EXPERT 75 - HW 1.0

User manual

Version: 1.0; 10.01.2022; Kallinger Madeleine

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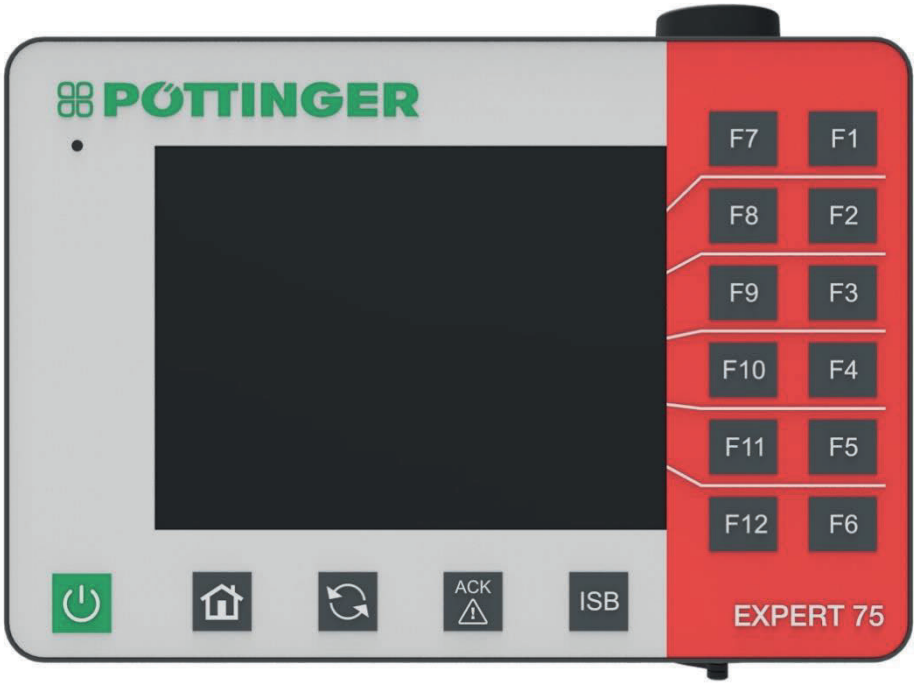
ANEDO

Erfolg steuern



Overview of changes

Version	Comment	Date	Name
1.0	Creation of initial version	18.05.2018	S. Bilsing / C. Lenz

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1 Greeting

Dear Sir or Madam,

Thank you for deciding in favour of one of our numerous, innovative and, at the same time, extremely reliable products. This user manual is intended for all service technicians and users who come into contact with our product. This user manual describes the general handling of this product. It supports the installer during installation by offering guidance through the first steps towards a successful start. Furthermore, it explains the product's own applications and settings. However, should an error occur, you will be given detailed advice here.

1.1 Field of application

This product is an operations terminal for use in agricultural engineering. Its ISOBUS functionality enables a variety of application scenarios. However, this product should not be used outside the working environment intended by the manufacturer, as the guarantee for specification limits compliance becomes invalid in such cases.

1.2 Contact

If there are any questions or uncertainties about any aspects of this document or this product, please contact the machine manufacturer.

1.3 Technical alterations

ANEDO Ltd. reserves the right to make changes to this document without notifying other parties.

2 General safety regulations

Please read this manual thoroughly and carefully before staring any installation or commissioning work on the device. Should there be any individual points that remain unclear or are not covered in this user manual, refrain from commissioning the device yourself and contact your authorized dealer.

In addition to the safety instructions in this user manual, always observe the general safety regulations and accident prevention regulations (UVV) applicable to agricultural engineering, industry, road traffic and medicine, in accordance with the current state of these technologies, when using, installing, storing and disposing of this device.

Particularly important safety-relevant information is highlighted again below. In addition, hazards are categorized according to severity, any anticipated injury to humans and/or animals, or any damage to nature and/or property. The Table 2-1 explains the meaning of the pictograms used, utilizing a hazard sign.

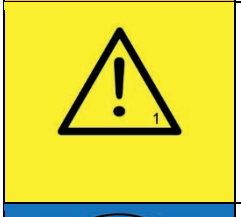
	"Danger" Denotes an imminent danger. If not prevented, death or serious injury will result.
	"Warning" Denotes a possible imminent danger. If not prevented, death or serious injury may be the result.
	"Caution" Denotes a possible imminent danger. If not prevented, minor or slight injuries may be the result.
	"Caution" Denotes a potentially damaging situation. If not prevented, the machine or something in its vicinity may be damaged.

Table 2-1: Hazard sign

2.1 Scope of application

In its delivered state, the device has been designed, constructed and tested as an ISOBUS-capable operations terminal for agricultural engineering. Therefore, it may only be be assembled or used as such. The manufacturer accepts no responsibility for any alternative installation. In such a case, the installer alone assumes all risks and is liable for damage to people, animals, nature and property.

	"Warning" The device is to be used solely in the agricultural application intended for it.
	"Warning" Do not make any modifications to the device that have not been specifically approved by the manufacturer.

2.2 Assembly/Commissioning

The increased use of electronic devices in agriculture means that disruptions can occur due to electromagnetic interference.

When installing electronic devices on a machine, the installer must determine whether the use of the device will cause interference to the electronic components of the machine. Such disruptions can lead to people being harmed if the specified safety instructions are not followed correctly. When using controls for rotating machines or hoists, the functional safety should also be checked to rule out any inadvertent tripping.

The device must be installed in compliance with the relevant applicable version of the EMC directive 2014/30/EU. Check whether other EU/EC directives are applicable to the particular use of this device. Power must be supplied to the device directly from the battery.

The acoustic signaling mechanism must be checked to prevent any damage to any person's hearing.

If shielded cables are used, it must be ensured that the shield is connected to the attached machine.

The maximum tightening torque of the fastening screws in the M5 threaded sockets on the back of the device is 3 Nm. The thread reach must not exceed 7 mm.

The device supply line must be protected externally with a 1.8 A fuse. The tripping instant for the fuse can be increased to a maximum of 3 A if required. The operating voltage limits (+9 V - +30 V) and the temperature range (-20 °C - +70 °C) must be observed at all times.

	"Warning" When installing, make sure to comply with the applicable EMC standard and the corresponding directive. The installation location, intended use and device connection must be carried out accordingly.
	"Caution" The device should be placed at a sufficient distance from the operator (esp. the head) according to the applicable safety rules.
	"Attention" The use of shielded cables is only permitted if the shield is connected to the attached machine.
	"Attention" The maximum tightening torque of the fixing screws is 3 Nm. The maximum thread reach is 7 mm.
	"Attention" The supply line must also be externally protected with a maximum 3 A fuse. The specification limits must not be exceeded/fallen short of.

2.3 Life span

During the entire life of the device, care must always be taken by the operator not to damage it or drop it. Moreover, the operator is responsible for ensuring the intactness of the housing at regular intervals (e.g. before each start-up). Special care must be taken when handling pointed tools.

If the manufacturer or dealer has specified service intervals, these must be observed under all circumstances. Furthermore, it is necessary to ensure that licence stickers or warning signs on the device are not damaged or illegible. If this occurs, they must be replaced as soon as possible. For this purpose, please contact your dealer.

If the device has not been installed, it must be stored in a dry place and protected from direct sunlight. Ensure compliance with the specified storage temperatures (-40°C - +80 °C) and protect the connectors from contamination.

If any one of the following scenarios is detected, then switch off the device in each case and do not use it any further. To use the device again, contact a service technician or your dealer.

- The touchscreen, the membrane keypad or the selection wheel can no longer be operated, or generate unwanted inputs.
- The terminal switches on, but the display remains black or white.
- The acoustic signal mechanism no longer functions.

	"Caution" Certain scenarios indicate a malfunction or damage to the device. In such a case, the device should be switched off immediately and maintenance be carried out.
	"Caution" If any damage to the device is detected, do not use it any further. To this end, regular visual inspections are necessary.

	"Attention" Service intervals must be observed no matter what.
	"Attention" An original WindowsCE 6 (Windows operating system) sticker is attached to the device. If the sticker is damaged or removed, the licence agreement and therewith the operating permit for the device become obsolete.
	"Caution" When storing the device, aspects such as storage temperature, exposure to sunlight and protection against contamination should be observed.

2.4 Repair/Maintenance

Only the manufacturer is to repair the device under any and all circumstances. Furthermore, opening the casing is prohibited. Doing otherwise will void the warranty, as the device's protection class is no longer ensured and consequent damage to the device may occur.

If work is to be carried out on the machine using increased voltage or with anticipated voltage peaks (e.g. charging the battery or welding work), the device must be electrically disconnected from the machine. Therefore, the connection cable must be removed from the device.

	"Caution" Repair and maintenance work must always be carried out by qualified personnel.
	"Caution" Opening the casing is prohibited and will void the warranty.

	"Caution" DRemove the connection cables from the device during maintenance work on the machine, especially when charging the battery or welding.

2.5 Disposal

The device must be disposed of in an environmentally friendly manner at the end of its service life. To do so, contact your dealer or a disposal centre.

	"Warning" Environmentally sound disposal is imperative for the protection of humans, animals and nature.

3 First steps

All the information necessary for initial operation is gathered below. The installer is given an overview of the components, functions and design of the device. It also describes what must be observed during installation and electrical connection.

3.1 The Expert 75

The EXPERT 75 is an operation terminal for mobile work machinery. It is used in particular in agricultural engineering. Windows CE is the operating system for the EXPERT 75, on which customer-specific applications and functions can be implemented. The interface is displayed using the ANEDO Graphic Framework (AGF). The EXPERT 75 is fully ISOBUS-capable in accordance with UT version 4.

The device consists of a plastic casing and a front panel. The inside of the front features a resistive touchscreen and a 5.6" display. The display has an increased brightness. This means that it is still easy to read even in direct sunlight. The brightness can be adjusted manually or automatically, depending on the ambient light. A light-dependent resistor (LDR) measures the ambient light for this function. When the night design is turned on, the keys on the front panel are also illuminated.

The EXPERT 75 has a convenient power management system that automatically controls the on/off behaviour of this and cooperating devices depending on external signals (e.g. terminal 15) and user inputs. It also features a real-time clock with battery backup.

The EXPERT 75 is equipped with a CAN interface and a RS232/signal interface. The RS232/signal interface includes, among other things, an analogue input and four frequency measurement inputs. The tractor's sensors or the signal socket can be connected here. It also has a USB Type-A port that can be used to access USB mass storage devices and update the device.

In addition to the resistive touchscreen, the EXPERT 75's operating concept consists of twelve keys to the right of the screen surface. These keys are mechanical, highlighted in colour on the front foil and labeled. The functions of these keys depend on their configuration in the software. The "Home", "Exchange", "Acknowledge" and "ISB" keys are also located on the front. The functions of these keys are defined as higher-level. The operating concept is completed

by a rotary impulse encoder that can be actuated infinitely in both directions and includes an additional button for selection.

Acoustic warning or confirmation signals can be emitted via the integrated loudspeaker. The volume is adjustable.

3.1.1 Front

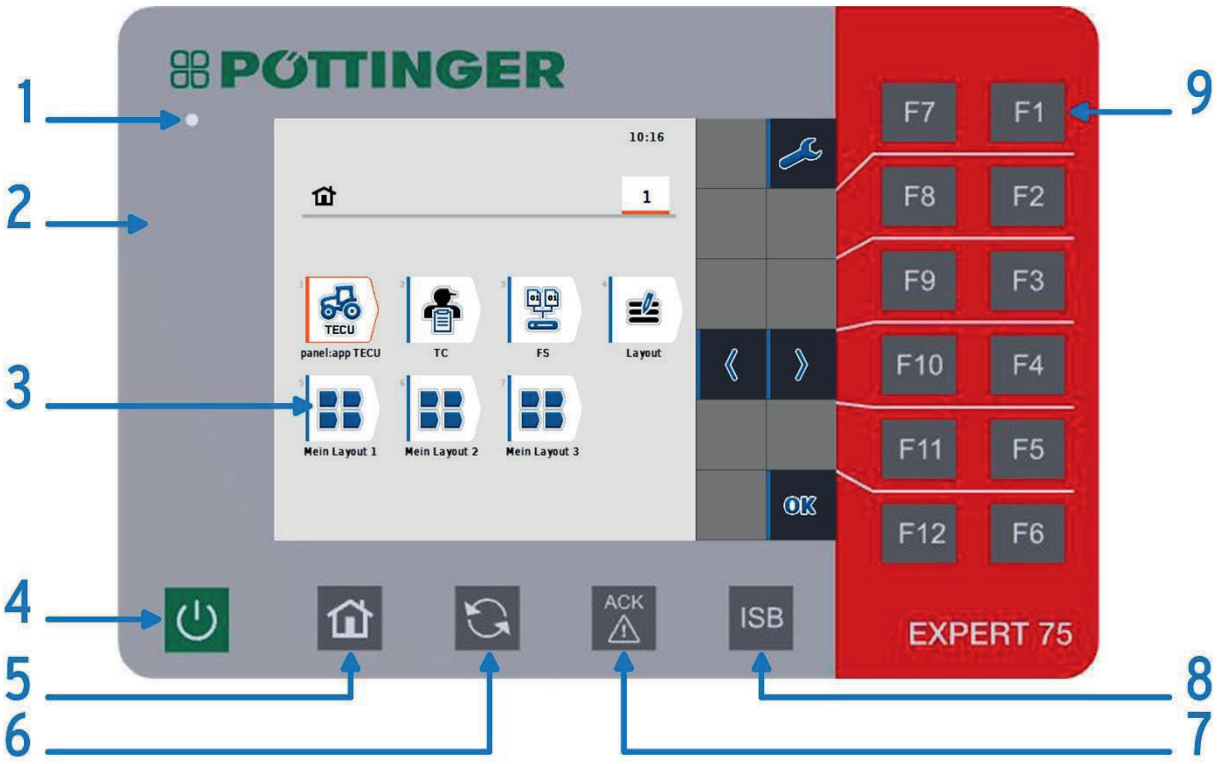


Illustration 3-1: Front panel controls

1	Light-dependent resistor (ambient light sensor - LDR) The ambient light sensor is used to automatically control the night design.
2	Front panel with luminous foil and decorative foil in Pöttinger design. The keys on the front are backlit by a luminous foil when night design is active.
3	5.6" TFT display and resistive touch sensor The colour display has a resolution of 640x480 pixels. The resistive touchscreen can be operated with just one finger.
4	On/Off key The on/off key must be pressed for at least 3 seconds to switch the device on or off.
5	"Home" key The "Home" key returns the user to the menu start screen from any app in the software.
6	"Exchange" key The "Exchange" key is used to quickly switch between apps. Exactly which apps are switched between can be configured individually. Section 4.2.3.
7	"Acknowledge" key The "Acknowledge" key is used to acknowledge warning and advisory messages in accordance with ISO 11783.
8	"ISB" key (Implement-Stop-Button) The ISB sends a stop signal to all ISOBUS-compliant ECUs on the machine. This signal only lasts as long as the key is pressed and held.

9	Function keys F1 - F12 These function keys are dynamically assigned and correspond in their function to the currently displayed virtual keys that can be seen to the left of the display.

