

*Electronic*



## Communication parameter programmer

ESA PROG-1 (E7061 rev. 02 - 15/09/2016)

## GENERAL WARNINGS:



■ All installation, maintenance, ignition and setting must be performed by qualified staff, respecting the norms present at the time and place of the installation.

■ To avoid damage to people and things, it is essential to observe all the points indicated in this handbook. The reported indications do not exonerate the Client/User from observing general or specific laws concerning accidents and environmental safeguarding.

■ The operator must wear proper DPI clothing (shoes, helmets...) and respect the general safety, prevention and precaution norms.

■ To avoid the risks of burns or high voltage electrocution, the operator must avoid all contact with the burner and its control devices during the ignition phase and while it is running at high temperatures.

■ All ordinary and extraordinary maintenance must be performed when the system is stopped.

■ To assure correct and safe use of the combustion plant, it is of extreme importance that the contents of this document be brought to the attention of and be meticulously observed by all personnel in charge of controlling and working the devices.

■ The functioning of a combustion plant can be dangerous and cause injuries to persons or damage to equipment. Every burner must be provided with certified combustion safety and supervision devices.

■ The burner must be installed correctly to prevent any type of accidental/undesired heat transmission from the flame to the operator or the equipment.

■ The performances indicated in this technical document regarding the range of products are a result of experimental tests carried out at ESA-PYRONICS. The tests have been performed using ignition systems, flame detectors and supervisors developed by ESA-PYRONICS. The respect of the above mentioned functioning conditions cannot be guaranteed if equipment, which is not present in the ESA-PYRONICS catalogue, is used.

## DISPOSAL:



To dispose of the product, abide by the local legislations regarding it.

## GENERAL NOTES:



■ In accordance to the internal policy of constant quality improvement, ESA-PYRONICS reserves the right to modify the technical characteristics of the present document at any time and without warning.

■ It is possible to download technical sheets which have been updated to the latest revision from the **www.esapyronics.com** website.

■ The products manufactured by ESA-PYRONICS have been created in conformity to the **UNI EN 746-2:2010** Norms: Equipment for industrial thermal process - Part 2: Safety requirements for combustion and the movement and treatment of combustible elements. This norm is in harmony with the Machine Directive **2006/42/CE**. It is certified that the products in question respect all the requirements prescribed by the above mentioned Norms and Directives.

■ Certified in conformity with the **UNI EN ISO 9001** Norm by DNV GL.

## CERTIFICATIONS:



ESA PROG-1 is in compliance with European Union directives **2014/30/UE** with reference to standards: **EN61000-6-2** (immunity for industrial environments), **EN61000-6-4** (Emission standard for industrial environments).



The products conform to the requests for the Euroasia market (Russia, Belarus and Kazakhstan).

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ESA PROG-1 is a portable microprocessor device with a liquid crystal display conceived for the programming of communication parameters towards ESA ESTRO and ESA REFLAM burner control devices. Its ergonomic design has been studied to facilitate on field configuration operations on industrial plants.

## APPLICATIONS

- Reading and writing of communication parameters.
- Reading of ignition cycles performed by ESA ESTRO and ESA REFLAM.
- Enabling of the front key for ESA ESTRO 2.1 when it is set as "REMOTE ENABLE".

## CHARACTERISTICS

### GENERAL:

- Communication channel: infrared or ECS (by wire)
- Distance of infrared use: 100mm from the instrument
- Distance of use from ECS: 1 mt max from the instrument
- Baud rate: 4800 or 9600 ECS by wire
- Bit data: 8
- Parity: none
- Stop bit: 1 or 2
- Communication line voltage (ECS): 25 Vdc max
- Instruments to be configured connected (ECS): 1 max
- Supply voltage: 9 Vdc battery with automatic disconnection after 5 min.
- Low battery indication: Lowbattery
- Functioning temperature: 5÷45°C
- Storage temperature: 0÷60°C
- Protection degree: IP40
- Working environment : not suitable for explosive environments
- Maximum dimensions: 145X85X39 mm
- Weight: 250 g
- Type of serial interface: infrared or ECS (wire)

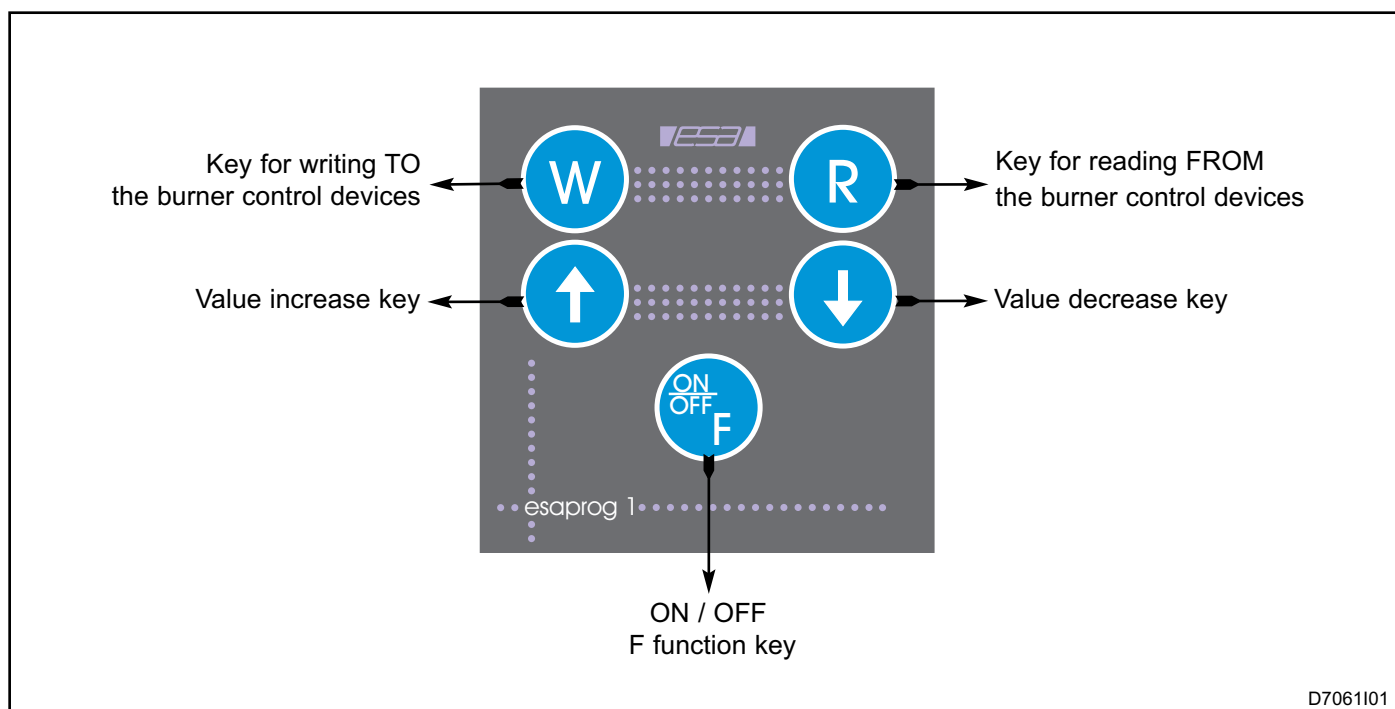


## DESCRIPTION

ESA PROG-1 allows the programming of communication parameters and the reading of the ignition cycles number of the ESA ESTRO, ESA REFLAM-H flame control devices as well as that of their previous versions. Configuration can take place via a serial line or via infrared signals. The fact that it is compact and doesn't have a power cord make the instrument manageable and easy to use. The front panel has five buttons to select and confirm parameters as well as a liquid crystal display to visualize the data. On the top of the instrument there is the infrared

ray interface and next to it there is the serial (ECS by wire) connector input (wire). When powered the instrument displays the ADDRESS menu and using the "F" button you can visualize the serial address (segment and node) that can be changed and transmitted to the flame control device. The selection of the type of interface and the flame control model that is to be configured is carried out in "programming" mode. The instrument indicates to the operator the operations that are carried out signalling possible communication errors.

