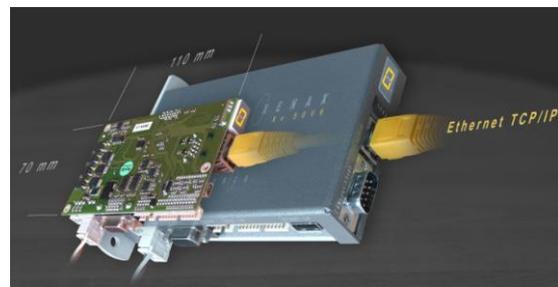


## XENAX® Xv 50V6, Xvo 50V5

### 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<sup>®</sup> servo controller Xv 50V6 and the OEM version Xvo 50V5. With them it is possible to control LINAX<sup>®</sup> 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<sup>®</sup> are already installed and XENAX<sup>®</sup> is ready for use.

XENAX<sup>®</sup> can be put into operation simply and quickly with the intuitive user-software WebMotion<sup>®</sup>. 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\*

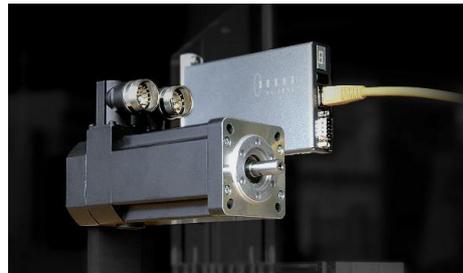
Specially supported are the following:  
Distance coded reference mark, no external  
home sensor is necessary.  
Temperature query over I<sup>2</sup>C bus



### 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“



## 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
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<sup>®</sup>, [the DeviceInstaller](#) tool is used.

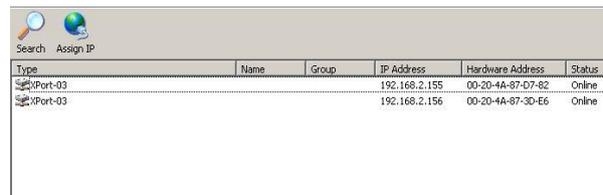
Use the adjacent link and click [DeviceInstaller](#). Select the component [Xport](#) and install it.

<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

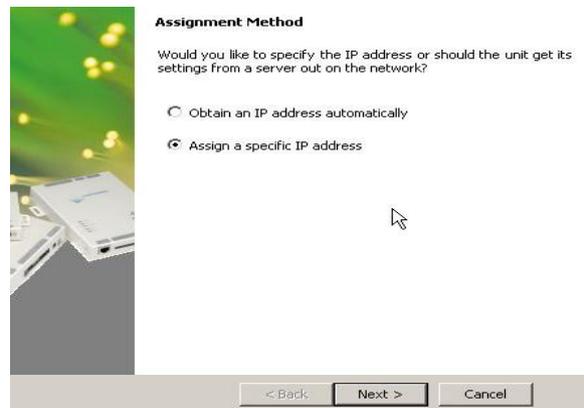
Start the Device Installer of Lantronix and choose [Search](#) to look for existing IP addresses.



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

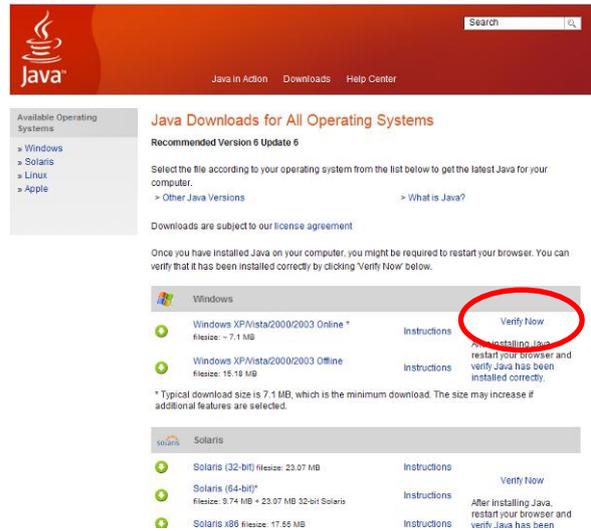
< Back    Next >    Cancel

## 2.5 JAVA plugin check

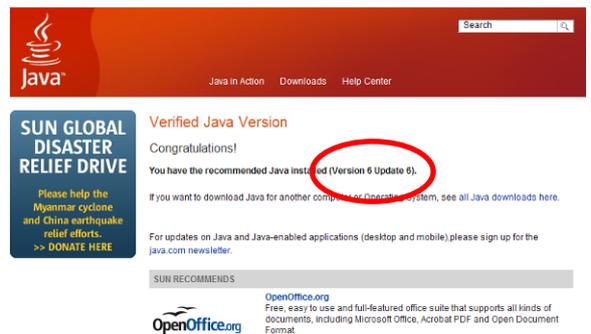
In case of problems with JAVA software you can execute a check with the link on right side.

<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.

