

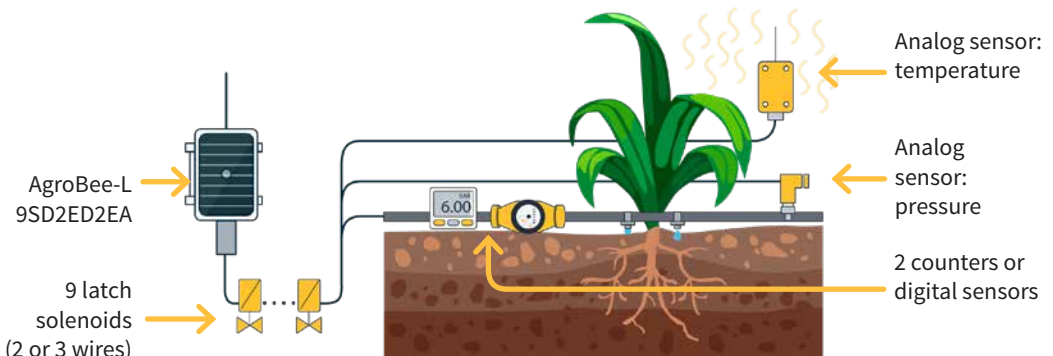
AgroBee-L Manual

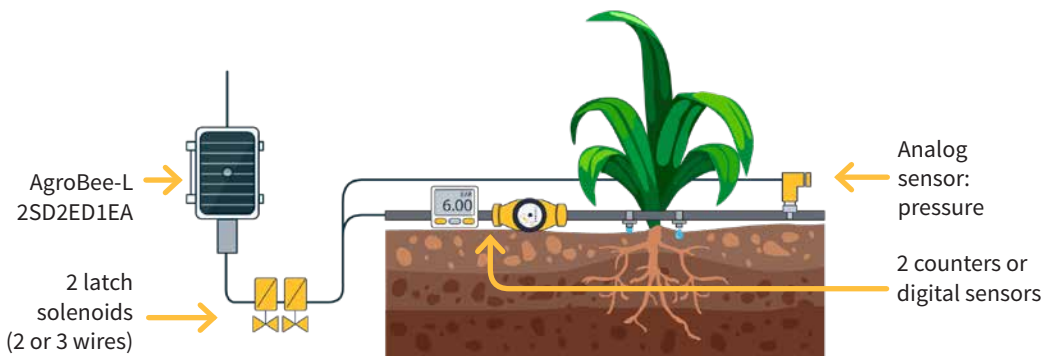
AgroBee-L 9SD2ED2EA, 6SD6ED2EA, 2SD2ED1EA, 8SD2ED, 2SD2ED System

Very low consumption radio modules and integral components of the AgroBee-L system for the activation of latching solenoids and reading of digital and analog sensors.

The AgroBee-L 9SD2ED2EA, 6SD6ED2EA, 2SD2ED1EA, 8SD2ED, 2SD2ED models offer the following:

- 9SD2ED2EA:
 - 9 2-wire or 3-wire latch solenoids
 - 2 counters or digital sensors or rain gauges
 - 2 analog 4-20 mA or 0-20V sensors
- 6SD6ED2EA:
 - 6 2-wire or 3-wire latch solenoids
 - 6 counters or digital sensors or rain gauges
 - 2 analog 4-20 mA or 0-20V sensors
- 2SD2ED1EA:
 - 2 2-wire or 3-wire latch solenoids
 - 2 counters or digital sensors or rain gauges
 - 1 analog 4-20 mA or 0-20V sensor
- 8SD2ED:
 - 8 2-wire or 3-wire latch solenoids
 - 2 counters or digital sensors or rain gauges
- 2SD2ED:
 - 2 2-wire or 3-wire latch solenoids
 - 2 counters or digital sensors or rain gauges





The different models are divided into 2 different groups according to the size and the power supply possibilities they present:

- 9SD2ED2EA, 6SD6ED2EA, 8SD2ED:
 - 1.60 W solar panel + supercapacitors: no need to replace batteries.
- 2SD2ED1EA, 2SD2ED:
 - 1.05 W solar panel + supercapacitors: no need to replace batteries.

2-wire or 3-wire latch solenoids can be used at 6 Vdc, 9 Vdc, 12 Vdc or 19 Vdc. The type of solenoid, as well as the trigger voltage, can be configured using a Module Reader of the module itself, or from the controller to which said module is associated.

In all of the models, within the configuration options of the module itself, a general output can be configured. In this case, the general output will be the R9 for the 9SD2ED2EA model, the R6 output for the 6SD6ED2EA model, R8 for 8SD2ED, and R2 for 2SD2ED. The number of analog sensors used (from 1 to 2) by a module (9SD2ED2EA, 6SD6ED2EA, 2SD2ED1EA) can be configured with the Module Reader or from the controller to which the module is associated. The type of these (4-20 mA or 0-20 V) must be configured from the Module Reader or from the controller; and in addition, the switches installed inside the module (sensor 1) must be fixed to the corresponding position.

Likewise, the supply voltage supplied to the analog sensors (5 Vdc or 12 Vdc) as well as the time during which the voltage is applied (250ms, 500ms, 1s, 2s) can also be configured from the Reader or from the associated controller.

These sensors' reading rates can be selected from 3 different values: 5, 10, or 20 minutes, with the default value being 5 minutes.