## DISPLAY SECTION AND LOCAL COMMAND



ESA PROG-1 displays in automatic mode the available menus to which you can enter with the function key. In the "ADDRESS" menu the display indicates both the parameters of the address and if the change phase is activated a flashing point indicates the data that can be changed with the arrow keys. During the communication with the flame control device it indicates the operation taking place (reading or writing). In the other automatic

mode menus and programming menu, all the parameters and selectable values are indicated with a scrolling text. This simplifies the use by the operator. The keyboard is made up of 5 keys that can be distinguished in the following groups:

- Writing key (**W**) and Reading key (**R**)
- Increase key (**↑**) and Decrease key (**↓**)
- Function key (**F**)

## DISPLAY SECTION AND LOCAL COMMAND

OPERATION	MODE	DESCRIPTION
<b>W</b>	Automode	Via the selected serial interface, it allows writing of the parameter visualized on the display. During this operation the "writing" indication is displayed.
<b>R</b>	Automode	Allows the reading via the selected serial interface of the flame control's set parameters, visualizing them then on the display. During this operation the "reading" indication is displayed.
<b>↑ o ↓</b>	Automode	Displays scanning menus and editable parameters and possible settings. During parameter modification, it allows the change of values.
<b>F</b>	Automode	With the instrument off, if pressed for one second, it enables power on. In automatic mode it allows to access the parameters of the menu and inside the menus allows to visualize the selectable values for each parameter. In the "ADDRESS" menu it allows the scanning access to the communication parameters to be edited. With the instrument on, if pressed for three seconds, it switches off.
<b>↑ + F</b>	Automode	Activates the programming mode.
<b>↑ o ↓</b>	Program	Displays scanning menus and editable parameters and possible settings. During parameter modification, it allows the change of values.
<b>F</b>	Program	Enables the change of the current value of the parameter. After the change, it stores the selected value.
<b>↑ + F</b>	Program	Activates automatic mode exiting the programming mode.

## FUNCTIONING

### ON and OFF

Power on of ESA PROG-1 takes place pressing the “F - ON/OFF” button for at least one second. During initialization the display will indicate in sequence “ESA SPA”, “PROG-1”, the software version, to then move directly to “Automode” and indicate the ADDRESS menu dedicated to the serial address change of the burner control.

Everytime the instrument is powered select the infrared ray interface, while the ECS interface must be enabled in “Program” mode.

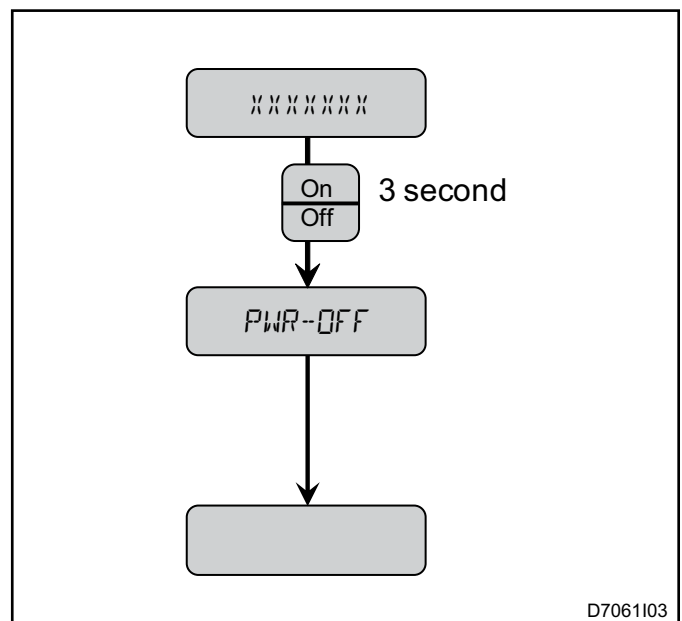
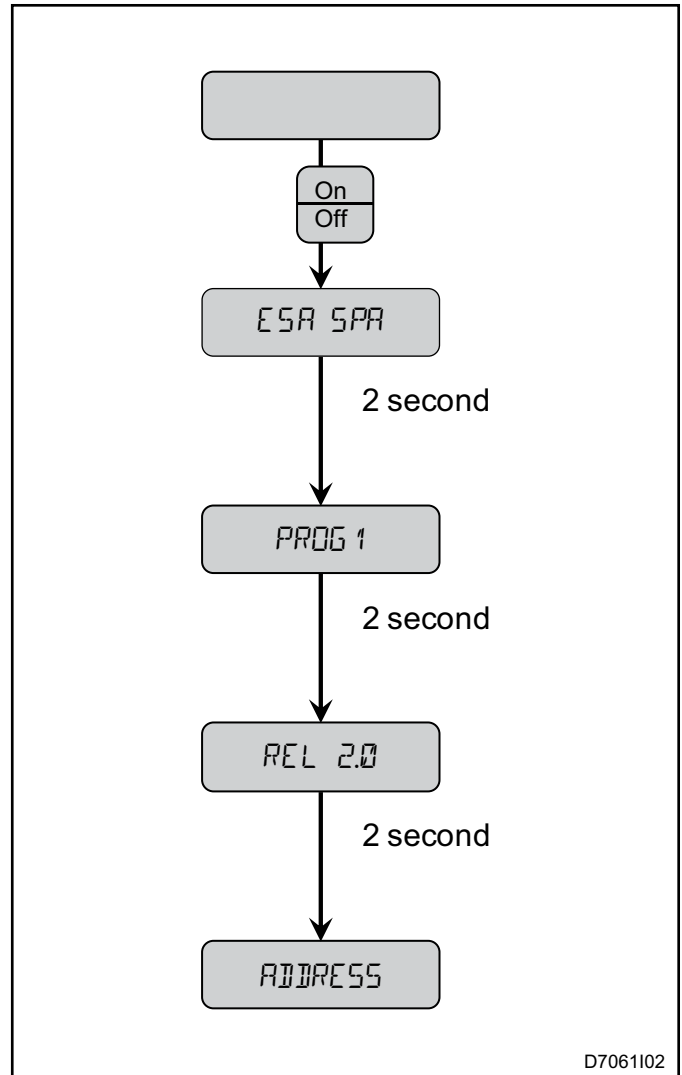
The switching off of ESA PROG-1 takes place by pressing the “F - ON/OFF” key for at least three seconds and once “PWR-OFF” appears, release the key. Automatic shut off is activated after five minutes that the instrument is not being used.

In all the writing and reading operations the ESA ESTRO or the ESA REFLAM-H burner control device must be in manual block (0). During communication with the infrared interface the display will indicate a central line (-).

At the end of each communication the flame control device performs initialization of the programme (8) repositioning itself in manual block.

The reading of the parameters takes place bringing ESA PROG-1 less than 100mm from the infrared ray interface of the burner control (under the display) pressing the “R” key and maintaining the position until communication ends.

The change in the configuration parameter values is obtained by first changing the ESA PROG-1 indication and then sending it to the flame control via the “W” key. Also during the writing phase ESA PROG-1 must be kept in front of the burner control device for a few seconds until writing is completed. If communication does not take place correctly “ERROR” will appear on the display.

