# Instruction

# SEEDER+ unit

Revision 1.82 20140825 (last update) Software Version 8:32

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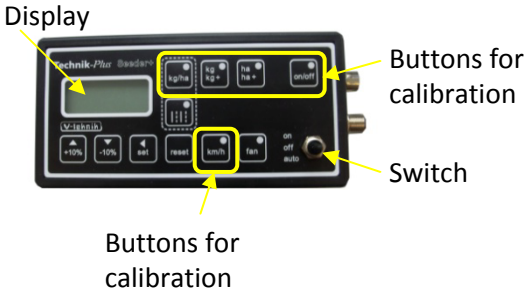
# Description

**SEEDER+ unit**




**CONTROL BOX (mounted on seeder)**

# Program version

After the startup the program version for the unit and the control box is shown as follows:

Program version SEEDER+ unit : Program version control box

**Startup =** It is after connecting the SEEDER+ unit with the battery. On the display is shown a dashed line and one LED after the other starts to shine.

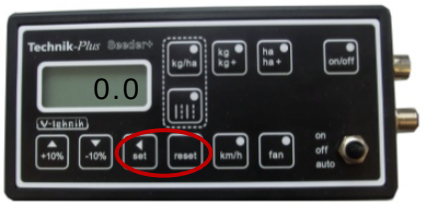
# HOW TO CHANGE VALUES

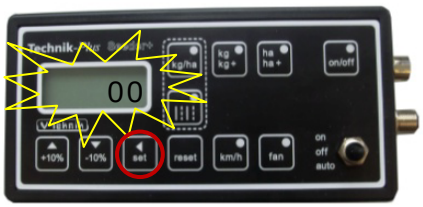
In some parts of the instruction you must put in values with SET and the +10% / -10% buttons. Do this as follows:

| | |
|---|---|
| | You can change the numbers of a value independent. Toggle with SET between the numbers. An underline shows you at which number you are at the moment. |
| | Change the number with the +10% / -10% buttons. Press short SET. The underline changes to the next number. Change this number with the +10% / -10% buttons … |
| | Do this as long until you have the correct value on the display. |

# ADJUSTING THE PARAMETERS

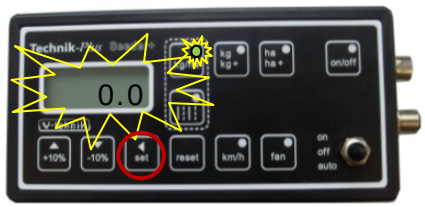
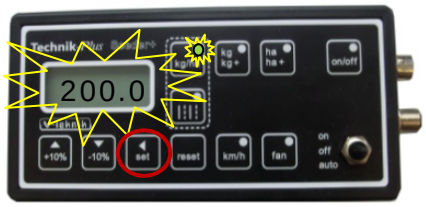
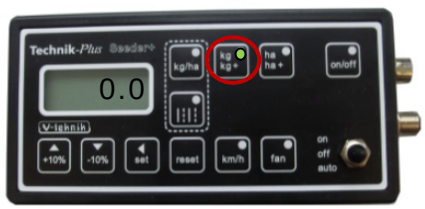
The SEEDER+ can control motors with different technical details. Therefore you must adjust the parameters correct. Some parameters are for the sensors (speed sensor, ON/OFF sensor, level sensor). Check the parameters before the first calibration! The correct values for the parameters are in attachment 1.

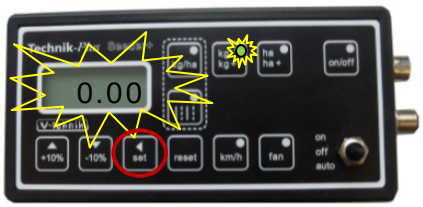
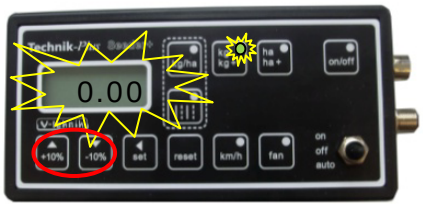
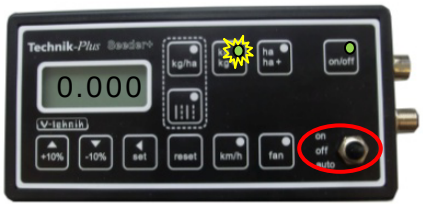
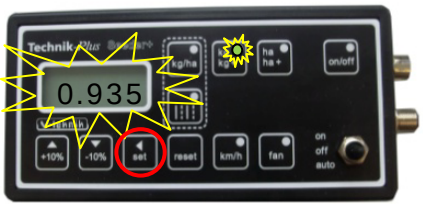
| | |
|---|---|
|  | 1. Press SET and RESET together for 2 seconds. |
| | 2. The display shows now the parameter number. The value flashes.<br>(00=Parameter no.0)<br>Adjust the value to the correct parameter number with SET and the +10% / -10% buttons. |

