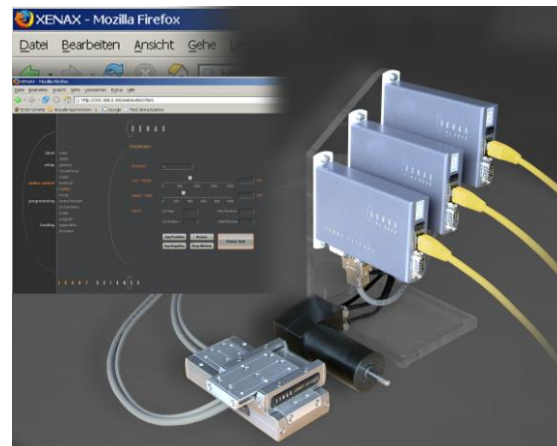
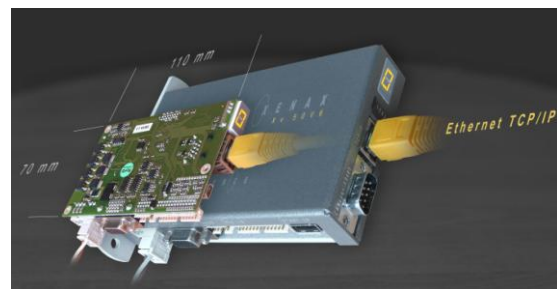


XENAX® Xv 50V6, Xvo 50V5

Instruction Manual

Ethernet Servo controllers for AC / DC / EC servo motors

Edition April 2014



Compact Ethernet servo controllers with TCP/IP Web Technology

Starting and setup via web browser.
All user setup's can be saved on PC
and by Xv 50V6 optionally on start-up
key.

Flexible machine integration with
various interfaces. Full
programmable for stand-alone
running. PLC functionality via 12
inputs and 8 outputs.

General

This instruction manual describes the XENAX[®] servo controller Xv 50V6 and the OEM version Xvo 50V5. With them it is possible to control LINAX[®] linear axis as well as AC / DC / EC servo motors. With brush-type DC servomotors an incremental encoder is necessary. With brushless AC / EC servomotors 3 phase commutation signals (hall) and incremental encoder are necessary.

It contains the necessary information about set up, electrical connections, control, bus operation and error handling etc.

The firmware and the user site WebMotion[®] are already installed and XENAX[®] is ready for use.

XENAX[®] can be put into operation simply and quickly with the intuitive user-software WebMotion[®]. Just start your Web Browser and put in the TCP/IP address.

We will gladly answer any questions you may have or supply additional information.

Alois Jenny
Jenny Science AG

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1 Motor types

LINAX[®] linear axis

3 phase synchronous motor
with linear encoder, RS422
A/A*, B/B* and R/R*

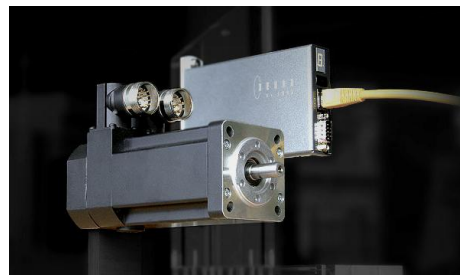
Specially supported are the following:
Distance coded reference mark, no external
home sensor is necessary.
Temperature query over I²C bus



Servo motors

AC servo motor
with encoder A/A*, B/B* and Z/Z*
with or without hall sensors

e.g. AEG B28 D4 from our selection
0,4Nm, 6000 rpm
Optional with break for vertical
applications



Mini motors

AC / DC / EC brushless servo motors
with incremental encoder RS422 A/A*,
B/B* and Z/Z* and hall sensors, as well
as DC brush-type servo motors with
incremental encoder.

e.g. „Faulhaber“, „Minimotor“,
„Maxon“



FAULHABER GROUP



maxon motor



2 WebMotion®

WebMotion® is an integrated graphic user interface (website), located in XENAX®. This is loaded and activated via web browser. (Internet Explorer> = 6.0, Mozilla, Firefox, Opera, ...)

2.1 Ethernet connect

Connection of XENAX® to laptop / PC via Ethernet-switch with normal network cable RJ45.

For connection of the laptop / PC directly to XENAX® use a crossed cable RJ45. With newer network boards a crossed cable is not necessary any more.

LED status on Ethernet connector

Colour	LED left	Colour	LED right
off	no connection	off	no data
orange	10Mbps	orange	half duplex
green	100Mbps	green	full duplex



2.2 Test IP with >IPCONFIG

IPCONFIG command DOS window

Check TCP/IP address range
IP address in range off 192.168.2.xxx
If necessary adjust IP address manually via "network set up", e.g.
192.168.2.200
xxx = 001 – 255
≠ address XENAX®

```
Verbindungsspezifisches DNS-Suffix:
IP-Adresse (Autokonfig.) . . . . . : 192.168.2.200
Subnetzmaske . . . . . : 255.255.255.0
Standardgateway . . . . . :
```

2.3 Test connection with >PING

PING command DOS window

Find IP address at the back of XENAX®

If no answer, check direct connection with crossed cable.

If you do not know the IP address, you can look for it with the [DeviceInstaller](#). Make sure that the Ethernet connection is operational.

```
C:\Dokumente und Einstellungen\ping 192.168.2.100
Ping wird ausgeführt für 192.168.2.100 mit 32 Bytes Daten:

Antwort von 192.168.2.100: Bytes=32 Zeit<1ms TTL=64
Antwort von 192.168.2.100: Bytes=32 Zeit<1ms TTL=64
Antwort von 192.168.2.100: Bytes=32 Zeit<1ms TTL=64
Antwort von 192.168.2.100: Bytes=32 Zeit<1ms TTL=64

Ping-Statistik für 192.168.2.100:
    Pakete: Gesendet = 4, Empfangen = 4, Verloren = 0 (0% Verlust)
    Ca. Zeitangaben in Millisek.:
        Minimum = 0ms, Maximum = 0ms, Mittelwert = 0ms
```

2.4 IP address search/change

To view and change the IP address as well as to update WebMotion[®], [the DeviceInstaller](#) tool is used.

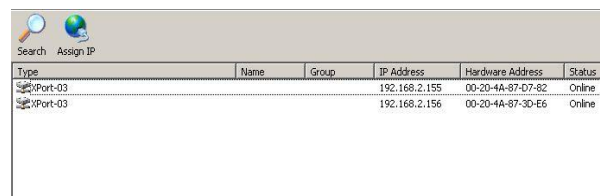
Use the adjacent link and click [DeviceInstaller](#).
Select the component [Xport](#) and install it.

<http://www.lantronix.com/device-networking/utilities-tools/device-installer.html>

The [DeviceInstaller](#) needs the Microsoft NET Framework driver.
Should this driver not exist it can be download by returning to adjacent link [Microsoft .NET Framework](#).

Search IP address

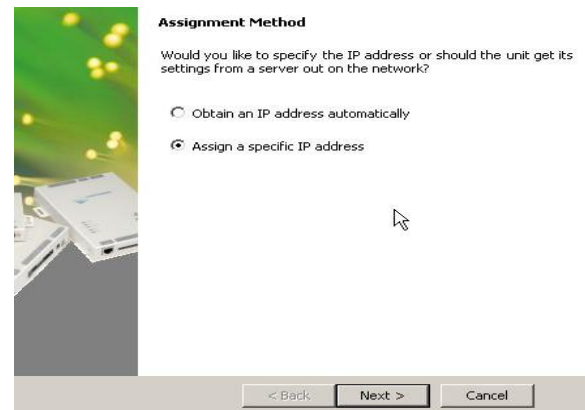
Start the Device Installer of Lantronix and choose [Search](#) to look for existing IP addresses.



Type	Name	Group	IP Address	Hardware Address	Status
XPort-03			192.168.2.155	00-20-4A-87-07-82	Online
XPort-03			192.168.2.156	00-20-4A-87-30-E6	Online

Change IP address

Via [Assign IP](#) you choose [Assign a specific IP address](#). Now it's possible to set up a new IP address.



Assignment Method

Would you like to specify the IP address or should the unit get its settings from a server out on the network?

☐ Obtain an IP address automatically
☒ Assign a specific IP address

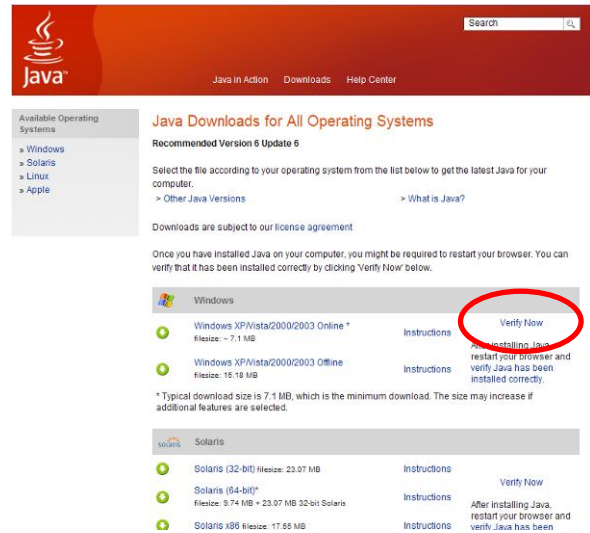
< Back Next > Cancel

2.5 JAVA plugin check

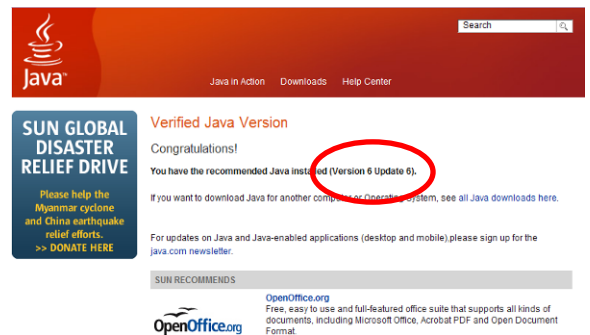
In case of problems with JAVA software you can execute a check with the link on right side.

<http://www.java.com/en/download/manual.jsp>

By selecting *Verify now* (marked red on right), your installed JAVA Plugin version will appear.



The version of JAVA Plugin Software must be higher or the same as 1.4. The verified JAVA version is the first figure after the dot. The example on the right shows the version 1.6.



If a lower version is installed, it can be actualized with Java software download. The current version of JAVA Runtime Environment (JRE) is also available on enclosed CD.

