CONTROL BOX
5.7

OPERATING MANUAL

PLEASE READ CAREFULLY BEFORE COMMISSIONING!

Translation of the original operating manual

Version: 2.1 EN; item number: 00602-3-796

TABLE OF CONTENTS

1 IDENTIFICATION OF THE IMPLEMENT

The control box can be clearly identified based on the serial number. The serial number can be found on the rear side of the control box.

NOTE!
In cases of inquiries or warranty claims, please always tell us the serial number of your implement.

1.1 INTENDED USE

Control Box 5.7 may only be used to control Pneumatic Seeders (PS 120-1600 incl. Fertiliser Editions) or Multi-Metering Systems (MDC, MDG, MDP). Please also observe the operating manual for your Pneumatic Seeder / Multi-Metering System.

Do not use Control Box 5.7 to control other implements.

2 SERVICE

Please contact our service address in the following cases:

- If you still have questions regarding the handling of this implement despite the information provided in this operating manual
- For questions regarding spare parts
- To order maintenance and repair work

Service address:

APV Technische Produkte GmbH
Zentrale: Dallein 15
A-3753 Hötzelsdorf
AUSTRIA

Telephone: +43 2913 8001-5500
Fax: +43 2913 8002
Email: service@apv.at
Web: www.apv.at

3 WARRANTY

Please check the control box for any transport damage immediately upon receipt. Later claims regarding transport damage can no longer be considered.
We provide a **one-year factory warranty** starting on the date of delivery (your invoice or the delivery slip serve as a warranty certificate).
This warranty is applicable for cases of material or construction faults and does not include parts that are damaged by normal or excessive wear.

The warranty expires

- if damage is caused by external forces.
- if the control box is opened
- in cases of operating errors
- if the prescribed requirements are not met
- if the implement is modified, expanded or equipped with third-party spare parts without our permission.

3.1 WARRANTY ACTIVATION

To be able to offer the best possible service, warranty activation must be performed for your implement after acquisition.
To activate the warranty for your implement, simply scan the QR code with your smartphone – you will then be taken directly to the warranty activation page.

You can also call up the warranty activation page through our website www.apv.at in the Service area.

4 QUICK START

4.1 SCOPE OF DELIVERY AND ATTACHMENT

4.1.1 ACCESSORIES KIT A

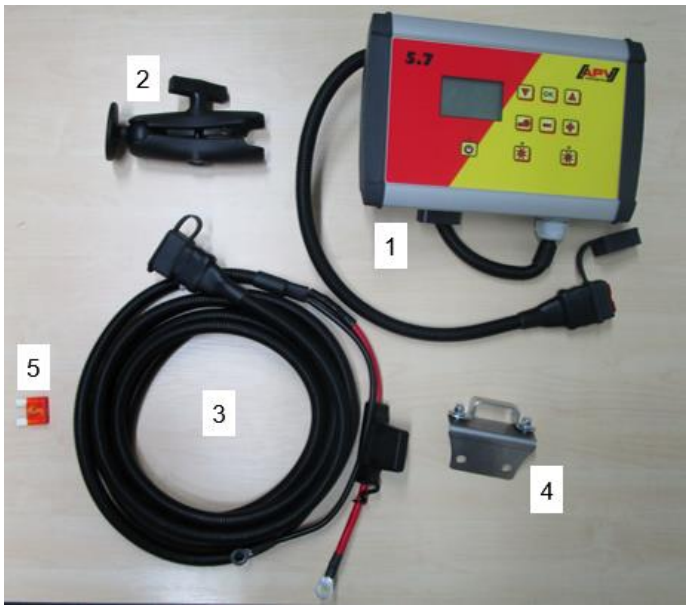
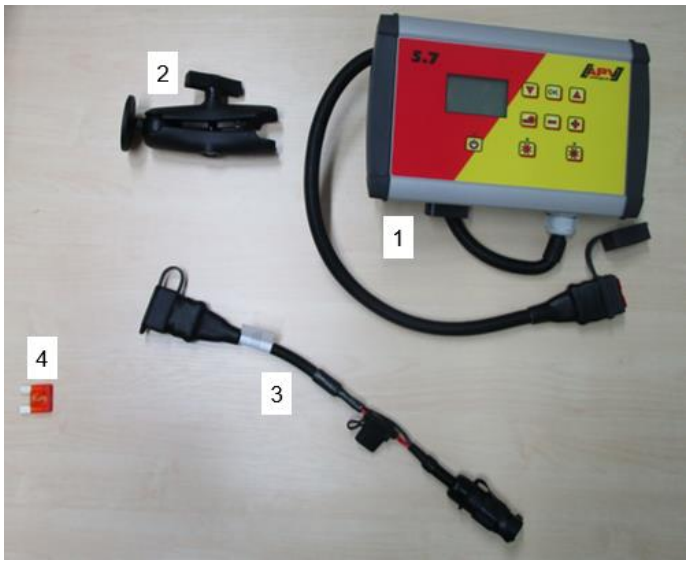


Figure 1

1	Control box
2	Control box bracket incl. RAM ball
3	Power cable
4	Power cable holding plate (optional)
5	Fuse

4.1.2 ACCESSORIES KIT B



1	Control box
2	Control box bracket incl. RAM ball
3	Power cable
4	Fuse

Figure 2

Pay attention to the angle at which you look at the control box to be able to read the display optimally.

CAUTION!
If possible, do not roll up the cable into a coil!

4.2 ELECTRICAL CONNECTION

Connect the standard supplied cable directly to the tractor battery. The other end is connected to the control box.

The fuse (40 A) can be found on the positive terminal of the power supply cable.

Make sure that the connection cable is correctly seated. Check the plug for damage.

Figure 3

CAUTION!
The 12 volt power supply must NOT be connected to the socket for the cigarette lighter and also not to the 3-pin power socket.

CAUTION!
After using the implement, the control box should be disconnected again (for various safety-related reasons).

CAUTION!
If these instructions are not observed, damage may be caused to the control box!

If you want to use the control box on a second tractor, you can order a second power supply cable.

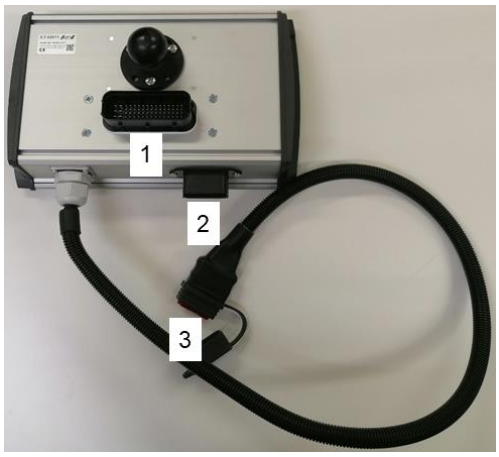


Figure 4

1	**62-pin plug** Connection to the seed drill (implement cable)
2	**12-pin plug** • 7-pin signal plug • Linkage sensor • Wheel sensor • Radar sensor • GPSa sensor
3	**2-pin plug** Connection to the battery (power supply)

NOTE!
The installation and connection may only be performed by trained specialist personnel and may never be performed alone!

