

OETIKER EPC 01

Instruction manual

Translation of the original
instructions
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1 Information about this instruction manual

1.1 Symbols and meanings of the representations used

Various warning signs are used in this instruction manual to alert the reader about potential damage to property and personal injury.

- ▶ Compliance with these warning signs is mandatory.
- ▶ Compliance with the instructions that are flagged with a warning symbol and text is mandatory.

The following symbols are used in this instruction manual:



Situation will result in serious injury or death.



Situation could result in serious injury or death.











Situation could result in moderate or minor injury.



Situations that at worst will only result in property damage and will not result in physical injuries.

Symbol	Meaning
▶ ...	Single-step call to action
1. ... 2. ... 3. ...	Multi-step call to action ▶ Note the sequence.
✓ ...	Requirement <ul style="list-style-type: none"> Necessary or labor-saving steps for the successful execution of an action.
Connect	Display or operating elements of the menu or the PC software are highlighted.

Symbol	Meaning
	Draws attention to dangerous situations with possible personal injury and damage.
	Risk of hand injuries
	For your own safety read the instruction manual and safety instructions before operating tool.
	Mandatory general notes! The mentioned safety instructions must be observed.
	Wear eye protection! Wearing safety goggles when working on the system is mandatory.
	Wearing safety boots is mandatory! Wearing safety boots when working on the system is mandatory.
	DO NOT USE IN DAMP AREAS! DO NOT EXPOSE TO RAIN OR USE IN DAMP LOCATIONS.
	Correct disposal The device must not be disposed of in the waste.

1.2 Scope

This instruction manual applies to all OETIKER Electro-Pneumatic Controllers 01 (EPC 01) and describes the mode of operation as well as the correct commissioning, operation, decommissioning, recommissioning, storage and transport. This instruction manual contains important information for safe working procedures.

Maintenance information can be found in *chapter 10*.

1.3 Compatibility

Some components of the OETIKER products EPC 01, ELK 01 and ELK 02 are compatible with each other. The following should be noted:

- The Trigger Unit of the ELK 02 cannot be used as a hand-held tool.
- The Trigger Unit of the ELK 02 can be used with the EPC 01, provided it is operated in the semi or fully automatic mode.
- The Trigger Unit of the EPC 01 cannot be used with ELK 01 and ELK 02.
- The pincer body of the ELK 02 can be retrofitted to the Trigger Unit of the EPC 01.
Retrofitting is carried out after prior consultation with the local OETIKER Service Center (see *chapter 14*).

2 Basic safety instructions

2.1 How to use the instruction manual

- ▶ Make sure that this instruction manual is always available for use within easy reach.
- ▶ If the device is sold, ensure this instruction manual is passed on to the next owner of the device.
- ▶ Please read the instruction manual carefully before commissioning the EPC 01.
 - Familiarize yourself with all settings and their functions.
 - Anyone setting up, commissioning, maintaining or repairing the unit must have read and understood the instruction manual and in particular the safety instructions.


2.2 Intended use

- The EPC 01 with the associated OETIKER pincers is used exclusively for closing OETIKER ear clamps and low profile clamps with high process reliability.
- The EPC 01 must be used only as specified in the intended use and under technically safe and fault-free conditions.
- Intended use also covers observance of this instruction manual and compliance with the technical data.
- The EPC 01 is designed for one-man operation. Action by other persons to start of the closure cycle is prohibited.
- The EPC 01 is designed for manual operation.
- The use of the EPC 01 in potentially explosive atmospheres or outdoors is not permitted.
- If the EPC 01 is used in an automated environment, the operating company is responsible for compliance with the applicable safety regulations.
- Any use not in accordance with the intended use shall be regarded as incorrect usage.


Usage other than intended use

The EPC 01 device is built to current state-of-the-art technology and is safe to operate. Residual hazards remain if the device is used incorrectly or by untrained personnel. The manufacturer cannot be held responsible for injuries to personnel and/or damage to property arising from the improper use of the EPC 01. In such cases the operating company shall be solely responsible.

2.3 General safety instructions

	WARNING
	IMPORTANT SAFETY INSTRUCTIONS

	WARNING
	INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

	NOTICE
	For your own safety read the instruction manual and safety instructions before operating tool.

- ▶ Observe the instruction manual and maintenance instructions.
- ▶ Only qualified technicians shall be permitted to proceed with maintenance and repair tasks.
- ▶ Only persons who are familiar with it and have been informed about the dangers shall be permitted to use the EPC 01.
- ▶ Compliance with all relevant accident prevention regulations, and generally accepted health and safety rules is mandatory.
- ▶ KEEP CHILDREN AWAY. All visitors should be kept safe distance from work area.
- ▶ MAKE WORKSHOP KID PROOF with padlocks or master switches.
- ▶ DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was designed.
- ▶ ALWAYS USE SAFETY GLASSES. Also use face or dust mask if cutting operation is dusty. Everyday eye-glasses only have impact resistant lenses, they are NOT safety glasses.
- ▶ SECURE WORK. Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.
- ▶ MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- ▶ NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF. Don't leave tool until it comes to a complete stop.

Work area

- ▶ Keep the work area clean and well lighted. Cluttered benches and dark areas increase the risks of electric shock, fire, and injury to persons.
- ▶ Do not operate the tool in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. The tool is able to create sparks resulting in the ignition of the dust or fumes.
- ▶ Keep bystanders, children, and visitors away while operating the tool. Distractions are able to result in the loss of control of the tool.

Personal safety

- ▶ Stay alert. Watch what you are doing and use common sense when operating the tool. Do not use the tool while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating the tool increases the risk of injury to persons.
- ▶ Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, or long hair increases the risk of injury to persons as a result of being caught in moving parts.
- ▶ Avoid unintentional starting. Be sure the switch is off before connecting to the air supply. Do not carry the tool with your finger on the switch or connect the tool to the air supply with the switch on.
- ▶ Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.
- ▶ Use safety equipment. Non-skid safety shoes must be used for the applicable conditions.
- ▶ Always wear eye protection.
- ▶ Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded.
- ▶ Explore the workpiece to avoid contact with hidden wiring. Thoroughly investigate the workpiece for possible hidden wiring before performing work. Contact with live wiring will shock the operator.

Tool use and care

- ▶ Do not use the tool if the switch does not turn the tool on or off. Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- ▶ Disconnect the tool from the air source before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool unintentionally.
- ▶ Store the tool when it is idle out of reach of children and other untrained persons. A tool is dangerous in the hands of untrained users.
- ▶ Check for misalignment of binding of moving parts, breakage of parts, and any other condition that affects the tool's operation. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools. There is a risk of bursting if the tool is damaged.
- ▶ Use only accessories that are identified by the manufacturer for the specific tool model. Use of an accessory not intended for use with the specific tool model, increases the risk of injury to persons.

Service

- ▶ Tool service must be performed only by qualified repair personnel.
- ▶ When servicing a tool, use only identical replacement parts. Use only authorized parts.
- ▶ Use only the lubricants supplied with the tool or specified by the manufacturer.

Air source

- ▶ Never connect to an air source that is capable of exceeding 200 psi. Over pressurizing the tool is able to result in bursting, abnormal operation, breakage of the tool or serious injury to persons. Use only clean, dry, regulated compressed air at the rated pressure or within the rated pressure range as marked on the tool. Always verify prior to using the tool that the air source has been adjusted to the rated air pressure or within the rated air-pressure range.
- ▶ Never use oxygen, carbon dioxide, combustible gases or any bottled gas as an air source for the tool. Such gases are capable of explosion and serious injury to persons.



WARNING

SAVE THESE INSTRUCTIONS

Improvements to the machine

In our endeavor to continuously improve the quality of our products, we reserve the right to make improvements without changing the instruction manual. Details of dimensions, weights, materials, performance ratings and names may therefore be subject to necessary changes. Regarding electrical diagrams, the diagram supplied with the machine takes precedence in all cases.

2.4 Special safety instructions

Only specially trained personnel are authorized to proceed with maintenance and repair work on pneumatic and electrical equipment.

- ▶ Before maintenance and repair work, switch off all devices and disconnect the EPC 01 from the mains and the compressed air supply.
- ▶ Check hose lines for wear in the course of preventive maintenance, and replace them if necessary.

2.4.1 Moving parts

During operation, there is a risk of serious injury from crushing, cutting and shearing of fingers by the moving jaws on the pincer head.

- ▶ Do not reach into the clamping area of the pincer head during operation.
- ▶ Before carrying out any work on the clamping area of the pincer head, switch off the voltage and compressed air supply of the EPC 01.
- ▶ Do not point the pincer head at other persons.

2.4.2 Flying parts

If the workpiece, accessories or machine tool breaks, parts can be ejected at high speed. There is a risk of serious injury.

- ▶ Before use, check the EPC 01 for fractures. Change damaged parts.
- ▶ Wear protective equipment.

2.4.3 Noise level

When venting the pincer, a max. noise level of 92 dBA can be expected at the Control Unit.

- ▶ Where high noise levels are present, wear hearing protection.
- ▶ Do not mount the Control Unit at head height.

2.4.4 Compressed air

The EPC 01 is operated with compressed air. Even after switching off, individual system parts and devices may still be under pressure. Compressed air flows out when the pincer is vented.

Escaping compressed air can cause injuries.

- ▶ Before all maintenance and repair work, switch off the compressed air supply.
- ▶ Depressurize all air-operated plant components and equipment.
- ▶ Please operate the EPC 01 between 4 bar to 10 bar (recommended: 6 bar). Do not operate the EPC 01 at pressures above 10 bar.
- ▶ Ensure that the vent holes on the pincer body are clear.

2.5 Safe working methods

- ▶ Before each start of production, check the EPC 01 for visible damage and ensure that it is only operated in perfect condition.
- ▶ Report deficiencies to supervisor immediately.
 - Do not attempt to continue using the EPC 01 if defects have been identified.
- ▶ Wear safety glasses and safety shoes during operation and maintenance. Wear a safety helmet when working overhead.
- ▶ The EPC 01 is designed for operation by a single operator: The closure cycle must never be initiated by a second person.
- ▶ Keep sufficient space around the product. Users must not be obstructed by third parties.
- ▶ Set up the workstation ergonomically for working with the EPC 01. In particular, this includes the following:
 - Ensure lighting intensity of at least 400 lux.
 - Enable safe and comfortable posture during operation.
 - Set up and lay plant components, hoses and lines in such a way that they cannot cause any tripping or falling hazards during operation.
- ▶ When working with the EPC 01, the hands, arms, shoulders and neck can be stressed. Pain and discomfort can be the result.
 - Interrupt work with the EPC 01 at regular intervals.
 - Stop work if symptoms of stress persist or recur. Have stress symptoms medically checked.

2.6 Safety devices

Safety devices protect against hazards when handling the EPC 01.

- ▶ Do not modify safety devices.
- ▶ Ensure that all safety devices are effective during operation.

The operator must ensure that the supply pressure falls within the specified range. If the supply pressure is too high, a pressure relief valve must be used. Alternative pneumatic components, for example pressure regulators, may be used provided they meet the requirement of the application.

Furthermore, the operator is responsible for ensuring that the EPC 01 is safely disconnected from the compressed air supply before disassembly.

2.6.1 Safety lever

There is a safety lever on the Trigger Unit of the pincer. The safety lever is pressed and held down during the crimping process. The safety lever actuates the integrated 3/2 safety valve. The safety valve is designed to close independently under pressure and to vent safely.

Unintentional closures are prevented by actuating the safety lever.

2.7 Using the EPC 01 via an external control system


- The integrator is responsible for the safe integration of the EPC 01.
- The integrator must prepare a risk assessment and implement the system according to the risk assessment.
- Integration may be performed only by qualified personnel.
- For more information on this topic see *chapter 9*.
- If you have any questions about integration, contact OETIKER.

2.8 Modifications, changes

If the seal on the EPC 01 is damaged or removed without authorization, OETIKER will not accept any warranty claims.

- ▶ Do not modify the EPC 01 without the consent of OETIKER. Any modification excludes liability on the part of OETIKER for any resulting damage.
- ▶ Only use original spare parts and accessories. In particular, use only the pneumatic components and lines described in this instruction manual.
- ▶ Do not remove any safety devices.

2.9 Qualified personnel

	WARNING
	<p>Risk of injury</p> <p>Danger due to actions of unauthorized or unqualified personnel.</p>

The use of this device is reserved exclusively for authorized and qualified personnel. Use without the instruction manual is prohibited. The authorization levels for use are as follows:

<div>Personnel</div> <div>Activities</div>	User (public)	Line responsible	Customer Administrator
Operating the EPC 01	✓	✓	✓
Making settings	✗	✓	✓
Training users in using the EPC 01	✗	✓	✓
Providing the instruction manual	✗	✓	✓
Ensuring closure data	✗	✓	✓
Updating firmware	✗	✗	✓

Explanation: ✓ = permitted ✗ = not permitted

«User»:

- is familiar with the specified safety instructions and regulations
- knows the relevant procedures described in this document
- has been trained appropriately
- has been trained by the responsible line manager or an employee of OETIKER

The operating company must ensure that the employee has received the safety instructions and regulations in his or her respective language.

«Line responsible»:

- possesses the knowledge described for the «user»
- trains the operator

«Customer Administrator»:

- possesses the knowledge described for the «line manager»
- is the administrator and has comprehensive rights

2.10 Maintenance tasks

The inspection and maintenance intervals specified in the instruction manual must be observed (see *chapter 10*).

Maintenance and repair instructions must be observed accordingly.

- ▶ Regularly check that the pincer head and pressing mechanism are working properly. If cracks and fractures occur, replace the corresponding components.
- ▶ Complex maintenance work involving opening the EPC 01 must be carried out exclusively by a local OETIKER Service Center (see *chapter 14*).

2.11 Signs and instruction plates on the EPC 01

2.11.1 Safety signs / safety plates

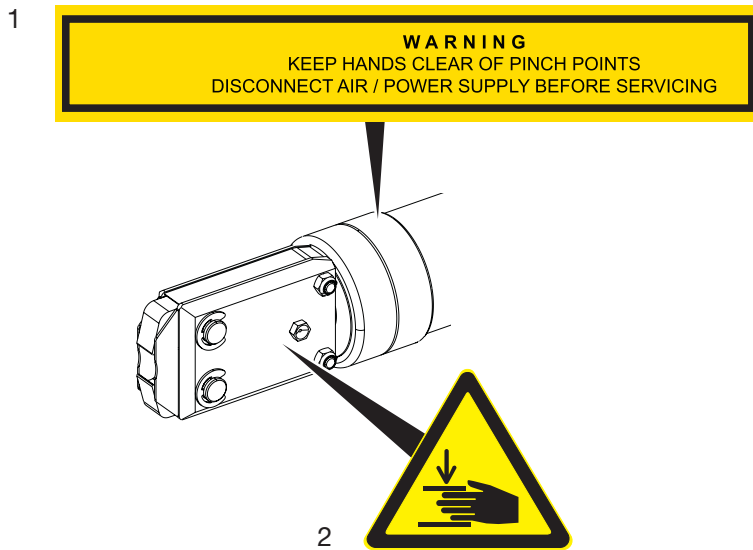



Fig. 1: Safety signs and safety plates on the pincer head of the EPC 01

1. Warning plate:
Keep hands away from the pinch points!
Disconnect compressed air / power supply before maintenance!
2. Warning sign:

Symbol	Meaning
	Risk of hand injuries Pinching hazard in the crimping area of the pincer head!

- Observe the safety signs and safety plates.
- Do not remove the safety signs and safety plates: keep them in legible condition at all times.

2.11.2 Nameplates (Template)

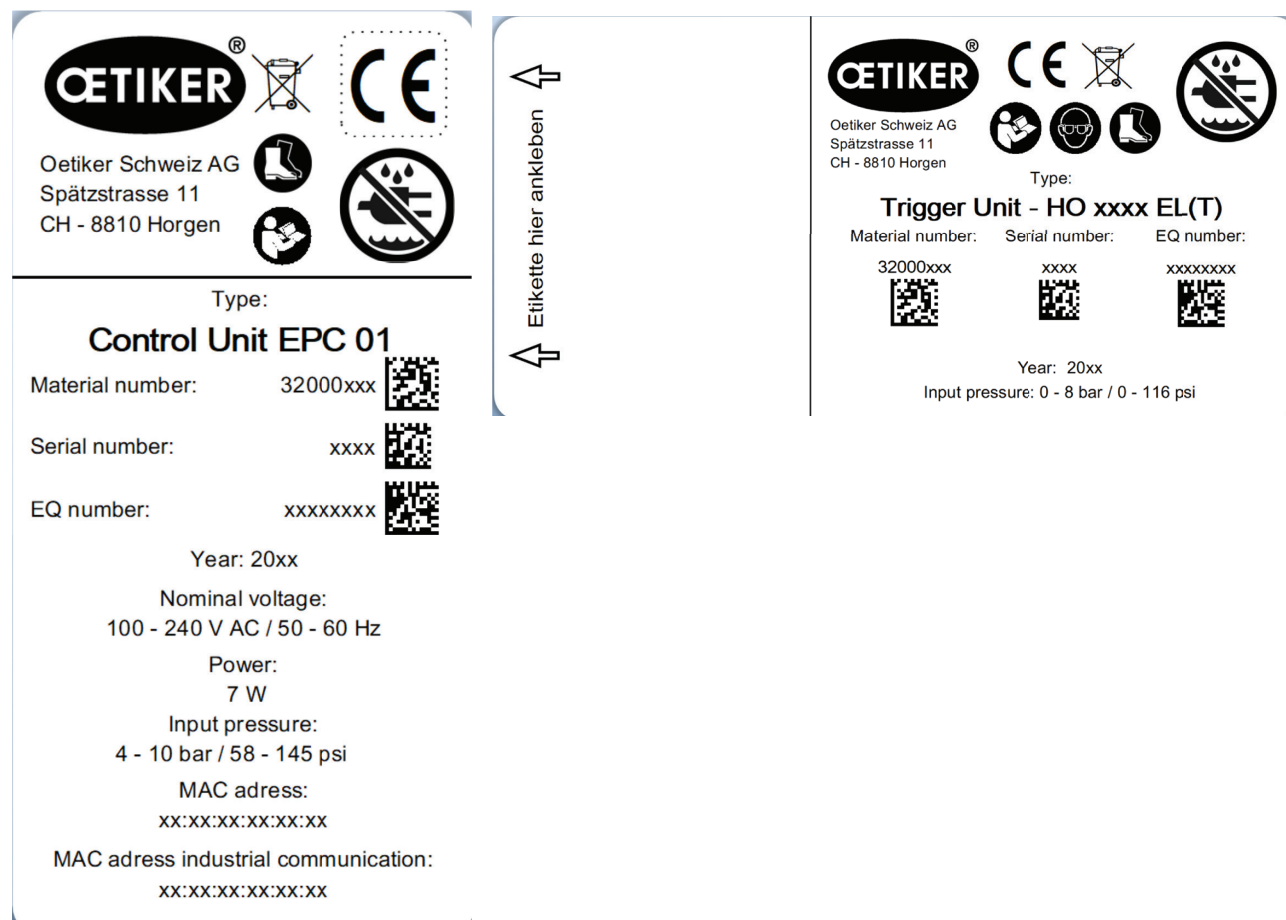


Fig. 2: Nameplates (left: Control Unit, right: pincer)

Symbol	Meaning
	For your own safety read the instruction manual and safety instructions before operating tool.
	Wear eye protection! Wearing safety goggles when working on the system is mandatory.
	Wearing safety boots is mandatory! Wearing safety boots when working on the system is mandatory.
	DO NOT USE IN DAMP AREAS! DO NOT EXPOSE TO RAIN OR USE IN DAMP LOCATIONS.
	Correct disposal The device must not be disposed of in the waste.

3 Structure and description

3.1 Overall EPC 01 system

Structure

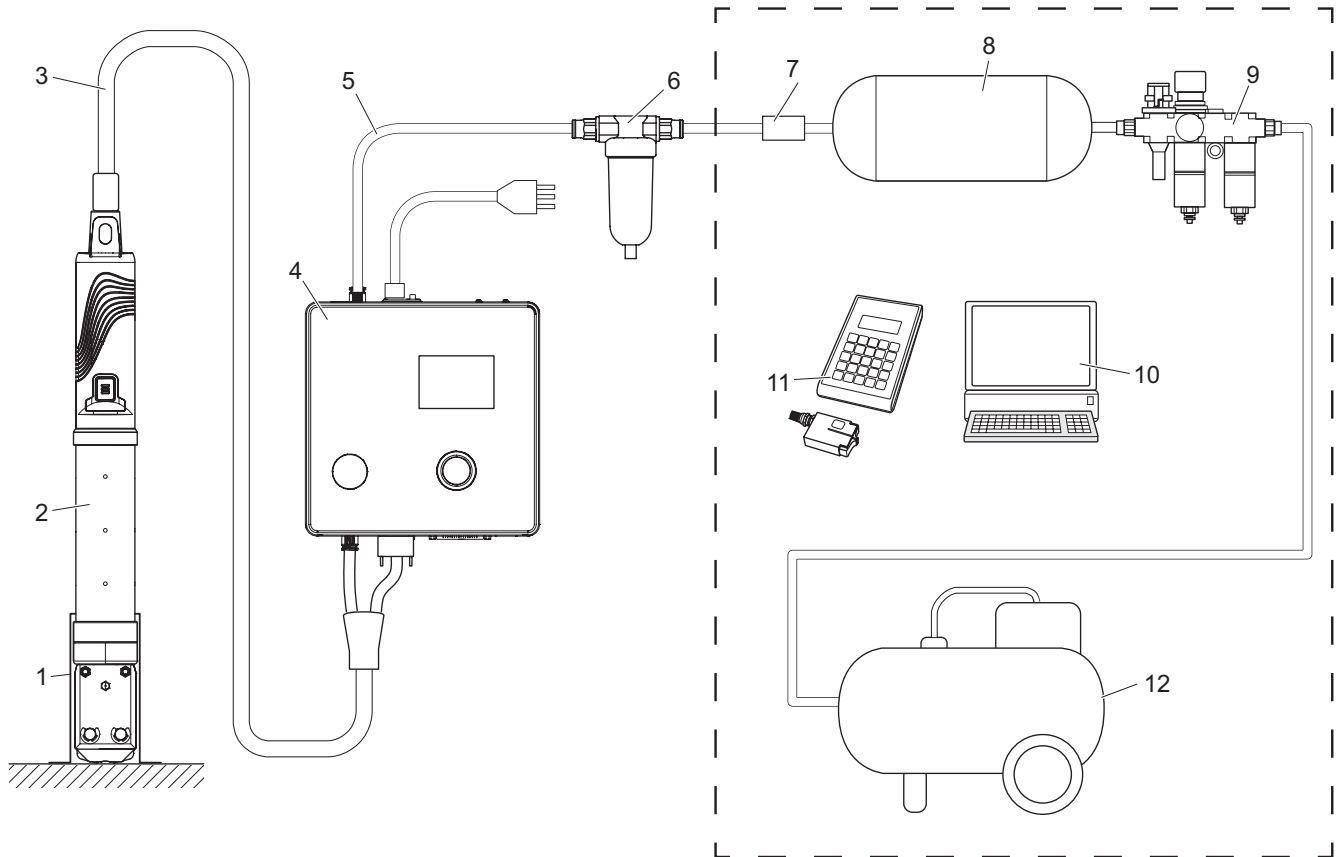


Fig. 3: Structure of the overall EPC 01 system

- | | |
|---|--|
| 1. Pincer holder (recommended, plastic) | 7. Safety shut-off valve |
| 2. Pincer | 8. Compressed air tank |
| 3. Hybrid hose | 9. Maintenance unit / pressure regulator |
| 4. Control Unit | 10. PC |
| 5. Compressed air supply line | 11. CAL 01 |
| 6. Compressed air filter | 12. Compressor / compressed air supply |

Description

The OETIKER EPC 01 is an electro-pneumatic system for closure of ear clamps and low profile clamps. The components of the system are connected to each other via compressed air and hose lines (3, 5).

The compressor / compressed air supply (12) generates compressed air which flows to the maintenance unit (9). The air pressure is reduced to the defined pressure range by the maintenance unit (9) to protect the entire system from overpressure. The compressed air is stored in the compressed air tank (8). The compressed air filter (6) cleans the compressed air. In the event of impermissible pressure, the safety shut-off valve (7) closes and shuts off the compressed air supply line (5) to the Control Unit (4).

The Control Unit (4) controls and monitors the crimping operations using defined control parameters and closure data. The data of the Control Unit are stored in the PC software of the PC (10). The hybrid hose (3) supplies the pincer (2) with compressed air and power.

The pincer (2) is the tool used by the operator to close the ear clamps and low profile clamps. The pincer is held in the pincer holder (1).

The CAL 01 (11) is used to calibrate the pincer during the pincer test.

3.2 Control Unit

Layout

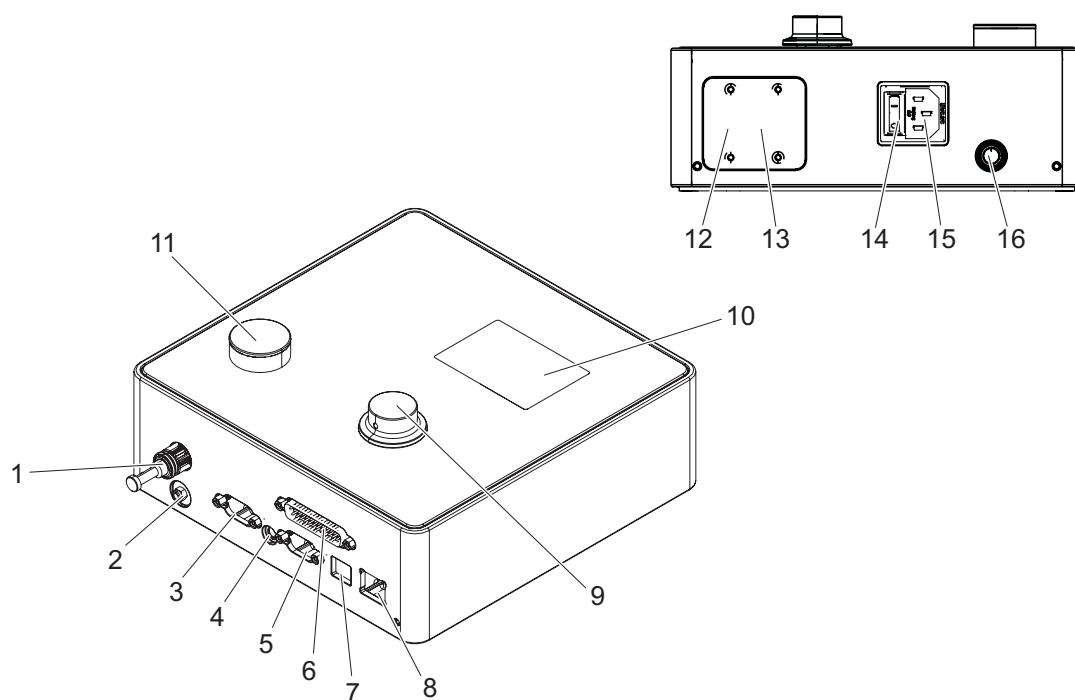



Fig. 4: Layout of the Control Unit

Item	Designation	Description / Use
1	pA	Hybrid hose connection (Pincer pneumatic connection)
2	Vent	Compressed air outlet during venting
3	X1	Pincer electrical connection
4	X12	Jack plug interface for reading out pressure and stroke (linear position) as analog signals for optical display on relevant display devices (e.g. an oscilloscope)
5	X3	RS232 interface for communication with the PC software / CAL 01
6	X20	25-pin D-SUB interface Connection for control via the logic module (PLC), inputs/outputs

Item	Designation	Description / Use
7	USB	Interface for communication with the PC software
8	Ethernet	Interface for communication with the PC software
9	Rotary pushbutton	Operating the menu of the Control Unit
10	Display	Displaying the menus of the Control Unit Displaying error messages
11	Vent	Outlet quick exhaust valve
12	IN / X30 P1	Optional BUS interface for industrial communication with a external system (PLC)
13	OUT / X30 P0	
14	On/Off switch	Switching the Control Unit on and off
15	Plug for low-power equipment	3-pin plug (male) for low-power equipment
16	pE	Compressed air inlet (compressed air supply line)

Description

The Control Unit is the central device for controlling and monitoring the crimping operations. Control parameters and closure data are set and read on the Control Unit.