Technical characteristics

Power supply		
Power supply:	9SD2ED2EA / 6SD6ED2EA / 8SD2ED: Solar: 7,68 V / 1,6 W → 3,3 V	Panel plus high capacity supercapacitors
	2SD2ED1EA / 2SD2ED: Solar: 5V / 1,05W → 3,3V	Panel plus high capacity supercapacitors
Energy consumption: 9SD2ED2EA 6SD6ED2EA 2SD2ED1EA 8SD2ED 2SD2ED	Average consumption: 0,45 mW (TBC)	

Outputs		Inputs	
Number	9 (9SD2ED2EA) 6 (6SD6ED2EA) 2 (2SD2ED1EA) 8 (8SD2ED) 2 (2SD2ED)	Maximum distance between sensor and AgroBee-L: 50m	
Type	6 Vcc, 9 Vcc, 12 Vcc , 19 Vcc Firing time: 80 ms Capacitor charge: 4700 µF	Number	2 (9SD2ED2EA) 2 (2SD2ED1EA) 2 (8SD2ED) 2 (2SD2ED) 6 (6SD6ED2EA)
Number	2 (9SD2ED2EA and 6SD6ED2EA) 1 (2SD2ED1EA)	Type	For potential-free contacts
Type	5 Vcc or 12 Vcc (Sensor power supply) Maximum current: 50 mA	Number	2 (9SD2ED2EA and 6SD6ED2EA) 1 (2SD2ED1EA)
		Type	Analog (16 bits)
Box dimensions			
		9SD2ED2EA 6SD6ED2EA 8SD2ED	2SD2ED1EA 2SD2ED
Height		150 mm	150 mm
Width		150 mm	100 mm
Depth		90 mm	70 mm
Weight (approx.)		0,8 Kg	0,4 Kg
Environment			
Temperature	-10 °C a +60 °C		
Moisture	< 95 %		
Altitude	2000 m		
Pollution	Grade II		

Declaration of conformity

This system conforms with the regulations and other regulatory documents in the following list:



Electrical safety	Low voltage directive 2014/35/EU	UNE-EN 62368-1:2014+AC:2015+AC1:2015+AC2:2015+AC:2017-03+A11:2017 Audio and video equipment, information and communication technology. Part1: Security requirements.
EMC	Directive 2014/53/EU	ETSI EN 301 489-1 Ver. 2.1.1.1 – <i>ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU.</i> ETSI EN 301 489-3 Ver. 2.1.1.1 – <i>ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.</i>



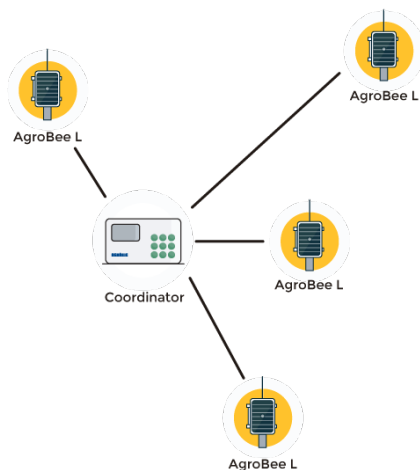
This symbol indicates that electrical and electronic controller must not be disposed of along with household waste at the end of its useful life. The product must be taken to the corresponding collection point for the recycling and proper treatment of electrical and electronic controller in accordance with national legislation.

AgroBee-L System Operation

The AgroBee-L radio modules are used for the activation of valves and other irrigation elements, as well as the reading of sensors and meters. It is very low consumption and follows the LoRa radio modulation, which operates in the 868MHz, 433 MHz and 915 MHz, free bands, obtaining radio coverage of up to 2500 m between two points (depending on the orography).

Currently, they can be incorporated into the Agrónic 2500, Agrónic 5500 and Agrónic Bit Con fertirrigation controllers.

The AgroBee-L system consists of a coordinator device (located in the Agrónic 2500, Agrónic 5500 or Agrónic Bit Con controllers) and by field elements with different functions, depending on the model in question. This system does not include the use of repeater elements, so all modules must connect directly with their coordinator. The field modules manage their consumption by activating the communication in the precise time of the exchange; the rest of the time, they are asleep or attending to irrigation control.



Its low consumption allows it to operate with a solar panel integrated into the module and supercapacitors or battery (depending on the model). The solar panel stores the energy in the supercapacitors/battery, offering a long operational life. It is only necessary to replace batteries in models that include batteries instead of supercapacitors.

The maximum number of modules that an Agrónic controller can manage is 20 units in standard mode, which can be configured as modules of any of the available types. There is also a priority mode, which makes it possible for the modules to communicate more often: in this case, the number of modules (10) is halved.

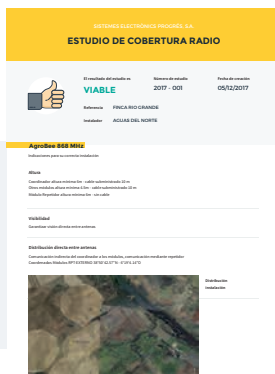
To use AgroBee-L modules, it is necessary to assign their outputs to the sectors or generals of the controller in question, and their inputs to the digital, analog, or counters sensors.

The AgroBee-L system has the following features, among others:

- Operation in 868 MHz, 433 MHz and 915 MHz free bands.
- Availability of 13 communication channels plus 18 transmission modes, which allow for the operation of more than one network in the same area working on the same channel.
- Availability of network code, which allows for filtering the information of several networks configured with the same parameters.
- Self-adjustable communication rate according to the chosen transmission mode and the

timing mode:

- Timing in standard mode (60 –200”). Up to 20 modules.
- Timing in priority mode (30 –100”). Up to 10 modules.
- Distances of up to 2500 metres between any module and its coordinator (depending on the orography).
- Manual actions, consultations, and configuration of the network number, channel, transmission mode, and communication timing (standard/priority):
 - In-situ: Through the Module Reader
 - From a distance: Through the Agrónic
- Battery/charge level reading and solar panel (if any).
- Reading SNR level (signal-to-noise ratio) reception in the module and coordinator (in [%]).
- Reading the status of the last 16 communications and remaining time indicator until the next communication.



