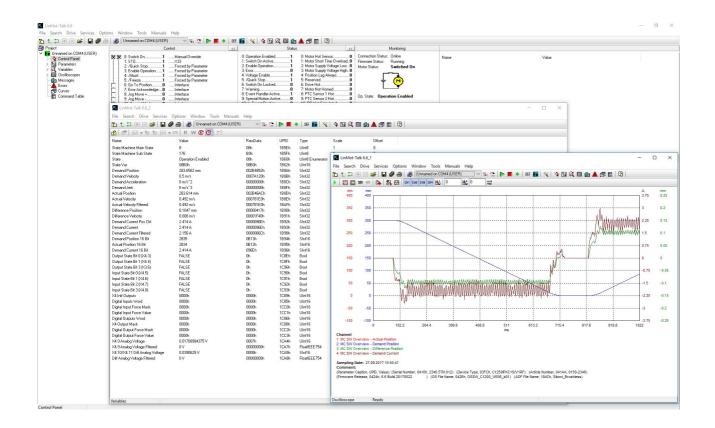


# LinMot-Talk 6 Configuration Software

# Manual



Doc.: 0185-1059-E\_6V7\_MA\_LinMotTalk



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#### Note

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# LinMot®

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# 1 Introduction

The LinMot-Talk 6 software is a PC based tool, which helps the user in a comfortable way <u>installing firmware</u> on the drive, setting up the drive's configuration, defining and programming motion profiles, emulating the PLC, watching variables and reading messages and errors. The LinMot-Talk 6 works with the drive series A1100, B1100, C1100, E1100, C1200, E1200, E1400 and B8050. It replaces the LinMot-Talk1100 software. For the rest of this document and all other documents, the more general term "LinMot-Talk" will be used for the Linmot- PC configuration software.

# 1.1 System Generation (SG)

The LinMot drive families are based on different hardware platforms, which are called system generations. The abbreviation is "SG". Whereas differences of hardware of software functionality exist between the system generations, the documentation is marked with the "SG" term. The following table gives an overview of which drive family belongs to which SG:

SG	Drives
SG1	Families E400, E4000 V1 (not supported by LinMot-Talk 6)
SG2	Families E400, E4000 V2 (not supported by LinMot-Talk 6)
SG3	Family E1100 (GP, CO, DN, DP) (LC/HC/XC)
SG4	Family B1100 (VF, PP, GP, ML) (LC/HC/XC)
SG5	Family E1200 (GP, DP, DS, EC, IP, PD, PL, PN, SC, SE) Family E1400 (GP, DP, DS, EC, IP, PD, PL, PN, SC, SE) (0S/1S) Family B8000-ML (GP, EC, IP, PL, SC)
SG6	Family C1250 (DS, EC, IP, PD, PL, PN, SC, SE) (0S/1S) Family E1400V2 (GP, DP, DS, EC, IP, PD, PL, PN, SC, SE) (0S/1S)
SG7	Family A1100 Family C1100 (GP, DS, EC, PD, PN, SE) (0S/1S)

### 1.2 UPID (Unique Parameter ID)

All parameters have an assigned identification number, which is called a UPID (Unique Parameter ID). All parameters are accessed on the drive over this identification.

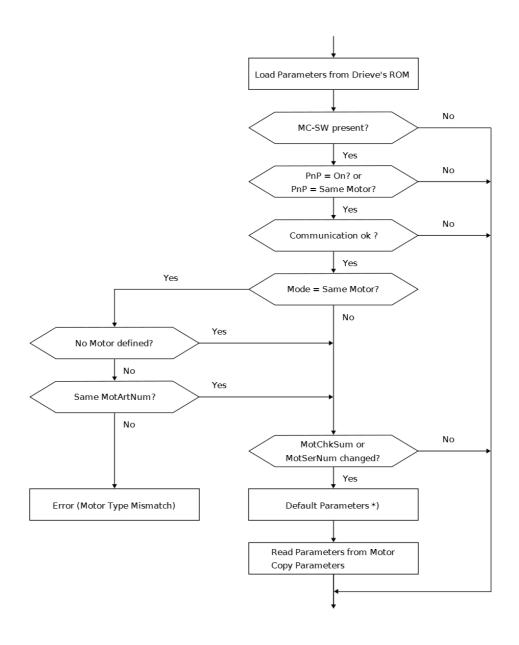
### 1.3 PnP (Pug and Play)

The drive families A1100, C1100, C1200, E1200 and E1400 support the so called "Plug and Play" functionality. When a motor is connected to the drive, the motor will be automatically detected and the parameters will be set accordingly. The drive then can control the motor without any further configuration procedure. When starting the motor wizard, the connected motor is already selected and all the further configuration, such as exact slider, moving mass, friction etc can be set up.

All components (drives and motors) which support the plug and play functionality are marked on the type label with "PnP".

The drive startup sequence is the following:





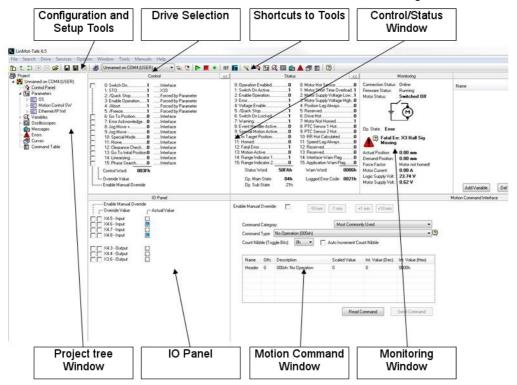
\*) All parameters, which are set by the previous PnP motor and do not exist in the new motor will be set to default values prior to load the new parameters.



# 2 Overview

The most used functions after a start of the LinMot-Talk software is <u>Install firmware</u> or <u>Login to a drive</u>.

The following screenshot gives an overview of the different functions integrated in the LinMot-Talk software. The Configuration and Setup Tools the Drive Selection and the Shortcuts to Tools are in the <u>tool button bar</u>. In the <u>control panel</u> are the Control/Status Window, the IO Panel, the Motion Command Window and the Monitoring Window.



#### 2.1 Tool button bar

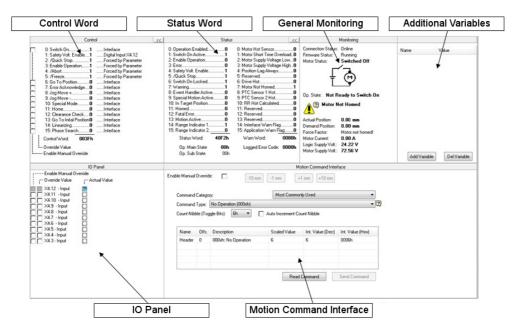
- Show/Hide Tree shows or hides the project tree window.
- 1 Up sets the focus in the project tree to the parent of the selection.
- 📜 Toggle toggles between the last two displayed tree branches.
- *Import Configuration* imports configurations to the drives.
- Export Configuration exports configurations. Different drives and parts, such as parameters, variables, oscilloscope or curves, can be selected to be exported.
- Print prints items like curves, parameter configurations etc.
- B Install Firmware Start the drive's firmware installation.
- 🖳 Open Login, login to all drives in the selected workspace.
- 🔁 Save Login, save the actual workspace
- 🜔 Reboot restarts the firmware on the drive.
- Stop stops the firmware on the drive, used for downloading and software configuration.
- Slink sends a blink LED command to the drive, which is selected.



- Default: Parameters can be defaulted by instances. With this button, the default parameter procedure is started. A window will be shown where the instances (OS, MC, INTF and APPL software) can be selected. All parameters of the selected instances will be set to their default value.
- **Go** Offline logs out from actual drive.
- K Start Motor Wizard starts the motor configuration setup wizard.
- Show Control Panel switches to the control panel.
- Es Show Parameters switches to the variables.
- Show Variables switches to the variables.
- El Show Oscilloscope switches to the oscilloscope.
- Show Messages switch to the message viewer.
- <u>Show Errors</u> switches to error viewer.
- Show Curves switches to the curve tool.
- Show Command Table switches to the command table editor.
- Show Object Inspector displays a window in which shows help information to each selected object.
- 🕅 Shows one decimal place more, for numbers like variable values. This button is only activated when the option "Round the decimal places" is activated.
- Shows one decimal place less, for numbers like variable values. This button is only activated when the option "Round the decimal places" is activated.
- (1) Activates the <u>Information Window</u>. This window will be showed on the bottom of the LinMot-Talk when there is a message inside and it is activated.

#### 2.2 Control Panel

The Control Panel helps the user to access directly to the control and status word of the MC Software. The drive can be commanded from the PC, thus no PLC is necessary to be used for the first commissioning.



• **Control Word** The MC software's control word can be directly written from the PC. For taking over the PC control the left check box (Enable Manual Override) must be selected. The state of each flag can be set with the right check box (Override Value). If other flags have to be altered, the override mask must be configured in the



parameter tree under \Parameters\Motion Control SW\State Machine Setup\Control Word\Ctrl, Word Parameter Force Mask.

- **Status Word** The status word shows the actual state of the drive's MC software status word. It is updated automatically.
- General Monitoring This window displays actual motor and drive information
- Additional Variables In this window variables could be chosen, then they are shown in the list and would updated automatically.
- **IO Panel** For commissioning. The user can take control of the X4 IOs on E1100 or X14 IOs on B1100 drives.
- Motion Command Interface The MC software's motion command Interface can be directly accessed over this window. When enabled (Enable Manual Override switch must be set), MC commands can be selected, parametrized and sent to the drive. Because the motion command interface is, independent of the interface running on the drive, the same, the commands can be exactly tested before programming them in the PLC.

#### 2.3 Messages

This panel reads out and shows all messages, which are logged on the drive, and displays them in chronological order. If logged in a B1100 series drive, this window does not appear, because those drives do not support message logging. To get some informations aubout a message, select the message and press F1, the object inspector will show some information about the selected message.

	ns Window Tools		
	med, IP: 10.3.10.126 (U	SER) 🔽 Þ 📕 🔶 🔢 💐 😵	li 🔇 🖬 🕼 🔺 🗇 🗉 🔍
Project	1		
Unnamed, IP: 10.3.10.126 (USER)	Event Time	Message	Source
	001604:11:32.773	MC SW Started	MC SW State Machine
Variables	001604:11:30.710	Software Reset	OS
Oscilloscopes	001604:11:23.897	MC SW Stopped	MC SW State Machine
Messages	001584:39:45.813	Trn To Error State	MC SW State Machine
- A Errors	001584:39:44.008	MC SW Started	MC SW State Machine
- 🗗 Curves	001584:39:41.945	Software Reset	OS
Command Table	001582:00:44.953	MC SW Stopped	MC SW State Machine
	001581:40:15.176	Trn To Ready To Switch On State	MC SW State Machine
	001581:10:53.469	Trn To Operation Enabled State	MC SW State Machine
	001581:10:50.487	Trn To Ready To Switch On State	MC SW State Machine
	001581:10:26.394	Trn To Error State	MC SW State Machine
	001581:10:01.482	Trn To Ready To Switch On State	MC SW State Machine
	001581:09:53.817	MC SW Started	MC SW State Machine
	001581:09:51.754	Software Reset	OS
	001581:09:51.603	MC SW Stopped	MC SW State Machine
	001581:04:01.988	Trn To Error State	MC SW State Machine
	001581:04:00.183	MC SW Started	MC SW State Machine
	001581:03:58.120	Software Reset	OS
	001581:03:57.969	MC SW Stopped	MC SW State Machine
	001581:03:41.101	Trn To Error State	MC SW State Machine
	001581:03:39.296	MC SW Started	MC SW State Machine
	001581:03:37.233	Software Reset	OS
	001581:03:37.082	MC SW Stopped	MC SW State Machine
	001581:03:28.981	Trn To Error State	MC SW State Machine
	001581:03:27.176	MC SW Started	MC SW State Machine
	001581:03:25.113	Software Reset	OS

#### 2.4 Errors

This panel reads out and shows all errors, which are logged on the drive and displays them in chronological order. Install new firmware will logged because it is interesting if the error was before or after installing a new firmware.

To receive more information about an error, select the error and press F1, the object inspector will show some information about the selected error. It is possible to get the information about all errors by generate an error list under Manuals -> Errors. The error list is a HTML Document and will open in a browser. There are error lists for every



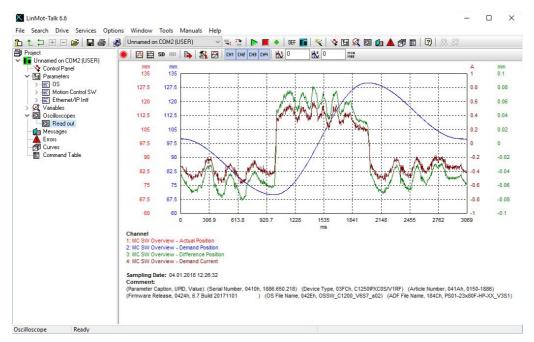
software layer. Therefore it is important to have a look on the source of an error. The source symbolises the layer where the error is explained.

