# elneos® six

enjoy your work


With its innovations, the new elneos six electronic device system once again sets the bar for the entire industry.
As the successor to the elneos six series, all components of the elneos six have been newly developed and improved in many details. In addition, new device groups such as DC high-current power supplies and AC sources have significantly expanded the device system.
This range makes it possible for the new series to be used for the first time in new industries such as battery research and electromobility.

The 8 device groups of elneos® include:
- Precision control devices linear (various options)
- Power Arbitrary Generators linear (various options)
- NEC CLASS 2 100VA Stromversorgungen
- Digital multimeter up to 125 A
- Power meters 1 and 3 phases
- Function generators up to 40 MHz
- Fast signal arbitrary generators
- AC sources (electronic) 1-phase up to 400 Hz
- AC sources (electromechanical) 1- and 3-phase

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**Manufacturer**
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# 1 Device information of the built-in components

Serial number: ERFI10000001
Firmware-Version: v3.7.1
Web-Version: v0.81
Operating System Version: v8.71

Geräteliste:
EL6. D DC power supply 1 30,000V | 1,000A (NEC CLASS2)
EL6. D DC power supply 2 30,000V | 2,000A (NEC CLASS2)
EL6. M Meter 1
EL6. G Generator/Generator 1
EL6. L Logger

**This mark guarantees that the device complies with the requirements of the EU (European Union) in terms of safety regulations and electromagnetic compatibility.**

# 2 Foreword

Talk to elneos six! With the Hey erfi voice pack, elneos six elneos six talks to you via the integrated microphone and speaker.

A rest for your eyes! The new haptic 8-inch display allows a clear, free and simultaneous arrangement of the devices in full-screen, field,2/3-screen and quattro-screen layouts.

Expand your flexibility! The ten new pairs of laboratory sockets expand your flexibility for even more device functions in the control center.

Steering without touching! The new Air Wheel is more than just capacitive. The non-contact operation enables 3D gestures such as wiping and circling finger movements and noticeable feedback through vibration. The Air Wheel is therefore very comfortable and hygienically clean.

The visionary capacitive technology together with the device combination and the modularity of elneos six are outstanding in measurement technology.

## 2.1 Warnings

- The elneos devices correspond to the state of the art and are reliable.
Nevertheless, they pose dangers.
Therefore, every person entrusted with the installation, commissioning, operation, maintenance and repair of these devices must have read and understood the operating instructions.

- The devices comply with VDE 0411 and are intended for operation in laboratories, test facilities and other rooms located in the
Pollution level 2 are classified according to VDE 0110.
The devices must be protected against condensation and in the cold state must be adapted to the room temperature before connection to the supply voltage
to match the supply voltage.

- Unauthorized modifications and modifications to the devices as well as operation outside the 19-inch racks or outside the portables are strictly prohibited for safety reasons.
The manufacturer is not liable for damage caused by improper use
have not been used as intended or caused by improper operation.
Repairs may only be carried out by electrically qualified persons. Significant
Improper repairs can pose significant risks to the user.

- If special regulations and rules have to be observed for the operation of the devices, the user is obliged to comply with them.
The devices comply with protection class I and may only be operated with a properly installed protective conductor.

- In order to ensure trouble-free operation, the tolerance of the operating voltage of 230 VAC +/-10 %.

## 2.2 Safety

## 2.3 Warnings and hazard classes

In this user manual you will find warnings to alert you to possible dangers and risks. Warnings in this User's Guide are marked with warning icons and signal words.

The signal word describes the source of the danger. The text of the warning contains instructions to avoid the danger and describes the consequences of non-observance of the warning.

Depending on the severity of a dangerous situation, the warnings are divided into four hazard classes.

**Danger**

**Danger alerts you to an imminent dangerous situation that occurs when**

**if it is not avoided, it inevitably leads to serious** or fatal **injuries.**

Warning

**WARNING alerts you to a dangerous situation that, if not avoided, may result in serious or fatal injury or property damage.**

Caution

**CAUTION alerts you to a dangerous situation that, if not avoided, can potentially lead to injury or property damage**.

Hint

NOTE alerts you to a dangerous situation that, if not avoided, can lead to property damage.

In addition to the notes and warnings in this user guide, you must ensure that all
Observe the applicable regulations, standards and safety regulations at the place of use of the product.

## 2.4 2.2 Dangersymbol

This user guide uses the following icons:

This is the general warning icon. It indicates the risk of injury and property damage. Follow all instructions related to this warning icon instructions to prevent fatal accidents, injuries and property damage.

This symbol warns of dangerous electrical voltage. If this icon appears in a warning, there is a risk of electric shock.

# 3 Note: Returns / Packaging regulations!

**MUST BE STRICTLY FOLLOWED**

Before returning an elneos six device, the scope of the return must be agreed with the company erfi. It may be sufficient to return only the front panel (control center) or individual plug-in cards so that the power cassette can remain with the customer.
When returning the complete device, the front panel must in any case be mechanically separated from the cassette and these parts must be transported separately from each other.

## 3.1 Instructions for packaging:

It is ideal to pack the device directly in foam.

If this is not possible, the front panel and the power cassette must be securely packed so that they are not damaged during transport. For this purpose, soft foam and bubble wrap must be used. In any case, the front panel must be packed and padded separately from the power cassette. The modules must not slip. When positioning in a cardboard box, care must be taken to ensure that the front panel is not exposed to shocks or hard objects. The front panel is made of tempered glass, but can be destroyed by blows.

The company erfi assumes no liability for transport damage of any kind.

## 3.2 Waste disposal:

Electrical and electronic equipment must not be disposed of with residual waste. They can be handed in free of charge at the local collection point, e.B. collection point.

# 4 Description of the front panel

## 4.1 Front panel


**Figure 4-1 Full-screen mode with 8-inch multi-touch display and air wheel with tactile feedback.**

Legend

Point 1 8" display, 8-inch multi-touch display with ceramic print
Point 23D wheel, 3D gestures for Airwheel with tactile feedback
Point 3OK Button, Capacitive push button to confirm the command prompt
Point 4On/Off button, Capacitive on/off button for switching the control center
Item 5Menu call, capacitive button for calling submenus and device groups
Point 6Connection range, BNC socket outputs for function generators
Point 7Si sockets Agile ring lighting for increased safety

Other device features are:
- Four split screens for variable display
- Display of the service life measurement via connection panel
- Device expansion capacity to accommodate up to 4 power supplies
- Voice control with built-in intelligence

Tactile feedback. Both the capacitive wheel and the entire touch surface give the user real feedback on their actions. This optional addition further helps to significantly increase ease of use and safety (see figure above)

## 4.2 Splitsceens and color coding

The size of the 8" multi-touch display allows simultaneous operation of all devices in different display sizes.

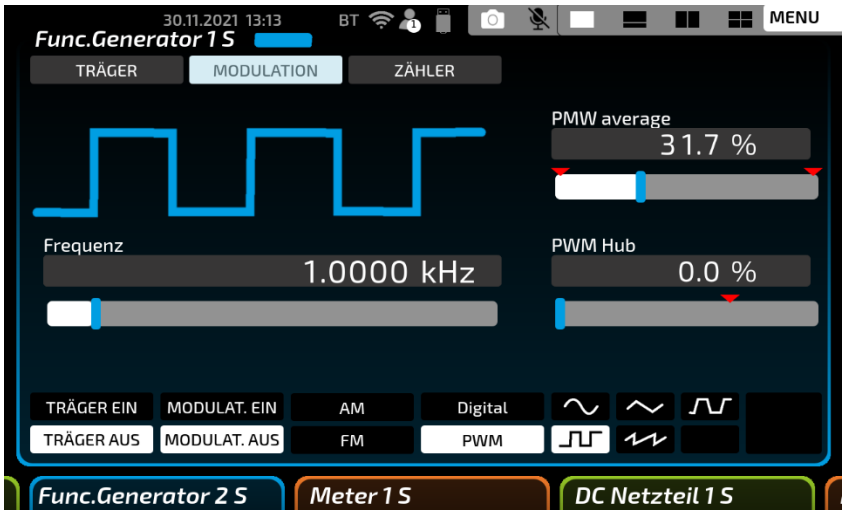



**Figure 4-2 elneos six in full screen mode (e.B. Function generator)**

Four split screens are available, which are activated via the selection bar below (yellow frame):

- Fullscreen (1),
- 2/3 screen (2),
- half screen (3) and
- Quattro screen (4).

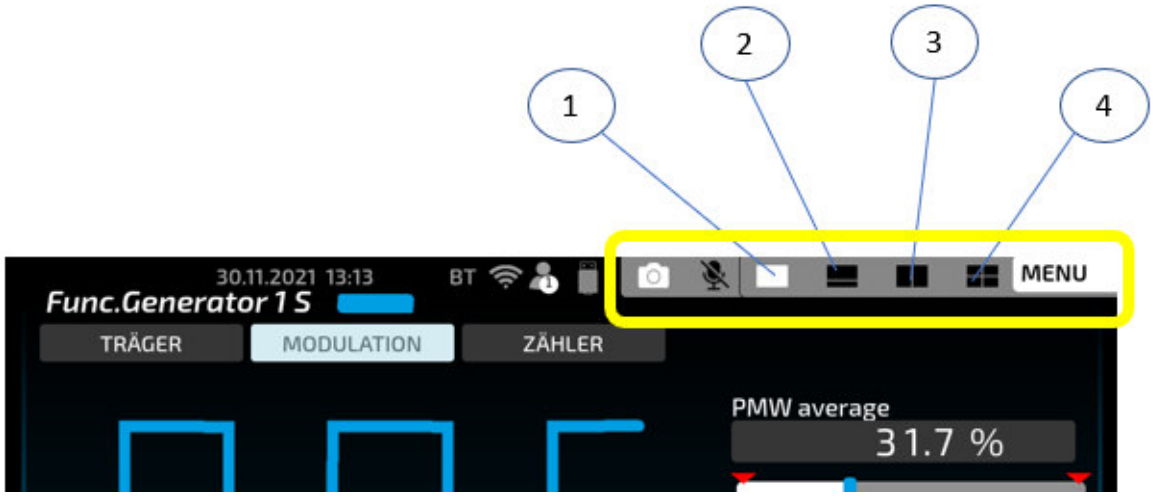



**Figure 4-3 Split Screen Selection Bar**

In the full-screen, field and quatro screens, all active devices in the lower part of the display are displayed in reduced size in the bleed image below (yellow frame) You can scroll horizontally and select by swiping.

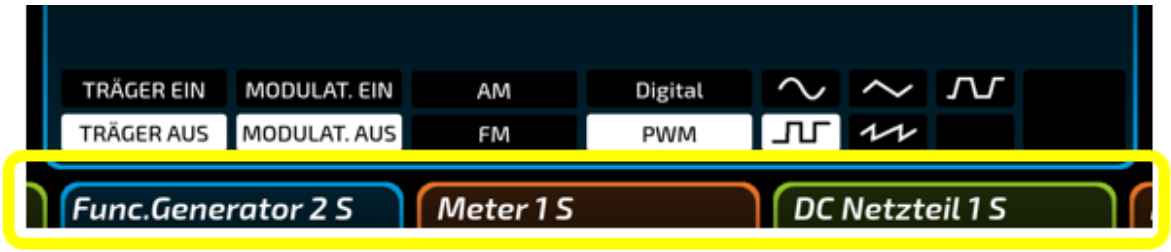



**Figure 4-4 Scroll Bar with Active Devices**

Only in the display mode 2/3 screen are the other active devices including a data display display displayed. This multi-device operating mode offers the user maximum ease of use and an up-to-date device overview at all times. In the picture below you can see DC power supply 2S, 3S and 4S with voltage and current value.

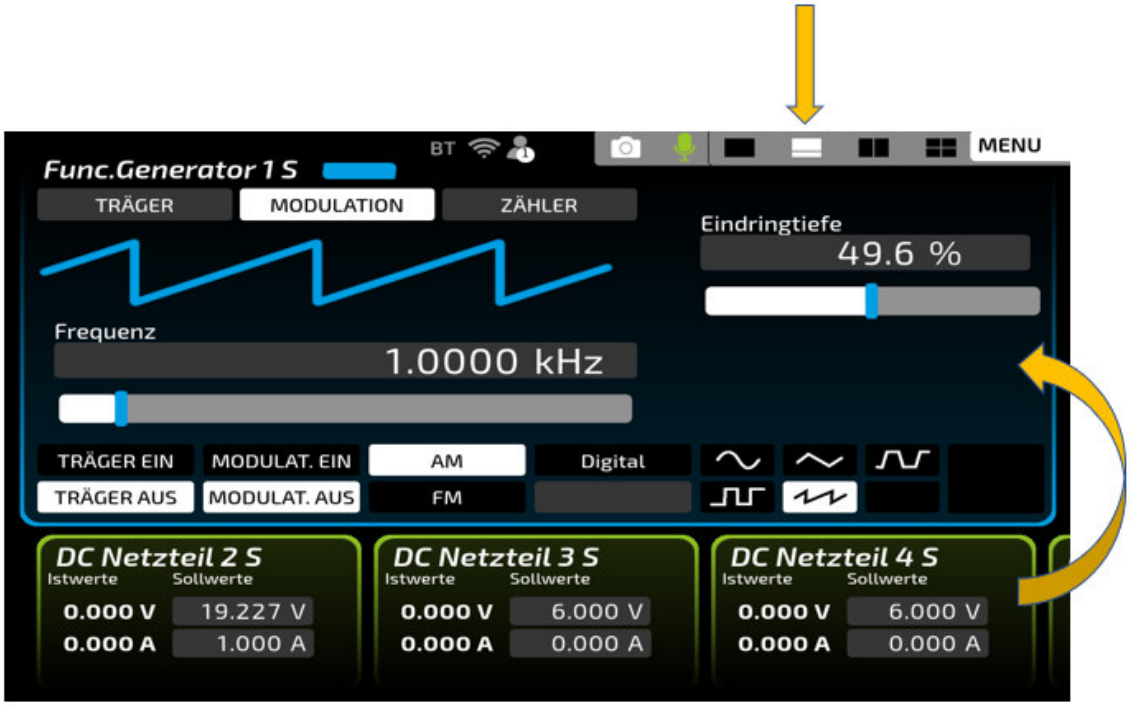



Figure 4-5 Scroll Bar with Active Devices in 2/3 Screen View

These devices could now be pulled into the main area and operated if necessary. Both devices then swap their place on the display. Hold a finger on the desired device in the running list. The area now touched is slightly grayed out and in this state the object can be moved. Drag the object to the main area of the display and remove the finger after placement.
Where previously the DC power supply 4S section sat, the function generator has now been placedas shown in the following picture.