NOTICE	
	Further information:
	<ul style="list-style-type: none"> • Operation via external controls <i>see chapter 9.</i> • Detailed information of the interfaces <i>see chapter 13.2.</i>

3.3 Pincer

Structure

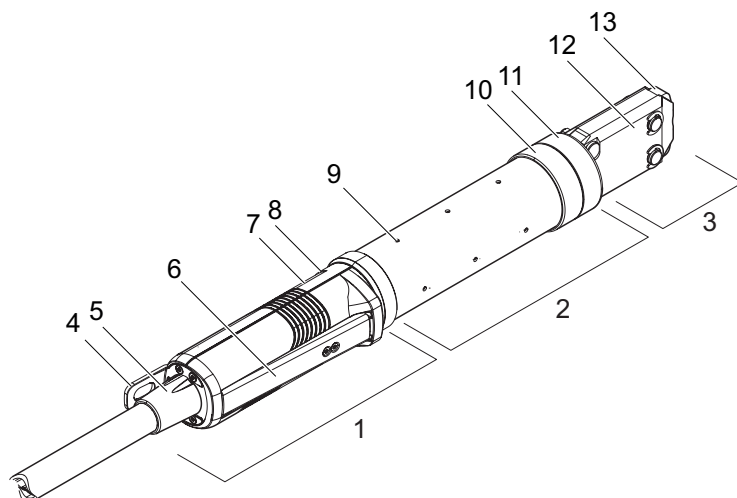


Fig. 5: Structure of the pincer

- | | |
|-----------------------|------------------------------|
| 1. Trigger Unit | 8. LED (hidden) |
| 2. Pincer body | 9. Vent hole |
| 3. Pincer head | 10. Available fixing surface |
| 4. Suspension bracket | 11. Union nut |
| 5. Rotary adapter | 12. Pincer plate |
| 6. Safety lever | 13. Pincer jaw |
| 7. START key (hidden) | |

Description

The pincer is the operator's tool and is used to close the ear clamps and low profile clamps. The pincer consists of 3 elements: the Trigger Unit, the pincer body and the pincer head.

The pincer is held and operated at the Trigger Unit (1). Pressing the START key (7) triggers a closure. The integrated 3/2 safety valve enables safe closure and venting when the safety lever (6) is actuated. The LED (8) signals status messages. The pincer is suspended from the suspension bracket (4).

The pincer body (2) has several vent holes (9) for venting. The pincer head (3) is mounted to the pincer body.

The pincer head (3) uses the pincer jaws (13) to close the ear clamps and low profile clamps. There are different pincer heads for different product groups of clamps. Depending on the clamp design and type, a specific pincer head is required for each customer's application. For applications that are difficult to access, for example, special pincer heads can be mounted (consultation with OETIKER required). After the pincer head has been changed, a pincer test is required.

The pincer head can be changed as required within the following 3 groups:

- HO 2000, HO 3000 and HO 4000
- HO 5000 and HO 7000
- HO 10000

3.4 CAL 01

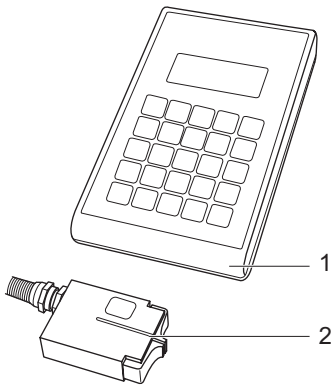


Fig. 6: Structure of the CAL 01

1. CAL 01
2. Sensor SKS0x

The CAL 01 measuring device (1) is used to calibrate the pincer and is particularly required for the force test during the pincer test. The SKS0x sensor (2) is mounted on the pincer head. The measured force can either be transferred to the PC software or directly to the Control Unit.

The CAL 01 is a stand-alone device available from OETIKER. The function of the device can be found in the corresponding Instruction manual.

4 Process description

4.1 Process flow

The EPC 01 is used for professional and reliable closure of OETIKER ear clamps and low profile clamps.

To do this, an ear or the closure hook of the low profile clamp (1) is inserted between the pincer jaws (2).

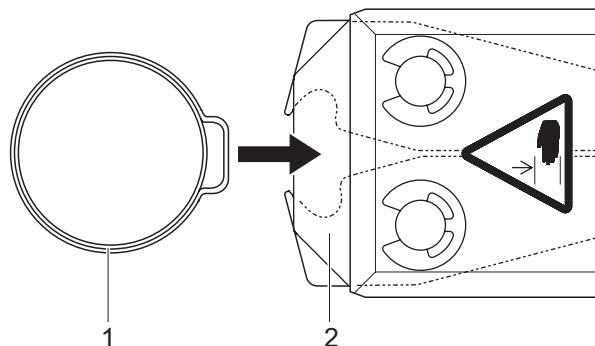


Fig. 7: Inserting an ear clamp / a low profile clamp

Subsequently, the closure process on the Trigger Unit is first released by pressing and continuously holding the safety lever (4) and then initiated via the START button (3).

The safety lever should be released after each completed closure (but required every 20 closures).

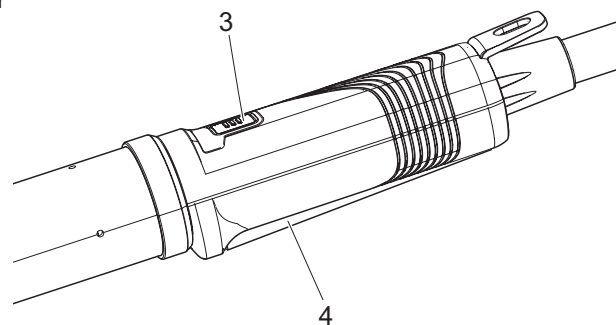


Fig. 8: Starting the closure process

The pincer jaws crimp the ear (5), using the preset force.

When using low profile clamps, the preset value is used so that the clamp is hooked in.

The Control Unit monitors, qualifies and quantifies the crimping process. Various interfaces allow the measured variables as well as OK/NOK conditions to be displayed.

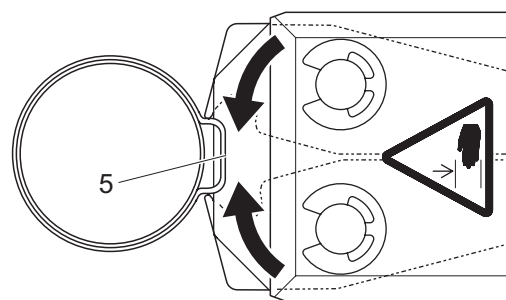


Fig. 9: Closing the ear clamp / low profile clamp

4.2 Closing modes

4.2.1 Force priority

With this closing function, closure takes place at a defined closure force, which is controlled by the Control Unit.

The deformation of the clamp and the parts being clamped results in a closing gap. The closing gap can be used to verify the position of the assembled components; however, this gap is subject to change due to various tolerances (of the parts being clamped, the clamp itself, and the nozzle).

Force priority closure is used to close the ear clamps. The performance of the clamp depends on the closing force (and not on the closing gap).

The figure to the right shows a simplified force priority closing process.

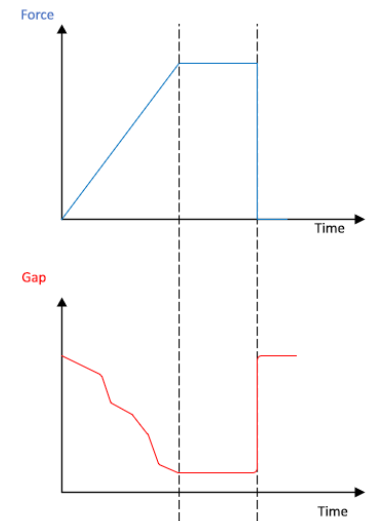


Fig. 10: Force priority closure

4.2.2 Stroke priority

With this closing function, closure takes place at a defined closure gap, which is regulated by the Control Unit.

The resistance of the parts being clamped and the resistance of the clamp itself result in a closing force. This closing force was needed in order to move to the given position. The closing force can be used to verify the assembled components; however, this force is subject to change due to various tolerances (of the parts being clamped, the clamp itself, and the nozzle).

The stroke priority closing function is used to close low profile clamps. Because the performance of a low profile clamp is guaranteed only when the hook is engaged, the EPC 01 closes up to a certain gap value at which the engagement of the low profile clamp is ensured.

The figure to the right shows a simplified stroke-priority closing process.

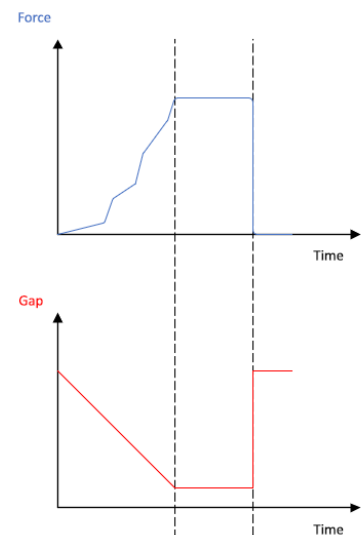


Fig. 11: Stroke priority closure

4.2.3 Schnappi

With this closing function, closure takes place at a defined closure force (force priority closure), whereby the control unit detects when the hook has been passed over and stops the crimping process. This ensures that the material is not stressed excessively. This closure method is recommended for type PG168 and PG192 low profile clamps. The closing process with verification is illustrated in the figure below.

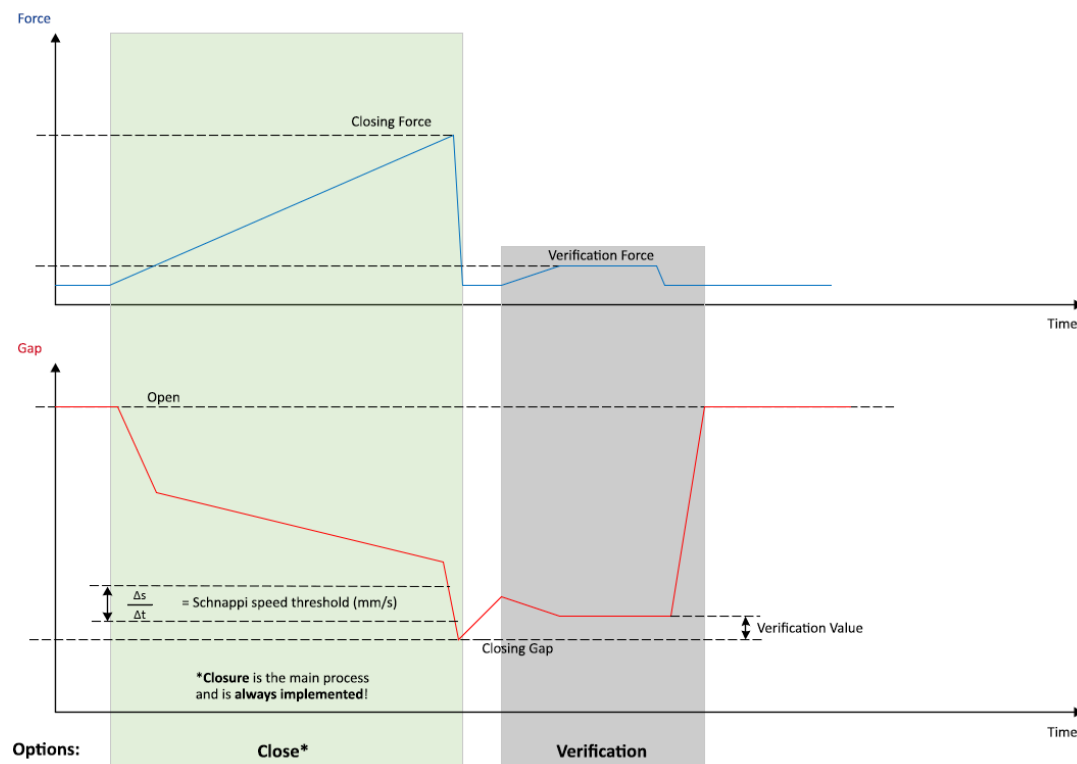


Fig. 12: Schnappi closing

4.3 Options

The closing process can be extended by incorporating the options shown below. The options can be set in the PC software (see chapter 8.6.5).

4.3.1 Open

Turning this option on, allows the tool to be pre-loaded with air to keep it at a specific gap.

This option is suitable when the open gap is larger than the ear of the clamp. To activate the opening gap, the safety lever must be pressed and held continuously. As soon as the START key is pressed, the pincer moves to the set opening gap and remains there until the cycle is triggered by pressing the START key again. After the cycle is completed the pincer retracts completely and is brought back into the opening gap by releasing and pressing and holding the safety lever again and pressing the START key.

4.3.2 Hold or detect

Only one option can be selected and used at a time.

Hold

The clamp is held in place using a little force between the pincer jaws in order to pre-position and hold in place the parts being crimped. Thus, the clamp can be moved to the desired position and subsequently closed.

Holding must be performed by continuously pressing the safety lever and pressing the START key. In order to proceed with the closing function, a new start must be triggered.

The course of holding for all the options is shown in the figure below:

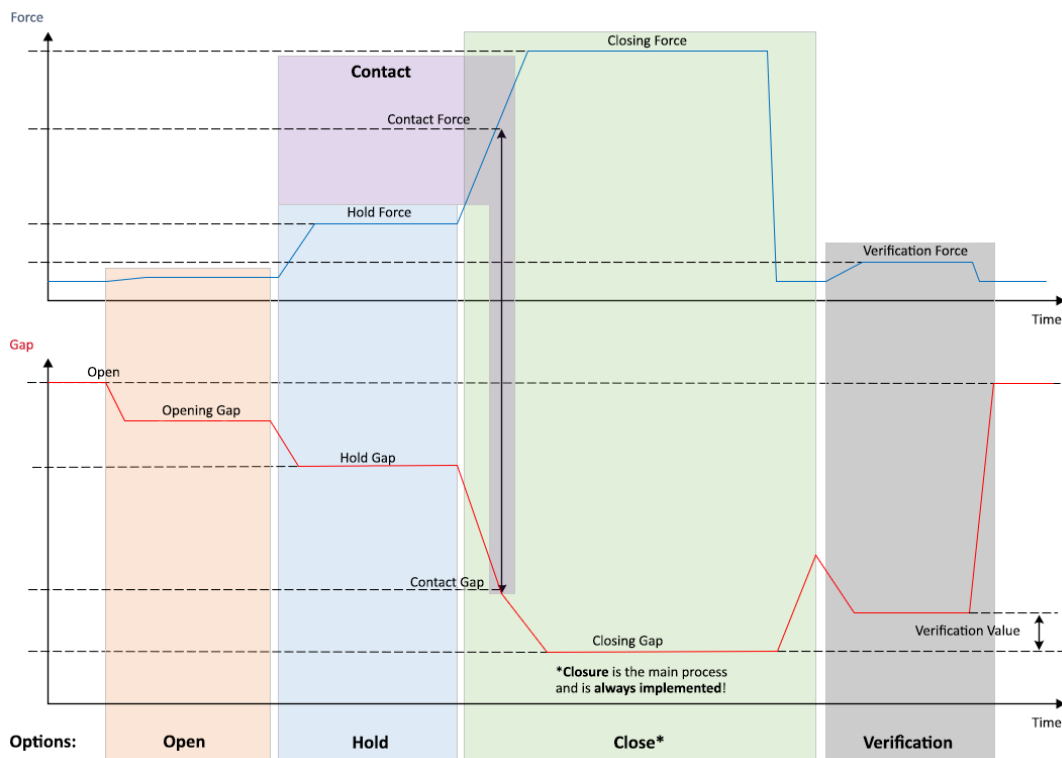


Fig. 13: Holding for all options

Detect

The detection function identifies a second closure of the same ear clamp or low profile clamp and reports the procedure as NOK. The detection function requires that a specified force must be achieved for a specified gap. If the clamp had already been closed the force at the gap will not be reached and the closure process is canceled.

This type of detection can also be implemented with the Hold or detect option. If the pincers do not reach the holding force at the holding gap, this is an indication that the clamp is already deformed. This requires a correct setting.

The course of detection for all options is shown in the figure below:

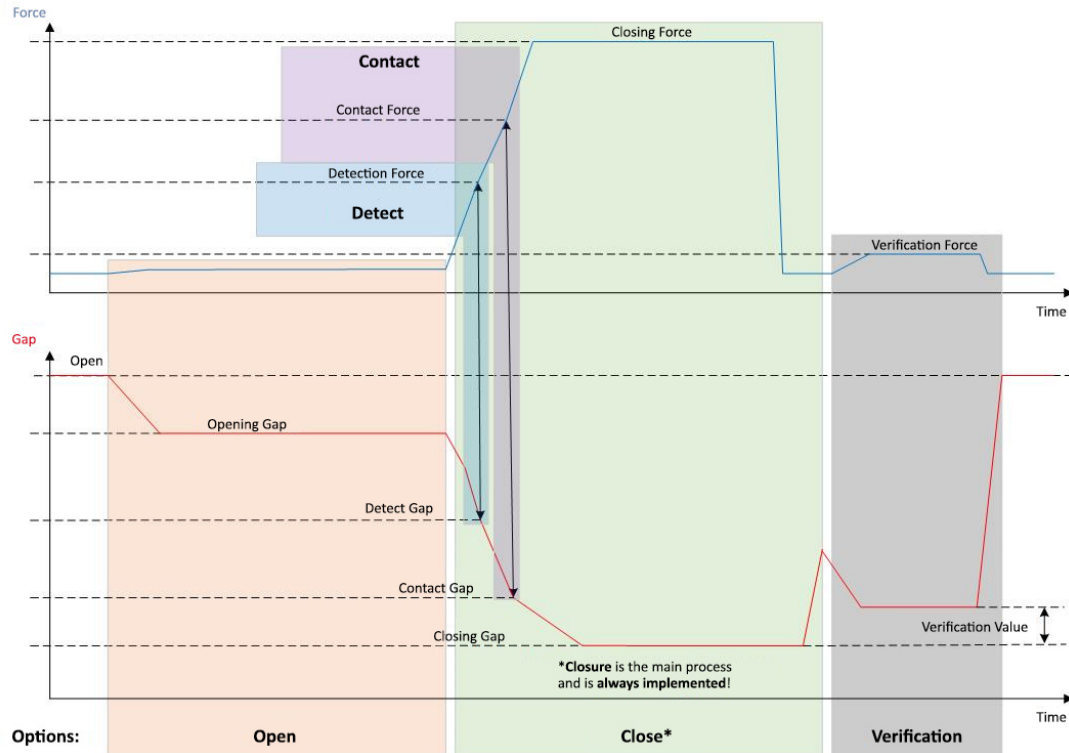


Fig. 14: Detection for all options

4.3.3 Contact

With this option, the contact position is determined. This refers to the contact of the clamp to the parts being crimped but not to the ear of the clamp. The contact detection function displays the contact gap when the specified force is reached. Together with the closing gap, an external system can calculate the difference and thus an approximation to the compression of the material.

4.3.4 Verification

In this option, the closure is checked. After closing, the pincer jaws are pressed against the low profile clamp with low force. This can verify whether the low profile clamp has sprung open or has closed correctly. If a force cannot be built up on the low profile clamp, the low profile clamp has sprung open again and the assembled components are NOK. The safety lever must be held in the actuated position during the entire closure process, including verification.

4.4 Pincer test

The pincer functions as a crimping tool, which is stressed and subjected to wear during use. OETIKER therefore strongly recommends that the pincer is regularly calibrated using the pincer test. The pincer test should be performed at the beginning of a shift and must be performed after changing the pincer jaws or the pincer head. The mentioned pincer test is selected with the rotary pushbutton on the Control Unit.

Basically, 3 test steps are performed one after the other during the pincer test:

- Friction test
- Force test
- Gap test

The safety lever must be pressed and held continuously during the entire test procedure. Pressing the START key starts the pincer test cycle. Each test step is triggered by pressing the START key again.

4.4.1 Procedure

The following flow chart provides an overview of the pincer test sequence:

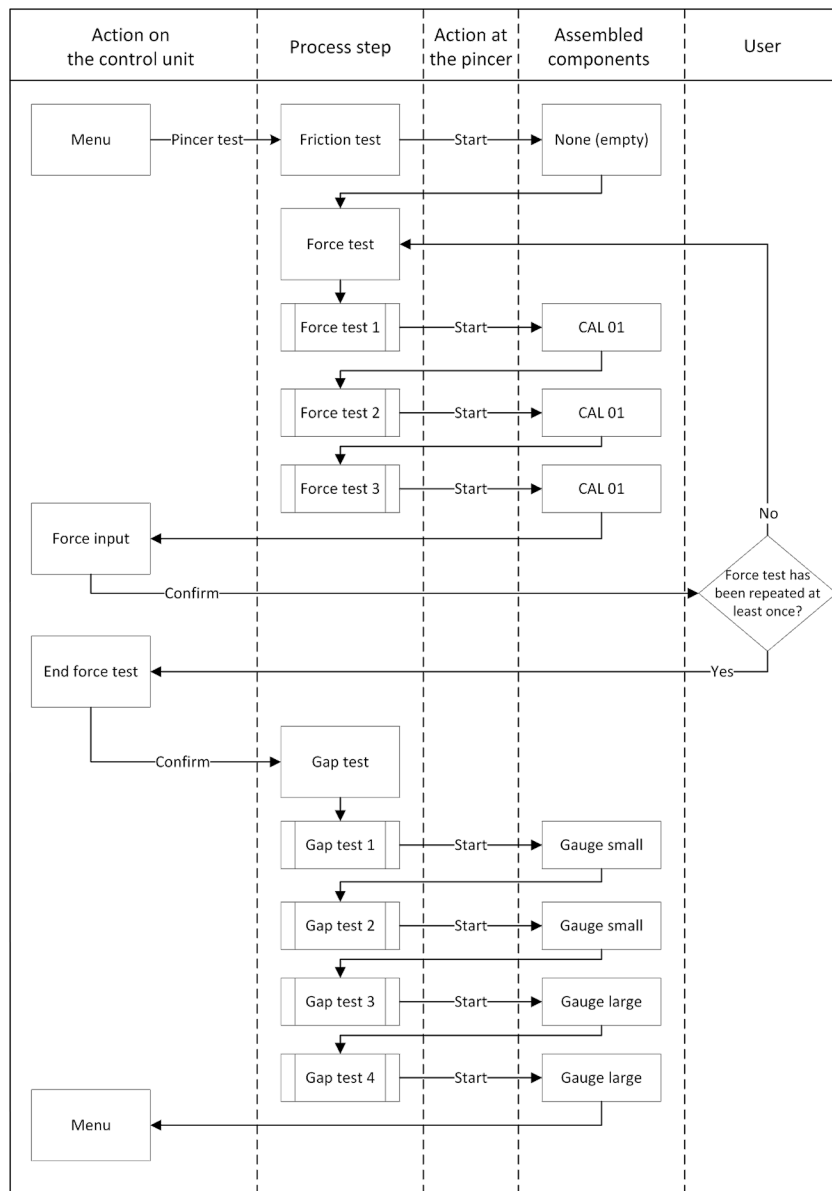


Fig. 15: Procedure for the pincer test

4.4.2 Friction test

In order to set the pincer jaws in motion, a minimum force is required to overcome friction. Since this force does not act on the clamp during crimping, it is determined during the friction test and compensated accordingly during crimping.

During the friction test, the pincer closes empty (without parts being crimped between the pincer jaws) and thus determines its internal friction.

4.4.3 Force test (standard-setting)

The force test is carried out in order to match the displayed force of the Control Unit to the actual force at the pincer head. A CAL 01 is required for the force test. The CAL 01 determines the force applied to the pincer jaws.

During this test, the closing force sensor SKS0x simulates the closing force and the CAL 01 records the force for calibration purposes. The displayed force can be entered either in the PC software or directly on the Control Unit.

At least 2 iterations, of 3 crimping operations each, must be performed and their mean value transferred. An iterative determination of the closure force is more precise (see *chapter 4.4.1*).

If a subsequent check (after the determination) of the closure force reveals a deviation that is greater than HO 2000-4000: ± 100 N, HO 5000-7000: ± 170 N, HO 10000: ± 250 N, the procedure must be repeated.

4.4.4 Two-stage guided force test

In the PC software it is possible to enable the two-stage guided force test. This test is safer, more accurate and more guided than the previously described force test. Enabling the two-stage guided force test, will replace the standard-setting Force test (see *chapter 4.4.3*).

In the first stage of the two-stage force test, a low force is produced in the pincer. Providing a force correction is only needed, if the actual force value measured with CAL 01 is outside of the range displayed on the EPC 01.

The second stage of the two-stage guided force test is performed at 100% of the current APN closing force. Three closures must be repeated two times in order to proceed with the gap test. Consequently, a total of a minimum of six closures will be carried out in this stage.

In conclusion, a total of at least seven closures are performed in the entire two-stage guided force test.

4.4.5 Gap test

The pincer body can be equipped with different heads. After a change, each pincer head must be recalibrated. The displacement measuring system is compared with the pincer jaw travel.

During the gap test, a gap gauge is held between the pincer jaws. The pincer is calibrated based on two gap gauge values (i.e. 2 mm and 4 mm). Two closures are carried out for each gap gauge. Consequently, a total of four closures will be carried out.


5 Commissioning

5.1 Prepare assembly and connection

5.1.1 Checking the ambient conditions

1. Ensure the required ambient conditions (see *chapter 13.1.1*).
2. Ensure that there is no potentially explosive atmosphere at the installation site.

