# Operating Instructions

## Controler

## Solitronic 1.53

**- EN -**

Item no.
175_4841
1/11.10

**LEMKEN GmbH & Co. KG**

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**Dear customer,**

Thank you for the trust you have placed in us by purchasing this device. The device can only be used to its full advantage when operated and used properly. When the device was delivered, you will already have been instructed in operation, adjustment and maintenance by your dealer. However, this brief instruction is not a substitute for thorough study of the operating instructions.

These operating instructions will help to familiarise you with the LEMKEN GmbH & Co. KG device and the options available for using it.

The operating instructions contain important information about how to operate the device safely, properly and efficiently. Following the instructions will help to prevent hazards, faults and down times and will increase reliability and service life. Read the operating instructions carefully and attentively before commissioning.

Make sure that the operating instructions are always available at the location where the device is used.

The operating instructions must be read and followed by anyone who is involved in carrying out the following work:

- Coupling and uncoupling
- Adjustments
- Operation
- Maintenance and repairs
- Troubleshooting, and
- Final shutdown and disposal.

These operating instructions are deemed to be the original operating instructions.

## Spare parts ordering

This device is supplied with a specification listing all assemblies that are relevant for the product. The spare parts list valid for your device includes both those assemblies relevant to you and those that are not intended for your device. Make sure that you only order spare parts that belong to the assemblies that can be found on your specification or the enclosed print out. When ordering spare parts, state the type designation and serial number of the device. This information can be found on the rating plate. Enter this data in the fields below so that it is always to hand.

| | |
|---|---|
| Type designation: | |
| Serial number: | |

Remember that you should only use genuine LEMKEN spare parts. Reproduction parts have a negative influence on the function of the device, have a shorter service life and present risks and hazards that cannot be estimated by LEMKEN GmbH & Co. KG. They also increase the maintenance costs.

## Service and spare parts

Information on service and spare parts is available from your local dealer or our website at www.lemken.com.

# CONTENTS

# 1 POWER SUPPLY

The connecting cable for the electronic control system's power supply must be connected straight to the tractor's battery. An operating voltage of 12 Volt is required. A 40A fuse is located inside the connecting cable to the battery.

# 2 BASIC INFORMATION

## 2.1 Field of application

The electronic control system has been developed for controlling, monitoring and configuring the Compact-Solitair tilling combinations.

- The Compact Solitair can only spread seed or fertiliser.
- The Compact-Solitair HD can spread both seed and fertiliser, insofar as the corresponding selection has been activated in the "Fertilising and drilling" option.

The control terminal on the electronic control system can be used to set the time delay between raising and lowering the soil-working implement and coulter bar. The following functions can be activated and deactivated independent of each other:

- the lane scriber folding device,
- the raising and lowering of the fertiliser coulter
- the raising and lowering of the coulter bar
- the raising and lowering of the leading roller or harrow with coulter bar
- the raising and lowering of the soil-working implement

**DANGER**

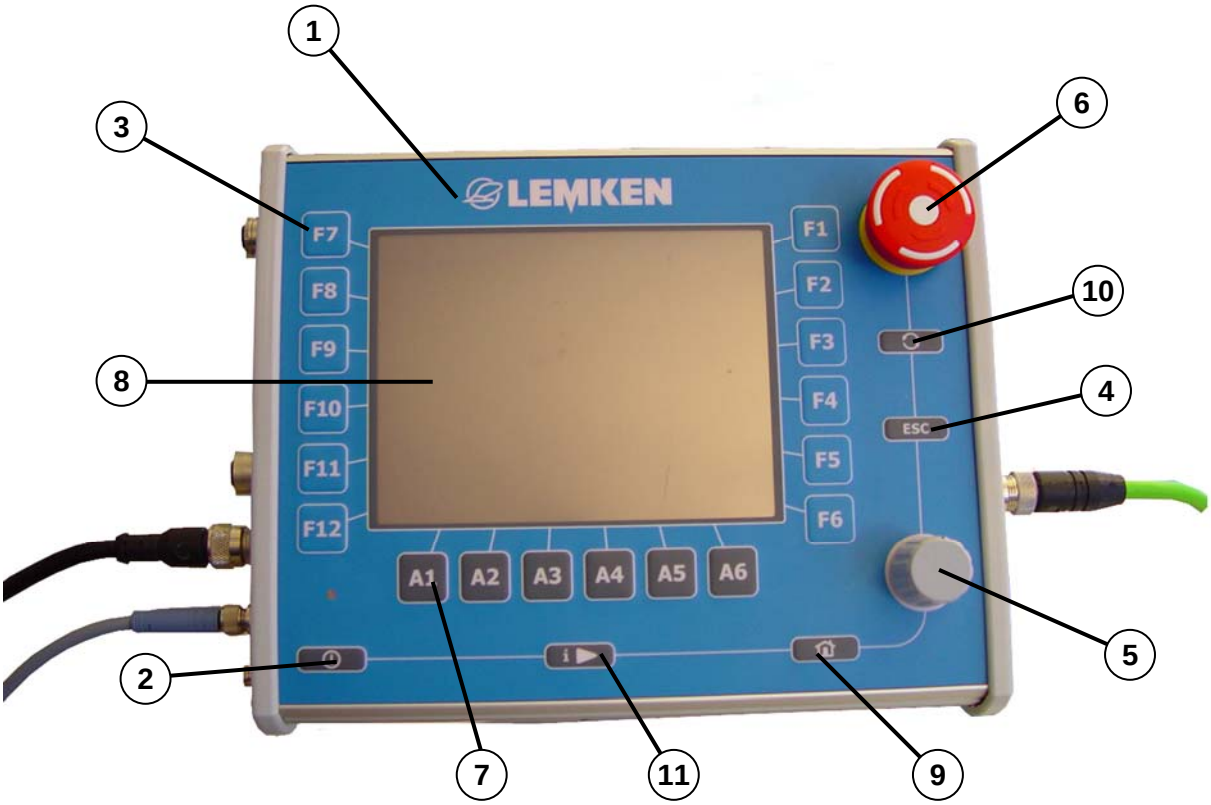
During the transport always switch off the control terminal!

## 2.2 Displays and menus

Depending on the implement model and the equipment available on each implement combination, several displays on the control terminal may differ from those shown here in these operating instructions. A special reference is given where this is of relevance to operation of the implement.

## 2.3 LEMKEN Solitronic

The electronic control system is operated using the control terminal (1). It also consists of a touch screen (8), function keys (3), shift keys (7) and a rotary encoder (5).




1 Control terminal
2 On/Off switch
3 Function keys
4 ESC key (Return key)
5 Rotary encoder
6 EMERGENCY STOP switch
7 Shift keys
8 Touch screen
9 Start menu key
10 WorkingSet key
11 Freely assignable key

### 2.3.1 On/Off switch

The On/Off switch (2) has to be pressed and held for 2 seconds to switch the electronic control system on or off again.

### 2.3.2 Function keys

When a function key (3) is pressed the function situated next to it on the touch screen (8) is then executed or activated.

### 2.3.3 Rotary encoder

Turning the rotary encoder (5) selects and enters a value, which is then confirmed by a press of the key.

### 2.3.4 ESC key

Pressing the ESC key (4) cancels the entry of any values.

### 2.3.5 Shift keys

When a shift key (7) is pressed the function situated next to it on the touch screen (8) is then executed or activated.

### 2.3.6 Start menu key

Pressing the Start menu key (9) will take you straight back into the control terminal's main menu. Active applications are not closed by this change. They remain active, but they are not visible.

### 2.3.7 WorkingSet key

Repeatedly brief presses of this WorkingSet key (10) enables a change to be made between currently active applications.

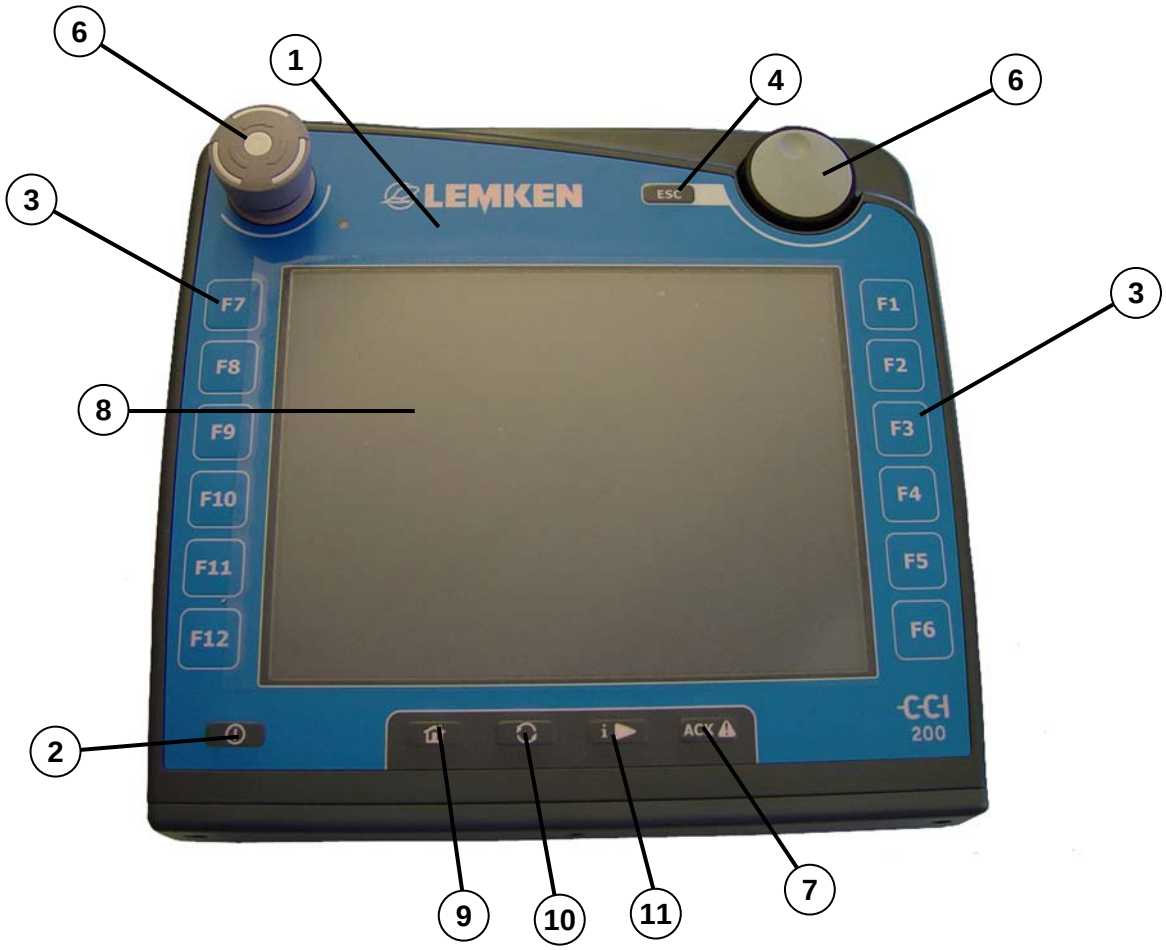
### 2.3.8 Freely assignable key

This key (11) is currently not assigned.

## 2.4 ISOBUS terminal

When equipping the implement with ISOBUS it is advisable to use a LEMKEN-ISOBUS terminal. The implement can also be operated using other ISOBUS terminals.

The electronic control system is operated using the control terminal (1). It also consists of a touch screen (8), function keys (3) and a rotary encoder (5).




1 Control terminal
2 On/Off switch
3 Function keys
4 ESC key (Return key)
5 Rotary encoder
6 ISOBUS STOP switch
7 Acknowledge key (ACK)
8 Touch screen
9 Main menu key
10 WorkingSet key
11 Freely assignable key

### *2.4.1 On/Off switch*

The On/Off switch (2) has to be pressed and held for 2 seconds to switch the electronic control system on or off again.

### *2.4.2 Function keys*

When a function key (3) is pressed the function situated next to it on the touch screen (8) is then executed or activated.

### *2.4.3 Rotary encoder*

Turning the rotary encoder (5) selects and enters a value, which is then confirmed by a press of the key.

### *2.4.4 ESC key*

Pressing the ESC key (4) cancels the entry of any values.

### *2.4.5 Acknowledge key (ACK)*

The ACK key (7) can be used to confirm error messages.

### *2.4.6 Main menu key*

Pressing the Main menu key (9) will take you straight back into the control terminal's main menu. Active applications are not closed by this change. They remain active, but they are not visible.

### *2.4.7 WorkingSet key*

Repeatedly brief presses of the WorkingSet key (10) enables a change to be made between currently active applications.

### *2.4.8 Freely assignable key*

This key (11) is currently not assigned.

# 3 MENU SELECTION

– Press this key for at least two seconds to switch on the electronic control system.


The Main menu appears after switching on the electronic control system and a brief system check.

– Press this key to enter the Operating menu.

– Press this key to enter the Calibration menu.

– Press this key to enter the Entry menu.

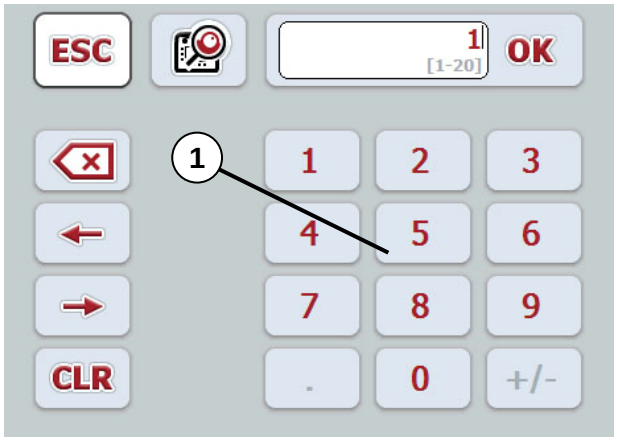
– Press this key to enter the Information menu.

