LinMot®

Analog Current Command Interface

Quick Start Guide B1100-VF

B1100-VF/HC/XC

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System Overview

This manual gives a short step by step introduction in the functionality of the B1100-PP(-HC/-XC) servo controller family.
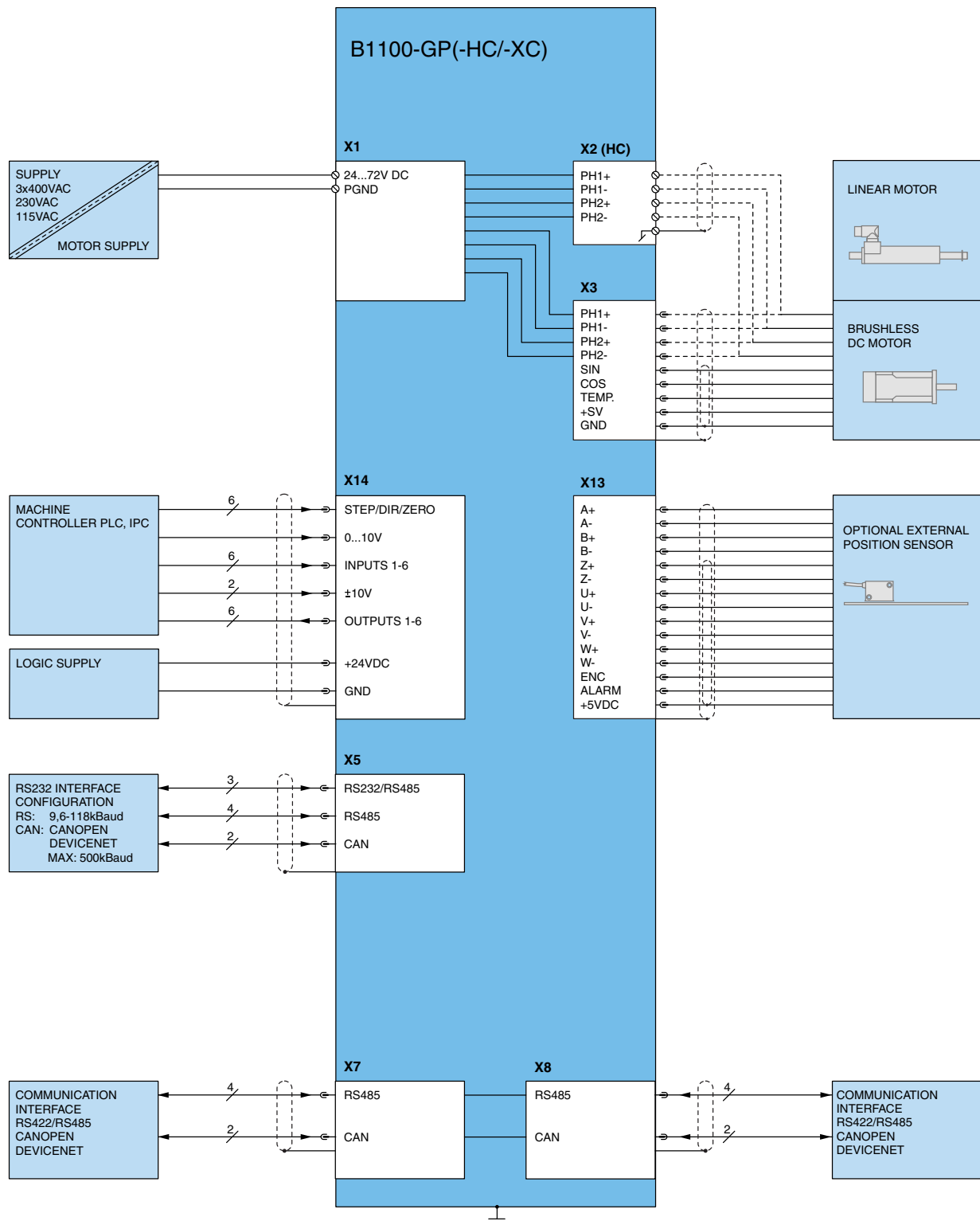
References

Ref	Name	Source
1	Installation_Guide_B1100.pdf	www.linmot.com
2	Usermanual_LinMot-Talk1100.pdf	www.linmot.com
3	Usermanual_MotionCtrlSW_1100.pdf	www.linmot.com

The documentation is distributed with the LinMot-Talk1100 configuration software, which can be downloaded from the LinMot homepage for free.