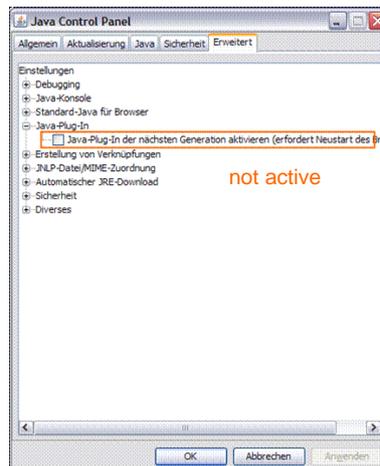
### Remark

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



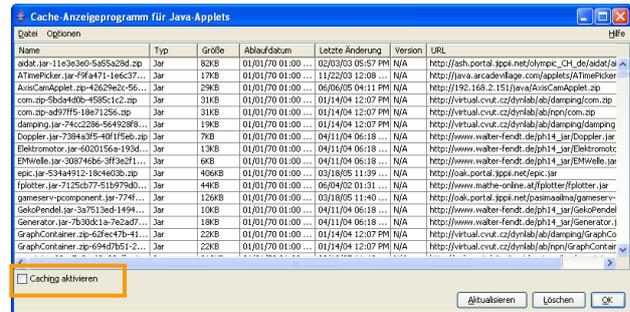
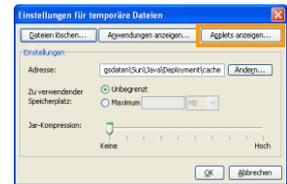
## 2.6 Applet Cache

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<sup>®</sup> plugs „MOTOR“ and „ENCODER/HALL“.  
Connect DC power supply to PWR plug.  
Pin1 (-) is GND /0V and Pin 2 Voltage 15-50V.

XENAX<sup>®</sup> 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®

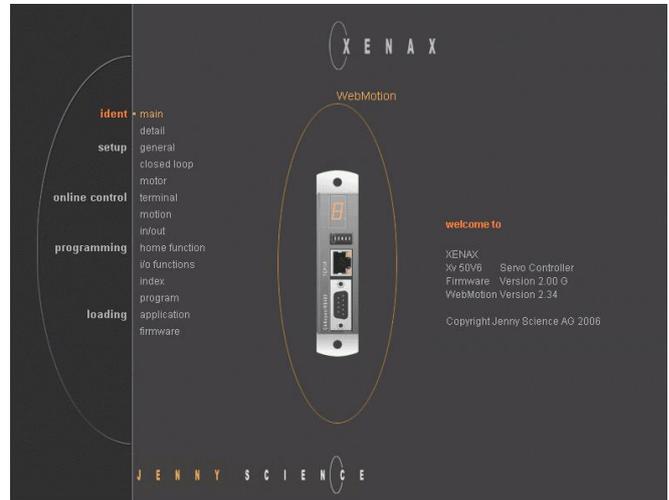
Start your Web-Browser with the IP address number, adding /WebMotion.html as a suffix.

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

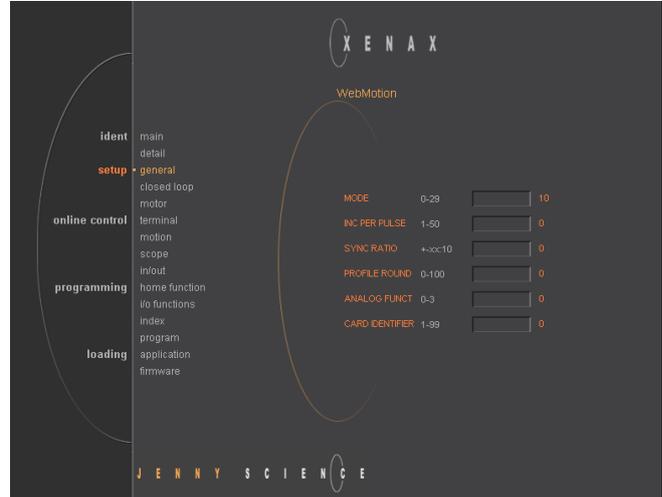
#### HORM DIRECTION

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

Default values for closed loop parameters are 20 for all. With this setting LINAX<sup>®</sup> 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).



Remarks for practice

### 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

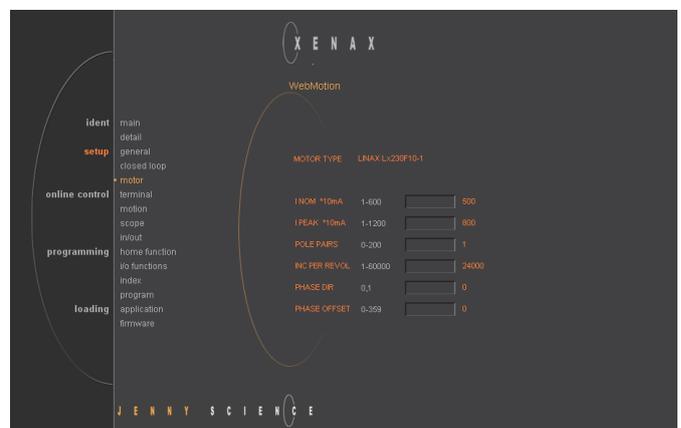
Number of encoder increments per revolution by AC / DC / EC brushless servo motors.  
With DC brush-type servo motors it is irrelevant.  
Linear axis:  
Lx 44F04, INC PER REVOL = 12'000  
other LINAX® products like Lx ..F10, Lx ..F40, Lxe F40, INC PER REVOL = 24'000