Depending on the equipment specification and the implement model, either one menu page or several menu pages will be available to choose from. If there are several menu pages, a scroll function will also always be available for changing pages.

– Press this key to change the menu page.

– Press this key to jump back by one menu.

## 3.1 Entering of values



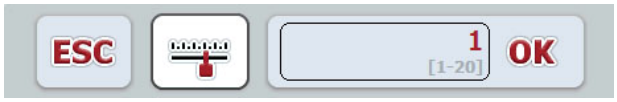

This window opens when a key is pressed at the appropriate point on the touch screen.

The corresponding value can be entered here on the number field (1) or by actuating the control terminal's rotary encoder.

A value can be entered in both this input window and using a number scale.

Changing the number scale:

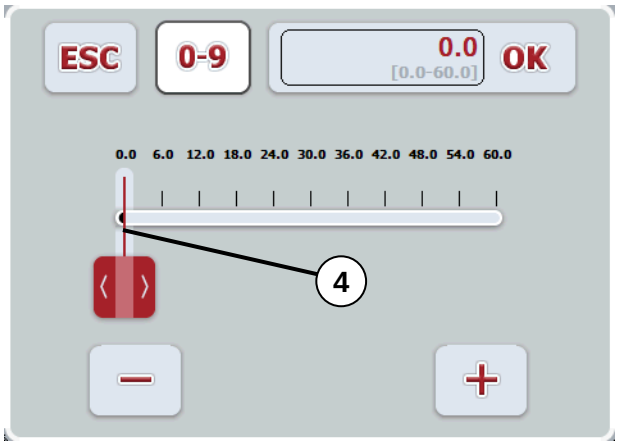
– Press this key to change the entry.




The window for entering values with the rotary encoder appears.

This value can only be entered by operating the rotary encoder on the terminal.

– Press this key to set the value using the number scale.




The window for entering values with the number scale appears.

The value can be entered here through operating the rotary encoder on the control terminal or through sliding the control (4) on the touch screen.


– Press this key to return to the number field.

## 3.2 Confirming values, alarms and error messages

Confirm entered values, alarms and error messages through:

- pressing "OK" on the touch screen
- selecting and pressing the "OK" using the rotary encoder

# 4 OPERATING MENU

## 4.1 General information

The Operating menu is always to be selected when the implement has been configured and used for seeding.

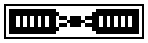
– Press this key to enter the Operating menu.

## 4.2 Operating menu displays

### Seeding

| | Function | Press the key |
|---|---|---|
|   | Hectare counter | Total hectare counter |
|   | Current operating speed | Calibration menu - Information |
|   | Current seed rate quantity kg/ha | Fill, seed and residual quantity |
|   | "Fertilising and drilling" option<br>Current seed rate quantity kg/ha for seed and fertiliser | Fill, seed rate quantity and residual quantity for seed |
|   | Increasing sowing quantity | Increases sowing quantity |
|   | Reducing sowing quantity | Reduces sowing quantity |
|   | Specified sowing quantity | Sets specified sowing quantity |
|   | Manual start | Starts seeding |
|   | Manual stop | Stops seeding |

## Sequence control

| | Function | Press the key |
|---|---|---|
|  | Lowering process | - |
|  | Raising process | - |
|  | Signal for partial-area specific seeding through GPS system | - |
|  | Lowering process completed | - |
|  | Raising process completed | - |
|  | Manual harrow actuation | Manual raising and lowering of harrow |
|  | Automatic harrow actuation | Manual raising and lowering of harrow |
|  | Automatic operation of sequence control | Switch sequence control to manual operation |
|  | Manual operation of sequence control | Switch sequence control to automatic operation |
|  | Activate soil-working implement | Deactivate soil-working implement |
|  | Soil-working implement deactivated | Soil-working implement activated |
|  | Coulter bar activated | Deactivate coulter bar |
|  | Coulter bar deactivated | Activate coulter bar |
|  | Raising levelling work tines section | Lowering levelling work tines section |
|  | Lowering levelling work tines section | Raising levelling work tines section |

## Lane scriber

| | Function | Press the key |
|---|---|---|
|  | Automatic operation of lane scribers | Switch lane scribers to manual operation |
|  | Manual operation of lane scribers | Switch lane scribers to automatic operation |
|  | Right lane scribers activated | Activate left lane scribers |
|  | Left lane scribers activated | Activate right lane scribers |
|  | Lane scribers activated | Deactivate lane scribers |
|  | Lane scribers deactivated | Activate lane scribers |
|  | Actuation of left lane scribers | Retract or extend left lane scribers |
|  | Actuation of right lane scribers | Retract or extend right lane scribers |

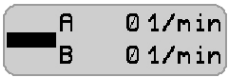
## Coulter pressure / roller pressure

| | Function | Press the key |
|---|---|---|
|  | Coulter pressure | - |
|  | Roller pressure | - |
|  | Reducing roller pressure | Reduce roller pressure |
|  | Increasing roller pressure | Increase roller pressure |
|  | Reducing coulter pressure | Reduce coulter pressure |
|  | Increasing coulter pressure | Increase coulter pressure |

## Tramline shifting

| | Function | Press the key |
|---|---|---|
|   | Tramline rhythm | Switch interval control on and off |
|  | Manual switching of current track | Switches track |
|  | Manual switching-back of current track | Switches back to previous track |
|   | Manual switching-back of current track | Maintain track |
|   | Section-width switch-off | Switch off section width |

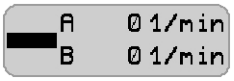
## Speed monitoring

| | Function | Press the key |
|---|---|---|
|   | Current motor speed for sowing shaft | Sowing shaft motor data |
|   | "Fertilising and drilling" option<br>Current motor speeds for seed and fertiliser sowing shafts | Motor data for seed and fertiliser sowing shafts |
|   | Current blower speed | Minimum and maximum blower speeds (alarm setting) |
|   | Current speed of circular spike harrow | Minimum and maximum speed of circular spike harrow<br>(Alarm setting) |

## 4.3 Operating voltage and current power consumption


– Press this key to display the operating voltage and the current power consumption of the electric motor.

"Fertilising and drilling" option




– Press this key to display the operating voltage and the current power consumption of the electric motors.

## 4.4 Blower speed alarm setting


– Press this key to display the permissible blower speeds.

## 4.5 Checking the seed rate quantity


– Press this key to display the seed quantity filled and spread since the previous distribution process in kg and to also show the quantity remaining in the tank.


"Fertilising and drilling" option

– Press this key to call up the display.


Last filled seed quantity


Total filled seed quantity


Sown seed quantity


Quantity left in tank

## 4.6 Cardan shaft alarm setting


– Press this key to display the settings for an alarm message.


The minimum speed is shown after this display.


The time interval is shown after this display, after which an alarm is issued when the minimum speed is dropped below.

## 4.7 Hectare counter


– Press this field to display the field hectare counter, the daily hectare counter, the annual hectare counter and the total hectare counter.

## 4.8 Electrohydraulic coulter pressure adjustment

The coulter pressure of the coulter bar can be gradually increased or reduced during operation.


Set coulter pressure display

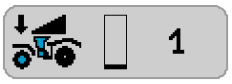
- Minimum coulter pressure = level 0
- Maximum coulter pressure = level 10

– Press this key to increase the coulter pressure.

– Press this key to reduce the coulter pressure.

## 4.9 Electrohydraulic roller pressure adjustment

The pressure load on the leading roller can be gradually increased or reduced during operation.




Set roller pressure display

- Minimum coulter pressure = level 0
- Maximum coulter pressure = level 10

– Press this key to increase the roller pressure.

– Press this key to decrease the roller pressure.

## 4.10 Interval tramline shifting


– Press this key to switch on the interval tramline shifting function.

– Press this key again to switch off this function again.


Interval tramline control is switched off


Interval tramline control is switched on

## 4.11 Adjusting the seed rate quantity


– Press this key to increase the seed rate quantity in the previously entered percentage increments.


– Press this key to reduce the seed rate quantity in the previously entered percentage increments.

A maximum of 10 increments can be used to increase or reduce the seed rate quantity. This enables seed rate quantity adaptations of up to + / - 200% (10 steps of 20% increments) to be realised.


– Press this key to set the standard specified seed rate quantity.

### *4.11.1 Manual start*

To start seeding in, e.g. the corners of a field, independent of the implement control system, the sowing shaft can be manually operated.


– Press this key for longer than 15 seconds to start seeding independent of the implement control system.

The seeding wheels rotate for 20 seconds. If a minimum working speed of 1.3 km/h is reached within this period of 20 seconds, the sowing shaft or the implement is regulated by the implement control system again.

### *4.11.2 Manual stop*


– Press this key to interrupt the seeding process.

The sowing shaft is not driven again until

- the lift sensor is switched on again
- the "Manual start" button is pressed

## 4.12 Section-width switch-off

The number of section widths can vary depending on the type of implement.


– Press the respective key to switch off the corresponding section width.




If a section width, e.g. is switched off for the first passage, the respective LED goes on. This is shown here by way of an examples for section widths 3 and 4.

Every 30 seconds, a reminder alarm is sounded when the section width is switched off.


If, after turning at the headland, the section width is not switched off, this display is shown with a reference code. The display disappears after confirmation.

This display is used to ask whether work is to be continued with the switched-off section width or not. If not, then the switched-off section widths must be switched on again by pressing the corresponding keys. Once switched on, the LEDs go off.

## 4.13 Tramline control

– Press this key to switch the current tramline forward when required.

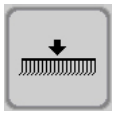
– Press this key to switch the current tramline back when required.


– Press this key to stop the tramline control.

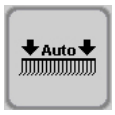
Tramline control has to be stopped, e.g. when the implement or the coulter bar is raised during a passage. Otherwise, the current track is shifted forward on implements, which are not equipped with a pressure switch for the lane scribers.

## 4.14 Sowing harrow

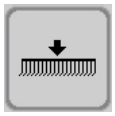
If the implement is equipped with a sowing harrow, the manual harrow actuation function or the automatic harrow actuation function is shown on the display, depending on what was selected in the Entry menu.



Manual harrow actuation




Automatic harrow actuation



– Press this key to raise or lower the harrow.

In automatic harrow actuation, the harrow is automatically raised when the implement is raised and automatically lowered when the implement is lowered. In automatic mode the harrow can also be manually raised and lowered again during a passage.

An arrow indicates whether the harrow is being raised or lowered:

- Arrow upwards = harrow raised.
- Arrow downwards = harrow lowered.

## 4.15 Automatic mode

**WARNING**

- Ask everyone to leave the implement's working range when the implement is put into operation.
- Ensure that an adequate safety distance is maintained to the lane scribers.
- Each raising and lowering of the implement sections results in the lane scribers being folded in and out. See also the implement's operating instructions.

In automatic mode the sequence control runs automatically. The soil-working implement, coulter bar and the lane scriber are actuated one after the other. The coulter bar is raised and lowered after the soil-working implement has been raised and lowered. The time interval is defined in the Setting menu.

If the "Fertiliser and drilling" option is switched on, the coulter bar is automatically actuated in the Automatic mode. It is raised at the same time as the seeding coulters and lowered again at the same time as the soil-working implement.

If the "Fertiliser and drilling" option is not switched on, the coulter bar for the fertiliser is carried along in raised state.

**CAUTION**

- The "Fertiliser and drilling" option should only be switched off when the coulter bar is completely raised.

If the "Fertiliser and drilling" option is deactivated when the fertiliser bar is lowered, the fertiliser bar remains lowered and is not raised too.

### Raising

If you set the corresponding control unit for the sequence control to "Raising", the soil-working implement and the lane scriber are raised at almost the same time. The coulter bar (and the leading roller with mounted coulter bar – option) is raised. The coulter bar is raised until the preset position is reached. Five brief signal tones indicate that the position has been reached. After the signal the control unit is then to be set to the neutral position.

### Lowering

If you set the corresponding control unit for the sequence control to "Lowering", the soil-working implement and the lane scriber are lowered at the same time. The coulter bar (and the leading roller with mounted coulter bar – option) is lowered. Five brief signal tones indicate that the process has been completed. After the signal the control unit is then to be set to the neutral position. The preset coulter pressure (and roller pressure) are then adapted.

## 4.16 Solo operation of lane scribers

**WARNING**

Never stand in the extending range of the lane scriber!

- Extended, deactivated lane scribers are retracted when the control unit is actuated, although they are deactivated.
- Retracted, activated lane scribers are extended, although the control unit was not actuated.
- depending on the control system involved, a renewed activation or deactivation of the lane scribers can result in the lane scribers being retracted.

In the automatic and manual operating modes it is possible, e.g. to retract the lane scribers for avoiding obstacles.

### *4.16.1 Solo operation of the lane scribers with folding implements*

Irrespective of the chosen operating mode and settings for the lane scribers, it is possible to control the lane scribers as follows:


– Press this key to select the left lane scriber.


– Press this key to select the right lane scriber.

The selected lane scriber is indicated by an LED in the key.

– Actuate the control unit to retract or extend the selected lane scriber.

The lane scriber selection is deactivated and the LED goes out:

- Automatically after 16 seconds
- Through repeatedly pressing the key

### *4.16.2 Deactivating lane scribers during a passage:*

The soil-working implement and the coulter bar are extended.


– Press this key to deactivate the lane scriber. At the same time the soil-working implement and die coulter bar are deactivated.

When the lane scribers are deactivated, the lane scribers can be retracted, but not extended.


