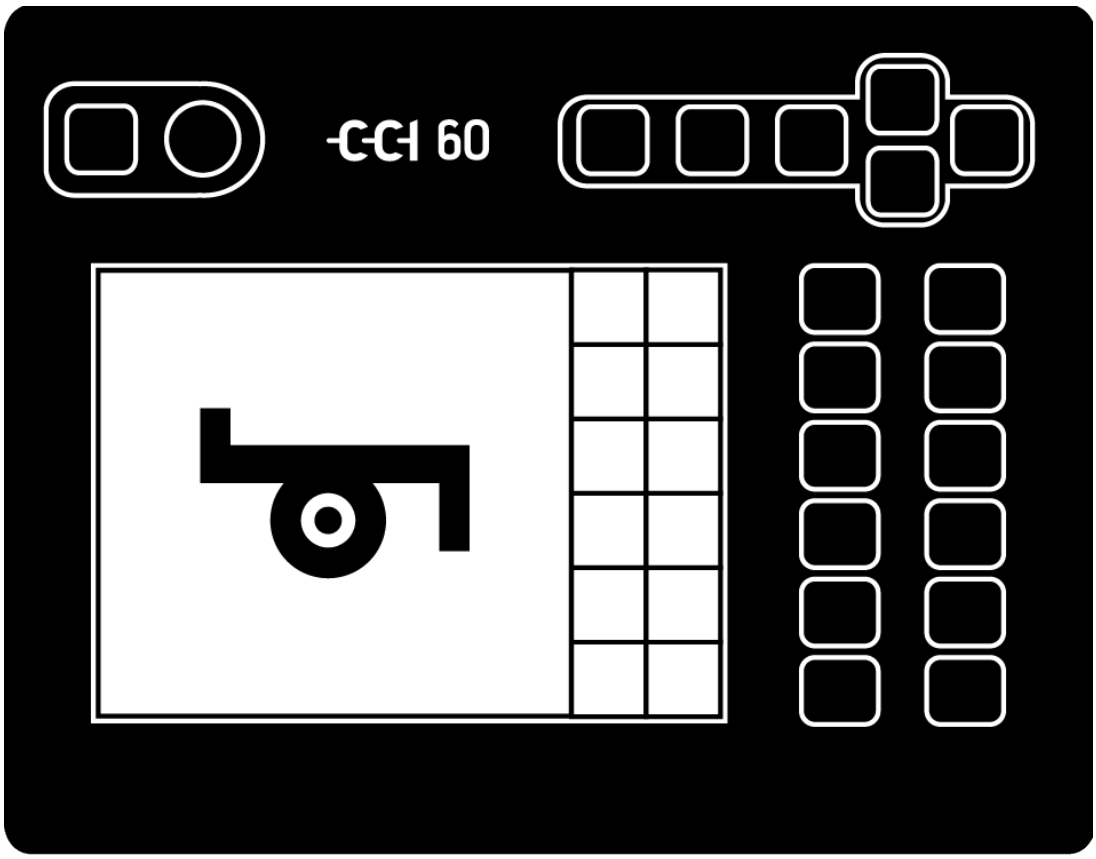
CCI 60

ISOBUS Terminal

Operating instructions



ISOBUS
team play works.

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Contents

About these operating instructions

Target group

These operating instructions are intended for users of the ISOBUS CCI 60 Terminal. They include all necessary information for safe handling of software and terminal.

All information provided in the operating instructions relates to the following device configuration:

Terminal	CCI 60
Software version	v3.0.0
Hardware version	1.2 and higher

These operating instructions introduce you to operation:

- About the CCI 60
- Safety
- Setting up for operation
- User interface
- Settings
- Implement operation with and without the AUX control
- Troubleshooting
- Technical data, interfaces and cables

Thanks to the detailed index, you can easily find what you want in the instructions.

The comprehensive glossary explains relevant technical terms; terms that are explained in the glossary are highlighted in *italics*.

Liability disclaimer

To ensure fault-free operation of your CCI 60, please read the operating instructions carefully. Keep the operating instructions for future reference.

To prevent problems during use, these operating instructions must be read and understood prior to assembly and commissioning. No liability is accepted for damage resulting from failure to observe these operating instructions!

If problems arise

If you need further information or if problems occur that are not covered in enough detail in these operating instructions, then please contact your dealer to obtain the required information.

Pictograms

Each function is explained with step-by-step instructions. On the left next to the operation instruction you can see the button to be pressed or one of the following pictograms:

Enter a value via the keyboard

Enter the value via the terminal’s screen keyboard.

Select a value from a selection

▶ Navigate through the selection list until you reach the desired value.

Change value

Change a value.

▶ Enter the new value via the terminal’s screen keyboard.

Confirm action

Confirm the action carried out previously.

▶ Press the "OK" key or the "OK" button on the touchscreen.

Repeat steps or action

Repeat the preceding steps either in full or in part.

Press button

Press briefly on the button or point described in the text.

The checkbox on the right side of a button has the following function:

Activate the element

The checkbox is ticked:
→ The element is activated.

About the terminal

The CCI 60 is a manufacturer-independent operating terminal for controlling ISOBUS implements.

The touchscreen

- The resistive touchscreen is 5.7" in size and has a resolution of 640x480 pixels.
- Is highly luminous and suitable for day and night operation.
- As an alternative to the touchscreen, the terminal can also be operated **fully** using the control and function keys.
- The **user interface**, which was developed based on practical experience, allows quick and easy access to settings and implement operation.
- The plastic**casing** is designed for use in harsh environments.

The interfaces

- ISOBUS, signal connector, USB:
  → All necessary ports and interfaces are laid out on the rear side so they are readily accessible.
- The buzzer volume signals alarm states and provides audible feedback.
- The USB interface is protected against moisture and dust by a cap.

Apps

The terminal software of the CCI 60 provides the following apps:

TECU	The TECU sends speed and hoisting gear position to the ISOBUS implement
UT	ISOBUS implement operation with and without the AUX control
FS	The file server makes storage available to all ISOBUS participants

Structure

1. 5.7” Touchscreen
2. Light sensor
3. Control keys
4. Function keys

5. Buzzer
6. USB 2.0
7. Panel connector DT/A for ISOBUS, supply voltage, RS232, signal connector

Touch-screen

Most terminal functions can be invoked via the touchscreen. The touchscreen supports the touch gesture "Press".

Control keys

Special functions such as ON/OFF and ISB can only be invoked via the control keys. Frequently used functions, such as "OK", "Cancel" or navigation, can be accessed via the control keys **or** the touchscreen.

Function keys

12 function keys (F1-F12) are arranged to the right of the screen. They keys can be used as an alternative to the buttons on the right side of the screen.

Light sensor

The light sensor measures the ambient light and matches the screen brightness to the ambient light.

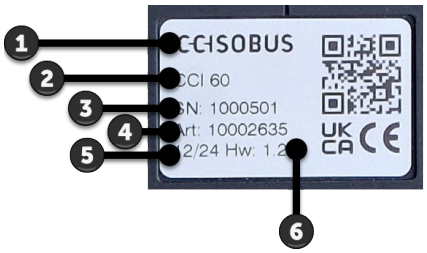
ON/OFF

Switch the terminal on or off using the "ON/OFF" key.

- To switch on, press and hold the ON/OFF key until the main menu is displayed.
- To switch off, press and hold the ON/OFF key until the log-off screen is displayed.

Nameplate

Identify your device based on the information on the nameplate. The nameplate is attached on the back of the terminal.



1. Manufacturer
2. Terminal type
3. Serial number
4. Manufacturer’s article number
5. Production date (week/year)
6. Hardware version

USB

Both USB ports on the terminal rear side are of type A. Standard flash drives can be connected. The USB interface is protected against moisture and dust by a cap.

Buzzer

The buzzer is sized so that even if there is a noisy background, terminal and implement audio warnings can be clearly heard.

Connector

The 12-pin connector connects the terminal
- To the ISOBUS
- To the power supply
- To the signal connector
- To the serial interface of an N-sensor

1 Safety

These operating instructions contain basic instructions which must be observed during setting up, configuration and operation. As such, it is absolutely essential to read these operating instructions prior to setting-up, configuration and operation.

Not only do the general safety indications listed in this chapter have to be observed but also the special safety indications appearing in other chapters as well.

1.1 Identification of notes in the operating instructions

The warning notes in these operating instructions are specially identified:

WARNING - GENERAL HAZARDS!

This warning symbol identifies general warning notes the non-observance of which poses a danger for life and limb.

▶ Strictly observe the warning notes and take particular care in these cases.

CAUTION!

This caution symbol identifies all warning notes referring to regulations, directives or working procedures which must be observed.

Non-observance can result in damage to or destruction of the terminal as well as malfunctions.

You can find tips for use in the "Notes":

NOTE

The note symbol highlights important and useful information.

Further information provides background knowledge:

The Info symbol highlights practical tips and further information.

- The info block makes complex technical connections easier to understand
- The info block provides background information
- The info block gives practical tips

1.2 Intended use

The terminal is intended exclusively for use with approved ISOBUS implements and devices in agriculture.