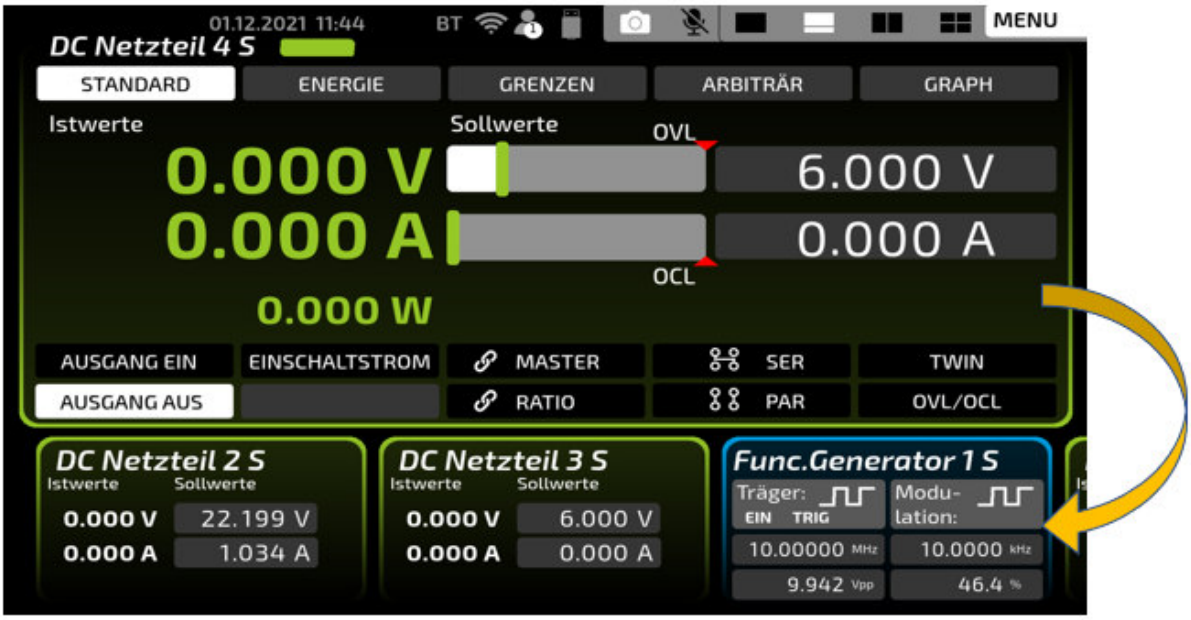



Figure 4-6 Running strip after changing power supply with function generator
In the selection bar at the top of the image you can see the activated 2/3 screen icon. In the field view, only the device names are listed in the scroll bar.

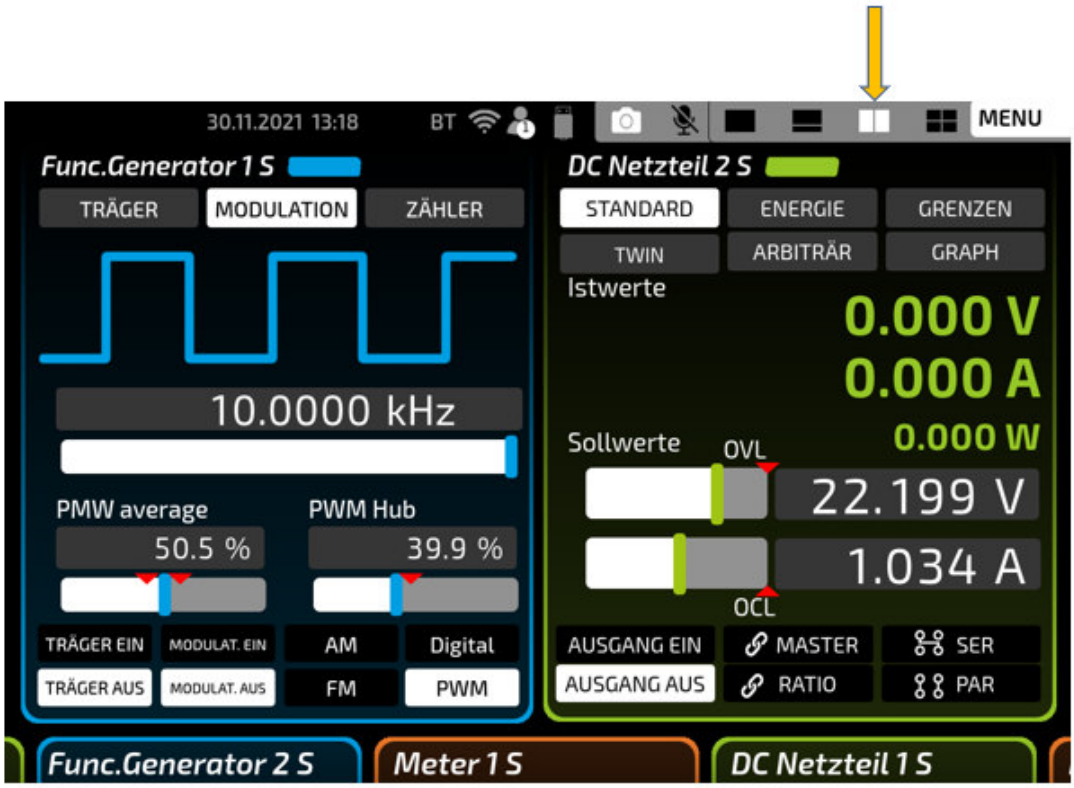



Figure 4-7 elneos six field mode with function generator 1 S and DC power supply 2 S
In this example, the main area is shared by the function generator and a DC power supply. Other devices are shown by name in the scroll bar .

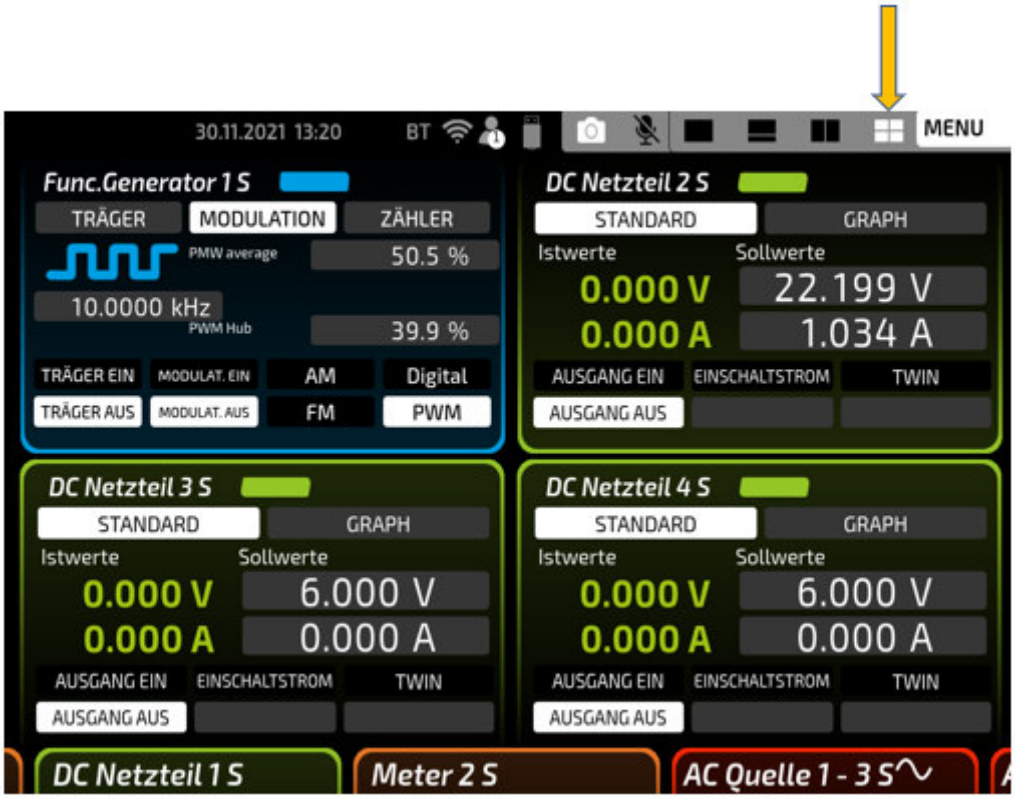



**Figure 4-8 elneos six in Quattroscreen mode**

With the set Quattroscreen mode, symbol in selection bar with arrow marking, the four devices function generator, DC power supply 2, 3 and 4 can now be seen in the main area.

## 4.3 Dynamic screen layout and connection panel

The display of 4 devices simultaneously by the Quattro screen and the measured value display of other devices in the connection field is dynamic. Thus, up to 8 devices can be visualized simultaneously.


**Figure 4-9 elneos six dynamic screen layout with menu panel open**

Once the menu box appears, all screens of the device are automatically zoomed together. It is crucial that all information is still readable and nothing is hidden.
In all device screens, the values can be changed and in the connection field all measured values are displayed live and parallel to the device directly at the inputs or outputs.
The screen content can also be switched on and off by remote control command.

## 4.4 Menu bar

In this menu, some settings can be made for the communication, the look & feel, i.e. the appearance and the function modes of the device.

### 4.4.1 Network Interface


**Figure 4-10 Networks & Interfaces - DHCP MENU Panel**

The communication interfaces are set to DHCP. A click on "Static IP" opens the mask for entering IP address, netmask and broadcast.


**Figure 4-11 Networks & Interfaces - Static IP MENU Panel**

A static IP address is simply an address that does not change. Once your device is assigned a static IP address, that number usually remains the same until the device is decommissioned or your network architecture changes.

If a USB stick is inserted, a data export is now possible. The name with the memory information is displayed on the display. It is then possible to copy internal data to this stick.

### 4.4.2 Web

The menu item "WEB" opens the Internet browser directly.

### 4.4.3 Display Settings


**Figure 4-12 Display Settings MENU Box**

Here you can adjust brightness, language, screensaver and haptic feedback of the display. Press the appropriate buttons for the desired selection.

### 4.4.4 Sounds and volume


**Figure 4-13 MENU panel „Tones & Volume“**

In this menu item the possible acoustic signals can be set. Slider in the left position does not mean a signal, slider in the right position means maximum value of the respective signal.

### 4.4.5 Other settings


**Figure 4-14 MENU panel „Further Settings“**

Here the 3D gestures, the Airwheel and the start options can be activated or deactivated. The jump distance can be set in the point "Wheel dynamics". With setting 3 e.B., the numerical value to be set changes by 3 in the window during a step on the airwheel.

### 4.4.6 Menu Devices Information


**Figure 4-15 Device Information MENU Field**

The Device Information tab (readable only) contains the serial number and software version, as well as a list of installed or available devices in the EL6.

### 4.4.7 Operating instructions

User Manual tab. The selection of this tab leads directly to the view of the user manual- stored as a PDF document in the device. To exit the view, simply click the Menu button.
You can navigate the document as you are used to from PDF files.

### 4.4.8 Service


**Figure 4-16 Service MENU Panel**

In the "Service" tab, in addition to the manufacturer's contact information, you will also find a way to be automatically reminded of the next upcoming service appointment.

### 4.4.9 Experten Modus


**Figure 4-17 Expert Mode - Haptics MENU Panel**


**Figure 4-18 Expert Mode Audio MENU Field**


**Figure 4-19 Panel "Expert Mode - Lightning Strike"**

## 4.4.10 User Profile


**Figure -20 user profile panel4**

# 5 Connectionpanel

Eight connection sockets with RGB ring illumination. The RGB LEDs light up in red, blue or white, depending on the function. The color coding of the sockets guides the user unerringly to the correct connection. All safety laboratory sockets can be used for control power supplies, power generators, digital multimeters and power meters. The laboratory sockets are flush into the embedded in the glass surface.

The panel is pushed into the screen by swiping from the right and the rest of the screen content is pushed together.
In this way, all connections remain visible and operable when the connection panel is displayed.


**Figure 5-1 elneos six with the connection panel view open in the display**

Legend:
- BNC Socket Function Generator (1)
- Connection sockets for integrated devices (2)
- Description range of electrical connections (3)

Additional ring liners in the control center. Due to the additional two ring liners, an additional slot is no longer required. A much higher packing density is achieved, such as.B.:

- Double power supply incl. digital multimeter in the control center or

- 4x power supply 0-30 V / 2.
Ring socket lighting system - user guidance

1. Output active / not active: If the function is inactive, the illumination of the ring liner will be hidden. When the output is active, the rings appear in the correct color for the correct connection of the device to be tested.

2. the ring liners flash white for a short time in the voltage-free passage.

3. Very high connection security with serial and parallel connection due to integrated color control of the RGB LED ring liners. Serial (purple), parallel (light blue).

Flashing function for ring liner illumination
When the power supply goes into power control! Safety! Color change in flashing mode: switches between white and the normal colors! 1 x white, 1 x blue/red, every second

For DMM/P measuring instruments:
Whenever you change the function! z.B. change from voltage to current measurement: In the first few seconds , the sockets can flash in the color to which the cables are to be connected!
After that, the sockets go into continuous light! This signals to the user where to connect!

# 6 General operation

**DC-Präzisionssteuerungsaktuatoren**


**Figure 6-1 elneos six Standard View with Live Graphics**

**Editable ramp function on the 8" display**

Direct convenient input of the ramp parameters on the large 8" display.
Input of:

1. Voltage ramps with current limitation
2. Current ramps with voltage limitation

**Constant voltage and constant current source**

Automatic change of operating modes CV and CC - elneos six serves both as a voltage source and as a power source. This allows both voltage and current ramps to be generated.

**Reading of all device states**

All device states can be read out via the readout function. The states are displayed directly in the highlink Power control software. This query option can also be very useful in the field of test systems.

**Preset function (output OFF/ON)**

Function to turn off or turn on the output. If the output is disabled, the maximum current can be changed.
After switching on the output, the new maximum current value is active - the circuit no longer needs to be manually disconnected from the power supply.

| | |
|---|---|
| Einstellgenauigkeit<br>16 Bit D/A-Wandler (1mV, 1mA); | Measurement accuracy<br>24-Bit-A/D-Wandler (1mV, 1mA); |
| Spannungsbereiche<br>0-30 V (depending on model); | Strombereiche<br>0-3 A (depending on model); |
| Temperaturkoeffizient<br>Voltage: 0.002%/K<br>Current: 0.008%/K; | Regelabweichung 1<br>Voltage: 300µV/A,<br>Current: 150 µA/V (with load change 0-100 %); |
| Restwelligkeit<br>Voltage: 100 µVrms<br>Current: 200 µAeff; | Regelabweichung 2<br>Voltage and current: <0.01% (with load change 10%); |
| Integrated square wave generator<br>up to 1 kHz at resistive load; | Stepped pilot control<br>New software-controlled winding switching with minimal heat generation; |
| | Einschwingzeit<br>12 µs Laststufe 0-100%; |

# 7 Edit values and input options

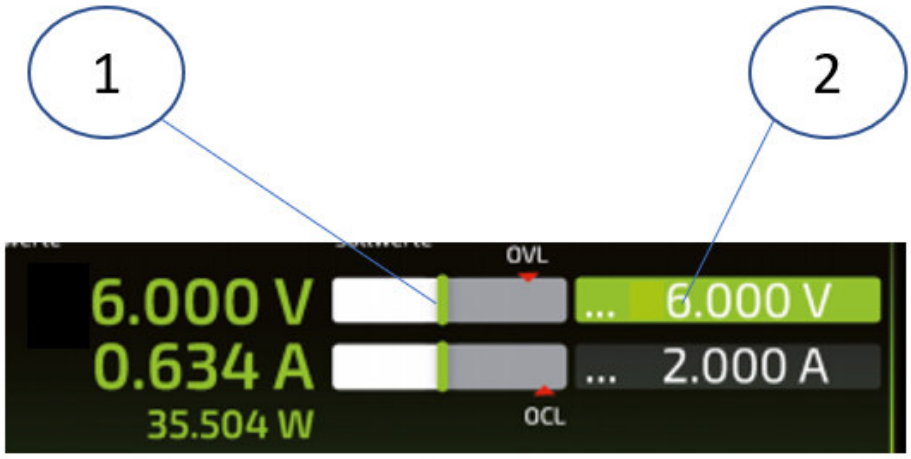



**Figure 7-1 elneos six Standard View with Live Graphics**

The values can be changed either with the slider (1) or by entering the desired value (2) via the keyboard (3).


