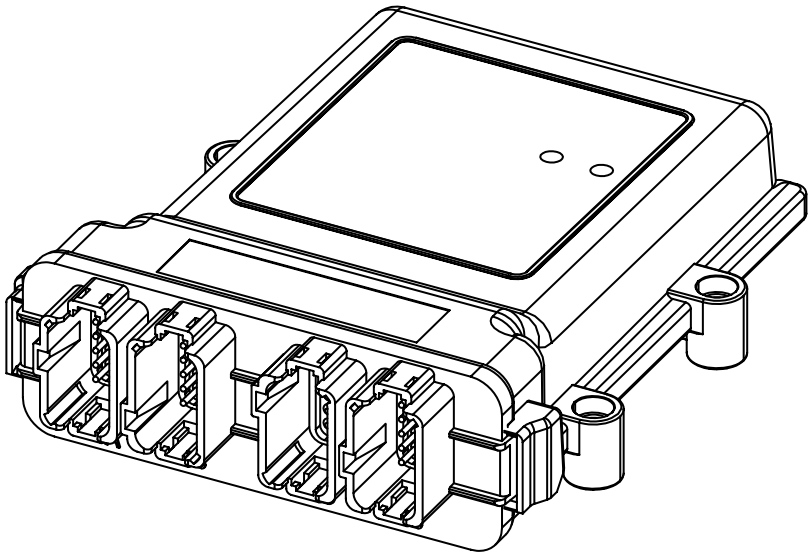
MMISBFMAI010

FARMNAVIGATOR



ISO Boost

Depth Control

INSTALLATION MANUAL

1. Product description

ISOBoost - Depth Control (namely “ISOBoost” in the following) is an ISOBUS Electronic Control Unit (ECU) designed for soil tillage implements.
With ISOBoost, you can upgrade any mechanical implement into an ISOBUS-ready system, fully compatible with ISOBUS tractors.

1.1 Content of the package

The Package includes:
- ISOBoost ECU
- ISOBoost Power Cable

2. Main Functions

ISOBoost reads analogue sensors visualizing in the ISOBUS Virtual Terminal the depth of the implement. It is possible to apply a precise manual or automatic adjustment of working depth, according to soil conditions and operator settings.
The main functions of ISOBoost for depth control are:
- Equip the soil preparator implement with ISOBUS;
- Depth monitoring;
- Manual or Automatic adjustment of the depth;
- Define a specific target of depth;
- Control the depth based on prescription maps (ISOXML)
- If enabled by the end user, share the real time telematics data via cellular connectivity (position, speed, etc.) for remote supervision, maintenance and warranty of the implement.

3. Connection and Installation

3.1 Install the ISOBoost ECU

The ECU must be fixed to the implement. Please take care about these suggestions:
- The ECU must be installed in a protective part of the implement, away from mechanical movements, possibly protected from water, mud, or possible clods of soil;
- Keep the wiring facing downward or, if vertical, facing away from the vehicle's forward motion;
- Do not cover the ECU with metal covers that completely envelop the unit;
- Maintain visibility of the LEDs for diagnostics and any technical assistance.

3.2 Install the ISOBoost wiring harnesses

The product is equipped with a main wiring harness – “power cable”, which runs from the ECU to the tractor. Additionally, an optional sensor wiring harness – “I/O cable” - runs from the ECU to the sensors installed on the implement.
Please take care about these suggestions:
- Secure the wiring harnesses so that their weight does not affect the ECU connector;
- Avoid tension on the cable;
- Route and secure the cables to the tool frame to prevent breakage during use.

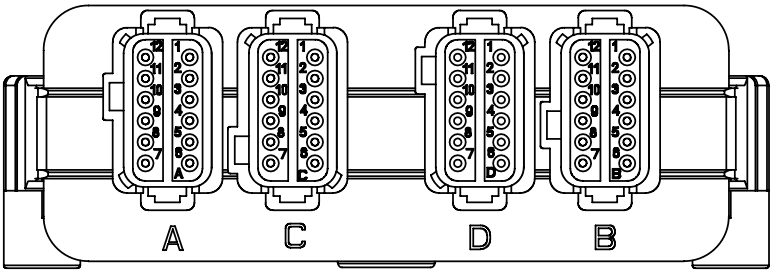


Figure 3.2 - Image of the ECU ports, ABCD

Description	Part number	Connection method
ISOBoost Power Cable, 5m	CBKYFG0600	Connect the cable to the port “B” of the ECU
ISOBoost I/O Cable	CBKYFG0900	Connect the cable to the port “C” of the ECU

Table 3.2 - Connection method

NOTE: Port "A" and Port "D" are not used for this product

3.2.1 Details of ISOBoost I/O Cable

The ISOBoost I/O Cable is pre-defined to output one analog sensor, one switch sensor and two connectors for Electro-Hydraulic (EV) valves. In details:

- Label “SENSOR”: it is possible to connect any analog sensor 5V power source and 0-5V signal output.

