 Line up index line and mark to be deleted. Push ENTER Button.
2 Use up/down buttons to highlight MARKS.
3 Push ENTER Button.
4 Use up/down buttons to highlight DLT ALL [group deletion] or MODIFY/DELETE for individual mark deletion.


BRIGHTNESS 3
COLOR 28
CONTRAST 40
EXIT
CAMERA ON
LENS ON
24
10.0
55' 0
T5.6


ZAP
SPD
VIDEO
A/B
TEXT

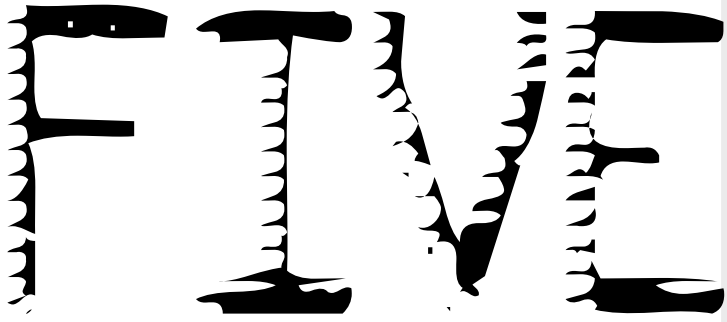
1

4.4 VIDEO SCREEN

Camera information and lens information can be displayed over video image. This information is generated from the digital side. Therefore, if the video image falls off, the data will still be displayed.

1 Push Video Text Button 1 to display video image.
2 Push ENTER Button.
3 Use up/down buttons to highlight Item to change.
4 Push ENTER Button.
5 Use up/down buttons to adjust/toggle item.
6 Push ENTER Button.

5.0 CAMERA CONTROL



SET SPD: 24.00
SET DEG: 180.00

OPER: NORMAL

EXIT
SETUP

5.1 CHANGING CAMERA SPEED / SHUTTER ANGLE

This command will allow the user to set camera speed and shutter angle. The RDC system automatically knows the camera and/or motors being used for lens control through cable I.D. Therefore, the exacting constraints of each camera will be automatically determined.

1 Ensure unit is in main text screen [See Section 4.1].

2 Push ENTER button.

3 Use up/down buttons to highlight SPEED [or SHUTTER].

4 Push ENTER button.
Whole number blinks.

5 Use up/down buttons to increase/decrease value.

6 Push ENTER button.
Fractional number blinks.

7 Use up/down buttons to increase/decrease value.

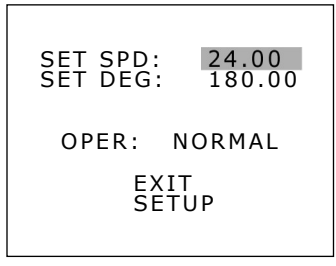
8 Push ENTER button.
Speed [Shutter]set.

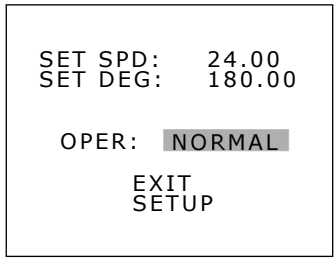
9 Use up/down buttons to highlight EXIT.

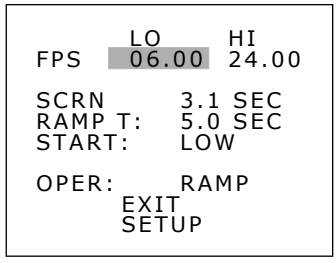
10 Push ENTER button.
Screen returns to run mode.

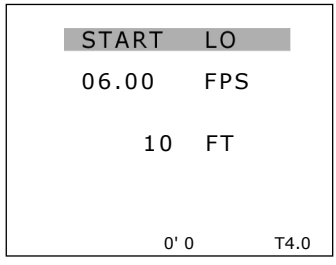
5.2 CAMERA RUN MODE: NORMAL

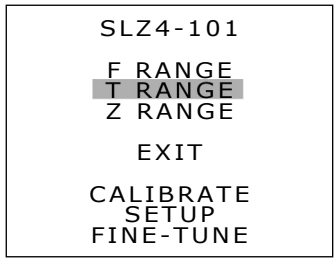
1 Push ENTER button.
2 Use up/down buttons to highlight OPER [Operation].
3 Push ENTER button.
Function blinks.
4 Use up/down buttons to toggle selection to NORMAL.
5 Push ENTER button.
Function Set.
6 Use up/down buttons to highlight EXIT.
7 Push ENTER button Screen returns to run mode.











