

MCD EPOS P 60 W

Programmable Compact Drive

Getting Started



Document ID: rel2475

PLEASE READ THIS FIRST



These instructions are intended for qualified technical personnel. Prior commencing with any activities ...

- you must carefully read and understand this manual and
- you must follow the instructions given therein.

We have tried to provide you with all information necessary to install and commission the equipment in a **secure, safe and time-saving** manner. Our main focus is ...

- to familiarize you with all relevant technical aspects,
- to let you know the easiest way of doing,
- to alert you of any possibly dangerous situation you might encounter or that you might cause if you do not follow the description,
- to **write as little** and to **say as much** as possible and
- not to bore you with things you already know.

Likewise, we tried to skip repetitive information! Thus, you will find things **mentioned just once**. If, for example, an earlier mentioned action fits other occasions you then will be directed to that text passage with a respective reference.



Follow any stated reference – observe respective information – then go back and continue with the task!

PREREQUISITES FOR PERMISSION TO COMMENCE INSTALLATION

The **MCD EPOS P 60 W** is considered as partly completed machinery according to EU's directive 2006/42/EC, Article 2, Clause (g) and therefore **is intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment**.



You must not put the device into service, ...

- unless you have made completely sure that the other machinery – the surrounding system the device is intended to be incorporated to – fully complies with the requirements stated in the EU directive 2006/42/EC!
- unless the surrounding system fulfills all relevant health and safety aspects!
- unless all respective interfaces have been established and fulfill the stated requirements!

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1 About this Document

1.1 Intended Purpose

The purpose of the present document is to familiarize you with the described equipment and the tasks on safe and adequate installation and/or commissioning.

Observing the described instructions in this document will help you ...

- to avoid dangerous situations,
- to keep installation and/or commissioning time at a minimum and
- to increase reliability and service life of the described equipment.

Use for other and/or additional purposes is not permitted. maxon motor, the manufacturer of the equipment described, does not assume any liability for loss or damage that may arise from any other and/or additional use than the intended purpose.

1.2 Target Audience

This document is meant for trained and skilled personnel working with the equipment described. It conveys information on how to understand and fulfill the respective work and duties.

This document is a reference book. It does require particular knowledge and expertise specific to the equipment described.

1.3 How to use

Take note of the following notations and codes which will be used throughout the document.

Notation	Explanation
«Abcd»	indicating a title or a name (such as of document, product, mode, etc.)
□Abcd□	indicating an action to be performed using a software control element (such as folder, menu, drop-down menu, button, check box, etc.) or a hardware element (such as switch, DIP switch, etc.)
(n)	referring to an item (such as order number, list item, etc.)
→	denotes “see”, “see also”, “take note of” or “go to”

Table 1-1 Notations used in this Document

1.4 Symbols and Signs

1.4.1 Safety Alerts



Take note of when and why the alerts will be used and what the consequences are if you should fail to observe them!

Safety alerts are composed of...

- a signal word,
- a description of type and/or source of the danger,
- the consequence if the alert is being ignored, and
- explanations on how to avoid the hazard.

Following types will be used:

- 1) **DANGER**
Indicates an **imminently hazardous situation**. If not avoided, the situation will result in death or serious injury.
- 2) **WARNING**
Indicates a **potentially hazardous situation**. If not avoided, the situation **can** result in death or serious injury.
- 3) **CAUTION**
Indicates a **probable hazardous situation** and is also used to alert against unsafe practices. If not avoided, the situation **may** result in minor or moderate injury.

Example:



DANGER

High Voltage and/or Electrical Shock

Touching live wires causes death or serious injuries!

- *Make sure that neither end of cable is connected to live power!*
- *Make sure that power source cannot be engaged while work is in process!*
- *Obey lock-out/tag-out procedures!*
- *Make sure to securely lock any power engaging equipment against unintentional engagement and tag with your name!*

1.4.2 Prohibited Actions and Mandatory Actions

The signs define prohibitive actions. So, you **must not!**

Examples:



Do not touch!



Do not operate!

The signs point out actions to avoid a hazard. So, you **must!**

Examples:



Unplug!



Tag before work!

1.4.3 Informatory Signs



Requirement / Note / Remark

Indicates an action you must perform prior continuing or refers to information on a particular item.



Best Practice

Gives advice on the easiest and best way to proceed.



Material Damage

Points out information particular to potential damage of equipment.



Reference

Refers to particular information provided by other parties.

1.5 Trademarks and Brand Names

For easier legibility, registered brand names are listed below and will not be further tagged with their respective trademark. It must be understood that the brands (the below list is not necessarily concluding) are protected by copyright and/or other intellectual property rights even if their legal trademarks are omitted in the later course of this document.

The brand name(s) is/are a registered trademark(s) of ...
Adobe® Reader®	© Adobe Systems Incorporated, USA-San Jose, CA
Pentium®	© Intel Corporation, USA-Santa Clara, CA
Windows®	© Microsoft Corporation, USA-Redmond, WA

Table 1-2 Brand Names and Trademark Owners

1.6 Copyright

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maxon motor ag

Brünigstrasse 220

P.O.Box 263

CH-6072 Sachseln

Switzerland

Phone +41 (41) 666 15 00

Fax +41 (41) 666 15 50

www.maxonmotor.com

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2 Introduction

The present document provides you with information on the first steps using MCD EPOS P 60 W Programmable Compact Drive. It describes the standard procedure when putting the device into operation and is meant to facilitate installation and configuration of a basic MCD EPOS P 60 W system.

maxon motor control's MCD EPOS P 60 W is a small-sized, free programmable compact drive. It contains a brushless EC motor with Hall sensors, digital encoder and a digital position control unit. The optimized commutation by space vector control offers to drive the integrated brushless EC motor with minimal torque ripple and low noise. The integrated position, velocity and current control functionality allows sophisticated positioning applications.

The MCD EPOS P 60 W is programmable with a very efficient software tool. The programming languages are according to IEC 61131-3 standard. The built-in CANopen interface allows the design of an easy-to-use standalone multiple axis system, particularly with standard maxon MCD EPOS controllers or standard maxon EPOS controllers. In addition, the unit can be operated via any RS232 interface.

