



ViX Intelligent Digital Drives

Quick Start Guide



IMPORTANT INFORMATION FOR USERS

Installation and Operation of Motion Control Equipment

It is important that motion control equipment is installed and operated in such a way that all applicable safety requirements are met. It is your responsibility as an installer to ensure that you identify the relevant safety standards and comply with them; failure to do so may result in damage to equipment and personal injury. In particular, you should study the contents of this user guide carefully before installing or operating the equipment.

The installation, set-up, test and maintenance procedures given in this User Guide should only be carried out by competent personnel trained in the installation of electronic equipment. Such personnel should be aware of the potential electrical and mechanical hazards associated with mains-powered motion control equipment - please see the safety warning below. The individual or group having overall responsibility for this equipment must ensure that operators are adequately trained.

Under no circumstances will the suppliers of the equipment be liable for any incidental, consequential or special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with the use of the equipment or this user guide.



SAFETY WARNING

High-performance motion control equipment is capable of producing rapid movement and very high forces. Unexpected motion may occur especially during the development of controller programs. **KEEP WELL CLEAR** of any machinery driven by stepper or servo motors. Never touch any part of the equipment while it is in operation.

This product is sold as a motion control component to be installed in a complete system using good engineering practice. Care must be taken to ensure that the product is installed and used in a safe manner according to local safety laws and regulations. In particular, the product must be enclosed such that no part is accessible while power may be applied.

This and other information from Parker-Hannifin Corporation, its subsidiaries and authorised distributors provides product or system options for further investigation by users having technical expertise. Before you select or use any product or system, it is important that you analyse all aspects of your application and review the information concerning the product in the current product catalogue. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, safety and warning requirements of the application are met.

If the equipment is used in any manner that does not conform to the instructions given in this user guide, then the protection provided by the equipment may be impaired.

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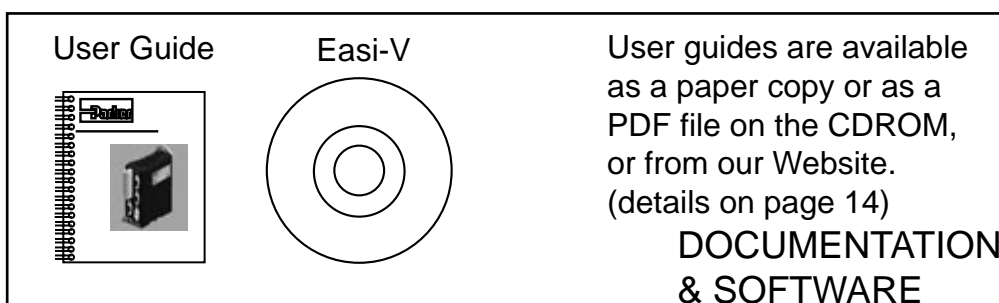
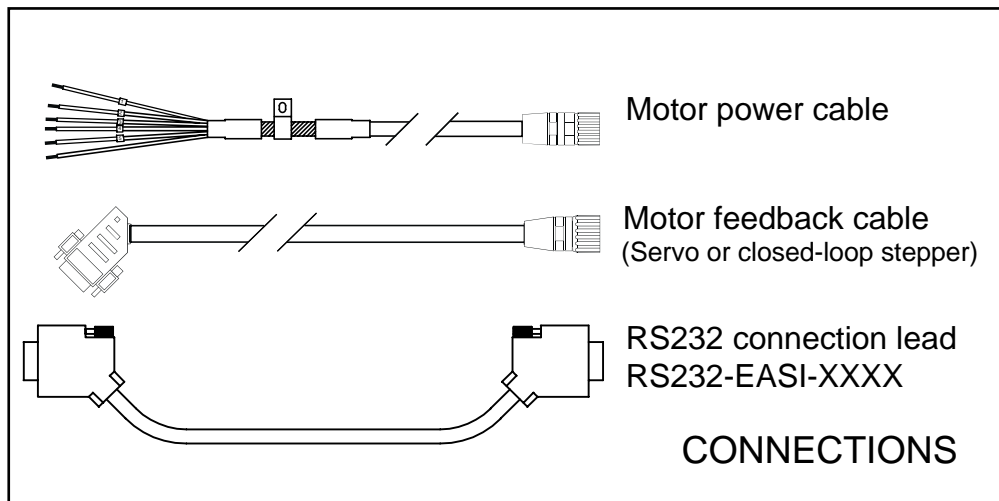
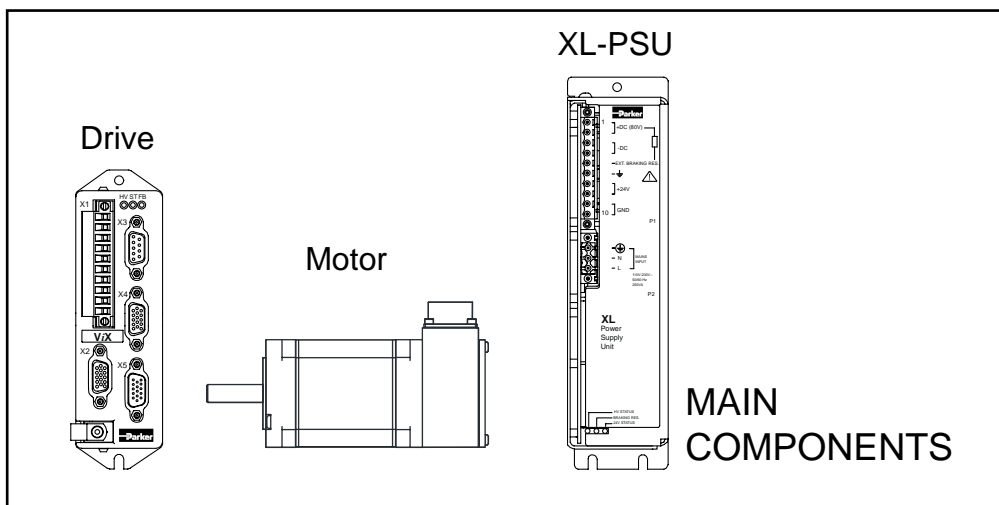
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ViX Quick Start Guide