5.1.2 Preparing the installation site

	NOTICE <ul style="list-style-type: none"> ▶ To avoid physical strain when operating the pincer vertically, provide a suitable suspension device at the installation site. The pincer is suspended from the suspension bracket on the Trigger Unit. ▶ To avoid trip hazards, provide sufficient storage space for the hybrid hose at the setup location. ▶ Observe the length of the hybrid hose at the installation site and do not change it (standard: 3 m, optional: 6 m, 9 m, 12 m) ▶ OETIKER EL (T) pincer installed in a mounting fixture float. The floating bearing facilitates the closure process of the ear clamps and low profile clamps. Appropriate devices are available as an option.
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- ✓ Ambient conditions tested.
- ▶ Ensure that the installation site meets the following conditions:
 - Sufficient space for the installation/removal of all components as well as for the operator's work area
 - Necessary connections for pneumatic and electric supply available
 - Good visibility of the display of the Control Unit for the operator
 - The power supply and compressed air supply can be disconnected at any time

5.1.3 Preparing the components for installation

- ✓ Assembly area prepared.
- 1. Remove packaging materials completely. Do not remove transport or sealing covers until immediately before assembly.
- 2. Check components for completeness, correctness and damage. Replace damaged components with original spare parts.
- 3. Ensure that compressed air lines and connections are free of objects.
- 4. Provide compressed air supply or compressor (see *chapter 2.4.4*).
- 5. Provide a compressed air tank, 2 to 5 l tank volume is recommended.
- 6. Read and observe the notes on assembly in the supplier documentation.

5.2 Setting up and connecting the EPC 01

The following figure shows the structure and connection points of the components:

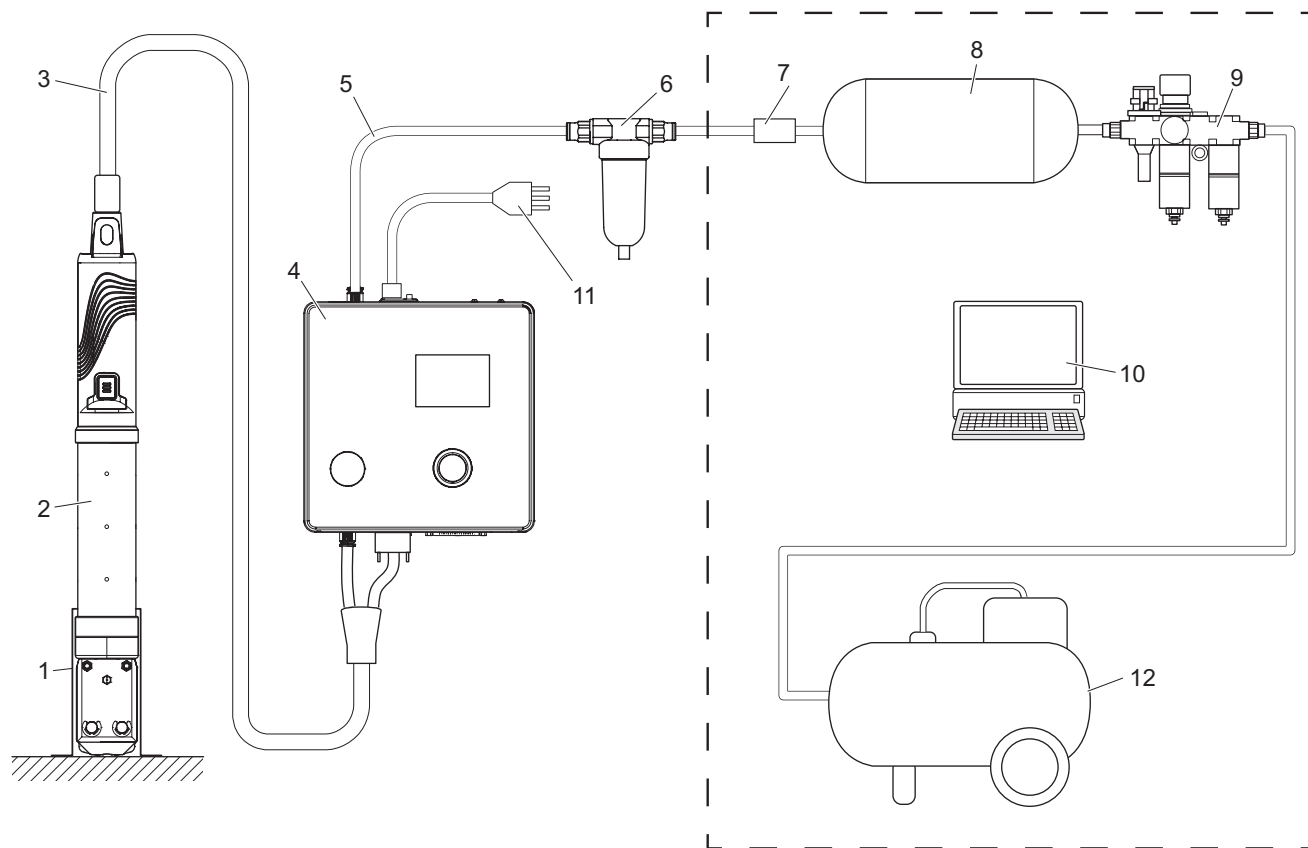


Fig. 16: Setting up and connecting the EPC 01

- | | |
|---|--|
| 1. Pincer holder (recommended, plastic) | 7. Safety shut-off valve |
| 2. Pincer | 8. Compressed air tank |
| 3. Hybrid hose | 9. Maintenance unit / pressure regulator |
| 4. Control Unit | 10. PC |
| 5. Compressed air supply line | 11. Power cable |
| 6. Compressed air filter | 12. Compressor / compressed air supply |


	CAUTION
	Risk of injury from escaping compressed air!
	<p>Incorrect configuration of the components can lead to damage to the operator and/or equipment / system.</p> <ul style="list-style-type: none"> ▶ The system must be capable of being depressurised and vented. ▶ The max. permissible pressure must not be exceeded by the system. Follow the product specification.

- ✓ Setup and connection prepared.
- ✓ Tools / resources prepared:
 - Drilling machine
 - EPC 01 bracket

Control Unit

1. Proceed as follows for wall mounting:
 - Measure the oblong or round holes of the EPC 01 bracket.
 - Drill 4 holes in the wall accordingly.
2. Mount the EPC 01 back plate with four M6 screws.
3. Mount the Control Unit (4) on the back plate and secure it with four grub screws.

Pincer and hybrid hose


	CAUTION
	<p>Damage to the pincer and the hybrid hose due to improper assembly!</p> <ul style="list-style-type: none"> ▶ Do not clamp the pincer at the cylinder tube of the pincer body (only the HO 7000 version can be clamped at the reinforced point at the center of the pincer body). ▶ Do not strike the pincer and do not allow it to be dropped. ▶ Do not lift and transport the pincer using the hybrid hose. ▶ Comply with the maximum permissible bending radius of 50 mm of the hybrid hose; do not bend it to a tighter radius. ▶ After assembly, clamp the pincer in the pincer holder.

4. Using the hybrid hose (3), connect the pincer (2) on the underside of the Control Unit (4):
 - Connect the electrical plug of the hybrid hose to the connector **X1**. Secure the plug-in connection finger-tight with both screws.
 - Connect the pneumatic plug of the hybrid hose to the compressed air outlet **pA**.
5. Mount the pincer holder (1).
6. Secure the pincer (2) in the pincer holder (1) or optionally suspend it from the suspension bracket.

PC and PLC (option)

7. If required, connect the PC (10) or a PLC to the interfaces of the Control Unit (4).

Components of the compressed air supply

	WARNING
	<p>Escaping compressed air!</p> <p>In the event of improper work on the compressed air supply, escaping flows of compressed air can lead to injuries.</p> <ul style="list-style-type: none"> ▶ Allow only qualified personnel to work on the compressed air supply. ▶ Ensure that the compressed air supply is disconnected.

1. Mount the compressed air filter (6):
 - Fasten the mounting bracket of the compressed air filter close to the Control Unit.
 - Mount the compressed air filter suspended on the mounting bracket (the filter insert points downwards).
2. Mount the compressed air tank (8) prior to the compressed air filter (6).
3. Mount the maintenance unit (9) prior to the compressed air tank (8) and connect it to the compressed air tank (8).
4. Mount and connect the safety shut-off valve (7) between the compressed air tank (8) and the compressed air filter (6).
5. Connect the compressed air supply line (5) to the compressed air inlet **pE** on the top of the Control Unit (4).
6. Check all connections for tight fit and tighten them if necessary.
7. Connect the maintenance unit (9) to the compressor / compressed air supply (12) using a suitable hose.

Electrical connection

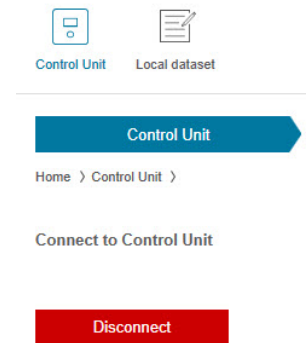
**NOTICE**

- ▶ For the variant with a **low-power equipment plug** ensure the following:
 - Connect the EPC 01 only to power supply systems fitted with a ground fault circuit interrupter / GFCI.
 - Use only the power cord supplied with the device and do not exchange it.
- ▶ For the variant with an **AIDA socket for 24 V supply** ensure the following:
 - Fuse 0.3 A is a slow-blow fuse connected in series
 - Switch-on time of the 24 V DC supply < 10 ms

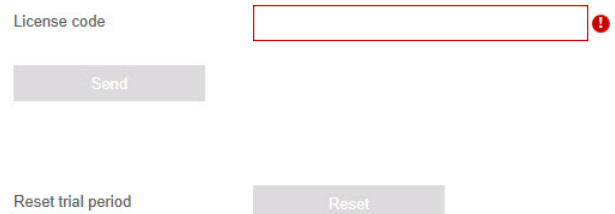
8. For the variant with a **low-power equipment plug** proceed as follows:
 - Connect the power cable (11) to the **low-power equipment plug** of the Control Unit (4).
 - Plug the power cable (11) into the socket.
9. For the variant with an **AIDA socket for 24 V supply** proceed as follows:
 - Connect the **AIDA plug** to the 24 V DC power supply (on the operator side).
 - Connect the **AIDA plug** to the AIDA socket of the Control Unit (4).

5.3 Initial commissioning

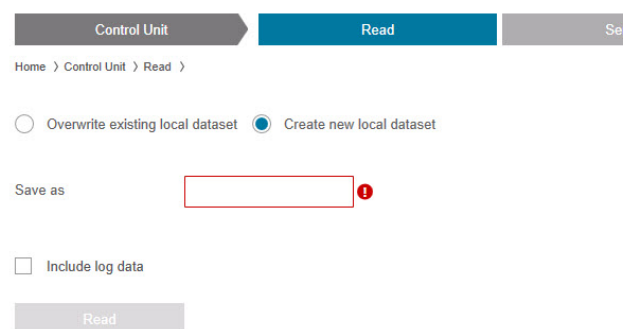
- ✓ EPC 01 set up and connected.
- ✓ Documents supplied with licensing code.
- 1. Start the PC-software on the PC.
- 2. Switch on Control Unit. Acknowledge error, if present.
- 3. Connect PC to an interface of Control Unit (e.g. USB).
- 4. In the PC-software, navigate to menu page **Home > Control Unit > Connect to Control Unit**.
- 5. Select correct interface (e.g. USB).
- 6. Press **Connect** button.
- 7. Log in as Customer Admin.



- 8. Navigate to menu-page **Home > Control Unit > Commands > Control Unit Licensing**.
- 9. Enter the license-code provided with your documentation in the input field.
- 10. Press **Send**.
The transfer is successful when the connection is interrupted and the connection view is displayed.
- 11. Reconnect Control Unit to PC-software.



- 12. Navigate to menu-page **Home > Control Unit > Read**
- 13. Select **Create new local data set**.
- 14. Enter a name for the data set in the input field.
- 15. Press **Read**.
- 16. Configure database with desired settings and send to Control Unit.



6 Working with the EPC 01

6.1 Preparatory activities

Ensure prior to the start of each shift, that the EPC 01 is ready for proper use.



WARNING

Risk of injury from escaping compressed air!

- ▶ Do not use pincer above the maximum permissible inlet pressure (see chapter 2.4.4).

1. Ensure that the EPC 01 is properly assembled and connected (see chapter 5).
2. Ensure that the PC software is installed on the connected PC (see chapter 8).
3. Check the vent holes on the pincer body:
 - Clean any vent holes that are clogged.
 - Make sure that any mounted devices / brackets do not cover the vent holes.
4. Switch on the compressed air supply / compressor and ensure that sufficient inlet pressure is applied to the EPC 01 (see chapter 2.4.4).

6.2 Switching the EPC 01 on and off

6.2.1 Switching the EPC 01 on

✓ Preparatory activities carried out (see chapter 6.1).

1. Ensure that the power supply is switched on at the workstation.
2. On the Control Unit, switch the **On/Off switch** on.
3. For the 24 V DC variant, switch on the EPC 01 at the separate voltage supply (detailed information on this see chapter 13.2).

After the power is switched on, a system check is performed:

- After an error-free system test, the function selection appears in the display; The EPC 01 is now ready for operation.
- In the event of an error, an error message appears in the display. The error must be rectified (see chapter 11).

6.2.2 Switching the EPC 01 off

1. On the Control Unit, switch the **On/Off switch** on.
2. At the end of the shift (optional):
 - Switching off the compressed air supply / compressor.
 - Release system pressure.

6.3 Proceed with the closing functions



NOTICE

In order to ensure a consistent and reproducible quality of the working process, the pincer test must be performed before the start of the shift, but in any case at least once a day. A pincer test is also required if components of the pincer have been changed.

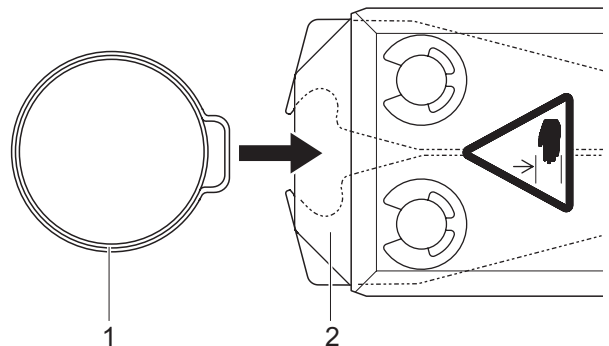
After the mandatory pincer test, OETIKER recommends the closure force should be checked using the CAL 01.

✓ EPC 01 switched on.

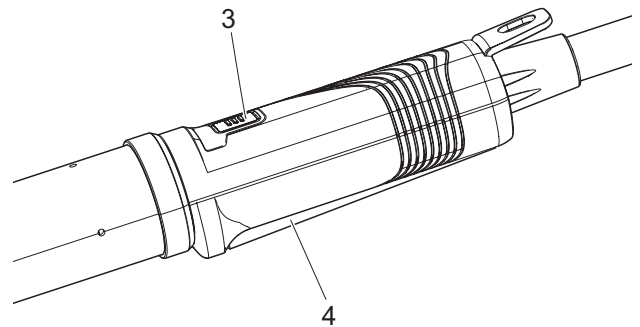
1. Ensure that the correct closure data for the application is on the Control Unit.
2. Select the intended APN for the application.
3. Proceed with the pincer test (see *chapter 4.4*).
4. Insert one ear of each OETIKER ear clamp (1) into the clamping area on the pincer head (2).

For low profile clamps:

5. Position the pincer jaws on the closure hooks of the low profile clamp.

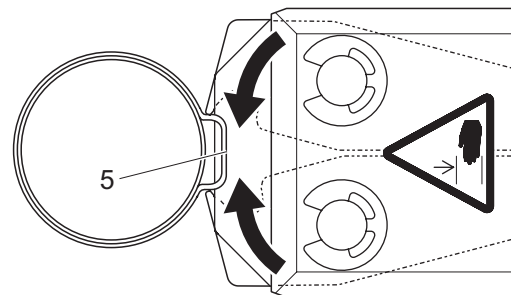


6. Trigger closure:
 - Press and hold the safety lever (4).
 - Press the START key (3).



The crimping process is triggered and the ear (5) in the ear clamp is closed.

- The pincer jaws crimp the ear, using the preset force.
- When using low profile clamps, the preset value is used so that the low profile clamp is hooked in.



After the preset parameter values have been reached, the pincer jaws on the pincer head are opened.

7. After crimping, release the safety lever per closure, but can be held up to a maximum of 20 closures.

6.4 EPC 01 feedback

The feedback of the system can be read out via the following channels (OK/NOK).

- When the button **START** on the Trigger Unit or the LED above the rotary pushbutton on the Control Unit
 - Continuous green signal: System is OK
 - Blinking red signal: Error (for exact error identification check Error message-number on display of the Control Unit *see chapter 11*)
- Via the interfaces, depending on the configuration of the PC software (*see chapter 8.6.7*).

6.5 Changing the pincer


	WARNING
	<p>Risk of injury from escaping compressed air!</p> <p>► When changing the pincer, switch off the Control Unit.</p>

1. Switch the Control Unit off.
2. Vent the Control Unit.
3. Disassemble the pincer:
 - Disconnect the pneumatic plug of the hybrid hose from the compressed air outlet **pA**.
 - Disconnect the electrical plug of the hybrid hose from the connection **X1**.
 - Remove the pincer.
4. Mount the new pincer:
 - Connect the electrical plug of the hybrid hose to the connector **X1**. Secure the plug-in connection finger-tight with both screws.
 - Connect the pneumatic plug of the hybrid hose to the compressed air outlet **pA**.
5. Switch on the Control Unit.
6. Proceed with the pincer test (*see chapter 4.4*).

6.6 Set EPC 01 out of operation

If the EPC 01 is not going to be used for an extended period of time it must be taken out of operation and then stored.

- ✓ EPC 01 switched off.
1. Disconnect the EPC 01 from the compressed air and voltage supply.
 2. Depressurize the EPC 01.
 3. Disconnect the cables and hose connections.
 4. Remove the components.
 5. Storing the EPC 01 (*see chapter 11.2*).

	NOTICE
	<p>When the EPC 01 is put back into operation having been taken out of operation, the activities must be carried out as for a new purchase (<i>see chapter 5</i>).</p>

7 EPC 01 menu

7.1 User level


The access rights for the settings and functions in the menu depend on the user level. A role description of the personnel can be found in the personnel qualification (see chapter 2.9).

7.2 Display and operating elements



Fig. 17: Display and operating elements on the Control Unit

Item	Element	Designation	Description / Function
1	–	Display	Show menu.
2		Rotary pushbutton	Press to trigger an action.
			Turn the rotary pushbutton counterclockwise or clockwise to navigate in the menu.
–		Selection	Confirm the selection.
–		Cancel	Cancel action.
–		Back	Navigate back to the previous menu page.
–		Settings	Call up the menu settings.
–		Language	Set the language of the menu.
–		Information	View information.
–		Nominal force	Enter values of the nominal force from CAL 01.

Item	Element	Designation	Description / Function
–		Pincer test	Proceed with the pincer test.
–	–	START key (pincer)	Release the pincer. Press the safety lever and keep it pressed.

7.3 Menu structure

7.3.1 Overview

The start menu appears when the EPC 01 is switched on. Starting from the start menu, the rotary pushbutton can be used to navigate to the next menu level.

For the complete structure, refer to the graphical menu structure (see *chapter 7.3.2*).

Start menu	Menu	Sub-menu	Functions / Description
Function selection	APN	Current APN	APN selection
	Pincer test	Start	Friction test
	System	Languages	<ul style="list-style-type: none"> • English • German • French • Spanish • Chinese • Japanese
		System Info	<ul style="list-style-type: none"> • Firmware Version • Build Date
		Hardware Info	<ul style="list-style-type: none"> • Input pressure • Supply voltage • Temperature • Log memory • Trigger Unit • Industrial network module • Version • Date
		Network settings	<ul style="list-style-type: none"> • IP settings

7.3.2 Structure

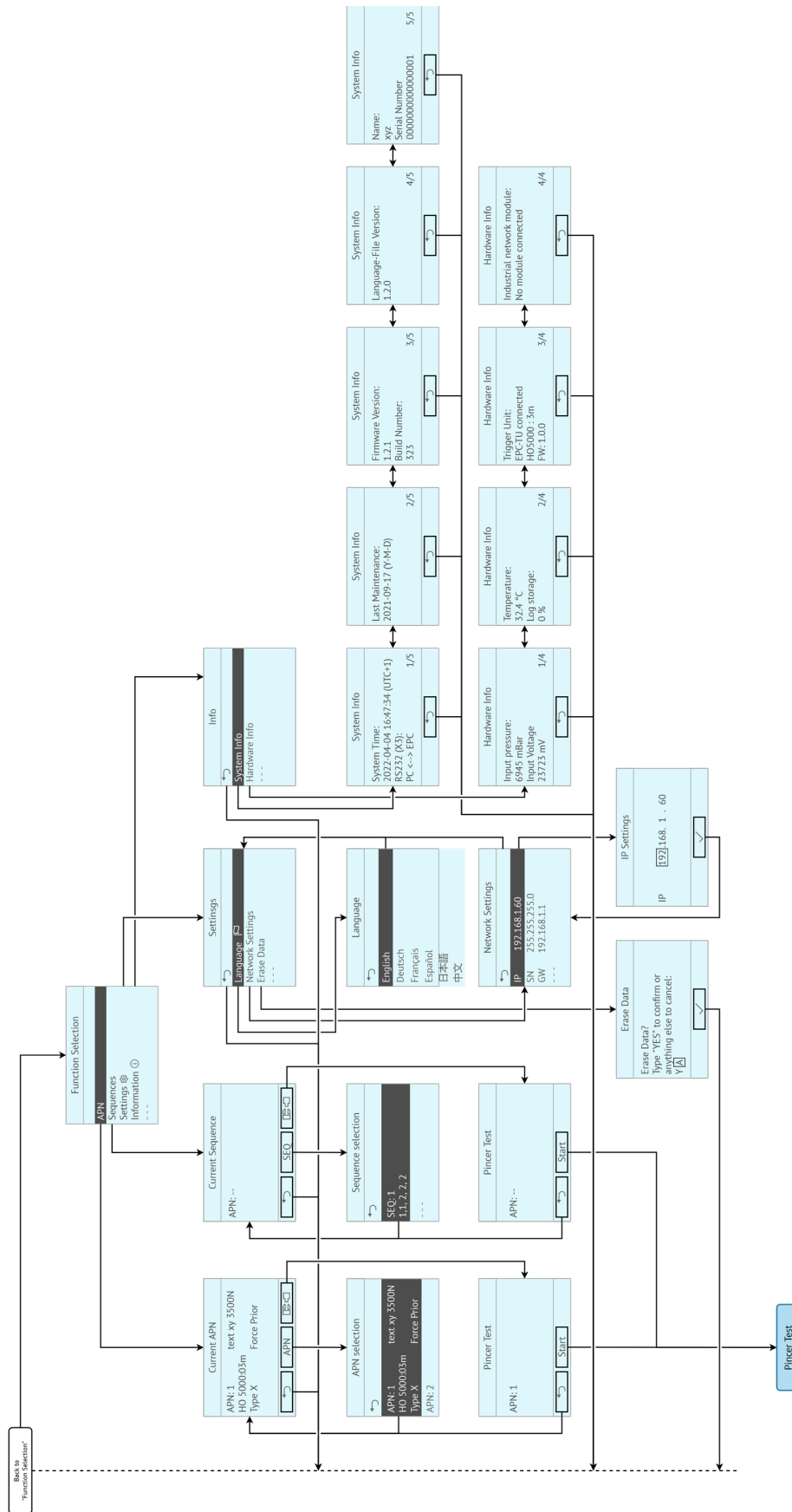


Fig. 18: Structure of the menu

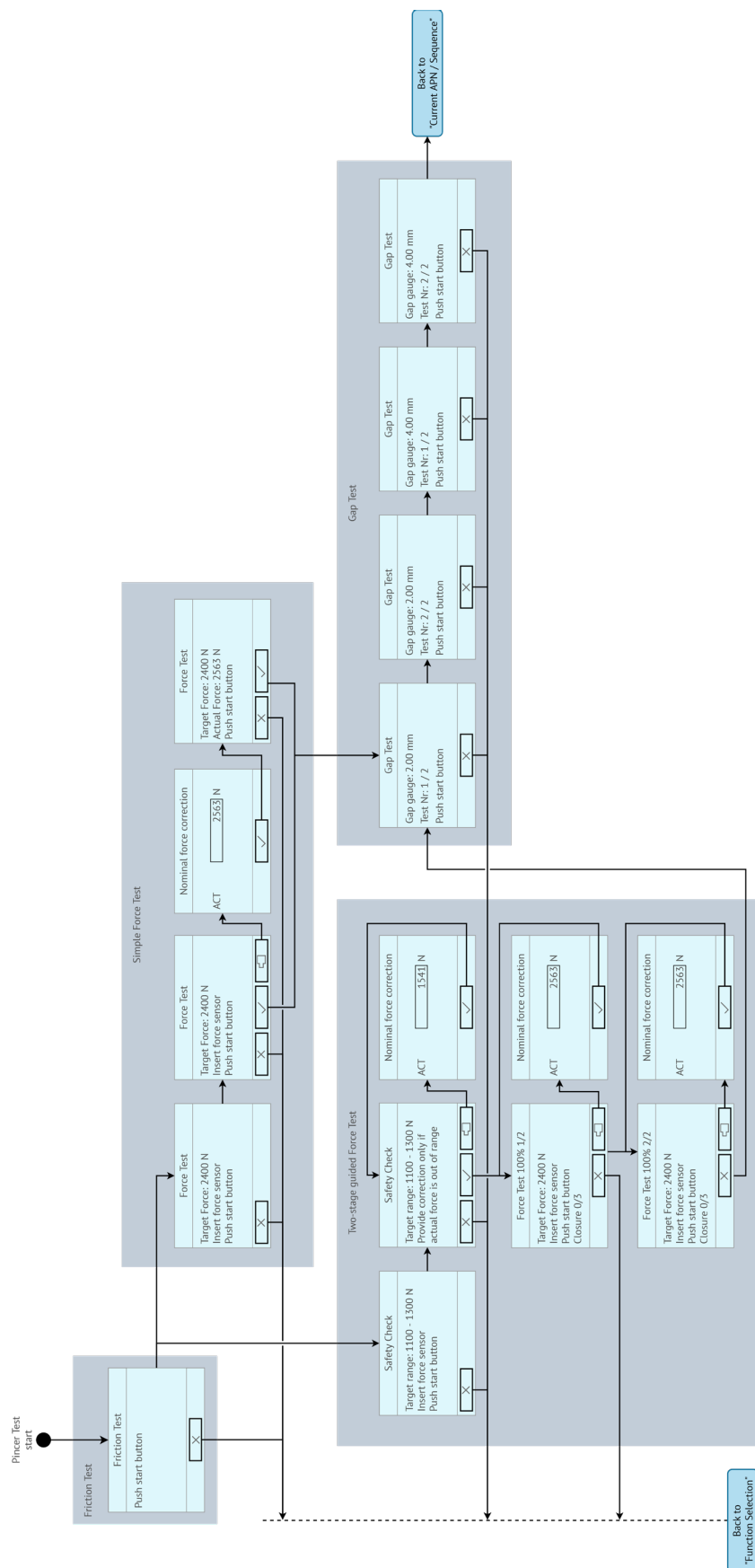


Fig. 19: Structure of the menu (here: Pincer Test)

8 PC-Software

8.1 Basic matters

The PC software has the following basic tasks and functions:

- Manage the databases. The data for the Control Unit are stored in the databases (DB). Multiple databases can be stored and edited on the PC. When sending/reading data sets, the entire databases are transferred.
- Read and edit datasets. During operation, log data are stored and data are updated (e.g. pincer test). The data can be read out and edited. Processed data can then be sent back to the Control Unit. If data sets are sent directly to the Control Unit (without first reading the records), the log memory and the data from the pincer test are overwritten.
- Configuring and setting the EPC 01.