Installation

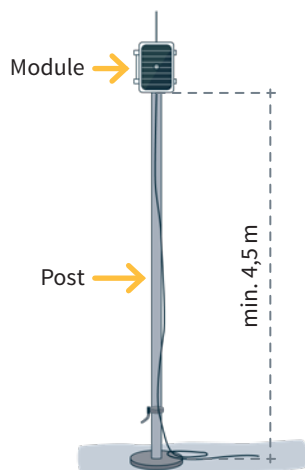
For the supply of radio controller, it is essential to have a coverage study. This study verifies the viability of the system according to the profile of the terrain, the location of the points to be controlled, and the distance between them. The study is delivered along with the controller offer.

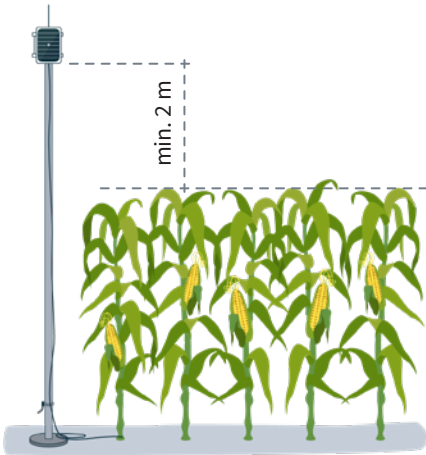
INSTALLATION OF MODULES

The AgroBee-L modules have the antenna integrated into the module, so they are installed on top of a post.

For good radio communication, it is very important to place the modules in areas free of vegetation, walls, and metal structures.

The minimum recommended height to place the module is 4.5 metres from the ground. If there are tall crops (corn, trees, ...) this minimum height of the module must be increased by 2 metres above the height of the crop. In all cases, it must always have direct visibility with the coordinator's antenna that sends the information (coordinator located in Agrónic). The 7 metres of cable supplied already include these assembly recommendations.





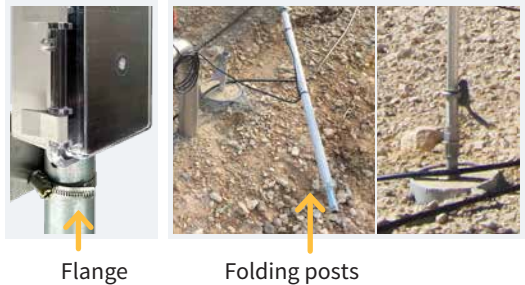
To increase the coverage, and if necessary, the best system is made by raising the module as high as the length of the cable allows.

The modules with solar panels must be placed orienting the panel to the South (Northern hemisphere) or North (Southern hemisphere) to obtain the best solar coverage.

To keep it watertight, it is necessary to always leave the lid closed.

The modules can be fixed on a 35 to 45mm post by means of the support and flange, incorporated (Endless stainless steel clamp, measure 32-50mm DIN3017) in such a way that the cable output passes through the inside of the post.

It is recommended to install it on folding or extendible posts for easy access to the module.



Flange

Folding posts

Inputs and Outputs

DIGITAL OUTPUTS

The trigger voltage of the solenoids (digital/latch outputs) is programmable through the Reader or from the Agrónic, which may be 6, 9, 12 or 19 Vdc. The default voltage is 12 Vdc.

You can also choose the action that a module will perform with the digital outputs if the settings are lost. The options are:

- Do not perform any action
- Deactivate all outputs immediately after losing communication
- Deactivate all outputs after about 15 minutes after losing communication

9SD2ED2EA:

The 9SD2ED2EA model can work with two- and three-wire latch solenoids:

- 2/3 wire latch solenoids: these modules can drive up to 9 solenoids. The solenoids must be connected as defined in the wiring table in the next section.

6SD6ED2EA:

The 6SD6ED2EA model can work with two- and three-wire latch solenoids:

- **2/3 wire latch solenoids:** these modules can drive up to 6 solenoids. The solenoids must be connected as defined in the wiring table in the next section.

8SD2ED:

The 8SD2ED model can work with two- and three-wire latch solenoids:

- **2/3 wire latch solenoids:** these modules can drive up to 8 solenoids. The solenoids must be connected as defined in the wiring table in the next section.

2SD2ED1EA | 2SD2ED:

The 2SD2ED1EA model can work with two- and three-wire latch solenoids:

- **2/3 wire latch solenoids:** these modules can drive up to 2 solenoids of this type. The solenoids must be connected as defined in the wiring table in the next section.

*For 3-wire models, a diode box is required.

DIGITAL INPUTS

Maximum allowed distance between AgroBee-L module and a digital sensor or meter is 50m.

9SD2ED2EA:

There are up to 2 digital inputs in the 9SD2ED2EA model, that can work as a digital input or counter/rain gauge input. When the input is connected to a counter, the minimum time between pulses must be 0.1 seconds and an anti-bounce filter may be enabled in order to avoid accumulating undesired pulses.

6SD6ED2EA:

There are up to 6 digital inputs in the 6SD6ED2EA model, that can work as a digital input or counter/rain gauge input. When the input is connected to a counter, the minimum time between pulses must be 0.1 seconds and an anti-bounce filter may be enabled in order to avoid accumulating undesired pulses.

8SD2ED:

There are up to 2 digital inputs in the 8SD2ED model, that can work as a digital input or counter/rain gauge input. When the input is connected to a counter, the minimum time between pulses must be 0.1 seconds and an anti-bounce filter may be enabled in order to avoid accumulating undesired pulses.

2SD2ED1EA | 2SD2ED:

There are up to 2 digital inputs in the 2SD2ED1EA / 2SD2ED model, which can work as a digital input or counter input. When the input is connected to a counter, the minimum time between pulses must be 0.1 seconds and an anti-bounce filter may be enabled in order to avoid accumulating undesired pulses.

