

Installation and operating instructions

Weather Station



Version: V9.20200120



3030247102-02-EN

Read and follow these instructions. Keep these instructions in a safe place for later reference. Please note that there might be a more recent version of these instructions on the homepage.

Company details

Document

Installation and operating instructions
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1 For your safety

1.1 Basic safety instructions



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

- Before installation, switch off the engine and the tractor's ignition.
- Do not drop the components on the floor because they can be damaged.
- The product does not include any user serviceable parts. Do not open the casing.
- Never clean the product with a high-pressure cleaner, as this will damage it.

1.2 Intended use

The product is intended to accurately display weather data on an ISOBUS terminal.

The product is only intended for use in the agricultural sector. The manufacturer shall not be held responsible for any other use of the system.

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

The operating instructions form part of the product. The product may only be used in accordance with these operating instructions.

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.

1.3 Layout and meaning of warnings

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

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

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

NOTICE
<p>This signal word identifies hazards that could potentially cause damage to property, if not avoided.</p>

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.

1.4**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.

2 Product description

The Weather Station is a sensor, which can determine different weather data, and display it on an ISOBUS terminal.

If a Weather Station is connected to a terminal, the ISOBUS-TC application will save the determined weather data.

The Weather Station can determine the following values. All values can be displayed using the metric, American or imperial systems:

- Speed and direction of true wind
 - Actual wind speed and direction relative to North.
- Speed and direction of apparent wind
 - True wind together with airstream. The latter is the wind felt by the machine user.
Example: When driving at speed of 20 km/h in an eastward direction, with a wind of 10 km/h from the west, apparent wind is 10 km/h from the East.
- Gust speed
 - A gust speed will be displayed if there is a brief increase in wind speed of more than 5 km/h above the average wind speed for the last 10 minutes.
- Temperature
- Relative air humidity
- Air pressure
 - With GPS reception: Air pressure is set to sea level.
 - Without GPS reception: Air pressure is set to the current position of the vehicle, i.e. the height of the terrain.
- Roll
 - Slope of the vehicle along its longitudinal axis
- Pitch
 - Slope of the vehicle along its transverse axis
- Driving speed
- Delta T
 - Indicator for suitability of weather for spray agent application. The value provides a recommended droplet size when working with field sprayers.
- Dew-point
 - Temperature at which air humidity condenses and becomes dew.
- Drift
 - Droplet deviation in a specific direction depending on driving speed and true wind.
- Grassland fire danger index
 - Fire risk for different plants.

Scope of delivery

The following items are included in the delivery as standard:

- Weather Station with connection cable
- Magnetic base and adhesive band for magnetic fixture of the Weather Station [→ 9]
- Base for screwing on the Weather Station [→ 11]
- Communication module with connection cable
- Installation and Operating Instructions


You can also order the Weather Station without a communication module.