The symbol for the deactivated function then appears.

– Actuate the control unit to retract the lane scriber.

Only the lane scriber is retracted. The soil-working implement and the coulter bar remain in the lowered working position. Once the obstacle has been passed you can extend the lane scriber again.


– Press this key to extend the lane scribers again, and to activate the sequence control.


The symbol for the activated function then appears.

**for rigid implements:**
The lane scriber extends again without actuating the control unit.

**for folded implements:**
Actuate the control unit to extend the lane scriber.

The lane scriber is activated again the next time the implement is raised.

In Automatic mode with lowered soil-working implement and lowered coulter bar after deactivating the lane scriber, the lane scriber, the soil-working implement and the coulter bar are all deactivated.

### *4.16.3 Deactivating lane scribers at the headland*

The soil-working implement and the coulter bar are raised.


– Press this key to deactivate the lane scriber.


The symbol for the deactivated function then appears.

Actuate the specified control unit to lower the soil-working implement and the coulter bar.

The deactivated lane scriber remains retracted. Once the obstacle has been passed you can extend the lane scriber again.


– Press this key to activate the lane scriber.


The symbol for the activated function then appears.

**for rigid implements:**
The lane scriber extends again without actuating the control unit.

**for folded implements:**
Actuate the control unit to extend the lane scriber.

The lane scriber is activated again the next time the implement is raised.

In Automatic mode with raised soil-working implement and raised coulter bar after deactivating the lane scriber, only the lane scriber is deactivated.

## 4.17 Manual operation

**WARNING**

- Ask everyone to leave the implement's working range when the implement is put into operation.
- Ensure that an adequate safety distance is maintained to the lane scribers.
- Each raising and lowering of the implement sections results in the lane scribers being folded in and out. See also the implement's operating instructions.

To deactivate the soil-working implement, the coulter bar or the lane scriber, the manual operating mode must be selected.

If the manual operating mode has been selected, the activated soil-working implement and activated coulter bar are always raised together, and the activated lane scriber is also actuated.

It is possible to deactivate the following implements thereby making them inactive:

- the soil-working implement
- the coulter bar
- the lane scriber

This can be useful, e.g when avoiding obstacles on the field.

The lowered soil-working implement and the lowered coulter bar can also be deactivated and the lane scriber retracted. The working position of the soil-working implement and the coulter bar is not influenced. It is therefore not necessary to interrupt the tilling work.

After extending the retracted lane scriber a switch can be made to the automatic operating mode.

It is also possible to deactivate the raised coulter bar, in order to initially prepare the field during the passage for seeding.

### 4.17.1 Deactivating soil-working implement


– Press this key to enter the Manual mode.


The Manual operating mode symbol appears.


– Press this key to deactivate the soil-working implement.


The symbol for the deactivated function then appears.

### 4.17.2 Deactivating coulter bar


– Press this key to enter the Manual mode.


The Manual operating mode symbol appears.


– Press this key to deactivate the coulter bar.


The symbol for the deactivated function then appears.

If the "Fertilising and drilling" option is switched on, then the coulter bar for the fertiliser is also deactivated.

The coulter bar is automatically switched off when the configured coulter pressure is reached.

### 4.17.3 Deactivating lane scribers


– Press this key to enter the Manual mode.


The Manual operating mode symbol appears.


– Press this key to deactivate the lane scriber.


The symbol for the deactivated function then appears.

The extended lane scriber is then retracted, but not extended again.

### *4.17.4 Lane scriber folding method*

Lane scriber operation can be individually selected.


The lane scriber is set to the Automatic mode. The lane scribers are alternately retracted and extended.

– Press this key to switch the lane scriber to the Manual mode.


The lane scriber is set to the Manual mode. Only the left or right lane scriber is retracted and extended.

– Press this key to switch the lane scriber to the Automatic mode.

### *4.17.5 Selecting lane scribers*

The right, the left or both lane scribers can be retracted and extended.


Only the left lane scriber is retracted and extended.

– Press this key to select the right lane scriber.

– Press this key longer to select both lane scribers.


Only the right lane scriber is retracted and extended.

– Press this key to select the left lane scriber.

– Press this key longer to select both lane scribers.


The left and right lane scriber are extended.

– Press this key to select the left or right lane scriber.

## 4.18 Levelling work tines section

The operating height of the levelling work tines section can be adjusted when the implement is in its working position.

When turning at the headland the levelling work tines section is automatically swivelled upwards. After turning the levelling work tines section swivels automatically back in to the working position.

Press this key to lower the levelling work tines section.

Press this key to raise the levelling work tines section.

## 4.19 Other displays in Operating menu

The electric motor is not regulated, e.g. when it has no speed rating, when the implement is raised or when the electric motor's set value and actual value match.

The motor is regulated up and down until the adapted speed is reached.

Indicates malfunction, warning or information, e.g. when the minimum permissible blower speed is dropped below or the maximum permissible blower speed is exceeded if the level sensor indicates that the level is too low.

This is always shown with a graphical display and a code.

Implement sensor has switched, e.g. with raised implement.


Auto Stop sensor actuated

Everything OK. No faults.

No warnings or information shown.

Notice that the alarm functions have been deactivated.

## 4.20 Sowing pipe monitoring

### *4.20.1 General information*

Sowing pipe monitoring is used - depending on the implement's equipment specification - to monitor tramlines, spreaders (section widths) or the tramlines and spreaders (section widths) together.

Each installed sowing pipe monitor can be seen on the implement setting display


Tramline monitoring version


Spreader monitoring (section widths) version


Combined tramline and spreader monitoring (section widths) version

The sowing pipe monitoring is automatically actuated, when the implement is in the working position and seed is being metered.

### *4.20.2 Tramline monitoring*


In the tramline monitoring version, all given tramline rows are specifically monitored. If, when the tramline is not switched on, there is no flow of seed, this error message is shown, as well as for any seed flow and switched-on tramline. If the implement is equipped with a section width circuit, the tramline monitoring is not active when a section width is activated.

### *4.20.3 Spreader monitoring (section width monitoring)*

In this version one seeding row per spreader (section width) is monitored. This enables blockages in the spreaders to be detected quickly. Spreader monitoring is also useful when used to inspect the proper function of an optional section width circuit. In other words, when the section width is activated, the relevant sowing pipe must not measure any flow of seed and vice versa.

# 5 CALIBRATION MENU

## 5.1 General information

– Press this key to enter the Calibration menu .

If the "Fertilising and drilling" option is switched on, then an additional calibration test sample has to be run for the fertiliser.


– Press this key to enter the Calibration menu for seed.


– Press this key to enter the Calibration menu for fertiliser.

In the Configuration menu

- the seed to be sown is selected by a code number,
- the required seed rate quantity is entered and
- after entering the weight of the configured seed rate quantity, the electronic seed drill control system is automatically adjusted to match the required seed rate quantity.

Prepare the implement as described in the operating instructions before carrying out a calibration test sample.

Once the calibration test sample is started it must be completely run through until it reaches the result display. See section on "Result". If the calibration test sample is interrupted an alarm is issued along with code A41. The alarm(s) must be confirmed by repeated pressing of the confirmation key and the calibration test sample conducted again. See section on "Entering code for seed" up to "Result".

A suitable set of scales must be used for weighing the calibration test sample. The scales must be calibrated beforehand and checked for accuracy. This also applies to scales delivered along with the seed drill. In case of doubt, only calibrated scales may be used.

## 5.2 Converting grains/sq. m. into kg/ha

The required seed rate quantity must be entered as kg/ha in the Calibration menu. To enter a seed rate quantity as grains per sq. m., the required seed rate quantity can be calculated in kg/ha as follows.

– Press this key to enter the Information menu.

– Press this key to call up the "Pocket calculator".

– Press the key after this display.

– Enter the required seed rate quantity in grains/sq. m.

– Confirm the entry.

– Press the key after this display.

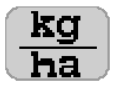
– Enter the result in thousand-seed weight grams.

– Confirm the entry.

– Press the key after this display.

– Set the germination capacity as a %.

– Confirm the entry.



This display shows the corresponding converted seed rate quantity value appears in kg/ha. This value is to be entered for the calibration test sample.

## 5.3 Calibration test sample

Once the calibration test sample is started it must be completely run through until it reaches the result is displayed. See section on "Result".

If the calibration test sample is interrupted an alarm is issued along with code A41. The alarm(s) must be confirmed by repeated pressing of the confirmation key and the calibration test sample conducted again. See section on "Entering code for seed" up to "Result".

A suitable set of scales must be used for weighing the calibration test sample. The scales must be calibrated beforehand and checked for accuracy. This also applies to scales delivered along with the implement. In case of doubt, only calibrated scales may be used.


– Press this key to start the Calibration program.

The pressed key goes out.

The calibration test sample is to be run in the following steps.

- Entering seed code number
- Entering seed rate quantity
- Filling seed wheels
- Entering calibration time
- Starting calibration time sample
- Enter calibrated seed quantity

Once completed the calibration test sample is displayed. The calibration test sample can be repeated for checking purposes.

The entered seed rate quantity can be altered in the Configuration menu. The data are recalculated here.

### *5.3.1 Entering seed code number*

The code number for the seed to be used for sowing is available in the table.

| **Seed** | |
|---|---|
| Corn | 1 |
| Peas | 2 |
| Beans | 3 |
| Rape and fine seed | 4 |
| Grass | 5 |


– Press this key.

– Enter the code number for the seed to be used for sowing.

– Confirm the entry.

This key is not shown in the Calibration program for the fertiliser option. The code number for the fertiliser option is not applicable here.

### *5.3.2 Entering seed rate*

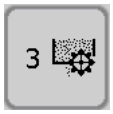

– Enter the required seed rate (kg/ha) between 0.5 kg/ha and 500 kg/ha.

– Confirm it.

See section on "Converting grains/sq. m. into kg/ha".

### *5.3.3 "Filling" seed wheels*

– Move the implement's calibration tray into position.




– Press this key.

The sewing wheels are now "filled" with seed. Depending on the set code number, 1 to 5, this procedure can take from 10 to 25 seconds.

– Drain the implement's calibration tray.

– Move it back into position.

### *5.3.4 Calibration time*


This key shows a proposed calibration time that - depending on the selected code number - causes the calibration tray to be filled to approx. 75 %. This requires the sewing wheels to be switched on or off in accordance with the sewing table. Corn is calibrated, e.g. for 60 seconds and fine seed for 300 seconds.

The proposed calibration time can be altered, if required.

– Press this key to change the proposed calibration time.

– Enter the required calibration time.

– Confirm the entry.

### *5.3.5 Starting calibration time sample*

All required settings have been made.


– Press this key to run the Calibration program.

### *5.3.6 Entering calibrated seed quantity*

After starting the calibration sample test, the calibration time countdown

starts. At the same time the counted motor pulses are added up.

After the drive motor has stopped:

– Weigh the calibrated seed quantity.


– Press this key.

– Enter the result in grams.

– Confirm the entry.

A value less than 100 g and more than 30000 g will not be accepted. The gram/impulse value = g/Imp is calculated after entering the result, whereupon the control system is then adjusted accordingly.

This then completes the calibration test sample.

### *5.3.7 Result*

The display now shows the adjusted and selected data along with the possible minimum and maximum operating speeds, e.g. 0.52 km/h and 15.1 km/h.

If an unrealistic or unfavourable speed range appears, this is then indicated on the display by means of a reference code.

If a speed range is shown that is too high or too low, then a new calibration test sample must be conducted, and it has to be conducted using another setting for the proportioning seed wheel.

Displayed speed range too high:

– Switch off one or more seed wheels.

Displayed speed range too low:

– Switch on one or more seed wheels.

The speed range is regarded to be ideal, when the upper value is approx. 25 % above the desired operating speed.

Desired operating speed, e.g.: 12 km/h, max. speed = 15 km/h.

A calibration test sample has to be conducted if the seed wheels are switched on or off.

## 5.4 Repeating calibration test sample (calibration test sample monitor)

A shortened calibration test sample can be conducted

- to check the executed calibration test sample
- with the same seed and the same seed rate quantity for the last calibration test sample and filled sewing wheels

– In the Calibration menu press this key for at least 2 seconds.

– Run the calibration test sample as described from the "Calibration period" to "Result" 42 page.

## 5.5 Changing seed rate quantity

In order to change the seed rate quantity a calibration test sample must have been performed beforehand. The values of the last calibration test sample are retained in the control system after it is switched off.

It is not necessary to repeat the calibration test sample.

– Press this key for at least 2 seconds to change the seed rate quantity kg/ha in the Calibration menu.


– Enter the new required seed rate quantity in kg/ha.

– Confirm the entry.

After this entry, the display shows the altered data and the new minimum and maximum operating speed options. See "Result" page 44.

# 6 ENTRY MENU

## 6.1 General information

– Press this key to enter the Entry menu .

The following entries and settings are required or can be selected in the sub-menus:

Tramline menu

- Tramline rhythm
- Field boundary side
- Hectare counting with tramlines


Hectare counter

- Reset hectare counter (area, day, season) to zero

Tank menu

- Enter added seed quantity
- Set residual quantity to zero
- Set seeded seed quantity to zero

Blower monitoring

- Enter minimum permissible speed
- Enter maximum permissible speed


Wheel calibration in mm/pulse

- Manual entry
- 100 m calibration


Adjusting the sowing quantity

- Entry of increment values for percentage change to seed rate quantity.
- When the "Fertilising and drilling" option is switched on, the increment value for the percentage spread rate for the fertiliser can also be entered here

Alarm functions

- Switch alarm functions on and off
- Enter minimum permissible residual quantity in hopper.

