

# Assembly and operating manual

## SDH2

### Servo-electric 3-finger gripping hand



## Imprint

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### **Technical changes:**

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thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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## 1 General

### 1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under Applicable documents [▶ 6] are applicable.

#### 1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.



#### ⚠ DANGER

##### Danger for persons!

Non-observance will inevitably cause irreversible injury or death.



#### ⚠ WARNING

##### Dangers for persons!

Non-observance can lead to irreversible injury and even death.



#### ⚠ CAUTION

##### Dangers for persons!

Non-observance can cause minor injuries.

#### NOTICE

##### Material damage!

Information about avoiding material damage.

### 1.1.2 Applicable documents

- General terms of business\*
- SDH2 Calibration (on SDH\_CD\_Library)
- SDH2 Configuration and Update (on SDH\_CD\_Library)

The documents marked with an asterisk (\*) can be downloaded on our homepage [schunk.com](http://schunk.com)

Additional information is available on the enclosed CD.

A reduced version of the CD can be requested for download on request. ([robotics@de.schunk.com](mailto:robotics@de.schunk.com)).

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 12 months from the ex-works delivery date under the following conditions:

- Observe the ambient conditions and operating conditions, [Basic data \[▶ 16\]](#)
- Observe the specified maintenance intervals, [Maintenance \[▶ 32\]](#)

Parts touching the workpiece and wear parts are not included in the warranty.

## 1.3 Scope of delivery

The scope of delivery includes

- Servo-electric 3-finger gripping hand SDH2 in the version ordered
- Operating manual
- Tool change head with base plate
- 2 cable PAE120, Sub-D 9-pin plug/socket, 1:1
- Product CD with documentation, function library and program examples
- Transport box with foam insert

## 1.4 Accessories

A computer and a 24 V DC power supply and other accessories such as interface adapters are required for operation.

The following accessories are available for the product, which must be ordered separately:

Designation	Piece	Ident number
Power supply 90 W (without cable)	1	1002497
Power cable	1	1002498
PCM13, adapter USB/CAN-Bus	1	0307913
PCM15, adapter USB/CAN-Bus	1	0307915
Converter USB/RS 232	1	9951791
Adapter cable (2 x 4-mm-plug/socket)	1	On request
Laboratory cable red, 4-mm-plug	1	On request
laboratory cable black, 4-mm-plug	1	On request
Network cable (Cat. 5)	1	9872055

## 2 Basic safety notes

### 2.1 Intended use

The 3-finger gripping hand SDH2 has been designed for form-fitting and force-locking gripping of a wide variety of objects.

The product is intended for installation in a machine. The conditions of the Machinery Directive for an incomplete machine must be observed.

The product has been specially designed for use on lightweight arms from SCHUNK. If the defined application parameters are adhered to, the use on standard industrial and lightweight robots is permitted.

The manufacturer of the machine is responsible for carrying out a risk analysis and for the protective equipment resulting from the analysis. The safety-related information contained in the "Electrical equipment of machines" standard (DIN EN 60204) must be observed. Commissioning is only permitted in compliance with EMC directives (89/336/EEC).

The safety-related information contained in the "Electrical equipment of machines" standard (DIN EN 60204) must be observed. Commissioning is only permitted in compliance with EMC directives (2014/30/EU).

- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- The product may only be used within the scope of its technical data, [Technical data](#) [▶ 16].
- The product is intended for installation in a machine/system. The applicable guidelines must be observed and complied with.
- Appropriate use of the product includes compliance with all instructions in this manual.

### 2.2 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

It is forbidden to use the product outdoors, underground or in explosive atmospheres.

- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

## 2.3 Constructional changes

### Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.

## 2.4 Spare parts

### Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

## 2.5 Environmental and operating conditions

### Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

See also [Basic data \[▶ 16\]](#).

## 2.6 Personnel qualification

### Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

#### Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

#### Qualified personnel

Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

#### Instructed person

Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.

#### Service personnel of the manufacturer

Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

## 2.7 Personal protective equipment

### Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

## 2.8 Notes on safe operation

### Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

## 2.9 Malfunctions

### Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

## 2.10 Disposal

### Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

## 2.11 Fundamental dangers

### General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

### 2.11.1 Protection during handling and assembly

#### Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

#### Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

### 2.11.2 Protection during commissioning and operation

#### Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

### 2.11.3 Protection against dangerous movements

#### Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

### 2.11.4 Protection against electric shock

#### Possible electrostatic energy

Components or assembly groups may become electrostatically charged. When the electrostatic charge is touched, the discharge may trigger a shock reaction leading to injuries.