RAMPING:
Set HI and LO speeds
Set RAMP Time or choose manual for hand control via iris knob.
Set Iris range to desired limits [see above procedure]

5.3 CAMERA RUN MODE: RAMP SETUP

The RDC system can perform various speed ramps. A camera speed can be exposure compensated using the iris and/or shutter in either manual or automatic modes.

All shutter compensated actions will only work with the Millennium XL and 435 cameras.

1 Ensure RDC is in main text mode [see section 4.1].
Push ENTER button.

2 Use up/down buttons to highlight NORMAL [Operation].

3 Push ENTER button.
Function blinks.

4 Use up/down buttons to toggle selection to RAMP.

5 Push ENTER button.

6 FPS LO is highlighted.

7 Push ENTER button.
Whole number blinks.

8 Use up/down buttons to increase/decrease value.

9 Push ENTER button.
Fractional number blinks.

10 Use up/down buttons to increase/decrease value.

11 Push ENTER button. Low speed set.

12 Use down button to highlight HI speed. Push ENTER button.
Whole number blinks.

13 Use up/down buttons to increase/decrease value.

14 Push ENTER button.
Fractional number blinks.

15 Use up/down buttons to increase/decrease value.

16 Push ENTER button.
High speed set.

17 Use down button to highlight RAMP T. Push ENTER button.
Time blinks.

18 Set RAMP T to desired ramp time or MANUAL.
Screen time is automatically calculated.

19 Use down button to highlight START. Push ENTER button.
LOW or HIGH will blink.

20 Push ENTER button.

21 Use down button to highlight EXIT and push ENTER button.

22 Set desired iris range as described in section 3.2.

START LO
06.00 FPS
10 FT
0' 0 T4.0

5.4 CAMERA RUN MODE: RAMP INITIATE

Manual

1 Turn camera on.

2 Use T-Stop knob to control ramp.

Automatic

1 Turn camera on.

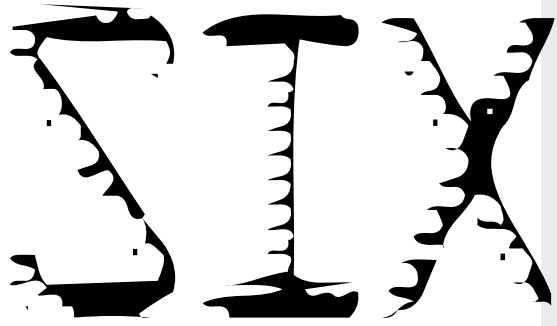
2 Use Up/Down buttons to initiate ramp.

Up to increase speed [Lo to Hi].

Down to decrease speed [Hi to Lo].

NOTE: Pushing up or down button without camera running will change ramp start mode [LO or HI]

6.0 BATTERIES AND CHARGER



6.1 BATTERIES

The RDC system uses Lithium Ion batteries which will power the RDC for approximately 4 hours on a full charge.

RDB

CHARGING 0-80%

CHARGING 80-99%

6.2 BATTERY CHARGER

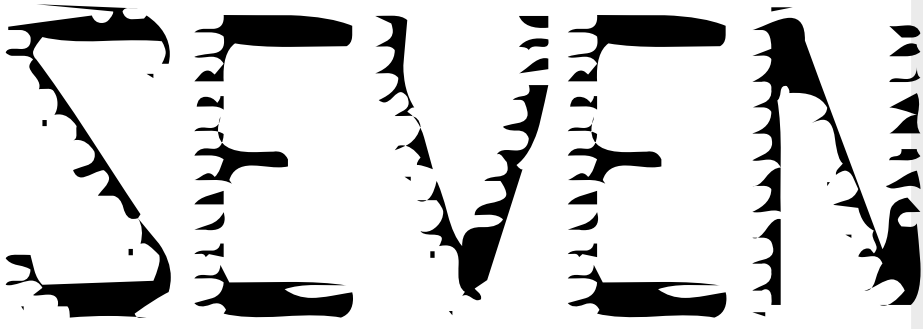
The RDBC charger lights indicate the following:

- GREEN LED - Charger has power
- CHARGING - [yellow LED] Battery is charging from 0 - 80%
- FULL - [green LED] Battery is charging from 80 - 99%
- FAULT - [red LED] Battery fault

NOTE: All lights are off when batteries are fully charged.

