



PLANTER MONITOR DIGITAL UNIT

User Guide



SW VERSION 5.20

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1 Introduction

Thank you for purchasing an Electrolee Planter monitor Digital Unit.

This unit is implemented with the Planter Monitor to provide additional information through a digital interface. For example, it can indicate, percentagewise, the performance of every row in comparison with the average of all the rows. It is intended for use with maize, sunflower and bigger seeds. The information produced by the Digital Unit will not be sufficiently accurate when planting smaller seeds.

Information is easily obtainable by navigating through a simple menu using four buttons. Calibration is also simple. Information is retained even if the system is powered down.

2 Information reported by the Digital Unit

- Graphic indication of how rows are performing in comparison to each other
- A percentage of how each row deviates from the average
- Total seed for the last 5 seconds (For a specific row)
- Total seed for the last 100 meters (For a specific row)
- Total seeds counted per row
- Ratio of seeds per hectare for the last 100 meters
- Ratio of seeds per hectare on average over the counted area
- Total hectares planted

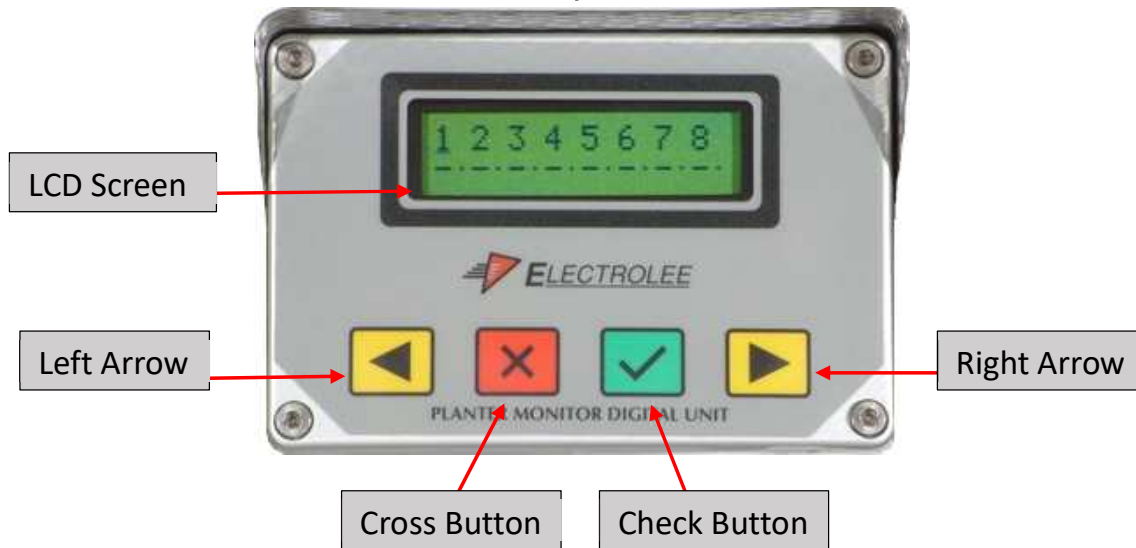
3 Other features

- Channels can be switched on or off. Any number of channels, from 1 to 8, can be active at the same time
- Counters can be zeroed
- The Digital Unit can be used at night, as the unit is equipped with a backlit screen

4 Mounting of the Digital Unit

See Planter Monitor Manual for mounting instructions.

5 Functions on the front panel



LCD Screen

Used to show numerical and graphical information.

Left arrow (◀)

With the use of the right or the left arrow, the cursor can be moved from one channel to the next.

Cross button (X)

Press to move *upwards* in the information column. It can also be used to indicate "NO" or a "go back to previous choice".

Check button (✓)

Press to move *downwards* in the information column. Where applicable, it can indicate a "YES" response.

Right arrow (▶)

With the use of the right or the left arrow, the cursor can be moved from one channel to the next.

6 Setup and calibration of the Digital Unit

To ensure that the Digital Unit provides trustworthy information, it is important to set up and calibrate it correctly. Before starting with software setup, please ensure that the Planter Monitor sensors and harness are correctly installed and functioning well.

The channel on the furthest right-hand side of the Planter Monitor (or Right Axle for the PM8+2,) is internally connected to the Digital Unit. This channel must be used for sensing axle rotation.

Identify a straight path through which the implement can be moved. It must be a distance of more than 100 meters. Mark a suitable starting point, measure exactly 100 metres and mark the end of the distance. It is very important to use a reliable source, for example a tape-measure or a measuring wheel. Before switching on the Planter monitor and Digital Unit, please move the implement to the starting point.