#### 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



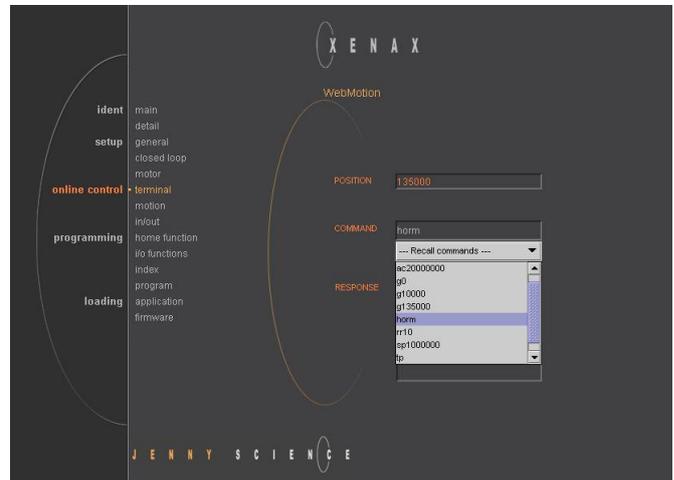
## 2.14 Terminal

XENAX<sup>®</sup> 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<sup>®</sup>



## 2.15 ASCII Protocol

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

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

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

Continuation command set XENAX®

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

/ ? Query the programmed value

<sup>2)</sup> 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 @l	x				y				z			
Example event @l	"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<sup>®</sup> servocontroller or application download, default settings are

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

## 2.18 XENAX<sup>®</sup> 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/s<sup>2</sup> 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)

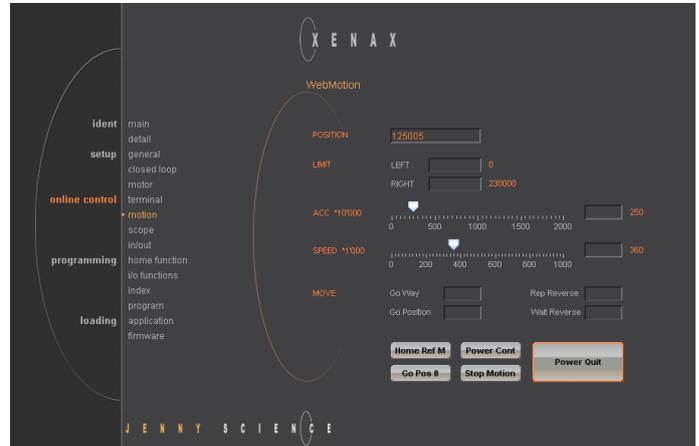
Input of the position absolute to the zero point in Increments. Start with "Enter".

### 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)

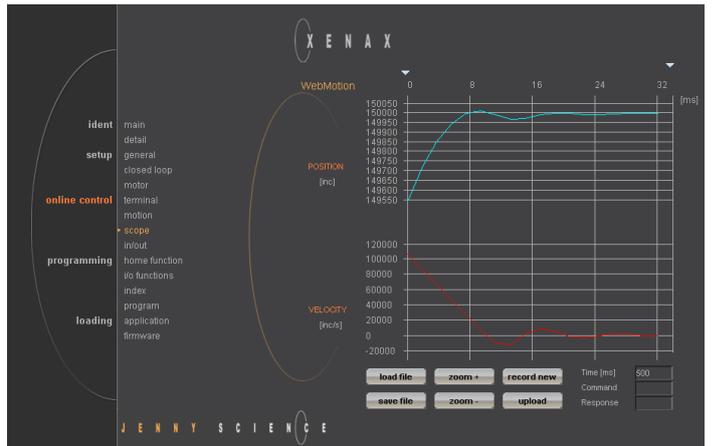
**record new**  
Initialization of a new recording sequence.  
Wait for message „ready for recording next motion“  
Start motion (e.g. G150000)



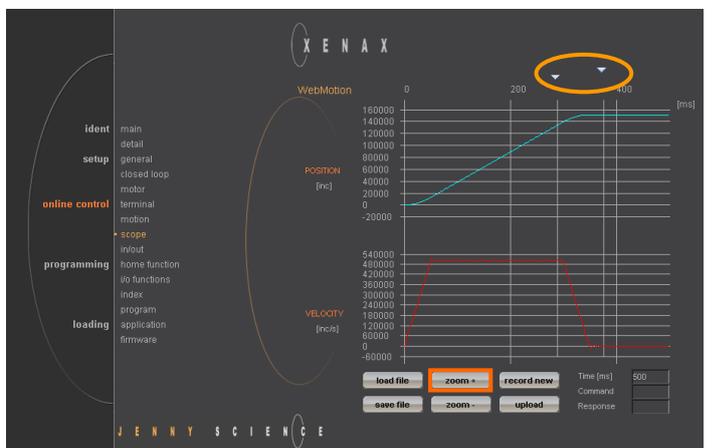
**upload**  
After selected recording time, data can be uploaded from servocontroller.