ANALOG INPUTS

Many models have up to 2 analog inputs for reading and managing a maximum of 2 4-20 mA or 0-20 V sensors. The sensors must be connected as defined in the table in the next section.

9SD2ED2EA:

There are up to 2 analog inputs.

6SD6ED2EA:

There are up to 2 analog inputs.

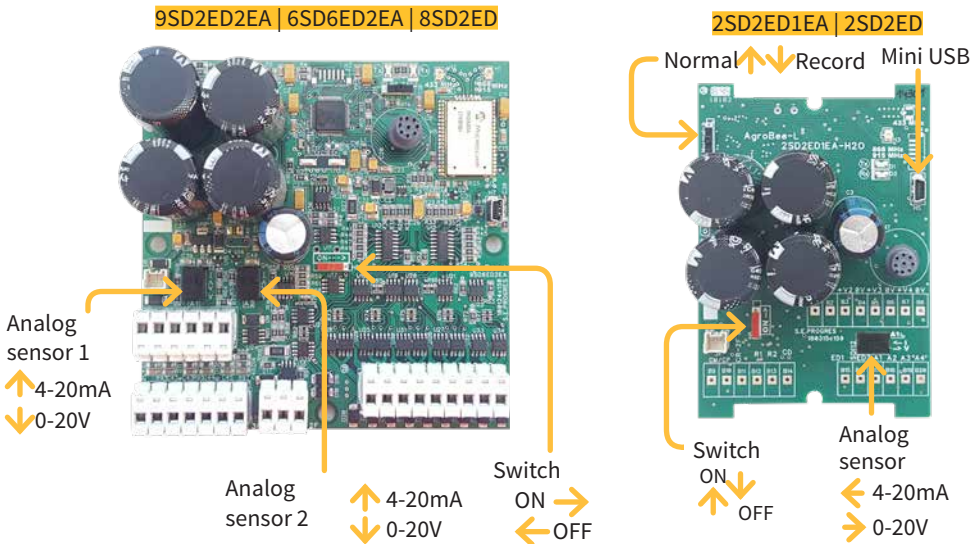
2SD2ED1EA:

There is 1 analog input.

IMPORTANT

To obtain the reading of an analog sensor through a specific “analog input” (1 or 2), the sensor must be powered by the corresponding “sensor feed” (1 or 2). Therefore, the power supply will be independent for each sensor.

The black switches located on the inside of the device (see images) make it possible to select whether the corresponding sensor delivers voltage, between 0-20 V, or a current, between 4-20 mA. Place the switch to the right toward the voltage input or to the left for the current. This action must be accompanied by the corresponding configuration in the associated controller.



CONNECTION

Each of the modules in question (9SD2ED2EA / 6SD6ED2EA / 2SD2ED1EA / 8SD2ED / 2SD2ED) is provided with a 7-metre cable hose that allows different connections to be made more easily without the need to access the interior of the module:

9SD2ED2EA: 20-wire tube

6SD6ED2EA: 20-wire tube

2SD2ED1EA: 10-wire tube

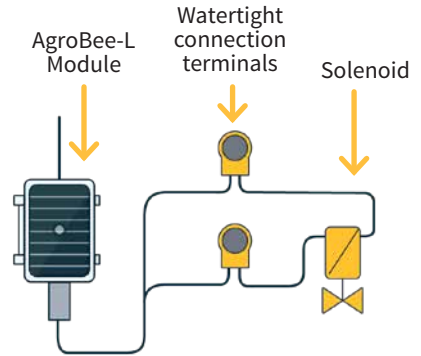
8SD2ED: 13-wire tube

2SD2ED: 7-wire tube





















The cables in the different tubes come identified by colour. Connect them according to the table on the following page according to their function.











To ensure that the module's cable connections are watertight, it is recommended to use watertight terminals. The connection through these terminals must be made without stripping the cable's wires.





















The 3M Scotchlok series (www.3m.com), ES Caps from TYCO Electronics (www.tycoelectronics.com), or Cellpack resin splicing and junction kits (www.cellpackiberica.com) can be used as connecting elements.










8SD2ED			
Wire colour		Function 1 (2-wire latch)	Function 2 (3-wire latch)
	White		R1
	Brown		R2
	Green		R3
	Yellow		R4
	Grey		R5
	Pink		R6
	Blue		R7
	Red		R8
	Black	Common (CR-2F)	Common Stop (CP)
	Purple	-	Common Activate (CM)
	Grey-pink	Digital Input 1 (D1)	
	Red-blue	Digital Input 2 (D2)	
	White-green	Common Inputs (CD)	