Harrow guide actuation

- Select manual operation
- Select automatic operation

Spotlights

- Switch on
- Switch off

Cardan shaft monitoring

- Enter minimum permissible cardan shaft speed
- Enter permissible period of time with which the speed may be dropped below


Partial-area specific seed rate over GPS

- Switching function on and off


Fertilising and drilling (option)

- Switching on "Fertilising and drilling" option. Both seed and fertiliser can be spread.
- Switching off "Fertilising and drilling" option. Only seed can be spread.


Time management for sequential circuit

- Enter time delay - Raise coulter bar to soil-working implement
- Enter time delay - Lower coulter bar to soil-working implement

Retracting and extending function (option)

- Coulter bar and heliodor section / circular spike harrow
- Tyre packer


Lane scriber operation (option)

- Enter period – Enable control system after starting lane scriber folding function.

Interval tramline control (option)

- Configuring sown and non-sown area in the tramline

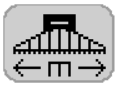
## 6.2 Tramline menu

The following displays and functions can be called up in the Tramline menu:

- Cultivator working width
- Hectare counting with tramlines
- Straight rhythm, type of passage

– Press this key to enter the Tramline menu.

### *6.2.1 Cultivator working width*




– Press the key after this display.

– Enter the cultivator's working width.

– Confirm the entry.

The cultivator working width can be entered in increments of 0.5 m. If a tramline is not to be made, a working width of 0.0 m must be entered.

After entering the cultivator's working width the control system calculates the tramline rhythm.


This display shows the calculated tramline rhythm.

### *6.2.2 Hectare counting with tramlines*

Hectare counting with tramlines can be counted as follows:

- the total area with the tramline ducts or
- the total area actually sown (total area minus tramline ducts)


This display indicates that the total area with the tramline ducts is counted by the hectare counter.


This display indicates that only the area actually sown is counted by the hectare counter.

– Press this key to change to hectare counting.

### *6.2.3 Straight tramline rhythm, type of passage*

If a straight rhythm is calculated, the tramline can be made in a single passage or in two passages.


In this display the tramline is made in a single passage.

An initial passage with half the width of the implement is required if a tramline with a single passage is to be applied.

In this display the tramline is made in two passages.

It is only possible to choose to make the tramlines in two passages if the implement is equipped with a tramline shifting element with 4x2, 4x3 or 4x4 tramlines.


– Press this key to change the type of passage.

When changing from a straight rhythm to an uneven rhythm make sure that you adapt the advance marking.

When changing from an uneven to a straight rhythm, an alarm is sounded and the code A46 is shown in the touch screen. This indicates that the first track has to be run at half the width of the implement. This alarm has to be confirmed.

### *6.2.4 Tramline rhythm*

The tramline rhythm depends on:

- the working width of each cultivator combination
- the cultivator working width
- the given tramline system

## Tramline system 2x2, 2x3 and 2x4

| Working width | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 6.00 | 8.00 | 9.00 | 10.00 | 12.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cultivator working width | | | | | | | | | | |
| 0 | | | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | 1.00 | | | | | | | | | |
| 4 | | | 1.00 | | | | | | | |
| 4.5 | | | | 1.00 | | | | | | |
| 5 | | | | | 1.00 | | | | | |
| 6 | 2.00 | | | | | 1.00 | | | | |
| 7 | | 2.00 | | | | | | | | |
| 8 | | | 2.00 | | | | 1.00 | | | |
| 9 | 3.00 | | | 2.00 | | | | 1.00 | | |
| 10 | | | | | 2.00 | | | | 1.00 | |
| 10.5 | | 3.00 | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | 4.00 | | 3.00 | | | 2.00 | | | | 1.00 |
| 13 | | | | | | | | | | |
| 13.5 | | | | 3.00 | | | | | | |
| 14 | | 4.00 | | | | | | | | |
| 15 | 5.00 | | | | 3.00 | | | | | |
| 16 | | | 4.00 | | | | 2.00 | | | |
| 17 | | | | | | | | | | |
| 18 | 6.00 | | | 4.00 | | 3.00 | | 2.00 | | |
| 19 | | | | | | | | | | |
| 20 | | | 5.00 | | 4.00 | | | | 2.00 | |
| 21 | 7.00 | 6.00 | | | | | | | | |
| 22 | | | | | | | | | | |
| 22.5 | | | | 5.00 | | | | | | |
| 23 | | | | | | | | | | |
| 24 | 8.00 | 7.00 | 6.00 | | | 4.00 | 3.00 | | | 2.00 |
| 25 | | | | | 5.00 | | | | | |
| 26 | | | | | | | | | | |
| 27 | 9.00 | | | 6.00 | | | | 3.00 | | |
| 28 | | 8.00 | 7.00 | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | 10.00 | | | | 6.00 | 5.00 | | | 3.00 | |
| 31 | | | | | | | | | | |
| 31.5 | | 9.00 | | 7.00 | | | | | | |

| Working width | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 6.00 | 8.00 | 9.00 | 10.00 | 12.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cultivator working width | | | | | | | | | | |
| 32 | | | 8.00 | | | | 4.00 | | | |
| 33 | 11.00 | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | 10.00 | | | 7.00 | | | | | |
| 36 | 12.00 | | 9.00 | 8.00 | | 6.00 | | 4.00 | | 3.00 |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | 13.00 | | | | | | | | | |
| 40 | | | 10.00 | | 8.00 | | 5.00 | | 4.00 | |
| 40.5 | | | | 9.00 | | | | | | |
| 41 | | | | | | | | | | |
| 42 | 14.00 | 12.00 | | | | 7.00 | | | | |
| 43 | | | | | | | | | | |
| 44 | | | 11.00 | | | | | | | |
| 45 | 15.00 | | | 10.00 | 9.00 | | | 5.00 | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | 16.00 | | 12.00 | | | 8.00 | 6.00 | | | 4.00 |
| 49 | | 14.00 | | | | | | | | |
| 49.5 | | | | 11.00 | | | | | | |
| 50 | | | | | 10.00 | | | | 5.00 | |
| 51 | 17.00 | | | | | | | | | |
| 52 | | | 13.00 | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | 18.00 | | | 12.00 | | 9.00 | | 6.00 | | |
| 55 | | | | | 11.00 | | | | | |
| 56 | | | 14.00 | | | | 7.00 | | | |
| 57 | 19.00 | | | | | | | | | |
| 58 | | | | | | | | | | |
| 58.5 | | | | 13.00 | | | | | | |
| 59 | | | | | | | | | | |
| 60 | 20.00 | | 15.00 | | 12.00 | 10.00 | | | 6.00 | 5.00 |

## Tramline system 4x2, 4x3 and 4x4

| Working width | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 6.00 | 8.00 | 9.00 | 10.00 | 12.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cultivator working width | | | | | | | | | | |
| 0 | | | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | 1.00 | | | | | | | | | |
| 4 | | | 1.00 | | | | | | | |
| 4.5 | 1.50 | | | 1.00 | | | | | | |
| 5 | | | | | 1.00 | | | | | |
| 6 | 2.00 | | 1.50 | | | 1.00 | | | | |
| 7 | 2.33 | 2.00 | | | | | | | | |
| 8 | 2.66 | | 2.00 | | | | 1.00 | | | |
| 9 | 3.00 | | | 2.00 | | 1.50 | | 1.00 | | |
| 10 | 3.33 | | 2.50 | | 2.00 | | | | 1.00 | |
| 10.5 | 3.50 | 3.00 | | 2.33 | | | | | | |
| 11 | | | | | | | | | | |
| 12 | 4.00 | | 3.00 | 2.66 | | 2.00 | 1.50 | | | 1.00 |
| 13 | | | | | | | | | | |
| 13.5 | 4.50 | | | 3.00 | | | | 1.50 | | |
| 14 | 4.66 | 4.00 | 3.50 | | | 2.33 | | | | |
| 15 | 5.00 | | | 3.33 | 3.00 | 2.50 | | | 1.50 | |
| 16 | 5.33 | | 4.00 | | | 2.66 | 2.00 | | | |
| 17 | | | | | | | | | | |
| 18 | 6.00 | | 4.50 | 4.00 | | 3.00 | | 2.00 | | 1.50 |
| 19 | | | | | | | | | | |
| 20 | | | 5.00 | | 4.00 | 3.33 | 2.50 | | 2.00 | |
| 21 | 7.00 | 6.00 | | 4.66 | | 3.50 | | 2.33 | | |
| 22 | | | 5.50 | | | | | | 2.20 | |
| 22.5 | 7.50 | | | 5.00 | 4.50 | | | 2.50 | | |
| 23 | | | | | | | | | 2.30 | |
| 24 | 8.00 | 7.00 | 6.00 | 5.33 | | 4.00 | 3.00 | 2.66 | | 2.00 |
| 25 | | | | | 5.00 | | | | 2.50 | |
| 26 | | | 6.50 | | | | | | | |
| 27 | 9.00 | | | 6.00 | | 4.50 | | 3.00 | | |
| 28 | | 8.00 | 7.00 | | | 4.66 | 3.50 | | | 2.33 |
| 29 | | | | | | | | | | |
| 30 | 10.00 | | 7.50 | 6.66 | 6.00 | 5.00 | | 3.33 | 3.00 | 2.50 |
| 31 | | | | | | | | | | |
| 31.5 | | 9.00 | | 7.00 | | | | 3.50 | | |

| Working width | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 6.00 | 8.00 | 9.00 | 10.00 | 12.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cultivator working width** | | | | | | | | | | |
| **32** | | | 8.00 | | | 5.33 | 4.00 | | | 2.66 |
| **33** | 11.00 | | | | | 5.50 | | | | |
| **34** | | | | | | | | | | |
| **35** | | 10.00 | | | 7.00 | | | | 3.50 | |
| **36** | 12.00 | | 9.00 | 8.00 | | 6.00 | 4.50 | 4.00 | | 3.00 |
| **37** | | | | | | | | | | |
| **38** | | | | | | | | | | |
| **39** | 13.00 | | | | | 6.50 | | | | |
| **40** | | | 10.00 | | 8.00 | 6.66 | 5.00 | | 4.00 | 3.33 |
| **40.5** | | | | 9.00 | | | | 4.50 | | |
| **41** | | | | | | | | | | |
| **42** | 14.00 | 12.00 | | | | 7.00 | | 4.66 | | 3.50 |
| **43** | | | | | | | | | | |
| **44** | | | 11.00 | | | | 5.50 | | | |
| **45** | 15.00 | | | 10.00 | 9.00 | 7.50 | | 5.00 | 4.50 | |
| **46** | | | | | | | | | | |
| **47** | | | | | | | | | | |
| **48** | 16.00 | | 12.00 | | | 8.00 | 6.00 | 5.33 | | 4.00 |
| **49** | | 14.00 | | | | | | | | |
| **49.5** | | | | 11.00 | | | | 5.50 | | |
| **50** | | | | | 10.00 | | | | 5.00 | |
| **51** | 17.00 | | | | | | | | | |
| **52** | | | 13.00 | | | | 6.50 | | | |
| **53** | | | | | | | | | | |
| **54** | 18.00 | | | 12.00 | | 9.00 | | 6.00 | | 4.50 |
| **55** | | | | | 11.00 | | | | 5.50 | |
| **56** | | 16.00 | 14.00 | | | | 7.00 | | | 4.66 |
| **57** | 19.00 | | | | | | | | | |
| **58** | | | | | | | | | | |
| **58.5** | | | | 13.00 | | | | 6.50 | | |
| **59** | | | | | | | | | | |
| **60** | 20.00 | | 15.00 | | 12.00 | 10.00 | 7.50 | 6.66 | 6.00 | 5.00 |

### *6.2.5 Field boundary side*

This display is shown wherever the field boundary side (left or right) is relevant for the selected tramline rhythm.

– Press this key to change the field boundary side.

## 6.3 Rhythm displays

As work is conducted, the following displays are shown in the Operating menu to match the rhythm entered:

**Uneven rhythm 3.00 L**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2-3 | 3-3 | 1-3 | 2-3 | 3-3 | 1-3 | 2-3 | 3-3 | 1-3 | 2-3 |

Example: 3-rhythm sequence, left field boundary side

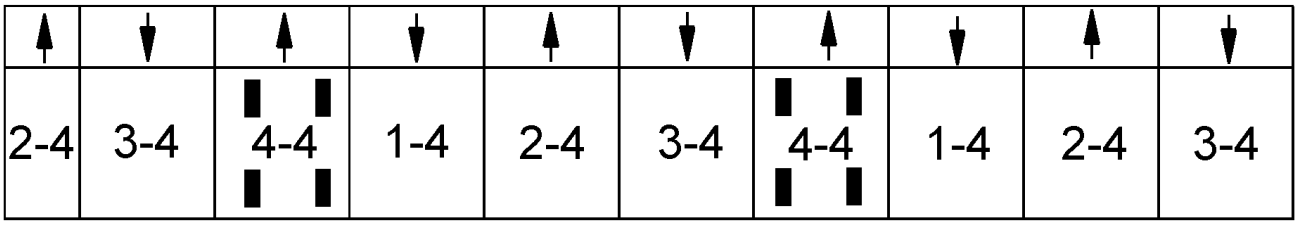
Tramline made in a 3-rhythm sequence in 3rd. track.

Tramline made in a 5-rhythm sequence in 5th. track.

Tramline made in a 7-rhythm sequence in 7th. track.

Tramline made in a 9-rhythm sequence in 9th. track.

**Straight rhythm 4.00 L, 1. Track with half width of implement 4.00 L**




Example: 4-rhythm sequence, left field boundary side

Tramline made in a 4-rhythm sequence in 4th. track.

Tramline made in a 6-rhythm sequence in 6th. track.