Introduction

This quick start guide is intended as a fast-track means of becoming familiar with the operation of the drive and checking that it can successfully rotate a motor shaft. Install the drive in accordance with the detailed mechanical and electrical installation information provided by the relevant sections of the complete user guide. To minimise wiring errors this guide assumes you are using Parker supplied cable sets.

1. Identify the System Components



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2. Assemble the Main Components & Power Connections

If you are using an XL-PSU, position the drive and power supply vertically on a common earth-plane, as shown below.

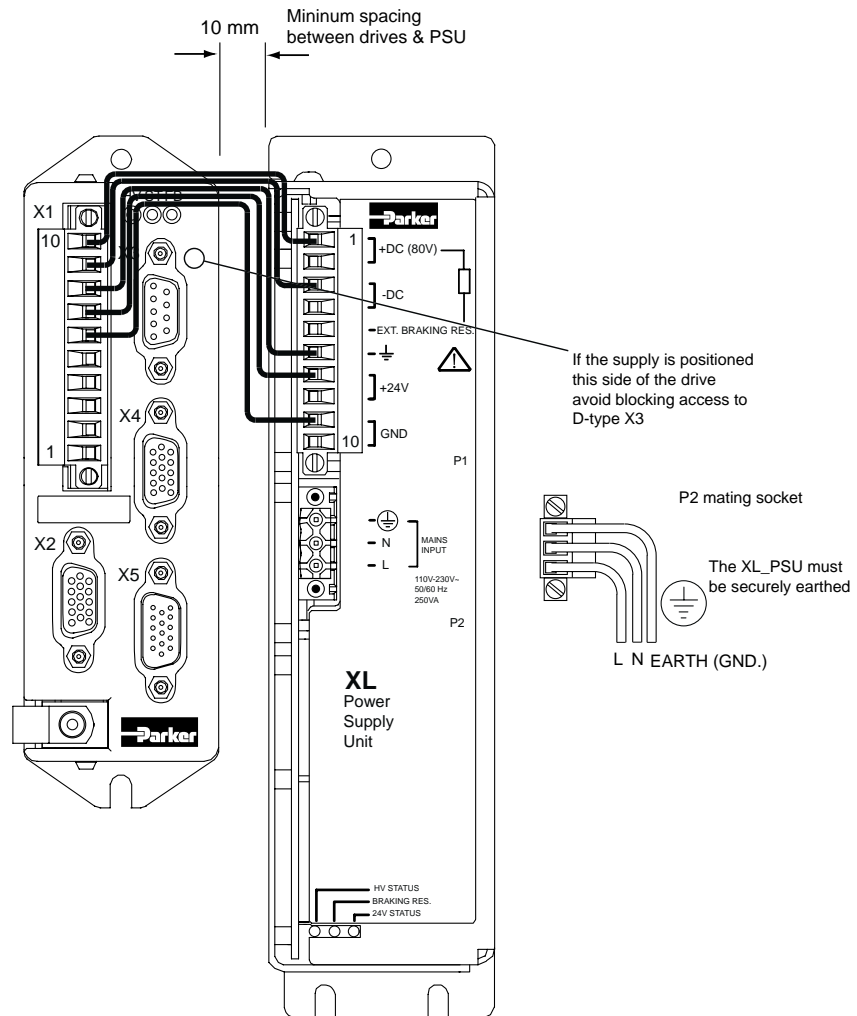
Note: The final installation must comply with EMC and LVD requirements, specified in the User Guide.

ViX with XL-PSU

Fit the drives to the left or right of the power supply with a minimum gap of 10mm between drives or supply and drives. Wire the power connections using 0.75mm² equipment or switch gear wire.

For mains wiring use approved mains cable with a minimum wire size of 0.75mm².

Note: You will need to satisfy yourself that the XL-PSU can offer the peak and continuous power required for your application.



If you are using an alternative power supply, please refer to 'Supply Requirements' in the user guide. Note: drive mounting information is included in the user guide and with the fit kit.

CAUTION

Do not apply any power at this stage, wait until the motor and RS232 connections have been made.

Drive Connector Pin Identification

Power & Motor : 10 Way Connector		
X1	AE/AH/CE/CH/IE/IH	CM / IM
10	24-80VDC in	24-80VDC in
9	0V/GND	0V/GND
8	Earth	Earth
7	24VDC in	24VDC in
6	0V (GND 24VDC)	0V (GND 24VDC)
5	Motor Earth	Motor Earth
4	Motor phase U	Motor phase A+
3	Motor phase V	Motor phase A-
2	Motor phase W	Motor phase B+
1	Motor Brake	Motor phase B-

Communications : 9-way 'D' type socket		
X3	AE/AH/IE/IH/IM	CE/CH/CM
1	Reserved	Rx+/Tx+ (RS485)
2	Drive clear	Drive clear
3	RS232 GND	RS232 GND
4	RS232 Rx	RS232 Rx
5	RS232 Tx	RS232 Tx
6	Reserved	Rx-/Tx- (RS485)
7	RS232 Tx (D loop)	RS232 Tx (D loop)
8	do not connect	do not connect
9	+5V output	+5V output