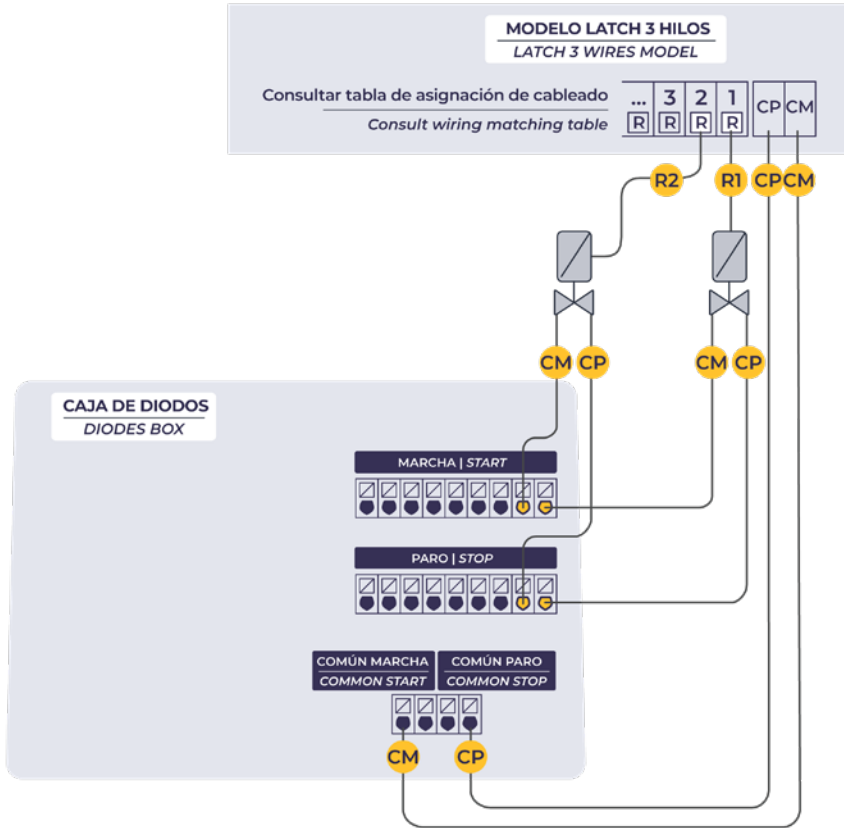
9SD2ED2EA			
Wire colour		Function 1 (2-wire latch)	Function 2 (3-wire latch)
	White		R1
	Brown		R2
	Green		R3
	Yellow		R4
	Grey		R5
	Pink		R6
	Blue		R7
	Red		R8
	Black		R9
	Purple	Common (CR-2F)	Common Stop (CP)
	Grey-pink	-	Common Activate (CM)
	Red-blue		Digital Input 1 (D1)
	White-green		Digital Input 2 (D2)
	Brown-verde		Common Inputs (CD)
	White-yellow		Analog input sensor 1 (A1)
	Yellow-brown		Common power sensors (CA1)
	White-grey		Power supply sensor 1 (+V1)
	Grey-brown		Analog input sensor 2 (A2)
	White-pink		Common power sensors (CA2)
	Pink-brown		Power supply sensor 2 (+V2)

2SD2ED1EA			
Wire colour		Function 1 (2-wire latch)	Function 2 (3-wire latch)
	White		R1
	Brown		R2
	Green	Common (CR-2F)	Common Stop (CP)
	Yellow	-	Common Activate (CM)
	Grey		Digital Input 1 (D1)
	Pink		Digital Input 2 (D2)
	Blue		Common Inputs (CD)
	Red		Analog input sensor 1 (A1)
	Black		Power supply sensor 1 (+V1)
	Purple		Common power sensors (0V)

6SD6ED2EA		
Wire colour	Function 1 (2-wire latch)	Function 2 (3-wire latch)
 White		R1
 Brown		R2
 Green		R3
 Yellow		R4
 Grey		R5
 Pink		R6
 Blue	Common (CR-2F)	Common Stop (CP)
 Red	-	Common Activate (CM)
 Black		Digital Input 1 (D1)
 Purple		Digital Input 2 (D2)
 Grey-pink		Digital Input 3 (D3)
 Red-blue		Digital Input 4 (D4)
 White-green		Digital Input 5 (D5)
 Brown-green		Digital Input 6 (D6)
 White-yellow		Common Inputs (CD)
 Yellow-brown		Analog input sensor 1 (A1)
 White-grey		Power supply sensor 1 (+V1)
 Grey-brown		Analog input sensor 2 (A2)
 White-pink		Power supply sensor 2 (+V2)
 Pink-brown		Common power sensors (CA1, CA2)

2SD2ED		
Wire colour	Function 1 (2-wire latch)	Function 2 (3-wire latch)
 White		R1
 Brown		R2
 Green	Common (CR-2F)	Common Stop (CP)
 Yellow	-	Common Activate (CM)
 Grey		Digital Input 1 (D1)
 Pink		Digital Input 2 (D2)
 Blue		Common Inputs (CD)

3-WIRE LATCH ASSEMBLY DIAGRAM WITH DIODE BOX



Settings

For any AgroBee-L module to enter the correct operating mode, you must have an Agrónic controller (Agrónic 2500, Agrónic 5500 and Agrónic Bit Con) with the AgroBee-L option installed, which includes the internal coordinator and an antenna with 10 metres of cable. This can be verified by doing the following in the controller:

Consult → Communication → AgroBee-L → Status: Correct








In the same way, a module must be configured to communicate with the Agrónic with which you want to associate it. To do this (if the module is not already configured at the factory) you must use the Module Reader (or Agronic Radio Reader, LAR) consisting of a screen and four keys, that is connected to the AgroBee-L module through the only connector visible on the inside.

A wireless module reader is also available that allows you to perform functions without the need for a cable. Consult the wireless AgroBee Reader manual to learn about the steps to link it to the controller.

You will see the following options in the main menu:

- Consult controller
- Consult communications
- Consult digital and analog inputs
- Communication parameters
- Input-Output parameters
- Various parameters

Press the  key to enter the main menu. Use the  and  keys to change the options within the menu. Use the  key to enter the selected menu option. Use the  key to return to the previous hierarchy's menu.

NOTE

Once the AgroBee-L module is linked with an Agrónic, all the consultations and parameters are accessible through the Agrónic.

CONTROLLER QUERY OF AN AGROBEE-L MODULE

General query menu of the module, where the following parameters are displayed:

- Module and serial number:
 - Module: It refers to the module number (1 to 20) according to the established communication parameters. There can only be one same module number for each Agrónic.
 - Serial number: Information regarding the controller. It comes from the factory.