Any installation or use of the terminal going beyond this, is not the responsibility of the manufacturer: the manufacturer is not liable for any resulting damage to persons or property; all risks resulting from improper use are borne solely by the user.

Observance of the operation and maintenance conditions stipulated by the manufacturer also form part of intended use.

The accident prevention regulations in force, as well as other generally recognised safety, industrial, medical and traffic laws must be observed. Unauthorised modifications to the device exclude the manufacturer's liability.

1.3 Safety notes

WARNING - GENERAL HAZARDS!

Please take special care to ensure the following safety instructions are complied with.

Non-compliance could result in malfunctions and consequently danger for any bystanders.

- ▶ Switch the terminal off, if any of the following problems occur:
  - the touchscreen does not react
  - the display hangs
  - the user interface is not properly displayed
- ▶ Ensure that the touchscreen is dry before working with the terminal.
- ▶ Do not operate the touchscreen while wearing gloves.
- ▶ Ensure the terminal does not exhibit any external damage.

BASIC SAFETY INSTRUCTIONS

Please also observe the following safety instructions.

If they are not observed, the terminal could be damaged.

- Do not remove any safety mechanisms or safety signs.
- Do not open the terminal housing. Opening the casing can result in reduced terminal service life and malfunctions. If the terminal casing is opened, the warranty will become void.
- Disconnect the power supply to the terminal before carrying out the following work:
  - welding work on the tractor and self-propelled implement or on a towed implement
  - maintenance on the tractor and self-propelled implement or on a towed implement
  - use of a charger connected to the battery of the tractor and self-propelled implement.
- Carefully read and observe all safety information in the operating instructions and the safety labels on the terminal. Safety labels must always be in a proper legible condition. Replace missing or damaged labels. Ensure that new terminal parts are provided with the current safety labels. Spare labels can be obtained from your authorised dealer.
- Learn how to use the terminal in accordance with regulations.
- Keep the terminal and accessories in good condition.
- Only use a soft cloth moistened with clean water or a small amount of glass cleaning agent to clean the terminal.
- Do not operate the touchscreen with a sharp-edged or rough object because this could damage its surface.
- Do not exceed the temperature range of the terminal.
- Keep the light sensor clean.
- If the terminal is not fitted in the cab, it should be stored in a dry and clean location. Do not exceed the storage temperature range.
- Use only cables that have been approved by the manufacturer.

1.4 Installation of electrical devices

Modern farming implements use electronic components and parts the operation of which can be compromised by electro-magnetic interference from other devices. Such effects can endanger people if the following safety indications are not observed.

In the event of retrofitting electric and electronic devices, and/or components, in an implement with connection to the on-board network, the user must independently verify whether the installation interferes with vehicle electronics or other components.

- Following an upgrade installation, ensure that the following components function correctly:
  - EHR
  - Front hoisting gear
  - Power take-offs
  - Engine and gears
- Ensure that the retrofitted electric and electronic components comply with the EMC Directive 89/336/EC in its respectively valid version and that they bear the CE marking.

2 Setting up for operation

Setting the terminal up for operation is a quick and uncomplicated process based on the following step-by-step guide.

2.1 Check the scope of delivery

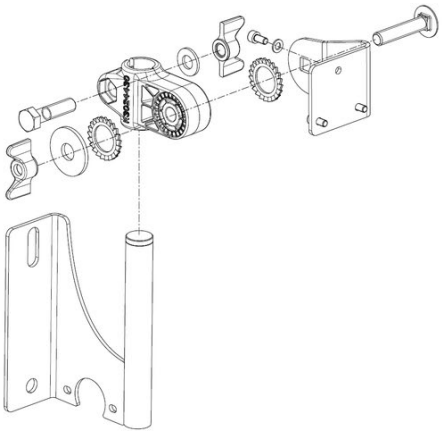
Check the scope of delivery of your terminal before you start setting up for operation:

1. Terminal
2. Cable A

The device holder and a retaining tube for mounting in the tractor cab are contained in a separate outer cardboard box and are included in the scope of delivery.

2.2 Mounting the terminal

Attach the terminal to the tube using the device holder:



Alternatively another device holder can be used, e.g. the RAM-B-202U base plate from RAM.

CAUTION!

Do not overtighten the screws on the device holder and do not use screws that are too long.

Both will lead to damage of the terminal housing and malfunctioning of the terminal.

- ▶ Tighten the screws to 1.5 to 2.0 Nm.
  → This is the maximum tightening torque for the screws.
- ▶ Secure the screws with circlip, groove washer or wave washer to prevent undoing.

Mount the terminal in landscape format.

NOTE

The terminal must be correctly installed.

During installation, pay particular attention to the following points:

- Ensuring that the touchscreen is easy to read and operate
- Easy access to the tractor's or self-propelled implement's operating elements
- Unimpeded view of the outside

2.3 Connect the terminal

Connect the terminal to the ISOBUS and supply it with power via connector DT/A:

- Connect cable A to panel connector DT/A, on the terminal. Connector and coupling are protected against incorrect connection by physical coding.
- Connect the "In-cab" coupling of cable A to the In-cab panel connector of the tractor or the self-propelled implement.

2.4 Switch on the terminal

1. Press and hold the ON/OFF key until the main menu is displayed.

2. Press the "Settings" button.
   → The "Settings" operating screen is displayed.

3. Press the button "User Settings".
   → The "User settings" operating screen is displayed.

4. Scroll down in the list of user settings until the "Language" button appears.

5. Press the "Language" button.
   → The "Language" selection list is displayed.

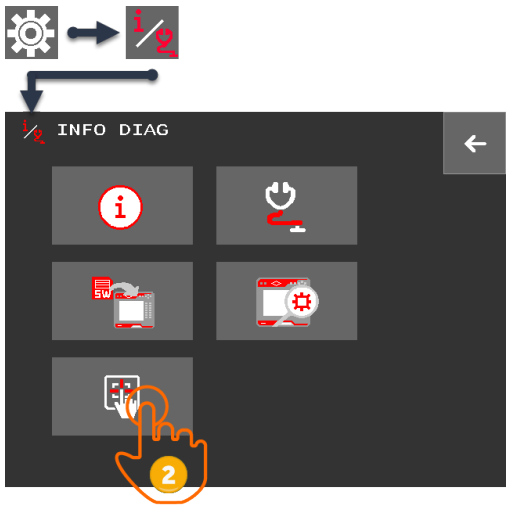
6. Select your language and press "OK" to confirm the selection.
   → The "User settings" operating screen is displayed.

7. Restart the terminal.
   → Text is displayed in the selected language.

2.5 Touchscreen calibration

You only need to calibrate the touchscreen once when it is first commissioned:

1. Open the operating screen "INFO DIAG".



2. Press the button "Touchscreen calibration".
   → The screen for calibrating the touchscreen is displayed.

3. Press the centre of the displayed cross.
   → A new cross is displayed in another position on the screen.

4. Repeat the process until no more crosses are displayed.

5. End the process by pressing the "OK" key.

NOTE

Cancelling the calibration

You can cancel the calibration.

▶ Press the "Home" key.
→ The old values are retained.
→ The "INFO DIAG" operating screen is displayed.

3 Operation

Get to know about the control and function keys and how the touchscreen works.

3.1 Touchscreen

Most terminal functions can be implemented via the touchscreen.

→ The terminal supports the touch gesture "Press":

NOTE

Unsupported touch gestures

The touch gestures swipe, long press, spread, drag-and-drop are not recognised by the terminal.

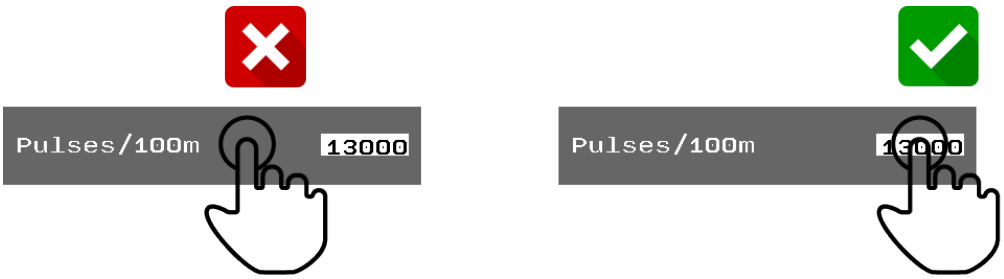
NOTE

Operating the terminal with a defective touchscreen

Even if the touchscreen cannot be operated due to a defect, all functions of the terminal can be accessed via the control and function keys.

The entire surface of a button does not respond to pressure.

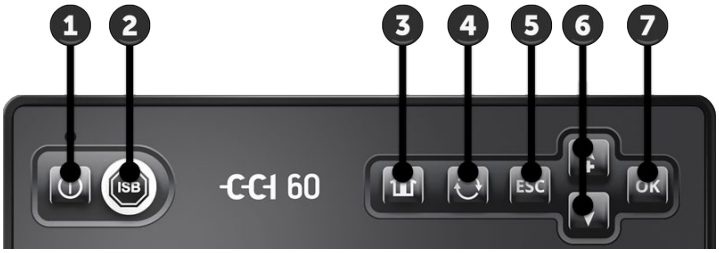
▶ Always press the right side of the button where the value is indicated:



3.2 Control and function keys

Control keys

The following functions can only be invoked using the control keys:



Switching the terminal on and off

Switch the terminal on or off using the "ON/OFF" key.