- The operator must ensure that all components and assembly groups are included in the local potential equalisation in accordance with the applicable regulations.
- While paying attention to the actual conditions of the working environment, the potential equalisation must be implemented by a specialist electrician according to the applicable regulations.
- The effectiveness of the potential equalisation must be verified by executing regular safety measurements.

## 2.11.5 Protection against magnetic and electromagnetic fields

### Work in areas with magnetic and electromagnetic fields

Magnetic and electromagnetic fields can lead to serious injuries.

- Persons with pace-makers, metal implants, metal shards, or hearing aids require the consent of a physician before entering areas in which components of the electric drive and control systems are mounted, started up, and operated.
- Persons with pace-makers, metal implants, metal shards, or hearing aids require the consent of a physician before entering areas in which magnetic grippers or motor parts with permanent magnets are stored, repaired, or assembled.
- Do not operate high-frequency or radio devices in the proximity of electric components of the drive system and their feed lines.  
If the use of such devices is necessary:

When starting up the electric drive and control system, check the machine or automated system for possible failures when such systems are used at different intervals and in different states of the control system. A special additional EMC test may be necessary if the system has a high risk potential.

## 2.12 Notes on particular risks



### ⚠ DANGER

#### Danger from electric voltage!

Touching live parts may result in death.

- Switch off the power supply before any assembly, adjustment or maintenance work and secure against being switched on again.
- Only qualified electricians may perform electrical installations.
- Check if de-energized, ground it and hot-wire.
- Cover live parts.



### ⚠ DANGER

#### Risk of fatal injury from suspended loads!

Falling loads can cause serious injuries and even death.

- Stand clear of suspended loads and do not step within their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.
- Wear suitable protective equipment.



## ⚠ WARNING

### Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.



## ⚠ WARNING

### Risk of burns through contact with hot surfaces!

The product can heat up considerably during operation. Touching hot surfaces can cause burns.

- Do not touch hot surfaces.
- Let them cool down before working on the product.
- Wear appropriate safety equipment.



## ⚠ WARNING

### Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Ensure that no residual energy remains in the system.



## ⚠ WARNING

### Risk of injury due to sudden movements in case of EMC malfunctions!

If the requirements of the EMC directive are not observed, malfunctions in the control units and drives can lead to unexpected machine movements and cause serious injuries.

- Ensure that the requirements of the EMC directive are observed during installation, commissioning, operation and maintenance of the product.

**⚠ WARNING****In case of overload, risk of injury due to sudden movements!**

If the product is overloaded, the integrated brake will no longer function properly. This may result in sudden machine movements.

- Operate the product within the specifications defined at all times.

**⚠ WARNING****In case of product malfunction, risk of injury due to sudden movements!**

Electrical devices are not generally protected against failure.

- Therefore, the user is responsible for ensuring that the machine is brought into a safe state in case of product malfunction.

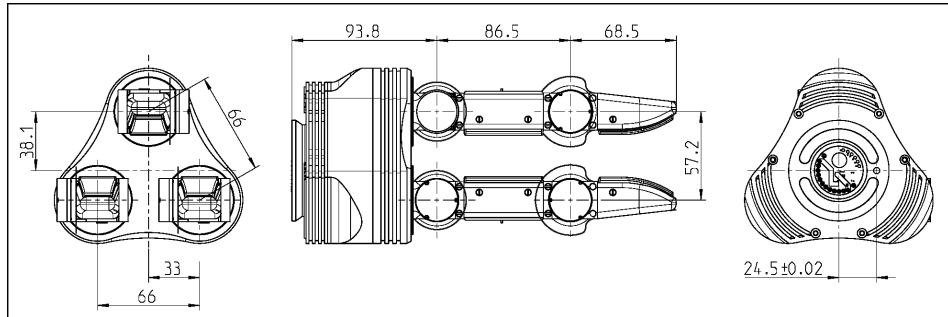
**⚠ WARNING****Risk of injury due to sudden movements in case of electrical malfunctions!**

Electrical malfunctions can lead to unexpected machine movements and cause serious injuries.