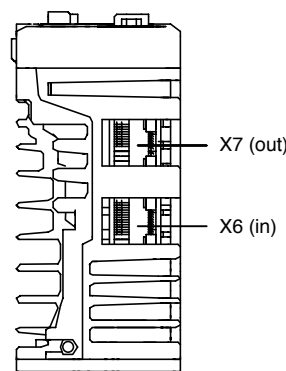
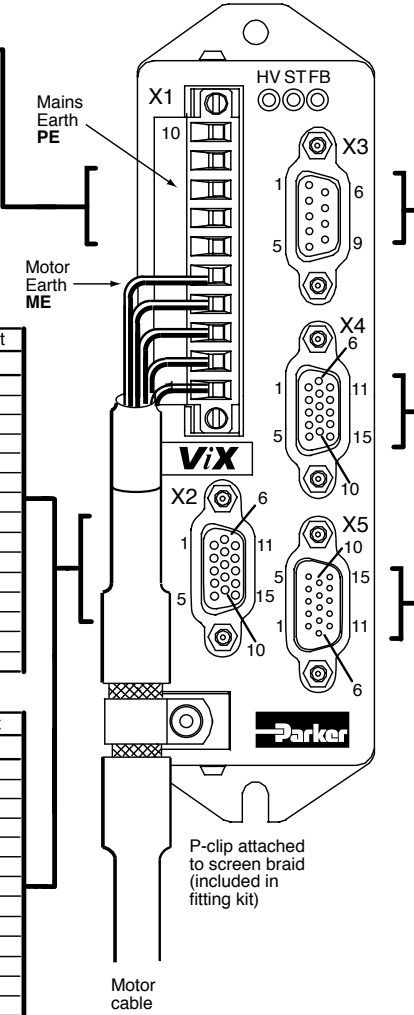
Primary Resolver Feedback : 15-way HD 'D' type socket		
X2	AE/IE/CE	
1	Reserved	
2	Reserved	
3	GND	
4	REF.res+	
5	+5V Enc Supply	
6	GND / MOT-	
7	SIN-	
8	SIN+	
9	Reserved	
10	MOT+	
11	COS-	
12	COS+	
13	Reserved	
14	Reserved	
15	REF.res-	

Control & Auxiliary I/O : 15-way HD 'D' type socket			
X4	CE/IE	AE/AH/CH/IH	CM/IM
1	ANA1+ in	ANA1+ in	ANA1+ in
2	ANA1- in	ANA1- in	ANA1- in
3	0V	0V	0V
4	0V	Enc Z- out	0V
5	+5V Enc output	Enc Z+ out	+5V Enc output
6	Fault output	Fault output	Fault output
7	Enc A-/STEP- in	Enc A-/STEP- in	Enc A-/STEP- in
8	Enc B-/DIR- in	Enc B-/DIR- in	Enc B-/DIR- in
9	Enc A- out	Enc A- out	Enc A- out
10	Enc B- out	Enc B- out	Enc B- out
11	Enable/Enable	Enable/Enable**	Enable/Shutdown
12	Enc A+/STEP+ in	Enc A+/STEP+ in	Enc A+/STEP+ in
13	Enc B+/DIR+ in	Enc B+/DIR+ in	Enc B+/DIR+ in
14	Enc A+ out	Enc A+ out	Enc A+ out
15	Enc B+ out	Enc B+ out	Enc B+ out

Primary Encoder Feedback : 15-way HD 'D' type socket		
X2	AE/AH/CE/CH/IE/IH	CM/IM
1	Incremental Enc Z+	Incremental Enc Z+
2	Incremental Enc Z-	Incremental Enc Z-
3	GND	GND
4	Reserved	Reserved
5	+5V Enc Supply	+5V Enc Supply
6	GND / MOT-	GND / MOT-
7	Incremental Enc A-	Incremental Enc A-
8	Incremental Enc A+	Incremental Enc A+
9	Commutation f-b A0	Reserved
10	MOT+	MOT+
11	Incremental Enc B-	Incremental Enc B-
12	Incremental Enc B+	Incremental Enc B+
13	Commutation f-b A1	Reserved
14	Commutation f-b A2	Reserved
15	Reserved	Reserved

User Input/Output : 15-way HD 'D' type plug			
X5	CE/CH/IE/IH	AE/AH	CM/IM
1	0V	0V	0V
2	0V	0V	0V
3	0V	0V	0V
4	OUT2	Reserved	OUT2
5	OUT1 (drive ok)	Reserved	OUT1 (drive ok)
6	IN5 (limit +)	Reserved	IN5 (limit +)
7	IN4 (limit -)	Reserved	IN4 (limit -)
8	IN3 (home)	Reserved	IN3 (home)
9	IN2 (registration)	Reserved	IN2 (registration)
10	IN1 (stop)	BRAKE IN	IN1 (stop)
11	+24V output	+24V output	+24V output
12	+24V output	+24V output	+24V output
13	+24V output	+24V output	+24V output
14	OUT3	Reserved	OUT3
15	Analog Monitor	Analog Monitor	Reserved