**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

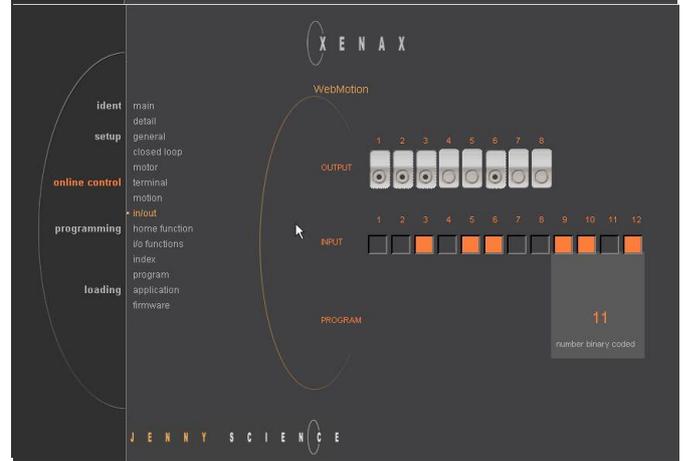
ON and OFF of outputs via mouse click.

### 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  $F = \text{motor current} \times \text{force constant}$

### HOME DEV POS

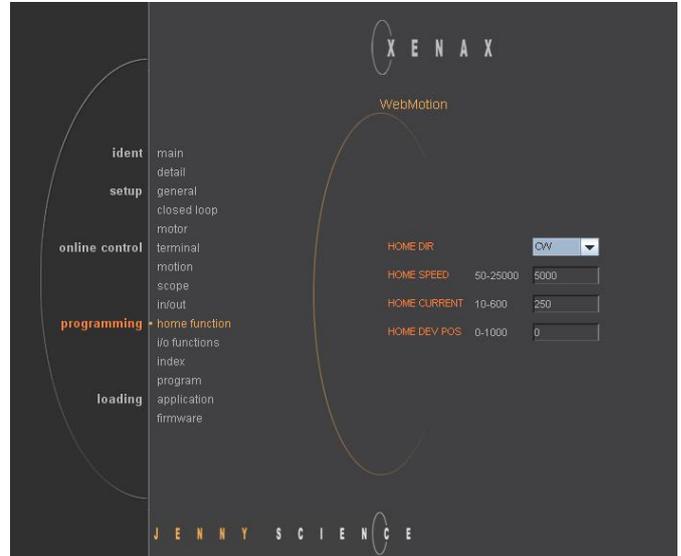
Maximum deviation position to the last homing position [INC].

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



**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.

2.24 I/O Functions



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/s<sup>2</sup>)  
SPEED (100-5'000'000 Inc/s<sup>2</sup>)  
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

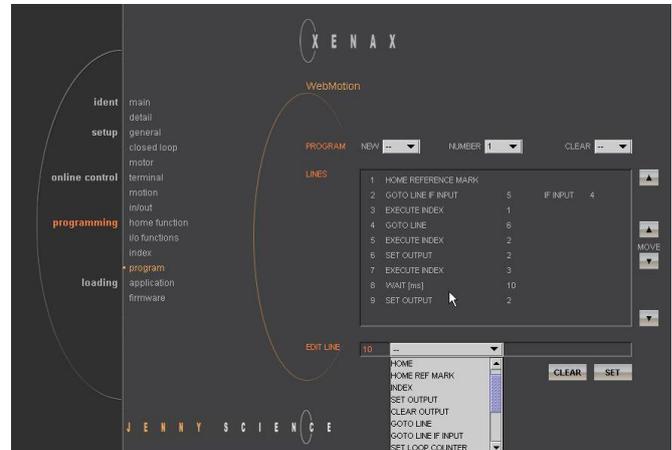
### LINES

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 XX

### POSITION CORRECTION

### Note:

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

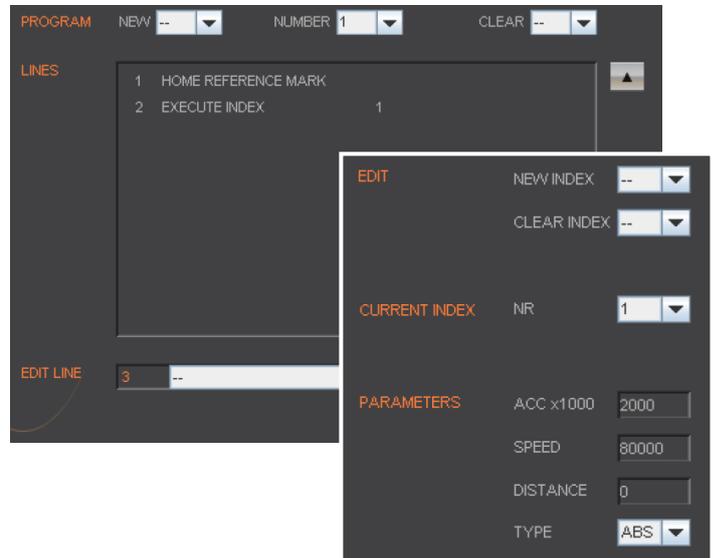
**Example: Initialization LINAX®**

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.

