

TRACK-Guide III

Installation and operating instructions



Corporate Office

10368 Westmoor Drive
Westminster, CO 80021
USA

Agriculture Business Area

Trimble Inc.
Trimble Agriculture Division
10368 Westmoor Drive
Westminster, CO 80021
USA
trimble_support@trimble.com
www.trimble.com

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For your safety

- ▶ Basic safety instructions [▶ 2]
- ▶ Intended use [▶ 3]
- ▶ Layout and meaning of warnings [▶ 3]
- ▶ Disposal [▶ 4]
- ▶ Instructions on retrofitting [▶ 4]

Basic safety instructions

Please read the following safety instructions carefully before using the product for the first time.

- Do not operate the display while driving in road traffic. Come to a standstill in order to use the unit.
- Before maintenance or repair to the tractor, always disconnect the connection between the tractor and the display.
- Before charging the tractor battery, always disconnect the connection between the tractor and the display.
- Before welding on the tractor or implement, always disconnect the power supply to the display.
- Do not make any unauthorized modifications to the product. Unauthorized modifications or use may impair safety and reduce the service life or operability of the unit. Modifications are considered unauthorized if they are not described in the product documentation.
- Follow all recognised safety, industrial and medical rules as well as all road traffic laws.
- The product does not include any user-serviceable parts. Do not open the casing. If the casing is opened, its imperviousness can be changed.
- Read the operating instructions to the agricultural device which you want to control by using the product.

Using a camera

The camera serves **solely** for observing the implement functions in non-safety-related working areas of the agricultural implement.

In certain situations, the camera image may appear on the screen with a delay. The delay depends on the respective use of the display and can also be affected by external factors and devices.

For this reason, please note the following information:

- Do not use the camera to assist with steering the vehicle: not in road traffic, and not on private properties.
- Do not use the camera to watch the road traffic or when driving into intersections.
- Do not use the camera as a rear view camera.
- Do not use the camera as a visual aid for controlling the implement, especially , when a delayed reaction can lead to risks.
- Using a camera does not exempt you from your due diligence obligation to pay attention to safety when operating the implement.

Intended use

The display is used to operate implements equipped with ISOBUS ECUs.

Intended use also includes compliance with the conditions for operation and repairs prescribed by the manufacturer.

The manufacturer cannot be held liable for any personal injury or property damage resulting from non-compliance. All risk arising from improper use lies with the user.

All applicable accident prevention regulations and all other generally recognized safety, industrial, and medical standards as well as all road traffic laws must be observed. Any unauthorized modifications made to the equipment will void the manufacturer's warranty.

Layout and meaning of warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

WARNING

This signal word identifies medium-risk hazards, which could potentially cause death or serious physical injury, if not avoided.

CAUTION

This signal word identifies hazards that could potentially cause minor or moderate physical injury or damage to property, if not avoided.

NOTICE

This signal word identifies hazards that could potentially cause damage to property, if not avoided.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning appears in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

Example

1. **NOTICE! This is a notice. It warns that there is a risk involved in the next step.**
2. Step involving risk.

Disposal



When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with all applicable waste management laws.

Instructions on retrofitting

Instructions on how to retrofit electrical and electronic farm equipment and/or components

Agricultural equipment used today features electronic components and parts whose function can be affected by other farm equipment which emits electromagnetic waves. Such effects could lead to personnel being put in danger, if the following safety instructions are not adhered to.

Selecting components

When selecting components, make sure first of all that the retrofitted electrical and electronic components comply with the current version of the EMC Directive 2004/108/EC and carry the CE marking.

User responsibility

When retrofitting a machine with electrical and electronic farm equipment and/or components connected to the vehicle's electrical system, it is your own responsibility to check whether the installation causes interference with the vehicle's electronic system or other components. This applies, in particular, to the electronic control of:

- electronic hitch control (EHR),
- Front lifting gear,
- PTO shafts,
- Motor,
- Gear.

Additional requirements

The following requirements must be met in order to retrofit mobile communication systems (e.g. radio, phone):

- Only approved devices complying to national regulations (e.g. BZT approval in Germany) are to be installed;
- The equipment must be installed as a fixed installation.
- The use of portable or mobile devices inside the vehicle is permissible only via a connection to the permanently installed outside antenna;
- The transmitting part must be spatially separated from the vehicle's electronic system.
- When attaching the antenna, pay attention to proper installation, including a sound ground connection between the antenna and the vehicle's ground wire.

For information on wiring and installation as well as the maximum allowable current consumption, please also refer to the installation guide provided by the machine manufacturer.

About these Operating Instructions

- ▶ Target group of these Operating Instructions [[▶ 7](#)]
- ▶ Layout of operating instructions [[▶ 7](#)]
- ▶ Layout of references [[▶ 7](#)]
- ▶ Directional information in these instructions [[▶ 7](#)]

Target group of these Operating Instructions

These Operating Instructions are intended for personnel entrusted with installing and operating the display.

Layout of operating instructions

The operating instructions explain step by step how you can perform certain operations with the product.

In these instructions, the following symbols are used to identify different operating instructions:

Type of depiction	Meaning
1. 2.	Actions that must be performed in succession.
⇒	Result of the action. This will happen when you perform an action.
⇒	Result of an operating instruction. This will happen when you have completed all steps.
☑	Requirements. In the event that any requirements have been specified, these must be met before an action can be performed.

Layout of references

If any references are given in these Operating Instructions, they appear as:

Example of a reference: [▶ 7]

References can be identified by their square brackets and an arrow. The number following the arrow shows you the page on which the section where you can find further information starts.

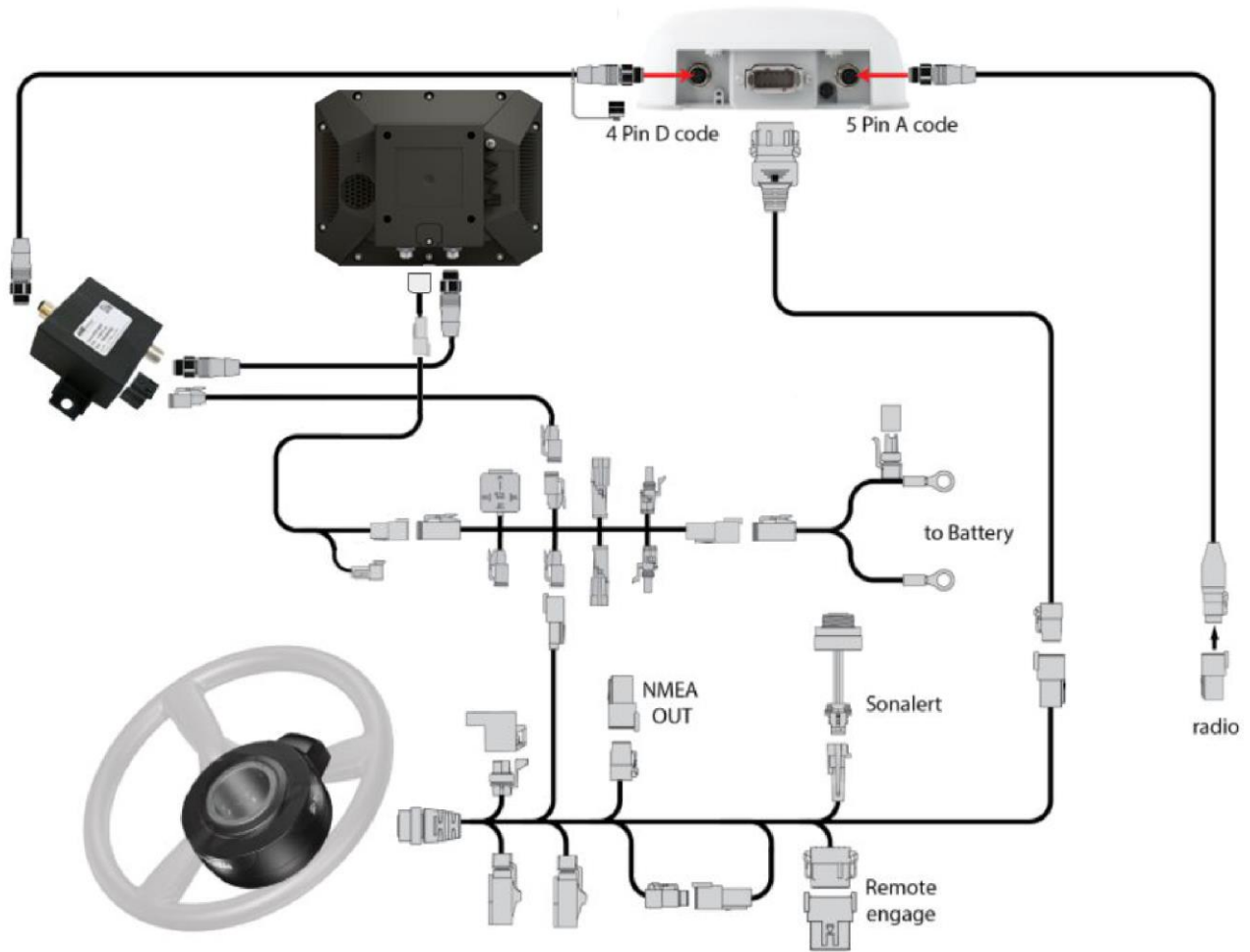
Directional information in these instructions

All directional information in these instructions, such as "left", "right", "forward", "back", is relative to the movement direction of the vehicle.

Product description

- ▶ Overview [▶ 9]
- ▶ Display buttons [▶ 10]
- ▶ Display ports [▶ 11]
- ▶ Applications on the display [▶ 11]
- ▶ Rating plates [▶ 13]




Overview



Display buttons

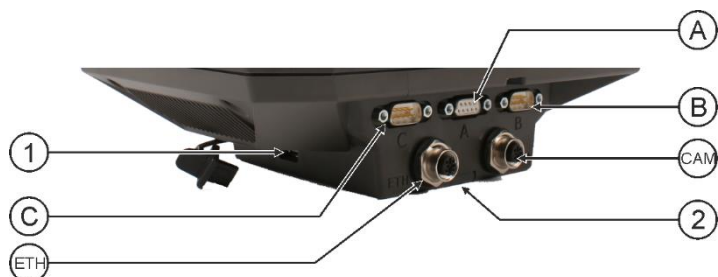
You will find a number of buttons on the housing of the display that are used to operate the display.



① Display buttons	
	Switches the display on and off.
	Creates screenshots.
	Saves the window layout.

Function of the buttons

Display ports



Display ports

①	USB port for: - USB memory device [▶ 26]	Ⓐ	Port A CAN bus port for: - ISOBUS basic vehicle harness - Connection to the tractor CAN bus
Ⓒ	Port C Serial port for: - GPS receiver [▶ 30]	Ⓑ	Port B See section: Pin assignment connector B [▶ 95]
Ⓔ	ETH port M12 port for: - Ethernet	Ⓒ	CAM port Port for an analog camera
		②	Slot with the SD card

Applications on the display

The display is delivered with a range of installed application (apps). Most of these can be used immediately. Even the non-activated applications can generally be tested for 50 hours. If a specific application works well for you, a license can be ordered from Müller-Elektronik to activate the full version of the application.

Full versions

The full versions of the following applications are installed on the display:



- - Service application.

The Service application allows you to:

- Configure the display.
- Enable and disable other applications.

- Enter license activation codes.
- Enable drivers for connected devices.
- Configuration of the GPS settings



- TRACK-Leader application.

The TRACK-Leader application allows you to work the field on exact parallel tracks.

The app contains the following module:

- TRACK-Leader AUTO: Automatic vehicle steering on the field.



- Tractor-ECU application

The Tractor-ECU application is used to record all settings around the tractor.

Here, you can e.g.:

- Enter the position of the GPS receiver.
- Set the GPS receiver as the speed signal source.
- Select which sensor signals are received by the display.
- View the speed and PTO shaft rotational speed on the screen.

More about this in section: Overview [▶ 59]



- Virtual ECU application

The Virtual ECU application is a central hub where virtual ECUs can be created for machines and devices that do not communicate through ISOBUS.

The Virtual ECU enables the use of apps such as TRACK-Leader and ISOBUS-TC with non-ISO machines.

More about this in section: Overview [▶ 73]



- FILE-Server application

This application is used to define a storage location on the display. This storage location can be used by ISOBUS ECUs that support the FILE-Server functionality. The options for use depend on the ISOBUS ECU.