4.3 CONTROL BOX USER INTERFACE

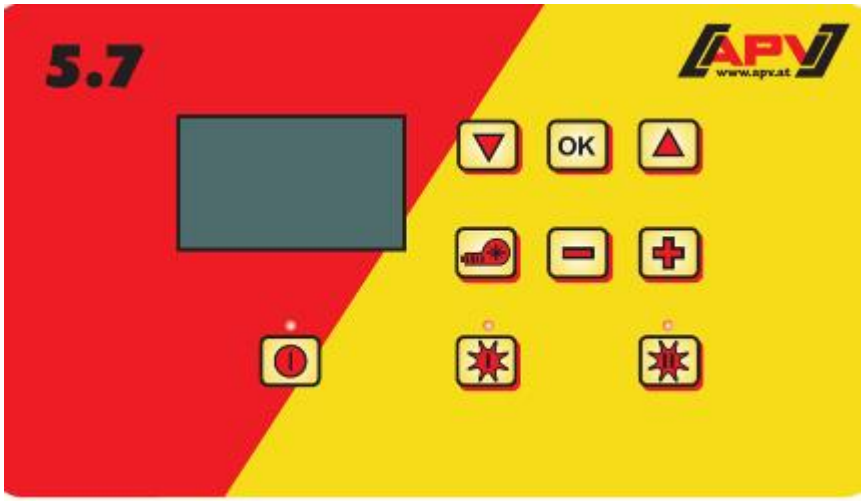


Figure 5: User interface

Button	Designation	Function
	On/Off button	Switches the implement on and off. The control lamp lights up when the implement is switched on.
	Plus/minus buttons	Changes the speed of the seeding shaft and the respective parameters in the menu points.
	Seeding shaft On/Off buttons	Switches the seeding shaft on/off. When button is pressed, the respective seeding shaft starts rotating and the control lamp lights up.

Button	Designation	Function
	Arrow buttons Up arrow button (▲) Down arrow button (▼)	Navigates through the menu points.
	OK button	Confirms the selection.
	Fan button	Switches the electric fan on and off.

4.4 INITIAL OPERATION

For the initial operation or when it was restored to the factory settings in the Programming menu, the following settings must be entered on your Control Box 5.7:

4.4.1 LANGUAGES

Select your desired menu language here:

Language Language **Langue Язык ?** **German**	Select the desired language with the plus/minus buttons and confirm with the OK button.

4.4.2 UNITS OF MEASURE

Select metric (m, ha, km/h, kg) or imperial (ft, ac, mph, lb) measuring units.

14. Units of measure:	Use the plus/minus buttons to select **metric (kg, ha, m)** or **imperial (lb, ft, ac)** and confirm with the OK button.

4.4.3 FAN

Here, you must select whether an electric or hydraulic fan is installed on your PS.

1. Fan motor:	**OFF:** no fan equipped **Hydraulic/external:** hydraulic (or external) fan equipped **Electric:** electric fan equipped **Electric PLUS:** electric fan PLUS equipped

Select with the plus/minus buttons and confirm with the OK button.

4.4.4 FAN MONITORING

If you selected OFF or Hydraulic/external in the previous menu point, the monitoring options appear here.

12. Fan monitoring equipped?	Using the plus/minus buttons, select **NO, PRESSURE** or **SPEED** and confirm with the OK button.

4.4.5 CALIBRATION BUTTON EQUIPPED

Here, you can set whether a calibration button is installed on your PS (available as an accessory).

13. Calibration button equipped:	Use the plus/minus buttons to select **YES** or **NO** and confirm with the OK button.

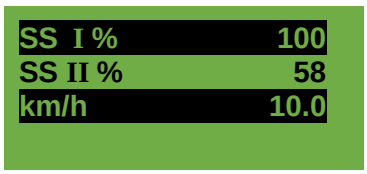
ⓘ **The implement is being switched off!**	After successfully entering this data, the control box switches itself off automatically so that the entries are saved.

Depending on the selected settings, all of the points might not be requested. However, you can also change the points as described under chapter 7 Programming 5.7 (customer service).

If you are not using a TWIN-PS, you must enter the settings as described under chapter 7 Programming 5.7 (customer service).

4.5 MAIN DISPLAY

Switch-on message: Is shown during the switch-on procedure and shows the type and device version.
This information is very helpful in the case of service and is even essential for malfunctions to be able to perform diagnosis!



SS I %: set speed for seeding shaft **I** (in %)
SS II %: set speed for seeding shaft **II** (in %)
Must be set using the plus/minus buttons on the control box or automatically when performing the calibration test.
km/h: forward speed [km/h] defined in menu item "Calibration test".

There are two main displays, between which you can switch with the arrow buttons.
Depending on which display you are on, pressing the plug/minus buttons changes the seeding shaft % or the spread rate.

4.6 SELECTION MENU

After switching on the device, you can use the arrow buttons and the "OK" button to move through the menu. Each time the arrow buttons are pressed in the menu, you move one menu item up or down.

The following menu points are available:

- Main display (seeding shaft I/II)
- Calibration test
- Emptying
- Hour overview
- Area overview
- Operating voltage
- Calibrating the speed
- Blower fan settings
- Languages

With the OK button, you go to the respective menu points. Here, you can change the value using the plus/minus buttons.

5 FUNCTION DESCRIPTIONS

5.1 CALIBRATION TEST (GENERAL INFORMATION)

NOTE!
In addition to performing a calibration test (setting of the seeding shaft speed), this menu point is also used to set the working width and the forward speed. The entered values are also used to calculate the area (seeded area).

Procedure:

calibration test

1. Go to the Calibration test menu point and press the OK button.

Settings

2. In the "Settings" menu point, you can select whether you want to perform the calibration in kg/ha, grains/m² (with thousand grain weight and germination capacity) or g/m². This can be set separately both for motor I and for motor II.

Calibrate in

The settings can be changed using the plus/minus buttons. By pressing the OK button, you go back to the Calibration test menu.
Here, you must select one of the three variations (see chapter 5.1.1 Calibrating in kg/ha, 5.1.2 Calibrating in grains/m², 5.1.3 Calibrating in grams/m²).

3. Select the **seeding shaft speed (%)**.
4. Select the **working width**.
5. Select the **forward speed**.
6. Select the **spread rate**.
7. Select the **calibration time** (0.5 minutes, 1 minute or 2 minutes). If you scroll further with the plus button here, you go to the selection "Calibration by area and time" (see chapter 5.1.4 Calibrating according to the area and time).

5.1.1 CALIBRATING IN KG/HA

If you selected "Calibrating in kg/ha" in the Settings menu, the following points appear in the Calibration menu:

Working width? Enter the working width here. Take note of the working width overlap.

Forward speed? Enter the forward speed here.

kg/ha I ? Enter the desired spread rate for motor I or motor II (e.g. 20 kg/ha).

Calibration time? Set the duration or the area for the calibration test here.
If a calibration button is installed and YES was entered in the Programming menu for "Calibration button equipped?", this point does not appear.

TIP:
For small seed types, e.g. canola, phacelia, poppy etc., it is best to calibrate for 2 minutes.
A calibration time of 1 minute is standard.
For larger seed types, e.g. wheat, barley, peas etc., 0.5 minutes of calibration is most suitable.