8.2 Installation

8.2.1 System requirements

1. Check the minimum requirements of the PC in the following table:

Parameter	Value / Description
Graphics	Minimum screen resolution 1920x1080
Working memory	8 GB
Hard disk space	2 GB free disk space
Operating system	Windows 10 (64 Bit) or Windows 11 Professional
Connections	USB, Ethernet

8.2.2 Installing the PC software and USB driver

The PC software can be downloaded from www.oetiker.com --> **Downloads** --> **Software**

- ✓ System requirements checked.
- ✓ User has all administrator rights of the PC.
- ▶ Start the installer-programm and follow the instructions on the screen.
The installation process starts.
Once the software installation is complete, an Explorer-window listing available USB-drives will open automatically.
- ▶ If updating the firmware of the EPC 01 is desired, the appropriate driver must be selected and installed. For 64-bit systems, execute the driver **dpinst_amd64.exe** and install it (see hint after the installation of the PC software).

8.3 Structure and elements of the PC software

The following figure shows the structure of the home page with its basic software elements:

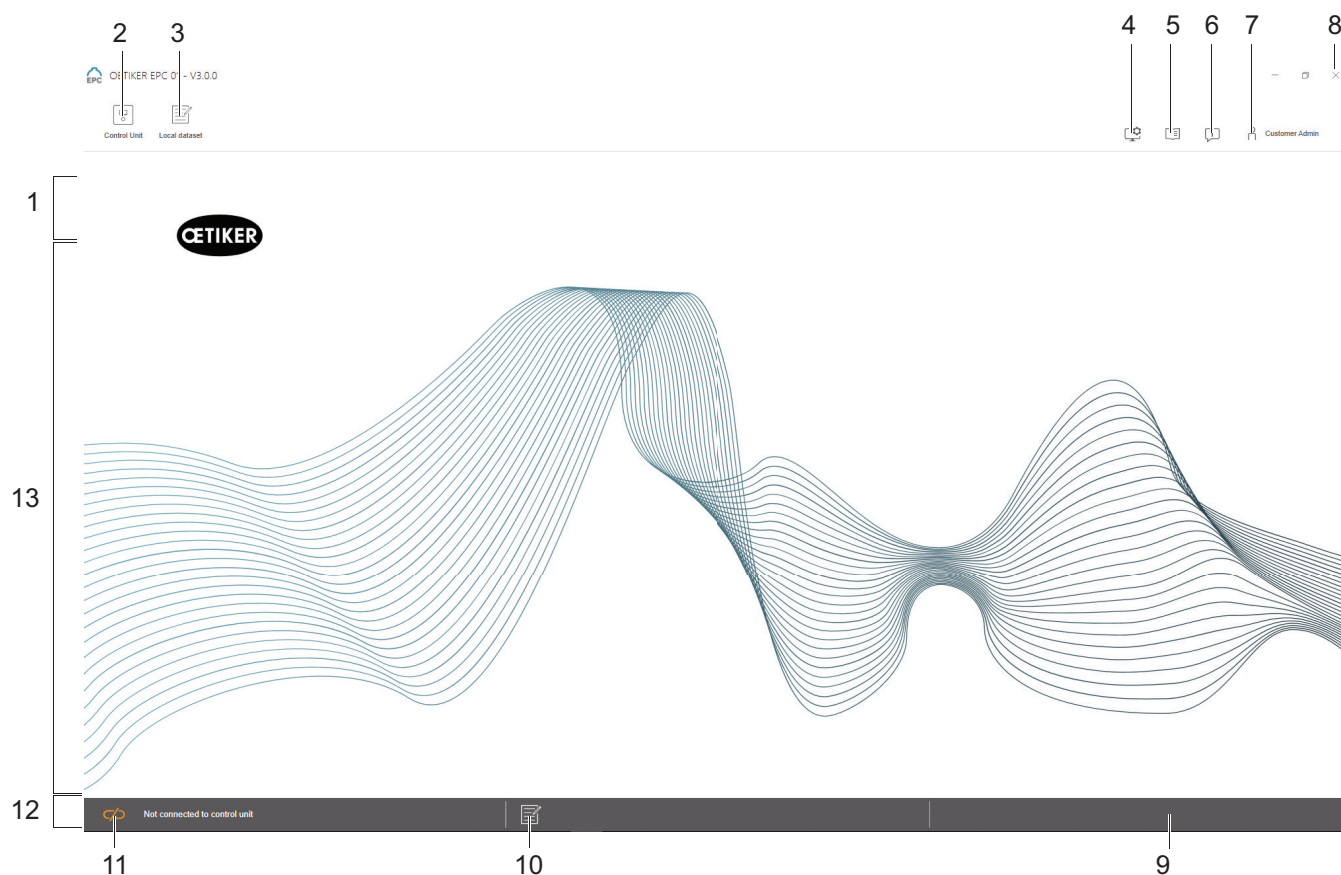


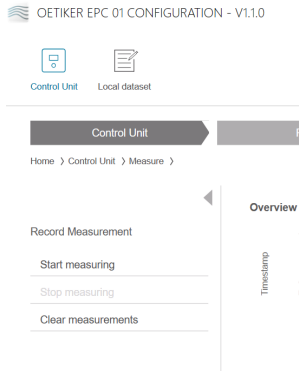


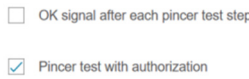

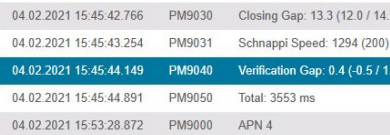


Fig. 20: Structure of the PC software (here: start page)

Item	Element	Designation	Description / Function
1	–	Menu bar	Allows, among other things, the Control Unit , Local dataset and Settings menus to be called up.
2		Control Unit	Calls up the Control Unit menu.
3		Local dataset	Call up the Local dataset menu.
4		Settings	Calls up the Settings of the PC software, including the following: <ul style="list-style-type: none"> • Converting the force display from Newton to pounds. • Configure TCP/IP address. Here, a list of Control Units can be created so that the connection between the computer and Control Unit can be easily selected. The set IP address cannot be sent to the Control Unit. • Roles configuration • Software language setting
5		Instruction manual	Opens the instruction manual.
6		About	View information about software and OETIKER.
7		Log In	<ul style="list-style-type: none"> • User login and logout. • Password for user role «Line Responsible»: Easy! • Password for user role «Customer Admin»: Not_EazY • Customer Admin Password can be changed under settings --> roles configuration

Item	Element	Designation	Description / Function
8	x	Exit	Exit PC software.
9	–	Feedback	Displays feedback from the PC software.
10		Help text	Call help text of the currently opened file.
11		Connection status	Displays the connection status to the Control Unit. <ul style="list-style-type: none"> Symbol orange (open): PC software not connected Symbol green (closed): PC software connected
12	–	Status bar	Displays, among other things, the connection status to the Control Unit and feedback messages from the PC software.
13	–	Menu page	The menu page changes depending on the selection in the menu bar. The specific software items and parameters for operation appear on each menu page.

On the different pages of the PC software there are specific software elements and parameters and they have the following meaning:

Element (example)	Naming	Description / Function
	Function bar	The function bar is displayed on the left side of the software interface and is not present on every menu page or sub-menu page (example here: Record measurement). Depending on the menu, the toolbar contains specific dialog elements for editing as well as navigating the page contents.
	Increase or decrease the value	<ul style="list-style-type: none"> Press the + button to increase the value Press the - button to decrease the value
	Input field	Enter characters or values (example here: EPC 01).
	Check box	<ul style="list-style-type: none"> Check the box to select the function. Remove the check mark to deselect the function.
	Drop-Down menu	Select value from a drop-down menu.
	Edit list entry	Select list entry for editing. <ul style="list-style-type: none"> Blue coloration: List entry selected. The list entry can be edited e.g. with the dialog elements from the function list. White/Gray coloration: List entry not selected or not selectable.

8.4 Basic operation

8.4.1 Start PC software

- ✓ Monitor and PC are switched on.
- ✓ Operating system is started.
- On the desktop, click the shortcut to the PC software.
The PC software is started and the start page appears.

8.4.2 Exit PC software

- In the title bar of the PC software, press the **x** button.

8.4.3 Customize the roles configuration

Navigation: **Home > Settings**

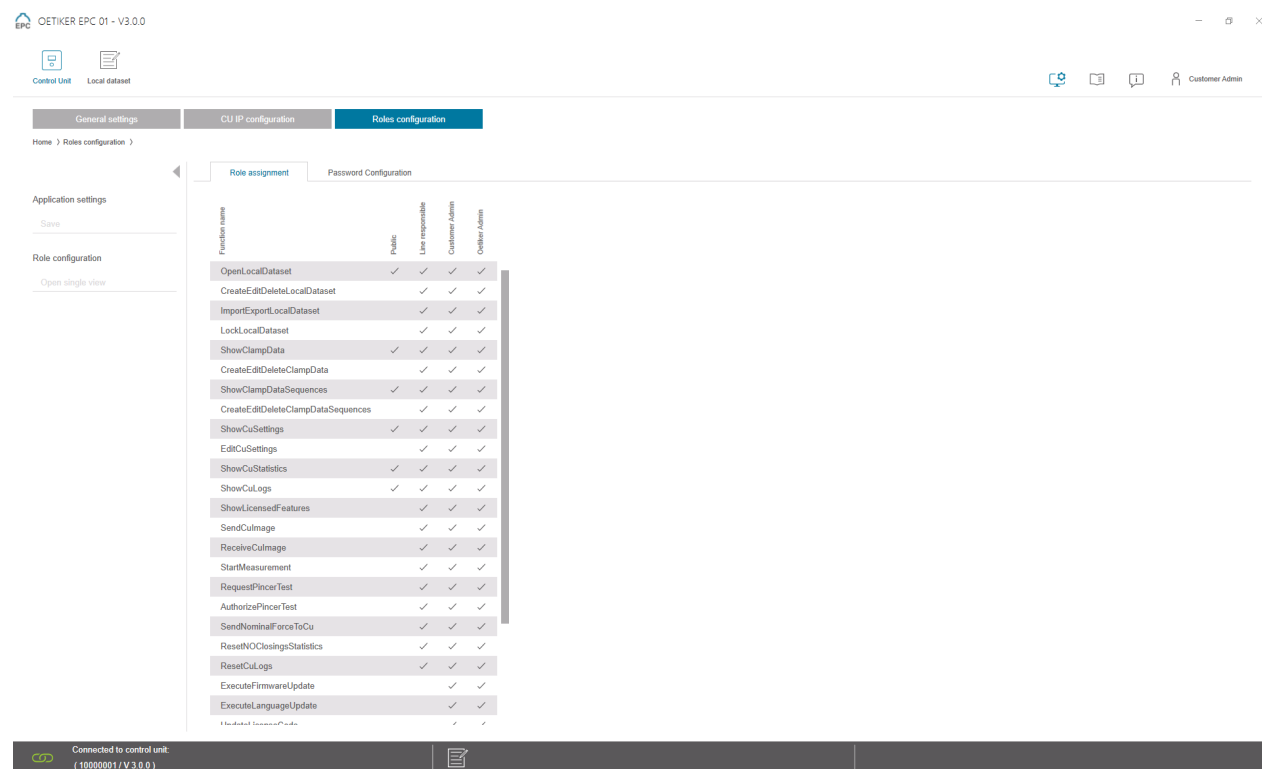


Fig. 21: Roles configuration

On this configuration page, each authorization can be customized based on the specific roles (users).

8.5 Menu Control Unit

Navigation: **Home > Control Unit**

8.5.1 Overview of the menu structure

Menu page	Sub-menu page
Control Unit	Connect to Control Unit
Read	–
Send	–
Measure	Start measuring
	Stop measuring
	Clear measurements
Pincer test	Request pincer test
	Nominal force input
	Authorize pincer test
Commands	Reset the Control Unit
	Update firmware
	Update firmware language
	Control Unit license

8.5.2 Connecting to the Control Unit

Navigation: **Home > Control Unit > Connect to Control Unit**

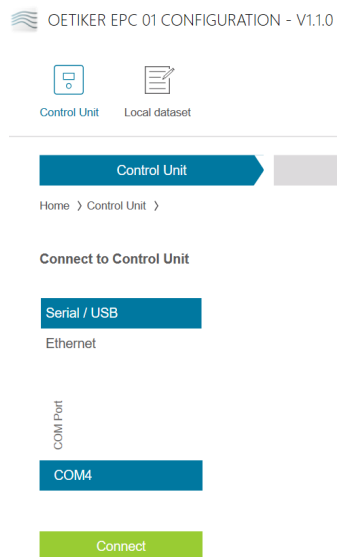


Fig. 22: Menu Connect to Control Unit

The Control Unit is connected to the PC using the **Connect to Control Unit** menu page. To establish the connection, first select the interface to the Control Unit: **Ethernet** or **Serial (RS232) / USB**. The interface is then selected in the software **COM Port** range. The connection is established by pressing the **Connect** button.

8.5.3 Read data set

Navigation: **Home > Control Unit > Read**

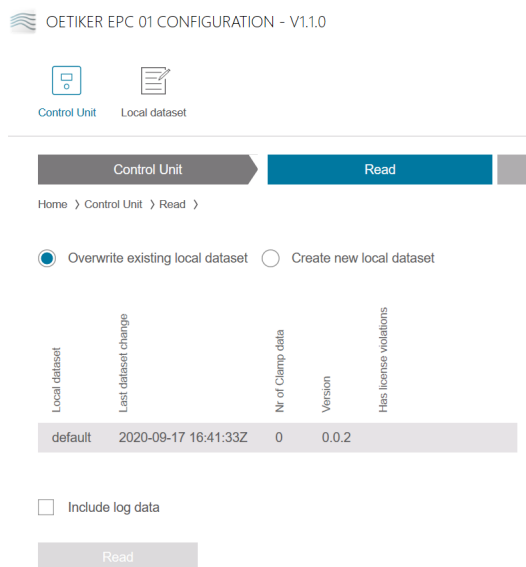


Fig. 23: Read menu

On the **Read** menu page, data from the Control Unit are read into the PC software. Either the data are read in as a new dataset or an existing dataset is overwritten in the process. The reading in is done by pressing the **Read** button.

The log file of the Control Unit can also be read in (see *chapter 8.6.9*). by selecting the **Include log data** function. This is necessary, for example, in the event that support is being provided.

8.5.4 Sending the data set

Navigation: **Home > Control Unit > Send**

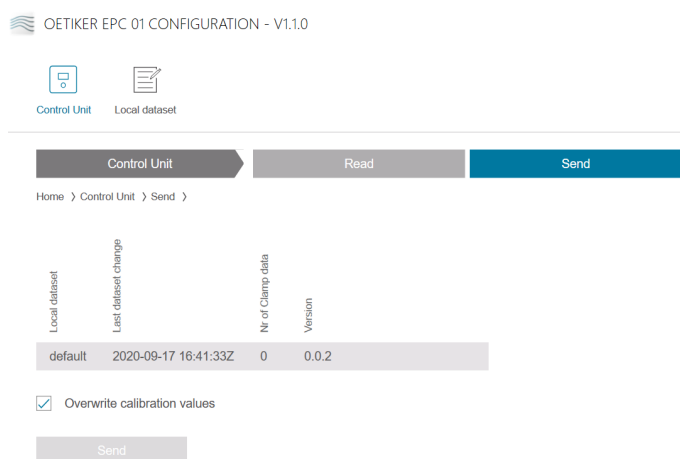


Fig. 24: Send menu

On the **Send** menu page, a newly created or edited dataset is sent to the Control Unit.

The Control Unit determines specific values for each pincer test. When the **Overwrite calibration values** function is performed, the defined values of the pincer test are overwritten with default values. The pincer must be recalibrated after the data have been sent.

For minor editing operations (e.g. closure force or tolerances), sending the calibration values is optional.

8.5.5 Measure

Navigation: **Home > Control Unit > Measure**

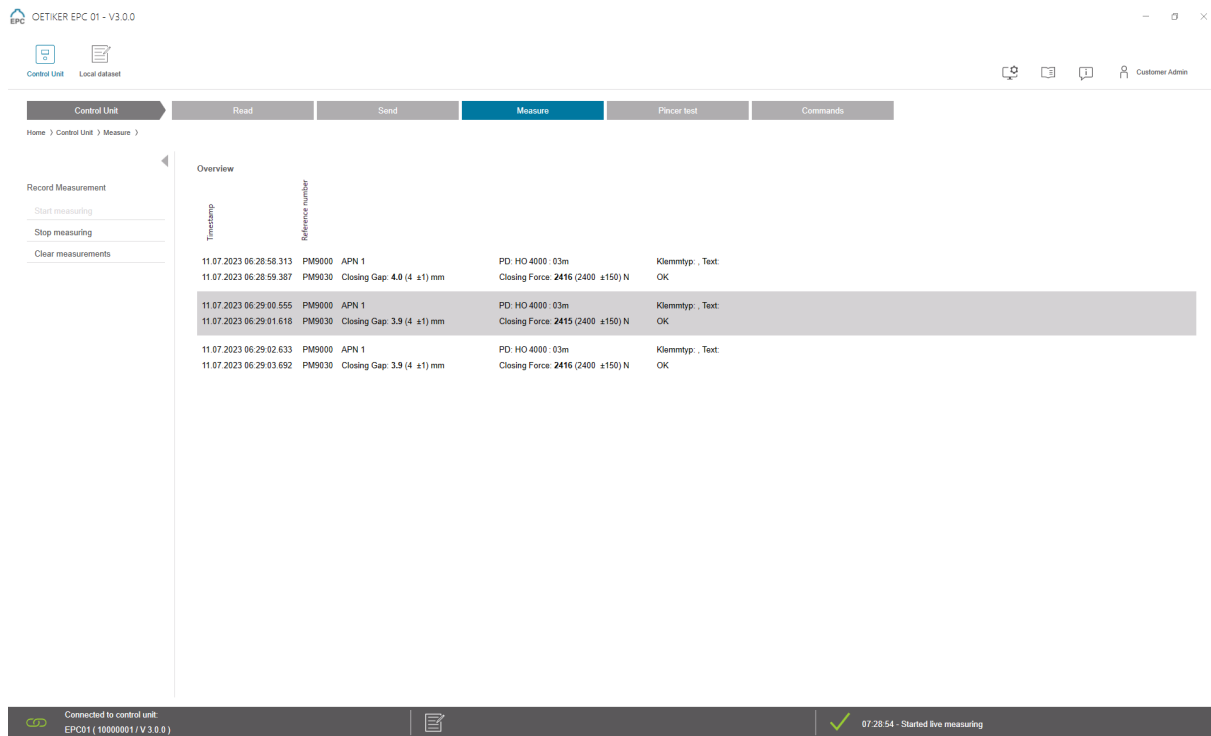


Fig. 25: Measure menu

On the **Measure** menu page, all log entries relevant for closure are displayed as an overview. This is required for the validation phase.

Measurements can be started or stopped. Existing entries can be erased.

The log entry selected as an example in the figure has the following meaning:

Verification Gap: 0.4 (-0.5 / 1.0 / 2.5) mm

Verification Force: 243 (150 / 250 / 350) N

Log message	Meaning	Log message	Meaning
Verification gap	Verification gap	Verification Force	Verification force
0.4	Actual value [mm]	243	Actual value [N]
-0.5	Lower tolerance [mm]	150	Lower tolerance [N]
1.0	Set point [mm]	250	Target value [N]
2.5	Upper tolerance [mm]	350	Upper tolerance [N]

8.5.6 Pincer test

Navigation: **Home > Control Unit > Pincer Test**

OETIKER EPC 01 - V3.0.0

Control Unit
 Local dataset

Control Unit

Read

Send

Measure

Pincer test

Home > Control Unit > Pincer test >

Request pincer test

Request

Nominal force input

+

-

1

Transmit

Authorize pincer test

Authorize

Deny

Fig. 26: Pincer test menu

On the **Pincer Test** menu page, the pincer test is requested by pressing the **Request** button. Work with the pincer must be interrupted in order to perform the pincer test.

If CAL 01 is used for the pincer test, the nominal force determined there can be entered in the **Nominal force input** field. Pressing the **Transmit** button sends the value to the Control Unit. If this is a repetition of the nominal force measurement, the new value can be sent to the Control Unit.

The pincer test can be **authorized** or **denied**. Authorization is available only if the **Authorize the pincer test** option is selected in the local dataset (see section «Edit pincer test settings» on page 62).

	NOTICE
	Detailed information on the procedure of the pincer test and the description of the action steps are given in <i>chapter 4.4</i> described.

8.5.7 Execute commands

Navigation: **Home > Control Unit > Commands**

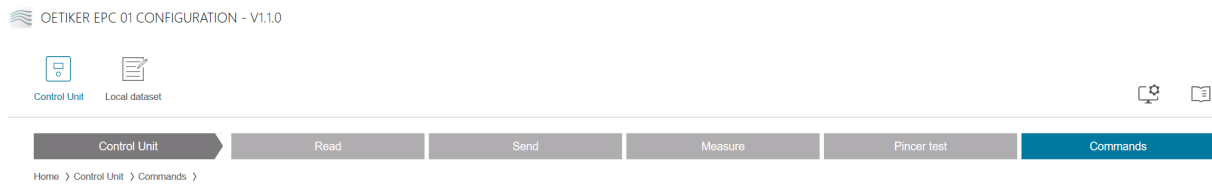


Fig. 27: Commands menu

On the **Commands** menu page, the following commands can be executed in the corresponding sub-menus:

- Deleting a log file
- Updating firmware
- Update firmware language
- Enter the license key

Deleting a log file

Navigation: **Home > Control Unit > Commands > Reset statistics and log data**



Fig. 28: Reset Control Unit sub-menu

On the **Reset statistics and log data** sub-menu page the log file is deleted by pressing the **Reset** button.

Update the firmware

Navigation: **Home > Control Unit > Commands > Update Firmware**

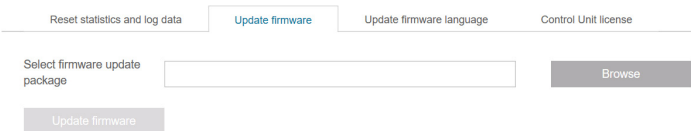


Fig. 29: Update Firmware sub-menu

On the **Update firmware** sub-menu page the firmware of the Control Unit is updated.

To be able to update the firmware, the following requirements must be met:

- ✓ The Control Unit is connected to the PC via the USB port. The other ports cannot be used for this purpose.
- ✓ The USB driver must be installed. (see section «8.2.2 Installing the PC software and USB driver» on page 41).
- ▶ Pressing the **Browse** button selects the firmware update file.
- ▶ After selecting the correct file, the update is started by pressing the **Update firmware** button.

Updating the firmware language

Navigation: **Home > Control Unit > Commands > Update firmware Language**

Fig. 30: Update firmware language sub-menu

On the **Update Firmware Language** sub-menu page, the firmware languages are updated. By pressing the **Browse** button, the folder containing the firmware language files is selected.

Fig. 31: Update firmware language sub-menu, after folder selection

After selecting the correct folder, the customer-specific language can be set by using the drop-down menu, if desired. Once selected, the update is started by pressing the **Update firmware language** button.

Entering the license key

Navigation: **Home > Control Unit > Commands > Control Unit license**

Fig. 32: Control Unit license sub-menu

On the **Control Unit license** sub-menu page the license key is entered to unlock extended functions. Pressing the **Send** button sends the license key to the Control Unit for processing.

8.6 Local dataset menu

Navigation: **Home > Local dataset**

The **Local dataset** menu allows both the closure data and the settings of the Control Unit to be managed. These can also be exported or imported as a complete package.

8.6.1 Overview of the menu structure

Menu page	Sub-menu page	Functions
Local dataset	Local dataset	<ul style="list-style-type: none"> • Open • New from existing • Delete • Rename • Lock • Unlock
	Import	<ul style="list-style-type: none"> • Import data set
	Export	<ul style="list-style-type: none"> • Exporting the data set
Clamp data	Dataset	<ul style="list-style-type: none"> • Save • Send to Control Unit
	Clamp data	<ul style="list-style-type: none"> • Open single view • New • New from existing • Delete
Sequence	Dataset	<ul style="list-style-type: none"> • Save • Send to Control Unit
	Clamp data Sequence	<ul style="list-style-type: none"> • Open single view • New • New from existing • Delete
Settings Control Unit	General	–
	Closing	–
	Closing feedback	–
	Pincer test	–
	Compatibility mode	–
Statistic	General	–
	Closures	Reset closings divisions
	Pincer test	–
Log data	Export measurements	–
Licensed features	–	–

8.6.2 Edit local dataset

Navigation: **Home > Local dataset > Local dataset**

The screenshot displays the 'Local dataset' sub-menu in the OETIKER EPC 01 - V3.0.0 software. The interface is divided into several sections:

- Top Navigation:** Includes 'Control Unit' and 'Local dataset' tabs. The 'Local dataset' tab is selected.
- Left Sidebar:** Contains a 'Dataset' section with buttons for 'Open', 'New from existing', 'Delete', 'Rename', 'Lock', and 'Unlock'.
- Main Content Area:**
 - Local dataset:** A table showing a list of datasets. The first entry is 'LogDb_PreTest3_0' with a 'Last dataset change' of '10.07.2023 09:28:58'.
 - Import/Export:** Buttons for 'Import' and 'Export' are visible.
- Right Panel:** A detailed view of the selected dataset 'LogDb_PreTest3_0, Version 1.0.1'. It includes:
 - Settings Control Unit:** Name: Test, Language: English, Start: Start button.
 - Log data:** Total: 9190.
 - APN:** A table with columns 'Nr', 'Description', and 'Clamp type'. It lists three APNs: 1 (Test, Spalllehre), 2 (Hold Closing Verification, xxx), and 3 (1, 1, 2). Total: 7.
 - Sequence:** A table with columns 'Nr' and 'APNs'. It lists two sequences: 2 (1, 2, 1) and 3 (1, 1, 2). Total: 2.
 - Statistic:** Nr of closings Control Unit: 151.
 - License feature with violations:** A list of features with checkboxes indicating their status. The 'Safety lever override' feature is highlighted with a red box and has a checkmark.

