

# Miniature Rotary Actuator MRD-S with IndraDrive CS control unit

## Commissioning



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Translation of the original commissioning manual

Dear Customer,

Congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

**You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.**

**SCHUNK products are inspiring.**

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase. You can reach us directly at the mentioned addresses in the last chapter of these instructions.

Kindest Regards,

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# 1 About this manual

## 1.1 Purpose/validity

This manual is part of the drive control unit IndraDrive CS and describes the safe and proper start up of an electrically miniature rotary actuator MRDS-CS.

This manual is valid only for the module specified on the front page.

## 1.2 Target groups

Target group	Task
Manufacturer, operator	<ul style="list-style-type: none"> <li>➔ Keep this manual available for the personnel at all times.</li> <li>➔ Require personnel to read and observe this manual and the applicable documents, especially the safety notes and warnings.</li> </ul>
Skilled personnel, fitter	<ul style="list-style-type: none"> <li>➔ Read, observe and follow this manual and the applicable documents, especially the safety notes and warnings.</li> </ul>

Tab. 1

## 1.3 Applicable documents





You can find the following documents on our homepage:

Document	Purpose
Catalog	Technical data or application parameters of the module and information on accessories. The last version is always valid.
Assembly and operating manuals for Rotary Actuators	Detailed information about assembly, adjustment and commissioning of the rotary actuator.
Manual and references for drive control unit IndraDrive CS	Detailed information about assembly, adjustment and commissioning of the drive control unit IndraDrive CS.
General terms of business	Including notes on the warranty.

Tab. 2

## 1.4 Symbols in the manual

To give you quick access to information, the following symbols will be used in this manual:

Symbol	Meaning
 <b>DANGER</b>	Dangers for persons. Nonobservance causes death or serious injuries.
 <b>WARNING</b>	Dangers for persons. Nonobservance can cause death or serious injuries.
 <b>CAUTION</b>	Dangers for persons. Nonobservance can cause slight injuries.
 <b>NOTICE</b>	Information on avoiding material damage.
✓	Prerequisite for a handling instruction.
➔	Handling instruction, also measures in a warning or note.
1. 2. 3. ...	Step-by-step handling instruction. ➔ Observe the order.
< >	Menus and menu items

Tab. 3

## 2 Basic safety notes

### 2.1 Intended use

The module is intended for installation in a machine. The requirements of the applicable guidelines must be observed and complied with.

The module may be used only in the context of its defined application parameters.

Any other use or use exceeding that specified is an infringement of use for intended purpose. The manufacturer bears no liability for damage resulting from such use.

## **2.2 Environmental and operating conditions**

- ➔ The module may be used only in the context of its defined application parameters (see catalog and applicable documents).
- ➔ Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Excepted are modules that are designed especially for contaminated environments.

## **2.3 Controlled production**

The module represents the state of the art and the recognized safety rules at the time of delivery. However, it can present risks if, for example:

- The module is not used in accordance with its intended purpose.
- The module is not installed or maintained properly.
- The EC Machinery Directive, the VDE directives, the safety and accident-prevention regulations valid at the usage site, or the safety and installation notes are not observed.

### **2.3.1 Protective equipment**

- ➔ Provide protective equipment per EC Machinery Directive.

### **2.3.2 Constructional changes, attachments, or modifications**

Additional drill holes, threads, or attachments that are not offered as accessories by SCHUNK may be attached only with permission of SCHUNK.

## **2.4 Personnel qualification**

The assembly, initial commissioning, maintenance, and repair of the drive control unit may be performed only by trained specialist personnel.

Every person called upon by the operator to work on the module must have read and understood the complete Assembly and Operating Manual, especially chapter 2 “Basic safety note”. This applies particularly to occasional personnel such as maintenance personnel.

## **2.5 Safety-conscious working**

- ➔ Avoid any manner of working that may interfere with the function and operational safety of the drive control unit.
- ➔ Observe the safety and accident-prevention regulations valid at the usage site.

# **3 Commissioning**

## **3.1 Required equipment**

The following equipment/requirements are necessary for commissioning a drive with IndraDrive CS:

- ✓ a fully installed drive with an IndraDrive CS drive control unit (for connection schematics, see chapter “4.1”)
- ✓ PC with Ethernet TCP/IP interface
- ✓ IndraWorks operating software (from Version 08Vxx)
- ✓ Ethernet (Patch cable) PC connection cable - IndraDrive (order no. 329 962)
- ✓ Commissioning CD with the motor parameters and the files for parameter selection.

## 3.2 Commissioning tasks

### **DANGER**

**Danger to life due to electric shock!**

**Touching live parts can cause death.**

→ Only professional electricians may carry out work on electrical systems and equipment under compliance of the rules for working with electrical systems..