NOTE!
Before you start the test, check whether you have removed the calibration cover and are using it or the calibration slide. Check whether the calibration bag or a collection bucket is place precisely under the outlet! The calibration test can be aborted at any time by pressing the seeding shaft button or the fan button on the control box.

Start test (Motor I) ?	Start test (Motor II) ?

When all of the values are correctly set, start the test for the respective motor with OK.

Test in progress!

Calibration test in progress: After starting, the seeding shaft begins rotating automatically without the fan motor. The seeding shaft stops automatically after the set time. If a calibration button is installed, the test is only stopped once it is pressed.

To really spread the desired spread rate, we recommend repeating the calibration test until the message "Test not precise! Repeat?“ no longer appears. If "Seeding shaft speed too high" appears on the display, the seeding shaft is not able to rotate fast enough. If "Seeding shaft speed too low" appears, the seeding shaft is not able to rotate slowly enough. To fix this error, you can replace the seeding shaft with a larger or smaller seeding shaft (see also chapter 6.1 Notes).
With the OK button, you can return to the previously displayed value. Only when the automatic readjustment of the seeding shaft is under 3 % (difference), the "checkmark symbol" and the spread quantity in kg/ha will appear on the main screen.

Entry of the Calibration test: ☑

The seeding shaft speed is now automatically correctly calculated. Then the display goes back to the Main menu.

SS % I	100
SS % II	58
km/h	10.0
kg/ha I	20.0

SS I %	61 /	50.3
SS II %	61 /	50.3
km/h	10.0 /	8.3
kg/ha I		13.2

SS % I	100
SS % II	58
km/h	10.0
kg/ha II	20.0

SS I %	61 /	50.3
SS II %	61 /	50.3
km/h	10.0 /	8.3
kg/ha II		13.2

Now the set kg/ha appears on the display.

The two-column display appears when working with a speed sensor.

If a fill level sensor is installed on your PS/MD, and the message "Hopper almost empty" appears on the display during the calibration test, the test will continue running. If there is not enough seed in the hopper, however, this can falsify the precision of the calibration test.

Seeding shaft - manual I
Seeding shaft - manual II

This menu point is used for rough presetting of the seeding shaft speed. The speed (%) of the seeding shaft does not need to be changed, because the settings are automatically adopted from the calibration test.

5.1.2 CALIBRATING IN GRAINS/M²

Calculation of the spread rate:

$$\textbf{Seeding rate (kg/ha)} = \frac{\text{Thousand grain weight TGW (g) x grains/m}^2 \text{ x } 100}{\text{Germination capacity (\%)}}$$

If you selected "Calibrating in grains/m²" in the Settings menu, the following points appear in the Calibration menu:

Working width?		Enter the working width here. Take note of the working width overlap.
Forward speed?		Enter the forward speed here.
Grains/m2 I	**Grains/m2 II**	Enter the desired grains/m² here.
Thousand grain weight I	**Thousand grain weight II**	Here, the respective thousand grain weight (TGW) must be entered.
Germination capacity I	**Germination capacity II**	Here, the germination capacity of the seed is set.
Calibration time?		Set the duration for the calibration test here. If a calibration button is installed and YES was entered in the Programming menu for "Calibration button equipped?", this point does not appear.

TIP:
For small seed types, e.g. canola, phacelia, poppy etc., it is best to calibrate for 2 minutes.
A calibration time of 1 minute is standard.
For larger seed types, e.g. wheat, barley, peas etc., 0.5 minutes of calibration is most suitable.

NOTE!
Before you start the test, check whether you have removed the calibration cover and are using it or the calibration slide. Check whether the calibration bag or a collection bucket is place precisely under the outlet! The calibration test can be aborted at any time by pressing the seeding shaft button or the fan button on the control box.

Start test (Motor I) ?	**Start test (Motor II) ?**	When all of the values are correctly set, start the test for the respective motor with OK.

Test in progress!	Calibration test in progress: After starting, the seeding shaft begins rotating automatically without the fan motor. The seeding shaft stops automatically after the set time. If a calibration button is installed, the test is only stopped once it is pressed.

To really spread the desired spread rate, we recommend repeating the calibration test until the message "Test not precise! Repeat?“ no longer appears. If "Seeding shaft speed too high" appears on the display, the seeding shaft is not able to rotate fast enough. If "Seeding shaft speed too low" appears, the seeding shaft is not able to rotate slowly enough. To fix this error, you can replace the seeding shaft with a larger or smaller seeding shaft (see also chapter 6.1 Notes5.1).
With the OK button, you can return to the previously displayed value. Only when the automatic readjustment of the seeding shaft is under 3 % (difference), the "checkmark symbol" and the spread quantity in kg/ha will appear on the main screen.

Entry of the Calibration test: ☑	The seeding shaft speed is now automatically correctly calculated. Then the display goes back to the Main menu.

SS I %	39.5
SS II %	39.5
km/h	8.3
Grains/m² I	21

SS I %	48 /	39.5
SS II %	48 /	39.5
km/h	10 /	8.3
Grains/m² I		21

SS I %	39.5
SS II %	39.5
km/h	8.3
Grains/m² II	21

SS I %	48 /	39.5
SS II %	48 /	39.5
km/h	10 /	8.3
Grains/m² II		21

Now the set kg/ha appears on the display.

The two-column display appears when working with a speed sensor.

If a fill level sensor is installed on your PS/MD, and the message "Hopper almost empty" appears on the display during the calibration test, the test will continue running. If there is not enough seed in the hopper, however, this can falsify the precision of the calibration test.

Seeding shaft - manual I	This menu point is used for rough presetting of the seeding shaft speed. The speed (%) of the seeding shaft does not need to be changed, because the settings are automatically adopted from the calibration test.
Seeding shaft - manual II	

5.1.3 CALIBRATING IN GRAMS/M²

If you selected "Calibrating in g/m²" in the Settings menu, the following points appear in the Calibration menu:

Working width?	Enter the working width here. Take note of the working width overlap.
Forward speed?	Enter the forward speed here.

g/m2 I	**g/m2 II**	Here, you must enter the desired spread rate for motor I or motor II (e.g. 20 g/m²).

Calibration time?	Set the duration for the calibration test here. If a calibration button is installed and YES was entered in the Programming menu for "Calibration button equipped?", this point does not appear.

TIP:
For small seed types, e.g. canola, phacelia, poppy etc., it is best to calibrate for 2 minutes.
A calibration time of 1 minute is standard.
For larger seed types, e.g. wheat, barley, peas etc., 0.5 minutes of calibration is most suitable.

NOTE!
Before you start the test, check whether you have removed the calibration cover and are using it or the calibration slide. Check whether the calibration bag or a collection bucket is place precisely under the outlet! The calibration test can be aborted at any time by pressing the seeding shaft button or the fan button on the control box.

Start test (Motor I) ?	**Start test (Motor II) ?**	When all of the values are correctly set, start the test for the respective motor with OK.

Test in progress!	Calibration test in progress: After starting, the seeding shaft begins rotating automatically without the fan motor. The seeding shaft stops automatically after the set time. If a calibration button is installed, the test is only stopped once it is pressed.
Entry of the calibration test:	Now weigh the calibrated seed quantity (deduct the weight of the collection bucket or the calibration bag) and enter the weight. Confirm with OK.