**Figure 7-2 elneos six Standard View with Live Graphics**

Convenient access: Even on the smallest screen, the 8" display allows you to enter values via the keyboard (3) or wheel/encoder.

# 8 Change Primary Area

To gain active access to a device, it must be in the primary area. To move devices from the secondary area to the primary area, there are 2 ways.

- Tap on the kap. "Menu" area to display the available device groups.
- A strip appears on the display with the symbols of the available devices.
- Tap the desired device and it will appear in the primary area.
- Device that previously in the prim. range, is automatically moved to the secondary area.

A swipe gesture can be used to move the devices that are visible in the secondary area to the peripheral area.

Please proceed as follows:

- Place the index finger on the desired device in the secondary area.
- (The finger should rather be positioned in the middle of the frame of the secondary area).
- Drag your finger vertically up to the primary area.
- Now the requested device is in the primary area for active treatment.
- The device that was previously in the primary area is now automatically moved to the secondary area.

**Gesture functions and new haptic functions**

You have the choice between device operation using a ground wheel with haptic feedback or an airwheel.
The latter can also be switched off, but offers possibilities that were previously unthinkable in device control. Previous gestures are extended with the new 3D gestures of the Airwheel. This makes the interface much more intuitive to use, even without touch. You will receive haptic feedback during operation through the ground-out wheel. This gives a haptic feedback in the form of small pulses during rotation and thus confirms the input.

**3D gestures of the Airwheel**

1. Rotate with your finger for quick value adjustment.
2. Swipe from left to right in front of the display/wheel
to spread the counts and slide effect on the device bar.
3. Swipe from right to left in front of the display / wheel
to reduce the counts and the sliding effect on the device bar.
4. Swipe from bottom to top to scroll through
Tables (ramps and readings).
5. Number selection by horizontal swiping of the hand as well as
Number change by swiping with vertical hand movement.
6. Move towards the glass front to confirm the entry.
7. Holding the movement for 5 sec. causes the display to lock and
Unlocking by second approach with 5 sec. duration of the stay.

**Smart Scroll and Device Positioning**

The Smart Scroll allows a slide effect on any screen display in the device bar through the 1-finger swipe function.
The device positions can be moved back and forth at the edge of the screen and connected to the position on the screen.


**Figure 8-1 elneos six standard view with live graphics and device selection**

# 9 Connection of sockets with RGB ring lighting.

Eight connection sockets with RGB ring illumination
Depending on the function, the RGB LEDs light up red, blue or white, the color coding of the sockets leads the user to the correct connection. All safety laboratory sockets can be used for control power supplies, current clamps, digital multimeters and power meters. The laboratory sockets are flush with the glass surface.

Additional ring liners in the control center
The use of an additional slot is no longer necessary due to the two additional ring binder paths. A much higher packing density is achieved, such as.B.:
- Double power supply including digital multimeter in the control center or
- 4x power supply 0-30 V / 2.

Ring socket lighting system - user guidance
1. Output active / not active: If the function is inactive, the ring liner lights up. If the output is activated, the rings appear in the correct color for error-free connection of the DUT.
2. In the zero voltage transition, the ring liners flash briefly white.
3. Very high connection security due to serial and parallel connection Integrated color control of the RGB LED ring binders. Serial (purple), parallel (light blue).

Flashing function with ring liner illumination
When the power supply goes into power control! Safety! Color change In flashing mode: Switches between white and normal colors! 1 x white, 1 x blue / red, every second

For DMM / P knives:
Whenever you change the function! E.B. Change from voltage to current measurement: The sockets in the flash light have the respective color to which the cables are to be connected! Afterwards change the sockets to continuous light! This signals to the user where to connect!

# 10 Assignment of ports

The elneos control center offers a menu that shows the assignment of the respective devices to the respective output sockets. This menu can be displayed by a swipe gesture on the display.

1.Place the index finger on the left edge of the display and drag the finger horizontally to the center of the display. The menu opens and is displayed on the display.


## 11 Occupancy of sockets (1, 2)

Place your index finger on the right edge of the adjacent box (Item 3) of the menu and drag your index finger to the left edge of the display. To make the menu disappear again, it must be deactivated by a swipe gesture.

# 12 control unit for operating power,

When a power CONTROL unit is in the primary area, the following operations are possible:

# 13 Static operation

1 In static operation, the power control unit can be used as a constant current source or constant voltage source


**Figure 13-1 Standard Static Operation Power Control Unit**

2 Tap the parameter you want to change in the primary pane under the Setting heading.


**Figure 13-2 elneos six standard view with live graphics**

3 A virtual keyboard control panel opens. It is now possible to set the desired setpoint with the 3D wheel or to enter it directly.

# 14 Output ON/OFF

As long as the frame of the surface "OUT ON (1)" is white, the output is active. Turn the output OFF. In this mode, the desired nominal voltage and maximum current can first be set and later the output can be activated by pressing the "OUT ON" area.
The advantage is that the consumer no longer has to be de-energized. As soon as the output is activated, the ring socket lighting is also activated.

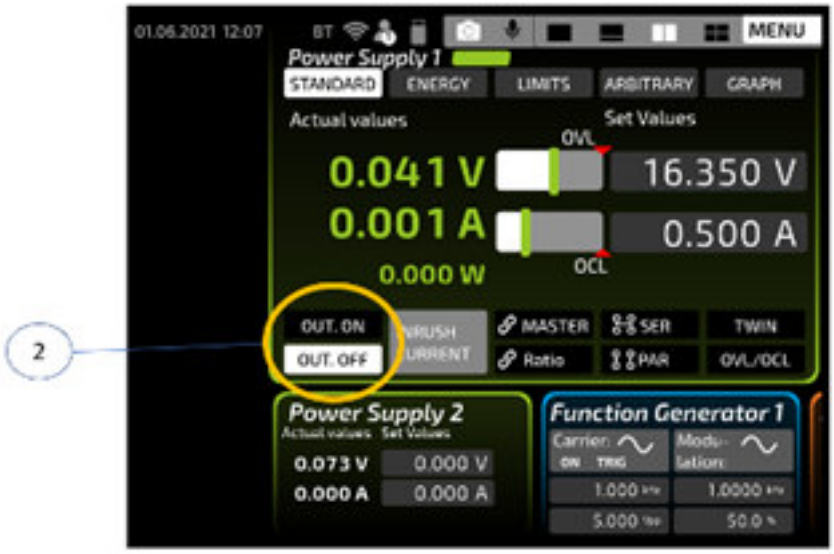



**Figure 14-1 elneos six output on/off**

If the output state changes from the constant current source to the constant voltage source during operation or vice versa, this is signaled by flashing the ring illumination of the respective connection.

If the power control unit is in the voltage control, "CV" is displayed. As soon as the control card is in the power control, the display changes to "CC".

"CV" - Constant voltage
"CC" - Constant current

# 15 Ramp

In ramp mode, the power controller can drive through the current and voltage ramps.
To do this, tap the Ramp tab in the primary area.


**Figure 15-1 elneos six ramp operation**

Ramp generator: With the 8" display, any sequences can be entered directly without programming effort - a decisive advantage for daily work.
Alternatively, the sequences can also be transferred and started via the interface.

Choose between a voltage ramp or a current ramp. The change is done by tapping with the index finger on VRamp /ARamp.

Tap a column to edit it.

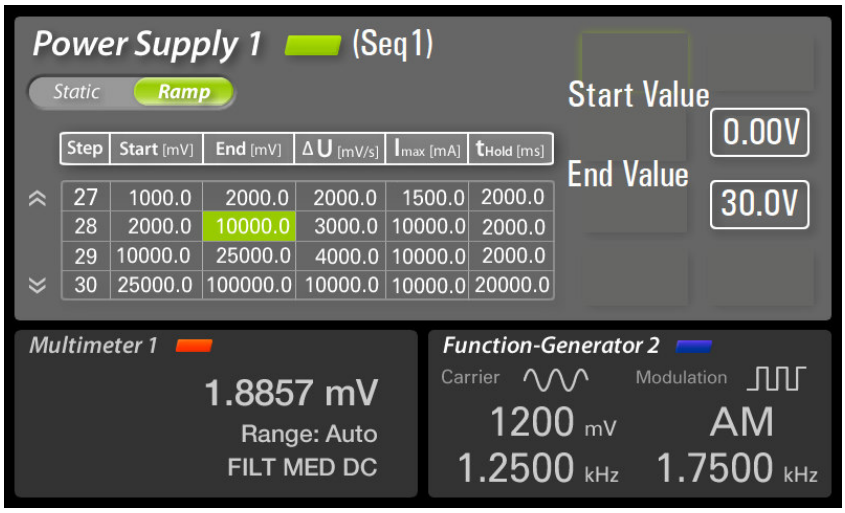



**Figure 15-2 six ramp operation**

- Segment Time: The ramp response time / cooldown is entered here.
- Segment Limit: This is where the maximum current is entered.
- Up to ten sequences can be created.
- They can be used with all power ECUs.
- First, the sequence must be released globally by tapping "RUN".
- To edit the sequence with the desired power ECU, the
- Pushbutton "Out".
- The sequence is repeated as many times as it was entered.
- A continuous loop is possible by setting the counter to "Inf".

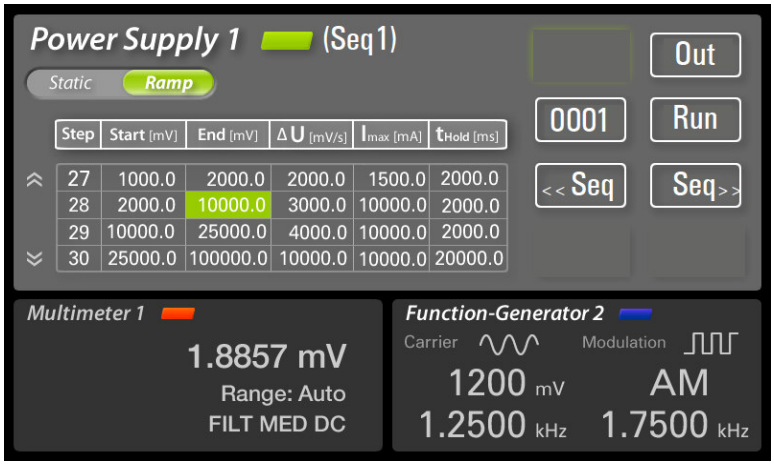



**Figure 15-3 elneos six ramp operation**

# 16 Power Arbitrary Generator

**Graphical Arbitrary Generator**

A table allows you to enter all waveforms and parameters. The evaluation of the curves is carried out by the visualization of the data logger with recording function. Thanks to the powerful processor, two power infinite generators can simultaneously generate, process and display different gradients.
Up to five measurement curves can be visualized simultaneously. In parallel, values from other devices can also be recorded and displayed. With the graphical representation, the results can be documented quickly. The data logger working in the background stores the data that can be read out later.


**Figure 16-1 elneos six Arbitrary Generator**

**Sequencer function**

Up to 100 segments per sequence can be entered or transmitted via interfaces and up to 10 different sequences can be processed.

Each sequence can be assigned to any power generator that processes the composite waveform.

The segments in a sequence have different **AC parameters:** waveforms (sine, rectangle, triangle), period, and amplitude. In addition, **DC parameters** will be defined per segment. The sequencer makes it possible to cascade waveforms with different frequencies and can thus be sequenced and mapped.

The dynamics of the new measuring card enable the reproduction of almost all signal forms. Vehicle on-board voltage pulses, high-energy bursts, sudden voltage drops and much more are quickly reproduced. As a highly efficient tool, the sequencer is also suitable for training and industry.


**Figure 16-1 elneos six sequencer function**


**Figure 16-2 elneos six Signal Shape Selection**

1 Selection of the power supply Tab Arbitrary

2 Number of different waveforms

3 The Type field can be used to select the desired waveform.
(DC Voltage / Sine / Rectangle / Triangle)

4 In this input field, the parameters for the desired signal form are entered. Virtual keypad 7 displays any parameters in this column. By selecting the appropriate line, the value can be entered.

5 Input for the duration of each step.

6 Input current limit

7 This keypad can be used to switch between the DC parameters and the arbitrary parameters.

8 The Power Arbitrary Generator can store up to 10 different sequences. With the help of the arrow keys the sequences can be changed.

9 Keypad for the number of times the sequence should be executed.

10 The output is released and "RUN" appears on the keypad. Then the sequence can be started. When the "RUN" keypad is pressed again, any parameters are switched off and the DC parameter remains where it stood during the passage of time.

(Example: A ramp from 0 to 10V is performed with a duration of 2s. After one second, the RUN button stops the sequence. There is then a voltage of 5V at the output).

Only by the keypad 10 (switching symbols) the output is completely switched off.

11 The entire sequence can be deleted using the Delete key.

# 17 Data logger

Data logger with graphical recording function
The data logger with graphical curve display is included as standard with every control power supply, power arbitrary generator, digital multimeter and power meter and can be used by all built-in devices.

The data logger has a storage volume for measurement data of up to 100,000 measuring points, i.e. for example, 5 measurement curves with 20,000 measuring points can be stored.

It offers very short data intervals of 1/1000 sec. Resolution and curves of the new power supplies can be up to 1 kHz. Complex, hard-to-explain connections. The measurement data can be retrieved directly, stored on the USB stick and screenshots can be output via an interface. The data is also stored via Highlink Power via an interface

The zoom and pan function
The graphs can be moved and zoomed with the 2-finger gesture. The graphs can be spread in the X and Y directions as well as diagonally. With one finger, the graph can be moved to the left and right. Due to the high resolution of the graphs (1 ms), measurement data are displayed quickly and without spikes in curve form.

In the full-screen display, a graph is permanently displayed and in the Quattro screen graphical representations of the graphs as well as the zoom functions are possible

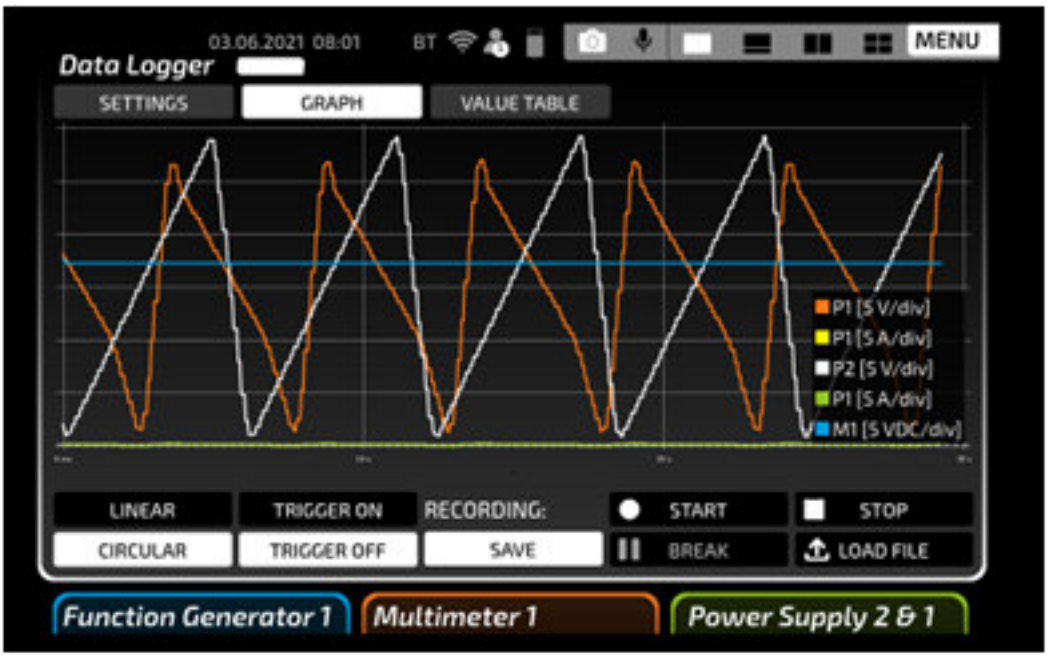



**Figure 17-1 elneos six Data Logger**

**Graphical representation of the measured values**
The stored measured values as well as all current measured values can be quickly visualized in X and Y graphics on the large 8" multi-touch display.