Table 3-1: Explanation of the controls

3.1.2 Rear

Illustration 3-2: Backshell controls

10	Rotary impulse encoder, infinite with additional selection key The rotary impulse encoder is used for better navigation in the menu.
11	Fixing thread M5 The device must always be installed using both fixing points.
12	On/Off key The on/off key must be pressed for at least 3 seconds to switch the device on or off.
13	Loudspeaker The loudspeaker is used for an acoustic warning or confirmation.
14	USB type A port A USB 2.0 full-speed host-interface is available on the lockable USB type-A port (with bayonet lock and protective cap). The +5 V USB supply voltage with max. 500 mA is available in addition to the data lines (Data+, Data-) Full functionality can only be guaranteed with industry standard USB storage media.
15	Windows CE licence sticker The Windows CE licence sticker must not be damaged in any way, or removed .
16	Interface labelling
17	RS232/signal (M12, 12-pin, A-coded, socket) The 12-pin connector provides four frequency measurement inputs and one analogue input in addition to the two RS232 interfaces. The signals from the tractor signal socket, in accordance with ISO 11768, or separate sensors can be connected here.

	The analogue input can detect a resolution of 0 V - 10 V and the frequency inputs can detect a frequency up to 6.5 kHz. The two RS232 interfaces offer a transmission rate of up to 115 kbits/s. An input is provided for connecting the ignition signal (terminal 15) for the power management system. A switched supply voltage (+U_{B_SW} to GND) is provided at the connector (max. 1 A).
18	CAN1-IN (M12, 8-pin, A-coded, plug) In addition to the bus signals for CAN communication, the supply voltage +U_B and the screen are also routed via the CAN1-IN connector. The CAN-Bus is operated at 250 kbits/s as standard. Switching voltage +U_{ON} (max. 1,8 A) is provided for the control of further devices.
19	Pressure equalising membrane The pressure equalising membrane prevents condensation in the unit through temperature fluctuations.
20	Type plate The type plate includes information on the manufacturer.

Table 3-2: Explanation of the controls (cont'd)

3.1.3 Interface assignment

The pin assignment for the connectors is given in Table 3-3.

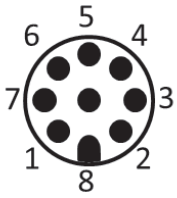
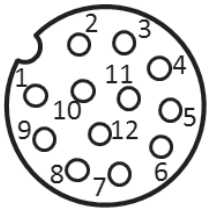
Symbol	PIN	Signal designation	Colour	Function
CAN1-IN / M12 x1 - 8pin - plug				
	1	$+U_B$	white	9…30 V supply voltage
	2	-	brown	Not assigned
	3	$+U_{ON}$	green	External on/off switch signal
	4	-	yellow	Not assigned
	5	CAN0L	grey	CAN 1 Low
	6	GND	pink	GND
	7	CAN0H	blue	CAN 1 High
	8	Screen	red	Screen
RS232/signal / M12 x1 - 12pin - socket (for signal socket in accordance with ISO 11768)				
	1	$+U_{B\_SW}$	brown	Supply voltage interconnected
	2	GND	blue	GND
	3	SMFQ_IN 2	white	ISO11786 "PTO shaft speed"
	4	SAN_IN0	green	ISO11786 "Hoist position"
	5	SMFQ_IN 3	pink	ISO11786 "Wheel speed"
	6	SMFQ_IN 4	yellow	Direction of travel
	7	SMFQ_IN 1	black	ISO11786 "Slip-free speed"
	8	COM0_RxD_IN	grey	RS232 1 RxD (Input)
	9	COM0_TxD_OUT	red	RS232 1 TxD (Output)
	10	IGN	violet	Ignition signal / Terminal 15
	11	COM1_RxD_IN	grey /pink	RS232 2 RxD
	12	COM1_TxD_OUT	red / blue	RS232 2 TxD
USB – Host 2.0 – socket – with bayonet catch for the protection cap				
	1	+5V	red	USB supply voltage +5V
	2	D -	white	Data
	3	D+	green	Data +
	4	GND	black	GND

Table 3-3: Interface assignment

3.1.4 Fuses

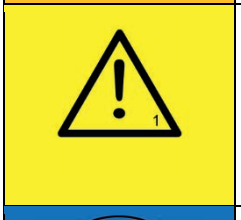
	"Caution" Without an external fuse (max. 3 A), incorrect handling can cause damage to / destroy the device.

The supply voltage must be protected externally with a 1.8 A (max. 3 A) fuse. In addition, internal fuses are used to prevent destruction of the device in the event of a faulty connection. So, the switched supply voltage $+U_{B\_SW}$ at the RS232/signal connector is protected with 1 A fuse and the $+U_{ON}$ signal with 1.8 A fuse. The values apply at 20°C. The fuses may blow earlier depending on the ambient temperature.

The fuses regenerate automatically after tripping and do not need to be replaced. However, the time needed for regeneration is strongly dependent on the ambient temperature. There is no guarantee that the fuses will fully regenerate after the first trip. Nevertheless, the unit should be able to be switched on again after just a few minutes.

3.2 Initial operation

The applicable safety rules, according to page 2 "2 General safety regulations", must be observed before, during and after initial operation.

	"Warning" When installing, ensure compliance with the applicable EMC standard and the corresponding directive. The installation location, intended use and device connection must be carried out accordingly.
	"Caution" The device should be placed at a sufficient distance from the operator (esp. the head) according to the applicable safety rules.
	"Attention" The use of shielded cables is only permitted if the shield is connected to the device.

	"Attention" The maximum tightening torque of the fixing screws is 3 Nm. The maximum thread reach is 7 mm.
	"Attention" The supply line must also be externally protected with a maximum 3 A fuse. The specification limits must not be exceeded/fallen short of.

3.2.1 Fitting

The device is attached via the inserted M5 threaded sleeves on the back. The screws should be secured with a schnorr washer to prevent them from self-loosening. The thread depth must not exceed 7 mm. The tightening torque of the M5 fixing screws in the threaded sleeves is 3 Nm (+ 0.25 Nm). The device must always be fastened/supported via both threaded sleeves. The cable may only be bent in accordance with the data sheet. Before any installation, make sure the sealing rings are present in the sockets of the M12 connectors.

3.2.2 Connection

The power supply must be connected directly to the battery via an external fuse (max. 3 A). The maximum current compatibility per cable and per strand must be observed. A supply voltage of 13.8 V (minimum 9 V and maximum 30 V) between pins 1 (+) and 6 (-) of the CAN1-IN connector must be applied to activate the device. It should be noted that as soon as the device is started, the supply voltage is switched to pin 3 of the CAN1-IN and pin 1 of the signal/RS232 connector. The signal $+U_{ON}$ (pin 3 at CAN1-IN) can be loaded up to 1.85 A. The signal $+U_{B\_SW}$ (pin 1 at signal/RS232) can additionally be loaded up to 1 A.

The device can be switched on via the front or rear pushbutton. Press and hold the button for 3 seconds to do this.

4 Menu system (panel:app Menu)

Regardless of the apps actually purchased and activated on the terminal, the terminal always has a menu system in which the various settings can be made. These are global device settings on the one hand, but also settings for other apps on the other.

Among other things, the menu provides the so-called home screen. This can be reached via the home button.

In the home screen, press F1 to access the settings. These are divided into user settings, regional settings, system settings, info and diagnostics.

4.1 Features

The panel:app Menu includes the following functions and features:

- Sound and lighting configuration
- Configuration of a free assignable key[1]
- Regional-specific settings for text, keyboard, unit, etc. for more than 20 countries.
- Various service functions
- GPS processing in accordance with NMEA 0183 and NMEA 2000
- Self-tests
- Resources monitor
- Diagnostic functions in accordance with ISO 11783-12

4.2 User settings

Under user settings there are various settings available to adjust appearance and behaviour according to personal requirements.

Display lighting

opens a dialogue for configuring the background illumination of the display. Section 0.

Volume

opens a dialogue for configuring signals volume. Section 4.2.2.

[1] only for the T35i (ANEDO version) and T55i models

Switch apps

opens a dialogue for selecting the apps to be taken into account by the app-switching mechanism. Section 4.2.3.

Free key assignment[2],

opens a pop-up dialogue that lists various apps or functions. A preferred app is selected and confirmed with OK. If the I-key on the unit is pressed later during operation, the software switches directly to the desired app.

Function-key selection with scroll wheel[3]

opens a pop-up dialogue for activating/deactivating the softkey selection via scroll wheel in UT screens.

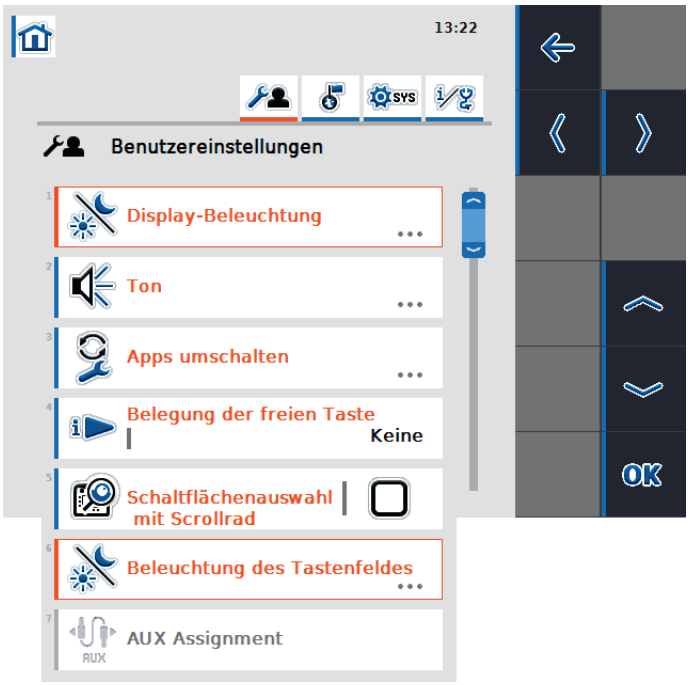


Illustration 4-1 : User settings

Keypad lighting[4],

opens a dialogue in which the day/night settings for the backlighting of the membrane keys can be configured. Section 4.2.4.

AUX Assignment[5],

opens the assignment screen for AUX inputs, if required. This function is only available if there is both an AUX input device and an ECU with AUX function are located on the bus.

[2] only the T35i (ANEDO version) and T55i models,
[3] only the T35i, T50i, T55i and T80i models,
[4] only the T35i and T55i models,
[5] only in combination with panel:app UT,

4.2.1 Display lighting

Icon	Description
	Day lighting [0 - 100]% sets the illuminance for the day.
	Night lighting [0 - 100]% sets the illuminance for the night.
	Illumination mode [Day, Night, Auto] sets the lighting strategy. The "Day" and "Night" strategies are static and use the set illuminance levels for day and night. The "Auto" strategy is dynamic and automatically switches between the illuminance levels for day and night depending on the illumination limit.
	Illumination limit [0 - 100]% sets the threshold for automatic switching between day and night illuminance levels.

4.2.2 Volume

Icon	Description
	Signaller [activated, deactivated] activates the internal beeper.
	Volume [0 - 100]% sets the beeper volume.

4.2.3 Switch apps

AGF plug-ins are listed here and can be switched between using the "Exchange" key. The plug-ins can be activated or deactivated for switching.

For example: The plug-ins panel:app Menu and TC are listed and can be activated for switching.

Icon	Description
	Panel:app Menu [activated, deactivated]
	TC (Task Controller) [activated, deactivated]
…	….

4.2.4 Keypad lighting

Icon	Description
	Illumination mode [Off, On, Automatic] sets the illumination strategy. The "On" and "Off" strategies are static and switch the keypad illumination on and off. The "Automatic" strategy is dynamic and automatically switches the keypad illumination on and off depending on the illumination limit.
	Illumination limit [0 - 100]% sets the threshold for automatic switching between day and night illuminantion.

4.3 Regional settings

Settings for language, keyboard, unit systems and number formats are listed here.

Language

opens a pop-up list of all installed languages.

Keyboard

opens a pop-up list of all keyboard layouts. The keyboard layout refers to the virtual on-screen keyboard for input fields.

Units

opens a dialogue in which the standard units used for the display of various parameters (distance, area, volume, etc.) can be selected. (See section 4.3.1.

Number formats

opens a pop-up dialogue where a choice can be made between full-stop (.) or comma (,) as separator for decimal fractions.

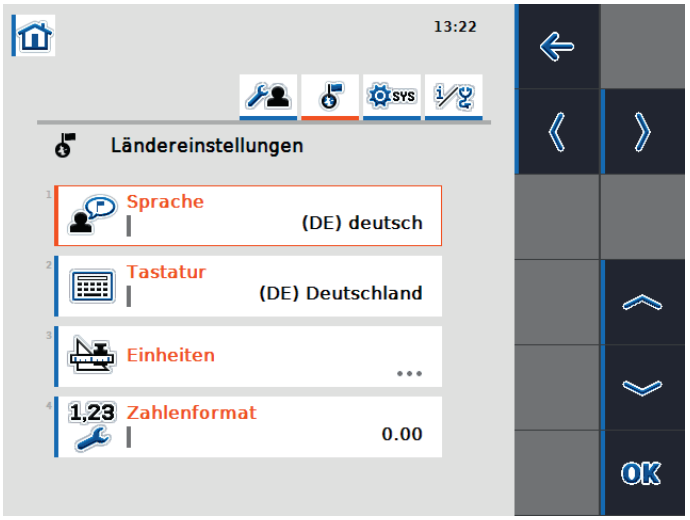


Illustration 4-2: Regional settings

4.3.1 Units

sets the unit system. The unit systems are "Metric", "Imperial", "US" and user-specific. When selecting "User-specific", the unit system to be used can be selected individually for each size. Metric", "Imperial" and "US" are also available here.

4.4 System settings

In this section, the terminal can be set according to its surrounding overall system.

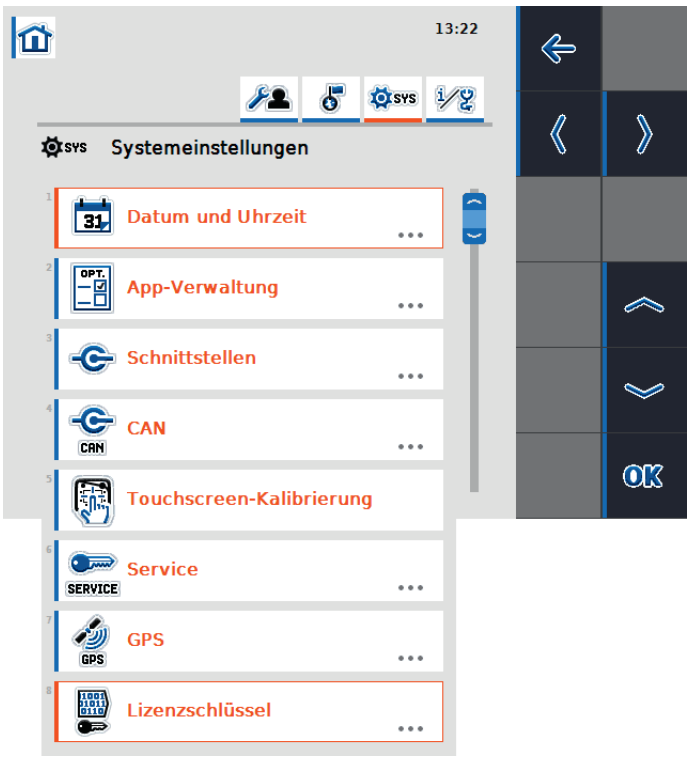


Illustration 4-3: System settings

Date and time

opens a dialogue in which various settings for date and time can be made. Section 4.4.1.

App management

opens a dialogue in which individual apps can be activated and deactivated. Section 4.4.2.

Interfaces

opens a dialogue in which settings for various hardware interfaces can be made. Section 4.4.3.