For more detailed information about the functionality of the software please refer to the manuals above:

- Installation_Guide_B1100.pdf:
  data sheet, wiring and connections

- Usermanual_MotionCtrlSW_1100.pdf:
  motion controller software description (state machine, motion interface)

Connector Overview

B1100-GP(-HC/-XC)

X1
24...72V DC
PGND

X2 (HC)
PH1+
PH1-
PH2+
PH2-

X3
PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+SV
GND

X14
STEP/DIR/ZERO
0...10V
INPUTS 1-6
±10V
OUTPUTS 1-6
+24VDC
GND

X13
A+
A-
B+
B-
Z+
Z-
U+
U-
V+
V-
W+
W-
ENC
ALARM
+5VDC

X5
RS232/RS485
RS485
CAN

X7
RS485
CAN

X8
RS485
CAN

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

LINEAR MOTOR

BRUSHLESS
DC MOTOR

MACHINE
CONTROLLER PLC, IPC

LOGIC SUPPLY

OPTIONAL EXTERNAL
POSITION SENSOR

RS232 INTERFACE
CONFIGURATION
RS: 9,6-118kBaud
CAN: CANOPEN
        DEVICENET
   MAX: 500kBaud

COMMUNICATION
INTERFACE
RS422/RS485
CANOPEN
DEVICENET

COMMUNICATION
INTERFACE
RS422/RS485
CANOPEN
DEVICENET

Typical servo system B1100-XX-YY: Servo controller, motor and power supply.

Getting Started Current Command Mode

Connect the motor with the controller, wire at least the motor power supply on X1 and the 24VDC logic supply on X14.

Wire the differential analog current command input to X14.8/X14.21.

Wire the position encoder signals from the X13 connector to the superior control system.

Wire the state machine control lines according the configuration. For the quick start configuration use the following:

Descriptor	IO type	Configured Function
X14.14	Input	Ctrl Word: Switch On
X14.2	Input	Ctrl Word: Home
X14.15	Input	Ctrl Word: Error Acknowledge
X14.3	Input	Ctrl Word: Special Mode
X14.16	Input	Ctrl Word: Go To Initial Position
X14.5	Output	Status Word: In Target Position
X14.18	Output	Status Word: Warning
X14.6	Output	Status Word: Error
X14.19	Output	Status Word: Special Motion Active

⚠️ Alternatively to the digital IO control of the state machine and error handling you can use a B1100-GP controller and do this over a serial bus interface (CANopen, DeviceNet or LinRS). This offers deeper integration into your superior control system.
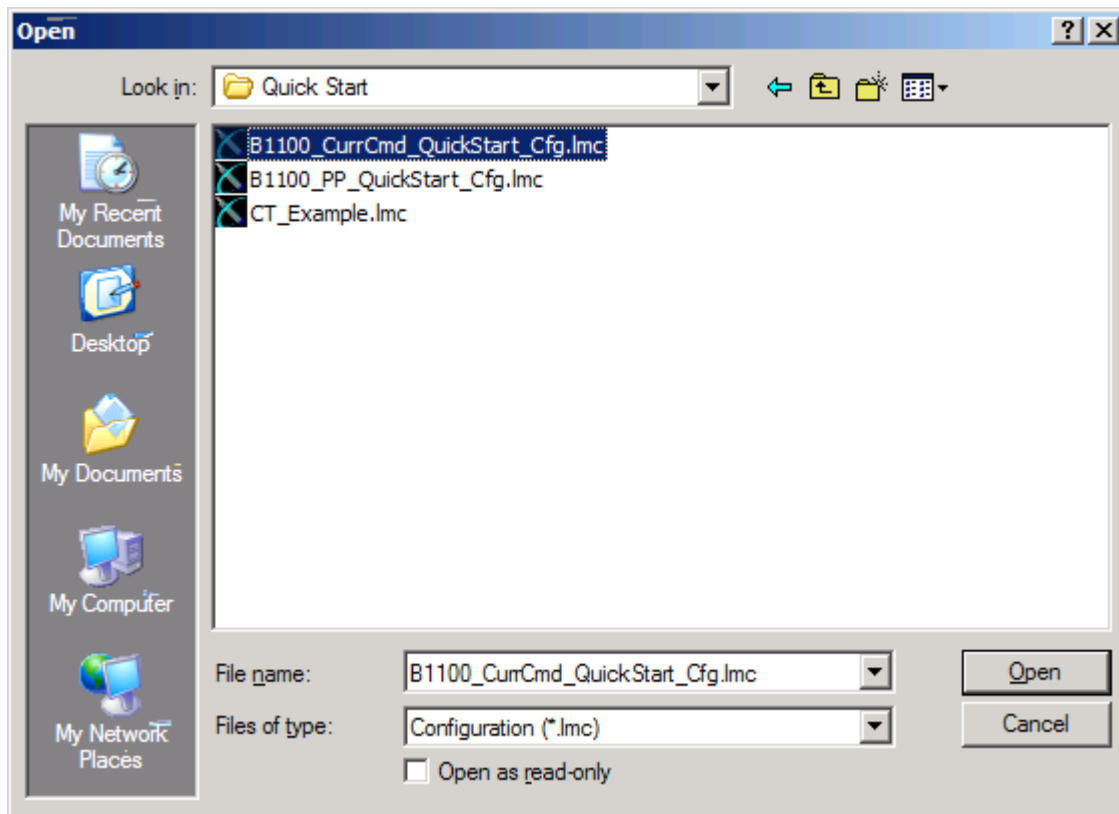
Connect your configuration PC using a 1:1 serial RS232 cable (female/female) with the servo controller X5.