3 Mounting and installation

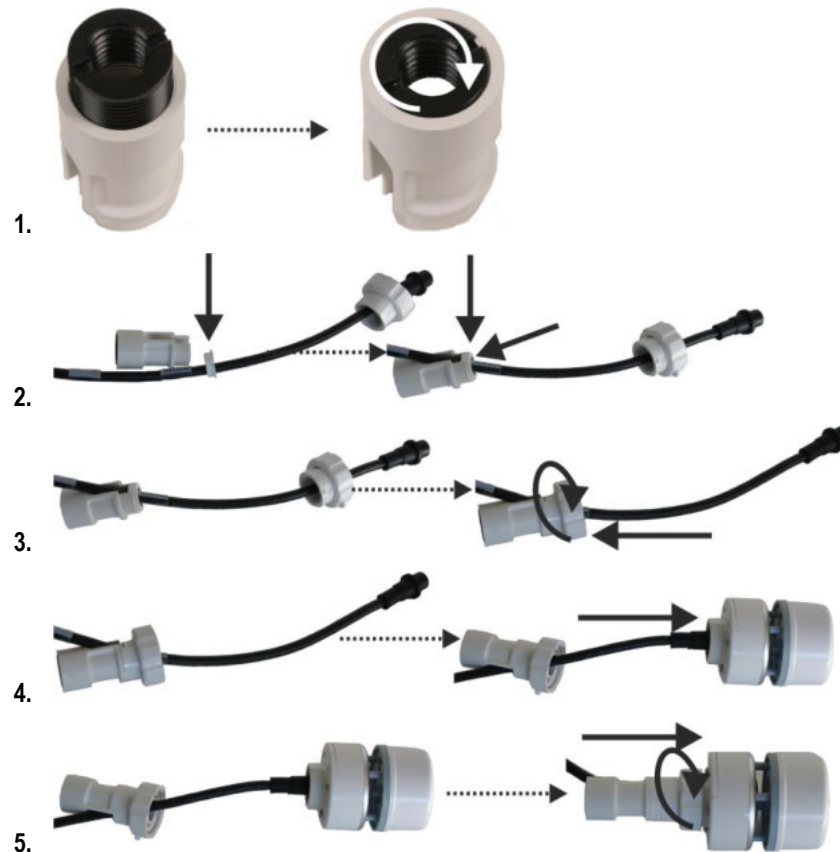
3.1 Installing the Weather Station

You can either install the Weather Station using its magnetic base, or screw it to the roof of your vehicle.

3.1.1 Installation with magnetic base

	<p>⚠ CAUTION</p>
	<p>Crushing hazard due to very powerful magnet The Weather Station has a very powerful magnetic base.</p> <ul style="list-style-type: none"> ◦ Never place your fingers between the Weather Station's magnetic base and a metal surface. ◦ Hold the Weather Station in your hands firmly, but do not place your fingers beneath the magnetic base.

Procedure





6.

7. Identify an appropriate position on the roof of the vehicle. This position must not be in the slipstream.
8. Use alcohol to clean the position on which you want to mount the Weather Station.
9. Stick the provided 3M double-sided adhesive tape onto the clean surface.
10. Clean the provided metal plate.
11. Remove the protective paper from the 3M adhesive plate and bond the metal plate onto this.



12.

Place the magnetic base and Weather Station onto the metal plate. Ensure that the Weather Station is firmly secured. The recess **must** face the direction of travel.

⇒ You can now connect the Weather Station to a terminal.

3.1.2 Installation with screws

Procedure



1.



2.



3.

4. Identify an appropriate position on the roof of the vehicle. This position must not be in the slipstream.
5. Use alcohol to clean the position on which you want to mount the Weather Station.



6.

Screw the Weather Station firmly onto the roof of the vehicle. Ensure that the Weather Station is firmly secured. The recess **must** face the direction of travel.

⇒ You can now connect the Weather Station to a terminal.

3.2

Connecting the Weather Station

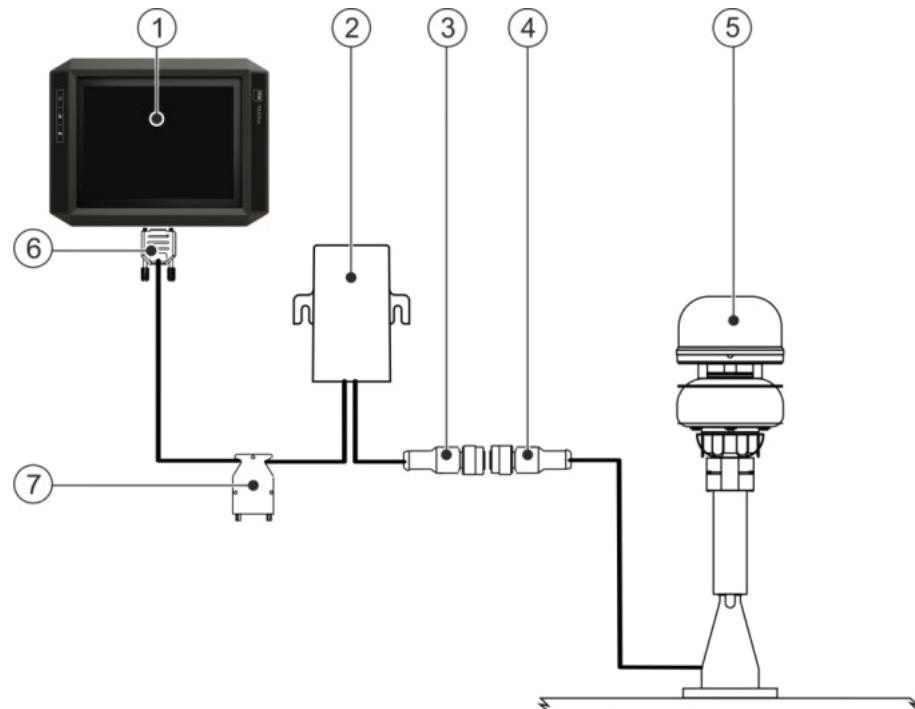
The Weather Station can be connected in the following ways:

- To a terminal. [→ 12]
- To an ISOBUS in-cab-connector. [→ 13]
- With a Deutsch plug to the vehicle's ISOBUS. [→ 14]

You need different connection cables for each variation.

3.2.1

Connecting the Weather Station to a terminal



①	Terminal	⑤	Weather Station
②	Communication module	⑥	CAN connection for the terminal
③	Connector for communication module	⑦	Connection for the ISOBUS basic vehicle harness
④	Weather Station connection		

NOTICE


Terminal connector supplying power

Potential damage to the terminal from a short-circuit.

- Switch the terminal off before plugging in or removing the connector.

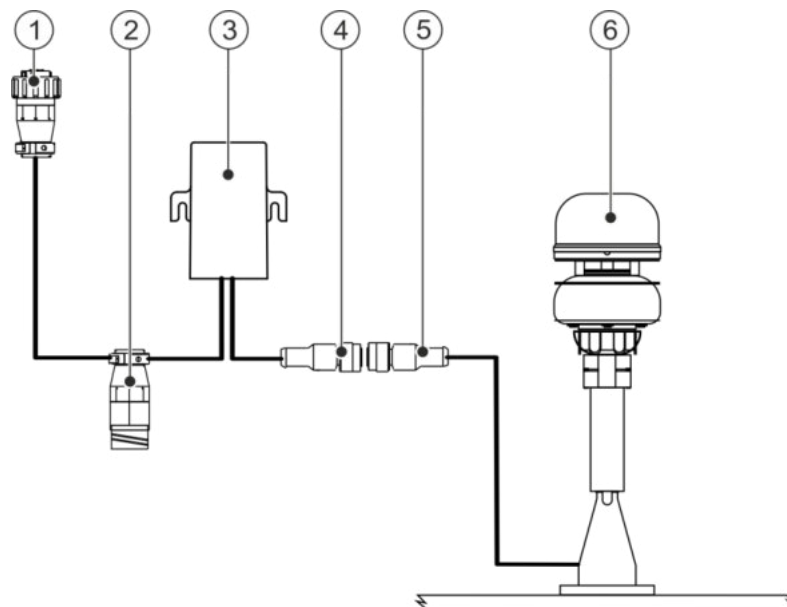
Procedure

You have now installed the Weather Station.

1. Switch off the terminal.
2. Route the cable of the Weather Station into the vehicle cab.
3. Connect the connector from the Weather Station to the connector of the communication module.
4. Connect connector A of the communication module to the CAN bus socket of the terminal. For the majority of terminals from Müller-Elektronik this is going to be the A socket.
5. Connect the connector for the ISOBUS basic vehicle harness to the ISOBUS basic vehicle harness.
 - ⇒ The Weather Station is now connected between the basic vehicle harness and the terminal.
 - ⇒  - You can now launch the Weather Station application.

3.2.2

Connecting the Weather Station directly to the ISOBUS in-cab-connector




①	CPC connector for connecting to the ISOBUS in-cab-connector	④	Connector for communication module
②	Connector for a further ISOBUS device	⑤	Weather Station connection
③	Communication module	⑥	Weather Station