- Camera

The Camera application displays on the screen the image from the camera which is connected to the display.

Rating plates






Abbreviation	Meaning
HW	Hardware version
SW	Software version upon delivery
K-Nr	Customer number If the product was manufactured for an agricultural machinery manufacturer, the agricultural machinery manufacturer's item number will be shown here.
P/N	Item number
S/N	Serial number

Abbreviations on the rating plate

Entry	Meaning
Reg. Model	Regulatory model to which the technical tests refer.
Made in Germany	Country of manufacture
Year of Mfg.	Year of manufacturing
Input	Operating voltage
IPxxx	Protection class according to ISO 20653

Information on the rating plate

Symbols on the rating plate

	<p>The concept and design of the product as well as the model we put on the market comply with the applicable legal provisions of the EU.</p>
	<p>The concept and design of the product as well as the model we put on the market comply with the applicable legal provisions of the United Kingdom.</p>
	<p>The concept and design of the product as well as the model we put on the market comply with the applicable legal provisions of the FCC.</p>
	<p>The concept and design of the product as well as the model we put on the market comply with the applicable legal provisions of the EAWU.</p>
	<p>When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with all applicable waste management laws.</p>

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Mounting and installation

- ▶ Mounting the display in the vehicle cab [▶ 16]
- ▶ Inserting micro-SD card [▶ 16]

Mounting the display in the vehicle cab

Procedure

1. Screw the to RAM mount onto the rear of the display. Always use all four screws supplied.



2. Attach the bracket to the RAM mount.
3. Secure the display to a suitable location in the vehicle cab. Use the supplied V bolts for this purpose:



Inserting micro-SD card

The micro-SD card serves as internal storage for the display.

Procedure

To change the SD card:

1. Switch off the display and disconnect all cable connections.
2. Unscrew the cover on the rear of the display.
3. Use your finger to press on the SD card in the slot.
 - ⇒ The SD card is unlocked and now protrudes by approx. 1 mm.
4. You can remove the card.
5. To lock the card again, press the card lightly into the slot until it is locked again.
6. Screw the cover back onto the rear of the display.

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Basic control principles

- ▶ Switching on the display [▶ 18]
- ▶ Initial start-up [▶ 18]
- ▶ Switching off the display [▶ 21]
- ▶ Display screen layout [▶ 21]
- ▶ Opening applications [▶ 24]
- ▶ Moving an application [▶ 23]
- ▶ Saving and loading window arrangements [▶ 26]
- ▶ Hiding an application [▶ 25]
- ▶ Using the keyboard [▶ 25]
- ▶ Using a memory device [▶ 26]

Switching on the display

Procedure

To switch on the display:

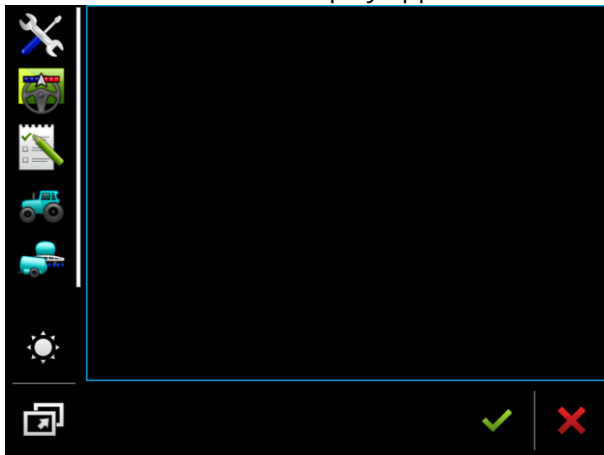
- ✓ The display is installed and connected to the power cable or the ISOBUS basic vehicle harness.

1. Press and hold the  button for approx. 3 seconds.

⇒ The display will beep briefly.

⇒ The display screen remains dark for approx. 10 seconds until the applications are loaded in the background.

⇒ The Start screen of the display appears:



⇒ You have started the display.

Initial start-up




The next step to perform after switching on the display depends on the purpose of the display:

- Parallel driving
- Operation of ISOBUS implements
- Task management and documentation

These cases will be described in the following sections.

Using the display for parallel driving

If you want to use the display for parallel driving, TRACK-Leader is the most important app for you.

Setting	Where?	Purpose
Select the GPS driver.	 / Driver / GPS	The standard driver works in most cases for the receivers sold by ME. However, to change the correction signal, a fitting driver for the GPS receiver must be activated.
Enter the tractor geometry and activate the tractor profile.	 / Settings	See: - Managing the tractor profiles [▶ 59] - Tractor geometry [▶ 66]
Virtual ECU	 / Settings	For the system to be able to know the working width and other parameters of the machine, you must create a virtual ECU for every non-ISOBUS-compatible machine that you use. See: Overview [▶ 73]

Most important settings

Other settings must be made in the TRACK-Leader application.

Operating ISOBUS implement

If you purchase and activate an ISOBUS display licence, you can operate ISOBUS implements. In the standard version of the display, you can test the function for 50 hours.

Procedure


- ✓ The "ISOBUS-UT" licence is activated.
- 1. Insert the ISOBUS cable of the ECU into the ISOBUS rear socket.
- 2. Switch on the display.
- 3. Wait until the ECU application has copied all of the relevant data on the display.
- 4. Open the ECU application using the selection menu.

Display for task management

You can always use ISOBUS-TC task management, regardless of whether you are driving in parallel, switching sections or simply operating an ISOBUS ECU. However, the most important settings mentioned in the previous sections must be made for each of these applications.


Important for ISOBUS-TC:

- Always remember to start and stop the tasks.
- After finishing work, you must save all of the tasks on the USB memory device (log out the USB memory device) before you remove the USB memory device or transmit new tasks onto the display.

Setting	Where?	Purpose
Set the operating mode to "Extended".	 / Settings	Activates and deactivates task management in the ISOBUS-TC application. If you do not want to create tasks, set the operating mode to "Standard".
Insert the USB memory device with task data or create tasks without a USB memory device.		

Most important settings

Procedure

- ✓ The "ISOBUS-TC" licence is activated.
- 1. Switch on the display.
- 2.  - Open the ISOBUS-TC application using the selection menu.
- 3. Insert a USB memory device with task data.
- 4. Start a task.

Switching off the display


NOTICE Data loss due to improper shutdown

Disconnecting the power supply without properly shutting down the display may result in data loss.

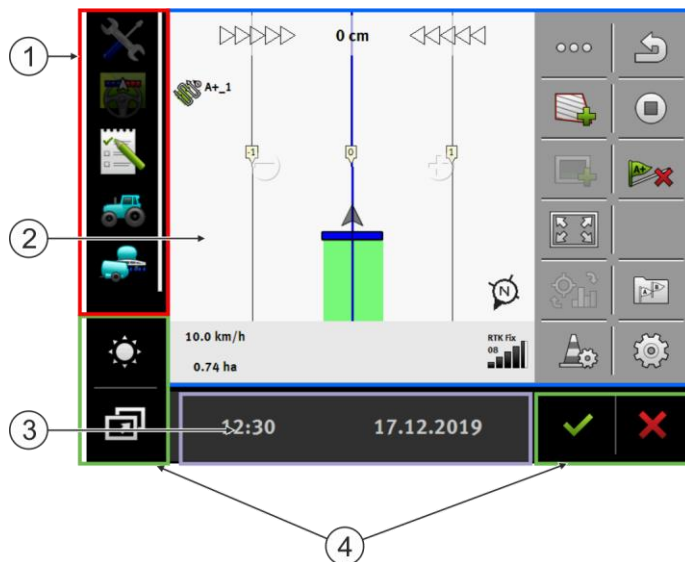
- Always wait until the display is shut down before disconnecting the power supply. This procedure can take up to 5 minutes.

Procedure

To switch off the display:

1. Press and hold the  button for approx. 3 seconds.
 - ⇒ You have now switched off the display.





Display screen layout



Display screen layout

<p>① Selection menu</p> <p>You can open applications in the “Selection Menu” area.</p>	<p>③ Wide additional window</p> <p>You can move the TRACK-Leader app into this window and use it as a Lightbar.</p>
<p>② Main window</p> <p>This area enables you to operate applications. Touching the display screen in the “Main window” area will actuate the function whose icon you have touched.</p> <p>The controls depend on the opened applications.</p>	<p>④ System icons</p>

System icons


Icon	Meaning
	Changes the brightness for day and night.
	Changes the arrangement of the applications in the windows.
	<p>Has no function in this area.</p> <p>When this icon appears in other areas, it is used for confirmation purposes.</p>
	<p>Has no function in this area.</p> <p>When this icon appears in other areas, it is used for cancellation or deletion purposes.</p>

Opening applications

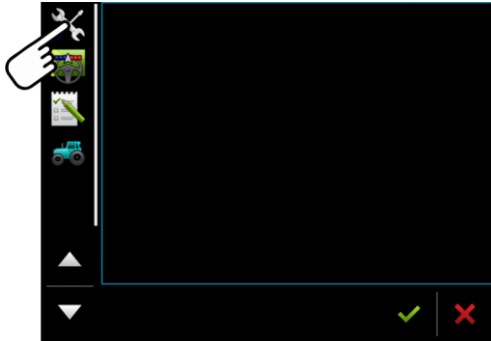
An application opens when it appears in the main window or in an additional window.

Procedure

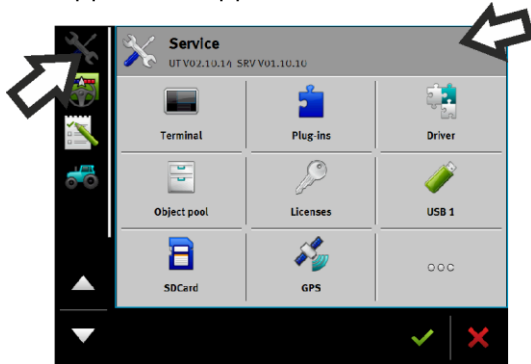
To open an application:

1. Find the function icon for the desired application in the Selection menu area. For example, the icon: 

2. Tap the function icon of the application:



⇒ The application appears in the main window:



- ⇒ The function icon of the application in the Selection menu now appears darker. This tells you that this application is already open. You will no longer be able to open it from the Selection menu.
- ⇒ If the main window is occupied, the application that is already opened will be moved to a free additional window. If this is occupied, the application that is already opened will be moved back to the Selection menu. Their icon becomes bright again. However, it can continue to work in the background.

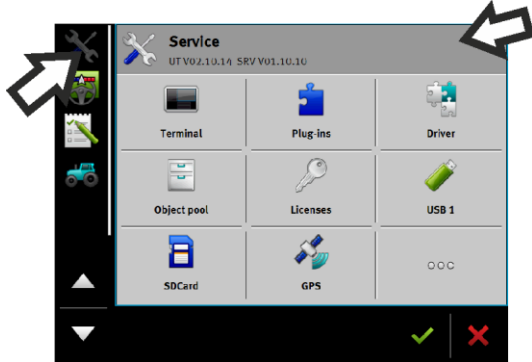
Moving an application

You can move any application from the main window to one of the additional windows or to the ME-Header.

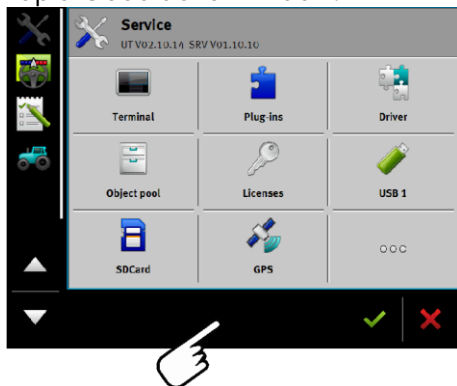
Procedure

To move an application from the main window to an additional window:

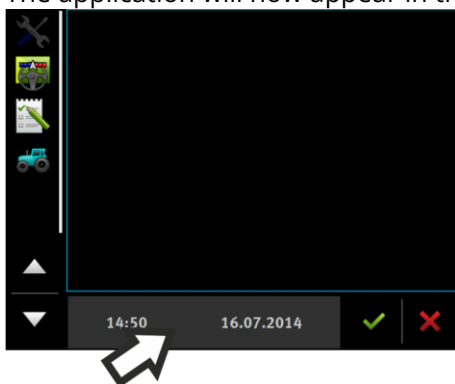
- ✓ You have opened an application in the main window. For example, the Service application:



1. Tap the additional window:



- ⇒ The application will now appear in the additional window:



2. Tap the additional window with the application.


- ⇒ The application will once again appear in the main window.

