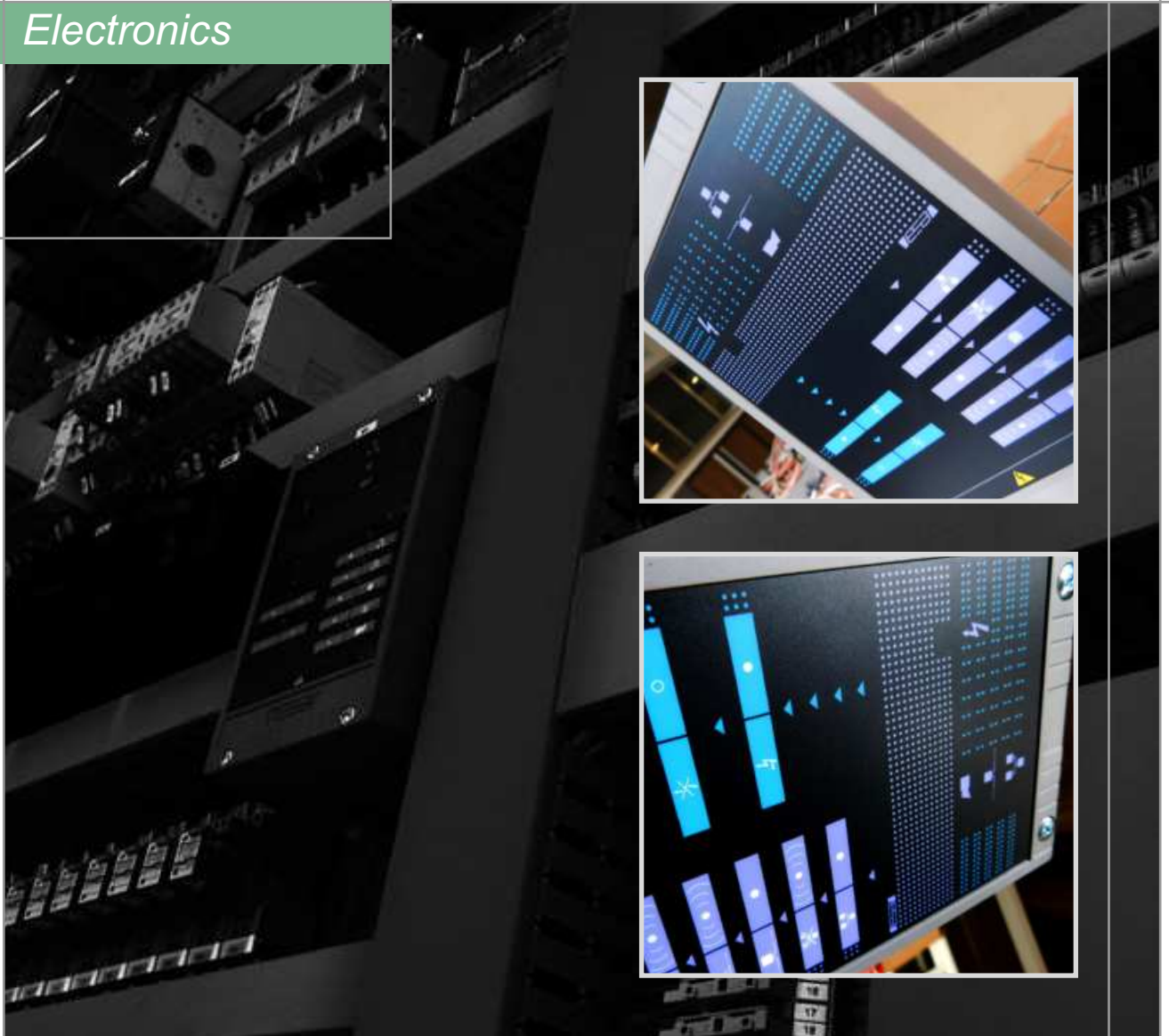


Electronics



Serial Gateway for
Esa Estro and Esa Reflam

ESA BRIDGE & ESA EXP-3 (E7015 rev. 03 - 13/01/2017)



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 BRIDGE & EXP-3 ESA conforms to European Union directives and standards: **2014/30/UE** (EMC) **2014/35/UE** (low voltage), **EN 55011** (noise limits) and **EN 55014** (electromagnetic compatibility), **EN 61000-4-2**, **EN 61000-4-4**, **EN 61000-4-5**, **EN 61000-4-11**, **EN 61000-6-1**, **EN 60204-1** (immunity electrostatic discharge, to burst, surges, and power fails).



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

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ESA BRIDGE is a serial gateway and protocol converter used for the management of ESA ESTRO flame control or ESA REFLAM. The device allows any control and supervision device (PLC, PC, DCS etc...) to command and receive information on the status of the burners via fieldbus standards, in a fast and versatile way. ESA BRIDGE comes in a resistant case and includes power supply stage and communication to the flame controls. The device is also available in its compact EXP-3 ESA version suitable for direct mounting inside the ESA ESTRO flame control or ESA REFLAM.

APPLICATIONS

- Protocol converter from Profibus DP®, DeviceNet®, Ethernet®, or Profinet® a ECS for controlling the ESA ESTRO or ESA REFLAM flame control devices.
- Communication Gateway for mono zone or mono furnace flame control devices up to a maximum of 16 devices
- Serial protocol converter placed on field in the burner vicinity.

CHARACTERISTICS

ESA BRIDGE:

- Supply voltage: 115Vac o 230Vac 10 +/-15%
- Power frequency: 45÷65 Hz
- Supply type: not suitable for phase-to-phase systems
- Neutral type: suitable for both systems with earthed neutral and with non-earthed neutral
- Consumption: 10VA max
- Working temperature: 0÷50 °C
- Storage temperature: -10÷70 °C
- Device protection fuse: 1A quickly replaceable
- Mounting position: any
- Protection degree: IP54
(For wiring use special cable gland)
- Work environment : not suitable for ATEX classified area nor for corrosive areas
- Container: Thermoset with fiberglass
- Dimensions: 200×120×96 mm
- Weight: 1.200 g
- Receiving data speed from the control device depends on the fieldbus master
- Number of controllable burners on ECS bus: max 16
- ECS fieldbus voltage: max 25Vdc



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- Data transmission speed on ECS bus: max 19200 baud
- ECS line length:
 - Max 150m with ECS wire or busway to 4800
 - Max 100m with ECS wire or busway to 9600
 - Max 50m with ECS wire or busway to 19200
- ECS type conductor line: ESA ECS CABLE (not shielded)

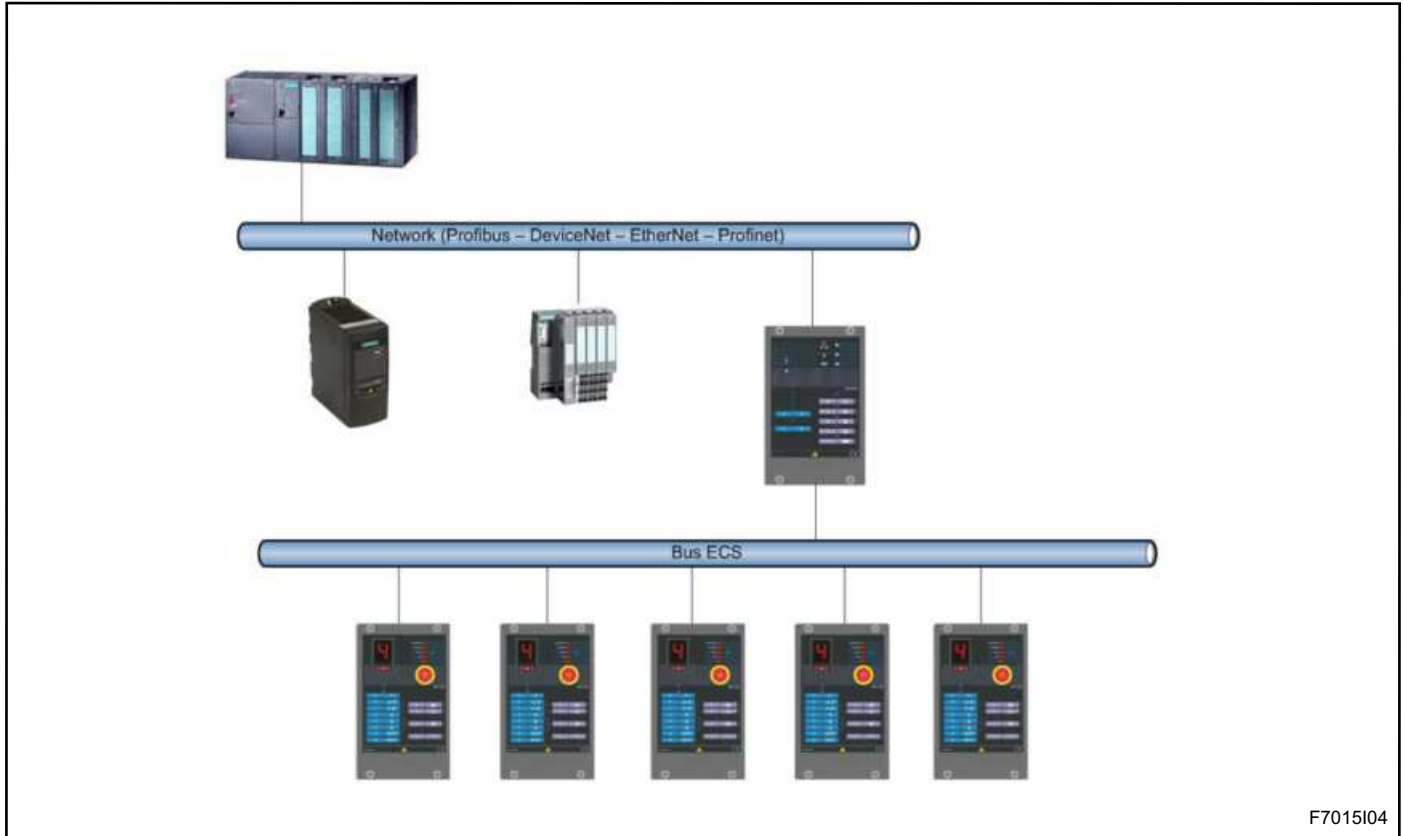
ESA EXP-3

- Supply voltage: 24Vdc +10 +/-15%
- Consumption: 10VA max
- Working temperature: 0÷50 °C
- Storage temperature: -10÷70 °C
- Mounting position: inside ESA ESTRO or ESA REFLAM
- Protection degree: See encompassing device
- Dimensions: See encompassing device
- Weight: 15 g in addition to the encompassing device
- Receiving data speed from the control device depends on the fieldbus master
- Number of controllable burners: max 1

DESCRIPTION

The main ESA BRIDGE function is to convert Flag-bit commands received by the supervisor in ECS serial commands recognized by the flame controls, and vice versa

to convert the status of the flame controls Flag-bit thus facilitating the diagnosis of the operating state of the burners.



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ESA BRIDGE is completely transparent in the data exchange, so it does not perform any management commands and states, leaving total flexibility of supervisor to manage the burners as needed.

The device communicates continuously with both the flame controls with the supervisor, by forwarding the received commands and returning information about the status of the burners.

The Flag-bit management allows to control all the phases allowed by flame controls such as ignition of the burner, power off, air activation only for prewash or cooling up to the manual management for maintenance.

ESA BRIDGE devotes to each burner four control bytes and four status, divided into different levels, depending on the information that the supervisor needs, it can read only

the generic state of the burner present in the first layer, or read more detailed states up to the flame signal value or the burner block type.