While pressing the ✓ button on the Digital Unit, switch on the Planter Monitor using the red *Power On* button. Keep the ✓ button pressed until the following message is displayed on the screen:

```
UNIT SETUP MODE
X=OUT ✓=CONTINUE
```

If the ✕ button is pressed, the system will enter normal operation. If the ✓ button is pressed, *Setup Mode* is entered. The following options are shown:

```
SETUP: CHAN, TOTL
100m, IMPL WIDTH
```

Note: While the Digital Unit is in Setup Mode, the alarm is deactivated. By pressing the ◀ or ▶ button, the indicator Δ will move to the next position.

6.1 Set up channels

Move the indicator to the “CHAN” option.

```
SETUP: █CHAN, TOTL
100m, IMPL WIDTH
```

Press the ✓ button to view the screen where channels may be switched on or off. Any channel may be switched on or off, as long as at least one channel remains switched on. To toggle the state of any channel, press the ✓ button. If the channel was switched off, it will switch on, and vice versa. The ◀ or ▶ buttons move the indicator _ (underscore) between channels.

On the following example screen, the indicator is at channel six. Channels 7 and 8 are switched OFF. This would be a proper setup for a six-row planter.

```
1 2 3 4 5 6 7 8
✓ ✓ ✓ ✓ ✓ ✓ ✕ ✕
```

Note: The channel that is connected to the axle stays off (Channel 8 in this example.) Only channels that should record seedflow should be switched on.

After configuring the channels, press the ✖ button to return to the setup screen.

```
UNIT SETUP MODE
X=OUT ✓=CONTINUE
```

6.2 Calibration of the number of axle (fertiliser) rotations/100m

By pressing the ◀ or ▶ button, move the indicator block, Δ, to the 100m option and press the ✓ button.

```
SETUP: CHAN, TOTL
■ 00m, IMPL WIDTH
```

The following screen will be shown:

```
PRESS ✓ AT 0m
PRESS ✓ AT 100m
```

At this stage, the implement should be at the start of the measured 100m position. Press the ✓ button so that the Digital Unit registers the starting position. The Digital Unit will now count the axle rotations and reflect this information on the screen:

```
WHEEL ROT: 25
PRESS ✓ AT 100m
```

Drive straight forward until you reach the 100m mark and stop right there. Do not reverse. Now, press the ✓ button, so that the Digital Unit can register the total of axle rotations per 100m.

Afterwards, the setup screen will display four options again.

```
SETUP: CHAN, TOTL
100m, IMPL WIDTH
```

6.3 Entering the width of the implement

To input the implement width, please select IMPL WIDTH by moving the indicator with the arrow buttons. Press ✓ to select the option.

The effective cultivating width of the planter is the width of one row, times the number of rows available. For example, a 91cm row width, 6-row planter:
 $91\text{cm} \times 6 = 546\text{cm}$ effective width.

However, if you are measuring the planter, the effective cultivating width of the planter is the distance between the outside rows of the planter, plus the width of one row. For example, for a 91cm, 6-row planter, measuring the distance between rows 1 and 6 gives 455cm. Add 91cm for the effective width of 546cm.

```
IMPLEMENT WIDTH
ADJUST:      546cm
```

The width can be adjusted using the arrow buttons. The ► arrow increases the number, while the ◀ arrow decreases the number. The rate of adjustment will increase when holding down the button.

After the correct value is shown, press the ✓ button to confirm your choice.

6.4 Resetting (zeroing) values

After changing values on the setup screen, it is important to clear all counters. At the start of a new planting season, it is also important to clear all data from the previous season. On the ZERO ha & TOTALS screen, all seed and hectare counters can be cleared. Calibration values will not be affected.

Remember that data will be *cleared* completely, so make a note of important data before it is *zeroed*.

On the setup screen, move the indicator to the TOTL option.

```
SETUP:CHAN, ■TOTL
100m, IMPL WIDTH
```

Press ✓ and the screen will display:

```
ZERO ha & TOTALS
Press < with >
```

To zero counters and hectares, press the ◀ and ► buttons simultaneously.

6.5 Exiting setup mode

Press the ✕ button as a first step to exit from setup mode.

```
UNIT SETUP MODE
X=OUT ✓=CONTINUE
```

Pressing ✕ again will let the Digital Unit return to the normal screen.

```
1 2 3 4 5 6 7 8
- . - . - . - . - . - . X X
```

7 Functions of the Digital Unit (normal switch-on)

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PLANTER MONITOR



VERSION 5.28



PLANTER MONITOR
DIGITAL UNIT



```

1 2 3 4 5 6 7 8
- . - . - . - . - . - . X X
    
```

When switching on, the Digital Unit briefly displays the name of the instrument and software version.