Find the latest edition of the present document, as well as additional documentation and software to the MCD EPOS P 60 W Programmable Compact Drive also on the internet:

- www.maxonmotor.com – category «Service & Downloads»
- shop.maxonmotor.com

2.1 Documentation Structure

The present document is part of a documentation set. Please find below an overview on the documentation hierarchy and the interrelationship of its individual parts:

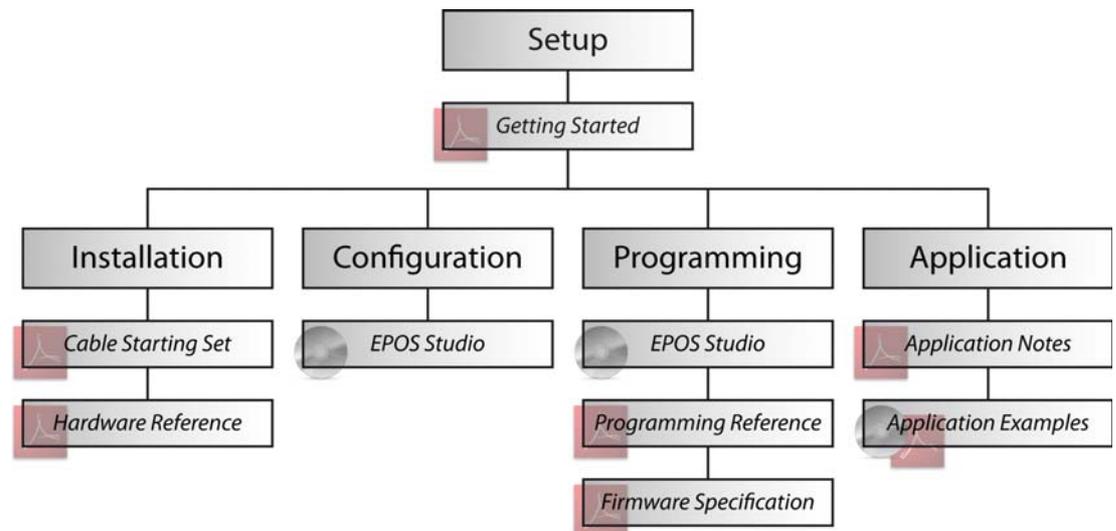


Figure 2-1 Documentation Structure

2.2 Safety Precautions

Prior continuing ...

- make sure you have read and understood chapter “ PLEASE READ THIS FIRST” on page A-2,
- do not engage with any work unless you possess the stated skills (→chapter “1.2 Target Audience” on page 1-5,
- refer to chapter “1.4 Symbols and Signs” on page 1-6 to understand the subsequently used indicators,
- you must observe any regulation applicable in the country and/or at the site of implementation with regard to health and safety/accident prevention and/or environmental protection,
- take note of the subsequently used indicators and follow them at all times.



DANGER

High Voltage and/or Electrical Shock

Touching live wires causes death or serious injuries!

- Consider any power cable as connected to life power, unless having proven the opposite!
- Make sure that neither end of cable is connected to life power!
- Make sure that power source cannot be engaged while work is in process!
- Obey lock-out/tag-out procedures!
- Make sure to securely lock any power engaging equipment against unintentional engagement and tag with your name!



Requirements

- Make sure that all associated devices and components are installed according to local regulations.
- Be aware that, by principle, an electronic apparatus can not be considered fail-safe. Therefore, you must make sure that any machine/apparatus has been fitted with independent monitoring and safety equipment. If the machine/apparatus should break down, if it is operated incorrectly, if the control unit breaks down or if the cables break or get disconnected, etc., the complete drive system must return – and be kept – in a safe operating mode.
- Be aware that you are not entitled to perform any repair on components supplied by maxon motor.



Best Practice

- For initial operation, make sure that the motor is free running. If not the case, mechanically disconnect the motor from the load.



Maximal permitted Supply Voltage

- Make sure that supply power is between 12...50 VDC.
- Supply voltages above 55 VDC will destroy the unit.
- Wrong polarity will destroy the unit.



Electrostatic Sensitive Device (ESD)

- Make sure to wear working cloth in compliance with ESD.
- Handle device with extra care.

3 Installation and Configuration

3.1 Important Notice: Prerequisites for Permission to commence Installation

The MCD EPOS P 60 W is considered as partly completed machinery according to EU's directive 2006/42/EC, Article 2, Clause (g) and therefore **is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment.**



WARNING

Risk of Injury

Operating the device without the full compliance of the surrounding system with the EU directive 2006/42/EC may cause serious injuries!

- Do not operate the device, unless you have made sure that the other machinery fulfills the requirements stated in EU's directive!
- Do not operate the device, unless the surrounding system fulfills all relevant health and safety aspects!
- Do not operate the device, unless all respective interfaces have been established and fulfill the stated requirements!

3.2 Step 1: Software Installation

Install the software from the «EPOS Positioning Controller» CD-ROM. It contains all necessary information and tools (such as manuals, firmware, tools, Windows DLLs, drivers) required for installation and operation of the MCD EPOS P Programmable Compact Drive.



You can download the latest software version from the internet (for URLs → chapter “2 Introduction” on page 2-9).

3.2.1 Minimum System Requirements

Component	Minimum Requirement
Operating System	Windows 7, Windows Vista, Windows XP SP2
Processor	Core2Duo 1.5 GHz
Drives	Hard disk drive, 1.5 GB available space DVD drive
Memory	1 GB RAM
Monitor	Screen resolution 1024 x 768 pixels at high color (16-Bit)

Table 3-3 Minimum System Requirements

3.2.2 Installation

- 1) **Insert «EPOS Positioning Controller» CD-ROM** into CD-ROM drive of your computer. Autorun will commence automatically. If autorun should fail to start, find the installation file named “EPOS Positioning Controller.msi” on your explorer, then doubleclick to start.
- 2) **Follow the instructions** during the installation program. Please read every instruction carefully. Indicate location of working directory when prompted.



Best Practice

- We recommend following location as working directory: *C:\Program Files\maxon motor ag* (note that designation of program directory may vary depending on the system language installed).

3) View new shortcuts and items in the start menu.

- The files have been copied to the menu «maxon motor ag», where you can access the program as well as the entire documentation set.
- Clicking the «EPOS Studio» shortcut on your desktop will launch the program.

- 4) **If needed: Modify or remove the software.** To change application features or to uninstall the software, start the installation program «EPOS Positioning Controller.msi» anew and follow the instructions given.

3.3 Step 3: Minimum External Wiring



Maximal permitted Supply Voltage

- Make sure that supply power is between 12...50 VDC.
- Supply voltages above 55 VDC or wrong polarity will destroy the unit.
- Note that necessary output current is depending on load (continuous max. 2.6 A; acceleration/short-time max. 9 A).