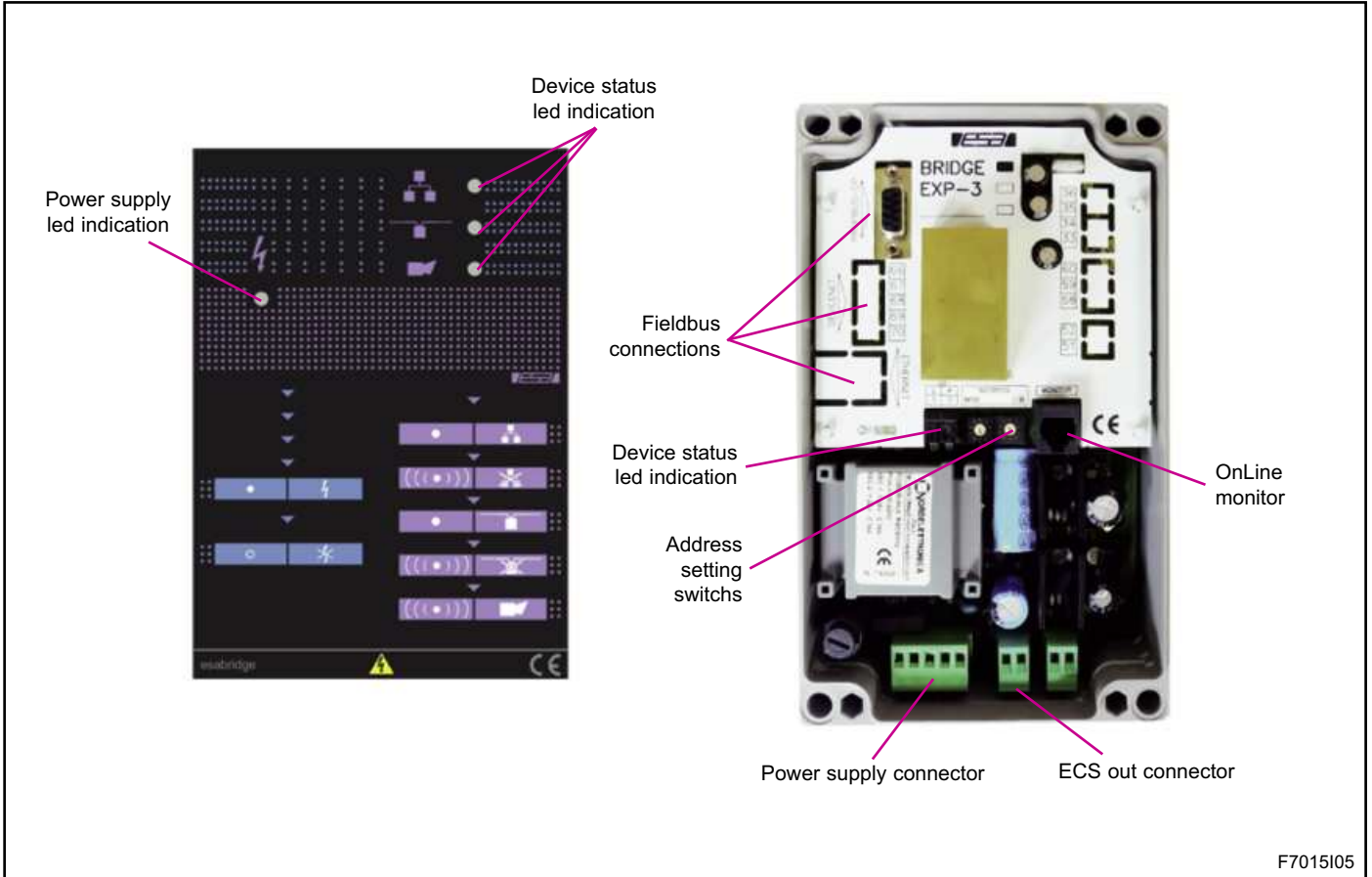
All this detailed information returned by ESA BRIDGE, allows the supervision systems to make lists of saved anomalies of the individual burners, focusing on maintenance.

ESA BRIDGE is to be considered a plug & play device: it has no configuration parameters apart from the address to the supervisor and the maximum number of managed flame controls. In its communication to the flame controls it allows the supervisor to select the communication speed on the ECS bus, which must match the one set in the flame control. The addresses of the flame controls instead are fixed and not changeable.

DESCRIPTION

ESA BRIDGE comes in a durable case to complete the field of power supply stage and communication to the flame controls. In front are diagnostic LEDs that indicate

the status of the device and communications. Connections are made using the quick release connectors, which facilitate the wiring or maintenance.



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ESA EXP-3 is the reduced version of the device designed to be installed directly in the flame control when there are no other expansion cards. ESA EXP-3 has all the functionalities of ESA BRIDGE communication with the difference that it can only control one burner.





ESA EXP-3 also requires an external power supply 24Vdc, so it is recommended for applications with single burner flame monitoring installed in the control cabinet. ESA EXP-3 is installed in the ESA ESTRO flame control or ESA REFLAM directly by the manufacturer.

DISPLAY SECTION

ESA BRIDGE in the front section has a display composed of four LED indications, one of which relates to the supply and the other is used for the indication of the state of the device or of the state of the communication bus.

Inside the device there are further leds that repeat the




indications of the front LED. ESA EXP-3 has only the LEDs on the board that are within the flame control, so for the diagnosis of communication it is necessary to open the flame control.

LED	STATO	DESCRIZIONE
LED POWER 	off	BRIDGE ESA or ESA EXP-3 is not powered. Consequently all other indications are not present.
	steady on	ESA BRIDGE or EXP-3 ESA is powered. Inside there are two green LEDs that indicate the presence of both power supplies required for operation. Furthermore, the power stage of ESA BRIDGE has two other LEDs that indicate the status of the two supply voltages.
LED 1	off	The red Led 1 is only installed inside the device and has no associated function.
LED 2 	off	Regular operation of the device and the communication bus
	Flashing	The device has detected a problem on the communication bus. Depending on whether LED 3 or 4 are flashing, it is possible to identify whether the problem is related to the fieldbus from the supervisor or if it is a problem related to the ECS bus to the flame controls. The yellow diagnostic LEDs 2 inside the device are red on the front of ESA BRIDGE
LED 3 	steady on	Smooth operation of the ECS communication bus to the flame controls, for which the device correctly sends commands to the flame controls and receives them from the state. If no burner is activated from the supervisor acting on the installation bit, the device maintains this indication even if there is no communication towards the flame control devices
	Flashing	The device has detected a problem on the ECS bus to the flame controls. One or more burners in which the installed bit is present, do not respond to the commands.
LED 4 	steady on	Regular communication fieldbus operation coming from the supervisor. The device communicates correctly with the supervisor.
	Flashing	The device is not interrogated by the supervisor and does not detect any communication coming from the fieldbus.

DISPLAY SECTION

INDICATIONS, ANOMALIES AND ERRORS

thanks to the indication LED, ESA BRIDGE allows easy identification of the regular state and possible malfunctioning.

STATO LED E DISPOSITIVO				
FIELD BUS	ECS BUS	ALARM	DESCRIPTION	SOLUTION
LED 4 	LED 3 	LED 2 		
●	●	Off	The device works correctly and there are no anomalies	-
●	(((●)))	(((●)))	Problem on ECS bus	
			One or more ESA ESTRO flame control devices are not connected.	Reset the installatio bit related to the flame control device that is not present. (see "Flag-bit Command").
			ESA ESTRO flame control connected but with ECS bus polarity reversed.	Check all connections of the ECS bus.
(((●)))	●	(((●)))	ESA ESTRO flame controls connected but with incorrect serial address.	Check via PROG-1 ESA the serial address of the flame controls installed. (See "Operation-BUS ECS").
			Problem with bus Master	
			Address setting	Check that the address given to ESA BRIDGE is equal to the address configured in the master device.
			Interface with master device	Check the memory area set within the PLC that is correct. Check the correct installation of the GSD / EDS in the PLC. Make sure the device is properly connected to the network.
(((●)))	(((●)))		Problem with master and ECS network	
			Device is not connected to the master and to the ECS bus	See solutions above

(((●))) Flashing indication

● Steady indication

FUNCTIONING

GENERAL

ESA BRIDGE is a slave device that responds only after receiving a request from the master. All slave devices connected to the same network must have different addresses. The communication on the ECS bus to ESA ESTRO or ESA REFLAM is cyclical and the device updates continuously the command to the flame controls and requests their state, including the value of the flame signal. This operation will be stopped only in the presence of alarms, such as time-out due to lack of communication with supervisor or problems found on the ECS bus. During communication all the flame controls installed are interrogated sequentially, while for the burners in which

the installation bit is not present, a shutdown command is sent. ESA BRIDGE makes available for each burner eight memory locations (bytes), four to write the command to the burner and four for the burner states. The commands from the supervisor and the states sent to it all operate in Flag-bits, so that the combination of all the processes facilitates any process requested and makes the identification of the state and management by the supervisor easier. The device has a byte dedicated to general duties for all burners, such as operating watchdog, the setting of the baud rate on the ECS bus or scheduled shut-down of a burner placed in manual mode.

SAFETY AND CONTROL

ESA BRIDGE provides various security checks on communication, such as watch-dog with the supervision system, a com-timeout of communication and the ECS bus check. As for the Watch-dog, ESA BRIDGE allows the supervisor to an ongoing review its reception data from the fieldbus via a specific bit on bytes of generic command and a bit on the status byte: the bit when the active supervisor in command, ESA BRIDGE to active state, and vice versa. The supervisor may at its discretion use this function or not, and if not used ESA BRIDGE no alarm active. The function of Com-communication timeout provides that if the communication by the supervisor missing for more than 10 seconds, BRIDGE ESA activates the Com-timeout alarm.

When this alarm is active in the device switches off all the

burners, keeping them off until communication is re-established. Shutdown is necessary because the application is out of control. Once communication is re-established with the supervisor, ESA BRIDGE reignites the burners according to the requirements found in the byte commands. Finally ESA BRIDGE continuously monitors the state of the ECS bus and if it detects any hardware faults it stops all the burners and activates the alarm signal. The possible hardware anomalies are the inversion of the ECS bus polarity on one or more of the devices connected, or a short circuit on the line which, if maintained for too long could compromise the stage of transmission of the ESA BRIDGE tab.

MANAGEMENT OF THE MISSING FEEDBACK FROM THE FLAME CONTROL DEVICE

For each command sent to the flame controls connected to the ECS bus ESA BRIDGE waits for the answer from them with the burner status. When a flame control does not respond to the command, the device waits for the response for a certain time, after which it passes to the subsequent flame controls. Failure to respond by a burner can be occasional or persistent: in the first case some interference disturbs the communication bus cancelling

certain communication, whereas in the second case the flame control no longer responds to commands sent. To avoid that single missed occasional answers activate false signalings to the supervisor, ESA BRIDGE filters them, indicating to the supervisor the previous state of the burner. When the missing answers become persistent, the burners involved are referred to the supervisor as not communicating until communication is restored.

BURNER MANUAL OR LOCAL CONTROL

ESA BRIDGE makes manual mode available for each burner, allowing you to turn on or turn off the burner acting locally on the flame control, facilitating any maintenance or adjustment of the burner. Activating this ESA BRIDGE function can have two different behaviors: only detect the condition of the burner without any limit or allow manual control only for a defined period of time. The selection between the two behaviors takes place via a specific bit on the generic command byte managed by the control device. If no time limit is active, as soon as the

burner is commanded into manual mode, ESA BRIDGE only sends status request commands without altering the set established locally by the operator. Viceversa is the limit is active, when manual mode is activated and when the time limit expires (5 minutes), the burner is commanded to switch of regardless of its state. Afterwards to be able to turn the burner on again it is enough to act on the local flame control button and the burner is automatically reset.

FUNCTIONING

FIELDBUS PROFIBUS DP®

ESA BRIDGE-F-PDP is the version of the device with an onboard Profibus Gateway DP® to communicate with the supervisor.

The Profibus DP bus lets you connect multiple devices to

Address definition of Profibus DP®

Before installing ESA BRIDGE the user must set the Profibus DP® address defined for the device.