** AE/AH : Energise/Energise



Base view of drive showing RJ45 auxiliary communications connectors

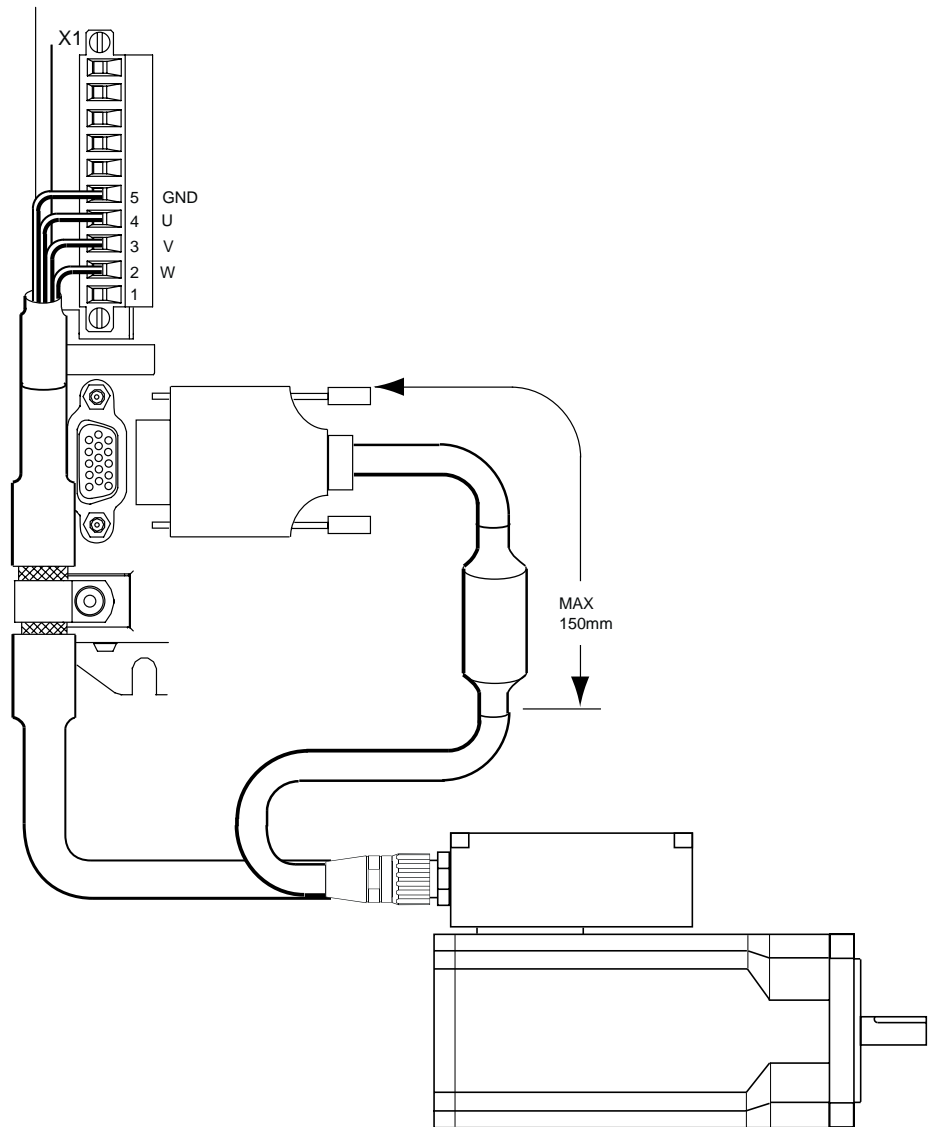
3. Motor Connections

Wire the main motor connections to the lower part of X1 connector, as shown.

Any motor feedback connections will need to be returned to X2 primary feedback connector.

Fit a ferrite absorber to the feedback cable, no more than 150mm away from the drive.

Ready made power and feedback motor cables are available for the ViX drive and motors.



CAUTION

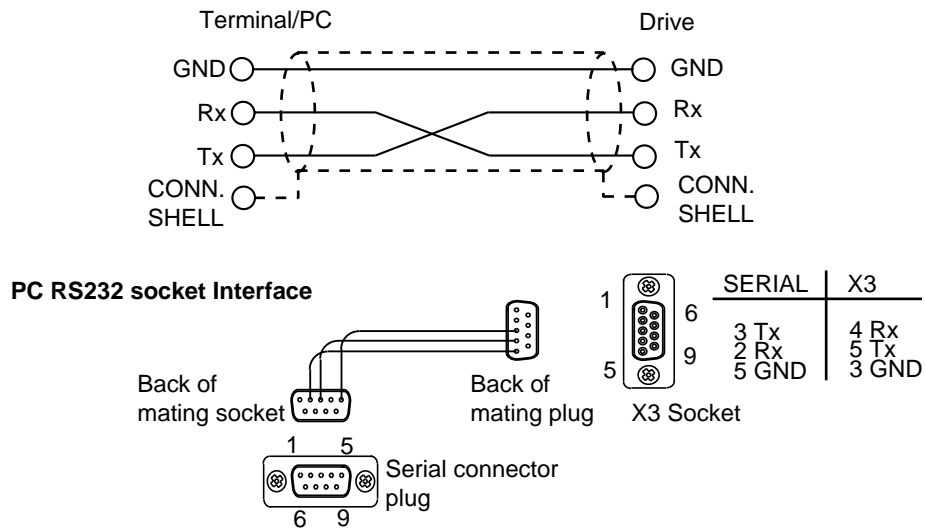
Make sure the motor is securely held in position before applying any power to the system.

Motor Movement

Before you can use the drive to rotate the motor shaft, you will need to communicate with the drive and perform the **Guided drive initialisation** provided as part of Easi-V Software. At the end of the setup you have the option of downloading a small program file (.prg file) that rotates the motor shaft to confirm correct operation. Provided both limits have been disabled, this program file will ignore the drive limit inputs to allow motion. The drive must be enabled before you can command movement of the motor shaft.

4. RS232 Connections

RS232 communication connections are made via X3.