### **WARNING**

**Risk of injury due to unwanted movement of the system!**

**Activating the “Automatic set up of the control circuit” command can lead to a crash of the guided slide.**

→ Under no circumstances activate the automatic set up of the control circuit for motors.

1. Wire drive control unit IndraDrive to motor and higher-order controller in accordance with the connection schematics.  
(see Chapter 4, page 18)
2. Create connection between PC and controller.

#### **Note**

The control unit has the IP address 192.168.0.1 (default setting)

The PC interface must have a similar IP address, e.g. 192.168.0.11 and the subnet mask must also be identical: 255.255.255.0.

3. Set the controller to Sercos III communication. This is done using the front side panel.

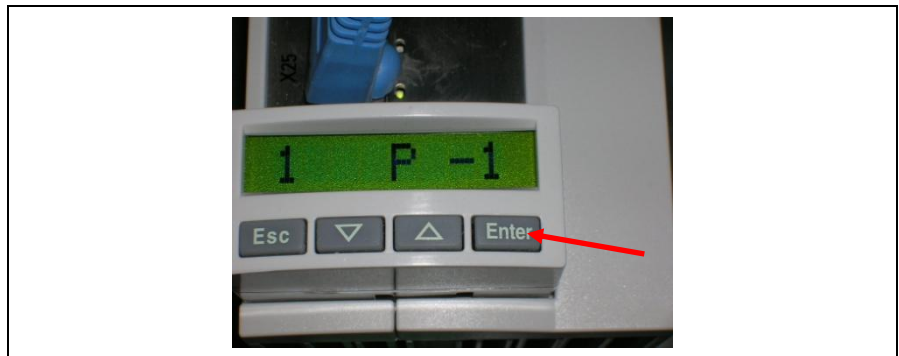


Fig. 1 Front Side Panel

3.1 Press the [Enter] key four times.

The desired field bus option flashes on the display.

3.2 Use the arrow keys   to select Sercos III..

3.3 Confirm your selection with the [Enter] key..

The display now shows Sercos III and does **not** flash.

3.4 Switch off the 24V supply and switch it back on again.

The controller reboots and Sercos III is activated.

**To verify:**

After start-up the display should show **P -1** (see Fig. 1).

4. Start IndraWorks DS on PC.

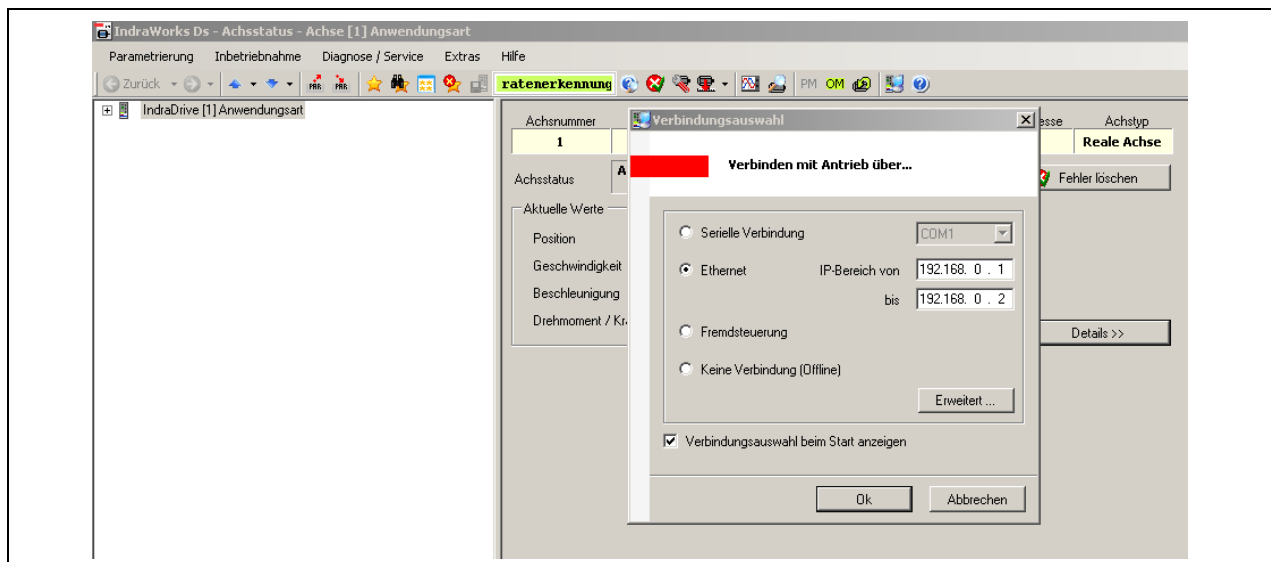


Fig. 2

5. Select Ethernet and set the IP address search range.

**Note**

Operation of IndraWorks is explained in the help menu of the program.