1

- ▶ To switch on, press and hold the "ON/OFF" key until the main menu is displayed.
- ▶ To switch off, press and hold the "ON/OFF" key until the log-off screen is displayed.

Sending the ISB command

Use *ISB* to send the ISB command to all ISOBUS implements.

! Refer to the implement's operating instructions to determine whether the implement responds to the command.

2

- ▶ Press the "ISB" key.
  → The terminal sends the ISB command to all ISOBUS participants.

WARNING - GENERAL HAZARDS!

Not all ISOBUS implements support ISB functioning.

Without checking you cannot assume that in hazardous situations certain implement functions will be triggered by the ISB.

Non-compliance could result in malfunctions and consequently danger for any bystanders.

- ▶ Refer to the implement operating instructions to determine whether the implement reacts to the ISB and which implement functions the ISB triggers on the implement.

Returning to the main menu

You return to the main menu by pressing the "Home" key.

If you return to the main menu from settings, the following applies:

→ Any unsaved changes in the settings will be lost.

3

If you return to the main menu from the operating screen of an ISOBUS implement, the following applies:

→ The implement remains active in the background.

▶ To return to the implement, press the toggle button.

Changing to the next implement

The toggle button can only be used when one or more implements and AUX controls are connected to the terminal.

4

▶ Press the toggle button to open the operating screen of the next implement or AUX control.

→ The sequence is determined by the terminal.

▶ To return to the main menu, press the "Home" key.

ESC

The "ESC" key has the same function as the "ESC" or "Back" buttons in an operating screen:

5

→ You cancel an action that has been started.
→ You return to the higher-level operating screen.
→ Changes are not saved, previous values are retained.

The following control keys can be used as an alternative to the corresponding buttons on an operating screen:

6

Arrow keys

The arrow keys are used to move through the buttons of an operating screen.

1. Move to the desired button using the arrow keys.
2. Press the "OK" key to press the selected button.

→ Buttons to which one of the function keys F1-F12 has been assigned cannot be reached with the arrow keys.

7

OK

The "OK" key has the same function as the "OK" button in an operating screen:

→ You save a changed value or acknowledge a message.

12 function keys (F1-F12) are arranged to the right of the screen. They keys can be used as an alternative to the buttons on the right side of the screen:

F1 – F12

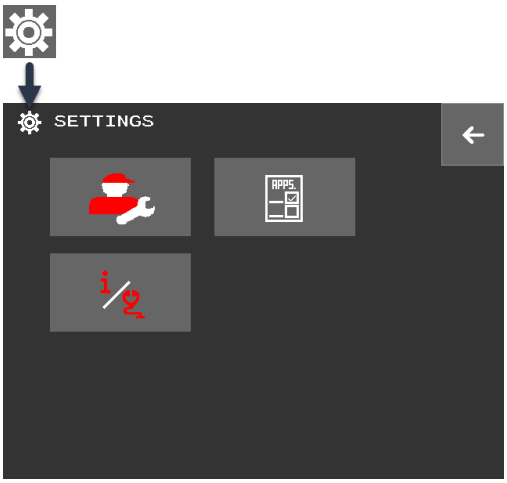
▶ You can choose between button and function key.

4 Settings

The settings are divided as follows:

- In User Preferences, you set the screen brightness, sound, language, system of units, date, and date format.
- In the info/diagnostics area, you can retrieve information about the terminal software and hardware, update the terminal software, and calibrate the touchscreen.
- In the app settings, you can set the UT number, activate the TECU and delete the implements stored on the terminal.

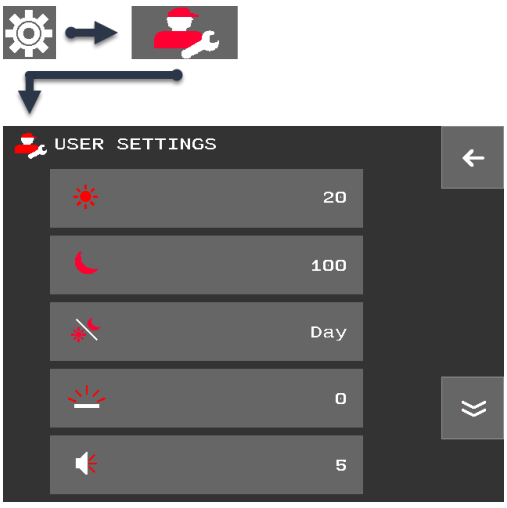
The settings can be accessed directly from the main menu:



▶ Press the "Settings" button.
→ The "Settings" operating screen is displayed:

4.1 User settings

Adjust the terminal to match your personal requirements.



▶ Open User settings.

You have the following setting options:

Screen brightness in day mode

The screen brightness can be set between 1 (very dark) and 100 (maximum brightness):

1. Press the button "Day screen brightness".
   → The screen keyboard is displayed.
2. Enter a value and confirm it with "OK".

Screen brightness in night mode

The screen brightness can be set between 1 (very dark) and 100 (maximum brightness):

1. Press the button "Night screen brightness".
   → The screen keyboard is displayed.
2. Enter a value and confirm it with "OK".

Switch between day and night modes

You can switch manually between day and night mode or activate automatic switching. In automatic mode, the value measured by the brightness sensor triggers the switch between day and night mode:

1. Press the "Lighting Mode" button.
   → A selection list is displayed.
2. Select the lighting mode and press "OK" to confirm the selection.

Key illumination

The background illumination can be set between 1 (very dark) and 100 (maximum brightness):

1. Press the "Background illumination" button.
   → The screen keyboard is displayed.
2. Enter a value and confirm it with "OK".

Volume

The terminal and many ISOBUS implements issue audio warnings. The volume can be set between 0 (no sound) and 100 (maximum volume):

1. Press the "Volume" button.
   → The screen keyboard is displayed.
2. Enter a value and confirm it with "OK".

Activate touch sound

If touch sound is active, then you receive an audible acknowledgement upon touching a button or key.

▶ Switch "Touch sound" "on".

→ Upon pressing a button or key, you receive an audible acknowledgement.

! Only activate the touch sound when a volume greater than 0% has been set.

Select language

Select the language in which the text is to be output to the screen:

1. Press the "Language" button.
   → The "Language" selection list is displayed.
2. Move through the selection list using the arrow keys.
3. Select a language and press "OK" to confirm the selection.
4. Restart the terminal.
   → Text is displayed in the selected language.

Units

Changing the system of units:

1. Press the "Units" button.
   → The "Units" selection list is displayed.
2. Select a system of units and press "OK" to confirm the selection.
   → The terminal applies the system of units to all values.

Date input

You can change the day, month and year:

1. Press on day.
   → The screen keyboard is displayed.
2. Enter the value and confirm it with "OK".
   → The new value type is saved.
3. Repeat the process for month and year.

Select date format

1. Press the "Date format" button.
   → The "Date format" selection list is displayed.
2. Select the format and press "OK" to confirm the selection.

Enter time

You can change the values for hours, minutes and seconds:

1. Press on hour.
   → The screen keyboard is displayed.
2. Enter the value and confirm it with "OK".
   → The new value type is saved.
3. Repeat the process for minutes and seconds.

Select time format

You can choose between 12h and 24h formats.

1. Press the "Time format" button.
   → The "Time format" selection list is displayed.
2. Select the format and press "OK" to confirm the selection.

Even if "12h" format is selected, enter the hours in 24h format when changing the time:
→ for example, enter 14 when you want to set 2 pm.

NOTE

We recommend adherence to the factory settings for time and date formats.

Time and date format are used as follows:

- Display of time and date on the terminal
- Format and content of the time stamp that the terminal sends over the ISOBUS

NOTE

No automatic daylight saving.

As the terminal cannot set the time zone, no automatic change between summer and winter time (and vice versa) occurs.

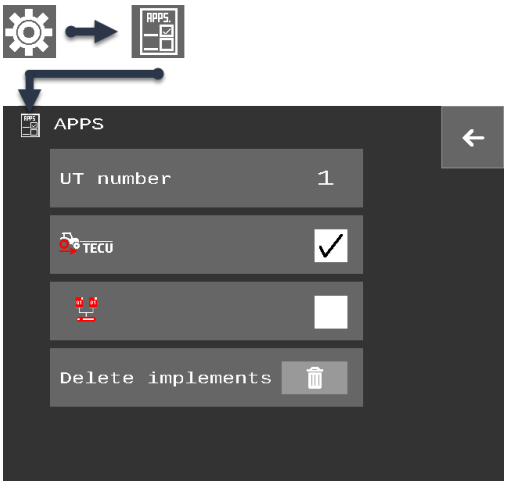
▶ Change the time manually when a daylight saving change occurs.