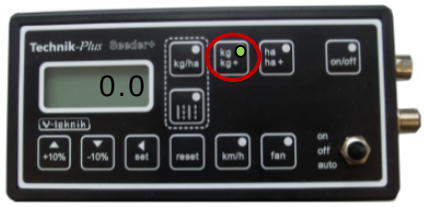
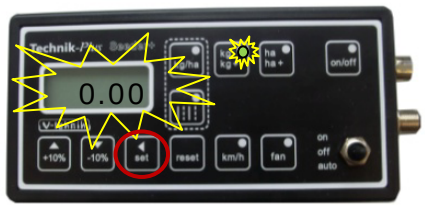
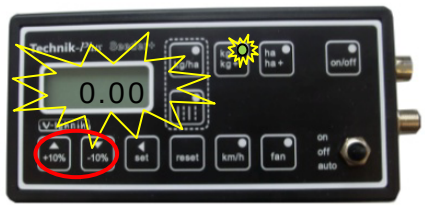
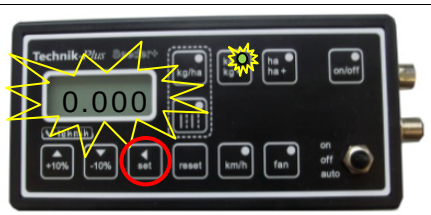
| | |
|---|---|
|  | 3. Press SET for 2 seconds. The display shows know the value that is programmed for this parameter. |
| | 4. Put in the correct value with SET and the +10% / -10% buttons. |
| | 5. Press SET for 2 seconds. The new value is confirmed. |
| | 6. The display shows the parameter no. again. Go to the next parameter with SET and the +10% / -10% buttons. |
| | 7. Press SET for 2 seconds. The display shows know the value that is programmed for this parameter. |
| | 8. Put in the correct value with SET and the +10% / -10% buttons. |
| | 9. Press SET for 2 seconds. The new value is confirmed. |
| | 10. The display shows the parameter no. again. Go to the next Parameter with SET and the +10% / -10% buttons. |

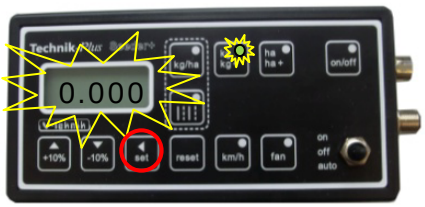
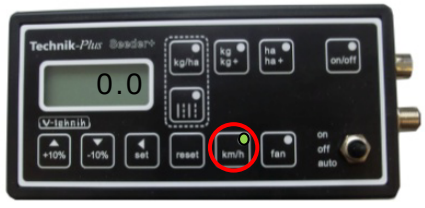
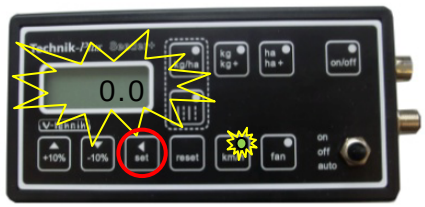
| | |
|---|---|
| | 11. Follow the step 7-10 until all parameters are adjusted to the correct value |
| | 12. Press RESET to exit the parameter menu. You can abort the adjusting with RESET as well. |

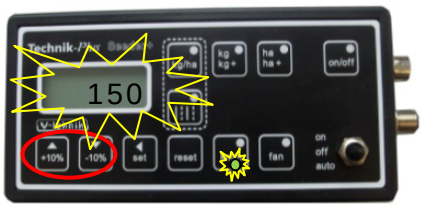
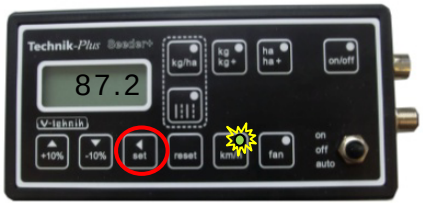
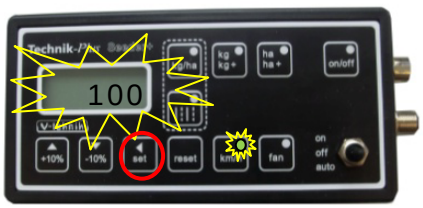
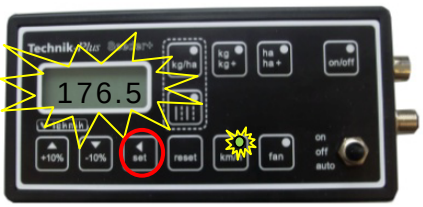
# CALIBRATION