### 3.2.1 Loading motor parameters

- 1 In the main window of IndraWorks, select <View> → <Project Explorer>. The Project Explorer appears.

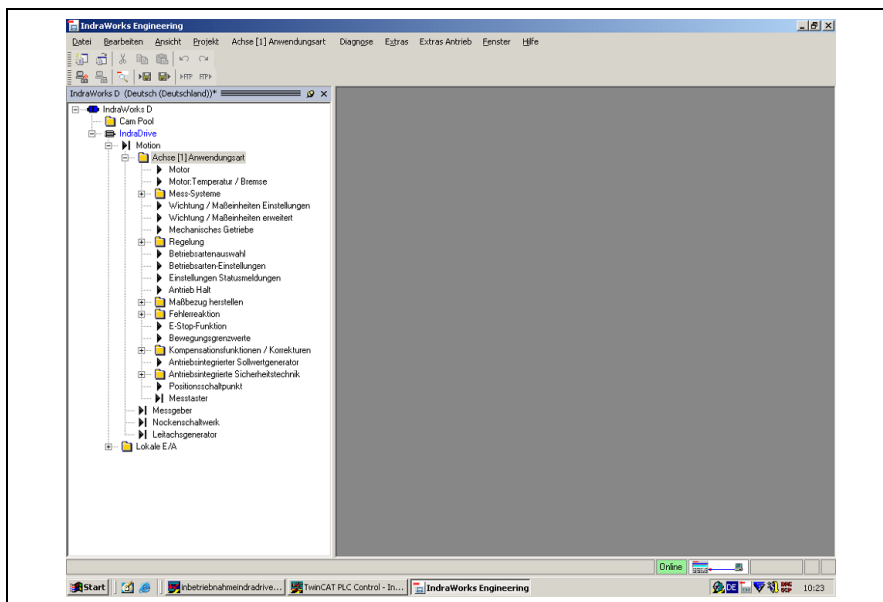


Fig. 3 Project Explorer

- 2 Select the project explorer via the overview structure: <IndraDrive>→ <Motion> data file <Axis>.

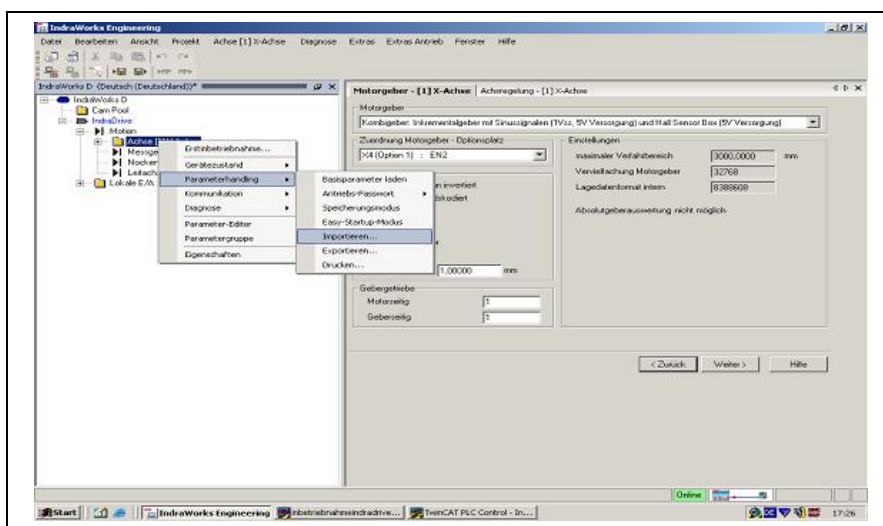


Fig. 4 Selecting motor type

- 3 Select <IndraDrive> with right mouse button and then in the context menu <Parameter handling> → <Import>.