Note: These serial connections do not follow standard RS232 pinouts. Do not attempt to use a null modem cable, use an RS232-EASI-XXXX lead available from Parker. Where XXXX specifies the length in cm.

5. Apply Power

Using the serial communications lead, connect the serial port of the controlling PC to the drive's X3 D-type socket. Check that the drive is connected to a reliable earth and apply power to the PC and the drive.

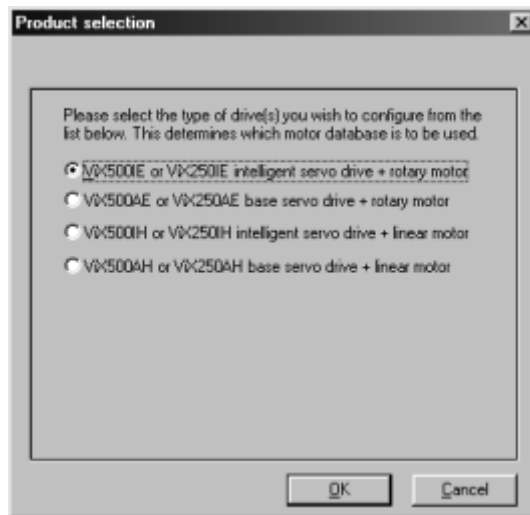
6. Load Easi-V Software

Easi-V software can be run on a PC running Windows™ 95, 98, 2000, XP or NT and equipped with at least one RS232 serial port.

Insert the Easi-V CDROM disk, which should auto-start, if not click on the Windows™ START BUTTON and select menu option RUN. In the command line type: **d:\vix.exe** (where 'd' is the letter of your CD drive) and press return. Follow the on screen instructions to complete the installation of Easi-V. If you experience any problems, refer to the User Guide Section 5 for further advice.

Product Selection

Once started, Easi-V displays the product selection screen. Select the required drive and click upon the OK box. In the following screens we will assume a ViX500IE is connected.

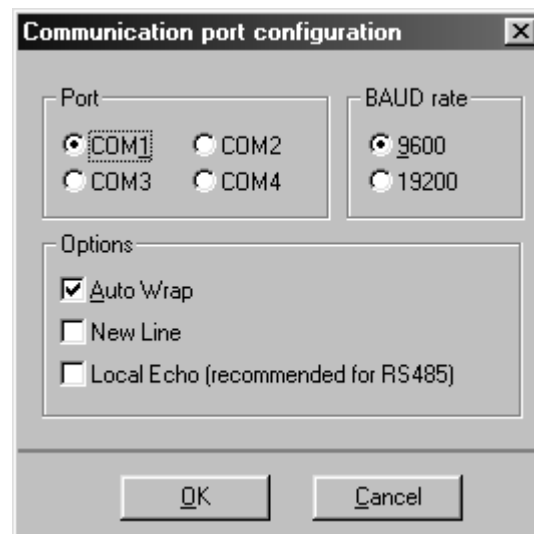


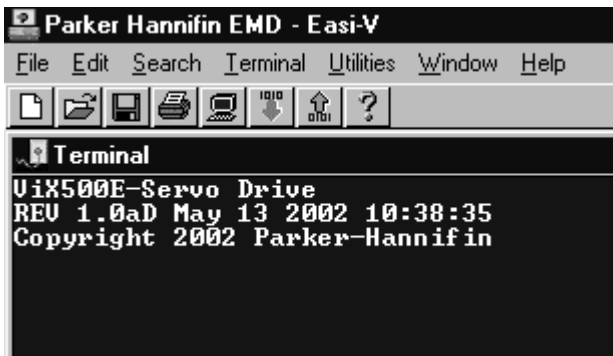
Communicating with a drive

With Easi-V running, select the menu option **Terminal - Settings** to give the Port Configuration box shown opposite.

Select the COM port you are using to communicate with the drive and set the Baud rate to 9600.

Press OK to close this box. Select menu option **Terminal - Connect**. Following a communications test, a blue 'Terminal' window will open, as shown (opposite-top).





Type in the drive reset command **1Z** and press the enter key. The response should be as shown.

Note: Software revision and dates will be different from those shown.

At this point, you have confirmed the operation of the RS232 serial communications interface. You are now ready to start the drive configuration.

From the Utilities menu select 'Guided drive setup'.

To perform a simple motor movement, the majority of the setup screens do not require any user interaction, simply accept the default values displayed and click 'Next>'.

The default axis address is '1'. Keep this address throughout the set-up procedure.



Click 'Next>'.

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Select the required motor type. From the drop-down menu select your motor type or perform a custom set-up.

Guided V i X I E initialisation - 2 of 10

Select the motor to be connected to this axis from the list. If the motor is not listed then click the button below to add it as a special.



SELECT YOUR MOTOR

Cont. stall current	2.1	Amps-RMS
Number of motor poles	8	
Resolution	8000	feedback counts
Rated speed	5000	rpm
Feedback type	encoder	
Rotor inertia	1.2E-6	Kg-m ²
Static brake	not fitted	
Commutation	standard (+30°)	
Thermal protection	sensor not fitted	
BE series motor	Yes	
Torque constant (Kt)	0.052	Nm/A peak
Viscous damping	3.5E-3	Nm/Krpm
Resistance (line - line)	4.31	Ohms
Inductance (line - line)	12.10	mH
Thermal time constant	498	seconds
Motor I.D.	5	
Motor type (MT)	40965	

< Back Next > Cancel Help

Click 'Next>'.

This screen allows adjustment of Tracking Limit, Peak Current and Current Clamp values.

Accept the motor default values displayed.

Guided V i X I E initialisation - 3 of 10

Tracking limit (TL) determines when the axis sees a motor stall and is normally set to the same value as the motor resolution (to prevent nuisance faults).