Decimal separator

You can change the character between the integer and fractional part of a number; either a full stop or comma can be selected:

1. Press the "Decimal separator" button.
   → The "Decimal separator" selection list is displayed.
2. Select a decimal separator and press "OK" to confirm the selection.
   → The terminal applies the selection to all decimal numbers.

4.2 App settings



▶ Open the app settings.

You have the following operating options:

UT number

The terminal logs on to the ISOBUS using the UT number.

▶ Set the UT number as described in ⇒ Chapter 6.1.1.

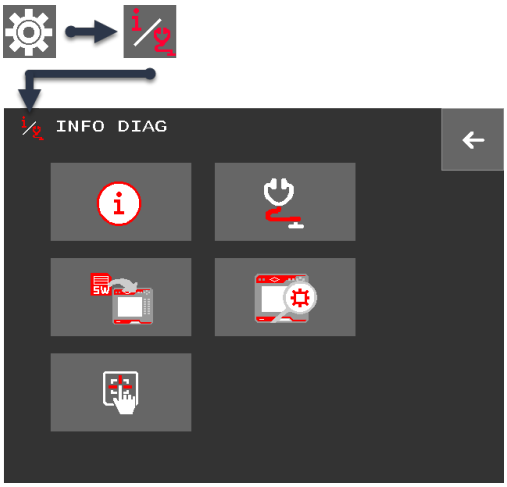
Speed output

When the terminal is connected to the signal connector, the terminal can send the speed over the ISOBUS (⇒ Chapter 5).

Delete implements

After an implement software update, delete the implement from the terminal (⇒ Chapter 6.5).

4.3 Info and diagnostics



▶ Open the "Info/Diagnostics" area.

You have the following operating options:

Terminal data

The terminal data includes the version of the installed software and the serial number of the terminal together with other information:

1. Press the "Terminal data" button.
   → The terminal data is displayed.
2. End the process with "Back".

Diagnostics data

The diagnostics data includes the supply voltage, operating temperature and operating hours:

1. Press the "Diagnostics data" button.
   → The diagnostics data is displayed.
2. End the process with "Back".

Install terminal software

Update the terminal software as described from ⇒ page 19.

Key test

You can check if the keys are working.

1. Press the "Key test" button.
   → The "Key test" operating screen is displayed.
2. Sequentially press the function keys F1-F12 and the control keys.
   → The screen indicates which key you have pressed.
3. End the process with "Back".

Touchscreen calibration

Calibrate the touchscreen once when commissioning the terminal (⇒ Chapter 2.5).

Install terminal software

The terminal software is constantly subject to further development and new functions are continuously being added. Your service partner will make new versions available to you.

CAUTION!

Prior to installation of implements, disconnect them from the ISOBUS.

→ During the update process, the terminal must not be connected to an ISOBUS implement.

Update vs. Rollback

In an update, a terminal software version is installed that is newer than the version installed on the terminal.

In a rollback, software is rolled back to a previous version.

- The Install Terminal Software button installs the version stored on the flash drive, whether it is a newer or older version.
  → Ensure that the desired version of the terminal software is available on the flash drive.

CAUTION!

Do not interrupt the update process for any reason.

Installation of the terminal software may take a few minutes, and is only completed after the terminal has restarted.

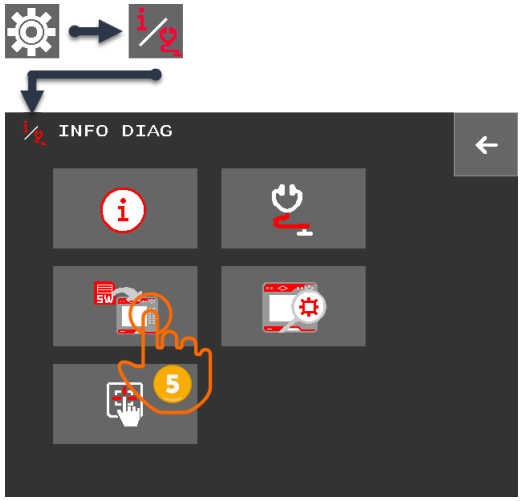
- ▶ Do not switch off the terminal and do not disconnect the terminal from the power supply.
- ▶ Do not pull out the flash drive when updating over the USB bus.

Non-observance can result in damage to or destruction of the terminal as well as malfunctions.

Update from the flash drive

If you want to install the update from a flash drive, proceed as follows:

1. Copy the installer to the root directory of the flash drive. Ensure that the installer is the only file in this directory.
2. Connect the flash drive to the terminal.
3. Disconnect all connected ISOBUS implements from the terminal.
4. Open the operating screen "INFO DIAG".



5. Press the "Software-Update" button.
   → A warning is displayed.

6. Start the update with "OK".
   → The software installs.

7. Restart the terminal.
   → The terminal can be used again.

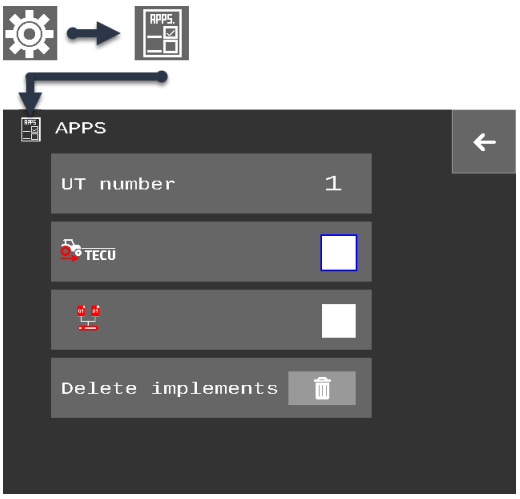
5 Speed

This chapter introduces you to the following topics:
- Functioning of the TECU
- Connect the terminal to the signal connector of the tractor (⇒ Chapter 5.2)
- Set or calibrate the speed measurement (⇒ Chapter 5.3)

5.1 TECU basics

Tractor with *TECU*

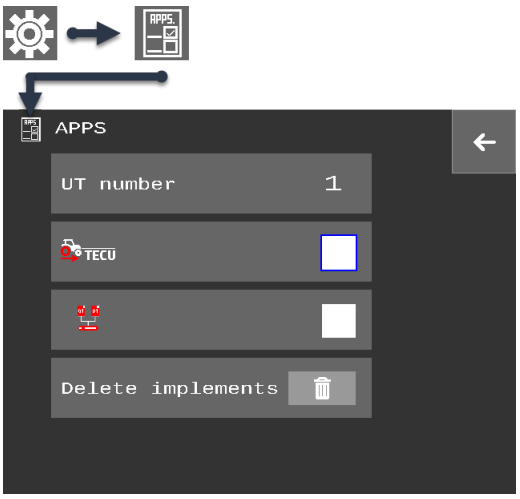
Each ISOBUS tractor has one *TECU*; this establishes the connection between the tractor bus system and the ISOBUS and sends the following tractor data to all ISOBUS implements:
- Ground and wheel speed
- Power take off speed
- Direction of travel
- Position of the *Rear 3-point hitch*



▶ On an ISOBUS tractor, switch off the CCI 60 TECU in the "App Settings".

! You can omit Chapter 5 of these instructions.

Tractor with ISOBUS upgrade kit



▶ If the upgrade kit includes a TECU, switch the CCI 60 TECU off in the "App settings".

! You can omit Chapter 5 of these instructions.

Tractor without *TECU*

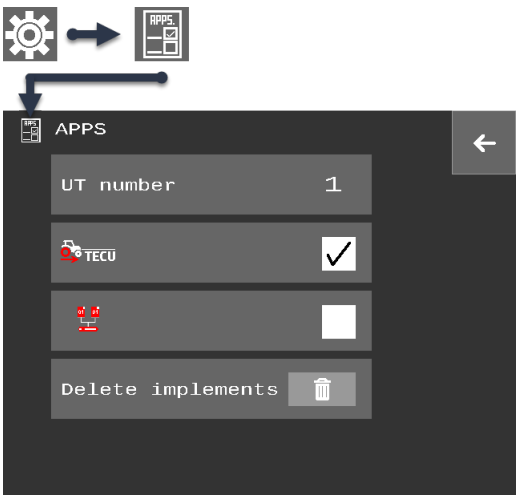
Use the terminal's TECU in the following cases:

1. The tractor has no TECU of its own.
   → The tractor cannot send the tractor data over the ISOBUS.

The terminal can (partially) take over the task of the TECU and send the speed and the hoisting gear position over the ISOBUS.

1. Connect the terminal to the signal connector(⇒ Chapter 5.2).

2. Switch on the TECU in the "App Settings".
   → The terminal logs on to the ISOBUS as a TECU.



3. Set up the TECU (⇒ Chapter 5.3).
   → The TECU reads the signals from the signal connector.
   → The TECU calculates the speed values.
   → The TECU sends the calculated speed values to all ISOBUS implements.

5.2 Connect terminal to signal connector

Your require the cable A-signal (⇒ Appendix C).

1. Connect cable A-signal to the connector on the terminal.
2. Plug "Signal" connector (cable A-signal) into the tractor signal connector.

5.3 TECU set-up

After you have connected the terminal to the signal connector and activated the TECU, you must adjust the speed sensors.