KinMot-Talk 6.7 File Search Drive Services Opt	ions Window Tools	Manuals	Help			
6t 🕽 🗄 🖻 🚅 📕 🎒	릟 🛛 Unnamed on COM4 (	Para	meters and Variables	•	) DEF 📷 📉 😽 🛅	i 🕰 國 🔔 🔺 🗊 🖬 📿   🔅 🍀 🚺
Project	8	Erro	rs	•	MC Layer	
Unnamed on COM4 (USER)	Event Time	Motion Commands			Interface Layer	Irce
> 🔚 Parameters	001940:49:45.335	Rele	vant Documents	•	Application Layer	SW Error Handler
> 🐼 Variables > 📴 Oscilloscopes	001930:56:49.452 001926:17:53.197	All E	All Documents		• MC 05	SW Error Handler
Messages	001921:27:29.427	0001h	Err: Logic Supply To	o Low	MC	SW Error Handler
A Errors	001919:46:46.972	00BBh	New Firmware Instal	led	OS	
Curves	001912:07:02.844	0001h	Err: Logic Supply To	o Low	MC	SW Error Handler
Emilia Command Table	001909:18:12.355	0067h	Cfg Err: Wrong State	ог Тури	e MC	SW Error Handler

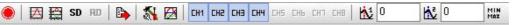
#### 2.5 Oscilloscope

The drive's built in oscilloscope, which can record up to eight channels in real time, is controlled with the oscilloscope tool.

During login the oscilloscope reads out the settings and data from the drive. If an oscilloscope shot is running or ready to read out data, an item called "Read out" will be displayed. Otherwise a default item will be generated.



The oscilloscope is controlled with the buttons



The functions are (from left):

- Start/Abort Start or abort an oscilloscope shot. The button changes the symbol
   Abort the actual record.
   Abort the continous mode and stop after the next record.
- EXAMPLE A Displays the recorded channels such as they fit best in the scope window.
- EXAMPLE THE SAME UNIT SAME IT Displays the recorded channels such as the channels with the same unit have the same scaling and offset.
- SD Save Display stores the settings for zoom, scaling and offset.
- RD Recall Display restores the settings for zoom, scaling and offset, which are previously stored with Save Display.
- Export Data: Export data and setups of the last recorded oscilloscope shot in a csv file.



- Solution Settings Switch to setup mask for channels, triggers, times and modes.
- Display Settings is used to set scale, offset and color for the oscilloscope channels.
- **Show/Hide:** Show and hide the oscilloscope channels.
- Show/Hide Cursor: Two time cursors can be displayed for measuring the signals.
- MIN Statistics Value: This button opens a window that shows some statistics value for each channel. The calculation is between the two cursors. When both cursor are disabled then the calculations are over the whole oscilloscope shot.

#### 2.6 Curves

With the curve tool, motor motion profiles can be easily created, joined, uploaded, downloaded and saved. NOTE: On B1100 the curve feature must be enabled with an access key.

LinMot-Talk 5.0 File Search Drive Services Options W	indow Tools Ma	nual	s Help			
🛅 👠 🕽 🚅 🔲 🎒 🕵 Unnamed, IP:		-		V 🗄 🔍 🖬 🖉		3
Project		_		Edit Window		
Innamed, IP: 10.3.10.126 (USER) Scontrol Panel						
P-15 Parameters	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
▶ Strait     Variables       ▶ Image: Cascilloscopes       ▶ Image: Carves       ▶ Image: Carves       ▶ Image: Command Table	SineOut		Position vs. Time Position vs. Time Position vs. Time	Sine Sine None	1000 ms 500 ms 1500 ms	501 501 1501
	$\times \sim \land \approx$	X				
			) <del>6</del> 8	Download Window		
	🛛 🖥 🛓 Upload from					ged! Please download.
	Name	ID		Setpoint Wizard	Length	No. of Setpoints
	SineOut SineIn	1 2	Position vs. Time Position vs. Time	Sine Sine	1000 ms 500 ms	501 501
	SinOutIn Curve			None	1500 ms	1501
	μ					

The curve tool is divided into the edit and the download window.

The edit window is used to generate, merge and modify curves with the following buttons:



- New Curve Starts the curve wizard, which guides through the curve generation.
- Edit Properties The properties of a selected curve, like name, time or stroke, can be modified.
- **Edit Curve Values** The curve points can be manually edited.
- Join Curves All selected curves are joined. A wizard will be started for defining the curve properties of the joined curve.

The download window is used to manage the curves, which are stored on the drive or have to be downloaded. Modifications in this window will show up the message "Curves have changed! Please download." After pressing the download into Drive button the window and the drive will be synchronized.



📱 🖞 Upload from Drive 🛛 🗳 🗓 Download into Drive

- Upload Curves from Drive All curves stored on the drive will be uploaded and displayed.
- **Download Curves to Drive** The drive's curve sector will be synchronized with the download window.

ID

• **D** Auto Numerate Curves The curve ID, which must be unique, will be set automatically.

The maximum number of curves and number of sample points is defined as follows: Series B1100:

Max. 16 Curves #Curves \* 70 Bytes + #SamplePoints1 \* 4 Bytes <= 2016 Bytes Series A110/C1100: Max. 50 Curves #Curves \* 70 Bytes + #SamplePoints1 \* 4 Bytes <= 32512 Bytes All other Series: Max. 100 Curves #Curves \* 70 Bytes + #SamplePoints1 \* 4 Bytes <= 65280 Bytes

1 #SamplePoint: total of sample points in all curves

#### 2.7 Parameters

The drive's parameters are displayed in a tree view.

roject	ů		1	× 🕑								
Unnamed on COM2 (USER)	Name	Value	Raw Data	Value (RAM)	UPID	Type	Scale	Offset	Min	Max	Def	Attr
Parameters	FF Constant Force	0A	0000000h	0A	139Ch	SInt32	0.001 A	0A	-15 A	15 A	0A	BN
> (= 0S	FF Friction	0A	00000000h	0A	139Dh	SInt32	0.001 A	0A	0A	15A	0A	B
V E Mation Control SW	*FF Spring Compensation	0.A/m	0000h	0 A/m	139Eh	SInt16	1.A/m	0 A/m	-25000 A/m	25000 A/m	0 A	B
> E Drive Configuration	FF Damping	0 A/(m/s)	0000h	0 A/(m/s)	139Fh	SInt16	0.01 A/jm/s)	0 A/(m/s)	-250 A/(m/s)	250 A/[m/s]	0 A	B
> E Motor Configuration	FF Acceleration	0.A/(m/s^2)	0000h	0 A/(m/s^2)	13A0h	Uint16	0.001 A/(m	0 A/(m/s^2)	0 A/(m/s^2)	65.535 A/(	0 A	B
> 🗐 State Machine Setup	Spring Zero Position	0 mm	0000000h	0 mm	13A1h	SInt32	0.0001 mm	0 mm	-214748.36	214748.364	0 mm	B
> E Motion Interface	P Gain	1.5.A/mm	000Fh	1.5 A/mm	13A2h	UInt16	0.1 A/mm	0.A/mm	0 A/mm	6553.5 A/mm	1.5	B
Y E Position Controller	DGain	3 A/Im/s)	001Eh	3 A/(m/s)	13A3h	UInt16	0.1 A/(m/s)	0 A/Im/s)	0 A/Im/s)	6553.5 A/I	3A	
- 🔚 Feedback Selection	D Filter Time	Ous	0000h	Ous	13A8h	Uint16	1 us	Ous	Ous	50000 us	Ous	R
- E Dtl Par Set Selection	<sup>1</sup> I Gain	0.A/(mm*s)	0000h	0 A/(mm*s)	13A4h	UInt16	0.1 A/(mm*s)	0 A/(mm*s)	0 A/(mm*s)	6553.5 A/(	0 A	R
Control Parameter Set A     Control Parameter Set B	<sup>1</sup> Integrator Limit	17 A	00004268h	17 A	1345h	SInt32	0.001 A	0A	0A	25 A	25 A	R
Control Parameter Set B     Advanced Settings	Maximal Current	17 A	00004268h	17.A	13A6h	SInt32	0.001 A	0A	0A	25 A	25 A	B
Current Controller	Maximal Current Positive	25 A	000061A8h	25 A	13FCh	SInt32	0.001 A	0A	0A	25 A	25 A	B
> Errors & Warnings	<sup>4</sup> Maximal Current Negative	25 A	000061A8h	25 A	13FDh	SInt32	0.001 A	0A	0A	25 A	25 A	B
> Protected Technology Function:		0 mm	0000h	0 mm	13A7h	UInt16	0.0001 mm	0 mm	0 mm	0.2 mm	0 mm	R
> Ethernet/IP Intf												
X Variables												
C Oscilloscopes												
Messages												
Errors												

The parameter service is controlled with the following buttons:

👸 0000h 🛛 🛛 🖬 🗸 🗭

- Show/Hide Details: Additional information for each parameter, such as unique parameter ID (UPID), scaling, min/max value, can be displayed on demand.
- Show UPID Browser: When parameters are edited, which represent a UPID, this button will be visible. With this button, the UPID browser will be opened for an easy selection of a parameter.
- **OK:** The input value is confirmed with this button. Pressing the enter key has the same effect.
- **Cancel:** This button cancels the value typed in.
- Read: All parameters will be read and refreshed from the drive.

When a parameter is marked with a little red L ( $\cdot$ ), in front of the name, the parameter is a live parameter. A live parameter could be changed without stopping the firmware, all other parameter can only be changed when the firmware is stopped.

In the table below the columns of the parameterview are explained. Name: This is the Name of the Parameter



Value:	Value is the ROM Value, after a restart the ROM value is written in to the RAM value. This value is editable in the LinMot-Talk
Raw Data:	is the Data like it is in the ROM without scaling and without the offset, in hexadecimal
Value (RAM):	stands in the RAM, this is the active value at the moment. This value is not editable in the LinMot-Talk. When the parameter is a live parameter then the RAM value will change when the user changes the ROM value in the LinMot-Talk
UPID:	Unique Parameter IDentification
Туре:	is the type of the parameter, for example SInt32, Ulnt32, String
Scale:	is the scale factor from the Raw Data to the Value.
Offset:	is the offset that must be added to the Raw Data to receive the Value
Min:	is the minimal value that the parameter value could have
Max:	is the maximal value that the parameter value could have
Default:	is the value that the parameter has after defaulting the drive
Attr.:	The Attribut defines what are the rights of the user with this parameter. R means read, W means write, with RW is both possible

When a parameter is selected and then the F1 button would be pressed, the Object Inspecter starts up. In the Object Inspecter are some informations about the parameter. If there is a blue more in the window it is a link to the documentation where it has more information about this parameter and his functionality.

Object Description	What is the Object Inspector?	
Object Type	UInt8 Parameter	
Name	IP address 3rd Byte	
UPID	2113h	
Description	3rd byte of device IP address.	

#### 2.8 Variables

The drive's variables, which can be watched, are arranged in different functional groups. The MC SW overview group contains the most used variables.



Search Drive Services Options Window     T      T      Project     Onnamed, IP: 10.3.10.184 (USER)     Onnamed, IP: 10.3.10.184 (USER)     Parameters     Period     OS     Point OS	).184 (USER) 👻 Þ 📕		🌾   🔖 🖬 🔍   R W 🖲 🚱 RawData		Ø 🖬 🔍		
Project	Image: Constraint of the second se	Faz + UPIC Value	R W 🕑 😋				
Unnamed, IP: 10.3.10.184 (USER)	Name State Machine Main State State Machine Sub State	Value		1 2.3			
<ul> <li>✓ Control Panel</li> <li>✓ Parameters</li> <li>→ Ξ OS</li> <li>→ Ξ Motion Control SW</li> </ul>	State Machine Main State State Machine Sub State		BawData				
▷·E OS ▷·E Motion Control SW	State Machine Sub State	0	i lawbata	UPID	Туре	Scale	Offset
▷ · E Motion Control SW			00h	1B5Eh	UInt8	1	0
	Chala	0	00h	1B5Fh	UInt8	1	0
	Sidle	Not R	00h	1860h	UInt8 Enumerator		
▷ E sercos	State Var	0000h	0000h	1B62h	UInt16	1	0
4 🕰 Variables	Demand Position	0 mm	00000000h	1B8Ah	SInt32	0.0001 mm	0 mm
	Demand Velocity	0 m/s	00000000h	1B8Bh	SInt32	1E-6 m/s	0 m/s
	Demand Acceleration	0 m/s^2	00000000h	1B8Ch	SInt32	1E-5 m/s^2	0 m/s^2
OS SW Message/Error	Actual Position	-0.000	FFFFFFAh	1B8Dh	SInt32	0.0001 mm	0 mm
- E OS SW Monitoring	Actual Velocity	-0.000	FFFFFF06h	1B8Eh	SInt32	1E-6 m/s	0 m/s
OS SW HW Configuration	Actual Velocity Filtered	0 m/s	00000000h	1BAFh	SInt32	1E-6 m/s	0 m/s
	Difference Position	0.000	00000003h	1B90h	SInt32	0.0001 mm	0 mm
US SW Status     MC SW Overview	Difference Velocity	0.000	00000EAb	1891h	Sint32	1E-6 m/s	0 m/s
E MC SW Motor	Demand Current Pos Ctrl	0.002 A	00000002h	1B92h	SInt32	0.001 A	0A
E MC SW X13 Ext Sensor	Demand Current	0A	00000000h	1893h	SInt32	0.001 A	0A
- E MC SW Current Controller	Demand Position 16 Bit	0	0000h	1B94h	Sint16	1	0
E MC SW Control Word	Actual Position 16 Bit	ñ	0000h	1895h	Sint16	1	ñ
E MC SW Status Word	10 State Word	0200h	0200h	1C84h	UInt16	1	0
- E MC SW Warnings	IO State Bit 0 (×4.3)	FALSE	0h	1C8Eh	Bool		°.
IT MC SW Phase Search	10 State Bit 1 (×4.4)	FALSE	0h	1C8Fh	Bool		
MC SW Linearizing	10 State Bit 2 (X4.5)	FALSE	0h	1C90h	Bool		
- E MC SW Motion Interface	10 State Bit 3 (X4.6)	FALSE	Oh	1C91h	Bool		
MC SW Capture, Trigger & Mapped Inputs	10 State Bit 4 (X4.7)	FALSE	Oh	1C92h	Bool		
	10 State Bit 5 (X4.8)	FALSE	0h	1C93h	Bool		
- E MC SW Curve	10 State Bit 6 (X4.9)	FALSE	Oh	1C94h	Bool		
IE MC SW Monitoring	10 State Bit 7(X4.10)	FALSE	Ωh	1C95h	Bool		
E MC SW Errors	10 State Bit 8 (X4.11)	FALSE	0h	1C96h	Bool		
MC SW Encoder CAM	10 State Bit 9 (X4.11)	TRUE	1h	1C97h	Bool		
MC SW Motor Data Sheet	X4 Intf Outputs	0000h	0000h	1C89h	UInt16	1	0
MC SW Command Table	Digital Inputs Word	0200h	0200h	1C85h	Ulnt16	1	0
MC SW Force Control	Digital Input Force Mask	0200h	0200h	1CC0h	Ullot16	1	0
E sercos						1	0
Gscilloscopes	Digital Input Force Value	0000h	0000h	1001h	UInt16	1	0
Messages	X4 Output Mask	0000h	0000h	1C88h	UInt16		
Errors	Digital Output Force Mask	0000h	0000h	1CC2h	UInt16	1	0
Command Table	Digital Output Force Value	0000h	0000h	1CC3h	UInt16	1	0
	X4.4 Analog Voltage	0.010	0004h	1CA4h	UInt16	0.0027027027 V	0 V
	X4.4 Analog Voltage Filtered	0 V	00000000h	1CA7h	FloatIEEE754	0.0027027027 V	0 V
	Diff Analog Voltage Diff Analog Voltage Filtered	-0.059 0 V	FFF5h 00000000h	1CA6h 1CA8h	SInt16 FloatIEEE754	0.00537056928 V 0.00537056928 V	0V 0V