The channel status screen is displayed, where the numbers 1 through 8 represent the possible channels that can be used for counting seed.

A X symbol under any channel will indicate that that channel is disabled. To disable a channel, see the section on setup and calibration. No data will be collected on deactivated channels. Where the symbol – appears, the channel is active. The (·) dot indicates average (and centreline). The extent to which the – symbol moves up or down will indicate the difference between that channel and the average. It can move

positively (up) or negatively (down) from the centre line.

Remember that the number of activated channels must be equal to the number of seed rows on your planter. In our example, channel number 8 is deactivated because the axle is connected to it.

In the example that follows, the Digital Unit indicates that channel 1 is performing far below average, while channel 2 is far above average.

```

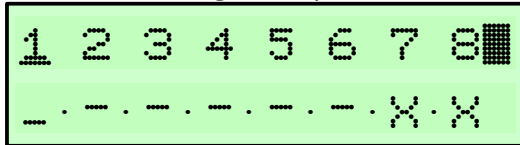
1 2 3 4 5 6 7 8
- . - . - . - . - . - . X X
    
```

The indicators at channels 3, 4, 5 and 6 are indicating average seed flow. Channels 7 and 8 are switched off (as indicated by the X). The black block just to the right of the 8 shows when the magnet sensor is activated by each rotation (in order to measure distance and calculate area.)

The extent to which the – symbol deviates from the average is as follows:

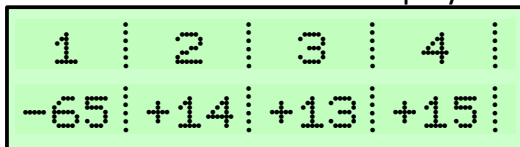
Symbol lies on the centreline	Percentage deviation less or equal to 9%
One line above or below	Percentage deviation between 10% and 19%
Two lines above or below	Percentage deviation between 20% and 29%
Three lines above or below	Percentage deviation between 30% and 100%

In the following example, none of the channels are the same as the average.



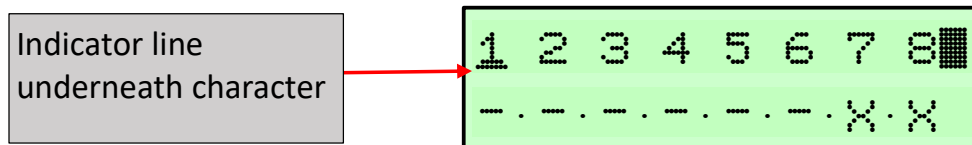
As a result of channel 1 being far below average, the other channels indicate a slight increase (compared to the average).

From the main screen, pressing the ✖ button shows the differences between channels as percentage values. The channel number is shown on the top line of the screen, while the bottom line indicates the percentage deviation of that specific row from the average. It could be positive or negative. Pressing either of the ◀ or ▶ buttons will display the alternate group of channels.



Press the ✓ button to move “down” to the original screen.

Under one of the numbers indicating the channel, an indicating line will be flashing (underscore). This indicator can be moved from one channel to the next by using the ◀ or ▶ buttons.



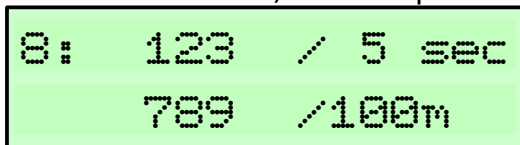
By pressing the ✓ button while the indicator is below the 1, the following display will show more information about channel 1.

The 8: in the top left identifies the channel, namely channel eight.

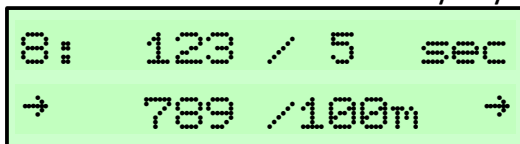
The 123 / 5 sec indicates the tempo at which seeds are planted.

The number of seeds planted per 100 meters is indicated by 789 / 100m.

This would mean 7,89 seeds per meter.



If the ◀ and ▶ buttons are pressed simultaneously, the Digital Unit will automatically step from channel to channel. Two arrows will appear on the screen while this mode is active. If any key is pressed, the Digital Unit will exit this mode.