To really spread the desired spread rate, we recommend repeating the calibration test until the message "Test not precise! Repeat?“ no longer appears. If "Seeding shaft speed too high" appears on the display, the seeding shaft is not able to rotate fast enough. If "Seeding shaft speed too low" appears, the seeding shaft is not able to rotate slowly enough. To fix this error, you can replace the seeding shaft with a larger or smaller seeding shaft (see also chapter 6.1 Notes).
With the OK button, you can return to the previously displayed value. Only when the automatic readjustment of the seeding shaft is under 3 % (difference), the "checkmark symbol" and the spread quantity in kg/ha will appear on the main screen.

Entry of the Calibration test: ☑	The seeding shaft speed is now automatically correctly calculated. Then the display goes back to the Main menu.

SS I %	100
SS II %	58
km/h	10.0
g/m² I	20.0

SS I %	20 /	20.1
SS II %	20 /	20.1
km/h	10.0 /	10.1
g/m² I		20.0

SS I %	100
SS II %	58
km/h	10.0
g/m² II	20.0

SS I %	20 /	20.1
SS II %	20 /	20.1
km/h	10.0 /	10.1
g/m² II		20

Now the set kg/ha appears on the display.

The two-column display appears when working with a speed sensor.

If a fill level sensor is installed on your PS/MD, and the message "Hopper almost empty" appears on the display during the calibration test, the test will continue running. If there is not enough seed in the hopper, however, this can falsify the precision of the calibration test.

Seeding shaft - manual I

Seeding shaft - manual II

This menu point is used for rough presetting of the seeding shaft speed. The speed (%) of the seeding shaft does not need to be changed, because the settings are automatically adopted from the calibration test.

5.1.4 CALIBRATING ACCORDING TO THE AREA AND TIME

If you do not want to calibrate for a time, but rather for an area, you can now choose between 3 pre-set areas (1/10 ha, 1/20 ha and 1/40 ha). In addition to the area, the calibration time in seconds is also shown depending on the preset working width and forward speed.

Calibration time?
1/40 ha (30 s)

Calibration time?
1/20 ha (60 s)

Calibration time?
1/10 ha (120 s)

Now you can choose between the 3 pre-set areas for the calibration time. The rest of the procedure for the calibration test is the same as in chapters 5.1.1 – 5.1.3.

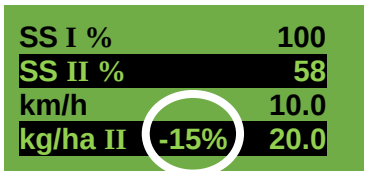
5.1.5 CALIBRATION BUTTON

If a calibration button is installed on your implement, and it is set to YES in the Programming menu (7.12), the "Calibration time" menu point is not shown. Enter the desired settings. Then press on "Start test". The following screen is then shown on the display and the system waits until the calibration button is pressed. The seeding shaft rotates until the calibration button is deactivated. The control box calculates the target rate based on the calibration time, and shows it on the display. Now weigh the calibrated quantity and enter it on the control box. If necessary, repeat the procedure to obtain more precise settings.

NOTE!
To achieve sufficient accuracy, the calibration button must be pressed and held for at least 20 seconds; otherwise, the notification message "Calibration time too short!" appears and the kg/ha, grains/m² or g/m² are not shown on the main display.

If the calibration button is activated, it can also be used to empty the hopper.

5.2 CHANGING THE SPREAD RATE DURING OPERATION

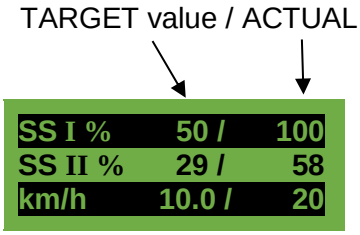


By pressing the plus/minus buttons – as soon as a successful calibration test was performed – the spread rate for the selected (highlighted in black on the display) seeding shaft is increased or reduced by 5%. Every time the plus button is pressed, the spread rate increases by 5% of the entered spread rate, and when the minus button is pressed, the spread rate is reduced in 5% increments. The spread rate can be increased or reduced by a maximum of 50%.
If there is no (successful) calibration test, the seeding shaft speed is increased or reduced in 1% increments by pressing the plus/minus button.

TIP!
If you also want to change the spread rate for the 2nd seeding shaft, you can switch to the other main display by pressing the arrow buttons and also change the rate there by pressing the plus/minus buttons.

5.3 OPERATION WITH A SPEED SENSOR

When working with a speed sensor, the display looks as follows:



	TARGET value	ACTUAL value
SS I % (seeding shaft)	Set speed of the seeding shaft I (in %). Setting using the plus/minus buttons in the Work I menu on the control box or by performing a calibration test.	Actual speed of seeding shaft I (in %). Is calculated and displayed by the control box depending on the forward speed.
SS II % (seeding shaft)	Set speed of the seeding shaft II (in %). Setting using the plus/minus buttons in the Work II menu on the control box or by performing a calibration test.	Actual speed of seeding shaft II (in %). Is calculated and displayed by the control box depending on the forward speed.
km/h (forward speed)	Is set in the "Calibration test" menu point.	Actual forward speed in km/h. Is measured by the sensor and shown on the control box.

5.3.1 PRE-METERING

When the OK button is pressed and held for 1 second, the seeding shaft starts rotating at the speed determined by the calibration test as long as the OK button remains pressed. This allows you to avoid gaps in the seeded area (at the beginning of the field or when standing still on the field). As soon as the button is released again, the control box works with the signals from the respective speed sensor again. When working with a linkage sensor, the soil tillage implement must be "in working position".

5.3.2 CALIBRATING THE FORWARD SPEED (TACHOMETER)

The calibration should be performed because the control box uses this value as a basis for all calculations (speed display, metering, area calculation).

There are 3 options for the calibration:

5.3.2.1 TEST DISTANCE 100 M

Calibrate the speed? > **OK** > **Test distance 100 m?** > **OK**

Drive 100 m => START? > **OK**

=> STOP Drive a distance of exactly 100 m. While driving, the control box counts the pulses for the travelled distance on the display.
Stop with the OK button after 100 m.

Speed has been calibrated! Appears when the calibration is finished.

TIP!
The maximum values for the wheel sensor are 1500 pulses per 100 m, all other sensors have 51200 pulses per 100 m.

5.3.2.2 MANUAL CALIBRATION

Manual? > **OK** > **Manual?** **13 km/h 125%** > **OK**

While driving, compare the speed on the display to the speed of the tractor tachometer. Use the plus/minus buttons to correct the value until they are equal.

TIP!
This calibration can be performed manually, without driving the 100 m test distance.

5.3.2.3 CALIBRATION VALUE

Calibration value? Here, the pulses/100 m can be set manually.

TIP!
If you have calibrated your implement before, take note of the value and set it here again if necessary.

5.3.2.4 CALIBRATION RESET

Calibration area calc.? Confirm with the OK button.
Resets the value back to the factory setting.

Calibration reset ☑	Appears after the calibration has been successfully reset.

5.4 OPERATION WITH LINKAGE SENSOR

With a linkage sensor, the seeding shaft of the PS can start and stop rotating automatically when lifting and lowering the implement. As a result, you don't need to switch the seeding shaft on/off manually at the headlands.