| CALIBRATION OF OUTPUT AMOUNT | |
|---|---|
| | 1. Press the kg/ha button. The green LED at the button shines. |
|  | 2. Press SET for 2 seconds. The green LED at the button flashes. The value at the display flashes. |
| | 3. Put in the output amount you need (in kg/ha) with SET and the +10% / -10% buttons. |
|  | 4. Press SET for 2 seconds. The output amount is confirmed. |
| **CALIBRATION OF SEED ROLL SENSOR** | |
|  | 5. Press the kg/kg+ button. The green LED at the button shines. Switch must be in position **OFF** |

| | |
|---|---|
|  | 6. Press SET for 2 seconds. The green LED at the button flashes. The value at the display flashes. |
|  | 7. The shown value is the g/impulse during calibration. This value must be 1.00. (Adjusting with SET and the +10% / -10% buttons) |
| | 8. Press SET for 2 seconds. The value is confirmed. The LED at the on/off button shines. |
| | 9. Open the bottom cover and put a bin underneath (with known weight). Fill seed into the hopper. |
|  | 10a. Put the switch to on. Seed roll starts turning.<br>10b. After some seconds turn the switch to off. The seed roll stops and is filled up with seed now. Press RESET to abort the calibration of seed roll sensor. Follow point 5-10a again. And then go on with 10c. If you don´t fill up the seed roll first the output amount can differ from the adjusted one. Especially for small amounts.<br>10c. Collect the seed in the bin as long as you have enough to weigh it. We recommend collecting the seed as long as possible. Especially for big output amounts. -> Higher accuracy! |
| | 11. Put the switch to off. The seed roll stops. Weigh the collected seed. Don´t forget to count away the weigh for the bin. |
|  | 12. Press short SET. The value at the display starts to flash. The LED at the on/off button expires. |

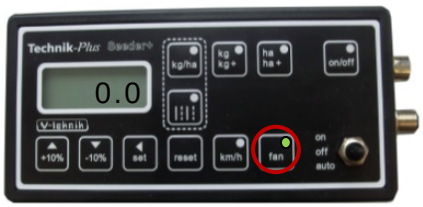
| | |
|---|---|
| | 13. The value on the display shows the flown down kg with 3 decimals. Correct this value to the amount you have just weighed. (With SET and the +10% / -10% buttons) |
| | 14. Press SET for 2 seconds. The value is confirmed. |
| | 15. The shown value is the correct g/impulse. (Remember: At the beginning you put in 1.00) You can note this calibration value to skip the calibration for this seed in future. (Attention: The mass of the seed can change because of different factors. That can lead to an incorrect output amount!) Press short SET to confirm. |
| **CALIBRATION OF THE SEED ROLL SENSOR WITH CALIBRATION VALUE** | |
|  | 16. Press the kg/kg+ button. The green LED at the button shines. |
|  | 17. Press SET for 2 seconds. The green LED at the button flashes. The value at the display flashes. |
|  | 18. Adjust the display with the SET and +10% / -10% buttons to the calibration value on your notes. |
| | 19. Press SET for 2 seconds. The value is confirmed. The LED on the on/off button shines. |
|  | 20. Press short SET. The value on the display flashes. The on/off button LED expires. |

