MP36 Planting Monitor

agrosystem

Manual

Introduction

The MP36 model Planting Monitor is designed to meet the needs of farmers in monitoring the planting process and uses two different operating modes with the verification of seeding rates by area (population) or monitoring of seed drop or fertilizer on any crop row.

The console provides audible and visual alarms with all operating modes, which identify faults and the corresponding rows. A fault log is also available with the MP36, which makes it possible to monitor the frequency of events occurring in each row of seed or fertilizer.

The MP36 offers a simple installation and operation that is completely compatible with the majority of seed and fertilizer sensors available on the market.
Population monitoring operations require the use of the AGROSYSTEM Speed Sensor (SVA).

Technical specifications

Power Supply: 10 to 16 V DC, Max. 3A current. (36 Sensors);
Operating Temperature: -10 to 70°C ;
Dimensions: 176 x 132 x 35 mm (H x L x D);
Weight: 6.8 Kg (console + cables);

Wiring Harness: power supply input protected by fuses and connectors that are compatible with existing AGROSYSTEM wiring harnesses. The MP36's wiring harness has a mesh finishing and conductors that provide increased durability and are compatible with DC current.

Sensors: compatible with seed and fertilizer sensors with NPN outputs and 9V DC voltage, consumption compatible with the recommend maximum 3A current (total consumption of all attached sensors);

Support: made from SAE1010/20 steel with black epoxy finishing and anchored using screws, with connections allowing for adjustments in angle between 0 and 180 at 45° intervals.

Cabinet: Black thermoplastic with UV protection and an IP32 ingress protection rating.

Overview of MP36 Planting

Operating keys: The direction keys (up, down, right and left) are used to toggle between the fields in the configuration windows. The Enter key is used to confirm choices or toggle the values permitted in the configuration fields. When toggling these fields, the up and down keys are used to increase or decrease the values displayed in the field, respectively (this will be discussed in more detail in the "Configurations" section).


Navigation and shortcuts


Enter key

Shortcut keys: The up/down keys also provide shortcuts to the different configuration screens and fault log. The right key temporarily mutes the audible alarm.


Configuration

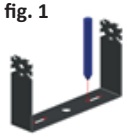

Event reports


Mute alarm

Installation and Configuration

Installation of mounting support: The support for mounting the monitor in the tractor's cab must first be installed in a location that does not block the operator's (driver) view of the area planted. We usually recommend that the support be installed on the side of the cabin opposite the access door.

fig. 1

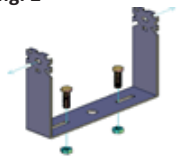


Use the support to mark the points for drilling in the tractor's panel (Fig. 1) The support may also be mounted using the central drill hole, which allows the support/cabinet unit to be rotated.

Before drilling, make sure that the position chosen for the monitor's support allows the cabinet to move freely in order to be adjusted to the operator's angle of vision.
The position chosen must also allow for the installation of cables, which must be connected to the planter and the speed sensor (optional).

The support must be attached using two screws (or a central screw) as shown in the figure to the right (Fig. 2).
After the support has been attached, the monitor is mounted by gently opening the sides of the support enough to position the cabinet between them.

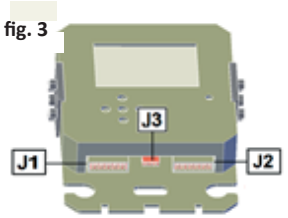
fig. 2



Connector cables: Connect the wiring harness to the monitor. The wiring harness has three (3) connectors that are numbered J1, J2 and J3. The J1 and J2 connectors correspond to the rows monitored and are divided into an 18+18 row configuration. The J3 connector is used to connect the MP36 to the 12V DC battery power supply and the GPS Speed Sensor.

The J1, J2 and J3 connector cables must be sent through the slots located immediately below the bottom of the monitor and fixed using an adjustable clamp to prevent wear and subsequent damage to the connectors / circuit board.

fig. 3



The power supply must be connected to the battery or other power source (12V DC) inside the tractor's cab, taking the power source's polarity into account and allowing access to the fuseholder (red wire).

Startup: After switching on the monitor, the start screen is displayed, and the system carries out an automatic verification of the sensors. The identified sensors, as well as their respective addresses (rows), are sent to the MP36's retentive memory; any sensor that was not found in previous verifications, or that did not respond to the monitor's identification, will be shown as a fault and highlighted in the alarm window (Figure 5).

Fig. 4 Startup Screen

Fig. 5 Alarm Screen

Configuration: It is possible to access the configuration routine through the main window using the up arrow shortcut key. The configuration is divided into two windows, the first of which allows users to edit, include, or exclude planting rows and determine the type of sensor that is associated with this row, selecting between seed or fertilizer using the enter key. It is also possible to adjust the row spacing. Only editable fields are accessible and are highlighted in green (Figure 6):

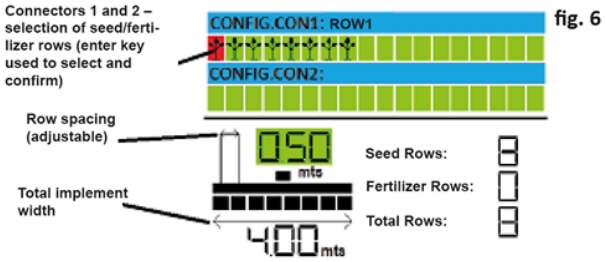


fig. 6

After entering the data on the configuration screen, the next screen, which contains the alarms and operating mode (Figures 7 and 8), is displayed. The data can be edited using the navigation arrows and selected using the enter key. Once the data has been selected, the value can be increased or decreased using the up/down arrow keys.