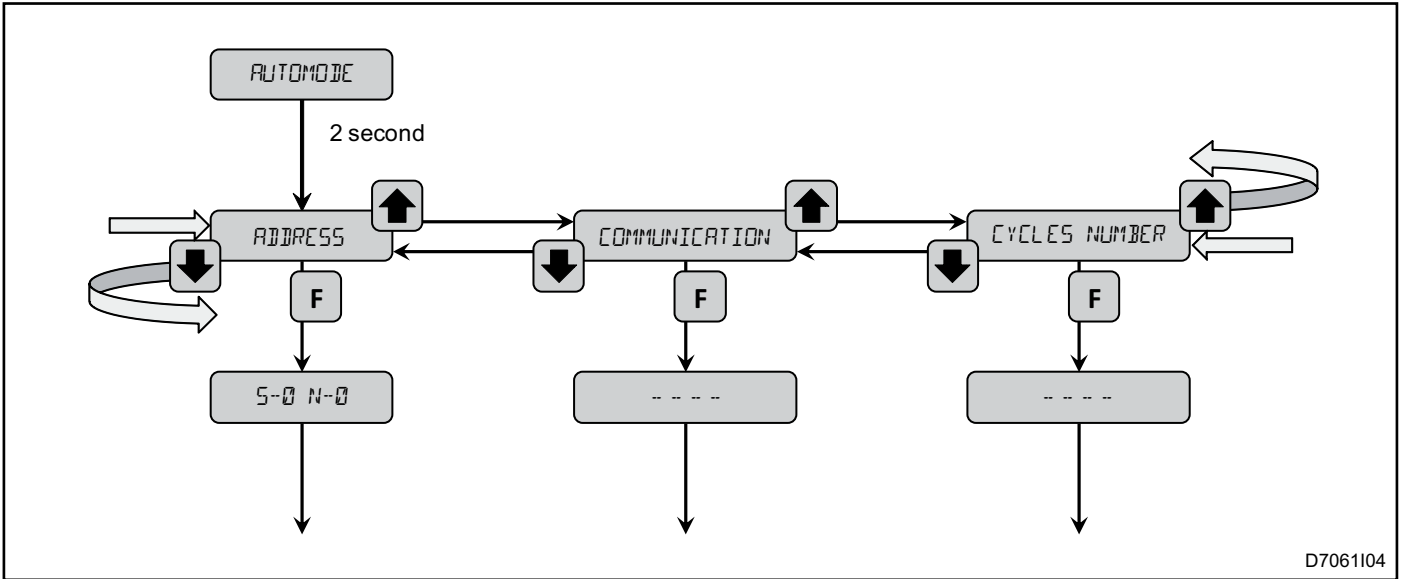


## FUNCTIONING

### AUTOMATIC MODE - AUTOMODE

In AUTOMATIC mode it is possible to enter three menus, ADDRESS, COMMUNICATION and CYCLES NUMBER. The ADDRESS menu is for the reading and writing of the flame control serial address. The serial address of the flame control devices is made up of two digits (letter or number) defined as "segment" (S) and "node" (N). The

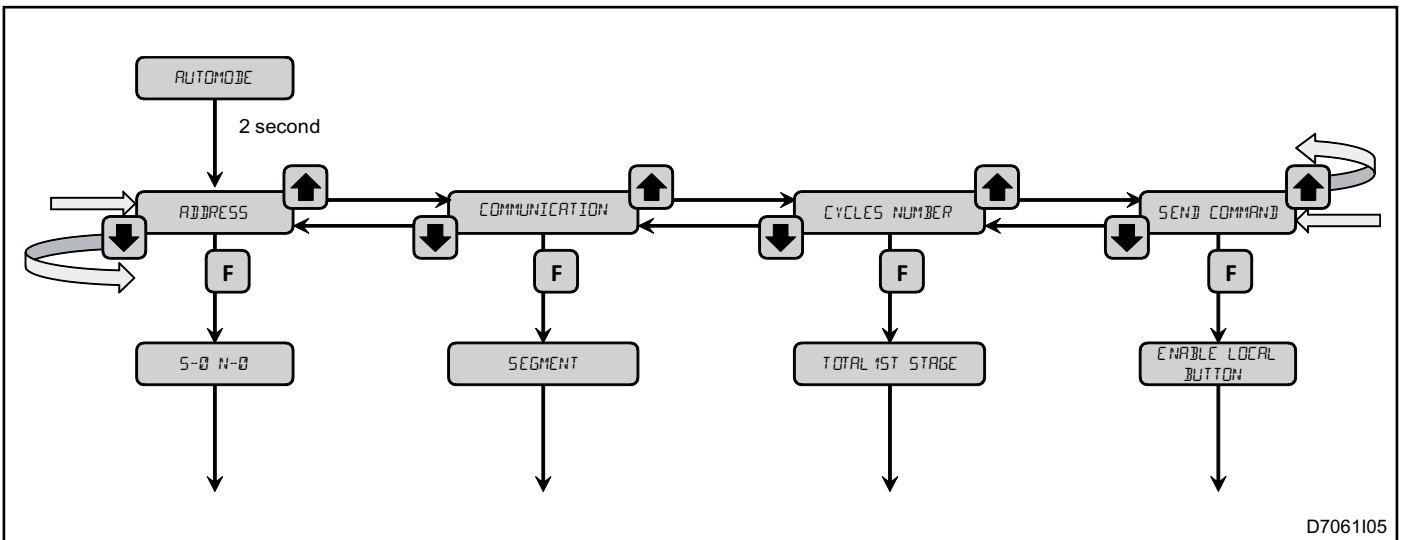
COMMUNICATION menu allows to visualize or change the parameters regarding the serial communication. The CYCLE NUMBER menu allows to visualize how many ignition cycles were carried out by the burner control device and if necessary, to reset the partial counter.



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When communication mode is selected via the "ECS BY WIRE" cable (see programming mode), the SEND COMMAND menu also appears. In this menu there is a com-

mand for activating the front key of the burner control device when it is programmed as "REMOTE ENABLE".