With 2-finger gesture control, you can stretch graphics. Display up to 5 measurement curves of different devices simultaneously, e.B.:

Curve 1: Voltage of the power supply 1
Curve 2: Voltage of the power supply 2
Curve 3: Temperature digital multimeter 1
Curve 4: Temperature digital multimeter 2
Curve 5: Active power meter

**Synchronous real-time measurement**
The fully automatic and simultaneous acquisition of up to 4 measured variables by an integrated 5-channel real-time measurement module enables the storage of up to 20,000 measured values each. Recordings: one-time processing of a ramp or against infinite Triggering: manual or by an external trigger signal at the digital input Log rate: 0.1s to 60 seconds adjustable

**Time display:**
- the available recording time
- the record time consumed
- the still available recording time

From channel 1 (CH1) to channel 4 (CH4), the respective device and the desired measurement can be set.
Example:
CH1 M1[VDC] | Multimeter 1 -> DC voltage
CH2 P1[A] | Control unit 1 -> output current
CH3 [none]
CH4 [none]

Log rate: Input of the time at which intervals a measured value should be recorded.

Length: Points stands for samples, as measuring points. For each set sampling period, such a point is recorded. Length stands for the buffer length, i.e. the number of samples in the buffer.

Linear: Recording starts only once and ends with the time specified under Total. (Depends on recording rate and length)

Circular: The recording will restart as soon as the "Total" time is reached.
Infinite loop.

Trigger: The data logger can be started by a signal at input 1 to 8.

It must be selected whether the recording should begin with a falling or a rising flank.

The recording of the measured values is started with the recording symbol at the top of the display.

Measured values
To view the graphical representation of the data, switch to the second side of the data logger by touching the "Graph" keypad.

At the top of the display, the set channels that have been recorded are listed.
The measured value as well as the resolution per division are given in brackets.

A time bar appears below the Chart window.

The "Setup" keypad takes you back to the settings of the data logger.

**Set up data loggers:**


**Figure 17-2 Setting up elneos six data loggers**

**Data logger graphics:**


**Figure 17-3 elneos six data logger graphic**

Zoom in /out:
With the two-finger gesture, the representation of the time base can be changed. On the one hand, the entire curve linearity can be displayed and, on the other hand, the distinctive parts of the signal course can be viewed more closely.
In addition, the graphic can be moved to the left and right.

**- Zoom in: Spreading the fingers**
**- Zoom out: contraction of fingers**

The functions are displayed in the upper right corner of the recording window

# 18 Digital Multimeter

**53/4-digit precision digital multimeter**

The digital multimeter enables the detection of currents up to 40 A and voltages up to 1000 V. Intelligent additional functions such as capacitance measurement significantly expand the range of application of the device.
An integrated diode test as well as temperature and frequency measurements and the graphical representation of the current and stored measured values make the multimeter an all-rounder.

By using new TRMS converter modules with significantly improved linearity and bandwidth, excellent measurement accuracy with a very good Crest factor of 5 is achieved. The new 53/4-digit digital multimeter enables the acquisition of non-sinusoidal signals with unprecedented accuracy. Voltage measurements with an accuracy of ± 0.08% and a resolution of 1 µV are the prerequisite for the highest accuracy of the elneos six. A fast 24-bit converter guarantees excellent resolution.


**Figure 18-1 elneos six Digital multimeter**

When the digital multimeter is displayed in the primary area, various settings can be made.


**Figure 18-2 elneos six Digital multimeter**

Use the virtual keypad to enter which physical value to measure.

- Voltage VDC / VAC
- Current ADC / AAC
- Resistance / Continuity test Ω / Z
- Diode test / temperature V / °C
- Capacity C
- Frequency / period duration f / T

Two measurement functions are assigned to each of the virtual keypads. By tapping the selected keypad again, the device switches to the second measurement function. For example, from VDC to VAC.

If a measuring range is exceeded, the display of the digital multimeter shows "Overflow".

When you are in auto-range mode, the digital multimeter automatically changes the measuring range.

The assignment of the sockets can be indicated by a swipe gesture. (The chapter "Allocation of sockets" describes how the information window can be displayed).
The RGB ring illumination of the safety laboratory sockets indicates which socket must be used for the selected measurement.

Power sensor **:[P]**
Power can only be measured in AC.
With the RESET button, all displayed values marked with a small 1 can be set to zero.

Figure 18-3 elneos six Data logger

| | |
|---|---|
| Signal frequency: | Hz |
| Efficacy: | W |
| Apparent power: | VA |
| No-load power: | where |
| Phase difference angle: | ϕ |
| Efficiency = active power / apparent power | cos ϕ |
| Crest factor Crest value / RMS value | e.g. Û= 325V / Ueff=230V crest= 1,414 |

# 19 Function Generator

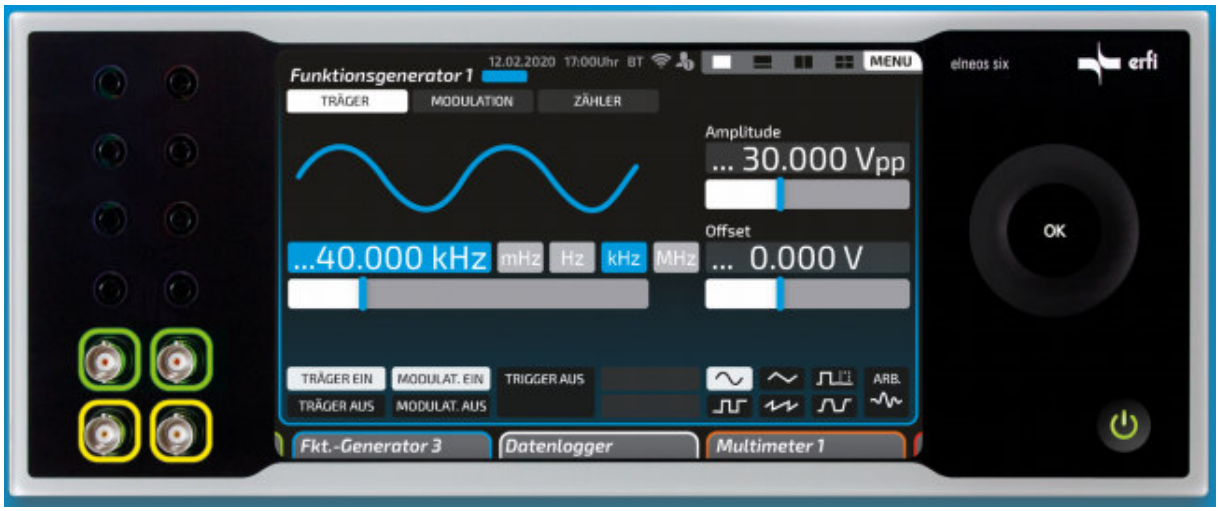



**Figure 19-1 elneos six Function Generator**

Two function generators with counters
The device contains two function generators and uses the working principle of direct digital Synthesis (DDS) with the associated advantages of frequency-stable and low-distortion signal generation. The first function generator serves as a basic function generator and tracks its signals to the outside.
The second function generator is used exclusively for modulation. Its signals are modulated according to the selected modulation type with the signals of the first function generator.
Outstanding are the maximum output frequency up to 40 MHz and the amplitude level with 30 Vss at idle. In combination with an adjustable duty cycle of 0.1 to 99.9%, elneos six is an all-rounder. elneos six has numerous functions such as sweep, an external and an internal trigger for defined starting conditions, programmable single and multiple pulses and much more, which make the function generator an all-rounder.

A standard counter up to 150 MHz (optional up to 1.5 GHz: order no. EL6. F1G) guarantees the acquisition of fast signals. All device states can be read out at any time.

Hint
The signal generation of the second function generator is only used for modulation and is not guided externally. Elneos six can accommodate additional function generators via additional bays, which work simultaneously and independently of each other and provide a second independent hardware signal. Thanks to the 2/2 screen display, you can operate and display both double generators at the same time.

Freely programmable modulation through 2 fully integrated function generators
elneos six offers a special functionality in terms of modulation. The carrier signals and the useful signals (modulation signal) can be separated by the two function generators and parameterized completely independently of each other. The modulated signal is displayed on
Output and a separate second external source or a second function generator is no longer necessary. The benefits for education and industry are therefore enormously high, because it is

In this way, each modulation can be realized very quickly and without additional external hardware. The carrier signal and the useful signal can be conveniently generated in the device as required become. The result of the modulation is immediately visible and the parameters of the signals can be changed very quickly to achieve the desired result.
All parameters of the carrier signals and the useful signals (modulation signal) such as waveforms (sine, rectangle, triangle, etc.), amplitude, frequency, duty cycle are stored separately and modulated at the output. The depth of the modulation sheets is adjustable from 0 -100%. With the freely programmable modulation, elneos six offers a productive tool for training and industry with a direct positive effect in use.

## 19.1 Modulation

In addition to the previous frequency modulation (FM), amplitude modulation (AM) and pulse width modulation (PWM), the new device now also masters the modulation types amplitude shift keying (ASK), frequency shift keying (FSK) and pulse width shift keying (PSK).

All parameters of the carrier signals and the useful signals (modulation signal) such as signal forms (sine, rectangle, triangle, etc.), amplitude, frequency, duty cycle are stored separately and modulated at the output. The modulation depth can be set from 0 -50%.

The device consists of two fully integrated function generators.

- **Carrier (carrier signal)**

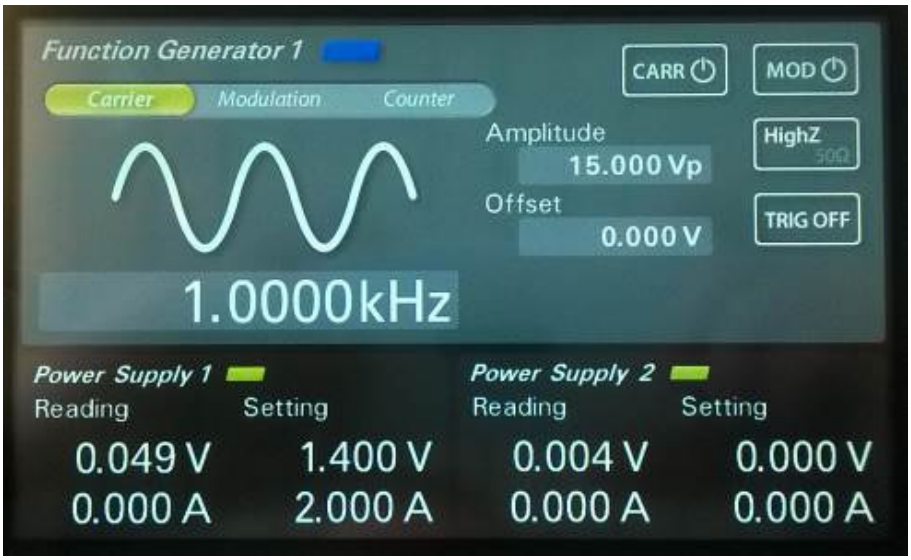



**Figure 19-1 Function Generator Modulation Carrier Signal**

## 19.2 Modulation (useful signal)

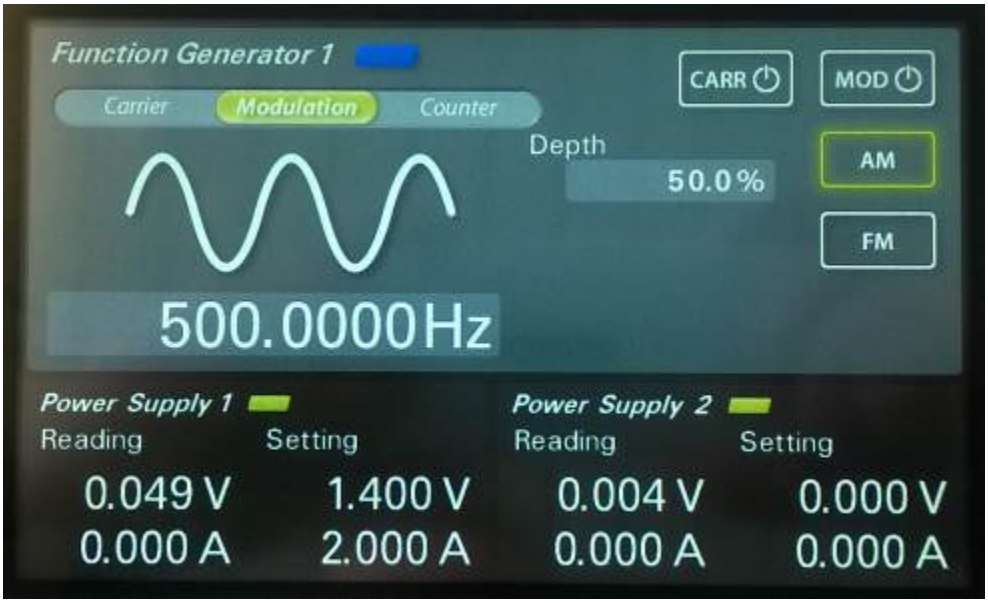



**Figure 19-2 Function Generator Modulation Useful Signal**

Set the waveform: Tap the currently displayed waveform. Six keypads appear on the right edge of the display. Now the desired signal form can be selected.
- Sine / rectangle / triangle / sawtooth / trapezoid.

Set the frequency: Tap the currently set frequency. The keypad opens. Enter the desired frequency and confirm with OK. In addition, the frequency can be changed with the 3D wheel.

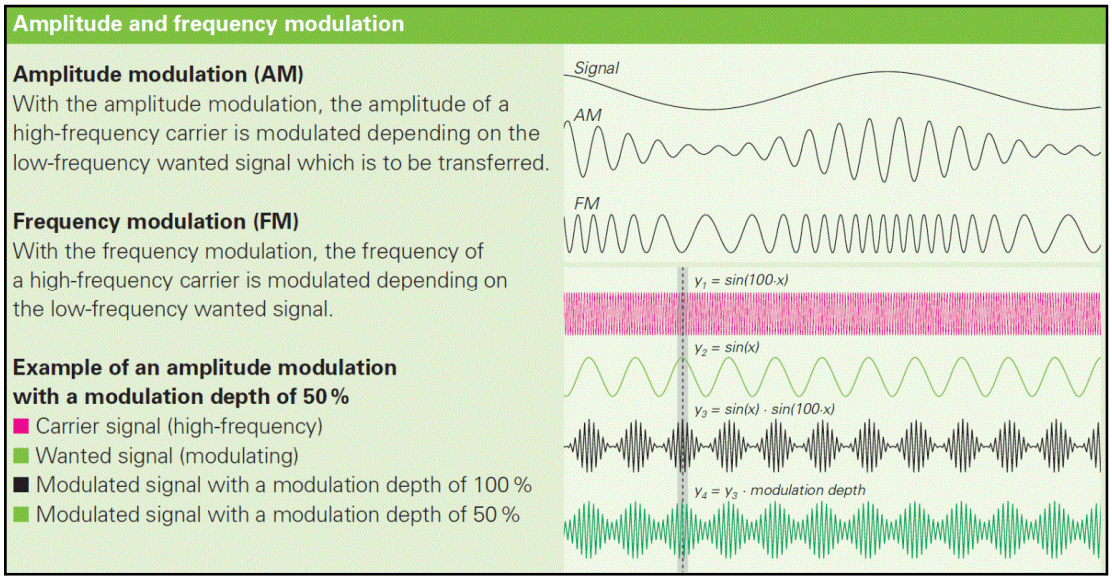



**Figure 19-3 Modulation Types**

## 19.3 Occupancy of BNC sockets


**Figure 19-4 elneos six Occupancy BNC Sockets (1)**

OUT:Carrier: Adjustment of frequency, amplitude and offset . The output impedance can be switched to either 50Ω or "HighZ" (high impedance).