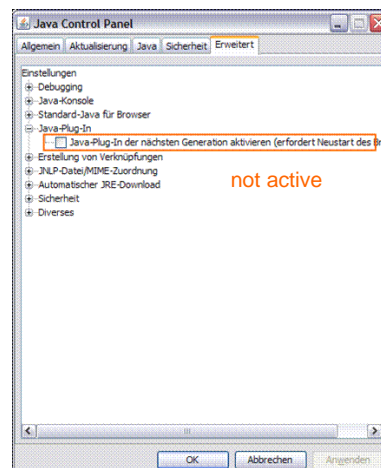
Remark

At later versions than JAVA Runtime Environment (JRE) 1.6.0_15, following setup in JAVA control panel must be done:

Java-Plug-In for next generation not active

Setup in Java:

Start / System control / Java / Extended / Java-Plug-In /
-> Java Plugin for next generation not active



2.6 Applet Cache

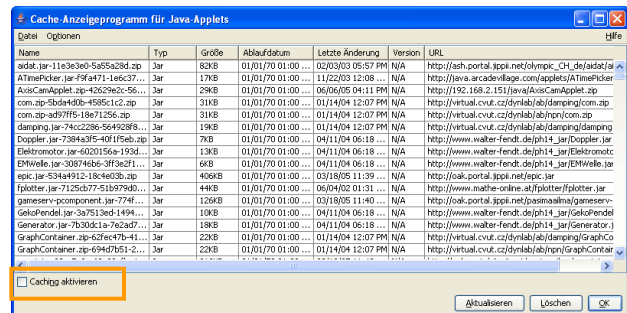
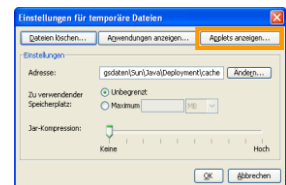
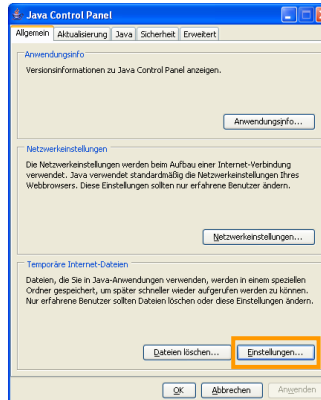
To provide a correct loading procedure of WebMotion applet into the browser, caching functionality of java plugin must be switched off.

Otherwise loading procedure can be unreliable.

Java Control Panel open with:
start / systemcontrol (classic view) / java

temporary internet files / setup

change view to „show applets“



checkbox must be switched off

2.7 Connection of power and motor

Connect the motor cable to the XENAX[®] plugs
„MOTOR“ and „ENCODER/HALL“.

Connect DC power supply to PWR plug.
Pin1 (-) is GND /0V and Pin 2 Voltage 15-50V.

XENAX[®] shows a „0“ on the 7 segment display
after power on.

In this case the initialisation of firmware was
successful and the device is ready.

2.8 Start WebMotion®

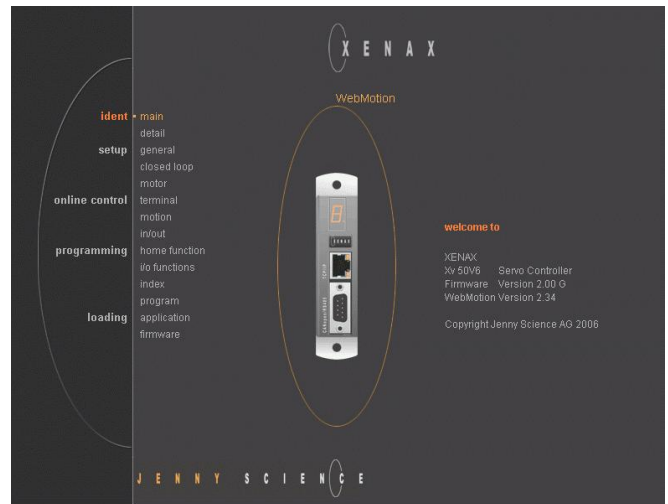
Start your Web-Browser with the IP address number, adding /WebMotion.html as a suffix.

IP address is labelled on the back of XENAX®
Xv 50V6 or on ethernet chip of Xv 50V5

<http://192.168.2.xxx/xenax.html>

XENAX® starts up with type identification and information about the version of Firmware and WebMotion®.

At first the application (parameter, programs) will be loaded from XENAX to WebMotion automatically.



Remarks

After switching on the XENAX® power supply wait at least 10 seconds until the XENAX® web server is initialised. Only afterwards start the browser with Webmotion®.

On interruption of the XENAX® power supply, please exit the browser. When turning on wait 10 seconds again before restarting the browser with WebMotion®.

In case of a different port number than the standard value 10001 of TCP/IP communication, the port number can be added optional into start-URL of WebMotion®.

Example: Connection to port number 10005
<http://192.168.2.xxx/xenax.html?Port=10005>

2.9 Data Input in general

Input values are memorised using <Enter> key.
The orange values next to the fields are the present memorised values in XENAX®.

In case of XENAX® power supply interruption, the TCP/IP connection has to be set up by a new one. Therefore load the WebMotion® site with „reload“ in the browser. In case of blocking exit the browser and restart it.

2.10 Details

This side shows you an overview with the present status of XENAX®. These are read only values, they cannot be changed.

MODE

Displays the running mode, e.g. stepper emulation or analogue function. (Set up via the heading general)

STATUS

Power Off = 0
Power On = 1
In Motion = 2
Error = 9

POSITION

Shows the present motor position with encoder increments

OUTPUT

Shows the Output status
(Changing via in/out)

INPUT

Shows the Input status

PROGRAM

Shows the present binary coded program number

MOTOR TMP

Shows the present temperature of the motor coil. This feature is only supported with the LINAX® linear axis.



2.11 General

General setup

MODE

Choice of running mode

Standard	0
Stepper control	2
Analogue function	3
Coded program number	10
Coded prog. numb. & stepper	12
Coded prog. numb. & analogue	13

INC PER PULSE

Inc. per pulse, MODE 2/12,
Pulse/direction control

SYNC RATIO

Ratio of electronic gear

PROFILE ROUND

Rounding of speed profile, soft start and stop

ANALOGUE FUNCT

Analogue function MODE 3/13

- 0 = CW (+)
- 1 = CCW (-)
- 2 = CW and CCW (+/-)
- 3 = CW and CCW digital value analogue speed (>ASP 0-511 = CCW 512 = Stop 513-1023= CW)

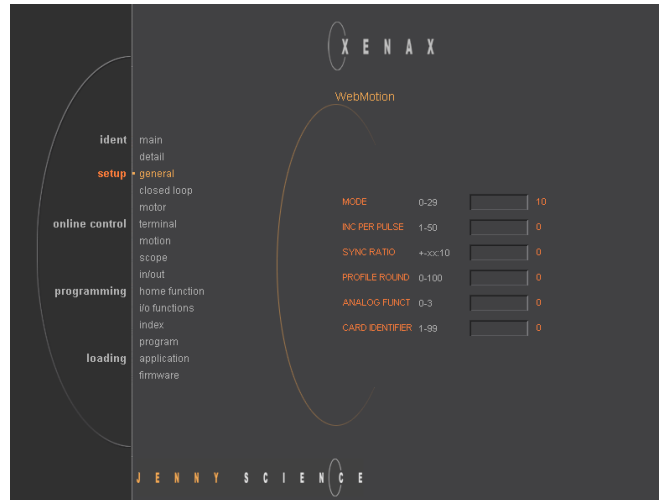
HORM DIRECTION

Start direction HORM function

- 0 = positive
- 1 = negative

CARD IDENTIFIER (Xv 50V6)

Bus address RS485, CANopen
Read form start-up key (2 x binary coded switch)
or set manual if there is no start-up key



2.12 Closed loop parameters

Set up of closed loop parameters

PROPORTIONAL

Proportional value of position loop

INTEGRAL

Integral value of position loop

DERIVATIVE

Differential value of position loop

VELOCITY

Proportional value of velocity loop

CURRENT PROP

Proportional value of current loop

DEVIATION POS

Maximum permissible deviation of position in encoder increments.

If this value is crossed the error 50 follows and flashes on the segment 7 display.

DEV TARGET POS

Permissible deviation of position in the target point until the status "in position" comes up.

With small values, the positioning can be need more time



Remarks for practice

Default values for closed loop parameters are 20 for all. With this setting LINAX® and other motors can be running for the first time. After the motors have been build into the equipment, these closed loop parameters can be optimised. so that system swinging, hard or soft running, or inaccuracy etc. can be eliminated.

If the parameters are adjusted "completely outside" you can set all values to 20 again and begin anew.

The simplest way for optimising these parameters is to do this while running motor. Under MOTION you can run a way with repeat reverse (RepReverse).

Basic rules

High values, hard, noisy run
 Low values, soft, quiet run
 PROPORTIONAL → stiffness and
 swinging characteristic
 DERIVATIVE → swinging characteristic
 INTEGRAL → accuracy
 VELOCITY → stiffness
 CURRENT PROP → stiffness

Increase PROPORTIONAL and DERIVATIVE
 Reduce INTEGRAL

High inertia (swinging)

2.13 Motor

MOTOR TYPE

The connected motor type of LINAX® series will be shown automatically.

I NOM

Maximum nominal current

I PEAK

Maximum peak current during acceleration and deceleration

POLE PAIRS

Number of pole pairs of AC / DC / EC brushless servo motors
 For DC brush-type servo motors,
 POLE PAIRS set to 0
 LINAX® Lx linear axis pole pairs = 1

INC PER REVOL

Number of encoder increments per revolution by
 AC / DC / EC brushless servo motors.
 With DC brush-type servo motors it is irrelevant.
 Linear axis:
 Lx 44F04, INC PER REVOL = 12'000
 other LINAX® products like Lx ..F10, Lx ..F40,
 Lxe F40, INC PER REVOL = 24'000

PHASE DIR

Direction of phase control
 U, V, W or V, W, U, depending on motor type.
 With DC brush-type servo motors,
 set PHASE DIR to 0.
 LINAX® Lx linear axis PHASE DIR = 0

PHASE OFFSET

Correction of the electrical angle at new adjustment of coils to magnets. Value for all LINAX® products and the most of rotative motors
 PHASE OFFSET = 0
 Harmonic Drive PHASE OFFSET = 330



2.14 Terminal

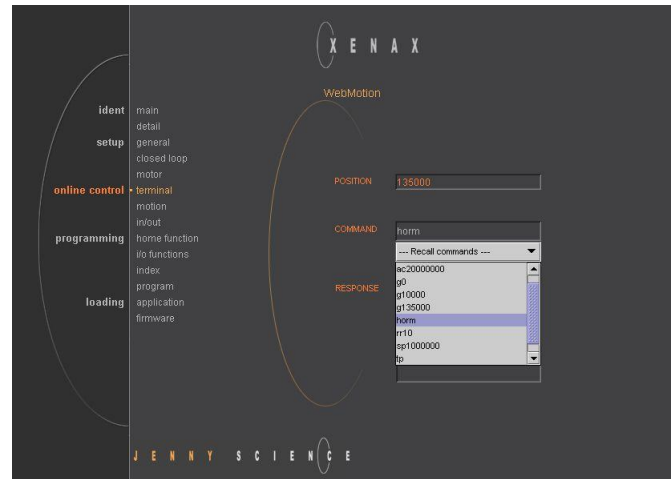
XENAX® can be controlled directly by simple ASCII commands.

POSITION, shows present encoder position in increments.

COMMAND, transmits an ASCII command complete with <Enter>

With “Recall commands” the activated commands are saved und could be reactivated by mouse click.

RESPONSE, echo, shows received characters by WebMotion®



2.15 ASCII Protocol

Via Ethernet TCP/IP, like at TERMINAL window of WebMotion® or over RS232 / RS485 e.g. with hyper terminal.

The simple protocol ASCII works with the echo principle. The sent characters come back as an echo and can be checked immediately. Thus, if existing, you get a parameter value and finally the character prompt ">". If the command could not be accepted then, instead of the prompt ">" you get the "?" character.

