MANUAL OF THE

Expansión module 2

Sections in the manual:

- Description
- Dimensions
- Technical specifications
- Connection locations
- Connections
- Configuration
- Installation example

The Parameters and consultation sections of the expansion modules are detailed in the external module manual.





Hello!

Welcome to the expansion module 2 manual

We are very grateful for the trust you have placed in us by expressing an interest in our products. This manual provides information about the features of the unit as well as its installation and use.

Who is this manual for?

This manual is intended for people who physically install the expansion module on the property or in the electrical panel. Shows the dimensions and how the different connection options must be wired.



Index

1	Description4				
2	Dimensions5				
3	Technical specifications6				
4	Connection locations	7			
	4.1. Box and DIN rail format	7			
5	Connections	9			
	5.1. Connecting the power supply	10			
	5.2. Connecting the ground connection	10			
	5.3. Connecting digital inputs	11			
	5.4. Connecting the outputs	11			
	5.5. Connecting the diesel engine				
	5.6. Connecting the dual voltage option	15			
	5.7. Connecting the latch option	17			
	5.8. Connecting the analog inputs and outputs	19			
6	Configuration	20			
	6.1. Configuring the module number	20			
	6.2. Configuring the module number	21			
	6.3. Coding the inputs and outputs	22			
7	Example of installation diagram				
	7.1. Recommended type of installation				
	7.2. Type of installation to avoid				
	7.3. Indication in installations with more than 1 controller	25			
8	Recommendations				

1 DESCRIPTION

Remote expansion module for the Agrónic 4500. It expands the number of outputs and inputs to perform quick-action controls or control of different heads.

•

It has the following features:

Expansion Module 24S 12ED

- 24 relay outputs (or latch type), expandable to 99
- 12 digital inputs
- 12 analog inputs (option)
 - 10 4-20 mA analog inputs
 - 2 analog inputs 0-20 V
- 10 analog outputs of 4-20 mA or pulses (option)

The expansion modules communicate with the Agrónic 4500 through a single 0.5 mm section two-wire cable (RS-485).

Allows a maximum of 1200 meters cable distance from the controller to the last module. If more distance is needed, it is possible to install:

- An RS-485 repeater (06741220) that reaches an additional 1200 meters to the next device.
- A radio modem system between the Agrónic 4500 and the expansion module.

The Agrónic 4500 can have a maximum of 15 expansion modules connected.



2 **DIMENSIONS**





Expansion module location

Install the expansion module at the correct height and position for good handling. Avoid direct sunlight, humidity, dust and vibrations as much as possible.

Avoid being close to elements that generate interference and may affect correct operation.

In the box format, the unit is housed in a hermetically-sealed box (IP65) with a transparent front cover and an opaque cover for housing the connections. To maintain the seal, the covers must always be closed and the cable glands included with the unit installed in the cable outputs.

TECHNICAL SPECIFICATIONS 3

General power supply							
Voltage		12 Vdc ±10%	12 Vdc ±10%				
Power consumption		Less than 12 W	Less than 12 W				
Fuse	Input	Thermal (PTC) 1.1	Amp. at	25°C, auto-reset	table		
Output power sup	ply						
Voltage From 12 to 24 Vdc			or Vac (r	maximum 30 V)			
Fuse	Input "R+"	Thermal (PTC) 6.0 Amp. at 25°C, auto-resettable					
Outputs							
	Number	24, expandable to 40, 56, 72, 88 and 99.					
Digital	Туре	By relay contact, w	By relay contact, with 24 Vac potential (external transformer).				
	Limits	30 Vac / 30 Vdc, 1 Ampere, 50-60 Hz, CAT ll (per output)					
Analog /	Number	5 or 10	5 or 10				
Pulses (option)	Туре	4-20 mA (galvanica	lly isola	ted)			
All outputs have d	louble isolation in	respect to the mains	input.				
Inputs							
Digital sensors	Number	12					
0	Туре	Opto-coupled, operate at 12 or 24 Vdc or Vac					
	Number	5 or 10					
Analog (option)	Туре	4-20 mA (galvanically isolated)					
(option)	Number	1 or 2					
	Туре	0-20 V (galvanically isolated)					
Environment			Weig	ht			
Temperature	-5°C to 45°C	C to 45°C		model	From 2 kg to 3 kg		
Humidity	< 85%		DIN	rail model	From 0.5 k	g to 1 kg	
Altitude 2000 m							
Pollution Grade 2							
Statement of com	nliance						
Complies with Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive							
73/23/EEC for Product Safety Compliance. Compliance with the following specifications was							
demonstrated as indicated in the European Community Official Gazette.							
Sumbols that may appear on the product							
symbols that may appear on the product							
Protective terminal	ground	Danger, risk of electric shock	m	Ground termina	al 🔲	Double isolation	

This symbol indicates that electronic devices should not be disposed of along with household waste at the end of their useful life. The product must be taken to the corresponding collection point for electric and electronic unit recycling and correctly processed pursuant to Spanish legislation.