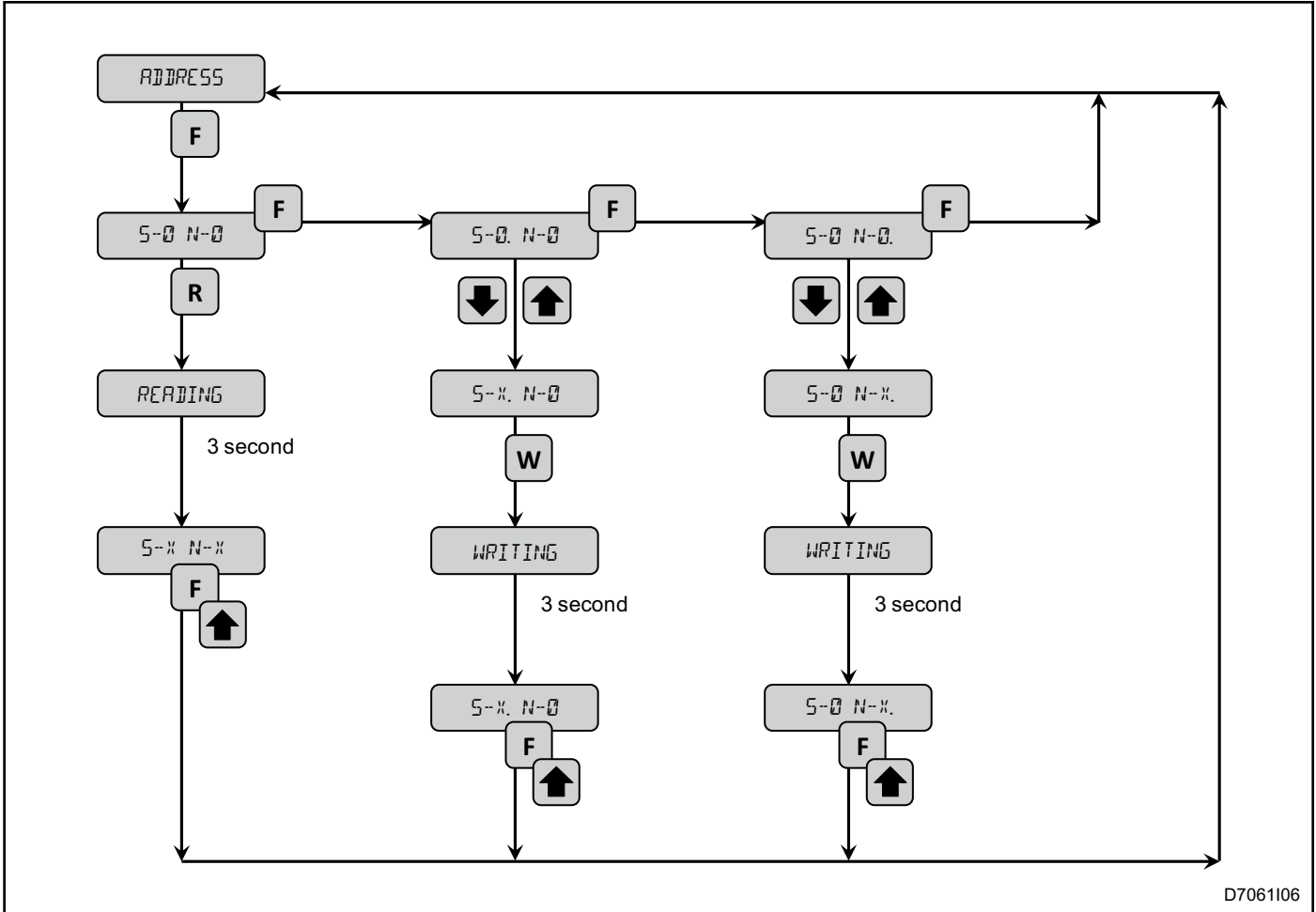
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## FUNCTIONING

### AUTOMATIC MODE - ADDRESS MENU

Below the operations for reading or writing the flame control serial address are illustrated



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To enter the menu press the "F" key. Press it again to select the change of segment S (with decimal point flashing) and with the increase and decrease keys set the new value. After having edited the new segment (the decimal point remains flashing) writing with the "W" button can be carried out. If not, press the "F" key proceeding with

the editing of the new node (the flashing point moves). Once setting of the new address has been accomplished, by moving the ESA PROG -1 to the flame control device and pressing the "W" key the configuration of the new values is performed.



## FUNCTIONING

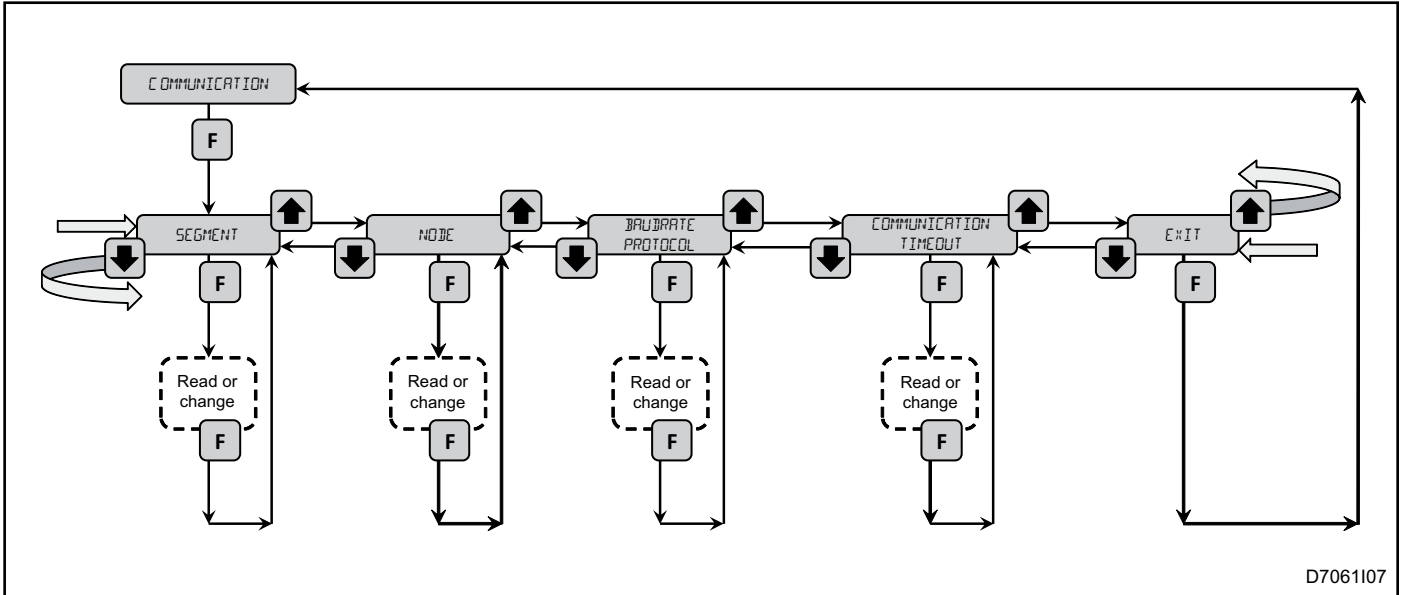
Example for changing the burner control serial address from "A1" to "D2", passing through C1.

OPERATION	DISPLAY	DESCRIPTION
none	ADDRESS	Automatic mode
<b>F</b>	S-0 N-0	Visualizes the change address menu
<b>R</b>	READING	ESA PROG-1 reads the address from the burner control device
none	S-A N-1	Visualizes segment and node from the flame control device
<b>F</b>	S-A. N-1	The segment editing is selected
↑ or ↓	S-C. N-1	The new segment is selected
<b>W</b>	WRITING	The new address is written to the flame control device
none	S-C. N-1	If there are no writing errors it returns to the condition prior to writing
↑ or ↓	S-D. N-1	The new segment is selected
<b>W</b>	writing	The address is written in another flame control device
none	S-D. N-1	If there are no writing errors it returns to the condition prior to writing
<b>F</b>	S-D N-1.	The node editing is selected
↑ or ↓	S-D N-2.	The new node is selected
<b>W</b>	writing	The new address is written to the flame control device
none	S-D N-2.	If there are no writing errors it returns to the condition prior to writing
<b>R</b>	reading	Reading on another instrument
none	error	Reading error due to a connection problem (too far etc...)
none	S-D N-2.	After four seconds the error is reset to allow writing or reading again
<b>F</b>	ADDRESS	Returns to the main "ADDRESS" menu

## FUNCTIONING

### AUTOMATIC MODE - COMMUNICATION MENU

In the COMMUNICATION menu the parameters related to the serial communication of the ESA burner control device can be edited.



The SEGMENT and NODE parameters allow to individually edit each segment or node of the serial address. The BAUD RATE PROTOCOL parameter allows to select the speed and type of serial communication of the burner control device. The ESA burner control device standard is 4800 b/s ECS. Below we have indicated the possible speeds and communication protocol available on the flame control devices. Furthermore we annotate that ESA

PROG - 1 also allows the editing of addresses on less recent instruments, provided that the correct communication channel is used.