The dialog box appears

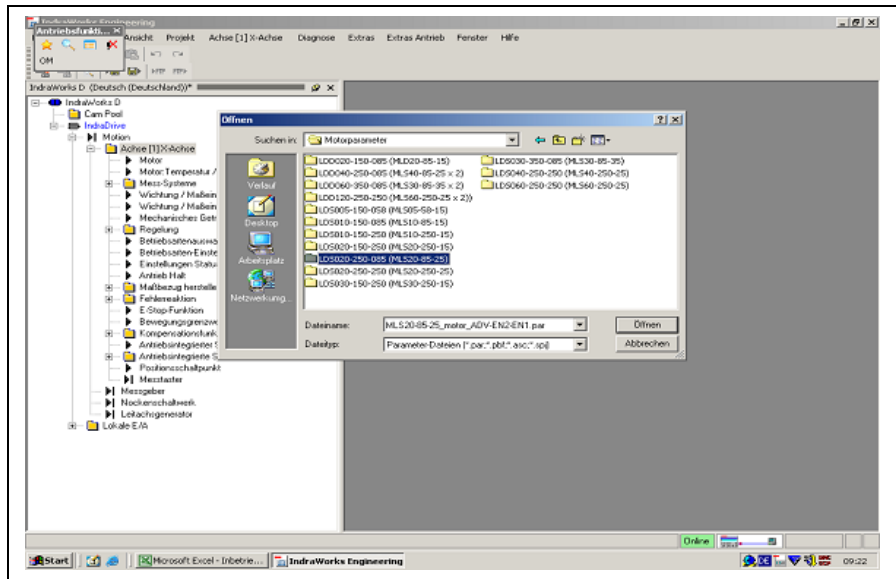


Fig. 5 import motor parameters

6. Select file <Motor parameter> under <MRD-S Torque motor> and <IndraDrive> on the commissioning-CD IndraDrive.
7. Select the appropriate motor parameter file.
8. Select the folder of the desired torque motor type in the dialog box.

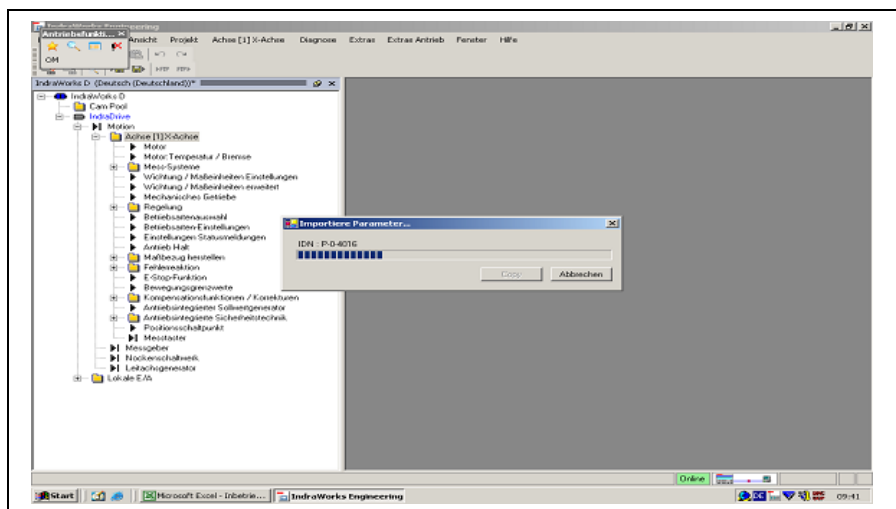


Fig. 6 load motor parameter

9. Select desired motor parameter file in the next dialog box and open it.  
The motor parameters are loaded.

### 3.2.2 Starting field bus

1. Configure field bus interface in accordance with IndraDrive CS manufacturer documentation and control cabinet documentation.
2. Connect and start field bus.
3. Implement and check the wiring for controller enable, stop, reference switch and limit switch, depending on the field bus interface.

### 3.2.3 Selecting operating mode

** WARNING**

**Risk of injury when the machine/system moves unexpectedly!**

**An improperly set operating mode can lead to undesired drive movement.**

- ➔ Under no circumstances set the operating modes “Torque control” or “Speed control”
- ➔ Activate the drag fault monitoring and configure it sensibly..

➔ Switch the control unit into the operating mode (phase 4).  
In the standard control display on drive control unit  
IndraDrive CS **BB** will be displayed.