Sample	Command	[Parameter]	
Power	PW		<CR>
Speed	SP	25-2'000'000	<CR>
Acceleration	AC	1'000-100'000'000	<CR>
Tell Position	TP		<CR>

Echo command accepted

```
PW <CR> <LF> >
SPxxxxxx <CR> <LF> >
ACxxxxxx <CR> <LF> >
TP <CR> <LF> XXXXXXXX<CR> <LF> >
```

Echo command not accepted

```
<Command> <CR> <LF> ?
```

Remark sequential commands:
Terminate a command with <CR> only, no additional <LF>. Do not send a new command until you have received the prompt character „>“ or the „?“ before.

2.16 ASCII Command set XENAX®

Using the simple ASCII command [+PARAMETER] set, all Controller functions can be activated with an extremely short reaction time.

DESCRIPTION	SHORT	CMD	PARAMETER
Set up of MODE (Operating)	Mode	MD	0,2,3 resp.10,12,13 / ? see in SET UP VALUES
Important! In case of changing this value, the servo amplifier must be POWER OFF (>PQ).			
Power ON incl. reset encoder counter	Power	PW	
Power ON continue, keep encoder counter	Power continue	PWC	
Power ON, force a new adjustment of coils to magnets with 3 phase motors (for test)	Power reset	PWR	
Power OFF servo amplifier	Power quit	PQ	
Stop motion with deceleration	Stop Motion	SM	
Max. motor current nominal	I nominal	IN	1-xx / ?
Max. motor current peak	I peak	IP	1-xx / ?
Actual motor current	Tell motor current	TMC	(· 10mA)
Proportional value position loop	Proportional	PP	1-100 / ?
Integral value position loop	Integral	IT	1-100 / ?
Differential value position loop	Derivative	DV	1-100 / ?
Proportional value velocity loop	Velocity Loop	VL	1-100 / ?
Proportional value current loop	Current Proportional	CPP	1-100 / ?
Maximum position deviation in encoder increments	Deviation Position	DP	1-10000 / ?
Permissible deviation in target point	Deviation target Pos.	DTP	1-1000 / ?
Acceleration Inc/s ² (encoder counter)	Acceleration	AC	10'000-100'000'000 / ?
Speed Inc/s (encoder counter)	Speed	SP	50-10'000'000 / ?
Deceleration Emergency Exit Inc/ s ² (INPUT FUNCTION EE)	Emergency Deceleration	ED	10'000-100'000'000 / ?
Jog (run) positive, v = constant	Jog Positive	JP	(Speed = SP Value)
Jog (run) negative, v = constant	Jog Negative	JN	(Speed = SP Value)
Position rated absolute, Inc	Position	PO	± 2'000'000'000 / ?
Go to position absolute	Go Position	GP	(Position = PO Value)
Go direct to rated position absolute, Inc	Go Position direct	G	± 2'000'000'000
Limitation driveway left	Limit Left	LL	0 - <Linax stroke>
Take effect by LINAX motors only			
Limitation driveway right	Limit Right	LR	0 - <Linax stroke>
Take effect by LINAX motors only			
Present position ± 2*10E9	Tell Position	TP	
<i>Present-position ± 2*10E9 continuously display, Exit with ESC</i>	<i>Tell position continues</i>	TPC¹⁾	
Way relative, encoder increment	Way	WA	± 2'000'000'000 / ?
Go way relative	Go Way	GW	(Way = WA Value)
Go to zero-mark on encoder disk	Go Z-Mark	GZ	
Clear actual position counter, (not possible with Linax)	Clear position to 0	CLPO	
Analogue function MODE 3/13	Analogue Function	ANF	0-3 / ?
0 = CW (+)			
1 = CCW (-)			
2 = CW and CCW (+/-)			
3 = CW and CCW (+/-) with digital value ASP			
Automatic zero adjust at power up (between +0.7V)	Analog. Offset Disable	AOD	0-1 / ?
0= Compensate analogue offset			
1=Center position of analogue value is 0 V			
Analogue Speed 0-511=CCW, 512=Stop, 513-1023=CW	Analogue Speed	ASP	0-1023
Inc. per pulse, MODE 2/12, pulse/direction control	Inc per Pulse	ICP	1-50
Synchronous ratio for electronic gear	Synchronous Ratio	SR	± 1-1'000 : 10
Rounding of speed profile, smooth start and stop	Profile Round	PFR	1-100

¹⁾ Diagnosis and test functions
/ ? Query the programmed value

Continuation command set XENAX®

DESCRIPTION	SHORT	CMD	PARAMETER
<i>Repeat way(WA value) positive/negative</i>	<i>Repeat Reverse</i>	RR¹⁾	1-100'000
<i>Repeat way (WA value) constant direction</i>	<i>Repeat Way</i>	RW¹⁾	1-100'000
<i>Waiting time on command RR and RW</i>	<i>Wait Repeat</i>	WT¹⁾	1-10'000 (x 10ms)
Home function according to program	Home	HO	
Direction of motor rotation for seeking external coarse sensor 1 = CW, 2 = CCW	Dir Home	DRH	1-2
Speed for seeking external sensor	Speed Home	SPH	50-25'000 Inc/s
Input number connected to external sensor	Input Home	INH	1-8
Direction of motor rotation for seeking z-mark on encoder 1 = CW, 2 = CCW	Dir Z-Mark	DRZ	1-2
Speed for seeking z-mark	Speed Z-Mark	SPZ	50-10'000 Inc/s
Clear outputs after home function 0 = no, 1 = yes	Clear Output	CLO	0-1
Offset after edge of external sensor no stop same direction. IF HOF is active (≠0), then this value is indicated at Home Menu	Home Offset	HOF	0-100'000 Increment
Home LINAX® linear axis with distance coded reference mark on optical encoder	Home Reference Mark	HORM	/ ?
? = Test, distance to present reference marks and distance absolute to position 0.			
Start direction HORM function 0 = positive, 1 = negative	Direction HORM	DRHR	/ ?
<i>Test only, looks for all reference marks and tells all corresponding reference distances</i>	<i>Tell Ref. Mark All</i>	TRMA¹⁾	
Run index number	Index	IX	1-50
Number of index pre-load for changing index parameters by remote control (RS232/485)	Number Index	NIX	1-50
Acceleration write in Index at the NIX preloaded number	Accel. Index	AIX	10-50'000 (x1000) Inc/s ²
Speed write in Index at the NIX preloaded number	Speed Index	SIX	50-10'000'000 Inc/s
Distance write in Index at the NIX preloaded number	Distance Index	DIX	± 2'000'000'000 Increment

¹⁾ Diagnosis and test functions
/ ? Query the programmed value

Continuation command set XENAX®

DESCRIPTION	SHORT	CMD	PARAMETER
Program number run complete	Program	PG	1-15
Set output (GND, logical 1)	Set Output	SO	1-8
Clear output (high-impedance, logical 0)	Clear Output	CO	1-8
Trigger upward count, absolute, at output #x defined in O-FUNCTION during 5ms	Trigger upward	TGU	± 2'000'000'000 Increment
Trigger downward count, absolute, at output #x defined in O-FUNCTION during 5ms	Trigger downward	TGD	± 2'000'000'000 Increment
1 = input HIGH active, 0 = input LOW active 2=individual inputactivity selection	Input LOW active	ILA	0-2 / ?
Set ILA to 2, First hex-number binary Inputs 9-12,only 0 or F, 2nd and 3rd hex-number for input 1-8	Input LOW Active Single	ILAS	0xx / Fxx / ?
Status all 12 inputs, 0 = Low, 1 = High / ? incl. indication of input number	Tell Input	TI	/ ?
Status single input, 0 = Low 1 = High	Tell Input	TI	1-12
Status all 8 Outputs, 0 = passive (high impedance), 1 = active (GND)	Tell Output	TO	
Status: 0 = Power OFF, 1 = Power ON, 2 = In motion, 3 = Prog active, 9 = Error	Tell Status	TS	
Error number 01-99	Tell Error	TE	
Shows present position captured with Input	Tell Capture Position	TCP	1-8
Set all 8 Capture Position Register to 0	Clear Capture Position	CLCP	1-8 (all)
Set CI (request) for RS485easy Bus	Card Identifier	CI	1-99 / ?
Request RI in RS485easy Bus	Requ. Identifier	RI	1-99 / ?
Requests complete value set of IDENTIFIER, POSITION, and STATUS	RI with Status *	RI	1-99
Event activation	Event status or input	EVT²⁾	
Save Application to Startup Key	Save to Startup Key	SVST	
Reset setup parameters to default values	Reset	RES	
Version number of installed firmware	Version	VER	
Identification max 16 char. free for user	Servo controller ident.	SID	/ ?
Pole-pair number of motor	Polepair	POL	1-100 / ?
Number of encoder increments per revolution	Encoder	ENC	10-32'000/ ?
Direction of phase control u,v,w or v,u,w	Phase Direction	PHD	0-1 / ?
Correction of the electrical angle at new adjustment of coils to magnets (after PWR)	Phase Offset	PHO	0-359 / ?
Baudrate of the optional CANopen interface	CAN Baudrate	CAB	1'000 – 1'000'000 / ?

/ ? Query the programmed value

²⁾ For critical realtime applications. Automatic,
asynchronous information (Event) by status change or
input change. Please ask, we support you gladly.

2.17 Asynchronous messages (events)

To reduce response time, status or PLC input
changing can be sent automatically.
It is not necessary to poll the status or inputs cyclic.
Make sure that the internal baudrate of XENAX®
servocontroller and XPort device is set to the
maximum value of 115'200 baud (see chapter 4.1
and 4.3)

Enable events

Events disabled, default EVT=0
Events enabled generally EVT=1

Status changes

Will be sent in case of generally activated events.

Power OFF @S0
Power ON / Halt @S1
In motion @S2
Error @S9

PLC Input

Inputs are selectable with ETI (Event Track Input)

Enable event of Input 1..12 ETI=1..C
Disable all Input events ETI=0

Disable event of PLC input with DTI (Disable Track Input)

Disable event of Input 1..12 DTI=1..C
Disable all Input events DTI=0

Structure of input events @lxyz
with xyz as halfbytes in Hexadecimal notation.

PLC I/O pin no.	16	15	14	13	24	23	22	21	20	19	18	17
INPUT no.	12	11	10	9	8	7	6	5	4	3	2	1
Example input bits	1	0	1	1	0	0	1	0	1	1	0	1
Input event structure @I	x				y				z			
Example event @I	"B"				"2"				"D"			

Disable echo

To further reduce response time, disable of protocol echo can be defined.

Disable echo ECH=0
Enable echo, default ECH=1

Response without echo is \r\n> or ?\r\n>

For correct handshake, the „>“ prompt character or the „?“ error character must be detected before sending next command.

Disabled echo takes effect over the complete command set.

Important: Do not use WebMotion in case of disabled echo.

Default settings after Power ON

After power on of XENAX[®] servocontroller or application download, default settings are

events OFF	EVT=0
PLC input events OFF	DTI=0
Echo ON	ECH=1

2.18 XENAX[®] DLL

For PC based systems, a dynamic link Library is available for a simple and efficient Implementation of the command set.

XENAX.DLL encases the communication with the XENAX Servocontroller to the Ethernet TCP/IP.