Push release buttons to eject batteries

7.0 QUICK SETUP GUIDE



7.1 QUICK SETUP GUIDE PART 1

The Panavision Remote Digital Control [RDC] system is a remote lens control for focus, iris, and zoom functions. It incorporates speed / iris ramping on compatible cameras, lens information, and video display. It is compatible with all Panavision and Panavised cameras, including the 435ES and HD900F.

1. SET UP MOTORS [RDM]

- BRACKETS [RDMB/RDRC] - fully adjustable, compatible with 15mm, 19mm, and 5/8" rods.
- Choose proper gear -
  For Panavision lenses:
  64P = iris
  48P = zoom
  32P = focus
  Large or small diameter
  Use small gears when possible.
- Mount motors from irisrods, above or below lens as appropriate.
  Check for proper gear mesh.

RDMB / RDRC

RDM

2. CONNECT MOTOR DRIVER [RDMD]

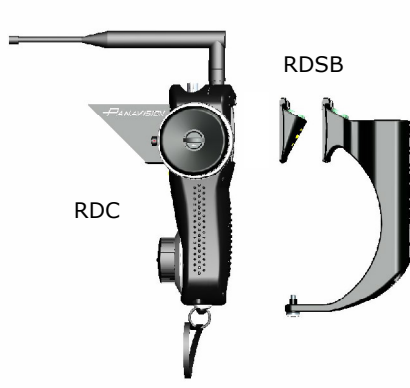
- Mount motor controller [RDMD] to camera dovetail
- Connect RDMD to camera via appropriate cable to accessory port.
  CBLE-SSACC - PFX
  CBLE-RD435 - 435ES
  CBLE-HDLI - HD900F
  CBLE-ZLP - 24V POWER
- Connect motors using any CBLE-RFM
  Note: use RDM or analog zoom motor for zoom.
- Wait for motors to calibrate.
- Solid Green light = calibrated
- Use Remote Digital Hopper [RDHV] for wireless data operation. Mount to PFXMXL mag port or to RDMD [all other cameras].
- Yellow light flickers to indicate proper communication with controller.
- Connect Panatape [optional]

RDMD

RDHV

3. CONNECT CONTROLLER [RDC]

- Choose wired or wireless. [See Quick Setup Section 5 for more details.]
- **Hold the ON switch to the left for 3 seconds and choose COMMUNICATION to change between wireless and hardwired data.**
- Use antenna for wireless, or CBLE-RS20 to RDMD [or to RS232 port on XL for hardwired].
- Video is hardwired only. Connect BNC cable from video out to RDC.
- Power via battery [RDB] or external [belt battery] in wireless mode.
- Power supplied via RS232 cable in hardwired mode



RDC is now ready to use!
To calibrate lens and set up focus marks continue to part 4.

4. SET UP LENS

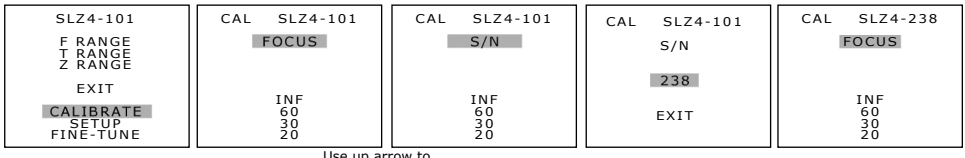
Press LENS button for quick access to the lens menus

Use up/down arrows to highlight menu item
Push ENTER button to select

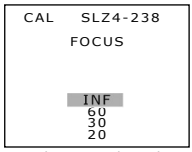
Choose Lens Type

Choose quantity of lens types in package.

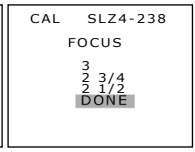
Set lens Serial Number and CALIBRATE LENS



Use up arrow to change FOCUS to S/N

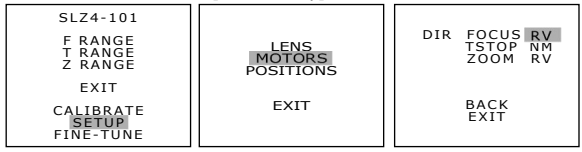


Move lens to each mark as indicated.
Press ENTER twice to set mark.