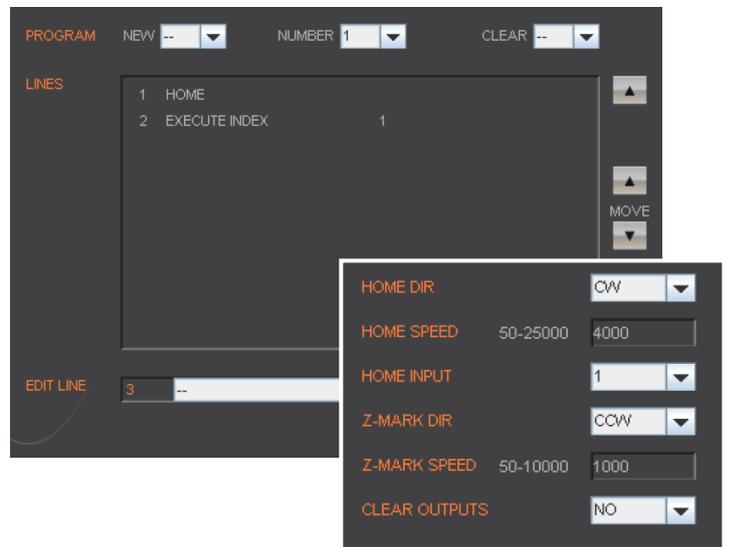


**Example: Initialization rotative motor**

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 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

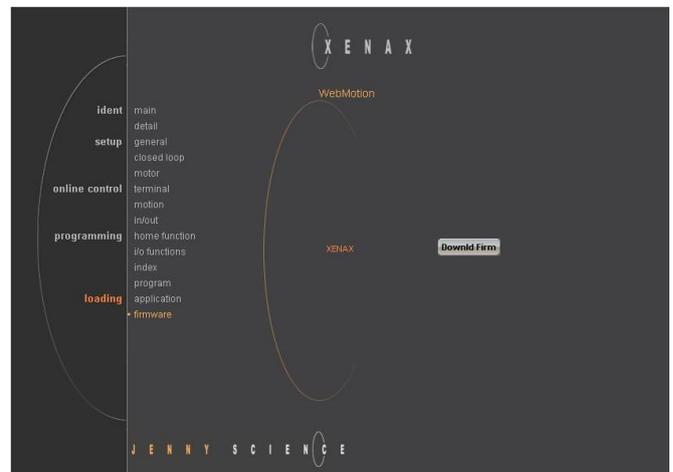
Install a new version of firmware to XENAX®

### DOWNLOAD

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

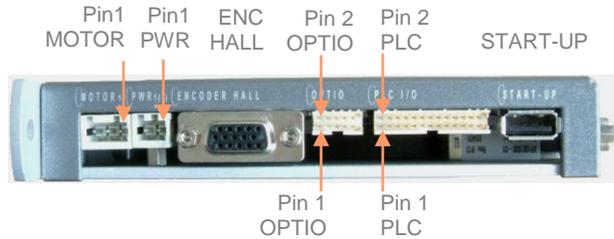
The download runs automatically and after the installation all functions are available immediately.

During download process all functions are inactive.

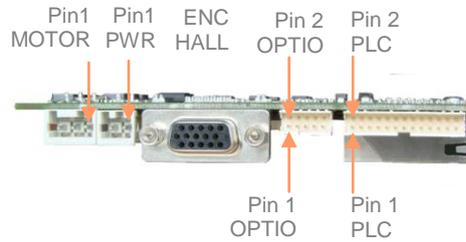
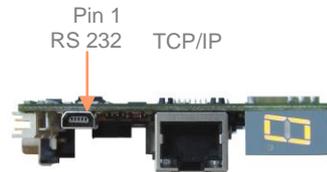


### 3 Electrical connections

#### Xv 50V6



#### Xvo 50V5



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<sup>®</sup> / 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.

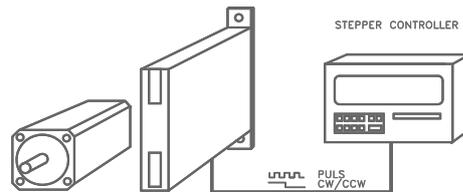
## ENCODER HALL

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

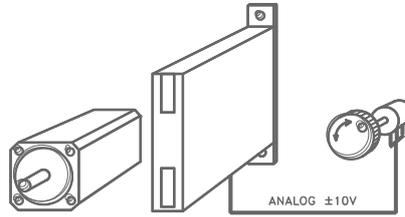
## OPTIO

STEPPER CONTROL EMULATION MODE 2  
standard implemented



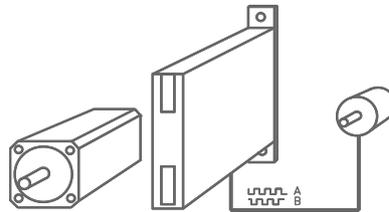
GND internal	Pin 1	white	GND
5V internal	Pin 2	brown	5V
<b>Pull up 2,4k to 5V, differential input 26LS32</b>	<b>Pin 3</b>	<b>green</b>	<b>PULSE</b>
<b>Pull up 2,4k to 5V, differential input 26LS32</b>	<b>Pin 4</b>	<b>yellow</b>	<b>DIRECTION</b>
<b>Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32</b>	<b>Pin 5</b>	<b>grey</b>	<b>DIRECTION*</b>
<b>Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32</b>	<b>Pin 6</b>	<b>pink</b>	<b>PULSE*</b>
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