- Battery voltage and solar panel:
 - Vbat: Battery voltage:
 - Panel+Supercapacitors: Maximum value: 3.4V; Minimum value: 2.2V
 - Panel+Battery: Maximum value: 4.2V; Minimum value 3.4V
 - Vsol: Voltage of the solar panel

These same data can be viewed in the Agrónic by accessing “Consult - Communications - AgroBee,” as you will see in the next section.

CONSULT COMMUNICATIONS IN AN AGROBEE-L MODULE

Communication consultation menu of the module, where the following parameters are displayed:

- Transceiver: Type of emitter installed in the module. It tells you if the module works at 868MHz/433MHz or 915MHz
 - RN2483 (868MHz/433MHz)
 - RN2903 (915MHz)
- Band and transmission mode:
 - Band: 868MHz, 433MHz, 915MHz
 - Transmission Mode: 1 to 18 (mode 5 will be set by default)
- Consult parameters of the communication type:
 - Channel: 1 to 13
 - Network code: It is usually the associated Agrónic serial number
 - BW: Bandwidth of the radio modulation (125KHz, 250KHz, 500KHz). It is set according to the transmission mode chosen in the communication parameters.
 - Radio modulation factor: SF7, SF8,..., SF12. It is set according to the transmission mode chosen in the communication parameters.
 - Communication status:
 - Status message:
 - Correct Communication
 - Network error
 - Communication error
 - Model error
 - Does not communicate
 - Signal-Noise ratio of the last received message: Reliable communication if >40%.
 - Time until next radio emission: time in [s]
 - Status of the last 16 communications (the previous communications appear on the right side of the screen):
 - 1: It indicates that the emission has been made and the correct information received in the last communication
 - 0: Indicates that the radio emission has been made, but the correct data has not been received or no data has been received

Part of this information is available through the Agrónic by accessing “Consultation | Communications | AgroBee”, where you can also see the query regarding the controller and the parameters of the communication.

CONSULT COMMUNICATIONS

AgroBee-L 868

Status: Correct

Timing: 60”

Channel: 01 TX Mode: 05

Network code: 00001

CONSULT COMMUNICATIONS

M01 (ns. 236) V1.00

Status: Correct (40”)

Level: 80% / 82%

Vbat: 04.0 V Vsol: 05.8 V

1111111111111111

CONSULT THE AGROBEE-L MODULE DIGITAL OUTPUTS

Menu that shows the status of each of the outputs, one by one.

The states that can be shown for each digital latch output are the following:

- Activated
- Stopped
- Latch tension load (running)
- Latch tension load (stopped)
- Running time
- Stopped time

The status of the digital outputs (latch) can also be displayed through the Agrónic: see the next section.

CONSULT THE AGROBEE-L MODULE DIGITAL INPUTS

Menu to consult the status of digital inputs, counters, and analog inputs. The analog inputs are only available for models 9SD2ED2EA, 6SD6ED2EA, 2SD2ED2EA.

The information shown on the different screens is as follows:

- Consult digital inputs: For each of the digital inputs available to the module in question, its status is shown either as ‘0’ (open contact) or ‘1’ (closed contact)
- See accumulated counter sensors: The total number of pulses detected will be displayed for each digital input configured as a counter sensor. If this entry is not configured as a counter, the text ‘N-A’ (Not-Activated) will appear.
- See instant flow rate (time between pulses): The time in [ms] between the last 2 pulses detected will be displayed for each digital input that is configured as a counter sensor. If this entry is not configured as a counter, the text ‘N-A’ (Not-Activated) will appear.

- Consult analog inputs: For each of the available analog inputs, the value read is displayed and expressed in [mA] or [V] according to the type of input in question. Likewise, the value in the format in which the Agrónic receives it (800-4000mV) is shown in parentheses. If the analog input in question is not configured, the text 'N-A' (Not-Activated) will appear.
- Check the supply voltage of the analog sensors: The value of the supply voltage sent to the active analog sensors is displayed in [mV].

From the Agrónic, press the '1' key in the module's consultation screen on the Agrónic to view the values of the analog/digital inputs as well as outputs of the module.

Nomenclature used in these queries:

- **ED**: status of digital inputs. With a '1' indicating that the contact is closed and a '0,' that it is open. The digit on the far right corresponds to input 1.
- **SD**: status of digital outputs (latch valves). With a '1' indicating that the valve is open and a '0,' that it is closed. The digit on the far right corresponds to output 1.
- **EA**: analog input values in mV. If the sensor is 4-20mA, 4mA=800mV and 20mA=4000mV. The number next to EA indicates the sensor number.

Below is an example of the screens you can see, depending on the model:

AgroBee-L 02 2SD
ED: 01
SD: 00

AgroBee-L 03 8SD
ED: 00
SD: 00010010

AgroBee-L 07 2SD2ED1EA
EA1: 1402
ED: 00
SD: 10







AgroBee-L 08 9SD2ED2EA
EA1: 963
EA2: 2033
ED: 10
SD: 100100100

AgroBee-L 09 6SD6ED2EA
EA1: 963
EA2: 2033
ED: 100100
SD: 000001

COMMUNICATION PARAMETERS OF AN AGROBEE-L MODULE

The following parameters are in the Communication Parameters menu of the Module Reader, which allow you to establish the communication of a certain AgroBee-L module with a controller:

- **Module** Module number in the network. It is used to distinguish all modules that may be associated with an Agrónic. The module number cannot be repeated in the same Agrónic:
 - 1 to 20 (timing in normal mode)
 - 1 to 10 (timing in priority mode)
- **Band** Frequency Band:
 - 868MHz or 915MHz (default value, depending on the model)
 - 433MHz (only available in models that also support 868MHz band)
- **Channel** Frequency channel number:
 - 1 to 13 (independent from the band used)
- **TX Mode** Transmission method. Set the radio's transmission and reception parameters.
 - 1 to 18 (mode 5 set by default):
 - Mode 1: The shortest coverage length permitting the lowest lag time
 - Mode 18: The greatest coverage length, but with the most lag time
- **Timing** 2 timing modes:
 - Normal mode (recommended): It is automatically set according to the chosen transmission mode, but always includes the communication of up to 20 modules. Value between 60" and 200".
 - Priority mode: It is automatically set according to the chosen transmission mode and includes the communication of up to 10 modules. Value between 30" and 100".
- **Network code** It differentiates the information from several controllers with the same communication parameters (band, channel, and transmission mode). The Agrónic serial number is assigned by default.