Procedure

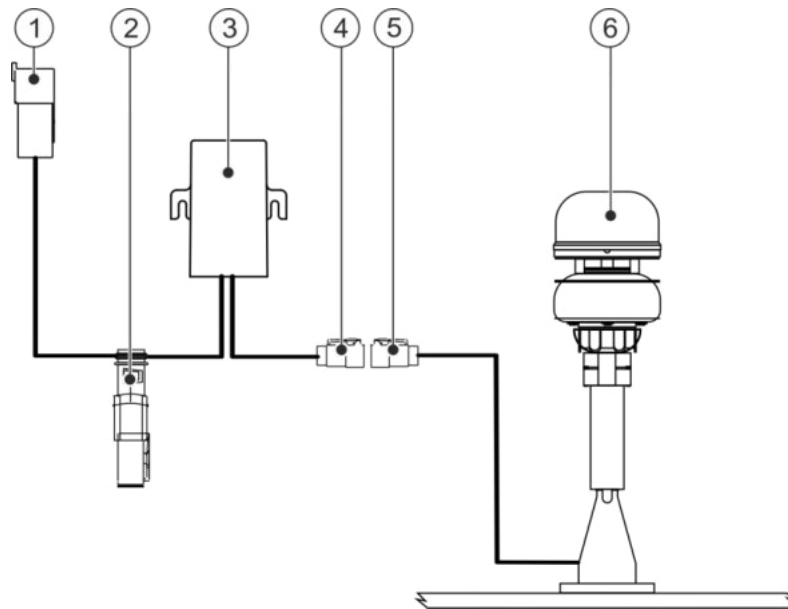
You have now installed the Weather Station.

1. Route the cable of the Weather Station into the vehicle cab.
2. Connect the connector from the Weather Station to the connector of the communication module.
3. Connect the CPC connector of the communication module to the ISOBUS in-cab-connector of your vehicle.
4. Optionally, you can also connect a further ISOBUS device using the free connector. Otherwise, use the supplied termination plug.

⇒  - You can now launch the Weather Station application.

3.2.3


Connecting the Weather Station with a Deutsch connector and a Deutsch socket to the vehicle's ISOBUS



①	Deutsch socket for connection to the Deutsch plug of the vehicle's ISOBUS	④	Connection of the communication module
②	Deutsch plug for connection to the Deutsch socket of the vehicle's ISOBUS	⑤	Connection of the Weather Station
③	Communication module	⑥	Weather Station

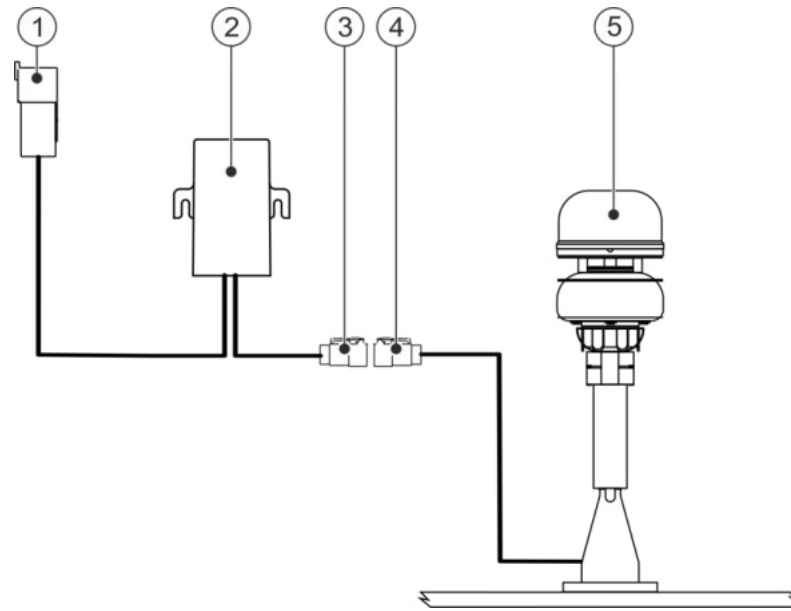
You have now installed the Weather Station.

1. Route the cable of the Weather Station into the vehicle cab.
2. Connect the Weather Station to the communication module.
3. Connect the Deutsch plug of the communication module to the Deutsch socket of the vehicle's ISOBUS.
4. Connect the Deutsch socket of the communication module to the Deutsch plug of the vehicle's ISOBUS.

⇒  - You can now launch of the Weather Station application.