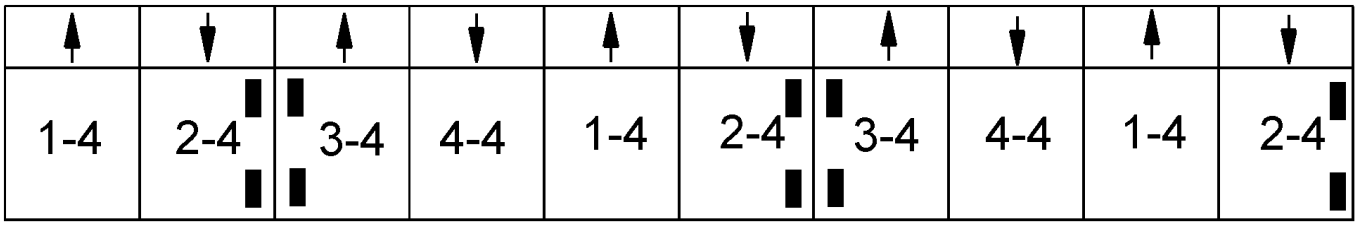
Tramline made in a 8-rhythm sequence in 8th. track.

Tramline made in a 10-rhythm sequence in 10th. track.

The first track has to be sown with half the width of the implement. To do so, the corresponding section widths must be switched off.

**CAUTION!** After the first track, the switched off section widths have to be switched back on again!

**Straight rhythm 4.00 L, tramline made in 2 tracks**




Example: 4-rhythm sequence

Tramline made in 2 tracks in the middle of the rhythm.

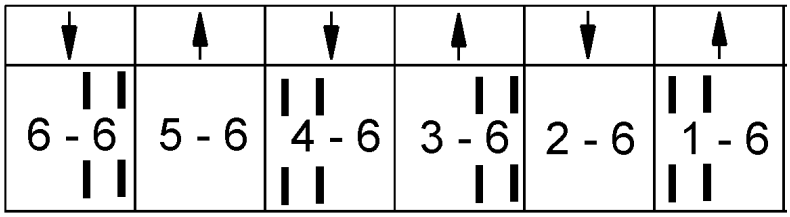
Tramline made in a 4-rhythm sequence in the 2nd. and 3rd. track.

Tramline made in a 6-rhythm sequence in 3rd. and 4th. track.

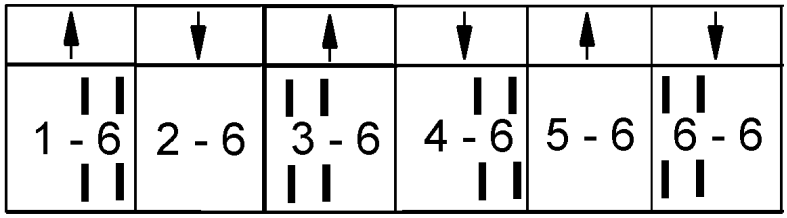
Tramline made in an 8-rhythm sequence in the 4th. and 5th. track.

Tramline made in a 10-rhythm sequence in 5th. and 6th. track.