Consult the documentation "XENAX_DLL_Manual.pdf"

2.19 Motion

XENAX® online control for test

POSITION

Shows present encoder position of motor

LIMIT

Driveway setup with limitation values in Increments. Take effect by LINAX® motors only.

ACC *10000

Adjusts acceleration at Inc/s² multiply by 10000

SPEED *1000

Adjusts speed at Inc/s multiply by 1000

Go Way (REL)

Input of the way relative to the present position in Increments. Start with "Enter".

Go Position (ABS)

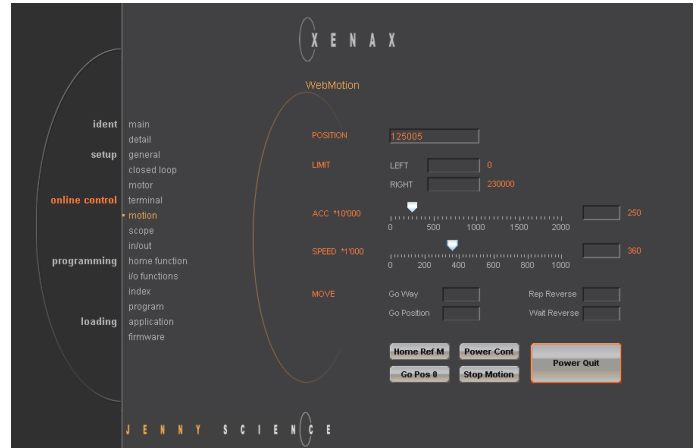
Input of the position absolute to the zero point in Increments. Start with "Enter".

Rep Reverse

Input of the way relative to the present position in increments. This way is running endlessly forth and back. Start with "Enter".
While running the values of acceleration, speed and wait time can be changed online.
With Stop Motion, the running process is stopped.

Wait Reverse

Wait time at reversal point of Rep Reverse in units of 10 milliseconds.
Acceptance with „Enter“.



Home Ref M, LINAX®

Home Reference Mark (>HORM)

On the glass scale LINAX has a number of reference marks with different distances. While running over two reference marks the absolute position is calculated.

Run this function once after switching power on.

Go Pos 0, LINAX®

(>G0) go to position 0,

according to calculation by Home Ref M

Power Cont, LINAX®

Power continues (>PWC)

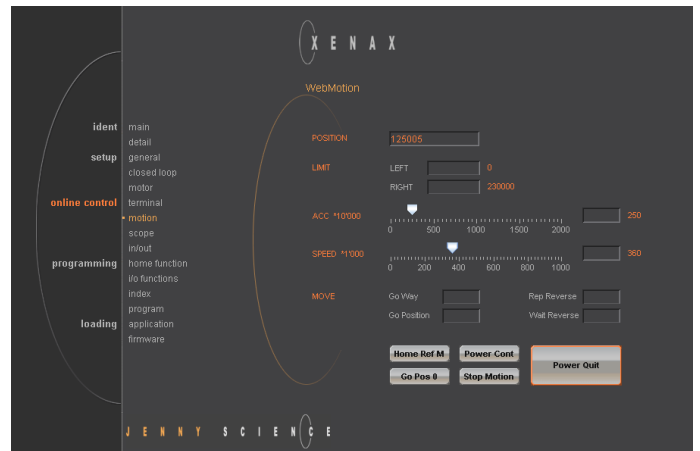
The position counter continues and will not be set to 0 first. So, after an error the system will continue the positioning without **Home Ref M**. With Power only (>PW) the position counter will be set to 0.

Stop Motion

The movement is stopping under control with deceleration ramp.

Power Quit

Switches off the power stage, the motor is movable by hand.



Motion for rotative Motors

If the servo controller XENAX® does not recognize a linear axis LINAX®, there are 3 different functions available for rotative motors

Jog Positive

Is running the motor in positive direction until the command Stop Motion stops the motor.

Jog Negative

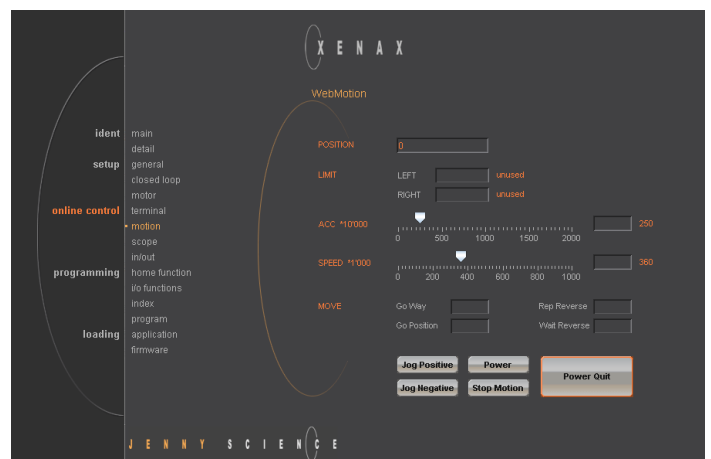
Is running the motor in negative direction until the command Stop Motion stops the motor.

While the motor is running with Jog, the speed (SPEED) can be adjusted online.

Power

Power on the power stage (>PW)

The position counter will be set to 0.



2.20 Scope

Online recording of position and velocity

Time

recording time in milliseconds

Command

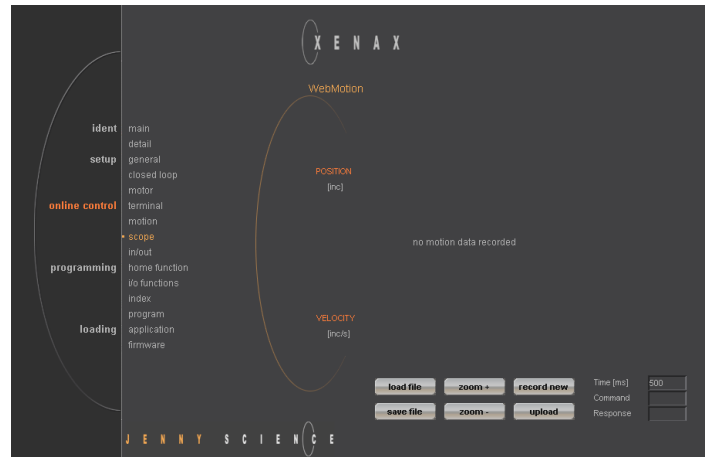
Field of command entries. Provides to set startup position of the motor (e.g. HORM, G0)

Response

Response messages of command entries (e.g. position request TP in command field)

record new

Initialization of a new recording sequence.
Wait for message „ready for recording next motion“
Start motion (e.g. G150000)



upload

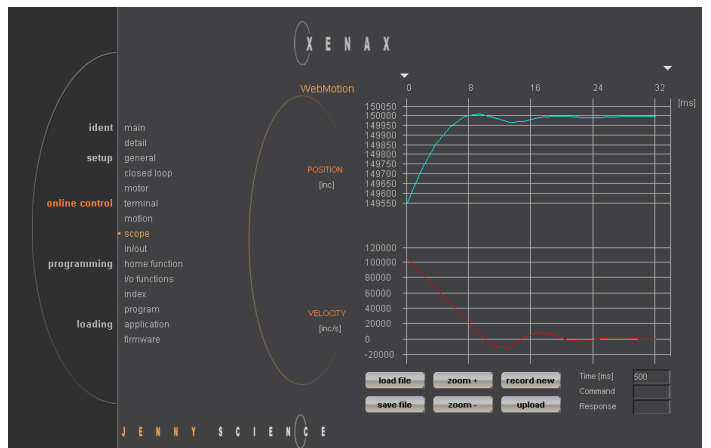
After selected recording time, data can be uploaded from servocontroller.

save file

Save record file on PC

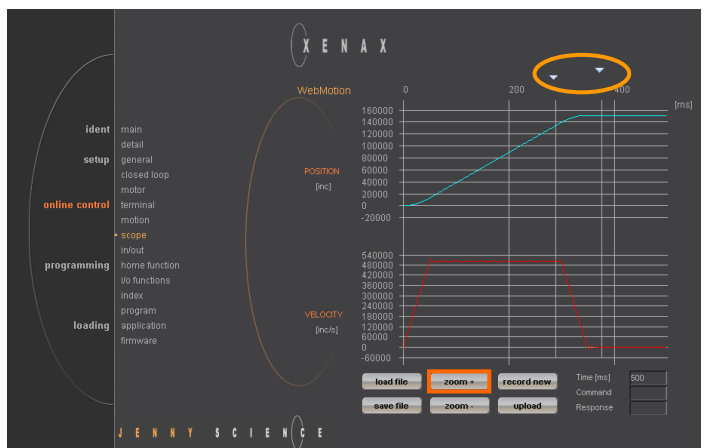
load file

Load record file from PC. This operation takes no effect on servocontroller parameters.



zoom + / zoom -

Zoom of course section on time axis.
Set time range with the two arrow buttons on the top.
Press key „zoom +“ to draw the course section.
Press key „zoom -“, for undo zoom action



2.21 Input / Output

Shows the physical state of the inputs and outputs

OUTPUT

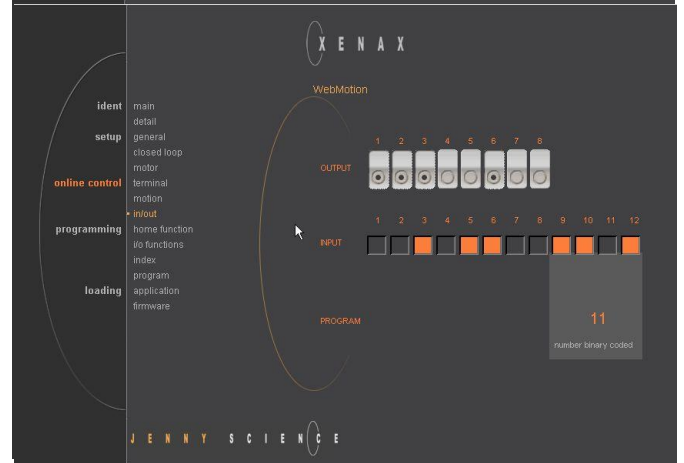
ON and OFF of outputs via mouse click.

INPUT

Shows the input status (ON/OFF) including binary coded input (9 – 12)

PROGRAM

Present selected program number, binary coded



2.22 Home function (rotative)

For rotating motors only, for LINAX® simply use the command "HORM"

HOME DIR

Defines start direction for searching the external HOME sensor 1 = CW, 2 = CCW

HOME SPEED

Defines speed for searching the external HOME sensor.