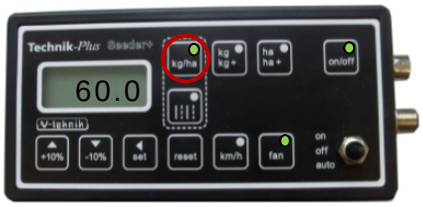
| | |
|---|---|
|  | 21. Press SET for 2 seconds. You have skipped the calibration. |
| | 22. The display shows the calibration value again. Press SET to confirm. |
| **CALIBRATION OF WORKING WIDTH** | |
| | 23. Press the ha/ha+ button. The green LED at the button shines. |
| | 24. Press SET for 2 seconds. The green LED at the button flashes. The value at the display flashes. |
| | 25. Adjust the value to your working width.<br>6m = 600<br>(With SET and the +10% /-10% buttons) |
| | 26. Press SET for 2 seconds to confirm. |
| **CALIBRATION OF SPEED** | |
|  | 27. Press the km/h button. The green LED at the button flashes. |
|  | 28. Press SET for 2 seconds. The green LED at the button flashes. The value at the display flashes. |

| | |
|---|---|
|  | 29. Enter SET and +10% / -10% button to adjust the estimated distance traveled by the tractor wheel from signal to signal (Value between 1-500; look at mounting of speed sensor). If you take speed signals from the signal plug of tractor, enter value 7,3 |
| | 30. Press SET for 2 seconds to confirm. |
| | 31. Drive the tractor a known length (Recommended: 100m on the field). |
|  | 32. After passing 100m, press short SET. |
| | 33. The value on the display shows the distance passed in meters. This value must now be corrected to the traveled 100m (with SET and +10% / -10% buttons) |
|  | 34. Press SET for 2 seconds to confirm. |
|  | 35. This value on the display is now the correct way from pulse to pulse. Do not change this value! Press short SET to confirm. |

| **FAN SPEED** | |
|---|---|
| 29. Adjusting and controlling of fan speed. (On hydraulic driven fan with fan control sensor):<br>**ATTENTION!**<br>**PLEASE ADJUST FAN SPEED NOT BEFORE THE OIL FOR HYDRAULIC FAN DRIVE WILL REACH OPERATING TEMPERATURE.** | |
| | 36. Press the „fan“ button for 2 seconds. The LED on the button is flashing |
| | 37. The display shows now the speed (in rpm) of the fan. Regulate this speed with hydraulic flow rate on the hydraulic (max. 50lit./min.). Press the “fan” button to exist the fan menu. |

# WORKING ON THE FIELD

| | |
|---|---|
|  | 1. Press the button „fan“ for switching on the fan. |
| | 2. Press the ON/OFF button. |
| | 3 . Put the toggle switch to the correct position:<br>ON = The seedrolls are adjusted according to the driving speed, but ON/OFF sensor is deactivated.<br>OFF = The seedrolls are switched off. The display is flashing a double point “:”.<br>AUTO = The seedrolls are adjusted according to the driving speed and switching on/off the seedrolls will be adjusted with the ON/OFF sensor. The display is flashing a double point “:”.<br>The polarity of the sensor can be changed. (look at parameter no. 04) |

| The machines are now activated. You can see the following values during work: | |
|---|---|
|  | 4. Press the „kg/ha“ button. The display shows the entered kg/ha.<br>Press the “kg/ha” button a second time. The display now shows the effectively kg/ha. This value may differ a lot from the entered output amount, if:<br>1. The tractor is broken abruptly.<br>2. The tractor is rapidly accelerated.<br>3. The seedroll motor not rotates. |
| | 5. Press the „kg/kg+“ button. The display shows the previously output amount in kg. |
| | 6. Press the „ha/ha+“ button. The display shows the previously worked area in ha. |
| | 7. Press the „km/h“ button. The display show the actual speed in km/h. |

# ADDITIONAL FUNCTIONS

**Startup =** It is after connecting the SEEDER+ unit with the battery. On the display is shown a dashed line and one LED after the other starts to shine.

## Resetting of the SEEDER+ unit

In case the memory has gone corrupt (ER 10) or for any reason one would like to reset all parameters, this can be done by holding down a series of buttons at startup.

1. Disconnect the unit from the battery.
2. Connect the SEEDER+ with the battery again.
3. Make sure the switch is at position **on**.
4. Press the **+10%** and **kg/ha** and **ha/ha+** buttons together during start up.
5. The SEEDER+ starts again. The parameters and calibrations are deleted.

## Hardware Test:

The unit has a built in test in order to control that all buttons, LEDs, switch and display work properly. To activate this hardware test complete the following procedure:

1. Disconnect the unit from the battery.
2. Make sure that the switch is at position **off**.
3. Connect the unit to the battery. Press the **on/off** and **ha/ha+** buttons together during start up.
4. The unit is now in hardware test mode.