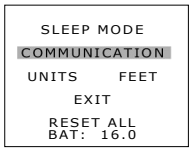
Finished with FOCUS.
Repeat for T-Stop and Zoom

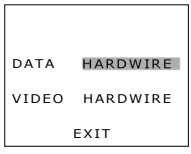
Reverse motor direction [if necessary]

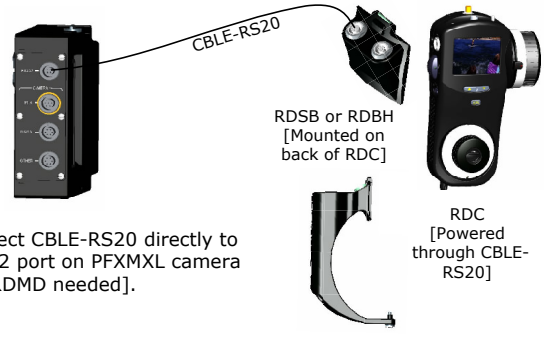


5. SETUP COMMUNICATIONS

HARDWIRE SETUP

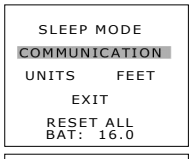


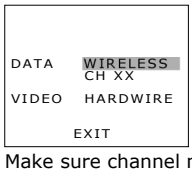


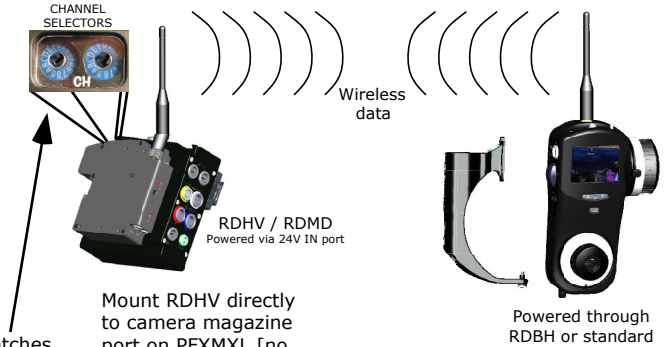


Connect CBLE-RS20 directly to RS232 port on PFXMXL camera [No RDMD needed].

WIRELESS SETUP







Make sure channel matches selectors on RDHV.

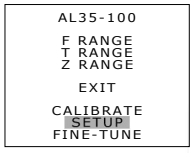
Mount RDHV directly to camera magazine port on PFXMXL [no RDMD needed].

Powered through RDBH or standard 24V source

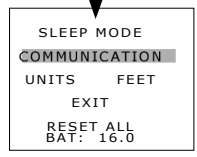
7.2 QUICK SETUP GUIDE PART 2

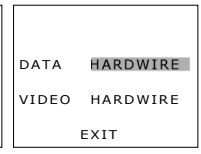
6. RDC SWITCHES AND MENUS OVERVIEW

LENS BUTTON:
LENS SELECTION
LENS RANGE LIMITER
LENS CALIBRATION

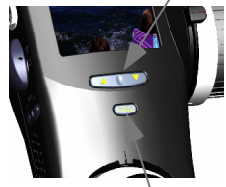


ON [CAM RUN]:
CAMERA RUN
PREFERENCES SCREEN
[HOLD TO LEFT FOR 2 SEC]





UP / DOWN:
CHANGE MENU SELECTION

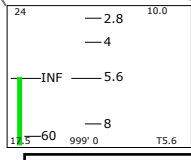


ZOOM CONTROL:
ZOOM IN / OUT
ZOOM SPEED
ZOOM ZAP

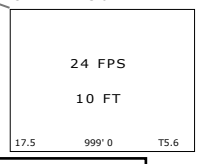
ENTER:
CHOOSE SELECTION
ACCESS CAMERA SPEED [FROM CAMERA DISPLAY]
ACCESS SCREEN SETUP FUNCTIONS