The COMMUNICATION TIMEOUT parameter allows to read or change the value in seconds of the time period in which communication is absent and after which the burner switches off. If set to zero seconds, the Com-timeout alarm is deactivated.

TYPE OF FLAME CONTROL	BAUD RATE / COMMUNICATION PROTOCOL	DESCRIPTION
<b>QUAD-BOSS II</b>	4800 ECS	Communication only works via wire (ECS WIRED)
<b>ESTRO 1.0 REFLAM</b>	4800 ECS	The communication works both via infrared rays and wire.
<b>ESTRO 2.0 (Blue)</b>	4800-9600-19200 38400 ECS 4800-9600-19200 38400 MODUS 1 E 2	The communication works both via infrared rays and wire. In wire communication mode you have to set the segment and node of the burner control and the baud rate can be 4800 and 9600 baud
<b>ESTRO 2.1 (Grey) REFLAM-H</b>	4800-9600-19200 38400 ECS 4800-9600-19200 38400 MODUS 1 E 2	The communication works both via infrared rays and wire. In wire communication mode you have to set the segment and node of the burner control and the baud rate can be 4800 and 9600 baud

## FUNCTIONING

### AUTOMATIC MODE - CYCLES NUMBER MENU

In the CYCLES NUMBER menu it is possible to read the number of ignitions carried out by the ESTRO 2.1 flame contro devices. For all the other flame control models this menu is not available.

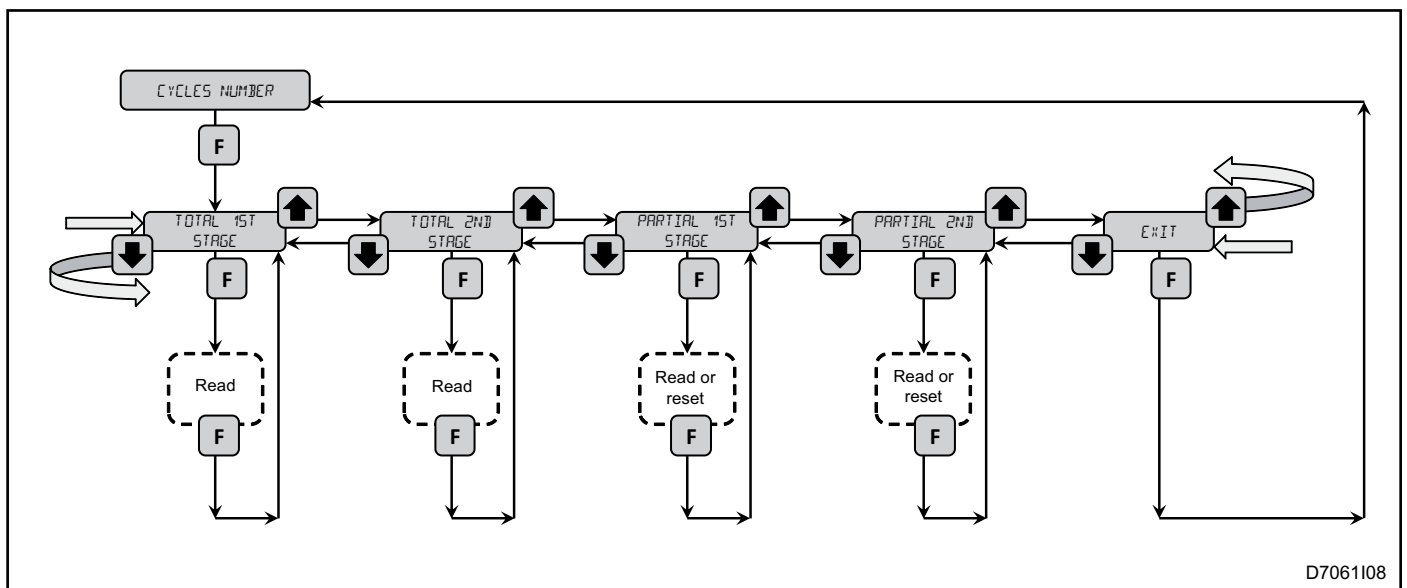
The TOTAL 1ST STAGE indicates the number of ignition cycles of the first gas stage (Phase 2 on the display). This is only a reading value and thus cannot be changed.

The TOTAL 2ND STAGE indicates the number of ignition cycles of the second gas stage or air valve (phase 3/4/6) carried out by the flame control device. This is only a rea-

ding value and therefore cannot be changed.

The PARTIAL 1ST STAGE and PARTIAL 2ND STAGE parameters as opposed to the TOTAL parameters, can be both read as well as reset, for example after maintenance or replacement of a burner part.

Knowing how many ignition cycles an instrument performs can be useful as the components connected to the flame control device get worn with time (ignition transformers, gas valves, servocommands...).



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## FUNCTIONING

### AUTOMATIC MODE - SEND COMMAND MENU

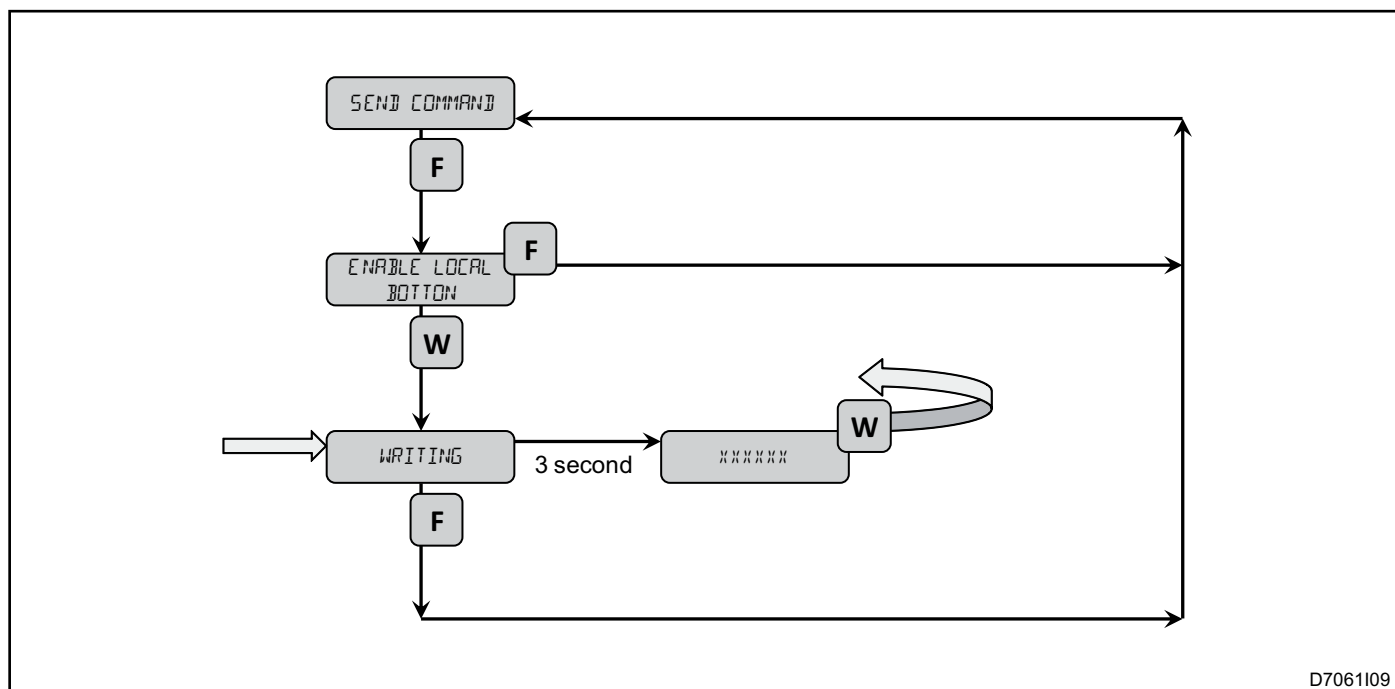
In this menu it is possible to send specific commands to the burner control device. Considered that it only receives commands from ECS input, this menu is only available with "ECS WIRE" communication channel.