This operation should be performed before powering ESA BRIDGE-F and in the case of successive addresses changes, the device must be switched off and on again so

the same network, and considering that it is a field bus it allows you to ESA BRIDGE-F near the furnace, reducing the length of the ECS bus.

that the new address is acquired.

The configuration of the address for which values from 1 to 99 are accepted in decimals, is carried out acting on the two rotary switches inside the instrument where the left one (MSB) concerns the tens while the right one (LSB) is for the units.

Example: Address = (left switch x 10) + (right switch x 1)

Profibus Switch	
	
X10	X1

PROFIBUS DP® ADDRESS	Left MSB address selector	Right LSB address selector
1.....9	0	1.....9
10...19	1	0.....9
20...29	2	0.....9
30...39	3	0.....9
40...49	4	0.....9
50...59	5	0.....9
60...69	6	0.....9
70...79	7	0.....9
80...89	8	0.....9
90...99	9	0.....9

Definition of Baudrate Profibus DP®

ESA BRIDGE automatically detects the Profibus communication baud rate DP® from the communication from the

supervisor.

GSD File for Profibus DP®

The GSD file allows the device to recognize the the supervisor, in order to properly establish the communication on Profibus DP® network.

ESA BRIDGE has a generic GSD file, which corresponds to the default settings in the module.

FUNCTIONING

FIELDBUS DEVICENET®

ESA BRIDGE-F-DNT is the version of the device carrying a DeviceNet® Gateway to communicate with the supervisor.

The DeviceNet bus lets you connect multiple devices to

the same network, and considering that it is a field bus allows the positioning of ESA BRIDGE near the furnace, reducing the length of the ECS bus.

Definition of address and baudrate DeviceNet®

Before installing ESA BRIDGE the user must set the DeviceNet address defined for the device and the baud rate of the fieldbus.

This operation is to be performed before powering ESA BRIDGE and in the case of address or subsequent baud rate changes, the device must be switched off and on

again to acquire the new values.

The address configuration includes values from 1 to 63 and carried out using dip-switch bank inside the instrument. Part of the dip-switch bank is reserved for the setting of the baud rate.

Address	Baudrate	DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8
0		0	0	0	0	0	0		
1		1	0	0	0	0	0		
2		0	1	0	0	0	0		
3		1	1	0	0	0	0		
....			
61		1	0	1	1	1	1		
62		0	1	1	1	1	1		
63		1	1	1	1	1	1		
	125Kbps							0	0
	250Kbps							0	1
	500Kbps							1	0
	Auto/Net							1	1

EDS File for DeviceNet®

The EDS allows the device to recognize the supervisor, in order to properly establish communication on the DeviceNet network.

ESA BRIDGE has a generic EDS file, which corresponds to the default settings in the module.

FUNCTIONING

FIELD BUS ETHERNET®

ESA BRIDGE-F-ETH is the version with an Ethernet® Gateway on board to communicate with the supervisor. The Ethernet® bus allows the connection of multiple

devices to the same network, and considering that it is a field bus allows the positioning of ESA BRIDGE near the furnace, reducing the length of the ECS bus.

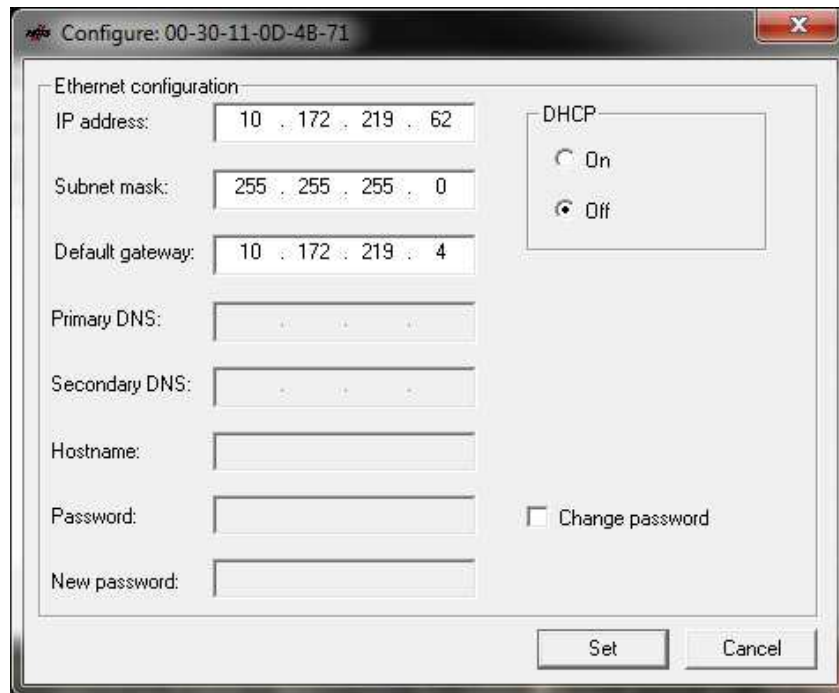
Address definition of the Ethernet®

Before installing ESA BRIDGE the user must set the Ethernet® address defined for the device.

The IP address configuration is performed via the "AnyBusIPConfig" software that can be freely downloaded from the HMS website.

Once the ESA BRIDGE is connected to the network the activating the "Scan" button, the software will scan the

network looking for the known devices that are connected. After the scan, the software displays the list of detected instruments. Then select the device that you want to insert in the network and the software will display the window for the IP address change, so that you can set the desired values.



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After having set the desired address press the "Set" button.

FUNCTIONING

FIELD BUS PROFINET®

ESA BRIDGE-F-PNT is the version of the device with onboard a Profinet® gateway to communicate with the supervisor.

The PROFINET® bus lets you connect multiple devices to the same network, and considering that it is a field bus it allows the positioning of ESA BRIDGE near the furnace, reducing the length of the ECS bus.

Definition of Profinet® interface

The definition interface Profinet® is performed during the hardware configuration of the PLC which is associated with the MAC ESA BRIDGE-F-PNT IP address and the device name.

Besides being able to configure the Profinet® interface from PLC, if the option is not enabled, you can configure the IP address using dedicated software (AnyBusIPConfig). In this case the operator will worry about associating the new IP address to the device name used in the Supervisor software.

Before installing ESA BRIDGE the user must set the Profinet® address defined for the device.

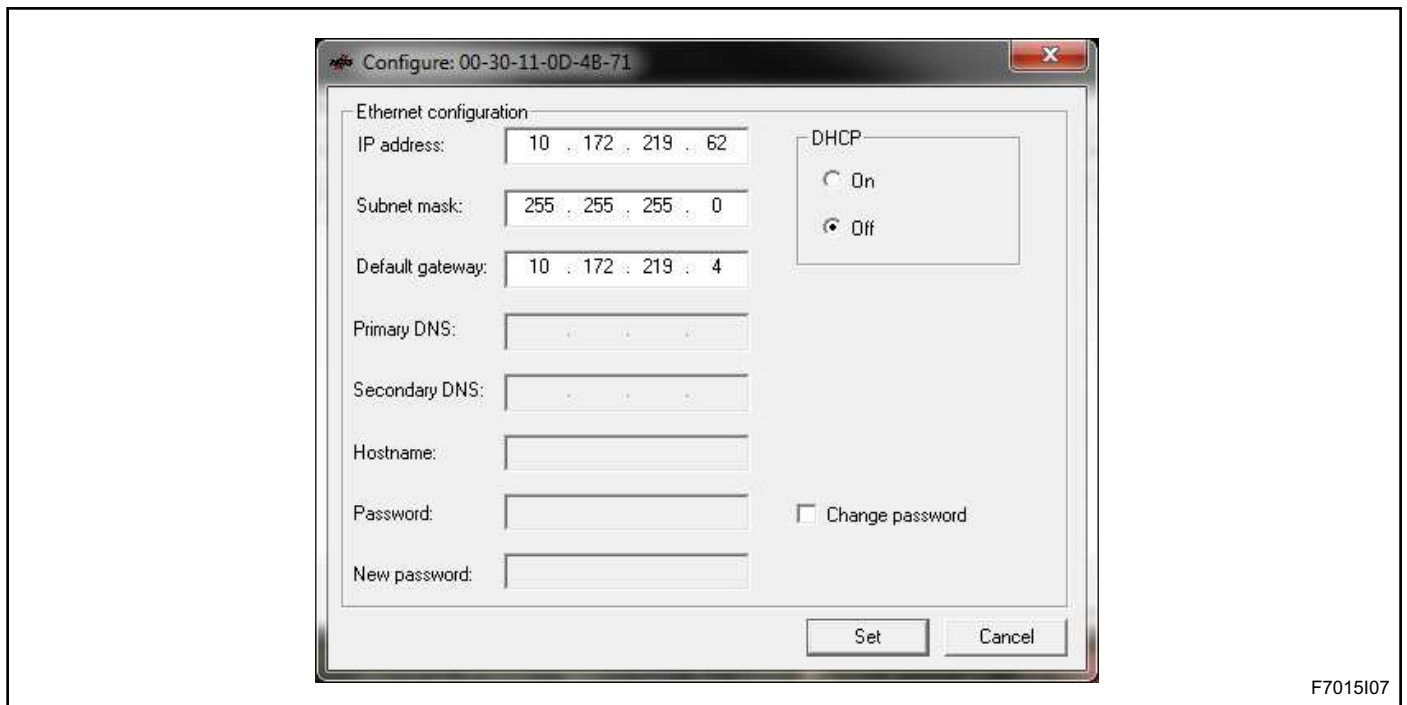
In the network every Profinet® device is uniquely identifiable by its Profinet® interface.

Each interface has the following Profinet® :

- A MAC address (factory setting)
- IP address
- A Profinet® device name

The IP address configuration is performed via the "AnyBusIPConfig" software that can be freely downloaded from the HMS website.

Once connected to the network ESA BRIDGE device, activating the "Scan" button, the software will scan the network looking for the known devices that are connected. After the scan, the software displays the list of detected instruments. Then select the device that you want to insert in the network and the software will display the window for the IP address change, so that you can set the desired values.



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After setting the desired address press the "Set" button.

In the PLC software development, during the hardware configuration pay attention to the "Update time" parameter that must not be less than 64 ms.

GSD File for Profinet®

The GSD file allows the supervisor to recognize the device, in order to properly establish the communication on the Profinet® network.

ESA BRIDGE has a generic GSD file, which corresponds to the default settings in the module.

FUNCTIONING

ECS BUS

The communication to the flame controls takes place with bus and ECS protocol. The ECS bus allows you to connect multiple flame control devices to the same network.

The communication to the flame controls is cyclical and continues: in every communication the last command received from the supervisor is sent and prompted the state of the flame control is requested.

ECS address definition

To allow the ESA BRIDGE device to communicate with the connected flame controls, you must configure the serial address in each flame control using the PROG-1 ESA device. In multiple-burner applications managed

only by ESA BRIDGE, the default addresses are shown below. Flame detection systems with different serial addresses are not managed by ESA BRIDGE.

Burner number	Address allowed by flame control device	
	Segment	Node
1	0	1
2	0	2
3	0	3
4	0	4
5	0	5
6	0	6
7	0	7
8	0	8
9	0	9
10	1	0
11	1	1
12	1	2
13	1	3
14	1	4
15	1	5
16	1	6

In applications with ESP-3 ESA or ESA BRIDGE which manages a single burner (see Configuration chapter), the

flame control address must be Segment 0, Node 0.

ECS Baudrate definition

The ECS BUS communication speed must be set to the baud rate selected on the flame controls. The selection of the baudrate takes place by means of two specific bits on the bytes of the generic command run by the Supervisor (see Commands).