Press the ✓ button to move further down to see the total for each specific channel individually. Move between channels with the ◀ and ▶ buttons.

```
1: Total Seeds:
    123456
```

Moving further using the ✓ button displays the ratio of seed per hectare. This is calculated using seed counts from the previous 100 meters. It is advisable to complete at least 300 meters of planting to ensure that enough data is available for an accurate seeds per hectare ratio.

```
Sd/ha      50234
(For last 100m)
```

Press the ✓ button again to show the ratio of seed per hectare as planted. This is the average over the total area. On the second line, the hectare counter is displayed.

```
Sd/ha      51021
Ttl ha:    34.55
```

By pressing the ✓ button, the following choice is displayed:

```
ZERO ha & TOTALS
PRESS < WITH >
```

At the start of a new planting season, it is also important to clear all data from the previous season. On the ZERO ha & TOTALS screen, all seed totals and hectare counters can be cleared. Calibration values will not be affected.

Remember that data will be *cleared* completely, so make a note of important data before it is *zeroed*.

To zero counters and hectares, press the ◀ and ▶ buttons simultaneously.

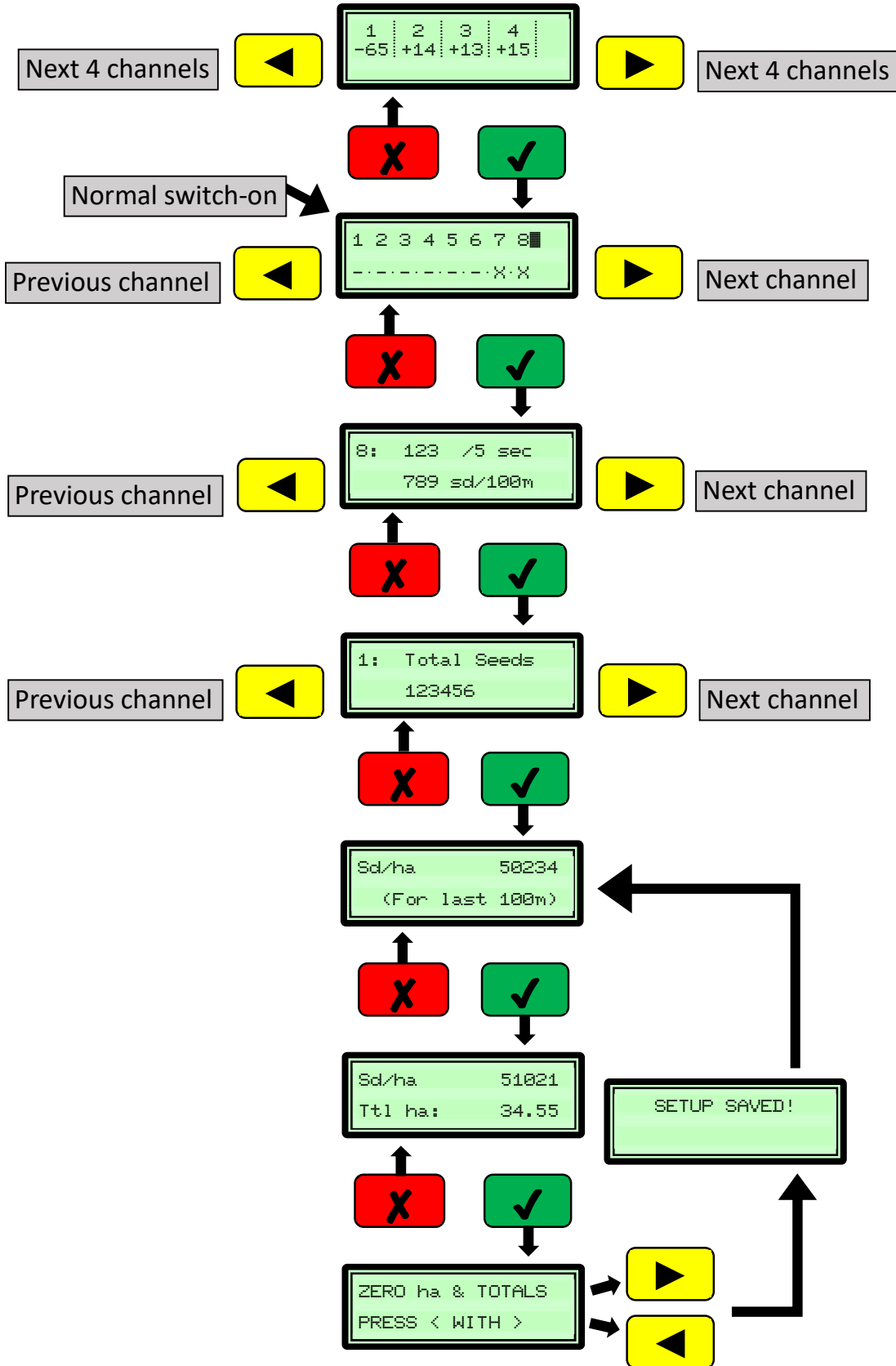
The following message will be flashed on the screen to confirm:

```
SETUP SAVED!
```

After flashing SETUP SAVED! the screen returns to the seed per hectare screen. Navigate from there with the ✖ button.