- 1) Install «MCD EPOS P 60 W Programmable Compact Drive» (315665).
- 2) Connect MCD EPOS Power/RS232-CAN Cable (325939) to following interfaces:
 - MCD EPOS P 60 W's connector “J2”
 - Power supply +12...+50 VDC (the necessary output current depends on the load, continuous max. 2.6 A / acceleration, short-time max. 9 A)
 - PC's RS232 interface

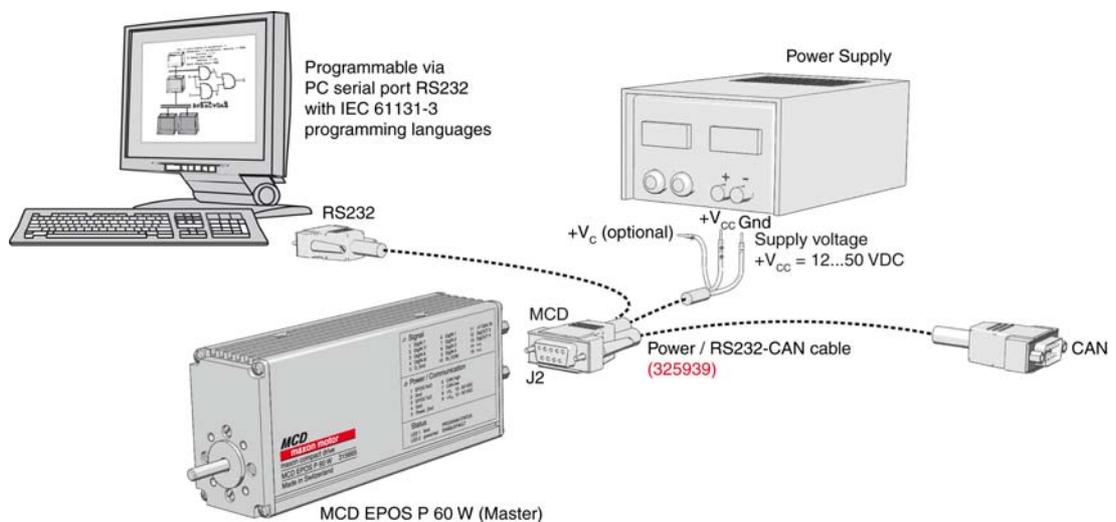


Figure 3-2 Minimum Wiring

3.4 Step 4: System Configuration



Read separate instructions

You will need to know certain technical data of your system.

Refer to maxon catalog or respective data sheets of components used.

- 1) Switch on MCD EPOS P 60 W power supply.
- 2) Doubleclick «EPOS Studio.exe» shortcut on your desktop.
«EPOS Studio» will start and the “New Project Wizard” will automatically be launched.
- 3) Make sure that you are using the latest version of «EPOS Studio». If you are in doubt on the version you are currently using, proceed as follows:
 - a) Click menu «Help», then select menu «About EPOS Studio». The currently installed version will be displayed.
 - b) Click one of the displayed hyperlinks to find out on the latest version available. Download the latest version, if needed.
- 4) Load an existing EPOS P Project:
 - a) Select «MCD EPOS P Project» from list.
 - b) Click «Next» to proceed.



Figure 3-3 Project Configuration Dialog

- 5) Set project settings:
 - a) Click browse icon (arrow) to set path and name for your project.
 - b) Click «Finish» to create new project.

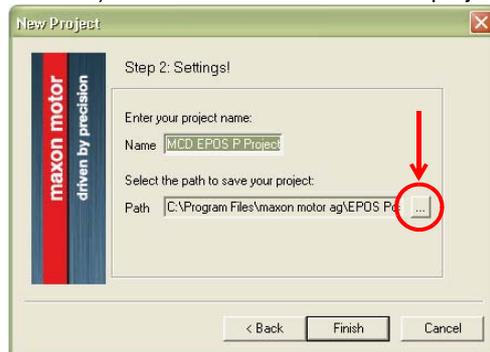


Figure 3-4 Project Path and Name

6) Clear CAN Warning:

The Project Tree will be displayed in the “Page Navigator Window”. If CAN is not connected, the warning “CanPassiveError on CAN Port” will appear (arrow).

- a) Click right on warning.
- b) Click “Clear All Entries”.
- c) If other errors or warnings appear, check wiring and startup configuration (for details on errors and warnings → separate document «EPOS P Firmware Specification»).

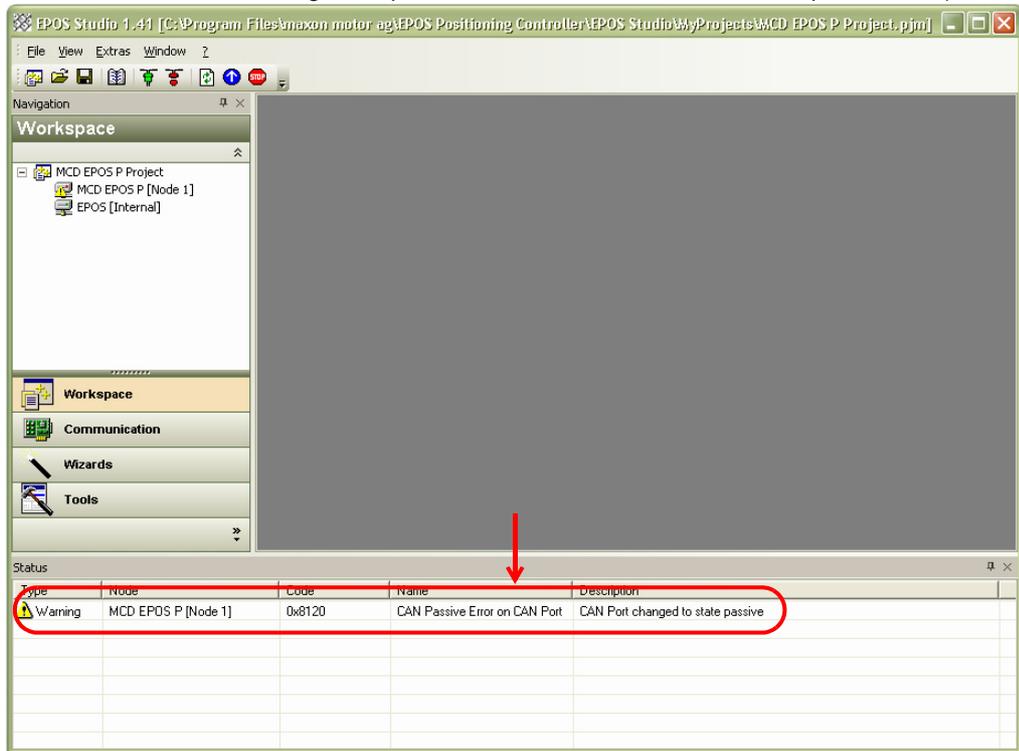


Figure 3-5 Project Tree and Warnings

7) Start “Startup Wizard”:

- a) Click “Wizards”.
- b) Select “MCD EPOS P” from Device Selection Combo Box (arrow).
- c) Doubleclick “Startup Wizard” item in Wizard Tree.

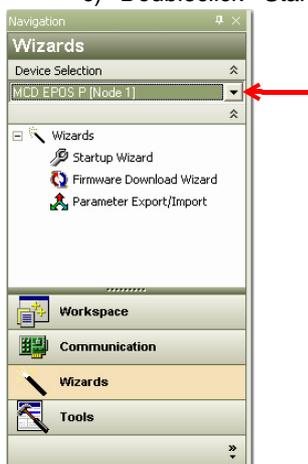


Figure 3-6 Page Navigator Window

8) Startup Wizard (Step 1): Minimum External Wiring:

- a) Verify correct hardware installation (→chapter “3.3 Step 3: Minimum External Wiring” on page 3-12).
- b) Make sure you have read “Getting Started” and confirm by clicking “Confirm that you’ve read the “Getting Started” document”.
- c) Click “Next” to proceed.