If no home sensor exists, then set this value to 0

HOME INPUT

Home sensor external, input number (1-8)

Z-MARK DIR

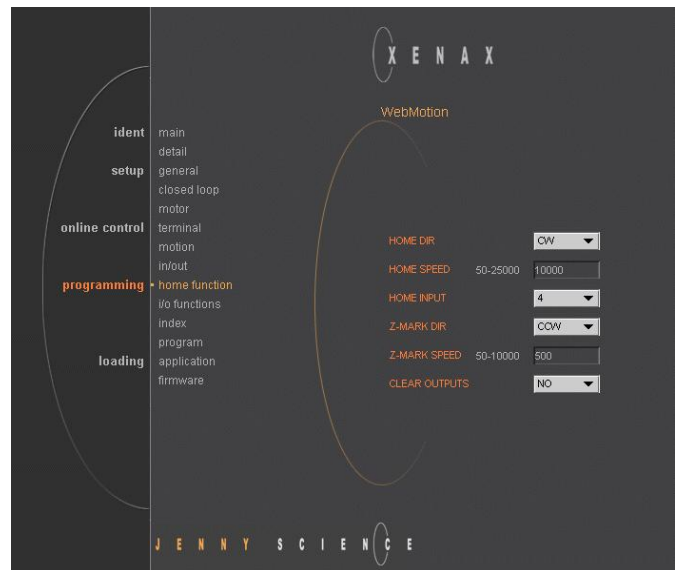
Defines start direction for searching the Z-mark on encoder 1 = CW, 2 = CCW

Z-MARK SPEED

Speed for search the Z-mark. If no Z mark (Reference mark) exists, then set this value to 0

CLEAR OUTPUTS

Clear all outputs to OFF after HOME



2.23 Home function (Linear)

For LINAX® use the command “HORM” first.

This optional function can be used to contact the LINAX® slide on a mechanical barrier.

HOME DIR

CW (motion direction positive)
CCW (motion direction negative)

HOME SPEED

Motion speed on mechanical barrier [INC/s]

HOME CURRENT

Nominal motor current [x10mA] during home drive.
force F = motor current x force constant

HOME DEV POS

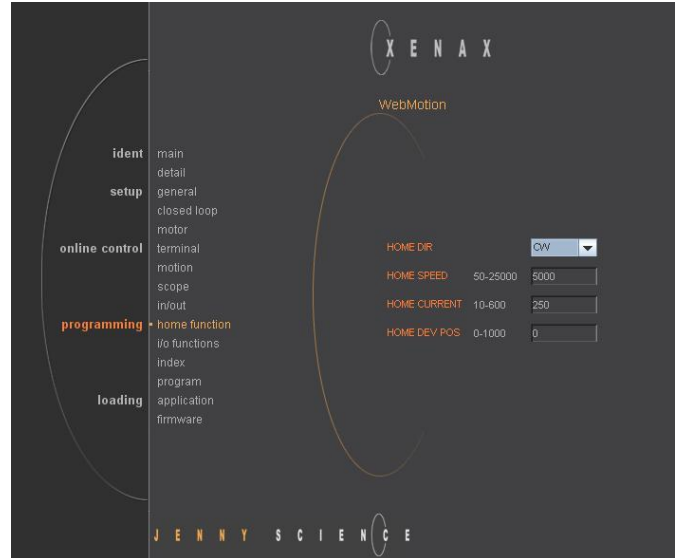
Maximum deviation position to the last homing position [INC].

HOME DEV POS = 0, test OFF
Output Function HOME = 1

HOME DEV POS = 1, test ON

Deviation inside of tolerance:
Output Function HOME = 1, current position is taken
for new reference position

Deviation outside of tolerance:
Output Function HOME = 0,
New reference position is set as result of the next
home drive



2.24 I/O Functions

INPUT FUNCTIONS

Assignment of an Input Function to a physical input.
choice of high- or low-activity of all inputs

OUTPUT FUNCTIONS

Assignment of an Output Function to a physical output.



Input Functions

Home start according to HOME FUNCTION, with rotative motors	HO	
Home Reference mark for LINAX®, travels distance of 2 reference marks and calculates the absolute position from Home. This without physically travelling to the Home position	HORM	
Execute index number xx or change according operation yy with distance zz	IX	xx, yy, zz
Execute Program xx	PG	xx
Set output xx	SO	xx
Clear output xx	CO	xx
Jog positive (const. speed xxxxx inc/sec) while input # is active	JP	xxxxx
Jog negative (const. speed xxxxxx inc/sec) while input # is active	JN	xxxxx
Capture Position, on triggered edge at input	CPOS	
Interrupt program, while Input active	IP	
Stop Impulse, edge triggered*)	SI	
Stop Impulse Counter, like SI but does not set position counter to 0*)	SIC	
Limit-switch Left*)	LL	
Limit-switch Right*)	LR	
Emergency Exit with power off*)	EE	
Emergency Exit with power on, Position stop does not set position counter to 0*)	EE1	
Power ON continue, keep encoder counter	PWC	

*)Stop with ED
(Emergency Deceleration) break ramp

Remark to Input Function

For rapid deceleration in emergency shut down situations (LL, LR, EE, EE1) the special ED (Emergency Deceleration) can be given a value.
(COMMAND > ED xxxxx)

The Emergency Exit functions have the highest priority and are always activated immediately. As long as EE is active no other function can be executed.

When another function is already active it has to be finished before the next one is started. If several function calls are current at the same moment, then the one with the lowest input number is executed.

To run a program endlessly the assigned input can be simply left active.

With Interrupt program (IP) the program being executed can be interrupted. If IP becomes inactive the interrupted program will be continued directly.

With stop impulse the running movement is stopped and aborted. Following this a new travel command can be executed even with unreleased stop impulse (SI active).

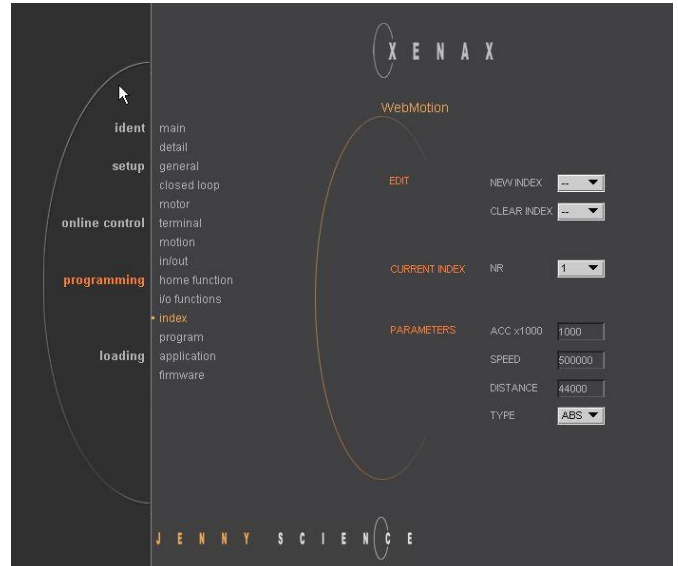
Output Functions

HORM, HO has been activated	HOME
In motion, motor is running	INMO
End of program	EDPG
Trigger (5ms, defined by TGU, TGD commands)	TGR
Error	ERR
Brake release	BRK

If one of these conditions occurs, the output will be set logically to 0 (NPN, open collector)

2.25 Index

An Index is a travel profile and contains acceleration (ACCEL), speed (SPEED), distance (DISTANCE) and TYPE of distance. (Absolute, with reference to the 0 position or Relative with reference to the present position). The values always refer to increments of the incremental encoder. The INDEXES simplify programming and reduce the communication time by serial control. Execute with IXxx<CR>. A maximum of 50 INDEXES can be predefined.



EDIT
NEW INDEX
CLEAR INDEX

Enter new INDEX
Clear INDEX number

CURRENT INDEX
The list contains all already defined Indexes

PARAMETERS
Set up of parameter in
„CURRENT INDEX“

ACCEL	(10'000-60'000'000 Inc/s2)
SPEED	(100-5'000'000 Inc/s2)
DISTANCE	Distance in Inc
TYPE	ABS= Absolute (Position), REL=Relative (Way)

2.26 Program

Here the program lines will be defined.

PROGRAM

Select, define or clear a program

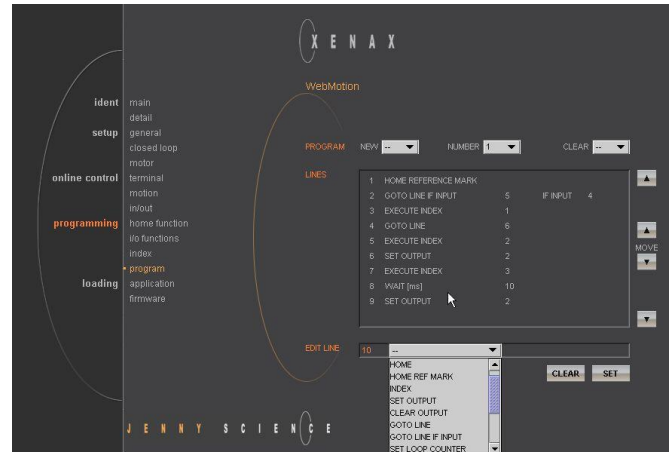
LINES

In this list all defined program lines of present program will be shown. The arrows at the top and below serve for scrolling within the window. Is a line in the list selected then it can be moved with MOVE arrow.

Maximum number of lines:

Prog 1-15: 50 lines

Prog 16-63: 10 lines



EDIT LINE

With EDIT LINE a program line can be defined.

SET sets the edited line in the LINES list.

When a line is selected in the list, it can be modified or cleared.

Thanks to the predefinitions (HOME, INDEX) programming is simple and orderly.

Program commands

Execute Home Function
Home ref mark for LINAX[®], see Input Function
Execute index number xx or change according operation yy with distance zz
Set Output number xx (NPN, logical 0)
Clear Output number xx (NPN, open collector)
Go to Line number xx
Go to line number xx, if input number yy active
Set Loop Counter # to xxxx (1-10000)
Decr. Loop Counter #, if not zero, jump line xx.
Loop counters can be interleaved with each other
Wait xx ms
Wait to logical High of Input number xx
Wait to logical Low of Input number xx
Set position counter to 0, not possible with linear axis LINAX[®]
Spezial command customized

HOME

HORM

INDEX

xx, yy, zz

SET OUTPUT

xx

CLEAR OUTPUT

xx

GOTO LINE

xx

GOTO LINE IF INPUT

xx,yy

SET LOOP COUNTER (A-E)

xxxx

DEC LOOP COUNT (A-E) JNZ LINE

xx

WAIT TIME (ms)

xx

WAIT HIGH INPUT

xx

WAIT LOW INPUT

xx

CLEAR POSITION

POSITION CORRECTION

Note:

All entries in menu *programming* must be downloaded in menu *loading* / *application* / *Download Appl* to take effect on servocontroller

Example: Initialization LINAX®

This example shows the initialization of a LINAX® motor with the command HORM (Home Reference Mark) with driving to a certain start position (INDEX 1).

For example, the axis drives to start position 0.

Important:

The command HORM must be executed once after power on of the servocontroller. Then any move commands are workable.

The screenshot shows the LINAX initialization interface. The main window displays a program editor with the following lines:

LINE	COMMAND	INDEX
1	HORM REFERENCE MARK	
2	EXECUTE INDEX	1

The 'EDIT LINE' field shows '3' and '--'. The 'EDIT' panel on the right contains the following settings:

- NEW INDEX: --
- CLEAR INDEX: --
- CURRENT INDEX: NR 1
- PARAMETERS:
 - ACC x1000: 2000
 - SPEED: 80000
 - DISTANCE: 0
 - TYPE: ABS

Example: Initialization rotative motor

The HOME function for rotative motors must be defined into menu *programming / home function*.

First, the motor drives to a reference switch, then it adjust to encoder z-mark.

If start position differ from HOME position, an index (INDEX 1) can be executed optionally.