### 3.2.4 Testing measuring system

1. In the tree view of the project Explorer, select <IndraDrive> → folder <axis>.

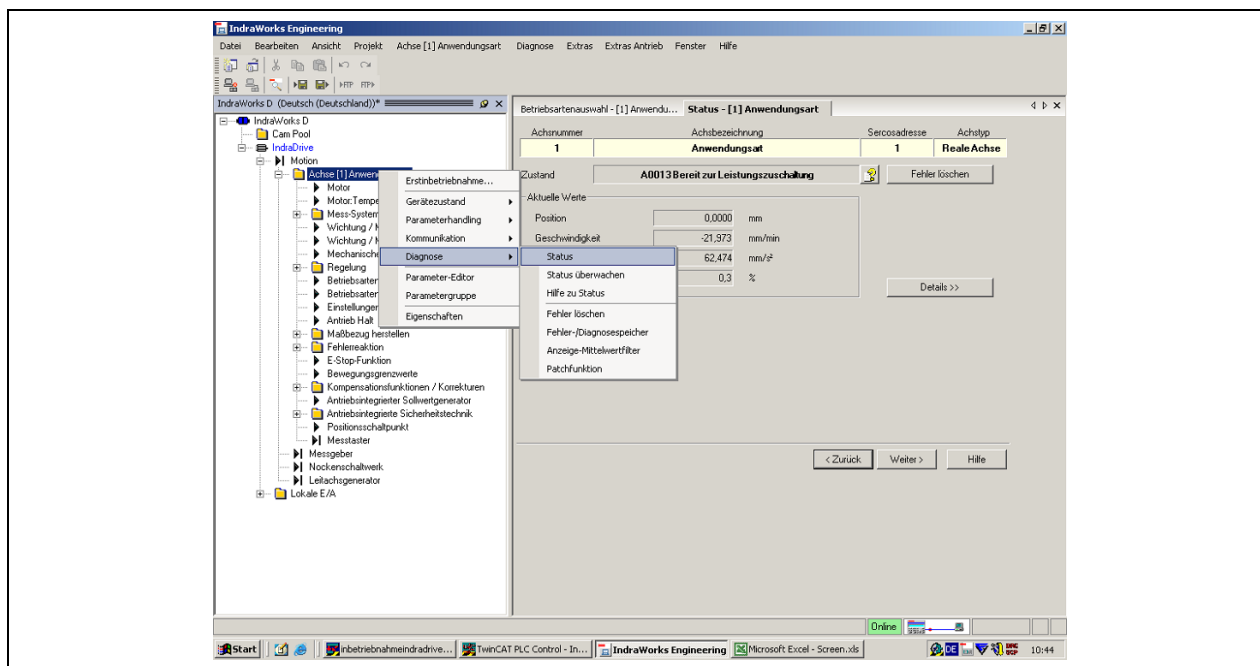


Fig. 7 checking status

2. Right click <Type of application> and then select <Diagnostics> from the resulting context menu → Select <Status>.  
The window for the <Status> folder will open.

### 3.2.5 Control loop monitoring

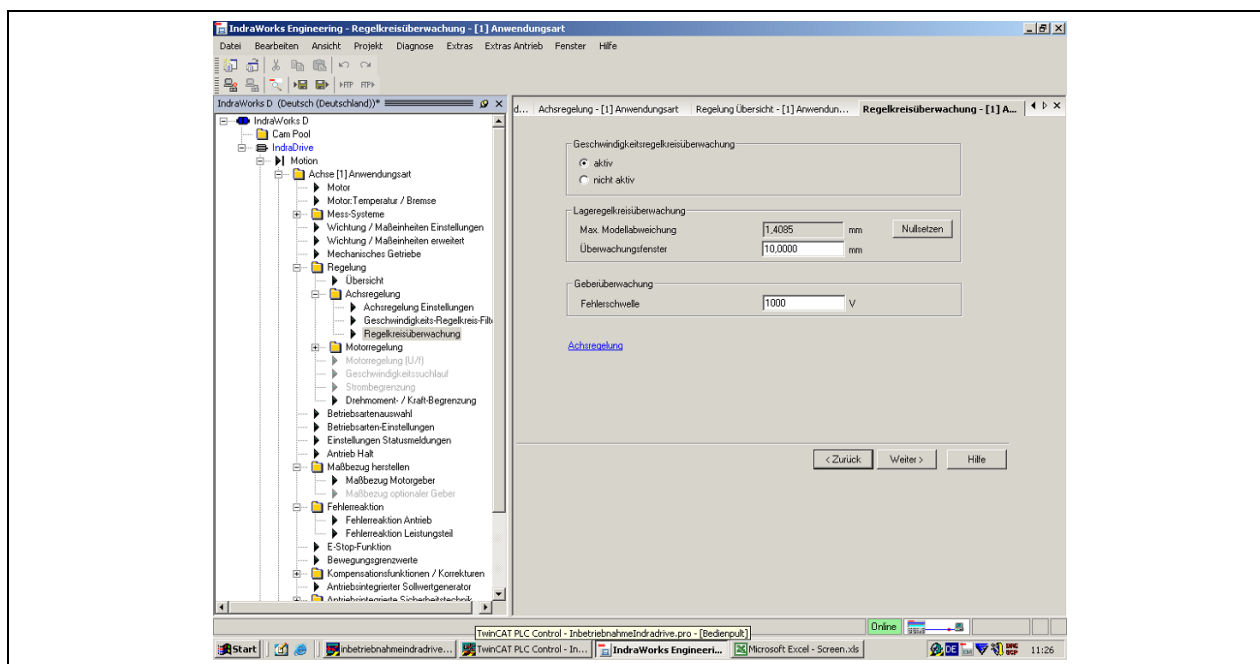


Fig. 8 control loop monitoring

➔ In the tree view of the project Explorer, select  
<IndraDrive> ➔ <Motion> ➔ <Axis> ➔ <Control> ➔ <Axis  
control> ➔ <control loop monitoring> .