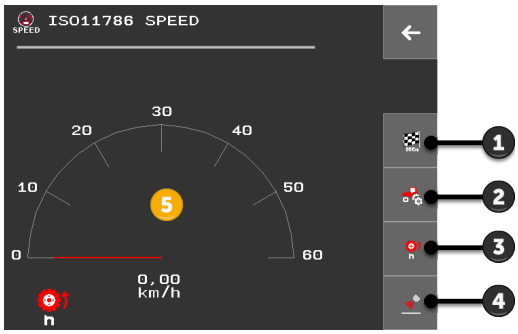
NOTE

Why the speed sensors should be adjusted or calibrated

You will not be using the speedometer display on the terminal while working. Nevertheless, the accurate setting or calibration of the speed is important:
→ The speed is sent to the implement via the ISOBUS.
→ Some implements require speed information that is as accurate as possible.

Proceed as follows:

1. Press the "TECU" button on the start screen.
   → The "Signal connector" operating screen is displayed:



1: Calibrate speed sensors
2: Adjust speed sensors
3: Display wheel speed
4: Display ground speed
5: Speedometer

NOTE

Adjust or calibrate?

Adjust the sensors when the sensor is part of the basic equipment of the tractor and the technical data of the sensor is available.

→ Take the number of pulses per distance travelled from the tractor's technical data or the wheel speed sensor.
→ The valid value range is between 200 and 30000 pulses/100 m.

Calibrate the speed sensors in the following cases:

- The technical data of the tractor does not include any information about the sensor
- The sensor was retrofitted to the tractor

Adjust the wheel speed sensor as follows:

2. Press the "Sensor settings" button in the "Signal connector" operating screen.
   → The "Sensor settings" operating screen is displayed.

3. Press the "Wheel speed sensor" button.
   → The wheel speed sensor settings are displayed.

4. Press the "Pulses / 100 m" button.
   → The screen keyboard is displayed.

5. Enter the number of pulses per 100 m and confirm the entry with "OK".
   → The wheel speed sensor settings are displayed.

Adjust the ground speed sensor as follows:

2. Press the "Sensor settings" button in the "Signal connector" operating screen.
   → The "Sensor settings" operating screen is displayed.

3. Press the "Ground speed sensor" button.
   → The ground speed settings are displayed.

4. Press the "Pulses / 100 m" button.
   → The screen keyboard is displayed.

5. Enter the number of pulses per 100 m and confirm the entry with "OK".
   → The ground speed settings are displayed.

If you do not know the number of pulses per 100 m, you must calibrate the measured speed.

NOTE

A field is not suitable for calibration of the speed.

▶ Calibrate the speed on smooth surfaces (e.g. asphalt) and not on a field.

Prior preparation

▶ Set out a distance of 100 m.

▶ Position the tractor at the start of the distance.

Calibrate wheel speed

Calibrate the wheel speed sensor code as follows:

2. Press the "Calibrate" button in the "Signal connector" operating screen.
   → The "Sensor calibration" operating screen is displayed.

3. Press the "Wheel speed sensor" button.
   → The wheel speed sensor is selected.

4. Press the "Calibrate" button.
   → The "Sensor Calibration" input dialogue is displayed.

5. Press the "START" button.

6. Drive at constant speed for 100 m and then press the "STOP" button.
   → The measured pulses are displayed in the operating screen.

7. End the process with "Back".
   → The "Signal connector" operating screen is displayed.

Calibrate ground speed

Calibrate the ground speed sensor as follows:

2. Press the "Calibrate" button in the "Signal connector" operating screen.
   → The "Sensor calibration" operating screen is displayed.

3. Press the "Ground speed sensor" button.
   → The ground speed sensor is selected.

4. Press the "Calibrate" button.
   → The "Sensor Calibration" input dialogue is displayed.

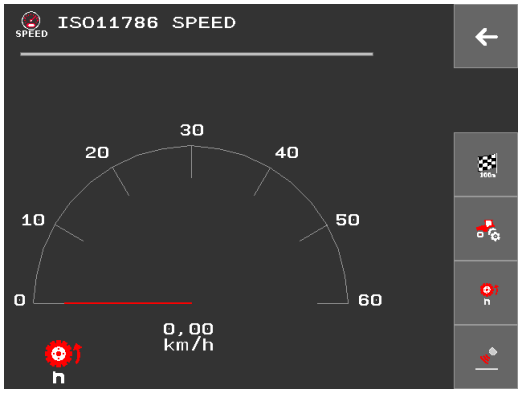
5. Press the "START" button.

6. Drive at constant speed for 100 m and then press the "STOP" button.
   → The measured pulses are displayed in the operating screen.

7. End the process with "Back".
   → The "Signal connector" operating screen is displayed.

Checks

After calibration, check the measured values. The speedometer in the "Signal connector" operating screen indicates the measured speed:



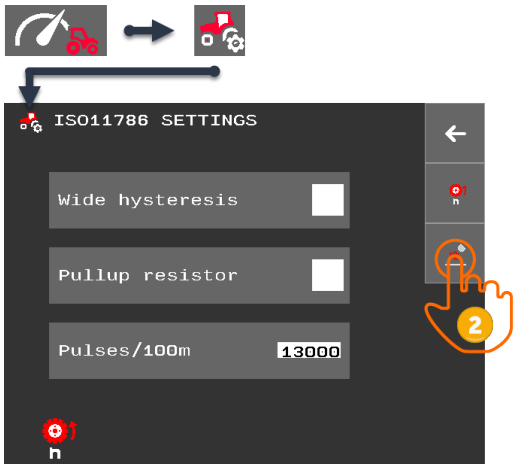
▶ Press the "Ground speed" button.
→ The speedometer indicates the speed measured by the ground speed sensor.

▶ Press the "Wheel speed" button.
→ The speedometer indicates the speed measured by the wheel speed sensor.

Trouble-shooting

If a speed of 0 km/h is displayed in spite of setting or calibrating the sensors, activate the "Pull-up resistance" and/or "High hysteresis" in the sensor settings:

1. Open the "sensor Settings" operating screen:



2. Press the "Ground speed sensor" button.
   → The ground speed settings are displayed.

3. Activate the "Pull-up resistance" and/or "High hysteresis" in the sensor settings.

4. Press the "Back" button and check the speed.

5. If a speed of 0 km/h is still displayed, repeat steps 1 to 4 for all 3 possible switch settings:
   - "Pull-up resistance" on, "High hysteresis" off
   - "Pull-up resistance" off, "High hysteresis" on
   - "Pull-up resistance" on, "High hysteresis" on

6. Press the "Wheel speed sensor" button.
   → The wheel speed sensor settings are displayed.

7. Now perform steps 3, 4 and, if necessary, 5 for the wheel speed sensor.

6 ISOBUS implement and AUX control

This chapter introduces you to the following topics:
- Operating one or more ISOBUS implements with the terminal (⇒ Chapter 6.3) ,
- Assigning implement functions to an AUX control (⇒ Chapter 6.4.1),
- Resetting the terminal after updating the implement software (⇒ Chapter 6.5),
- Set the UT number (⇒ Chapter 6.2).

6.1 Setting up for operation

The terminal makes the following functions available on the ISOBUS:
- Universal Terminal
- AUX-N Terminal Functions
- TECU
- File Server

All ISOBUS functions are activated ex works.

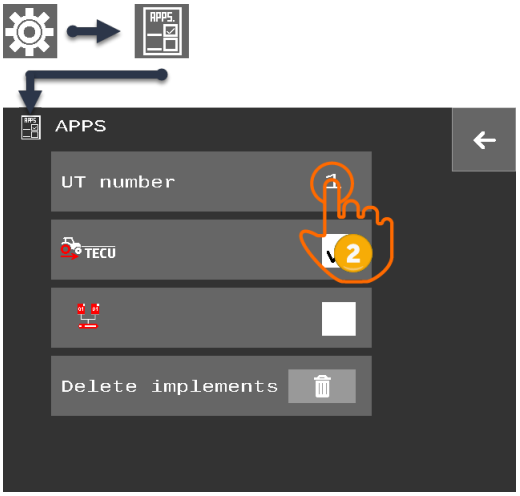
6.1.1 Setting the UT number

Do not change the factory-set UT number 1 unless you have connected another ISOBUS terminal and it already has UT number 1.

→ If two terminals are connected over the ISOBUS, they cannot have the same UT number.

Set the UT number as follows:

1. Open the app settings:



2. Press the "UT number" button.
   → The screen keyboard is displayed.

3. Enter the UT number and confirm with "OK".

4. Restart the terminal.
   → The UT logs in to the ISOBUS using the new UT number.

6.1.2 Connecting the AUX control

Connect the AUX control to the ISOBUS.

→ You require cable A.

1. Connect cable A into the 12-pin connector on the rear side of the terminal.
2. Insert the in-cab plug of the AUX control in the "InCab" coupling on cable A.
3. Plug the In-cab coupling of the AUX control in the In-cab panel connector of the tractor or the self-propelled implement.
   → The AUX control connects with the terminal.
   → The operating screen of the AUX control is displayed on the terminal.
   → Implement functions are not yet assigned to the operating elements of the AUX control.