**Rhythm 1.50 R**

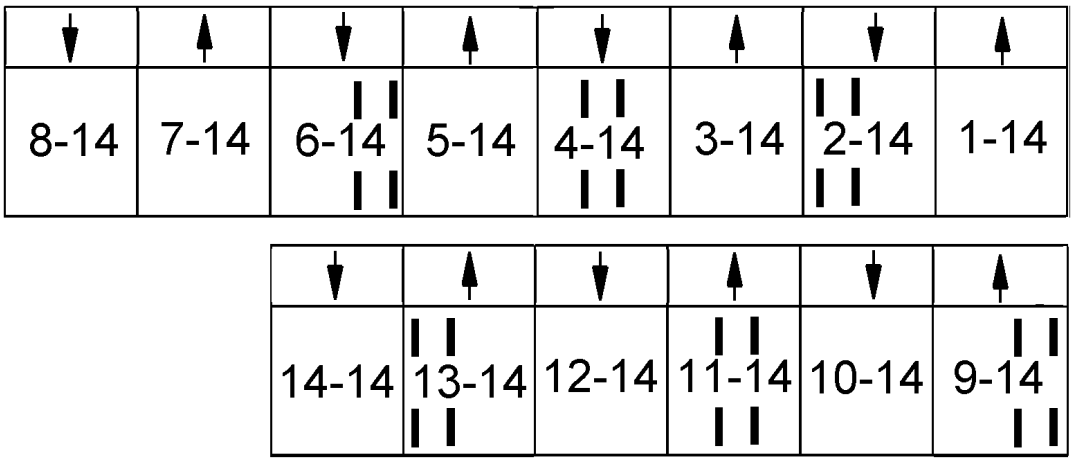



**Rhythm 1.50 L**

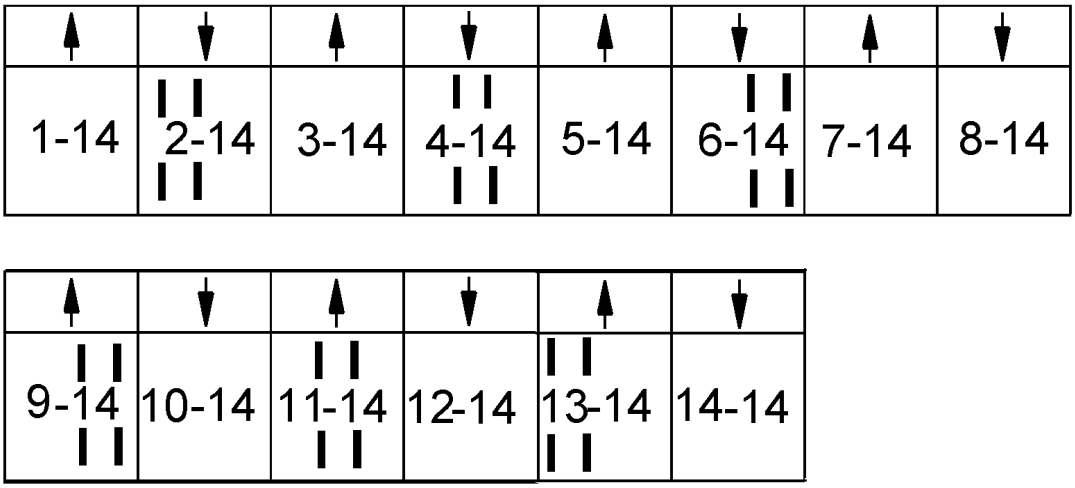



Example: 12 m seeder for 18 m cultivator

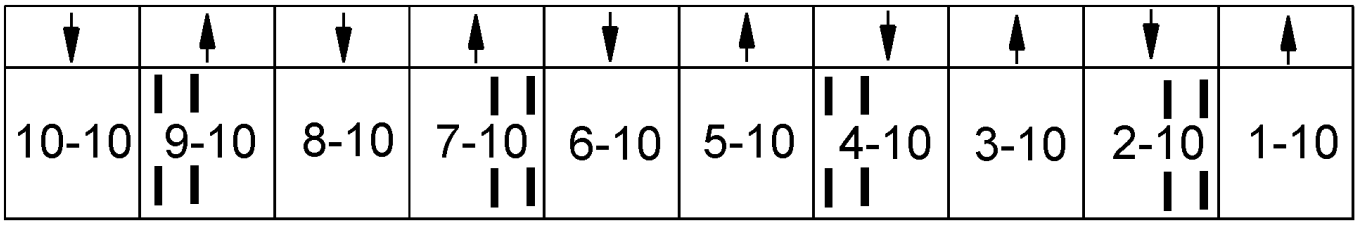
**Rhythm 2.33 R**



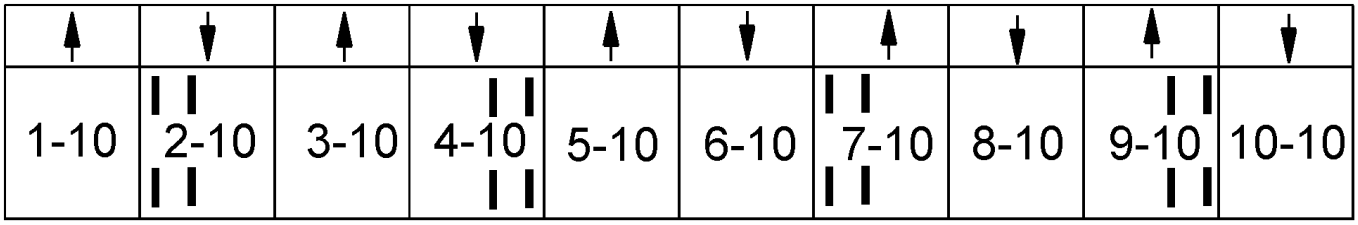

**Rhythm 2.33 L**



**Rhythm 2.50 R**

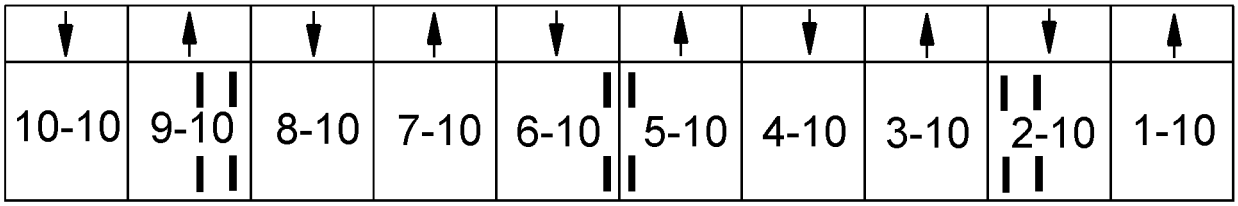



**Rhythm 2.50 L**

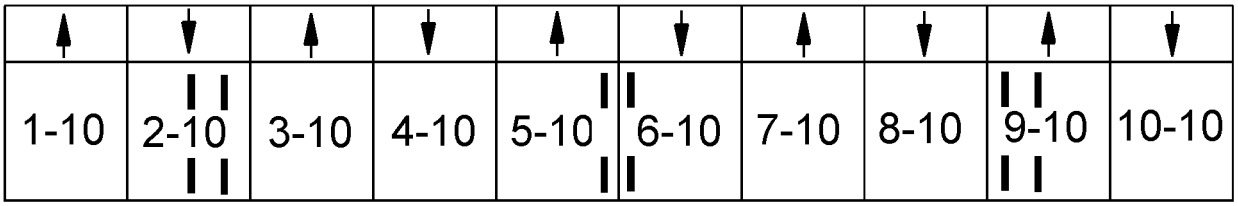



Example: 6 m seeder for 15 m cultivator or 4 m seeder for 10 m cultivator

**Rhythm 3.33 R**

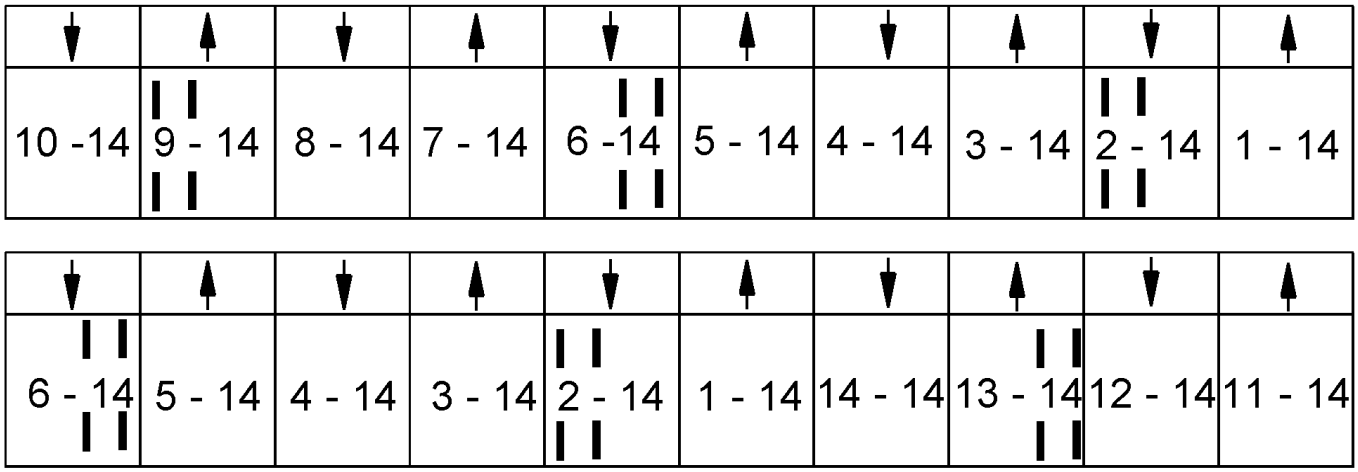



**Rhythm 3.33 L**

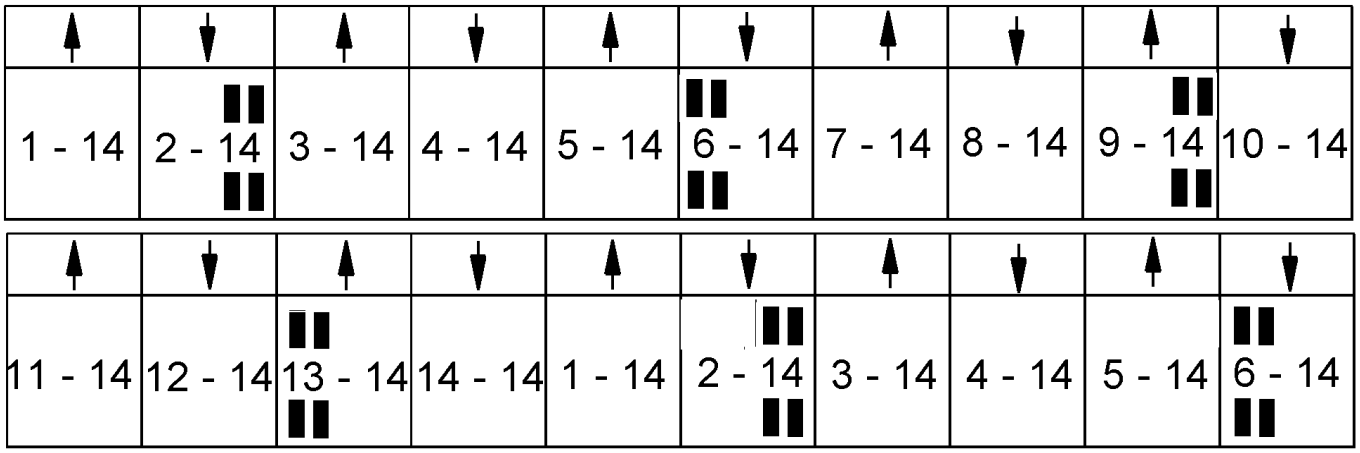



Example: 6 m seeder for 20 m cultivator or 9 m seeder for 30 m cultivator

**Rhythm 3.50 R**

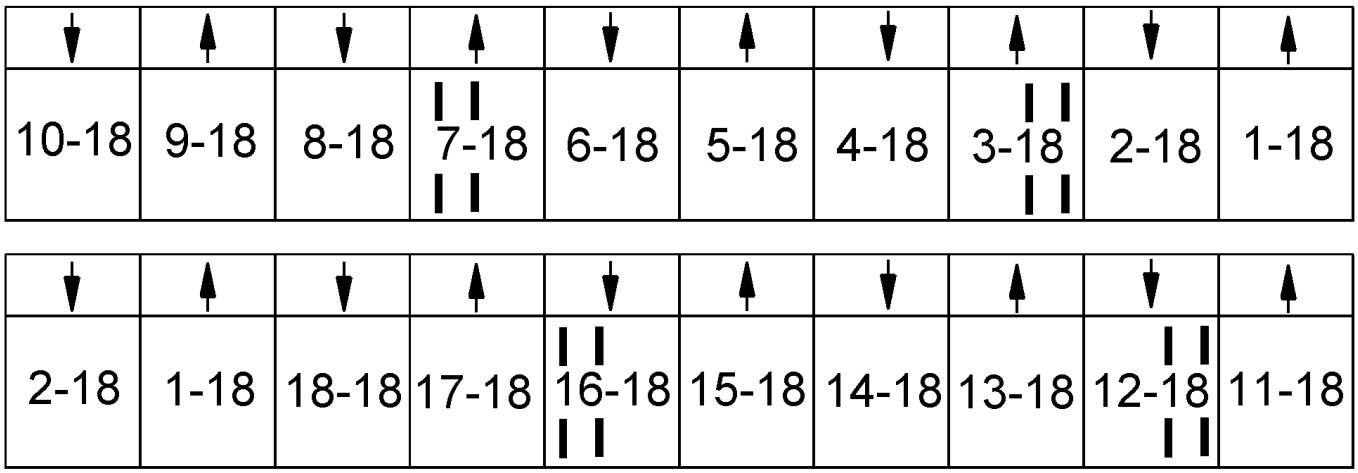



**Rhythm 3.50 L**

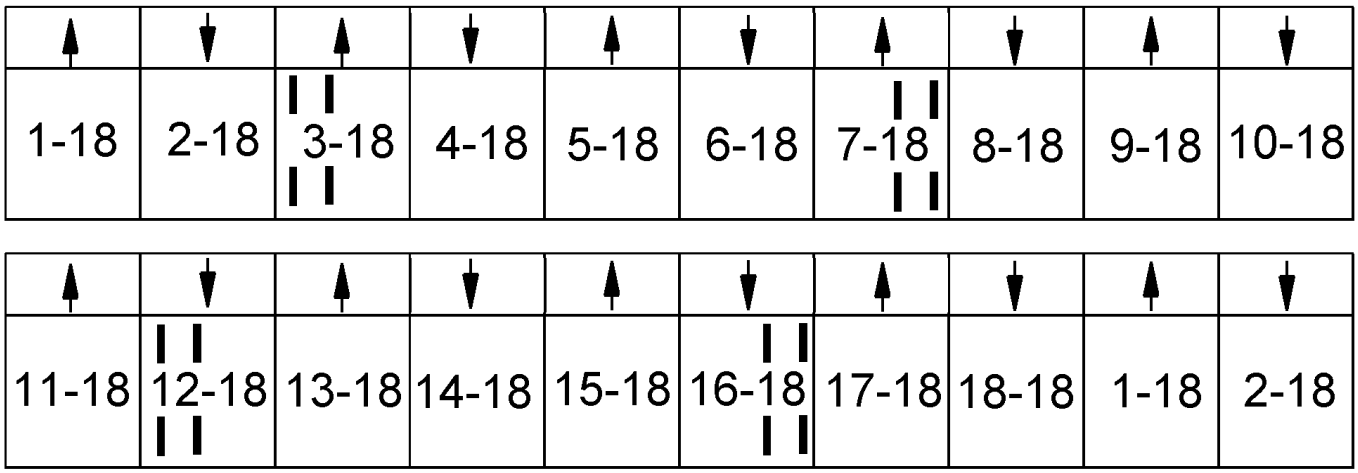



Example: 6 m seeder for 21 m cultivator

**Rhythm 4.50 R**

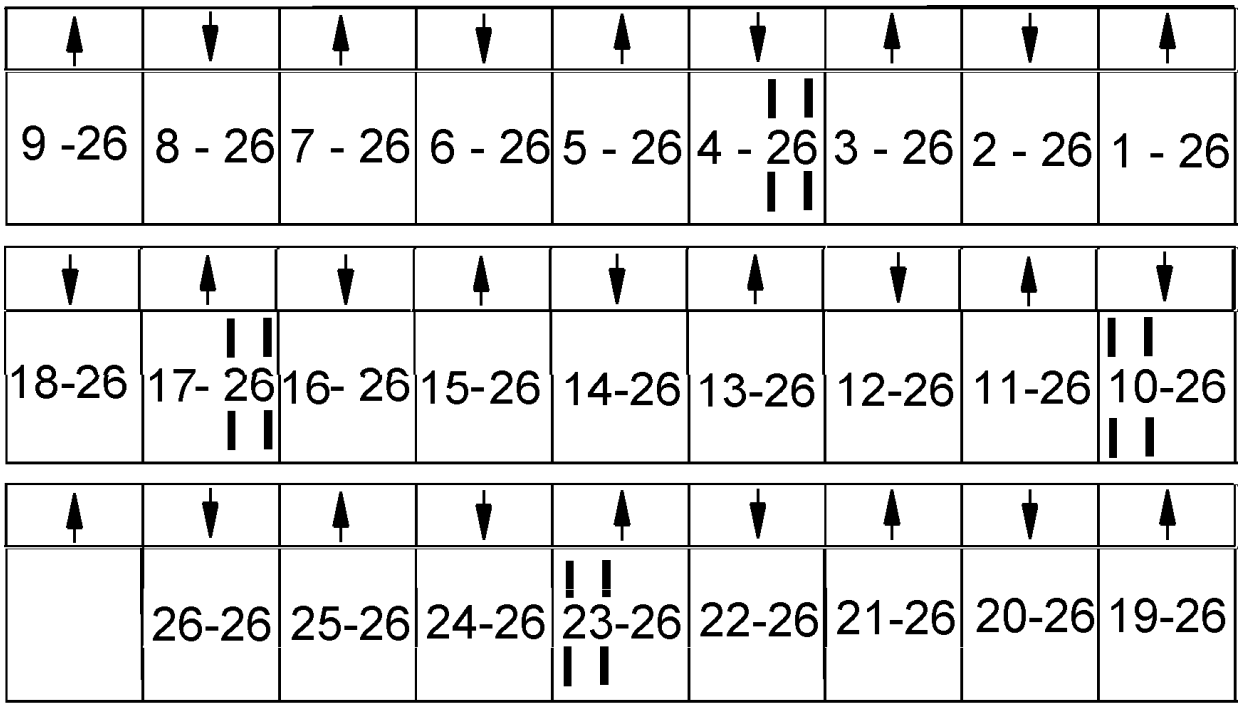



**Rhythm 4.50 L**

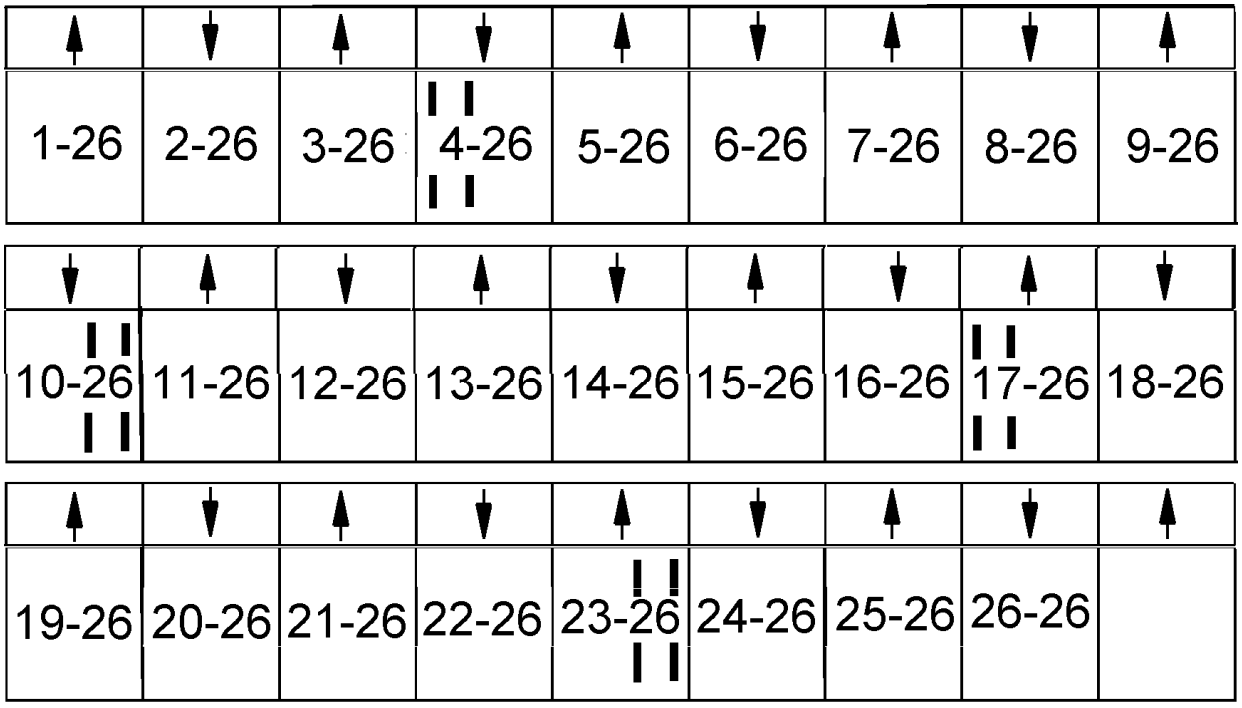



Example: 4 m seeder for 18 m cultivator or 6 m seeder for 27 m cultivator

**Rhythm 6.50 R**




**Rhythm 6.50 L**




Example: 6 m seeder for 39 m cultivator

## 6.4 Hectare counter

The following hectare counters can be called up:

- Field hectare counter
- Day hectare counter
- Annual hectare counter
- Total hectare counter

Each individual hectare counter, with the exception of the total hectare counter, can be set to '0'.


– Press this key to enter the Hectare menu.

The following hectare counters are displayed:

Field hectare counter


Day hectare counter


Annual hectare counter

Total hectare counter


– Press this key for 2 seconds to reset the field hectare counter to zero.


– Press this key for 5 seconds to reset the daily hectare counter to zero.


– Press this key for 10 seconds to reset the annual hectare counter to zero.

The total hectare counter cannot be reset to 0.

## 6.5 Tank menu

The following displays can be called up in the Tank menu through entering the added seed quantity:

- total added seed quantity
- total sown seed quantity
- calculated quantity left in tank

The individual quantity counters for the added seed quantity and the sown seed quantity can each be reset to 0 again.

– Press this key to enter the Tank menu.

– Press the key behind this display.

– Enter the added seed quantity in kg.

– Confirm the entry.

The following quantity data are displayed:

total added seed quantity

total sown seed quantity

calculated quantity left in tank

– Press this key to reset the annual seed quantity in the tank to zero.

– Press this key to reset the sown seed quantity to zero.

## 6.6 Blower monitoring

– Press this key to enter the Blower monitoring menu.

– Press the key after this display.


– Enter the minimum blower speed, at which if it is dropped below an alarm is issued.

– Confirm the entry.

Settings can be made in a speed range of 2500-3000 rpm.

– Press the key after this display.


– Enter the maximum blower speed, at which, if it is exceeded, an alarm is issued.

– Confirm the entry.

Settings can be made in a speed range of 3100-4500 rpm.

## 6.7 Wheel calibration in mm/pulse


– Press this key for 2 seconds to enter the Calibration menu.

### *6.7.1 Manual calibration*

– Press the key after this display.


– Enter the mm/Imp value.

– Confirm the entry.

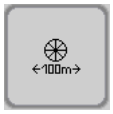
Depending on the impulse wheel and sensor design, the following values will have been entered at the factory:

- 90 mm/Imp for pressure roller with sensor (standard)
- 150 mm/Imp for steel wheel with sensor (option)

### *6.7.2 100 metre calibration*

Route calibration is used to calculate an exact value for each pulse wheel.