The screenshot shows the LINAX initialization interface for a rotative motor. The main window displays a program editor with the following lines:

LINE	COMMAND	INDEX
1	HOME	
2	EXECUTE INDEX	1

The 'EDIT LINE' field shows '3' and '--'. The 'HOME DIR' panel on the right contains the following settings:

- HOME DIR: CW
- HOME SPEED: 50-25000 4000
- HOME INPUT: 1
- Z-MARK DIR: CCW
- Z-MARK SPEED: 50-10000 1000
- CLEAR OUTPUTS: NO

The program starts with ASCII command PG1 into menu *online control / terminal* or through activating an input function PG1.

2.27 Application

The application contains all user defined parameters, data and programs.
The application can be located in 4 different places:

- In WebMotion® to show and modify
- In a File on PC to save or load
- In XENAX® to execute
- In the Start-up Key (Optional) as backup and for fast transfer to other XENAX®

PC

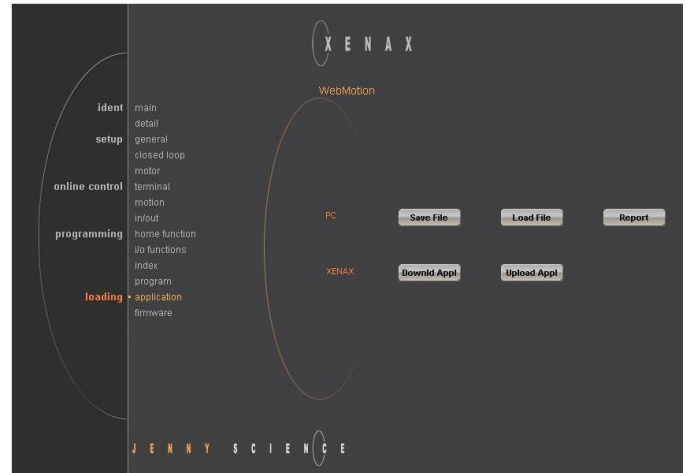
Save File saves the application from WebMotion® in a File on PC/Laptop (Hard disc, Server).

Load File loads an existing application from file to WebMotion®.

Report creates a report file with all application data and set up in readable format. This file is just for program overview and cannot be reloaded.

XENAX®

- Downld Appl saves the application from WebMotion® to XENAX®
- Upload Appl loads the application from XENAX® to WebMotion®.



2.28 Firmware

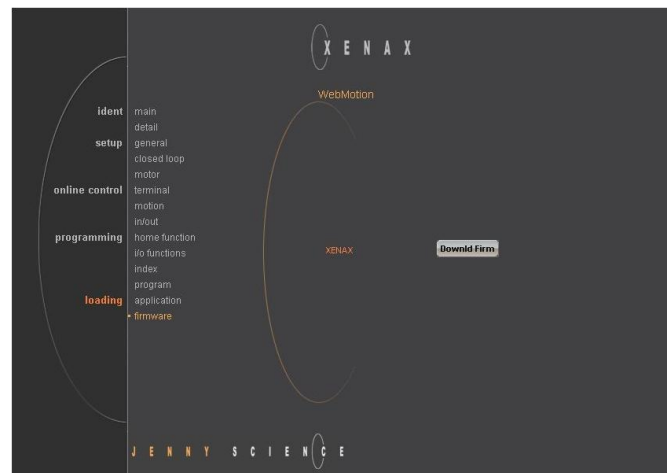
Install a new version of firmware to XENAX®

DOWNLOAD

Select the firmware via Explorer window via mouse click (*.A37).

The download runs automatically and after the installation all functions are available immediately.

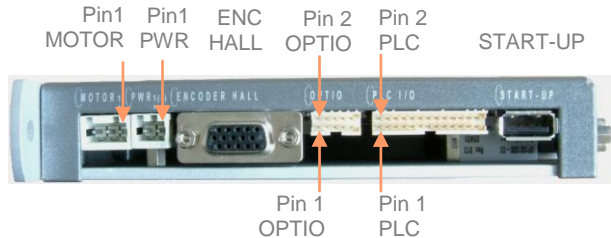
During download process all functions are inactive.



3 Electrical connections

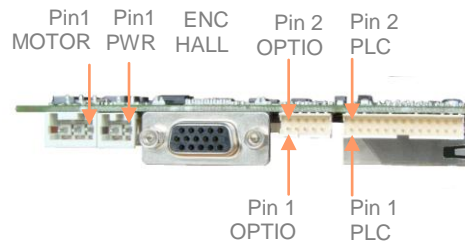
Xv 50V6

CANopen /
RS485 /
RS232 TCP/IP



Xvo 50V5

Pin 1
RS 232 TCP/IP



DESCRIPTION

PLUG

CANopen / RS485 / RS232	9 Pole Plug D-Sub
RS232	5 Pol USB Mini Plug A/B
TCP/IP	8 Pole Jack RJ45 with status LED
MOTOR	3 Pole Plug Wago, pitch 3,5mm
PWR	2 Pole Plug Wago, pitch 3,5mm
ENCODER HALL	15 Pole Jack D-Sub High Density
OPTIO	10 Pole Plug MINITEK, pitch 2mm
PLC I/O	26 Pole Plug MINITEK, pitch 2mm
START-UP	4 Pol Plug USB A

3.1 Pin configuration

MOTOR

LINAX[®] / Servo Motor
Phase U / Motor -
Phase V / Motor +
Phase W

Pin 1	white
Pin 2	brown
Pin 3	green

PWR

POWER -	Pin 1	white	0, GND
POWER +	Pin 2	brown	15–50V

Typically supply voltage is 24V DC. Increasingly powerful Lx F40 / Lxe F40 axes 48V DC, in case of higher load (>2kg) or high velocity (>1,5m/s). Power requirement for 1 axis 3-5A / for 2 axes 5-7A / for 3 axes 7-10A. Additional supply fuse is not necessary, 10AF internal.

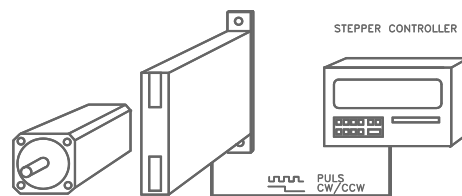
ENCODER HALL

GND for both, encoder and hall	Pin 1	GND
150mA	Pin 2	5V Encoder
Pull up 2,4k to 5V, differential input 26LS32	Pin 3	Encoder A
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 4	Encoder A*
Pull up 2,4k to 5V, differential input 26LS32	Pin 5	Encoder B
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 6	Encoder B*
Pull up 2,4k to 5V, differential input 26LS32	Pin 7	Encoder Z
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 8	Encoder Z*
Pull up 2,4k to 5V, differential input 26LS32	Pin 9	HALL 1
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 10	HALL 1*
Pull up 2,4k to 5V, differential input 26LS32 Over-temperature signal Motor	Pin 11	HALL 2 / -TMP
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 12	HALL 2*
Pull up 2,4k to 5V, differential input 26LS32 I2C clock signal	Pin 13	HALL 3 / I2C_SCL
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 14	HALL 3*
5V, 150mA / I2C data signal	Pin 15	5V Hall / I2C_SDA

Definition: View in front to motor shaft, turn CW the counter has to count upward. Otherwise change encoder channel A to B.

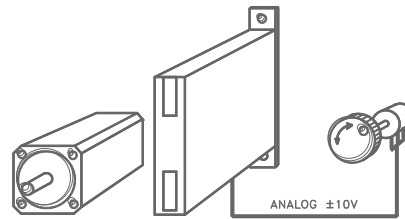
OPTIO

STEPPER CONTROL EMULATION MODE 2 standard implemented



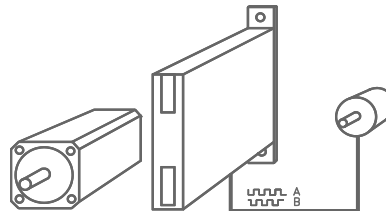
GND internal	Pin 1	white	GND
5V internal	Pin 2	brown	5V
Pull up 2,4k to 5V, differential input 26LS32	Pin 3	green	PULSE
Pull up 2,4k to 5V, differential input 26LS32	Pin 4	yellow	DIRECTION
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 5	grey	DIRECTION*
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Pin 6	pink	PULSE*
Analogue input reference, range +/-10V	Pin 7	blue	+/-10V
Analogue input reference, range 0-10V	Pin 8	red	0-10V
4-20mA input 1 / Direction signal virtual master	Pin 9	black	4-20mA_1 / DIR Out
4-20mA input 2 / Pulse signal virtual master	Pin 10	violet	4-20mA_2 / PULSE OUT

ANALOGUE FUNCTION MODE 3 standard implemented



GND internal 5V internal Pull up 2,4k to 5V, differential input 26LS32 Pull Up 2,4k to 5V, differential input 26LS32 Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32 Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32 Analogue input reference, range +/-10V Zero adjustment in startup sequence between -1V to +1V Analogue input reference, range 0-10V 4-20mA input 1 / Direction signal virtual master 4-20mA input 2 / Pulse signal virtual master	Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6 Pin 7 Pin 8 Pin 9 Pin 10	white brown green yellow grey pink blue red black violet	GND 5V PULSE DIRECTION DIRECTION* PULSE* +/-10V (ANF 2=CCW/CCW) 0 -10V (ANF 0=CCW, 1=CCW) 4-20mA_1 / DIR Out 4-20mA_2 / PULSE OUT
---	--	--	---

ENCODER 2 electronic gear Option E2



GND internal 5V internal supply E2 Pull up 2,4k to 5V, differential input 26LS32 Pull up 2,4k to 5V, differential input 26LS32 Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32 Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32 Analogue input reference, range +/-10V Analogue input reference, range 0-10V 4-20mA input 1 / Direction signal virtual master 4-20mA input 2 / Pulse signal virtual master	Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6 Pin 7 Pin 8 Pin 9 Pin 10	white brown green yellow grey pink blue red black violet	GND 5V A B B* A* +/-10V 0-10V 4-20mA_1 / DIR Out 4-20mA_2 / PULSE OUT
--	--	--	---

PLC I/O

Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode
Active low, NPN open coll. 50V/350mA, freewheeling diode

Pin 1	white	Output 1
Pin 2	brown	Output 2
Pin 3	green	Output 3
Pin 4	yellow	Output 4
Pin 5	grey	Output 5
Pin 6	pink	Output 6
Pin 7	blue	Output 7
Pin 8	red	Output 8

Power supply voltage protected with 100mA poly-switch
With 24V supply usable for Input signal level
With higher power supply voltage (e.g. 48V)
separate 24V power supply necessary

Pin 9	black	PWR
-------	-------	-----

2A	Pin 10	violet	GND
2A	Pin 11	grey - pink	GND
250mA	Pin 12	red - blue	5V

5V pull up or 24V pull down *)	Bit 0 binary coded
5V pull up or 24V pull down *)	Bit 1 binary coded
5V pull up or 24V pull down *)	Bit 2 binary coded
5V pull up or 24V pull down *)	Bit 3 binary coded

Pin 13	white - green	Input 9
Pin 14	brown - green	Input 10
Pin 15	white - yellow	Input 11
Pin 16	brown - yellow	Input 12

With MODE <10 Input 9-12 normal, with MODE >=10
input 9-12, binary coded for program numbers 1-15,
Input 8 reserved for program start