8 Operation menu

The diagram on this page shows how to navigate between the different screens available on the Digital Unit.



9 Maintenance

9.1 Possible causes of inaccurate reporting

9.1.1 Singulation of the planter unit

If the planter does not singulate seeds properly, with multiple seeds passing the sensor at once, only one seed may be counted.

9.1.2 Seed size

If seeds smaller than 5mm are used, a decrease in accuracy will occur because some seeds will not be detected and therefore not counted.

9.1.3 Dirty sensors

It is important to clean the sensors with a brush daily. A clean eye is an accurate eye! Please see the Planter monitor user guide for instructions on cleaning sensors.

9.2 Control buttons and screen

Please refrain from using anything other than a fingertip to press buttons. Do not press down on the LCD screen as it can damage from excessive pressure.

9.3 General

Although the Digital Unit is dust-proof, it is always wise to take good care of electronic equipment. When the unit is not in use, it is better to keep it in a cool and dry place, not exposed to outdoor weather conditions.

10 Digital Unit specifications

Height	110 mm
Width	170 mm
Depth	100 mm
Minimum total of active channels	1
Maximum total of active channels	8
Maximum number on Seed counter	4 294 967 296 seeds/channel
Maximum number on Hectare counter	65 536 hectares
Maximum count of Seed per hectare	16 777 216 seeds per hectare
Minimum seed size	5mm diameter
Maximum planting tempo	40 kernels/second

11 Fault finding table

Nr	Fault	Cause	Action
1	Area monitoring is incorrect	The magnetic sensor responsible for distance monitoring does not properly monitor every rotation of the axle it is applied to.	Make sure the positioning of the magnetic sensor and magnet is exactly according to the installation manual. Recalibrate the 100m function.
		The ratio of the axle rotations with relation to distance travelled has changed. Possibly a gear ratio in the gearbox.	Recalibrate the 100m function.
		The effective width of the planter was not correctly entered during the set-up procedure.	Go to the unit setup mode and enter the effective width of the planter.
2	The count for seed kernels per 100meters is too low.	If the planter does not singulate seeds properly and multiple seeds pass the sensor at once, only one seed is counted.	Consult your planter handbook or planter's consultant.
		If seeds smaller than 5 mm are used, a decrease in accuracy will occur due to seeds missed.	If singulation is good and the speed is not too high, reasonable accuracy should be obtained. A feed cup does not singulate seed and does not have good results in accuracy.
		The sensor cannot operate properly due to excessive dust or debris on the lenses.	It is important to clean the sensors with a brush daily. Please see the Planter monitor user guide for cleaning instructions.
		A wire/cable is shorting to ground and thereby causing a false signal. The seed count can be either too high or too low.	Always check that wiring is in a good condition.
		Ambient light is entering the seed tube, interfering with the optical seed sensor.	Take out the seed tube and inspect it for cracks and broken isolation on the wiring of the sensor. When testing the unit, be sure the bins are in position so that light isn't entering from the top of the seed tube.

Warranty

ELECTROLEE CC warrants this Digital Unit, purchased from ELECTROLEE CC or approved dealer, to be of a high quality and undertakes to replace or repair at its discretion, free of charge at ELECTROLEE CC's premises, any component (other than cables and/or electrical plugs) or the article itself, should it be found and brought to ELECTROLEE CC within three years from date of purchase, that any component or article itself is defective due to defects in workmanship or materials used in its manufacture.

This warranty does not cover:

1. Damage resulting from incorrect installation, or calibration, or use other than the designed use, or other than in accordance with the operating instructions issued by ELECTROLEE CC.
2. Any kind of consequential damage.
3. Abuse or neglect of the article.

The purchaser must deliver the article to ELECTROLEE CC, with proof of purchase, stating the date and serial number of the Digital Unit, at the premises of ELECTROLEE CC, for inspection and the carrying out of any repairs, if necessary.

Liability

ELECTROLEE CC will not be liable for any losses incurred whatsoever, whether directly or indirectly, due to the use, misuse, or purchase of the ELECTROLEE Digital Unit.

Also see our Standard terms and conditions for sale, available on request from ELECTROLEE CC.

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