Start with the kg/ha button. Press one button after the other. The following must occur:

| Button | Display shows | LED on button must |
|---|---|---|
| kg/ha | 1111 | shine |
| kg/kg+ | 2222 | shine |
| ha/ha+ | 3333 | shine |
| on/off | 4444 | shine |
| \|⁞\|⁞ | 5555 | shine |

| | |
|---|---|
| + 10% | The display is rolling through the individual segments for the 1st number (finishing with an “8”) |
| - 10% | The display is rolling through the individual segments for the 2nd number (finishing with an “8”) |
| set | The display is rolling through the individual segments for the 3rd number (finishing with an “8”) |

| | | |
|---|---|---|
| reset | The display is rolling through the individual segments for the 4th number (finishing with an “8”) | |
| km/h | 9999 | shine |
| fan | ???? | shine |

| switch | Display shows |
|---|---|
| on | colon |
| off | |
| auto | 3 decimal points |

To exit the hardware test mode disconnect the unit from the battery. Connect the unit to the battery. You are in the normal mode again.

## Emergency mode

*(Attention: The parameter adjustment and the calibration will be canceled and must be new programmed/calibrated for the normal working modus.)*

It may happen that, for various reasons, the SEEDER + control or control box is not working properly. In this case there is an emergency mode. So you can finish your work on the field until the replacement part has arrived or you can send the seeder+ control to us for repair.

1. Disconnect the unit from the battery.
2. Make sure that the switch is at position **OFF**.
3. Connect the unit to the battery. Press the **+10%** and **-10%** buttons together during start up.
4. The unit is now in Emergency mode.

In emergency mode, the following functions are possible:

1. Adjustment of output amount
2. Adjusting of fan speed. (On hydraulic driven fan with fan control sensor)
3. Reading the driving speed, if speed signals are working.
   (In emergency mode this value will not be used for a calculation of total output amount or total working area.)
4. Switching on the seeding unit
5. Alarms and error codes are NOT available!

1. Adjustment of output amount:

Press the kg/ha button. The LED on the button begins to flashing. Now you can adjust the speed on the seedroll between 0 (off) and 100 (max. speed)

Please make a calibration for correct adjustment:
Put a collection container under the seeding unit and open the bottom flap. Press now the ON/OFF button. The toggle switch must be on “ON” or “AUTO”.
(In emergency mode both buttons “on” and “auto” have the same function).
The seeding machine is now turned on. Let the seedroll run one minute and turn off then the toggle switch. Weigh the seeds now.
By using this formula you can if your setting was correct:

$$\frac{\text{working width (m) x speed (km/h) x output amount (kg/ha)}}{600} = \text{kg per minute}$$

Compare the weighed seed with the result of this formula. If the two values are complying, then your setting is correct. Otherwise please correct the speed of the seedroll.

2. Adjusting of fan speed. (On hydraulic driven fan with fan control sensor):

Press the button „fan“. The LED on the button begins to flashing. Now you can adjust the speed on the fan between 0 (off) and 10 (max. speed)

3. Reading the driving speed, if speed signals are working:

Press the button „km/h”. The driving speed will be show on the display.

4. Switching on the seeding unit:

Press the „fan“ button. The fan is now turned on.
Press the ON/OFF button. The toggle switch must be on “ON” or “AUTO”.
(In emergency mode both buttons “on” and “auto” have the same function).
The seeding machine is now turned on

To exist the emergency mode, please disconnect the unit from battery. Connect the unit again to the battery. No you are now back in normal modus.

## Tamline function

Please note that for the tramline function motors/valves for closing the outlets are needed. (not included in delivery!)

For the tramline function press the tramline button: |⁞⁞|

More information on tramline menu on request.