The definition of the communication speed depends on

several factors: the type of the application, the expected wiring and environmental factors that can disrupt the data flow with more evident effects at high speeds, so if one wants to reduce it is necessary to change the baud rate both on ESA BRIDGE as well as on the flame controls

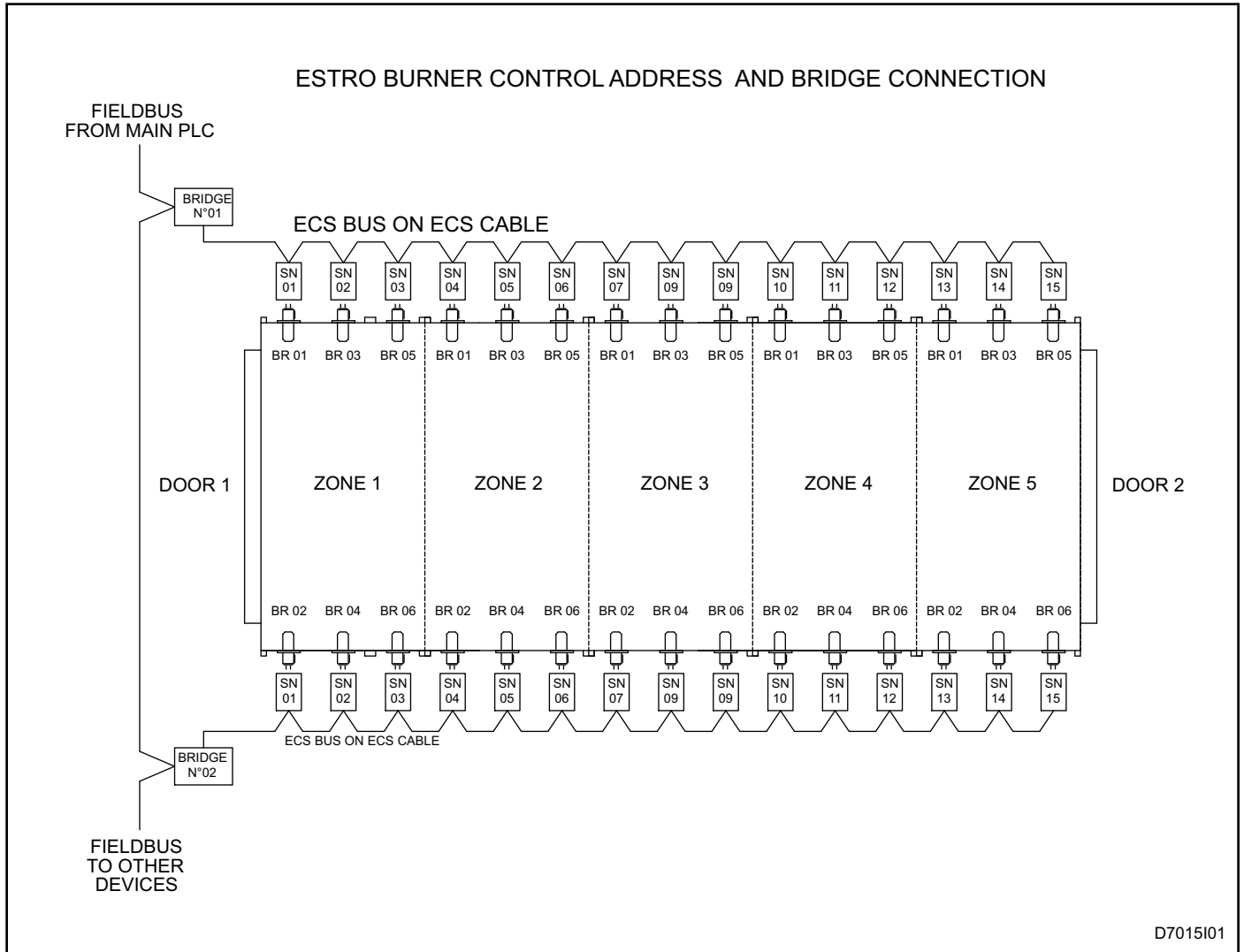
APPLICATION EXAMPLE 1 - ESA BRIDGE-F

The combustion system is a horizontal furnace and provides for the presence of 30 burners divided into 5 control zones.

Despite the zones of the furnace have both burners placed on one side than on the other of the furnace, the serial connection of the burners is made for the furnace side and ends in an ESA BRIDGE-F, which manages the

connected flame controls.

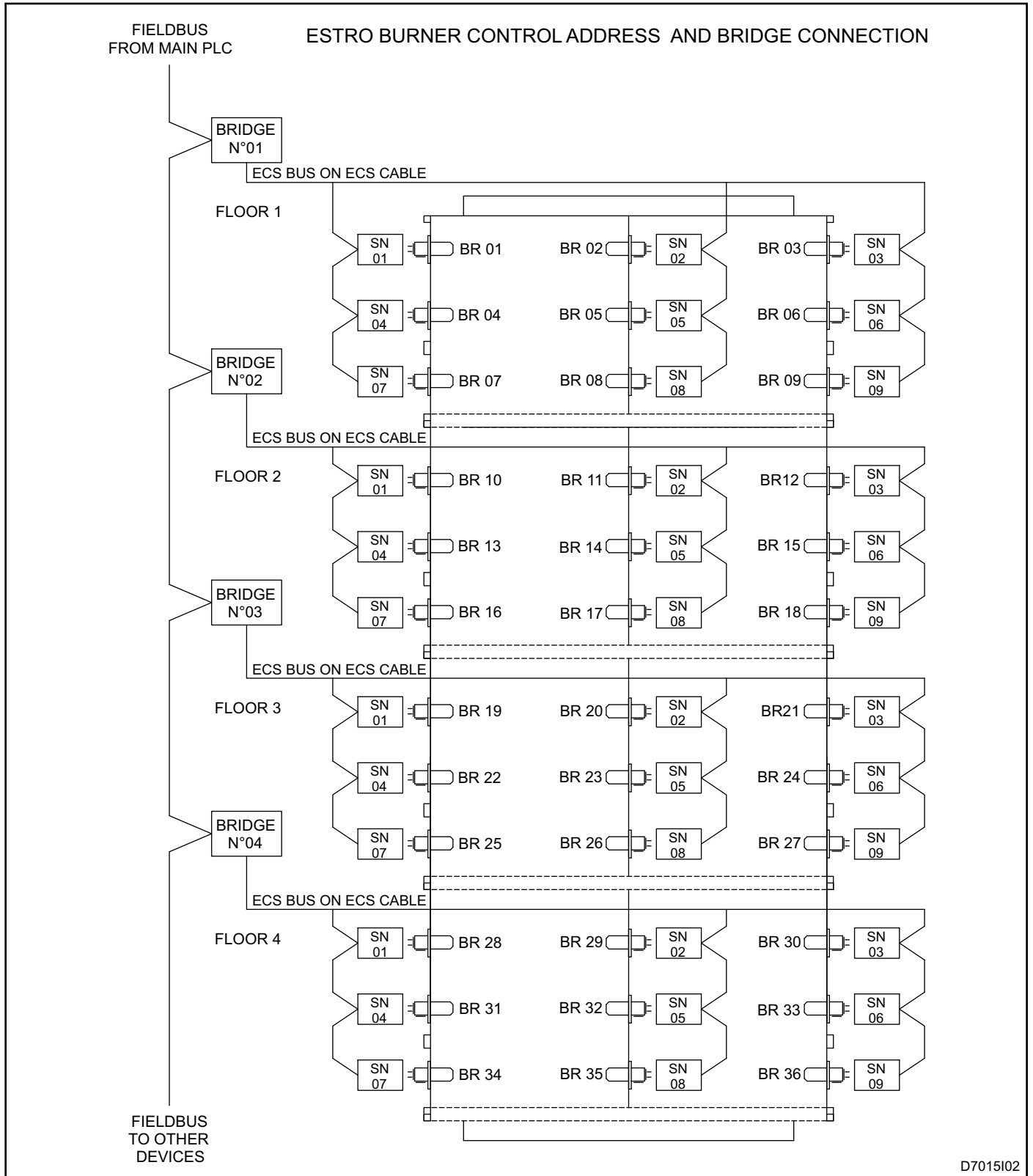
The division of the flame controls for each zone is virtual and operated only in software by the supervisor. The system is flexible and possibly allows to move burners from one area to the other only by acting in the supervisor configuration.



APPLICATION EXAMPLE 2 - ESA BRIDGE-F

The combustion system is a vertical furnace and provides the presence of 36 burners divided into 4 levels, each level is a control area. In this application an ESA-BRIDGE-F is installed on each level that runs the control

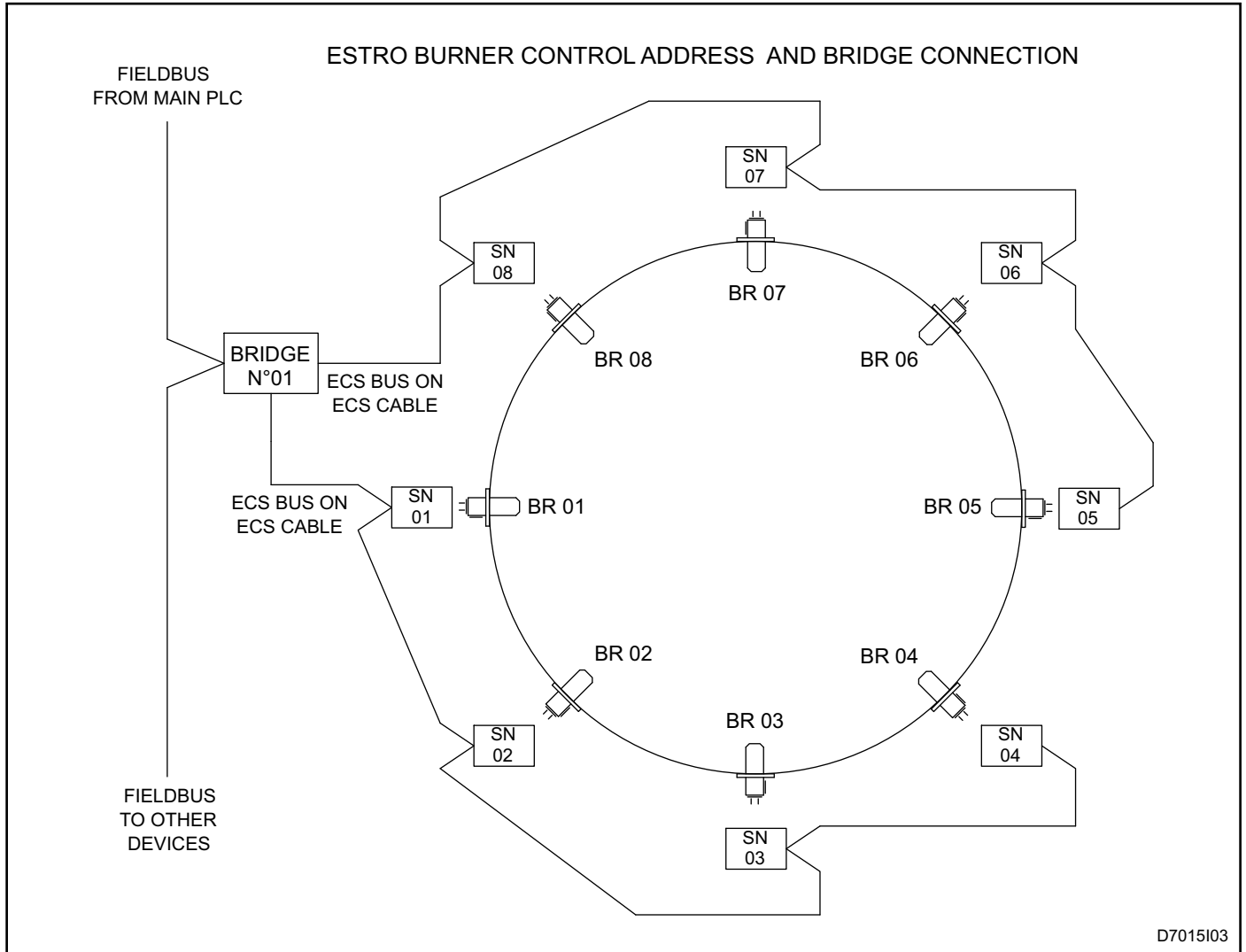
and supervision of the connected flame controls. The subdivision of the flame controls for each zone is managed in software depending on the path of the product inside the furnace.



