ES10ZE

OptiScan Focus Only Controller

Manual Version 1.0

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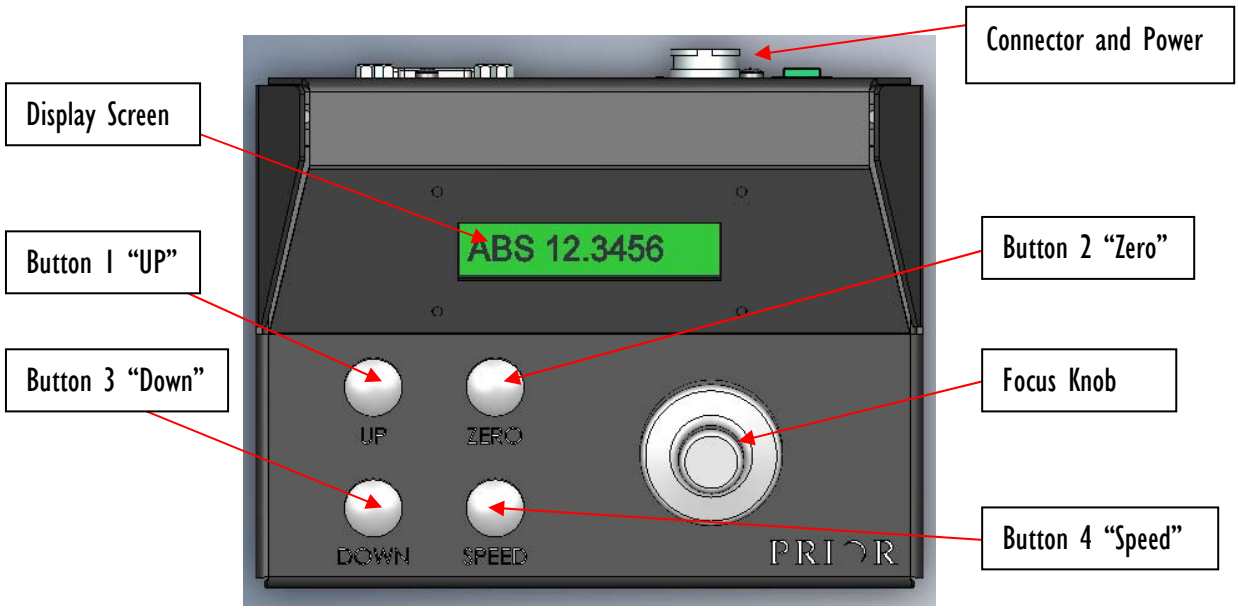
Section 1 Important Safety Information

Important Safety Information

- Keep this manual in a safe place as it contains important safety information and operating instructions.
- Before using the focus system, please follow and adhere to all warnings, safety and operating instructions located either on the product or in this User's Manual.
- **Do not** expose the product to water or moisture.
- **Do not** expose the product to extreme hot or cold temperatures.
- **Do not** expose the product to open flames.
- **Do not** allow objects to fall on or liquids to spill on the product.
- Connect the AC power cord only to designated power sources as marked on the product.
- Make sure the electrical cord is located so that it will not be subject to damage.
- **Always disconnect power from product before connecting the components together.**
- **DANGER** - never alter the AC cord or plug. If the supplied plug adaptor is not the correct fitting for your geographical area, contact your supplier for the correct power adaptor.
- Use only the power supply cord set provided with the system for this unit, should this not be correct for your geographical area, contact your supplier.

  Do not in any way attempt to tamper with the product, doing so will void the warranty, and may damage the system. This product does not contain consumer serviceable components, all repairs or services should be performed by Authorised Service Centres, contact your local dealer for details.

2.1 Identifying the parts of the ES10ZE.



Button Functionality:

The **Focus Knob** controls Z axis, rotate to move focus.
Button 1 is the fast up button, hold down to move up at fast speed.
Button 2 is the zero relative position.
Press once to set Relative 0, Relative mode shown by * on display.
While in Relative mode press to zero counter.
When in Relative mode if display at 0 press to return to absolute mode.
e.g., press once to 0 and a second time to return to absolute position.
Button 3 is the fast down button, hold down to move down as fast speed.
Button 4 is the toggle speed button, press to toggle Focus Knob speed through 25-50-100% speed.

2.2 Connecting to the H122 to the microscope

For installation procedure for Zeiss Axio range (H122AXIO and H122AXIE), Leica DML range (H122LB), and direct coupling models, see Appendix A.

The following instructions refer to the standard split sleeve mounting.

1. Loosen the clamp screw on the focus motor assembly and remove the focus motor from the focus adapter. (See fig.4.4)

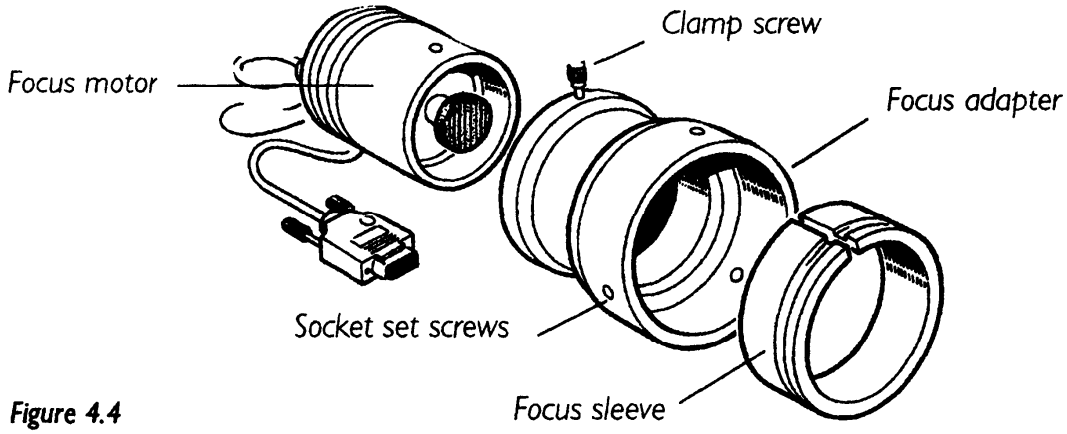


Figure 4.4

2. Loosen the 3 socket set screws around the periphery of the focus adapter using a 2mm Allen wrench until the focus sleeve is able to fit inside the adapter. Note that it is important to insert the sleeve in the correct orientation with the lip furthest inside the adapter (the chamfered edge of the sleeve will be inserted first). Note the orientation of the sleeve as it has a recess around its outer surface, which will hold the sleeve in when the setscrews are tightened. This recess must line up with the tips of the socket set screws. (See fig.4.4).

3. With the sleeve in place, tighten the 3 socket set screws in sequence until they all just touch the sleeve, ensuring that the split in the sleeve does not line up with any of the set screw positions. DO NOT TIGHTEN UP ANY OF THE SETSCREWS AT THIS STAGE.

4. Push the adapter onto the preferred coarse knob of the microscope as far as it will go. **The controller is factory configured to drive the focus motor in the correct direction when mounted to the left hand side of an upright microscope. If the right hand coarse control knob is preferred by the user or the focus drive is to be mounted on an inverted microscope, the motor direction can be reversed by using a PC with a terminal emulation programme e.g. HyperTerminal and changing the settings of the ZD command (see section 3) via RS232 communication.**
The inside fitting diameter of the sleeve is designed to be slightly larger than the coarse knob, provided the setscrews have not been tightened and are compressing the sleeve.

5. While holding the adapter in place, tighten the set screws in sequence only enough to secure the unit onto the coarse focus knob. The focus knob will have to be rotated to gain access to all of the screws.

6. Check that the unit has been tightened sufficiently by taking hold of it and turning it. If the adapter is correctly fitted it will stay attached to the coarse knob.

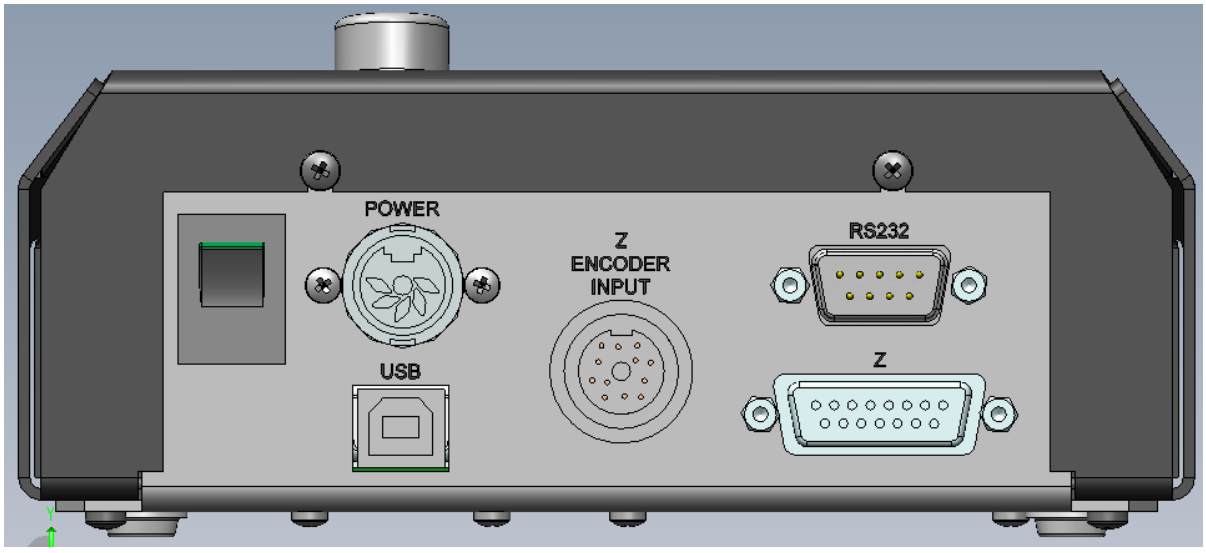
7. Slide the focus motor into the adapter as far as it will go and while applying gentle pressure to the motor, tighten the clamp screw. This will hold the motor in place. The rubber drive bush on the end of the motor spindle should now be pressing against the end surface of the fine focus control knob. This can be confirmed by manually rotating the exposed fine focus knob on the opposite side of the microscope and feeling for the resistance caused by the detent positions of the stepper motor as it rotates. This will not cause any damage to the focus motor.