CAN

opens a dialogue in which settings for the CAN interface or ISOBUS can be made. Section 4.4.4.

Touchscreen calibration

starts the the touch screen calibration. Follow the directions on the screen.

Service

opens the menu system service area. This section is only accessible to service technicians and developers. More detailed information can be found in the system manual.

GPS

opens a dialogue to enable GPS-related settings. Section 4.4.5.

Licence key

opens a dialogue to display and activate the individual app licences. See chapter {190.}

4.4.1 Date and time

The following settings can be made for the date and time:

Day [1 - 31]

sets the calendar day.

Month [1 - 12]

sets the calendar month.

Year [2000 - 2038]

sets the calendar year.

Hour [1 – 12 (12hr format), 1 – 24 (24hr format)]

sets the hour.

Minute [1 - 60]

sets the minute.

Date format

sets the date format to be used.

Time format [12hr, 24hr]

sets the time format to be used.

GPS update [activate, deactivate]

activates automatic updating of date and time via GPS.

Time zone [-12 - +12]

sets the time zone.

Summer/Winter [activated, deactivated].

Activated means summer. Deactivated means winter.

am/pm [am, pm]

specifies the addition for the time format. Only for the 12hr time format.

4.4.2 App management

The app management lists all installed AGF plug-ins. The plug-ins can be activated or deactivated here.

AGF plug-in [activated, deactivated]

activates the available AGF plug-in.

4.4.3 Interfaces

For models with an ethernet port and/or Wi-Fi module, the network settings can be made here.

LAN settings

fixes LAN interface settings. (See Chapter 4.4.3.1)

Wi-Fi settings

fixes Wi-Fi interface settings. (See Chapter 4.4.3.2)

4.4.3.1 LAN settings

DHCP [activated, deactivated]

activates the DHCP server.

IP address

sets the address in the LAN.

Subnet mask

sets the subnet mask.

Gateway

sets the gateway address.

DNS server

sets the DNS server address.

4.4.3.2 Wi-Fi settings

Wi-Fi network

specifies the Wi-Fi network to connect to.

DHCP [activated, deactivated]

activates the DHCP server.

IP address

sets the address in the Wi-Fi.

Subnet mask

sets the subnet mask.

4.4.4 CAN

CAN or ISOBUS-related settings can be made here.

Primary terminal [activate, deactivate]

sets the terminal as the primary terminal.

Terminal position

sets the terminal position. The terminal can be inside or outside the driver's cab.

4.4.5 GPS

GPS information can be displayed and GPS settings can be made in this dialogue.

4.4.5.1 GPS info

displays various information on GPS signal reception. For example, this information includes latitude, longitude, speed, current time and signal quality.

4.4.5.2 GPS settings

specifies the settings for establishing a connection to a GPS module.

GPS source [NMEA 0183, NMEA 2000]

sets the standard to be used for a GPS source.

COM Port [COM 0, COM 1]

sets the COM interface. (Only valid for NMEA 0183)

Baud rate

sets the COM interface connection speed .

4.4.5.3 Geometry settings

The position of the GPS receiver in relation to the tractor is set in the geometry settings. This is relevant for functions like TC-GEO and TC-SC.

NRP Offset A [-10 - +10]

describes the front or rear distance between the machine and navigation reference points. A positive value represents a distance to the front and a negative value to the back.

NRP Offset B [-10 - +10]

describes the lateral distance between the machine and navigation reference points. A positive value represents a distance to the right and a negative value to the left.

Coupling point

specifies the type of coupling point. There is a choice of three-point linkage, drawbar hitch, tow ball and drawbar.

Coupling point distance [0 – 10]

sets the distance between the machine reference point and the coupling point.

4.5 Info and diagnosis

This area contains various information dialogues, diagnostic functions and a few simple test functions.

Illustration 4-4: Info and diagnosis

Terminal

opens a dialogue that leads to software and hardware version information. Section 4.5.1.

Network participants

opens a dialogue that lists all network participants logged on to the ISOBUS. Section 4.5.2.

Memory

opens a resource monitor for the various device memories. Section 4.5.3.

Self-test

opens a dialogue on various device test functions. Section 4.5.4.

Error memory

opens a dialogue that lists all errors that have been recorded in the long-term device memory. Section 4.5.5.

Credits

opens a dialogue that lists the copyright information of the software components that were not developed at ANEDO but were provided by third-party suppliers. This screen displays licence information for third-party software components (see Chapter 12).

4.5.1 Terminal

This section contains general information about the terminal.

Software

lists the installed software. Included are the package version, the base system, the boot loader, the kernel and the plug-ins.

Hardware

lists the hardware characteristics.

4.5.2 Network participants

lists all the ISOBUS network participants. A corresponding object pool can be found for each participant here. The object pool for a machine is displayed even though it is not connected. Machines that are not connected are indicated by a greyed-out object pool. The controls allow targeted object pool management .

Filters list

sets the filter for unconnected machines. Machines that are not connected disappear from the object pool list.

Filtered list

resets the filter.

Reset filters list

resets the filter.

Delete object pool

removes the selected object pool from the device after confirmation.

Selection upwards

marks the next object pool upward.

Selection downwards

marks the next object pool downward.

Confirm selection

acknowledges the selection.

4.5.3 Memory

This section provides overviews of memory usage.

Main memory

shows an overview of working memory usage.

Internal memory

shows the usage overview of the internal flash storage medium.

USB stick

shows the usage overview of the external USB storage medium

4.5.4 Self-test

There are various test functions available here.

Check the interfaces

opens a dialogue that lists the interfaces that can be tested.

Power supply

opens a dialogue in which the current operating voltage is displayed.

Touchscreen

opens a dialogue via which the touchscreen can be tested

Function keys

opens a dialogue in which all function keys can be tested and displayed

Scroll wheel

opens a dialogue in which the scroll wheel function can be tested.

Loudspeaker

opens a dialogue in which the loudspeaker function is tested. A test sound is played when accessing the dialogue.

Daylight sensor

opens a dialogue in which the value of the light sensor is displayed.

Display brightness

opens a dialogue in which different display brightness levels are tested.

Stop switch

opens a dialogue in which the ISB function is tested.

CAN trace

opens a dialogue in which a CAN trace is started. The trace is stored on the internal flash storage medium. (See Chapter 4.5.4.1)

4.5.4.1 CAN trace

This is the control window for recording messages on the CAN bus.

Start recording

starts the recording of CAN messages in a log file.

Selection downwards

No function

Selection downwards

No function

Confirm selection

acknowledges the selection.

End recording

ends the recording of CAN messages.

4.5.5 Error memory

The error memory lists all terminal errors that occurred during operation. The errors are listed chronologically and include the date, time, serial number, version number and an error description.

4.6 Problem solving

Problem	Solution
GPS is configured for NMEA 0183, but the system is not receiving GPS data.	1. Check if the GPS is configured for the COM port to which the GPS antenna is connected. 2. Check if the same COM port is already used for another function.
The device is connected to a router via ethernet but no Internet connection is established.	Check the IP address to see if the router and terminal are in the same network, or switch to DHCP if necessary.
The error memory continues to fill. How can I delete this?	The error memory is protected and can only be deleted by a service technician. If the device repeatedly reports errors, please contact your support team.

5 Universal Terminal (panel:app UT)

The panel:app UT establishes communication between the terminal and an attached ISOBUS machine and visualises the operation of the attached machine on the terminal. For easier control of the machine, so-called auxiliary controls such as a joystick or toggle switch can be connected and machine functions can be assigned to them.

5.1 Features

The panel:app UT offers the following features:

- Connection set-up between terminal and attached ISOBUS machine
- Visualisation and control of the attached machine on the terminal
- Connection and assignment of auxiliary controls
- Request behaviour according to ISO standard 11783-6
- Manufacturer-independent use for all attached machines that comply with ISO standard 11783

5.2 Operation

If an attached ISOBUS machine is connected to the ISOBUS network, some basic information is transmitted to the terminal, where it is displayed in the "Info and diagnostics" menu under "Network participants". Furthermore, the object pool of the attached ISOBUS machine is transmitted to the terminal (cf. Illustration 5-1). The object pool is the data set that contains the attached machine user screen. To make adjustments to the attached machine, refer to its operating instructions.

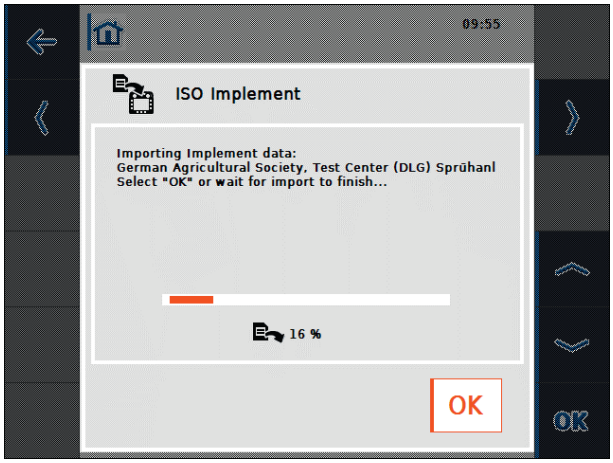


Illustration 5-1: Attached machine object pool transfer

If an AUX input device such as a joystick or toggle switch is connected for easier control of a machine with AUX function, its object pool is displayed on the terminal (cf. Illustration 5-2). To assign machine functions to the input device, select the settings in the home menu. In the tab "User Settings", the listed item "AUX Assignment" is now active (cf. Illustration 5-3).

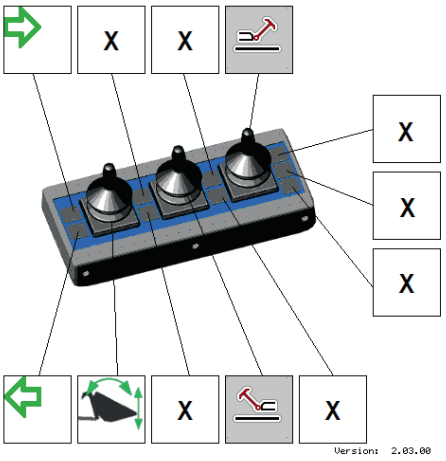


Illustration 5-2: Visualisation of the AUX input device

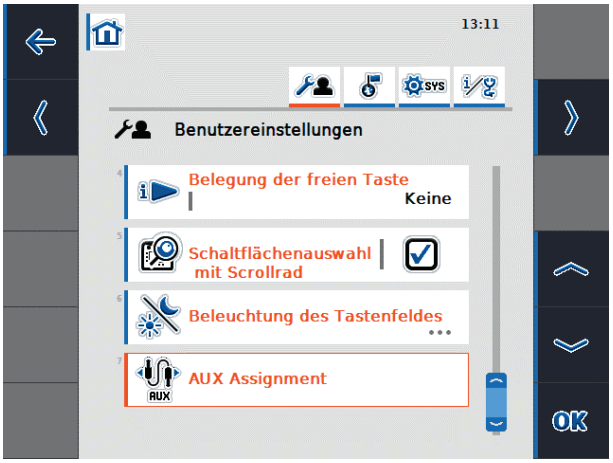


Illustration 5-3: "AUX Assignment" in the "User Settings"

After opening the "AUX Assignment", the current AUX functions assignment is shown (cf. Illustration 5-4). Each list item shows an AUX function of a machine on the left and the assigned AUX input device on the right. In the list in Illustration 5-4, the upper two functions have already been assigned input devices, while the lower function has not yet been assigned. This is represented by the zero symbol. To make a new assignment or change an existing one, select the relevant function from the list. The pop-up dialogue that opens in Illustration 5-5 shows all available input options.

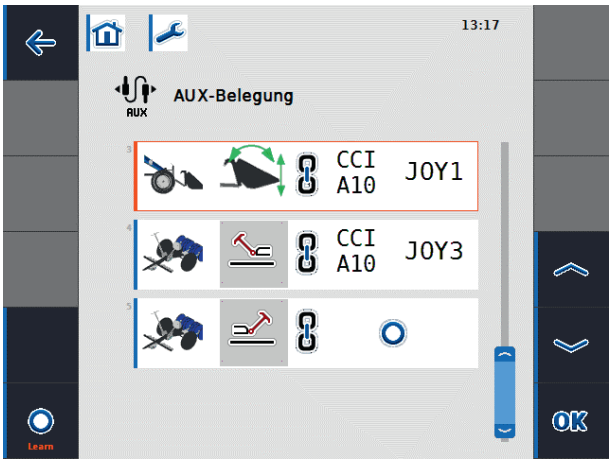


Illustration 5-4: AUX assignment

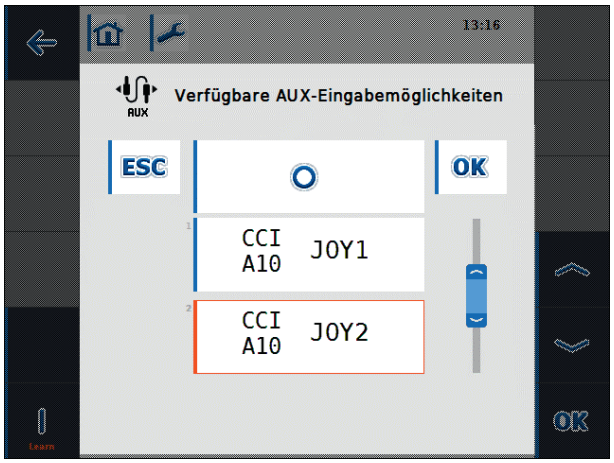


Illustration 5-5: Available AUX input options

When assigning the AUX functions, the Learn mode function is available in addition to the list selection:

The Learn mode is active.

The Learn mode is inactive.

Switching between the two modes is possible using the function key F12 (cf. Illustration 5-4). If the Learn mode is active, an input option (e.g. joystick or switch) can be assigned to a selected AUX function by pressing it directly. Assigning then takes place automatically without having to select from the list. If the Learn mode is inactive, then assignment is only possible via the selection list as in Illustration 5-5.

5.3 Problem solving

The following table summarises the panel:app UT error messages, shows their possible cause and gives a suggested solution.

Problem	Solution
The attached ISOBUS machine operating screen is not displayed on the terminal.	There may be various causes: • The terminating resistor is missing. • The attached machine software has been loaded onto the terminal, but is not displayed. In this case, check whether the software can be started from the terminal start menu. • There is a connection error when the attached machine software is being loaded onto the terminal. Check the cable connection between the attached machine and the terminal. If necessary, contact the attached machine manufacturer's customer service.

6 Layout manager (panel:app Layout)

The panel:app layout allows the user to display information from multiple panel:apps as well as ISOBUS attachments, all on the same screen. This allows the view of two cameras, or data from a front and rear attached device, to be displayed simultaneously. The user can continuously create several layouts and flexibly adapt the screen display to his or her respective work situation.

6.1 Features

The panel:app Layout offers the following features:

- Create and manage multiple screen layouts that are available as individual desktops.
- Simultaneous display of information from different panel:apps as well as attached ISOBUS devices (via panel:app UT) on one screen.
- Create flexible layouts consisting of 12 cells of 240x80 pixels each and 12 soft keys of 80x80 pixels each.

6.2 Operation

If the panel:app Layout is selected in the terminal's main menu, the panel:app Layout main view is shown as in Illustration 6-1.