The dialog box <Control loop monitoring> appears:

### 3.2.6 Connecting drive control unit IndraDrive CS to the power supply

➔ Switch on power at the control switch cabinet (power supply connection 380 V).

AB appears on the display of the standard operating field of the drive control unit IndraDrive CS which indicates that the drive control unit IndraDrive CS is connected to the power supply

### 3.2.7 Controller enable (AF)

**Note**

The controller enable can be activated with either hardware or software, depending on the field bus system.

1. Activate controller enable (AF).
2. „Activate “stop“.

$\overline{AF}$  appears on the display of the standard operating field of the drive control unit IndraDrive CS.

The drive automatically determines the commutation offset (sinus method) via the measuring system. The drive is set on „control“.

### 3.2.8 Mounting the drive

1. Mount all moving modules (moving mass).
2. Move drive to the intended position.

### 3.2.9 Set the parameters for the software controlled limits

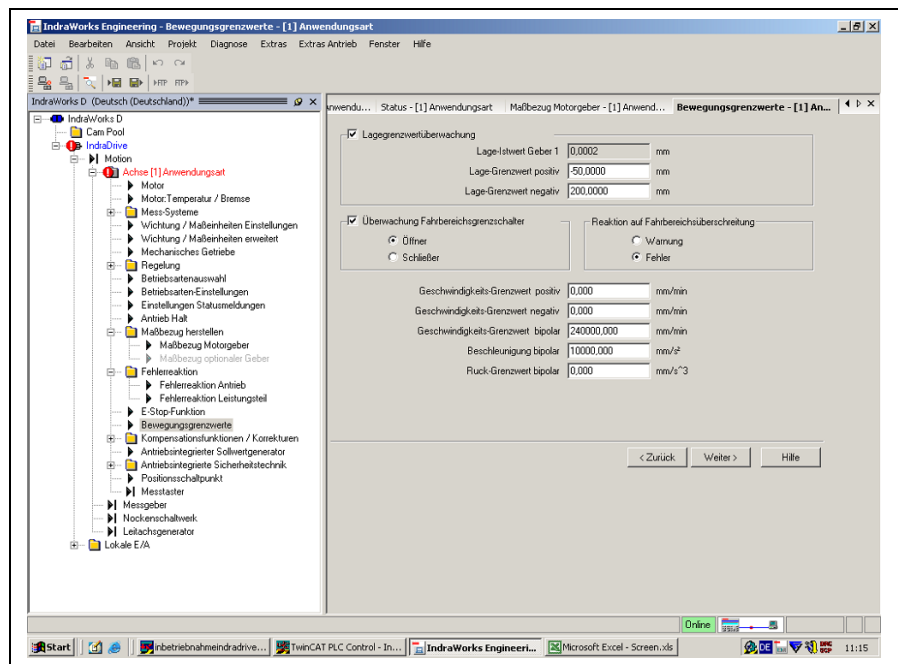


Fig. 9 Travel limits

1. In the tree view of the Project Explorer, select <IndraDrive> → <Motion> → <Axis> → <Travel limits>. The <Travel limits> window will open:
2. Activate the <Position limit monitor> field
3. Activate the <Travel limit switch> field
4. Configure the travel limit values in the window