BLACK	Ground
RED	+5V (max 200mA)
YELLOW	Signal, 0-5V

- Label “SWITCH”: it is possible to connect any switch to detect/define the position of the lifter.

BLACK	Switch status 0/1
BLUE	Reference

- The two connectors for the EVs can be connected if the implement is controlled automatically.

EV1	Up
EV2	Down

3.3. Details of the LEDs

The ECU has two LEDs to let the user understand the status of the unit. In details:

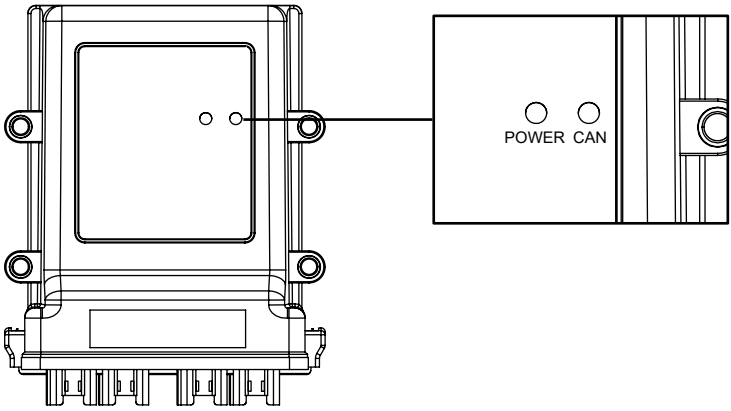


Figure 3.3 - Led indicators

- POWER LED

Green, solid	Manual mode
Green, blinking	Automatic mode

- CAN LED

Red, solid	Power on
Blue, blinking	Boot stage and loading
Green, solid	Software loaded
Green, blinking	CAN communication

ATTENTION: if the CAN LED is steady on green solid state, then it should be checked the CAN communication in order to verify a possible issue.

NOTE: the unit requires a 120 Ohm terminator, if not connected to a standard IBBC ISOBUS connector.

4. ISOBUS communication

To power the system, connect the ISOBoost power cable to the vehicle so that power and CAN communication are provided.
The LEDs light up and the communication with the ISOBUS terminal starts. Then, wait for the object pool to load, once loaded, the result will be as shown here below:

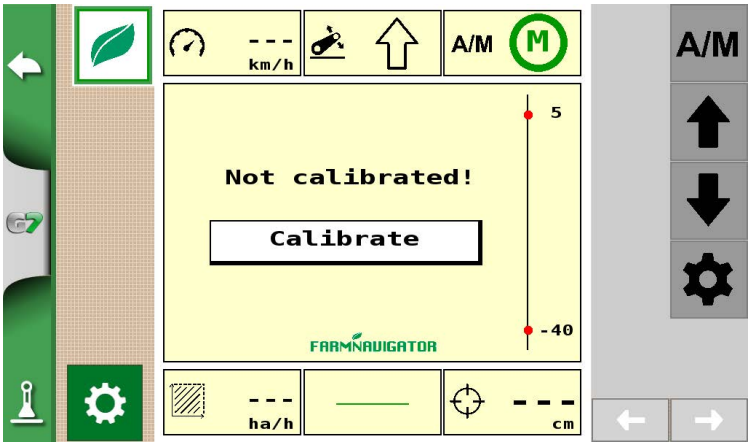


Figure 4 - ISOBUS communication setup

Next step is press “Calibrate” and proceed with the calibration.

5. Calibration of the depth

Sensor calibration is necessary to establish a relationship between the movement of the implement and the sensor reading.

ATTENTION: Preliminary condition is to complete sensors installation correctly, ensuring that the sensor(s) is not subject to deformations or stresses throughout the implement entire range of motion.

The calibration is divided into two steps:

1. Calibration of the first reference point:
   - On a flat area, adjust the depth of the implement in order to have it on the same line of the tractor wheels;

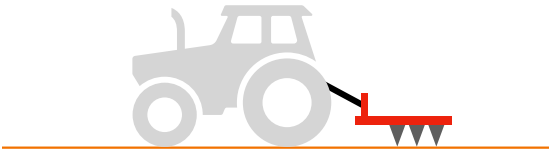


Figure 5.a - Implement position on the ground

- Set on the terminal the value as 0 cm, then press OK.