- During transport and handling, do not bend any of the components or change the insulation clearance.
- To avoid damage due to electrostatic charges, do not touch the electrical components.
- Properly execute all grounding, fastening and cabling work in accordance with applicable regulations.

### 3 Technical data

#### 3.1 Outer dimensions



#### 3.2 Basic data

Overall length [mm]	248.5
Finger length [mm]	155
Finger pitch [mm]	66
Relation to the human hand	1.4:1
Number of fingers	3
Degrees of freedom	7
Degrees of freedom per finger	2
Degrees of freedom 2-finger rotation	1
Moment (proximal joint) [Nm]	2.1
Moment (distal joint) [Nm]	1.4
Gripping force [N]	
Min.	30
Max.	200
Resolution [°]	0.011
Weight [kg]	1.95

#### *Environmental and operating conditions*

Ambient temperature [°C]	
min.	+5
max.	+55
IP protection class *	50
Noise emission [dB(A)]	≤ 70

- \* For use in dirty ambient conditions (e.g. sprayed water, vapors, abrasion or processing dust) SCHUNK offers corresponding product options as standard. SCHUNK also offers customized solutions for special applications in dirty ambient conditions.

### 3.3 Electrical operating data

<b>Drive</b>	
Nominal voltage [VDC]	24.0
Nominal power current [A]	2
Max. current [A]	3
<b>Electronic control unit</b>	
Power supply [VDC]	24.0
Nominal power current [A]	0.23
Sensor system	<ul style="list-style-type: none"> <li>• 7 encoders and 7 absolute measuring systems</li> <li>• 6 tactile sensor matrices (6 x 13 Texel)</li> </ul>
Interfaces	<ul style="list-style-type: none"> <li>• Flat change system FWS115</li> <li>• CAN bus</li> <li>• RS232</li> <li>• Ethernet</li> </ul>

More technical data is included in the catalog data sheet.  
Whichever is the latest version.

### 3.4 Data Base plate

ID number	5522920
Dimensions (LxBxH) [mm]	300 x 300 x 95
Weight [kg]	2.9
Operating elements	Toggle switch ON/OFF
Nominal voltage [VDC]	24.0
Nominal power current [A] (without SDH2)	0.100
Interfaces	<ul style="list-style-type: none"> <li>• Flat change system FWS115</li> <li>• CAN bus</li> <li>• RS232</li> <li>• Ethernet</li> </ul>

### 3.5 Name plate

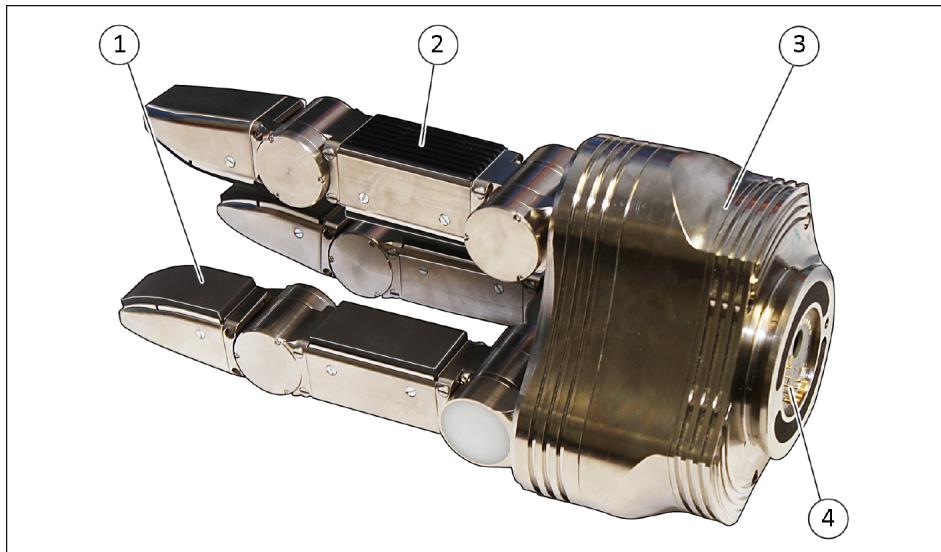


*Name plate*

The type plate is located in the area of the middle hand, on one of the concave shaped surfaces on the housing.