**ATTACHMENT 1**

# PARAMETER ADJUSTMENT

| No. | Name | Description | Value |
|---|---|---|---|
| 00 | P (PID) Motor | P-Value for adjusting the motor. Please use the given values!<br>Allowed values from 0-100. | 25 |
| 01 | I (PID) Motor | I- Value for adjusting the motor. Please use the given values!<br>Allowed values from 0-100. | 5 |
| 02 | ON/OFF sensor | Reversing the function of the ON / OFF sensor. The sensor reacts to metal.<br>„1“: Sensor has no contact to metal = seedroll on; Sensor has contact with metal = seedroll off<br>„0“: Sensor has contact to metal = seedroll off; Sensor has no contact with metal = seedroll off<br>(Look at mounting of low-level sensor)<br>Allowed values from 0-1. | 1<br>or<br>2 |
| 03 | Calibration speed | Adjustment of motor speed during calibration. Max. value is 100<br>(= max. motor rotation speed). Allowed values from 0-100.<br>Ex: 80 = 80% of max. speed<br>Correctly adjusted calibration speed increases the output accuracy. In small quantities a value of approximately 40 is recommended for large application rates of about 80 | 80 |
| 04 | Signal input ON / OFF Switching | Adjustment of signal input. Allowed values are 1 and 2.<br>1 = Signal input via control box<br>2 = Signal input via SEEDER+ control unit | 1<br>or<br>2 |
| 05 | Signal input speed | Adjustment of signal input. Allowed values are 1 and 2.<br>1 = Signal input via control box<br>2 = Signal input via SEEDER+ control unit | 1<br>or<br>2 |
| 06 | Actual motor current | Shows the actual motor current for the seedroll motor in Ampere. Value is not changeable. | |
| 07 | Max. motor current | Maximum allowable current for motor.<br>If the motor is 1 second over this value, the motor turns off automatically and an alarm is triggered.<br>Allowed value from 0-100. | 8 |
| 08 | Actual voltage | Incoming voltage. The control unit is developed for 12V. This value is not changeable. | |

| | | | |
|---|---|---|---|
| 09 | Low-level sensor | Reversing the function of the low-level sensor.<br>If error code Er06 will be displayed on full hopper, please change this parameter to the value of each other.<br>Enter „0“ if you do not have a low-level sensor. Allowed values 0 and 1. | 0 |
| 10 | Pulse / Rotation fan | Number of pulses (= Signal from sensor) per rotation for measurement of fan speed.<br>This parameter is only import for hydraulic fan with a fan rotation sensor.<br>Allowed values from 1-100 | 1 |
| 11 | Adjustment Fan speed | Adjustment of fan speed (in %) on hydraulic fan with electrical proportional valve.<br>ex. „10“: The fan is driven at 10% of the hydraulic capacity.<br>If you have electric driven fan or hydraulic driven fan without proportional valve pleas ender “0”.<br>Allowed values from 0-100 | 100 |
| 12 | Min. fan speed | Lowest allowable fan speed. This parameter is only import for hydraulic fan with a fan rotation sensor.<br>ex. 3000 rpm = „3000“<br>Please enter “0“ if you do not have a fan rotation sensor. So also error code Er02 is deactivated.<br>Allowed values 0-9999 | 2000 |
| 13 | Max. fan speed | Maximum allowable fan speed. This parameter is only import for hydraulic fan with a fan rotation sensor.<br>ex. 4500 rpm = „4500“<br>Please enter “0“ if you do not have a fan rotation sensor. So also error code Er03 is deactivated.<br>Allowed values 0-9999 | 2300 |
| 14 | Tramline sensor | Polarity of the sensor for tramline function. This parameter is only import for seeding units with tramline function.<br>Please enter “0“ if you do not use the tramline function.<br>Allowed values 0 and 1 | 0 |
| 15 | Number of outlets | Please enter the outlets for tramline function.<br>ex. If you use distributor tower with 8 outlets, the parameter value is „8“<br>Please enter “0“ if you do not use the tramline function. Attention: First please set parameter no. 16 to “0”.<br>Allowed values from 0-999 | 0 |
| 16 | Closed outlets | Enter the number of closed outlets, when the tramline should be set.<br>ex. If 2 outlets should be closed, parameter value is „2“.<br>Please enter “0“ if you do not use the tramline function.<br>Allowed values from 0-99 | 0 |
| 17 | Operation time | Shows the approximate number of hours during which the control unit was switched on.<br>Only for internal service purposes! | |
| 18 | ha-counter | Shows the done area (when seed roll is turnded on). This value is not changeable. | |

## ATTACHMENT 2

# ALARM SIGNALS / ERROR-CODES

**Following alarms can occure:**

- Flashing Error Code on Display. More than one Error Codes are shown serial.
- Acoustic alarm.
- Flashing LED.