Peak current ratio (PC) is used to match drive peak output to that of the motor. It is important to set this correctly to prevent excessive motor current.

Current clamp (CL) limits drive peak output current. This setting over-rides the value of PC and so can limit the output current to a value less than the motor normally requires. CL = 100% means full peak output.

Tracking limit (TL)

$\% \text{ Peak current ratio} = \frac{\text{desired maximum drive current}}{\text{motor nominal current (MC)}}$

$\% \text{ Peak current ratio (PC)}$

$\% \text{ Drive current clamp (CL)}$

< Back Next > Cancel Help

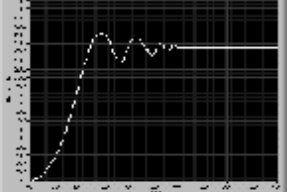
Click 'Next>'.

This screen allows adjustment of the gain parameters.

Accept the motor default values displayed.

Guided ViX IE initialisation - 4 of 10

These gain parameters can be adjusted to improve the dynamic response of the system.



If integral mode is checked, the integral gain is active when within the integral window and demanded motion is complete.

Feedforward (GF)

Integral (GI)

Proportional (GP)

Velocity (GV)

Filter time (FT)

Integral mode (IM)

Integral window (IW)

< Back Next > Cancel Help

Click 'Next>'.

This screen allows adjustment of the Error Window and In Position Time parameters.

Keep the default values displayed.

Guided ViX IE initialisation - 5 of 10

Adjust these values if you wish but normally the defaults are OK.

To wait for motor settling within your program you can trigger on the in-position flag becoming true i.e. TR(IP,=,1).

You MUST use this TRigger command if you turn off command queuing by W(CQ,0), as this ensures that motion has ceased at the end of a move.

The motor has settled and is deemed in-position when:

- (i) No motion is demanded.
- (ii) Position error is within the error window count from the commanded position.
- (iii) The above condition is true for at least the in-position time.

Error window (EW)

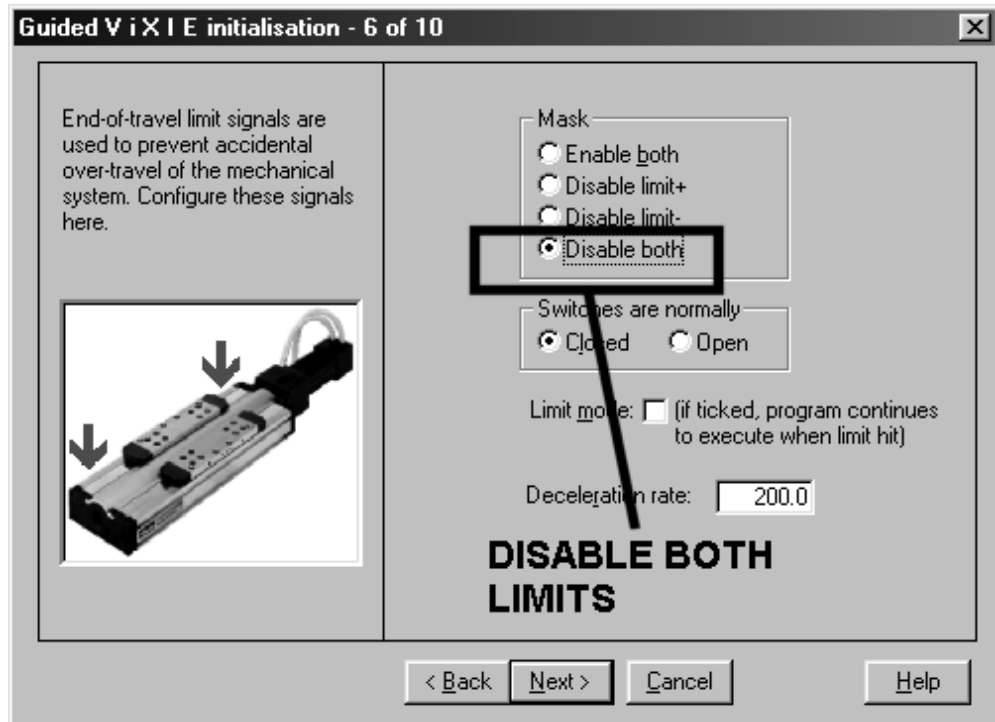
In Position Time (IT)

< Back Next > Cancel Help

Click 'Next>'.