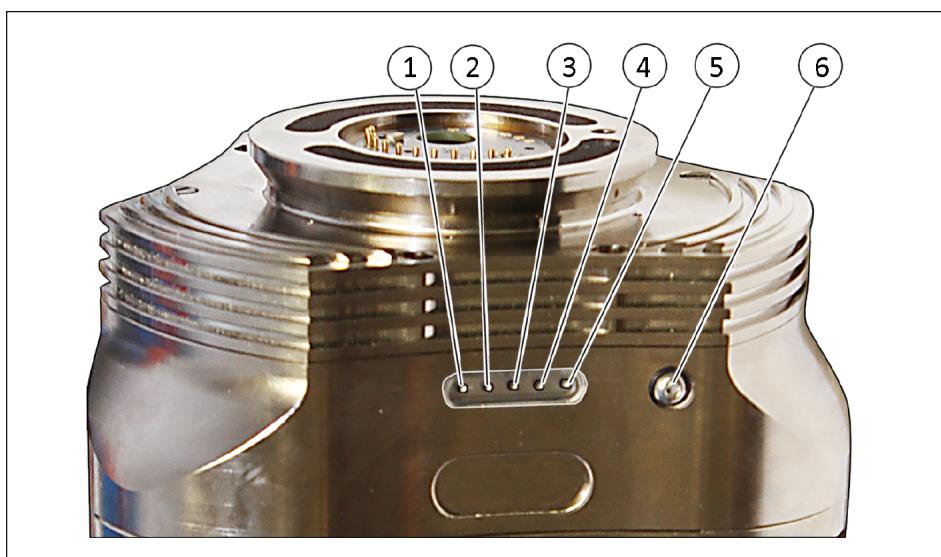
## 4 Design and description

### 4.1 Design



*Image of the 3-finger gripping hand SDH2*

1	Distal finger area, inside with tactile sensor module (domed)	3	Middle hand housing
2	Proximal finger area, outside with metal cover (and with flat sensor module on the inside)	4	Flat change adapter FWA115 (integrated as hand root)



*Display of status LEDs and reset button*

1	Ethernet "Link" (green LED)	4	Operation (orange LED)
2	Ethernet "Traffic" (yellow LED)	5	Ready for operation (blue LED)
3	Error (red LED)	6	Reset button (behind the screw)

## 4.2 Description

The 3-finger gripping hand is a servo-electric gripping module with integrated control electronics.

The 3-finger gripping hand was designed to be attached to a standard LWA 4P or LWA 4D lightweight arm.

The defined mechanical and electrical interface also makes it possible to attach it to other commercially available industrial and lightweight robots.

In this case, the 3-finger gripping hand SDH2 must always be operated within its technical specifications, [Technical data](#) [▶ 16]. The 3-finger gripping hand SDH2 is suitable for mobile applications due to its design and low energy consumption.

Flexible gripping of objects is facilitated by the individually controlled finger joints and the material used for all finger insides (plastic or silicone rubber).

Pressure position and surface detection is achieved by an optional tactile sensor system.

The gripping force can be indirectly monitored and controlled with the signals from these sensors via suitable computer software (example program is included on the supplied data carrier). The rotary movement of the finger joints in the 3-finger gripping hand hand is realized with compact integrated drive units. The motion sequences and the sensor system of the 3-finger gripping hand are controlled via functions of a supplied software library. An additional computer required for operation must be connected via Ethernet/IP or a combination of the CAN and RS232 interfaces. There are different connection possibilities:

connection possibility	Connection for motion sequences	Connection for sensor system
1	RS232 Channel 0	RS232 Channel 1
2	CAN bus	RS232 Channel 0
3	CAN bus	RS232 Channel 1
4	Ethernet	Ethernet

The control, regulation and power electronics are integrated into the wrist of the 3-finger gripping hand SDH2.

The reset button is located on the side of the palm housing of the 3-finger gripping hand behind a screw. Different boot modes can be selected by pressing the reset button for different lengths of time.