The variable service is controlled with the following buttons:

#### 🛅 😭 🖬 🕶 👘 🖪 R W 😢 🤩 📬

- Show/Hide Details Additional information for each parameter, such as unique parameter ID (UPID), scaling, min/max value, can be displayed on demand.
- **R Read Variable:** Reads the selected variable from the drive once.
- W Write Variable: Writes the selected variable to the drive.
- Read All Variables: Reads from the drive all variables of the section once.
- **Read All Variables Cyclically:** Reads from the drive all variables of the section cyclically.
- **Remove (Del):** Removes the selected variable from the list.

The following buttons are only used in special cases.

- Edit Properties The parameter properties can be displayed and changed.
- **New ... Variable** In a new generated variable section a new variable can be defined. This is a drop down menu, which supports different variable types.
- **New Bit Variable** In a new generated variable section a variable of the type bit can be defined.
- Is New String Variable In a new generated variable section a variable of the type string can be defined.
- **New Float32** In a new generated variable section a variable of the type float32 can be defined.
- We With UPID In a new generated variable section a variable can be added by using the UPID from the appropriate parameter.

Under "User Defined" any variables or parameters can be arranged together. Typically the variables are selected via UPID. It is also possible to drag and drop them from the parameter or variable section.



### 2.9 Command Table

The drive supports the command table (CT) functionality, which means a set of up to 255 motion commands (31 commands for B1100GP and B1100VF series drives, on B1100PP CT is not supported) can be stored in this table. An example of is shown in the following picture:

LinMot-Talk 5.0 File Search Drive Services Options Window Tools Manuals Help 🛅 🔪 🗇 📴 🛃 🥔 🐉 (Unnamed, IP: 10.3.10.184 (USER) 🕒 Þ 🔳 🔶 🔢 💘 💱 🖼 💐 🖾 🏚 🗊 😰 Project Auto execute new command on next cycl Entry ID Control Panel Entry Name Motion Command Category: Most Commonly Used E OS Motion Control SW Sercos Variables Motion Command Type VAI Go To Pos • 🤉 Target Position: 0 mm - 🔇 Variables - 📴 Oscilloscopes Maximal Velocity:  $1 \, \text{m/s}$ Acceleration: 10 m/s^ Messages Deceleration 10 m/s^2 Errors Apply Unload from Drive Download to Drive Command Table m ed Please do nload to drive ID Name Туре Par 1 Par 2 Par 3 Vel: 1 m/s VAI Go To Pos Pos: 0 mm Acc: 10 m/s^2 Unnamed VAI Go To Po: Pos: 0 mm Vel: 1 m/s Acc: 10 m/s^2 VAI Go To Pos Pos: 0 mm Vel: 1 m/s Acc: 10 m/s^2 Command Table 2/255

A big variety of commands can be set in this tables, such as motion commands, conditions, sequence directives, parameter access, ...

This makes the CT to very powerful functional unit. The CT entries can be accessed (executed) via digital inputs (on X6) or via interface software.

The CT tool has the following editing elements:

- Entry ID indicates the CT entry, which is being edited.
- Entry Name is a descriptive string of max. 16 characters
- Motion Command Category the available commands are fitted into groups for keeping a better overview
- Motion Command Type specifies the command to be executed in this entry.
- Auto execute new command on next cycle when selected, on the next cycle the entry specified under "ID of Sequenced Entry" will be executed. This gives the possibility of defining cycles, simple logical sequences.
- **ID of Sequenced Entry** defines the CT entry executed on the next cycle when "Auto execute new command on next cycle" is activated.
- **Apply** writes the edited values into the entry.
- Upload from Drive reads and displays the entire command table from the drive.
- Download to Drive writes the edited table (from the PC) to the drive.

An application example of the CT can be found in the motion control software user manual (Usermanual\_MotionCtrlSW\_E1100.pdf).

#### 2.10 Access Codes

On the drive, special features or customer specific applications can be protected by a software key. This means, a key must be activated by an access code, which is drive specific (pinned to the serial number). Under Drive\Set Access Code\ the following window will open:

A maximum of four keys can be set on the drive. Under Active Keys all valid installed keys are listed (key value and access code).



A new key can be set by selecting the key name and defining the value and access code. With the write button, the key and access code are written to the drive. As soon as the drive has rebooted (click the Activate button) the new key will be active, if the access code fits.

Please note: Access codes are drive specific. They cannot be copied from one drive to another.

The following table shows on which drives the different functions are available: Legend:

- S: Standard Function
- TF: Technology Function, can be enabled with key
- NA: Function not available

Technology Functions	Curve	Force Control
E1100	S	TF
B1100	TF	TF
B1150ML	TF	TF
E1200	S	TF
E1400V2	S	TF
A1100	S	TF
C1100	S	TF
C1200	S	TF
C1400	S	TF
D1400	S	NA



# 2.11 Information Window

The Information Window is only visible when it has a message inside and it is activated.

It could activated with the Information Window button *in the Tool button bar. The window can show the messages from the list below.* 

Motor Wizard:	used, the Motor is only defined by PnP.	The Motorwizard defines more Parameter then the PnP, this Parameters are not set now. This message will be cleared when the user finishes the Motor Wizard
Oscilloscope:	data.	This message shows that an oscilloscope has finished, it will be cleared when the user goes to an oscilloscope

# 3 Quick Start Guide

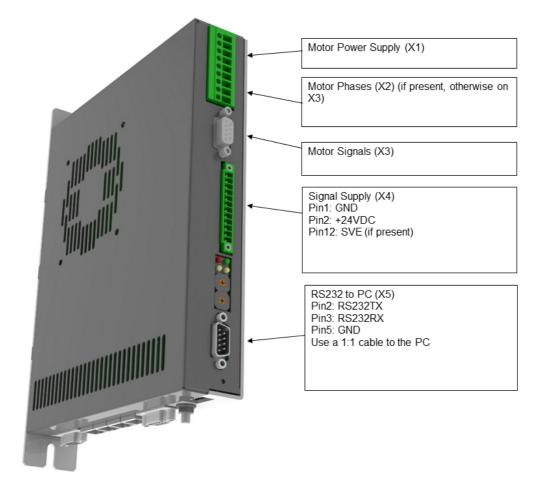
This chapter helps step by step to set up a system using servo drive and the LinMot-Talk configuration software.

Cabling drive is described in the following chapters:

Cabling E1100 Cabling E1200 Cabling E1400 Cabling B1100 Cabling B8050-ML Cabling A1100 Cabling C1100 Cabling C1200 Cabling M8000

#### **3.1 Cabling E1100**

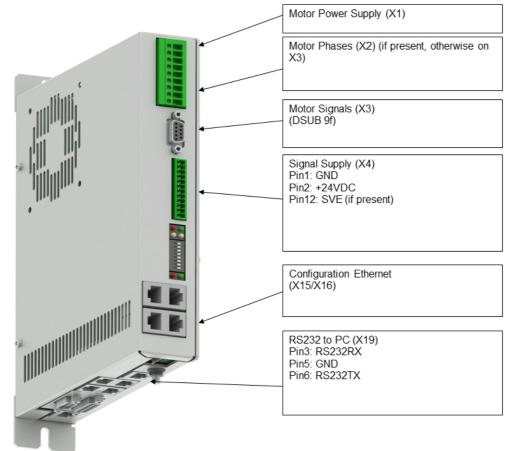




- X1 Motor Supply, use 48..72 VDC (between PWR+ and PGND).
- X2 Motor Phases: if this connector is not present, connect the motor on X3 only.
- X3 Motor signals: if motor has a DSUB-9 connector, connect it directly, otherwise use an adapter to DSUB-9 or wire the phase lines to X2.
- X4 For a commissioning with the PC it is necessary to wire only the Pin1 (GND), Pin2 (+24VDC) and, if present, Pin12 save voltage enable (SVE, +24VDC).
- X5 RS232: The cable between the LinMot drive and PC must be DSUB-9 F/F, 1:1 (X modem). If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).



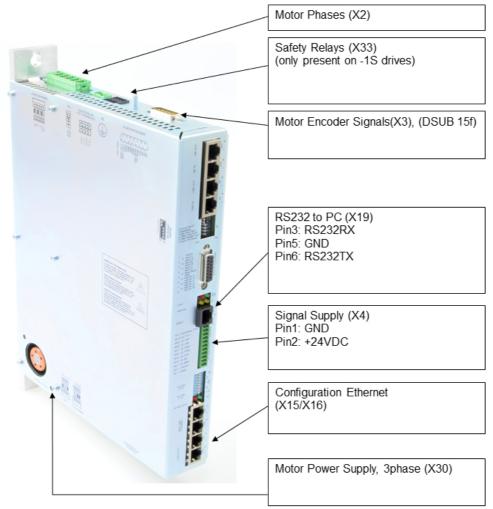
# 3.2 Cabling E1200



- X1 Motor Supply, use 48..72 VDC (between PWR+ and PGND).
- X2 Motor Phases.
- X3 Motor Signals. (Note: the motor phases are not present on this connector. Thus wire the motor phases in any case to X2).
- **X4** For a commissioning with the PC it is necessary to wire only the Pin1 (GND), Pin2 (+24VDC) and, if present, Pin12 save voltage enable (SVE, +24VDC).
- X15/X16 Ethernet: Use a standard RJ45 patch cable to wire to the LAN.
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-2143) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).



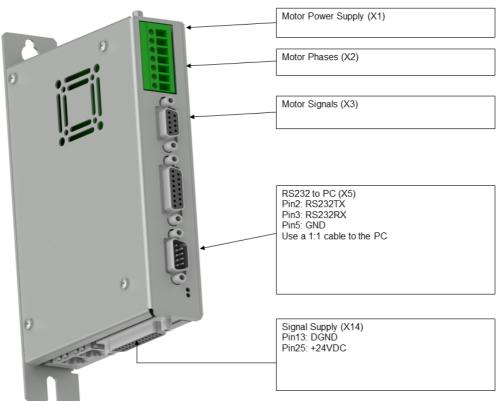
# 3.3 Cabling E1400



- X2 Motor Phases.
- X3 Motor Encoder Signals.
- **X4** For a commissioning with the PC it is necessary to wire only the Pin1 (GND) and Pin2 (+24VDC).
- X15/X16 Ethernet: Use a standard RJ45 patch cable to wire to the LAN.
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-2143) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- X30 Motor Supply, use 3x400 / 3x480VAC 50/60 Hz
- X33 Safety Relays: For the safety relays use a separate +24VDC supply. For a commissioning it is necessary to wire both Ksr+ (X33.4 and X33.8) to +24 VDC and both Ksr- (X33.3 and X33.7) to GND.



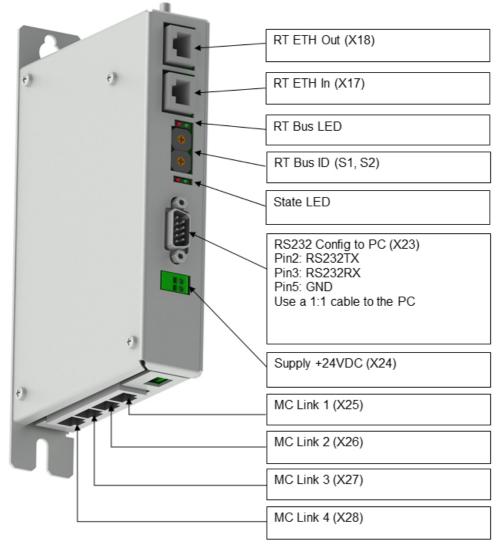
# 3.4 Cabling B1100



- X1 Motor Supply, use 48..72 VDC between (PWR+ and PGND).
- X2 Motor Phases
- X3 Motor signals: if motor has a DSUB-9 connector, connect it directly, otherwise use an adapter to DSUB-9 or wire the phase lines to X2.
- X5 RS232: The cable between the LinMot drive and PC must be DSUB-9 F/F, 1:1 (X modem). If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- **X14** For a commissioning with the PC it is necessary to wire only the Pin13 (DGND) and Pin25 (+24VDC).