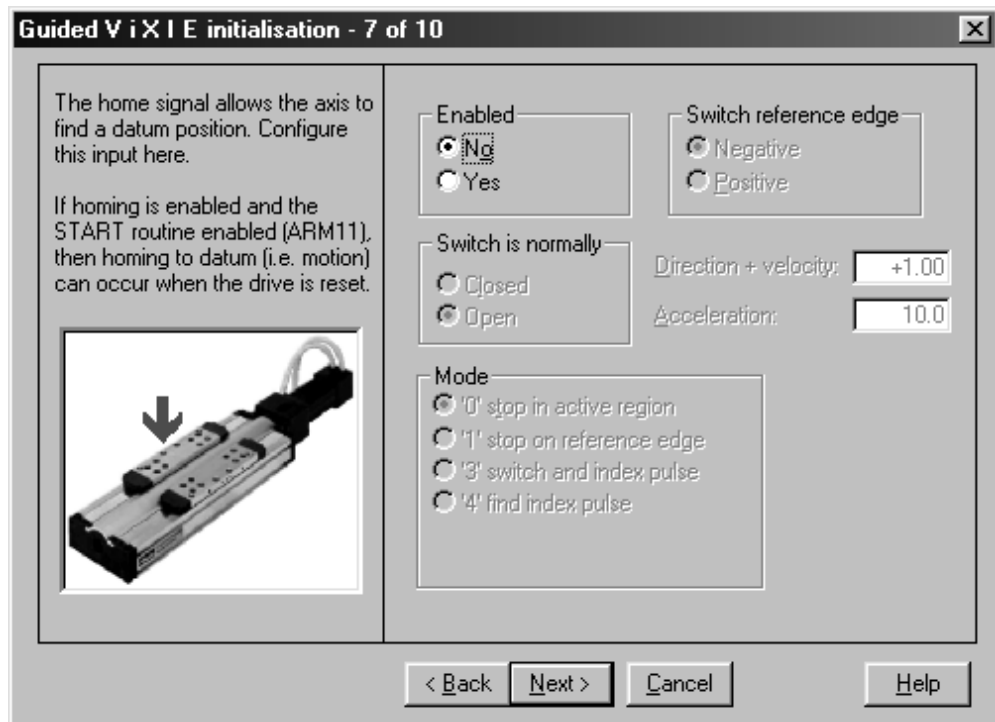
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Limit switch configuration is possible in screen 6 of 10, but for test purposes both limits are disabled.



Click 'Next>'.

This screen allows configuration of a home position, but may be ignored for testing.



Click 'Next>'.

The user input/output and encoder configuration screen can also be ignored for testing purposes.

No input/output connections should be made to the drive during this preliminary testing stage.

Click 'Next>'.

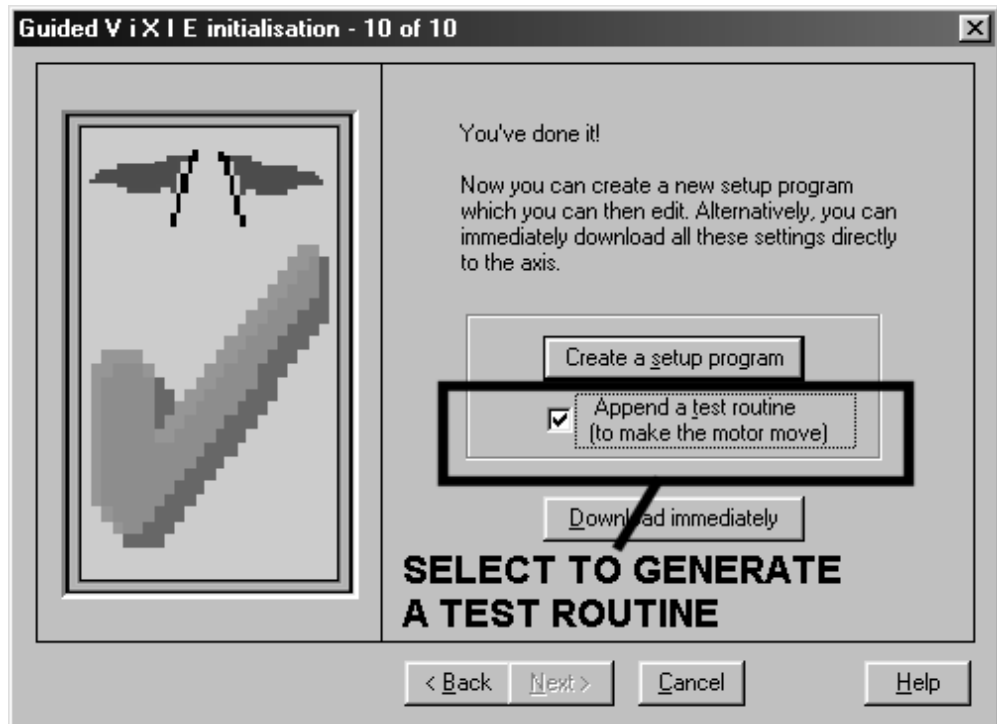
In the general configuration screen, make the selections shown.

Click 'Next>'.

Enable the Drive

By ticking the 'Enable input sense (ES)' box you are allowing the drive to be energised without requiring an enable link to be made between X4 pin 3 (GND) and X4 pin 11 (ENABLE).

In the final initialisation configuration screen select 'Append a test routine' to create the required motor movement test program.



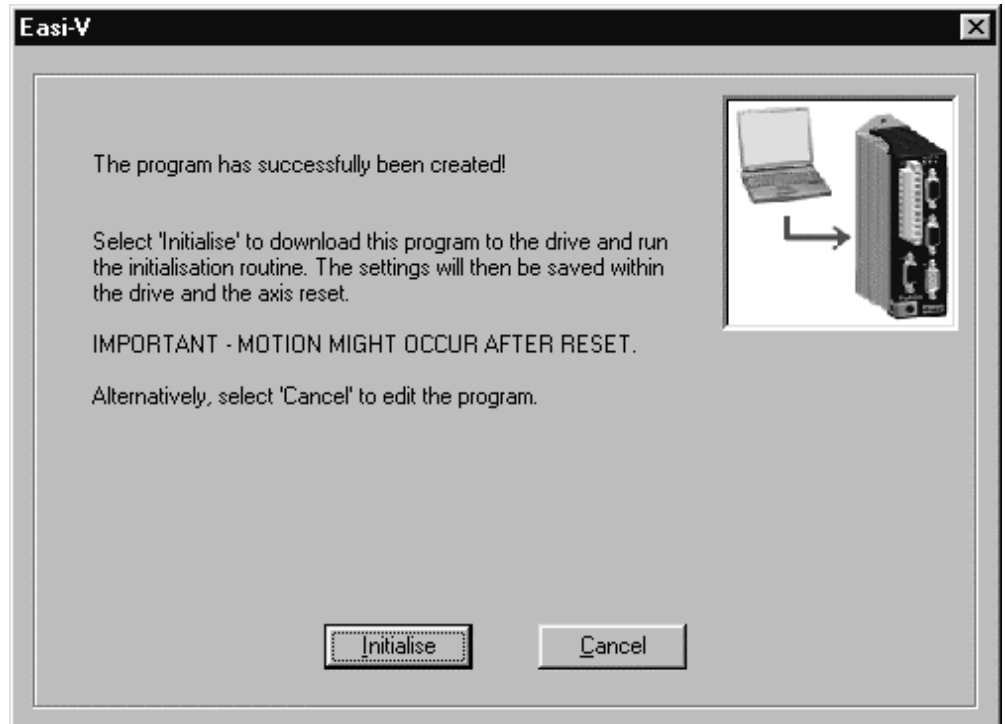
Click 'Create a setup program'.