By pressing and holding the seeding shaft button for 2 seconds, the seeding shaft can be switched on regardless of the position of the linkage sensor. This only works when working without a speed sensor.

NOTE!
The warning tone that is emitted when switching the seeding shaft on/off can be deactivated as described in chapter 7.2.

5.5 EMPTYING

Emptying	This menu point is for practical emptying of the hopper (e.g. when finishing work, changing seeds, changing the seeding shaft).

Select the side of the hopper that you want to empty:

Motor I or **Motor II** > **OK**

Emptying in progress!	The motor is running at maximum speed (without fan).

Emptying can be stopped at any time by pressing the plus/minus, seeding shaft or fan buttons. Then the display goes back to the Main menu.

TIP!
Before you start emptying, check whether you have removed the calibration cover and are using it or the calibration slide. Check whether the calibration bag or a collection bucket is place precisely under the outlet.

5.5.1 EMPTYING USING THE CALIBRATION BUTTON

If you have a calibration button installed on your implement and it is set to YES in the Programming menu (7.12), it can then be used to empty the hopper. The seeding shaft rotates at maximum speed as long as the calibration button is pressed.

5.6 OPERATING HOURS COUNTER

Operating hours counter = running time of the seeding shaft.
Shows the total hours and the daily hours.
By pressing the OK button (press and hold for 5 seconds), the daily hours can be reset to zero. The total hours cannot be reset to zero.

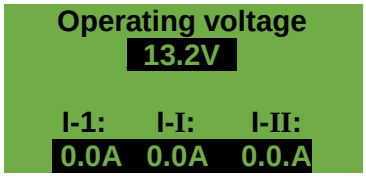
5.7 HECTARE COUNTER (SEEDED AREA)

Shows the total seeded area in hectares.

The values are automatically set when the calibration test is performed. The area that is seeded is only counted when the seeding shaft starts rotating.

By pressing the OK button (press and hold for 5 seconds), the area can be reset to zero. The total area cannot be reset to zero.

5.8 OPERATING VOLTAGE / CURRENT DISPLAY



Shows the current operating voltage.
If this value starts fluctuating strongly during operation, there are problems with your on-board electronics. This can lead to poor spreading results!

I-1: Shows the current consumption of the fan motor in amperes.
I-I: Shows the current consumption of the electric seeding shaft motor I in amperes.
I-II: Shows the current consumption of the electric seeding shaft motor II in amperes.

5.9 LANGUAGES

Select your desired menu language here:

Select the desired language with the plus/minus buttons and confirm with the OK button.
You can go back to the Main menu with the OK button.

NOTE!
If a hydraulic fan in installed on your PS and you want to change the language during initial operation, proceed as follows:

- **If the message "Motor not connected! (fan)" is shown on the display (always in German during initial operation), press the OK button. Then you have 15 seconds to adjust the language in the menu. Afterwards, you can make the desired settings in the Programming menu in your selected language.**

5.9.1 AVAILABLE LANGUAGES:

As of software version V1.28, the following languages are available for selection:

- German (Deutsch)
- English (English)
- French (Français)
- Dutch (Nederlands)
- Danish (Dansk)
- Polish (Polski)
- Italian (Italiano)
- Spanish (Español)
- Czech (Česky)
- Hungarian (Magyar)
- Finnish (Suomi)
- Portuguese (Português)
- Rumanian (Romana)
- Swedish (Svenska)
- Estonian (Eesti)
- Latvian (Latvijas)
- Lithuanian (Lietuvos)
- Norwegian (Norske)
- Slovenian (Slovenski)
- Russian (Русский)
- Serbian (Srpski)
- Turkish (Türkçe)
- Croatian (Hrvatski)
- Chinese (中文)
- Japanese (ニホンゴ)

5.10 BLOWER FAN SETTINGS

In this menu point, the rotational speed of the electric fan and therefore also the air output can be set. This can be helpful when working with very fine (light) seeds (e.g.: micropellets, canola,…) or if air separators are installed. Moreover, the current consumption of the fan can be reduced if the full air output is not required for operation.

Blower fan settings > **OK** > **Fan speed** **100 %**

Correct the fan speed in 1% increments using the plus/minus buttons until the desired fan speed is set.

If a hydraulic fan is being used, the following setting options are possible under the fan settings menu point:

Fan speed min. Here, the lower limit is set for the speed. If this limit is undercut, the error message "Speed too low (fan)!" is shown.

Fan speed max. Here, the upper limit is set for the speed. If this limit is exceeded, the notification message "Speed too high (fan)!" is shown.
Use the plus/minus buttons to correct the value (in increments of 100) until the limit values are set.

Pulses per revolution Here, you can set the number of pulses per revolution. The default value is 5 and it can be changed in increments of 1 from 1-10 using the plus/minus buttons.

5.11 UNITS OF MEASURE

NOTE!
This menu point can only be called up through the Programming menu or during initial operation. See chapter 7.13.

14. Units of measure: The units of measure for length, area, weight and forward speed can be switched between the metric units (m, ha, kg, km/h) and imperial units (ft, ac, lb, mph).

6 CONTROLLER MESSAGES

6.1 NOTES

Display	Cause	Solutions
⚠ Internal VCC (5 V) not OK!	The internal control voltage is below a minimum value.	➢ Send the control box back to the factory.
⚠ Low operating voltage!	The operating voltage is too low. The operating voltage must be above 10 V (see chapter 5.8).	➢ Minimise the consumers. ➢ Check the battery. ➢ Check the cabling. ➢ Check the alternator.
⚠ High operating voltage!	The operating voltage is too high.	➢ Check the alternator.
⚠ Hopper I almost empty	The fill level sensor in hopper I is no longer covered with seed (for longer than 30 seconds).	➢ Refill seed. ➢ The sensor may need to be readjusted (rotated further down).
⚠ Hopper II almost empty	The fill level sensor in hopper II is no longer covered with seed (for longer than 30 seconds).	➢ Refill seed. ➢ The sensor may need to be readjusted (rotated further down).
⚠ Calibration value too high!	The number of pulses during calibration is too high.	➢ When calibrating the speed, reduce the number of magnets on the wheel sensor. ➢ Install the sensor on the shaft rotating more slowly.
⚠ Calibration value too low!	The number of pulses during calibration is too low. No sensors are detected.	➢ When calibrating the speed, increase the number of magnets on the wheel sensor. ➢ Check the sensor. ➢ Check the cabling. ➢ Check the settings for the speed sensor.
⚠ Seeding shaft speed too low!	Appears when the seeding shaft speed is too low during the calibration test.	Use a seeding shaft with smaller/finer or fewer seed wheels.
	Appears during field operation when the PS is equipped with several implement extension cables and it may not be possible to achieve the higher seeding shafts speeds that may be required.	If possible, reduce the implement extension cables or check the battery and also the plug connections.
⚠ Seeding shaft speed too high!	Appears when the seeding shaft speed is too high during the calibration test.	Use a seeding shaft with larger/coarser or multiple seed wheels.