6.1.3 Connecting the implement

If you connect an implement to the ISOBUS, the implement connects to the terminal.

→ The implement can only be used if the connection is correctly made.

▶ If you have connected an AUX control, assign the operating elements of the AUX control to the implement functions (⇒ Chapter 6.4.1).

Object Pool

The graphical user interface of an ISOBUS implement is referred to as an Object Pool. The Object Pool contains all the operating screens of an ISOBUS implement.

The operating screens consist of display and operating elements:

- Text and pictograms
- Buttons
- Input fields
- Selection lists etc.

The operating screens are displayed on the terminal. The display elements provide information and the operating elements are used for implement operation.

If an ISOBUS implement connects to the terminal for the first time, the implement uploads the Object Pool into the terminal.

Dependent on the size of the Object Pool, the upload may take several minutes. The implement cannot be used during uploading:

→ Start using the implement only once its graphical user interface is displayed.

The terminal saves the Object Pool. If the implement subsequently connects with the terminal again, the terminal uses the saved Object Pool.

→ Uploading is not necessary.
→ The implement can be used immediately.

CAUTION!

After an update of the implement software, the Object Pool of the implement saved on the terminal is not always automatically updated.

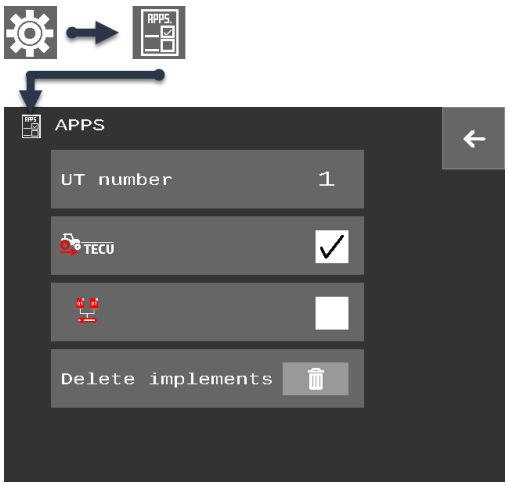
The terminal shows you the GUI saved on the terminal and not the new GUI:

- The implement saved on the terminal and the implement software do not match
- Malfunctions of the implement are possible
- New implement functions are not available

After an implement software update, delete the implement from the terminal:

1. Disconnect the implement from the ISOBUS.
2. Delete the implement from the terminal (⇒ Chapter 6.5).
3. Connect the implement to the ISOBUS.
   → The implement connects to the terminal.
   → The new graphical user interface is uploaded to the terminal.
   → The terminal displays the new graphical user interface of the implement.

6.2 Settings



▶ Open the app settings:

You have the following operating options:

UT number

The CCI 60 logs on to the ISOBUS using the UT number.

▶ Set the UT number as described below.

Delete implements

After an implement software update, delete the implement from the terminal (⇒ Chapter 6.5).

NOTE

ISOBUS terminals with the same UT number cannot connect to the ISOBUS.

The operation of an ISOBUS implement is not possible.

The CCI 60 and a second ISOBUS terminal are connected to the ISOBUS:

▶ Ensure that the CCI 60 and other terminals connected to the ISOBUS have different UT numbers.

Set the UT number as follows:

1. Press the "UT number" button.
   → The screen keyboard is displayed.

2. Enter an unassigned UT number and confirm the entry with "OK".

3. Restart the terminal.
   → The UT logs in to the ISOBUS using the new UT number.

UT number

The CCI 60 logs on to the ISOBUS using the UT number.

→ The CCI 60 is visible for implements and AUX controls under this UT number.

→ The implement decides with which ISOBUS terminal it connects based on the UT number.

Implements connect first to an ISOBUS terminal having the UT number "1".

If no ISOBUS terminal is logged onto the ISOBUS with the UT number "1", then the implement searches for the ISOBUS terminal with the next highest UT number.

The implement saves the UT number and connects to this ISOBUS terminal when it next connects.

AUX controls only connect to an ISOBUS Terminal having UT number "1".

6.3 Using the UT correctly

The following sections describe how you use the terminal optimally for the following applications (among others):

- Two or more implements are to be operated in alternation
- One implement is to be operated with the AUX control

6.3.1 One implement, one AUX control

- The CCI 60 is the only ISOBUS terminal.
- You want to operate no more than one ISOBUS implement with the terminal.
- You want to use an AUX control to operate the implement.

1. In App settings, set the UT number to 1 (⇒ Chapter 6.2).
2. Connect the AUX control and the implement to the ISOBUS.
   → The implement and the AUX control connect with the terminal.
   → The implement operating screen is displayed.
3. Press the toggle button to open the operating screen of the AUX control.
4. Carry out the AUX assignment (⇒ Chapter 6.4.1).

6.3.2 Two implements in an alternating manner, one terminal

- The CCI 60 is the only ISOBUS terminal.
- You want to operate two ISOBUS implements alternately with the terminal, e.g. a towed seed drill implement with a fertilizer tank.

1. In App settings, set the UT number to 1 (⇒ Chapter 6.2).
2. Connect the implements to the ISOBUS.
   → Both implements connect to the terminal.
   → The operating screen of one of the two implements is displayed.
3. Press the toggle button to open the operating screen of the second implement.

6.4 Working with an AUX control

Often and regularly required functions of an ISOBUS implement, can in the main be executed more quickly using a joystick, a toggle switch strip or some other AUX control (AUX).

▶ Assign implement functions to the operating elements of an AUX control (⇒ Chapter 6.4.1).

6.4.1 Assigning implement functions to an AUX operating element

NOTE

The implement saves the AUX assignment.

The AUX assignment must only be performed once.

The assignment is available again after a restart of the implement and the AUX control.

Prior preparation

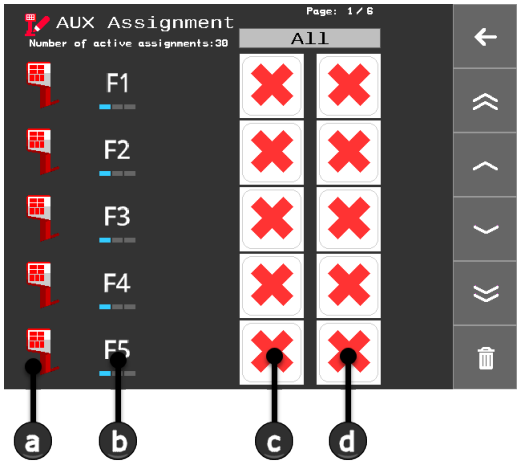
▶ In App settings, set the UT number to "1" (⇒ Chapter 6.1.1).

NOTE

An AUX control requires an ISOBUS terminal having UT number "1".

The AUX control only connects to the terminal if this has logged on to the ISOBUS using the UT number "1".

1. Open the "AUX Assignment" screen.
   → AUX assignment changes to editing mode.



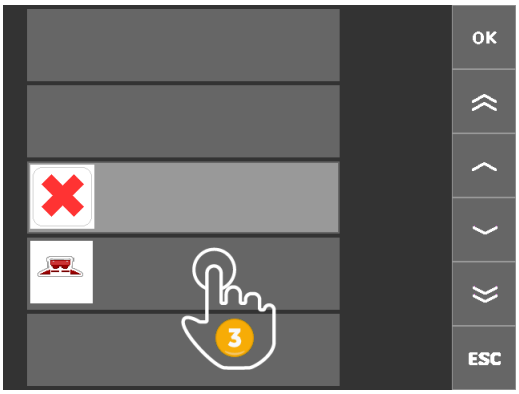
a: AUX control

b: Selection list of the operating elements

c: "Implement" column

d: "Implement function" column

2. Press button "x" in the "Implement" column.
   → A list of all implements connected to the terminal displays.

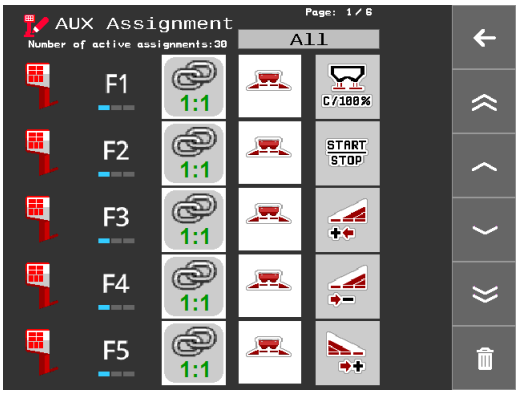


3. Select an implement and press "OK" to confirm the selection.
   → The "AUX assignment" operating screen is displayed.
   → The implement is displayed in the "Implement" column.

4. Press button "x" in the "Implement function" column.
   → The list of the available implement functions is displayed.

5. Select an implement function and press "OK" to confirm the selection.
   → The "AUX assignment" operating screen is displayed.
   → The implement function is assigned to the AUX operating element.

6. To assign functions to other AUX operating elements, repeat steps 2 to 5.



7. Press the "Home" key.
   → Editing mode is switched off.
   → AUX assignment is ended.
   → The implement functions can be executed with the AUX control.