The "ENABLE LOCAL BUTTON" command is needed to activate the ESA ESTRO front button when configured as "remote enable" when the serial line is not working.

When the operator visualizes the "ENABLE LOCAL

BUTTON " command and press the "W" (write) key ESA PROG-1 sends the corresponding command to the flame control device connected. The instrument connected acknowledges the command received and activates the local button allowing the operator to operate locally, even with the serial communication out of order.

As soon as serial communication is restored, the local button deactivates itself automatically.



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## APPLICATION EXAMPLE 1 - ESA PROG-1

ESA PROG-1 is used for programming communication parameters via interface and infrared rays. To be able to communicate with the burner control device it is suffi-

cient to put it in manual block (state 0) without disconnecting it from the ECS bus.

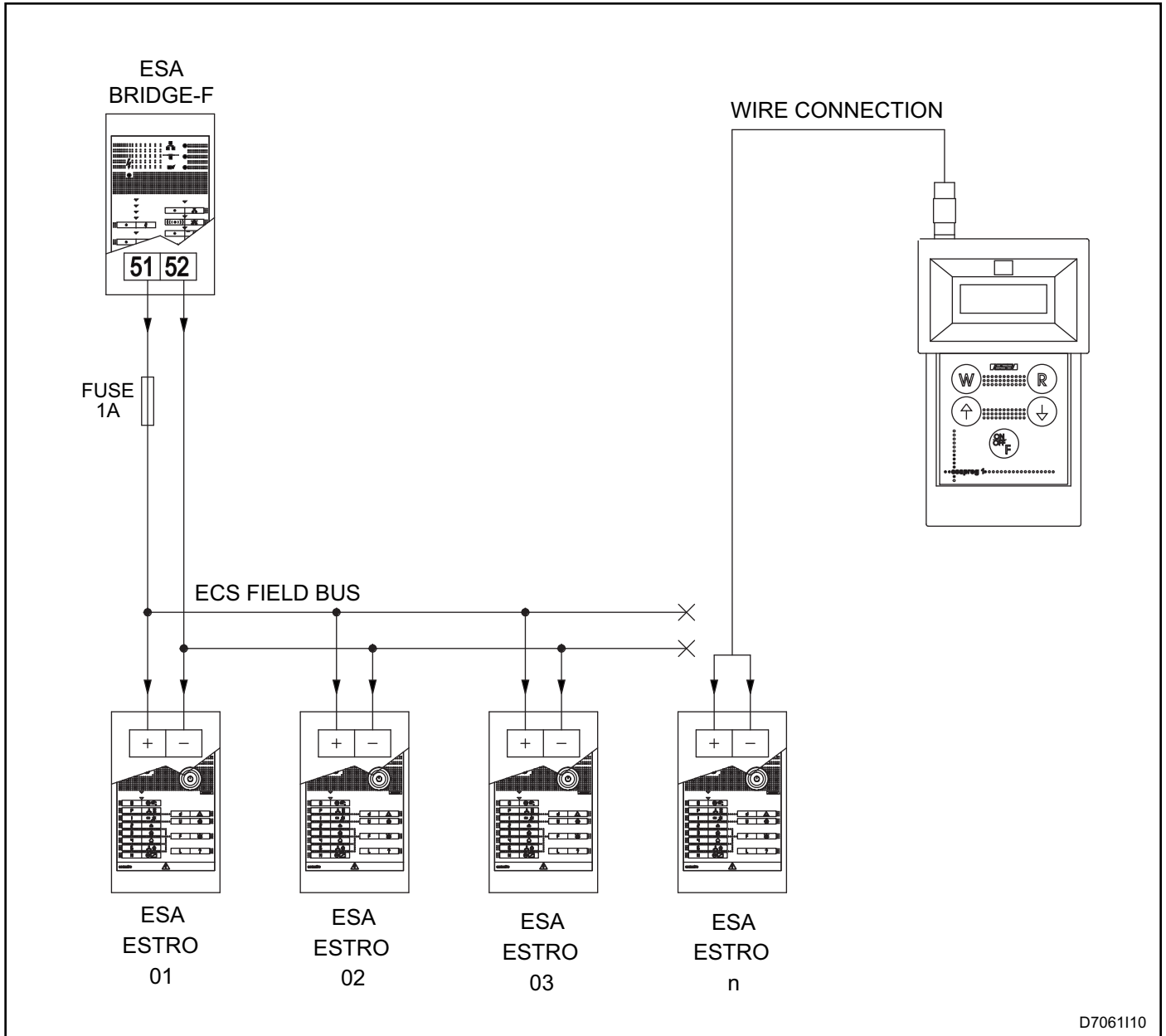


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**APPLICATION EXAMPLE 2 - ESA PROG-1**

ESA PROG-1 is used for programming communication parameters via ECS wire interface connection. To communicate with the burner control device it is necessary to isolate it from the ECS bus coming from the

furnace control and connect it to the ESA PROG-1 output via the cable supplied. In this case in configuration it is necessary to activate the communication via the ECS WIRE.