8. Confirm that the controller is switched off before connecting the 9 way D type plug on the focus motor lead to the socket on the rear of the controller as shown in fig.2.1.

2.3 Connecting to the ES10ZE

Switch off the ES10ZE unit.
Connect the Z motor into the connector labelled z, ensure the connector is firmly screwed in.
If supplied, connect the focus encoder into the connection labelled Z encoder input, ensure the connector is firmly screwed in.
If required, connect the communications cable via RS232 or USB (Requires drivers, see www.prior.com)
Connect the power (H407, external 24v power supply) to the connector labelled Power.

Switch on the EZ10ZE unit.
Un-encoded: The unit will power up and display "PRIOR Z v1.0" while starting up.
Encoded: The unit will power up and display "PRIOR ZE v1.0" while starting up.
The position will then be displayed in microns.



The unit is now ready to use.

2.4 Display features.

The display is in absolute microns, this will be remembered by the controller if switched off.

Display modes:
Absolute Mode ()
The default mode, position is displayed in microns (um).

Relative mode: (*)
When the Zero button is pressed the display is in relative mode, and the counter is set to zero.
If the counter is at zero and in relative mode when the “zero” button is depressed again the display will toggle back to absolute mode.
If the counter is not at zero and in either absolute or relative mode the counter will be set to zero and the system will be in relative mode.

Encoder mode: (E)
If encoders are fitted and activated an E is displayed in the display screen.

Section 3 Advanced operations

3.1 RS232 Command Set

The OptiScan II controller can accept commands from either serial port, or USB port (with appropriate divers installed on PC). The ports (RS232-1 & RS232-2) default to a baud rate of 9600, this can be increased to 38400 if desired (see BAUD below). The ports can have different BAUD speeds, the system functions in Compatibility mode 0.

Commands are terminated with a Carriage Return code <CR> (the 'ENTER key of the pc keyboard').

One or more of the following delimiters separates commands from arguments.

COMMA
SPACE
TAB
EQUALS
SEMICOLON
COLON

To set focus speed to 100 the user could enter any of the following

SMZ,100<CR>
SMZ 100<CR>
SMZ, 100<CR>
SMZ,, 100<CR>

The controller immediately returns R after any movement command (the user has to query the controller with the $ command to determine if the stage has stopped moving). commands can be stacked.

All communication is non blocking so commands can always be sent although some will not be performed immediately or indeed at all.

The FOCUS, command response is terminated with the word END. This will enable extra information about the ES10ZE to be added in the future and still be readable by the Application Software.

3.2 General Commands

Command	Arguments	Response (All end with <cr>)	Description
$	[a]	decimal number	Reports status as a decimal number and gives motion status of any axis of the controller. After binary conversion convention is as follows:- Z 0 0 D02 0 0 If Z only moving 4 would be returned Optional parameters "$,Z The command would return 0 or 1 depending on if the axis is in use.
?	None	Text string	Reports information about the peripherals currently connected to the controller. E.g. DRIVE CHIPS 000100 means Z chip is fitted. The information end is always a line saying END This allows for the addition of extra fields of information without effecting application software. Users should always read lines in until the END is seen. A typical response is shown below OPTISCAN INFORMATION DRIVE CHIPS 00100 JOYSTICK ACTIVE STAGE = NONE FOCUS = NORMAL FILTER_1 = NONE FILTER_2 = NONE SHUTTERS = 000 END

BAUD	b	0	Sets the baud rate of the port issuing the command to the value specified by b. Allowable values for baud are 96, 9600, 19, 19200, 38, and 38400 **WARNING** **If Baud rate of ES10ZE is changed it is important for Application software to check communication with ES10ZE by scanning Baud Rate on initialisation. This will avoid a permanent communication failure should the PC Port and OptiScan II port be set at different Bauds.**
DATE	None	Text string	Reports Instrument name, version number and compile time. Note that the system description refers to the presence or absence of internal drivers **NOT** which peripherals are connected.
I	None	R	Stops movement in a controlled manner and returns to the position the interrupt was entered at. This command is acted on immediately in compatibility mode there is no need for a <CR>. The command Queue is also emptied.
K	None	R	Stops movement with no regard for position (Not recommended). This command is acted on immediately in compatibility mode there is no need for a <CR>. The command Queue is also emptied.

LMT	None	Nm	Reports whether any limit switch is currently active. A limit switch is active if the switch is in contact with the axis hardware. Nm is a two digit Hex number (one Byte) which when converted to binary is as follows:- to binary is as follows:- D05 D04 -Z +Z eg 16 means stage is in contact with +Z limit switch, and 32 indicates contact with –Z limit switch. 00 means all axes are not in contact with any limit switch. (Note that the controller knows whether the limit switch is normally low or normally high and corrects accordingly. This does **not** return the hardware signal level of the limit switch.
SERIAL	None	Nnnnn	Reports the units serial number nnnnn, if the serial number has not been set "00000" is returned.
VERSION	None	Ddd	Reports the units software version number as a 3 figure number eg 041 is Version 0.41

3.3 Z Axis Commands

Command	Arguments	Response (All end with <cr>)	Description
BLZH	s,b	0	Sets the Z backlash value for host moves to b in microsteps. s = 1 enables backlash s=0 disables backlash
BLZH	s	0	Enables / Disables the Z backlash s = 1 enables backlash s=0 disables backlash.
BLZH	None	s,b	Reports back the Z backlash value for Host moves.
BLZJ	s,b	0	Sets the Z backlash value for Joystick/Digipot to b in microsteps s = 1 enables backlash s=0 disables backlash.
BLZJ	s	0	Enables / Disables the Z backlash s = 1 enables backlash s=0 disables backlash.
BLZJ	None	s,b	Reports back s and b for Z axis (see above)
C	None	w	Reports the current step size for the focus motor.
C	w	0	Sets the current step size for the focus motor w
D	z	R	Moves Down by z steps.
D	None	R	Moves Down one step as defined by the 'C' Command.
FOCUS	None	Text string	Prints information about focus unit.. There are 250 microsteps per full step. The information end is always a line saying END This allows for the addition of extra fields of information without effecting application software. Users should always read lines in until the END is seen to keep in sync. Example FOCUS = NORMAL TYPE = 0 MICRONS/REV = 100 END

H	None	0	Turns OFF the joystick (Stage and Z axes) after completion of any current joystick move. Joystick is re-enabled using 'J' Command below. The joystick is re-enabled each time the controller is powered up.
I	None	R	Gracefully stops movement and returns to the position the interrupt was entered at.
J	None	0	Turns ON the joystick. (Stage and Z axes) This command is acted upon immediately.
JZD	d	0	Sets the direction of Z axis under digipot control, d=1 or d=-1.
JZD	None	d	Reads d.
K	None	R	Stops movement with no regard for position (Not recommended). The command Queue is also emptied.
M	None	R	Moves stage and focus to zero (0,0,0)
OF	s	0	Sets the speed of the focus motor under joystick/digipot control. s is percentage in range 4 to 100.
OF	None	s	Reports value of OF allowing for joystick speed buttons effect (if the button speed is ½ and OF is set to 50 the returned value will be 25)
PZ	None	z	Reports position of z only.
PZ	z	0	Sets Absolute position of z axis, No axis can be moving for this command to work. If encoder on Z the position is only set when the current position is in the encoder range (it must have been further down than it is currently).
SAZ	a	0	Sets the current Z acceleration to a. Range is 4 to 100
SAZ	None	a	Report the current Z acceleration setting.
SMZ	None	m	Report the current Z maximum speed setting m
SMZ	m	0	Sets the current Z maximum speed to m. Range is 1 to 100
U	z	R	Moves Up by z steps.

U	None	R	Moves Up by one step as defined by the 'C' Command.
V	z	R	Go to the absolute position z, in steps.
VZ	z	R	Sets the focus motor into constant speed, z (range -30000 to +30000). VZ, 1000 give velocity of 30000 microsteps per second. To stop the focus motor use VZ, 0, i.e., set the speed to 0.
Z	None	0	Sets the stage and focus to absolute position to ZERO (0, 0, 0).
ZD	d	0	d=1 Sets direction of rotation of focus motor. Defaults to 1 and is correct for motor fitted on right hand side of microscope. d=-1 Direction of rotation of focus motor opposite to above.
ZD	None	d	Returns d
UPR	a	0	Sets the um's per Revolution of the focus. This allows you to setup the screen output to match the actual movement of the focus. The RES,Z command must be resent after setting the UPR.
SSZ	s	0	Sets the value for Z user units to s. Entering negative number reverses direction of motor
ENCW,Z	None	n	Returns the allowable encoder window for the axis in encoder counts for determining when position acquired.
ENCW,Z	n	0	Sets the encoder window n. This can prevent excessive hunting as controller tries to close the position loop.
RES,Z	None		Returns resolution for axis.
RES,Z	r		Sets the desired resolution for the stage, r can be a non integer number setting the resolution for the axis in units of microns. e.g. RES,s,1.0 Resolution set to 1.0 micron