APPLICATION EXAMPLE 3 - ESA BRIDGE-F

The combustion system is a bell furnace with 8 burners, operated by a single ESA BRIDGE-F. Considering that the furnace is mobile, the ESA BRIDGE-F device is mounted in the furnace edge and ECS BUS remains

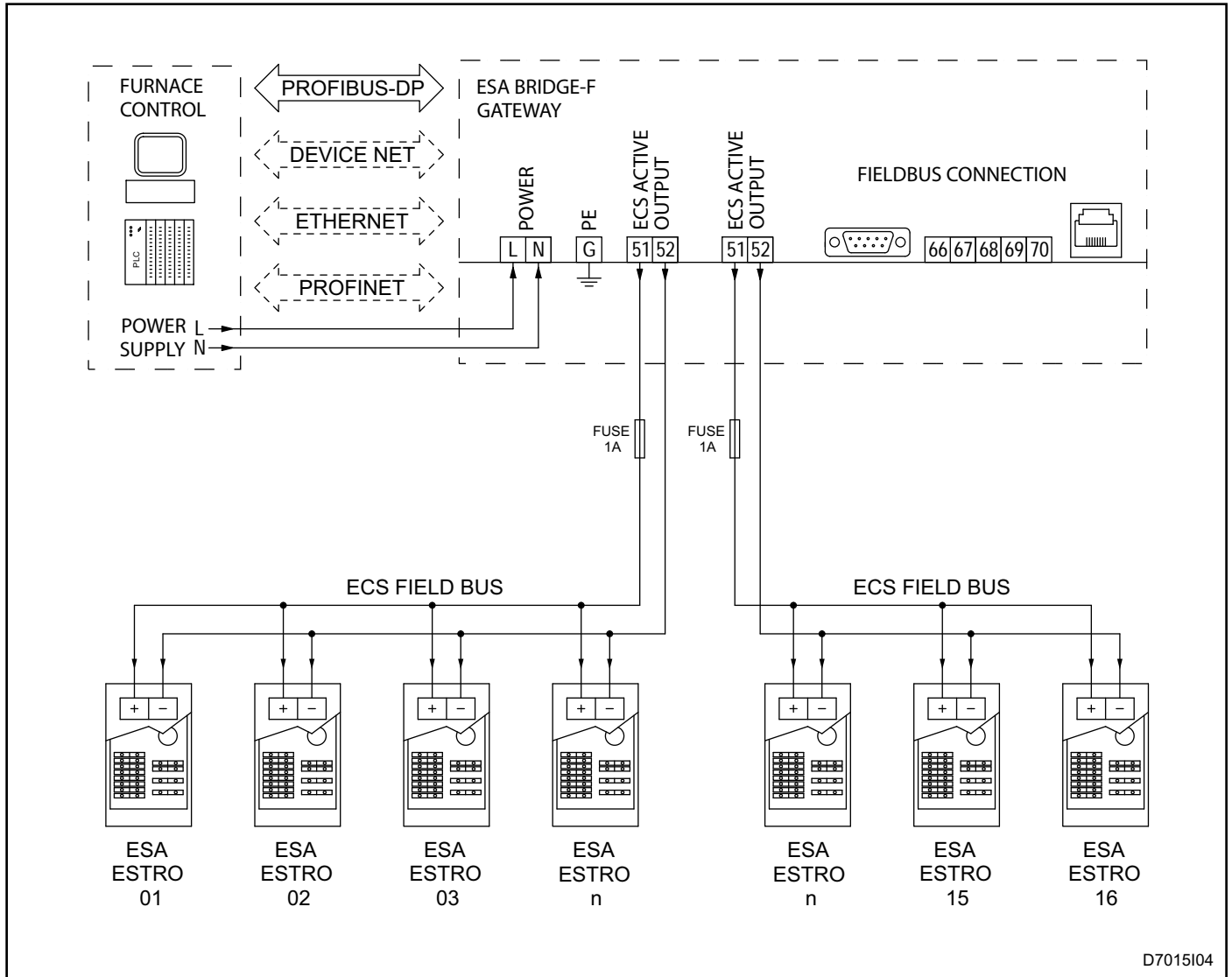
permanently connected to the flame controls, while the fieldbus from the supervisor is connected to the furnace with quick connectors, the same connectors that also carry the power supply.



APPLICATION EXAMPLE 4 - ESA BRIDGE-F

ESA BRIDGE-F is installed in the vicinity of the burners and receives from the supervisor both the power supply as well as the control fieldbus. The burners are located on both sides of the furnace

and the ESA BRIDGE-F reaches the two ends of the ECS bus that are connected separately to the two ECS output connectors.

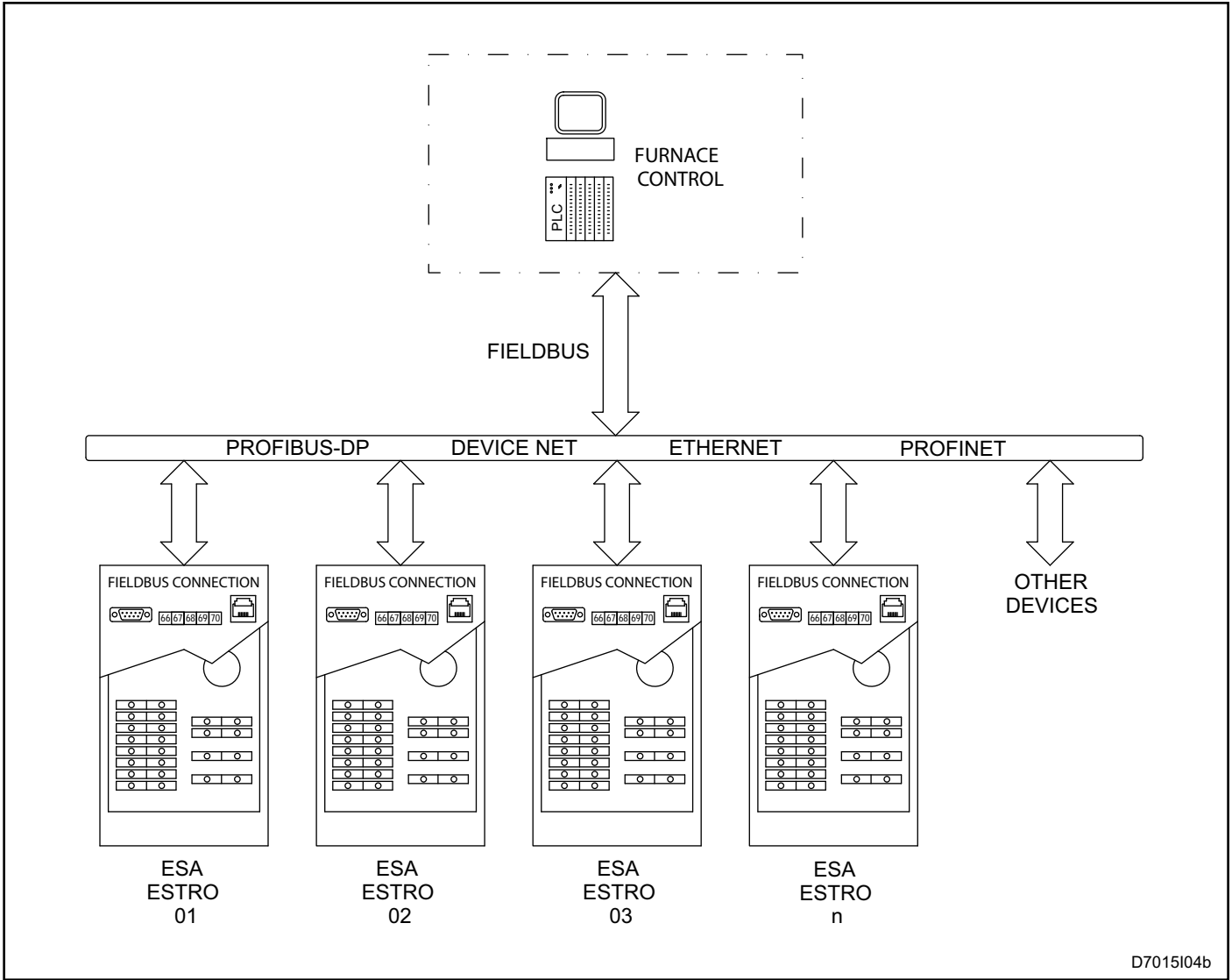


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APPLICATION 5 EXAMPLE - ESA EXP-3

ESA EXP-3 is installed inside the ESA ESTRO or ESA REFLAM burner control device and allows the supervisor to communicate directly via the specific fieldbus (Profibus, DeviceNet, Ethernet or Profinet) without the

use of the ECS bus. During burner control the fieldbus connection and the relative addressing changes according to the fieldbus used.



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CONFIGURAZIONE PARAMETERS

The configuration defines the operation ESA BRIDGE or ESA EXP-3, adjusting it to the requirements. The device provides two configurations a hardware and a software one.

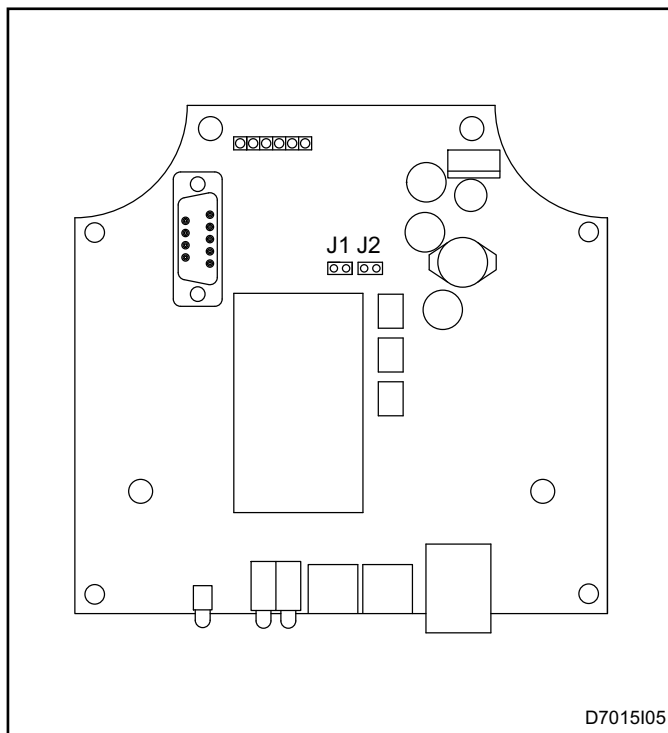
HARDWARE CONFIGURATION

The hardware configuration of ESA BRIDGE is to place two jumpers in the correct position on the maximum number of burners managed by the device.

The jumpers position is adjusted in the factory according to the customer's request, and reflects what is indicated in the order code on the identification label.

However, the customer is free to change this selection if necessary.

The Jumper J1 and J2 are placed at the center of the board on which the fieldbus is disconnected. The configuration change requires ESA BRIDGE to be disconnected, after which you must disconnect the connectors and remove the rear cover, to gain access to the two jumpers. After modification, before powering the device again, you must refit the cover and connect all disconnected connectors.



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JUMPER J1	JUMPER J2	Description
Open	Closed	ESA BRIDGE o ESA EXP-3 communicates with one flame control that must have address equal to 00. This selection is mandatory for EXP-3 ESA which communicates only with the flame control in which it is inserted
Open	Closed	ESA BRIDGE 3 communicates with up to eight flame controls whose address must have 01 to 08
Closed	Open	ESA BRIDGE communicates with up to sixteen flame controls whose address must have 01 to 16.

SOFTWARE CONFIGURATION

The ESA BRIDGE software configuration is performed directly by the supervisor acting on Flag-bit bytes of the general control of the device, and allows you to select:

- ECS baud rate: select the communication speed of bus ECS according to the value set in the flame control. In this case the selection must be made when switching on the device, then is stored. The change is performed by selecting the flag-bits of the baud rate desired and enabling the flag-bit exchange activation, after which it must be disabled. The exchange activation Flag-bit should be maintained until the generec state byte of the BRIDGE communicates the new baud rate.