VIDEO A/B:
SELECT VIDEO ONLY OR VIDEO WITH LENS/CAMERA DATA

LENS SCALE

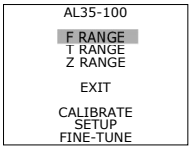


CAMERA FPS & FT



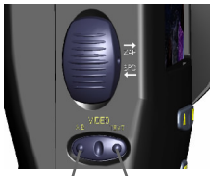
NOTE: TEXT button also acts as a quick EXIT to the LENS SCALE screen from most menus

7. LIMIT / EXPAND KNOB RANGE



1 Push lens calibration button [on top of unit]
Lens calibration menu comes on
2 Use up/down arrows to highlight desired function to change [T, F, or Z]
3 Push enter button
Item will blink on screen, Status light on RDMD will blink green
4 Push and hold lens calibration button
5 Turn knob to first desired footage mark [or T-Stop]
All the way to one end for full range
6 Release lens calibration button
7 Push and hold lens calibration button
8 Turn knob to second position [*or other end for full range]*
9 Release lens calibration button. Function set. Highlighted function will stop flashing.
10 Use up/down arrows to calibrate next function or EXIT.
11 When finished, the status light will go solid green.
12 Unit is ready for use

8. DISPLAY SCREENS - LENS SCALE AND CAMERA DATA

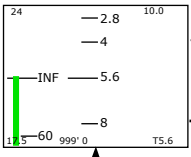


Use VIDEO A/B - TEXT button on side of RDC to change modes.

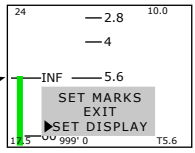
VIDEO A/B toggles video display with or without lens data.

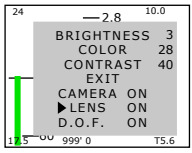
TEXT toggles between LENS SCALE display and CAMERA display.

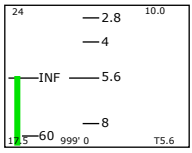
LENS SCALE



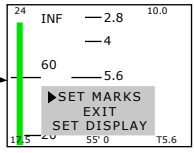
Press ENTER to access DISPLAY and MARKS setup options

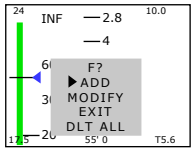






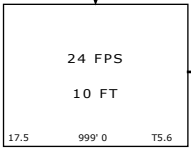
Green bar indicates Depth of Field





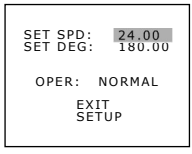
Line u line and mark to be modified.

TEXT button

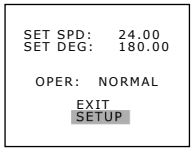


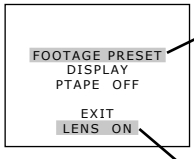
CAMERA

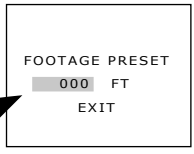
Press ENTER to access speed / ramp menu and display SETUP options

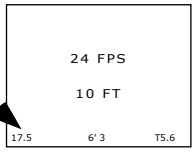


Set speed / shutter

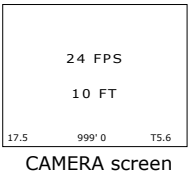




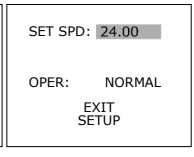


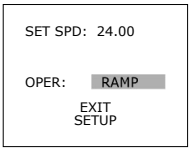


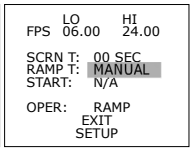
9. SPEED RAMPING



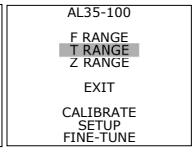
CAMERA screen





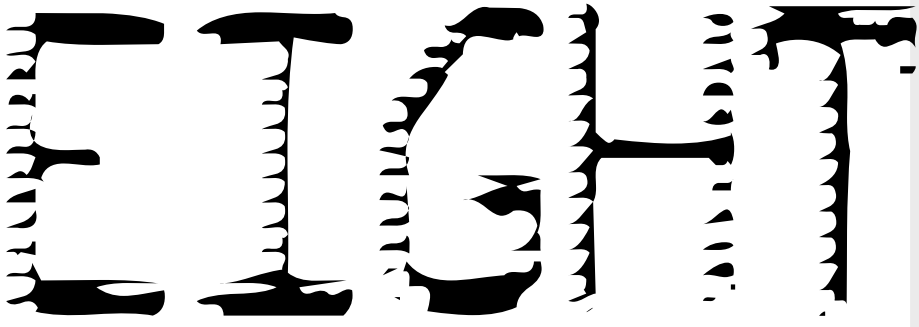


RAMPING:
Set HI and LO speeds
Set RAMP Time or choose manual for hand control via iris knob.