Modulation: Adjustment of frequency, amplitude and modulation depth. Modulation type - frequency or amplitude modulation. This signal is modulated to the carrier signal.

**TTL:** The TTL output is always connected parallel to the carrier output.
The TTL signal is processed at the set frequency.

**External trigger**:
With this function, the output of the function generator can be switched on or off from an external device.
If the external trigger is in the OFF position, this feature is disabled.

**External trigger:**
**"TRIG":** ⌐¬ The output of the frequency generator is active when the setting on the trigger input +5V DC (high-signal). At 0V (low signal), the output is inactive.

**"TRIG":** ⌐ The output of the frequency generator is active when the setting on the trigger input 0V DC (low signal). At +5V (high signal) the output is inactive.

**Counter:** The counter allows the display of the frequency and period duration of different waveforms.

With an amplitude of less than 300mV, it is necessary to switch to DC. 50% of the measured amplitude must be adjusted during the level adjustment. This concerns signals with low ramp steepness (e.B. sine / triangle).

# 20 DC-precision-controlled power supplies

The control power supplies are a comprehensive innovation with the highest demands on accuracy, dynamics and quality. A powerful proprietary microprocessor system on the control card enables autonomous operation, independent of the control center's main processing system.
On the STANDARD tab (1), the output voltage (2) and output current (3) are set using either the mini keyboard or the slider (4.5).


Figure 20-1 elneos six signal power supply STANDARD parameter

With the button (6) the output can be switched. The actual load value for voltage and current is then displayed on the green display (7.8).

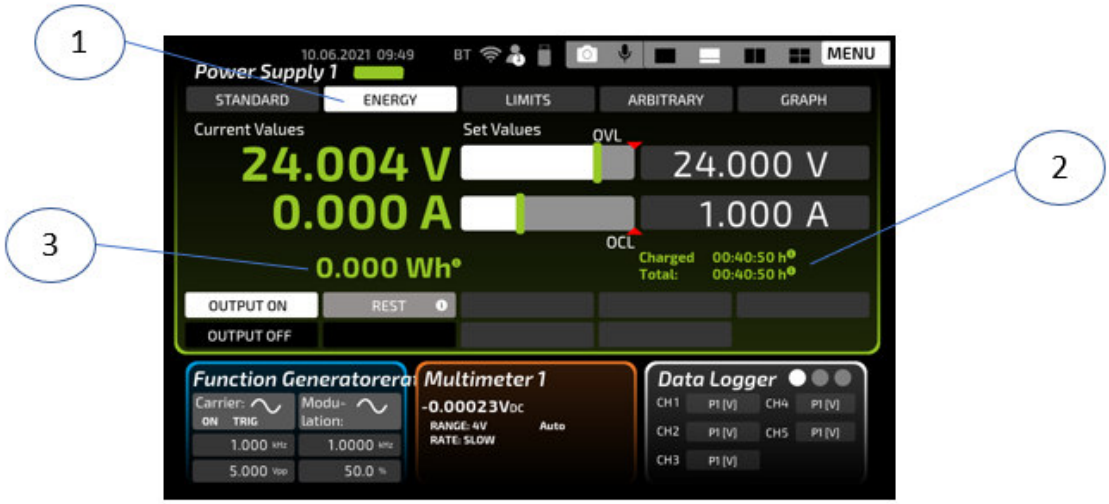



**Figure 20-2 elneos six Signal power supply ENERGY parameter**

On the ENERGY (1) tab, the unit is changed from [W] to [Wh](3) and at the same time the effective charging time over the entire period is displayed (2).

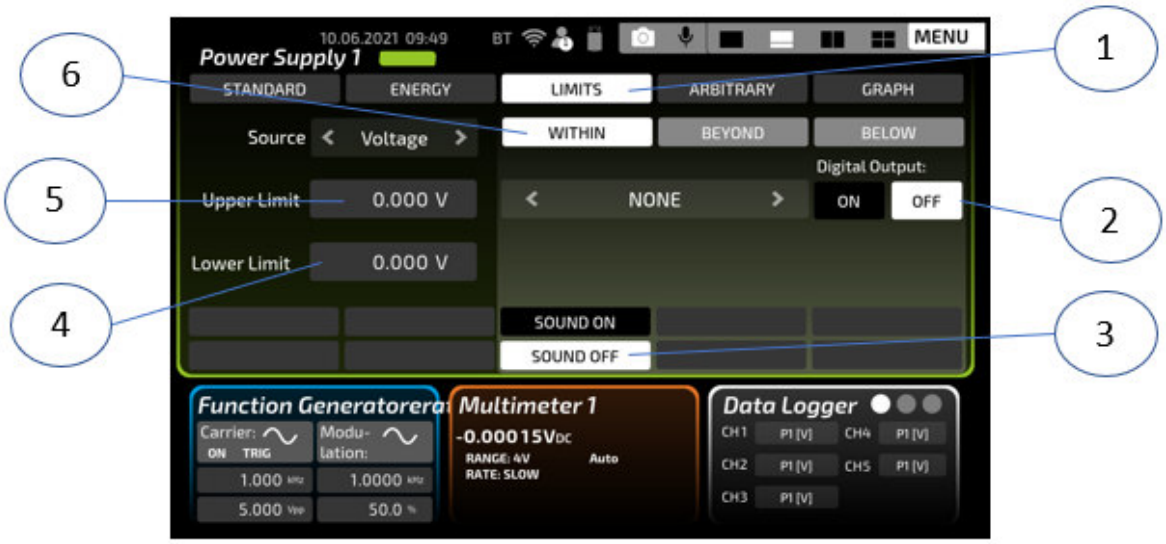



**Figure 20-3 elneos six Signal Power Supply LIMITS Parameters**

The LIMITS tab (1) allows you to set a lower and upper limit value (4.5), when reached, an acoustic signal (3) and the setting of a digital output (2) can be output. Furthermore, it can be selected whether a signal should be output when reaching, falling below or exceeding (6) these values.

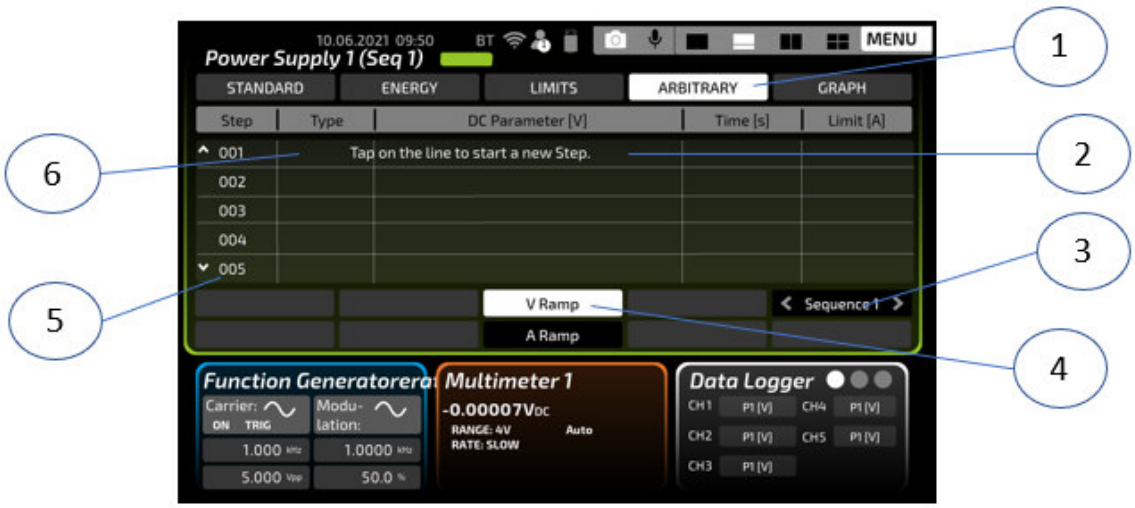



**Figure 20-4 elneos six Signalnetzteil ARBITRARY Parameter**

On any index card (1), different waveforms (6) sine, sawtooth, rectangle and others, even with different DC parameters, can be defined step by step (2) (5). Optionally, this can be a special voltage form or a special current curve (4) that has a certain duration and size.


**Figure 20-5 six Signal Power Supply GRAPH Parameter**

The LIMITS tab (1) allows the controlled (3) graphical recording of the output variables voltage and current (2).

# 21 Signal arbitrary generator

This device represents the latest state of the art in the field of arbitrary technology and at the same time includes all the functions of the function generator and the meter.

Any waveforms can be transferred to the internal memory via remote control. Signalforms recorded with an oscilloscope can be transferred to the highlink elneos software and, after transformation, directly to the arbitrary generator.


**Figure 21-1 elneos six Signal Arbitrary Generator**

Arbitrary functionality: Any two curve shapes can be transferred and selected and stored in the device memory with 4,096 sampling points each.

The desired signal form with a maximum of 4000 voltage values / period can be loaded into the device. The frequency can be entered either manually on the display or by telecontrol command. Up to 10 waveforms can be stored in the device's buffer.
Signal form 1 is stored non-volatilely, i.e. it is retained even when the device is switched off.

With the help of highlink elneos, signal forms can be loaded into the memory of the elneos device.

- Launch of highlink elneos
- Devices are automatically scanned
- Select device
- Calling the Function Generator
- Create new chart / Open existing chart
- The input signal form is displayed under the Graph tab

Settings:

- Select Memory (Memory 1 ... Memory 10)
- Clear storage
- Submit data
- Save the signal form in the elneos six device

Table:


**Figure 21-2 Arbiträr Generator Table**

Graph:


Carrier
Signalform
Sinus
Amplitude
1,000
V
DC Offset
0,000
V
Frequenzbereich
Hz
Frequenz
5,0000
Hz
Output on/off
OFF
%
Einstellen
Tabelle
Grafik
Tabelle
Öffnen
Speichern
neu
Setting
Speicher 1
Senden
Speichern
Löschen

# 22 Protective

Placing three fingers on the display activates the protection function.
A lock appears on the display and the ON/OFF button oscillates red.
The elneos six device switches all integrated devices to the ground state. All output voltages and frequencies are reset immediately.


**Figure 22-1 Protection Function**

Disabling the locking function: Pressing the "OK" button for 5 seconds will turn off the lock.

# 23 Locking Function

If you place all five fingers on the display, the lock function will be activated.
A lock appears on the display and the ON / OFF button oscillates red.
The output states and settings are retained.

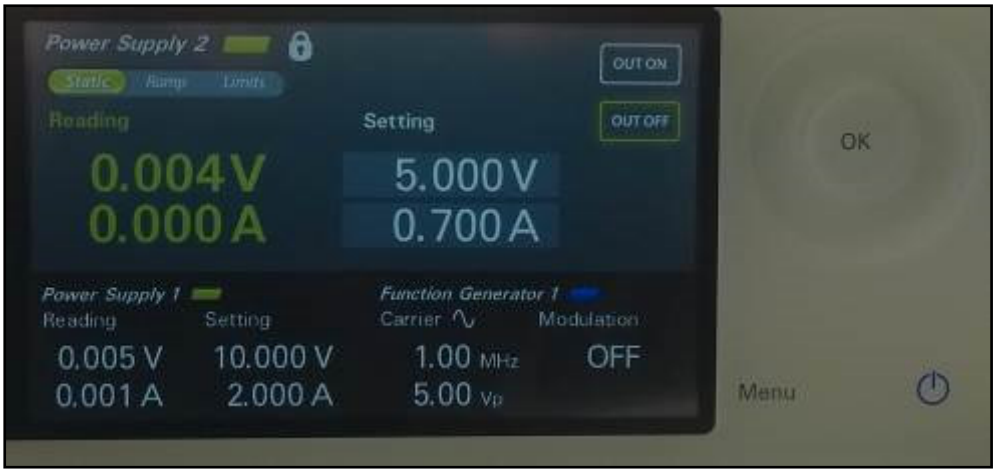



**Figure 23-1 Locking Function**

Disabling the locking function: Pressing the "OK" button for 5 seconds will turn off the lock.

# 24 Interfaces

In the delivery state, the control center from elneos is equipped with an Ethernet and a USB interface.

**Figure 24-1 Device Interfaces**

The USB interface is activated by the manufacturer. Press the "Menu" button for 10 seconds to choose a different interface.

# 25 Commands Remote Control

Adjustments of the interface USB port:

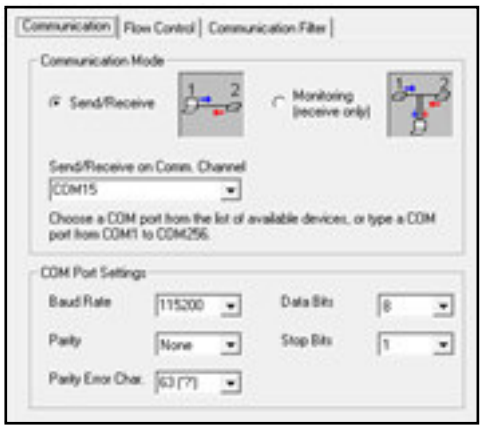
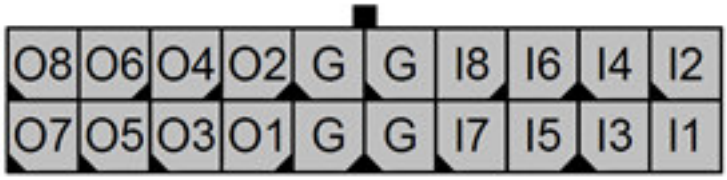



**Figure 25-1 USB Port Setting**

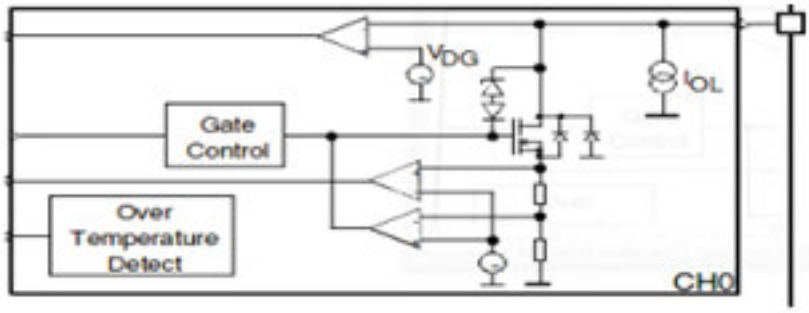
# 26 Digital inputs and outputs

On the board of the telecontrol device there are 8 freely programmable digital inputs and outputs (low side). They can be set and read out via the telecontrol commands.