You can filter the list in the "AUX assignment" operating screen:

1. Open the "AUX Assignment" screen.
   → AUX assignment changes to editing mode.

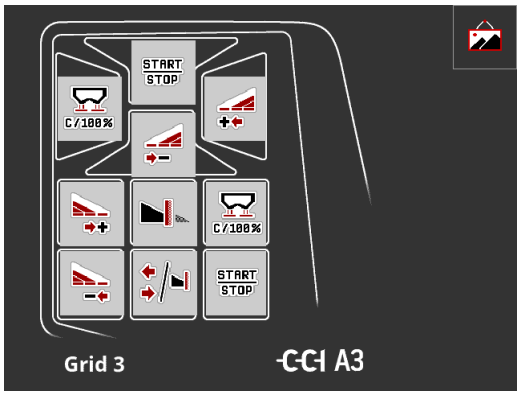
2. Press on the active filter.
   → The list of possible filters is displayed:
   - **All -** All AUX operating elements are displayed
   - **Unassigned -** AUX operating elements that are not assigned to an implement function are displayed
   - **Assigned -** AUX operating elements that are not assigned to an implement function are displayed
   - **Conflicts -** AUX operating elements having a conflict are displayed

3. Select the Filter and press "OK" to confirm the selection.
   → Those AUX operating element are displayed that fulfil the filter condition.

6.4.2 Checking the AUX assignment

Check the AUX assignment as follows:

1. Press the toggle button until the operating screen of the AUX control is displayed.
   → The AUX assignment is displayed.



2. Change to the AUX control in all operating levels and check the AUX assignments on the terminal.

NOTE

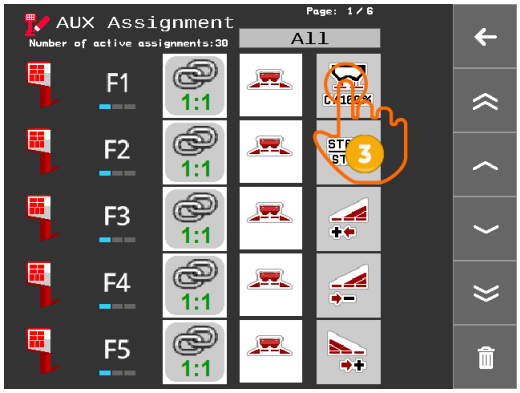
No changes to the AUX assignment can be made in the operating screen of the AUX assignment.

▶ To make changes to the AUX assignment, switch to "AUX assignment" editing mode (⇒ Chapter 6.4.1).

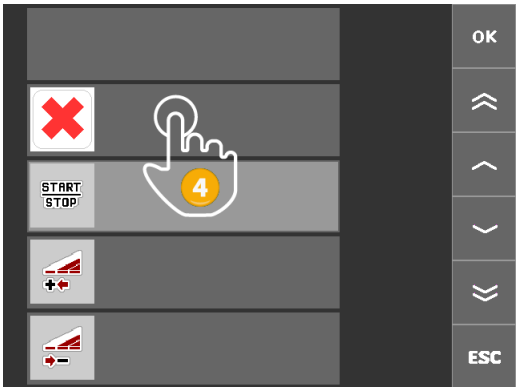
6.4.3 Delete AUX assignment

To delete the assignment of an individual operating element, proceed as follows:

1. Open the "AUX Assignment" screen:



3. Press the button with the implement function.
   → The list of the available implement functions is displayed.



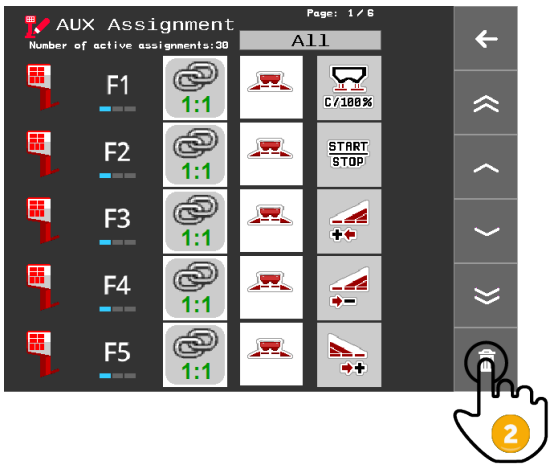
4. Select a list element "x" and press "OK" to confirm the selection.
   → The assignment is deleted.
   → The implement function can no longer be executed with the operating element.
   → The operating element can now be assigned to another implement function.

5. Press the "Home" key.
   → AUX assignment is ended.

6.4.4 Delete all AUX assignments

To delete the assignment of all operating elements, proceed as follows:

1. Open the "AUX Assignment" screen.



2. Press the button "Delete all AUX assignments".
   → The assignment of all operating elements is deleted.
   → The implement can no longer be operated with the AUX control.

3. Press the "Home" key.
   → AUX assignment is ended.

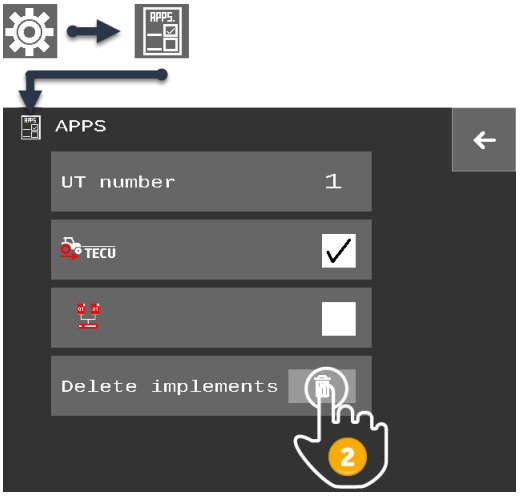
6.5 Delete implements

Delete implements saved on the terminal in the following circumstances:

- After updating the implement software
- The implement operating screen is no longer correctly displayed

Proceed as follows:

1. Open the app settings:



2. Press the "Delete implements" button.
   → The implements are deleted without a confirmation query.
   → A message is displayed.

3. Confirm the message with "OK".

4. Restart the terminal.

NOTE

It is not possible to delete just one implement from the terminal.

All implements saved on the terminal are always deleted.

7 Troubleshooting

This chapter introduces you to the following topics:
- Solving common problems when operating the terminal
- Supporting the service partner by the provision of screenshots during troubleshooting
- All error messages, possible causes and tips on how to rectify them

CAUTION!

If a technical failure occurs, the work process must be interrupted.

Continuation of working after technical failures can result in damage to the terminal or the implement!

1. Stop working.
2. Look for a solution in this chapter of the operating instructions.
3. Contact your dealer if the problem persists.

Forced shut-down

In the event of a fault, the terminal may no longer respond to user inputs.
1. Press and hold the ON/OFF key until the terminal shuts down.
2. Press and hold the ON/OFF key until the terminal restarts.

CAUTION!

In a forced shut-down all internal supply voltages are switched off.

Unsaved data is lost. The terminal and its software are not damaged by the switch-off.

▶ Perform a forced shut-down only if it is absolutely unavoidable.

7.1 Problems during operation

This chapter lists problems that may occur during use of the terminal.

A suggestion is made for rectification for each problem.

- Try to rectify the problem.
- Contact your dealer if you cannot resolve the problem.

Problem	Cause/remedy
The terminal does not switch on.	Terminal not connected to the ISOBUS. ▶ Connect the terminal to the ISOBUS as described in ⇒ Chapter 2. Ignition is not switched on. ▶ Start the tractor.
The connected implement is not displayed on the terminal.	Implement is not connected or is incorrectly connected. ▶ Ensure that the implement's ISOBUS cable is correctly connected at the tractor. Bus terminator missing. ▶ Check whether a bus terminator must be attached to the implement.
Two ISOBUS terminals are present on the ISOBUS. The connected implement is not displayed on either of the terminals.	The universal terminals have the same UT number and thus cannot log on to the ISOBUS. ▶ Set different UT numbers in the two terminals.
The connected AUX control is not displayed.	Incorrect configuration of the UT. 1. Disconnect the AUX control from the ISOBUS. 2. Set the UT number to "1" on the terminal. 3. Reconnect the AUX control to the ISOBUS.
The cable of the AUX control only has an In-cab connector instead of a Y-cable.	You require A and Y cables: 1. Connect cable A to connector A on the terminal. 2. Insert the plug "UT" on cable Y into the "InCab" socket on cable A. 3. Insert the plug "AUX" on cable Y into the In-cab coupling of the AUX control. 4. Insert the "InCab" coupling on cable Y into the In-cab panel connector of the tractor or the self-propelled implement.
No implement functions are displayed in the "AUX assignment" operating screen.	Does the implement support operation via AUX control? The implement operating instructions provide information. The implement is not connected to the UT with UT number "1". Move the implement into the UT with UT number "1". Most implements offer a function for moving to another UT.

7.2 Take a screenshot

A picture says more than a thousand words.

If you are having problems operating the terminal or ISOBUS implement, you can capture a screenshot and send it to your service partner. Also describe in detail the work steps that led to the error:

Prior preparation

- Connect a flash drive to the terminal.