4 CONNECTION LOCATIONS

4.1. BOX AND DIN RAIL FORMAT

To make the connections to the box-format unit, remove the bottom cover to access the connectors.

To insert cables, the holes required must be punched out (do this with the connection cover in place and screwed in to avoid breaking it). The connectors and antennas from the rest of the options are located on the right side.

It is recommended to connect the wires to the terminal using the terminal connectors that come with the unit. (The terminals accept cables of up to 2.5 mm^2 in diameter).



Technical specifications | Box and DIN rail format

	to expand to models
SALIDAS OUTPUTS 41 42 43 44 45 46 748 49 50 51 52 53 54 55 56 CR Q R	SALIDAS <i>OUTPUTS</i> 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 CR (J) R R R R R R R R R R R R R R R R R R R

Pins 3(A) and 4(B) of the connector marked "RS485 ME" are used to make the connection between the Agrónic 4500 and the expansion module.



5 CONNECTIONS

The unit must be installed pursuant to the current regulations that apply to electrical installations. The unit will not be adequately protected if it is not used as specified in this manual.

All the connection terminals on the module can be plugged in, which allows for quick maintenance.

Some points to consider:

- Electromagnetic inteference must be minimized.
- The Expansion Module must be installed away from sources of interference such as frequency converters, motors, powers cables and alternating current cables (including the Monocable system).
- It is recommended to user separate tubes or rails for the communication and power lines.
- A distance of at least 15 cm must be maintained between the Expansion Module cables and the 230 Vac power cables.



5.1. CONNECTING THE POWER SUPPLY



The power supply is 12 Vdc for all models.

Installations with a solar cell, generator set or diesel engine are connected to the 12 Vdc battery.

In 110 or 230 Vac systems, a 90-230 Vac / 12 Vdc (50-60 Hz) power supply is available as an accessory to connect the unit. The socket to which the power supply is connected must be easily accessible.

The power supply intake has an auto-resetting thermal fuse and is also protected against reversed polarity and power surges.

The installation must have a separate thermo-magnetic switch to protect the module. Its output is connected to the general power supply and the transformer that powers the output.

When the diesel engine is running, avoid disconnecting the battery as the alternator will raise the electrical tension considerably and damage the module.

5.2. CONNECTING THE GROUND CONNECTION



It is extremely important to connect this socket independently for complete protection of the unit

The ground connection must be different and separate from the ground connection of drives or pumps.

The terminal used for the ground wires is located next to the power supply terminals; its function is to divert to the ground any possible electrical sparks generated by storms that can enter via the input and output cables. An arc sparkover in the internal gas discharger is produced with 90 volt or more.

PROGRES

5.3. CONNECTING DIGITAL INPUTS

Digital inputs

Both the digital inputs and the relay outputs are powered externally at 12 Vdc or 24 Vac.

The digital inputs are galvanically isolated by optocouplers from the rest of the circuit.

The contacts of the devices connected to the digital inputs must be voltage-free.

The unit has 12 digital inputs on the base, indicated as D1 to D12 and one common marked as CD.

5.4. CONNECTING THE OUTPUTS

All the outputs are operable at either 12 or 24 volt in alternating or continuous current (do not supply voltage higher than 30 volt).

To be operative at 24 Vac, an external transformer with a double-insulated 24 Vac output must be installed pursuant to UNE EN61010 standards.

The power supply intake for the outputs is marked 'R+' and 'R-'.

The 'AUX' terminal corresponds to the 'R+' input passed through the power supply protection. It is used to connect auxiliary manual control elements and relay expansions.

The solenoids on the solenoid valves, relays and contactors are connected between the 'CR' output common and the corresponding output between 'R1' and 'R99'.

The outputs are isolated from the internal circuitry by relays and protected by a varistor in each one.

The power supplied to the outputs and sensors is protected by an auto-resettable thermal fuse. The 'Consult - Modules' section indicates whether there is voltage for the outputs or not. When there is a short circuit in one of the outputs, the fuse will automatically be tripped, limiting the output until the short circuit has terminated.





5.5. CONNECTING THE DIESEL ENGINE

In installations where there is a motor pump, the Agrónic can manage the start and stop maneuvers. To manage it, it uses four outputs (preheating, contact, start and stop) and a digital input (oil pressure gage).