Alarms: The alarm configuration screen is presented as a mandatory sequence in the device's configuration process and is used to select the operating mode and the device's response to events (faults) encountered during operation.

fig. 7

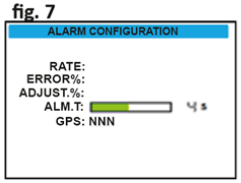
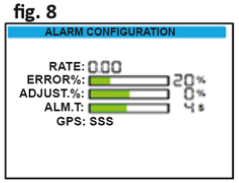


fig. 8



GPS – (S/N): selects the operating mode. Using the speed sensor allows the population to be monitored. Without the speed sensor, it is only possible to verify faults in planting or the application of fertilizer.
Figure 7 shows the display mode without using GPS in which only the option for alarm time control is available. Figure 8 shows the system with the GPS option engaged (in which other options for parametrization are available, which are presented in greater detail below).

RATE*: the rate (while the GPS is engaged) defines the desired population targets (selected using the arrow key and the up/down keys to increase/decrease the value). When the rate value is set to zero, the system begins monitoring the average values for seed per meter (obtained across all monitoring lines) and any discrepancies in relation to the average are highlighted on the screen.

ERROR PERCENTAGE*: establishes the admissible tolerance in relation to the target rate. For example, if the error percentage is set to 20%, this means that differences of less than 20% between the target and average rate will be ignored, but the alarm will sound for differences above 20%.

PERCENTAGE ADJUSTMENT*: allows the user to make percentage adjustments to the rate shown on the main screen in cases in which there is a recognized difference in the sensor reading process, which is notably common in crops with very small seeds (such as sorghum, for example).

ALARM TIME: establishes the maximum time limit in which a fault event is ignored before the alarm is sounded.
* options only available with the use of an SVA speed sensor

Work Screen:

fig. 9

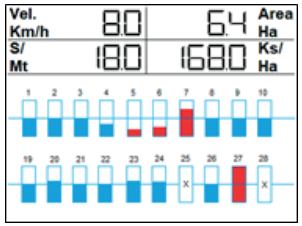


Figure 9 shows the work screen in operating mode with rate or population monitoring (with speed sensor). The following information is displayed in the upper half of the screen: speed in km/h, the area planted in hectares, seeding rates per meter, and seeding rates per hectare (x 1000). In the lower half of the screen, users can view the status of the rows monitored in a bar graph that displays the individual rates per row. Rows that are within the defined percentile limits are shown in blue; those that exceed the control limits are shown in red. Rows in which there is no seed drop are shown as empty bars (see lines 25 and 28).

Rows that do not attend to the limits established in the alarm screens are highlighted and are included in the alarm log.
The hectarimeter does not have retentive memory and is restarted each time the device is switched on. The distances calculated by the hectarimeter are only taken into consideration when the device has verified a release of seed in the rows engaged. If the monitor detects a release of seed with the machine stopped, a fault in the row is also shown to have occurred. Changes in verified seeding rates that are above the maximum alarm time limit are indicated with both audio and visually (red LED light). Alarms are immediately raised for rows that present an interruption in the flow of seed or fertilizer.

Figure 10 shows the work screen in operating mode without speed monitoring or, in other words, without GPS engaged.
In this mode, there is no data provided in relation to speed (speed, rates, and hectarimeter).

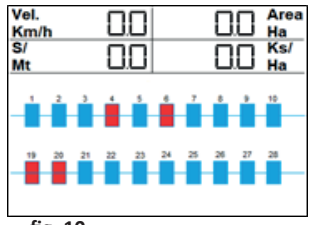


fig. 10

Rows of planting are represented by blue and red rectangles (rows with seed flow are shown in blue, and those without seed flow are shown in red). Faults with audible and visual alarms also adhere to the time criteria set in the alarm configuration screen.

Rows in which fertilizer is applied are only monitored with regards to whether or not there is flow of material and are represented by colored rectangles (red/blue), including in rate monitoring mode.

Fault Indication Screen:

fig. 11

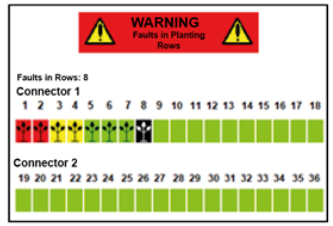
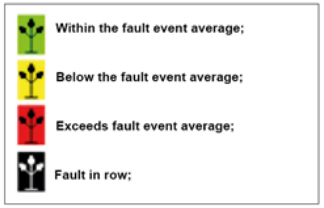


Figure 11 shows the fault indication screen, which displays the frequency of alarm events generated by the rows of planting or fertilizer using a scale of colors. An event average
is generated and the rows that are within this average are displayed in green. Rows with a number of events below the average are displayed in yellow and those with a a number above the average are shown in red.
Rows in which there is a fault at the moment in which the screen is displayed are shown in black.



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