- Measure out an exact distance of 100 m on the field.
- Drive to the start mark.
- Lower the coulter bar.




- Press this key.
- Drive off.
- Stop at the finish line.


- Press this key.

The impulse wheel (pressure roller or steel wheel) or the travel measurement is now calibrated taking slip into consideration.

The following applies as a guide value:

- 90 mm/Imp for pressure roller with sensor
- 150 mm/Imp for steel wheel with sensor

## 6.8 Increment value menu - Changing the seed rate quantity


– Press this key to enter the Increment value menu.

If the "Fertilising and drilling" option is switched on, then a selection has to be made in advance as to whether the seed rate quantity should only be changed for the seed, only for the fertiliser or for seed and fertiliser.


– Press the key after this display to change between the setting function for seed, fertiliser or seed and fertiliser.


Seed


Fertiliser


Seed and fertiliser


– Press this key to enter the percentage increment value for changing the seed rate quantity.

The value can be varied between 1% and 20%.

## 6.9 Switching off alarm functions

– Press this key to enter the menu for switching off the alarms. Generally all the alarm functions are switched on.

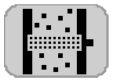

– Press the key after this display to switch the tank alarm on or off.

– Press the key before this display to enter the minimum quantity. If this minimum quantity is dropped below, a tank alarm is triggered.

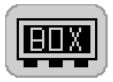
– Press the key after this display to switch the blower alarm on or off.

– Press the key after this display to switch the cardan shaft monitoring alarm on or off.

– Press the key after this display to switch the sowing shaft alarm on or off.



– Press this key after this display to switch the alarm for the sowing pipe monitor on or off.




– Press the key after this display to switch the coupling box alarm on or off.


Alarm function switched on


Alarm function switched off

After switching the control system on an off, the alarm functions are all switched on again.

## 6.10 Retracting/extending

All hydraulic and electrical connections must be connected to the tractor before retracting and extending.

| | |
|---|---|
| **WARNING** | Damage to the implement as a consequence of incorrect folding. |
|  | Non-observance of the sequence may end up damaging the implement. |
| | Always stick to the specified sequence when retracting and extending the implement. |

 – Press this key to enter the Entry menu.

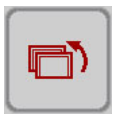
 – Scroll to the next page.

 – Press this key to enter the menu for retracting and extending.

If this is shown the implement has not been fully raised.

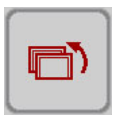
The implement has to be fully raised before retracting and extending.

A menu change is required to raise the implement.

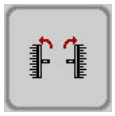
 – Press this key to return to the Main menu.

 – Press this key to change to the Operating menu.

– Use the control unit to raise the implement all the way.

 – Change back to the input menu.

– Press this key to choose whether the implement should be retracted or extended



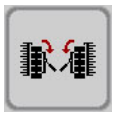
If this is shown the implement can be extended.

If this is shown the implement can be retracted.

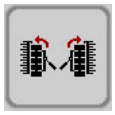
**WARNING**

– Observe the general safety instructions as well as the "Hydraulic" safety instructions.

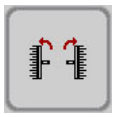
### 6.10.1 Extending



– If necessary, press this key to change to the extending function.



This signal indicates the "Extend" function.



– Press this key while simultaneously operating the control unit to extend the soil-working implement and the coulter bar.

– Press and hold the key until the soil-working implement and the coulter bar are completely extended.

This display is shown when you stop the extending function of the soil-working implement and the coulter bar.


– Press this key to confirm complete extending of the soil-working implement and the coulter bar.

– Press this key while simultaneously operating the control unit to extend the tyre packer.

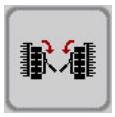
– Press and hold the key until the tyre packer is completely extended.

This display is shown when you stop the extending function for the tyre packer.


– Press this key to confirm complete extending of the tyre packer.

### *6.10.2 Retracting*

– If necessary, press this key to change to the retracting function.



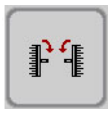
This signal indicates the "Retract" function.

– Press this key while simultaneously operating the control unit to retract the tyre packer.

– Press and hold the key until the tyre packer is completely retracted.

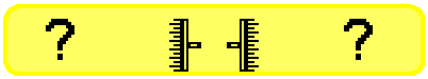
This display is shown when you stop the retracting function for the tyre packer.


– Press this key to confirm complete retracting of the tyre packer.



– Press this key while simultaneously operating the control unit to retract the soil-working implement and the coulter bar.

– Press and hold the key until the soil-working implement and the coulter bar are completely retracted.



This display is shown when you stop the retracting function of the soil-working implement and the coulter bar.


– Press this key to confirm complete retracting of the soil-working implement and the coulter bar.

## 6.11 Partial-area specific seed rate over GPS


– Press this key to enter the Entry menu for the partial-area specific seed rate over GPS.


– Press this key to switch the function on or off.

### *6.11.1 Interface*

The electronic control system is connected by means of a serial interface cable to the GPS receiver ("R" connection on body cable harness). In order to know which interface cable is required the GPS receiver must be known.

### *6.11.2 Seed rate quantity*

The calibration test sample is to be conducted as described in the "Calibration test sample" section. The average value of the scheduled seed rate quantity should be used here as a reference value.

Example: Lowest seed rate quantity: 120 kg/ha

Maximum seed rate quantity: 170 kg/ha

Average seed rate quantity value (reference value): (120 + 170) / 2 = 145 kg/ha

### *6.11.3 Receiving values from GPS receiver*

If a partial-area specific seed rate quantity is sent from the GPS receiver to the electronic control system, the seed rate quantity is then accepted during drilling.

GPS reception is indicated in each operating menu by showing this symbol.

The scheduled partial-area specific seed rate quantity can be matched to conditions at any given time. See "Adjusting seed rate quantity" section

### *6.11.4 Sending values to GPS receiver*

Here the seed rate quantity shown in the operating menus is forwarded to the GPS receiver. The data can be stored along with the GPS coordinates onto a storage medium and evaluated subsequently on the farmhouse PC.

## 6.12 Sequence control - Entering time delay


– Press this key to enter the menu for selecting time delay or sequence control.


– Press the key after this display.

– Enter the time delay for raising the coulter bar after the soil-working implement (adjustable from 0.1 – 10 seconds).

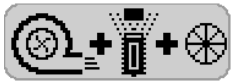
– Confirm the entry.


– Press the key after this display.

– Enter the time delay for lowering the coulter bar after the soil-working implement (adjustable from 0.1 – 10 seconds).

– Confirm the entry.


– Press this key to select the sowing shaft actuation.



When this is shown the sowing shaft starts to run as soon as the implement has been lowered, the blower is running and the impulse wheel turning.


When this is shown the sowing shaft starts to run as soon as the implement is lowered. This requires the blower to be running faster than the minimum blower speed.

The "Auto Stop" sensor is also activated (if mounted). The sowing shafts stops running as soon as this sensor switches, even when the implement sensor does not have any contact.

The rotational speed of the sowing shaft is geared towards the average value of the last passage. As soon as the impulse wheel touches the ground, the measured speed is adopted again for control.

## 6.13 Harrow function

– Press this key to enter the menu for selecting the harrow actuation.


– Press this key to switch between the "Manual" and "Automatic" operating modes.

Auto = Automatic actuation


Select this function if the harrow is to also be raised when the seed drill is raised, and also lowered when the bar is to be lowered again. Manual actuation is also possible during a passage.

Man = Manual actuation


This function is to be selected when the harrow is raised or lowered in the Operating menu by pushing a key.

The harrow can only be lowered or raised when the blower is running.

## 6.14 Spotlights

– Press this key to enter the Entry menu for the spotlights.


– Press this key to switch the spotlights on or off.


Spotlights switched on


Spotlights switched off

## 6.15 Cardan shaft monitoring

– Press this key to enter the Entry menu for the cardan shaft monitoring.


– Press the key after this display.

– Enter the minimum permissible speed, at which if it is dropped below an alarm is issued.

– Confirm the entry.


– Press the key after this display.

– Enter the time, at which an alarm is to be issued when the previously set speed is dropped below.

– Confirm the entry.

## 6.16 Lane scribers – Entering period


– Press this key to enter the menu for operating the lane scriber.

– Press the key after this display.


– Enter the period which the lane scriber requires for retracting and extending.

– Confirm the entry.

## 6.17 Interval tramline shifting

– Press this key to enter the Interval tramline shifting menu.

– Press the key after this display.

– Enter the interval value for the distance sown in a range of 10 to 99 metres.

– Confirm the entry.

– Press the key after this display.

– Enter the interval value for the distance not yet sown in a range of 10 to 99 metres.

– Confirm the entry.

The interval tramline shifting function can be switched on or off in the operating menu.

# 7 INFORMATION MENU

## 7.1 General information

The following displays and functions can be called up in the Information menu :

- Sensor test
- Software version
- Fault and code displays
- Hardware test
- Implement configuration
- Pocket calculator
- Calibration menu - Information

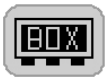
## 7.2 Sensor test


– Press this key to enter the Sensor test menu.

A 0 indicates that the respective sensor is not active. A 1 indicates that the respective sensor is active. If when switching the sensor a change from 0 to 1 or vice versa does not take place, then the sensor has to be replaced.

Implement combination folding sensor


Filling level sensor | A= seed | B= fertiliser




Coupling box signal

If a 0 appears the coupling box is OK. A 1 indicates a fault in the coupling box, e.g. fuse faulty.


Seed motor sensor


Fertiliser metering motor sensor


Seed sowing shaft sensor


Seed shaft sensor for fertiliser

Implement lifter sensor

A: Lift sensor | B: Stop sensor

Blower motor

Cardan shaft monitoring sensor

L: Left | R: Right


Impulse wheel sensor

## 7.3 Software version

– Press this key to display the implement's software version.

Menu pictures software version

Solitronic terminal software version


Gateway software version (equipped with ISOBUS)


Job computer software version

## 7.4 Fault and code displays

If a fault (information, warning, malfunction) is given, it is shown on the display as a code. The codes are all listed in diagnosis lists, together with a description of the fault, the reason for the fault and how to rectify it.

no fault present.

fault present.

### *7.4.1 Functional faults*

– Press this key when code A is shown to enter the Display menu for functional faults and malfunctions

This menu contains all fault codes in Group A. The type of fault (information, warning, malfunction), the reason for the fault and how to rectify it are available in the corresponding diagnosis lists.

In the event of a serious fault in the job computer, the lower display area shows a system code with a number, which has to be retained (e.g. memory fault or CAN error). This code must be communicated to the LEMKEN service employee to enable him/her to rectify it as quickly as possible. Example: SYSTEM CODE: 34.

### *7.4.2 Line fault*

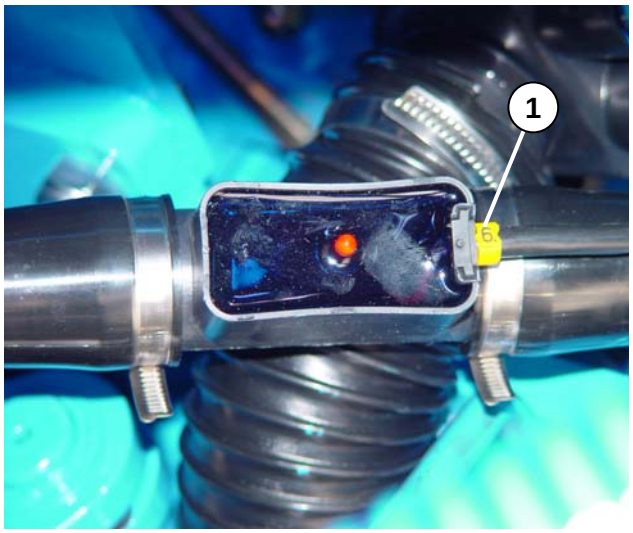
– Press this key for a B1X or B2X code in the Display menu for open circuits and short circuits.

This menu contains all fault codes in Group B. The type of fault, the reason for the fault and how to rectify it are available in the corresponding diagnosis lists.

### *7.4.3 Sowing pipe monitoring diagnosis*

Accurate diagnosis of the sowing pipe monitoring process can take place as soon as the A14 error message appears in the control terminal. To do so one changes to the Information menu for the electronic seed drill control.

– Press this key to enter the Entry menu for the sowing pipe monitoring.




Each seed flow sensor on the implement has been assigned a number (1).

This clearly indicates the row in which the error(s) is/are to be found. The error message "S06" also belong to sensor 6. During the fault analysis the respective state of the tramline control and the section width circuit must be considered, in other words, should seed have been flowing or not? The error messages do not disappear until a proper flow of seed is measured again.

### Hardware test


Each time the electronic seed drill control system is switched on, a hardware test of the sowing pipe monitor is performed. If an error should occur, this is shown as as follows.

The fault indicating window displays an A14 error message along with the total: 99.

## 7.5 Implement configuration

– Press this key to enter the Display menu for implement configurations.

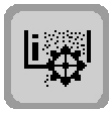
The following information is shown in this menu:

- Serial number
- Set working width
- Number of seeding coulters
- Number of return flows
- Configured mm/Imp of drive wheel
- Number of coulters in the tramlines
- Details on tramline setting
- Sowing pipe monitoring version (option)

## 7.6 Pocket calculator

– Press this key to call up the pocket calculator. See section on "Converting grains/sq. m. into kg/ha" page 39.

## 7.7 Calibration menu



– Press this key to call up the Calibration menu.


Code number for seed


Seed rate quantity


Pulse wheel value


Minimum working speed


Maximum working speed

If the "Fertiliser and drilling" option is switched on, the information for the Calibration menu on seed and fertiliser are shown separately.