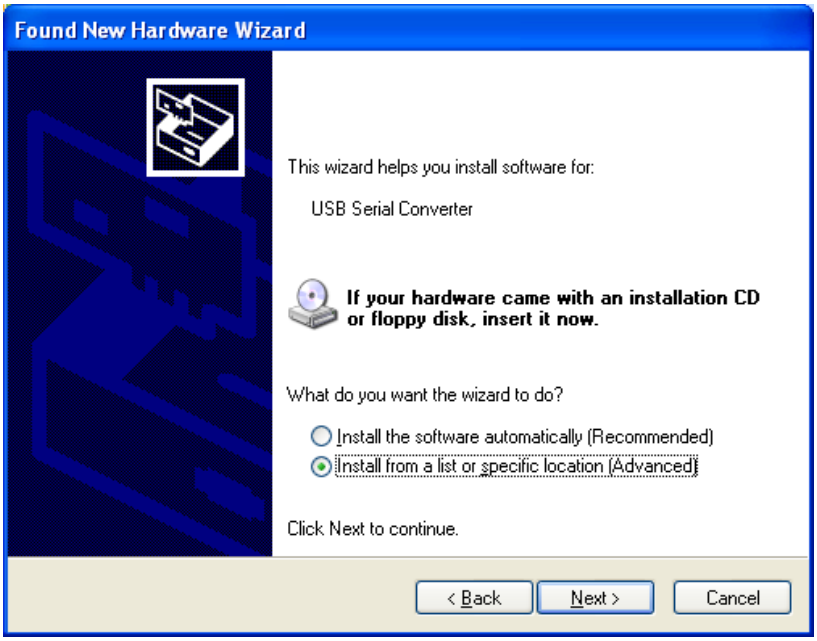
SWZ	n	0	Sets a window of n encoder counts about the current Z position to prevent excessive hunting when servo enabled.
ZCORRECT	a	0	A= linear scaling of z axis. Default = 1.0

3.4 USB operation.

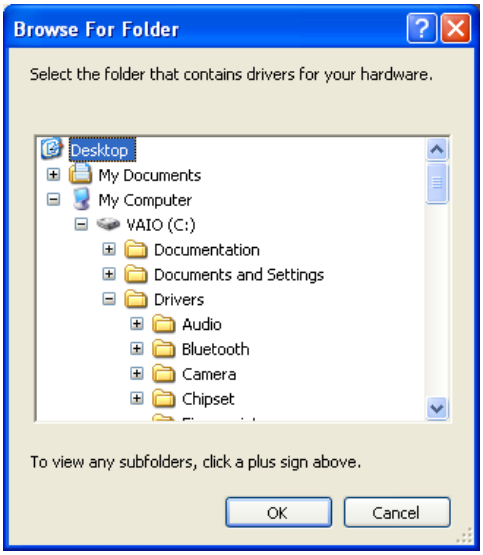
Setting up for the first time.
Installing the USB-COM port for ES10ZE.
Plug in the USB cable to the ES10ZE and computer, power on the ES10ZE.

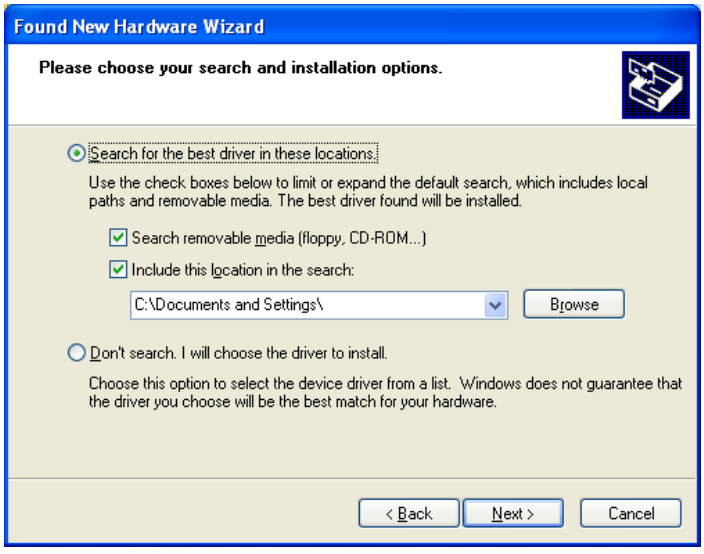
When prompted select No, not at this time, then click NEXT.

Select "Install from a list or specific location (advanced)"

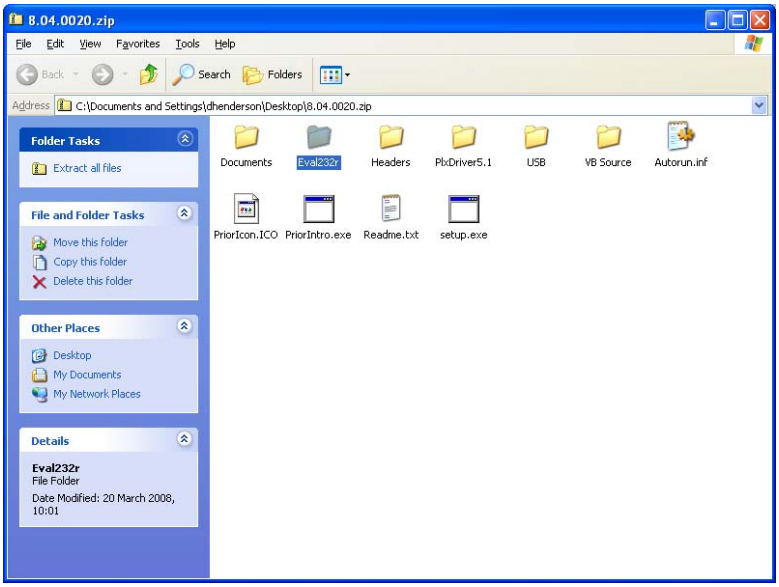


Browse to the location of Eval232R, click NEXT.





The Eval232R folder can be found in the SDK. This can be downloaded from www.prior.com.



Contents of SDK.

Click Finish,
Your computer may ask you to repeat this process.

3.5 Z Axis Encoder.

Prior stages can be equipped with either linear or rotary encoders for higher positioning repeatability and accuracy, EZ10ZE supports a Z axis encoder only.

A Z-probe or Z-encoder is an optical system that reflects light off a graduated scale through a grating and onto photo sensors. These sensors generate electrical currents. The electrical currents generated are used to determine distance and direction the stage has travelled. Unlike rotary encoders which imply a distance travelled by measuring the rotation of the motor, z-probes are actually mounted to the moving plates of a stage and therefore directly measure stage movement.

Z-probe Encoders benefit the focus user by providing:

- The ability to use a Digital Read Out (DRO), screen of ES10ZE
- The ability to provide closed loop "servo" control
- Superior precision and finer resolution.

Z-probe mounted on Prior focus now provide repeatability to +/- 0.3 microns and resolution (step size) as small as 0.05 microns. This superior performance is extremely critical in many Industrial and Bio-Science applications such as the performance of time-lapse imaging studies.

The ES10ZE Controller with the 'E' option enables encoder with RS485 differential quadrature square wave outputs to be inputted to the Z axis. The controller will have a round 12 pin connector on the back of the control box labelled, "Z encoder input". Turn the controller off and plug in the encoder or scale.

When an encoder is fitted and enabled (the default condition) the controller uses the position measured by the encoder as the true position and not the number of pulses sent to the stepper motor.

When the controller identifies an encoder fitted to the Z axis for the first power-up this prompts a small motion to be initiated (two full steps of the motor). The controller will use the number and sign of the counts from the encoder to establish the correct ratio between encoder pulses and motor pulses.

Stepper moves will be faster than moves under encoder control due to the feedback, checking, and adjusting required for the closed loop system.

The SERVO,b command gives the option for the controller to constantly read the encoder position (when stationary) and correct for any position drift.

b=4 SERVO on
b=0 SERVO off.

With SERVO off, the axis still moves to its destination positions measured by the encoder but will not correct for any drift once the destination has been reached.

Command	Arguments	Response	Description
ENCODER	none	n	Reports back as a decimal number (4) if the axis is operating using the encoder, or (0) if not.
ENCODER	b	0	b=0 Disables encoder b=4 Enables encoder.
ENCODER	Z	0,4	Returns whether the Z axis has encoder enabled or disabled.
SERVO	none	n	Reports back as a decimal number the axes that have servo operation enabled. For example, 4 means Z axis servo enabled.
SERVO	b	0	b = 0 stage moves to destination position (as read from encoders) and stops. There is no servo action therefore the focus can drift from destination position due to external mechanical and thermal forces. b = 4 focus continuously reads position from encoders (even when stationary) and corrects for any drift.
SERVO	Z	0,4	Returns whether the Z axis has servo enabled or disabled.
SERVO	Z,b	0	b=0 Disables servo specified by Z Axis b=4 Enables servo specified by Z Axis.
SWZ	n	o	Sets a window of n encoder counts about the current Z position to prevent excessive hunting when servo enabled.
P	e	x,y,z	Argument 'e' indicates encoder position. If ENCODER,0 returns encoder position at present stepper position (Use P Command) If ENCODER,4 Returns encoder position. This is the same as 'P' Command

3.6 Error Codes

If a command is not valid a response of "E,n" is returned the n specifying an error type as listed below.

Machine or human readable messages are chosen using the **ERROR** Command.

ERROR CODE	ERROR DESCRIPTION
1	NO STAGE
2	NOT IDLE
3	NO DRIVE
4	STRING PARSE
5	COMMAND NOT FOUND
6	INVALID SHUTTER
7	NO FOCUS
8	VALUE OUT OF RANGE
9	INVALID WHEEL
10	ARG1 OUT OF RANGE
11	ARG2 OUT OF RANGE
12	ARG3 OUT OF RANGE
13	ARG4 OUT OF RANGE
14	ARG5 OUT OF RANGE
15	ARG6 OUT OF RANGE
16	INCORRECT STATE
17	WHEEL NOT FITTED
18	QUEUE FULL
19	COMPATIBILITY MODE SET
20	SHUTTER NOT FITTED
21	INVALID CHECKSUM
60	ENCODER ERROR
61	ENCODER RUN OFF

Section 4 Troubleshooting

4.1 Troubleshooting

Problem:
Focus motor will not respond to Focus Knob or RS232 commands
Suggestions:
Check that the system is properly installed and that there is proper power to the controller. For Installation see section 4.
Check that the controller is switched on, and a position is displayed on the screen.
Set up and run HyperTerminal (Windows Users) see Appendix C and send the `?' command via RS232-1. The controller should report with information about the peripherals currently connected, as shown in section 6 of this manual.
If the controller does not acknowledge the presence of any of the connected peripherals return that peripheral to your local Prior dealer.