When making the connections for the diesel engines, the following details must be taken into account:

INPUT

PA oil pressure gage. The pressure switch input can be connected to any of the 12 digital inputs on the base. The CD digital input common does not have to be connected to the pressure gage as this is done directly through the pump chassis.



OUTPUTS

The outputs deliver the battery positive. A supplementary relay is intercalated between each to prevent damage to the internal relays.

The contact output is connected through the relay to the cable from the '15/54' terminal of the valve. This is the unit responsible for connecting and disconnecting the contact, so the valve must be left in the inactive position.

At the start output, a supplementary relay is intercalated with a capacity for 20 to 30 Amp, connecting the output to the cable from the '50' terminal on the valve.

If the pump is stopped by an electromagnet, this is connected to the supplementary relay from the stop output.

If the pump is stopped when the fuel supply is cut off

by a solenoid valve, it is installed at the same injector input for the stop to be as quick as possible. When the solenoid valve is normally open, it is connected directly to the stop output. If the solenoid valve is normally closed, it is connected to the contact output.

When there is a preheating function, this is connected to the relay to be activated.

For greater safety, it is convenient to have a dual stopping system that uses an electromagnet for stopping quickly and effectively, plus a solenoid valve that is normally closed so as to cut off the fuel supply if there is an incident or malfunction.

5.6. CONNECTING THE DUAL VOLTAGE OPTION

The Dual Voltage option is for installations where the power comes from a diesel generator. The module will start the generator when it has to irrigate and will stop it when finished.

The module is powered by the 12 V DC battery of the group. The four outputs that give the commands to start and stop the generator go to 12 Vdc, all the others go to 24 Vac and are operational when the generator is running.

At the base of the module, the 12 Vdc outputs are R21, R22, R23 and R24 (for any model).

The module can have two functions:

- With start and stop management of the diesel engine. In this case, the diesel engine control is used with the preheating, contact, start, stop outputs and the digital input of the oil pressure switch.
- With central control start management built into the generator. In this case, only a contact signal is needed. To activate this operation, the start and stop times will be '0'.



5.7. CONNECTING THE LATCH OPTION

In installations where very low power consumption is needed, latch valves are usually used. The latch solenoid valve, also called from impulses, functions by hydraulically locking its open or close position, consuming power only in the moment it changes position. This allows power to be powered by a battery only or by a battery and a solar cell. The calculation is made taking the installation's options and auxiliary systems into account. The installer can configure the unit to use latch solenoid valves in the two or three-wire format and a 12 or 22-volt trip voltage. See section 'Function - 4. Parameters - 14. Installer'.

If installing 3-wire models, a diode box must be incorporated that is appropriate to the total number of the unit's outputs, to make the connection from the start and stop common outputs. This is unnecessary in 2-wire models.



One of the two wires is connected to the 'CR' output common and the other to the corresponding output between 'R1' and 'R99'.

When the solenoid valve acts hydraulically in reverse of the order given by the unit, this command will be reversed by entering 'Function - 4. Parameters - 14. Installer - 5. Communications - 11. Expansion modules'.



This solenoid valve model has two commons; the one for starting (normally red) will be brought to the diode box, to one of the terminals marked '**Run**'; The stop common (normally black) is connected to a terminal marked '**Stop**'; the other cable (normally white) is connected to the corresponding output between '**R1**' and '**R99**'. The CM start and the CP stop commons must also be connected on the unit and from the diode box. If the valve order is the opposite of the desired order, reverse the Common Start and Common Stop cables.

5.8. CONNECTING THE ANALOG INPUTS AND OUTPUTS

In installations where analog sensors or analog outputs need to be read for fertilization or pressure regulation, this option is required.



6 CONFIGURATION

6.1. CONFIGURING THE MODULE NUMBER

In each climate control installation carried out by Progrés, an initial **configuration sheet** is provided containing essential information about the expansion modules used in the system. This sheet includes, for each module:

- Serial number: This is a unique factory identifier number.
- RS485 adress: This is an indentifier that Progrés assigns internally to each expansion module using internal switches. This number allows one module to be differentiated from another within the system and is essential for establishing accurate communication with each of them.
- Module model: This is the module model which can be ME1 or ME2.
- Repeater: This details whether the module acts as a

repeater or not.

This sheet is essential for:

- Correctly locating each module within the installation.
- Ensuring adequate communication between the modules ensuring that there is not a single module number repeated in the installation.

In case of doubts of future extensions to the systems, this sheet serves as a reference to correctly localte and configure the necessary module number.

To configure the number of a new module, see the following section '6.2 Configuring the module number'.