Saving and loading window arrangements

You can save and load the arrangement of the applications in the windows.


Procedure

To save the arrangement:

1. Hold the button  pressed down until the display beeps twice.
⇒ The arrangement will be saved.

Procedure

To load a saved arrangement:

1. Briefly press the button: 
⇒ The arrangement will be loaded.

Hiding an application

If you do not have enough space on the display screen to open new applications, you can hide an application. The application will not be shut down, but will instead continue to run in the background.



Procedure





To hide an application:

1. Open the application in the additional window.
2. Move the application to the selection menu.

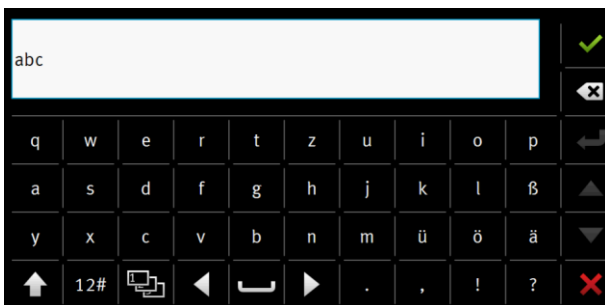
Using the keyboard

In order to enable you to also write numbers or text on the display, a keyboard appears on the display screen whenever this is necessary.

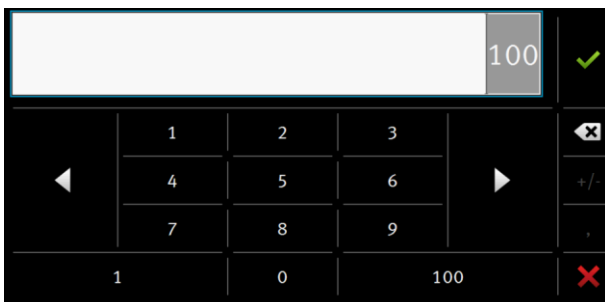
Icon	Meaning
 12# Abc	Changes the buttons on the keyboard.
	Deletes a character.

Icon	Meaning
	Moves the cursor.
	Saves the input.
	Cancel the input.
	Switches between upper and lower case letters.

Major icons



Keyboard for inputting text and numbers.



Keyboard for inputting text.

Using a memory device

The display can work with two kinds of memory devices:

1. With an integrated micro-SD card. This will be used as storage for most applications.
2. With an inserted USB memory device.

The USB memory device is used only for the following purposes:

- For data transfer [▶ 27] between the display and PC
- For saving screenshots

Using SD card

The display applications save most data [► 26] directly onto the SD card.

In order to exchange data between the display and a PC, you will need to proceed differently for each application. You can find out more about this in the instructions for each application.

Folders on the USB memory device

As soon as you insert the USB memory device into the display, several folders will be created on the USB memory device. You will need to set up other folders by yourself.

Each folder may only contain certain data, so that the applications on the display can use this data.

- “documents”
 - Files: .txt
 - Purpose: Records for all completed tasks are saved in this folder.
- “fileserver”
 - Files: All file formats are acceptable.
 - Purpose: Files which are to be imported or exported in the FILE-Server application are saved in this folder.
- “GPS”
 - Files: .txt
 - Purpose: GPS positions are saved in a file in the folder. This will enable Customer Service to reconstruct the traveled distance.
 - The folder will be created if you activate the “Record and save data” parameter.
- “NgStore”
 - Files: .iio, .data
 - Purpose: TRACK-Leader. Standard folder for saved routes and fields.
- “Screencopy”
 - Files: .bmp
 - Purpose: Screenshots are saved here.
 - The display will create this folder automatically when the “Screenshot” parameter is activated in the “display” menu and you create a screenshot.
- “SHP”

This folder replaces the “GIS” folder that was used in previous versions.

- Files: .dbf, .kml, .prj, .shp, .shx

- Purpose: TRACK-Leader: After saving with the SD card, the field data will be stored here. For example:
Field boundaries, applied areas, headlands, etc.
ISOBUS-TC: The shp files must be stored in this folder.
- “Taskdata”
 - Files: .xml
 - Purpose: The folder may only contain XML files which originate from an ISO-XML compatible FMIS. The ISOBUS-TC application accesses this data.
 - You must create this folder yourself.

Displaying the content of the memory device on the display

You can view the content of the memory device directly on the display.

Procedure

1. Insert the memory device (USB memory device or SD card) into the display.
 2. Open the “Service” application.
 3. Tap on “USB 1” or on “SDCard”.
- ⇒ The content of the USB memory device will be displayed.
- ⇒ The content of the SD card can be found in the “ME-TERMINAL” folder.

GPS receiver

- ▶ Connecting the GPS receiver to the display [▶ 30]
- ▶ Changing the driver for the GPS receiver [▶ 31]
- ▶ Configuring the GPS receiver [▶ 32]
- ▶ Configuring the NAV-900 for the steering system [▶ 42]
- ▶ Recording GPS positions [▶ 44]

Connecting the GPS receiver to the display

Find out how to connect a GPS receiver from Müller-Elektronik to the display from the operating instructions for the GPS receiver.

When mounting the display in a vehicle which is already fitted with a GPS receiver and another ISOBUS display, you must:

- connect the GPS signal to the display manufactured by Trimble.
- configure the GPS receiver.

Procedure

To connect the display to a GPS receiver which is already installed on the vehicle:

1. Find out how you can direct the signal from the GPS receiver to the display. This can differ for every vehicle or GPS receiver: Vehicles can be fitted with a GPS socket in the cab, a GPS receiver with a serial output or serial outputs to the ISOBUS display.
2. Check what cable you will use to connect GPS signal to the serial socket on the display manufactured by Müller-Elektronik.
3. Connect the GPS signal to the serial socket of the display manufactured by Müller-Elektronik.
4. Configure the GPS receiver so that it can communicate with the display manufactured by Müller-Elektronik. You can find the necessary specifications for this in the table below.
5. Activate the "Standard" GPS driver on the display.

Configuration

Frequencies	5 Hz (GPGGA, GPVTG)
	1 Hz (GPGSA, GPZDA)
Transmission rate	19200 baud
Data bits	8
Parity	no
Stop bits	1
Flow control	None

Changing the driver for the GPS receiver

Upon delivery, the “Standard” driver is activated on the display. You must change this driver if you want to reconfigure the GPS receiver, for example, to change the correction signal. In this case, you must select a driver that is fitting for the GPS receiver.

Driver name	GPS receiver
deactivated	No GPS receiver is connected.
Standard	Drivers for unknown GPS receivers, if they are connected to the serial interface. This driver is activated by default. The connected GPS receiver cannot thus be configured.
AG-200, NAV-900	Driver for the GNSS receiver NAV-900. If the NAV-900 is connected to the Ethernet interface.

Available drivers



NOTICE **Incorrect driver**

Damage to the GPS receiver.

- Before connecting a GPS receiver to the display, you must always activate the appropriate driver.

Procedure

To activate the driver:

-  - Open the “Service” application.
- Tap “Driver”.
- Tap “GPS”.
⇒ The installed drivers appear.
- Tap the appropriate driver.
-  - Confirm.
- Restart the display.

Configuring the GPS receiver

The internal software for each GPS receiver must be configured. You can configure the following GPS receivers via the display:

- NAV-900

All other GPS receivers must be configured in accordance with their manufacturer's instructions.

The configuration and the individual parameters that need to be configured differ depending on the GPS receiver.

Configuring the NAV-900

Please note that to use the NAV-900 as a system for automatic steering, you must always have it approved and registered by an official body according to the respective country-specific regulations.

Procedure

- ✓ The GPS receiver is connected to the display via the EXP-900L adapter.
- ✓ The "AG-200, NAV-900" driver is activated.



1. - Open the "Service" application.
2. Tap "GPS".
 - ⇒ The "NAV-900" screen appears.
 - ⇒ The display reads the current configuration of the GPS receiver.
3. Tap "Settings".
 - ⇒ You can now see all of the configurable parameters.
4. Configure the parameters. The parameters can be found on the following pages. The parameters that you need to configure depend on the respective correction source and the respective activation. Only those parameters that need to be configured are shown.
5. - Save the configuration.
6. Confirm.

"Frequency" parameter

Frequency at which the receiver transmits its current position to the display.

- "5 Hz"

“Position quality” parameter

Setting for the position quality of the receiver.

- “Accuracy”

For work that requires maximum accuracy, but not necessarily the maximum satellite availability. This setting is recommended.

- “Balanced”

For work that requires both adequate satellite availability and accuracy.

- “Availability”

For work that requires high satellite availability.

“Radar Out” parameter

If this parameter is activated, the receiver emits impulses through the radar output, which can be used to calculate the current speed. The receiver emits 13,000 impulses per 100 m.

“Use slope-compensated position” parameter

If this parameter is activated, the current receiver position is corrected to the reference point.

“Correction source” parameter

Source from which the receiver obtains its correction data to increase the position accuracy.

The list of selectable correction sources depends on the licenses that are available on the NAV-900.

The display of the parameters to be configured changes depending on the selected correction source.

- “Autonomous”

No correction data is used to improve the accuracy. The position is only determined based on the satellite positions.

- “SBAS”

These are free satellite-based correction services, e.g. EGNOS, WAAS, MSAS and GAGAN.

- “RangePoint RTX”

Is a satellite-based correction service that is available virtually worldwide for path to path accuracy of 15 cm. A local base station or modem is not required.

- “CenterPoint RTX Satellite”

Is a satellite-based correction service that is available virtually worldwide for accuracies of up to 2.5 cm. A local base station or modem is not required.

- “CenterPoint RTX Satellite Fast”

Initialization time of less than 1 minute. CenterPoint RTX Fast is available in selected regions and does not require a local base station or a modem.

- “CenterPoint VRS”

Refers to the correction method in which the RTK corrections are sent to the GNSS receiver per mobile Internet through a network consisting of base stations and servers. An external GSM modem is required.

Select this correction source if you are using the NAV-900 with the GX450 modem.

- “CenterPoint RTK”

Refers to the correction method in which the RTK correction data is sent to the GNSS receiver by a local base station through a radio connection. It requires either an external radio modem or an external GSM modem.

“SBAS+” parameter

Satellites that cannot be corrected via SBAS are still used to determine the position using SBAS+. This additionally increases the resistance to signal losses in case of shadowing.

“Correction satellite” parameter

Satellite that belongs to the respective SBAS system. The satellite sends the correction data for the respective region.

If a particular correction satellite is currently not in operation, the receiver must be reconfigured.

- “Automatic”
- “EGNOS 120”
- “EGNOS 123 ASTRA-5B”

This correction satellite is currently available for Europe.

- “EGNOS 124”
- “EGNOS 126”
- “EGNOS 136 SES-5”

This correction satellite is currently available for Europe.

- “MSAS 129”
- “MSAS 137 MTSAT-2”
- “GAGAN 127”
- “GAGAN 128”
- “WAAS 133”

- “WAAS 135 GALAXY XV”
- “WAAS 138 ANIK F1 R”
- “Custom”

A line appears in which you can enter the IDs for the desired correction satellites. You can only enter values that are within the value range and that are not already available in the selection list.

“MMS mode” parameter

This parameter can be used to reduce disruptions on the satellite frequency. Such disruptions can occur e.g. through telecommunications providers.

- “Automatic”

The disruptions are automatically reduced. This setting is recommended.

- “Narrow band”

If the disruption occurs in a narrow frequency range, this disruption is filtered out.

- “Wide band”

If the disruption occurs in a wide frequency range, this disruption is filtered out.

“Frequency selection” parameter

Specifies the frequency of the correction satellite that should be used by the receiver.

- “Automatic”
- “Asia and Pacific”
- “Central Asia”
- “North America”
- “Europe, Middle East and Africa”
- “Latin America”
- “Custom”

Two lines appear in which you can enter the desired frequency and select the desired baud rate.

“Fast restart” parameter

When finishing work, the receiver remembers the last position. When starting the receiver again, the position is then quickly found. The position of the receiver “converges” more rapidly.

When this function is activated, the receiver must **not** be moved when it is switched off.

“Convergence threshold” parameter

Threshold value below which the receiver shows that the specified accuracy is reached during operation. The position of the receiver is then “converged”.

“xFill mode” parameter

In xFill mode, RTK failures are bridged over, which can occur due to missing radio or Internet connections. If no RTK correction signal is received, xFill makes the corresponding corrections for up to 20 minutes.