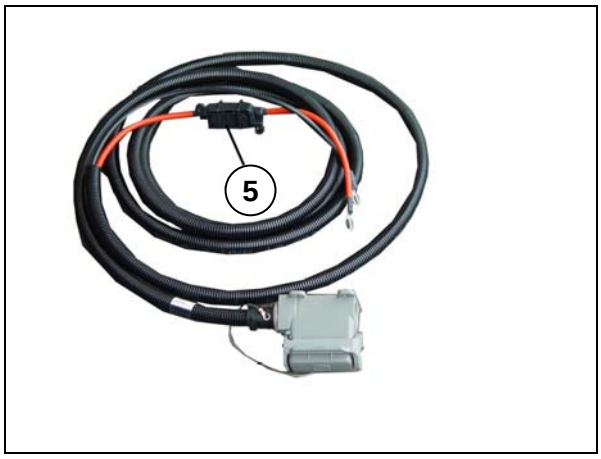

Information for seed Calibration menu

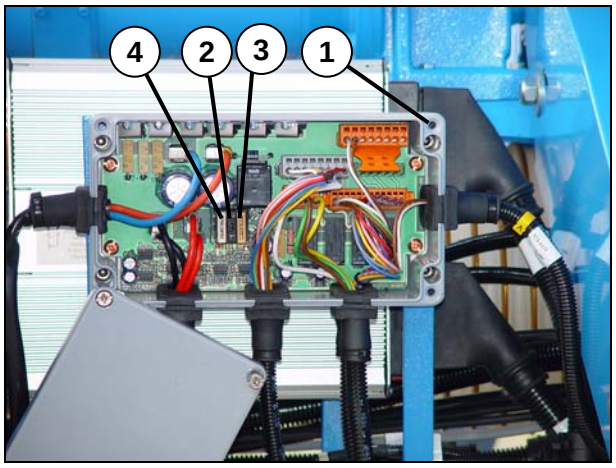
– Scroll forward to Calibration menu.


Information for fertiliser Calibration menu

## 8 FUSES

The electronic seed drill control system is equipped with a total of 4 fuses, which safeguard the system, coupling box (1) and the job computer (2) against overloading. The location of the fuses can be seen in the following figures.




| Fuse | Ampere |
|---|---|
| 2 | 1 |
| 3 | 5 |
| 4 | 25 |
| 5 | 40 |

# 9 DIAGNOSIS LISTS

## 9.1 Code displays

Depending on the operating status, the codes are shown on the touch screen for information, warnings and malfunctions.

| Code | Explanation |
|---|---|
| A40 - A46 | Information |
| A20 - A29 | Warnings |
| A01 - A15 | Malfunctions |
| B1X - B2X | Malfunctions |

The diagnosis lists below provide a detailed overview of the code group, fault description, possible reasons for faults and how to rectify them.

## 9.2 Information

| Code | Description | Possible cause | Remedial measures |
|---|---|---|---|
| **A40** | Tramline control | Selected tramline rhythm not possible | Select another tramline rhythm |
| **A41** | Calibration test sample faulty | Calibration test sample was not conducted properly | Perform new calibration test sample |
| **A42** | Possible working speed slightly too high | Calculated minimum working speed after calibration test sample too high | Switch off one sowing roller or several sowing rollers for each metering process and repeat the calibration test sample |
| **A43** | Possible maximum working speed too low | Calculated maximum working speed after calibration test sample too low | Switch-on one sowing roller or several sowing rollers for each metering process and repeat the calibration test sample |
| **A44** | Possible maximum working speed too high | Calculated maximum working speed after calibration test sample too high | Switch off one sowing roller or several sowing rollers for each metering process and repeat the calibration test sample |
| **A45** | Section width circuit active, one or more section widths switched off | Section widths still switched off | If necessary, switch section widths back on again |
| **A46** | Half width of implement | Start with half the width of the implement to get into the correct cultivation rhythm | Switch all deactivated section widths back on again after the first track. |

## 9.3 Warnings

| Code | Description | Possible cause | Remedial measures |
|---|---|---|---|
| **A20** | Minimum hopper capacity reached | Not enough seed in hopper | Add seed |
| **A21** | Maximum working speed reached | Working speed too high | Reduce working speed |
| **A22** | Minimum working speed reached | Working speed too low | Increase working speed |
| **A23** | Blower speed too high | | Reduce oil level through flow control valve (tractor/implement) |
| **A24** | Blower speed too low | | Increase oil level through flow control valve (tractor/implement) |
| **A25** | Circular spike harrow speed too slow | Circular spike harrow stopped<br>Cam shifting clutch activated | Rectify fault for switched-off power-take-off shaft and lowered tractor engine |
| **A26** | Hopper alarm | Level too low | Add seed |
| **A27** | Motor actual speed too low | Applied too quickly at start of field | Start slower |
| **A28** | Motor actual speed too high | | Drive slower |
| **A29** | Minimum start speed | Minimum start speed not reached, the seed rate kg/ha is set accordingly to a speed of 1.3 km/h. | Increase working speed to regulate the seed rate kg/ha as configured |

## 9.4 Malfunctions

| Code | Description | Possible cause | Remedial measures |
|---|---|---|---|
| **A01** | Emergency-stop chain interrupted | • Missing bus terminator<br>• EMERGENCY STOP switch pressed<br>• Faulty connector cable | • Fit bus terminator into place<br>• Release EMERGENCY STOP switch<br>• Repair 8-pin connector |
| **A02** | Faulty target-actual value comparison for motor speed | • "Motor" sensor faulty<br>• "Motor" sensor incorrectly set<br>• Cable harness defective | • Replace sensor<br>• Adjust sensor, distance 1.5 – 2.5 mm<br>• Repair or replace cable harness |
| **A03** | Battery voltage too high | • Wrong operating voltage<br>• Supply voltage from tractor too high | • Check tractor's electrical system |
| **A04** | Battery voltage too low | • Wrong operating voltage<br>• Supply voltage from tractor too low<br>• Power supply too low | • Check tractor's electrical system<br>• Check supply voltage lines |
| **A05** | Job computer with system error | • CAN hardware error<br>• CPU temperature too high<br>• Memory error | • LEMKEN Service |
| **A06** | Coupling box system error | • Faulty fuse in coupling box<br>• Master relay in coupling box defective (contact problems) | • Determine cause and replace fuse<br>• Replace fuse, if necessary |

| | | | |
|---|---|---|---|
| **A07** | Fertiliser sowing shaft<br>No pulse | • "Fertiliser sowing shaft" sensor defective<br>• "Fertiliser sowing shaft" sensor incorrectly set<br>• Drive chain faulty | • Replace sensor<br>• Adjust sensor, distance 1.5 – 2.5 mm<br>• Repair drive chain |
| **A08** | Seed sowing shaft, missing pulse | • "Seed sowing shaft" sensor defective<br>• "Seed sowing shaft" sensor incorrectly set<br>• Drive chain faulty | • Replace sensor<br>• Adjust sensor, distance 1.5 – 2.5 mm<br>• Repair drive chain |
| **A10** | Group signal open circuit on line | • No electrical connection to relevant component | • See B1X table |
| **A11** | Group signal short circuit | • Short circuit in electrical connection | • See B2X table |
| **A12** | Pulse count (travel) with raised implement | • "Implement lifter" is active during passage | • Re-adjust sensor position |
| **A13** | Software version incompatible | • Incompatible software version in job computer and control terminal | • LEMKEN Service |
| **A14** | Sowing pipe monitoring alarm | • Malfunction in one or more sowing pipes | • See page 81 |
| **A15** | Serial interface alarm | • Faulty connection to a GPS receiver | • Check cable connections, replace if necessary |
| **B1X** | Open circuit | • No electrical connection to relevant component | • See table: B1X |
| **B2X** | Short circuit | • Short circuit in electrical connection | • See table: B2X |

## 9.5 B1X – Open circuits

| Code | Output | Rigid implement<br>Description | Folding implement<br>Description | Remedial measures |
|---|---|---|---|---|
| **B01** | SA1 | Tramline signal 1 | Tramline signal 1 | Visual inspection |
| **B02** | SA2 | Tramline signal 2 | Tramline signal 2 | Visual inspection |
| **B03** | SA3 | Tramline signal 3 | Tramline signal 3 | Visual inspection |
| **B04** | SA4 | Tramline signal 4 | Tramline signal 4 | Visual inspection |
| **B05** | SA5 | Valve Y1<br>Heliodor section \| circular spike harrow | Valve Y3/Y4 Heliodor sections \| circular spike harrows | Visual inspection |
| **B06** | SA6 | Valve Y8<br>Fertiliser bar | | Visual inspection |
| **B07** | SA7 | Valve Y3<br>Left lane scriber | Valve Y8<br>Left lane scriber | Visual inspection |
| **B08** | SA8 | Valve Y4<br>Right lane scriber | Valve Y9<br>Right lane scriber | Visual inspection |
| **B09** | SA9 | Valve Y9<br>Fertiliser bar | | Visual inspection |
| **B10** | SA10 | Valve Y6<br>Coulter bar | Valve Y12<br>Coulter bar | Visual inspection |
| **B11** | SA11 | Valve Y7<br>Coulter bar | Valve Y13<br>Coulter bar | Visual inspection |
| **B12** | SA12 | Valve Y15<br>Profile run | Valve Y15<br>Profile run | Visual inspection |

| | | | | |
|---|---|---|---|---|
| **B13** | SA13 | | | Visual inspection |
| **B14** | SR | | | Visual inspection |
| **B15** | PA1 | PWM output, drive motor | PWM output, drive motor | Visual inspection |
| **B16** | PB1 | Harrow | Harrow | Visual inspection |
| **B17** | PA2 | Section width 1 | Section width 1 | Visual inspection |
| **B18** | PB2 | Section width 2 | Section width 2 | Visual inspection |
| **B19** | PA3 | Section width 3 | Section width 3 | Visual inspection |
| **B20** | PB3 | Section width 4 | Section width 4 | Visual inspection |
| **B21** | PA4 | | | Visual inspection |
| **B22** | PB4 | | | Visual inspection |
| **B23** | PA5 | | | Visual inspection |
| **B24** | PB5 | | | Visual inspection |
| **B25** | PA6 | | Valve Y32<br>Levelling work tines section | Visual inspection |
| **B26** | PB6 | | Valve Y14<br>Oscillation | Visual inspection |

| | | | | |
|---|---|---|---|---|
| **B27** | PB7 | | Valve Y1 / Y2<br>Soil cultivating folding | Visual inspection |
| **B28** | PA7 | | Valve Y17 / Y18<br>Tyre packer folding | Visual inspection |
| **B29** | PA8 | | Valve Y7<br>Left / right lane scriber | Visual inspection |
| **B30** | PB8 | | | Visual inspection |

## 9.6 B2X – Short circuits

| Code | Output | Rigid implement<br>Description | Folding implement<br>Description | Remedial measures |
|---|---|---|---|---|
| **B31** | SA1 | Tramline signal 1 | Tramline signal 1 | Visual inspection |
| **B32** | SA2 | Tramline signal 2 | Tramline signal 2 | Visual inspection |
| **B33** | SA3 | Tramline signal 3 | Tramline signal 3 | Visual inspection |
| **B34** | SA4 | Tramline signal 4 | Tramline signal 4 | Visual inspection |
| **B35** | SA5 | Valve Y1<br>Heliodor section \| circular spike harrow | Valve Y3/Y4 Heliodor sections \| circular spike harrows | Visual inspection |
| **B36** | SA6 | Valve Y8<br>Fertiliser bar | | Visual inspection |
| **B37** | SA7 | Valve Y3<br>Left lane scriber | Valve Y8<br>Left lane scriber | Visual inspection |

| | | | | |
|---|---|---|---|---|
| **B38** | SA8 | Valve Y4<br>Right lane scriber | Valve Y9<br>Right lane scriber | Visual inspection |
| **B39** | SA9 | Valve Y9<br>Fertiliser bar | | Visual inspection |
| **B40** | SA10 | Valve Y6<br>Coulter bar | Valve Y12<br>Coulter bar | Visual inspection |
| **B41** | SA11 | Valve Y7<br>Coulter bar | Valve Y13<br>Coulter bar | Visual inspection |
| **B42** | SA12 | Valve Y15<br>Profile run | Valve Y15<br>Profile run | Visual inspection |
| **B43** | SA13 | | | Visual inspection |
| **B44** | SR | | | Visual inspection |
| **B45** | PA1 | PWM output, drive motor | PWM output, drive motor | Visual inspection |
| **B46** | PB1 | Harrow | Harrow | Visual inspection |
| **B47** | PA2 | Section width 1 | Section width 1 | Visual inspection |
| **B48** | PB2 | Section width 2 | Section width 2 | Visual inspection |
| **B49** | PA3 | Section width 3 | Section width 3 | Visual inspection |
| **B50** | PB3 | Section width 4 | Section width 4 | Visual inspection |
| **B51** | PA4 | | | Visual inspection |

| | | | | |
|---|---|---|---|---|
| **B52** | PB4 | | | Visual inspection |
| **B53** | PA5 | | | Visual inspection |
| **B54** | PB5 | | | Visual inspection |
| **B55** | PA6 | | Valve Y32<br>Levelling work tines section | Visual inspection |
| **B56** | PB6 | | Valve Y14<br>Oscillation | Visual inspection |
| **B57** | PB7 | | Valve Y1 / Y2<br>Soil cultivating folding | Visual inspection |
| **B58** | PA7 | | Valve Y17 / Y18<br>Tyre packer folding | Visual inspection |
| **B59** | PA8 | | Valve Y7<br>Left / right lane scriber | Visual inspection |
| **B30** | PB8 | | | Visual inspection |

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