At the bottom of the interface, a status bar indicates 'Connected to control unit: (10000001 / V 3.0.0)'.

Fig. 33: Local dataset sub-menu

Local datasets are edited using the **Local dataset** sub-menu page. To do this, select the dataset from the list and then open it for editing with the **Open** button.

Datasets can be duplicated, deleted, renamed, locked or unlocked as needed. Locking prevents accidental deletion or renaming of the dataset.

8.6.3 Importing the local dataset

Navigation: **Home > Local dataset > Import**

The screenshot shows the 'Local Dataset' section of the software. The 'Import' sub-menu is active, displaying options for source and destination datasets, a table of existing local datasets, and checkboxes for import options.

Source dataset

Select dataset to import: **Browse**

Destination dataset

☒ Overwrite existing local dataset ☐ Create new local dataset

Local dataset	Version	Nr of Clamp data
ClampDataChanged_20230717	1.0.1	0
July_2023	1.0.1	3
ModifiedCuSettings	1.0.1	3

Import

☐ Clamp data sequences ☐ CU settings

☐ Clamp data ☐ Log data

☐ Process data ☐ Statistics

Import

Fig. 34: Import sub-menu

Local datasets are imported, e.g. even from an external device, using the **Import** sub-menu page. The dataset file is selected via the **Browse** button.

After the correct file has been selected, the type of saving is chosen:

- **Overwrite existing local dataset**
- **Create new local dataset**

The import of the dataset file is executed by pressing the **Import** button.

8.6.4 Exporting the local dataset

Navigation: **Home > Local dataset > Export**

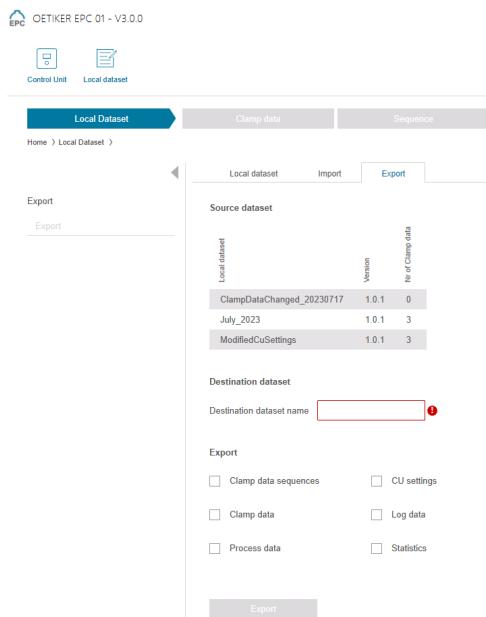


Fig. 35: *Export sub-menu*

In order to import the file e.g. to another PC, the local datasets are exported using the **Export** sub-menu page.

The desired dataset is selected in the list and named in the **Destination dataset name** field. Subsequently, the scope of the dataset is selected and exported by pressing the **Export** button. This automatically opens the storage location in the folder system. From there the file can then be copied and moved to another location, e.g. using drag and drop.

8.6.5 Editing the clamping dataset

Navigation: **Home > Local dataset > Clamp data**

Overview

ID	Description	Clamp type	Pinch type	Clamping mode	Open clasp	Open gap	Open clasp Tol	Open clasp Delay Time	Hold	Detect	Hold clasp	Hold clasp Tol	Hold Force	Hold Force Tol	Detect clasp	Detect Force	Contact Detection	Strip Detection Speed Threshold	Contact Force	Clamping Gap	Clamping Gap Tol	Clamping Gap Tol
1	Test	Spathebra	HO 4000 - Ø3m	FORCE_PRIOR	13.2	4.0	200.0		12.0	4.0	300	150	3.5	300	300	400	4.0	1.0	1.0			
2	Hold Closing Verification	xxx	HO 4000 - Ø3m	FORCE_PRIOR	13.2	4.0	200.0	✓	7.2	2.0	300	150	3.5	300	300	400	7.3	1.0	1.0			
3			HO 10000 - Ø3m	FORCE_PRIOR	22.0	4.0	350.0		18.0	4.0	500	150	4.7	700	300	1000	3.0	1.2	1.2			
4	Detect	xxx	HO 4000 - Ø3m	FORCE_PRIOR	13.2	4.0	200.0		8.4	2.0	300	150	8.4	300	300	400	7.2	1.5	2.0			
5	Contact	xxx	HO 4000 - Ø3m	FORCE_PRIOR	13.2	4.0	200.0		2.5	2.0	300	150	3.5	300	✓	300	400	7.2	2.0	2.2		
12			HO 4000 - Ø3m - PG168 T1-RT13	FORCE_PRIOR	28.0	4.0	200.0		13.0	4.0	200	150	10.5	300	80	400	7.4	1.0	1.0			
550	Test LoHi Byte		HO 5000 - Ø3m	FORCE_PRIOR	13.7	4.0	250.0		12.0	4.0	500	150	4.3	500	300	600	2.6	1.2	1.2			

Connected to control unit:
(10000000 / V 3.0.0)

Logfile: ProTest3_0

Fig. 36: Clamp data sub-menu

Oetiker offers various low profile clamps and ear clamps which are often specifically adapted to the application. For an optimal closure, the EPC 01 system should be correctly configured. This configuration is parameterized for the corresponding application in the closing data.

All clamping dataset are displayed as an overview on the **Clamp data** sub-menu page.

The clamping dataset to be edited is selected here and is then, depending on requirements, **opened**, **newly created**, **duplicated** or **deleted**.

Clamping data single view

Navigation: **Home > Local dataset > Clamping data > Clamp data single view**

OETIKER EPC 01 CONFIGURATION - V1.1.0

Control Unit Local dataset

Local Dataset Clamp data Sequence Settings control unit Statistic Log data

Home > Local Dataset > Clamp data > Clamp data single view >

Dataset

Save

Send to control unit

Clamp data

Back to overview

Single view

APN

Description

Pincer Type

Clamp Type

Closing mode

☐ Open Gap

Open Gap mm

Open Gap Tol. mm

Open Gap Delay Time ms

☒ Inactive ☐ Hold ☐ Detect

☐ Contact Detection

Contact Force N

Fig. 37: Clamp data single view sub-menu

Once the **Clamp data single view** has been opened, the closure dataset is edited as required.
In the individual view, additional options such as hold, verify or detect can be selected and parameterized.

NOTICE

Detailed information of the options is described in *chapter 4.3*.

8.6.6 Edit sequence

Navigation: **Home > Local dataset > Sequence**

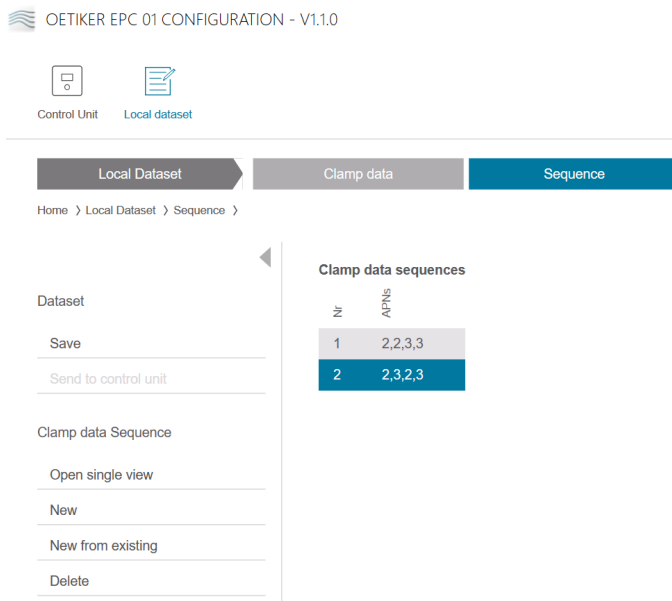


Fig. 38: Sequence sub-menu

A sequence is a series of two or more APNs. The sequence can be used when several bindings are required to complete a unit. The sequence can be used to provide easy verification as to whether all closures have been completed. To create a sequence, the corresponding APNs must first be created.

On the **Sequence** sub-menu page, all sequences are displayed as an overview.

The sequence to be edited is selected here, and then, depending on the requirements, selected as follows **opened, newly created, duplicated** or **deleted**.

In a sequence, different APNs can follow one another. This prevents frequent APN changes at the Control Unit.

Clamping data sequence single view

OETIKER EPC 01 - V3.0.0

Control Unit Local dataset

Local Dataset Clamp data Sequence Settings control unit Statistic Log data Licensed features

Home > Local Dataset > Sequence > Clamp data sequence single view >

Application settings

Save

Send to control unit

Clamp data Sequence

Back to overview

Single view

Sequence Nr + - 2

1. closure	1 (HO 4000: 03m - Test)	16. closure	
2. closure	2 (HO 4000: 03m - Hold Closing Verification)	17. closure	
3. closure	1 (HO 4000: 03m - Test)	18. closure	
4. closure		19. closure	
5. closure		20. closure	
6. closure		21. closure	
7. closure		22. closure	
8. closure		23. closure	
9. closure		24. closure	
10. closure		25. closure	
11. closure		26. closure	
12. closure		27. closure	
13. closure		28. closure	
14. closure		29. closure	
15. closure		30. closure	

Connected to control unit:
(10000001 / V3.0.0)

LogDb_PreTest3_0

Fig. 39: Sequence sub-menu

Navigation: **Home > Local dataset > Sequence > Clamp data sequence single view**

Once the **Clamp data sequence single view** sub-menu page has been opened, the sequence is edited as needed.

To create or edit a sequence, the clamping data are selected according to the desired sequence in the drop-down menu. Only the clamping operations that are actually required are selected, but not all 30.

8.6.7 Edit the Control Unit settings

Navigation: **Home > Local dataset > Settings Control Unit**

Edit general settings

Navigation: **Home > Local dataset > Settings Control Unit > General**

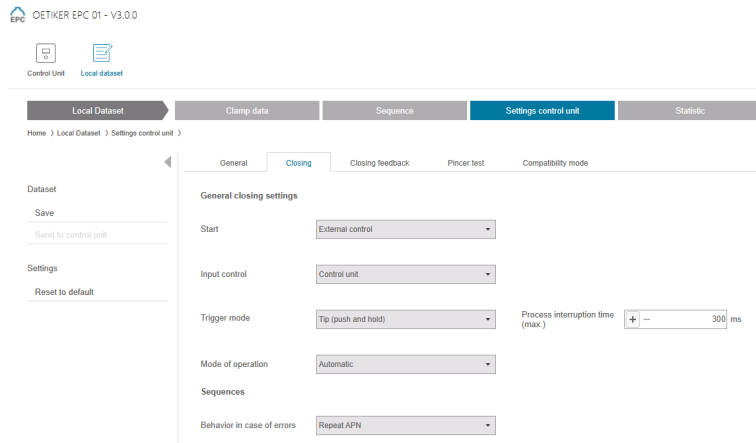


Fig. 40: General sub-menu

The following general settings are made on the **General** sub-menu page:

Element	Description of the settings
Control Unit name	Enter the name of the Control Unit.
Time synchronization type	Select time alignment of the Control Unit. <ul style="list-style-type: none"> PC: Each time a connection is established, the Control Unit compares the time with the PC Server: The Control Unit synchronizes the time with the integrated NTP server at regular intervals
Time zone	Set the time zone.
IP address	Enter the IP address.
Subnet mask	Enter the subnet mask.
Gateway address	Enter the gateway address.
Firmware language	Select the firmware language.
Force display in lbs	Select whether the force display is shown in the unit of pounds.
Pincer remains closed in case of NO	Select whether the pincer remains closed when set to NO.
Control Unit button active	Select whether the rotary pushbutton on the Control Unit is active.
Active X3 interface	Select the assignment of the X3 interface: <ul style="list-style-type: none"> PC CAL 01
Display time	If several data are displayed after a closure (e.g. with Verify), then the display changes at the intervals set here.



NOTICE

The firmware time of the Control Unit can deviate up to 6 minutes per day. Therefore, regular time synchronization is recommended for data storage.

If an NTP server is used, it must be included in the same network as the Control Unit

Editing clamping settings

Navigation: **Home > Local dataset > Settings Control Unit > Closing**

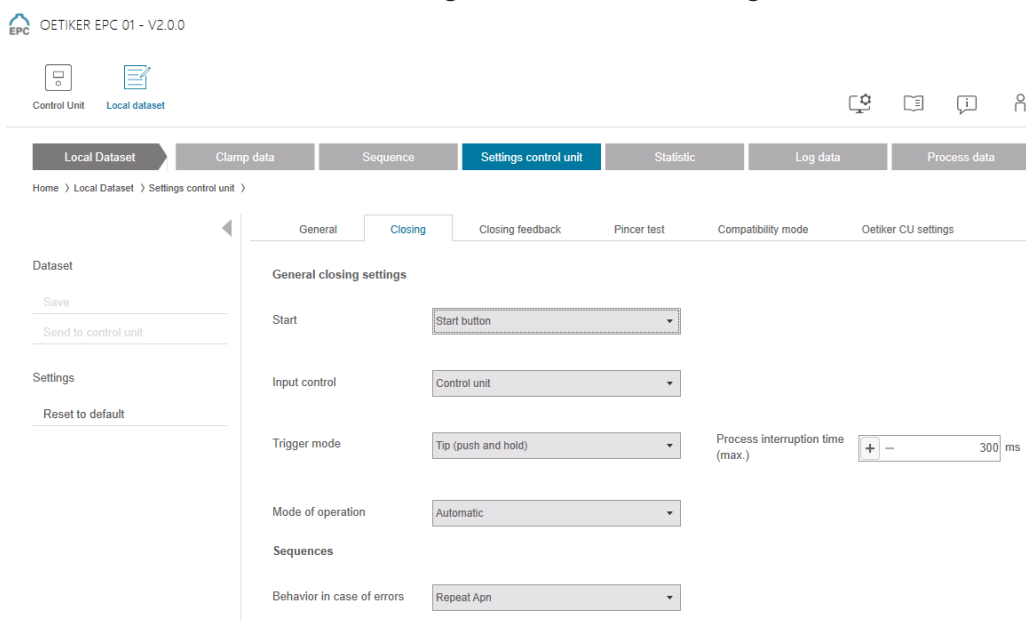


Fig. 41: Closure sub-menu

The following **General closing settings** are made on the **Closing** sub-menu page:

Element	Description of the setting
Start (Type of triggering)	<p>Select the type of triggering.</p> <ul style="list-style-type: none"> START button on the triggering unit External control: If the start signal is sent from a external control, this must be selected here. With this option, the safety valve must be actively mechanically locked by a locking ring recommended by OETIKER (see chapter 9). START button on the Trigger Unit and external control jointly
Input control	<p>Select the source of the start signal.</p> <ul style="list-style-type: none"> Control Unit: operation via the Rotary pushbutton X20: operation via digital signals of the X20 Industrial Network: operation via the selected bus system (EthernetIP, EtherCAT, ProfiNet)
Trigger mode	<p>Select starting the closure process.</p> <ul style="list-style-type: none"> Tip (press start button until closure is completed, when released the pincer opens and the process is aborted). Impulse (a short pulse on the start button triggers complete closure). Double-click (double-clicking the START button triggers complete closure).
Mode of operation	<p>Select operating mode.</p> <ul style="list-style-type: none"> Automatic Step by step (A step-by-step operation is implemented for demo purposes, among others. When the device is triggered, the system moves to the next step.)

The following **Sequence-settings** are made on the **Closing** sub-menu page:

Element	Description of the setting
Behavior in case of errors	<p>Select the behavior in the event of an NOK closure.</p> <ul style="list-style-type: none">Repeat APN: The currently active APN is repeated until the closure is successful.Skip APN: After an failed closure, the system skips to the next APN.A Abort sequence: After an failed closure, the sequence is aborted and restarted. This means that the first APN of the sequence is selected.

Edit settings for closure feedback

Navigation: **Home > Local dataset > Settings Control Unit > Closure feedback**

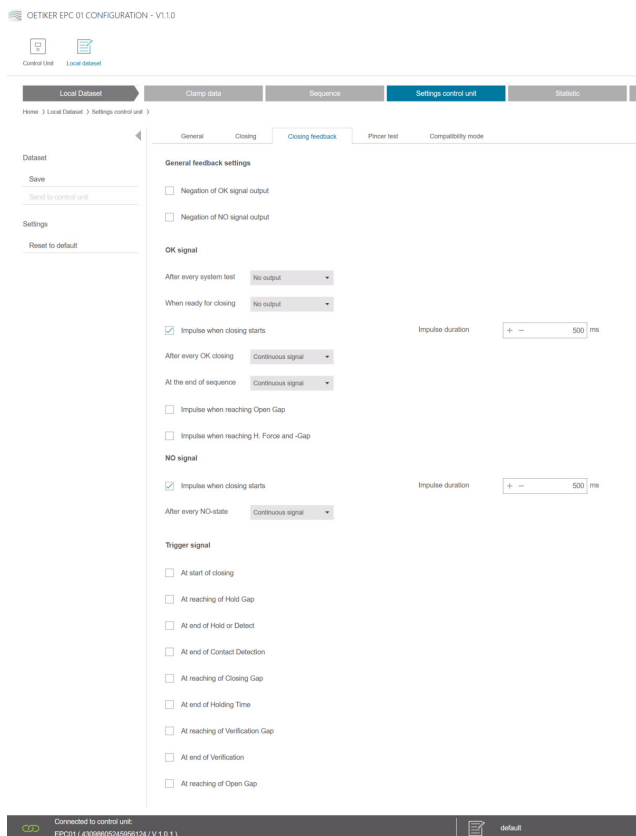


Fig. 42: Closure feedback sub-menu

The settings for feedback from the Control Unit are made on the **Closure feedback** sub-menu page.

The inversion of the OK signal and the NOK signal is selected / deselected in the **General feedback settings** range.

The output parameters of the respective signal are set in the **OK signal** and **NOK signal** ranges.

The time or the operating event for the signal output is selected / deselected in the **Trigger signal** range.

Edit pincer test settings

Navigation: **Home > Local dataset > Settings Control Unit > Pincer test**

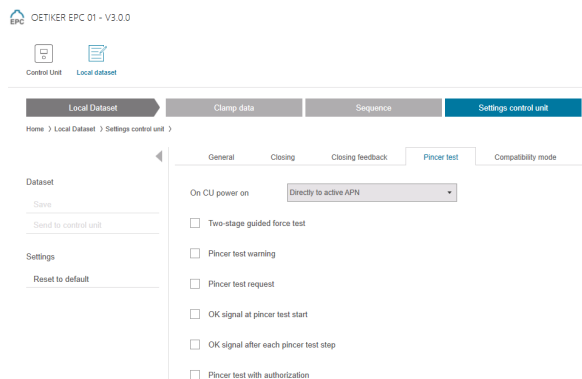


Fig. 43: Pincer test sub-menu

The settings of the pincer test are made in the local dataset on the **Pincer test** sub-menu page.

Element	Description of the setting
On CU power on	Select whether the pincer test is performed each time the Control Unit is started. Mandatory pincer test Function selection «PT» and «APN» Directly to active APN
Pincer test warning	Select whether a warning appears after a defined number of closures.
Pincer test request	Select whether a pincer test is performed after a defined number of closures.
OK signal at pincer test start	Select whether OK signals are sent at the start of the pincer test.
OK signal after each Pincer teststep	Select whether OK signals are sent after each step during the pincer test.
Pincer test with authorization	Select whether to authorize a pincer test in the pincer test menu at the Control Unit (see chapter 8.5.6).
Two-stage guided force test	Enables the two-stage guided force test (see chapter 4.4.4).

Edit compatibility mode settings

Navigation: **Home > Local dataset > Settings Control Unit > Compatibility mode**

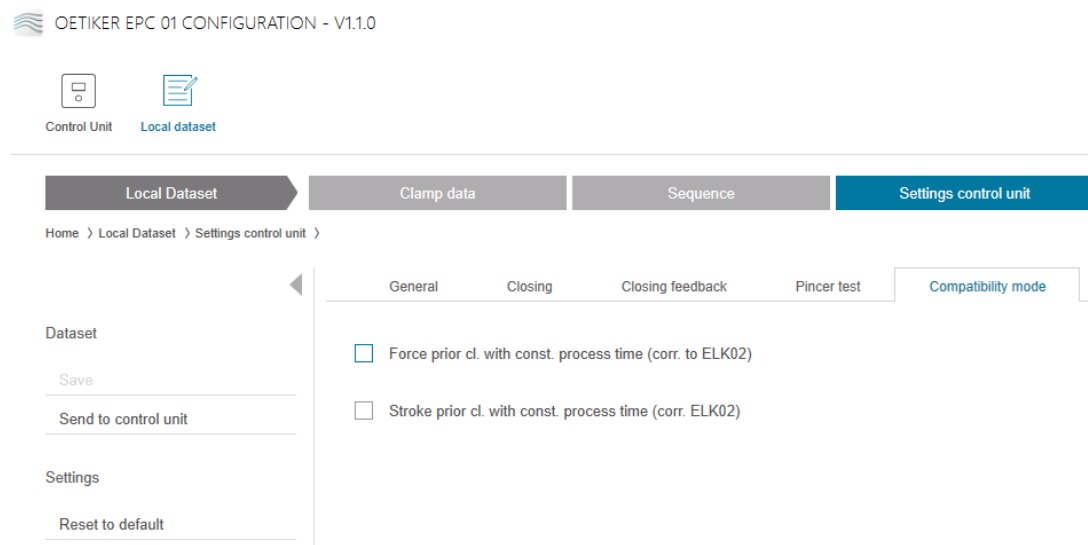


Fig. 44: Compatibility mode sub-menu

On the **Compatibility mode** sub-menu page the same process times of the OETIKER ELK 02 can be readjusted for force priority and stroke priority closures.

This function is selected only in the event that an ELK 02 is replaced or after consultation with OETIKER. The quality of the closures is maintained and there are no disadvantages.

8.6.8 View statistics

Navigation: **Home** > **Local dataset** > **Statistic**

EPC OETIKER EPC 01 - V3.0.0

Control Unit Local dataset

Local Dataset Clamp data Sequence Settings control unit **Statistic** Log data

Home > Local Dataset > Statistic >

Dataset

Save

Send to control unit

General Closings Pincer test

Material Nr 0x01e84801 Firmware version 2.0.0

Equipment Nr 0x000000000098a09b Statistics timestamp 02.06.2023 09:29:09

Nr of closings	Pincer	Equipment Nr
0	HO 4000 : 03m - PG168 T1-RT13	0x01e848d700010002

Control unit

Description	Value	Unit
Total nr of closings	151	Closures
Total nr of NO closings	98	Closures
Last maintenance at	4	Closures
Since last maintenance	147	Closures
Last maintenance timestamp	20.04.2021 06:38:27	
Maintenance note after	1000000	Closures
Repeat maintenance note after	1000	Closures

Description	Value	Unit
Pincer type	HO4000 : 3m	
Equipment Nr	0x01e848d700010002	
Total nr of closings	1880	Closures
Since last maintenance	106	Closures
Last maintenance timestamp	16.05.2023 16:27:00	
Maintenance note after	250000	Closures
Repeat maintenance note after	1000	Closures

Fig. 45: Statistic sub-menu

On the **Statistic** sub-menu page all closures per pincer are displayed. In addition, the Control Unit counts all closures and all NOK closures.

8.6.9 View log file

Navigation: Home > Local dataset > Log data

OETIKER EPC 01 - V3.0.0

Control Unit

Local dataset

Home > Local Dataset > Log data

Dataset

Save

Send to control unit

Log data

Export measurements

Local Dataset

Clamp data

Sequence

Settings control unit

Statistic

Log data

Licensed features

Overview

Timestamp	Logtype	Reference number	Logmessage
30.11.2003 01:00:15.977	Error	HE4002	No pincer connected.
30.11.2003 01:00:15.977	Information		Temperatures: CPU: 25.0°C, Input Air: 25.0°C, Output Air: 25.0°C
30.11.2003 01:00:15.997	Warning		Error State is running.
30.11.2003 01:00:16.000	Error	HE4003	No APN selected
30.11.2003 01:00:16.965	Error		NETIC 52 RE not found
30.11.2003 01:00:18.977	Error		NETIC 52 RE not found
30.11.2003 01:00:20.961	Error		NETIC 52 RE not found
30.11.2003 01:00:22.989	Error		NETIC 52 RE not found
30.11.2003 01:00:24.993	Error		NETIC 52 RE not found
30.11.2003 01:00:27.000	Warning		Too many initialization retries. NETIC communication will be stopped.
14.01.2022 13:01:51.481	Warning	SW2002	Log Memory almost full.
14.01.2022 13:02:59.372	Information		Valve on.
14.01.2022 13:03:00.313	Measuring	PM5000	APN 1 PD: HO 2000 : 03m Klemmtyp: PG167 / 24.1, Text: Test 13.01.2021
14.01.2022 13:03:00.528	Error		Control Sequence Failed: Fault on Position at 14841um
14.01.2022 13:03:00.532	Error		Control Task aborted before closure finished successful.
14.01.2022 13:03:00.532	Error	PE7004	Closing Force and gap are out of tolerance
14.01.2022 13:03:00.532	Measuring	PM5030	Closing Gap: 3.5 (3.5 / 4.5 / 5.5) mm Closing Force: 305 (1850 / 2000 / 2150) N NO 7004
14.01.2022 13:03:00.555	Warning		Error State is running.
14.01.2022 13:03:03.375	Measuring	PM5050	Total: 173 ms
14.01.2022 13:03:04.559	Measuring	PM9000	APN 1 PD: HO 2000 : 03m Klemmtyp: PG167 / 24.1, Text: Test 13.01.2021
14.01.2022 13:03:04.774	Error		Control Sequence Failed: Fault on Position at 14845um
14.01.2022 13:03:04.778	Measuring	PM9030	Closing Gap: 3.5 (3.5 / 4.5 / 5.5) mm Closing Force: 303 (1850 / 2000 / 2150) N NO 7004
14.01.2022 13:03:04.778	Error		Control Task aborted before closure finished successful.
14.01.2022 13:03:04.778	Error	PE7004	Closing Force and gap are out of tolerance

Connected to control unit:
(10000001 / V3.0.0)

LogDb_PreTest3_0

Fig. 46: Log data sub-menu

On the **Log data** sub-menu page all actions of the Control Unit are stored as log files, provided that the log files have been read in (see chapter 8.5.3). Log files that are not needed can be deleted (see chapter 8.5.7).