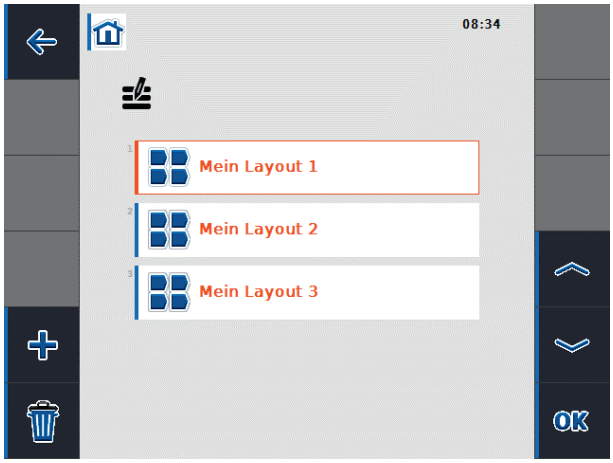


Illustration 6-1: Main view of the panel:app Layout

All created layouts are displayed in the main view. The name of the layout and the appearance of the associated desktop (main area and softkeys) are saved for each layout. This allows individual terminal users to flexibly adapt the screen display to their requirements and work situation. For each layout a button is provided in the start menu, which can be used to access the layout desktop (cf. Illustration 6-2).

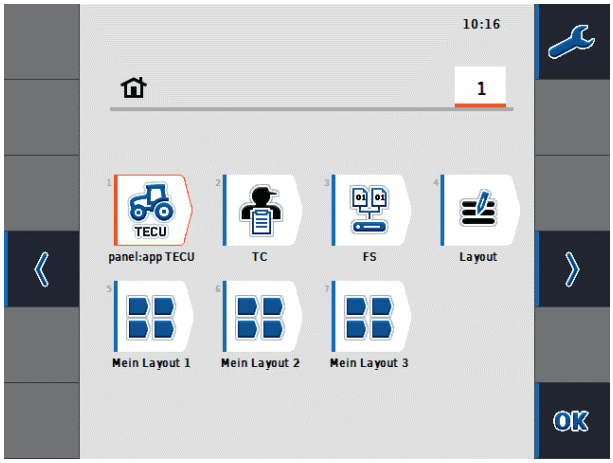


Illustration 6-2: Start menu

The main view of the panel:app layout offers the following operating options via the softkeys:

The layout context menu (cf. Illustration 6-3) opens for the layout selected from the list.

A new layout is created and the detailed view of the new layout opens.

All created layouts are deleted. There is a confirmation prompt before deletion.

The system switches to the start menu.

When leaving the panel:app layout, a synchronisation of the changes made to the layouts with the actual desktops takes place. If layouts have been deleted or added, the number of actual desktops changes accordingly.

The context menu in Illustration 6-3 offers the possibility to rename the selected layout, to edit and to delete it:

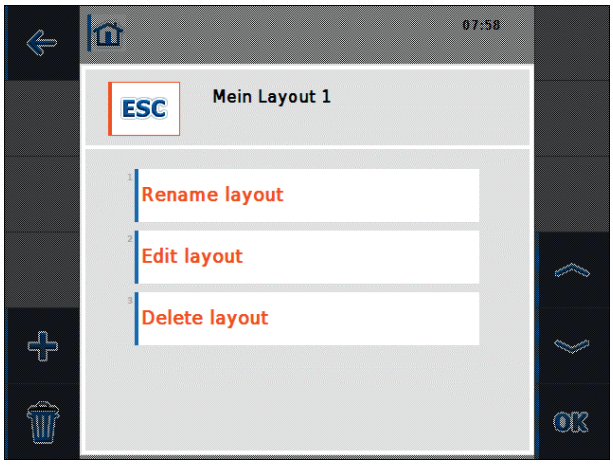


Illustration 6-3: Layout context menu

If a layout is edited or a new layout created, the detailed view of the layout opens as in Illustration 6-4.

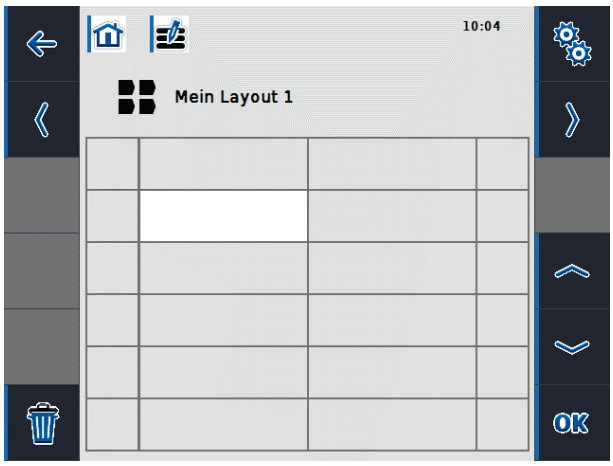


Illustration 6-4: Detailed view of layout

The current layout desktop is displayed in the main area. The current layout desktop is divided into twelve cells (two columns and six rows) to accommodate *widgets* and twelve softkey cells (one column each on the right and left) to accommodate *widget keys*. A cell for widgets is 240x80 pixels, a cell for a widget key is 80x80 pixels. Widgets are objects that are made available via other panel:apps or attached ISOBUS devices, and can be added to the current layout. They claim various numbers of layout cells. A list of widgets is shown in Illustration 6-5, which appears when a cell is selected in the layout detail view. The widget size in the layout is given in the list under the widget name. For example, the speed display from the panel:app TECU occupies six cells (two columns and three rows). The widget sizes should be considered when dividing the layout A "zero" widget is used to delete assigned cells.

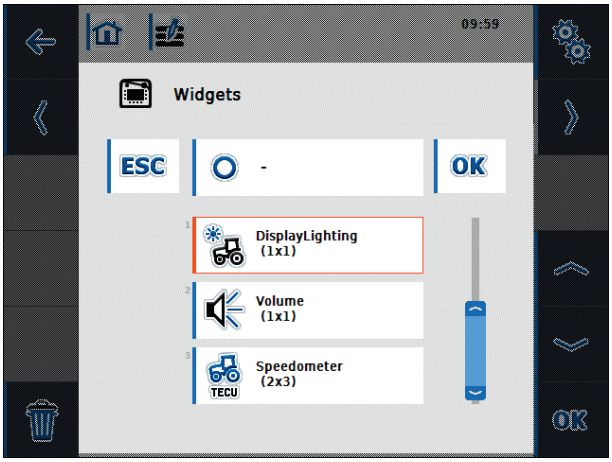


Illustration 6-5: Pop-up Widgets

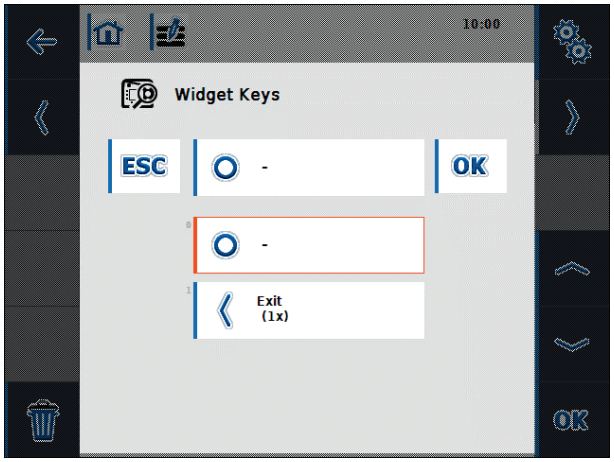


Illustration 6-6: Pop-up Widget Keys

The following operating options via the softkeys are available in the layout detail view:

Rename the selected layout.

Detail view of the next layout opens. If the last layout in the layout list is currently displayed, a new layout is created and the detailed view of the new layout is opened.

Detailed view of the previous layout opens.

It will change to the main view of the panel:app layout.

It will change to the previous cell in the main area.

It will change to the next cell in the main area.

Depending on the active cell, the pop-up widgets or the pop-up widget keys opens, and widgets or widget keys can be assigned to cells.

The selected layout will be deleted. There is a confirmation prompt before deletion.

To create an individual layout, proceed as follows:

1. In the main view of the panel:app layout, select the function key "Create a new layout".
2. In the detailed view of the new layout, the preset layout name can be changed.
   In the main area of the layout, select a cell in which a widget is to be placed. The selected cell is always the upper left corner of the widget. So there should be enough space available to the right and underneath the widget. A list of all possible insertable widgets opens (cf. Illustration 6-5). If a screen element is selected and confirmed with "Ok", it is placed in the corresponding cells in the main area.
3. To place widget keys in the layout, select a softkey cell in the main area and assign the desired widget key to the list (cf. Illustration 6-6).

Illustration 6-7 shows a layout after the panel:app TECU speed display has been placed in the left column of the first row in the main area, and the exit softkey has been inserted in the top left. The blue background of a widget indicates that the cell area is currently active, while the background of the widgets is otherwise shown in red. So, in Illustration 6-7 the cell area of the speed display is active, in Illustration 6-8 the cell where the illumination setting is placed is active.

To delete a widget or a widget key from a layout, select the associated cell range, or widget cell or the corresponding soft key. From the list that opens, assign the null widget or null widget key. This removes the widget or widget key from the display in the main area.

A widget can be moved in the layout by deleting it from the existing layout and reinserting it in another position.

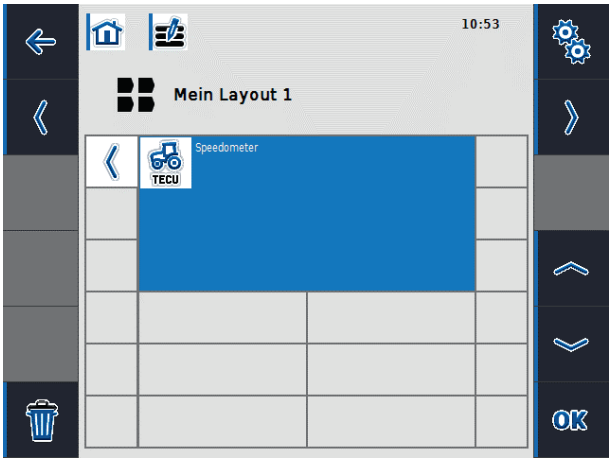


Illustration 6-7: Insertion step 1

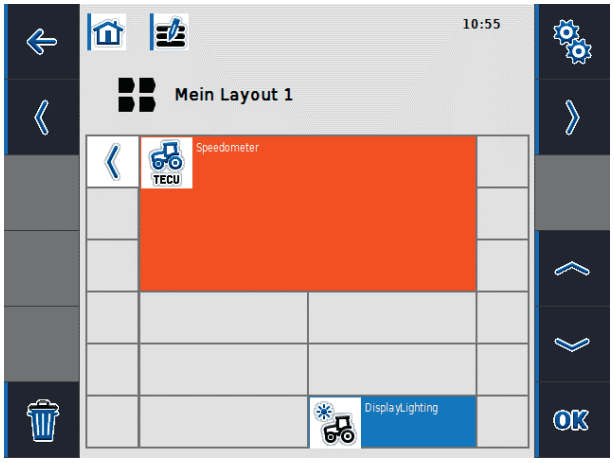


Illustration 6-8: Insertion step 2

The desktop associated with "My Layout 1" is displayed in Illustration 6-9 and can be accessed via the start menu.

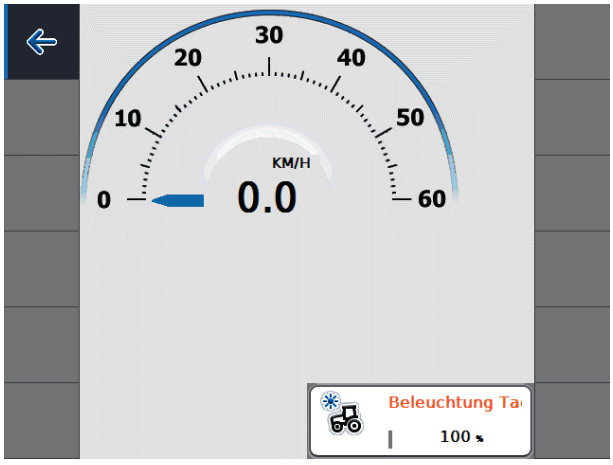


Illustration 6-9: Desktop for "My Layout 1“

All created screen layouts are permanently stored on the terminal. The associated desktops are adapted when the terminal is booted up and dynamically at runtime. So, if attachment devices are not present or are connected, apps are activated or deactivated, then synchronisation takes place with the created layouts and their desktops.

6.3 Problem solving

The following table summarises the panel:app Layout error messages, shows their possible cause and gives a suggested solution.

Problem	Solution
The desired widget is not available in the list of widgets.	There may not be enough space for the widget. Select another cell in the grid that has the appropriate space. The machine to be displayed is not connected. Connect the machine.
An empty area is displayed on the desktop of the selected layout, or a red area without an icon appears in the layout detail view.	The machine to be displayed is not connected. Connect the machine. The app associated with this widget may be deactivated. Check whether the desired app is activated in the app management, and activate it if it isn't. Restart the terminal.

7 File Server (panel:app FS)

This document describes the current operation of panel:app FS in 3.00.00 version . The file server provides ISOBUS participants with a network memory for exchanging files. These can be configuration files or image files, for example. The file server is permanently available to ISOBUS participants when the terminal is switched on and the panel:app FS is activated.

7.1 Features

The panel:app FS has the following functions:

- Information display such as connection details, open files and memory allocation.
- A file manager for managing folders and files.
- Internal and external memory management (USB sticks).
- The file server works according to ISO 11783-13.

7.2 Operation

If the panel:app FS is opened, the following window is shown:

Illustration 7-1 View of the main window.

The main window can be seen in Illustration 7-1. It shows current information about connected machines and open files. The following selection options are in the softkey area.

Opening the memory allocation data.

Opening the file manager.

Detailed view of files currently open.

7.2.1 Memory allocation data.

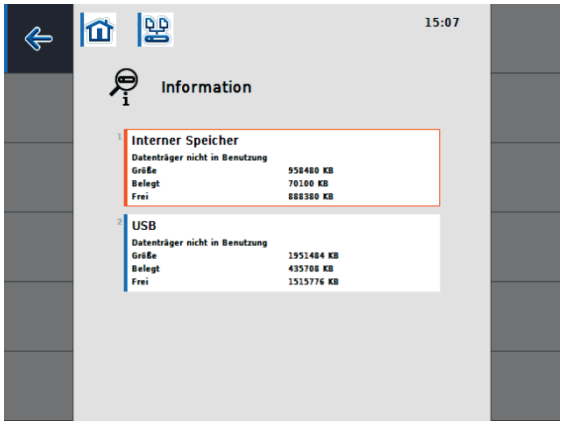


Illustration 7-2 Memory data.

Illustration 7-2 shows the memory allocation information. The total amount of memory currently available in the internal and external memory, what's allocated and what's still free, can be checked here.

7.2.2 The file manager

The file manager enables the management of folders and files.

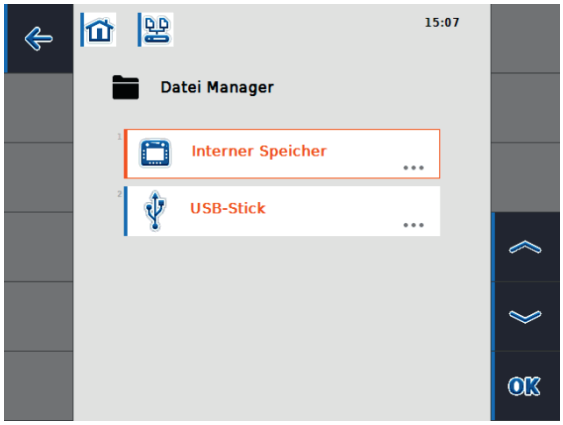


Illustration7-3 File manager - Memory selection.

When the file manager is open, a memory selection window appears first (Illustration7-3). A choice between the internal memory and the external memory can be made here.