“Base datum” parameter

Reference system for the region in which the receiver is used.

- “Automatic”

This setting is recommended.

- “ETRS89”
- “GDA94”
- “NAD83”
- “SIRGASCOM”
- “WGS84”

“xFill Premium” parameter

xFill Premium is an extended xFill mode that is **not** limited to a period of 20 minutes.

For this mode, an additional license is required.

- “Automatic”

This setting is recommended. In case of signal losses, the system automatically switches between xFill and the RTK correction signal.

- “Time based”

Time during which the use of xFill Premium is forced.

This setting can be useful in the southern hemisphere to prevent signal disturbances at sunrise or sunset.

“Server address” parameter

URL or IP address that is used to establish a connection to the correction data server.

“Port number” parameter

Port at the correction data server.

“Mountpoint” parameter

Name of the correction data source or the data stream. Pay attention to the use of upper and lower case letters.

“User name” parameter

Name to identify the customer account of the correction service. Pay attention to the use of upper and lower case letters in the entry.

“Password” parameter

Password for the user name. Pay attention to the use of upper and lower case letters.

“Radio modem” parameter

Selection of the connected radio modem.

- “Trimble 900 MHz”
- “Trimble 450 MHz”
- “External”

You must select this setting when you are using a radio modem or GSM modem that was not made by Trimble.

“Network ID” parameter

Enter the network ID with which the Trimble 900 MHz radio modem should work.

“Radio mode” parameter

Transmission mode that is used by the Trimble radio modem.

- “PCCEOT 4800”
- “PCCEOT 9600”
- “TRIMTALK V1 at 4800”
- “TRIMTALK V1 at 8000”
- “TRIMTALK V1 at 9600”

“Baud rate” parameter

Setting for the speed at which the external radio modem sends data to the NAV-900.

- “4800”
- “9600”
- “19200”
- “38400”
- “57600”
- “115200”

“Parity” parameter

Setting for the parity bits of the data transmission.

- “Odd”
- “Even”
- “None”

“Stop bits” parameter

Setting for the stop bits of the data transmission.

- “1 bit”
- “2 bit”

“External correction protocol (input)” parameter

Selection of the correction data protocol that is issued by the external radio modem.

- “RTCM3”
- “CMR”

“Data output” parameter

Selection of the data stream that should be emitted at the interface between the external radio modem and the NAV-900.

- “NMEA”
- “None”

“RTK base station filter” parameter

ID of the base station that is activated for receiving correction data.

“Base station CMR ID” parameter

Reference ID of the base stations from which the correction data is exclusively received.

Transferring licenses

You can purchase additional licenses to activate other functions and accuracy classes of the receiver.

The required licenses are available from Müller-Elektronik or your dealer.

Procedure

✓ You have additional licenses stored on a USB memory device. The file name must always start with the serial number of the receiver.

1. Insert the USB memory device into the display.



2. - Open the “Service” application.

3. Tap “GPS”.

4. Tap “Settings”.



5. - Open the license list.



6. - Start the license transfer.

7. Wait until the license transfer is complete.

8. Restart the display when you are prompted to do so.

⇒ You can now use the receiver with the new licenses.

Managing radio frequencies

If you are working with the Trimble 450 MHz radio modem, you can pre-set various radio frequencies so that you can simply switch between these frequencies when necessary.








✓ The Trimble 450 MHz radio modem is activated. [▶ 37]



1. - Open the “Service” application.






2. Tap “GPS”.

3. Tap “Settings”.

4.  - Open the radio frequency list.
5.  - Add the desired radio frequency.
6.  - Optionally, you can change or  delete radio frequencies.
7.  - Activate the desired radio frequency.
8.  - Exit the screen.
9.  - Transfer the new settings.
10. "Yes" - to confirm.

Configuring the NMEA messages

Procedure

1. Insert the USB memory device into the display.
2.  - Open the "Service" application.
3. Tap "GPS".
4. Tap "Settings".
5.  - Open the configuration.
 - ⇒ The "NMEA output configuration" screen appears.
 - ⇒ You can now see all of the configurable parameters.
6. Configure the parameters. The parameters can be found on the following pages.
7.  >  - Save the configuration.
8. Wait until the saving procedure has been completed.
9. Confirm.
10. Set the GPS driver to "Standard". [▶ 31]
11.  - Confirm.
12. Restart the display.

“NMEA output” parameter

Activate this parameter if you want to send the NMEA messages via the serial interface of the receiver.

“Port” parameter

Interface on the receiver through which the receiver is connected to the display.

“Baud rate” parameter

Setting of the speed of the serial transmission.

“NMEA messages” parameter

Selection of the NMEA messages that should be sent.

- “GST”

Position fault statistics

- “RMC”

Position, speed, direction, time

- “ZDA”

Date and time

- “GSA”

General satellite information

- “GSV”

Detailed satellite information

- “VTG”

COG and SOG

- “GGA”

Time, position (longitude/latitude) and solution status

Configuring unknown GPS receivers

Procedure

- ✓ The GPS receiver is connected to the display.
- ✓ The GPS receiver is connected directly to the display. Additional devices such as an external lightbar or tilt module may **not** be connected in between.
- ✓ The “Standard” driver is activated.



1. - Open the "Service" application.
2. Tap "GPS".
 - ⇒ The "Settings" screen appears.
 - ⇒ The following message appears during initial configuration: "GPS receiver detected. Read the configuration?"
3. Configure the "Baud rate" parameter.
4. Reconnect all of the additional devices that you had disconnected for the configuration.

"Baud rate" parameter

Setting for the speed at which the GPS receiver sends data to the display. The parameter sets the baud rate for the display.

Configuring the NAV-900 for the steering system

Please note that to use the NAV-900 as a system for automatic steering, you must always have it approved and registered by an official body according the respective country-specific regulations.

The NAV-900 does not need to be configured separately for the steering system.

If you want to use the receiver with the steering system, you need the following license on the display:

- TRACK-Leader AUTO®

Moreover, you need the following licenses on the NAV-900. The corresponding licenses are available from Müller-Elektronik or your dealer.

- EZ-Pilot Pro
- Autopilot
- CAN Autopilot to Autopilot
- CAN Autopilot


Recording GPS positions

If you are using the "Standard" driver, you can record the position data of the receiver. This can be necessary if errors occur.

Procedure

- ✓ A USB memory device is inserted into the display.



1.  - Open the "Service" application.
2. Tap "GPS".
3. Tap "GPS data".
 - ⇒ The "GPS data" screen appears.
4. Scroll down.
5. Tap "Trace data".
 - ⇒ The "Trace data" screen appears.
6. Scroll down.
7. Checkmark the "Record and save data" button.
 - ⇒ The display will immediately begin to record the data. This will be saved in the "GPS" folder on the USB memory device.
 - ⇒ The function will be deactivated following any restart.

Joystick

- ▶ Overview [▶ 45]
- ▶ Configuring the joystick button allocations [▶ 45]

Overview

The display offers you the possibility of assigning the functions of an ISOBUS ECU to the buttons of the joystick. To do so, the ISOBUS ECU and the joystick must fulfil the Auxiliary 2 specification requirements from the ISOBUS standard.



Configuring the joystick button allocations

Procedure

To activate the driver for this function:

- ✓ The joystick and ISOBUS ECU are connected and both support the Auxiliary 2 protocol.





1.  - Open the "Service" application.
2. Tap "Driver".
3. Tap "Auxiliary".
4. Mark "Auxiliary2".
5.  - Confirm.
6. Restart the display.

Procedure

To configure the button assignment:

- ✓ You have activated the "Auxiliary2" driver



1.  - Open the "Service" application.
2. Tap "Auxiliary".
3. Tap "Auxiliary Editor".
 - ⇒ If the ISOBUS ECU supports the Auxiliary 2 protocol, a list appears of the ECU functions.
 - ⇒ If no list appears, the ISOBUS ECU does not support this protocol.
4. Tap the function which you want to assign to this button on the joystick.
 - ⇒ A list of the buttons on the joystick appears.
 - ⇒ You have two options for assigning the function to the joystick.
5. **Possibility 1:** On the joystick, press the button to which you want to assign the function.
Possibility 2: On the display, select the button to which the selected function should be assigned and confirm with  .


⇒ The function will be assigned to the button and you can continue with the next function, until you have assigned all of the functions.

6. Restart the display.

⇒ After restarting, the following notification appears on the main display screen: "Confirm the assignments." This notification appears after any restart.

7. "OK" - acknowledge the notification.

⇒ A list of recognized assignments appears on the display screen.

8.  - Confirm the assignments.

Camera

- ▶ Connecting the camera to the display [▶ 48]
- ▶ Activating a camera [▶ 51]
- ▶ Operating the camera [▶ 50]

Connecting the camera to the display

Connecting the camera HQ2



Camera HQ2 - Connection to the touch display

①	Connector for connection to the display. CAM port	③	Camera HQ2
②	Extension cable	④	Camera connector
		⑤	Connector for the camera plug

Procedure

1. Assemble the camera together with its bracket, as described in the assembly instructions of the camera manufacturer.
2. Connect the camera to the extension cable.
3. **CAUTION! When laying out the extension cable, ensure that there are no kinks and that no one can stumble over the laid-out cable.**
4. Connect the extension cable to the **CAM port** of the display.
5. Secure the camera.
6. Activate the camera. [► 49]

Connecting the camera NQ



①	Connector for connection to the display. CAM port	④	Camera
②	Connector for the adapter cable	⑤	Camera connector
③	Connector for the extension cable	⑥	Connector for the camera plug

Procedure

1. Connect the cables to each other as shown in the figure. Pay attention to cable lengths when doing so.
2. **CAUTION! When laying out the cable, ensure that there are no kinks in the cable and that no one can stumble over the laid-out cable.**
3. Lay out the cable. Ensure that the cable reaches the display and is not pulled out during operation.
4. Attach the cable with the provided cable ties.
5. Secure the camera. Use the white cardboard drilling template from the quick start guide for this purpose.
6. Connect the camera to the display. Use the **CAM** port to do this.
7. Activate the camera. [► 49]
8. When disconnecting the cable from the display, use the enclosed rubber gasket to seal the exposed connector.

Activating a camera

In order to activate a camera, you must activate the “Camera_ME” plug-in.

Procedure



1. - Open the “Service” application.
2. Tap “Plug-ins”.
3. Tap “Camera”.
 - ⇒ The plug-in is marked with a green tick.
4. Restart the display.
 - ⇒ After restarting, the icon for the camera application appears in the selection menu.



5. - Open the Camera application.

Operating the camera

The camera serves **solely** for observing the implement functions in non-safety-related working areas of the agricultural implement.

In certain situations, the camera image may appear on the screen with a delay. The delay depends on the respective use of the display and can also be affected by external factors and devices.


WARNING Accident due to delayed image transmission

Rapidly moving objects may be detected too late.

- Do not use the camera as an aid for steering the vehicle.
- Do not use the camera in road traffic.
- Do not use the camera when driving into intersections.
- Do not use the camera as a rear view camera.
- Do not use the camera as a visual aid for controlling the implement, especially when a delayed reaction can lead to risks.

Function icon	Meaning
	Mirrors the image horizontally.
	Mirrors the image vertically.

✓ You have connected and activated the camera.

1.  - Open the Camera application.

⇒ The filmed image appears in the main window.

2. Tap on the main window.

⇒ Function icons appears on the side for 10 seconds, with which you can actuate the camera.

Service application

- ▶ [Changing the language \[▶ 53\]](#)
- ▶ [Basic display settings \[▶ 53\]](#)
- ▶ [Activating and deactivating applications \[▶ 55\]](#)
- ▶ [Unlocking licenses for full versions](#)
- ▶ [Creating screenshots \[▶ 56\]](#)
- ▶ [Deleting pools \[▶ 56\]](#)


Changing the language

When you switch on the display for the first time, the text may appear in a foreign language (in German).

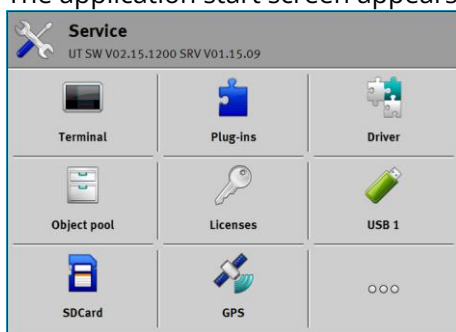
If you change the language in the Service application, you also change the language for all applications and the ISOBUS ECU.