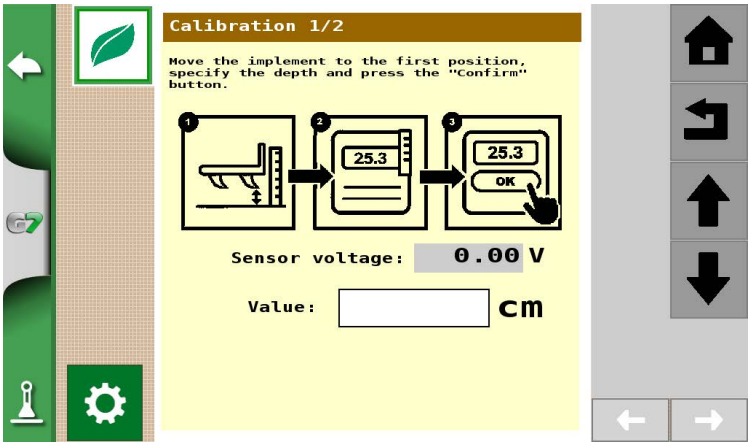


Figure 5.b - ISOBoost calibration - setting the zero

2. Calibration of the second reference point:
   - Lift the implement up to the maximum;

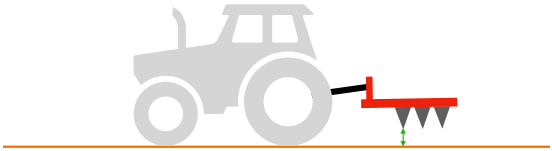


Figure 5.c - Setting the maximum height of the implement

- Measure the distance between the flat surface and the edge of the working point, set the value in the terminal, then press OK.

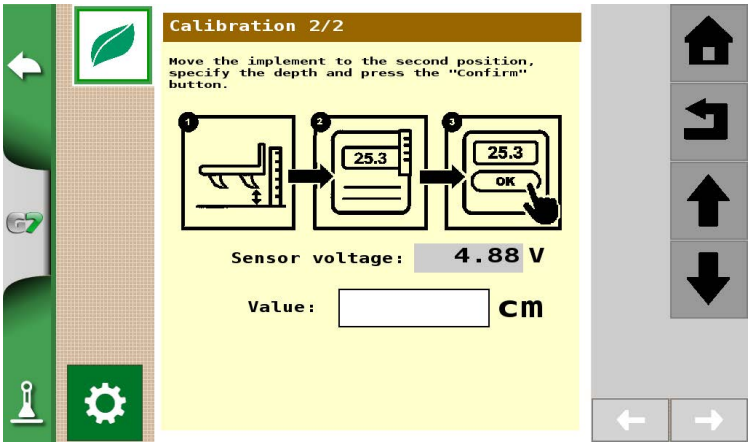


Figure 5.d - ISOBoost calibration - setting the highest implement position

At this point, the calibration is complete.

In the main page it is possible to see the depth value, where positive values are ABOVE the soil and negative values are UNDER the soil.

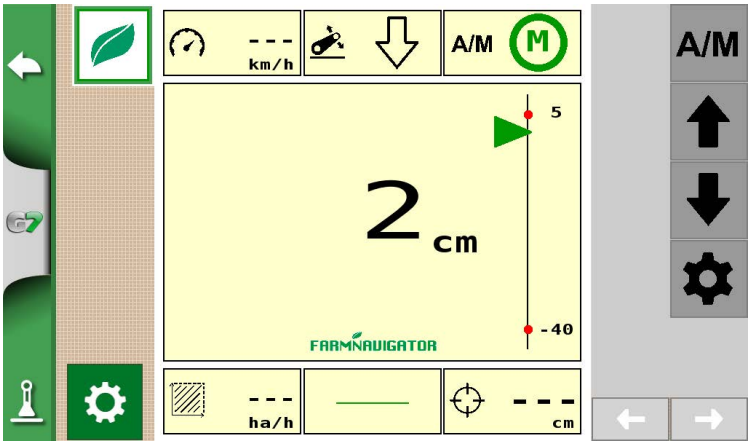


Figure 5.e - ISOBoost depth control in action

ATTENTION: If the values are not coherent, it is possible to repeat the calibration in the settings page. To repeat the calibration press "Settings" button, then in the "Job settings" press again "Calibrate" and repeat the steps as described above.

6. Setup the geometry of the implement

In the Settings page, select Implement Settings. In this page is possible to setup the geometry of the implement and the type of the connection between implement and tractor. These values will be loaded in the Task Controller and used in the ISOBUS line.