<p><b>GND internal</b> 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</p> <p><b>Analogue input reference, range +/-10V</b> Zero adjustment in startup sequence between -1V to +1V</p> <p><b>Analogue input reference, range 0-10V</b> 4-20mA input 1 / Direction signal virtual master 4-20mA input 2 / Pulse signal virtual master</p>	<p><b>Pin 1</b> white <b>Pin 2</b> brown <b>Pin 3</b> green <b>Pin 4</b> yellow <b>Pin 5</b> grey</p> <p><b>Pin 6</b> pink</p> <p><b>Pin 7</b> blue</p> <p><b>Pin 8</b> red <b>Pin 9</b> black <b>Pin 10</b> violet</p>	<p><b>GND</b> 5V PULSE DIRECTION DIRECTION*</p> <p>PULSE*</p> <p><b>+/-10V (ANF 2=CW/CCW)</b></p> <p><b>0 -10V (ANF 0=CW, 1=CCW)</b> 4-20mA_1 / DIR Out 4-20mA_2 / PULSE OUT</p>
--	---	--

ENCODER 2  
electronic gear  
Option E2



<p><b>GND internal</b> 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</p> <p>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</p>	<p><b>Pin 1</b> white <b>Pin 2</b> brown <b>Pin 3</b> green <b>Pin 4</b> yellow <b>Pin 5</b> grey</p> <p><b>Pin 6</b> pink</p> <p><b>Pin 7</b> blue <b>Pin 8</b> red <b>Pin 9</b> black <b>Pin 10</b> violet</p>	<p><b>GND</b> 5V A B B*</p> <p>A*</p> <p>+/-10V 0-10V 4-20mA_1 / DIR Out 4-20mA_2 / PULSE OUT</p>
--	--	---

**PLC I/O**

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

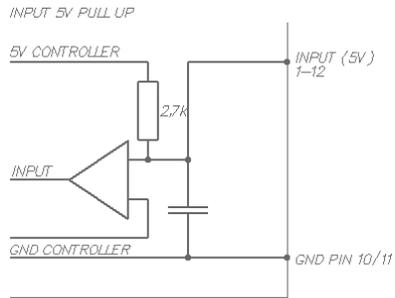
5V pull up 2.7 kΩ on 5V internal or  
 24V pull down 2.7 kΩ / 10 kΩ, for PNP initiators,  
 please specify when ordering

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

### 3.2 Input/Output Schematic

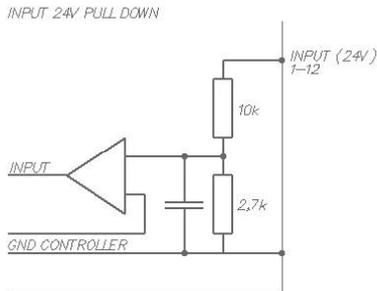
#### INPUT 1-12

5V Pull Up



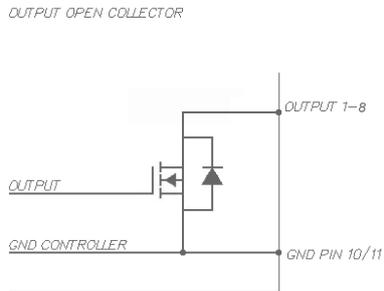
OR  
24V Pull Down

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

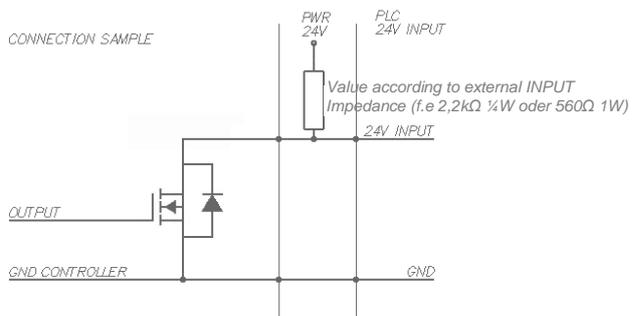


#### OUTPUT 1-8

50V / 350mA



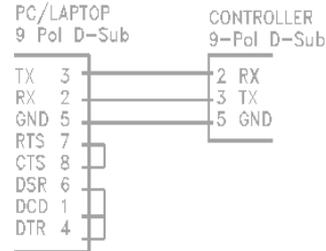
Connection example  
XENAX® OUTPUT to 24V PLC Input



## 4 Serial interface RS232/RS485

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

NC	Not connected	Pin 1
RS232	Receiver Rx	Pin 2
RS232	Transmitter Tx	Pin 3
NC	Not connected	Pin 4
RS232	GND	Pin 5
RS485	Receiver R	Pin 6
RS485	Receiver R*	Pin 7
RS485	Transmitter T	Pin 8
RS485	Transmitter T*	Pin 9

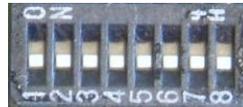


	+3.3V	Pin 1
RS232	Receiver Rx	Pin 2
RS232	Transmitter Tx	Pin 3
NC	Not connected	Pin 4
RS232	GND	Pin 5

### 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)

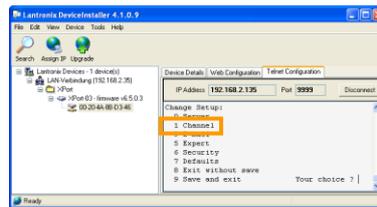
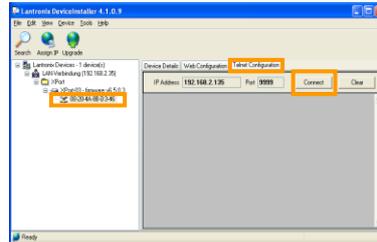
Start tool „DeviceInstaller“ and search for desired XPort.