If a connected ISOBUS ECU cannot activate the selected language, a standard language will be activated.

Procedure

1.  - Open the "Service" application.

⇒ The application start screen appears:




2. Tap "Terminal".
 - ⇒ A list of parameters appears.
3. Slide your finger over the display screen from the bottom to the top.
 - ⇒ New parameters appear.
4. Tap "Language".
 - ⇒ A list of abbreviations of available languages appears.
5. Tap the abbreviation for your language.
 - ⇒ The abbreviation is marked with a green dot.
6.  - Confirm.
 - ⇒ The "Terminal" screen appears.
7. Restart the display.

Basic display settings

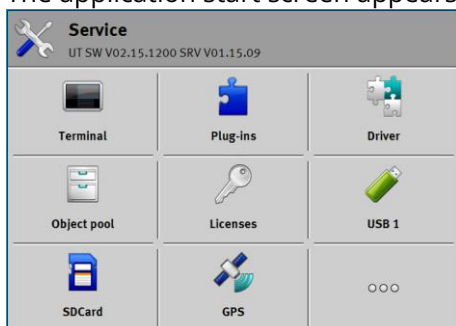
The basic settings include: Language, Time, Measurement units.


All settings which you make here will also apply to other applications and in connected ISOBUS ECUs.

Procedure

1.  - Open the "Service" application.

⇒ The application start screen appears:



2. Tap "Terminal".
 - ⇒ A list of parameters appears. See the table below.
3. To change the value of any of the parameters, tap the desired parameter.
 - ⇒ A window appears, into which you can input the value of the parameter as a number, or select from a list.
4.  - Confirm.
5. Restart the display.

Parameter name	Function
Day brightness	Brightness of the display screen during the day.
Night brightness	Brightness of the display screen at night.
Keyboard brightness	Lighting of the buttons.
Volume	Volume of the display.
Date	Current date.
Time	Current time.
Time zone	Time difference in relation to GMT.
Language	Language of the applications on the display screen.
Measurement units	Measurement system.
Screenshot	When this parameter is activated, you can create screenshots on the display.

Parameter name	Function
VT number	Parameters from the ISO standard Number that should be given to the display on the ISOBUS.
Login as ISOBUS-VT	Activate this parameter if you want the ISOBUS ECU to be displayed on the display. This parameter must be activated in most instances. On very few self-propelled agricultural machines, the parameter must be deactivated.
Number of navigation buttons	The display provides a maximum of 12 function icons in each application. When you connect an ISOBUS ECU that has more functions in a single screen to the display, their function icons are spread over multiple pages. Furthermore, navigation buttons appear that can be used to scroll to the next page. The number indicates how many buttons should be used to scroll between multiple pages with function icons.
Character representation	Character representation on the display.
Use satellite time	Activate this parameter if the current date and time should be synchronised with the satellite time.

Parameters in the "Terminal" menu

Activating and deactivating applications


In the "Service" application you can activate and deactivate other applications that are installed on the display. The applications are installed in packages, in so-called plug ins. A plug in can contain several applications. You can for example deactivate a plugin if you do not want to use it. The plug-in will then not be displayed in the selection menu.

Name of the plug-in	Activates the following applications
TRACK-Leader	TRACK-Leader TRACK-Leader AUTO
ISOBUS-TC	Overview [▶ 80]
Tractor-ECU	Overview [▶ 59]
Camera	The display screen will show the image from the connected

Name of the plug-in	Activates the following applications
	camera.
FILE-Server	FILE-Server application
Virtual ECU	Overview [▶ 73]

Procedure



To activate and deactivate plug-ins:

1.  - Open the "Service" application.
2. Tap "Plug-ins".
 - ⇒ Screen "Plug-ins" appears.
3. To activate or disable a plug-in, tap it.
 - ⇒ A plug-in is activated when a checkmarker appears in front of its name.
4. Restart the display.

Creating screenshots

A screenshot is a photo of the screen being displayed.

Procedure

1. Insert a USB memory device into the display.
2.  - Open the "Service" application.
3. Tap "Terminal".
4. Set the "Screenshot" parameter to "Activated".
5. To create a screenshot, press the  button.
 - ⇒ The content of the display screen will be saved as an image file on the USB memory device in the "Screencopy" folder.

Deleting pools

Pools are the intermediate storage for the display. Pools are used to temporarily store graphics or text. Over time, the pools will become too large and slow down the operation of the display.

You can delete the pools to speed up the display's operation.

When to delete?

Delete the pools:

- After updating the software of a connected ECU.
- If the display operates more slowly than usual.
- When asked to do so by Customer Services.

Procedure

To delete the pools:



1. - Open the "Service" application.
2. Tap "Object pool".
 - ⇒ A list with the ISO names of ISOBUS ECUs appears, whose graphics and text can be found in the storage of the display. You can determine from the icon which farm implement is being controlled by the ECU.
3. Tap the object pool which you want to delete.
4. - Delete the object pool.
 - ⇒ Nothing happens if you delete the wrong object pool.
 - ⇒ The following message appears: "Do you want to delete the folder?"
5. To confirm, tap "Yes".
6. The current pool of the ECU will be loaded after the next restart.

10

Tractor-ECU application

- ▶ Overview [▶ 59]
- ▶ Work screen [▶ 59]
- ▶ Managing the tractor profiles [▶ 59]
- ▶ Parameters [▶ 62]
- ▶ Results [▶ 70]

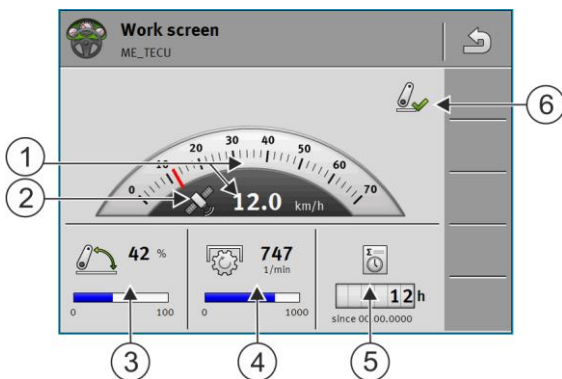
Overview

The Tractor-ECU application is used to compile all of the information of the vehicle on which the display is mounted. Tractor-ECU can transfer this information to other apps (e.g. the position of the GPS receiver to TRACK-Leader) or to a connected ISOBUS ECU (GPS signal as a speed source).

The Tractor-ECU application allows you to:

- Create a profile for each vehicle, with specific settings.
- Input the sensors which are mounted on the vehicle.
- Enter the position of the GPS receiver.
- Define the GPS signal to determine the speed on the CAN bus.

Work screen



①	Speed display	④	PTO shaft speed
②	Speed source	⑤	Number of operation hours
③	Position of the work position sensor	⑥	Status of the work position sensor

Managing the tractor profiles

Tractor profiles are used to store important features of the tractor on which the display is installed.

This offers the following advantages:

- You can use the display on several tractors. Each time you change tractors, you can activate the fitting tractor profile.
- Even if the display is always installed on one tractor, you can create several profiles for one tractor.

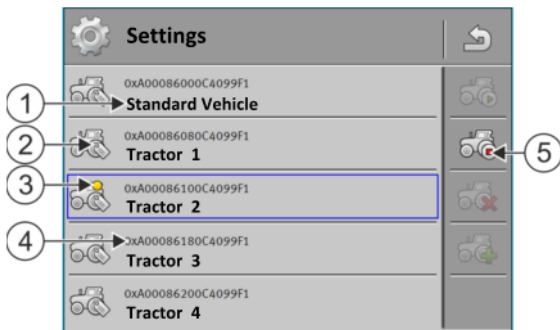
You can use between 1 and 31 tractor profiles.

The number of tractor profiles depends on several factors:

- Purpose of the display:
 - If you switch the mounted implement manually, or are using an implement for which cm-accuracy is not required, one tractor profile per tractor is enough.
 - If you are not using TRACK-Leader, you probably do not need tractor profiles.
- Number of tractors with different equipment and different geometries.

For self-propelled machines (e.g. field sprayers), you must use a tractor profile with the following settings:

- **“Connection with ISOBUS-TC?”** parameter - Ensure that this parameter is properly set.
- **“Speed”** parameter
 - GPS receiver - If a GPS receiver is connected to the display and is used to determine the speed.
 - Wheel sensor, radar sensor via CAN bus - If a speed sensor is connected to the junction box of the ISOBUS ECU, this setting allows you to use the speed display of the Tractor-ECU.
- **Geometry:** For self-propelled machines, the geometry is generally entered in the field sprayer ECU. For this reason, you do not need to enter any distances in the Tractor-ECU.



①	Name of a tractor profile	④	ISO name of the tractor profile (The numbers in the middle differ among the profiles)
②	Icon for the tractor	⑤	Function icons. If at least one tractor profile is activated, only the stop icon appears.
③	State of the tractor profile: Green = Profile is activated; Yellow = Profile will be activated after restarting the display.		

Function icon	Function
	Creates a new tractor profile.
	Activates the marked tractor profile.
	Deactivates the tractor profile.
	Calls up the parameters stored in the tractor profile.
	Deletes the tractor profile.




Procedure

1. - Open the Tractor ECU application.
2. Tap "Settings".
⇒ The existing tractor profiles appear.

- ⇒ If a tractor profile is activated, most of the other function icons are greyed-out.
- 3. A maximum of five tractor profiles can be displayed on one page. To view other profiles, swipe across the screen with your finger from bottom to top.
- 4. To edit a tractor profile or to create a new one, you must deactivate the activated tractor profile.

Parameters

Procedure

1.  - Open the Tractor ECU application.
2. Tap "Settings".
 - ⇒ The existing tractor profiles appear.
3.  - If a tractor profile is activated, deactivate it.
4. Tap on the profile to be configured.
 - ⇒ The profile will be marked.
5.  - Call up the parameters for the marked tractor profile.
 - ⇒ The parameters are displayed.

Name

Name of the tractor profile.

Connection with ISOBUS-TC?

With this parameter, you can set whether the Tractor ECU application should communicate with the ISOBUS-TC application. In doing so, it transmits: Counters, work position, position of the GPS receiver.

Deactivate this parameter only if the display is used as a secondary display and the GPS receiver is connected to a different display.

Speed

Configuring the speed sensor. This measures the speed.

Possible values:

- "deactivated"

No sensor measures the speed.

- "Wheel sensor"

A wheel sensor is connected to the display. The wheel sensor must be calibrated [► 65].

- “Radar sensor”

A radar sensor is connected to the display. The radar sensor must be calibrated [► 65].

- “GPS receiver”

The speed is calculated using GPS.

- “Unknown sensor via CAN”

A wheel sensor or a radar sensor is connected to the display via CAN.

- “Radar sensor via CAN”

A radar sensor is connected to the display via CAN.

- “Wheel sensor via CAN”

A wheel sensor is connected to the display via CAN.

Impulses per 100 m

This parameter is only required if you have selected one of the following speed sources: Wheel sensor or radar sensor. In other cases, any value entered here will be ignored.

The speed sensor calibration results appear under this parameter.

Work position sensor

With this parameter, you can set whether there is a work position sensor and how its signal reaches the display.

There are three parameters that can be used to configure the work position sensor:

“Mounting position and connection” parameter

Possible values:

- “deactivated”

No sensor measuring the work position.

- “Front via connector B”

A work position sensor, is located on the front hitch or on the implement mounted on the front hitch. It is connected to the display via connector B. The work position sensor must be configured.

- “Rear via connector B”

A work position sensor, is located on the rear hitch or on the implement mounted on the front hitch. It is connected to the display via connector B. The work position sensor must be configured.

- “Unknown sensor via CAN”

There is a work position sensor determining the work position of the implement. It is connected to an ISO-BUS ECU or to a different display. The signal reaches the display via CAN.

- “Front via CAN”

There is a work position sensor determining the work position of the implement at the front of the vehicle. It is connected to an ISOBUS ECU or to a different display. The signal reaches the display via CAN.

- “Rear via CAN”

There is a work position sensor determining the work position of the implement at the rear of the vehicle. It is connected to an ISOBUS ECU or to a different display. The signal reaches the display via CAN.

- “TRACK-Leader AUTO”

As soon as the steering system is activated, the system assumes that the implement is in work position.

“Sensor Type” parameter

If a work position sensor is connected to the display via connector B, you must tell the display the principle according to which the sensor functions.