Display	Cause	Solutions
⚠ Calibration time too short!	Is displayed when the calibration time is too short.	To achieve sufficient accuracy, the calibration button must be pressed and held for at least 20 seconds.
⚠ Vehicle speed too high!	Is displayed when the forward speed is too high and the seeding shaft can no longer readjust.	Reduce the forward speed or use a coarser seeding shaft.
⚠ Vehicle speed too low!	Is displayed when the forward speed is too low and the seeding shaft can no longer readjust.	Increase the forward speed or use a finer seeding shaft.
⚠ Searching for GPS signal Maintain speed (10.00 km/h)!	Is shown when there is no GPS signal and the seeding shaft is switched on.	Maintain the prescribed forward speed. The forward speed that was selected for the previously performed calibration test is always shown.
⚠ Searching for GPS signal!	Is shown when there is no GPS signal.	
ⓘ The implement is being switched off!	Is displayed during the shutdown process. The message disappears after a few seconds.	
⚠ Speed too high (fan)!	Is displayed when the speed of the hydraulic fan is higher than the upper limit (set in chapter 5.10).	➢ Reduce the rotational speed of the hydraulic fan ➢ The pulses/revolution parameter is set incorrectly, see chapter 5.10

6.2 ERRORS

Display	Cause	Solutions
ⓧ Operating voltage not OK!	Is shown when the operating voltage drops below a minimum value or when the voltage fluctuates too much.	Check the cabling and plugs; Check the battery; Check the alternator; switch off other consumers (e.g. work floodlights)
ⓧ Motor is overloaded (seeding shaft I)! ⓧ Motor is overloaded (seeding shaft II)!	Is displayed when the seeding shaft cannot rotate or when the motor is strained for too long at its limits.	If this message appears on the display, you must switch off the implement and check if there are solid objects or similar that prevent the seeding shaft or agitator from rotating properly! With seed that flows well, the agitator can also be switched off.

Display	Cause	Solutions
ⓧ Motor overloaded (fan)!	Is displayed when the electric fan is strained for too long at its limits.	If this message appears on the display, you must switch off the implement and check if there are objects blocking fan or preventing it from rotating properly. Check whether the calibration cover is installed, and also if the seeding hoses are connected.
ⓧ Fan error	Hydraulic: The fan speed of the hydraulic fan is outside of the pre-set tolerance range.	Check the fastening and the cables for the fan speed sensor.
	Electric fan PLUS: Is shown when no fan is connected and "Electric PLUS" is selected as the fan motor and also in case of overload (E2 or E1 on the motor control box).	Check the cables and plugs for damage.
ⓧ Motor not connected (seeding shaft I)! ⓧ Motor not connected (seeding shaft II)!	Is displayed when the wiring is not connected or is faulty.	Check the cables and plugs.
ⓧ Motor not connected (fan)!	Is displayed when the wiring is not connected or is faulty.	Check the cables and plugs. When using a hydraulic fan, see chapter 0.
ⓧ No motor speed (seeding shaft I)! ⓧ No motor speed (seeding shaft II)!	When the motor is connected and not overloaded, but still does not rotate.	Please contact customer service.
ⓧ No motor speed (fan)!	When the motor is connected and not overloaded, but still does not rotate.	Please contact customer service.
ⓧ Ground wheel not OK!	Is shown when the control box is not receiving any signals from the speed sensor!	Check the cables and plugs. If a defects cannot be found on the ground wheel that explain the malfunction, please contact customer service.
⚠ Short circuit on the sensor lines!	Is shown when the sensor supply lines are overloaded, or when there is a short-circuit.	Check the cabling for damage and short circuits.
ⓧ Speed too low (fan)!	Is shown if the speed of the hydraulic fan is below the lower limit (set in chapter 5.10).	➢ Switch on the hydraulic blower fan. ➢ Increase the speed of the hydraulic fan.

Display	Cause	Solutions
		➢ The pulses/revolution parameter is set incorrectly, see chapter 5.10. ➢ If no speed sensor is installed: Either retrofit or set Point 12 (speed monitoring) to NO in the Programming menu. However, then there is no more monitoring on the control box (see chapter 4.4.4 or 7.11).

7 PROGRAMMING 5.7 (CUSTOMER SERVICE)

To call up the Programming menu, press and hold the On/Off button for approx. 5 seconds. You can scroll through the Programming menu by pressing the arrow buttons. The parameters can be changed by pressing the plus/minus buttons.

Button	Designation	Function
	On/Off button	Switching on the Control Box and calling up the Programming menu.
	Arrow buttons Up arrow button (▲) Down arrow button (▼)	Scrolling in the programming menu.
	Plus/minus buttons	Changing the parameter.
	OK button	Finishing and confirming the programming.

NOTE!
If a value was changed in the programming menu and you exit the programming menu, the control box switches itself off automatically. You must then start the control box to accept the changed settings.
When it is set to AUTO, the control box automatically detects which sensor is connected and sending signals.

TIP: If the programming must be checked on your control box WITHOUT Pneumatic Seeder, the error message "Motor not connected (seeding shaft)" or "Motor not connected (fan)" appears directly after switching it on. These error messages can be suppressed for 15 seconds by pressing the OK button and then the programming can be checked.

7.1 FAN

1. Fan motor:

This menu point is used to select the fan. The following fan types can be set.
Use the plus/minus buttons to select whether:

- **OFF**
- **Hydraulic/external**
- **Electric**
- **Electric PLUS**

7.2 SIGNAL WHEN SWITCHING THE SEEDING SHAFT ON/OFF (WARNING TONE)

2. Signal when switching the seeding shaft on/off:

The acoustic warning tone when switching the seeding shaft on/off can be activated or deactivated here.
Use the plus/minus buttons to select **YES/NO**.

7.3 GROUND WHEEL

3. Ground wheel equipped:

In this menu point, you can select whether you are working with or without a ground wheel.
Use the plus/minus buttons to select **YES/NO/AUTO**.

7.4 WHEEL SENSOR

4. Speed sensor on the tractor wheel equip.:

Here, you can select whether you are working with the speed sensor on the tractor.
Use the plus/minus buttons to select **YES/NO**.

7.5 DIN 9684 signal

Here, you can select whether you are using signals from the tractor and which ones.

Provided that they are equipped, 3 different signals are used:

- Linkage signal (not equipped on all tractors)
- Theoretical speed (from the gearbox)
- Actual speed (usually from the radar sensor)

TIP: If several speed signals are available, the (more accurate) actual speed signal is preferred.

5. DIN signal "Cur. speed" equipped:

Here, you can set whether an actual speed signal is available.
Use the plus/minus buttons to select **YES/NO**.

6. DIN signal "Theor. speed" equipped:	Here, you can set whether a theoretical speed signal is available. Use the plus/minus buttons to select **YES/NO**.

7.6 RADAR SENSOR

7. Radar sensor equipped:	Here, you can select whether you are working with or without a radar sensor (or GPSa). Use the plus/minus buttons to select **YES/NO**.

7.7 LIFTING UNIT SENSOR

8. Linkage equipped:	If you want to work with the linkage signals from the tractor or a linkage sensor, please select: Use the plus/minus buttons to select **YES/NO/AUTO/2 sections**.

The "2 sections" setting is used to enable the one-sided switching function via 2 linkage sensor inputs. With this setting, the linkage input Pin 10 (NPN) is used for seeding shaft 1 and linkage input Pin 11 (PNP) is used for seeding shaft 2.