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<sup>®</sup> servocontroller.

**LINAX<sup>®</sup> linear axis**

XENAX<sup>®</sup> Xv 50V6  
12I x 24V, **Lx**  
SN Xv-50V6.xxxx  
JENNY SCIENCE AG

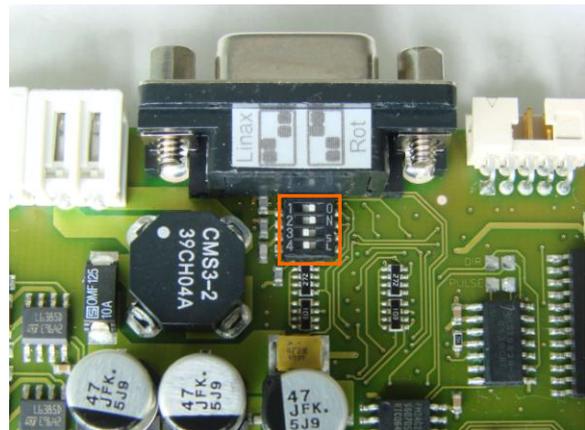
**rotative servomotor**

XENAX<sup>®</sup> Xv 50V6  
12I x 24V, **Ro**  
SN Xv-50V6.xxxx  
JENNY SCIENCE AG

The basic motor type is set in XENAX<sup>®</sup> servocontroller by hardware and written on serial number etiquette

Motortype	Bit 1	Bit 2	Bit 3	Bit 4
LINAX <sup>®</sup> 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.



exceptional motion controls

## 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

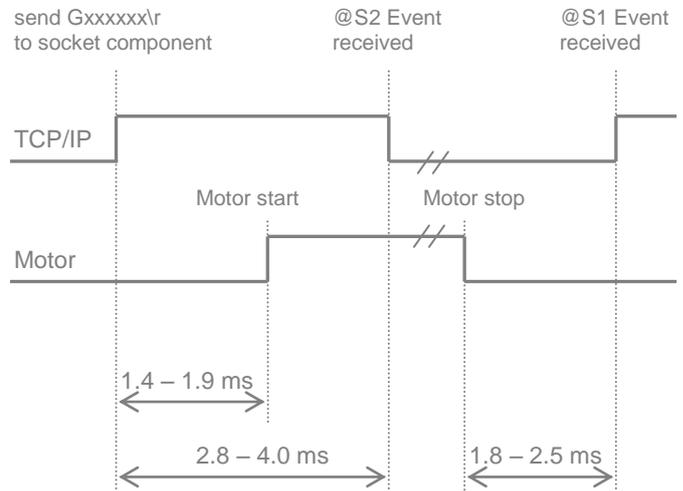
#### Move command with status events

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

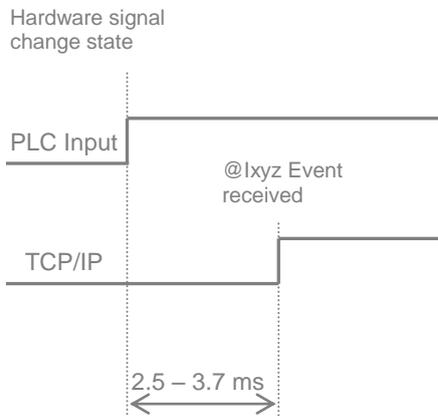
The internal baud rate of the servocontroller is set to 115'200 baud. Protocol echo is switched off.

**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.



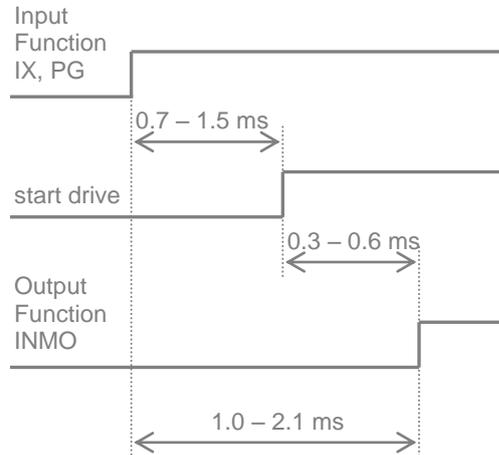
#### Input Event



## 7.2 Timing PLC I/O

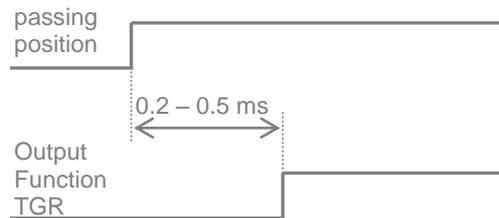
### Input Function IX, PG - Output Function INMO

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 <sup>®</sup> readhead signal go off	The signal in the measurement system of glass scale is not ok. Clean the glass scale, see LINAX <sup>®</sup> 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 <sup>®</sup> linear axis	Above 80° coil temperature in LINAX <sup>®</sup> 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 <sup>®</sup> 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