Problem:
The focus will not respond to my Image Analysis Software.
Suggestions:
Check that the Image Analysis Software Program has drivers for Prior systems. If not, consult the software dealer.
Close down the Image Analysis Software.
Set up and run HyperTerminal (Windows Users) see Appendix C.
Try several basic commands while in HyperTerminal to determine if the focus responds correctly, if so the controller is functioning properly. At this point consult the supplier of the Image Analysis Software. If the stage does not respond to the commands, contact your local Prior dealer for further advice.
Note: Before running commands using HyperTerminal make sure that your microscope objectives and any other objects that may impede the motion of the stage are moved out of the way, to avoid damage.

Problem:
The focus motor turns but the microscope fine focus knob does not.
Suggestions:
The focus drive may not be properly positioned against the fine focus knob.
Loosen the knurled screw that holds the focus motor and press it gently against the fine focus knob. While pressing, re-tighten the knurled screw. Note: If the fine focus knob on the microscope is difficult to turn or the movement rough, then the focus drive may not function until the microscope is properly adjusted.

Problem:
The focus drive does not repeat to the same "Z" position every time.
Suggestions:
Check that the "Z" backlash routine is turned on. Refer to the Command Set for command "BLZH"
For upright microscopes check that the focus motor is mounted on the right.
For inverted microscopes check that the focus motor is mounted on the left.
If the focus drive cannot be mounted on the correct side of the microscope, refer to the command set and use command "ZD" to reverse the rotation of the motor.

5.1 Replacement Parts

Description	Part Number
Focus Drive and Adapter	H122
Focus Drive and Adapter for Zeiss	H122AXIO
RS232 cable for PC (9 or 25 pin)	H276K
RS232 cable for Macintosh	H277
Solid Couple Adapter for Focus Drive on Olympus/Nikon	H122KON
Solid Couple Adapter for Focus Drive on Leica	H122KLC

Section 6 Specifications

6.1 Specifications.

Dimensions:

165x126x60mm

Power:
Universal external power supply
Input: 110 – 240V, 50/60Hz 60W
Output: 24VDC 2.5A
Specifications subject to change without notice.

Section 7 Returns and Repairs

7.1 Returns and Repairs

Should you experience problems with your ProScan System and want to send it back for service, warranty or otherwise, a Return Material Authorisation (RMA) number must be obtained from the appropriate Prior Scientific office before returning any equipment. For North and South America contact Prior Scientific Inc. and for the rest of the world call Prior Scientific Instruments Limited on the telephone numbers shown below.

Prior Scientific Instruments Ltd
Unit 4,
Wilbraham Road,
Fulbourn,
Cambridge,
England,
CB21 5ET
Tel: 01223 881711
Fax: 01223 881710
email: uksales@prior.com

Prior Scientific Inc.
80 Reservoir Park Drive,
Rockland,
MA 02370-1062
USA
Tel: 781 878 8442
Fax: 781 878 8736
email: info@prior.com

Prior Scientific GmbH
Wildenbruchstr. 15
D-07745
JENA
GERMANY
Tel: +49 (0)3641 675 650
Fax: +44 (0)3641 675 651
email: jena@prior.com

Appendix A Non Standard Focus Drive Installations

Notice:
This installation should only be attempted by a qualified technician. It involves some minor disassembly of critical mechanical components. If you are not familiar with this type of mechanical assembly do not attempt this installation, consult your local microscope representative.

Introduction
The focus drive is compatible with all of the Zeiss Axio type microscopes listed below. However, it is not compatible with the Zeiss Axiskop 2 and Axioplan 2. The focus drive must be attached to the fine focus ball reduction mechanism as follows:

Axioplan	Left Side	Axiotron 10	Right side	Axiolab	Right side
Axioskop	Left Side	Axiovert 35	Right side	Standard	Right side
Axiovert 25	Left Side	Axiovert 100	Right side	Axiovert 135	Right side

Components
The focus drive assembly is comprised of the following:
Drive motor, motor bracket and switch assembly
Mounting block
Anti backlash gear and locknut
Cover and lead
Also included are screws and hexagon keys needed to install the focus drive unit.

Tools Required
14mm AF spanner or socket, 1pt Philips screw driver, 1.27mm hexagon key (supplied) 2.5mm hexagon key (supplied) 3.0mm hexagon key (supplied).

Prepare the focus drive

Remove the cover.

Remove bag containing anti-backlash gear, locknut and hexagon keys.

Using 3.0 hexagon key remove the two 4mm cap head screws that hold the mounting block to the motor bracket assembly.

Installation of the focus drive

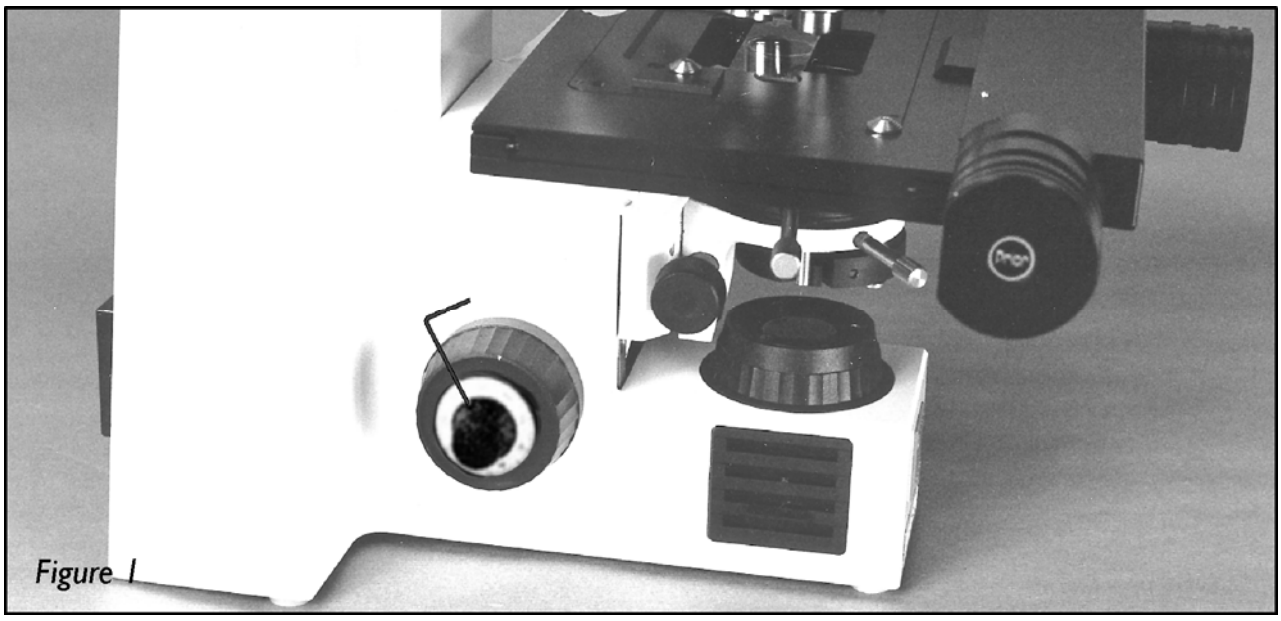


Figure 1

Determine which side the focus drive must go (see introduction).

Remove the fine focus knob by using the 1.27mm hexagon key to unscrew the set screw. The knob can then be pulled off.

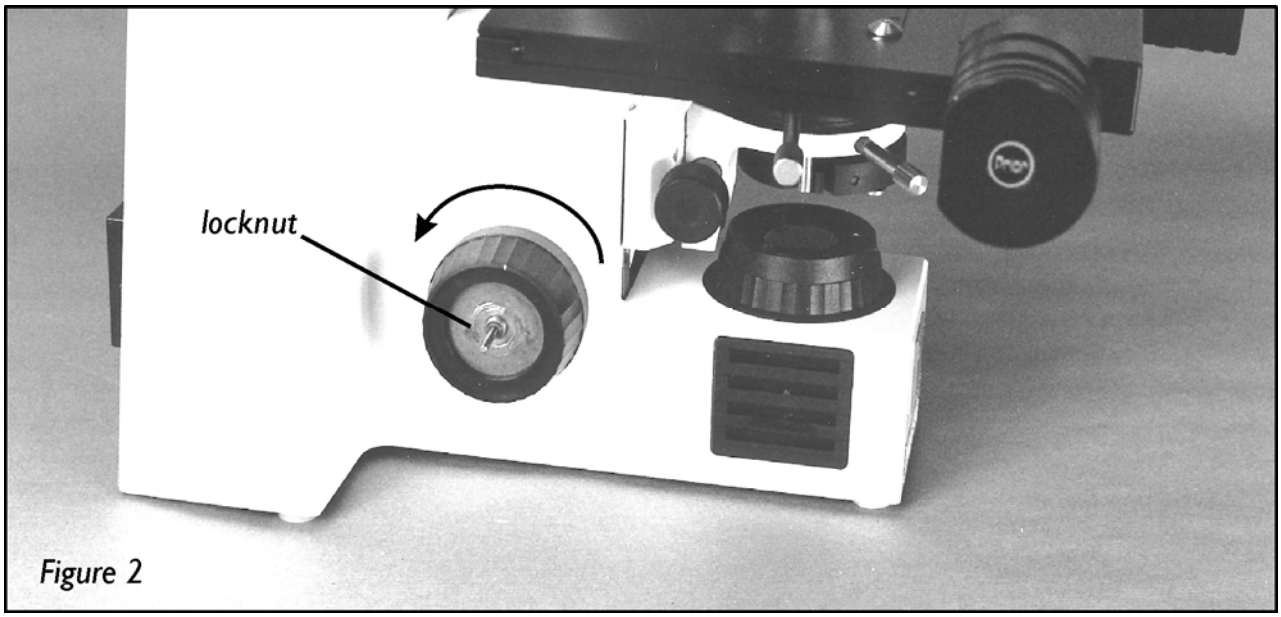


Figure 2

Using the 14mm spanner or socket to remove the lock nut. The coarse knob can now be removed by turning anti-clockwise and unscrewing from the coarse focus shaft.