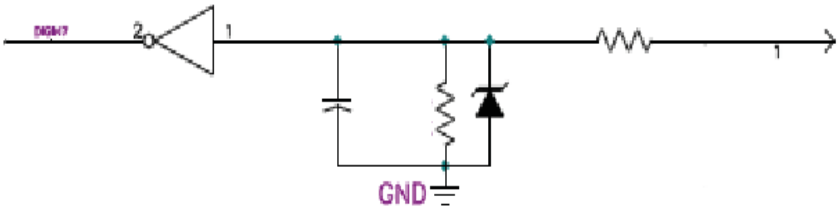
Connection assignment: WR-MPC3 - 20pin (front view)




Mating connector: Messrs. Würth Elektronik WR-MPC3 - 20pol




OUT 1-8
Low Side
5... 24V
protected
GND-ref




IN 1-8
5... 24V
protected
GND-ref

# 27 Cleaning glass pane

No special care is required for cleaning. To clean the surface, use a soft cloth that is lightly moistened with glass cleaner. If the glass is to be cleaned when the device is switched on, the locking function should be activated to avoid incorrect insertion (see locking function).

# 28 Specifications

## 28.1 Digital multimeter

**Technical data and features**

Display: 5 3/4 digits, display range 40,000 points voltage measurement
DC: 0 bis 1000 V; 1 µV; ± 0,08% + 5 dgt.
AC: 0 to 750 V (peak 1060 V); 1 µV; ± 0.5% +10 dgt,
Bandwidth 20 Hz to 2 kH
Strommessung
DC: up to 32 A continuous current (short-term up to 40 A),
100 nA; ± 0,15% + 5 dgt.
AC: up to 32 A continuous current (short-term up to 40 A),
100 nA; ± 0.8% +10 dgt., bandwidth 20 Hz to 2 kHz
Widerstandsmessung
0 to 40 MΩ, 1 mΩ; ± 0.5% +10 dgt.
Kapazitätsmessung
0 to 400 nF / 4/40/400/4000 µF
1 pF; ± 1,0% + 10 dgt
Measurement of frequency
0 to 100 kHz, 1 Hz; ± 0.1% +10 dgt
high resolution: lower measuring speed
Temperature measurement
- 200 to + 600 °C, depending on the sensor, resolution 0.1 °C

Measurement accuracy
Class B according to EN 60751; Pt 100 sensor or Pt 1000
Sensor can be connected (automatic detection)
Messgeschwindigkeit
DC: Fast (10 Hz), Medium (5 Hz), Slow (1 Hz)
AC: Slow (1 Hz)
True RMS function: True RMS measurement
For all measured variables: AUTO RANGE

## 28.2 Power and energy meters

**Technical data and features:**

Display: Simultaneous display of U and I on one screen for all power and power values
Efficacy –
24 kW to + 24 kW at 750 V AC - 7.5 kW to + 7.5 kW at 230 V AC, (short-term 9.2 kW) Accuracy: ± 0.2% +10 dgt
Scheinleistung
0 to 24 kVA at 750 V AC
- 7.5 kVA to + 7.5 kVA at 230 V AC, (short-term 9.2 kVA)
Accuracy: ± 0.4% +10 dgt
Reactive power
- 24 left bis + 24 left bei 750 V AC
- 7.5 left bis +7.5 left bei 230 V AC, (kurzzeitig 9.2 left)
Accuracy: ± 0.2% +10 dgt
Technical data and characteristics of standard equipment
Wirkenergie
- 24 kWh to + 24 kWh at 750 V AC
- 7.5 kWh to + 7.5 kWh at 230 V AC, (short-term 9.2 kWh)
Accuracy: ± 0.2% +10 dgt
Apparent energy
0 to 24 kVAh at 750 V AC
0 to 7.5 kVAh at 230 kV AC, (short-term 9.2 kVAh)
Accuracy: ± 0.4% +10 dgt
Blindenergie
- 24 kvarh to + 24 kvarh at 750 V AC
- 7.5 kvarh to + 7.5 kvarh at 230 VAC, (short-term 9.2 kvarh)
Accuracy: ± 0.2% +10 dgt
Exit
If the measured values are exceeded or undercut, a
digital output triggered.
Entrance
Start of the measurement by trigger pulse of the input
(Flankensteuerung).
Data logger
The 5-channel operation allows the storage of 20,000 measured values per channel. The values are graphically retrievable and readable.
Display of measured values
X and Y graphics can be scaled with a 2-finger gesture. Ideal for recording changes (long-term measurement).

Power factor
cos phi from - 1 to + 1 and angle display!
current (AC / DC): 32 A, (short-term 40 A)

voltage (AC): 750 V

Voltage (DC): 1000 V
Crest factor: for voltage and for current
For all measured variables: AUTO RANGE
Limit values: all measured value limits can be programmed

## 28.3 Function generator

Technical data and features:

Technical Data and Features - Function Generators
Modulation
- Freely programmable modulation based on two integrated function generators
- Freely programmable carrier signal generator 1
- Freely programmable useful signal (modulation) generator 2
- All waveforms, frequencies, amplitudes, etc. are freely available.

Modulation depth 0 to 100%
0% modulation depth: With AM, the modulated signal reaches the maximum
Point the amplitude of the carrier signal. The amplitude level of the carrier signal is determined accordingly depending on the useful signal.
With FM, the modulated signal reaches the frequency of the carrier signal at the maximum point. The frequency spectrum of the carrier signal is changed according to the useful signal.
With PWM, the modulated signal reaches the duty cycle 1 as the maximum point. The duty cycle is changed according to the useful signal from 0 to 1.

x% Modulationstiefe:
With AM, the amplitude of the modulated signal is reduced as a percentage. With FM, the frequency of the modulated signal is reduced by percentage. With PWM, the duty cycle of the modulated signal is reduced by percentage.

Duty cycle: 0.1 to 99.9%

Types of modulation (carrier and useful signal):
- Amplitude modulation (Amplitude Modulation-AM)
- Frequency modulation (frequency modulation FM)
- Pulsbreitenmodulation (Pulsbreitenmodulation-PWM)
- Amplitudenumtastung-ASK
- Frequenzumtastung (FSK)
- Impulsbreitenumtastung (PSK)
- Wobbelmodulation (special form of FM)

Einstellbereiche
Frequency: 100 mHz to 40 MHz !, resolution 1 µHz
Amplitude: 0 to 30 Vss ± 0.5 dB + 1 mV of the entered value
Duty cycle rectangle: 0 to 100% in 0.1% increments
Offset: 0 to ± 15,000 V.

Frequenzkennlinien
Sine: 1 µHz to 40 MHz!
Trapezoidal: 1 µHz to 5 MHz
Ramp: 1 µHz to 5 MHz
Triangle: 1 µHz to 5 MHz
Sawtooth: 1 µHz to 5 MHz
Rectangle: 1 µHz to 5 MHz

Frequenzzähler
Measuring range: 150 MHz, optional up to 1.5 GHz
Input voltage: 100 mVeff to 5 Vrms

Frequency Sources
Two independently programmable
function generators; an external source and a
internal source for modulation

Amplitude
Resolution for all waveforms: 14 bit (16,384)
Output: 30 Vss, 50 Ω from 0-20 MHz, 1.8 mV resolution
Output: 20 Vss, 50 Ω from 0-40 MHz, 1.2 mV resolution

Triggerimpulse
External: via BNC socket
Internal: via menu for defined signal start

Distortion factor
Sine wave: 0 MHz to 1 MHz <1%
Sine wave: 1 MHz to 20 MHz <5%
Sine: 20 MHz to 40 MHz <6%

Impulses
Single pulse: Single and multiple pulses up to 999 s
Burst operation freely programmable via parameters:
Pulse and pause times: up to 999 s
Number of repetitions: 1 to ∞.

Entrance
Illuminated BNC laboratory sockets with disappear effect
Input: Counter input ext. Input signals up to 150 MHz
(optional up to 1.5 GHz: Order no. EL6. F1G)
Input: Trigger input for a defined signal start
Eingangsempfindlichkeit: 100 mVeff

Exit
Illuminated BNC laboratory sockets with disappear effect
Output: up to 30 Vss idle
Output: 5 V TTL compatible

## 28.4 Fast Arbitrary Signal Generators

**Technical data and features:**

**Frequenzkennlinien**
**Sine: 1 µHz to 40MHz! Triangle: 1 µHz to 5 MHz Trapezoidal: 1 µHz to 5MHz Sawtooth: 1 µHz to 5 MHz**
**Ramp: 1 µHz to 5MHz Rectangle: 1 µHz to 5MHz**
**Arbitrary: 1 µHz to 5 MHz, 2 memory slots, up to a maximum of 8,192 sampling points**
**Frequenzquellen**
**two independently programmable function generators;**
**Frequenzzähler**
**Measuring range: 150 MHz, optional up to 1.5 GHz (order no. EL5. F1G) Input voltage: 100 mVeff to 5 Vrms**
**Amplitude**
**Resolution for all waveforms: 14 bit (16,384) Output amplitude: 30 Vss idle, 1.8 mV resolution**
**Technical data and features**
**Entrance**
**Illuminated BNC laboratory sockets with disappear effect**
**Input: Counter input ext. Input signals up to 1.5 GHz**
**Input: Trigger input for a defined signal start**
**Eingangsempfindlichkeit: 100 mVeff**
**Exit**
**Illuminated BNC laboratory sockets with disappear effect**
**Output: up to 30 Vss idle / 5 V TTL compatible**
**Trigger-Impulse**
**External: via BNC socket; Internal: via menu for defined signal start**
**Impulses**
**Single pulse: Single and multiple pulses up to 999 s**
**Burst operation freely programmable via parameters:**
**Pulse and pause times: up to 999 s**
**Number of repetitions: 1 to ∞ oo**

## 28.5 Data logger

**Technical data and features:**
**Graphic display of measured values**
The saved measured values as well as all current ones Measured values can be quickly displayed in X and Y graphs can be visualized on the large 8 “multi-touch display.
Using the 2-finger gesture control, you can Graphics are spread.
Up to 5 measurement curves of different devices at the same time represent, e.g. :
Curve 1: voltage of power supply unit 1
Curve 2: voltage of power supply unit 2
Curve 3: Temperature digital multimeter 1

Curve 4: Temperature digital multimeter 2
Curve 5: Active power power meter

**Synchronous real-time measurement**
The fully automatic and simultaneous acquisition of up to 4 measured variables through an integrated 5-channel real-time measurement module enables storage of up to 20,000 measured values each.
Recordings: one-time processing of a ramp or towards infinity Trigger: manually or by an external trigger signal on the digital input
Log rate: 0.1s to 60 seconds adjustable
Time display:
• the available recording time
• the recording time used
• the still available recording time

## 28.6 DC-powersupplies

**Technical data and features:**

**Editable ramp function on the 8" display**
**Direct, convenient input of ramp parameters on the large 8" display. Input of:**
**1. Voltage ramps with current limitation**
**2. Current ramps with voltage limitation**
**Preselection function (output OFF/ON) function to turn the output on or off. Is**
**If the output is disabled, the maximum current can be changed. After switching on the output, the new maximum current value is active - the switching must or can no longer be manually disconnected from the power supply.**
**Reading of all device states**
**All device states can be read out with the help of the interfaces. The states are displayed directly in the Highlink Power control software. This query option can also be used very sensibly in the field of test systems.**
**Constant voltage and constant current source**
**Automatic change of operating modes CV and CC - elneos six serves both as a voltage source and as a power source. These properties enable the generation of voltage and current ramps.**
**Einstellgenauigkeit**
**16 bit D/A converter (1mV, 1mA); Voltage ranges 0-30 V (depending on model);**
**Temperaturkoeffizient**
**Voltage: 0.002%/K**
**Tree: 0.008%/K;**
**Restwelligkeit**
**Voltage: 100 µVeff**
**Current: 200 µAeff;**
**Integrated square wave generator up to 1 kHz with resistive load;**
**Measurement accuracy 24 bit A/D converter (1mV, 1mA);**
**Current ranges NEC CLASS2, 1-3 A (depending on model);**
**Regelabweichung 1**
**Voltage: 300µV/A,**
**Current: 150 µA/ V (with load change 0-100%);**
**Regelabweichung 2**

Voltage and current: <0.01% (when changing the grid 10%);
Stepped pre-regulation
New software-controlled winding switching with
minimal heat generation;
Einschwingzeit
12 µs Lastsprung 0-100%

# 30 General technical data

***: All data apply at + 23 ° C after 30 minutes of warm-up time**

erfi Hygienic: The new benchmark in terms of hygiene:

The new device system elneos six with the new and contactless operating concept through 3-D gestures, its integrated voice control and the new comprehensive glass device fronts made of specially etched ESG glass with an antiviral-bacterial surface across the entire width of the workplace, effectively protects the user against viruses and Bacteria. The surface structure prevents the accumulation of viruses and bacteria.

The revolutionary contact-free operation through 3-D gestures and voice control significantly reduces touch contact.

A valuable contribution to health. The glass is a special development and is superior to any standard display glass in terms of hygiene, stability and scratch resistance.

**Glass fronts control center, additional modules, connection panels and operating elements**

Description:

Front glass

- Ceramic printed on the back with a disappearing effect
- 3 mm toughened safety glass
- antiviral and antibacterial special glass surface erfi hygienic

Detailed explanation:

The new hygiene standard: erfi Hygienic

Continuous, uninterrupted glass appliance front

- Special etched ESG front glass for all device groups, additional operating elements and slide-in units
- AC sources additionally equipped with intelligently illuminated function labels and a disappearing effect
- Additional glass control elements with backlit glass device front with disappearing effect:
    - second capacitive 3-D wheel
    - two more manual rotary encoders
- Further additional glass fronts:
    - High-current sockets on the front for power supply units and high-current digital multi-meters up to 125 A.
    - Device interfaces on the front such as LAN, USB A + B, digital I / Os
    - Additional drawers for further devices (slaves) including ring socket lighting with disappearing effect

A continuous glass appliance front ensures an exceptionally beautiful, uninterrupted operation and functional surface with the following properties:

- Antiviral and antibacterial, viruses and bacteria have very little chance of survival on the special surface
- Continuously closed glass surfaces across the entire width of the workplace
- vandal-proof
- impact, scratch and break resistant
- Anti-fingerprint surface (permanent), fingerprints are largely prevented
- Lettering is 100% abrasion-resistant thanks to printing behind the glass

- Function labeling for AC sources with a disappearing effect
  L1, L2, L3, N, PE, floating, +/-
- high-resolution writing, behind glass printing
- lifelong high quality look
- Triple glazing in the display area for maximum impact protection
- Loock in mint condition for life
- Haptically very high quality sensation when touched through special etching

**Alternative Aluminum front panel design,**
excluding control centers (always glass front)
- for all device groups in additional racks and insert plates of the device series basic and acto
- for all additional controls

Size: large control center elneos six with 8 "display"
- height 3 U, width 63 HP optionally with installation depth 160 mm (order no. EL6.1.185) or 220 mm (order no. EL6.1.360) "

Size: small control center elneos six compact with 7 "display"
- height 113 mm, width 56 TE suitable for installation in the vertical and horizontal Expand 2 profile of the elneos connect furniture system "

"Size: additional racks and insert plates Glass fronts and aluminum front panels of the 19 "" device series basic ""
- height 3 U and 6 U, different widths [TE] suitable for installation in 19 "" device kokpits, 19 "" superstructures and TechCubes "

Size: Insert plates of the acto "device series
- height 113 mm, different widths [TE] suitable for installation in the vertical and horizontal Expand 2 profile of the elneos connect furniture system "