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## CONFIGURATION PARAMETERS

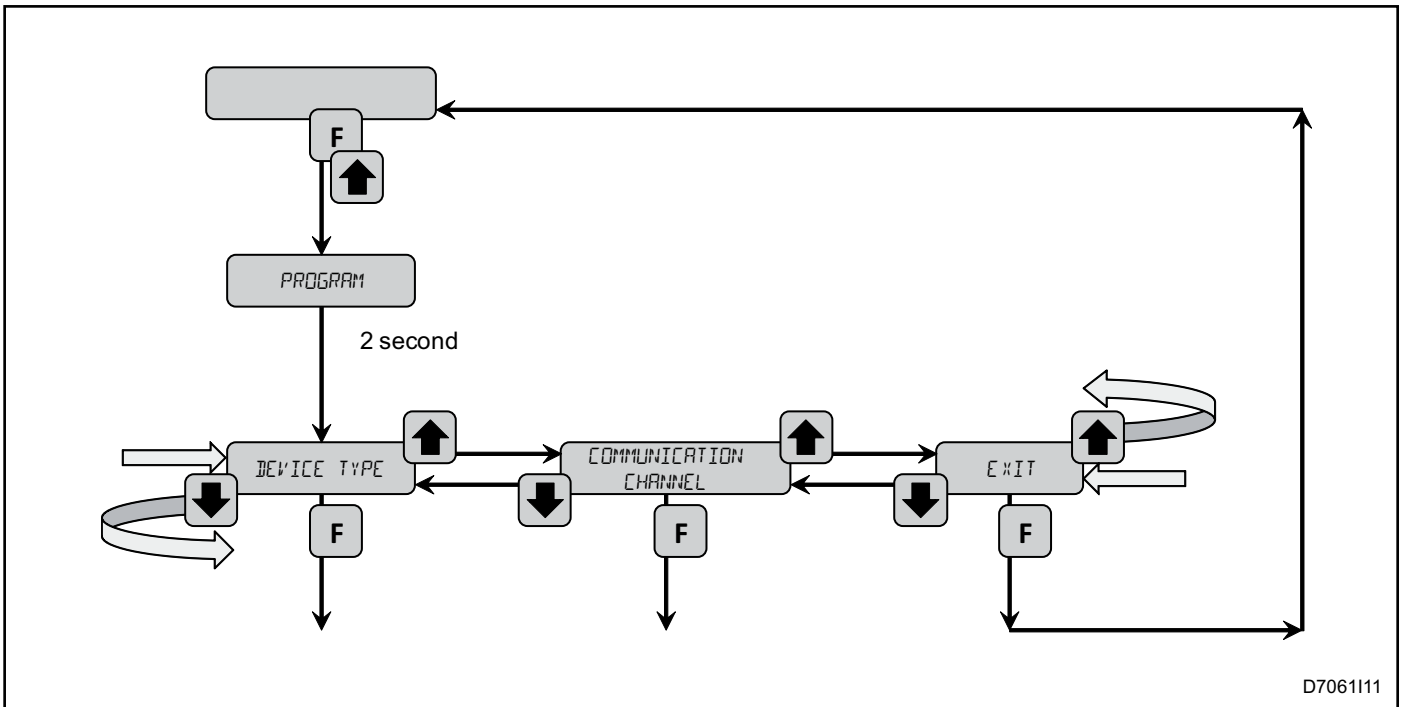
### PROGRAMMING MODE

To access the programming mode press the **↑ + F** buttons together.

In the PROGRAM Mode there is the possibility of entering 2 menus, DEVICE TYPE and COMMUNICA-

TION CHANNEL.

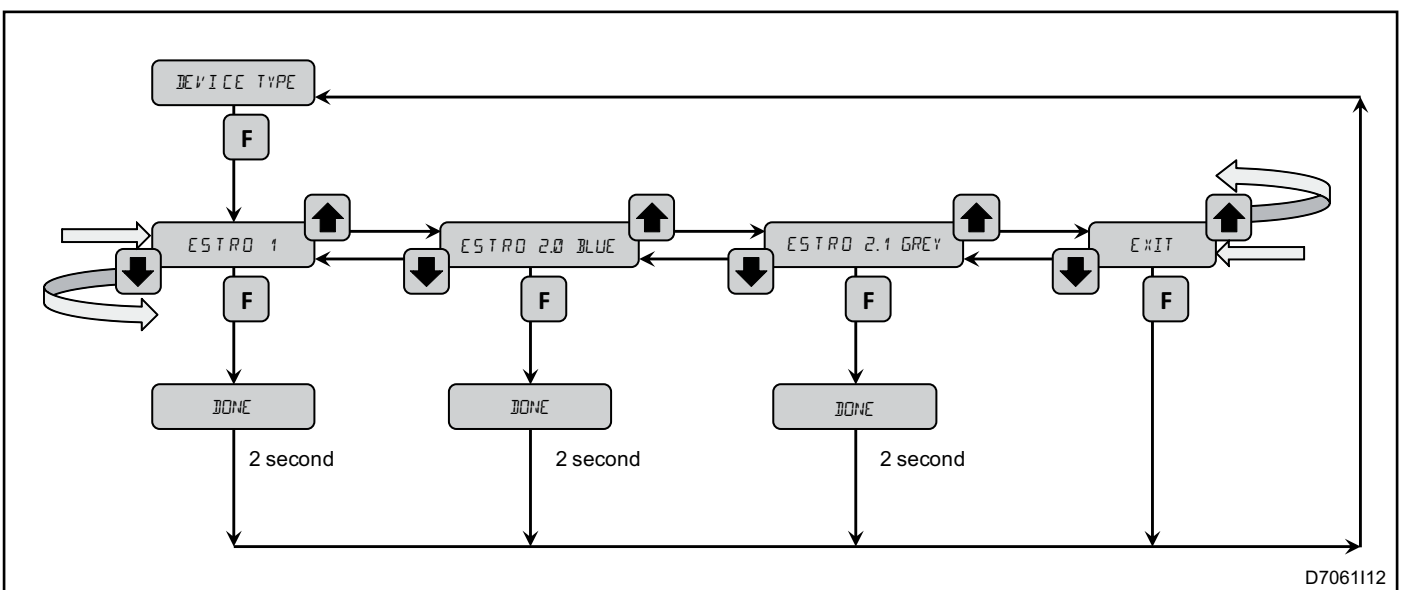
To return to automatic mode simultaneously press the **↑ + F** buttons again.



### PROGRAMMING MODE - DEVICE TYPE MENU

In the DEVICE TYPE menu it is possible to select the burner control type with which you are operating as they have different editable parameters. ESA PROG-1 is set in default to communicate with ESTRO 2.1 at 4800 b/s

in infrared communication mode. Selecting ESTRO 1 it is possible to communicate also with previous devices like the ESA BOSS-II and ESA QUAD models (only via ECS WIRE).





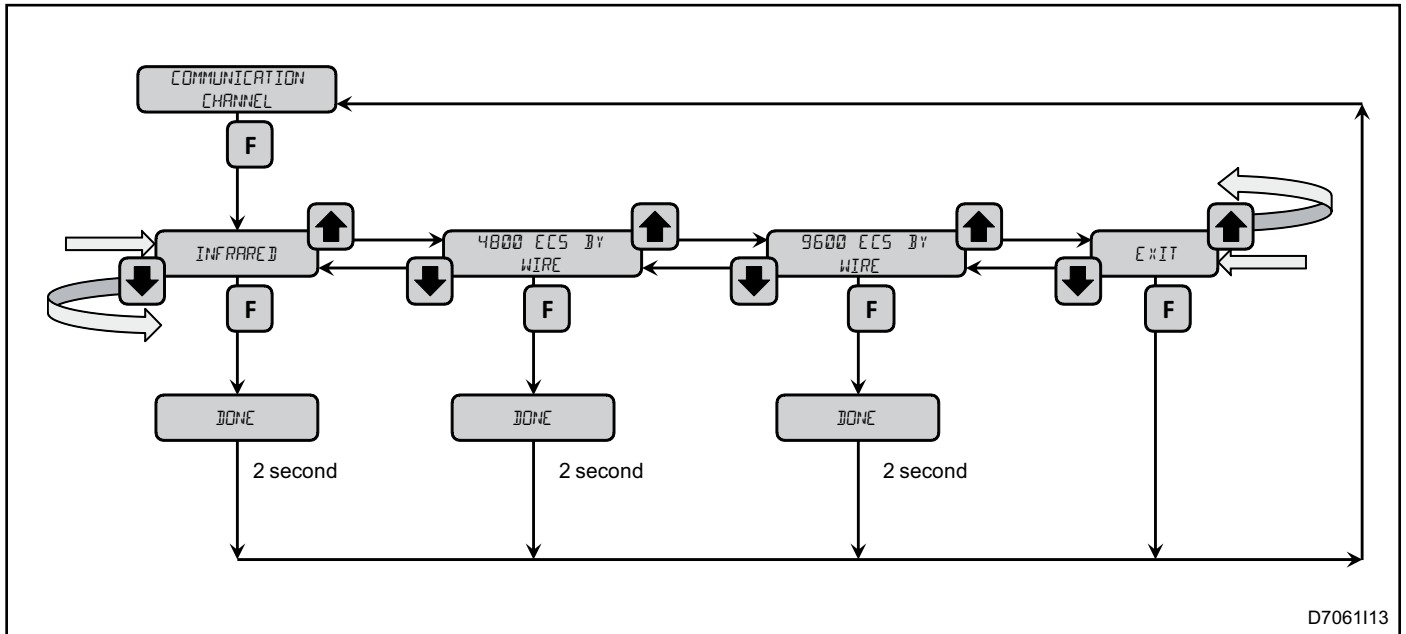
## CONFIGURATION PARAMETERS

### PROGRAMMING MODE - COMMUNICATION CHANNEL MENU

In the COMMUNICATION CHANNEL menu it is possible to change the communication interface from infrared to ECS WIRE.