5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down
5V pull up or 24V pull down

Pin 17	white - grey	Input 1
Pin 18	brown - grey	Input 2
Pin 19	white - pink	Input 3
Pin 20	brown - pink	Input 4
Pin 21	white - blue	Input 5
Pin 22	brown - blue	Input 6
Pin 23	white - red	Input 7
Pin 24	brown - red	Input 8 (program start)

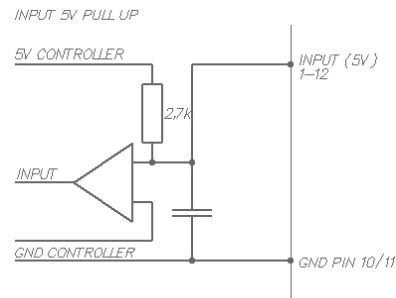
5V pull up 2.7 kΩ on 5V internal or
24V pull down 2.7 kΩ / 10 kΩ, for PNP initiators,
please specify when ordering

2A	Pin 25	white - black	GND
250mA	Pin 26	brown - black	5V

3.2 Input/Output Schematic

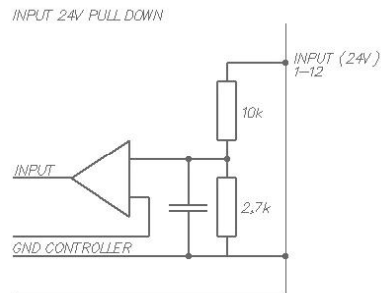
INPUT 1-12

5V Pull Up



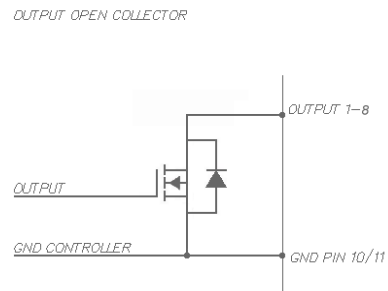
or
24V Pull Down

Input configuration 5V or 24V
(please specify when ordering)



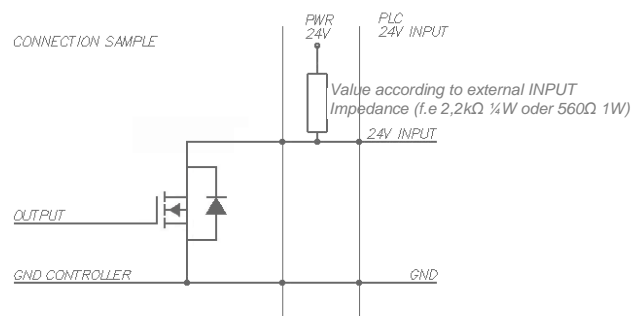
OUTPUT 1-8

50V / 350mA



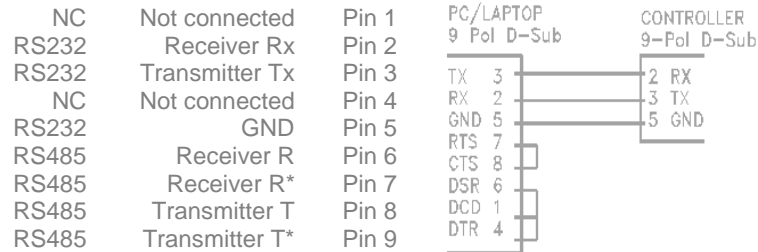
Connection example

XENAX® OUTPUT to 24V PLC Input



4 Serial interface RS232/RS485

RS 232 / RS 485, 9 Pole D-SUB (Xv 50V6)



RS 232, USB Mini plug A/B (Xvo 50V5)



4.1 Baud rate RS232 XENAX

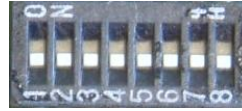
Setting the baud rate RS232 using the 8-bit CONFIG switch S1 (remove the cover to find the multi-switch)
The new baud rate will be activated after switching the device off and on again.



Baud rate		Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
RS232 9600 baud		x	x	x	x	x	x	OFF	OFF
RS232 115'200 baud (default)		x	x	x	x	x	x	OFF	ON
RS232 57'600 baud		x	x	x	x	x	x	ON	OFF
RS232 19'200 baud		x	x	x	x	x	x	ON	ON
Data	8 Bit								
Parity	none								
Stop	1 Bit								

4.2 Baud rate RS485 Xv 50V6 only

Setting the baud rate RS485 using the 8-bit CONFIG switch S1 (remove the cover to find the multi-switch)
The new baud rate will be activated after switching the device off and on again.



Baud rate	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
RS485 19200 baud (default)	x	x	x		OFF	OFF		
RS485 9'600 baud	x	x	x		ON	OFF		
RS485 38'400 baud	x	x	x		OFF	ON	x	x
RS485 free	x	x	x		ON	ON	x	x
Data	8 Bit							
Parity	none							
Stop	1 Bit							

4.3 Baud rate XPort

Important:
On operation with WebMotion® the baud rate of XPort (Ethernet gateway) must agree with the baud rate of XENAX® (Default 115'200)

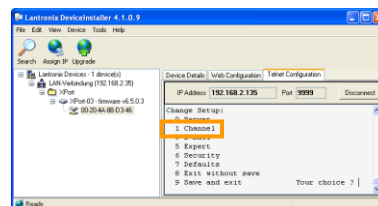
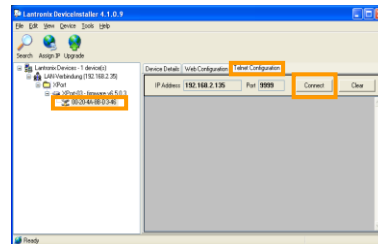
Start tool „DeviceInstaller“ and search for desired XPort.

Select MAC address, choose „Telnet Configuration“, press „Connect“ button and confirm with „Enter“ key.

Choose selection 1 (Channel 1) and set Baudrate according XENAX® setup.
Confirm all other menu items with „Enter“ key.

In the end, save setup with selection 9 (Save and exit).

Close Tool „DeviceInstaller“ and start WebMotion®.



5 Motortype definition

There are two basic types of motors supported by XENAX[®] servocontroller.

LINAX[®] linear axis

XENAX[®] Xv 50V6
12I x 24V, **Lx**
SN Xv-50V6.xxxx
JENNY SCIENCE AG

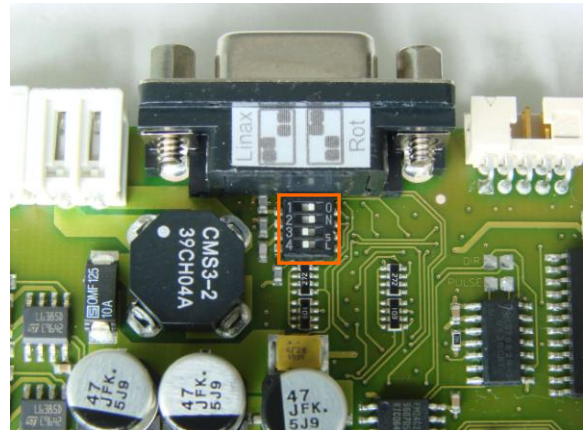
rotative servomotor

XENAX[®] Xv 50V6
12I x 24V, **Ro**
SN Xv-50V6.xxxx
JENNY SCIENCE AG

The basic motor type is set in XENAX[®] servocontroller by hardware and written on serial number etiquette

Motortype	Bit 1	Bit 2	Bit 3	Bit 4
LINAX [®] linear axis	ON	ON	OFF	OFF
rotative servomotor	OFF	OFF	ON	ON

A readjustment of the servocontroller is possible by according setup of the DIP switches.



6 Operation status on 7-Seg display

Xv 50V6

Xvo 50V5

Description	Display
No Firmware installed	F
Firmware active, Servo amplifier OFF	0
Servo amplifier ON, closed loop system active, ready for motion	1
Error, see troubleshooting	xx blinking



7 Performance data / Options

XENAX® Xv 50V6

Voltage	U 15-50VDC
Nominal current	In 0-6A
Peak current	Ip 12A
Temperature sensor	T 85°
Over-voltage monitor	Ov 58V
Ballast circuit	up to 80W
Power fuse	10A fly
Options	
CANopen	DS402
Analogue 4-20mA	2 channels
Start-up Key	ID number and Application memory
E2	Second encoder channel for electronic gear

XENAX® Xvo 50V5

Voltage	U 15-50VDC
Nominal current	In 0-5A
Peak current	Ip 12A
Temperature sensor	T 85°
Over-voltage monitor	Ov 58V
Ballast circuit	up to 80W
Power fuse	10A fly
Options	
Analogue 4-20mA	1 channel
E2	Second encoder channel for electronic gear

Accessories

WebMotion® Ethernet Adapter in cable	XPort, Ethernet and Webserver not assembled on XENAX
--------------------------------------	--

7.1 Timing TCP / IP Communication

Move command with status events

The timing is based on the absolute move command “G” and the TCP/IP socket component (Delphi) of a host application.

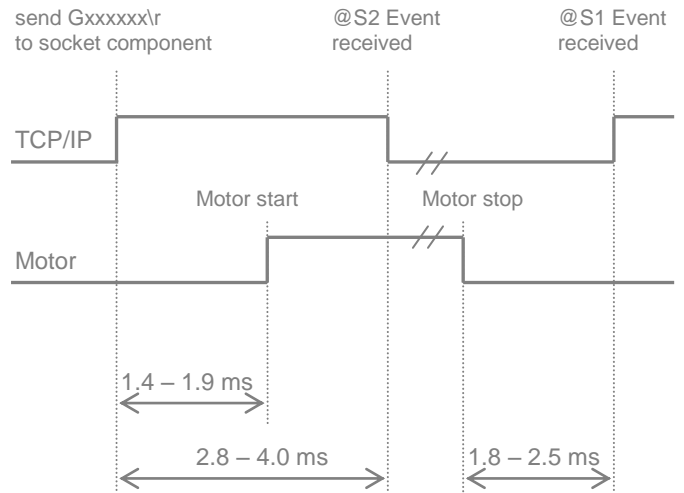
The internal baud rate of the servocontroller is set to 115'200 baud. Protocol echo is switched off.

Note:

To reduce communication time, if ECH=0 and EVT=1, no prompt sequence will be sent to the host application.

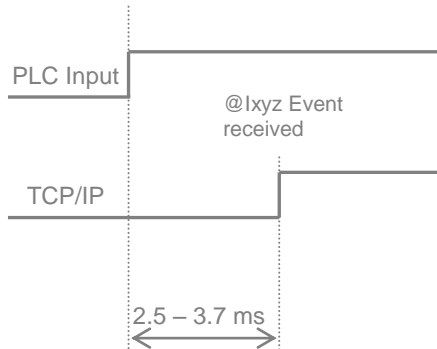
Correct handshake must be done by event messages.

This optimization relates to move command “G” only.