8.6.10 View Licensed Functions

Navigation: **Home > Local Dataset > Licensed features**

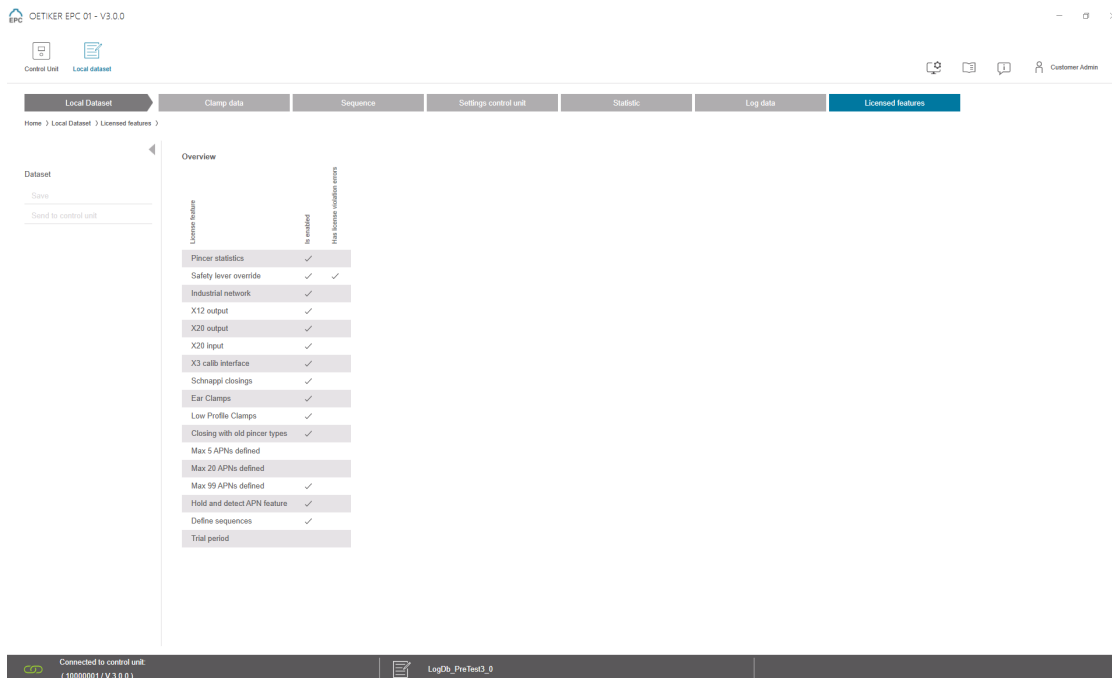


Fig. 47: Licensed features sub-menu


The rights conferred by the license that is used are displayed on the **Licensed features** sub-menu page. Active rights are marked with a check mark. License violations are displayed in the right-hand column.

Extended functions or rights can be unlocked by entering a license key see section «Entering the license key» on page 50).

8.6.11 License change

For assistance in performing a license change, please contact your local OETIKER Service Center.


9 Operate the EPC 01 via an external control unit (PLC)

	DANGER
	<p>Risk of serious injury when operating the EPC 01 via an external control unit!</p> <p>Unintentional closures may occur due to system errors.</p> <p>During operation, there is a serious risk of injury due to crushing, cutting and shearing of fingers by the moving jaws on the pincer head.</p> <ul style="list-style-type: none"> ▶ The system integrator is responsible for the safe integration of the EPC 01. ▶ The system integrator must perform a risk assessment and set up the tool according to this analysis. ▶ The integration shall only be carried out by qualified personnel. ▶ If you have any questions about the integration, please contact OETIKER.

9.1 Description of the integration for semi/fully automatic mode

9.1.1 Assembly instructions for partly completed machinery

The standard version (delivery condition) of the EPC 01 is designed as a complete machine with valid CE conformity.

	NOTICE
	<p>When operating the EPC 01 in semi/fully automatic mode via an external control, the closing process is controlled or triggered by an external control unit (PLC). In this case, the product operated in semi/fully automatic mode is therefore considered to be an incomplete machine!</p> <p>The valid Declaration of Incorporation for semi/fully automatic mode is provided with the purchase of the corresponding license for the release of semi/fully automatic mode.</p> <ul style="list-style-type: none"> ▶ For a safe integration, it is imperative that the assembly instructions are read and observed in their entirety.

- ▶ OETIKER accepts no liability for EPC 01 units controlled by third parties.
- ▶ All personal injury and damage to property resulting from improper use is the responsibility not of the manufacturer but of the operator of the EPC 01.
- ▶ The relevant accident prevention regulations and other generally recognized safety-related legal regulations must be observed.
- ▶ Unauthorized modifications to the EPC 01 exclude any liability of the manufacturer for resulting damage.

10 Maintenance and repair


10.1 General safety instructions for maintenance and repair work

- Cleaning, lubrication and maintenance work should only be carried out by authorized technical personnel in accordance with the enclosed maintenance instructions and local safety regulations. Failure to observe these instructions and regulations may lead to personal injury and property damage.
- Use only the tools and original parts recommended by OETIKER for maintenance and repair work.
- Use only original spare parts from OETIKER.
- Maintenance work may be performed only once the EPC 01 has been disconnected from the power supply.
- Following initial commissioning, the EPC 01 unit should be cleaned daily or weekly, depending on the degree of soiling.
- Never immerse the EPC 01 in water or other liquids.

10.2 Preparation and completion of maintenance

Before and after maintenance, the following preparatory and final activities are performed.

10.2.1 Preparing for maintenance

	DANGER
	<p>Danger of death from electric shock.</p> <p>Touching live parts can result in death.</p> <ul style="list-style-type: none"> ▶ Disconnect the mains plug from the socket and secure the EPC 01 against unintentional reconnection. ▶ Ensure that only qualified and authorized electricians work on the electrical equipment. ▶ Ensure that operators rectify only faults that are clearly attributable to operating or maintenance errors.

1. Disconnect the EPC 01 from the compressed air and power supplies and depressurize the relevant system parts and equipment.
2. Perform maintenance according to the maintenance schedule (*see chapter 10.3*).

10.2.2 Completing maintenance

- ✓ Maintenance and repair completed.
1. Make all separate electrical and pneumatic plug connections.
 2. Install safety devices, if they had been dismantled.
 3. Check screw connections and tighten them if necessary.
 4. Check the EPC 01 for proper operation.


10.3 Perform maintenance according to the maintenance schedule

► Maintain the EPC 01 as specified in the maintenance schedule:

When?	Where?	What?
Weekly	EPC 01	► Clean the EPC 01 (see chapter 10.3.1).
Monthly	Pincer head	► Lubricate the pincer head (see chapter 10.3.2).
Annually or after 250,000 closures	Pincer Pincer head	► Have the pincer or pincer head serviced (see chapter 10.3.4)
As needed	Pre-filter	► Check and change the pre-filter (see chapter 10.3.3)

10.3.1 Cleaning the EPC 01

✓ Maintenance prepared.

	CAUTION
	<p>Material damage due to aggressive cleaning agents!</p> <ul style="list-style-type: none"> ► Clean the EPC 01 exclusively with water. ► Do not use aggressive cleaning agents.

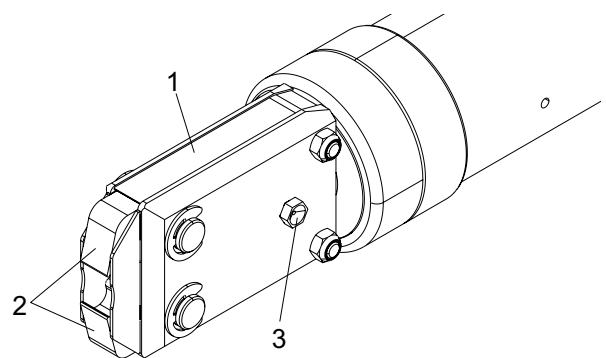
1. In the event of minor contamination, clean the EPC 01 with a dry cloth.
2. In the event of heavy soiling, clean the EPC 01 with a damp cloth.
3. Completion of maintenance (see chapter 10.2.2).

10.3.2 Lubricating the pincer head

The rollers and plunger are mechanically stressed parts on the pincer head, and must be monthly regularly lubricated with a small quantity of grease.

✓ Maintenance prepared.

1. Make sure that the compressed air supply is disconnected and the Control Unit is de-energized.
2. Remove old or excess grease in the area of the grease nipple.
3. Relubricate the pincer head (1) at the grease nipple (3) with a small quantity of the specified grease using a grease gun. (see chapter 13.1.6).
4. Check the pincer jaws (2) for wear and chipped closure edges, replace them if necessary (see chapter 10.4.3).
5. Check the pincer and Control Unit for mechanical damage.
6. Replace any defective parts.
7. Completion of maintenance (see chapter 10.2.2).



10.3.3 Checking and changing the pre-filter

Inspect the pre-filter at regular intervals for soiling and replace if necessary

Recommended filters, pre-filters and accessories:

Designation	Manufacturer, type	Part no.
Filter	OETIKER, standard filter with sieve function $\leq 5\mu$	05005930
Filter	FESTO, Type MS4-LF-1/4-C-R-V	529 397
Pre-filter (for heavily polluted air)	FESTO, Type MS6-LF-1/4-E-R-V	527 668
Bracket for FESTO filter	FESTO, MS4-WB or MS6-WB	–

✓ Maintenance prepared.

1. Check the pre-filter for contamination.
2. Change the pre-filter in the event of contamination. Install the new pre-filter vertically to ensure proper operation.
3. Completion of maintenance (see chapter 10.2.2).

10.3.4 Have the pincer and pincer head serviced (recommended)

OETIKER recommends that the pincer and the pincer head are sent to the local OETIKER Service Center (see chapter 14) for servicing after the specified interval.


A counter is integrated in the Trigger Unit of the clamp, which after 250,000 closures issues a warning to the Control Unit that maintenance is due.


✓ Maintenance prepared.

1. Disassemble the pincer and pincer head, send them in and have them serviced.
2. After maintenance, install the pincer and pincer head.
3. Completion of maintenance (see chapter 10.2.2).

10.4 Repair

10.4.1 Changing the pincer head

	WARNING
	<p>Risk of injury when pincer head is not mounted!</p> <p>Starting a closure can cause the compression spring and plunger to fly apart if the pincer head is not mounted.</p> <ul style="list-style-type: none"> ▶ Never operate the pneumatic pincer unless the pincer head is mounted. ▶ Change the pincer head only when the power supply and compressed air supply are disconnected.

	NOTICE
	<p>Each pincer body is compatible with different pincer heads. The type designations can be found in the tool catalog.</p>

Scope of supply of a pincer head set

- Lip seal (1)
- Piston guide band with wedge piston (2)
- Compression spring (3)
- Plunger (4)
- Spacer washer, usually only included in the scope of delivery in special versions (5)
- Pincer head (6)

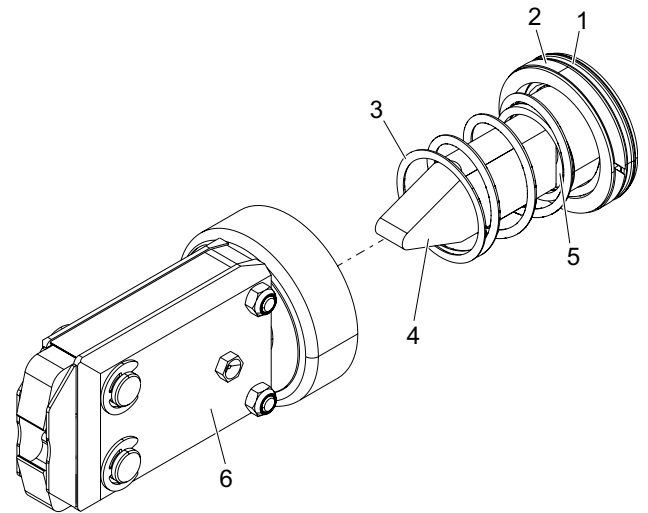
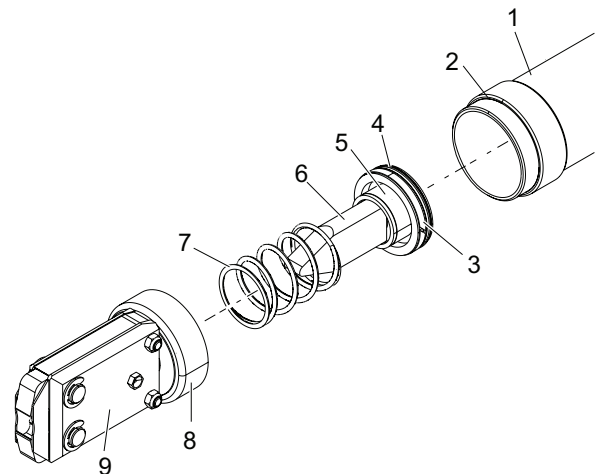


Fig. 48: Pincer head set

Changing the pincer head

1. Disconnect the compressed air supply and switch off the Control Unit.
2. Detach the pincer unit from the Control Unit.
3. Separate the pincer head (9) from the pincer body (1):
 - Undo the locknut (2).
 - Undo the union nut (8).
4. Remove the plunger (6), plunger piston (5), piston guide band (4), lip seal (3) with compression spring (7) from the pincer body (1).
5. Lubricate the plunger piston (5) together with the plunger (6), piston guide band (4) and lip seal (3) from the new pincer head set with the recommended lubricant (see chapter 13.1.6).
6. Insert the lubricated unit into the pincer body (1).
7. Mount the compression spring (7) on the plunger (6).
8. Fully screw in the lock nut (2).
9. Screw the pincer head (9) on to the pincer body (1).
10. Align the pincer head (9) on the plunger (6) and tighten the union nut (8) hand-tight so that the pincer head can be rotated only with difficulty.
11. Tighten the lock nut (2) against the union nut (8).



10.4.2 Aligning the pincer head



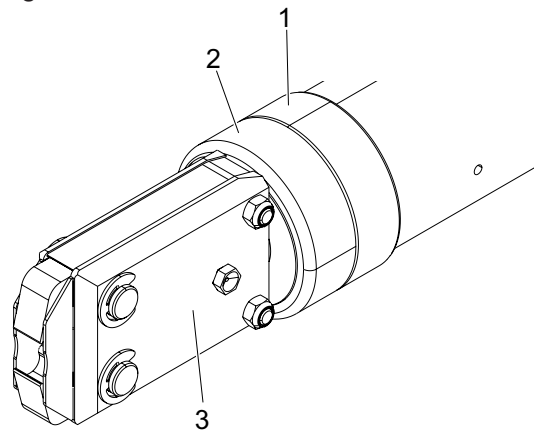
WARNING

Crush hazard when aligning the pincer head!

Fingers can be crushed or severed when the START button is pressed or when a start is initiated by an external control.

- ▶ Do not reach in the closure area of the pneumatic pincer.
- ▶ Align the pincer head only when the power supply and compressed air supply are disconnected.

1. Disconnect the compressed air supply and switch off the Control Unit.
2. Undo the locknut (1).
3. Undo the union nut (2) slightly so that the pincer head (3) can be aligned.
4. Align the pincer head (3) and hold it in the desired position.
5. Tighten the union nut (2).
6. Tighten the lock nut (1) against the union nut (2).
7. Proceed with the pincer test (see *chapter 4.4*).



10.4.3 Changing the pincer jaws



NOTICE

Pincer jaws to be replaced are available as a pincer jaw replacement kit. In order to ensure the fast and accurate delivery of spare parts, a complete purchase order is essential.

It must include the following information:

Product name, part number, shipping method, full address.

Changing the pincer jaws – HO pincers

A number is engraved on the pincer jaws. Use this number to order a pincer jaws replacement kit. Only the designated pincer jaws must be fitted into the pincer head.

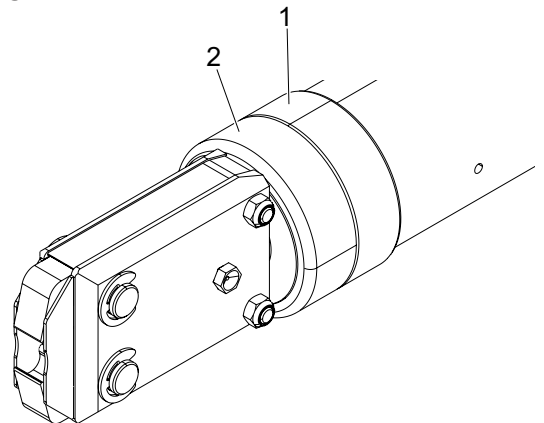


CAUTION

Damage to the pincer from third-party parts!

- ▶ Only use original OETIKER pincer jaws. Only fit the designated pincer jaws type in the pincer head.

1. Disconnect the compressed air supply and switch off the Control Unit.
2. Detach the pincer unit from the Control Unit.
3. Undo the locknut (1).
4. Unscrew the union nut (2)



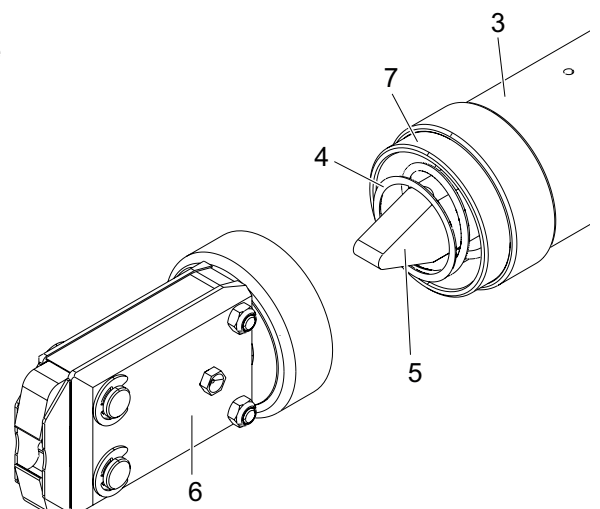
CAUTION

Risk of injury from flying parts!

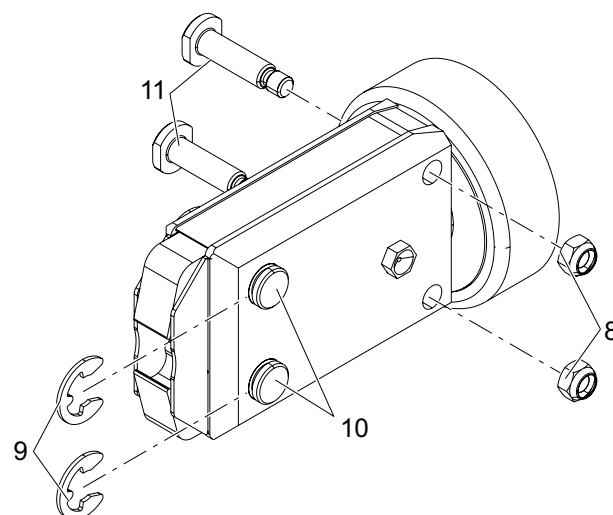
The built-in compression spring (4) is under compression.

- ▶ Hold the pincer head firmly during disassembly.

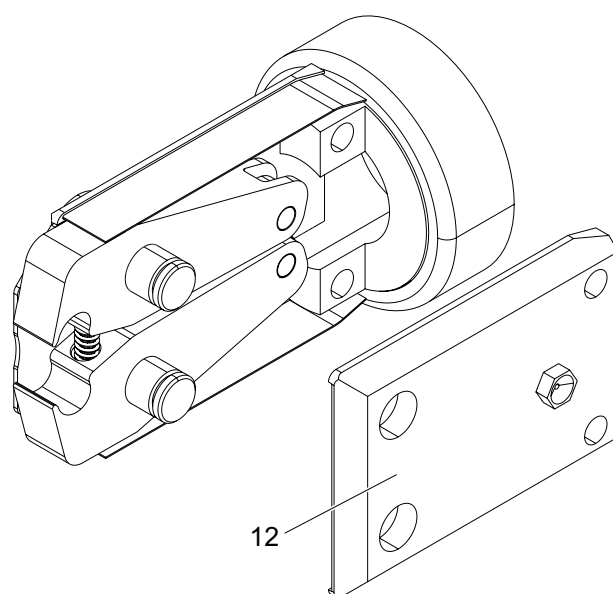
5. Separate the pincer head (6) from the pincer body (3).
The plunger (5) and compression spring (4) remain within the pincer body.



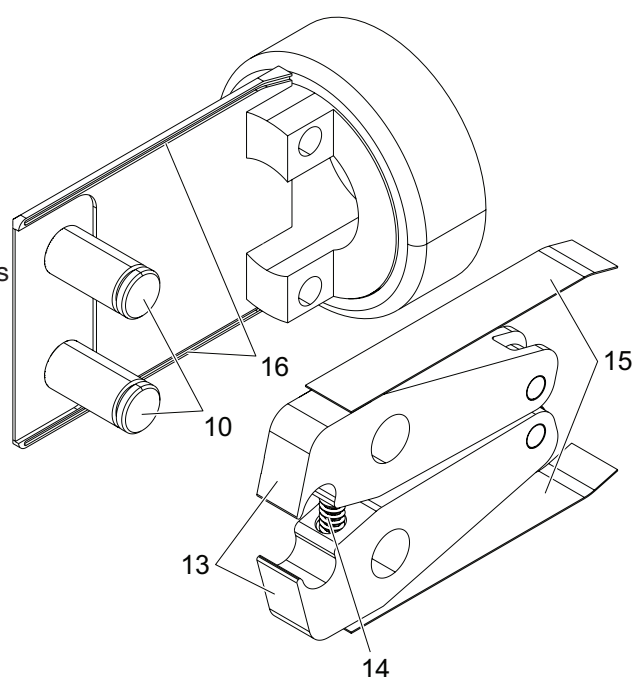
6. Remove two circlips (9) on the pincer head from the side with grease nipple. Do not push back the bolts (10).
7. Remove the two hexagon nuts (8) from the screws (11).
8. Remove the screws (11).



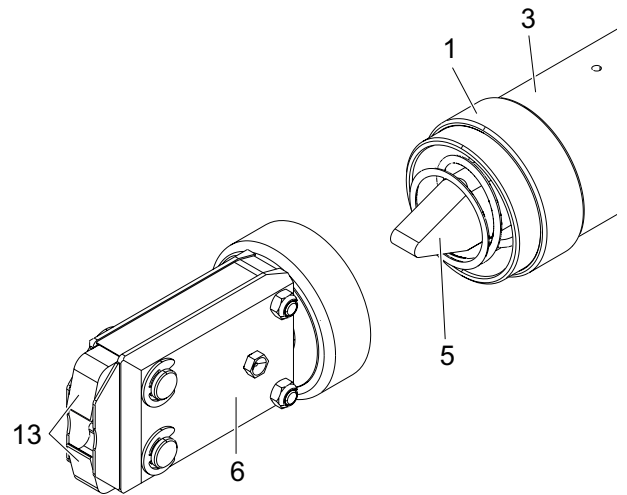
9. Remove the pincer plate (12).



10. Remove the unit consisting of the pincer jaws (13), compression spring (14) and cover plates (15).
11. Lubricate the sliding surfaces of the new pincer jaws (13) from the pincer jaw replacement kit using the recommended lubricant (see *chapter 13.1.6*).
12. Assemble the lubricated pincer jaws (13) and compression spring (14) as one unit on the bolts (10).
13. Insert the cover plates (15) on both sides into the grooves (16) of the pincer plates.
14. Check that the new pincer jaws (13) move freely.



15. Screw the pincer head (6) on to the pincer body (3) and secure it with the lock nut (1).
The plunger (5) must lie between the two pincer jaws (13).



10.4.4 Have the EPC 01 unit repaired

For repair requests please complete the Power Tool Return Form – please go to:
<https://oetiker.com/en-us/powertoolreturn>

Sending the unit back

OETIKER recommends that the components are sent back in their original packaging.

Where this is not possible, the components must be equivalently packaged in order to protect the device / tool from damage during transport.

	NOTICE
	To be observed when returning the components:
	<p>Improper packaging can damage the device / tool during return.</p> <p>The following measures will ensure the longevity of the OETIKER Power Tools and their functional reliability when being returned:</p> <ul style="list-style-type: none">▶ Insert plugs into the compressed air connections of the Control Unit.▶ Insert the protection cap on the compressed air hose of the Trigger Unit.

11 Troubleshooting and error messages

11.1 General instructions in the event of errors

- If the crimping cannot be started or if malfunctions occur during operation, the specialist maintenance personnel responsible for the EPC 01 must be called in.
- Correction of errors must be performed only in a professional manner. If in doubt, contact OETIKER (www.oetiker.com).

11.2 Displaying errors

Errors are displayed as follows:

- The error is shown as an error message with a clear marking in the display of the Control Unit (see *chapter 11.3*).
- Errors that cannot be shown in the display of the Control Unit are described separately (see *chapter 11.4*).

The error message in the display of the Control Unit is structured as follows:

SE1001

Fig. 49: Structure of the error message (example)

Position	Characters	Designation	Description
1	S	System	The first letter describes the type of error.
	H	Handling	
	P	Process	
2	E	Error	The second letter describes the error category.
	W	Warning	
	I	Info	The category M is applicable only to for error type Process .
	M	Message	
3	–	Number	The four-digit number describes the unique identification.

11.3 Troubleshooting measures for error messages

11.3.1 Fixing errors of the «System» error type

Error message	Cause of the error	Troubleshooting measures
SE1001	Incorrect or no data from pressure / temperature sensor, valve sensor or travel measuring system	<ul style="list-style-type: none"> ▶ Switch the Control Unit off. After approx. 20 s, switch the Control Unit on and check that the data are displayed correctly. ▶ If the error message appears again, change the pincer (if possible). ▶ If the error message can be acknowledged, send in the defective pincer. If the error message cannot be acknowledged, send in the defective Control Unit.

Error message	Cause of the error	Troubleshooting measures
SE1002	Inlet pressure in the Control Unit fell below the threshold value during crimping	<ul style="list-style-type: none"> ▶ Ensure the following: <ul style="list-style-type: none"> • The pressure accumulator is installed. • The supply pressure is sufficient. • The flow rate at the pre-filter is sufficient. ▶ Reduce the closure force if necessary.
SE1003	<ul style="list-style-type: none"> • Max. permissible friction force of the pincer was exceeded • Friction in the pincer head is too high • Pincer head is obstructed 	<ul style="list-style-type: none"> ▶ Check that the plunger of the pincer head lies between the rollers. If necessary, realign the plunger. ▶ If the error cannot be resolved return the defective pincer.
SE1004	Firmware is not compatible with the new pincer	<ul style="list-style-type: none"> ▶ Update the firmware of the Control Unit (Customer Admin). ▶ Send in the pincer and have the firmware updated.
SE1005	No data received from the proportional valve	<ul style="list-style-type: none"> ▶ Send in the Control Unit and have it serviced.
SW2001	Preset number of closures until maintenance of the Control Unit has been reached	<ul style="list-style-type: none"> ▶ Send in the Control Unit and have it serviced.
SW2002	The log memory on the Control Unit is 90% full. (this message only appears in the log)	<ul style="list-style-type: none"> ▶ Read log memory and then delete it. If the log memory is not deleted, the oldest entries are overwritten automatically.
SW2003	Temperature too low ($\leq 10^{\circ}\text{C}$)	<ul style="list-style-type: none"> ▶ Use device within working temperature range (see <i>chapter 13.1.1</i>) ▶ To avoid damage to the pincer and Control Unit, ensure that there is no water in the compressed air system.
SW2004	Preset number of closures until maintenance of the pincer is triggered	<ul style="list-style-type: none"> ▶ Send in the pincer and have it serviced.
SW2005	A stack overflow has occurred. The device has been rebooted.	<ul style="list-style-type: none"> ▶ Contact support if it happens more than once.
SI3001	When updating the firmware, the FRAM of the Control Unit was deleted	<ul style="list-style-type: none"> ▶ Update the firmware (Customer Admin).