Note: The external memory can only be selected if a USB stick is connected to the terminal.

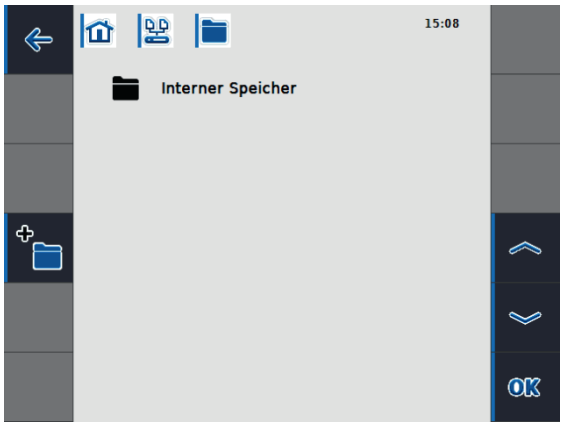


Illustration 7-4 File manager - Internal memory.

The file manager internal memory has been selected in Illustration 7-4. If folders or files already exist, they are displayed here. The following functions can be used via the softkey area.

Create new folder

7.2.3 File manager - Folder managemant

Illustration 7-5 New folder - Enter the folder name.

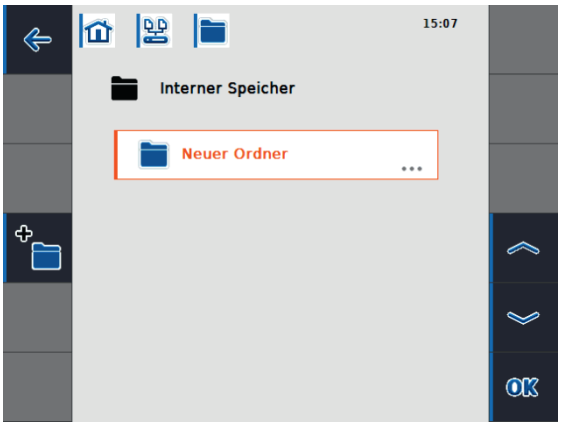


Illustration 7-6 The new folder is created.

When you create a new folder, an input window opens next (Illustration 7-5). Enter the name of the folder here. After you press "OK", the folder is created and you return to file management (Illustration 7-6).

To open or delete a folder, proceed as follows:

1. Press on the required folder. A selection window opens (see Illustration 7-7).
2. The folder can then be opened or deleted.
3. When you open the folder, you are in the folder.
4. If you want to delete the folder, a confirmation window is displayed first. (see Illustration 7-8)
5. If there are files or subfolders in the folder, they are also deleted.
6. After pressing "OK", deletion is carried out.

Note: Deletion cannot be reversed. Therefore, only delete folders and files that you are sure are not being used by any other application.

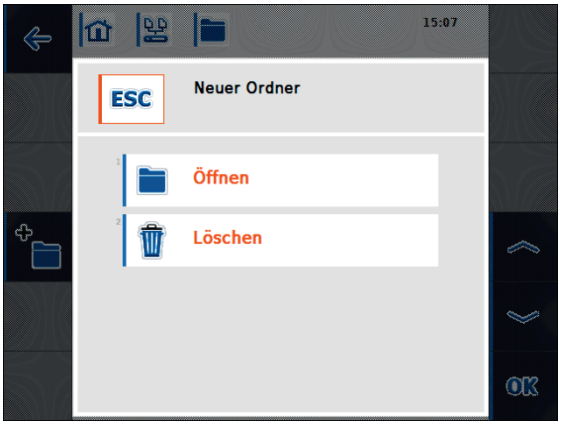


Illustration 7-7: Selection window after pressing a folder

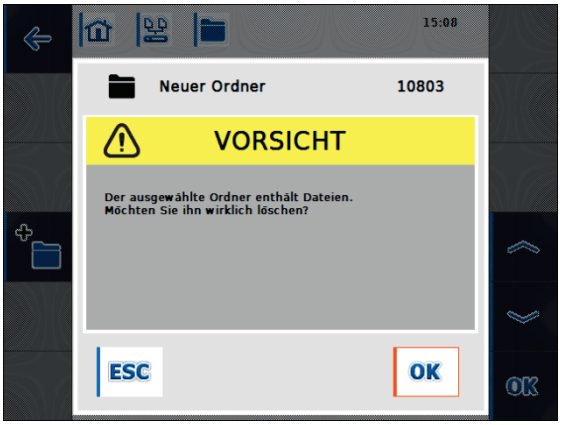


Illustration 7-8: Request to confirm the deletion

7.2.4 File Manager - File Management

Files are displayed in the file manager as seen in Illustration 7-9. Files cannot be opened via the file manager, unlike folders. However, you can view more information about the file or delete the file.

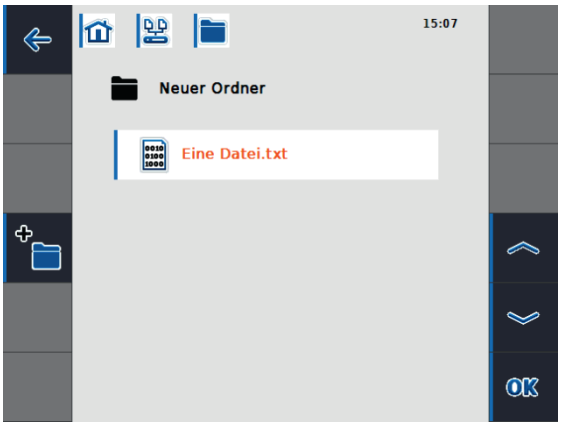


Illustration 7-9: File display in the file manager

Pressing on the file opens the selection window (Illustration 7-10). By selecting "Information", further information on the file appears. This can be seen in Illustration 7-11. In addition to the name of the file, the path in the file system can be recognised as well as the current size and date of modification. By selecting "Delete", the files can be deleted. As is with the deletion of folders, this must be confirmed, as seen in Illustration 7-12.

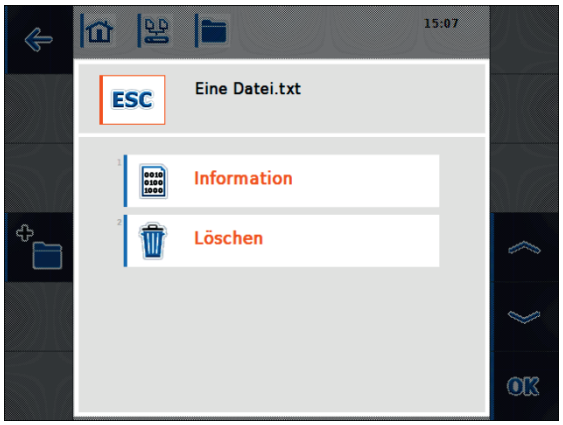


Illustration 7-10: Selection window after pressing on a file

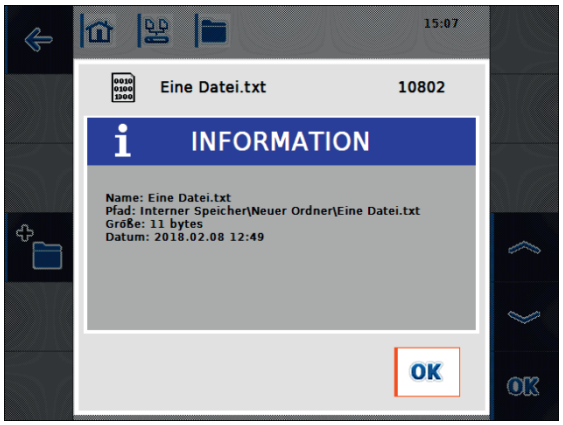


Illustration 7-11: File information

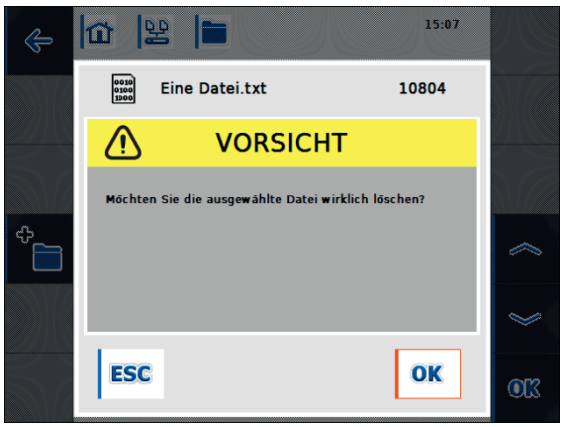


Illustration 7-12: Prompt to confirm the deletion

7.2.5 Detailed view of files currently open

The panel:app FS provides a detailed view of files currently open. This can be reached via the main window. The detail view is shown in Illustration 7-13. Here you can obtain further information on the files currently open by selecting an appropriate file.

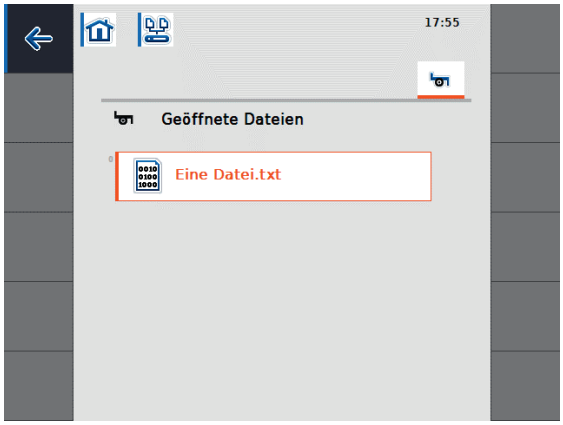


Illustration 7-13: Detail view - open file

7.3 Troubleshooting

Problem	Solution
The external memory cannot be selected in the file manager.	Ensure that a USB stick is plugged into the terminal.
A file or folder cannot be deleted.	This can occur if a file is currently opened using another application. Ensure that the file is not currently opened from any application. You can check this in the main panel:app FS window.
The detailed information on currently opened files cannot be selected.	This button is only activated if an ISOBUS participant with File Server Client is connected to the terminal.

Table 7-1: panel:App FS - Troubleshooting

8 Tractor ECU (panel:app TECU)

The panel:app TECU establishes the terminal's connection to the tractor control system and provides the user with central information such as driving speed, PTO speed and the position of the hoists. This data is forwarded to the attached ISOBUS machines. The sensors for recording this data can be configured in the panel:app TECU. In addition, several tractors can be managed and their settings are stored in a tractor database.

8.1 Features

The panel:app TECU offers the following features:

- Reading the signals at the tractor signal socket.
- Calculating speed on the basis of wheel and radar sensors
- Determining the PTO shaft speed and the 3-point position
- Forwarding tractor data to attached ISOBUS machines
- Selection of sensor sources and calibration of the sensors
- Manage multiple tractors and their settings in a tractor database
- Active and passive mode: Recognize a primary TECU or a higher priority TECU and switch to passive mode.
- Hectare counter for displaying working time, travel distance and area output
- Connection set-up to panel:app control for the documentation of process data
- Delayed shutdown of ISOBUS machines to save configuration parameters and achieve a safe status
- Request behaviour according to ISO standard 11783-9

8.2 Operation

8.2.1 Basics of the tractor ECU

The tractor ECU is the tractor's electronic control unit that takes control of the various tractor functions. It establishes the connection between the tractor bus system and the ISOBUS. This provides an attached ISOBUS device with tractor information such as forward speed, PTO speed and position of the rear hoist.

New tractors are often ISOBUS-compatible and equipped with a TECU ex works . Such a TECU is called a primary TECU.

Tractors that are not yet ISOBUS-compatible can be retrofitted with the aid of an upgrade cable kit. The panel:app TECU offers the possibility of reading tractor information via the signal socket and forwarding it to attached ISOBUS machines. This is then referred to as a secondary TECU or TECU.

If only the panel:app TECU is present on a tractor, it automatically works in active mode. In active mode,

- the signals from the signal socket can be read,
- the values for driving speed, PTO speed and position of the 3-point calculated, and
- these calculated values are forwarded to attached ISOBUS machines.

If the tractor has a primary TECU or a higher priority TECU that provides the tractor information via ISOBUS, the panel:app TECU switches to passive mode. The display in passive mode is shown in section 8.2.9.

The information available on the ISOBUS is displayed in the passive mode. However, connection to the signal socket is only necessary if not all tractor information is provided via the ISOBUS.

8.2.2 Initial operation

The panel:app TECU evaluates the tractor information present at the tractor signal socket, such as forward speed, PTO speed and position of the rear hoist, and forwards this information to all attached ISOBUS machines.

According to ISO standard 11786, the signal socket is assigned the following sensor data:

Wheel sensor:

The wheel sensor emits a certain number of electrical signals proportional to the wheel rotation. This allows the tractor speed to be calculated.

Radar sensor:

The radar sensor emits a certain number of electrical pulses proportional to the distance travelled. The tractor speed can also be calculated.

PTO shaft sensor:

The PTO shaft sensor emits a certain number of electrical pulses proportional to the PTO shaft speed. This allows the PTO shaft speed to be determined.

3-point-sensor:

The 3-point sensor provides an output voltage to the signal socket that is proportional to the current position of the rear hoist.

A signal cable is required to connect the terminal to the signal socket. Connect the "Signal" interface on the rear of the terminal to the tractor signal socket.

8.2.3 Main view of the panel:app TECU

If panel:app TECU is selected in the terminal's main menu, then the main view of panel:app TECU is shown. The main view displays important current parameters such as speed, PTO speed and 3-point position and provides direct access to all panel:app TECU functions.

Illustration 8-1: Main view of the panel:app TECU

Illustration 8-1 shows the main view of the panel:app TECU with the following information:

1. Name of the active tractor
2. Speed indicator
3. The selected speed sensor display

4. PTO shaft speed display
5. Display for the working or transport position and the direction of travel
6. Display for the position of the 3-point linkage

The main view provides the following operating options via the softkeys:

Edit active tractor (F2)

Select speed sensor (F4)

Set working position (F6)

Show tractor list (F8)

Activate documentation and task management (F10)

Show hectare counter (F12).

In addition, you can access a tractor selection menu from the main view by selecting the "Tractor name" field. This allows the currently active tractor to be set from a list of stored tractors (cf. Illustration 8-2).

Illustration 8-2: Set active tractor

8.2.4 Select speed sensor

To display the speed in the main view, one of two possible sensors is evaluated. The two possible speed sensors are

- Wheel sensor and
- Radar sensor.

The icon below the speed display in the main view shows which speed sensor is currently selected.

Wheel sensor is selected.

Radar sensor is selected.

To switch between the speed sensors, select the softkey F4 "Select speed sensor". The icon in the main view adapts accordingly.

8.2.5 Set working position

The lower part of the main view shows whether the machine is in the working or transport position.

The machine is in the working position.

The machine is in the transport position.

If you select the softkey F6 "Set working position", a numerical input window opens in which the working position limit in percent is to be entered (cf. Illustration 8-3).