A black plastic cover should now be visible (see fig. 3). If this is not the case, check the introduction to ensure you removed the knobs from the correct side. It is very important that you replace both coarse and fine knobs before removing the knobs on the opposite side.

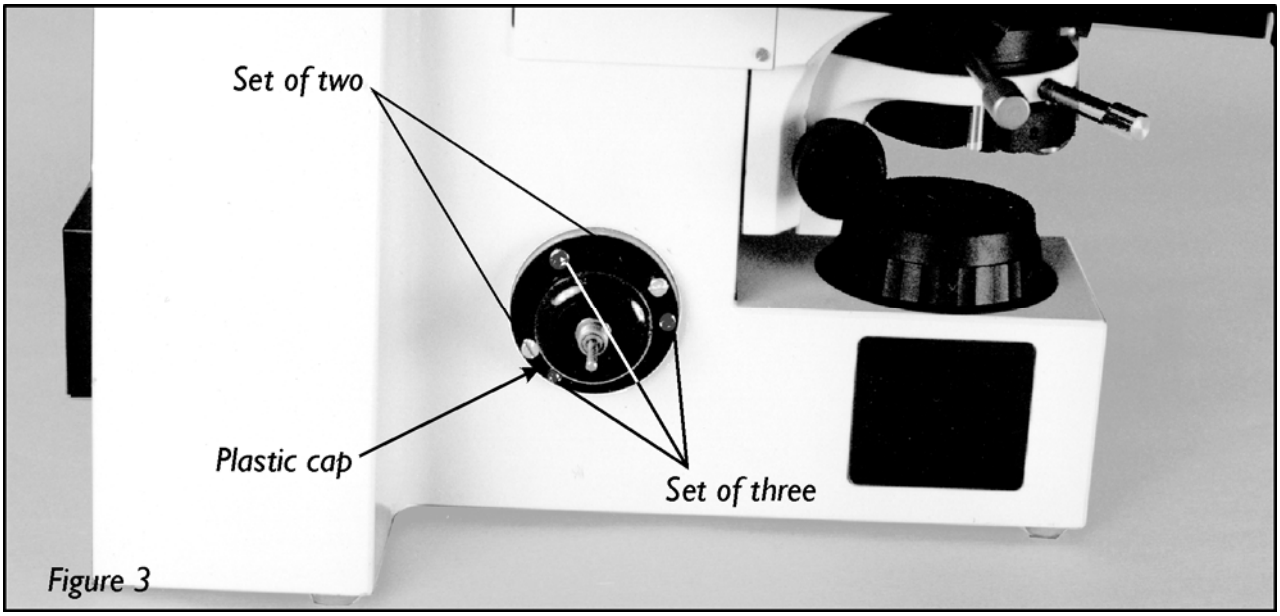


Figure 3

The plastic cap is held on with five screws, one set of two screws and one set of three. If the set of two screws are missing then install the two M3 x 6mm cap head screws supplied. Remove the set of 3 screws using the 2.5mm hexagon key.

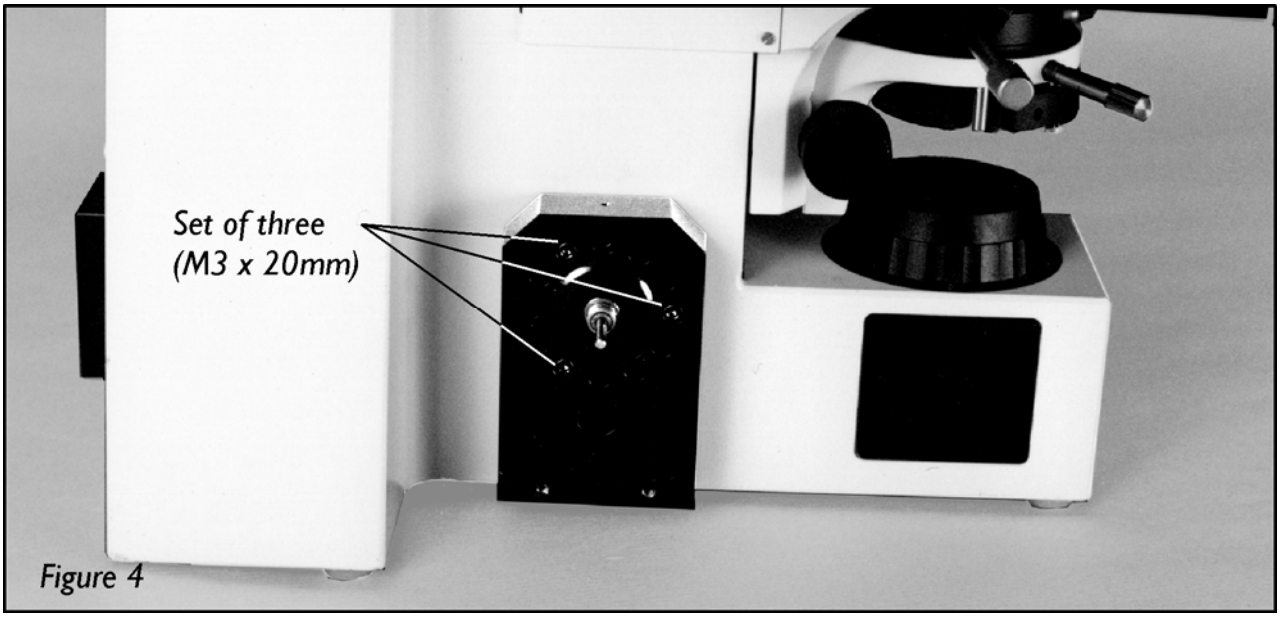
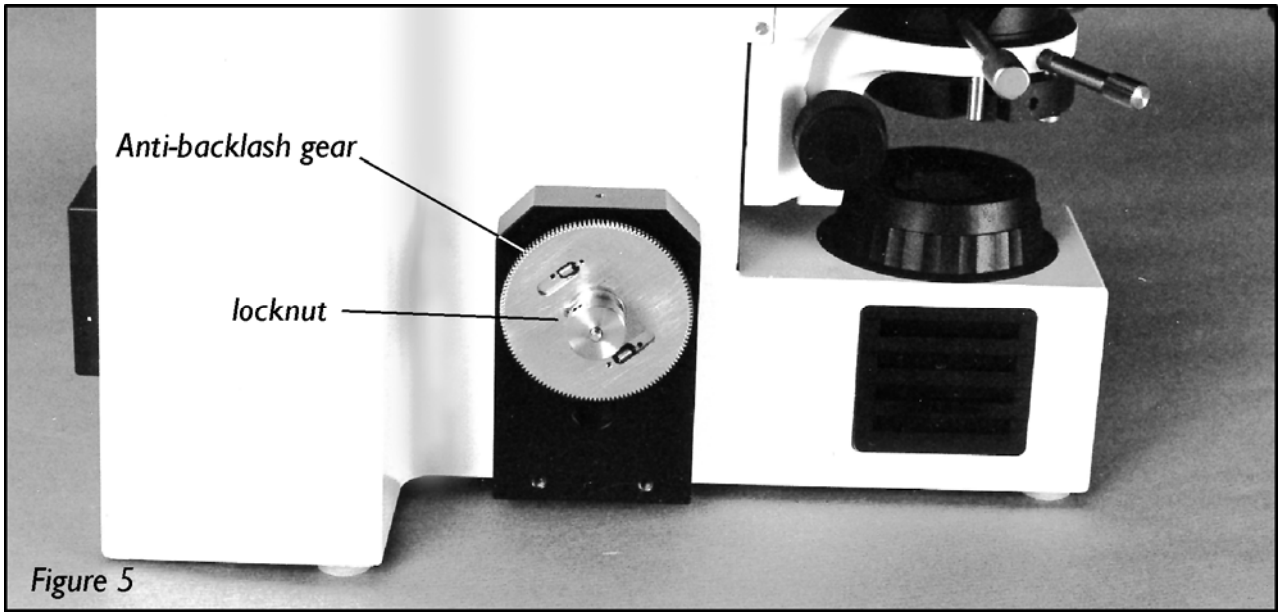
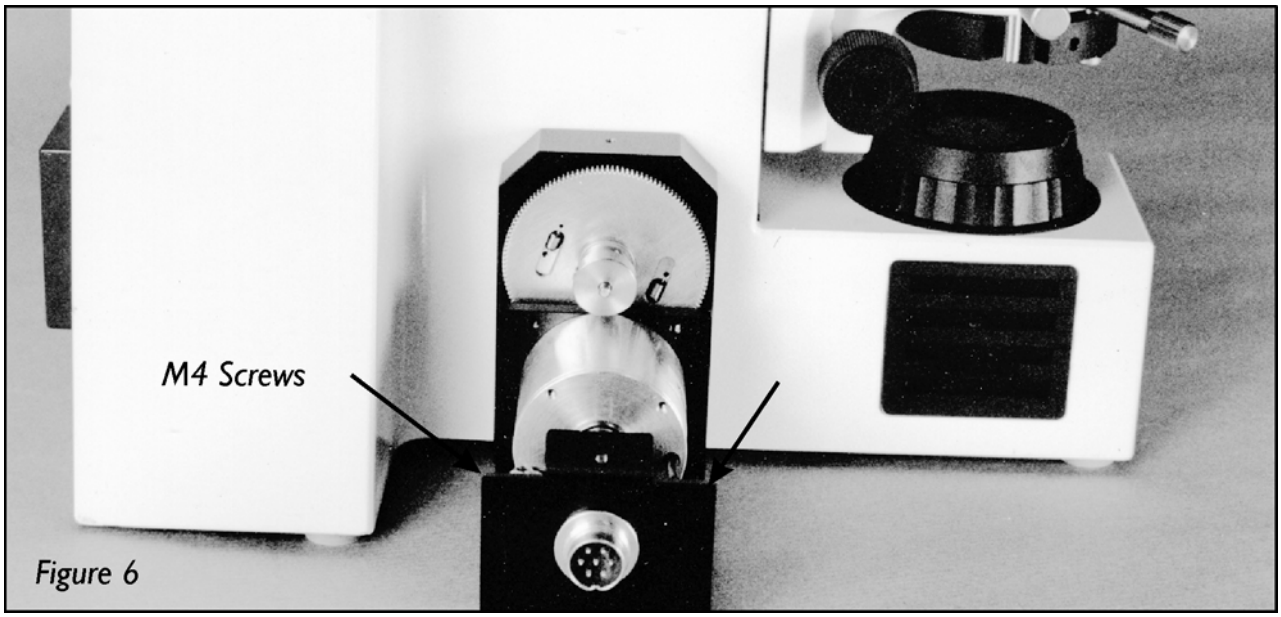