11.3.2 Fixing errors of the «Handling» error type

Error message	Cause of the error	Troubleshooting measures
HE4001	Inlet pressure of the Control Unit ≤ 2.5 bar	► Increase the inlet pressure of the Control Unit.
HE4002	No pincer detected: ► Pincer is not connected ► Pincer is defective	Perform actions in the following sequence until the error is eliminated: ► Check the connection of the pincer to the Control Unit and connect it correctly if necessary. ► Send in defective pincer and have it repaired.
HE4003	No APN selected: • APN was not selected after the device was started or after sending a dataset • No matching APN available for the pincer type	► Select an appropriate APN. ► Create and send APN with corresponding pincer type.
HE4004	Incorrect or non-existent closure/ process data and settings: • Erroneous data received • Error during firmware update • Memory is damaged	Perform actions in the following sequence until the error is eliminated: ► Check the dataset and resend it if necessary. ► Update the firmware (Customer Admin). ► Send in the Control Unit and have it repaired.
HE4005	The crimping/measuring process was aborted: • Start button was released in jog mode • Process aborted by external device • Process abort at the Control Unit or Trigger Unit by the op- erator • Errors in the control sequence of the closure or the pincer test • Selected holding force too low • Selected open gap too small • Selected verification force too low	Perform actions in the following sequence until the error is eliminated: ► Check trigger mode setting and correct if neces- sary. ► Check the open gap parameter. ► Check the hold parameter. ► Check the verification parameter. ► Check pincer jaws for blockage.
HE4006	Max. number of closures in force test without force adjustment is reached	► Perform force adjustment. Proceed with the ad- justment of the force or complete the pincer test and crimp the clamps in closure mode.
HE4007	The set closure force cannot be reached at the applied inlet pressure	► Reduce the closure force. Alternatively, increase the inlet pressure.
HE4008	No pincer test performed: • The pincer has been newly connected • Control Unit restarted • The calibration values were overwritten when sending the dataset	► Proceed with the pincer test.

Error message	Cause of the error	Troubleshooting measures
HE4009	Wrong gap gauge inserted	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Perform the calibration step again using the correct gap gauge. ▶ Abort the pincer test and start again.
HE4010	License for demo version expired	<ul style="list-style-type: none"> ▶ Enter valid license (Customer Admin).
HE4011	Invalid or no license present on the Control Unit	<ul style="list-style-type: none"> ▶ Enter valid license (Customer Admin).
HE4012	ELK pincer was used: Pincer type is not covered by the current existing license	<ul style="list-style-type: none"> ▶ Enter valid license that includes ELK clamps (Customer Admin). ▶ Replace the ELK pincer with an EPC 01 pincer
HE4013	Safety lever was not fully actuated when triggering the closure or the pincer test	<ul style="list-style-type: none"> ▶ Fully actuate the safety lever and perform the closure or the pincer test again.
HE4014	The safety lever was released during the closure process or during the pincer test	<ul style="list-style-type: none"> ▶ Keep the safety lever fully depressed during the entire closure process (incl. retraction of the pincer).
HE4015	Safety lever was not released for more than 20 consecutive closures	<ul style="list-style-type: none"> ▶ Check safety lever for blockage and remove the blockage if necessary. ▶ During 20 consecutive closures, release the safety lever at least 1 time. ▶ Send in the pincer and have it repaired.
HE4016	ELK 02 Trigger Unit without safety lever is connected	<ul style="list-style-type: none"> ▶ Replace the ELK 02 Trigger Unit with an EPC 01 Trigger Unit with a safety lever.
HE4017	The selected APN/SEQ is not available.	<ul style="list-style-type: none"> ▶ Select an available APN/SEQ.
HW5001	Max. number of closures until the recommended pincer test has been reached	<ul style="list-style-type: none"> ▶ Proceed with the pincer test. ▶ Alternatively, set the number of closures as required in the Control Unit settings / pincer test menu.
HW5002	The force correction exceeds the factor 2 to the default setting	<ul style="list-style-type: none"> ▶ Ensure that the force has been transmitted correctly. If necessary, end the pincer test and start again.

11.3.3 Fixing error of the «Process» error type

Error message	Cause of the error	Troubleshooting measures
PE7001	Insufficient movement to reach the open gap: <ul style="list-style-type: none"> Excessive friction in the system (pincer and pincer head) Pincer jaws are prevented from moving towards the open gap The selection of the open gap tolerances is too tightly 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> Check whether the area of the pincer jaws is free. Proceed with the pincer test. Check the open gap tolerances and increase them if necessary. Send in the pincer and have it serviced. Send in the Control Unit and have it serviced.
	For the Force priority closing function, the closure force is outside the tolerance range: <ul style="list-style-type: none"> The closing time is too short. The pincer is not correctly positioned on the clamp (pincer jaws parallel to clamping strap) Selected closure force too low 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> Correct the pincer positioning so that the pincer jaws are aligned parallel to the clamp band Extend closing time. Check the closure force setting. Send in the pincer and have it serviced. Send in the Control Unit and have it serviced.
PE7002	For the Stroke priority closing function, the closure force is outside the tolerance range: <ul style="list-style-type: none"> In order to reach the closing gap more than the pre-set closing force is required. The set minimum force (closure force - closure force-tolerance) could not be reached at the set closure gap 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> Adjust the closure force tolerances more precisely to the application and increase the minus tolerance if necessary. Proceed with the pincer test. Check the closure gap and increase it if necessary. Check the type of clamp. Send in the pincer and have it serviced. Send in the Control Unit and have it serviced.
	For the Force priority closing function, the closure gap is outside the tolerance range: <ul style="list-style-type: none"> The pincer jaws have slipped off the clamp. Clamp is broken. A wrong clamp was closed (not suitable for this APN) The parts being clamped are outside the expected tolerance. The closing gap window selected is too narrow (or not adapted to the application). 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> If the clamp is broken or the pincer jaws have slipped, repeat closure using a new clamp. Insert correct clamp and the parts being clamped. Proceed with the pincer test Adjust closure gap tolerances more precisely to the application.
PE7003	For the Stroke priority closing function, the closure gap is outside the tolerance range: <ul style="list-style-type: none"> The pincer jaws have slipped off the clamp. Clamp is broken. The closing time was too short. 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> If the clamp is broken or the pincer jaws have slipped, repeat closure using a new clamp. Extend closing time.

Error message	Cause of the error	Troubleshooting measures
PE7004 *	For the Force priority closing function, the closure force and closure gap are outside the tolerance range: <ul style="list-style-type: none"> • The pincer jaws have slipped off the clamp. • Clamp is broken. • The pincer is not correctly positioned on the clamp (pincer jaws parallel to clamping strap) • No clamp inserted • The part being clamped is not inserted 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ If the clamp is broken or the pincer jaws have slipped, repeat closure using a new clamp. ▶ Insert correct clamp and the parts being clamped. ▶ Position the pincer correctly: perpendicular to the part being crimped. ▶ Extend closing time.
	For the Stroke priority closing function, the closure force and closure gap are outside the tolerance range: <ul style="list-style-type: none"> • The pincer jaws have slipped off the clamp. • Clamp is broken. • No clamp inserted • The part being clamped is not inserted • In order to reach the pre-set closing gap more than the pre-set closing force is required • The closing force setting is outside the pincer head specification 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ If the clamp is broken or the pincer jaws have slipped, repeat closure using a new clamp. ▶ Insert correct clamp and the parts being clamped. ▶ Extend closing time. ▶ Proceed with the pincer test. ▶ Check the type of clamp.
PE7005	The holding force is outside the tolerance range: <ul style="list-style-type: none"> • The selection of the holding tolerances is too tightly • Holding force selected is too low 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ Increase the holding force tolerance. ▶ Increase the holding force.
PE7006 *	The holding force is outside the tolerance range: <ul style="list-style-type: none"> • A wrong clamp was closed (not suitable for this APN) • The pincer jaws have slipped off the clamp. • While holding, the clamp was deformed 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ Insert correct clamp. ▶ Check the holding force and reduce it if necessary. ▶ Proceed with the pincer test. ▶ Check the holding gap tolerances and increase them if necessary.
PE7007	The holding force and holding gap are outside the tolerance range: <ul style="list-style-type: none"> • No clamp inserted 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ Insert correct clamp. ▶ Proceed with the pincer test. ▶ Check the holding force and holding gap tolerances and increase them if necessary.

Error message	Cause of the error	Troubleshooting measures
PE7008	<p>The verification force was outside the tolerance range:</p> <ul style="list-style-type: none"> • Verification force tolerance chosen was set too tightly • Selected verification force too low • Excessive friction in the system (pincer and pincer head) 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Proceed with the pincer test. ▶ Check the verification force tolerance and increase it if necessary. ▶ Increase the verification force, but do not exceed 500 N. ▶ Send in the pincer and have it serviced.
PE7009	<p>The verification value was outside the tolerance range:</p> <ul style="list-style-type: none"> • Clamp not hooked in or locked • The pincer slipped off the clamp during the verification function • The verification gap tolerance was set too tightly • Excessive friction in the system (pincer and pincer head) 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Check the clamp engagement and repeat the closure with a new clamp. ▶ Proceed with the pincer test. ▶ Check the verification gap tolerance and increase it if necessary. ▶ Send in the pincer and for servicing.
PE7010 *	<p>Verification force and verification value were outside the tolerance range:</p> <ul style="list-style-type: none"> • Pincer jaws have not verified on the closing mechanism (pincer was removed before verification) • The verification force was set too low • Verification force tolerance chosen was set too tightly • The verification gap tolerance was set too tightly 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Check the insertion of the clamp. ▶ Proceed with the pincer test. ▶ Check the verification force and increase it if necessary, but do not exceed 500 N. ▶ Check the verification force tolerance and increase it if necessary. ▶ Check the verification value tolerance and increase it if necessary. ▶ Send in the pincer and have it serviced.
PE7011	<p>Clamp snap-in not detected:</p> <ul style="list-style-type: none"> • The clamp did not travel past the hook • The clamp snapped in outside the closing gap tolerance window • The snapping force was too weak to be detected 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Check the closing gap tolerance and increase it if necessary. ▶ Check the type of clamp. ▶ Check the Snap Detection Speed Threshold (contact local OETIKER Service Center).
PE7012	Pincer test canceled by user	<ul style="list-style-type: none"> ▶ Repeat the pincer test.
PE7013	<p>Pincer does not move to the open starting position:</p> <ul style="list-style-type: none"> • The friction in the pincer is too high • Exhaust air vents blocked. • Incorrect initial position due to error PE7015 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> ▶ Proceed with the pincer test. ▶ Clean the exhaust air vents. ▶ Send in the pincer and have it serviced.

Error message	Cause of the error	Troubleshooting measures
PE7014	When passing over the detection gap, the measured force is less than the pre-set detection force: <ul style="list-style-type: none"> No clamp inserted The clamp has already been closed (attempted double closing) The part being clamped is not inserted Detection gap set too large Detection force set too high 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ Insert correct clamp and the parts being clamped. ▶ Check the detection gap and reduce it if necessary. ▶ Check the detection force and reduce it if necessary.
PE7015	The maximum speed of the pincer has been exceeded: <ul style="list-style-type: none"> The pincer jaws have slipped off the clamp. Clamp is broken. Displacement measuring system damaged 	Perform actions in the following sequence until the error is eliminated: <ul style="list-style-type: none"> ▶ If the clamp is broken or the pincer jaws have slipped, repeat closure using a new clamp. ▶ Send in the pincer and have it serviced.
PE7017	<ul style="list-style-type: none"> The Contact Force could not be reached before the Closing Force is reached. 	<ul style="list-style-type: none"> ▶ Decrease the Contact Force so it is lower than the Closing Force. ▶ Insert correct clamp and the parts being clamped. ▶ Adjust closing gap tolerances so Contact Force and Closing Force can be reached within the tolerance field.
PE7018	<ul style="list-style-type: none"> During the force test the pincer jaws were able to close completely. The force sensor wasn't present. 	<ul style="list-style-type: none"> ▶ Insert the force sensor

* The error code must always be considered to be determinative and the performed closure to be classified as defective, even if the indicated closing gap is within the tolerance.

11.3.4 Description of the messages when measuring with the PC software

In the PC software, closures can be performed when the «Measure» function is activated. The messages described in the table apply exclusively to this function. This information is required to supply the «Measure» screen in the PC software with data. Measurement with the PC software is described in the *chapter 8.5.5*.

Message	Description
PM9000	Measuring is started
PM9010	The «Hold» function is used when measuring
PM9011	The «Detect» function is used when measuring
PM9020	The «Contact» function is used when measuring
PM9030	The «Close» function is used when measuring
PM9031	The «Schnappi» function is used when measuring
PM9040	The «Verification» function is used when measuring
PM9050	The «Sequence time» function is used when measuring

11.4 Troubleshooting measures without error messages

The following table describes selected errors that are not indicated by an error message in the display of the Control Unit.

Description of fault	Cause of the error	Troubleshooting measures
When updating the firmware, the following message is displayed in the PC software: «Connect to Control Unit»	<ul style="list-style-type: none"> Driver not installed or outdated 	<ul style="list-style-type: none"> Install the correct driver on the PC (see chapter 8.2.2).
No connection establishment to the Control Unit via Ethernet	<ul style="list-style-type: none"> Control Unit and PC are not connected in the same network Wrong connection on the controller unit is used 	<ul style="list-style-type: none"> Check the IP configuration in the PC software and make sure that the IP address and subnet mask are correct. On the Control Unit, use the Ethernet port for the connection (bottom side of the device).
No values can be sent from CAL 01 to EPC 01 during the pincer test	<ul style="list-style-type: none"> Incorrect setting of Active X3 interface in the PC software Wrong cable is used 	<ul style="list-style-type: none"> In the PC software, navigate to the «Control Unit settings» screen and set the «Active X3 interface» to «CAL 01». Use the correct cable.
APN / sequence cannot be selected	<ul style="list-style-type: none"> No APN / sequence created APN / sequence does not match connected pincer type 	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> Resend the dataset. Ensure the correct type of pincer and reconnect the pincer.
The changes in the dataset were not applied after sending	Error not acknowledged	<p>Perform actions in the following sequence until the error is eliminated:</p> <ul style="list-style-type: none"> Acknowledge error. Resend the dataset.
APN which was used for a sequence cannot be deleted. It cannot be deleted even if the sequence has since been removed from the dataset.	Dataset not saved before deleting the APN	<ul style="list-style-type: none"> Save the dataset and then remove APN from the sequence.
The holding function aborts before the holding force or holding point is reached.	Holding force set too low so that the controller does not function properly in this range	<ul style="list-style-type: none"> Increase the holding force.
Contact detection shows unusual values	Contact force set too low, so that the controller does not function properly in this range	<ul style="list-style-type: none"> Increase the contact force.
Closing is canceled when detecting and/or contact detection are activated	Forces set incorrectly, so that a logical error causes the EPC 01 to abort the closure process	<ul style="list-style-type: none"> Observe the following rule when setting the forces: Holding force/detection force < Contact force < Closing force

12 Transport, storage and disposal


12.1 Transport

- ✓ EPC 01 disconnected from the power supply and compressed air supply.
- ✓ Compressed air operated equipment and plant components depressurized.
- 1. Disconnect the pincer and all connected devices and system parts from the Control Unit.
- 2. Pack the components in suitable transport containers. Secure the components against damage and sudden changes in position.

12.2 Storage

- ✓ Decommissioning carried out.
- 1. Ensure the following conditions at the storage place:
 - dust free
 - clean
 - dry
- 2. Prepare the pincer and Control Unit for storage as follows:
 - Use dummy plugs to close the pneumatic connections.
 - Cleaning.
- 3. Pack the components dust-tight in suitable storage containers. Ensure that the components are secured against damage and sudden changes in position.

12.3 Disposal

	<p>Correct disposal</p> <p>The device must not be disposed of in the waste.</p>
---	--

- ✓ EPC 01 disconnected from the power supply and compressed air supply.
- ✓ Compressed air operated equipment and plant components depressurized.
- ✓ Decommissioning carried out.
- 1. Disconnect the pincer and all connected devices and system parts of the EPC 01.
- 2. Remove all operating fluids and substances hazardous to the environment from the components and collect them safely.
- 3. Have operating materials, components and packaging material disposed of by a specialist company in accordance with local and statutory regulations.
- 4. Optionally, send the EPC 01 to the local OETIKER Service Center (*see chapter 14*) and have it disposed of.

13 Appendix

13.1 Technical data

13.1.1 Environmental conditions

Parameter	Value
Humidity	Max. 80% up to 31°C Max. 50% at 40°C (decreasing linearly between these ranges)
Working temperature	15°C to 40°C
Storage temperature	0°C to 60°C
Altitude	max. 2,000 m above sea level
Pollution level	2 (acc. to EN 61010-1)
Overvoltage Category	II (to EN 61010-1)

13.1.2 Electrical data

Parameter			Value
Power supply	Standard (power cord)	Input voltage	100-240 V AC
		Frequency	50-60 Hz
	24 V supply (external control)	Input voltage	24 V DC ± 10%
		Back-up fuse	0.3 A
Power consumption			7 W

13.1.3 Mass and weights

Control Unit

Parameter	Value
External dimensions without ports [mm]	200 x 200 x 85
Weight with back plate [kg]	3.2
Color	gray, powder-coated

Pincer

Parameter		Value
Length [mm] (without pincer head, without cable)	HO 2000	299
	HO 3000	338
	HO 4000	377
	HO 5000	366
	HO 7000	457
	HO 10000	465
Diameter / height EL [mm]	HO 2000 to HO 4000	50 / 57
	HO 5000 / HO 7000	54 / 59
	HO 10000	74 / 74
Diameter / height ELT [mm]	HO 2000 to HO 4000	50 / 82
	HO 5000 / HO 7000	54 / 90
	HO 10000	74 / 109
Weight without pincer head, without cable [kg]		0.7 to 1.9 (depending on version)
Color		blue / black

13.1.4 System capability within the working temperature range

	Force priority closure	Stroke priority closure*
HO 2000 to HO 4000	± 150 N	± 0.2 mm
HO 5000	± 250 N	± 0.2 mm
HO 7000	± 250 N	± 0.2 mm
HO 10000	± 300 N	± 0.2 mm
CmK value	≥ 1.67	

* The accuracy of travel (gap of the pincer) is ensured in the operative range of the clamp. Because the pincer head movement is radial, larger deviations outside the operative range may occur.

13.1.5 Compressed air**General technical data**

Parameter	Value
Air quality	≤ 5 µ, must not contain oil or water (ISO 8573-1)
Air volume	up to 2 l / closure
Compressed air inlet pE	> 4 bar to max. 10 bar (6 bar recommended)

Compressed air connection specification

Connection	Specification
Compressed air inlet pE	Push-in connector for hose 8/6 mm
Compressed air output pA	

Compressed air tank specification

Parameter	Value
Volume	2 to 5 l depending on the size of the pincer

13.1.6 Lubricant

Description	Type	Manufacturer	OETIKER Part no.
Grease	RENOLIT LX 2	FUCHS SCHMIERSTOFFE GmbH Friesenheimer Strasse 19 D-68169 Mannheim Telefon+49 621 3701-0 Fax +49 621 3701-7000	08901490
Grease for medical applications	MOTOREX FOOD GREASE CS-HS 2	MOTOREX AG Bern-Zürich-Strasse 31 CH-4901 Langenthal Tel. +41 (0)62 919 75 75	08906058

13.2 Electrical connections and interfaces

The following figure shows the electrical connections and interfaces of the Control Unit:

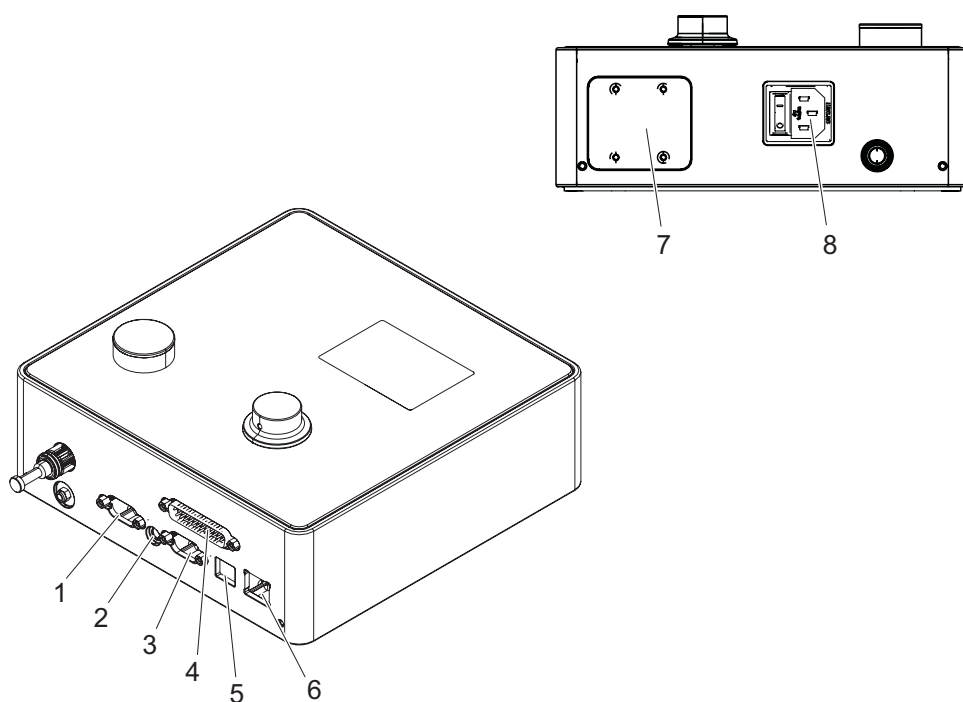


Fig. 50: Overview of electrical connections and interfaces

- | | |
|--------|---------------------------------|
| 1. X1 | 5. USB |
| 2. X12 | 6. Ethernet |
| 3. X3 | 7. PLC (Option) |
| 4. X20 | 8. Plug for low-power equipment |

13.2.1 Electrical connection

The electrical connection of the Control Unit is available in 2 variants.

Low-power equipment plug (standard)

Parameter	Value / Description
Designation	Plug for low-power equipment
Type	Socket for low-power equipment plug 3-pin (C13)
Usage	Electrical connection to the mains on site (110 V to 230 V AC, 50 to 60 Hz)
Cable specification	Only use power cord according to country-specific standard (may also be supplied by OETIKER)

AIDA socket for 24 V supply

Parameter	Value / Description
Designation	AIDA socket for 24 V supply
Type	AIDA H distributor
Usage	Electrical connection via a connected controller (24 V DC \pm 10%)

13.2.2 Interface X1 pincer

Parameter	Value / Description
Designation	X1
Type	Interface consists of 2 connections: <ul style="list-style-type: none">• D-Sub 9-pin for electrical connection, D-SUB connector with screw restraint• Plug-in connection for compressed air output pA
Usage	Connection of the hybrid hose

13.2.3 X12 interface jack

Parameter	Value / Description
Designation	X12
Type	Jack socket for 3.5 mm jack plug
Usage	Read out the following data in test mode: <ul style="list-style-type: none">• Traveled path in the pincer (not at the pincer head)• Pincer pressure curve
Cable specification	Suitable cable available from OETIKER

13.2.4 X20 interface digital connection

General technical data

Parameter	Value / Description
Designation	X20
Type	25-pin D-SUB plug with screw restraint
Usage	Connection for external control
Cable specification	<ul style="list-style-type: none">• Shielded cable required• Cable length \leq 3 m

Inputs and outputs

The opto-decoupled inputs and outputs are supplied by the customer.

Inputs		Outputs	
Parameter	Value / Description	Parameter	Value / Description
Pin 1	24 V \pm 10%	Pin 1	24 V \pm 10%
Pin 25	GND	Pin 25	GND
Signal 0	0 to 5 V	Signal 0	0 V
Signal 1	15 to 26.4 V	Signal 1	-0.5 V
Input current	10 mA (at 24 V)	Output current	20 mA (short-circuit proof)

Pin assignment

Pin	Assignment	Pin	Assignment
1	24 V \pm 10% (supply voltage)	14	Bit 32 input
2	Reset input	15	Bit 64 input
3	Enable input	16	Spare input
4	Quit / Function input	17	Busy output
5	Start input	18	System error at output
6	Spare input	19	Pincer test output
7	Function input	20	Ready output
8	Spare input	21	OK output
9	Input Bit 1	22	Output NOK
10	Input Bit 2	23	Trigger signal
11	Input Bit 4	24	Spare output
12	Input Bit 8	25	GND
13	Input Bit 16	Housing	PE (protective earth conductor)

Pin assignment	Function	Description	Times
Reset	Input	<ul style="list-style-type: none"> • Cancels a closure function that was started • cancels the pincer test 	Impulse > 300 ms
Enable	Input	Enable with start function	
Start	Input	Triggering the Start function (only if enable=TRUE possible)	> 100 ms
Function back	Input	Skip back to the «Function» display Error pending <ul style="list-style-type: none"> • Acknowledging errors At Function display (Start Screen) <ul style="list-style-type: none"> • Request pincer test • Skip to the selected APN * • Skip to SEQ At APN display <ul style="list-style-type: none"> • Skip to main menu (Start Screen) At pincer test <ul style="list-style-type: none"> • Confirm the force test • Skip to main menu (Start Screen) 	<ul style="list-style-type: none"> • 2 s • 2 s • 4 s • 6 s • 4 s • 2 s • 4 s

Pin assignment	Function	Description	Times
Bit 1 ... Bit 64 *	Input	Selecting the APN NOTE: The sum of the bits determines the APN Example: APN 40 = Bit 8 = TRUE + Bit 32 = TRUE	Continuous signal
Busy	Output	Active during the crimping process	–
System error	Output	Active in case of an error message	–
Ready	Output	Active: Close is enabled	–
Trigger signal	Output	After each closure step (Configurable via PC software)	–

* The APN is selected via the inputs «Input bit 1» .. «Input bit 64»

13.2.5 Interface X3, RS232

Parameter	Value / Description
Designation	X3
Type	RS232 (9-pin D-Sub)
Usage	<p>Two different protocols are used for communication. In the PC software, the corresponding device is selected for communication:</p> <ul style="list-style-type: none"> • Connection and communication with PC software <ul style="list-style-type: none"> – Read and write local datasets • Connection and communication with CAL 01 / Terminal <ul style="list-style-type: none"> – Sending the measured mean value to the Control Unit – Authorize pincer test – Setting to receive log data Baud rate: 9600 Data bits: 8 Stop bit: 1 Parity: Even

Log Messages

The language of the X3 log messages / commands is always English.