3.2.4


Connecting the Weather Station with a Deutsch connector to the vehicle's ISOBUS



①	Deutsch socket for connection to the Deutsch connector of the vehicle's ISOBUS	④	Connection of the Weather Station
②	Communication module	⑤	Weather Station
③	Connection of the communication module		

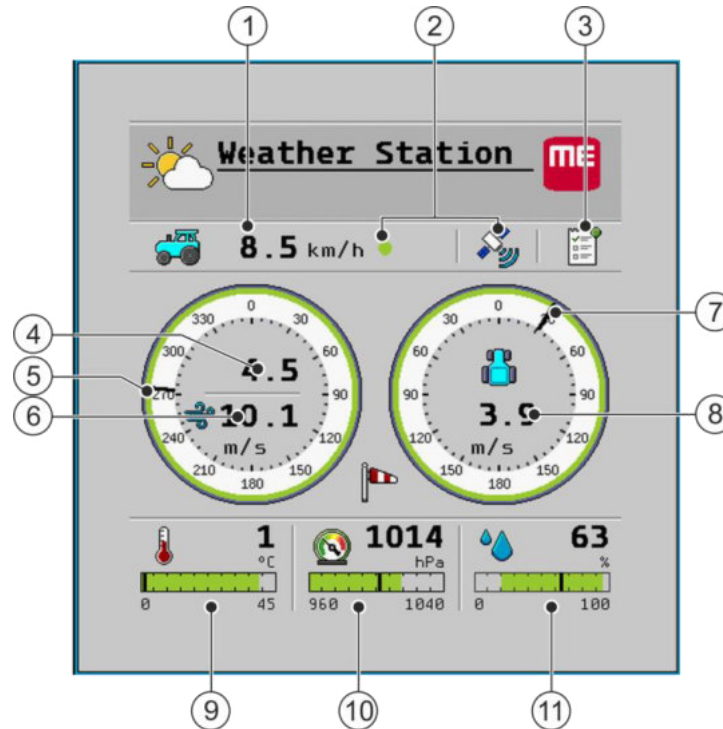
You have now installed the weather station.

1. Route the cable of the weather station into the vehicle cab.
2. Connect the Weather Station to the communication module.
3. Connect the Deutsch socket of the communication module to the Deutsch connector of the vehicle's ISOBUS.

⇒  - You can now launch of the Weather Station application.

4 Layout of work screen

You can view directly all of the data determined by the Weather Station on the work screen:



①	Driving speed	⑦	Direction of apparent wind
②	GPS status	⑧	Speed of apparent wind
③	ISOBUS TC status	⑨	Temperature with permissible range
④	Speed of true wind	⑩	Air pressure with permissible range
⑤	Direction of true wind	⑪	Air humidity with permissible range
⑥	Gust speed (appears 10 minutes after switching on)		

For a number of values, you can see whether the weather data is within a permissible range. You can see the permissible range from the colour of the bar graphs or of the borders of the wind display:

- Green: Value is within permissible range.
- Red: Value is not within permissible range.
- Grey: Value could not be found.

You can configure the permissible range. [→ 19]

5 Configuration

5.1 Calibrating the compass

After installation on any new vehicle, you must calibrate the Weather Station compass.

Procedure

1. On the work screen, press:



2. Select "Yes".



3. - Start the compass calibration.

4. Wait until the dot on the screen flashes yellow.

5. Drive circles as large as possible with the vehicle, until the dot on the screen flashes green.

When you want to stop the compass calibration, press:



⇒ The compass calibration was successful.

6. Repeat the process if the dot flashes red.

5.2 Configuring the screen layout

If you are using a Müller-Elektronik terminal, you can configure which weather data should be displayed in the header, in the additional window and in the main windows on the display screen.

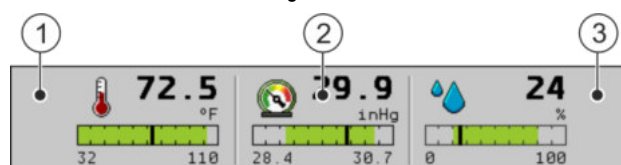
Procedure

1. On the work screen, press:

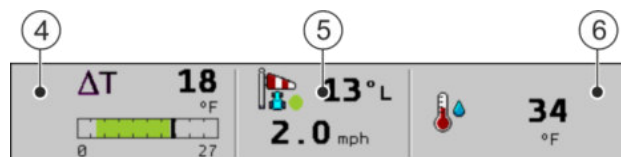


2. Select the window for which you want to configure the screen arrangement. You can choose from the main window, the compass rose in the main window as well as the header and the additional window.