	SISTEMES ELECTRÓNICS
	DDOCDES
52	PROGRES

Installation configuration sheet **EXPANSION MODULES**

Installation:					Configuration date:	
Installer:						
Serial nº Agrón	ic : 74-					
Time between	sendings:		Tiempo Timeou	t:		Retries:
IMPORTANT Check the correct installation of the cable and its correct polarizations (A, B).						
Equipment configuration	Serial N° ME	Adress RS485	Model (ME1, ME2)	Repeater [YES/NO]		Observations
M 01						
M 02						
M 03						
M 04						
M 05						
M 06						
M 07						
M 08						
M 09						
M 10						
M 11						
M 12						
M 13						
M 14						
M 15						

6.2. CONFIGURING THE MODULE NUMBER

Each of the expansion modules connected to an Agrónic 4500 must be assigned a module number. This number is indicated by the two switches on the module plate (SW1 and SW2).

The switch (SW1) selects the tens while the second switch (SW2) selects the units.



In the Agrónic 4500 controller, this address must also be configured in the required module. To configure it, consult the manual '2418 Agrónic 4500 Manual -External modules' and go to:

'Function - Parameters - Installer - Communications -Expansion modules - Select module number.'

To check whether the expansion module is communicating, press 'Consult - Modules' (F4 key).

Importante

Modules are identified by a number assigned by switches SW2 and SW3. This number is completely independent of the module's serial number, as the two numbers are not related to each other.



Important

If the expansion module is the last one in the line, it is essential to set the switch to position **120**, as shown in the image. This configuration ensures the correct operation of the system.

The switch (**RPT**) is used to determine whether or not the module should repeat the signal to another module.

If the module is a repeater, install the plate in the indicated connector and position the switch upwards, otherwise position it downwards.

6.3. CODING THE INPUTS AND OUTPUTS

The inputs and outputs are coded with 8 numbers for easy location.





11000201 Analog/digital input/output 1 of module number 2 of external 'Expansion module'

7 EXAMPLE OF INSTALLATION DIAGRAM

7.1. RECOMMENDED TYPE OF INSTALLATION

Bellow is an example of a suitable installation to distribute and connect the different modules to the Agrónic 4500, and to make the connection in series, following the method known as 'Daisy Chain'.

This type of connection guarantees efficient communication between the modules and the Agrónic 4500.



7.2. TYPE OF INSTALLATION TO AVOID

Below are 3 examples of typical installations that should not be done to avoid communication problems:







7.3. INDICATION IN INSTALLATIONS WITH MORE THAN 1 CONTROLLER

When two or more Agrónic 4500 controllers are used in the same installation, it is essential to pay attention to the cables that connect to their respective modules. The Bus lines of each controller must be kept separate and never mixed.



8 RECOMMMENDATIONS

Where to install the unit

- Install the unit at the correct height and position for good handling.
- Avoid direct sunlight, humidity, dust and vibrations as much as possible.
- Avoid being close to elements that generate interference and may affect correct operation.
- To maintain the tightness of the box format, always keep the lid closed and install cable glands on the cable outputs.

Installation with frequency drive

- The expansion module ground must be independent and separate the ground spike from the drive and the pump.
- Sensor cables must be shielded and installed separately from power cables.
- It is highly advisable to install the expansion module and the drive in different and separate cabinets.
- It is advisable to place a filter between the drive and the pump to reduce the harmonics of the output signal and thus comply with the CE marking regulations. The filter must be located near the converter, as well as using shielded cable (EMC).

- In installations that have a pressure transducer, it must be galvanically isolated from the pressure pipe, since interference can propagate through it. The transducer can be secured to the wall by means of an insulating support and connected to the pressure pipe by means of a microtube.
- In the expansion module, the consequences of incorrectly installing the drive can be random output activation, screen changes without touching the keyboard and incorrect probe readings, among others.
- See the manual '1406 Installations with Agrónics and frequency drives' available on the Progrés website.

Sensor and meter wiring

Sensor and meter cables should never pass next to or parallel to cables with alternate power. There must be a minimum distance of 0.5 meters between them.

SPACE RESERVED FOR THE USER

Use this space to record information such as the parameters entered into the controller, drawings, program information, determining factors, alarms, etc.



User manual	Expansion	module 2	for Agrónic	4500
-------------	-----------	----------	-------------	------

oser manual Expansion module 2 for Agrome 4500	User manual	Expansion module 2	for Agrónic 4500
--	-------------	--------------------	------------------

Warranty

The expansion module complies with CE marking directives. Products manufactured by Progrés have a two-year warranty against any manufacturing defect. Compensation for direct and indirect damage caused by the use of the controllers is excluded from the warranty.

Sistemes Electrònics Progrés, S.A.

Polígon Industrial, C/ de la Coma, 2 | 25243 El Palau d'Anglesola | Lleida | Spain Tel. 973 32 04 29 | info@progres.es | www.progres.es