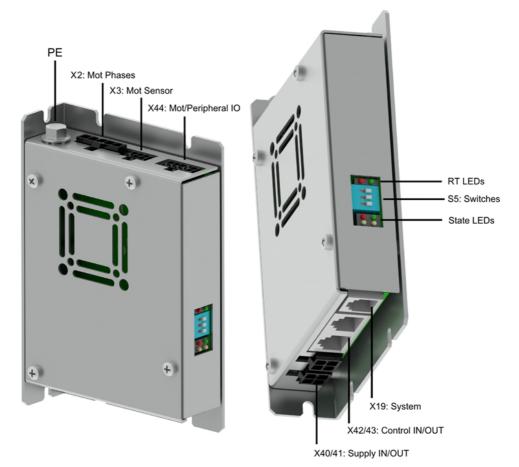
## 3.5 Cabling B8050-ML



- X23 RS232: The cable between the LinMot drive and PC must be DSUB-9 F/F, 1:1 (X modem). If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- **X24** Use a 24V switched power supply.



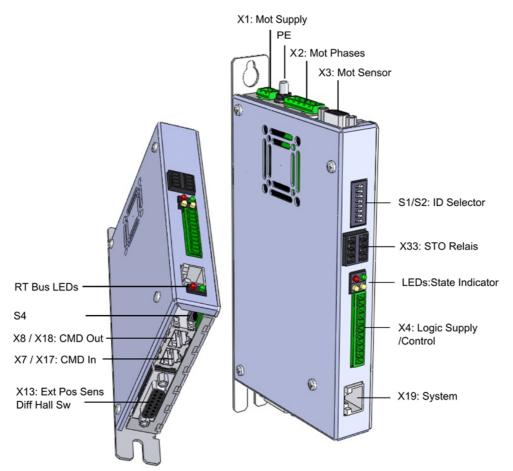
# 3.6 Cabling A1100



- X2 Motor Phases.
- X3 Motor Signals.
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-3544) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- **X40** Wire Pin1 (GND) and Pin2 (+24VDC) for signal supply, and for motor supply, use 48..72 VDC for PWR+ on Pin4 and PGND is on Pin3. (Linmot provides a connector with the crimped 1.5m long wires as a product under the article number 0150-3545.)



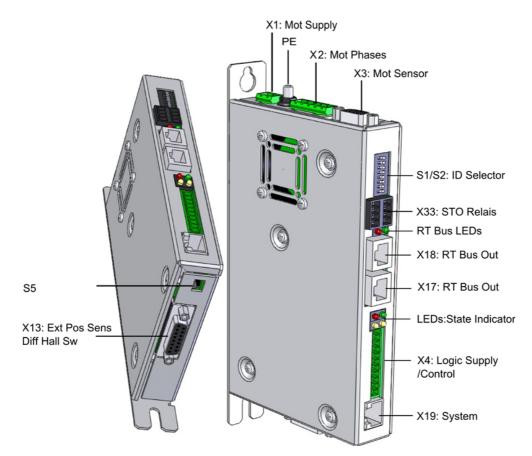
# 3.7 Cabling C1100



- X1 Motor Supply, use 48..72 VDC (between PWR+ and PGND).
- X2 Motor Phases.
- X3 Motor Signals. (Note: the motor phases are not present on this connector. Thus wire the motor phases in any case to X2).
- **X4** For a commissioning with the PC it is necessary to wire only the Pin1 (GND) and Pin2 (+24VDC).
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-2143) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- X33 Safety Relays: The connector X33 is only present for 1S safety functionality. For the safety relays use a separate +24VDC supply. For a commissioning it is necessary to wire both Ksr+ (X33.4 and X33.8) to +24 VDC and both Ksr- (X33.3 and X33.7) to GND.



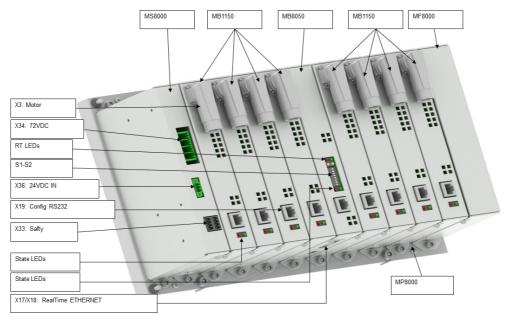
## 3.8 Cabling C1200



- X1 Motor Supply, use 48..72 VDC (between PWR+ and PGND).
- X2 Motor Phases.
- X3 Motor Signals. (Note: the motor phases are not present on this connector. Thus wire the motor phases in any case to X2).
- X4 For a commissioning with the PC it is necessary to wire only the Pin1 (GND) and Pin2 (+24VDC).
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-2143) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- X33 Safety Relays: The connector X33 is only present for 1S safety functionality. For the safety relays use a separate +24VDC supply. For a commissioning it is necessary to wire both Ksr+ (X33.4 and X33.8) to +24 VDC and both Ksr- (X33.3 and X33.7) to GND.



# 3.9 Cabling M8000



- X3 Motor: This is the only connector to the motor, it includes the phases and signals.
- **X19** RS232: Use the RS232 PC configuration cable (LinMot article number 0150-2143) to connect your PC via RS232. If the PC has no COM port available, use the USB to RS232 converter (LinMot article number 0150-3110).
- X33 Safety Relays: The connector X33 is only present for 1S safety functionality. For the safety relays use a separate +24VDC supply. For a commissioning it is necessary to wire both Ksr+ (X33.4 and X33.8) to +24 VDC and both Ksr- (X33.3 and X33.7) to GND.
- X34 Motor Supply, use 48..72 VDC (between PWR+ and PGND). The Axis 1-4 and 5-8 are supplied separately.
- **X36**: For a commissioning with the PC it is necessary to wire only the Pin1 (GND) and Pin2 (+24VDC).



## 3.10 Firmware Download

As the <u>cabling</u> is done correctly now, turn on the drive's power and start up the LinMot-Talk software. Before using the drive the first time, the firmware has to be downloaded.

Therefore press install firmware button 😼 to start the wizard. Choose the file "Firmware\_Build20101126.sct" (or similar) and press "Open". Then the wizard will start and guide through the installation.

In case of installing the firmware over ETHERNET, the service password is required. This is for safety reasons. Especially if there are a lot of drives accessible in the network, it can easily happen to confound them. Thus it is strongly recommended to set a password. By default no password is set. If the password is unknown, the parameters can be set to default by hex switches, see <u>4.1</u>. Installing the firmware over ETHERNET is only possible on drives with a separate Config Ethernet (E1200 and E1400). Installation over RT Ethernet is not possible.

According to the drive type, different interfaces and application software can be selected. The following tables show the compatibility of drive type, interfaces and applications. Legend:

- D: Programmed as default
- X: Can be selected
- P: Planned
- GW: Gateway Software
- 6.3: Until Software Build 6.3
- ML: Motion Link Version

Drivetypes/ Interfaces/ Applications	None	MC Link	CT Interface	LinRS	co	NU	DP	EtherCAT	SoE	CiA402	PN	PD	PL	sc	el.	LinUDP V1	LinUDP V2	None	EasySteps	EasyStepsX6	MasterSlave	AutoStart	Sinoide
A1100-GP	Х				D													D				х	Х
C1100-GP	х			х	D													D	х			х	
C1150-DS										D								D	х			х	
C1150-EC								D										D	х			х	
C1150-PD												D						D	х			х	
C1150-PN											D							D	х			х	
C1150-SE									D									D	х			х	
C1250-DS										D								D	х				
C1250-EC								D										D	х				
C1250-IP															D	6.3		D	x				
C1250-LU																	D	D	х				
C1250-PD												D						D	х				
C1250-PL													D					D	х				
C1250-PN											D							D	х				
C1250-SC														D				D	х				
C1250-SE									D									D	х				
E1200-GP	х			х	D													D	х		X		
E1230-DP							D											D	х		х		
E1250-DS										D								D	х		X		
E1250-EC								D										D	х		х		
E1250-IP															D	6.3		D	х		х		
E1250-LU																	D	D	х		х		
E1250-PD												D						D	х		X		
E1250-PL													D					D	х		х		
E1250-PN											D							D	х		х		
E1250-SC														D				D	х		х		
E1250-SE									D									D	х		х		
E1400GP V2	Х			х	D													D	х		х		
E1430-DP V2							D											D	х		x		
E1450-DS V2										D								D	х		X		
E1450-EC V2								D										D	х		х		
E1450-IP V2															D			D	х		х		
E1450-LU V2																	D	D	х		х		
E1450-PD V2												D						D	х		х		
E1450-PL V2													D					D	х		×		
E1450-PN V2											D							D	х		x		
E1450-SC V2														D				D	х		х		
E1450-SE V2									D									D	х		X		



E1400-GP V1	х			х	D										D	х		х		
E1430-DP V1	х			х	х		D								D	х		х		
E1450-EC V1	х			х	х			D	х						D	х		х		
E1450-IP V1	х			х	х								D	х	D	х		х		
E1450-PL V1	x			х	х						D				D	х		х		
E1450-PN V1	×			х	х					D					D	х		х		
E1450-SC V1	×			х	х							D			D	х		х		
E1450-SE V1	Х			х	х			х	D						D	х		х		
E1100-GP	Х		D	Х	х	Х									D	Х	х	Х	Х	X
E1100-CO	×			х	D										D	х		х	х	х
E1100-DN	×			х	х		D								D	х		х	х	X
E1100-RS	×			D											D	х		х	х	X
E1130-DP	X		х	х	х		D								D	х		х	х	X
B1100-GP	х			х	D	Х									D	х				X
B1100-VF	D														D	x				
B1100-PP	D															D				
B1100-ML		D													D	x				X
MB1100-ML		D													D	x				X
B8000-ML-GP					GW										D					
(M)B8050_ML-PL											ML				D					
(M)B8050-ML-SC												ML			D					
(M)B8050-ML-EC								EC							D					
(M)B8050-ML-IP													ML		D					
(M)B8050-ML-PN										ML					D					

#### 3.11 Login

When successfully finished downloading the firmware, login with \File\Login... or with a double click on Project in the project tree window, then select the appropriate port and press ok. A login info window will appear showing the login progress. When logged in you will find the following window:

	).184 (USER) 🕞 📂 📕 🔶 📑 🎉 🖄 🖼 🕰 💷 🕼		- <b>D</b> X
Project     Control Panel     Control Panel     Definition     Control Panel     Definition     Definition     Control SW     Definition     Control SW     Definition     Secos     Control SW     Definition     Control SW     Control SW     Definition     Definition     Control SW     Definition     Control SW     Definition     Definition     Control SW     Definition     Control SW     Definition     Definition     Definit     Definition     Definition     Definition     De	Control         C           0: Switch On	1 : Swich On Active	Hot Sensor Supply Voltage Supply Voltage Not Time Dv Supply Voltage Hot
	Variable shows in which safe et     Variable shows in which safe et     state machine diagram. In the I     state machine diagram. In the I     superior controller can be read     Coveride Value     Actual Value     X4.12 - Input	cottom part of the panel was send from the out. If Manual Override	ed Error Code: Motion Comm I mm -1 mr

The Object Inspector window can be dragged away or closed. It can be reopened with F1.

#### 3.12 Scanning CAN Bus

When one or several drives are linked with CAN bus for configuring, it can be very helpful to scan the CAN bus for linked drives automatically. Thus, it is not necessary to know all node IDs. Under \File\Scanning (with CANusb) a list of the present drives will be displayed:



			Login	>
Login	MACID	Drive Name	User ID	Password
	1	Y-Axis	USER	
	2	X-Axis	USER	

With just one click the LinMot-Talk software will log in to all drives.

#### 3.13 Scanning Ethernet

When one or several drives are linked with Ethernet for configuring, it is helpful to scan automatically for linked drives. Thus, it is not necessary to know all node IP addresses. Under \File\Scanning (via Ethernet) first the interface has to be selected (network link) With the radio button Group Number could be activated a scan for a special drive group. The list will only display the drives with the group number, like the number in the text field. In the drives this number is saved in the parameter with the name Net Group and the UPID 0078h.

Choose the Interface	•			×
Interface:				
Broadcom NetLink (T	M) Gigabit Ethernet - 10.3.10.	87		•
Send To:				
All Groups	🔘 Group Number.	0		
			Continue	Cancel

A list of the present drives will be displayed like in the picture below.

With just one click the LinMot-Talk software will log in to all drives. The colored markings have the following meaning:

- Green: The drive is ready to log in.
  - Grey: You are already logged into this drive.
  - Red: Another instance is logged into this drive (other user or other interface).

The default mode for acquiring an IP address is via DHCP. If no servers on the connected network respond, the drive switches to the Ipv4 Link-Local addressing scheme (also

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known as APIPA on Windows systems). This way the drive automatically assigns itself an address within the range of 169.254.0.1 through 169.254.255.254 (Subnet Mask 255.255.0.0).