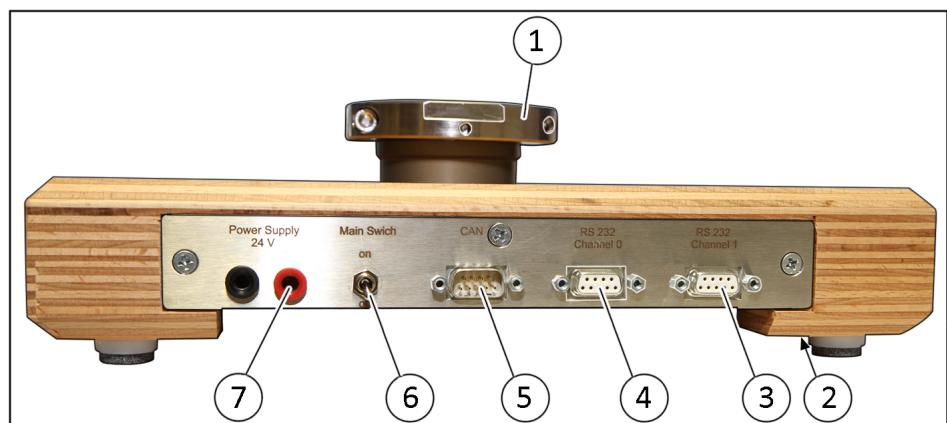
Further information is contained in the enclosed product CD.

The attachment to the light-weight arm or to another application is carried out via the SCHUNK flat-change system FWS115. Power supply and control cables for the 3-finger gripping hand SDH2 are connected with gold-plated spring contacts via connection boards of the flat change system.

The 3-finger gripping hand SDH2 can either operate on the supplied base plate or on another piece of equipment (connection via the FWK115 flat change head),[Assembly and settings \[▶ 22\]](#).

### 4.3 Base plate

For initial commissioning, demonstrations, test runs or software development, the 3-finger gripping hand can be mounted and operated on the base plate included.



*Assembly board with operating and control panels*

1	Flat change head FWK115	5	"CAN" connection
2	"Ethernet" connection (behind the connection panel)	6	Toggle switch "Main Switch" ON/OFF
3	"RS 232 Channel 1" connection	7	Input for current (DC) "Power Supply 24 V"
4	"RS 232 Channel 0" connection		

The base plate is basically comprised of:

- the operating and control panels
- Signal and supply lines
- Flat change head FWS115

## 5 Assembly and settings

### 5.1 Mechanical connection



#### ⚠ WARNING

##### **Risk of injury due to unexpected movements!**

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Ensure that no residual energy remains in the system.

#### NOTICE

##### **Risk of damage when using screws that are too long!**

The product may be damaged if the maximum permissible screw-in depth is exceeded.

- Observe the maximum depth of engagement permitted for the mounting screws.

#### NOTICE

##### **Risk of damage when using unsuitable connecting elements!**

Unsuitable components can result in damage to the product.

- SCHUNK recommends the use of SCHUNK fasteners

#### Evenness of the mounting surface

The values apply to the whole mounting surface to which the product is mounted.