3. Configure the screen layout. You can see which display corresponds to the different parts of the screen from the following illustrations.



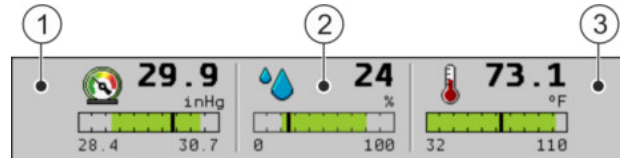
- Change the screens in the main window.



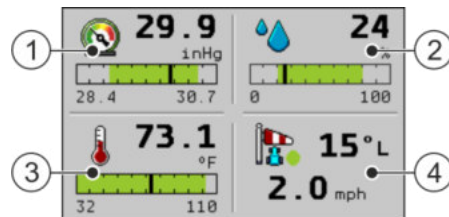
Layout in the main window



Layout of the compass rose in the main window






Layouts in the header



Layouts in the additional window

The following weather data may appear:

Value	Icon
True wind	
Apparent wind	
Temperature	
Air pressure	
Air humidity	
Roll/Pitch	
GPS position	
Driving speed	
Delta T	

Value	Icon
Dew-point	
Drift	
Grassland Fire Danger Index	

5.3 Configuring alarms

You can set measurement values for different weather data for which an alarm is triggered. See the screen to see which alarms you can set. You can also set a permissible range. You can see the permissible range in the green area on the bar graphs on the work screen. [→ 16]

Procedure

1. On the work screen, press:



2. Configure the alarms.

5.4 Configuring the ISOBUS-TC save interval

The time set indicates the number of seconds after which the ISOBUS-TC application should record the determined weather data.

Procedure

1. On the work screen, press:



2. Configure the parameter

5.5 Configuring the filter

You can configure a filter for true and apparent wind.

The average wind speed within the time set is always displayed on the work screen. The shorter the time, the more accurate the values. Shorter times also mean that values will often fluctuate.

Procedure

1. On the work screen, press:



2. Configure the "Filter True Wind" and "Filter Appar. Wind" parameters.

5.6 Configuring the unit of wind speed

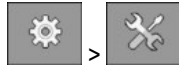
You can configure in which unit the speed of the true and the apparent wind should be displayed.

You can choose between:

- m/s
- km/h

Procedure

1. On the work screen, press:



2. Configure the "Unit Wind Speed" parameter.

5.7

Restoring factory settings

You can restore the factory settings at any time. In this case for example, the factory default values are displayed again on the work screen.

Procedure

1. On the work screen, press:



2. Select "Yes".

⇒ The Weather Station application will shut down.



3. - You can now launch of the Weather Station application with the factory settings.

5.8

Configuring the grassland fire danger index

The grassland fire danger index describes the fire risk for different plants. Depending on the appearance and colour of the plants, the fire danger is higher or lower.

The index is calculated based on a formula that takes account of the dryness of the plants, wind, temperature and humidity.

The following table shows how to recognise the respective dryness of the plants. The determined value must then be entered for the "Grass Curing" parameter.

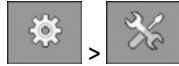
Cured	Colour	Physiological Change
0 %	Green	From the beginning of growth to commencement of seed head development.
10 %	Green	Seed heads formed and flowering
20 %	Yellowish-Green	Seeds heads maturing and seed dropping.
30 %	Yellowish-Green	Most seeds heads mature and seed dropping.
40 %	Yellow-Green	Most seeds heads mature and seed dropping.
50-60 %	Straw - odd patch of green and greenish-yellow	Up to 1/2 of all stems have dropped their seed, some paddocks will be fully cured, others may be green.
70-80 %	Straw - very little green showing anywhere	Most seeds heads have dropped their seed, lower third of stalk may be green.
90 %	Straw - odd green gully	Essentially all seed has dropped, odd individual stalk may be green.
100 %	Bleached	All stalks fully cured, seed heads and stalks break

Cured	Colour	Physiological Change
		easily.