- Simultaneously press the ON/OFF key and the OK key for 1-2 seconds.
  → The screenshot is automatically saved in the \screenshots directory on the flash drive.
  → If the subdirectory \screenshots does not exist, it is automatically created.

7.3 Messages

An error message is displayed when the terminal detects an error or if an attempt is made to perform an incorrect operation.

- Read the message. and confirm it with "OK".

- Rectify the cause of the error and repeat the process.

8 Glossary

AUX control	Also: AUX-Control. Typical AUX controls are joysticks or toggle switch strips. An AUX control enables the comfortable and efficient operation of frequently used implement functions.
AUX Control	AUX control, see also AUX control
Button	Operating element in the operating screen that is activated by pressing the touchscreen.
CAN	**C**ontroller **A**rea **N**etwork
CCI	**C**ompetence **C**enter **I**SOBUS e.V.
Coupling	Female connector on the end of a cable.
ECU	Electronic Control Unit Control unit, task computer
Function keys	The twelve keys F1-F12 located to the right of the touchscreen. The function displayed in the outer column on the right edge of the touchscreen is executed by pressing the function keys F1-F6; the function displayed in the inner column on the right edge of the touchscreen is executed by pressing the function keys F7-F12.
Ground speed sensor	It emits a specific number of electrical pulses in proportion to the distance already covered. As such, the real, slip-free speed, the ground speed, can be calculated. Note that under certain circumstances, ground speed sensors may supply inaccurate speed values depending on the surface, for example, high grass or puddles.
GUI	**G**raphical **U**ser **I**nterface The purpose of the graphical user interface is to ensure apps and ISOBUS implements can be operated on the terminal using graphical symbols. The GUI comprises all Operating screens of an app or implement.
Implement	Towed or attached implement. An implement with which a task can be executed.
In-cab	Term from the standard ISO 11783. Describes the nine-pole ISOBUS panel connector in the tractor cab.
Interface	Part of the terminal which is used to communicate with other devices.

ISB	**I**SOBUS **S**hortcut **B**utton In theory, the ISB should enable implements to be put into a defined state with a single command without having to switch off the active implement functions individually in CCI.UT. This can, for example, be necessary if you need to react quickly to an emergency situation or if CCI.UT is not currently displayed in the standard view and the implement is therefore not operable. The ISB sends a higher priority message to the ISOBUS. This message can be evaluated by the connected ISOBUS implements. The implement can initiate appropriate automatic operations in response to this message, e.g., to adapt a safe state.
ISOBUS	ISO 11783 International standard for data transfer between farming implements and devices.
ISOBUS participant	A device that is connected over the ISOBUS and communicates via this system.
Object Pool	A term taken from the ISOBUS standard ISO 11783. All operating screens of an ISOBUS implement are combined in the Object Pool. The operating screens consist of display and operating elements: • Text and pictograms • Buttons • Input fields • Selection lists etc. These display and operating elements are displayed on the terminal for implement operation. The Object Pool is sent to the ISOBUS terminal by the implement the first time the implement is connected to the terminal. The terminal saves the Object Pool.
Operating screen	The part of the graphical user interface (GUI) of an app or an ISOBUS implement visible on the screen. The operating screen is comprised of the displays and operating elements shown on the screen. The display elements provide information and the operating elements can be selected directly via the touchscreen.
Panel connector	Male connector permanently integrated in a device casing.
PDF	**P**ortable **D**ocument **F**ormat File format for documents
Plug	Male connector on the end of a cable.
Screenshot	Capture and saving of the display content in a file.
Signal connector	Seven pole socket based on the ISO 11786 standard, at which signals for speed, PTO speed and position of the rear 3-point hitch can be read.
Socket	Female connector permanently integrated in a device casing.

TECU	Tractor ECU On an ISOBUS tractor, the TECU establishes the connection between the tractor bus system and the ISOBUS. The TECU sends the following tractor data to all ISO-BUS participants: • Ground and wheel speed • Power take off speed • Direction of travel • Position of the rear 3-point hitch
Terminal	The CCI 60 terminal
Touchscreen	Touch-sensitive display for operation of the terminal.
USB	**U**niversal **S**erial **B**us: Serial bus system to connect the terminal to a storage medium.
UT	The Universal Terminal is the human machine interface (HMI) of ISOBUS. This is the display and operating device. Each implement connected to the ISOBUS logs on to the UT and uploads its Object Pool. You operate the implement via the operating screens of the Object Pool.
UT client	Universal Terminal Client The part of the implement software that connects with the Universal Terminal on the terminal. Used for implement operation.
Wheel speed sensor	It emits a specific number of electrical signals in proportion to the wheel rotation. As such, the theoretical slip-including speed of the tractor, the wheel speed, can be calculated. Wheel based speed sensors may supply inaccurate speed values when slip occurs.

9 Disposal

Dispose of a defective or no longer used terminal with due care for the environment:

- Dispose of the device parts in an environmentally friendly manner.
- Observe the local regulations.

Plastics

Dispose of plastics with normal domestic waste or according to the local regulations.

Metal

Enter metal into a metal recycling chain.

PCBs

Deliver the terminal PCBs to a specialist recycling company.

10 Index

A Technical data

Dimensions (B x H x D) [mm][inch]	207 x 161 x 50 / 8.1 x 6.3 x 1.97
Casing Type	Plastic
Operating Temperature [°C]	-20 - +70
Supply voltage [V]	12 VDC
Permitted Range [V]	8 VDC – 18 VDC
Power consumption (at 12V) [mA]	320, typical 2000, maximum
Display [inch]	5.7
Display resolution [px]	VGA, 640 x 480
Buzzer	70 dBA
Storage temperature [°C]	-30 - +70
Weight [gr]	460
Protection class	IP65
EMC	ISO 14982
ESD protection	ISO 61000:4-2

B Connector

CAUTION!

Do not connect or disconnect cable during live operations.

Connection or disconnection of a cable during live operation can cause an overvoltage at the terminal or a peripheral.

Overvoltages can destroy the electronics of the terminal or peripherals.

▶ Switch the terminal off before connecting or disconnecting the DT/A connector.

CAUTION!

Panel connectors with bent contacts must not be used.

If a pin becomes bent, the connection no longer functions reliably.

Every time the connector is plugged in again, the contact pin bends further.

▶ Submit the device for repair.

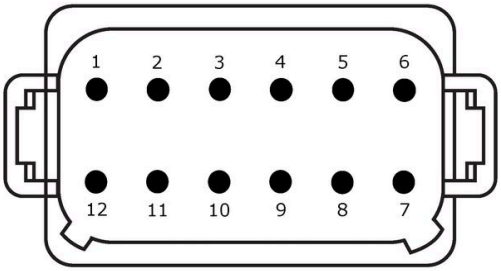
NOTE

Seal off unused connectors.

If a connector is not sealed, dust or moisture can get into the terminal.

▶ Seal off unused connectors with blanking caps.

Connector DT/A



Connector type

Panel connector German DT, 12 pin, A-coded

Function

- CAN1
- Power supply
- ECU power
- ISO 11786
- RS232

Use

ISOBUS, signal connector, LH5000

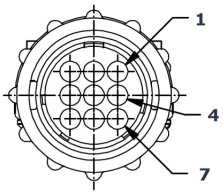
Pin	Signal	Comment
1	V+ in	Supply voltage, 12VDC
2	ECU Power enable	Switched ECU supply voltage, 1A
3	ECU Power enable	Switched ECU supply voltage, 1A
4	CAN_H	CAN1 High
5	CAN_L	CAN1 Low
6	ISO 11786, Linkage position	Position of the rear 3-point hitch
7	RS232 RxD	RS232
8	RS232 TxD	RS232
9	ISO 11786, Wheel based speed	Wheel speed sensor
10	Key Switch State	Ignition signal
11	ISO 11786, Ground based speed	Ground speed sensor
12	GND	Mass

C Cables

NOTE

Where possible only use the original cable to connect the terminal.

You can order this from the manufacturer or its approved dealers.



Identifier:
Cable A

Length:
150 cm

"InCab":
Coupling, 9-pole
→ In-cab *panel connector* in the tractor

"A":
Coupling, 12-pole
→ Panel connector DT/A on the terminal

Use:
Connect terminal to the power supply and ISOBUS

InCab

#1: V+ in
#2: CAN_L IN
#3: CAN_L OUT
#4: CAN_H IN
#5: CAN_H OUT
#6: -
#7: V+ in
#8: -
#9: GND

D AEF functionalities

With each new version, the terminal undergoes the AEF conformity test and is certified for the following AEF ISOBUS functionalities:

Universal Terminal

So that the terminal can be used to operate different implements.

Auxiliary Control (new)

For the operation of frequently uses implement functions with an AUX control.

Here there are "old" and "new" versions that are not compatible with each other. AUX controls that are AUX-N certified cannot be used with terminals that are certified AUX-O and vice-versa.

Basic Tractor ECU

For the provision of tractor data over the ISOBUS relating to ground and wheel speed, PTO speed, direction of travel and position of the rear 3-point hitch.

ISOBUS Shortcut Button

For rapid deactivation of implement functions without ISOBUS implement operation.