Switch on the 24V logic supply.

Start the LinMot-Talk1100 software.
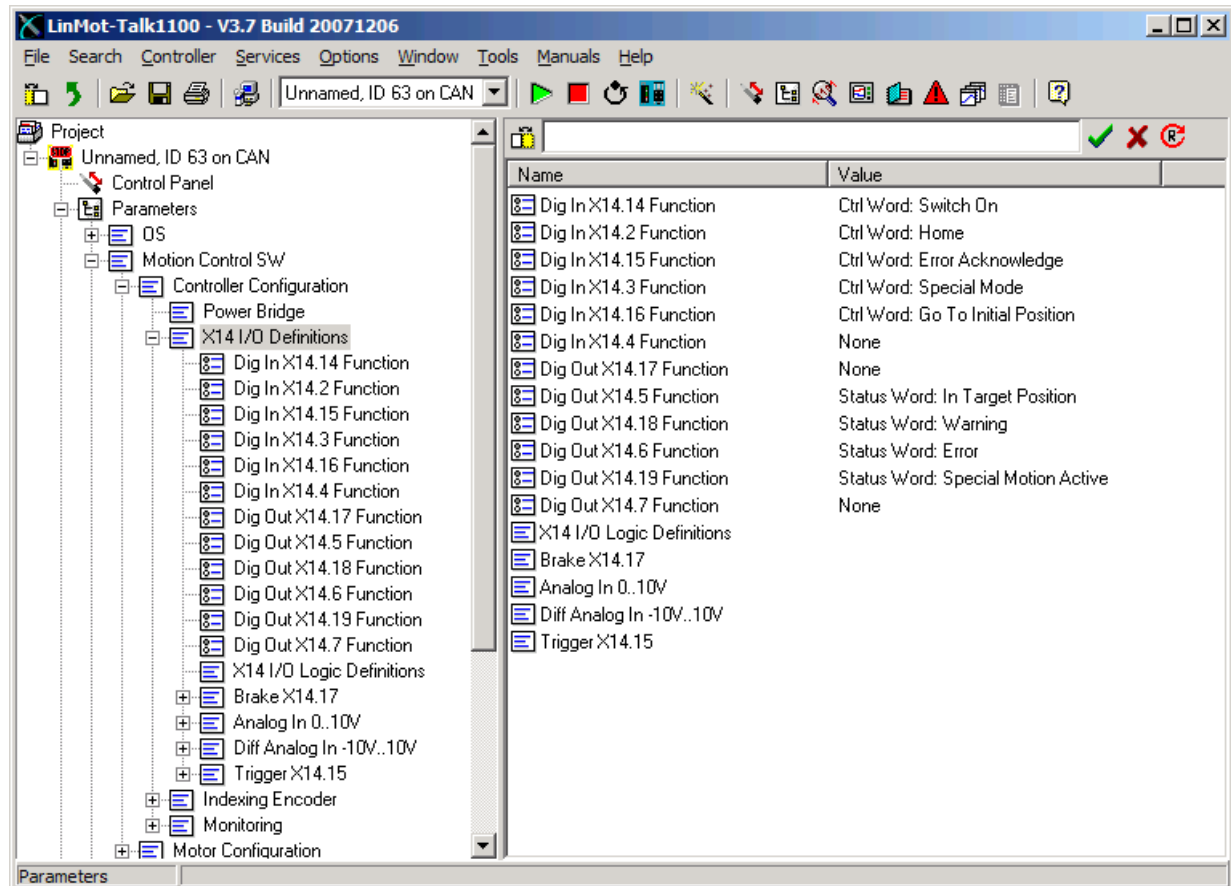
Login the servo controller.