Figure 4

Place the mounting block over the plastic cap and hold in place using the 3 M3 x 20mm cap head screws supplied.



Screw the anti-backlash gear onto the coarse drive shaft, making sure the gear's boss is facing outwards. Screw the locknut into the boss and tighten.



Attach the motor, bracket and switch assembly to the mounting block using the two M4 cap head screws. The anti-backlash gear has two gears, one fixed, the other spring loaded and free to rotate. Rotate this gear approximately 6 teeth before aligning with the motor gear.

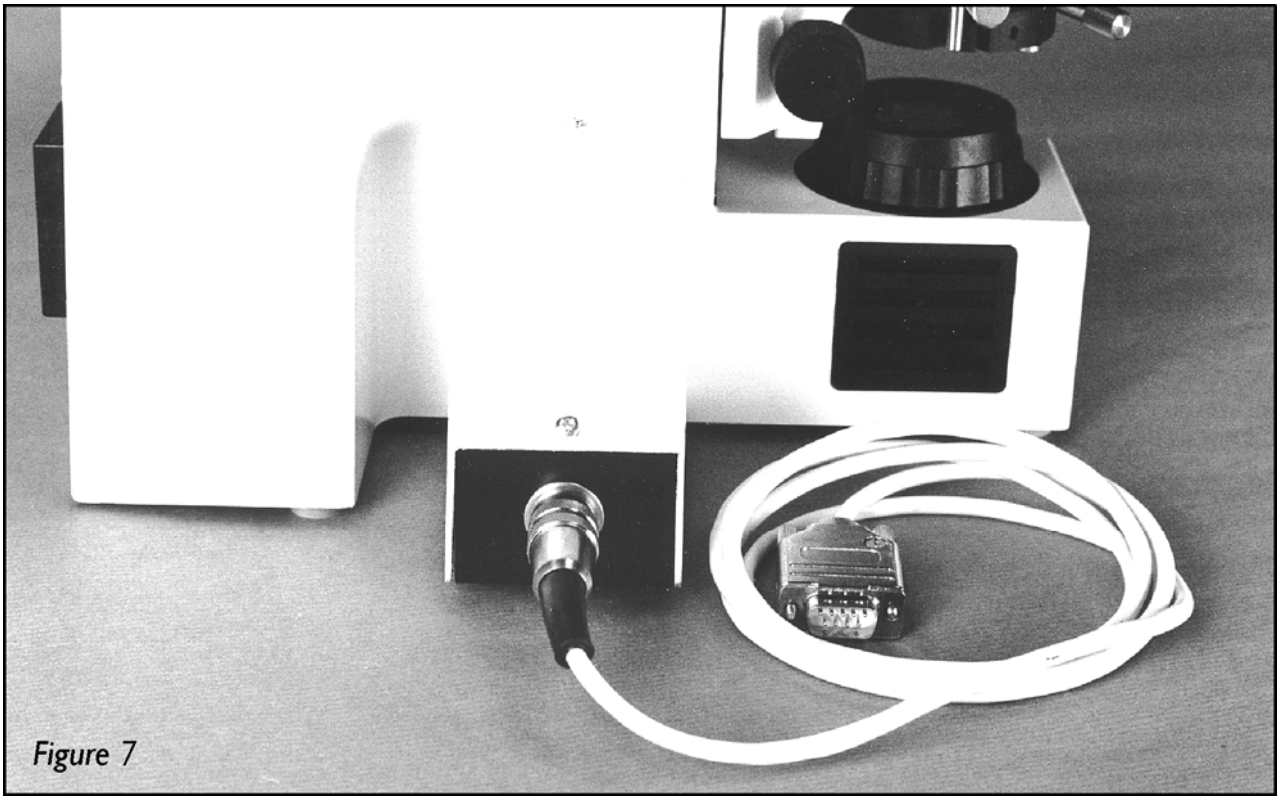


Figure 7

Replace the cover and attach the lead.

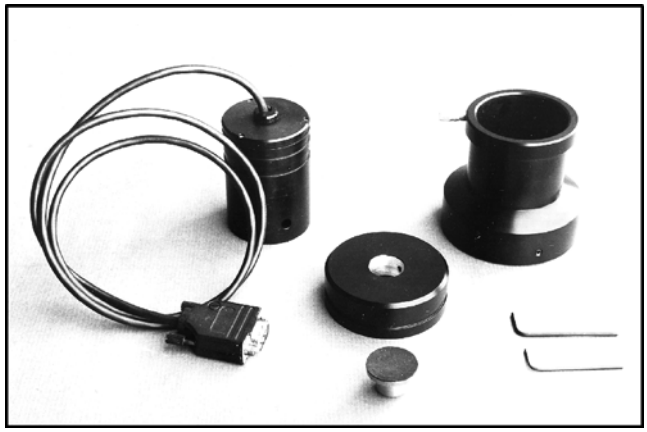
If the focus drive unit appears to drive in the wrong direction, i.e. you ask the controller to move up and the stage moves down, then the switch is set to the wrong position. Disconnect the power supply to the focus drive, remove the cover, move the switch and then replace the cover.

The unit will now move in the correct direction.

Focus drive installation for the Leica DML range

H122LB motorised focus kit parts list

H249 Microstep Focus Motor
H1073 Adapter ring (for Leica DMLB)
H1166 Drive coupling (For Leica DMLB)
H569 Focus motor sleeve
S690 Thumb locking screw
W1401 2mm hexagonal wrench
W347 1.5mm hexagonal wrench



Fitting the H122LB to the Leica DMLB involves removing the right hand fine focus knob. Note that this has two sensitivity settings depending on whether the fine focus mechanism is pushed to the right (4 microns) or pushed to the left (1 micron). This option is indicated by the label on the front surface of the left hand stabiliser.

The fine focus must be set at the 1 micron position.

Push the fine focus fully to the left. Note the amount of the vernier scale showing on the left hand knob (figure 1). Fitting the H122LB is done with the fine focus in this 1 micron position.

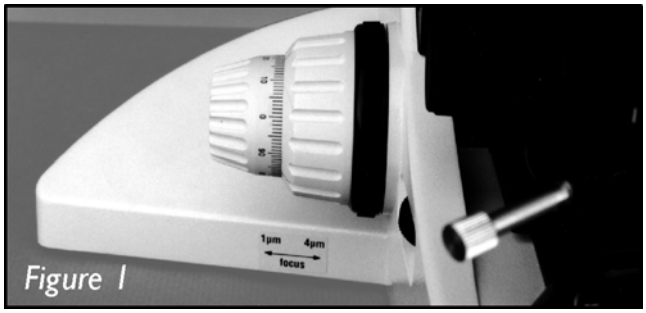


Figure 1

Remove the right hand focus knob using the 1.5 mm hexagonal wrench key inserted down the small hole in the right hand fine focus. Hold the left hand fine focus knob when pulling off the right hand fine focus knob ensuring that there is no lateral movement of the shaft. There should be approximatley 13mm shaft length protruding from the brass boss (figure 2). Ensure that the small spring washer is still on the shaft.

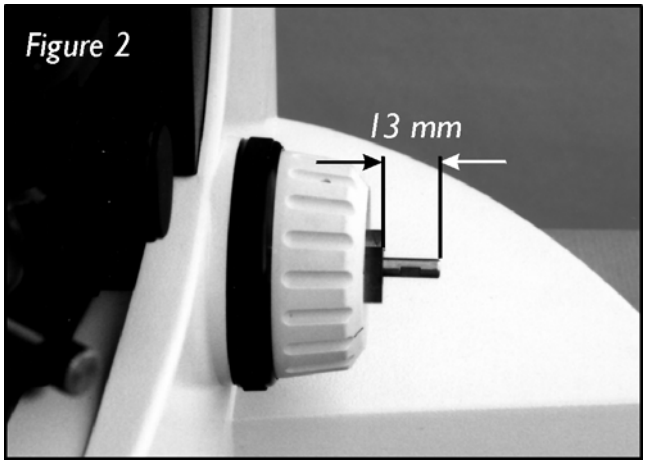


Figure 2

Fit the large adapter ring over the brass boss. Note that the orientation of the adapter ring should be such that the grub screw in the adapter ring screws down onto the centre of the radius (curved part of the brass boss) - (figure 3)

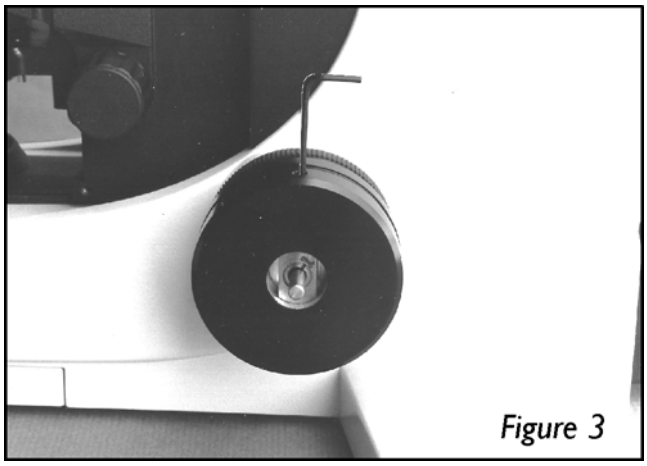


Figure 3

Push this fully towards the body of the microscope leaving approximately 9mm of shaft protruding from the adapter ring whilst tightening up the adapter ring using the 2mm hexagonal wrench key (figure 4).