Possible values:

- “analog”

You are using an analog work position sensor [► 66], which measures the height of the hitch linkage as a percentage.

- “digital”

You are using a digital, ISO-compatible work position sensor in accordance with ISO 11786. The sensor is connected to the display via the signal socket.

- “ME-sensor Y”

You are using a work position sensor provided by Müller-Elektronik. The sensor is connected to the display.

“Inversion” parameter

As a standard, the display assumes that the implement is in work position as soon as the work position sensor sends a signal. However, if the work position sensor functions inversely, you have to set it here.

Possible values:

- “Yes” - implement is in work position when the sensor is not occupied.
- “No” - implement is in work position when the sensor is detecting something.

PTO shaft speed

Configuring the PTO (power take-off) rotational speed sensor. It measures the rotational speed of the PTO.

Possible values:

- “deactivated”

No sensor measures the rotational speed of the PTO.

- “Revol. sensor - front”

A rotational speed sensor that is fitted onto the front PTO.

- “Revol. sensor - rear”

A rotational speed sensor that is fitted onto the rear PTO.

Impulses per revolution

Number of impulses per revolution that are transmitted by the PTO through the selected PTO sensor.

Warning - Incomplete geometry

With this parameter, you can set whether warning should appear if the geometry was configured incompletely.

A geometry is then recognized as incomplete if the distance C [▶ 66] is 0 cm.

No tractor geometries are used for self-propelled vehicles or if the GPS receiver is installed on the implement. In this case, deactivate the parameter so that the warning does not appear unnecessarily.


Calibrating the speed sensor

When calibrating the speed sensor using the 328.085ft (100m) method, determine the number of targets which the speed sensor encounters over a distance of 328.085ft (100m).

If you know the number of targets for the speed sensor, you can also input this manually.

Procedure

- ✓ You have measured and marked a distance of 100m. The distance must correspond to the field conditions. You must therefore drive across a meadow or a field.
- ✓ The vehicle with the connected implement is operational for a 100m drive and is at the start of the marked distance.
- ✓ You have connected a wheel sensor or radar sensor to the display.
- ✓ You have selected the value “Wheel sensor” or “Radar sensor” in the “Speed” parameter.

1.  - Open the Tractor ECU application.
2. Tap “Settings”.
3. Mark the vehicle for which you want to calibrate the speed sensor.

4. Tap  .

5. Tap  .

6. Follow the instructions on the display screen.




⇒ You have calibrated the speed sensor.

Calibrating an analog work position sensor

If you have connected an analog work position sensor to the display, you have to show the display the position as of which the implement is in work position.

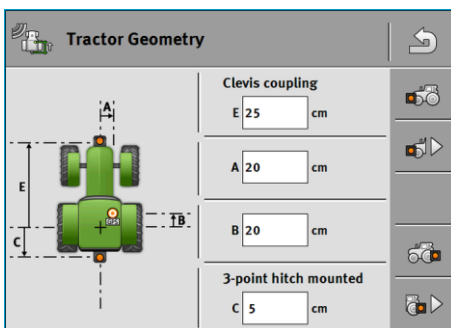
Procedure

- ✓ You have connected a work position sensor directly to the display or via the signal socket to the display.
- ✓ You have selected the analogue sensor in the "Sensor type" parameter.

1.  - Open the Tractor ECU application.
 2. Tap "Settings".
 3. Mark the vehicle for which you want to calibrate the analog work position sensor.
 4. Tap  .
 5. Move the implement into work position.
 6. Tap  to teach-in the work position on the display.
 7. Confirm.
- ⇒ You have configured the work position sensor.

Tractor geometry

The tractor geometry represents a series of dimensions on the vehicle.



Examples of tractor geometry

A	Distance between the centre of the vehicle and the GPS receiver, on the left-right axis. If the receiver is installed on the left side, enter a negative value. Users of TRACK-Leader AUTO® : The position of the GPS receiver must also be entered and calibrated in the steering ECU. For this reason, the A and B boxes are greyed-out and cannot be edited.
B	Distance between the GPS receiver and the rear axle of the vehicle.
C	Distance between the rear axle and the rear mounting or attachment point.
E	Distance between the rear axle and the front mounting or attachment point.




Configuring the tractor connector types

The connector type can differ among various tractors and mounted or trailed implements. Per default, the connector type is always set to "Unknown".












Please note that when you select a different connector type or multiple different connector types, the automatic list of connections no longer works. You then have to list the connections manually.

The following connector types are possible:

- Unknown
- Drawbar
- 3-point hitch semi-mounted
- 3-point hitch semi-mounted
- Hitch hook
- Clevis coupling
- Piton-type coupling
- CUNA hitch
- Ball-type hitch

Function icon	Meaning
	Adds a new connector type.
	Deletes the marked connector type.
	Edits the marked connector type.






Procedure

1.  - Open the Tractor ECU application.
2. Tap "Settings".
 - ⇒ The existing tractor profiles appear.
 - ⇒ If a tractor profile is activated, most of the other function icons are greyed-out.
3.  - To edit a tractor profile or to create a new one, you must deactivate the activated tractor profile.
4. Tap on the tractor profile to be edited.
5.  - Call up the parameter list.
 - ⇒ The parameters are displayed.
6.  - Open the tractor geometry screen.
7.  - Call up the screen for configuring the front connector types.
 - ⇒ The "Front - connector type" screen appears.
8.  - Add a connector.
9. Select the connector type.
10. Enter the distance between the rear axle and the front mounting or attachment point.
11.  - Confirm.
12. Optionally, you can  edit or  delete other connector types.
13.  - Repeat this procedure for the rear connector types. Enter the distance between the rear axle and the rear mounting or attachment point.
14.  - Terminate the entry.
 - ⇒ The tractor geometry can now be viewed and edited. [[▶ 68](#)]

Configuring the tractor geometry

Procedure

- ✓ You have configured the connector types of the tractor. [[▶ 67](#)]

1.  - Open the Tractor ECU application.
2. Tap "Settings".
 - ⇒ The existing tractor profiles appear.
 - ⇒ If a tractor profile is activated, most of the other function icons are greyed-out.
3.  - To edit a tractor profile or to create a new one, you must deactivate the activated tractor profile.
4. Tap on the tractor profile to be edited.
5.  - Call up the parameter list.
 - ⇒ The parameters are displayed.
6.  - Open the tractor geometry screen.
7.  - Select the currently used connector type. Per default, the connector type is always set to "Unknown". Please note that when you select a different connector type or multiple different connector types, the automatic list of connections no longer works. You then have to list the connections manually.
8. Adopt the pre-set distances for the connector types or enter new distances as shown in the figure above.

With an additional license (item number: 3038990035), you can configure other optional geometry parameters for using the slope-compensated GNSS position without automatic steering with the NAV-900. This parameter

is reached through the tractor geometry screen with the function icon .

The following parameters are possible:

Height above ground

The height of the GPS receiver above the ground.

Roll angle

Rotation around the longitudinal axle.

Pitch angle

Rotation around the transverse axle.

Yaw angle

Rotation around the vertical axle.

Slope offset

Slope offset of the receiver.

Results

The Tractor ECU application documents the work in two counter groups:


- Trip counter
- Task-related counter




Trip counter

Counter designation	This is documented
Applied distance	Distance during which the work position sensor was activated.
Applied area	Area during which the work position sensor was activated. The Tractor ECU application uses the set working width as a basis for the calculation of the area.
Working time	Time during which the work position sensor was activated.

Procedure

To clear a trip counter:

1.  - Open the Tractor ECU application.
2. Tap "Results".
⇒ The "Results" screen appears with the trip counters.
3. Tap the function icons to clear the trip counters.

Icon	This counter will be erased
	Applied distance
	Working time
	All trip counters

Task-related counter

These counters are transmitted to the ISOBUS-TC app. You can activate the counters in a task, and they will then appear in the additional window as soon as the ISOBUS-TC App is minimized.

Counter designation	Unit	This is documented
Distance	km	Distance during which the work position sensor was activated.
Time in work position	h	Time during which the work position sensor was activated.
Work position	0/1	0 = not in work position 1 = in work position

Task-related counter

Virtual ECU application

- ▶ [Overview \[▶ 73\]](#)
- ▶ [Managing virtual ECUs \[▶ 73\]](#)
- ▶ [Parameters \[▶ 74\]](#)
- ▶ [Work screen \[▶ 78\]](#)

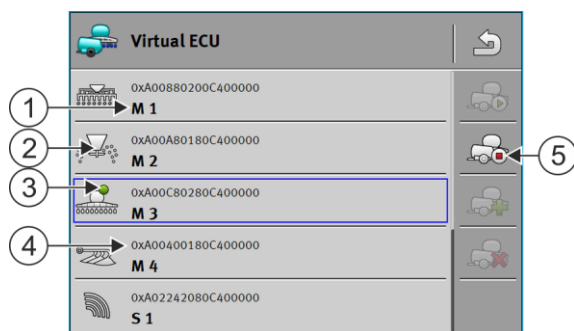
Overview

The Virtual ECU application (or VECU for short) is used to create virtual ECUs for the following implements:

- Implements that do not have their own ECU. For example: Cultivators, ploughs, mechanical seeders, etc.
- Machines that are operated using an on-board integrated display/controller connected to the serial interface.
- Crop protection sensors that are connected serially to the display.




Each virtual ECU contains the most important features of the respective machine (working width, geometry, type of on-board integrated display/controller) and provides these to other applications if required.

Managing virtual ECUs




①	Name of the virtual ECU	④	ISO name of the virtual ECU
②	Implement type	⑤	Function icons. If at least one virtual ECU is activated, only the stop icon appears.
③	State of the virtual ECU: Green = Profile is activated; Yellow = Profile will be activated after restarting the display.		

Function icon	Function
	Creates a new ECU.
	Activates the marked ECU.

Function icon	Function
	Deactivates the ECU.
	Calls up the parameters stored in the virtual ECU.
	Deletes the ECU.

Procedure

1.  - Open the "Virtual ECU" app.
2. Tap "Settings".
 - ⇒ The existing virtual ECUs appear.
 - ⇒ If a ECU is activated, most of the other function icons are greyed-out.
3. A maximum of five ECU profiles can be displayed on one page. To view other profiles, swipe across the screen with your finger from bottom to top.
4. To edit a ECU profile or to create a new one, you must deactivate the activated ECU profile.

Parameters

Name

Name of the virtual ECU.

External Controller

If you have connected an on-board integrated display/controller or crop protection sensor to the serial interface, you must select the model in this parameter.

The list contains the following devices:

- On-board integrated display/controllers that can communicate using one of the protocols ASD or LH5000 and are capable of communicating with the display. If you want to connect an on-board integrated display/controller that supports this protocol, but does not appear in the list, please contact Müller-Elektronik and perform the steps shown at the end of this section.
- Crop protection sensors that can be connected to the serial interface of the display.
- AMABUS. Please note that to connect the AMABUS, you need a special cable, item number: 30322572

Procedure

This is how you update the list of on-board integrated display/controllers:

- ✓ You have contacted Müller-Elektronik and received a USB memory device with the installation file.
- ✓ The Virtual ECU application is closed.
- 1. Insert the USB memory device into the display.
- 2. Start the Virtual ECU application.
 - ⇒ The following message appears: Do you want to update the list of external on-board integrated display/controllers?
- 3. Select "Yes" to update the list.
- 4. Confirm.
- 5. Restart the display.
- ⇒ You can now also select the added on-board integrated display/controller.

Implement type

Use this parameter to define the type of implement.

The following implement types are available:

- Seeder/planter
- Fertilizer spreader
- Sprayer
- Soil tillage

Connector type

Use this parameter to define the connector type of the agricultural implement.

The following connector types are possible:

- Unknown
- Drawbar
- 3-point hitch semi-mounted
- 3-point hitch semi-mounted
- Hitch hook
- Clevis coupling
- Piton-type coupling
- CUNA hitch

- Ball-type hitch

Machine model

This parameter influences how the working bar follows the arrow in TRACK-Leader. The configuration improves the precision of the recording of applied areas in curves.

After each change, you also need to adjust the geometry.

Possible values:

- “mounted”

Setting for implements that are mounted on the tractor three-point hitch.

- “trailed”

Settings for implements trailed by a tractor. The working bar is guided like a trailer behind a tractor.

Working width

This parameter shows the working width set for an implement.

Number of sections

Enter the number of sections that can be switched off on the implement. On a field sprayer, they are the section valves; on a fertilizer spreader or a planter/seedler, they can be e.g. metering units.