**Illuminated test object connections with disappearing effect**

**DUT connections control center EL6.1**
- Ring socket lighting
- Disappearance effect
- 4 mm laboratory sockets
- BNC sockets

up to 8 laboratory sockets and 4 BNC sockets with 12 oval ring socket lights with disappearing effect for up to
- 4 power supplies
  or
- 3 power supplies and 1 dual function generator
  or
- 2 power supplies, 1 digital multimeter and 1 dual function generator

**"DUT connections control center EL6.1C**
- Ring socket lighting
- Disappearance effect
- 4 mm laboratory sockets
- BNC sockets ""

up to 6 laboratory sockets and 4 BNC sockets with 10 vertical / horizontal socket lights with disappearing effect for up to
- 3 power supplies

or
- 2 power supplies and 1 dual function generator

or
- 1 power supply unit, 1 digital multimeter and 1 dual function generator

"

**"DUT connections for further devices in additional plug-in units (glass fronts)**
- Ring socket lighting
- Disappearance effect
- 4 mm laboratory sockets
- BNC sockets ""

Other power modules such as DC power packs, multimeters, power meters and function generators, which due to their size and number can no longer be accommodated in the control center, are outsourced to additional modules.
These are optionally integrated in device superstructures or cockpits or in TechCubes below the table tops.
All laboratory and BNC sockets with oval ring socket lighting with fading effect.
Alternatively, the additional plug-in units are available in the aluminum front panel design of the basic device series.
(see ordering information) "

**"DUT connections for AC sources in additional plug-in units (glass fronts)**
- Ring socket lighting with functional labeling and disappearing effect
- 4 mm laboratory sockets
- Sockets for 1- and 3-phase, earth-bound and ungrounded test items "" - up to 7 laboratory sockets with function labels in the glass including the disappearing effect.
- Labeling in the glass with: L1, L2, L3, N, PE, floating and +/- for rectified alternating voltages "

**Security flashing function:**

"With a large control center elneos six EL6.1:
oval ring socket lighting per socket
With a small control center elneos six compact EL6.1C:
Bar socket lighting (vertical / horizontal) per socket
For DC power supplies:
- at voltage zero crossing: white flashing
- in normal operation: blue / red (- / +)
- with double power supplies: Copmfort function with serial / parallel operating mode: purple / light blue "

"For AC sources:

- Ready-to-switch function: colored flashing with change of colors
between white and the respective socket color. "
"at DMM:
- when changing the measuring function: laboratory sockets to be contacted
flash briefly in the respective color. "
"with dual function generator:
- for modulation with a 2nd internal source: change from green to yellow "

**Capacitive multi-touch displays**

**"Capacitive 8" "multi-touch display**

for large control center elneos six EL6.1
erfi Hygienic "" - outstanding hygienic properties due to special glass front
- 5-finger multi-touch
- Resolution: 800 x 1280 pixels, Active Area: 172 x 107 mm
- Display color: 16.7 M, viewing angle: 85 °
- Screen saver function can be activated
- Very fast response time, very pleasant to the touch "

**"Capacitive 7" "multi-touch display**

for small control center elneos six compact EL6.1C
erfi Hygienic "" - hygienically outstanding property through glass front
- 5-finger multi-touch
- Resolution: 720 x 1280 pixels, Active Area: 155 x 87 mm
- Display color: 16.7 M, viewing angle: 89 °
- Installation position: horizontally and vertically possible
- Display aligned accordingly
- Screen saver function can be activated
- Very fast response time, very pleasant to the touch "

**"Gesture functions display (touch gestures)**

erfi Hygienic "" - 1-finger gesture:
SMART SCROLL effect: slide effect for every screen display (1 to 4)
The devices slide elegantly and smoothly in the Smartscroll device bar
along the bottom of the screen and can be swiped upwards
can be placed at any position on the screen.
In addition, graphs and tables of values can be scrolled.
Devices that have already been placed can be moved to the desired position as required.
- 2-finger gesture:
Zoom graph in XY direction
- 3-finger gesture:
Safeguard = immediate shutdown of all power outputs
- 5-finger gesture:
Display lock "

**"Variable display:**

The user can choose between 4 different display views.

**"" Selectable screen views:**

- Full screen (1 device visible and operable)
- Halfscreen (2 devices visible and can be operated at the same time)
- 2/3 screen (3 devices visible and can be operated at the same time)
- Quattro-Screen (4 devices visible and can be operated at the same time)

**Quickdevice function:**
Simultaneous operation of up to 4 devices on one display,
without prior device selection.
Positions 1 to 4 (module area) of the respective device can be freely assigned on the screen.
Smartscroll device bar at the bottom of the screen can be used in all 4 screen views.
Note on 2/3 screen:
In connection with the connection panel, up to 10 devices can be viewed at the same time with this screen setting. "

**"Tactile feedback for display surface (Option order no. EL6.1.HW)**
Note:
1. With this option, the rotations are made on the 3-D wheel
   additionally supported with tactile feedback.
2. This function is only available for the large control center elneos six EL6.1.

"" The option gives the user real feedback through vibration
its actions in the area of all functional surfaces on the display (slider and buttons) as well as on the capacitive 3-D wheel.
This increases the ease of use and safety again considerably.
A high-quality, unbalanced electric motor transmits the vibration to the display front and
simulates the grid of the respective control element. (Display or wheel)
At the same time, an acoustic click (in conjunction with the "Hey erfi" speaker package) amplifies the haptic effect, so that the feeling of a mechanical rotary encoder is simulated. "

**"Connection panel**
with actual value display
"" The connection panel is displayed by swiping from left to right.
The connection panel shows exactly the connection position of all device outputs and inputs.
The user is safely guided to the correct connection socket by means of graphic support.
The color indexing of the ring sockets is also displayed in the connection panel.

**The highlight:**
The actual values of the devices are displayed directly in the connection panel and thus ensure the possibility of using the remaining screen to display additional devices.
The connection panel can be used as a compact display and thus creates space for further tasks and even more overview and control. "

**"dynamic screen adjustment**
When displaying
- Connection panel

and
- Menu selection functions
"" When the connection panel and the menu selection functions are displayed, the screen is automatically scaled to the correct size without obscuring existing device displays.
With this function, all device functions can be operated and read at any time.
This means that when the connection panel is faded in, other devices are also shown in the rest of the display, thus increasing the number of devices that are visible at the same time.
(max. 10 actual device values visible on one screen at the same time)
All actual values are displayed in parallel in the connection panel.

When the menu functions are displayed, the full functionality of the device is retained.
"

**"Remote Features Screen**
"" The display can be darkened or blocked by remote control.
ON / OFF: off or Switching on the display
Locking: the surface of the display is locked or released (clean and protect function)
Ideal for training facilities and long-term experiments! "

**capacitive input sensors - wear-free**

**"Capacitive on-off sensor**
with backlit fingertip grind and disappearing effect
erfi Hygienic ""
- for increased safety and wear-free switching function
- backlit with colored safety indicators
- Ready to switch on: white pulses
- On function: permanent green light
- Safeguard function: red pulses (3-finger grip quick shutdown)
- Locking: blue pulsing (5-finger grip: locking for long-term tests and cleaning)
- Calibration mode: red, yellow, white, blue pulsing
- The fingertip grind increases safety because you don't accidentally switch it on or off. "

**"Capacitive wheel**
with backlit o.k. Confirmation sensor and disappearance effect
erfi Hygienic "" - capacitive input unit
- Planar ground wheel
- allows fast and highly precise value input with up to 3 digits after the decimal point
- can be operated with fingertip for the first time
- 100% wear-free and superior to any mechanical input unit
- 100% security against vandalism and no accidental getting stuck or breaking as with conventional ones
Rotary encoders possible. "

**"Airwheel with 3-D gesture function**
contactless input and control electronics
erfi hygienic
Hints:
1. Included in the standard scope of the large control center elneos six EL6.1.

2. This function is available on the small control center elneos six compact EL6.1C
not available.
3. Ideal in connection with the voice control function "" Hey erfi "" EL6. SP1.
4. 3-D Airheel function can be activated or deactivated in the menu at any time. ""

The innovative Airheel allows 3-D gestures and thus offers a complete system for the first time contactless operation of all device functions.
- for a hygienically clean and even faster, more convenient and safe value and device setting
- up to a distance of approx. 5 cm

The device can be controlled completely contactless with just a few 3-D gestures.
A revolution in device operation! You don't have to touch the device at any time.
3-D gestures:
- circling finger:
  - Scroll through all menu functions within a very short time
  - Value setting (simulation of capacitive wheel in the air)
  - Zoom in / out of graphs
- stationary finger:
  - After 1 second standstill, you automatically go one level lower
    or in the area of the value setting
- horizontal swiping movement with hand:
  - Smart scroll of the device bar,
  - scroll graphs,
  - Digit selection
- vertical swiping movement with hand:
  - scrolling tables,
  - change values (up + and down -)
- Move hand on device:
  - Wake up the device from sleep mode / screen saver
- Holding movement of the hand:
  - Locking the display by second approach "

**"Tactile feedback for capacitive wheel**
Option order no. EL6.1.HW
Note:
This function is only available for the large elneos six EL6.1 control center. ""
When touching the capacitive wheel, the user receives haptic feedback like a rotary encoder.
(Latching function)
A high-quality, unbalanced electric motor transfers the vibration to the respective capacitive wheel.
(1 and the 2) "

**"Additional input module**
2. Wheel
Option order no. EL6. ZG001
erfi Hygienic ""

A second, independent capacitive wheel allows simultaneous operation by several grooves.
It is another glass front with identical properties as the wheel in the control center.
It is equipped as standard with the 3-D Airwheel function and optionally with tactile feedback.
Connected to the control center via e-bus.
Positioning at any point in the 19 "" table structure or 19 "" device cockpit for optimal assignment to the user "

**"Additional input module**
1 mechanical rotary encoder (not capacitive)
alternatively
2 mechanical rotary encoders (not capacitive)
Option order no. EL6. ZG003
in addition to the standard 3-D wheel
"" This additional input module allows simultaneous operation by several grooves.
It is a further glass front with 1 or 2 rotary encoders including a print function.
Connected to the control center via e-bus.
Any positioning and ideally assigned to the respective user.
For users who want the modern device technology from elneos six with a conventional
Want to connect input technology. "

**"Smartscroll device bar**
works with all screen views
- Full screen (1 device visible and operable)
- Halfscreen (2 devices visible and can be operated at the same time)
- 2/3 screen (3 devices visible and can be operated at the same time)
- Quattro-Screen (4 devices visible and simultaneously operable) "" At the bottom of the screen there is always a movable device bar with all device names.
This enables instant access to any device.
In the Smartscroll device bar, you can scroll horizontally around the desired device
or to select the data logger.
The selected device can be moved to the desired location by simply swiping hte screen position can be freely placed. "

**<u>Voice control with voice output function "Hey erfi!"</u>**
**"Option order no. EL6. SP1**
Intuitive offline voice control and voice output module.
Enables voice-controlled remote control of the basic device functions as well as voice output for measured values and instructions.
Internal audio process: "" Convert speech to text to command "" and
"" Convert value / instruction to speach ""
erfi hygienic

Note:
Ideally complements the standard 3-D Airwheel of the large one Control center EL6.1. ""

For all device groups (DC power supplies, digital multimeters, power meters, function generators, AC sources.
Fully functional without internet thanks to integrated speech recognition software (erfi in-house development), quick evaluation and implementation of spoken commands.
Additional hardware included:
- 2 built-in special microphones
- 1 audio amplifier
- 1 high quality loudspeaker for speech output
With the voice output, for example, the current measured values or user instructions are read out. The user keeps his hands free for other important operations and his eyes on the circuit or the oscilloscope.
In addition, acoustic support for the wheel and air wheel through appropriate clicks. The device is also able to provide appropriate assistance. High quality audio files support the user when connecting the Test object and while a measurement is being carried out!
Examples:
"" Please connect cables to the sockets that are now flashing! ""
"" Warning limit exceeded! ""
Welcome text when switching on: "" Good morning Petra! ""

Activation by "" Push to Talk Button "" and alternatively by the spoken words "" Hey erfi! ""

Thanks to the "" contactless operation "", this additional function makes a decisive contribution to increasing operating safety, work productivity and hygiene . "

**Computer technology - industry standard - connectivity**

**"DUAL-CORE industrial computer**
**with fast booting Linux operating system (4 sec.)**
Note:
During the development, great emphasis was placed on boot optimization
placed in order to achieve quick availability after switching on. ""
Professional industrial computer
- Dual-core processor, 1 GHz per core
- Data storage: - for up to 100,000 measuring points (data logger)
- 512 MB Flash and 512 MB RAM
- for high end use
- designed for long-term and permanent measuring function
- 24 hours / 7 days - continuous operation
- vibration certified according to EN 60068-2-6: 2008
- shock certified according to EN 60068-2-27: 2009
- high temperature range: -20 ° C to + 85 ° C
- Long-term availability = safe investment in the future
- Well-known processor manufacturer with professional support "
"- with option erfi Speechaket" "Hey erfi!" "Order no. EL6.1SP1 additionally equipped with
- 2 microphone inputs for high-quality audio signal evaluation (voice control)
- Audio amplifier for voice output including loudspeakers

Ideal for automated and complex measuring tasks as well as for the school training company for increased safety (limit value monitoring and measured value announcement) as well as high hygiene in the workplace at the same time. "

**"Interfaces**
All remote functions with SCPI command sequences
Note:
Inventory drivers that are used in devices with SCPI commands, can continue to be used in connection with the elneos six device system can be used without expenses. ""
Radio interfaces:
- WLAN: for remote control of the device with mobile devices (SCPI command sequences)
- BT: for remote control of the device with mobile devices (SCPI command sequences)
- NFC: Near Field Connection
- for reading out valuable device data / information from the device to the smartphone / tablet
- to display the nameplate with S no., firmware no
- Calibration date, next due calibration date
- License key to enable additional device functions such as dual measurements with DMM etc.

wired interfaces:
- RJ 45: for remote control of the device (SCPI command sequences)
Optional interfaces:
- on the back of the device, order no. EL6.1.S1
- on the front of the device as a separate glass front, order no. EL6. ZG006_E
each:
- USB-A (for keyboard, mouse, scanner)
- USB-B for remote control of the device
- Trigger and control interface (PLC function) with
- 8 digital inputs, 10 digital outputs (see description of digital I / Os)
- Expandable to up to 16 additional inputs and 24 additional outputs "

**"Optional interfaces:**
- on the back of the device, order no. EL6.1.S1
- on the front of the device as a separate glass front, order no. EL6. ZG006_E
"" - USB A (for keyboard, mouse, scanner)
- USB B for remote control of the entire device
- Trigger and control interface (PLC function) with
8 digital inputs, 10 digital outputs (see description of digital I / Os)
- Expandable to up to 16 additional inputs and 24 additional outputs "

"**Digital I / Os: SPS / PLC function:**
ideally suited for automation and control tasks

Note: In the scope of delivery of the optional interfaces EL6.1.S1 and
EL6. ZG006_E included. "" - freely programmable digital inputs and outputs can be used in 3 different ways:
1. Control with the limiter / limit value monitoring (programmable on the display)

A measured value from DC, AC sources, digital multimeters or
Power meters can be monitored and thus a switching function can be linked.
A digital I / O with a corresponding active edge can be assigned to each value range.
Ideal in connection with the indication light of the furniture system elneos connect.

2. Remote control:
The digital inputs and outputs can be freely programmed using all interfaces using the SCPI command set.