Please note that this process can take up to a minute until a valid address is assigned to the drive this way.

tate	IP Address	MACID	Group	Device Name	Device Type	Release Info	User ID	Password
	10.3.10.22	00:1A:4E:00:10:5C	0	Lagertest1	E1400-GP-QN /1RB	4.4 Build 20120130	USER	
	10.3.10.61	00:1A:4E:00:1A:5C	0	Flo's E1250-SC	E1250-SC-UC/V1RE	4.4 Build 20120130	USER	
	10.3.10.66	00:1A:4E:00:0A:AA	0	KMT Referenzantrieb		4.3 Build 20110901	USER	
	10.3.10.67	00:1A:4E:00:0D:80	0	MotEnd		4.2 Beta 20110211	USER	
1 🌺	10.3.10.82	00:1A:4E:00:05:0C	0	Flo's E1250-PL	E1250-PL-UC/V1RD	4.4 Build 20120130	USER	
	10.3.10.93	00:1A:4E:00:02:2A	0	MM_E1250_EC_UC	E1250-EC-UC/V1RC	5.0 Beta 20120514	USER	
1 🏔	10.3.10.106	00:1A:4E:00:10:14	0	MM_E1450_SC	E1450-SC-QN /1RB	5.0 Beta 20120514	USER	
3 🏔	10.3.10.107	00:1A:4E:00:22:2C	0	KHS Teststand	E1400-GP-QN /1RD	5.0 Beta 20120514	USER	
l II	10.3.10.108	00:1A:4E:00:06:78	0	Flo's E1250-IP	E1250-IP-UC/V1RE	4.4 Build 20120130	USER	
	10.3.10.109	00:1A:4E:00:02:48	0	Ludo Desk	E1200-GP-UC/V1RC	4.4 Build 20120130	USER	
	10.3.10.123	00:1A:4E:00:10:0C	0	Unnamed	E1450-IP-QN /1RB	5.0 Beta 20120514	USER	
	10.3.10.127	00:1A:4E:00:2B:08	0	Unnamed	E1250-PN-UC/V1RE	5.0 Beta 20120702	USER	
1 II	10.3.10.129	00:1A:4E:00:1B:B8	0	Laser3 - Laser_X	E1250-EC-UC/V1RE	4.4 Build 20120130	USER	
	10.3.10.132	00:1A:4E:00:1B:BA	0	Laser3 - Laser_Z	E1250-EC-UC/V1RE	4.4 Build 20120130	USER	
	10.3.10.137	00:1A:4E:00:02:24	0	MM_E1250_PL_UC	E1250-PL-UC/V1RC	4.4 Build 20120130	USER	
	10.3.10.143	00:1A:4E:00:22:30	0	QS_TestCtr	E1400-GP-QN /1RD	5.0 Beta 20120514	USER	
3 🏯	10.3.10.179	00:1A:4E:00:10:0A	0	Unnamed	E1400-GP-QN /1RB	4.4 Build 20120130	USER	
	10.3.10.184	00:1A:4E:00:03:4E	0	Unnamed	E1250-SC-UC/V1RD	5.0 Build 20120710	USER	
3 🏔	10.3.10.186	00:1A:4E:00:10:24	0	Unnamed	E1450-EC-QN /1RB	4.4 Build 20120130	USER	
1 12	10.3.10.191	00:1A:4F:00:10:40	0	Lagertest3	F1400-GP-ON /1RB	4.4 Build 20120130	LIGER	

#### 3.14 Motor Wizard

As no motor is defined, the next step is to start the motor setup wizard. Press the button and the following window will appear:

Organisieren 👻 🛛	Neuer (	Ordner				
	^	Name	Änderungsdatum	Тур	Größe	
📌 Schnellzugriff		LinMot Linear Motors	18.01.2017 07:22	Dateiordner		
ConeDrive		LinMot Linear Rotary Motors	18.01.2017 07:22	Dateiordner		
Dieser PC		LinMot Modules	18.01.2017 07:22	Dateiordner		
_		LinMot Rotary Motors	18.01.2017 07:22	Dateiordner		
📰 Bilder 🛄 Desktop	~	Other Motors	18.01.2017 07:22	Dateiordner		
	↓ Dateina		18,01,2017 07:22		ta Files(*.adp )	

As we want to configure a LinMot Motor we choose "LinMot Linear Motors" and press Open. Then we choose the statorfamily like "PS0x-23x" and then the statorsubfamily like "PS01-23x160x". Select the actuator type you have connected to the drive, then press Open.



> • 🛧 📙 «	« LinMa	t Linear Motors > PS0x-23x > PS01-23x1	160x 🗸	ඊ "PS01-23x16	0x" durchsuchen	Q
Organisieren 👻 🕴	Veuer Or	dner			EE 💌 🔟	2
🖊 Downloads	^	Name	Änderungsdatum	Тур	Größe	
👌 Musik		PS01-23x160F-XX V3S1.adp	11.01.2017 11:40	ADP-Datei	102 KB	
Videos	- 1	PS01-23x160F-XX_V3S2.adp	11.01.2017 11:41	ADP-Datei	103 KB	
nublic (\\share)	)	PS01-23x160H-HP-XX_V3S1.adp	11.01.2017 11:40	ADP-Datei	64 KB	
🛖 workfolder\$ (\\	la	PS01-23x160H-HP-XX_V3S2.adp	11.01.2017 11:41	ADP-Datei	65 KB	
. OS (C:)		YS01-23x160-XX_V3S1.adp	11.01.2017 11:40	ADP-Datei	103 KB	
	~	PS01-23x160-XX V3S2.adp	11.01.2017 11:41	ADP-Datei	104 KB	
(	Dateinam	e: PS01-23x160F-XX V3S2.adp		Actuator Da	ata Files(*.adp )	~

## 3.14.1 Actuator Selection

The following steps will show forms including drawings and descriptive texts. The first step is to define the stator and slider.



Stator: PS01 Slider: PL01 The s front	andard -HP -L	the number of notches on the = HP, 3 Notches = LC).	<b>~</b>	
Stator: PS01 Slider: PL01 The s front	-37x120-C -20x600/540-LC (L: 600mm; D: 20mm; ider can be identified by its length ar end (1 Notch = Standard, 2 Notches andard -HP -L	m; ArtNo: 0150-2564) nd the number of notches on the := HP, 3 Notches = LC).	<b>~</b>	
Stator: PS01 Slider: PL01 The s front	-37x120-C -20x600/540-LC (L: 600mm; D: 20mm; ider can be identified by its length ar end (1 Notch = Standard, 2 Notches andard -HP -L	m; ArtNo: 0150-2564) nd the number of notches on the := HP, 3 Notches = LC).	<b>~</b>	
Slider: PL01 The s front	-20x600/540-LC (L: 600mm; D: 20mr ider can be identified by its length ar end (1 Notch = Standard, 2 Notches 	the number of notches on the = HP, 3 Notches = LC).	× ×	
The s front	ider can be identified by its length ar end (1 Notch = Standard, 2 Notches andard -HP -L	the number of notches on the = HP, 3 Notches = LC).	~	
front	end (1 Notch = Standard, 2 Notches	: = HP, 3 Notches = LC).		
Sta	andard -HP -L			
	ılar			
Slider Mounting Direction: Regu			~	
The s	iders are not symmetric. The value o ounting direction relative to the state changes with the mounting direction	or. Therefore the available strok	e	
÷	Fb SS	Stroke		
Positive Moving Direction: Regu		un(es)	~	
÷	Symbol for positive moving direction	n		
Derived Settings	Value	Comment		
STATOR	PS01-37x120-C			
Article Number	0150-1223			
Stator Length	216 mm			
Stator Mass	740 q			>
Help < Back Ne	ext > Finish Can			 

The derived settings show information about the complete motor type, article numbers and the most important technical data. The change of the positive moving direction is supported since release 6R7 and only for motors with PnP version V3S2 and higher. Motor with PnP version V3S1 do not work with changed positive moving direction. Be also aware in case of exchange!



# 3.14.2 Drive Settings

	( <u></u> )/	
Settings		
Unnamed		
5	Settings Unnamed	_

The next step is to choose a drive name and if it is possible a regeneration resistor.

<b>Regeneration Resistor:</b> Type:	None		~	
Derived Settings		Value	Comment	~
Help < Back	N	ext > Finish	Cancel	



# 3.14.3 Extantion Cable Setup

Longer extension cables will have an effect to the motor's phase resistance. In step 3 can be defined two cable segments.

Motor Wizard				×
Step 3/9: Extension (	Cable Setup			
First Extension Cable	Segment			
Type:	ко5 ~	•		
Length:	2	m		
Second Extension Cal	ble Segment			
Type:	No Extension Cable	•		
		-		
The obmic registered of	i autopoion cables can be quite bick in rel	ation to the mater's phase		
resistance. If the firmwa control loop to the load.	fextension cables can be quite high in rel are knows the total ohmic resistance it ca . If there are extension cables used in th should be defined here. The cable piece t	an optimize the current e application, then		
resistance. If the firmw, control loop to the load, that/these segment(s) : motor is negligible.	are knows the total ohmic resistance it ca . If there are extension cables used in th	an optimize the current e application, then		
resistance. If the firmw control loop to the load that/these segment(s) s motor is negligible.	are knows the total ohmic resistance it ca . If there are extension cables used in th should be defined here. The cable piece	an optimize the current e application, then that comes directly out of the		
resistance. If the firmw. control loop to the load. that/these segment(s) : motor is negligible. Derived Settings Notor Phase Resistance	are knows the total ohmic resistance it ca . If there are extension cables used in th should be defined here. The cable piece Value	an optimize the current e application, then that comes directly out of the		
resistance. If the firmw control loop to the load. that/these segment(s) s	are knows the total ohmic resistance it ca . If there are extension cables used in th should be defined here. The cable piece to Value 4.8 Ohm	an optimize the current e application, then that comes directly out of the		
resistance. If the firmw. control loop to the load. that/these segment(s) : motor is negligible. erived Settings lotor Phase Resistance able Resistance	are knows the total ohmic resistance it ca . If there are extension cables used in th should be defined here. The cable piece Value 4.8 Ohm 0.14 Ohm	an optimize the current e application, then that comes directly out of the		



# 3.14.4 External Position Sensor System

The next hardware setup step is to define an external position sensor system (if present). For E1100 drives can be chosen between none, incremental AB(Z) and analog sine/cosine 1Vpp. For B1100 drives can be chosen between none, incremental AB(Z) and AB encoder simulation.

📉 Motor Wizard					-		X
Step 4/9: External Po	sition Sensor S	System					
External Position Sense	Dr						^
Type:	Analog Sine/Cosine	g Sine/Cosine (1Vpp)		$\sim$			
	Positive	/e		~			
	250						
Minimal Edge Separation:	0.25			us			
X		$\overline{\boldsymbol{\lambda}}$	1v				
	$\mathbf{V}$		Ţ				
With an additional extern position sensor has to be recovery mode will be set	connected to Ext Pos						
Mode:	None			~			
Derived Settings	Value	Value		Comment			~
Help < Back	Next >	Finish	Cancel				



# 3.14.5 Feed Forward Parameters

With step 5 the feed forward parameters are set up. Depending on the moving mass, additional load mass, friction and orientation. Under the derived settings the influence can be watched.

Motor Wizard						-	×
Step 5/9: Feed Forward Pa	irameters						
Mechanical Layout							
Moving Part of Motor:	Slider	~					
Orientation Angle (-90°+90°):	0	0					
Moving Mass			2.5		+.		
Slider:	1064	g	_ <b>—</b> II				
Additional Load Mass:	500	g					
Friction Forces							
Dry Friction:	2	N					
Viscous Friction:	0	N/(m/s)					
MagSpring (or other constant	force)		-90°↓	⊷ +90° <b>1</b>			
External Constant Force:	0	N					
Force Direction:	Negative 🗸	1					
Derived Settings	Value		(	Comment			
Total Moving Mass 1564 g							
Gravitation force in motor direction 0 N							
External Constant Force	ON						
Sum of Constant Effective Forces <	0 N						>
Help < Back	Next >	Finish	Cancel				



## 3.14.6 PID Position Controller

With the next and last step the position drive's parameters will be set up:

📉 Motor Wizard					-	×
Step 6/9: PID Po	sition Co	ontroller				
PID Position Co	ntroller S	etting				^
P Gain:	2	A/mm	Set To Default Soft	(P=2, D=4, I=0)		
D Gain:	4	A/(m/s)	Set To Default Stiff	(P=5, D=10, I=0)		
I Gain:	0	A/(mm*s)				
D Filter Time:	0	us				
Noise Filter:						
Dead Band	0.0005	mm	Enable Noise Filte	r		
drive behavior. F given default set The Noise Filter o	or the mos tings (no a tan be used	t applications it is p dditional loop tunin to filter out any n	ious step), the PID controlle cossible to achieve good res g necessary), oise from the position feedb the drive's performance.	ults with one of the		v
Derived Settings		Value		Comment		•
P Gain				comment		
P Gain D Gain		2 A/mm 4 A/(m/s)				
I Gain		0 A/(mm*s)				
Integrator Limit		12 A				~
<						>
Help <	Back	Next >	Finish Cancel			

It is recommendable to start with the default soft settings, because the parameters can be changed any time later on (by restarting the motor wizard or by setting in the parameter tree directly).

With the soft parameter setting, PID values will be quite low such as the motor is low noise and the position is not controlled very stiffly.

The stiff parameter set tends to more noise and more power consumption of the motor, but the position will be controlled harder.

In both settings, the I Gain is set to zero, which means a steady-state deviation from the desired position can occur. When using the I Gain, the position controller may tend to swing.

The Noise Filter option is to reduce the noise from the position feedback sensor at standstill.