Set Iris range to desired limits.

8.0 TROUBLESHOOTING



8.0 TROUBLESHOOTING

Possible problems and their solutions:

- What does the LED on the RDMD mean?
  - Is RDMD STATUS LED solid green?
    - unit is finished calibrating.
  - Is RDMD STATUS LED flashing green?
    - unit is still calibrating. If motors are not moving, power down, make sure motors are not binding, and re-power.
  - Is RDMD STATUS LED yellow?
    - indicates communication error.
  - Is RDMD STATUS LED red?
    - indicates low battery at RDMD

- Upon power up, motors do not turn.
  - Motors could be bound. Check for proper gear mesh. Re-engage motor
  - Check power cable to camera and/or RDMD.
  - Check motor cable.

- Turning focus knob does not turn focus motor.
  - Does the RDC have power?
  - Does the RDMD or PFXMXL have power?
  - Make sure RDC is set to proper communication mode: hardwired or wireless.
  - If wireless, make sure RDMD and RDC are on the same channel
  - Make sure the motor is connected to the correct port?

- Lens scale on RDC is incorrect or blank.
  - Make sure the correct lens is selected on Lens Setup screen.
  - Recalibrate the lens [section 3.1, 3.5].

- RDC screen is completely blank.
  - Replace the battery [RDM].
  - Check the cable connection if hardwired.

- Lens control is erratic or intermittently responsive.
  - Unit may be out of range. A solid yellow LED on the RDHV indicates communication loss. LED on RDHV flickers when communicating.
  - Make sure antennas are pointed up, and roughly parallel to each other.

8.0 TROUBLESHOOTING

- Iris is going the wrong direction for a speed ramp.
  - Reverse the motor direction in the menu [section 4.1].

- Camera status page displays 29.97fps and 10ft, even after selecting a new speed.
  - Communication between RDC and camera was not established at startup.
  - Is RDHV STATUS LED solid yellow? On PFXMXL, does rear panel display EXT?
    - Check communication setup [hardwired/wireless] and channel selection

- Shutter angle information is not displayed on Camera status screen.
  - On PFX cameras, including PFX-M, shutter information is not available to the RDC.
  - On PFXMXL, communication channel set incorrectly.
    - Ensure RDHV and RDC are on the same channel.
  - On 435ES,
    - Ensure camera is set to PS/CCU [not NORM].
    - Ensure RDHV and RDC are on the same channel.

- "Illegal Setting" is flashing on RDC screen. [STATUS LED on RDMD will also flash red.]
  - Check that camera speed is within legal parameters.
  - Check that ramp time is not too fast.
  - Check that shutter angle is within legal parameters and not reversed HI to LO.

- RDHV STATUS LED is slowly blinking yellow [not flickering quickly]
  - Low battery at RDHV.

- I have both spherical and anamorphic lenses in my package, but I can only see one format in the main lens calibration menu.
  - Only one lens format is listed at a time. To switch between spherical and anamorphic sets, choose SETUP -> LENS -> ANAMORPHIC [or SPHERICAL as applicable], then EXIT.

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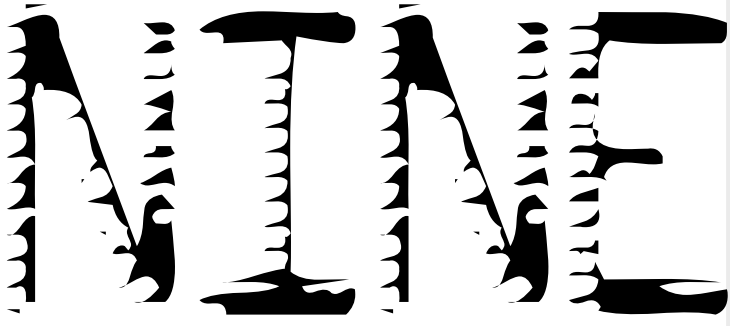

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