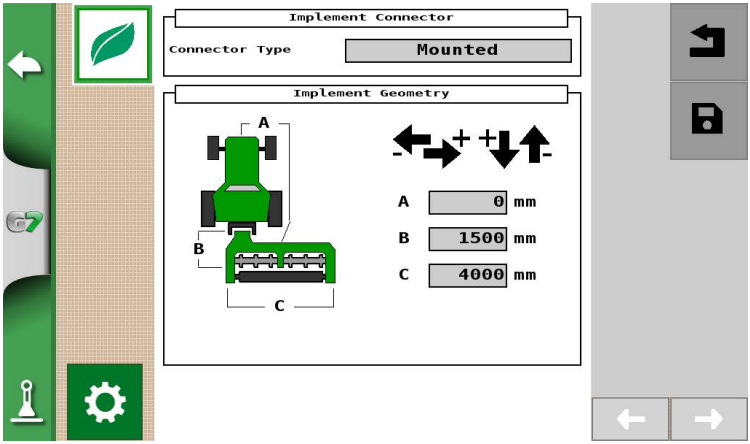


Figure 6 - Setting implement measures

7. Speed and rear hitch signal sources

In the settings, select Vehicle Settings. In this page is possible to define the source of the speed and rear hitch. The speed can be selected as ISO RADAR or J1939. The speed must be provided by the tractor to the implement in the same format selected.
The rear hitch signal can be selected from the external sensor (SWITCH) or from the Tractor ECU (TECU), if the tractor is ISOBUS ready from the factory.

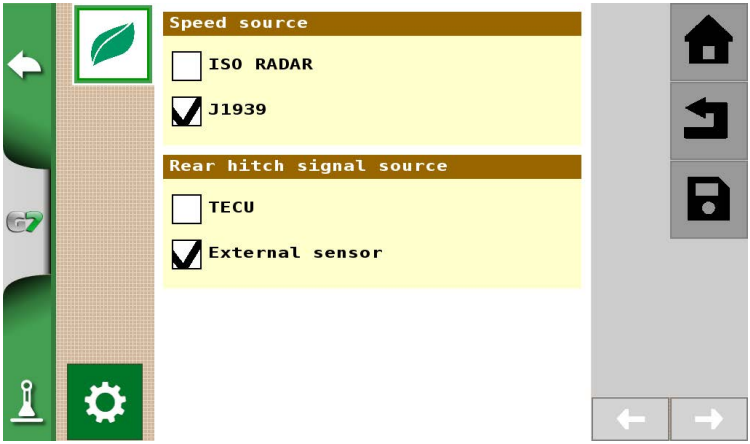


Figure 7 - Setting inputs and sensors

8. Electro Hydraulic control

In the settings, select Electrovalves Settings. In this page is possible to enable or not the output for the electro hydraulic valves.

WARNING: if the implement does not have any electro hydraulics parts, it is strongly suggested to keep the control state as disabled.

If the output is enabled, it is possible to select the valve type, the dead-zone value (0-20%) and the sensitivity (0-100%).
The dead-zone can be used to overpass the mechanical force necessary to lift up or down the implement, the default value can be between 0 to 5%.
The sensitivity can be modified lowering the value from 100% to make the movement smoother. At the same time, lowering the value makes the adjustment slower.

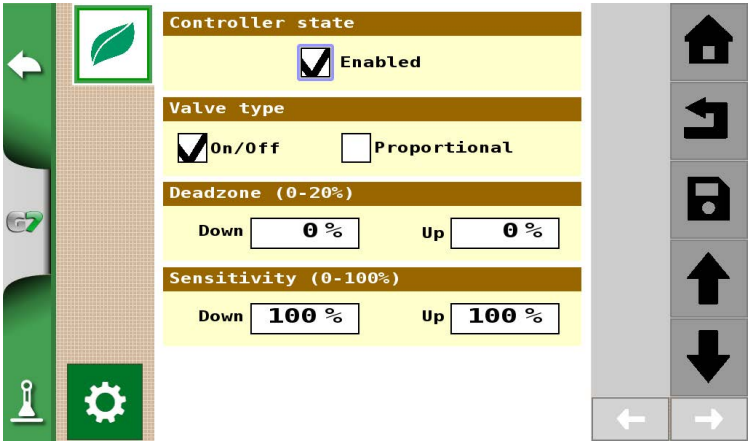
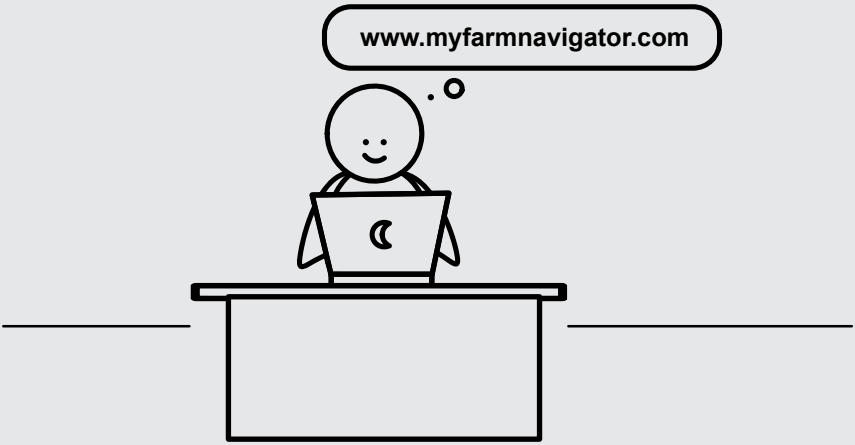