For finding the best set of PID parameters, the system has to be optimized iteratively. There is no general way of how to optimize the settings, because different goals can be achieved such as position accuracy, power minimization, noise reduction, ...



# 3.14.7 Homing 1

Step 7/9: Homin	ig l				
Home Position S	earch Move				
Speed:	0.01	m/s			
Mode:	Mechanic	al Stop Negative Search	~		
		moves in negative direction u . This position is assumed to b			
Before motion co	mmands can be	executed, the motor must be	homed. Depending on the		
		executed, the motor must be hes a mechanical stop and/or			
selected mode, t		hes a mechanical stop and/or	an electrical switch.		
selected mode, t					
selected mode, t		hes a mechanical stop and/or	an electrical switch.		
		hes a mechanical stop and/or	an electrical switch.		

The next step is to define the homing procedure.

The most frequently used homing mode is "Mechanical Stop Negative Search". In this case the slider will move with the notch towards the stator's front end (where no cable is).

Other modes support homing on home switches, limit switches, indexer inputs or some combinations of those.



# 3.14.8 Homing 2

Step 8 is to define the slider home position. This is for the motor and drive the most important value. It defines at the home position, where the slider is positioned relative to the stator. This defines how far the motor can move in each direction.

Motor Wizard				-	×
Step 8/9: Homing	11				
Distance from Sta	tor End to S 336 mm 500 mm	lider End at the Home I	Position		^
determine either dis (mechanical stop or	stance A or dis switch). Then oftware. If the	tance B when the motor st enter the corresponding v			v
Derived Settings Slider Home Position		Value 10 mm	Comment Corresponds to distance A		
Help <	Back	Next > Finish	Cancel		



# 3.14.9 Homing 3

With the last wizard step the user's coordinate system can be defined.

Motor Wizard				- 0	×
Step 9/9: Homing III					
Definition of the Application R	eference System				- 2
Home Position (HP): -10 mm	n 154 mm	336 mm 10 r			
Move to the Initial Position at	the End of the Hom	ing Procedure			
Initial Position (IP): 0 mn		336 mm	° ₽		
			IP		
You can define your application spe Home Position. All further position of At the end of the homing procedure execute the motion commands. If t Initial Position value should differ fr	values are based on this e the motor moves to the he motor has to be hom	s system. ne Initial Position. 1	osition value to the Then it is ready to		3
Home Position. All further position v At the end of the homing procedure execute the motion commands. If t	values are based on this e the motor moves to the he motor has to be hom	s system. ne Initial Position. 1	osition value to the Then it is ready to		nm)
Home Position. All further position At the end of the homing procedure execute the motion commands. If I nitial Position value should differ fr	values are based on this e the motor moves to th he motor has to be hon rom the Home Position.	s system. ne Initial Position. 1 ned on a mechanic	osition value to th Then it is ready to al stop, then the	,	nm)
Home Position. All further position of At the end of the homing procedure execute the motion commands. If t Initial Position value should differ fr Minimal Position Error Enabled	values are based on this e the motor moves to the motor has to be hon rom the Home Position. Minimal Position:	s system, ne Initial Position. T ned on a mechanic	osition value to ti Then it is ready to al stop, then the mm	,	nm)
Home Position . All further position . At the end of the homing procedure execute the motion commands. If t Initial Position value should differ fr Minimal Position Error Enabled Maximal Position Error Enabled	values are based on this e the motor moves to the motor has to be hon rom the Home Position. Minimal Position: Maximal Position: Value	s system, ne Initial Position. T ned on a mechanic	osition value to the Then it is ready to a stop, then the mm mm mm	,	nm)

At the end, press finish. If the firmware on the drive is still running, an appropriate message will be shown. All parameters will now being written to the drive.

The motor wizard can be run several times, e.g. to setup an external sensor, to change the load setup or to change the motor type. When rerunning it, at the end will be shown a list of parameters, which will be changed.



## 3.15 Unit System

For LinMot rotary Motors and the rotary part of PR01 motors in the motor wizard it has a special page. This page is to choose the unit system. The unit system is only in the LinMot-Talk active and has no effect to the drive. There are two unit systems. One is a Linear system the position is displayed in 'mm', the other system is a rotary system especially for rotary motors. The position is in this case displayed in '<sup>eo</sup>'. In the Page Number 5 Position Feedback, there is one parameter called "1 Revolution". In the Linear unit system, this parameter says how many mm represent one revolution. In the rotary unit system, this parameter says how many ticks (one bit of the position in the motioncontrol software) has a revolution. In both cases, it has two recommended possibility. If the parameter has a multiple of 360 the numbers are well represented.

Otherwise if the parameter has a value  $2^n$  or in linear case  $2^n \times 100nm$  the position of the motor is on 0 position the same also after an overflow of the position (  $0 \rightarrow 2^{31} \rightarrow -2^{31} \rightarrow 0$ )

The second s				
ep 5/5: Position Fee	dback			
Motor Angle to Position I	Ratio			
Base of Angle Measuring:	Sine/Cosine Sensor	$\sim$		
1 Revolution =	524288	Ticks:		
Positive Counting Direction:	Clockwise	~		
External Position Measur Sensor Type:	No Sensor	~		
Sensor Type:	No Sensor	×		
Power Up Position Reco Mode:	<b>Yery</b> X3 Single Turn Position	~		
Mode:	X3 Single Turn Position	~		
		~ •		
Mode:	X3 Single Turn Position	~₀		
Home Position (HP):	X3 Single Turn Position			
Mode: Home Position (HP): ved Settings	X3 Single Turn Position 0 Value	° Comment		
Mode:	X3 Single Turn Position			
Mode: Home Position (HP): ved Settings	X3 Single Turn Position 0 Value			
Mode: Home Position (HP): ved Settings	X3 Single Turn Position 0 Value			

### 3.16 Continuous Curve Mode

We want the motor to run a curve cyclically (The easiest, but not so informative way to run the motor would be the VAI 2 Pos Continuous mode).



The drive is set to continuous curve mode by selecting "Continuous Curve" under \Motion Control SW\Motion Interface\Run Mode Settings\RunMode Selection\ in the parameter tree.

NOTE: For enabling the curve feature on B1100 drives, it is necessary to set an access key.

Search Drive Services Options Window 1 1 2 2 3 3 2 1 2 1 2 1 2 1 2 1 2 1 2 1	<u>T</u> ools <u>M</u> anuals <u>H</u> elp 84 (USER) 🔹 ⊳ 📕 🔶 🔢 💘	<u>s</u> E ()		0		
Project	Continuous Curve	* 💷 🍋			EF	
Unnamed, IP: 10.3.10.184 (USER)	Name	Value	Raw Data	UPID	Туре	Scale
A Es Parameters	C <sup>*</sup> Motion Command Interface	Off	0001h	1450h	UInt16	
⊳ E OS	C <sup>*</sup> Triggered VA-Interpolator	Off	0002h	1450h	UInt16	
Motion Control SW	C <sup>L</sup> Rise Triggered VAI For/Backward	Off	000Dh	1450h	UInt16	
▷ E Drive Configuration	C <sup>t</sup> Triggered Time Curves	Off	0007h	1450h	UInt16	
Motor Configuration	C <sup>*</sup> Command Table Mode	Off	0003h	1450h	UInt16	
State Machine Setup	C <sup>t</sup> Triggered Command Table	Off	000Ch	1450h	UInt16	
Motion Interface	C <sup>*</sup> Position Indexing	Off	000Ah	1450h	UInt16	
Image: A setting and a setting and a setting a setting a set of the set o	O <sup>t</sup> Analog	Off	0004h	1450h	UInt16	
Fur Mode Selection Figgered VA-Interpolator Settings	C <sup>t</sup> Triggered Analog	Off	000Bh	1450h	UInt16	
Triggered Curves Settings	C <sup>*</sup> CAM Mode	Off	0006h	1450h	UInt16	
Command Table Settings	C <sup>L</sup> Triggered CAM Curve	Off	0008h	1450h	UInt16	
Triggered Command Table Setting	s O <sup>t</sup> VAI 2 Pos Continuous	Off	0009h	1450h	UInt16	
▷ E CAM Mode Settings	Continuous Curve	On	0005h	1450h	UInt16	
Finispered CAM Curves Settings     Finispered CAM Curves	C <sup>L</sup> PC Motion Command Interface	Off	0010h	1450h	UInt16	
Command Table						

The second parameter to be set is to define which curve has to be run. Set the parameter "Curve ID" to 1 under \Motion Control SW\Motion Interface\Time Curve Settings\.

<u>Search Drive Services Options Window</u>		<u>**  % P (*</u>				
1 🔁 🕞 🖶 🎒 🛞 Unnamed, IP: 10.3.10 Project	1104 (USEN) V P V V			X 🕑 🛛	÷	
🚺 Unnamed, IP: 10.3.10.184 (USER)	Name	Value	Baw Data	UPID	Type	Scale
A Cantrol Panel	Curve ID	1	0001h	14C8h	UInt16	1
	Curve Offset	0 mm	00000000h	14U8h 14C9h	SInt32	0.0001 m
A E Motion Control SW	Curve Orrset	0 mm 100 %	00000000n 03E8h	14C9n 14CAh	Sint32 Sint16	0.0001 m
Drive Configuration	Curve Amplitude Scale	100 %	03E8h 2710h	14CBh	Sint16	0.01 %
Motor Configuration	Curve i me Scale	100 %	2710h	14CBh	SINUE	0.01 %
▷ E State Machine Setup						
⊿ 🚍 Motion Interface						
▶ 🗐 Run Mode Settings						
= 16 Bit Interface Scaling						
- E Predef VA Interpolator						
- E PV Streaming Settings						
- 🖃 Time Curve Settings						
Master Encoder CAM						
Position Controller						
- E Current Controller						
▷ Errors & Warnings						
Protected Technology Functions						
▷ ·						
▶ E sercos						
▷ 🥰 Variables						
D Scilloscopes						
Messages						
Errors						
Curves Command Table						

Before running the curve, it is advisable to define the curve we want to run.



# 3.17 Defining Curves

Curves can be easily defined with the curve wizard. For this example we will define two sine curve forms over a stroke of 50mm out and in with different speeds, which will be joined together.

Now, step by step: Open the curve tool by clicking the "Show Curves" button 🗐 in the tool button bar. Then press the "New Curve" button 🛅 to start the curve wizard.

Curve Type Selection			×
Select Curve Type:	Position vs.	Time	~
Linear Position			■ ime
	< Back	Next >	Cancel

As we want to define a curve in position vs. time mode we can keep the default selection and press the next button.



Curve ID (1100):	2	•	
Curve Name:	SineOut		
Setpoint Calculation Wizard:	Sine		`
Curve Length:	1000	ms	
Start Point:	0	mm	
End Point:	50	mm	

In this mask, we will set the curve ID to 2 (we will have the merged curve with ID 1 at the end) and as name we set e.g. "SineOut". The end point is placed at 50mm. With "Next" the wizard will show some curve data:

Calculated Curve Data		>
Based on the Curve Setting curve information:	s Data the wizard has	calculated additional
Stroke:	50	mm
Peak Velocity:	0.07854	m/s
Peak Acceleration:	0.24674	m/s^2
[	< Back Ne	xt > Cancel

The next and last mask proposes a number curve setpoints. It is advisable to accept this proposal.



Number of Setpoints			×
The proposed number o	of setpoints i	s 501.	
Number of setpoints:	501	D.	
	< Back	Finish	Cancel

with "Finish" the first curve is defined. The curve will be displayed as follows:

LinMot-Talk 5.0						- 🗆 🗙
File Search Drive Services Options Window Tool	ls <u>M</u> anuals <u>H</u> elp	,				
🛅 🛍 🛱 🔛 🗁 🔚 🎒 🕌 🛛 Unnamed, IP: 10.3.10.184 (I	JSER) 🔻 Þ 📕	•	🔢 📉   🔖 🖼 🍕	🖻 🕼 🔺 🗇 🖻	2	
Project Image: Innamed, IP: 10.3.10.184 (USER) Image: Control Panel Image: Ima				Edit Window		
▲ · La Parameters ▷ · La OS	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
	SineOut SineOut SineOut	2	Position vs. Time	Sine	1000 ms	501
- 1 Messages - A Errors			D	ownload Window		
Table Curves	🛛 🖥 Upload from	Drive	e 🛛 📲 🛙 Download into D	Drive		
	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints

We will now define curve going back. So we start the curve wizard again and define under curve settings the following:



Curve ID (1100)	3	•	
Curve Name:	SineIn		
Setpoint Calculation Wizard:	Sine		~
Curve Length:	500	ms	
Start Point:	50	mm	
End Point:	0	mm	

Set curve ID to 3, Curve Name to "Sineln", Curve Length to 500ms, Start Point to 50mm and End Point to 0mm. Click twice "Next" and then "Finish".