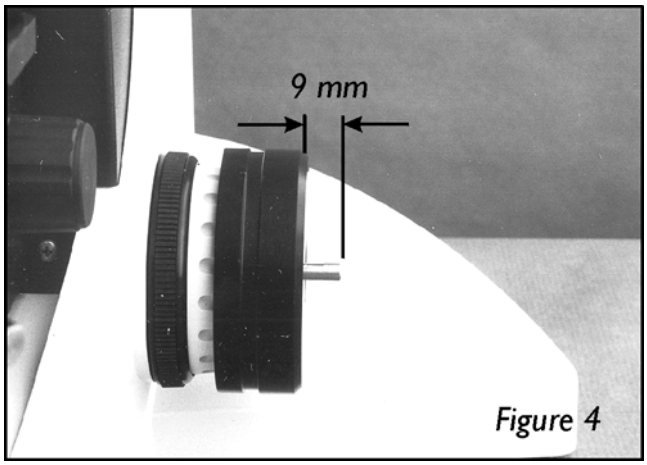


Figure 4

Fit the drive coupling on the fine focus shaft using the 1.5mm hexagonal wrench key. Orient the shaft so that the grub screw will locate on the flat of the shaft. Push the drive coupling gently towards the adapter ring whilst tightening the grub screw.

Check that the fine focus rotates freely and is still set at 1 micron.

Fit H569 motor sleeve on the adapter ring. Tighten up 3 grub screws in sequence using the 2mm Hexagonal wrench key (figure 5). It may be necessary to rotate the motor sleeve to gain access to each grub screw. The motor sleeve and adapter ring are now attached to the coarse focus.

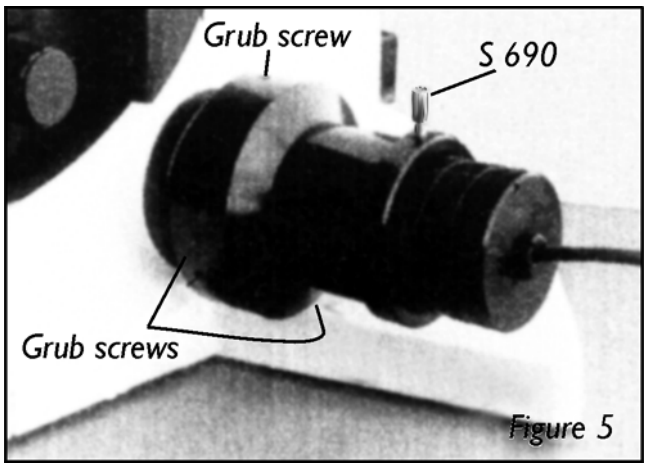


Figure 5

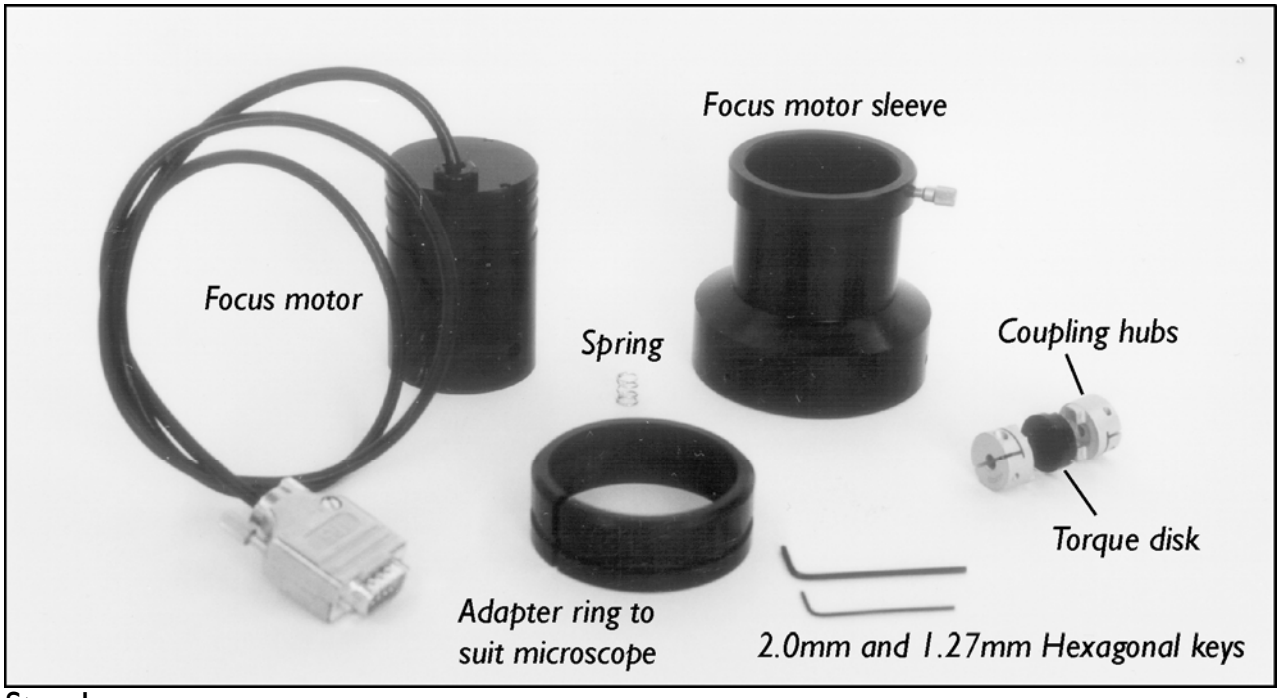
Slide the H249 Microstep Focus motor assembly into the motor sleeve and tighten the S690 thumb screw whilst gently pushing the focus motor assembly towards the microscope such that there is a good contact between the rubber surfaces of the drive of the motor and the drive coupling (figure 5). The fitting is now complete.

The motor is now able to drive the fine focus mechanism of the microscope.

Direct Coupling Focus Installation for Leica and DML and DMR Range

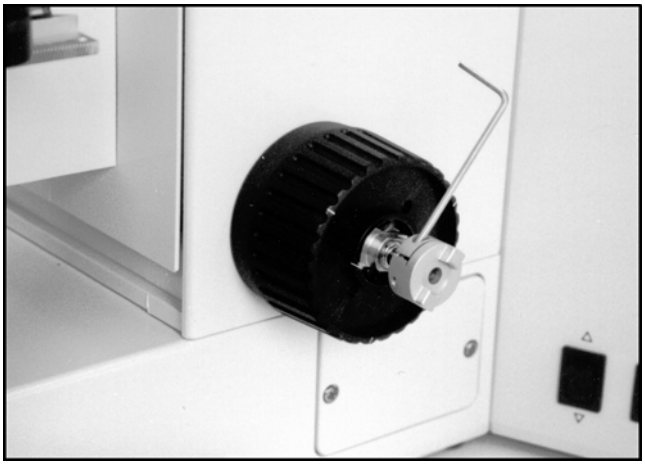
Notice:
This installation should only be attempted by a qualified technician. It involves some minor disassembly of critical mechanical components. If you are not familiar with this type of mechanical assembly do not attempt this installation, consult your local microscope representative.

Components
Installation on 'DMR'



Step 1
Using a 1.27mm Hexagonal key, undo the fine focus set screw. The knob can then be pulled off.

Step 2



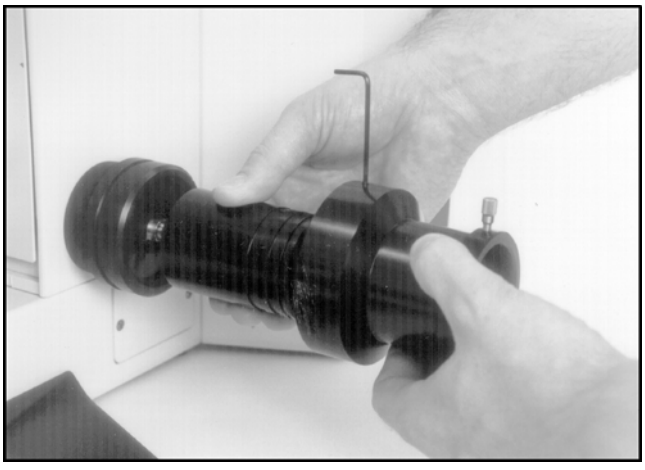
Place the spring over the fine focus shaft and place a coupling hub on the shaft whilst holding the opposite focus knob in position, or it may disengage from gears. Compress the spring by 3-6mm and clamp the hub using the 2mm hexagon key.
Note: Only one of the coupling hubs will fit the fine focus shaft.

Push the remaining coupling hub and plastic torque disc together and place on the focus motor shaft.
Tighten using the 2mm hexagon key making sure it does not bind on the motor casing.