If the serial interface used is 4800/9600 ECS BY WIRE, it is necessary to make the connection keeping ESA

PROG-1 and the flame control switched off, and then switch them on for configuration. You are reminded that it is possible to connect only one burner control device to the ECS output.



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## WARNINGS

- ESA PROG-1 is a configuration instrument for the ESA burner controls. It is therefore not intended as a safety organ for which special instruments exist.
- ESA PROG-1 must only be used by staff who are authorized to change the communication parameters of the ESA ESTRO burner controls and ESA REFLAM.
- The use of the ESA PROG-1 Programmer must take place in an environment where temperature variations are within the allowed limit.
- Avoid placing the instrument near intense magnetic or electric fields as well as in areas that are prone to vibrations.
- The instrument must neither be exposed to direct heat sources nor come into contact with combustion products such as liquids, solvents or corrosive gases.
- Programming is possible only if the burner control device is in manual block (0 flashing). If programming was not successful, the instrument indicates "ERROR" for four seconds.
- If programming is interrupted by external causes and the flame control device remains blocked in configuration, it is necessary to disconnect and reconnect again to the power supply, or send the writing or reading command again.
- In the presence of intense sunlight or particular lamps the infrared communication could be limited. If necessary, use screens or use the ECS WIRE communication.
- When "LOW BATTERY" appears on the display the battery must be replaced by the same type of battery indicated in the general characteristics of the instrument.
- In the case of rupture or malfunctioning ESA PROG-1 must be sent back to the manufacturer for repair or replacement.
- Any change or repair made by third parties causes the warranty conditions to automatically expire and could compromise the functioning of the instrument and the safety of the operators and plant.

## USE

For correct use carefully follow the instructions below:

- 1** - Switch on ESA PROG-1 and select the parameter that must be changed or checked.
- 2** - Press the front button of the burner control so that it positions itself in manual block indicated by "0":
- 3** - With infrared communication selected place the device in front of the burner control and press then release the writing or reading key. Keep ESA PROG-1 stopped until the end of communication.
- 4** - With ECS WIRE communication selected on the burner control device, first disconnect the serial conductors coming from the supervisor (isolating them from each other), then connect the ESA PROG-1 programmer wire respecting the conductor polarity.
- 5** - After having written a parameter, we advise you to reread the value to make sure that the change has been accepted by the burner control device.
- 6** - At the end restore the serial connection towards the supervisor, in case it was removed, and reset the burner control from the front button.
- 7** - Check that the burner control device correctly carries out the supervisor commands and that it returns the correct statuses.

## GENERAL MAINTENANCE PLAN

Check	Type	Advised time	Operation
<b>Integrity check</b>	O	every time it is used	Make sure the instrument and the cable for the ECS WIRE communication are not damaged.
<b>Battery replacement</b>	E	/	Replacement is necessary when the device indicates the low charge or if it does not switch on.

### NOTES

Key: O = ordinary / E = extraordinary

## ORDINARY MAINTENANCE

### INTEGRITY CHECK

- The integrity of the connection cable or the device can be checked visually prior to each use.

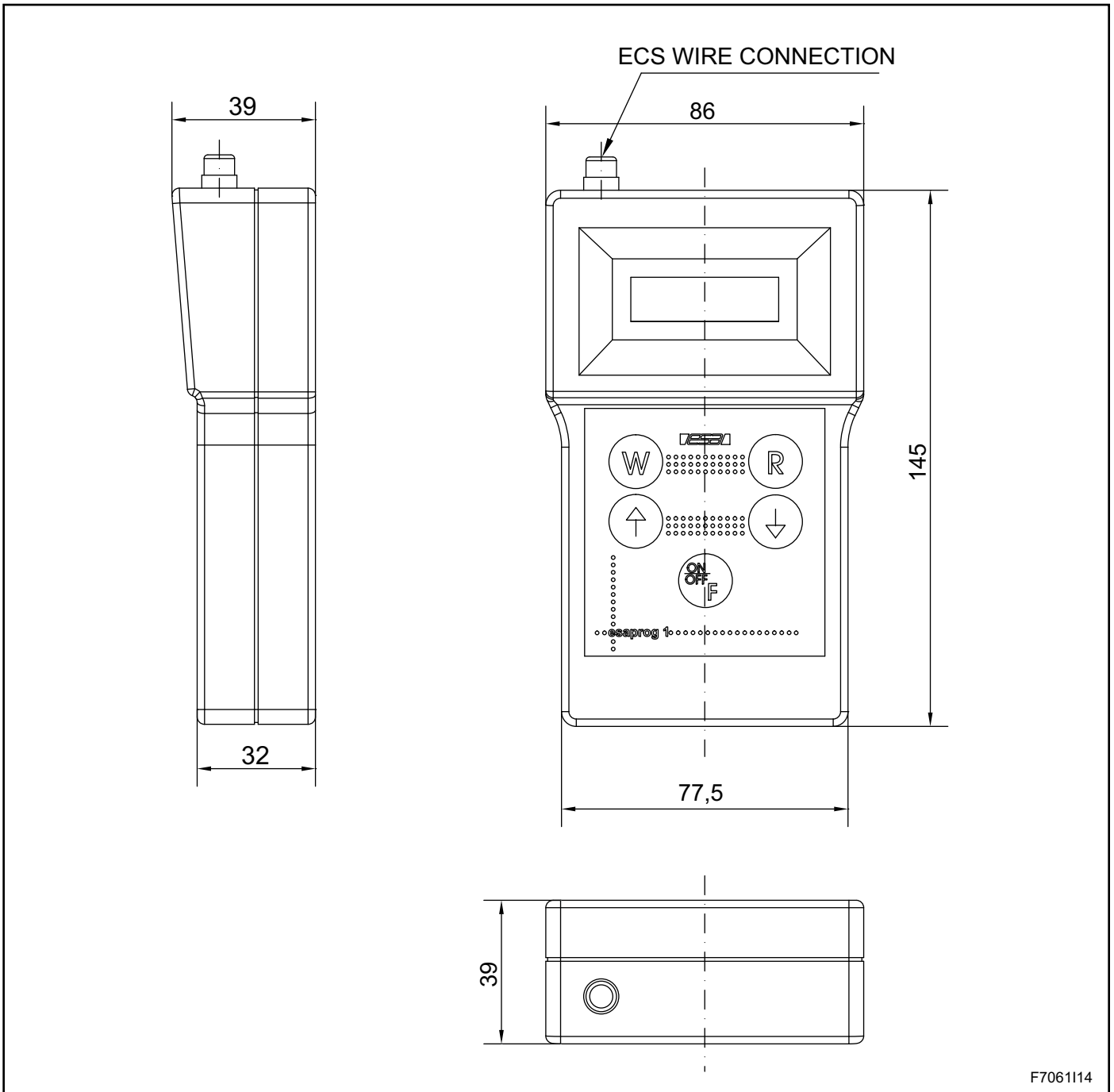
## EXTRAORDINARY MAINTENANCE

### BATTERY REPLACEMENT

- To replace the battery open the special compartment at the back of the instrument. Remove the flat battery and insert a new one paying attention to the polarity. The

new battery must be the same type that is specified in the characteristics.

**OVERALL DIMENSIONS - ESA PROG-1**



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**ORDERING CODE - ESA PROG-1**

ESA PROG-  01

MODEL		01
ESA burner control communication parameter programming	1	