| Code | description | Display and acoustic Alarm | solution |
|---|---|---|---|
| Er 1 | The ON/OFF button is active. Fan is turned off. | Er 1 is flashing on display + acoustic alarm. LED on “fan” button is flashing. | Press the fan button to switch on the fan. |
| Er 2 | Speed (rpm) on fan is too slow. | Er 2 is flashing on display + acoustic alarm. LED on “fan” button is flashing. | Is the fan wheel turning?<br>Check the fan and the cable for the fan sensor. Was the sensor moving and has now too much distance to the screw, metal, …<br>Check, if the sensor is working correct. Beyond every screw, metal the LED on the sensor must shine and then expire.<br>Are the cables and plugs or hydraulic hoses okay?<br>Is there an obstacle in the fan wheel? |
| Er 3 | Speed (rpm) is too high. | Er 3 is flashing on display + acoustic alarm. LED on “fan” button is flashing. | Check the speed of the fan. Slow down the speed of the fan if it is too high. Check the sensor cable of the fan sensor. |
| Er 6 | Level sensor is showing an error.. | Er 6 is flashing on display + acoustic alarm. LED on “kg/kg+” button is flashing. | Check the filling level of the hopper.<br>Check the cable and the signals of the level sensor.<br>Check Parameter no. 09. If you have no level sensor -><br>Parameter value is „0“ |
| Er 8 | The seed roll motor cannot regulate correct. Actual output amount differs from adjusted output amount. | Er 8 is flashing on display + acoustic alarm. | Check if the seed roll blocks because of obstacles (f.e. stones)<br>Check the sensor cable. Is it broken or bended (bad signal connection)? |
| Er 10 | Memory Error. Wrong adjustment or memory. | Er 10 is flashing on display + acoustic alarm. | Check the last adjustments. |

| | | | |
|---|---|---|---|
| Er 11 | Calibration Error. This calibration value is not allowed. | Er 11 is flashing on display + acoustic alarm. Press SET and RESET to switch of the alarm. | Check your calibration and calibrate a second time if necessary. |
| Er 12 | Amperage of seed roll motor is too high. | Er 12 is flashing on display + acoustic alarm. LED on “on/off” button is flashing. | Check if the motor is turning very hard.<br>Check if the seed roll blocks because of obstacles (f.e. stones) |
| Er 14 | Power supply under 12V. | Er 14 is flashing on display + acoustic alarm. All LEDs are flashing. | Check the battery fuse. |
| Er 15 | Communication problem between SEEDER+ control and controlbox. | Er 15 is flashing on display + acoustic alarm. All LEDs are flashing. | Check the cable between SEEDER+ unit and controlbox. |
| BEEP | Communication problem between SEEDER+ unit and control box. (Error made by SEEDER+ unit) | No Error code. No flashing LED. Just acoustic alarm. | Check the cable between SEEDER+ unit and controlbox. |

**Switch off the acoustic alarm:**
Press RESET to switch off the flashing LEDs and acoustic alarms. Is the ON/OFF sensor active next time, the acoustic alarm and flashing LEDs are switched on again. Error codes on display are always visible. You cannot turn off the alarm when the unit is in Parameter-, calibration-, or any other menu.

***ATTENTION!!: If you are in a menu making adjustments and you press RESET more than one second the value is deleted!***

## HARDWARE LEDs and fuses

The LEDs in the controlbox show you if the incoming and outgoing signals are processed correctly.