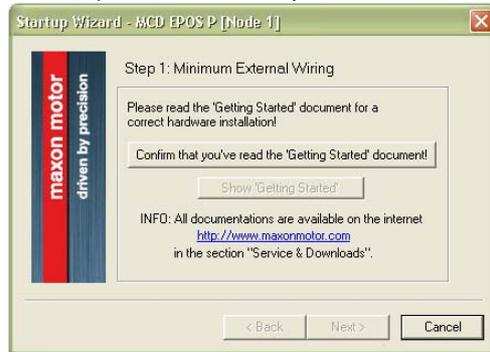


Figure 3-7 Startup Wizard Dialog: Minimum external Wiring

9) Startup Wizard (Step 2): Communication Setting:

- a) Verify correct wiring to RS232 interface (→chapter “3.3 Step 3: Minimum External Wiring” on page 3-12).
- b) Click “Search Communication Settings” to search COM port and to automatically adjust baud rate (arrow).

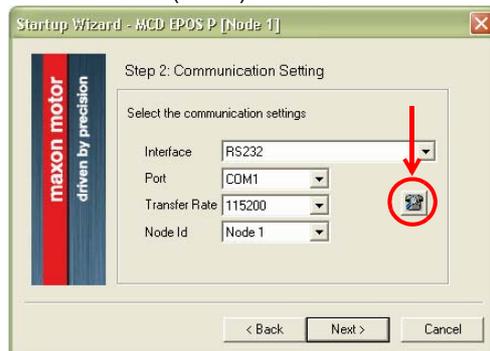


Figure 3-8 Startup Wizard Dialog: Communication Setting

- c) If correct communication settings were found, a respective message will be displayed.



Figure 3-9 Communication Settings Summary

- d) Click “OK” to confirm settings.
- e) Click “Next” to proceed.

10) Startup Wizard (Step 3): Motor Type

- a) "maxon EC motor" will automatically be selected.
- b) Click "Next" to proceed.

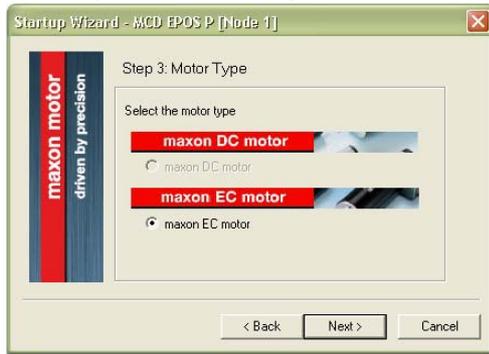


Figure 3-10 Startup Wizard Dialog: Motor Type

11) Startup Wizard (Step 4): Motor Pole Pair

- a) "1 pole pair" will automatically be selected.
- b) Click "Next" to proceed.

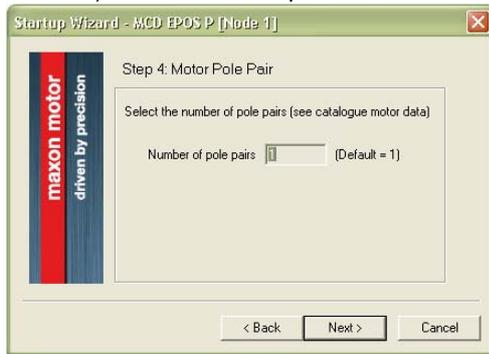


Figure 3-11 Startup Wizard Dialog: Motor Pole Pair

12) Startup Wizard (Step 5): Motor Data

- a) Enter maximum permissible speed.
- b) Enter nominal (maximum continuous) current.
- c) "2.7" as thermal time constant of motor winding will automatically be selected.
- d) Click "Next" to proceed.

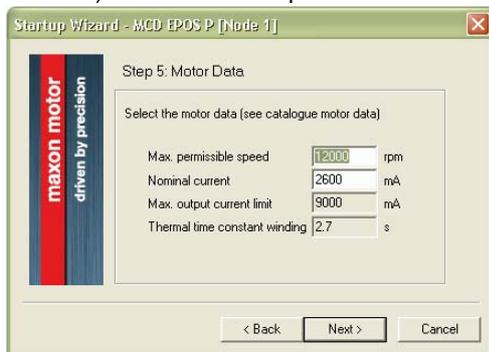


Figure 3-12 Startup Wizard Dialog: Motor Data

13) Startup Wizard (Step 6): Position Sensor Type

- a) "3-channel incremental encoder with line driver" will automatically be selected.
- b) Click "Next" to proceed.

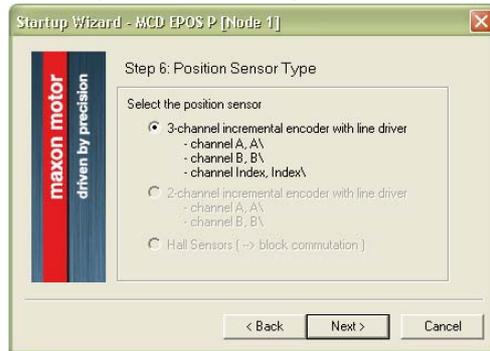


Figure 3-13 Startup Wizard Dialog: Position Sensor Type

14) Startup Wizard (Step 7): Position Resolution

- a) "1000 pulse/turn" will automatically be selected.
- b) Click "Next" to proceed.

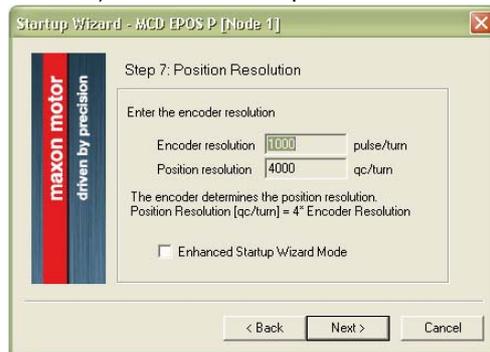


Figure 3-14 Startup Wizard Dialog: Position Resolution

15) Startup Wizard (Step 8): Configuration Summary

A short summary of most important configuration values will be displayed.

- a) If configuration is not correct: Click "Back" to modify settings.
- b) If configuration is correct: Click "Finish" to close the startup wizard.

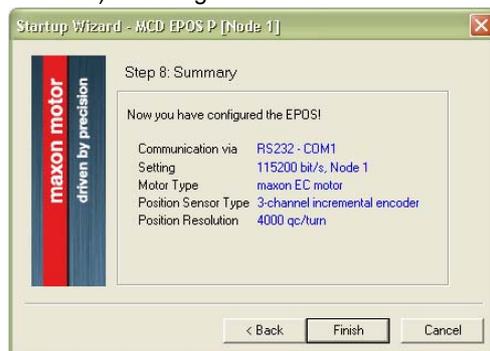


Figure 3-15 Startup Wizard Dialog: Configuration Summary

16) Save parameters!

a) Click "Yes" to accept and save parameters.