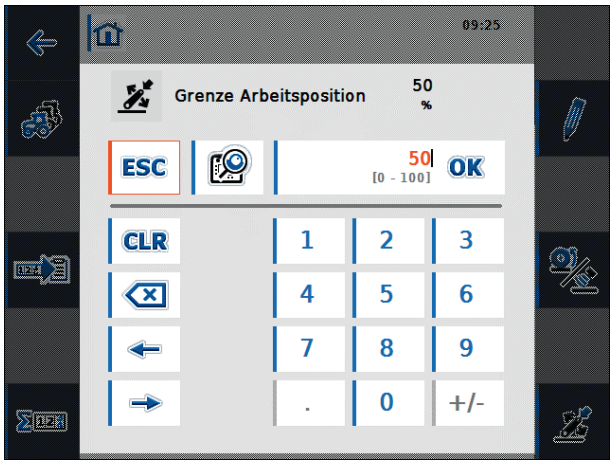


Illustration 8-3: Set working position limit

The 3-point sensor provides an output voltage to the signal socket that is proportional to the current position of the rear hoist. Once you have calibrated the tension values for the highest and lowest position of the 3-point linkage (cf. section 8.2.7.6), you can set the voltage limit value that differentiates between working and transport position. If the 3-point sensor output voltage is lower than the limit value, then the machine is in the working position.

When panel:app TECU is started, a limit value of 50 % is preset. To set the current position of the 3-point as the limit value for the working position, select the softkey "Set working position" for the selected 3-point position. The percentage value corresponding to the 3-point position is then adopted as the limit for the working position.

If the panel:app TECU hectare counter is used, the limit value for the working position must be set at the beginning of the task. This is the only way to determine whether the machine is in transport or working position. This allows the working time, the distance travelled and the area worked to be shown in the working position (cf. section 8.2.8).

8.2.6 Show tractor list

From the main view you can access the list of stored tractors via the softkey F8 "Show tractor list". The name of the each tractor, a comment on the tractor and its own setting values are stored.

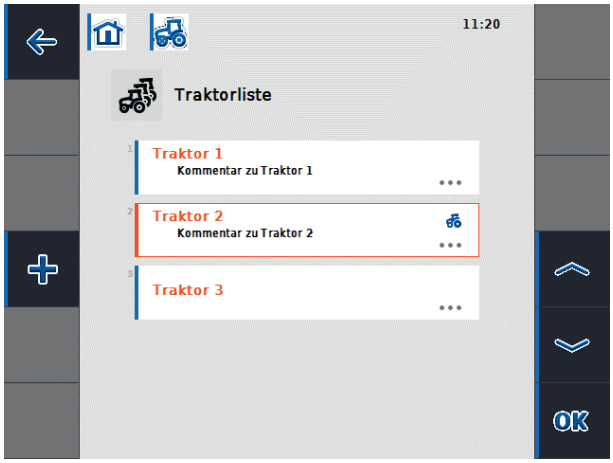


Illustration 8-4: Tractor list

Illustration 8-4 shows a list of three tractors with tractor 2 selected as the active tractor. This is identified by the tractor symbol in the upper right corner of the second field. In this display, the function keys provide the following operating options:

A new tractor can be created and the detailed view of the new tractor opens (see section 8.2.7).

The context menu then opens.

Illustration 8-5: Tractor context menu

Illustration 8-6: Confirmation prompt when deleting tractor

The context menu offers the following actions that can be performed with the selected tractor:

The selected tractor is edited and the detailed view of the tractor opens (see section 8.2.7).

The selected tractor is copied and the detailed view of the copied tractor opens. The name of the new tractor consists of the name of the original tractor accompanied by the word "Copy". This name can be changed in the tractor settings.

The selected tractor is deleted. A confirmation prompt occurs before deleting, such as in Illustration 6-6. The currently active tractor cannot be deleted.

8.2.7 Edit tractor - tractor detail view

The detailed view of a tractor is shown in Illustration 8-7 and is divided into 6 tabs.

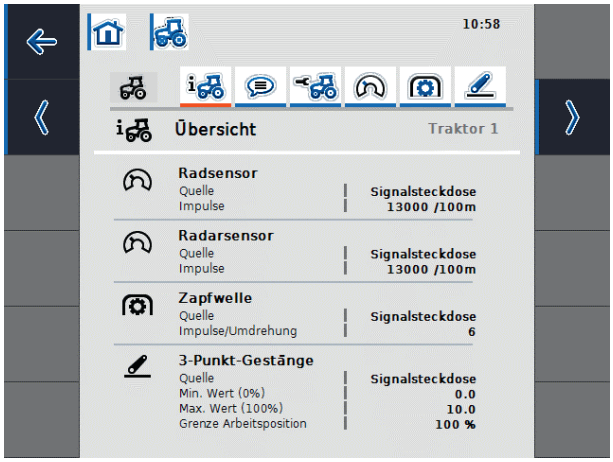


Illustration 8-7: Tractor detail view - Overview

Overview: Information on the wheel and radar sensor, PTO shaft and 3-point linkage is displayed.

Comment: A comment with a maximum of 160 characters can be added to the tractor.

Tractor settings: Settings can be made for tractor name, wheel and radar sensor, PTO sensor, 3-point sensor, power management and X-sensor.

Speed: The number of pulses per 100 metres for the wheel and radar sensor as well as the sensor source for the hectare counter can be set.

PTO shaft : The number of pulses per revolution can be set.

3-point linkage: The voltage values for the highest and lowest position of the 3-point linkage can be set.

The speed, PTO shaft and 3-point linkage tabs are deactivated and cannot be selected if the signal source for wheel or radar sensor, PTO shaft and 3-point linkage is not available in the "Tractor settings" tab, or the signal socket is not set as the source. If the signal socket is selected as the source for one of these sensors in the tractor settings, the corresponding tab is also active and the sensor can be configured.

8.2.7.1 Overview

The first tab displays an overview of the settings for the wheel and radar sensor, PTO shaft and 3-point linkage (cf. Illustration 8-7).

8.2.7.2 Comment

In this tab, you have the option of attaching a comment to the tractor, which contains explanations or remarks about the tractor. If you select the comment field in Illustration 8-8, you can add a new comment or change an existing one (cf. Illustration 8-9). A maximum of 160 characters is allowed for the comment. If this number is exceeded, the text field turns red and the entry cannot be saved.

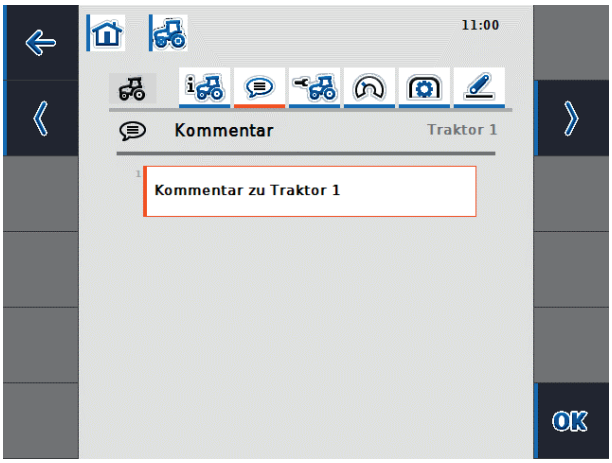


Illustration 8-8: Tractor detail view - Comment

Illustration 8-9: Add a comment

8.2.7.3 Tractor settings

In this tab, the name of the tractor can be customised and settings can be made for the wheel and radar sensor, PTO shaft sensor, 3-point sensor, power management and X-sensor (cf. Illustration 8-10 and Illustration 8-11).

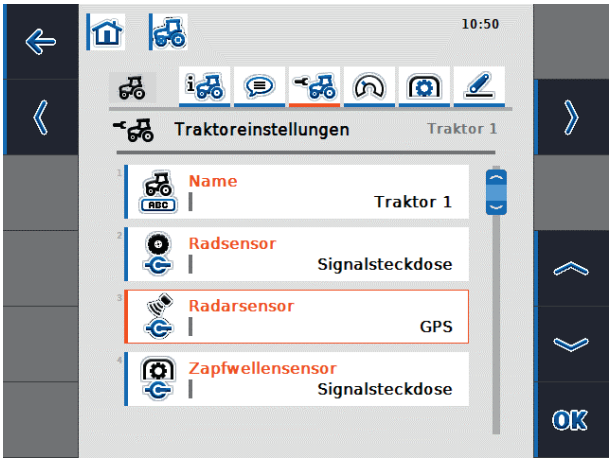


Illustration 8-10: Tractor detail view - Tractor settings

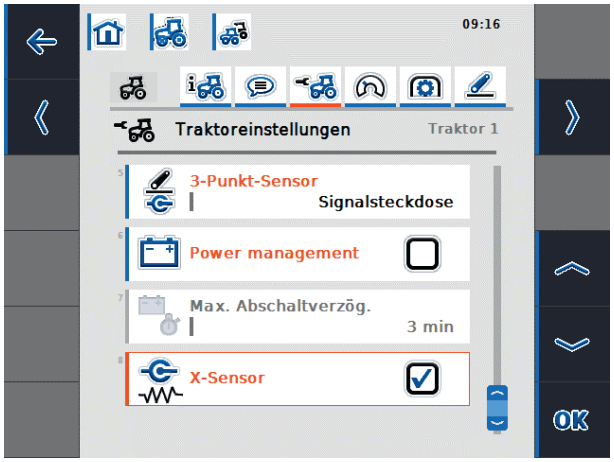


Illustration 8-11: Tractor detail view - Tractor settings

The following tractor settings can be made:

1. Edit tractor names
2. Select signal source for wheel, radar, PTO shaft and 3-point sensors
3. Activate Power Management
4. Set value for maximum switch-off delay
5. Activate X-sensor

Note:

If the panel:app TECU is in passive mode, it is not possible to edit the setting values of the active tractor that are made available via ISOBUS. In this case, the relevant buttons are deactivated and "CAN 1" is displayed as a selection.

1. Edit tractor names

To edit the name of the tractor, select the "Name" button from the list of tractor settings. In the text input field that opens, change the tractor name and confirm with "OK".

2. Select signal source

The possible choices of signal sources for wheel sensor, radar sensor, PTO sensor and 3-point sensor are:

- Not available
- Signal socket (ISO 11786)
- CAN 1
- GPS (only with radar sensor)

To set the signal source of the sensors, select the relevant button from the list of tractor settings. Selection lists open as in Illustration 8-12 and Illustration 8-13 for the wheel sensor and the radar sensor. Select the desired signal source and confirm with "OK".

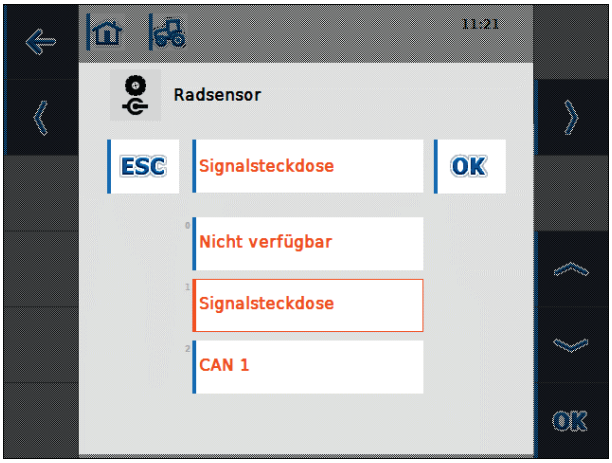


Illustration 8-12: Select wheel sensor signal source

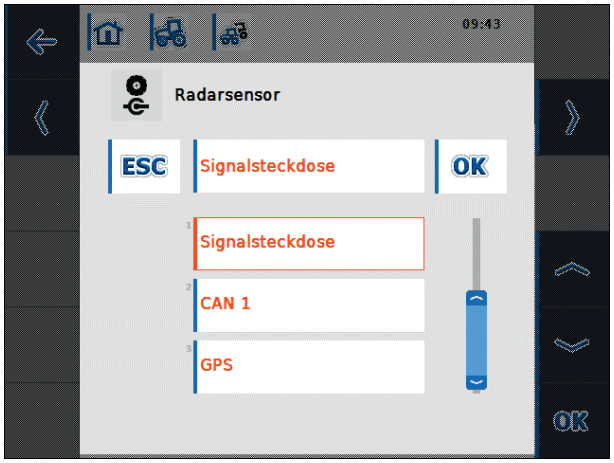


Illustration 8-13: Select radar sensor signal source

Note:

If you have set the signal socket as the signal source for the wheel or radar sensor, you must calibrate the speed or enter the pulses per 100 metres manually.

If you have set the signal socket as the signal source for the PTO shaft sensor, you must set the number of pulses per revolution.

If you have set the signal socket as the signal source for the 3-point sensor, you must calibrate the 3-point.

You can execute the calibrations in the relevant tractor detail view tab.

3. Activate Power Management

To activate the switch-off delay, select the "Power Management" button from the list of tractor settings. In the input field that opens, activate the switch-off delay using the check box and confirm with "OK".

4. Set value for maximum switch-off delay

To set the value for the maximum switch-off delay, select the "Maximum switch-off delay" button from the list of tractor settings. In the numeric input field that opens, enter the new value and confirm with "OK".

The effective value range for the maximum switch-off delay is between 1 and 250 minutes. The preset value is 3 minutes. If the power management is deactivated, the "Maximum switch-off delay" button is also deactivated.

5. Activate X-sensor

If you want to operate an X-sensor at the terminal, the input circuit must be configured. To do this, select the "X-Sensor" button from the list of tractor settings. Confirm the security prompt with "OK" and activate the X-sensor in the opening input field using the check box (cf. Illustration 8-14 and Illustration 8-15).

Illustration 8-14: X- sensor security prompt

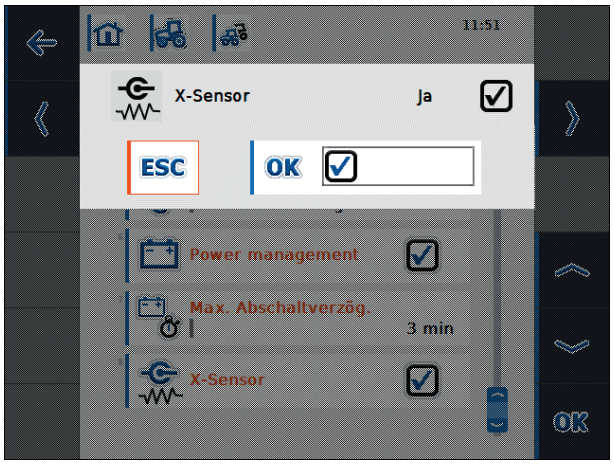


Illustration 8-15: Activate X-sensor

8.2.7.4 Speed

In the "Speed" tab, set the speed sensor to record the tractor speed. Both speed sensors (wheel and radar sensor) can be used simultaneously. Which speed sensor is currently selected for the speed display in the panel:app TECU main view and how to change it is described in section 8.2.4.

The wheel sensor emits a certain number of electrical signals proportional to the wheel rotation, while the radar sensor emits a certain number of electrical pulses proportional to the distance travelled. These values can be used to calculate the tractor speed every time. It should be noted that wheel sensors provide inaccurate speed values when slippage occurs. On the other hand, radar sensors may provide inaccurate speed readings in some circumstances depending on the ground surface, e.g. with high grass or puddles.

Illustration 8-16 shows the number of pulses emitted over a distance of 100 metres for both sensors.

If a new tractor is added, then a value of 13000 pulses per 100m is preset. The effective range of values for the number of pulses per 100 metres is between 200 and 30000. The more accurate this value is, the more precise the speed display is in the main view.

If the value for the number of pulses per 100 metres is known (e.g. from the sensor's data sheet), then this value can be entered directly. To determine a value that is as precise as possible, a calibration should be carried out.