- Burner in manual: select ESA BRIDGE behavior for the burners operated manually by choosing between allowing the burner to be switched on without a time limit or determine the burner shut down in manual when manual mode is activated, and when the time limit of 5 minutes has expired. For both selections ESA BRIDGE instantly transmits the status of the burner to the supervisor.

Refer to the chapters on the control Flag-bits to select the desired options.

EXCHANGE DATA FORMAT

ESA BRIDGE enables for every burner four data exchange locations (bytes) for writing the command and four locations for status reading.

The control for each burner involves only some of the dedicated locations, with the particularity that the byte of the ESA BRIDGE device generic command (software configuration and Watch-dog) is that of the first burner.

The location for the state of each burners are developed over several levels, where besides the first, in the following there are three detail levels of the flame control state.

The maximum number of burners and therefore of exchange locations to be managed are defined in the hardware configuration (1, 8 or 16 burners).

Burner number	ECS flame control address		Data exchange area		Command write	State reading
	Segment	Node	Word	Byte		
1	0	1	0	0	Generic function	Generic function
				1	Burner command	Burner state level 1
			1	2	Not used	Burner state level 2
				3	Not used	Burner state level 3
2	0	2	2	4	Not used	Generic function
				5	Burner command	Burner state level 1
			3	6	Not used	Burner state level 2
				7	Not used	Burner state level 3
3	0	3	4	8	Not used	Generic function
				9	Burner command	Burner state level 1
			5	10	Not used	Burner state level 2
				11	Not used	Burner state level 3
4	0	4	6	12	Not used	Generic function
				13	Burner command	Burner state level 1
			7	14	Not used	Burner state level 2
				15	Not used	Burner state level 3
5	0	5	8	16	Not used	Generic function
				17	Burner command	Burner state level 1
			9	18	Not used	Burner state level 2
				19	Not used	Burner state level 3
6	0	6	10	20	Not used	Generic function
				21	Burner command	Burner state level 1
			11	22	Not used	Burner state level 2
				23	Not used	Burner state level 3
7	0	7	12	24	Not used	Generic function
				25	Burner command	Burner state level 1
			13	26	Not used	Burner state level 2
				27	Not used	Burner state level 3

EXCHANGE DATA FORMAT

Burner number	ECS flame control address		Data exchange area		Command write	State reading
	Segment	Node	Word	Byte		
8	0	8	14	28	Not used	Generic function
				29	Burner command	Burner state level 1
			15	30	Not used	Burner state level 2
				31	Not used	Burner state level 3
9	0	9	16	32	Not used	Generic function
				33	Burner command	Burner state level 1
			17	34	Not used	Burner state level 2
				35	Not used	Burner state level 3
10	1	0	18	36	Not used	Generic function
				37	Burner command	Burner state level 1
			19	38	Not used	Burner state level 2
				39	Not used	Burner state level 3
11	1	1	20	40	Not used	Generic function
				41	Burner command	Burner state level 1
			21	42	Not used	Burner state level 2
				43	Not used	Burner state level 3
12	1	2	22	44	Not used	Generic function
				45	Burner command	Burner state level 1
			23	46	Not used	Burner state level 2
				47	Not used	Burner state level 3
13	1	3	24	48	Not used	Generic function
				49	Burner command	Burner state level 1
			25	50	Not used	Burner state level 2
				51	Not used	Burner state level 3
14	1	4	26	52	Not used	Generic function
				53	Burner command	Burner state level 1
			27	54	Not used	Burner state level 2
				55	Not used	Burner state level 3
15	1	5	28	56	Not used	Generic function
				57	Burner command	Burner state level 1
			29	58	Not used	Burner state level 2
				59	Not used	Burner state level 3
16	1	6	30	60	Not used	Generic function
				61	Burner command	Burner state level 1
			31	62	Not used	Burner state level 2
				63	Not used	Burner state level 3

FLAG-BIT COMMANDO AND DEVICE STATE

ESA BRIDGE makes available the command byte and the status for the exchange of generic features of the

device that affect all connected burners. In these bytes each bit has a specific function.

COMMAND FLAG OF GENERI FUNCTION

The generic function of the command byte is the first byte of the data exchange concerning the first burner and allows the supervisor to control all the generic functions such as the watch-dog, the selection of the baud rate for

the ECS bus and the ESA BRIDGE behavior for burners controlled manually. The flag-bit X indicates indifferent value.

generic function command	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Configuration of Baudrate for ECS bus						X	0	0	Controls the baudrate to 4800 baud when the Flag-bit2 is equal to1.
						X	0	1	Controls the baudrate to 9600 baud when the Flag-bit2 is equal to1.
						X	1	0	Controls the baudrate to 19200 baud when the Flag-bit2 is equal to1.
						0	X	X	Disables baudrate change
						1	X	X	Enables baudrate change therefore ESA BRIDGE sets the speed according to the values of Flag bit0 and bit1.
Enables 1° e 2° gas stage command			0						Disables special command finction
			1						ESA BRIDGE enables the function in which the supervisor can control the flame controls connected and configured discontinuously (can function only with ESA ESTRO-B) in order to keep active both the 1st and the 2nd gas stage.
Configuration of the local burner control behaviour		0							ESA BRIDGE allows the burner to be turned on manually indefinitely, communicating the burner status to the supervisor
		1							ESA BRIDGE stops the burner operated in manual mode when the manual function was activated when the time limit expired, besides communicating the supervisor the burner status.
Watch-dog command function	X								Flag-bits available for the watchdog function. The value written by the supervisor in this location will be recorded in the flag-bit generic status

FLAG-BIT COMMANDO AND DEVICE STATE

FLAG STATE OF GENERIC FUNCTION

The status byte of the generic function is repeated for each burner and displays the communication baud rate to

the flame controls and the watch-dog status. The flag-bit X indicates indifferent value.

Generic function command	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Baudrate value for ECS bus							0	0	The baudrate selected on the ECS bus is 4800 baud.
							0	1	The baudrate selected on the ECS bus is 9600 baud.
							1	0	Il baudrate selezionato sui bus ECS è 19200 baud.
Watch-dog function state	X								Flag-bit reading for the watchdog function. This value corresponds to what is written by the supervisor in the flag-bit generic command.

BURNER CONTROL FLAG-BIT

For each burner ESA BRIDGE a writable memory area where one or more active supervisor Flag-bits to control the burner in the state wanted.

In the command byte of the burner a Flag-bit specific ESA BRIDGE if the burner is installed or not, until it is activated this Flag-bit, the device sends to the flame control on only a stop command regardless of the status of the other

Flag-bit.

BRIDGE ESA expects the supervisor commands to arrive correctly and not in conflict. If the device receives two conflicting commands (eg. Power-stage gas purging and air activation) ESA BRIDGE does not accept either of them and stops the burner. The flag-bit X indicates indifferent value.

Burner command	FLAG - BIT								Description	
	7	6	5	4	3	2	1	0		
Burner installed or removed	0									Burner not installed. ESA BRIDGE sends only a stop command regardless of the state of the other Flag-bits.
	1									Burner installed. ESA BRIDGE sends the command related to the state of the other Flag-bits.
1° gas stage and e 2° gas stage output control	1						0	0		The burner is commanded to shut off and the flame control displays "H".
	1						0	1		The burner 1 ° gas stage (pilot) is controlled in ignition, and the flame control is forced to remain in this phase, showing the indication "2". For single gas stage burners this command should not be used.
	1						1	1		If the special function inside the generic command is enabled, the ESA ESTRO-B flame controls command the ignition of both the 1st gas stage burner (pilot) as well as the 2nd gas stage burner (main) keeping them in this condition until both the flag-bits are present. If the function is not on the ESA ESTRO-B flame controls command the ignition sequence until the scheme phase. For single gas stage burners this command takes the flame control to the scheme phase. The flame control displays the indication "3".
	1						1	0		The 2nd gas stage burner is kept on whilst the 1st gas stage is stopped and the flame control indicates the state "4". This command can be controlled only with ESA ESTRO-B that has the 1st gas stage output interrupted otherwise the flame control does not accept this command.
Burner lockout reset	1					1	X	X		ESA BRIDGE sends the burner unblock command to reset a standby condition after power supply or manual stop for any burner lockout. The number of unlock attempts in a time lapse is limited inside the flame control device.
Burner in local control	1				1		X	X		Enables local burner control for maintenance so the operator controls the burner directly from the button on the flame control device. According to the configuration, ESA BRIDGE can stop the burner.

BURNER COMMAND FLAG-BIT

Burner command	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Air output control for regulation	1			1			X	X	ESA BRIDGE activates the air outlet with the burner on to command the maximum power for regulation. When the flame monitoring is active this command indicates the state "6". This command is used with air outlets (ESA ESTRO-A or expansion) configured as discontinuous or impulsive.
Not used	1		X						Unused command
Air output control for purging and cooling	1	1							ESA BRIDGE activates the air outlet with the burner turned off by forcing the flame control during the purging stage all the time in which the command is active. This function is useful for purging the furnace or for controlled cooling.

BURNER COMMANDS

Below are some commands received from ESA BRIDGE on the burner control bytes and its states that the flame control assumes.

The example shows only the values of the significant Flag-bits for the command, while the insignificant ones will have a value 0. The flag-bit X indicates indifferent value.

Description	Generic function			Burner command						Not used						Not used						Display state				
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3		2	1	0	
Burner not installed	X	X					X	X	0																	H
Burner stop	X	X					X	X	1						0	0										H
Forced pre-purge	X	X					X	X	1	1																P
1st gas stage burner ignition	X	X					X	X	1						0	1										1
1st and 2nd gas stage burner ignition	X	X					X	X	1						1	1										3
Only 2nd gas stage burner ignition	X	X					X	X	1						1	0										4
Air regulation output command	X	X					X	X	1		1			X	X											6
Reset burner lockout	X	X					X	X	1					1	X	X										

BURNER STATE FLAG-BIT

For each burner ESA BRIDGE dedicates three storage locations for the supervisor's reading of the burner state that, according to the desired information, can choose among various detail levels. For example, in the first

level, ESA BRIDGE indicates if the burner is on or if there is an anomaly and in the next levels it also indicates the cause of the anomaly.

LEVEL 1

Burner level Level 1	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Burner in stop								1	The burner is off, stopped by serial command or by thermostat input connected to the burner control. In level 2 the cause for stopping is distinct.
Air control phase for purge or postpurge								1	The burner control is in one of the stages of verification or air management for prepurge or postpurge. This indication is present when the air pressure occurs, opening and closing air damper and during the counting of purging time and postpurge. In levels 2 and 3 the individual phases are distinct.
Burner on						1			The burner is powering up or already on and has at least one gas outlet active between 1st or 2nd stage. In level 2 the single phases are distinct.
Manual stop or standby					1				The flame control is waiting for the first release following power (Standby configuration) or the burner is stopped by the operator using the local button or from digital input.
Burner controlled locally				1					The burner is in local management for maintenance as a result of the specific command of the supervisor.
Burner anomaly or out of order			1						The flame control is blocked as a result of a burner failure or malfunction. In Level 2 some of the most common failures related to the burner are distinct.
High temperature functioning		1							The flame control is for high temperature operation commanded by its digital input. The flame control behaviour depends on its configuration, so refer to the specific manual.
No response by flame control	1								The flame control does not respond to commands sent from ESA BRIDGE. The cause is to be found in the connection of the ECS bus, the incorrect flame control address, baud rate set for the ECS bus incorrectly or in a failure of the flame control.