Figure 3-16 Save/activate configured Parameters

b) Click "OK" to confirm activation of parameters



Figure 3-17 Confirmation of Parameter Activation

3.5 Step 5: Regulation Gains Tuning

MCD EPOS P 60 W offers a fast and reliable way to automatically tune the regulation gains of current, velocity and position regulators. The function provides a good starting point for further manual tuning.



Best Practice

- The Auto Tuning function is a good way to start, nevertheless optimal regulation parameters cannot be guaranteed.
- Use following procedure to efficiently tune regulation gains.

3.5.1 Starting Auto Tuning

- 1) Click "Wizards".
- 2) Select "EPOS [Internal]" from Device Selection Combo Box (arrow).
- 3) Doubleclick "Regulation Tuning" item in Wizard Tree

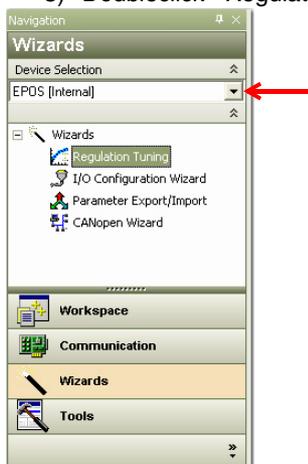


Figure 3-18 Page Navigator Window

3.5.2 Auto Tuning of Current Regulator

- 1) Leave all settings to default values.
- 2) Click "Start Tuning" (arrow).

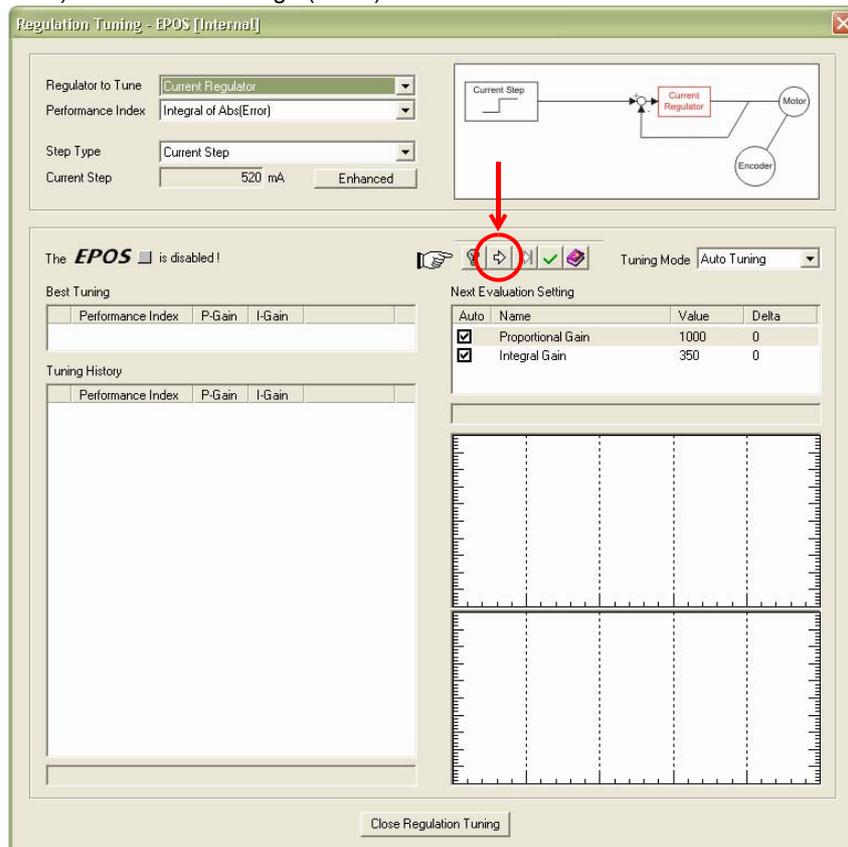


Figure 3-19 Auto Tuning of Current Regulator



CAUTION

Drawn-in and/or Affright Hazard

Unprepared attitude can lead to drawing-in or affright.

- *Check on motor's power rating to become aware of potential produced torque!*
- *Decide on how to block the shaft, whether by hand, or by using an appropriate tool!*
- *Be prepared for torque produced/noise emitted by the motor once you confirmed initiation of procedure!*

- 3) Consider message carefully.
- 4) Block motor shaft – seize and continuously keep fixed – until current regulator Auto Tuning has completed.

5) Click **Yes** to initiate Auto Tuning.



Figure 3-20 Confirmation of Shaft Blockage

6) Auto Tuning will commence automatically and will define suitable regulation gains for current regulation mode. This procedure can take a few minutes. All tuning steps will be displayed for further analysis.

In case of error follow → step 7.

If Auto Tuning has been successfully completed → step 8.

7) In case of occurring error or if Auto Tuning does not start:

- a) Confirm error message by clicking **OK**.
- b) Clear error by clicking **X** (arrow).
- c) Adjust starting parameters (→ chapter “3.5.5 Manual Tuning” on page 3-25).
- d) Then start Auto Tuning again.



Figure 3-21 Error Messages

8) A message will be displayed.

- a) If tuned regulation gains meet your requirements: Decline by clicking **No**.
- b) If regulation gains need further tuning: Accept restart of Auto Tuning by clicking **Yes**.

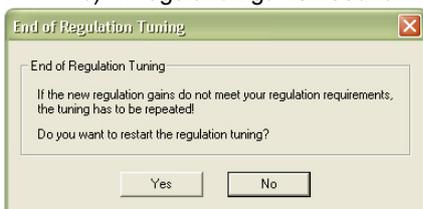


Figure 3-22 Confirmation of End of Regulation Tuning

3.5.3 Auto Tuning of Velocity Regulator

- 1) Select "Velocity Regulator" from Combo Box.
- 2) Leave all other settings to default values.
- 3) Click "Start Tuning" (arrow).