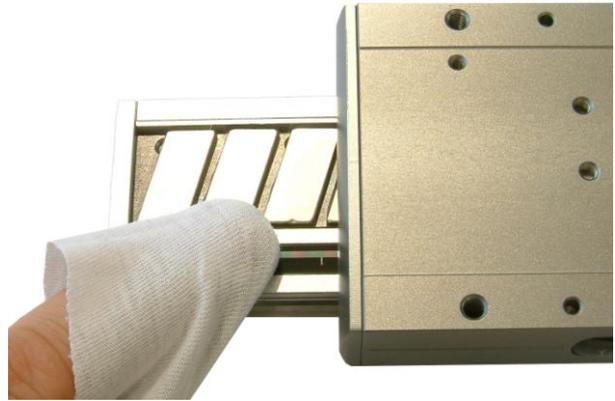
### 8.4 LINAX® Glass scale

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

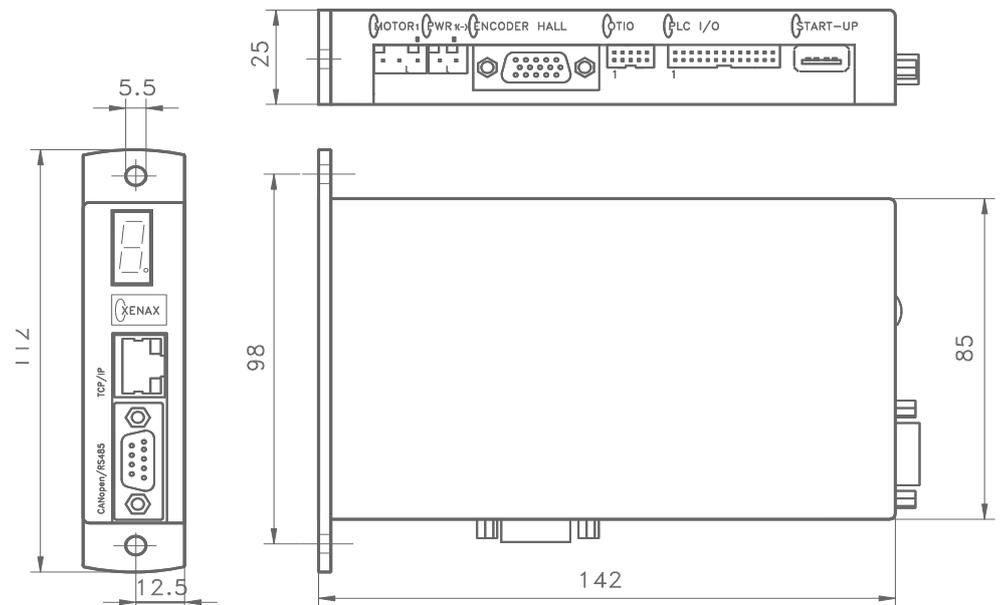
### 9.1 Electronics, Firmware

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

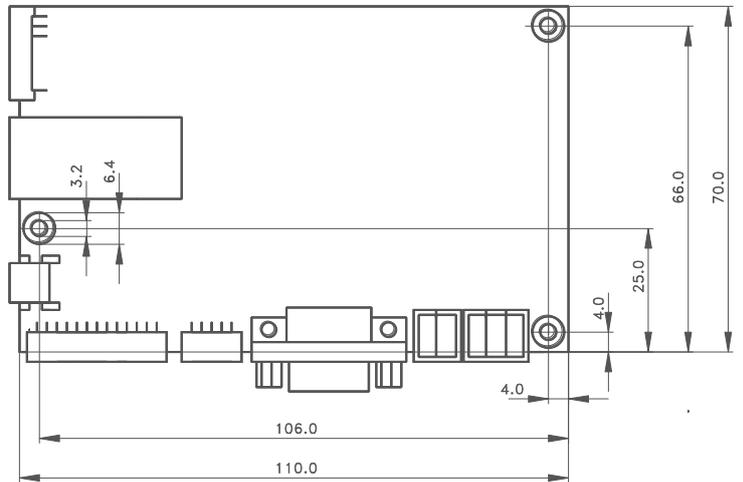
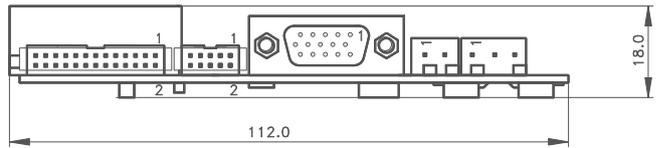
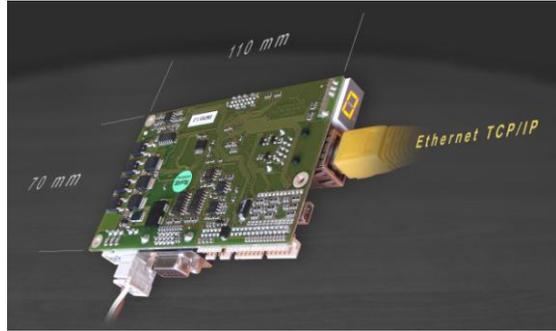
Weight Xv 50V6 360g



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XENAX® Xvo 50V5

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



## Notes

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