Source: *National US Weather Service*

Procedure

1. On the work screen, press:



2. Configure the "**Grass Curing**" parameter.

6 Technical specifications

6.1 Retrieving sensor information

On the "Information" screen, you can retrieve various information on the Weather Station.

The following information is displayed:

Information	Meaning
Software version	Software version of the communication module
Sensor information	
Model ID	Model identification number for the Weather Station.
Software version	Software version of the Weather Station.
Model vers.	Model version of the Weather Station.
Serial no.	Weather Station serial number
Sensor self-test	Was the sensor's self-test successful?

Procedure

1. On the work screen, press:

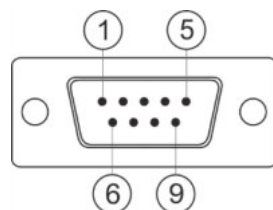


6.2 Technical data for Weather Station with communication module

Parameter	Value
Operating voltage	9-16 V
Temperature range	-20°C to +55°C
Power input	<2W
Protection class	IP X6

6.3 Connector pin assignment

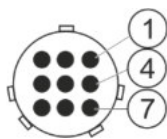
6.3.1 9-pin Sub-D connector



Pin no.	Signal	Pin no.	Signal
1	CAN_L	6	0VE
2	CAN_L IN	7	CAN_H IN
3	CAN_GND	8	CAN_EN OUT
4	CAN_H	9	+12VE
5	CAN_EN IN		

6.3.2

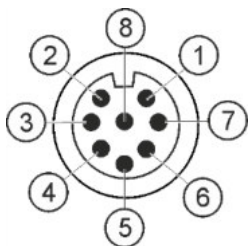
9-pin CPC connector



Pin no.	Signal	Pin no.	Signal
1	Relay	6	TBC PWR (CAN_EN_IN)
2	CAN_L_IN	7	+12 VE
3	CAN_L_OUT	8	CAN_0 V
4	CAN_H_IN	9	0 VE
5	CAN_H_OUT		

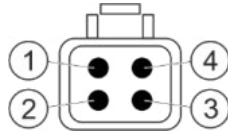
6.3.3

8-pin M12 plug



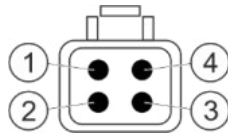
Pin no.	Signal	Pin no.	Signal
1	VDC	5	
2	0V	6	CAN_H
3		7	CAN_L
4		8	

6.3.4 4-pin Deutsch plug for connection to the Weather Station



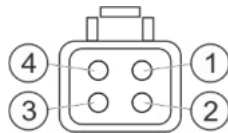
Pin no.	Signal	Pin no.	Signal
1	+12VE	3	CAN_H
2	0V	4	CAN_L

6.3.5 4-pin Deutsch plug for connection to the vehicle's ISOBUS



Pin no.	Signal	Pin no.	Signal
1	+12VE	3	0V
2	CAN_H_IN	4	CAN_L_IN

6.3.6 4-pin Deutsch socket for connection to the vehicle's ISOBUS



Pin no.	Signal	Pin no.	Signal
1	+12VE	3	0V
2	CAN_H_OUT	4	CAN_L_OUT

7 Article overview

Item number	Item name
3030247102	Weather Station with bracket but no communication module
3030247105	Weather Station with bracket and communication module with Sub-D connection cable for Sub-D connection to the terminal
3030247101	Communication module with Sub-D connection cable for Sub-D connection to the terminal
3030247103	Communication module with CPC connection cable for ISOBUS in-cab-connector
3030247104	Weather Station with bracket and communication module with CPC connection cable for ISOBUS in-cab-connector
3030247106	Communication module with Deutsch connection cable for Deutsch connector and Deutsch socket of the vehicle's ISOBUS
3030247110	Weather station with bracket and with communication module with Deutsch connection cable for Deutsch connector of the vehicle's ISOBUS
3030247109	Communication module with Deutsch connection cable for Deutsch connector of the vehicle's ISOBUS
31300582	Termination plug for the CPC connection cable