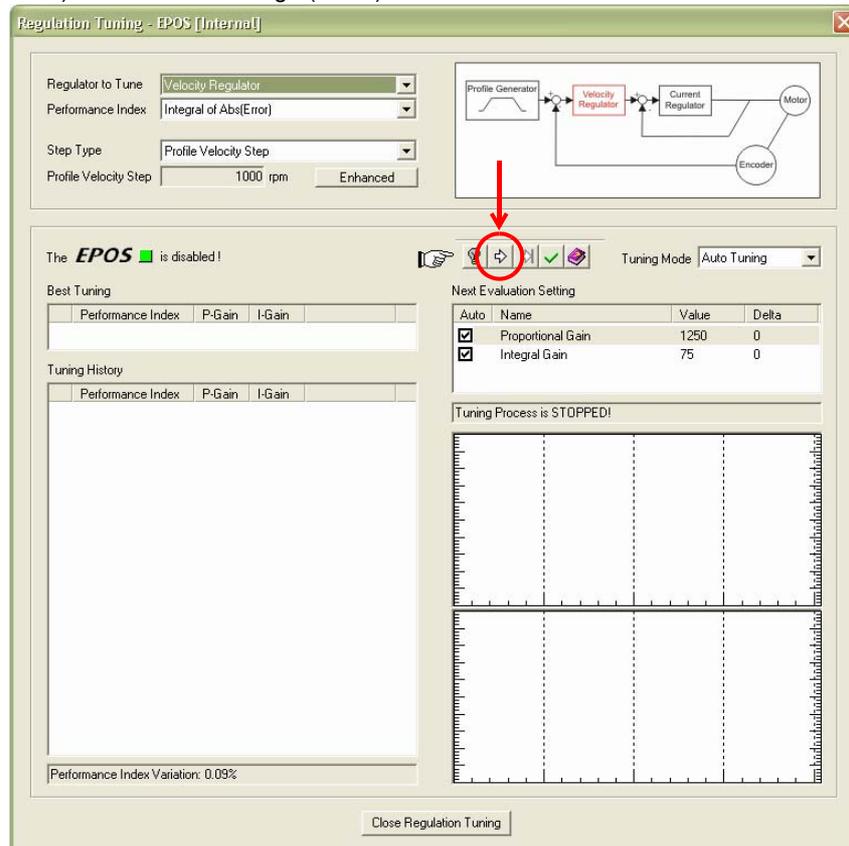


Figure 3-23 Auto Tuning of Velocity Regulator

- 4) Consider message carefully.
- 5) Make sure that motor shaft is free running.
- 6) Click "Yes" to initiate Auto Tuning.

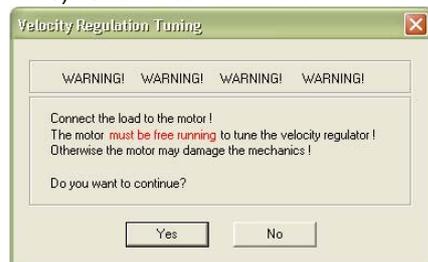


Figure 3-24 Confirmation of free running Shaft

- 7) Auto Tuning will commence automatically and will define suitable regulation gains for velocity regulation mode. This procedure can take a few minutes. All tuning steps will be displayed for further analysis.
In case of error follow → step 8.
If Auto Tuning has been successfully completed → step 9.

- 8) In case of occurring error or if Auto Tuning does not start:
 - a) Confirm error message by clicking .
 - b) Clear error by clicking (arrow).
 - b) Adjust starting parameters (→ chapter “3.5.5 Manual Tuning” on page 3-25).
 - d) Then start Auto Tuning again.



Figure 3-25 Error Messages

- 9) A summary will be displayed.
 - a) If configuration is not correct: Click to start Auto Tuning anew.
 - b) If configuration is correct: Click to close the wizard.

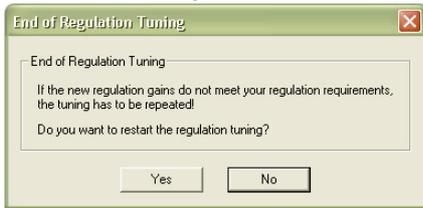


Figure 3-26 Confirmation of terminated Auto Tuning

- 10) A message will be displayed.
 - a) If tuned regulation gains meet your requirements: Decline by clicking .
 - b) If regulation gains need further tuning: Accept restart of Auto Tuning by clicking .

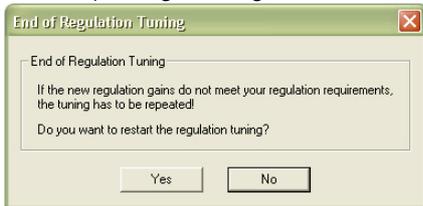


Figure 3-27 Confirmation of End of Regulation Tuning

3.5.4 Auto Tuning of Position Regulator

- 1) Select "Position Regulator" from Combo Box.
- 2) Leave all other settings to default values.
- 3) Click "Start Tuning" (arrow).

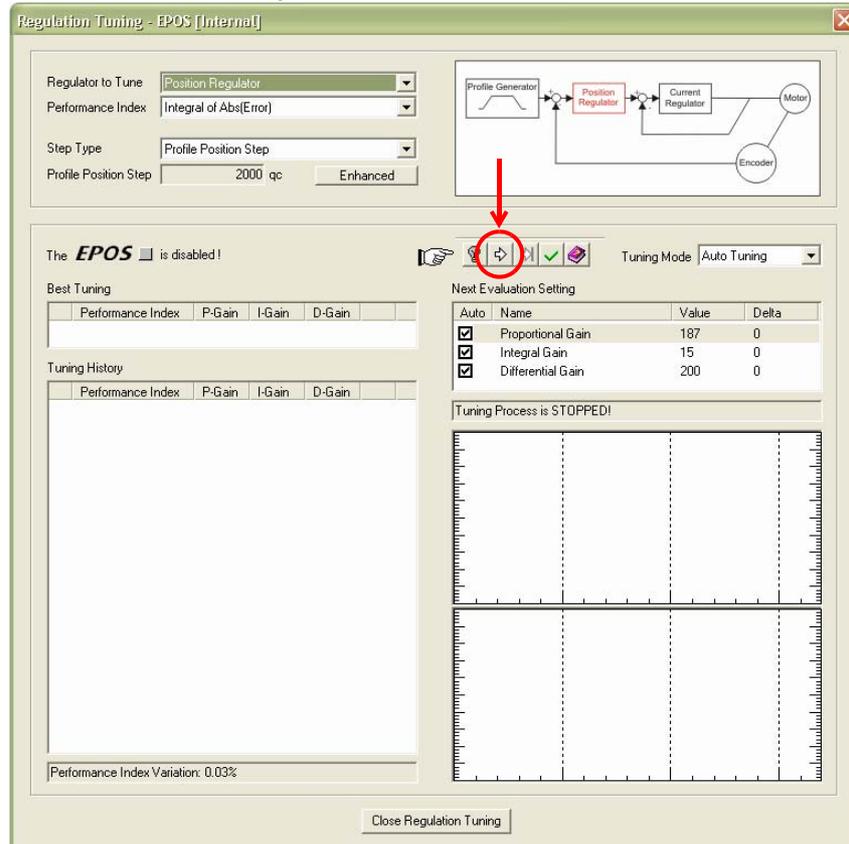


Figure 3-28 Auto Tuning of Position Regulator

- 4) Consider message carefully.
- 5) Make sure that motor shaft is free running.
- 6) Click "Yes" to initiate Auto Tuning.

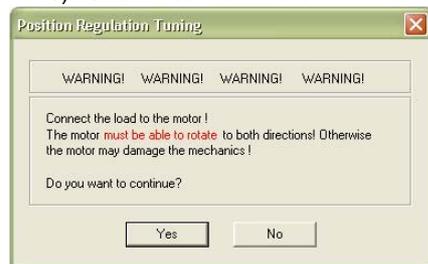


Figure 3-29 Confirmation of free running Shaft

- 7) Auto Tuning will commence automatically and will define suitable regulation gains for position regulation mode. This procedure can take a few minutes. All tuning steps will be displayed for further analysis.
In case of error follow → step 8.
If Auto Tuning has been successfully completed → step 9.