*Requirements for evenness of the mounting surface (Dimensions in mm)*

Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

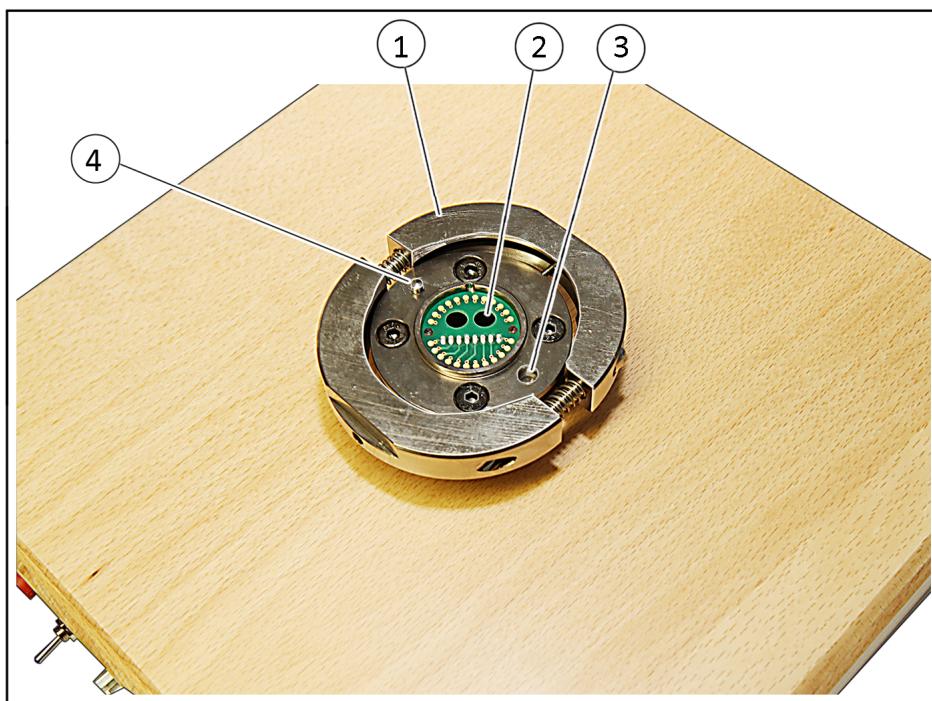
## 5.2 Electrical connection

The 3-finger gripping hand SDH2 has a common input (24 V DC) for motor voltage and logic voltage. For the supply, a sufficiently dimensioned power supply unit must be used. Ensure that the cable cross sections are sufficiently dimensioned when wiring. Installation and commissioning of the 3-finger gripping hand SDH2 differs in the following configurations.

- Operating on base plate
- Operating on an external robot arm

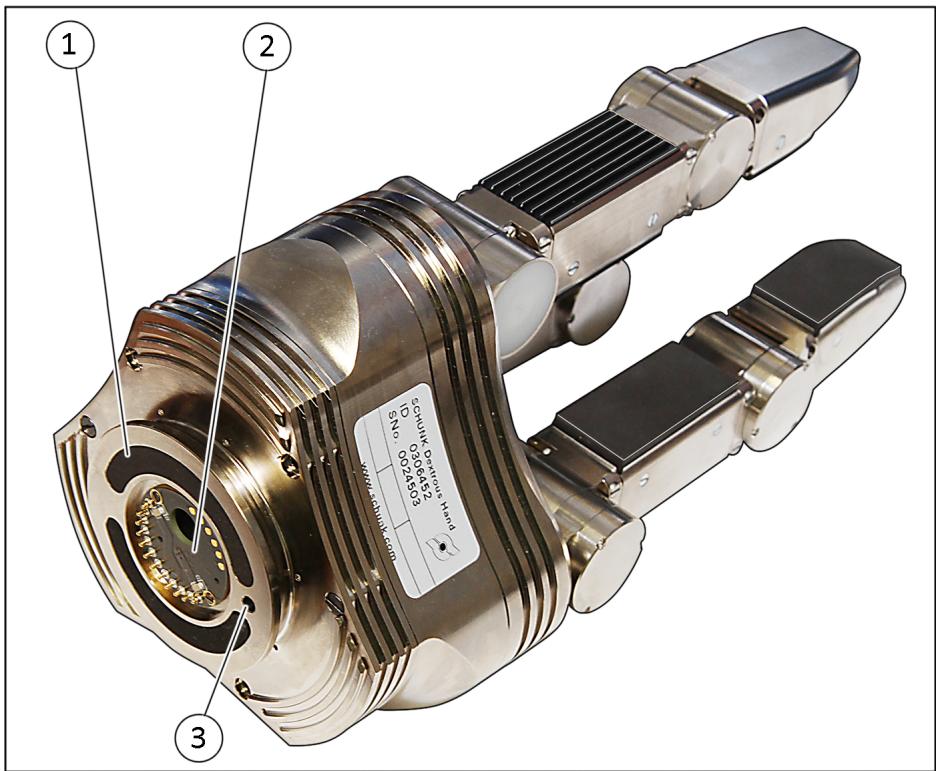
## 5.3 Installation and commissioning on the base plate

Commissioning via a network connection is described below.



*Flat change head FWK115 at the base plate*

1	Clamping ring with clamp- ing screws	3	Centering collar
2	Adapter board	4	Zentrierstift



*Connection to the 3-finger gripping hand SDH2*

1	Flange for mechanical mounting	3	Bore hole for centering pin
2	Adapter board		

- Disconnect the connection plug of the external power supply from the connection.
- Open the clamping ring on the flat change system on the base plate.
- Place the wrist of the 3-finger gripping hand in the flat changing system so that the centering pin aligns with the bore hole.
- Tighten the hexagon socket screws on the clamping ring evenly.
- Connect the communication cable of the external computer to the RS 232, CAN or Ethernet interface on the base plate.
- Plug the plug of the external power supply into the connector on the base plate (observe polarity)
- Make sure that the 3-finger gripping SDH2 hand can move freely.
- Set toggle switch ON/OFF to "ON".