### 3.2.10 Set the parameters for the position and speed controllers

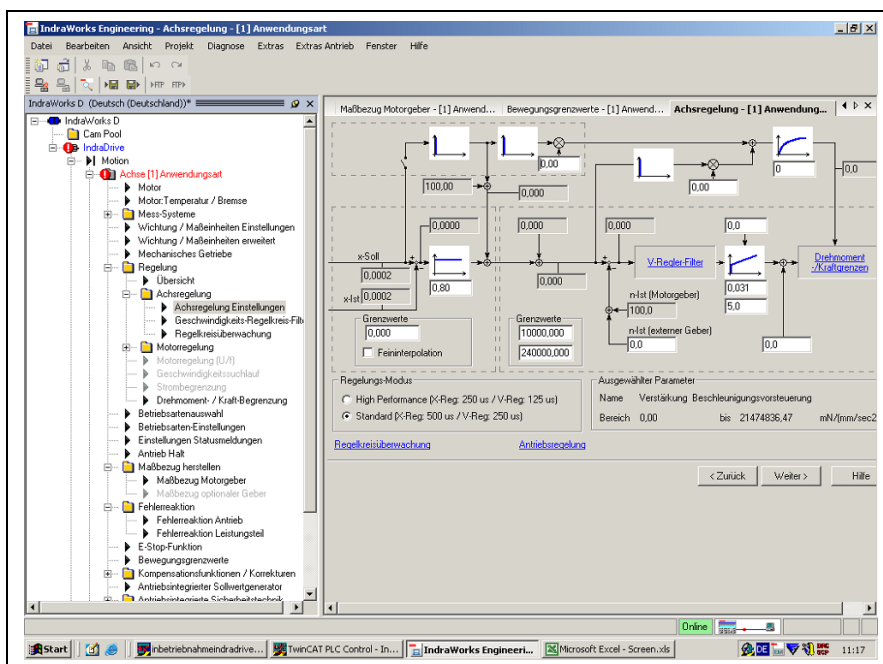


Fig. 10 Axis control settings

In the tree view of the Project Explorer, select <IndraDrive> → <Motion> → <Axis> → <Axis control> → <Select <Axis control settings>

The <Axis control settings> window will open

5. Make the fine adjustments for the position and speed controllers.

#### Note

Set the parameters as specified in the functional description in the documentation for the Rexroth IndraDrive (chapter <Drive controller>, section <axis control (closed loop mode)>).

## 4 Appendices

### 4.1 Connection diagram IndraDrive CS

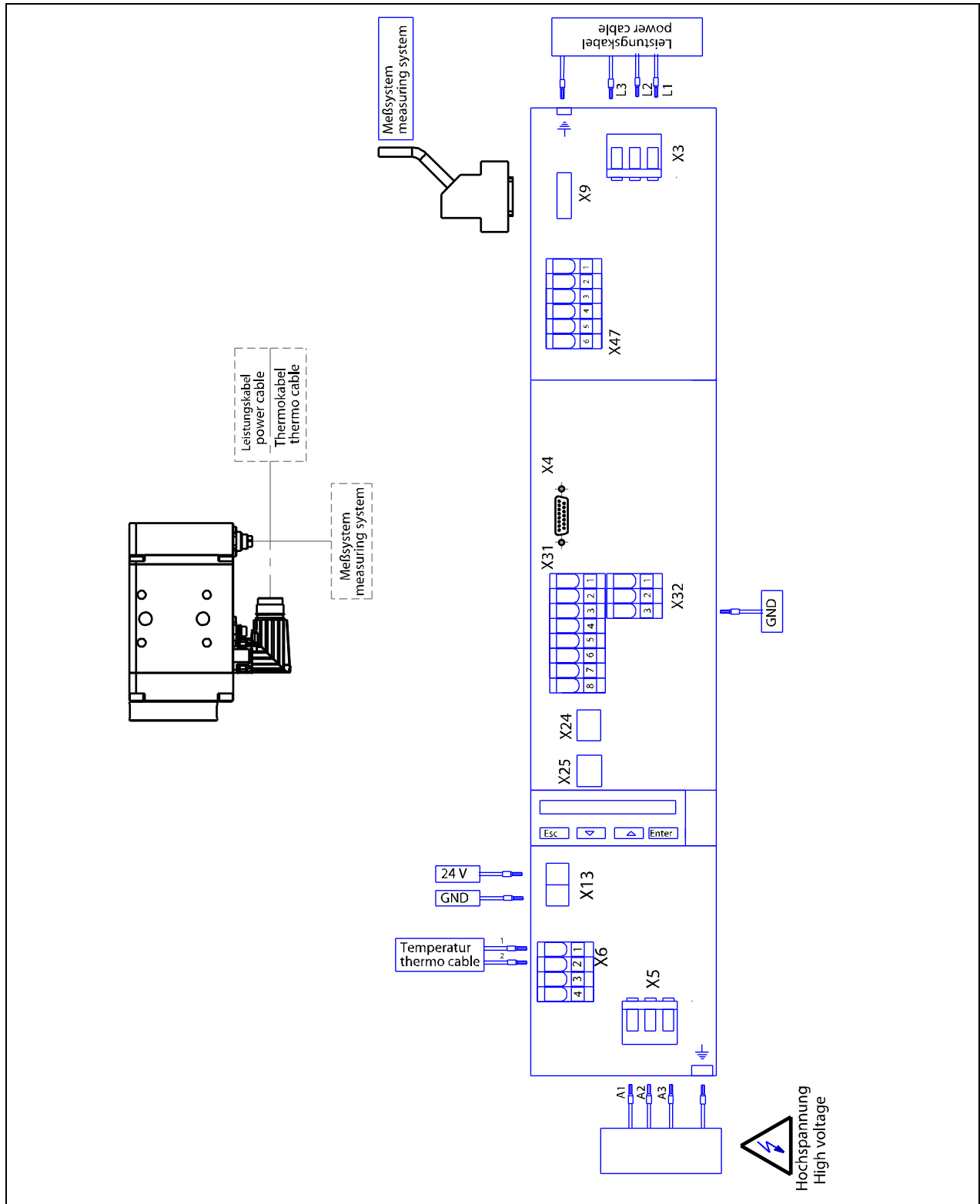


Fig. 11 Connection diagram IndraDrive CS (Drawing-No. 360218)