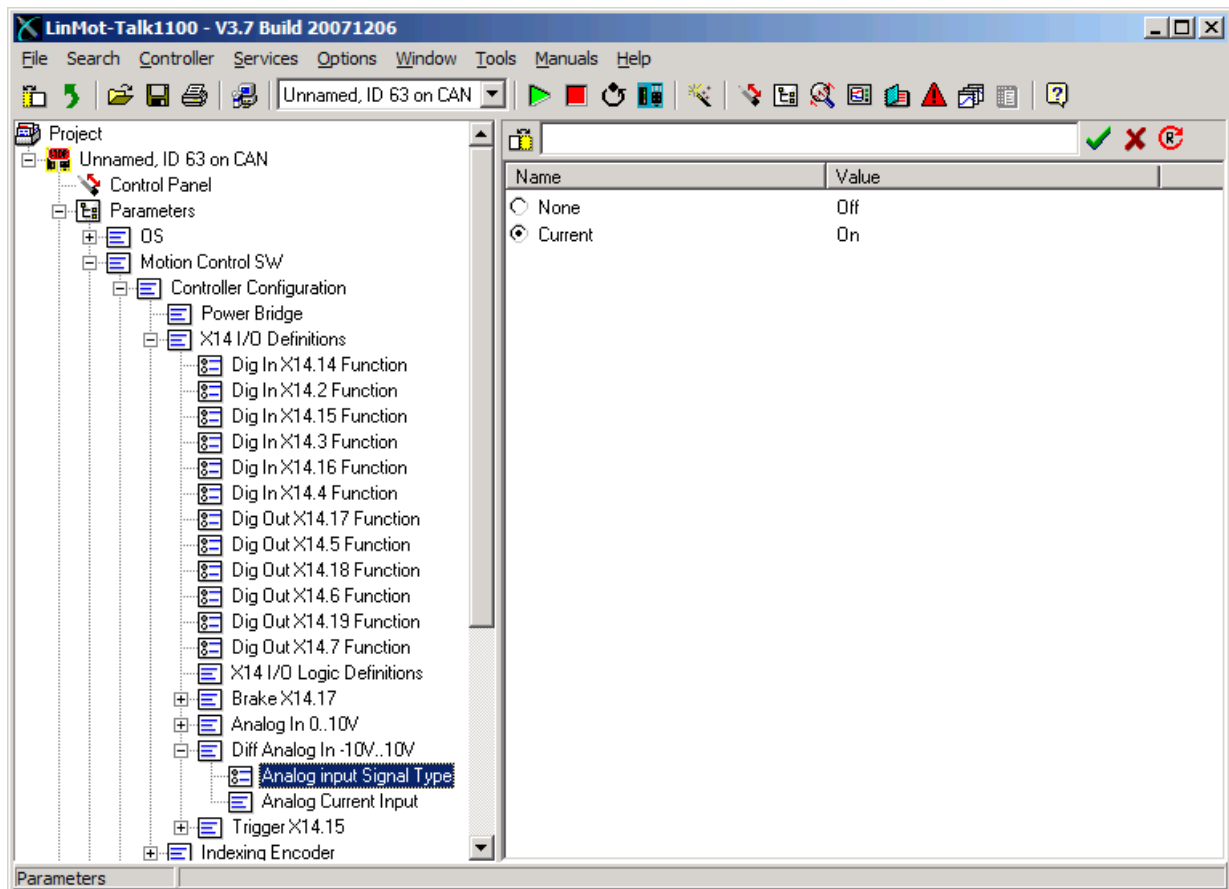Import the B1100_CurrCmd_QuickStart_Cfg.lmc configuration file:

The following description is a short tour through the imported configuration.

IO Configuration

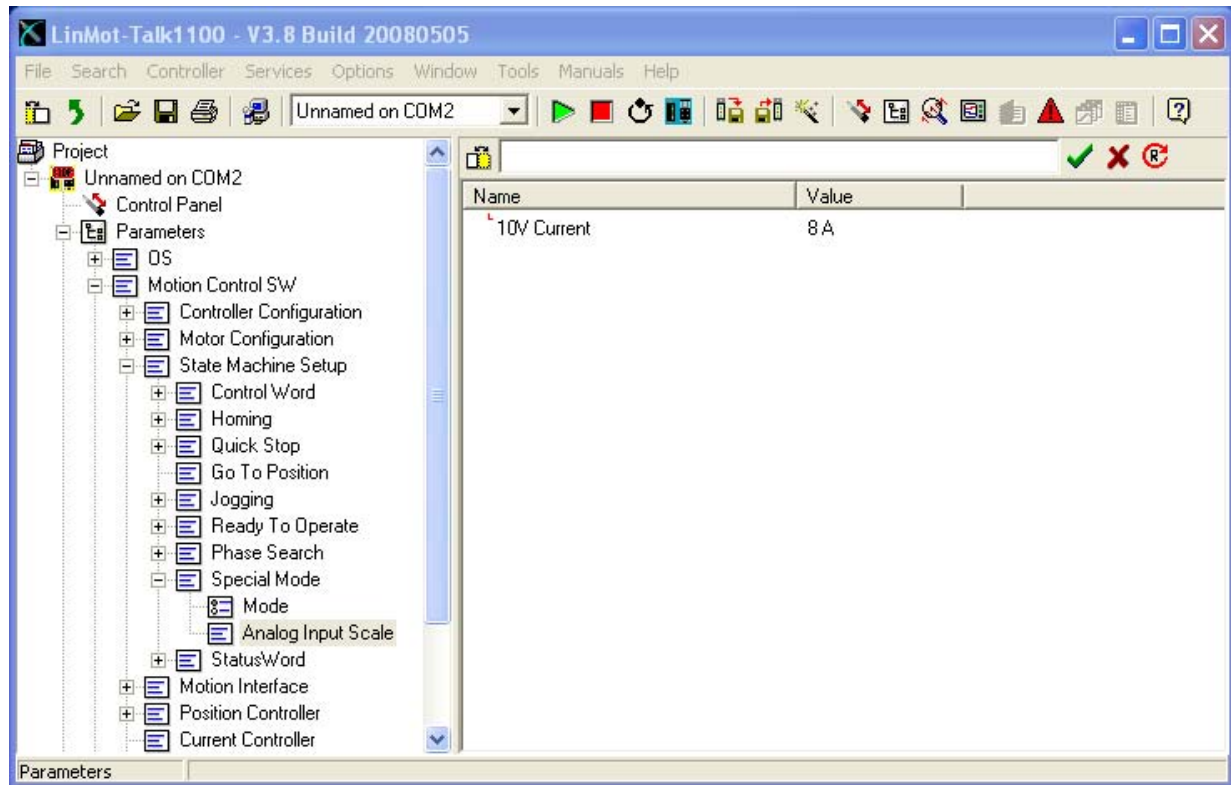In the quick start configuration the digital inputs and outputs are configured as shown:

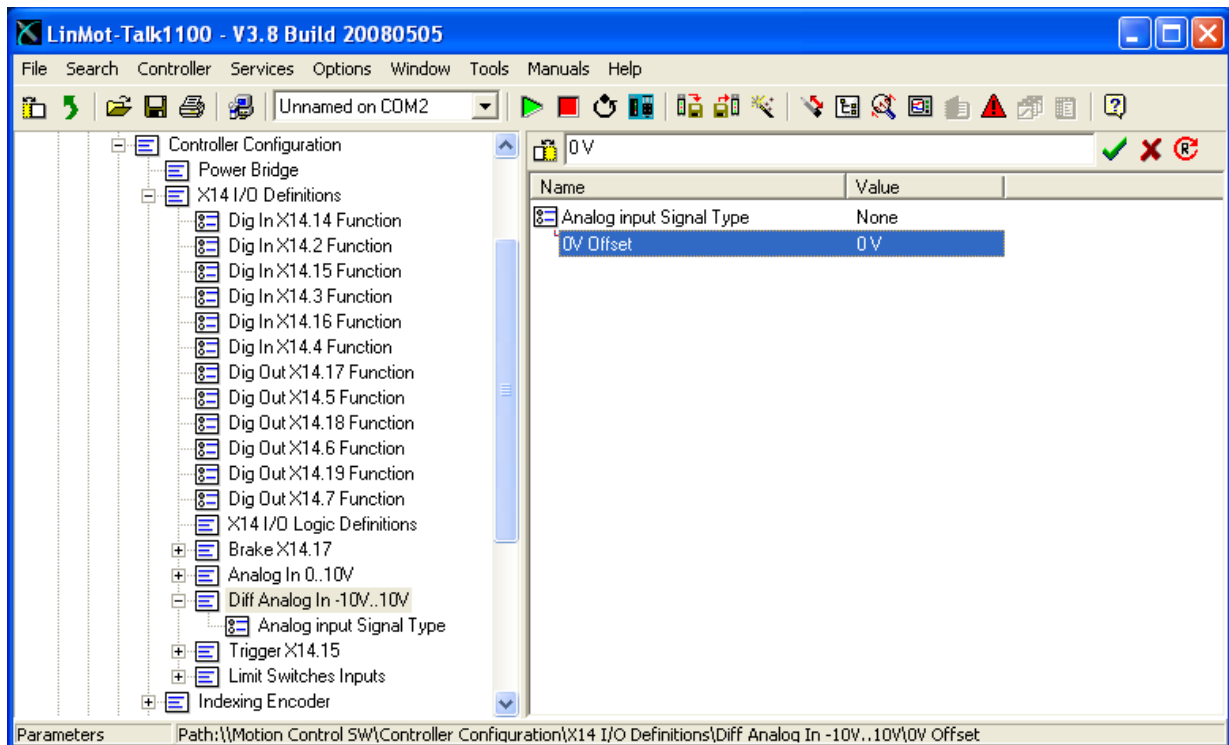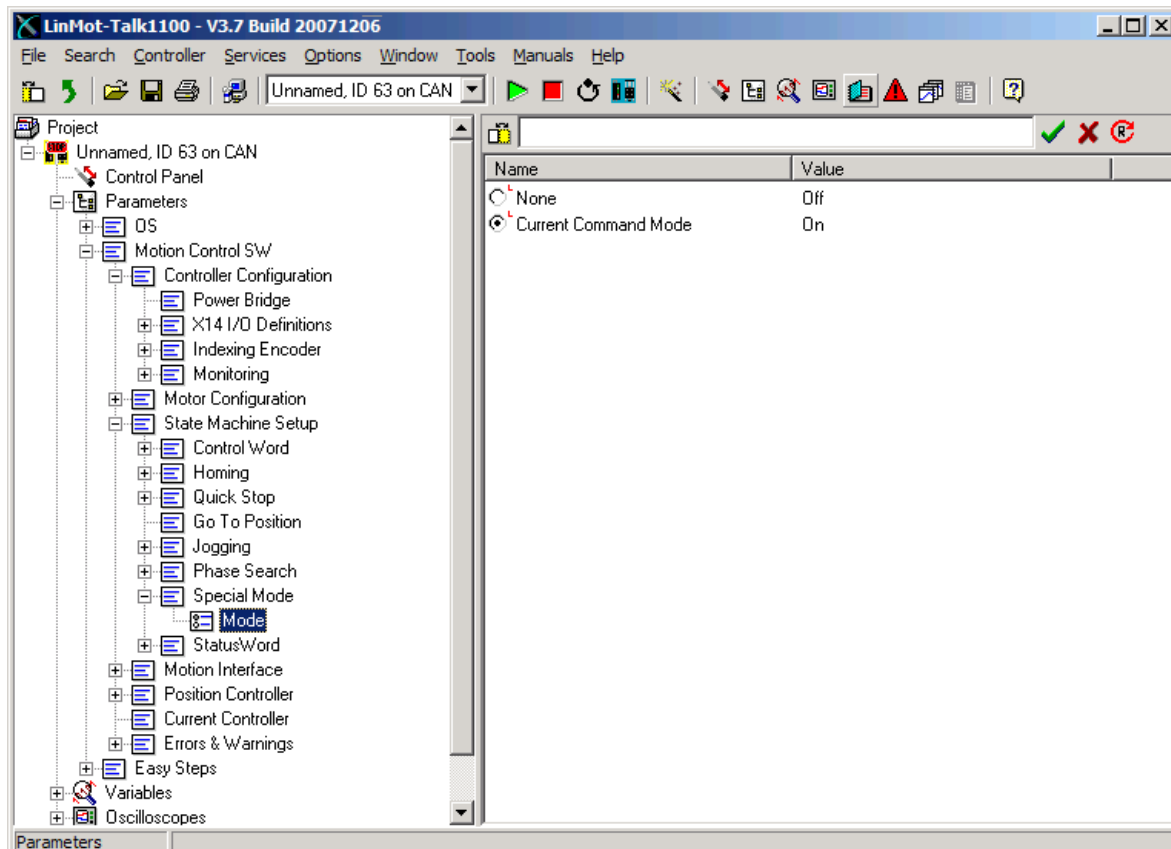The differential analog voltage input is configured as a current command input:

The scaling is done with the 10V current value and may be adapted regarding the motor's and servo controller's maximal current:

Also the 0V offset adjustment can be done here:

In the next step the state machine is set to the special mode "Current Command Mode":

Now the motor can be configured with the motor wizard. The motor wizard guides you through the configuration:

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Motor Wizard

Step 1/9: Actuator Selection

Actuator Data File:	**PS01-37x120-HP**.adf	[Change Actuator ...]
Stator:	PS01-37x120-HP-C ▼	
Slider:	PL01-20x600/540-HP ▼	

The slider can be identified by its length. Newer sliders have the type engraved on the surface.

Slider Mounting Direction: Regular ▼

The sliders are not symmetric. The value of ZP (Zero Position) depends on the mounting direction relative to the stator. Therefore the available stroke range changes with the mounting direction.

Derived Settings	Value	Comment
STATOR	PS01-37x120-HP-C	
Article Number	0150-1251	
Stator Length	216 mm	
Stator Mass	740 g	
SLIDER	PL01-20x600/540-HP	
Article Number	0150-1510	
Slider Length	600 mm	
Slider Mass	1327 g	
MOTOR	P01-37x120-HP/400x480-C	
Maximal Stroke (S)	480 mm	
Shortened Stroke (SS)	400 mm	
Electromagnetic Zero Position (ZP)	230 mm	
Force Constant	20.4 N/A	
Edge Force (Fb)	67 %	

[Help] [< Back] [Next >] [Finish] [Cancel]

If you use the encoder simulation you can configure it at the external position sensor system section. As resolution you may configure a multiple of 0.1um, recommended values are **2um** 5um 10um, which should be a good selection for most applications.

If the resolution value is too small, the maximal speed in operation may be reduced! For secure operation, the maximal velocity/resolution should not be greater than 2MHz. E.g. 4m/s/2um = 2MHz, which means 4m/s is the maximal save operation speed for 2um sensor simulation resolution.

Motor Wizard

Step 4/9: External Position Sensor System

External Position Sensor

Type: AB Encoder Simulation (RS422)

Resolution r (1/4 Period Length): 2 um

With an additional external position measuring system the positioning accuracy and the linearity can be improved. The optional position sensor has to be connected to X12 on the controller.

Derived Settings	Value	Comment

Help | < Back | Next > | Finish | Cancel

When the motor wizard is finished all the needed parameters are set accordingly. The system is now ready for operation. Switch on the motor supply.