#### 5.4 Switching off the base plate

- Set toggle switch ON/OFF to "OFF".

## 5.5 Mounting on external robot arm



### ⚠ CAUTION

#### Risk of injury due to the workpiece falling!

In the event of a power failure or incorrect gripping process, the gripped workpiece may fall.

- Ensure that the gripping process is performed correctly with a suitable gripping force.
- Keep distance.
- Wear suitable safety boots.



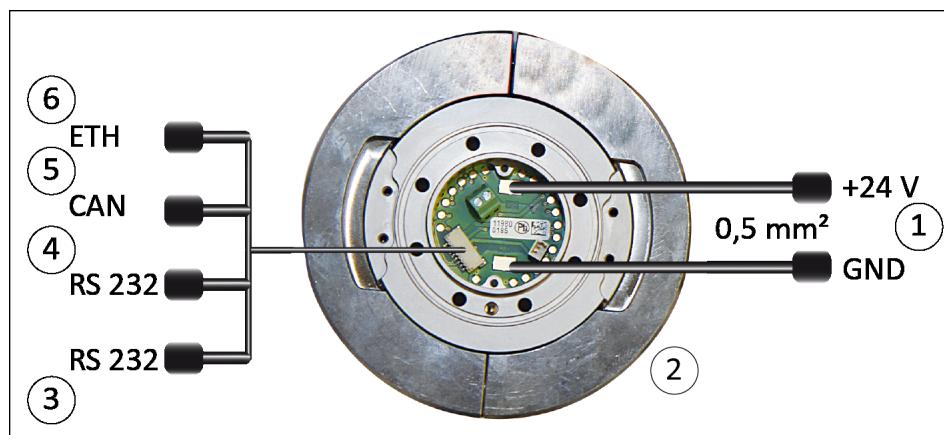
### ⚠ CAUTION

#### Risk of injury if the gripping hand is torn from the robot arm!

If the mounting process has not been performed properly, the gripping hand may come loose from the robot arm.

- Mount the flat change system properly.
- Tighten the side cap screws on the clamping ring with a hexagon wrench and with sufficient torque.

Using the flat change system, the gripping hand can be mounted on an external robot arm.



*Connection to the flat change system*

1	Supply voltage 24VDC on soldering surfaces	4	RS 232 for tactile feedback (configurable)
2	Flat change head FWS115	5	CAN for communication (configurable)
3	RS 232 for communication (configurable) and for configuration (not configurable)	6	Ethernet

The FWK115 flat change head is comprised of the following components:

- Clamping ring
  - flange
  - Adapter board
  - Centering pin
  - Seal
  - Screws
- 

### NOTE

- M3 or M6 mounting screws and O-rings are attached to the flat change system.
  - 2 FWK variants are available as an option.
- 

Mount the FWK115 flat change head on the external robot arm as follows:

- Ensure that the interface is de-energized.
- Align the flange with the centering pin and place on the centering pin.
- FWK115: Fasten the flange with 6 M3 screws.
- FWK115 ISO-50: Fasten the flange with 4 M6 screws.
- Place the wrist of the gripping hand in the flat changing system so that the centering pin aligns with the bore hole.
- Slightly tighten clamping ring on clamping ring evenly.



### ⚠ CAUTION

**Risk of injury due to incorrect electrical connection! Risk of product damage due to faulty electrical connection!**

If the electrical connection is not performed properly, a malfunction or short circuit may occur.

- The operator is responsible for executing the electrical connection correctly.
  - Ventilate the room adequately in case of a short circuit.
- 

Electrical connection is made at the adapter board of the FWK115 flat change head.

- Solder on the marked area of the soldering surfaces on the input side of the 24 V DC and GND power supply lines.
- Plug the JST connector of the signal lines in the JST adapter board socket.
- Connect the JST connector as shown in the figure "Connection with flat exchange system"

**Pin allocation for D-Sub to JST plug connection**Recommended cable cross-section 0,1 [mm<sup>2</sup>]**Soldering surfaces**

Designation	Assignment	Recommended cable cross-section [mm <sup>2</sup> ]	Recommended wire color
+UM	+24 VDC supply	0.5	Red
-UM	GND supply	0.5	Black

**NOTE**

The clamps and the two-pronged sockets on the adapter board are not used.