- 8) In case of occurring error or if Auto Tuning does not start:
 - a) Confirm error message by clicking .
 - b) Clear error by clicking (arrow).
 - b) Adjust starting parameters (→ chapter “3.5.5 Manual Tuning” on page 3-25).
 - d) Then start Auto Tuning again.



Figure 3-30 Error Messages

- 9) A message will be displayed.
 - a) If tuned regulation gains meet your requirements: Decline by clicking .
 - b) If regulation gains need further tuning: Accept restart of Auto Tuning by clicking .



Figure 3-31 Confirmation of End of Regulation Tuning

3.5.5 Manual Tuning

If Auto Tuning shows an error, or if self-adjusted result should prove dissatisfactory, you will need to tune manually and you will need to commence an iterative search for appropriate regulation gains.



Best Practice

- Change system parameters manually.
- Start a single step movement and check the recorded data.

- 1) Select "Manual Tuning" from drop-down list.
- 2) Click "Start Tuning" (arrow).

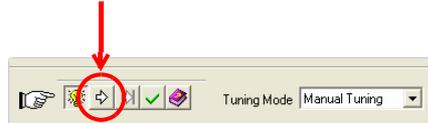


Figure 3-32 Manual Tuning

- 3) Select "Next Evaluation Setting".
- 4) Alter regulation gains (→ Best Practice below).



Figure 3-33 Next Evaluation Setting



Best Practice

Start values for current and velocity regulator are normally not difficult to find. For positioning regulator, following rule of thumb will be helpful:

- **Start values:** "Integral Gain" = 0 "Proportional Gain" = 2 x "Differential Gain".
- **Overshoot:** Reduce "Proportional Gain" or increase "Differential Gain".
- **Position Error:** Increase "Proportional Gain" and "Differential Gain".
- **Integral Gain:** Adjust "Integral Gain" at the end, if the other two gains are optimized. Increase "Integral Gain" until static position error is small enough.

- 5) Click "Start Tuning" (arrow).

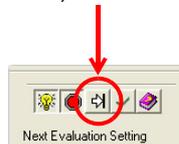


Figure 3-34 Next tuning Step

- 6) Judge recorded data.
- 7) Repeat iteration (→ steps 3 thru 6) until all regulation gains are optimized.

3.5.6 Save Regulation Gains

All regulation gains found during Auto Tuning have been saved locally (on your PC). For operation, now data will be transferred to MCD EPOS P 60 W.

- 1) Click **Save** (arrow).



Figure 3-35 Save Settings

- 2) Click **OK** to save regulation tuning gains.



Figure 3-36 Confirmation of Regulation Tuning Gains

4 Programming

4.1 Step 1: Opening Sample Project

4.1.1 Open “IEC-61131 Programming”

- 1) Select “MCD EPOS P” from Device Selection Combo Box (arrow).
- 2) Doubleclick “IEC 61131 Programming” item in Tools Tree.

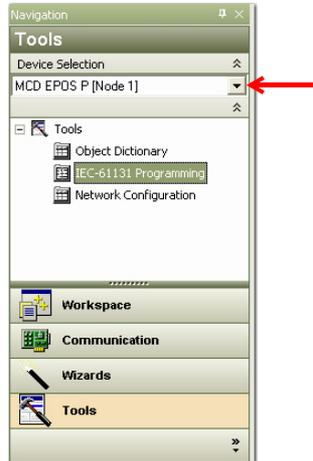


Figure 4-37 Page Navigator Window

4.1.2 Open Sample Project

- 1) Select sample project “SimpleMotionSequence”.
- 2) Click “Open Sample Project” will open external programming tool “OpenPCS”.

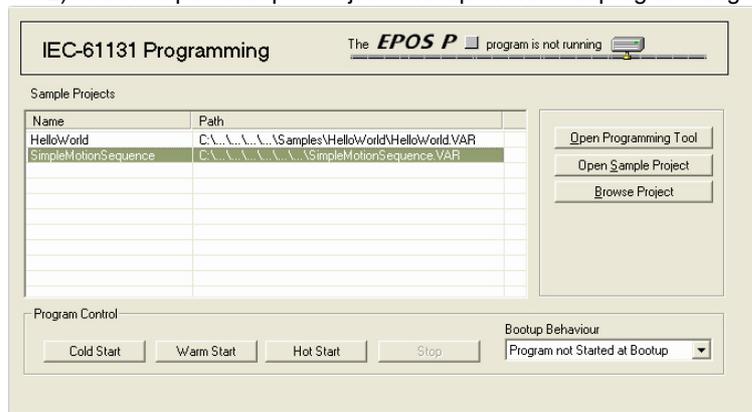


Figure 4-38 Tool “IEC-61131 Programming”

4.1.3 Open Program Code

- 1) Select tab "Files" from project window.
- 2) Doubleclick "FB_MAIN_StatePosSequence.FBD" to open program code.