7.8 LIFTING UNIT SIGNAL

9. Signal level "Linkage in working position":	If you are working with the linkage signal from the tractor or the linkage sensor, here you can set the position of the linkage sensor. The position of the sensor can be inverted here and therefore adjusted to the conditions. Use the plus/minus buttons to select **HI** or **LO**.

NOTE!
If you PS would, for example, seed with the wrong linkage position, this can be changed here.

7.9 BUZZER (WARNING TONE)

10. Buzzer:	In this menu point, you can set whether you want to work with an acoustic buzzer (e.g. warning signal in case of error messages) or without this aid. Use the plus/minus buttons to select **ON** or **OFF**.

7.10 SEEDING SHAFT MOTOR

11a. Motor Seeding shaft I: **P8 motor**	Here, the gear motor to be controlled can be set. Use the plus/minus buttons to select either **P8 motor** (installed on PS 120-500) **P16 motor** (installed on PS 800 up to serial number 04001-01299) **P17 motor** (installed on PS 800 for serial numbers higher than 04011-01300) **OFF:** **Select "OFF" for the seeding shaft II motor (11b.), if only <u>one</u> (1) seeding shaft motor is installed.**
11b. Motor Seeding shaft II: **P8 motor**	

7.11 FAN MONITORING

12. Fan monitoring equipped?	Here, you must set whether and which fan monitoring is equipped on your PS. Using the plus/minus buttons, select **NO, PRESSURE** or **SPEED**.

7.12 CALIBRATION BUTTON (CALIBRATION SWITCH) EQUIPPED

13. Calibration button equipped:	Here, you can set whether a calibration button is installed on your PS. Use the plus/minus buttons to select **YES** or **NO**.

7.13 UNITS OF MEASURE

14. Units of measure:	Here, you can switch from metric (m, ha, km/h, kg) units to imperial (ft, ac, mph, lb) units. Use the plus/minus buttons to select **Metric** or **Imperial**.

NOTE!
If the language is set to Chinese, there is only the option of setting the units to "mu".

7.14 RESTORING THE FACTORY SETTINGS

Restore the factory settings?	Here, you can restore the factory settings. Press the OK button. Using the plus/minus buttons, select **YES** and then press the OK button again. The set language, the total hours and the total areas are kept in the process.

8 ACCESSORIES

The following accessories can be ordered for Control Box 5.7:

8.1 7-PIN SIGNAL CABLE

With the 7-pin signal cable, a connection from the tractor to the control box can be established. In this case, the control box receives 3 signals from the tractor (DIN 9684 standard). The forward speed [km/h] and the linkage signal (working position) will then be transmitted from the tractor to the control box. It is shown on the control box. The seed quantity is now automatically regulated by regulating the speed of the seeding shaft. As a result, the desired seed quantity per hectare is always maintained, even if the driven speed deviates slightly from the defined speed.
The control box takes care of all procedures for the operator, such as the controlling during the working process. Thanks to the lifting unit signal, no manual operation on the control box is required when turning. On some tractors, the lifting unit signal is inverted. If the seeding shaft rotates as soon as the linkage is lifted out, then proceed as described under chapter 7.5 DIN 9684 signal.

Figure 6

Cable length: 1.5 m
Connection: 12-pin plug on the control box
Settings: see chapter 7.5
Order number: 00410-2-155

NOTE!
The signal socket is not completely assigned by all tractor manufacturers, even if it is installed in the cab.

8.2 ACCESSORIES KIT FOR GPSA SENSOR MX

The GPSa sensor transmits the current vehicle speed to the control box. The current speed is measured through the combination of a GPS and a 3D acceleration sensor. As a result, the sensor reacts extremely rapidly to changes in speed. Moreover, the sensor must only be mounted horizontally on the implement (with the arrow in the direction of travel). Calibration is NOT necessary!

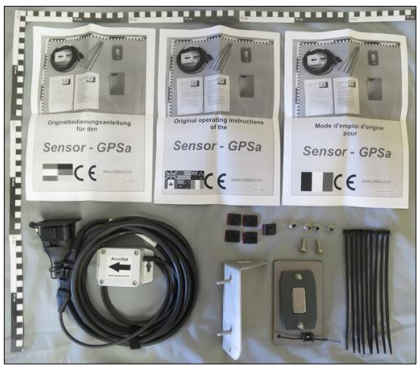


Figure 7

Cable length: 5 m
Connection: 12-pin plug on the control box
Scope of delivery: 1 GPSa sensor, data sheet, mounting plate incl. mounting material
Order number: 00410-2-180

NOTE!
The sensor does not function if there is complete GPS shadowing.

8.3 ACCESSORIES KIT FOR RADAR SENSOR MX 35

The radar sensor measures the forward speed [km/h]. This is displayed on the control box and the seed quantity is automatically regulated by regulating the speed of the seeding shaft. As a result, the desired seed quantity per hectare is always maintained, even if the driven speed deviates slightly from the speed defined by the calibration test.

Figure 8

The radar sensor works on almost any substrate (e.g. soil, sand, pavement, etc.). There may be imprecision if there is of snow or thick layers of ice, or when the on-board voltage drops below 9 V.

Connection: 1-pin plug on the control box
Scope of delivery: 1 radar sensor, 1 mounting plate, incl. fastening material
Settings: see Point Chapter 7.6
Cable length: 5 m
Installation position: Should be between the wheels. Refer to Figure 9 for the orientation and mounting dimensions (35° in the direction of travel or opposite).

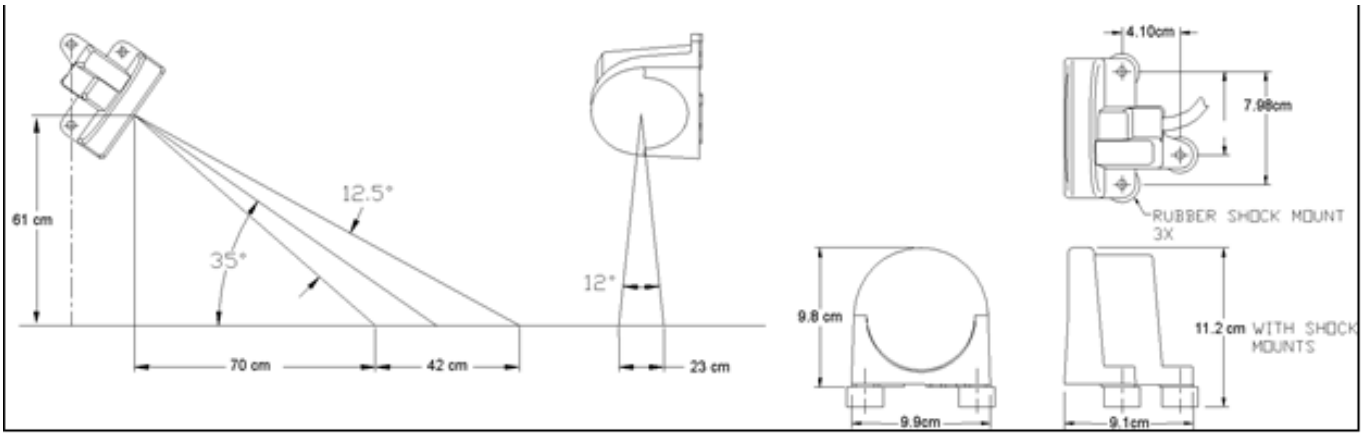


Figure 9

Installation: To fasten the radar sensor, please use the bolts, nuts, and holding plate provided for this purpose in the scope of delivery (see Figure 10).
Order number: 00410-2-179