Figure 8 - Setting outputs

How to activate ISOBoost

A. Register your ISOBoost to get instant access to Internet services

In order to register your ISOBoost, access www.myfarmnavigator.com website and complete the registration in few simple steps. Once it has been registered successfully, your ISOBoost starts sharing information with the remote server.



B. Regions where the Internet services are supported

ISOBoost	Worldwide*

*Contact support@avmap.it for detailed information about Internet services for your device.

9. Product conformity information

Hereby, AvMap Srlu, Viale Zaccagna, 6 54033 Carrara (MS), Italy declares that the radio equipment in the following table is in compliance with Directive 2014/53/EU.

ISOBoost	UX0ISB0EAM / UX0ISB00AM

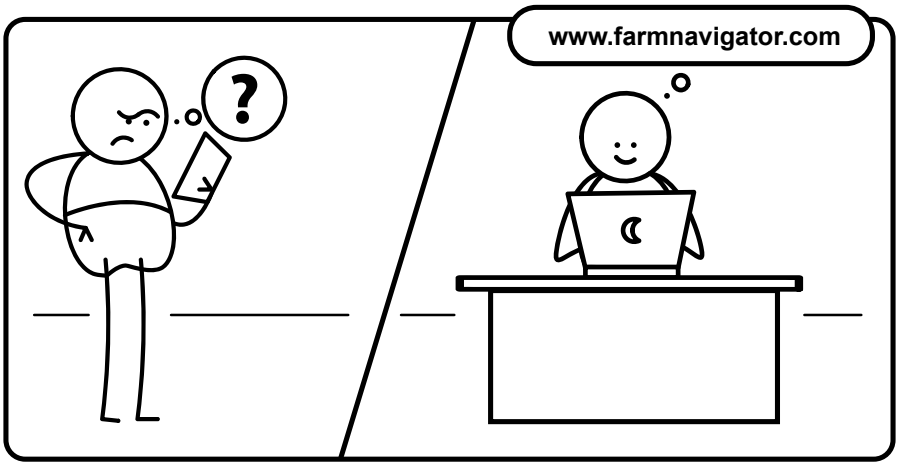
The full text of the EU declaration of conformity is available at the following internet address: **eudeclaration.avmap.it**

10. Safety Information

AvMap disclaims any liability deriving from an improper use or installation of the product in a way that may violate the regulations and safety.
It is highly recommended that the installation of the product will be performed by a qualified maintenance technician. Consult the Installation manual for a correct installation procedure.

11. Technical specifications

Dimensions	160 x 201.5 x 54.8 mm
Power supply	9-30V
Temperature range	Operative: -20°C, 60°C Storage: -30°C, 70°C
IP Protection	IP67 resistant to dust, water, mud, vibrations;
IMU sensors	3 axial accelerometer + gyro
Connectors	• 1x RS232 serial • 2x CANBUS
Inputs	• 2x Analog inputs 4-20mA • 1 Analog inputs 0-10V for WAS • 1 Analog input for Battery voltage level (internal) • 2 Opto-coupled digital inputs (up to 36V)
Outputs	• 4 Power PWM • 2 dry contacts (500mA max)
COMMUNICATION	
Bluetooth	Bluetooth LE v5.2
Modem	LTE CAT1 (global coverage)
SIM on chip	Roaming included
GNSS	L1 GPS+GLONASS+Galileo+Beidou
LED indicators	2x Led for power status, loading and CAN communication
ISOBUS	Interface with the tractor via a standard ISOBUS cable ISO11783-2
CONNECTIVITY	
Cloud connectivity	IoT Client for data transfer to MyFarmnavigator web portal
FOTA	Automatic Software updates



FARMNAVIGATOR

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