Every message is terminated with **carrier return** and **new line**: <\r><\n>

Message	Description
_001 SystemTestOK	The system test was successfully completed.
_002 ReadyForClosure	The EPC 01 is in the «closure»structure level and is waiting for a start from the user.
_010 PincerTestPrompt1	The EPC 01 is waiting for confirmation or acknowledgement of the prompt via the Start button or start signal.
_020 PincerTestPrompt2	The EPC 01 is waiting for confirmation of the prompt via the Start button or start signal. A pincer test must be performed.
_100 PincerTestStart	The user has confirmed the prompt.
_110 PType: HO 3000 3m/xxx	The current process data is suitable for «HO 3000 3m/xxx» pincers. The EPC 01 is waiting for the friction test to be started.
_120 FrictionTestStart	The friction test was started and performed by the user.
_130 FrictionTestEnd	The friction test was completed.
_200 ForceMeasurementStart	The EPC 01 is waiting for a closure in order to start a force test.
_210 FN: 2100 N	Standard force test: A closure for the force test has been started. The nominal value is e.g. 2100 N.
_220 FS: 1000 N	Two-stage guided force test: A closure for the safety check has been started. The low force value for the closure is e.g. 1000 N.
_230 FT: 1900 N	Two-stage guided force test: A closure has been started. The target closure force value from the selected APN : 1900 N
_290 ForceMeasurementEnd	The force value was confirmed by the user.
_300 GapMeasurementStart	Gap test has been started; the EPC 01 is waiting for the 1st measurement.
_310 Gauge_1_1_Done	Low force measurement for gap gauge 1 has been completed; the EPC 01 is waiting for the next measurement.
_320 Gauge_1_2_Done	High force measurement for gap gauge 1 has been completed; the EPC 01 is waiting for the next measurement.
_330 Gauge_2_1_Done	Low force measurement for gap gauge 2 has been completed; the EPC 01 is waiting for the next measurement.
_340 Gauge_2_2_Done	High force measurement for gap gauge 2 has been completed; the EPC 01 is calculating the results of the gap test.
_390 GapMeasurementEnd	The calculations have been completed.
_500 PincerTestEnd	The pincer test has been successfully completed.
_600 UserCancel	The user has canceled the pincer test.

Measurement output

All elements are separated by a **tab**: <\t>

The end of the line is terminated with **carrier return** and **new line**: <\r><\n>

```

1           2           3           4 5 6           7           8           9           10          11          12          13          14          15
Clamp type<\t>H0  5000 : 03m<\t>Description<\t>S<\t>f<\t> 2.0<\t> 1.2<\t> 1.2<\t> 1.54<\t>2600<\t> 200<\t> 200<\t>2625<\t> 0<\t>OK<\r><\n>

```

Table: Data output at X3 after each closure step (max. size: 243 characters)

	Designation	max. number of characters
1	Clamp type	63
2	Pincer type	55
3	Description	63
4	Function (H / D / K / S / V) *	1
5	Priority (F / f / S / s) **	1
6	Target values: holding gap or detection gap / closing gap / verification gap	4
7	+ tolerance settings: holding gap / closing gap / verification gap	4
8	- tolerance settings: holding gap / closing gap / verification gap	4
9	Actual values: holding gap or detection gap / closing gap / contact gap / verification gap	5
10	Target values: holding force or detection force / contact force / closing force / verification force	4
11	+ tolerance settings: holding force / closing force / verification force	4
12	- tolerance settings: holding force / closing force / verification force	4
13	Actual values: holding or detection force / closing force / contact force / verification force	4
14	Error number (1001 / 0) ***	4
15	Status OK, NO-OK	5

*** Function**

- H Hold function / step
- D Detect function / step
- K Contact function / step
- S Closing function / step
- V Verification function / step

**** Priority**

- F Force priority
- f Force priority with verification
- S Stroke priority
- s Stroke priority with verification

***** Error number**

The error number is printed as followed:

- no error: «0»
- errors: e.g. «1001»

13.2.6 USB Interface

Parameter	Value / Description
Designation	USB
Type	USB socket
Usage	Interface for short-term communication with the PC (e.g. service): <ul style="list-style-type: none"> Update the firmware of the Control Unit
Cable specification	<ul style="list-style-type: none"> Cable length ≤ 3 m Install a ferrite ring at the end of the cable (near the USB socket)

13.2.7 Ethernet interface

Parameter	Value / Description
Designation	Ethernet
Type	LAN socket (RJ45)
Usage	Interface for permanent communication with the PC: <ul style="list-style-type: none"> Send configuration data to the EPC 01
Cable specification	LAN cable, at least category 5

13.3 Industrial communication

13.3.1 General and preparatory activities

Check EPC 01 for industrial communication

In order to enable the EPC 01 to exchange data via the industrial communication interface, the applicable function must be enabled. This can be checked in the software in the **Licensed functions** sub-menu (menu description see *chapter 8.6.10*).

- ✓ EPC 01 switched on and connected to the PC.
 - ✓ PC software started.
1. In the PC software, navigate to the following sub-menu page: **Local dataset > Local dataset > Licensed functions**.
 2. In the **Industrial networks** overview, check the license function: If the license function is activated with a check mark, the EPC 01 can be used for industrial communication.

Defining the settings for industrial communication

The required parameters for industrial communication are set in the PC software in the **Closing** sub-menu (for the menu description see *section «Editing clamping settings» on page 60*). For this it is necessary to define the START button on the Trigger Unit and the command processing of the Control Unit.

✓ EPC 01 tested for industrial communication

1. In the PC software, navigate to the following sub-menu page: **Home > Local dataset > Settings Control Unit > Closure**.
2. In the **Start** drop-down menu set the **External control** value.
3. In the **Input control** drop-down menu set the **Industrial Network** value.

Check the hardware version

The hardware version of the integrated industrial interface can be read as follows:

- Part no. of EPC 01
- In the menu of the Control Unit under the item **Information / Hardware Info** on page 4

Description of the display elements on the Control Unit



Fig. 51: Display elements on the Control Unit

On the front panel, 4 LEDs (1) are provided for industrial communication. The LEDs have the following meaning:

Designation	Description
L/A0	Link/Activity Port 1
L/A1	Link/Activity Port 2
SF	System error (Profinet)
BF	Bus error (Profinet)
ST	Status (EtherCAT)
NS	Network Status (Ethernet/IP)
FB	FBLED Configuration -/Diagnosis LED

13.3.2 Profinet

The corresponding GSDML file can be downloaded from the OETIKER homepage (visit: www.oetiker.com).

When configuring the hardware, 128 input bytes and 128 output bytes must be defined:

Device overview						
Module	Rack	Slot	I address	Q address	Type	
epc01-pn	0	0			EPC 01 PN	3
PN-IO	0	0 X1			epc01-pn	
64 Bytes Output_1	0	1		368...431	64 Bytes Output	
64 Bytes Output_2	0	2		432...495	64 Bytes Output	
	0	3				
	0	4				
64 Bytes Input_1	0	5	368...431		64 Bytes Input	
64 Bytes Input_2	0	6	432...495		64 Bytes Input	
	0	7				
	0	8				

The structure for the applicable mapping is the same for all industrial communication types and is described in *chapter 13.3.5*.

The IP address and the device name can be assigned via the usual programs (hardware configuration Siemens Step7, Pronenta, etc.).

13.3.3 EtherNet / IP

The corresponding EDS file can be downloaded from the OETIKER homepage (visit: www.oetiker.com).

When configuring the hardware, 128 input bytes and 32 output bytes must be defined:

Connection

Default Connection (without eds)

General

Transport Trigger

Cyclic

Config Instance

1

Port

0

Timeout Multiplier

4

Config Size

0

Add Config

Slot

0

Inputs - Data Length: 128 Bytes

Connection Point

101

☒ Run/Idle

Cycle Time Multiplier

10

Transport Type

Multicast

Priority

Scheduled

Outputs - Data Length: 32 Bytes

Connection Point

100

☒ Run/Idle

Cycle Time Multiplier

10

Transport Type

Point to Point

Priority

Scheduled

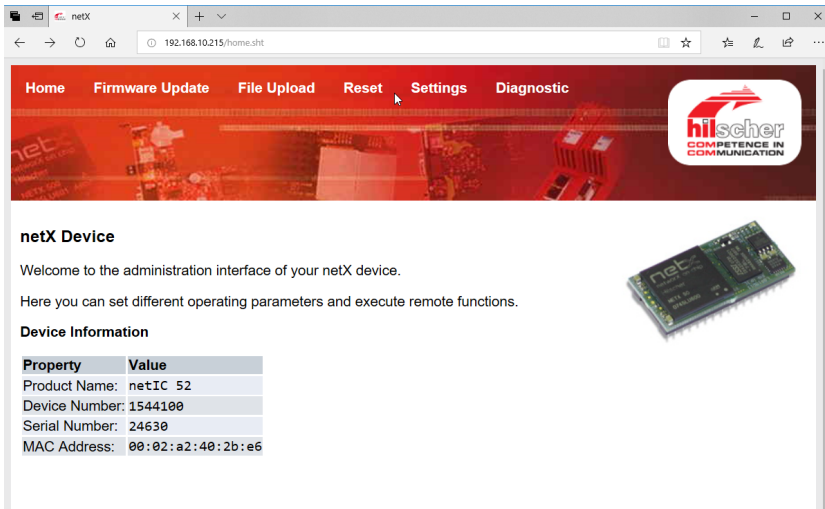
Parameter	Assembly Instance	Size [bytes]
Input	101	128
Output	100	32

The structure for the applicable mapping is the same for all industrial communication types and is described in *chapter 13.3.5*.

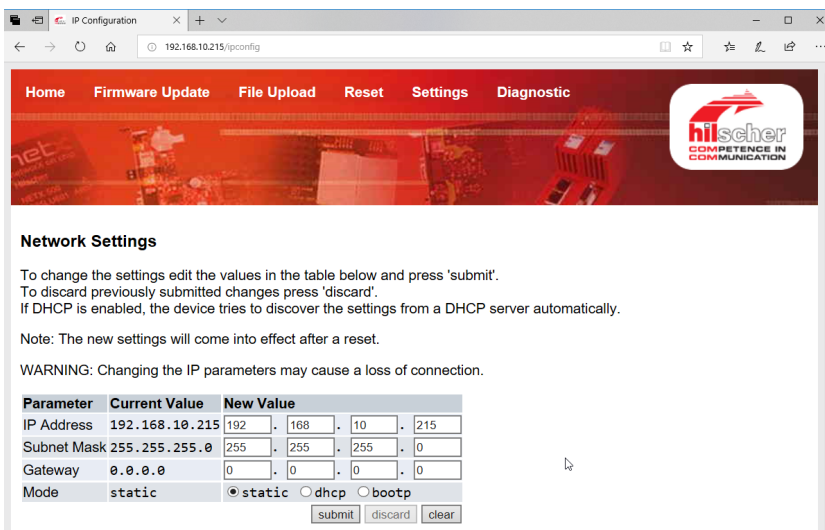
Use a web browser in order to assign the IP address. When delivered, the IP address 192.168.10.215 is assigned to the industrial communication interface.

Assign IP address

1. Open the web browser and enter the following IP address: **192.168.10.215**



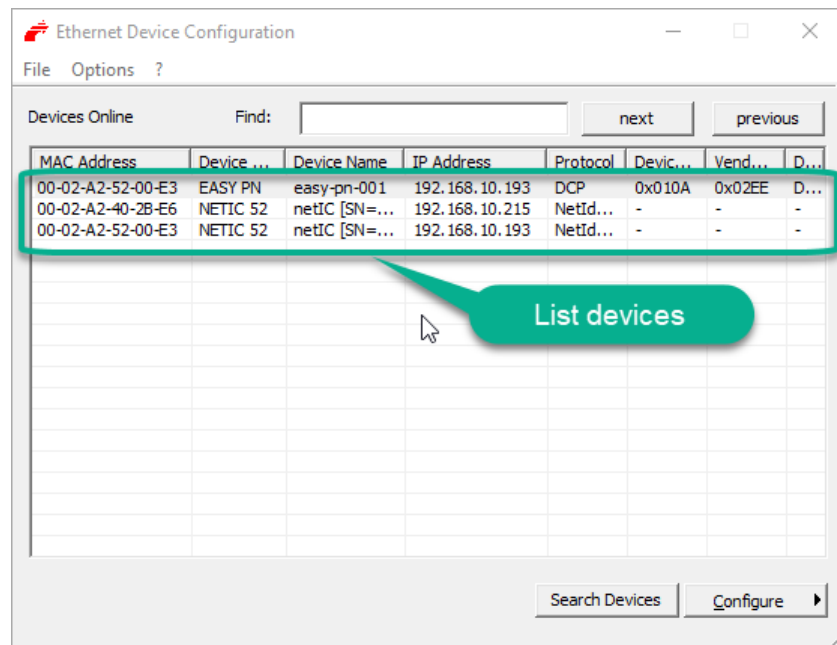
2. Navigate to the **Settings** page.
3. Log in with the following credentials:
 - Login: **Customer**
 - Password: **EPC01**



4. Enter the IP address in the corresponding menu.
5. Press the **Submit** button to confirm the assignment.

If the IP address is no longer known, the IP address can be determined with the help of the «Ethernet Device Configuration» tool:

6. Open the «Ethernet Device Configuration» tool (Company Hilscher GmbH).



7. Press the **Search Device** button to list all devices of the communication module, company Hilscher.
8. In **List devices**, determine the corresponding IP address.

13.3.4 EtherCAT

EtherCAT® is a registered trademark and patented technology licensed by Beckhoff Automation GmbH, Germany.



For the hardware definition a corresponding XML file is available, please visit:
www.oetiker.com --> Downloads --> Software

The structure for the applicable mapping is the same for all industrial communication types and is described in *chapter 13.3.5*.

13.3.5 Mapping list

Input

Offset	Length [Byte]	Bit Offset	Type	Data	Description
0	1	0	Bool	Functions Menu	Navigate to the functions selection menu.
		1	Bool	APN Menu	Navigate to current APN menu. A closure process can only be started from here.
		2	Bool	Sequence Menu	Navigate to Sequence Menu. From this menu a closure can be started and if this is OK, then the next APN is loaded automatically.
		3	Bool	Start Pincer test	Start Pincer test. If an APN is selected, the Pincer test can be started either from the main menu or APN menu or Sequence menu via industrial communication.
		4	Bool	Start	Starts a closure or in the Pincer test/StepbyStep the corresponding pincer test step. Value must be reset to effect a restart. The Enable function must be active.
		5	Bool	Canceled	Abort a started closing function.
		6	Bool	Acknowledge error	Acknowledge error.
		7	Bool	Confirm the force test	Confirm the force test and then move to the next test.
1	1	0	Bool	Enable	Safety control bit to ensure that a closure was not started accidentally.
		1	Bool	Apply APN	To be activated when the APN number is to be input and applied.
		2	Bool	Apply sequence No.	To be activated when the sequence number is to be input and applied.
		3	Bool	Apply nominal force	To be activated when the nominal force is to be input and applied.
		4	Bool	Pincer test authorization	Authorization when starting the Pincer test
		5	Bool	N/A	
		6	Bool	N/A	
		7	Bool	N/A	
2	2		Int	Applicable APN	Selects the current APN. APN number must be > 0 and the APN settings must correspond the locked pincer. Only active in the «Ready» status and in the APN menu.
4	2		Int	Applicable sequence	Selects the current sequence. Sequence number must be > 0 and the APN settings must correspond the locked pincer. Only active in the «Ready» status and in the Sequence menu.
6	2		Int	Measured nominal force	Applies the measured nominal force. The nominal force must be > 0. Only active during the pincer test and when the «Nominal force input allowed» flag is active. Can only be set 1x / force test closure.
8	110		---	N/A	

Output

Offset	Length [Byte]	Bit Offset	Type	Data	Description
4	1	0		Version	The protocol's version.
5	1	0	Bool	Ready	Active when ready for closure/pincer test or for receiving commands.
		1	Bool	System error	Active when serious errors have occurred. Error must be confirmed first, in order to continue working with EPC 01.
		2	Bool	Pincer test	Active during the pincer test. See pincer test status for sub-status information.
		3	Bool	Closure	Active during closure. See StepbyStep status for sub-status information.
		4	Bool	N/A	
		5	Bool	Input of nominal force permitted	Active when the EPC 01 is ready to accept the measured nominal force.
		6	Bool	N/A	
		7	Bool	Toggle Bit	Toggles every 1024 ms.
6	2		Int	APN No.	Currently selected APN No.
8	2		Int	SEQ No.	Currently selected SEQ No.
10	2		Int	Error number	Error number, current error shown on the display.
12	1		Sint	StepbyStep-Status	Step by step status according to coding. See Code Definitions->StepbyStep status codes.
13	1		Sint	Pincer test status	Pincer test status according to coding. See Code Definitions->Pincer test status codes.
14	4		String	Trigger Unit Type	Type of the Trigger Unit.
18	4		String	Trigger Unit Article No.	Article number of the Trigger Unit.
22	4		String	Pincer Head Article No.	Saved for article number of the pincer head.
26	1		Sint	Closing mode	Force-Prio=1, Stroke-Prio=2
27	1	0	Bool	OK	Active if last closure function was OK.
		1	Bool	NO	Active if last closure function was Not OK.
		2	Bool	Hold	Active when the measurement values of the hold function are available. The hold and detect functions can never be active together.
		3	Bool	Detect	Active when the measurement values of the detect function are available. The hold and detect functions can never be active together.
		4	Bool	Contact	Active when the measurement values of the contact function are available.
		5	Bool	Closure	Active when the measurement values of the closure function are available.
		6	Bool	Verification	Active when the measurement values of the verification function are available.
		7	Bool	N/A	
28	4		Float	Holding/detecting closing gap setpoint	Target gap during the holding or detecting function at the time of the last closure.
32	4		Float	Holding/detecting closing gap tolerance (-)	Negative tolerance of the target gap during the holding or detecting function at the time of the last closure.
36	4		Float	Holding/detecting closing gap tolerance (+)	Positive tolerance of the target gap during the holding or detecting function at the time of the last closure.
40	4		Float	Holding/detecting actual closing gap	Measured gap during the holding or detecting function at the time of the last closure.

Offset	Length [Byte]	Bit Offset	Type	Data	Description
44	2		Int	Holding/detecting closure force setpoint	Target force during the holding or detecting function at the time of the last closure.
46	2		Int	Holding/detecting closure force tolerance (-)	Negative tolerance of the target force during the holding or detecting function at the time of the last closure.
48	2		Int	Holding/detecting closure force tolerance (+)	Positive tolerance of the target force during the holding or detecting function at the time of the last closure.
50	2		Int	Holding/detecting actual closure force	Measured force during the holding or detecting function at the time of the last closure.
52	2		Int	Holding/detecting result	Result of the holding/detecting work step. OK = 0, Not OK = error number.
54	4		Float	Contact actual closing gap	Measured force during the contact function at the time of the last closure.
58	2		Int	Contact closure force setpoint	Target gap during the contact function at the time of the last closure.
60	2		Int	Actual closure force	Measured force during contact function in last closure.
62	4		Float	Closing closure gap setpoint	Target gap during the holding or detecting function at the time of the last closure.
66	4		Float	Closing closure gap tolerance (-)	Negative tolerance of the target gap during the closing function at the time of the last closure.
70	4		Float	Closing closure gap tolerance (+)	Positive tolerance of the target gap during the closing function at the time of the last closure.
74	4		Float	Closing actual closure gap	Measured gap during the closing function at the time of the last closure.
78	2		Int	Closing closure force setpoint	Target force during the closing function at the time of the last closure.
80	2		Int	Closing closure force tolerance (-)	Negative tolerance of the target force during the closing function at the time of the last closure.
82	2		Int	Closing closure force tolerance (+)	Positive tolerance of the target force during the closing function at the time of the last closure.
84	2		Int	Closing actual closure force	Measured force during the closing function at the time of the last closure.
86	2		Int	Closure Result	Result of the closing work step. OK = 0, Not OK = error number.
88	4		Float	Verification closure gap setpoint	Target gap during the verification function at the time of the last closure.
92	4		Float	Verification closure gap tolerance (-)	Negative tolerance of the target gap during the verification function at the time of the last closure.
96	4		Float	Verification closure gap tolerance (+)	Positive tolerance of the target gap during the verification function at the time of the last closure.
100	4		Float	Verification actual closure gap	Measured gap during the verification function at the time of the last closure.
104	2		Int	Verification closure force setpoint	Target force during the verification function at the time of the last closure.

Offset	Length [Byte]	Bit Offset	Type	Data	Description
106	2		Int	Verification closure force tolerance (-)	Negative tolerance of the target force during the verification function at the time of the last closure.
108	2		Int	Verification closure force tolerance (+)	Positive tolerance of the target force during the verification function at the time of the last closure.
110	2		Int	Verification actual closure force	Measured force during the verification function at the time of the last closure.
112	2		Int	Verification result	Result of the verification work step. OK = 0, Not OK = error number.
114	4		---	N/A	

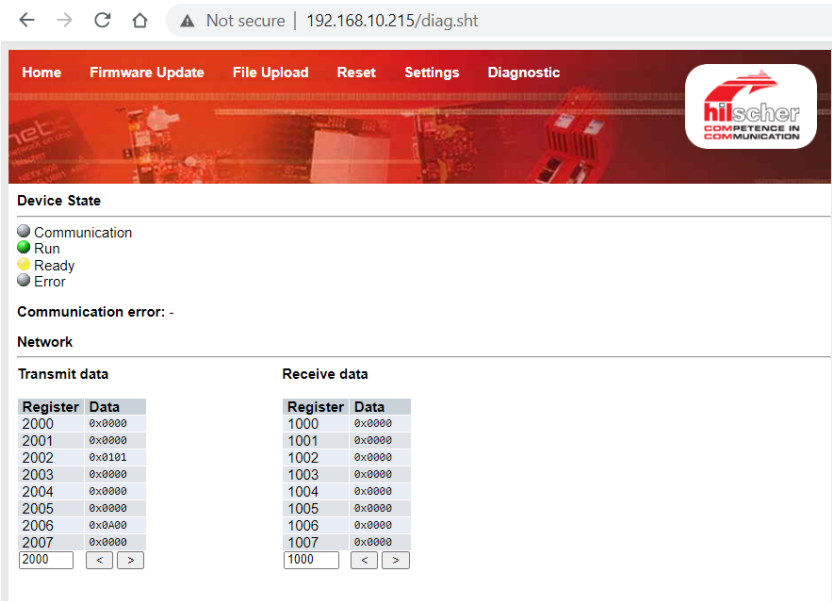
Codes Definitions

Code	Description
0	APN Menu
1	Authorization required
10	In Function menu. Pincer test can be started
11	in Function menu. Pincer test must be started
40	Friction test ready for triggering
41	Friction test running
60	Simple Force Test: Ready to triggering
61	Simple Force Test: Test running
62	Simple Force Test: Ready to retriggering
70	Two stage guided force test lower force: Ready to triggering
71	Two stage guided force test lower force: Test running
72	Two stage guided force test lower force: Ready to retriggering
86	Two stage guided force test higher force: Ready to triggering
87	Two stage guided force test higher force: Test running
88	Two stage guided force test higher force: Ready to retriggering
96	Gap test smaller gap and lower force ready to triggering
97	Gap test smaller gap and lower force running
98	Gap test smaller gap and higher force ready for triggering
99	Gap test smaller gap and higher force running
100	Gap test higher gap and lower force ready for triggering
101	Gap test higher gap and lower force running
102	Gap test higher gap and higher force ready for triggering
103	Gap test higher gap and higher force running
104	End of Pincer test (impulse)

Code	Description
0	Pincer jaw fully open
10	Open gap achieved
20	Hold function completed
30	Closing function completed
40	Verification function completed

13.3.6 Check the data

For the Profinet and Ethernet / IP interface, the data can be checked using a web browser. The values of the registers are displayed in hexadecimal notation..



13.3.7 Software for PLC

At OETIKER, the software mentioned in the table has been tested on a PLC of the relevant model. The software was written in the «tructured Text» language.

PLC	Type of communication	Connection established	Software	Programming language
Siemens S7-1212C	Profinet	Profinet connection S7-1212C	TIA Portal V15	Structured Text
Beckhoff CP6706	Profinet	Bus coupler EK1100 / Modul EL6631	TwinCAT 3	Structured Text
Beckhoff CP6706	EtherNet/IP	Bus coupler EK1100 / Modul EL6652	TwinCAT 3	Structured Text
Beckhoff CP6706	EtherCAT	Bus coupler EK1100	TwinCAT 3	Structured Text

13.4 Warranty and guarantee

13.4.1 Warranty

The legal warranty applies.

- 24 months for manufacturing faults, excluding wear parts.

13.4.2 Requirements

- The component has been commissioned in accordance with the instruction manual.
- The component has not been opened.
- The Trigger Unit has not been detached from the pincer body.
- The warranty does not apply in the case the damages arise from intentional or gross negligent behavior.

13.4.3 Warranty claims

A warranty claim may be made if, taking into account the preconditions, there are defects or the warranted characteristics are not present.

For warranty claims it is mandatory to complete the Power Tool Return Form – please go to:
<https://oetiker.com/en-us/powertoolreturn>

Sending the unit back

OETIKER recommends that the components are sent back in their original packaging.

If this cannot be done, the components must be packed in an equivalent manner. The condition is that the pneumatic plugs are plugged on the Control Unit and compressed air hose of the Trigger Unit. If the component is damaged due to defective packaging, the customer shall bear the costs, irrespective of any justified warranty claims.

13.4.4 Consequential damages

We accept no liability for consequential damages occurring directly or indirectly in connection with the installation of our components.

13.4.5 Costs

In the event of a valid warranty claim, OETIKER will bear the costs. This is conditional on the correct method of return and also submission of a full report to OETIKER.

If there is no valid warranty claim, the expenses will be invoiced at cost.

13.5 Pixel fonts

The pixel fonts used are published under the SIL Open Font License or GPLv2 FE License:

https://gitlab.com/aat_hoh/pixelfont

The following licenses are applicable:

License	Web address for retrieving the license terms
SIL Open Font	https://scripts.sil.org/OFL
GPLv2 FE	https://www.gnu.org/licenses/old-licenses/gpl-2.0

14 Contact details

If you need help or technical support, please contact your local OETIKER Service Center.

For more information, please visit www.oetiker.com.

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