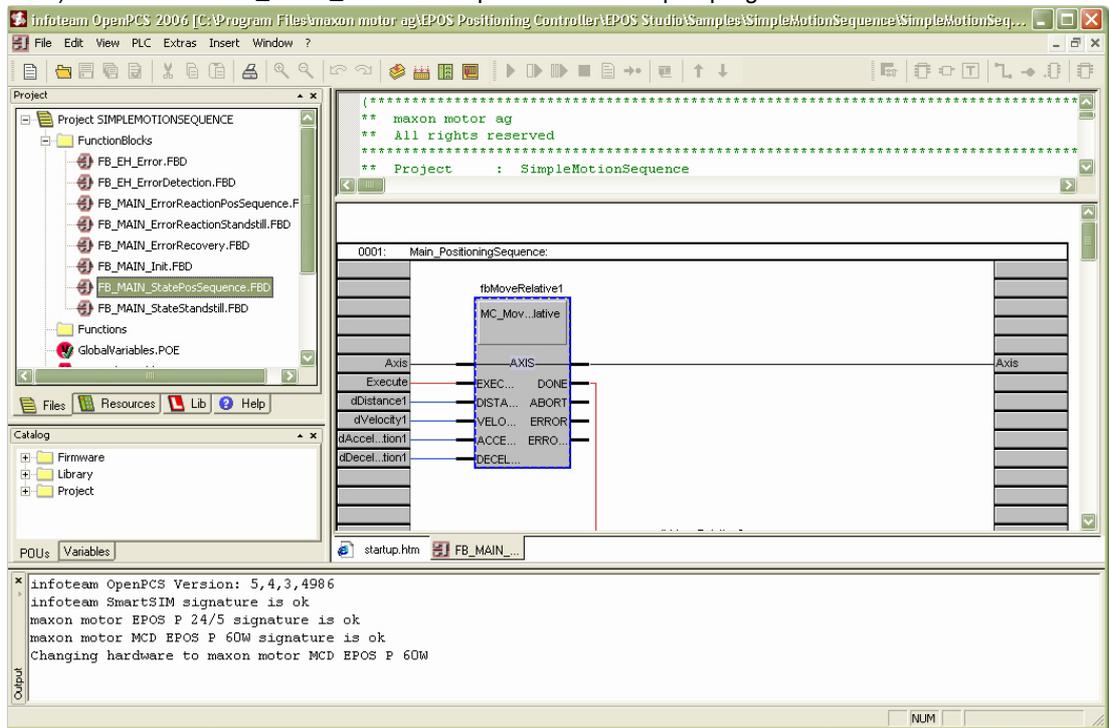


Figure 4-39 Program Code

4.2 Step 2: Programming Tool “OpenPCS” Configuration

4.2.1 Licence Key Configuration

- 1) Open menu “Extras”, then submenu “Tools” and menu item “License”.
- 2) Click “Info” to check if valid license is available.
If no license is registered, enter valid serial number and license key (→”ReadMe.txt” in «EPOS Studio» directory).

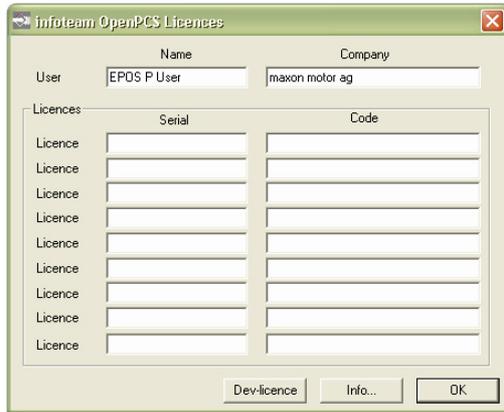


Figure 4-40 OpenPCS License Registration



If you find the license key out of date, download latest version of «EPOS Studio» from the internet (for URLs → chapter “2 Introduction” on page 2-9.

4.2.2 Communication Setup

- 1) Open menu “PLC”, then click menu item “Connections”.
- 2) Select connection “ProxyEpos” and click “Edit”.

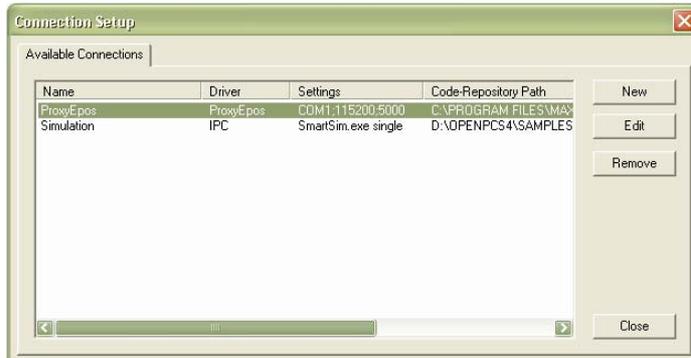


Figure 4-41 Connection Setup Window

3) Click **Settings**.

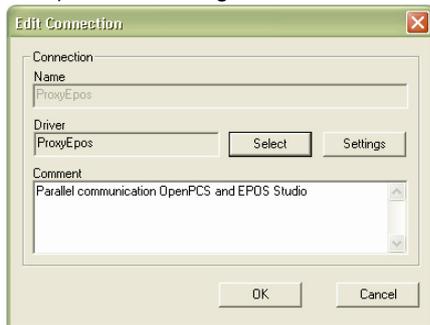


Figure 4-42 Edit Connection Window

4) Select same settings as in EPOS Studio.



Note

Default baud rate is 115200 Bd.

5) Click **OK** to confirm settings and to close dialog.

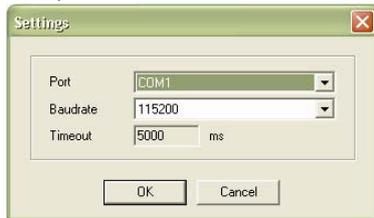


Figure 4-43 Communication Settings

6) Close open “Edit Connection” dialog by clicking **Cancel**.

7) Close open “Connection Setup” dialog by clicking **Close**.

4.3 Step 3: Compiling and Executing Sample Project

4.3.1 Compiling Sample Project

- 1) Open menu **PLC** and select menu item **Build Active Resource**. A logging output similar to below figure will be displayed.

```

C:\PROGRAM FILES\MAXONM-1\EPOSPO-1\EPOSP-1\04PROG-1\OPENPC-1\itmake.exe -m "C:\Program Files\maxon motor ag\EPOS Positioning Controller\EPOS Studio\Samples\SimpleMotionSequence\PROG_ERRORHANDL
Building resource C:\Program Files\maxon motor ag\EPOS Positioning Controller\EPOS Studio\Samples\SimpleMotionSequence\PROG_ERRORHANDL
Executing Pre-Build-Steps:

Creating dependency list(s):
C:\Program Files\maxon motor ag\EPOS Positioning Controller\EPOS Studio\Samples\SimpleMotionSequence\PROG_ERRORHANDL
C:\Program Files\maxon motor ag\EPOS Positioning Controller\EPOS Studio\Samples\SimpleMotionSequence\PROG_MAIN.POE

Compiling ...

Linking ...
0 error(s), 0 warning(s) - C:\PROGRAM FILES\MAXON MOTOR AG\EPOS POSITIONING CONTROLLER\EPOS STUDIO\SAMPLES\SIMPLEMOT
VARTAB32: 9 variables added in 1 segments (452 bytes)
Executing Post-Build-Steps:
Total:
0 error(s) 0 warning(s)
    
```

Figure 4-44 Compiler Logging Output

4.3.2 Downloading Sample Project

- 1) Open menu **PLC** and select menu item **Online**. An online connection will be established.
- 2) If new code is detected, you will be asked whether you wish to download the code or not. Click **Yes**.

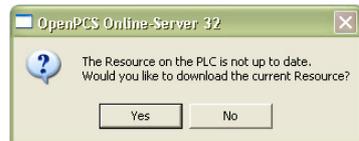


Figure 4-45 Confirmation of Code Download

4.3.3 Starting Sample Project

The following sample project is performing a motion sequence of two relative movements. Make sure the axis is free rotating.

- 1) Open menu **PLC** and select menu item **Cold Start**. The program will be launched.



Figure 4-46 Cold Start

- 2) Click **STOP** to stop the program.

4.4 Further Information



If you require additional information about programming, please read separate document «EPOS P Programming Reference» available from EPOS P CD-ROM or download it from the internet (for URLs → chapter “2 Introduction” on page 2-9.

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maxon motor ag

Brünigstrasse 220
P.O.Box 263
CH-6072 Sachseln
Switzerland

Phone +41 (41) 666 15 00

Fax +41 (41) 666 15 50

www.maxonmotor.com