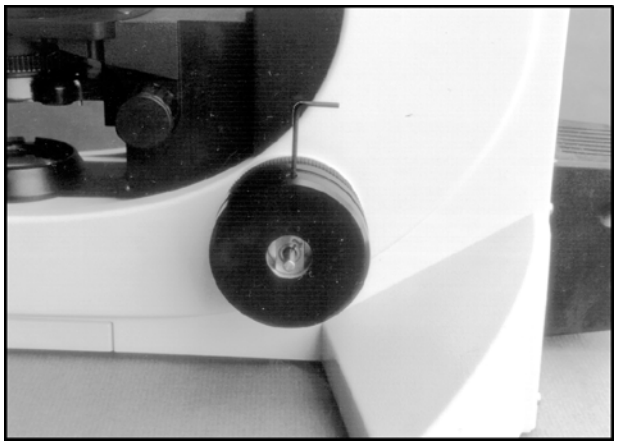
Step 3

Place the adaptor ring over the coarse focus knob. Align and push the couplings together and slide the focus sleeve over the focus motor and onto the adapter ring, using the 2mm hexagon key to tighten the three set screws. Again whilst holding the opposite focus knob.

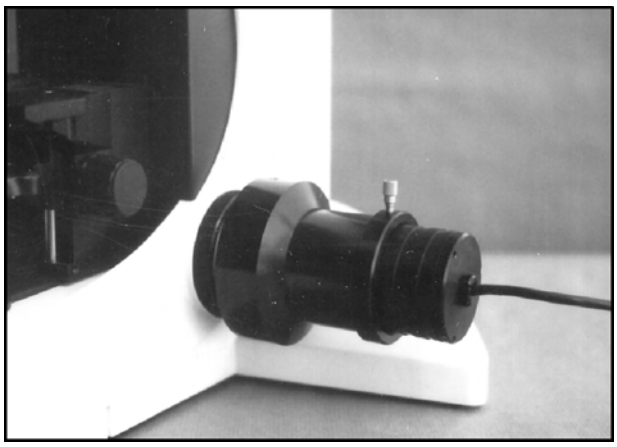
Step 4



Installation on the 'DML' Series
Step 1



Step 1 as for 'DMR' series - then place the adaptor ring over the coarse focus knob and secure the brass shaft using the 2mm hexagon key on the set screw.
Continue with steps 2, 3 and 4 as for 'DMR' series.



Appendix C How to Run HyperTerminal

Instructions for using Windows Terminal Emulation Program (Windows 3.11) for communication to Prior Controller.

Double-click the ACCESSORIES Group symbol in WINDOWS 3.11
Double-click the TERMINAL Icon.
From the SETTINGS menu select COMMUNICATIONS.

Choose: -

Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None
Connector	Com1 or Com2 depending on which port is required to be used.
Parity Check	Off
Carrier Detect	Off

Press OK button.
From SETTINGS menu select TERMINAL PREFERENCES

Choose: -

Line Wrap	On
Local Echo	On
Sound	Off
cr-cr/lf Inbound	On
cr-cr/lf Outbound	Off
Columns	80
Translations	United Kingdom
IBM to ANSI	Off
Buffer Lines	100

Press OK

From SETTINGS menu select TERMINAL EMULATION

Choose: -
DECVT-100 (ANSI)
Choose OK

Select SAVE AS --- from FILE menu and save settings as PRIOR
These settings can be retrieved at any time by selecting it from FILE menu at start of a new session.

Instructions for using Windows HyperTerminal Emulation Program (Windows 95)for communication to Prior Controller.

Click Start, then Programs, then Accessories, then HyperTerminal.
Double-click the "Hypertrm" icon.
Enter filename e.g. prior, select an icon and press OK
Select File, then Properties, then Phone Number
Select COM1 or COM2 as appropriate for the "Connect using..." option.
Press Configure…. Button

Enter the following parameters in the Port Settings box;

Bits per second	9600
Data bits	8
Parity	None
Stop bits	I
Flow control	None

Press OK button.
Select Settings tab.
Press ASCII Setup...
Select "Echo typed characters locally" and "Append line feeds to incoming line ends"
Press OK.
Press OK.

Instructions for using Windows HyperTerminal Emulation Program (Windows NT) for communication to Prior Controller.

Click Start, then Programs, then Accessories, then HyperTerminal.
Select the "HyperTerminal" icon.
In the "Connection description" dialog box enter filename e.g. prior, select an icon and press OK.
In the "Connect to" dialog box enter Phone Number (if required) and Select COM1 or COM2 as appropriate and press OK.

Enter the following parameters in the Port Settings box ;

Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

Press OK button.
Select File, Properties and Settings tab.
Press ASCII Setup...
Select "Echo typed characters locally" and "Append line feeds to incoming line ends" (you should find that "Wrap lines that exceed terminal width" has already been selected).
Press OK
Press OK.

Instructions for using Windows HyperTerminal Emulation Program (Windows Vista) for communication to Prior Controller.

Window Vista does not support HyperTerminal.
Prior have supplied a Vista compatible Terminal application for use under these circumstances.

Download the Terminal Installer from:
http://www.prioruk.com/downloadcentre/dc_software.html

Unzip the downloaded file and run the installer.

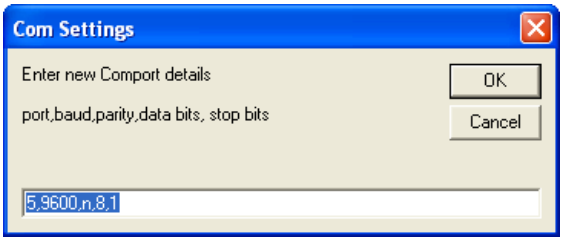
Follow the onscreen instructions to install the program.

Running Prior Terminal:

Start the program by running from the start menu:

Start>Prior Scientific>PriorTerminal

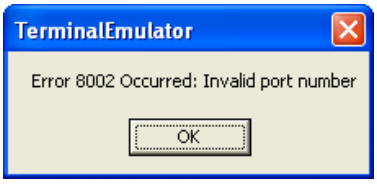
The following screen will be displayed:



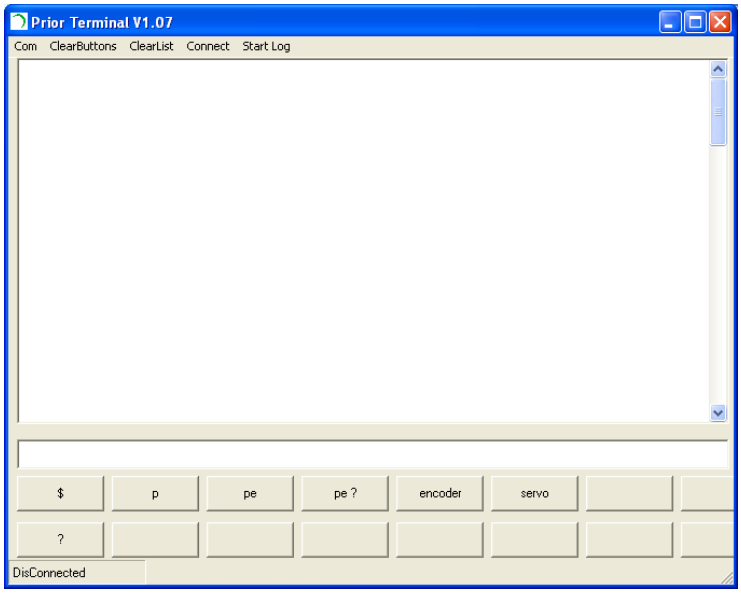
The connection properties should be typed into the window:
COM Port Number, Baud Rate, “n,8,1”

Users should only change the COM Port number and Baud Rate the remaining three characters, “n,8,1” should remain the same.

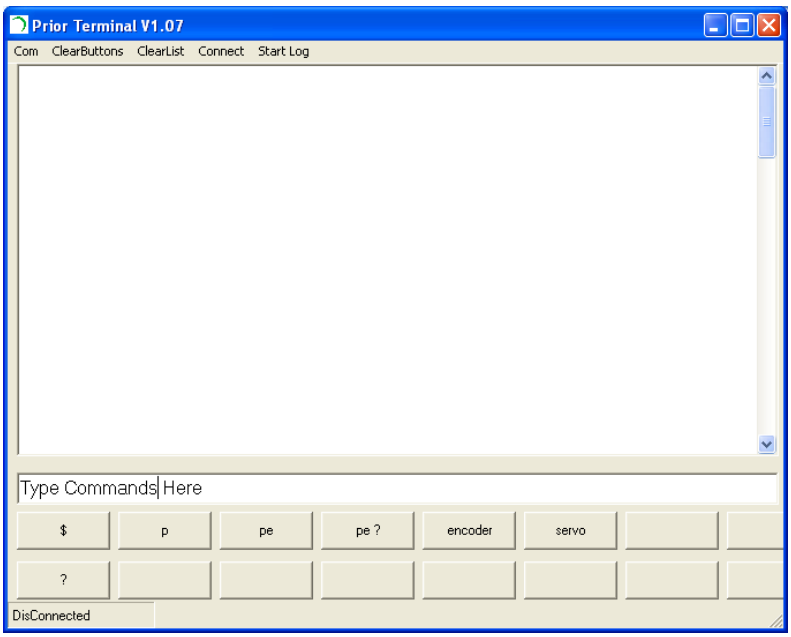
The ES10ZE with factory settings will have a Baud Rate of 9600.
Other baud rate options are: 19200 and 38400



If the above screen is displayed, select ok and then choose COM from the menu.



Identification of Menus:



COM: Allows the user to change the COM port settings.
ClearButtons: Clears the usage of all buttons.
ClearList: Removes all text from screen.
Connect/Disconnect: Connects and Disconnects to the COM Port selected with the settings provided in the COM menu.
Startlog/Stoplog: Writes all communications to a file "capture.txt" on the desktop. Test will be appended if capture.txt already exists.

Using the program:

Type the command into the line marked "Type Commands Here" and press return on the keyboard to send. The command will be displayed and the response from the controller.

Setting the buttons:
Right click with the mouse and type into the window the command to associate with the button.
Click ok.
Using the button:
Left click on the button.