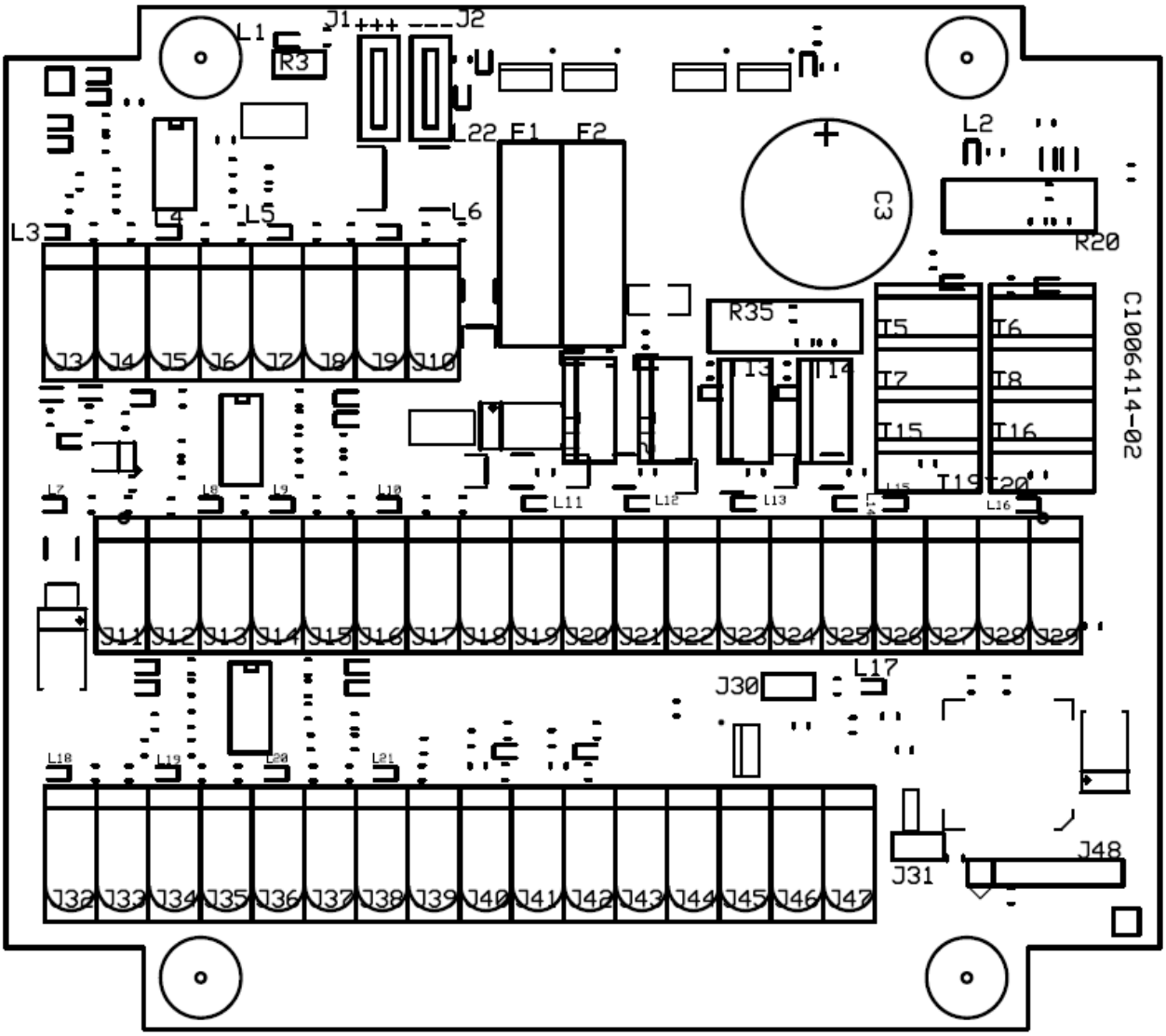
| LED # | description: |
|---|---|
| | |
| LED 1 | Connected to 12v |
| LED 2 | 12v supply to seed roll motor okay |
| | |
| LED 11 | Is flashing when writing to EPROM |
| LED 17 | Is flashing during CAN communication with the unit. |
| F1 | 2A fuse |
| F2 | 15A fuse |
| J31 | Canbus Term. Jumper should be always mounted. |

## PCB Seeder +

| INPUT | + | - | SIGNAL < 5Khz |
|---|---|---|---|
| Tank level | J7 | J10 | J8 |
| Fan (rpm) | J11 | J17 | J15 |
| AREALBRYTARE | J32 | J35 | J33 |
| Speed | J36 | J39 | J37 |
| Rot. (sensor) | J3 | J6 | J4 |

| OUTPUT | | |
|---|---|---|
| Motor | J26 | J27 |
| Fan | J20 | J21 |
| Tramline | J24 | J25 |

| COM | |
|---|---|
| CAN_L | J46 |
| CAN_H | J45 |
| GND | J47 |
| VCC | J44 |




## Spezifications

| Description | Data |
|---|---|
| Monitor display | Numerical with background lighting |
| Tolerated input voltage, feeding | 12V DC ± 20% |
| Power consumption (Electronics only) | 250mA |
| Working temperature | 0˚C - 65˚C |
| Digital input | High signal, 12V (± 25%)<br>Low signal, 0V (2-0V)<br>Maximum input frequency, 5KHz |
| Speed Input (digital) | Minimum input frequency, 5Hz. |
| Weight of monitor | Approx. 0.3kg |
| Weight of control unit, without cables | Approx. 0.4kg |
| Protection against polarity reversal | Yes |
| Short-circuited protected | Yes, flat pin fuse on circuit board |
| Protection rating (monitor) | IP54 (Protected against dust/against water sprayed from all directions) |
| Protection rating (control unit) | IP65 (Totally protected against dust/protected against low pressure jets of water from all directions) |