Now we have defined the two curve segments and will join them together. Select the two curves

LinMot-Talk 5.0						
File Search Drive Services Options Window Too	ls <u>M</u> anuals <u>H</u>	elp				
🛅 🛍 🃁 🗁 🔚 🎒 🖓 🗍 Unnamed, IP: 10.3.10.184 (	(USER) 🔻 Þ	<b>•</b>	1 🙀 🕺 🖼	🕺 🖻 🛕 📥 🗊 🗈	2	
Project				Edit Window		
Innamed, IP: 10.3.10.184 (USER) Control Panel	12 🗗 🖪 🛓	*				
A En Parameters	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
▷ E OS ▷ E Motion Control SW	🔀 SineOut	2	Position vs. Time	Sine	1000 ms	501
D · E sercos	🔀 Sineln	3	Position vs. Time	Sine	1000 ms	501
⊳ 🕰 Variables						
⊳ 📴 Oscilloscopes — Messages						
Errors						
Command Table						
	<b>* •</b> ^ *	×				
				Download Window		
	🛛 🛛 🔓 Upload fr	om Drive	e 🛛 🚽 🖬 Download ir	nto Drive		
	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
	U					

then press the "Join Curves" button 2 The curve settings mask for the joined curve appears:



urve Settings			×
Curve ID (1100)	1	•	
Curve Name:	SineOutIn		
Setpoint Calculation Wizard:	None		~
Curve Length:	1500	ms	
	< Back	Next>	Cancel

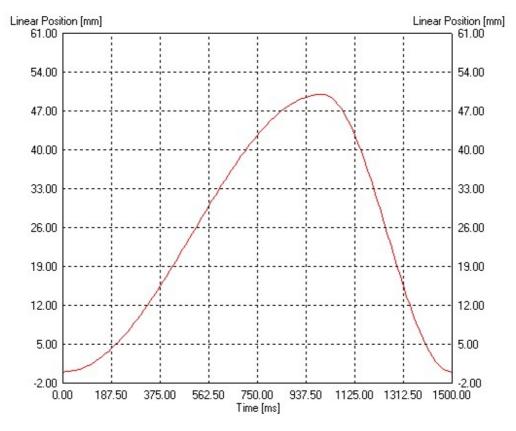
We will set the curve name to "SineOutIn" and make sure the curve ID is 1. The curve length is proposed as the sum of the curve segment times. Please consider the maximal number of curves and curve points indicated in chapter <u>2.6</u>

Press "Next" and "Finish". The curve for the continuous curve mode is now defined and has, according to the parameter settings, the curve ID 1. As we want to download the curves to the drive we select all the curves in the edit window and move them to the download window.

LinMot-Talk 5.0						
<u>File Search Drive Services Options Window To</u>						
🛅 🗙 🛱 🚅 🔚 🎒 🥵 Unnamed, IP: 10.3.10.184	(USER) 🔻 Þ	•	1 🔢 🕺 😽 🖬	🔍 🖻 🏚 🔺 🗇 🗉	2	
Project Unnamed, IP: 10.3.10.184 (USER)				Edit Window		
Control Panel						
▲ Es Parameters	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
▷ · E OS ▷ · E Motion Control SW	🔀 SineOut	2		Sine	1000 ms	501
b - E sercos	Sineln	3		Sine	1000 ms	501
⊳ 🕰 Variables	🔀 SineOutIn	1	Position vs. Time	None	2000 ms	1001
▷ 📴 Oscilloscopes — 🕼 Messages						
Errors						
Curves						
Em Command Table						
	¥ ~ ^ *	×				
				Download Window		
	🛛 🔋 🖢 Upload fre	om Drive	e 📄 🧧 🖬 Download ir	nto Drive 🛛 🔟 🧥 C	Curves have char	nged! Please download.
	Name	ID	Туре	Setpoint Wizard	Length	No. of Setpoints
	🕘 SineDut	2		Sine	1000 ms	501
	Sineln	3		Sine	1000 ms	501
	🕂 SineOutIn	1	Position vs. Time	None	2000 ms	1001
		_				
		_				

When double click the "SineOutIn" Curve the joined curve is shown:





Now the curves must be downloaded to the drive. Therefore press the "Show Curves" button and then the "Download Curves into Drive" button **Download into Controller** Then a warning comes up which has to be confirmed and the progress window will display the actions taken to download the curves.

#### 3.18 Control Status

As we have defined now all parameters and curves, we will let the motor running. For this time, we will take over the interface control from the PC. So we are interface-

independent. Switch to the control panel with the button  $\mathbb{N}$ , then press the start button (starting the drive's firmware) and wait until the control status panel is updated and looks the following:



LinMot-Talk 5.0			x
Eile Search Drive Services Options	Window Tools Manuals Help		_
🛅 1. 🕽 🚅 🖬 🗇 🥵 Unname	d, IP: 10.3.10.184 (USER) 🔹 Þ 🧰 🔹 🔢 🌾	1 💷 🏚 🛦 👼 🖪 🛛	
Project	Control	Status << Monitoring	
Command. IP: 10.3 10.194 (USER)     Command Parel     Command Parel     Command Table     Command Table	0. Switch Ora     1     Interface       1     5. defye/Vit Exbite.     1     Defail Input VA 12       2. Alouk Stop.     1     Forced by Parameter       3. Inable Operation.     1     Forced by Parameter       4. About.     1     Forced by Parameter       5. Frieze.     1     Forced by Parameter       6. Zima Acknowlegue.     1     Forced by Parameter       7. Zima Acknowlegue.     1     Interface       8. Jog Move     0     Interface       11. Species Mode.     0     Interface       13. Go Is Intel A Postor     0     Interface       14. Lineatring.     0     Interface       15. Phase Search.     0     No Source Specified       16. Control Word     003Fh     Devender Value       2. Control Word     003Fh     Devender Value	0. Description       0. Notor Med Sensor       0         2. Encide Denation       0. Notor Med Sensor       0         3. Encide Denation       0. Notor Status       Switch On Advis Status       Switch On Med Sensor         4. Safety Oval. Frazile       1. Sherened       Switch On Advis Scagel Voalage       Notor Status       Switch On Med Sensor         5. Status Noto       1. Sherened       1. Sherened       Switch On Status       Switch Off         7. Warning       1. Sherened       0. Sherened       0. Sherened       Switch On Status       Switch Off         7. Warning       1. Sherened       1. Sherened       0. S	
	IO Panel	Motion Command Interface	
	Actual Value           Actual Properties           Actual Properties	Enable Manuel Override: 10 mm 1 mm +10 mm Command Calegory: Most Commonly Used • Command Type: (No Operation (000+) • Count Nibble [ Count Nibble	
	X4.4 - Input	Name         Offs.         Description         Scaled Value         Int. Value (Dec)         Int. Value (Hex)           Header         0         0000kh: No Operation         0         0         0000h	
	C X4.3- Input	Rest Cormand Serd Cormand	

Now we will fetch the control over the "Switch On" and the "Home" flags.

Now turn off and turn on again the "Switch On" flag, this is because of the auto start prevention. At this time, the motor will be powered and position controlled at the actual position. Set the "Home" flag and the motor will initialize against the inner hard stop. When the motor stands still, clear the "Home" flag and the motor will run the curve continuously.

Detailed information about the MC software's state diagram can be found in the MC software manual.

#### 3.19 Oscilloscope

The oscilloscope is a very useful tool for tuning the motor. The LinMot-Talk software has defined a default oscilloscope, which samples the actual position, demand position, position difference and demand current. When clicking on the "Show Oscilloscope"

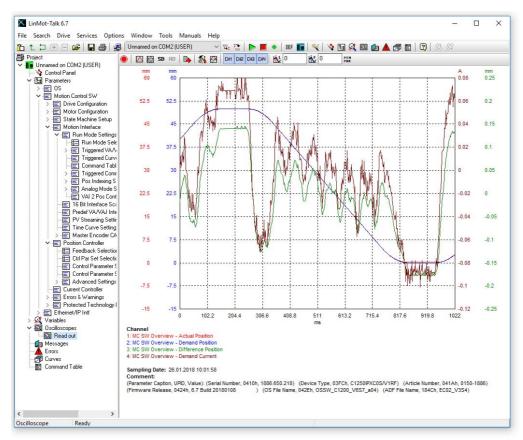
button 🗐, the focus will be set to the default oscilloscope. We could start the

oscilloscope now with the start button ..., but it is recommended to set the recording time about 2 seconds (one curve cycle is 1.5 s). We will switch to the oscilloscope settings with



General Trigger A	Advanced							
Acquisition Mode:	Single Shot			•				
Recording Time:	2044		ms	•				
🔽 Channel 1					Channel 5			
Group		Variable			Group		Variable	
MC SW Overview	•	Actual Positi	on	•	MC SW Overview	•	Actual Position	•
☑ Channel 2 Group		Variable			Channel 6 Group		Variable	
MC SW Overview	•	Demand Pos	sition	•	MC SW Overview	•	Demand Position	•
🔽 Channel 3					Channel 7			
Group		Variable			Group		Variable	
MC SW Overview	-	Difference P	osition	•	MC SW Overview	•	Difference Position	•
🔽 Channel 4					Channel 8			
Group		Variable			Group		Variable	
MC SW Overview	-	Demand Cur	rent	•	MC SW Overview	•	Demand Current	•
Save Color Set							Ok Cano	

Then press Ok and start the oscilloscope with . The recorded data on will be read out from the drive and displayed, which will look somehow like the following.



Possibly it is necessary to press button (<u>fit view</u>).

Tuning the system would be started at this point. One possibility is by restarting the Motor Wizard and changing the load or control parameter, another one is to change the parameters directly in the parameter tree.



# 3.19.1 Display Settings

To Change the display settings in the oscilloscope there are several possibilities. One is with the Fit-Buttons and and the forebot buttons it is possible to push the numbers on the Keyboard on the same time of clicking on the button. When some numbers are pushed, the functionality of the buttons has only influence on the channel with the same numbers. For example when somebody clicks on the Fit-Button and push on the same time number 2 and 3, only channel 2 and 3 will be fitted.

Fit view looks that every channel is showed optimized in the window of the oscilloscope. Every point of a channel is in the window, but it uses the most part of the window.

Fit view (same unit same fit) 🔛 makes the same like fit view but the channels with the same units have the same scale. That means all points of all channels with the same unit are in the window and have the same scale.

An other possibility to scale the view is the mousewheel. With it the Keyboard has also influence. The number make the same like by the fit-view buttons and when the 'X' is pushed then it scales only in X-direction. The same is with the 'Y' then it scales only in the Y-direction. By scaling without all channels, it scales also only in Y-direction.

The third possibility is with the Display Settings window 🖾. In this window it is possible to change the scale, offset and colour of each channel. It is possible to change the time

scale. This button *l* changes how the curves are represented, only with a line, only

with the measure points 🚬 or with line and measure points 🜌

In the tab print it is possible to add some UPIDs. This UPIDs will be written with their values in the comment when the oscilloscope window will be printed. With this function it could given out some information, fore example some control parameters.

### 3.20 Continuous Two Point Mode

The easiest way to run the motor continuously is to set the VAI 2 Pos Continuous mode. In this mode the motor moves between the two positions Trig Fall and Trig Rise. The time the motor waits at the two positions is defined under "VAI 2 Pos Cont Settings".

The minimal settings for this mode are shown next. First the mode has to be set:



Search Drive Services Options Window Io ↑ □ 🖨 🖶 🤹 🤻 Unnamed, IP: 10.3.10.184		<u>ः</u> जि.स. (१)	R <b>4 4</b> R	0		
Project	VAI 2 Pos Continuous					
📕 Unnamed, IP: 10.3.10.184 (USER)	Name	Value	Raw Data	UPID	Туре	Scale
▲ En Parameters	C <sup>®</sup> Motion Command Interface	Off	0001h	1450h	UInt16	
▶ Ē OS	C <sup>+</sup> Triggered VA-Interpolator	Off	00026	1450h	UInt16	
▲ ·	C <sup>®</sup> Rise Triggered VAI For/Backward	Off	OOODh	1450h	UInt16	
Drive Configuration	C <sup>+</sup> Triagered Time Curves	Off	0007h	1450h	UInt16	
Motor Configuration	C <sup>+</sup> Command Table Mode	Off	00036	1450h	UInt16	
⊳ 🖃 State Machine Setup	C <sup>+</sup> Triggered Command Table	Off	000Ch	1450h	UInt16	
▲ E Motion Interface		Off	000ch 000Ah	1450h	Ulint16	
A E Run Mode Settings		Off	0004h	1450h	Ulint16	
- 🔚 Run Mode Selection	C <sup>t</sup> Triggered Analog	Off	0004h	1450h	UInt16	
Figgered VA-Interpolator Settings		Off	0006h	1450h	Ulint16	
Triggered Curves Settings	CAM Mode	Off	0008h	1450h	Ulnt16	
Command Table Settings	✓ Higgeled CAM Curve ✓ VAI 2 Pos Continuous	On	0008h	1450h	UInt16	
Triggered Command Table Settings	C Continuous Curve	Off	0005h	1450h	UInt16	
▷ ·	C Continuous Curve	Off	000sh 0010h	1450h	Uinti6	
▶ = Post Indexing Settings         ▶ = Analog Mode Settings         → = VAI 2 Post Cord Settings         → = The Settings         → = The Settings         → = Predet VA Interpolator         → = Predet VA Interpolator         → = Predet VA Interpolator         → = The Curres Settings         → = The Curres Settings         → = The Current Controller         → = Theotected Technology Functions         → = Motor Info Block         → = Messages         → = Messages         → = Default         → = Three         → = Default						
Command Table						

And then the positions have to be set under "Trig Fall Config\Position" and "Trig Rise Config\Position":

Search Drive Services Options Window Too	ols <u>M</u> anuals <u>H</u> elp				
눈 📁   😅 🖬 🚭   🥵   Unnamed, IP: 10.3.10.184	(USER) 🔻 🕨 📂 🔳 🔶 📗	📱 💐 😵 🔛 🕵 I	8 🕼 🔺 🗇 🗈	2	
Project Unnamed, IP: 10.3.10.184 (USER)	🗂 10 mm		1	🗶 🕑 🛛 DEF	
Virialieu, in: 10.3.10.104 (USEN)	Name	Value	Raw Data	UPID Ty	ipe Scale
▲ Eg Parameters	Position	10 mm	000186A0h	145Ah Sli	nt32 0.0001 r
⊳ - 🖃 OS	Max. Speed	0.1 m/s	000186A0h	145Bh Sli	nt32 1E-6 m/:
Motion Control SW	Acceleration	1 m/s^2	000186A0h	145Ch Sli	nt32 1E-5 m/:
▷ E Drive Configuration	Deceleration	1 m/s^2	000186A0h	145Dh Sh	nt32 1E-5 m/:
▷ ·					
⊳ 🔄 State Machine Setup					
▲					
4 🗐 Run Mode Settings					
Run Mode Selection					
✓					
Trig Fall Config					
▷					
Triggered Curves Settings					
Command Table Settings					
Triggered Command Table Settings					
CAM Mode Settings					
Triggered CAM Curves Settings					
Pos Indexing Settings					
Analog Mode Settings					
VAI 2 Pos Cont Settings					
16 Bit Interface Scaling					
Predef VA Interpolator					
PV Streaming Settings					
Time Curve Settings					
▶					
Position Controller					
E Current Controller					
▷ Errors & Warnings					
Protected Technology Functions					
▷ E Motor Info Block					
▷ · E sercos					
⊳ 🥰 Variables					
Oscilloscopes					
Default					
👍 Messages					
Errors					
- 🗇 Curves					
Ten Command Table	4	III			

This is all we have to configure. The speed, acceleration and deceleration can also be defined at this place in the parameter tree. The motor can now be started the same way as described under 3.18.