BURNER STATE FLAG-BIT

LEVEL 2

Level 2 Burner state	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Burner stopped								0	The burner is off, stopped by serial command from the supervisor, and the flame control indicates the state "H" on the display.
								1	The burner is off, stopped because of no thermostat signal connected to the flame control device that indicates the state "T".
Air control phase for purging and post purging								0	Burner in the post-purging step following the powering off.
								1	Burner in the process of checking air before ignition. This indication is present during the verification of the air pressure switch, opening and closing air damper and during the counting of the purging time. The distinction between individual states is at level 3.
Burner on					0	0			In the absence of Flag-bit 2 in level 1 This status indicates that the 1° and 2° gas stage burners are both off. When in level 1 the Flag-bit 2 is present, this state indicates that the 1st stage burner is under ignition and flame control indicates the phase "1", or in stopping with indication "Y".
					0	1			The 1st gas stage burner is turned up to speed while the 2nd gas stage is turned off. This flame control condition indicates the phase "2".
					1	1			Both burners 1st and 2nd stage burners are lit to speed and the flame control indicates the phase "3".
					1	0			The 2nd gas stage burner is turned up to speed while the 1st gas stage is turned off. This flame control condition indicates the phase "4".
Air output for regulation				0					The air-operated valve for minimum-maximum adjustment is not active.
				1					The air-operated valve for minimum-maximum control is active and the flame sensor indicates phase "6" on the display.

BURNER STATE FLAG-BIT

LEVEL 2

Livello 2 Burner state	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Burner failure or fault	0	0	0						The flame control is in a generic state of lockout not among the states that are indicated below. The display locally indicates the type of lockout.
	0	0	1						The flame control is in a lockout state following an ignition failure of the burner and on the display the flashing code "U" is indicated.
	0	1	0						The burner control is in a lockout state as a result of illegal flame detection in the burner and the display indicates the "d" flashing code.
	0	1	1						The flame control is in a lockout state following a flame loss signal or unwanted switching off of the burner and on the display the flashing code "F" is indicated.
	1	0	0						The flame control is in a lockout state following a missing air pressure switch consent during the burner operation, indicated on the display by flashing code "A" (The alarm indication is made available only by the ESA ESTRO flame controls with version 2.2)
	1	0	1						The burner flame control is in a lockout state because it has detected a failure to limit or flow switches that enable prepurge or burner ignition. The problem is due to the presence of the signal in undesirable phases or the lack of it in the established time. Refer to the flame control manual to identify the fault. (The indication of alarm is only made available by ESA ESTRO flame control with version 2.2).

NOTE: The Flag-bit 7 changed function compared with the previous version.

BURNER STATE FLAG-BIT

LEVEL 3

Level 3 Burner state	FLAG - BIT								Description
	7	6	5	4	3	2	1	0	
Flame signal value detected						0	0	0	No flame signal detected
						0	0	1	Flame signal from 10µA to 20µA detected
						0	1	0	Flame signal from 30µA to 40µA detected
						0	1	1	Flame signal from 50µA to 60µA detected
						1	0	0	Flame signal from 70µA to 80µA detected
						1	0	1	Flame signal from 90µA to 100µA detected
Air control phase for purging				0	0				The flame control is waiting for the consent of the air pressure and the display shows the code "A".
				0	1				The flame control is waiting for the maximum limit switch or the consent by the flow state of minimum flow purging consent (FSL) to move to the prepurge.
				1	0				The flame control is performing the burner purging phase before lighting.
				1	1				The flame control is waiting for the minimum limit switch consent II controllo fiamma o the maximum ignition flow switch consent (FSH) to be able to ignite the burner.

BURNER STATUS FLAG-BIT







BURNER STATE

Below are indicated certain flame control states and their relative Flag-bit reply given back by ESA BRIDGE on the burner state bytes. In the example we have indicated only

the Flag-bit values that are significant for the state, whilst the non significant values will have zero value. The X flag-bit indicates the indifferent value.

State on display	Generic function								Level 1 state								Level 2 state								Level 3 state								Description									
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0										
H	X						X	X								1													0								0	0	0	Burner stopped from remote		
P	X						X	X								1													1					1	0	0	0	0	0	Burners in prepurge		
I	X						X	X								1													0								X	X	X	Burners in ignition phase		
2	X						X	X								1													1								X	X	X	1st gas stage burner on		
3	X						X	X								1													1	1								X	X	X	1st and 2nd gas stage burner on	
4	X						X	X								1													1								X	X	X	Burner with only 2nd gas stage on		
6	X						X	X								1													1	X	X								X	X	X	Burner on with air valve on
F	X						X	X								1													0	1	1								0	0	0	Burner in lockout for flame loss
U	X						X	X								1													0	0	1								0	0	0	Burner in lockout for no ignition
d	X						X	X								1													0	1	0								X	X	X	Burner in lockout for illegal flame

BURNER STATE FLAG-BIT

Flame value	Byte 0								Byte 1								Byte 2								Byte 3								Description													
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0														
																																								0	0	0	Flame signal not present			
																																									0	0	1	Flame signal from 10µA to 20µA		
																																									0	1	0	Flame signal from 30µA to 40µA		
																																										0	1	1	Flame signal from 50µA to 60µA	
																																										1	0	0	Flame signl from 70µA to 80µA	
																																											1	0	1	Flame signal from 90µA to 100µA

WARNINGS

For correct use of the device respect the following warnings:

■ In choosing the Fieldbus model the configuration parameters and supply voltage must be suitable for the application. Before installing the device, check that the characteristics conform to what has been defined.

■ ESA BRIDGE is intended to be electrically connected in a permanent and fixed manner.

si intende connesso elettricamente in modo permanente e fisso. The reversal of the phase / neutral connection may compromise system security. Do not use different phases between the different voltage inputs and do not apply voltages on the output terminals.

■ Check correct connections after installation. Before powering the instrument ensure that the voltage, frequency and type of fieldbus are correct

■ The device can be mounted on board the furnace or placed within the electrical panels, however, it should not be exposed to intense magnetic or electric fields and subjected to direct radiation from heat sources nor must it be touched by combustion products such as liquids, solvents or corrosive gases.

■ The use of the ESA BRIDGE device must take place in an environment with temperature variations within the permitted limits.

■ Reversing the polarity of one or more flame control involves the non-operation of the entire ECS bus. The same situation occurs with a short circuit on the communication line. This malfunction, if maintained leads to the breakdown of the device.

■ Connecting devices to the ECS bus during operation may cause a brief interruption of the running communication.

■ In case of malfunction BRIDGE ESA must be sent to the manufacturer for repair.

■ In the case of EXP-3 ESA, being an integral part of the flame control, in case of malfunctioning the whole device must be sent to the constructor. Any modifications or repairs performed by third parties automatically voids the warranty and compromises the application safety.

■ ESA BRIDGE is a device for the control and regulation of combustion plants. It is not to be understood therefore, as an instrument to ensure the safety, for which there are special specific instruments.

INSTALLATION

For correct installation follow the instructions below:

MOUNTING

1 - The installation should be performed by qualified personnel in compliance with the regulations in force at the time and place of installation.

2 - Check that the device is compatible with the control system, for both the supply voltage as well as the type of fieldbus.

3 - Avoid placing ESA BRIDGE near intense magnetic or electric fields and do not expose it to direct radiation from heat, nor combustion products, liquids, solvents or corrosive gases.

4 - Do not limit in any way the area around the instrument but ensure adequate space and ventilation to avoid overheating of the device.

5 - All the workmanship on the case of the device necessary for the installation of the instrument, must ensure a degree of protection equal to or not less than IP40. For systems used in open air the degree of protection should be equal to IP54. The degree of protection can also be guaranteed by the application in which the instrument is inserted.

ELECTRIC WIRING

6 - If the power system is phase-phase type, an isolation transformer must be installed with connection of a secondary winding head reported on the ground.

7 - In carrying out the electrical connection refer to the technical documentation, according to the polarity between phase and neutral. The terminals for the electrical connections are screw type and can accept section conductors from 0.5 to 2.5mm² and the choice of conductors and their location must be suitable for the application.

8 - Adequately tighten the wires into the terminals to prevent malfunction or overheating which can lead to dangerous conditions. We recommend numbering and the use of appropriate terminals on conductors.

9 - Always make sure that the protective earth is connected to the corresponding terminals. The non-connection of the protective earth to the device, determines a dangerous condition for the operator.

10 - The laying out of the communication line must be separated from power lines, motor control (inverters) and network voltage; above all MULTIPOLAR or SHIELDED cables must not be used.

11 - For the communication lines use the ECS CABLE. As an alternative we recommend the use of busbar systems taking into account a maximum length of 1mt of the connecting cable between the busway and device for both communication and for power.

12 - The length of the communication lines must not exceed the specified limit. If the controller is far from the plant, we recommend placing ESA BRIDGE near the furnace and avoid using an ECS signal repeater.

13 - It is recommended to have a fuse on the active ECS line to avoid prolonged short-circuits from damaging the card; If necessary use a rapid blow fuse 1 A.

14 - On each of the ECS bus parts it is possible to connect the active output of a single ESA BRIDGE device. If the number of burners exceeds the amount controlled by a single ESA BRIDGE device it is necessary to use more ESA BRIDGE devices; each one connected to its ECS part.

15 - At the end of the connections close the lid making sure that the wires do not remain pressed between the lid and base.

START-UP

The operations indicated in the following chapter must be carried out by expert technician staff. Failure to follow the indications may cause dangerous conditions.

1 - Check that BRIDGE ESA is installed and connected properly. Check that the wires are fully engaged in the terminals and that there are no exposed conductor parts.

2 - Before powering the device, check that the voltage and frequency are correct and make sure that the protection ground is connected to the specific terminal

3 - Set the address in the BRIDGE ESA device according to the value defined in the supervisor.

4 - Power the device and check that via the LEDs that communication with the supervisor is running. If necessary, check the configurations within the supervisor.

5 - Set with the ESA device PROG-1 addresses of all the flame controls connected according to the defaults of the ESA BRIDGE.

6 - Via specific fieldbus command, set the baud rate for the ECS bus within ESA BRIDGE, which must be the same as the one configured in the flame control.

7 - For each connected flame control, activate the corresponding flag-bit installation of the burner so that ESA-BRIDGE activates the communication to the flame controls. Check with the specific LED that the flame controls respond correctly.

8 - Via the supervisor send different commands to the burners checking that the flame controls receive them and perform them correctly. At the same time compare the state of the flame controls with the return to the supervisor.

GENERAL MAINTENANCE PLAN

Check	Type	Advised time	Operation
Case closing	O	periodic	Verify that the instrument is always closed to prevent dirt, dust and moisture from entering and damaging the device.
Integrity of connecting cable	O	every six months	Check the exterior insulation integrity and the absence of abrasion or conductor overheating.
Device response	O/E	annual	Verify that the commands from the supervisor are run correctly by the flame controls and that their state is signalled correctly.
Tightening of conductors	O/E	annual	Reduce to every six months is applications with vibrations.
Replacement of the device	E	/	Replacement is necessary if the device is no longer functioning.

Key: O = ordinary / E = extraordinary

ORDINARY MAINTENANCE

For proper maintenance of ESA BRIDGE, strictly follow the instructions. Before carrying out maneuvers with the system on, make sure that the safety of the process and the operator is not compromised, if necessary check the parts with the system off.

CHECK OF THE CASE CLOSURE

The closure of the device is essential for its proper functioning as it prevents the entry of agents that might damage the control board. Verify that the lid adheres to the base so that the sealing of the gasket is effective. If inside there is dirt, first disconnect the power supply to the device and then remove dirt by blowing with compressed air. Do not use any mechanical means for this operation.

CHECK OF CABLE INTEGRITY

The integrity of the electrical cables can be checked visually. In case it is necessary to operate on the conductors for verification, as they are not totally visible, discon-

nect the power to the device before performing any operation.

DEVICE RESPONSE

Via the supervisor send different commands to the burners making sure that they are properly carried out by the connected flame controls. At the same time compare the state of the flame control with what was received by the supervisor.