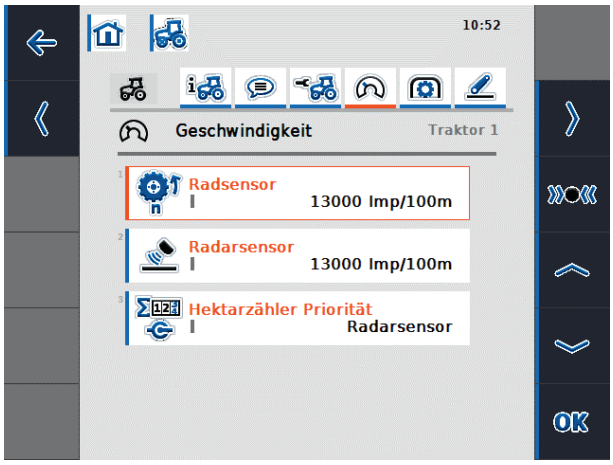


Illustration 8-16: Tractor detail view - Speed

The following operating options are available here:

Enter number of pulses per 100 metres for wheel sensor

Enter number of pulses per 100 metres for radar sensor

Select the hectare counter source

Calibrate the speed sensors:

1. Enter number of pulses per 100 metres for wheel or radar sensor

To enter the number of pulses per 100 metres for the wheel or radar sensor, select the wheel sensor or radar sensor button from the "Speed" tab. In the numeric input field that opens, enter the new value and confirm with "OK".

2. Select the hectare counter source

This button is only active when both speed sensors are used simultaneously.

To set the hectare counter source, select the "Hectare counter priority" button from the "Speed" tab. From the selection list that opens, select the wheel sensor or the radar sensor as the source for the hectare counter, and confirm with "OK".

3. Calibrate the speed sensors:

In order to achieve an accurate value, the calibration of the speed sensors should not be carried out on smooth surfaces such as asphalt, if possible, but directly in the field.

Ensure that the tractor for which the calibration is being carried out is active. Otherwise, a confirmation prompt opens as in Illustration 8-17.

Illustration 8-17: Calibration safety prompt

Illustration 8-18: Speed calibration

To calibrate a speed sensor, proceed as follows:

- Stake out a 100 metre section.
- Select the function key F3 "Calibrate" in the "Speed" tab.
- In the selection list (see Illustration 8-18), select the wheel sensor or the radar sensor for calibration.
- Drive to the starting point of the section and press the function key F3 "Start flag" (cf. Illustration 8-19).
- Drive the 100 metre section and press the function key F9 "Finishing flag" (cf. Illustration 8-20).
- Confirm with "OK".

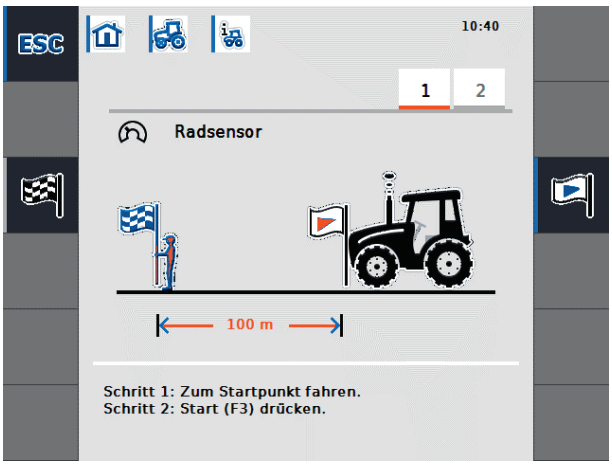


Illustration 8-19: Calibration - Start

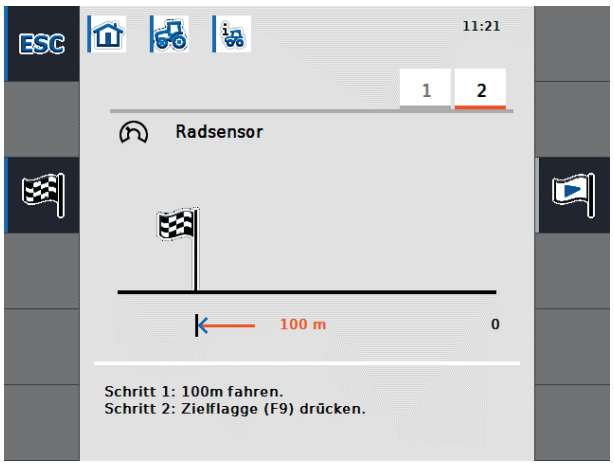


Illustration 8-20: Calibration - Goal

After calibration, a check is made as to whether the measured number of pulses is in the value range between 200 and 30000 pulses per 100 metres. If the measured value is plausible, it is saved for the respective sensor and it switches to the main view. If this is not fulfilled, a warning is displayed and the calibration must be repeated.

8.2.7.5 PTO shaft

In the "PTO shaft" tab, set the PTO shaft sensor. The PTO shaft sensor emits a certain number of electrical pulses proportional to the PTO shaft speed. Illustration 8-21 shows the number of electrical pulses emitted by the sensor during one PTO shaft revolution.

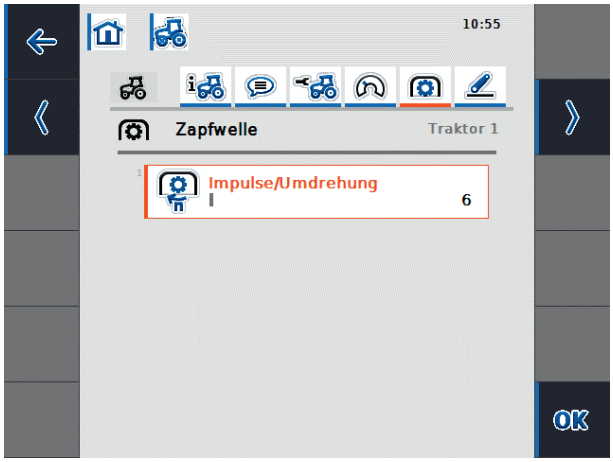


Illustration 8-21: Tractor detail view - PTO shaft

If a new tractor is added, then a value of 6 pulses per 100m is preset. The effective range of values for the number of pulses per revolution is between 1 and 40.

The value to be entered for your tractor can be found in your tractor's technical information.

To enter the number of pulses per revolution for the PTO shaft sensor, select the "Pulses/rev" button from the "PTO shaft" tab In the numeric input field that opens, enter the new value and confirm with "OK".

8.2.7.6 3-point linkage

The 3-point sensor is set in this tab. This provides an output voltage to the signal socket that is proportional to the current position of the rear hoist. Illustration 8-22 displays the voltage values for the highest and lowest position of the 3-point linkage.

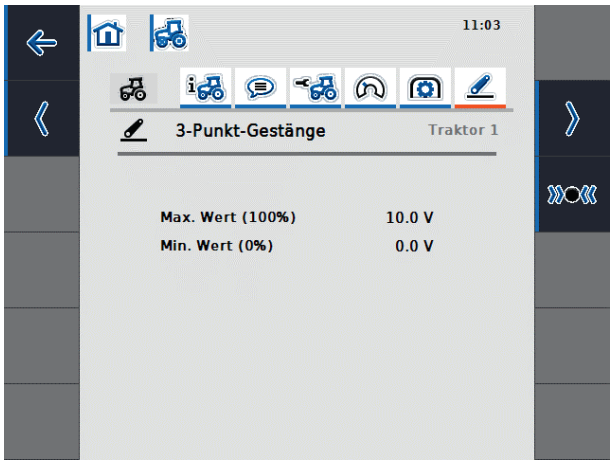


Illustration 8-22: Tractor detail view - 3-point linkage

You have the following operating options:

Calibrating the 3-point sensor

Ensure that the tractor for which the calibration is being carried out is active. Otherwise, a confirmation prompt opens.

To calibrate the 3-point sensor, proceed as follows:

- Select the function key F3 "Calibrate" in the "3-point linkage" tab.
- Raise the 3-point linkage to the maximum position and press the function key F3 "MAX" (cf. Illustration 8-23).
- Lower the 3-point linkage to the minimum position and press the function key F4 "MIN" (cf. Illustration 8-24).
- Confirm with "OK".

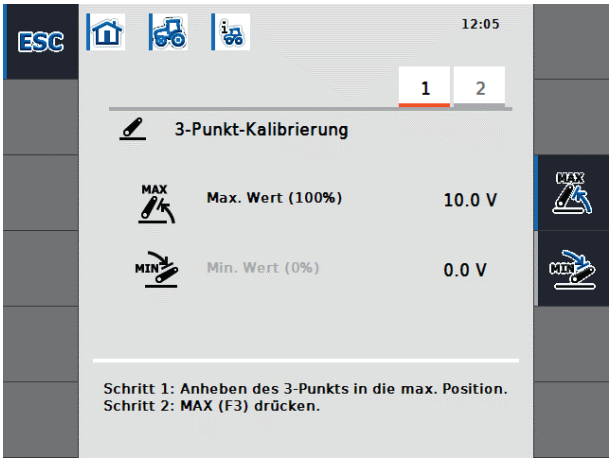


Illustration 8-23: 3-point calibration - Maximum value

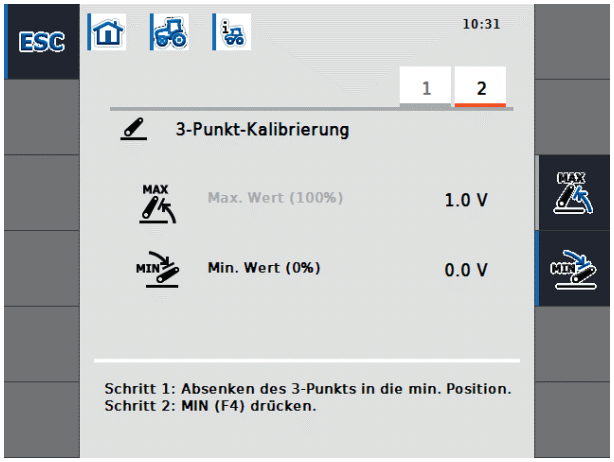


Illustration 8-24: 3-point calibration - Minimum value

During calibration, a check is made to determine whether the measured voltage value in the highest position of the 3-point is at least 0.1 V and whether the measured voltage value in the lowest position of the 3-point is lower than in the highest position.

If the measured values are plausible, a confirmation screen opens. Once confirmed with "OK", the new values are saved. If the values are not plausible, an error message is displayed.

8.2.8 Show hectare counter

If you select the softkey F12 "Show hectare counter" in the main view, you have the opportunity to display process data for an attached machine that is not operated via the ISOBUS. The following information is presented (cf. Illustration 8-25):

- Working width of attached machine,
- hectare counter speed source,
- working time,
- distance travelled and
- area worked.

A counter is kept for the working time, the distance travelled and the area worked. Each of these three counters can be reset individually.

For the time, the distance and the area, a total value and a value in the working position are given respectively. The total value shows the time, distance and area since the respective

counters were last reset. On the other hand, the value in the working position shows the time, the distance and the area the attached machine has operated in the working position since the respective counters were last reset.

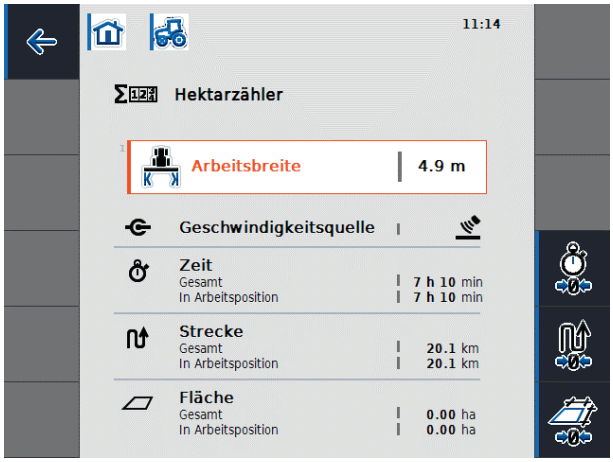


Illustration 8-25: Hectare counter

The hectare counter view offers the following operating options:

Reset time counter (F4)

Reset distance counter (F5)

Reset area counter (F6)

If one of these softkeys is pressed, the corresponding counter is reset to 0 and the display is updated.

In addition, the working width of the attached machine can be set when the "Working width" button is selected. In the numeric input field that opens, enter the new value for the working width and confirm with "OK".

The effective value range for the working width is between 0.0 and 99.0 metres. The more precise the value entered for the working width, the less the calculated value for the area worked deviates from the actual area size.

8.2.9 Passive mode

If the tractor has a primary TECU or a higher priority TECU that provides the tractor information via ISOBUS, the panel:app TECU switches to passive mode. The view of the panel:app TECU in passive mode is shown in Illustration 8-26.

Illustration 8-26: Passive mode

In passive mode, the information available from another TECU on the ISOBUS is indicated by a blue frame and the blue letter "i".

However, connection to the signal socket is only necessary if not all tractor information is provided via the ISOBUS. In this case, missing information can be provided via the panel:app TECU. For this purpose, the sensors must be calibrated.

8.3 Troubleshooting

The following table summarises error messages of the panel:app TECU, shows their possible cause and gives a suggested solution.

Problem	Solution
Delete tractor The active tractor cannot be deleted.	The active tractor cannot be deleted. Select another active tractor.
TECU error Invalid value! Speed (wheel sensor or radar sensor) exceeds 85 km/h.	The number of pulses emitted by the sensor per 100 metres is incorrect. Set the number of pulses in the tractor detail screen in the "Speed" tab. Check that the wheel sensor or radar sensor is intact.
Calibration error Invalid value! The number of pulses is less than 200 or greater than 30000. Please check the sensor and the distance travelled and repeat the calibration.	The number of pulses for the distance of 100 metres is too low or too high. Check the length of the section. Check that the sensor is intact. Repeat the calibration process.
Calibration error Invalid value! The max. position is approx. 0V. Please check the sensor and the 3-point position, and repeat the calibration.	The output voltage for the highest position of the 3-point linkage is too low. Check the maximum 3-point position. Check that the sensor is intact. Repeat the calibration process.

Calibration error Invalid value! New min. position is equal to or higher than stored max. position. Make sure that the min. position is reached and the stored max. position is valid.	Presumably the order of calibration was not followed. Ensure that you have carried out the calibration in the correct order. Repeat the calibration process. If the problem persists, contact your authorised dealer.
TECU error Connection to control failed.	panel:app TECU could not connect to panel:app TC. Check the Task Controller status.

9 Licencing (panel:app Licence)

The panel:app Licence is used to transfer licence information to the terminal, that can be used to activate apps or apps options. Apps that require licences cannot be started if there is no activation. Licenced apps options are not available if there is no activation.

9.1 Features

The panel:app Licence offers a display of currently available licence information and a possibility to request licence information through manual input, via a file on a USB stick and fully automatically via the internet. The panel:app Licence does not offer a licences purchasing function. Licence information transfers to the terminal must be initiated by the user or after the purchase of a licence.

9.2 Operation

9.2.1 To view the available licences

The panel:app Licence interface is located in the system settings in the panel:app Menu by clicking on the "Licence Key" button, see Illustration 9-1. How to access the system settings is described in the panel:app Menu documentation.

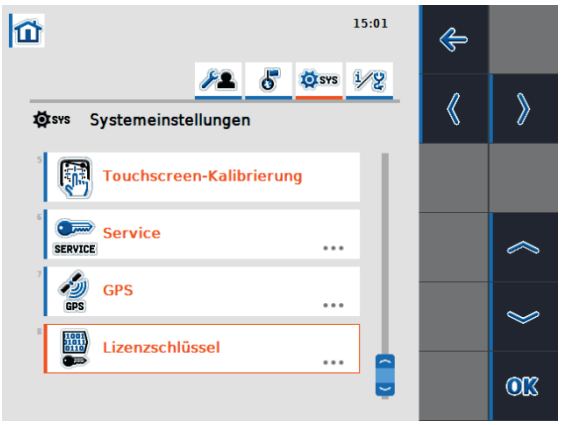


Illustration 9-1 Selection of panel:app License interface

This "Licence Key" button leads to the main view of the panel:app Licence. On the left, there is a list of apps that require a licence, together with their approval status on the right. The exact view varies according to the number of apps requiring a licence and their approval status, but may look like Illustration 9-2.