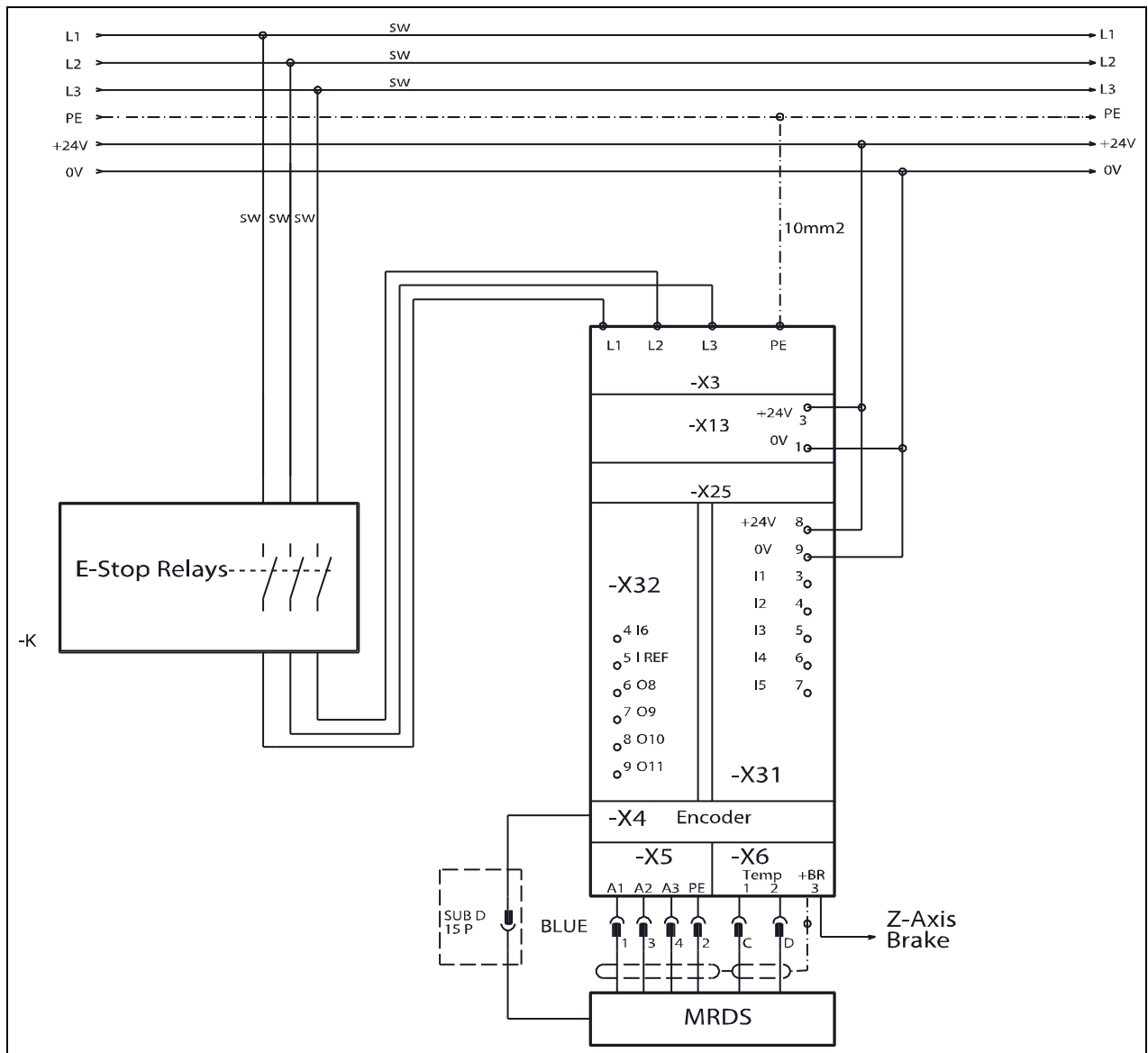


Fig. 12 connection diagram IndraDrive CS