This parameter serves to transmit the proper number of sections to the SECTION-View module, so that you can switch the sections manually.

Each section appears as part of the working bar on the screen.


Sections

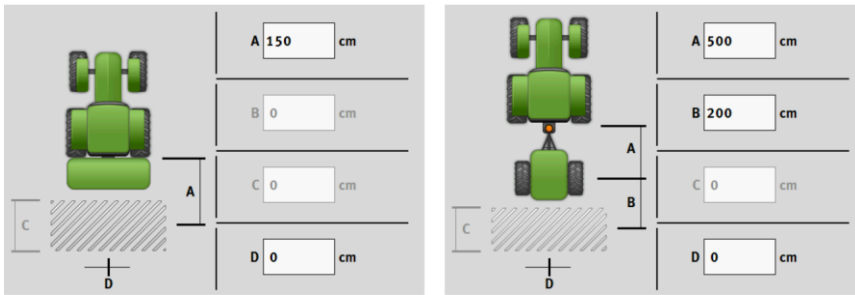
Opens a screen where you can enter the width of the individual sections on the implement.

Geometry

The geometry contains a series of dimensions that help to properly display the vehicle-implement combination in TRACK-Leader and determine its position.

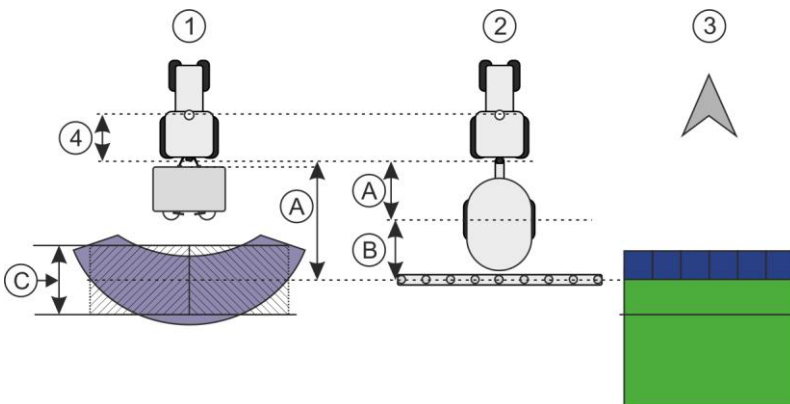
To call up the geometry, tap the function icon:

	<p>Calls up the machine geometry.</p>
---	---------------------------------------



Screen for entering the geometry for different machine models

<p>A Mounted:</p> <p>Distance between the coupling point and the work point of the machine.</p> <p>Trailed:</p> <p>Distance between the coupling point and the pivot point of the machine.</p> <p>For single-axle trailers, the pivot point is located at the centre of the axle, for tandem trailers between two axles. For planters/seeder, cultivators and other soil tillage implements, the pivot point must be determined individually.</p>	
<p>B Mounted:</p> <p>Not available</p> <p>Trailed:</p> <p>Distance between the pivot point of the machine and the work point.</p>	
<p>C Only for spreaders: Working length</p>	
<p>D Lateral offset</p> <p>If the mounted implement is offset to the left in the direction of travel, enter a negative value. For example: - 50 cm.</p>	



Geometry of machines and display in TRACK-Leader


①	Mounted fertilizer spreader
②	Trailed sprayer
③	Display in TRACK-Leader

TRAMLIN-View

TRAMLIN-View contains parameters that are used to correctly display tramlines in TRACK-Leader when using seeders.

To use TRAMLIN-View, the "TRAMLIN-Management" license must be activated.

To call up TRAMLIN-View, tap the function icon:

	Calls up TRAMLIN-View.
---	------------------------

Parameter:

- "Tramline rhythm"

Defines the tramline rhythm to be used for operation.

- "Working Start"

Defines the point on the field at which you want to start working.

- "Begin with half the working width"

Defines whether you make the first field track after starting to work with only half of the working width.

Work screen

The following information may appear on the work screen:

- Serially transmitted application/spread rates: Target rates and current rates
- Section status and number
- Implement geometry

ISOBUS-TC application

- ▶ Overview [▶ 80]
- ▶ Configuring ISOBUS-TC [▶ 80]
- ▶ Configuring the list of connections [▶ 81]
- ▶ Using fields and shp data [▶ 83]

Overview

The The ISOBUS-TC application has the following job:

- As **Task Controller**, the application controls all of the relevant data between the display and other implements that are connected to the ISOBUS or display (Part 11 of the standard ISO11783).

Configuring ISOBUS-TC

“Operating Mode” parameter



Use this parameter to set the ISOBUS-TC Task Controller to work in the background. With this display, the Task Controller can only be used in “Standard” mode.

The following tasks are performed:

- All task data is managed through the “TRACK-Leader” app.
- In ISOBUS-TC, you cannot create any tasks.
- In this operating mode, ISOBUS-TC works in the background.

Procedure



1.  - Open the ISOBUS-TC application.
2. Tap “Settings”.
3. Tap “Operating Mode”.
4. Tap “Standard” to be able to work without tasks.
5.  - Confirm.
 - ⇒ You will be asked whether you want to change the setting.
6. Tap “Yes” if you want to confirm this.
 - ⇒ All data will be saved and the operating mode will be switched.
7. Wait until all messages have faded out.

What happens with the data?

The data structure is different in the two operating modes. After changing the mode, the task and field data will be saved. When switching again, the stored data will be loaded.

“TC number” parameter

Number of the Task-Controller. For complex systems with multiple displays and Task-Controllers, several Task-Controllers can be distinguished based on this number. If need be, you can control which Task-Controller the connected ECU should communicate with.

“Prefer internal Tractor-ECU?” parameter

This parameter is important on vehicles that have their own Tractor-ECU in addition to the ME display.

Activate the parameter if the GPS receiver is connected to the ME display or to the TRACK-Leader AUTO steering system. Deactivate the parameter if the GPS receiver is connected to a different display.

“Simplified target rate assignment?” parameter

Optional parameter. Set to “No” per default.

When you activate this parameter, the target rate settings from the previous task can be adopted for a new task. To do so, you must set the parameter to “Yes”.

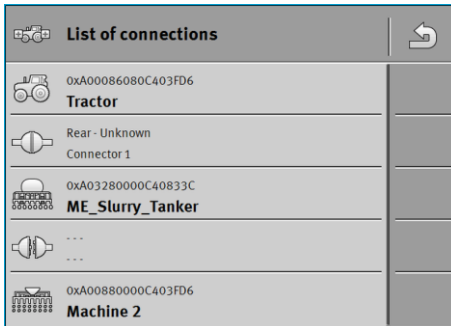
When you then create a new task, the following message appears:



“Should be target rate settings for the implement be adopted from the previous task?”

Confirm this message to adopt the target rate settings.

Configuring the list of connections

The list of connections indicates the ISOBUS ECUs from which the display will load the geometries of the connected implements. This geometry is required in order to calculate the position of all implement components on the basis of the GPS signal. Only in this way are precise parallel guidance and section control possible.



①	Icon for the tractor	④	ISO name of the tractor
②	Connection between the tractor and the ECU is established  - Connected implements	⑤	Name of the ECU
③	Icon for the ISOBUS ECU	⑥	Not all of the equipment in the list must be connected.  - Disconnected implements

In simple systems, the display can set up the list of connections automatically. In particular, when the ME display is the only unit containing the tractor geometry.


It can however still be necessary to set the list of connections manually in the following instances:

- If a tractor ECU (Tractor-ECU), in which the tractor geometry is saved, is mounted as an independent ECU on the tractor. In this instance, you must decide which Tractor-ECU is connected in the list of connections with other equipment: the application on the ME display or on the tractor ECU.
- If the system cannot organize the ISOBUS ECU by itself. For example when more than one implement is connected to the tractor (e.g.: slurry tanker and planter/seedler).
- If this error message appears when starting the display: "List of connections is incomplete."
- When the following error message appears when starting a navigation in TRACK-Leader: "The device data is still loading." The settings in the list of connections can eliminate this problem.



Procedure

If you are using the ISOBUS-TC application in "Standard" mode, you can configure the list of connections as follows:

- ✓ All ISOBUS ECUs and virtual ECUs that are required for a field are connected.

1.  - Open the ISOBUS-TC application.
2. Tap "Farm equipment".




⇒ The “Farm equipment” screen appears.











3.  - Open the list of connections.
 - ⇒ You have called up the list of connections screen.
 - ⇒ A list appears with all of ECUs, controllers and ECUs connected to the ISOBUS. The connectors appear between these devices.
4. Tap the task in the top row in order to select the first implement.
5. The device that is connected to the ME display should appear in the second line. Tap the line with the second implement and select one from this.
6. You now only need to select the appropriate connector between the two devices. Tap the line between the devices and select the appropriate connector for each device.
7.  - Exit the screen to save the settings.

Using fields and shp data

In the “Fields” category, you can create all of the fields that you want to process. For each field, you can enter the following properties:

- Field name
- Code
- Area
- Field boundary
- Guidance lines
- Guidance Line Set
- Obstacle
- Prescription map (ISOBUS-TC license required)

Icon	Function
	Creates a new field.
	Activates the field.
	Deactivates the field.

Icon	Function
	Enables editing of the field properties.
	Deletes the field.
	Icon only appears when you tap  .
	Enables the import of field data.
	Displays the loaded prescription map.
	Displays the imported field data.
	Enables the export of field data.
	Icon only appears when you tap  .
	Deletes the selected data.
	Icon only appears when you tap  .

What is field data for?



Purpose

All field properties that are stored in this way can be used when working in TRACK-Leader. To do so, you must activate the field to be processed in ISOBUS-TC before each navigation.

Creating fields


Procedure

To create a new field:

1.  - Open the ISOBUS-TC application.
2. Tap "Fields".
 - ⇒ A list with already created fields appears. You can store various field data for each field. For example: Field name, area, field boundary, prescription map and obstacles. You can access this data when you work on the same field in the future.
3.  - Create a new field.

⇒ A form for entering the data appears.

4. On the topmost line, enter a field name.

5.  - Exit the screen.

⇒ You will be asked whether you want to save the changes.

6. Confirm.

⇒ A list of created fields appears. The new field appears at the bottom end. Each field is given a clear PFD number. The fields are sorted according to these numbers. The numbers can be seen in the field list above the respective field name. Moreover, you can see the number in the header when you open the field.

PFD numbers

Each PFD number is only given one single time. Even if you delete a field, its PFD will not be used again.

When processing the fields in TRACK-Leader, this number will also be assigned when saving the field data in the ngstore database and attached to the field name.

Example:

Work performed on field PFD1 will be saved in TRACK-Leader under "ISOBUS-TC--1".

Work performed on field PFD50 will be saved in TRACK-Leader under "ISOBUS-TC--50".

Activating and deactivating fields

Procedure

You can activate a field as follows:

✓ In the "Virtual ECU" application, you have activated the virtual ECU for the implement to be used or you have connected an ISOBUS ECU.

✓ Operating mode of ISOBUS-TC: Standard

1.  - Open the ISOBUS-TC application.

2. Tap "Fields".

⇒ A list with already created fields appears.

3. Tap the entry with the field to be processed.

4.  - Activate the field.


5.  - Open the TRACK-Leader application.

6. Start a new navigation.

- ⇒ The display loads all of the data from the storage: Field boundaries, guidance lines, tracks.
- ⇒ In doing so, the display also takes account of which ECU was used to process the field. Therefore, if you work on the field two consecutive times with the field sprayer, the tracks for the field sprayer will be loaded the second time. However, if you work on the field with a fertilizer spreader, the tracks for the fertilizer spreader will be loaded.

7. Depending on which machine you are working with, you can create or select a suitable guidance line set in TRACK-Leader. More information on guidance line sets can be found in the instructions for TRACK-Leader.


If you want to rework the field, you must go to the "Storage" menu in TRACK-Leader and delete the tracks

there with .

Procedure

To finish the work:

- ✓ The navigation screen is called up in TRACK-Leader.
- ✓ You have worked the field in TRACK-Leader. On the screen, you can see the field with field boundary, guidance lines and other field data.

1.  - Terminate the navigation in TRACK-Leader.

2.  - Open the ISOBUS-TC application.

3. Tap "Fields".

4. Tap the entry with the field that was just processed.

5.  - Deactivate the field.