3. Direct control: (programmable on the display)
Each output / input is freely programmable:
- All outputs are represented by actuatable buttons
- Free naming per button (e.g. light, motor, low / low voltage, up / down etc.)
- Choice between push-button or switching function
- Level selection: active high or active low or active high and low "

**Data logger with curve display (option EL6. DL)**

Suitable for simultaneous recording of up to 5 independent measured values Measured values from: control power supplies (linear), power supply units, 1- and 3- phase AC sources, digital multimeters and power meters 1- and 3-phase

**Large storage volume:**

"Synchronous real-time measurement
5-channel measuring module enables up to 20,000 measured values to be saved at a time
Total memory for up to 100,000 measured values "
"Recording function:
Number of cycles: 1 to infinity, recording of the time range
Trigger: manually or by an external trigger signal at the selectable digital input (0 to 7)
Log rate: 10 ms to 999 seconds adjustable
Memory depth: up to 20,000 measuring points per curve
Storage of the measured value files with alphanumeric file names, editable using the full display keyboard "
"Time display:
- available recording time
- used recording time
- still available recording time "

**Graphical recording function:**

"Autoscale Graph:
- Up to 5 measurement curves can be displayed at the same time. (color)
- Individual measurement curves can be selected
- X / Y zoom function through 2 finger gestures and 3-D gestures in all 4 displays (full, half 2/3, quattro screen)
- High quality curve display thanks to high resolution "

**Tabular recording:**

"The device records the measured values in tables.
- Measured value tables can be displayed and scrolled, also using 3-D gestures

- immediate data dump on USB stick "

**Measured values can be called up at any time (file system):**

"Saved measured value files can be:

- be loaded by the file names
- be presented in tabular and graphical form "

**Inrush current function**:

"When activated, the inrush current of the selected power supply unit is measured and recorded graphically and in tabular form. This useful function allows the inrush current to be checked at the moment of switch-on without an expensive laboratory setup.

The device takes over the trigger function. At the same time, the energy is stored when the device is switched on.

**Data export to USB stick:**

The measurement data can be saved directly to the USB stick

**Data export via remote:**

The measurement data can be read out via the LAN, USB-B, WLAN and BT interfaces.

**Screenshot via screen button:**

The current screen with the graph or a table of measured values can be saved as a screenshot and transferred to a USB stick. (Prerequisite: the Connectplantine was also ordered)

**Web server**

Web server with 1: 1 screen display "The original device user interface is displayed on every device (PC, laptop, tablet, smartphone)

and is independent of the operating system.

This means that the device can be conveniently controlled immediately in remote control mode without any training period.

Many device functions can be remotely controlled without installing software.

"

**Web browser**

Internet access with a fast web browser "The modern web browser shares the engine with Google Chrome and MS Edge.

It allows quick and complete access to the Internet.

Including editable address line in the browser and complete display keyboard for entering addresses.

Alternatively, a keyboard / mouse can be connected to the USB-A interface.

This function can be deactivated in the menu. "

**Limiter with trigger and control interface, monitor limit values**

"Digital I / Os: SPS / PLC function:

ideally suited for automation and control tasks

Note: In the scope of delivery of the optional interfaces EL6.1.S1 and

EL6. ZG006_E included. "" Freely programmable digital inputs and outputs can be used in 3 different ways:

1. Control with the limiter / limit value monitoring (programmable on the display)

A measured value from DC, AC sources, digital multimeters or
Power meters can be monitored and thus a switching function can be linked.
A digital I / O with a corresponding active edge can be assigned to each value range.
Ideal in connection with the indication light of the furniture system elneos connect. "
"2. Remote control:
The digital inputs and outputs can be freely programmed using all interfaces using the SCPI command set. "
"3. Direct control: (programmable on the display)
Each output / input is freely programmable:
- All outputs are represented by actuatable buttons
- Free naming per button (e.g. light, motor, low / low voltage, up / down etc.)
- Choice between push-button or switching function
- Level selection: active high or active low or active high and low "

**Update capability**

Firmware update / remote maintenance through RJ 45 and USB interface
Firmware updates can be downloaded from the erfi homepage and read in using the USB interface

Calibration:
Calibration via interface through RJ 45 and USB interface

**Menu settings and other useful functions and properties**

**"Extensive menu settings;**
"" The following function groups can be selected:
- Networks and interfaces:
IP address management, USB memory stick, internal and external data export
- Web internet access:
Web browser with input address line through integrated display keyboard
- Display settings:
Brightness, languages, screen saver interval
haptic / tactile feedback can be switched on and off
International languages: elneos six trains many national languages so that the
the entire user guidance is stored in the device and can be selected in several languages.
- Sounds and volume:
Volume for key tones, advisory tones, warning tones, voice output
- More settings:
Gestures, Airwheel can be switched on and off
Wheel dynamics adjustable
Easy mode: In this mode, many menus are hidden.
Ideal for basic lessons in HWK's or
Beginning classes of vocational schools.
The easy mode can also be used in the user profile
be deposited.
- Device information:

Serial number, firmware version, web version, device list with existing devices
- Stored user manual and instructional videos can be called up directly "
"- service
Stored contact details of the company erfi Ernst Fischer GmbH + Co.KG
Selectable calibration interval 6/12 or 24 months
A calibration notice will then appear 4 weeks before the due date.
- User profiles:
The settings made by the respective user are stored here and managed with a password.
The respective user can use his preferred settings immediately after registration. "

**Time and date management**

"The device automatically displays the current date and time when an Internet connection is established.

**Further mechanical properties and general device data**

**"Central control center**

**The following device groups can be installed in the control center itself: -**

- DC power supplies, linear
- Power DC power supplies
- Power arbitrary generators
- digital multimeter
- power meter
- Function generator
- fast signal arbitrary generators

**Hints:**

- no separate slots required
- Simultaneous integration of all devices in one slot
- AC sources are usually installed in additional modules "" Notes on the large control center elneossix EL6.1 with 8 "" display:

Extremely compact and maintenance-friendly design with integrated backplane and 4 slots to accommodate the individual device boards.
This makes it ideal for use as a stand-alone device.
Up to 4 power supplies can be integrated at the same time.
Exception:
Very large power modules such as power DC power packs (3,000 W) and large AC sources are installed in additional plug-in units
or integrated in TechCubes.

**Note on the smaller control center elneos six compact**

(for Expand 2 profile) EL6.1C with 7 "" display:
The digital multimeter, the function generator, is even located in the smaller control center elneos six compact
and the complete control electronics of the power supply units in the control center.
Only the power output stages of the DC and AC sources and the power DC power supply units are in separate

| |
|---|
| Inserts or TechCubes relocated under the table. " |

| | |
|---|---|
| **Voltage**: | 230V (+/-10%) AC; 110V USA |

| | |
|---|---|
| **Permitted supply voltage frequency range**: | 48 Hz to 63 Hz |

| | |
|---|---|
| **Rated supply frequency** | 50/60 Hz |

| | |
|---|---|
| **Max. Load Power**: | 90VA |

| | |
|---|---|
| **Climatic environmental conditions operation:** | |
| Ambient temperature | ° C 5 ... +40 |
| Relative humidity, non-condensing | % +20 ... +80 |

| | |
|---|---|
| **Climatic environmental conditions transport and storage:** | |
| Ambient temperature | ° C 0 ... +40 |
| Relative humidity, non-condensing | % +5 ... +80 |

| |
|---|
| **Indoor use only!** |

| | |
|---|---|
| **Warm-up time** | Approx. 30 minutes |

**Certifications:**

for linear power supply units and power arbitrary generators, DMM, P-meters and function generators:

USA: UL 962 | Canada: CSA C22 No. 68

EU, according to Low Voltage Directive 2014/35 / EU: EN610010-1

EMC: EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN55011 Rad., EN55011 Cond.

for power supplies:

USA: UL 60950-1; IN 60950-1

The FCC identifier is **FCC ID:T7V9026, This FF identifier is valid for the PAN9026.**

**Calibration:**

Intelligent calibration through self-alignment and Monitoring of the calibration intervals

**integrated self-adjustment:** The device checks itself through regular self-alignment. It has an integrated calibration interval monitoring:

The calibration interval can be selected. (6, 12, 24 months)

The user receives a corresponding notification 4 weeks before the calibration period is reached.

Recommendation:

When operated 40 h / week in the working area of the above-mentioned environmental conditions: approx. 12 months

**Weight:**

Depending on the built-in power output stages of the power supply units.

Some exemplary combinations as a 19 "partial slide-in variant and installed in a stand-alone housing

| | 19 "partial rack: | Standalone: |
|---|---|---|
| **Combination example 1:** | 2.4 kg | 4.2 kg |
| Control center with equipment: | | |
| - 1 digital multimeter including power meter EL6. P: | | |
| **Combination example 2:** | | |
| Control center with equipment: | | |
| 2 power supply units 2 x 0-32 V / 0-2 A 2 x EL6. LDC.032.02 | 5.2 kg | 7.0 kg |
| 1 DMM including power meter 1 x EL6. P | | |
| 1 function generator 1 x EL6. F | | |
| **Combination example 3:** | | |
| Control center with equipment: | | |
| 1 power supply unit 0-30 V / 0-3A) 1 x EL6. LDC.030.02 | 6.7 kg | 8.5 kg |
| 1 DMM including power meter knife 1 x EL6. P | | |
| 1 function generator 1 x EL6. F | | |

Series / Type: ELNEOS 6

**DC precision regulating power supplies**

Order no. EL6. LDC.030.02 to EL6. LDC.030.10

**Double to 10-fold DC regulating power supply units**

Order no. EL6.CL

**Power arbitrary generator**

Order no. EL6. LDC.030.02A to EL6. LDC.030.10A

**Power DC regulating power supply units**
Order no. EL6. GDC.012.066 to EL6. GDC.400.007 from 880 watts to 3,000 watts
**Precision digital multimeter**
Order no. EL6. D and EL6. DUI
**Power and energy meters**
Order no. EL6. P
**Function generators**
Order no. EL6. F and EL6. F1G
**Fast signal arbitrary generators**
Order no. EL6. S
**AC voltage sources**
Order no. EL6. AC1.030.04.1 to EL6. AC3.720.03.1U for 1-. and 3-phase AC sources
**Data logger**
Order no. EL6. DL

**Dimensions:**

| **Order no.** | **Lateral functional handles** | **External dimensions (WxDxH) mm** | **19 "size** |
|---|---|---|---|
| EL5. SA1.28.1 | green RAL DESIGN 1107070 | 172 x 185 x 161 | 3 HE / 28 TE |
| EL5. SA1.42.1 | green RAL DESIGN 1107070 | 244 x 185 x 161 | 3 U / 42 TE |
| EL5. SA1.56.1 | green RAL DESIGN 1107070 | 315 x 185 x 161 | 3 HE / 56 TE |
| EL5. SA1.70.1 | green RAL DESIGN 1107070 | 386 x 185 x 161 | 3 HE / 70 TE |
| EL5. SA1.84.1 | green RAL DESIGN 1107070 | 457 x 185 x 161 | 3 U / 84 TE |
| EL5. SA1.28.2 | greyRAL DESIGN 5500 | 172 x 185 x 161 | 3 U / 28 TE |
| EL5. SA1.42.2 | greyRAL DESIGN 5500 | 244 x 185 x 161 | 3 U / 42 TE |
| EL5. SA1.56.2 | greyRAL DESIGN 5500 | 315 x 185 x 161 | 3 U / 56 HP |
| EL5. SA1.70.2 | greyRAL DESIGN 5500 | 386 x 185 x 161 | 3 U / 70 TE |
| EL5. SA1.84.2 | greyRAL DESIGN 5500 | 457 x 185 x 161 | 3 U / 84 TE |
| **Stand-alone housing with a construction depth of 2 = 360 mm** | | | |
| EL5. SA2.28.1 | green RAL DESIGN 1107070 | 172 x 360 x 161 | 3 U / 28 TE |
| EL5. SA2.42.1 | green RAL DESIGN 1107070 | 244 x 360 x 161 | 3 U / 42 TE |
| EL5. SA2.56.1 | green RAL DESIGN 1107070 | 315 x 360 x 161 | 3 HE / 56 TE |
| EL5. SA2.70.1 | green RAL DESIGN 1107070 | 386 x 360 x 161 | 3 U / 70 TE |
| EL5. SA2.84.1 | green RAL DESIGN 1107070 | 457 x 360 x 161 | 3 U / 84 TE |
| EL5. SA2.28.2 | greyRAL DESIGN 5500 | 172 x 360 x 161 | 3 U / 28 TE |
| EL5. SA2.42.2 | greyRAL DESIGN 5500 | 244 x 360 x 161 | 3 U / 42 TE |
| EL5. SA2.56.2 | greyRAL DESIGN 5500 | 315 x 360 x 161 | 3 U / 56 HP |
| EL5. SA2.70.2 | greyRAL DESIGN 5500 | 386 x 360 x 161 | 3 U / 70 TE |
| EL5. SA2.84.2 | greyRAL DESIGN 5500 | 457 x 360 x 161 | 3 U / 84 TE |

**Device Serialnumber: 0001**

**Built (year of manufacture): 03/2021**

**Uniquely high maintenance and service friendliness**

- The devices themselves are removable plug-in cards and are in a backplane contacted by means of a connector system.
- The mechanical central insert itself usually remains always under construction in the event of a repair and only needs to be removed to remove the device plug-in cards can be removed in a few simple steps.
- AC sources have increased protection against interference thanks to a new one Sandwich construction that protects against unauthorized access.

**elneos six - Because speed is important when servicing!**

The central insert of the control center consists of a high-quality stainless steel cassette that enables the immediate and allows convenient access to all devices in a few seconds.

- The device plug-in cards can be exchanged immediately by any user in just a few simple steps automatically recognized and displayed each time it is switched on and off.
- The replacement plug-in card is usually sent within one day. (Maintenance contract required)
- The replacement device plug-in cards are independent and calibrated functional units and immediately after installation fully functional. Each card has its own microcontroller and is automatically recognized by the main system.

Advantages compared to decentralized and modular device systems in the event of repairs:

- Only small plug-in boards have to be exchanged. (no whole inserts are sent in for repair)
- Very short removal and installation times, as it is only a matter of plug-in boards
- No downtime due to the immediate replacement of the device plug-in cards when signing a maintenance contract.
- As a rule, the calibrated replacement plug-in card will be sent to you on the same day.
- Even if a device plug-in card (very compact single board) is to be sent in for repair, this effort is considerably lower. (low handling costs)
- In the event of a repair, there are no longer any gaps in the device structure, as the front of the withdrawable unit always remains in the structure.
- Even after removing a device plug-in card, all other devices are fully functional (no loss of time).
- No complex decontacting of wiring harnesses to other additional plug-in units
- The glass front end forms a stable unit with the power cassette, which can be removed with very little effort.
- The 19 "additional racks are also built into TechCubes and allow easy access under the table thanks to the well-known advantages of the 19 "professional device technology.
  Some additional modules also have backplane technology and can therefore offer the same advantages as the control center
  unite in terms of service-friendliness.
- For AC glass fronts:
  These devices come up with a new type of sandwich construction in which the glass front is secured by means of strong magnets
  and a second metal wall behind it protects the slot from being tampered with.
  After removing the additional module, all components are easily accessible.

**Theft protection**

internal latching and locking mechanism prevents unintentional removal. All glass inserts have a high level of security against vandalism.
Strong magnets with large additional racks prevent unwanted access to the device itself. From the outside, the devices do not offer any points of attack.

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