To modify any of the sub-menu's fields, press . The screen will display that you are in edit mode. Use the  and  keys to set the desired value. Confirm with  or dismiss with . Press  to exit the menu and access the previous hierarchy's menu, which will change the parameters and let them take effect.

For an AgroBee-L module to establish communication with a certain Agrónic, you must set, through the reader, the parameters that have just been described, according to those established in the Agrónic in question. In the Agrónic, you can modify these parameters in 'Parameters | Installer | Communications | AgroBee | Coordinator':







AgroBee-L
Channel: 01
Network code: 00001
Timing: standard
Band: 868MHz
TX Mode: 05

INPUT/OUTPUT PARAMETERS OF AN AGROBEE-L MODULE

In the Input-Output Parameters menu of the Module Reader, you can set the parameters of the AgroBee-L module's different inputs and outputs, available through the following sub-menu:

- **Digital Inputs** Configuration of digital sensors or counters.
 - Configuration of functions of each of the available digital inputs:
 - Digital input
 - Counter
 - Anti-bounce filter: (default 300 ms) only applicable when digital input is setup as counter. A filter time between 0.0" and 10.0" can be fixed, and it represents the minimum time that a contact must be closed to count a new pulse. Same time is considered for all the inputs of the module. This filter time can only be setup by using the Module Reader (it cannot be setup from the programmer to which this module is linked).
- **Digital Outputs** Configuration of latch outputs:
 - Latch trigger voltage: 6V, 9V, 12V (default), 19V
 - Latch valve type: 2 wires, 2 wires-inverted (default), 3 wires
 - Number of fires: 1 (default) or 2 It refers to the number of activations that take place when an action is performed on an output. Only modifiable through the module reader.
 - Firing time: 31.25 ms, 62.5 ms, 93.75 ms (default)
 - Battery mode:
 - OFF: As it currently works. On receiving the first communication after startint up the module, the action of openint/closing all the valves is carried out.
 - ON: The module saves the current status of the valves in memory. If you do a reset, the unit recovers that state, and does not perform any action on the valves unless a different order is received from the controller.
- **Analog Inputs** Configuration of the measurement parameters of the analog inputs (option only available for models 9SD2ED2EA, 6SD6ED2EA, 2SD2ED1EA). You will have the following options for each of the available inputs, according to the model:
 - Active / Non-Active Input
 - Type of input: 4-20mA (default) or 0-20V. There is also a black switch in the circuit that must be in the same position as the one set through this option
 - Reading rate: 5min (default), 10min, 20min
 - Sensor's power supply: 5V, 12V (default)
 - Timing of the sensor's power supply: 250ms default, 500ms, 1s, 2s
- **General Parameters** It allows you to establish the last output of the module as a general output of the module itself. This output will be activated whenever any of the other outputs of the module is activated. There is a configurable hammer, from 1" to 250", between the activation of the generals and the sector. First activate the sector, and then the generals:
 - General module YES or NO (by default, NO).
 - Stop-Sector: YES or NO (by default, NO). Action to be taken when there is a general module command and the module receives the order for the last active sector:
 - YES: First for the general, and then the sector after the seconds set
 - NO: First for the sector, and then the general after the seconds set

- **Action Error** Indicates what action the module will take with the digital outputs when the radio communication between the module and Agrónic fails:
 - It does not close: the output state remains as it is
 - Close immediately: all outputs close immediately upon losing communication with the Agrónic
 - Close 15 min: all outputs close after 15 minutes of the module being unable to communicate with the Agrónic

To modify any of the parameter's fields, press . The screen will display that you are in edit mode. Use the  and  keys to set the desired value. Confirm with  or dismiss with . Press  to exit the menu and access the previous hierarchy's menu, which will change the parameters and let them take effect.

IMPORTANT

The detailed input/output parameters can also be entered in the Agrónic. In this case, the module will receive the parameters upon communicating with it. If not, and these parameters have been changed through the Module Reader in the same module, the Agrónic will receive and update said parameters.

To modify these parameters from the Agrónic, you must access “Parameters | Installer | Communications | AgroBee | Module.” Specify the module number in the Agrónic network in question, after which you will see the following screens to modify the detailed parameters (see the Agrónic manual in question for more details). Only the 9SD2ED2EA, 6SD6ED2EA and 2SD2ED2EA models will appear on the final screen.

AgroBee-L 01 Action error: Nothing Module general: no Stop sectors: no	AgroBee-L 01 Latch tension: 12 Vdc Latch valve: 2 wires	AgroBee-L 01 Sensor 1. Activate:yes Sensor: 4-20mA Timing: 5' Voltage: 12 Vdc Voltage time: 250 ms
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(*) As many screens as sensors in the module

AGROBEE-L MODULE MANUAL OUTPUTS

In this sub-menu, you can carry out the start and stop actions of the different outputs without accounting for the timings of the sectors that may be defined. The following options are available:

- Output Test: starts/stops all of the module's outputs. It cannot be carried out if any of the outputs is active at the time of the test.
- Start/Stop each of the outputs individually. It cannot be carried out if the specific output is active at the time of the test.