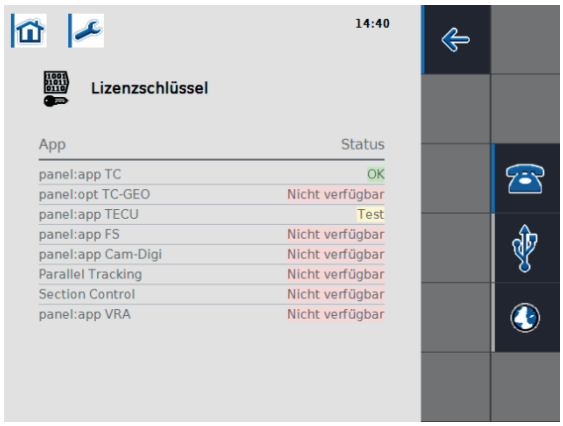


Illustration 9-2: Main view of the panel:app Licence

Nicht verfügbar "Not available" means that the app cannot be loaded because there is no approval.

Test "Test" means that the app is only available until the end of the test period.

OK "OK" means that the app is permanently available because it has been approved.

9.2.2 Licence input

The following interaction options are available:

Manual licence information input is done by pressing the F3 key.

Licence information input via USB stick is done by pressing the F4 key.

To request licence information via the internet, press F5.

9.2.2.1 Manual input

To enter licences manually, press the F3 key. This opens a new screen that has two tabs. The tab "panel:apps" shows the URL of the website where the licences can be requested, see Illustration 9-3.

It is: https://isobus.sdnord.de/ANDSP/publicactivation. Furthermore, the code for requesting a licence can be seen in red on the aforementioned page. Its form is 5 times 8 characters - "XXXXXXXX - XXXXXXXX - XXXXXXXX - XXXXXXXX". The hyphens are only for clarity. The button "Enter licence key" opens a text input in which a key obtained at the website mentioned can be entered. Its form is also 5 times 8 characters - "XXXXXXXX - XXXXXXXX - XXXXXXXX - XXXXXXXX". This activation code is only valid at the terminal of whose request code the release code was created for. Alternatively, the activation code can also be uploaded to the terminal as a file, as described in chapter 9.2.2.2.

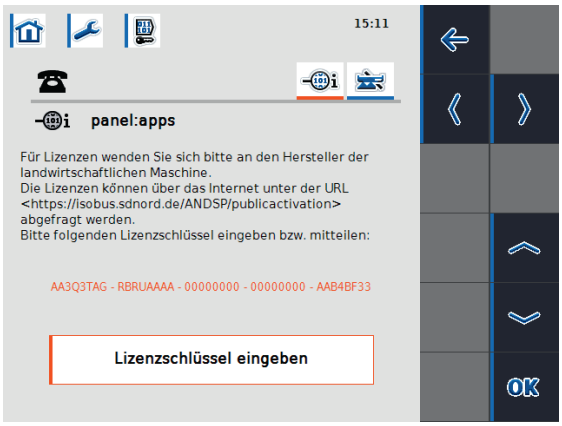


Illustration 9-3: Licence input by hand

The tab "panel:app Precision" offers an analogue input option for the "Section Control" and "Parallel Tracking" options of the "panel:app Precision", see Illustration 9-4

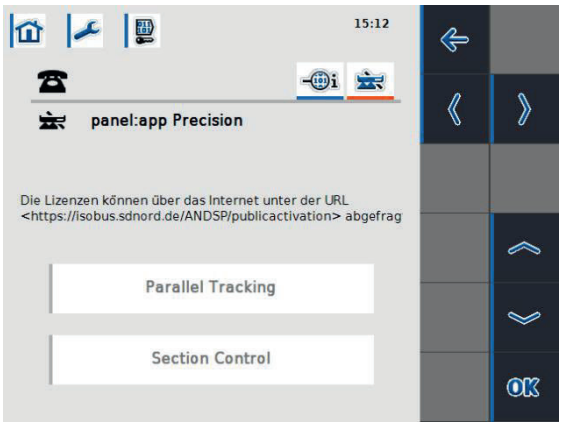


Illustration 9-4: Panel:app Precision options

9.2.2.2 Input via USB stick

If a USB stick is plugged into the terminal, the F4 key can also be pressed. This is made clear by a blue bar on the key. This will save a file on the USB stick containing the licence request. It has the name "<terminal serial number>.UTZ.liz". A pop-up shows that the file has been successfully saved and reminds the user of the file's name format, see Illustration 9-5.

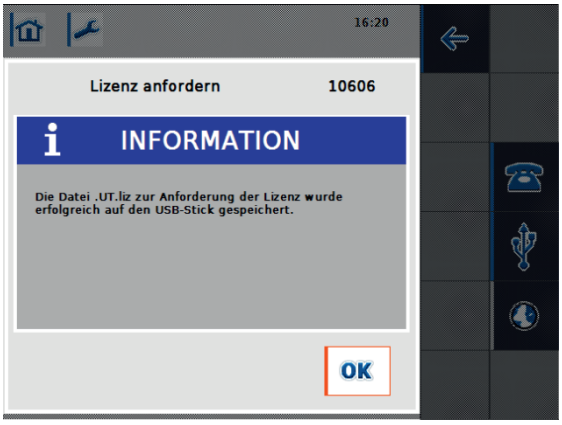


Illustration 9-5: Licence request on USB stick.

This file can be uploaded from the aforementioned website https://isobus.sdnord.de/ANDSP/publicactivation. The activation code generated by this can be downloaded as a file with the name "<terminal serial number>.SP.liz" and copied to a USB stick in the top directory.

The USB stick with this file can be inserted into the terminal again. By pressing the F4 key, the "<terminal serial number>.SP.liz" can be ported to the terminal. The "<terminal serial number>.SP.liz" file is only valid on the terminal where the "<terminal serial number>.UTZ.liz" was created.

9.2.2.3 Automatic request

If there is an internet connection at the terminal, the F5 key can be pressed. This requests the named internet page https://isobus.sdnord.de/ANDSP/publicactivation and automatically loads the licence information onto the terminal.

9.2.2.4 Evaluation of the licence entry

If a licence request has been made in one of the ways presented in the previous three chapters, it will be processed. If the licence information for the terminal is valid, a positive result is displayed, see Illustration 9-6.

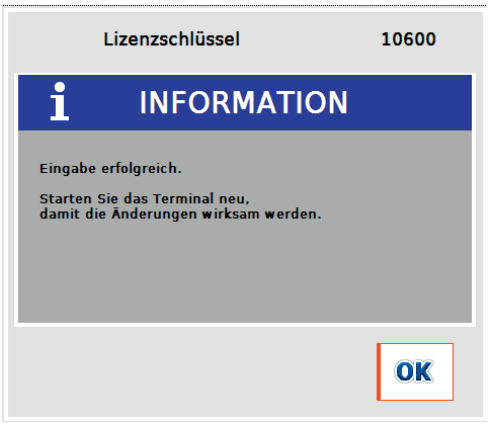


Illustration 9-6: Successful licence entry.

If the manually entered key is invalid due to a typing error, the error message from Illustration 9-7 appears.

Illustration 9-7: Invalid manual entry

If the manual or USB stick imported activation code is intended for another terminal, the error message from Illustration 9-8 appears.

Illustration 9-8: Licence key is not for terminal in use

9.3 Problem solving

Problem	Solution
 The internet activation button cannot be pressed.	The strip next to the button is grey. There is no internet connection on the terminal. How to set up an internet connection on the terminal is described in the panel:app Menu section 4.4.3
 The USB activation button cannot be pressed.	The strip next to the button is grey. The USB stick was not recognised by the terminal or a USB stick wasn't inserted at all. Ensure that the desired USB stick is inserted in the USB socket on the terminal.
Nicht verfügbar Licence information has been successfully imported, but an app still has the status "Not available".	No licence activation was available for the plug-in. Ensure that a licence activation has been purchased for the desired app for this terminal.
Test → Nicht verfügbar The status of an app has changed from "Test" to "Not available".	The trial period for the app has expired. Negotiate an extension of the trial period or buy a licence for the corresponding app, then carry out a licence request. The test period for an app refers to a period of use and is independent of the actual use of the app.
The terminal does not accept the activation code entered, see Illustration 9-7 and Illustration 9-8.	Check if you made a mistake when entering the activation code and try again if necessary. Furthermore, the activation code must be intended for the terminal. Check that the terminal serial number matches the serial number on the website https://isobus.sdnord.de/ANDSP/publicactivation given during the request. Only enter the displayed activation code on the terminal with the serial number provided.

The terminal does not import the licence file from the USB stick.	The licence file is intended for a terminal with a specific serial number. The serial number is in the file name: "<terminal serial number>.SP.liz". Files with a different serial number will not be loaded by the terminal. Ensure that the terminal serial number matches the serial number on the website https://isobus.sdnord.de/ANDSP/publicactivation given during the request.

10 General problem handling

	"Caution" Switch off your tractor before starting to make measurements on the wiring harness, or adding or removing a device from the wiring harness.
	"Caution" If your machine stops responding to your inputs, interrupt your current operation and stop the machine.
	"Caution" As soon as you remove the CAN1-IN connector from the current device, the power supply is interrupted and unsaved progress is lost.

The following table describes typical problems that can occur due to incorrect operation, configuration or device connection. Aided by the measures presented, the user can carry out troubleshooting and rectification themselves.

However, in general, if a problem occurs frequently or repeatedly, or if none of the described measures lead to success, the machine manufacturer or dealer should be consulted. The user must not attempt to repair the device themselves.

Unusual behaviour:	Measures:
No connection to the implement is established.	- Ensure that all necessary signals between the device and the implement are electrically connected. In particular, the implement must be powered and connected to the ISOBUS, see page 15 "3.2 Initial operation". - Ensure that the panel:app UT plugin is activated, see page.

	- Restart the device. However, take special care that the implement is not switched on until the control unit has been fully initialised. - Check whether the CAN bus of your ISOBUS is correctly connected or if you are missing a terminating resistor.
The terminal will not turn on.	- Ensure that a supply voltage of at least 9V exsists between pins 1 (+) and 6 (-) of the CAN1-IN connector. - Remove the CAN1-IN cable from the device and reconnect it. Try to restart the device. - Start your tractor and try to restart your device.
The terminal does not respond to the ignition signal.	- Make sure that the power management is activated on your control unit and that the tractor's ignition signal is present on pin 1 of the signal/RS232 connector, as long as it is the primary control terminal on the ISOBUS. - Make sure that power management is deactivated on your control terminal and that the $+U_{ON}$ signal is present on pin 3 of the CAN1-IN connector, as long as it is not the primary control terminal on the ISOBUS.
The terminal no longer reacts.	- Try restarting the device using the ON/OFF button. - Remove the CAN1-IN cable from the device and reconnect it. Try starting the device again.

Table 10-1: Catalogue of measures

11 Technical data

Mechanical values	
Dimensions:	202 mm x 165 mm x 5 mm
Weight:	0.56 kg
Casing type:	Plastic casing
Attachment:	2x M5 threaded bushes
Type of protection:	IP6k5
Operating temperature:	-20°C bis +70°C
Storage temperature:	-40°C bis +80°C
Electronic values	
Nominal voltage:	12V
Operating voltage:	9..30V
Polarity protection:	up to 30 V
Current consumption at 13.8 V:	0.26 A
External fuse:	Attach external 1.8A fuse (max. 3 A)
Display:	5.6“ TFT colour display
Resolution:	640 x 480 (VGA)
Brightness:	Maximum 450 cd/m2, minimum 7 cd/m2
CPU-Board	
CPU:	Freescale i.MX357CJQ5C
Frequency	532MHz
NAND Flash:	1GB
RAM:	256MB DDR2
Software	
Operating system:	Windows CE 6
Visualisation	ISO-UT according to ISO11783 at implementation level IL4 Conformance Test 2010
Operating functions	
Board front:	FR4
Strength:	1.6 mm
Night design:	Luminous foil that illuminates the back of the keys when required
Decorative foil:	Screen print, UV-resistant
Keys:	12x software-dependent keys (F1-F12); 4x fixed functionality ("Home", "Exchange", "Acknowledge", "ISB")
Rotary pulse encoder:	Infinite, with additional selection button
Touchscreen:	Resistive, fully laminated
Touch point:	1
Loudspeaker	
Acoustic pressure:	98.4 dBA (10 cm from the speaker) at 3000 Hz
On/Off button:	One on the front and one at the back
Light sensor	LDR; detects the brightness of the ambient light

Interfaces/connection		
	CAN1–IN:	CAN1 bus, supply, switching voltage +UON; (M12 8-pin A-coded plug)
	RS232/signal:	2xRS232, supply voltage, power management, 5x signal measurement inputs for ISO 11786; (M12 12-pin A-coded socket)
	USB Type A socket:	USB 2.0 full-speed host for USB mass storage media with protective cap

Table 11-1: Technical data

12 Appendix - Licence information

In addition to self-developed and proprietary licenced software components, the following third-party software components are used:

Expat

> Copyright (c) 1998 – 2000, Thai Open Source, Software Center Ltd, and Clark Cooper
> Copyright (c) 2001 – 2006

b64

> Copyright (c) 2001, Trantor Standard Systems Inc.

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13 Annex - Declaration of Conformity

EU-Konformitätserklärung gemäß der EU-Richtlinie 2014/30/EU für elektromagnetische Verträglichkeit vom 26. Februar 2014 Hiermit erklären wir, dass das nachstehend bezeichnete Gerät in seiner Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Anforderungen der EU-Richtlinie 2014/30/EU entspricht. Bei einer mit uns nicht abgestimmten Änderung des Gerätes verliert diese Erklärung ihre Gültigkeit.	**EU-Declaration of Conformity** in accordance with the Directive 2014/30/EU for Electromagnetic Compatibility of 26. February 2014 Hereby we explain that below designated product in its conception and design as well as its issued configuration the fundamental requirements of the directive 2014/30/EU for Electromagnetic Compatibility brought by us. In the case of a not coordinated modification of this product this explanation loses its validity.
Hersteller:	Manufacturer:
ANEDO Ltd. Hülsmeyerstr. 35 D-49406 Eydelstedt	
Produktbezeichnung:	Product name:
Bediengeräte EXPERT 75 HW1.0	Control devices EXPERT 75 HW1.0
Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen:	Conformity with the requirements of this Directives is testified by adherence to the following standards:
- Elektromagnetische Felder nach: DIN EN ISO 14982:2009 - Leitungsgeführte Störungen nach: ISO 7637-1/2:2011 und ISO 16750-2:2012 - Elektrostatische Entladung nach: ISO 10605:2008	
Die Hinweise in dem technischen Gerätehandbuch für die Inbetriebnahme des Bedienterminals sind zu beachten.	The instructions contained in the technical handbook for installation of this device have to be followed.
Eydelstedt, 16.05.2018 Dipl. Ing. (FH) Fredo Harms Geschäftsführer/Director	

ANEDO - Ltd.
Hülsmeyerstr. 35
D-49406 Eydelstedt

Tel: +49(0)5442 / 80379-0
Telefax: +49(0)5442 / 80379-22
email: info@anedo.de
Internet: www.anedo.de