- ⇒ The field will be deactivated. In the process, it will also be saved with all of the current field data. With the next activation, the data will be automatically loaded again.

Importing field data (*.shp)

Procedure

NOTICE **Import of field boundaries**

Only one field boundary should always be imported for each field to ensure proper functioning of the display.

- If possible, always only import one field boundary for each field. Each field boundary may contain several restricted areas.
-

To import field data:

✓ The shp files are in WGS84 format.

1. Copy the field data to be imported to the **SHP** folder on the USB memory device.

2. Please insert the USB memory device.


3.  - Open the ISOBUS-TC application.

4. Tap "Fields".

5. If you have not created a field yet, create a field. [▶ 84]

6. Tap the field for which you want to load the shp data.

⇒ The field properties appear. You can see the previously entered data and several function icons on the side.

7.  - Open the import view.

8. Tap "Data type".


⇒ A list with possible data types appears.

9. Select the type of field data that you want to load.

10. Tap "File selection".

11. Select the file.

⇒ A preview of the imported data appears.

12.  - Exit the screen.

⇒ The message "Do you want to import the selected file?" appears.

13. "Yes" - to confirm.

14. Repeat the import procedure for additional field data.

⇒ The preview of the imported data will be supplemented each time.

⇒ All of the desired field data will be loaded.

If you now activate the field, you can start a new navigation with the loaded field data.

Exporting field data

Procedure

To export field data:

1. Please insert the USB memory device.



2. - Open the ISOBUS-TC application.

3. Tap “Fields”.

⇒ A list with already created fields appears.

4. Tap the field for which you want to export data.

⇒ The field properties appear. You can see the previously entered data and several function icons on the side.



5. - Open the field view.



6. - Open the list with all field data.



7. - Export the field data.

⇒ The field data is exported as shape files to the folder “SHP” on the USB memory device.

Data on the memory device

During work with TRACK-Leader, two types of data are produced:

- Tracks - Everything that is marked in green on the screen. This data describes one single work process.
 - The tracks are automatically saved in TRACK-Leader as soon as the field is deactivated in ISOBUS-TC.
 - You are in the “ngstore” folder on the USB memory device.
 - They could be imported for evaluation with TRACK-Guide Desktop.
 - Each field is given the name **ISOBUS-TC--PFD**. Whereby PFD stands for the PFD number of the field in ISOBUS-TC. For example: ISOBUS-TC--2
- Changing of fixed field data: Field boundaries, guidance lines, obstacles. This data is not only important for one work process, it can also be used in the future.
 - This data is saved as shp files in the “SHP” folder.

Transferring field data to a different display

Procedure

To transfer all field data to a different display:

- ✓ Operating mode of ISOBUS-TC: Standard
- 1. Display 1: Export all field data to a USB memory device. [▶ 88]
- 2. Display 2: Create the field profiles once again. [▶ 84]
- 3. Display 2: Import all field boundaries, guidance lines etc. from a USB memory device. [▶ 86]

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FILE-Server application

- ▶ Overview [▶ 91]
- ▶ Copying files [▶ 91]

Overview

The FILE-Server application is used to define a save location on the display. This save location can be used by all ISOBUS implements which do not have their own USB interface. This enables the updating of certain ISOBUS ECUs, and also the possibility of saving, for example protocols or error messages.

A "Fileserver" folder is created for this purpose on the hard disk of the display. All ISOBUS implements can access this folder, and write or read data there.

The folder has a maximum disk space of 5 MB.

Copying files

Procedure

✓ If you want to copy files to the display, these must be on your USB memory device, in the **"Fileserver"** folder.


✓ The "FILE-Server" plug-in is activated.

1.  - Open the FILE-Server application.

⇒ The application start screen appears.

2. Tap "Storage".

3.  - Copy files from the USB memory device onto the display (Import).

4.  - Copy files from the SD card in the display to the USB memory device (Export).

⇒ One of the following messages appears: "Start import?" or "Start export?".

5. To confirm, tap "Yes".

⇒ The data will be copied.

⇒ Here is an overview of the folders on the USB memory device: Folders on the USB memory device

[▶ 27]

⇒ A report appears.

6. To confirm, tap "OK".

⇒ You have successfully imported or exported the data.

Technical specifications

- ▶ [Technical specifications of the display \[▶ 93\]](#)
- ▶ [Pin-out diagrams \[▶ 94\]](#)

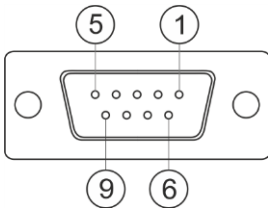
Technical specifications of the display

Operating voltage	10 V – 32 V
Current consumption (operation)	0.5 A (typical) - 4 A
Power input	Typical: 6 W
	Maximum: 40 W
Ambient temperature	-20 °C - +60 °C (-4°C - +140°F)
Storage temperature	-30 °C - +80 °C (-22°C - +158°F)
Dimensions (W x H x D)	243 mm x 186 mm x 69 mm (9.57 in x 7.32 in x 2.72 in)
Weight	1.1 kg (2.2 lbs)
Ingress protection code	IP6K4 according to ISO 20653:2013
EMC	ISO 14982
ESD protection	ISO 10605:2001 Level IV
Environmental testing	Vibration: ISO 15003 Level 1 with Level 2 temperature overlap in accordance with ISO 15003 Shock: 100 shocks per axis and direction with 15g and 11ms in accordance with IEC 60068-2-27
Processor	i.MX 515 600 MHz
Coprocessor	STM32F205
Storage	256 MB mDDR
Boot USB	128 MB SCL-NAND-Flash
Operating system	WinCE 6.0
Display	8" SVGA TFT
Housing	PC-ABS
Inputs / outputs	1 x USB

1 x 9-pin Sub-D socket (CAN and power supply)
 1 x 9-pin Sub-D connector
 1 x 9-pin Sub-D connector (CAN & signals)
 1 x 5-pin M12A socket (Camera)
 1 x 4-pin M12D socket (Ethernet)

Pin-out diagrams

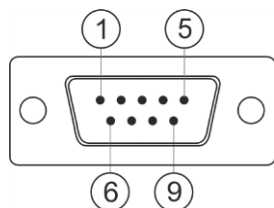
Port A (CAN bus)



9-pin Sub-D socket

Pin	Signal name	Function
1	CAN_L	CAN_L out
6	-Vin	Supply ground
2	CAN_L	CAN_L in
7	CAN_H	CAN_H in
3	CAN_GND	CAN ground, internally connected to the ground
8	CAN_EN_out	Switched input voltage, ≤ 250 mA
4	CAN_H	CAN_H out
9	+Vin	Supply
5	Ignition	Ignition signal
Electromagnetic shielding	Electromagnetic shielding	ESD/EMV shielding

Port B



9-pin Sub-D connector

Port B is a 9-pin Sub-D connector.

The connector can be used for the following purposes depending on its assignment:

Purpose	Pins used
As second CAN interface	7, 9
As second serial interface	2, 3, 4, 5
As signal input for two digital and one analog signal.	1, 5, 6, 8

Pin	Signal name
1	Wheel sensor ¹
6	PTO ²
2	/RxD2
7	CAN2_H
3	/TxD2
8	Work position sensor ³
4	Voltage supply for GPS receiver Switched input voltage, ≤ 250 mA
9	CAN2_L
5	GND
Electromagnetic shielding	ESD/EMV shielding

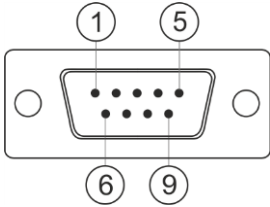
Legend:

¹) Digital input as per: ISO 11786:1995 chapter 5.2

²) Digital input as per: ISO 11786:1995 chapter 5.3

³) Analog input as per: ISO 11786:1995 chapter 5.5

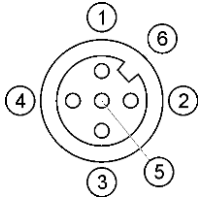
Port C



9-pin Sub-D connector

Pin	Signal name	Function
	1 (DCD1)	Switched input voltage, ≤ max. 250 mA total (Pin 1 + Pin 4)
6	DSR	DSR
	2 /RxD	/RxD
7	RTS	RTS
	3 /TxD	/TxD
8	CTS	CTS
	4 (DTR)	Switched input voltage, ≤ max. 250 mA total (Pin 1 + Pin 4)
9	(RI)	5 V ≤ 250 mA
	5 GND	Signal ground
Electromagnetic shielding	Electromagnetic shielding	ESD/EMV shielding

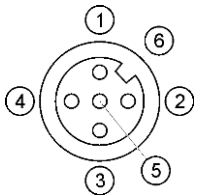
CAM port



M12 socket: Camera

Pin	Signal name	Function
1	Power	Voltage supply, max. 250 mA total
2	Power GND	Supply ground
3	FBAS2	Camera
4	FBAS	Camera
5	Signal GND	Signal ground
6	Electromagnetic shielding	ESD/EMV shielding

ETH (Ethernet) port



M12 socket: Ethernet

Pin	Signal name	Function
1	TD+	white-orange
2	RD+	white-green
3	TD-	orange
4	RD-	green
5	Pin not present	Pin not present
Electromagnetic shielding	Electromagnetic shielding	ESD/EMV shielding

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Troubleshooting

- ▶ General [▶ 99]
- ▶ GPS [▶ 99]
- ▶ Tractor-ECU [▶ 100]
- ▶ Virtual ECU [▶ 101]

General

Error message text	Possible cause	Possible error correction
Some files could not be deleted.	The files that should be deleted are currently being used.	
Object pool error		Delete the object pool and restart the display. [▶ 56]
ECU: Offline - The connection has been broken.	The connections between the display and ECU have been broken.	Check the connection.

Table 1: General

GPS

Error message text	Possible cause	Possible error correction
GPS receiver reset failed.	The wrong driver was selected.	Select the correct driver. [▶ 31]
	The external lightbar is activated.	Deactivate the external lightbar and connect the GPS receiver directly to the display. [▶ 30]
The GPS receiver is not enabled for E-Dif.	There is no E-Dif activation on the GPS receiver.	Please contact technical support.
GPS receiver has been removed.	The connection between the display and GPS receiver has been broken.	Check the connection. [▶ 30]
GPS receiver not initialized.	The GPS receiver has been configured for TRACK-Leader AUTO.	Reset the baud rate for the GPS receiver. [▶ 42]
	The display does not recognise the configuration of the GPS receiver.	Reset the GPS receiver to its factory settings. [▶ 32]
Timeout.	The wrong driver was selected.	Select the correct driver. [▶ 31]
	The external lightbar is	Deactivate the external lightbar

Error message text	Possible cause	Possible error correction
	activated.	and connect the GPS receiver directly to the display. [▶ 30]
SIM card is not unlocked.	The PIN request for the SIM card is activated.	Deactivate the PIN request for the SIM card.
Invalid entry.	Unauthorised special characters were used in the entry.	Correct the entry.
The connected receiver could not be recognized.	The wrong driver was selected.	Select the correct driver. [▶ 31]
	An unknown GPS receiver has been connected.	Use the default GPS driver. [▶ 31]
The modem is not answering.	The connection between the GPS receiver and GSM modem has been broken.	Check the connection.
	The modem is not ready for communication yet.	Please wait for a moment. Restart the system.
The driver cannot read.	The external lightbar is activated.	Deactivate the external lightbar and connect the GPS receiver directly to the display. [▶ 30]
The driver cannot write.		

Table 2: GPS

Tractor-ECU

Error message text	Possible cause	Possible error correction
A vehicle must be activated!	There is currently no activated vehicle.	Activate a vehicle. [▶ 59]
Active tractor geometry may be incomplete. Check settings.		Check the tractor geometry. [▶ 66]

Table 3: Tractor-ECU

Virtual ECU

Error message text	Possible cause	Possible error correction
Caution! The geometry settings for the machine have been reset.	The geometry of the virtual ECU is faulty.	Check the geometry of the virtual ECU. [▶ 76]
The connection to the external controller has been interrupted.	The connection between the display and the external on-board integrated display/controller has been broken.	Check the connection.
Error! There is no active machine.	There is currently no activated machine.	Activate a machine. [▶ 73]
This profile name already exists! Abort entry?	The identical profile name has already been used.	Enter a different profile name. [▶ 74]
Working width or sections have not been entered or are invalid. Abort entry?	The entries for the working width and sections are incomplete.	Check the settings for the working width and the sections. [▶ 76]

Table 4: Virtual ECU