Set the input on X14.14 high, this enables the position control of the motor:
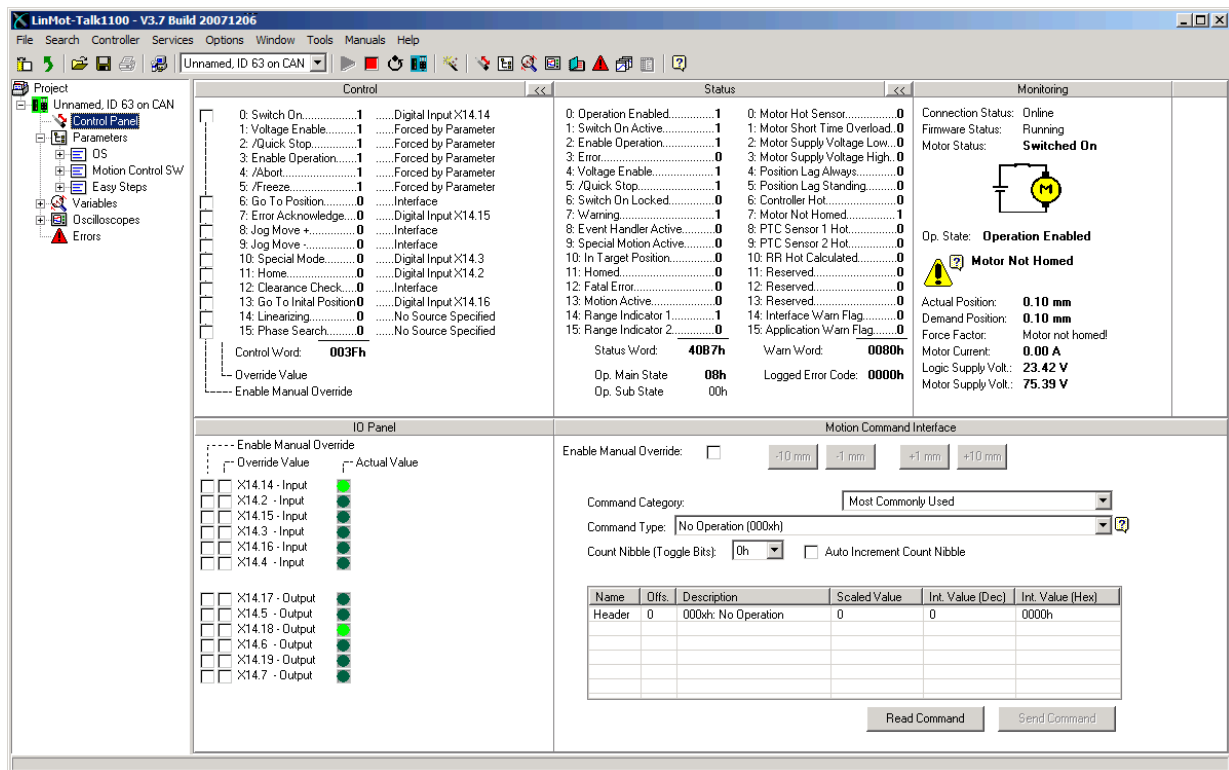
Now set the input on X14.2 to start the homing sequence. Wait until the warning on X14.8 disappears and the in target position on X14 5 is set. This indicates that the homing sequence has been completed.
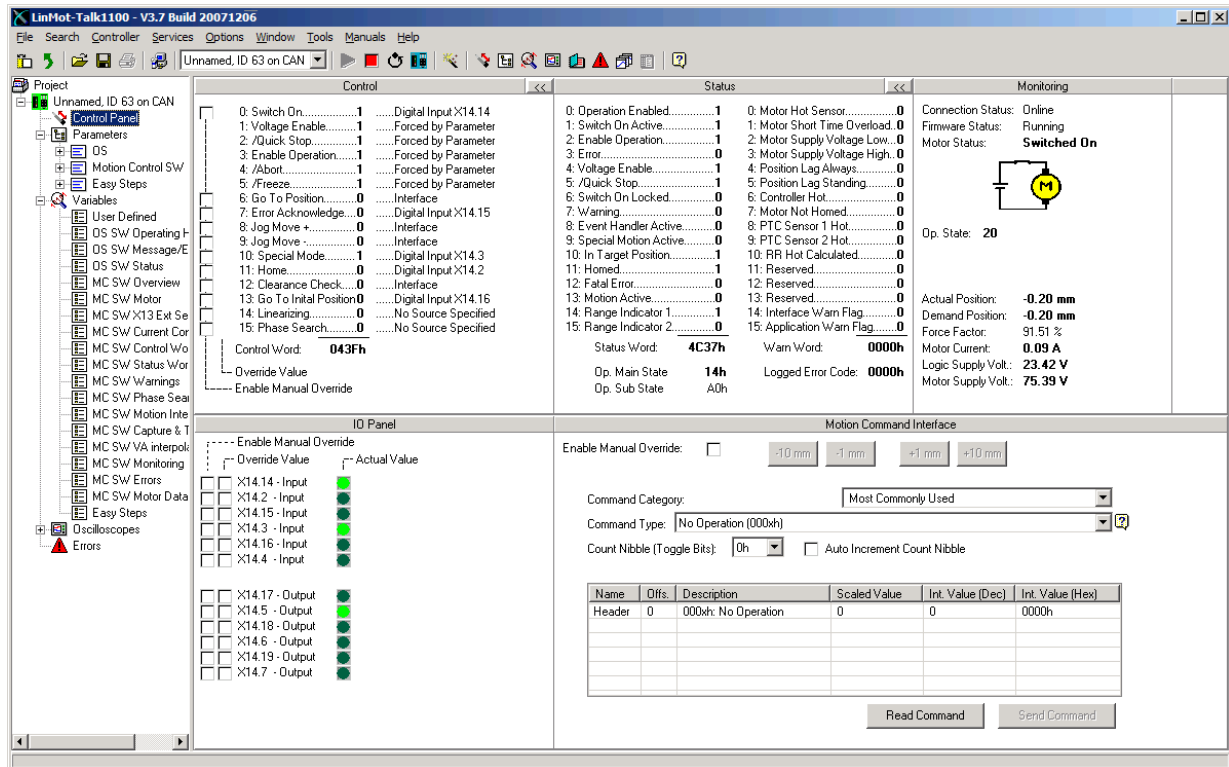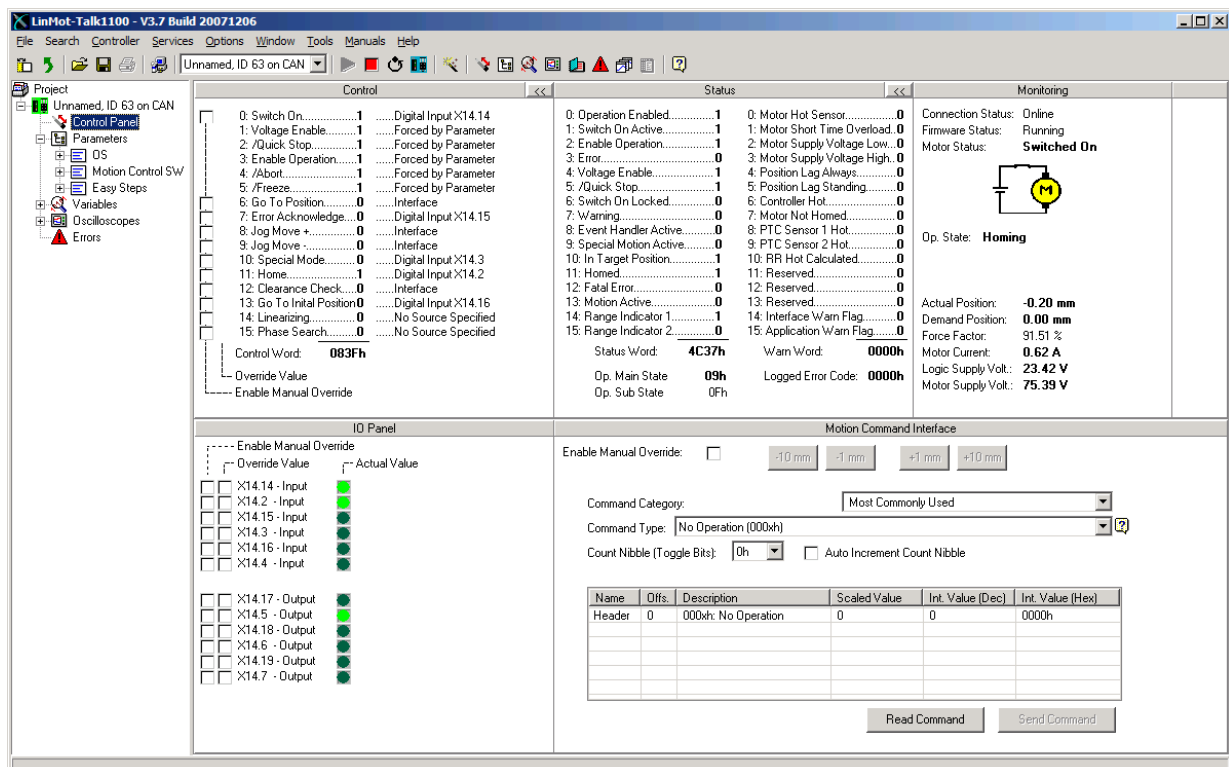

Set the input on X14.2 low to complete the homing.

By setting the input on X14.3 the current command interface will be activated!

⚠ Before activating the superior position control loop, make sure the position control loop in your superior system is initialised correctly and the position feedback direction is correct! Otherwise the motor will accelerate in any direction and crash to a limit!

If an error occurs, the output on X14.6 will go high. It can be acknowledged by a rising edge on the input X14.15.

Velocity Control Mode

The LinTalk1100-Firmware for the B1100 series controllers doesn't support the velocity control mode. The Velocity control mode isn't implemented on the B1100 series controller so far, because it is much easier to work with only current command mode. If the current command mode is used, only one control loop has to be tuned (position control loop on the superior motion controller). Whereas in velocity mode one always has to tune two loops: First the velocity loop in the drive and then the position control loop of the motion controller.

If your application requires the use of a velocity control mode, please contact our support team so a suitable solution to your problem can be worked out.

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