Input Event

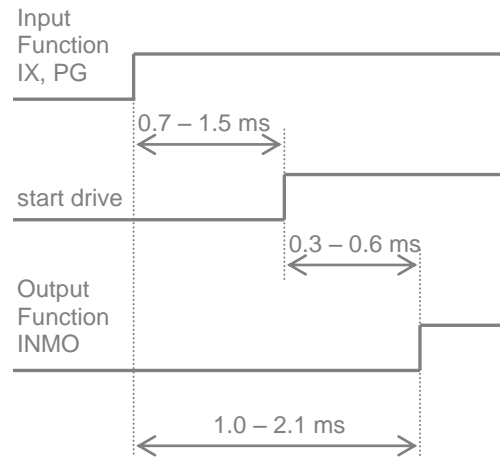
Hardware signal change state



7.2 Timing PLC I/O

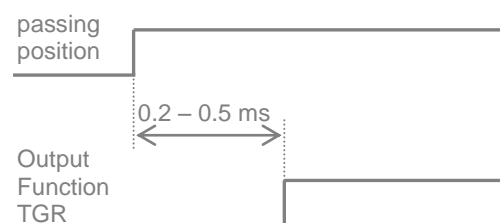
Input Function IX, PG - Output Function INMO

The timing includes the start of an input function INDEX (IX) or input function PROGRAM (PG) with index program line, until the output function IN MOTION (INMO).



Output Trigger

The measurement shows the reaction time of the output Function TRIGGER (TGR) after passing a defined position.



8 Troubleshooting

8.1 Error on 7- Segment Display

Error messages are shown on the 7-segment display as a 2-digit flashing number. It is distinguished between “wait for external condition” (WH, Wait High/ WL, Wait Low) and “error controller”. With error codes below 50 the program can be continued, above this the program will be stopped.

8.2 Error codes

Error code	Description	Notes
01 to 12	Waiting for input (low or high)	Continues if status has been reached or restarts new if SM, HO, HORM or PQ, PW
40	Driveway limitation due to soft limit values	Setup of soft limit values in WebMotion menu “online control / motion”
50	Position deviation is too large	The difference between the internal calculated position and the present motor position (encoder) is larger than the value defined as DP (deviation position) in Closed Loop, Setup.
54	LINAX [®] readhead signal go off	The signal in the measurement system of glass scale is not ok. Clean the glass scale, see LINAX [®] glass scale.
60	Over-temperature power stages	Above 85° detected by separate temperature sensor on power stage. Power stage will be switched off.
61	Over-voltage, DC power supply	Power supply voltage too high or retarding energy from servo motor too high
62	Ballast circuit too long active	The ballast circuit is still more than 5 sec continuously active: Retarding energy too high or the power supply voltage is too high, the power stage will be switched off.
63	Over-temperature LINAX [®] linear axis	Above 80° coil temperature in LINAX [®] linear motor. Power stage will be switched off
65	Field vector adjustment on the magnet pole	The adjustment on the magnet pole was not successful, travel-plate of LINAX [®] or rotor of a rotative motor is blocked or break of encoder / motor cable.
66	HORM error	Push the travel-plate by hand to a “free range” and try again with command >HORM
68	Velocity too high during HORM	Execute HORM again. Could be consecutive fault of vector field adjustment on the magnet pole.
70	Over current, in the power stages	Short circuit or ground contact in the motor cable/motor coil

8.3 Notes to Error 50

There can be different reasons for the error 50 (position deviation is too large). Please check following points:

XENAX® WebMotion® Menu Terminal

LINAX® linear axis, move the travel plate away from the cable entry, so the position counter has to count upward, change direction of travel plate, the counter has to count downward.

Rotative motors, turn the motor shaft clock-wise (View on front to the shaft), the counter has to count upward. Turn the motor shaft ccw, the counter has to count downward. If not ok, check encoder, encoder power supply, cable. In case of reverse count, change encoder channel A / B.

Test encoder counter

Test parameter in setup

I NOM	enough?
I PEAK	enough?
PROPORTIONAL	20 (Default)
INTEGRAL	20 (Default)
DERIVATIVE	20 (Default)
VELOCITY	20 (Default)
CURRENT P	20 (Default)
DEVIATE POS	5000 (Default)

Test power supply

Is there enough voltage and enough current?
With LINAX® for field vector adjustment min 2,5A.

With brushless motors test the hall and motor phase signals (wire and colours)

Unfortunately, there is no standardisation for these connections, we test in each case the motor and indicate the correct connection.
By presumption of this error, please give us the motor type, then we can offer you support.

Test if the system runs with speed reduced

With WebMotion® Menu Motion:
e.g. adjust following

- > SP 10 (x1000)
- > AC 10 (x10'000)
- > WA 10'000
- > PW
- > RR

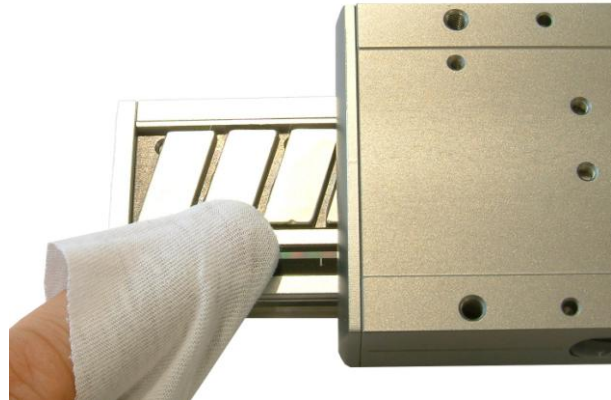
8.4 LINAX® Glass scale

Generally the glass scale should be cleaned at the end of mechanical installation. Afterwards the glass scale should not be touched any more.

If the error 54 occurs, readhead signal go off, the glass scale is dirty, a reading problem may be result.

Use a cloth and a degreasing, non-abrasive, cleaning liquid.
e.g., clear, cleaning petrol from a chemist.

Turn LINAX® upside down and push the travel plate to the mechanical limit on both side.
Thus the "soiled" area is exposed and can be cleaned.



LINAX® View of underside

8.5 Status queries with command

Command	Description	Remarks
TS	Tell Status	Status: 0 = Power OFF, 1 = Power On, 2 = In travel, 3 = Progr. active, 9 = Error
TE	Tell Error	Error numbers 01-99
TI	Tell Input	Status Input, all 12 inputs
Tlx	Tell single Input	Status Input number x, x = 1-12

9 Technical data

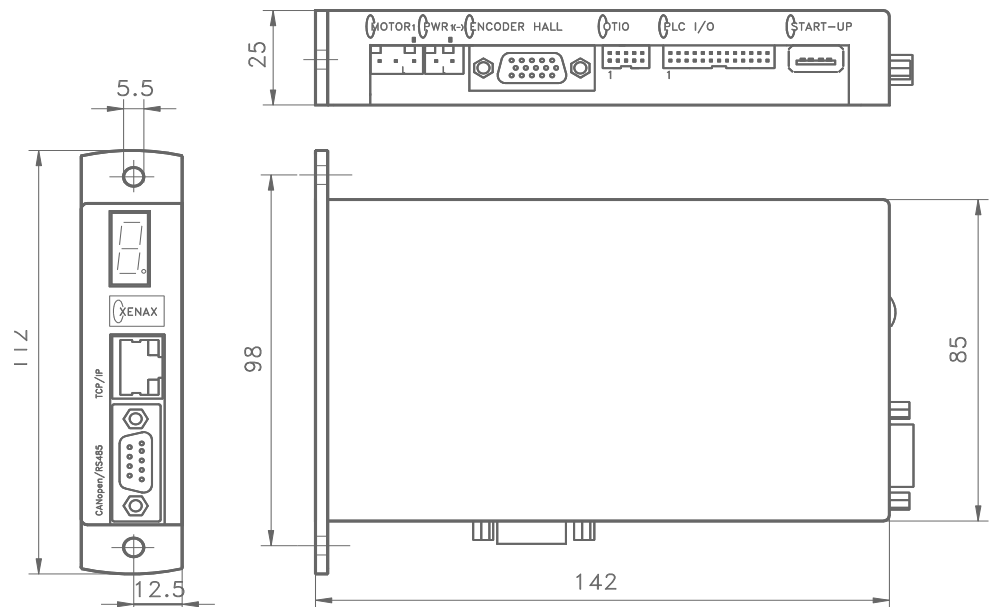
9.1 Electronics, Firmware

Description	Data
Interfaces	Ethernet, TCP/IP Stack, http Web Server CANopen (Xv 50V6), RS232, RS485 (Xv 50V6), pulse/direction, analogue, master encoder, I/O
Fieldbus, multi-axis running	Ethernet Switch, TCP/IP RS485easy (Xv 50V6), CANopen (Xv 50V6)
Status display	7-Segment display
Input digital	12 x 5V Pull-up or 24V Pull-down
Output digital	8 x 350mA, 50V
Input Function	8 Input to start a function or program direct
Output Function	8 Output to show a status
Home Function	Free programmable, incl. external sensor
Index	50 move profile (accel. / speed. / way, position)
I/O pre-selected application programs	15, Input 9-12 binary coded (MODE >=10)
Firmware Update	Via TCP/IP, Flash-Memory internal
Application and Parameter Update	Via TCP/IP, Flash-Memory internal

9.2 Dimensions

XENAX® Xv 50V6

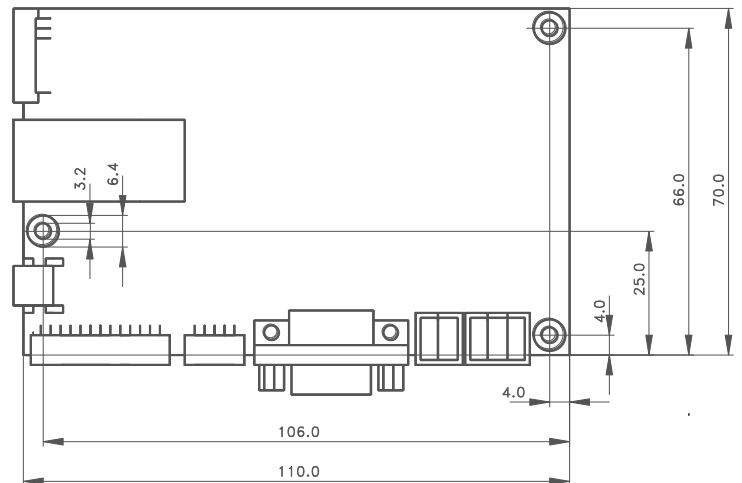
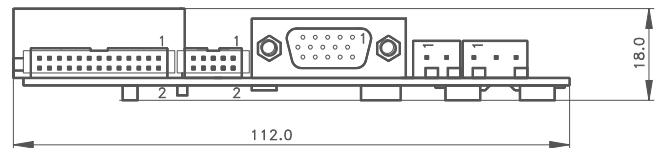
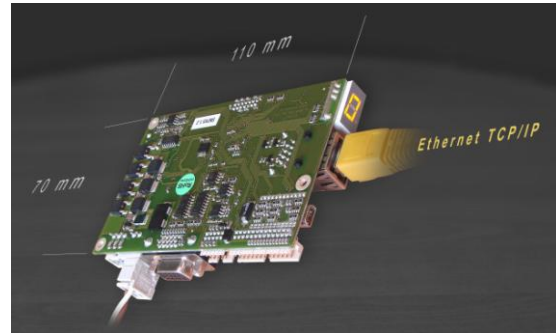
Weight Xv 50V6 360g



exceptional motion controls

XENAX® Xvo 50V5

Weight Xvo 50V5 62g without XPort
 72g with XPort



Notes

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