**5.6 System requirements for commissioning**

- Computer
- Control software

Commissioning is dependent on the control software installed. The operator is responsible for complying with the technical specifications of the 3-finger gripping hand SDH2 [Technical data \[▶ 16\]](#).

## 6 Commissioning

### NOTICE

#### Risk of damage to joints and drives!

Overloading can damage the joints and drives.

- Do not exceed specified current values and speed of the drives.
- Do not move the drives to the mechanical end stops during operation.
- Do not operate drives for long periods on blocks

The following considerations generally apply to operations:

- When the 3-finger gripping hand SDH2 is mounted on an external device (e.g. external robot arm), the operator is responsible for ensuring the operational safety of this equipment.
- The fingers of the 3-finger gripping hand can be carefully moved manually in the event of a failure of the power supply. This will not damage the drive.
- Commissioning can be carried out via RS 232, CAN or Ethernet.
- When commissioning via CAN bus, the addresses must be known.
- When commissioning via Ethernet, the following start screen is displayed in the web browser.



Initial screen SDH2

1	Text field for information and instructions	4	Tab "Direct Control"
2	Image of the 3-finger gripping hand	5	Tab "Home"
3	Tab "Configuration"		

Further information is contained in the enclosed product CD.

## 6.1 Setting parameters

Operating parameters for the 3-finger gripping hand SDH2 can be changed depending on which user is logged in.

### NOTE

In general, no change of the operating parameters is required. The parameters stored in the 3-finger gripping hand SDH2 were verified by the manufacturer.

### User administration

Access to the various module parameters is restricted by means of a four-level user management system:

In standard operation and to change all parameters of the communication interfaces as well as for the motion functions, only the access rights of a standard user are required.

Higher access rights are only required for some functions in the special diagnostics mode "Remote Update". On request, SCHUNK Service will provide the necessary access information if required.

A basic description of the similarly implemented user administration for the SMP (SCHUNK MOTION Protokoll) is contained in manual Motion Control SCHUNK, which is made available in the download area of schunk.com.

Further information is contained in the enclosed product CD.

## 6.2 Updating firmware

A firmware update is only required in exceptional cases and can only be performed after consultation with the SCHUNK service department.

Further information is contained in the enclosed product CD.

## 7 Operation

The 3-finger gripping hand does not have any operable elements. Operating and running the 3-finger gripping hand is dependent on the software installed.

Further information is contained in the enclosed product CD.

## 8 Troubleshooting

### 8.1 Communication interrupted

Possible cause	Corrective action
Faulty termination of CAN bus	Check whether termination is set correctly (termination at the start and end of the bus)
	Perform measurement between CAN_H and CAN_L (setpoint: 60 Ω)

### 8.2 Communication via Ethernet interrupted

Possible cause	Corrective action
Signal path interrupted	Check plug connector, cables and electrical components
Error while configuring network address	URL in Browser: 192.168.1.42/index.html (factory setting)

### 8.3 Product is not reacting, not moving or stops suddenly

Possible cause	Corrective action
The power supply for the drive or the electronic control unit has malfunctioned	Check the power supply
Communication has been connected incorrectly	Check the signal communication lines
Supply cable is defective	Check supply cables for damage; replace if necessary

### 8.4 Unusual noise during operation

Possible cause	Corrective action
Mechanical damage	Send the product to SCHUNK for repair

## 9 Maintenance, cleaning and repair

### 9.1 Maintenance

This product does not require maintenance.

### 9.2 Cleaning

Clean the surface of the product when necessary.

**The general rule is:**

- Only use solvent-free, water-based cleaning agents.
- The cleaning agent may not be flammable.
- Do not use steam, coolant or high-pressure cleaners.
- Do not allow the cleaning agent to penetrate into electrical or mechanical equipment.

### 9.3 Repair

#### **NOTICE**

##### **Risk of damage due to improper use of the product!**

The mechanics and internal electronics may become damaged when disassembling the product.

- The product may only be disassembled and repaired by SCHUNK.

The components of the product are adapted to each other. Repairs are only possible at the manufacturer.

For repair or replacement, send the product repair order to SCHUNK together with a repair order.