From the reader, you cannot leave this menu if all of the outputs have not been stopped.

If, in this menu, the module reader is disconnected, all outputs will be deactivated immediately.

These same actions can be carried out from the corresponding Agrónic menu: in this case, it must be taken into account that said action will not be carried out until the module communicates with the Agrónic.

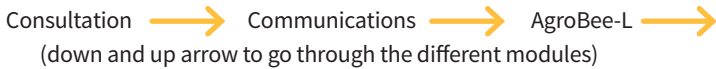
VARIOUS PARAMETERS OF AN AGROBEE-L MODULE

In the Various Parameters menu of the Module Reader, you can select the language among Spanish, Catalan, English, French, Italian, and Portuguese.

From this menu, you can also completely erase the module's data, restoring it to factory settings, maintaining the serial number and the model.

Battery levels and radio signal/quality

You have already seen how to consult the different parameters of an AgroBee-L module through the Module Reader. In the Agronic to which the AgroBee-L module is associated, it also shows the battery information and radio link performance of said module.



The information provided is:

- Module number, serial number, and firmware version
- Signal level received by the Agronic and the module. It is displayed in % and indicates the level of the signal-to-noise ratio.
- Advisable/recommended value > 40%
- Vbat: Battery level in mV:
 - Module with panel + supercapacitors: VBat max = 3.4 V; VBat min = 2.2 V.
- VSol: Voltage level delivered by the solar panel.

Estimated battery life

Battery life with standard communication rate mode 5: 60 seconds

Type	9SD2ED2EA(2) / 6SD6ED2EA(2) / 2SD2ED1EA 8SD2ED / 2SD2ED
Panel + Supercapacitors ⁽¹⁾	< 3 days

(1): The duration of the battery with its maximum charge and without recharging. This case can occur when the solar panel does not recharge the battery (with clouds or fog).

Battery life is approximate since there are several factors that can affect consumption. Frequent reading of digital sensors (when counters are configured) shortens the duration. Likewise, if a priority mode rate is set, the battery life will decrease.

Conversely, for the 9SD-2ED-2EA / 6SD-6ED-2EA / 2SD-2ED-1EA model, if a higher sensor reading rate is selected, the battery life will increase.

Battery replacement. you do not need to replace any battery in any case, since the power supply of the modules is based on a system of supercapacitors.

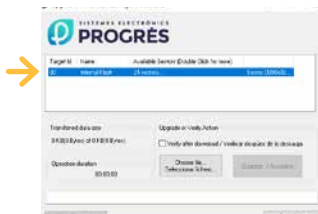
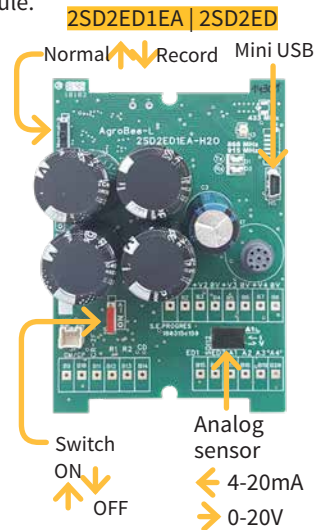
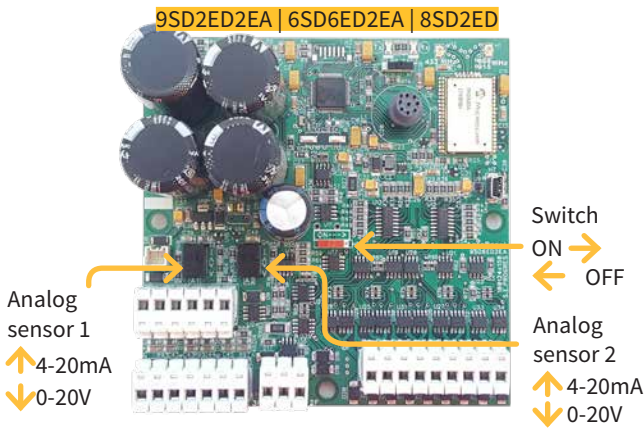
TURNING OFF THE CONTROLLER

If a module does not find the Agronic with which it communicates, said module will follow its own course, and will send data every certain time, according to the established timing. However, in order to avoid possible collisions and/or interferences, the module will slightly offset the pre-established communication time. The consumption of an AgroBee-L module is practically unchanged due to the fact that it is not connected to any Agronic.

Updating the AgroBee-L module software

Whenever there is a new software version for an AgroBee-L module, the user can update it. To do this, you must perform the following steps:

- Have a computer with an Internet connection and a USB to miniUSB cable.
- Download the program “AgronicUpg” + “drivers” + update file (dfu) by typing this address bit.ly/actualizaragronic into the computer’s browser.
- Select and download the AgroBee-L folder.
- Go to the module and turn it off using the switch.
- Place the other switch inside the module in the recording position (by default, it is in the ‘Normal’ position).
- Connect the USB to the computer and the miniUSB to the module.
- Start up the module using the ON/OFF switch.



- On the computer, run the program “AgronicUpg”. If you do not see the “Internal Flash” line on the screen as seen in the image, you must install the drivers. If you already have the drivers installed, skip to the next step.

- To install the drivers, go to the files you have downloaded and select the folder that corresponds to your Windows version. Run the file “dpinst_” and follow the steps. If you

- use Windows XP, call Progrés to help you with the installation.
- Press the “Choose file” button and select the file “xxx.dfu”. Once loaded, press the “Update” button and wait for the process to finish.
- Once the process is finished, the module is updated.
- To finish, turn off the module, disconnect the miniUSB cable, and place the second switch in the ‘Normal’ position.
- Finally, the module can be started up again.

PERSONAL NOTES

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