# 3.21 Export Configuration

When the drive settings are done, it is strongly recommended to save the complete

configuration. This can be done under File à Export... or with by clicking on . First it will open the Save Config window. This window is to choose the drives, from them the config should be saved. There are the possibilities to select one drive or a group of drives. With out the Advanced Options the LinMot-Talk will read the empty (still not read) variables before it saves the configuration.

Save Conf	ig				$\times$
Choose one or m	nore drives to save thei	r configuration.			
Select All	Name	Port			
	Unnamed	COM4			
	Unnamed	ETH 192.168.1	29		
		Advanced Options C	ancel	Continue	e

The selection Advanced Options opens the tree to select only parts of a drive. It can be selected for each drive different parts. The active drive is market green. To change the active drive only click on the new drive that should be active.

🔀 Save Config	9		– 🗆 X
Choose one or mo	ore drives to save their configuration.		
Select All	Name	Port	Export All     Y Parameters
	Unnamed	COM2	- 🗙 os
	Unnamed	COM4	Motion Control SW     X Ethernet/IP Intf     Variables
			Coscilloscope     X Default     X Messages     X Messages List
			K Errors     K Errors List     Curves
			Command Table Command Table
	Advanced Options	Read Variables	Cancel Continue

After that the file name dialog will open to choose the filename and the folder where the file should be saved.

It is recommended to export all parts of a drive. For a configuration recovery, it is necessary to select the parameters, curves and command table.

In case of a support request, it is recommended to save the configuration without the advanced options and all drives should be selected. Because then the supporters have all informations from the drive that they need.



# 3.22 Import Configuration

A configuration can be imported with File à Import... or with the button 😕. First it opens a dialog window.

Source Configur	ration(s)			Target Drive					
Port:	Name:	Drive Type:		Port:		Drive Type:			
COM4	Unnamed	C1250IPXC1S/V1RF	•	open offline	~			^	Y X Export All
TH 192.168.1.29	Unnamed	C1250IPXC0S/V1RE		import to ETH 192.168.1.29	~	C1250IPXC05/V1RE	Blink		<ul> <li>Parameters</li> <li>OS</li> </ul>
	E1250-IP-UC	E1250-IP-UC		import to COM4	~	C1250IPXC15/V1RF	Blink		K Motion Control SW     X Ethernet/IP Inff     X Osalioscope     X Default     X Messages     X Errors     X Errors     X Errors List     X Command Table     X Command Table

In this window, each configuration in the file has a line, in the combobox a drive could be selected. In this drive the configuration will be loaded. There are four possibilities of imports. They have the followed Symbols.

- 🗙 not used
- open offline
- import to a drive with the same drivetype like the drivetype in the config

import to a drive with another drivetype then the drivetype in the config. In this case, it can have some inconsistent parametertrees!

Two possibilities are always possible, not used and open offline. Not used means with this configuration nothing happens. Open offline means for this configuration an offline device will be created and the configuration will load in it. Each drive, on it the LinMot-Talk is logged in, could only selected in one line at the time.

In the green part on the right side of the window, it is possible to select the parts from the configuration, they will be imported to the drive. For each configuration, it has an only tree of parts. The shown tree is from the configuration that is green too. It is possible to import only some specific parts (e.g. curves or command table).

When opening a configuration to a drive, a compatibility list of the parameter trees will be shown. Then the selection of the importable parts will be shown.

### 3.23 Open Offline Configuration

A configuration can also be opened when no drive is present. Under File à Login/Open offline...



ogin	;
Configuration Interface:	<ul> <li>○ RS232</li> <li>○ CAN</li> <li>○ ETHERNET</li> <li>● OFFLINE</li> </ul>
Configuration File:	O OTTENTE
C:\Program Files\LINMOT\	LinTalk11 Browse
Login ID: user	
Password:	
Scan Blink	OK Cancel

This is a very helpful feature for supporting problems.

## 3.24 Create Offline Configuration

For any supported drive a configuration can be created offline. Choose the menu item File\Create Offline...

🔀 Create Cor	figuration —		×
Drive Family:	E11xx		~
Drive Type:	E1100-GP		~
Interface:	CT IO Interface		~
Application:	None		~
	OK	Car	ncel

The above window will be shown. Select the drive family first, then select the drive type, then choose the interface and application software. The software parts, which can be selected, are the same as when installing firmware to the drive. When created the configuration, the parameters will have their default values. The configuration can then be altered and saved the normal way.

#### 3.25 Compare Parameters

Under Drive  $\rightarrow$  Compare Parameters, there is a function, which allows to compare the settings between different drives.



Co	ompare Pa	rameters			- 0	×
Driv	e 1: E	1400-GP-QN-1S Ver.2 offline (USER)	V Drive 2:	E1450-EC-QN-0S Ver.2 offline (USER)	~	
$\square$	OS Paramet	er MC Parameter	Interface Parameter			
$\square$	Only writab	e Parameter				
۱ŕ.	UPID	Path	Name	Value 1	Value2	
1	03E8h	OS\Drive Name	Drive Name	E1400-GP-ON-1S Ver.2	E1450-EC-ON-0S Ver.2	
2	2000h	CANopen Interface\Dis-/Enable	Dis-/Enable	Enable	UPID does not exist	
3	2010h	CANopen Interface\Baud Rate\Baud	Baud Rate Source Select	By Hex Switch S1	UPID does not exist	
4	2011h	CANopen Interface Baud Rate Baud	Baud Rate Parameter Definition	500 kBit/s [3]	UPID does not exist	
5	2012h	CANopen Interface Baud Rate Advan	BTR Value	22345	UPID does not exist	
5	2013h	CANopen Interface Wode-ID Wode-ID	Node-ID Source Select	By Hex Switch S2	UPID does not exist	
7	2014h	CANopen Interface Wode-ID Wode-ID	Node-ID Parameter Value	63	UPID does not exist	
8	2100h	CANopen Interface PDO Configuratio	TxPDO 1 Enable	Enable	UPID does not exist	
9	2101h	CANopen Interface PDO Configuratio	Transmission Type	1	UPID does not exist	
10	2180h	CANopen Interface PDO Configuratio	No.of SYNC msgs between transmissions	1	UPID does not exist	
11	2102h	CANopen Interface PDO Configuratio	Inhibit Time	10000us(Scale: 1.0000E+002, Offset	UPID does not exist(Scale: 1.0000E+	
12	2103h	CANopen Interface PDO Configuratio	Event Time	100ms	UPID does not exist	
13	2110h	CANopen Interface PDO Configuratio	TxPDO 2 Enable	Enable	UPID does not exist	
14	2111h	CANopen Interface PDO Configuratio	Transmission Type	1	UPID does not exist	
15	2181h	CANopen Interface PDO Configuratio	No.of SYNC msgs between transmissions	1	UPID does not exist	
16	2112h	CANopen Interface PDO Configuratio	Inhibit Time	10000us(Scale: 1.0000E+002, Offset	UPID does not exist(Scale: 1.0000E+	
17	2113h	CANopen Interface PDO Configuratio	Event Time	100ms	UPID does not exist	
18	2120h	CANopen Interface PDO Configuratio	TxPDO 3 Enable	Enable	UPID does not exist	
19	2121h	CANopen Interface PDO Configuratio	Transmission Type	1	UPID does not exist	
20	2182h	CANopen Interface PDO Configuratio	No.of SYNC msgs between transmissions	1	UPID does not exist	
21	2122h	CANopen Interface PDO Configuratio	Inhibit Time	10000us(Scale: 1.0000E+002, Offset	UPID does not exist(Scale: 1.0000E+	
22	2123h	CANopen Interface PDO Configuratio	Event Time	100ms	UPID does not exist	

This useful function works with online and offline configurations. There are different setups available, such as firmware instances (OS, MC, INTF and APPL) or parameter types (read only or writable). The parameter list can be saved as a \*.pvl file (comma separated text file).



# 4 Trouble shooting

#### 4.1 Setting all Parameters to Default Values

#### E1100, E1200, E1400, B8050, MB8050, C1100-GP and C1250

All parameters of the SG3 and SG5 drives can be set to their default values without the use of the LinMot-Talk. This can be done according these steps:

- 1. Power off the drive.
- 2. Set the two ID switches to 0xFF.
- 3. Power on the drive, the Error and Warn LEDs will blink alternately at ~4Hz.
- 4. Set the two ID switches to 0x00.
- 5. Wait until the Warn and EN LEDs will flash together at ~2Hz.
- 6. Power off and on again.

#### B1100

On SG4 drives an image of the default parameters will be stored during the software installation. This image can be reloaded to the operating parameters. The procedure is the following:

- 1. Set the parameter with UPID 0x6085 to 0x0001.
- 2. Power off the drive.
- 3. Power on the drive.

The value of the parameter with UPID 0x6085 will be automatically cleared to 0x0000.

#### A1100

All parameters set to their default values without the use of the LinMot-Talk. This can be done according these steps:

- 1. Power of the drive.
- 2. Set the DIP switch S5.2 to on.
- 3. Power on the drive, the Error and Warn LEDs will blink alternately at ~4Hz.
- 4. Set the DIP switch S5.2 to off.
- 5. Wait until the Warn and EN LEDs will flash together at ~2Hz.
- 6. Power off and on again.

#### 4.2 Interface does not run

If the interface software (DeviceNet, CANopen, Profibus, LinRS) does not communicate there may be several reasons:

- Specific Interface Software not installed
- Switch S3.4 "Interface" on drive's bottom side must be set to "On". (In case of LinRS, this switch must be set to off when configuring over RS232, and set to on when running the LinRS interface).
- Parameter with UPID 2008h set to disable.
- Baud Rate and Node ID selection not correctly set (Parameters and/or ID switches on drive's front)

#### 4.3 Stopping Firmware

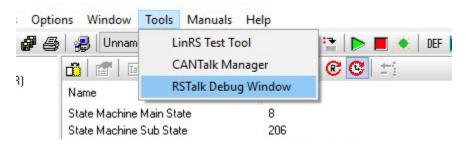
When the same link is used for configuration purposes and from the interface (e.g. RS232 link and LinRS interface) it may not be possible to login with the LinMot-Talk software. In some cases, it should be possible to log in, e.g. to download new firmware. On E1100 drives, the interface switch S3.4 can be set to off and after a power up the interface software should be deactivated and the configuration link should be free. If this does not help, or you are working with a B1100 drive, there is a script under File -> Open -> StopFirmware.sct, which keeps trying to stop the drives firmware while it is powered



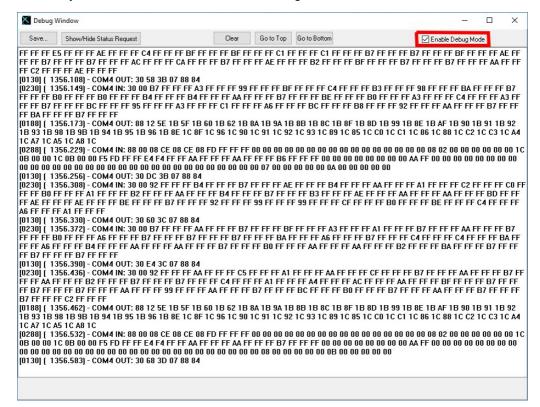
on. After a power up, within the first 2 seconds the interface can be prevented from starting.

#### 4.4 Communication debug Window

To see the communication between the LinMot-Talk and the Drives, there is a debug window. In the menu, Tools – RSTelk Debug Window, it opens the debug window.



The debug window looks like in the picture below. To see the communication, it is necessary to check the checkbox "Enable Debug Mode".



In the menu, Options – Save Debug Window Data, it is possible to enable the automatic save of the debug window.



Raw Data Display Mode Exit Warning Set Login Timeout	;			
Save Debug Window Data	<u>،</u>	/	Enable Disable	

If this is enabled, it is not necessary to have the debug window active. The data will be saved in files with the path: "C:\Users\username\AppData\Local\LinMot\LinMot-Talk6.6-BuildXXXXXX\Communication". The LinMot-Talk saves this data in 10 files. It saves the data cyclic and when it begins with a new file it overwrites the oldest one. Every time when the LinMot-Talk will be restarted this option is disabled.



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