Checking the 'Append a test routine' box will include a simple routine that turns the motor shaft to verify drive operation. To alter any configuration set-up, step backwards using the 'Back' button. Click on 'Create a setup program' when you are ready to test the drive/motor.

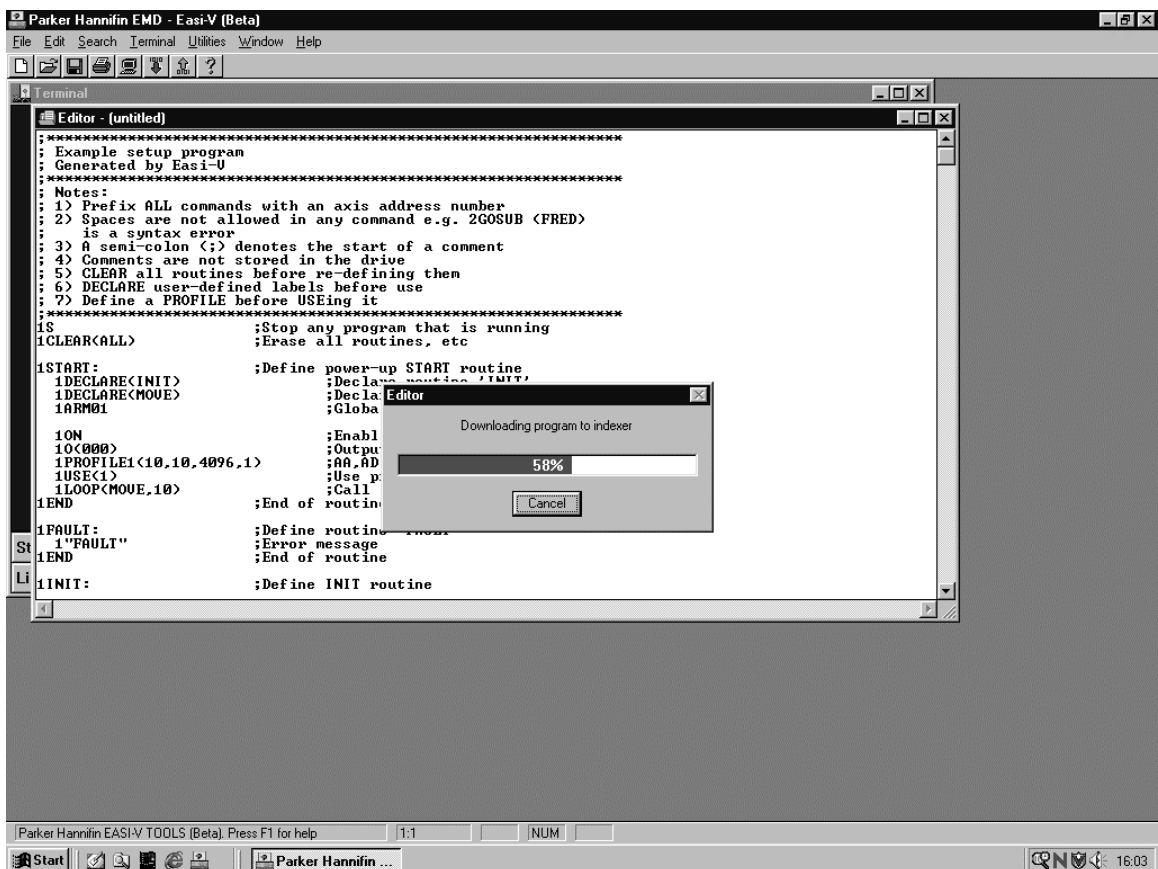
CAUTION – sudden motor movement

With HV applied and the 'Motor energised (ON command)' ticked in the general configuration screen 9 of 10, motor shaft movement may suddenly occur following a delay of up to 12 seconds during the final setting up of the axis. Make sure the motor is firmly secured in position and nothing is attached to its shaft.

To download the program click on the 'Initialise' button.



A progress bar moves to indicate downloading of the program to the drive.



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As the program is loaded into the drive the following messages are displayed: 'Waiting for axis ready', 'Saving settings', 'Resetting the drive', 'Configuration complete'. You can verify correct drive operation by checking that the motor performs a set of reciprocating moves of one revolution distance at 1 rev/sec (10 moves in total, alternating clock wise and counter-clockwise). At the end of the move click 'OK'.



If unexpected movement takes place, click on the large red 'Stop' button to de-energise the motor.

Once you have verified the correct operation of the drive and motor remove power.

You may now configure the drive for your own custom application. Please refer to the user guide for all installation and programming information. Note, a pdf file of the user guide is available on our web-site (details below).

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