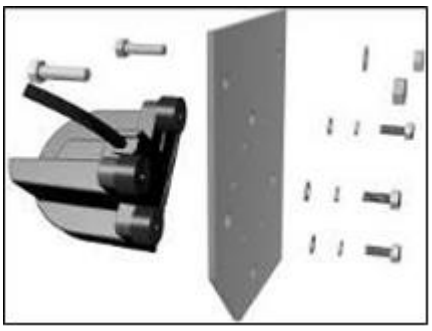


Figure 10

8.4 ACCESSORIES KIT FOR INDUCTIVE WHEEL SENSOR MX

The wheel sensor measures the forward speed [km/h]. This is displayed on the control box and the seed quantity is automatically regulated by regulating the speed of the seeding shaft. As a result, the desired seed quantity per hectare is always maintained, even if the driven speed deviates slightly from the speed defined by the calibration test.

The sensor can detect both the supplied magnets and any type of metal (bolt heads, wheel bolts, etc.).

Connection: 12-pin plug on the control box
Settings: see chapter 7.4
Cable length: 5 m

Figure 11

CAUTION!
Do not hold the Neodym magnets close to your heart! If you have a pacemaker, it can cause disturbances!

Installation position: The magnet is installed on the inside of the rim. The sensor must be fastened at a distance of **max. 5 mm** from the magnets (or wheel bolts, nuts, etc.). When the sensor is actuated, the LED on the rear lights up.

Number of magnets:

Wheel diameter [mm]	250	500	1000	1500	2000
Number of magnets [pcs.]	1	2	4	6	8

Installation instructions:

- For the optimal alignment of 6 magnets, it is best to use a compass (e.g. a string) to form an even hexagon.
- The magnet does not need to be bolted on. It is attached to steel rims through its high magnetic force.
- Route the cable through a well-protected area to avoid any damage (e.g. from the wheel).
- Do not install the wheel sensor on the cardan shaft because its rotational speed is too high and this may cause errors!
- There may not be more than 15 pulses/m.

Scope of delivery: 1 sensor and 2 fastening nuts, 8 Neodym magnets (very strong), cable ties, 1 fastening plate
Order number: 00410-2-181

8.5 ACCESSORIES KIT FOR LINKAGE SENSOR CHASSIS MX

Through this sensor, the seeding shaft of the implement can start and stop rotating automatically when lifting and lowering the implement.

Connection: 12-pin plug on the control box
Calibration: see chapters 7.7 and 7.8
Cable length: 5 m

Figure 12

Installation position: Since most soil tillage implements are lifted and lowered during their operation, installing the sensor on the tractor's lifting arm is the best method (see Figure 12). However, the sensor can also be attached at other positions that have a mechanical movement of more than 50 mm. The distance between the sensor and the magnet should be approx. 5 mm. For semi-mounted soil tillage implements, the sensor can be installed on the chassis, because the linkage is not used in this case. The programming (position in which work is performed) can be adapted for this purpose.

NOTE!
The sensor must not be bolted on too strongly (tension)!

Scope of delivery: 1 sensor, 2 magnets incl. bolts, cable ties,
1 fastening plate, 2 PVC nuts for the sensor
Order number: 00410-2-173

8.6 ACCESSORIES KIT FOR LINKAGE SENSOR TOP LINK MX

Through this sensor, the seeding shaft of the implement can start and stop rotating automatically when lifting and lowering the implement.

Connection: 12-pin plug on the control box
Calibration: see chapters 7.7 and 7.8
Cable length: 3 m

Figure 13

Installation position: Since most soil tillage implements are lifted and lowered during their operation, installing this sensor on the implement's three-point linkage is the best method. However, the sensor can also be attached at other positions that have mechanical movement. The programming (position in which work is performed) can be adapted for this purpose.

Order number: 00410-2-169

Figure 14

8.7 ACCESSORIES KIT FOR LINKAGE SENSOR PULL SWITCH MX

Through this sensor, the seeding shaft of the implement can start and stop rotating automatically when lifting and lowering the implement.

Figure 15

Connection: 12-pin plug on the control box
Calibration: see chapters 7.7 and 7.8
Cable length: 5 m

Installation position: Via a spring (for length compensation) and a chain, two points – which move relative to each other when lifting the implement – can be connected. The switch is activated by the change in length and switches off the seeding shaft. The pull switch can be installed on the three-point and can be tensioned with the chain, e.g. on the towing hitch on the tractor. Now if the implement is lifted out, the distance between the two points increases and the pull switch switches off the seeding shaft. However, the switch can also be installed parallel to cylinders in the parallelograms, where a relative movement between the two points takes place during the lift-out procedure. In the programming you can specify whether seeding should occur with the switch activated or not activated.

Scope of delivery: 1 sensor, 1 fastening plate incl. fastening bolts
Order number: 00410-2-174

8.8 SPLITTER SENSOR MX FOR POWER SOCKET

Is required if you want to work with 2 sensors (e.g. the wheel sensor and the linkage sensor).

Figure 16

Cable length: 1 m
Connection: 12-pin plug on the control box
Order number: 00410-2-153

Connection diagram:

12-pin plug for the control box

Speed sensors

Linkage sensor **yellow marking with the label "Hubwerk/Linkage"**

8.9 CALIBRATION BUTTON (CALIBRATION SWITCH)

The calibration button is installed directly in the cable harness of the implement and is simply mounted on the implement with the integrated magnets. This allows you to start the calibration test when you are standing beside the implement, to calibrate for any length of time, and also to empty the hopper. As soon as the calibration test was started on the control box and you actuate the calibration button, the seeding shaft starts rotating. The calibration procedure keeps running until you let go of the calibration button again. The controller then calculates the required spread rate, which then only has to be weighed and entered in the menu.

Figure 17

To achieve sufficient accuracy, the calibration button must be pressed and held for at least 20 seconds; otherwise, the notification message "Calibration time too short!" appears and the kg/ha or grains/m² are not shown on the main display.

Settings: see chapter 7.12
Cable length: 1 m
Order number: 00410-2-185

Figure 18: Installation example

8.10 MX MCP ADAPTER PS 2

With this adapter, it is possible to control two seeders. In doing so, the seeding shafts can be operated independently of one another.

Order number: 00410-2-164

Figure 19

8.11 UNIVERSAL CONTROL BOX BRACKET MOUNTING KIT

The universal control box bracket can be attached to an existing tube with a diameter of up to 22 mm. Then you can install different control boxes on this bracket. You can install Control Box 5.7 using a RAM C-ball head.

Order number: 00300-2-164

Figure 20

9 INDEX

APV Technische Produkte GmbH
Zentrale: Dallein 15
A-3753 Hötzelsdorf

Tel.: +43 2913 8001
office@apv.at
www.apv.at