FASTENING OF CONDUCTORS

The verification of the tightening of the wires into the terminals, required to prevent malfunction or overheating, applies both to the conductors connected to the device terminal as well as for those connected on users and for connecting the fieldbus. During this operation, also check that the insulation of the wire reaches the inside of the terminal or terminal block.

EXTRAORDINARY MAINTENANCE

For a correct replacement of ESA gateway BRIDGE, strictly follow the instructions to be carried out with the system off. It is recommended to have spare devices to intervene in quickly.

INSTRUMENT REPLACEMENT

1 - Make sure that the device is the cause of failure or malfunction, and to have a spare part the same as the one being replaced, verifying the data located on the identification label.

2 - Turn off the power supply, unscrew the locking screws and remove ESA BRIDGE from the base. Unhook the

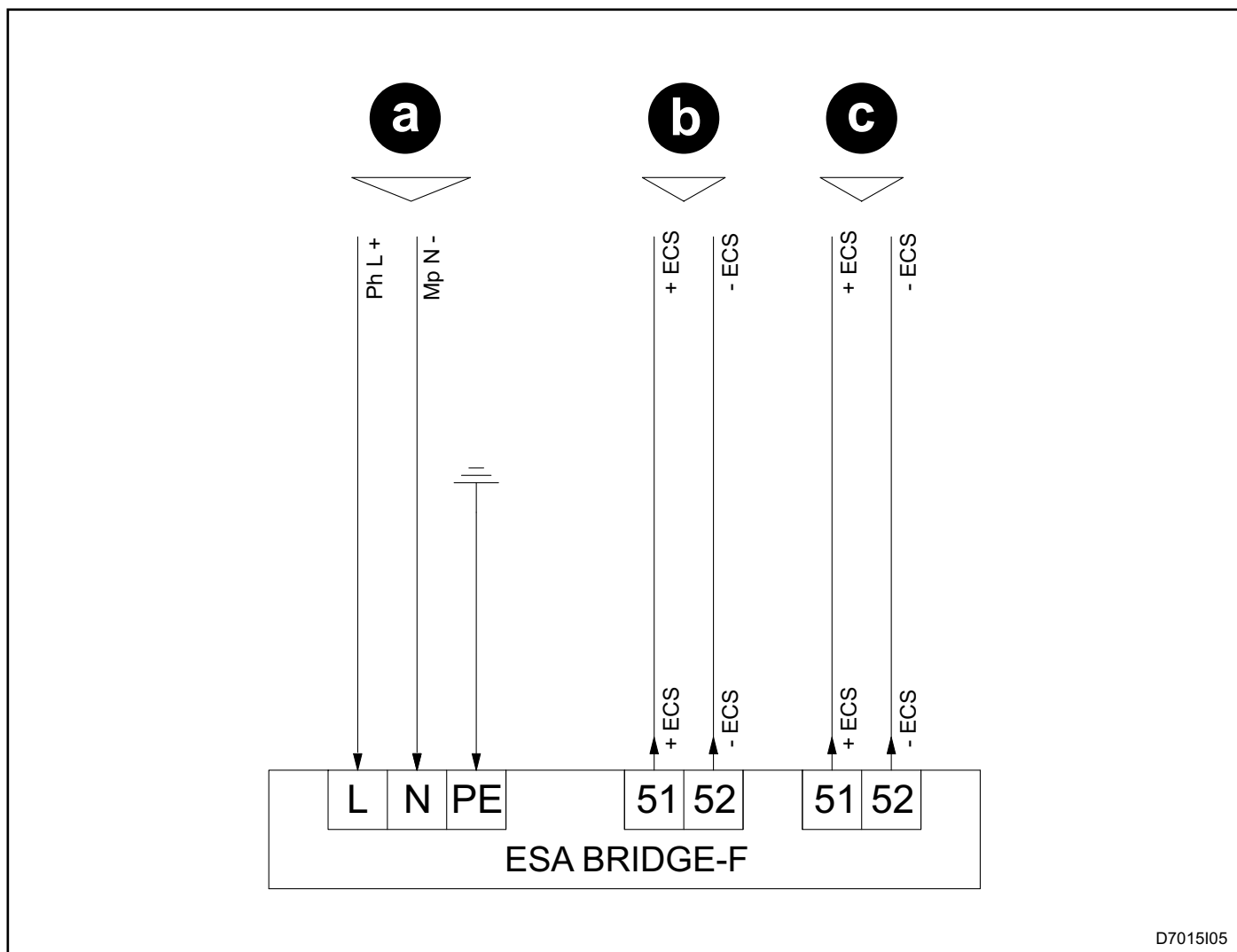
quick coupling connectors leaving the wires connected to them, so you do not disconnect the wires.

3 - Before inserting the new ESA BRIDGE set the specific address. Connect the connectors in their respective locations, making sure that they are seated properly and not overturned or shifted.

4 - Close the new instrument on the existing base, making sure that the wires do not remain pressed between the lid and base.

5 - Turn on power and check that the new device is functioning properly by repeating the "Ignition" steps.

ESA BRIDGE ELECTRIC WIRING



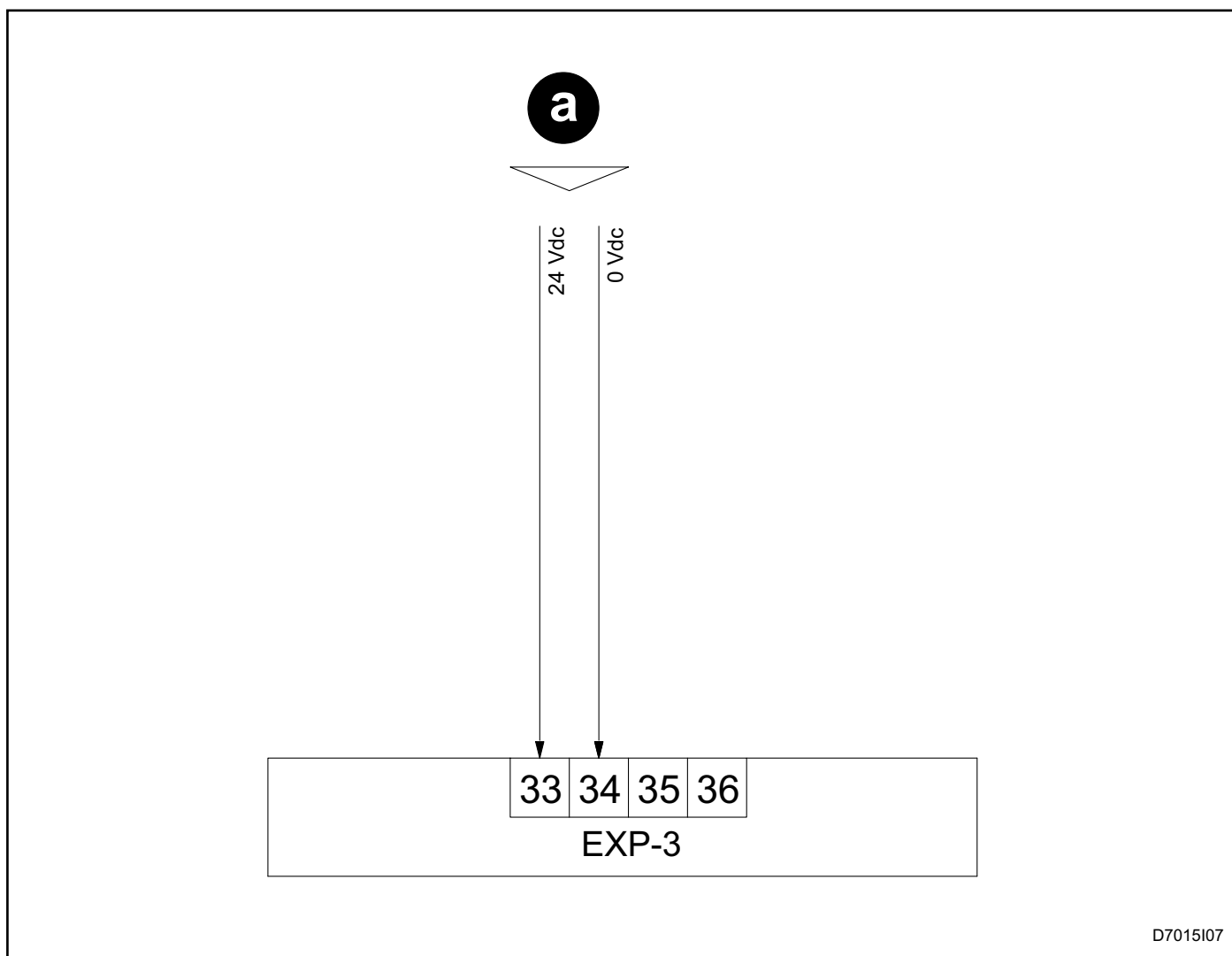
Pos.	Description	Pos.	Description
a	Power	c	ECS bus output towards the flame controls
b	ECS bus output towards the flame controls	-	

The two output connectors of the ECS bus are in parallel

TERMINAL CONNECTORS

Pos.	Description	Pos.	Description
L	Power Phase	52	Negative output to ECS bus communication
N	Power neutral	51	Positive output to ECS bus communication
PE	PE Protective earth	52	Negative output to ECS bus communication
51	Positive output to ECS bus communication	-	

ESA EXP-3 WIRING



D7015I07

Pos.	Description	Pos.	Description
a	Power	-	

TERMINAL CONNECTORS

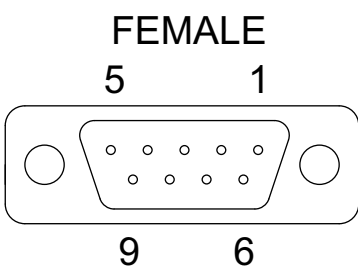
Pos.	Description	Pos.	Description
33	Positive power 24Vdc	35	Not connected
34	Negative power 0Vdc	36	Not connected

ESA EXP-3 only requires the external power supply and the fieldbus.
For the flame control connections in which it appears to refer to the specific documentation.

FIELDBUS ELECTRIC WIRING - PROFIBUS DP®

The Profibus fieldbus DP® connection from the supervisor is via a specific standard connector for the type of fieldbus.

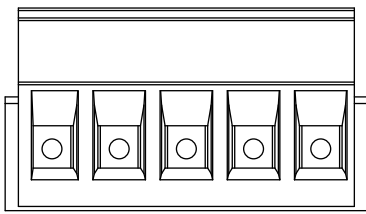
This connector is not supplied with the equipment, on which just the female connector is mounted.

PIN	Description	View
1	Not connected	
2	Not connected	
3	B-Line	
4	RTS	
5	GND BUS (isolated)	
6	+5V BUS (output, isolated, 100mA max.)	
7	Not connected	
8	A-Line	
9	Not connected	
Housing	Shield	D7015108

FIELDBUS ELECTRIC WIRING - DEVICENET®

The DeviceNet fieldbus connection from the supervisor is via a quick-release connector.

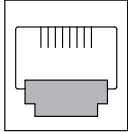
The connector is supplied with the equipment.

PIN	Description	View
66	Power 0V → pin 1 black wire	
67	CAN_L → pin 2 blue wire	
68	Drain or shield → pin 3 shield wire	
69	CAN_H → pin 4 white wire	
70	Power +24V → pin 5 red wire	
		D7015109

FIELDBUS ELECTRIC WIRING - ETHERNET®

The fieldbus connection Ethernet® coming from the supervisor takes place via a specific standard connector for the type of fieldbus.

This connector is not supplied with the equipment, on which just the female connector is mounted.

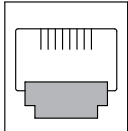
PIN	Description	View
1	Transmit Data+ → TX+	<p style="text-align: center;">FEMALE</p> <p style="text-align: center;">1 8</p> 
2	Transmit Data- → TX-	
3	Receive Data+ → RX+	
4	Not connected	
5	Not connected	
6	Receive Data- → RX-	
7	Not connected	
8	Not connected	
Housing	Shield	

D7015109

FIELDBUS ELECTRIC WIRING - PROFINET®

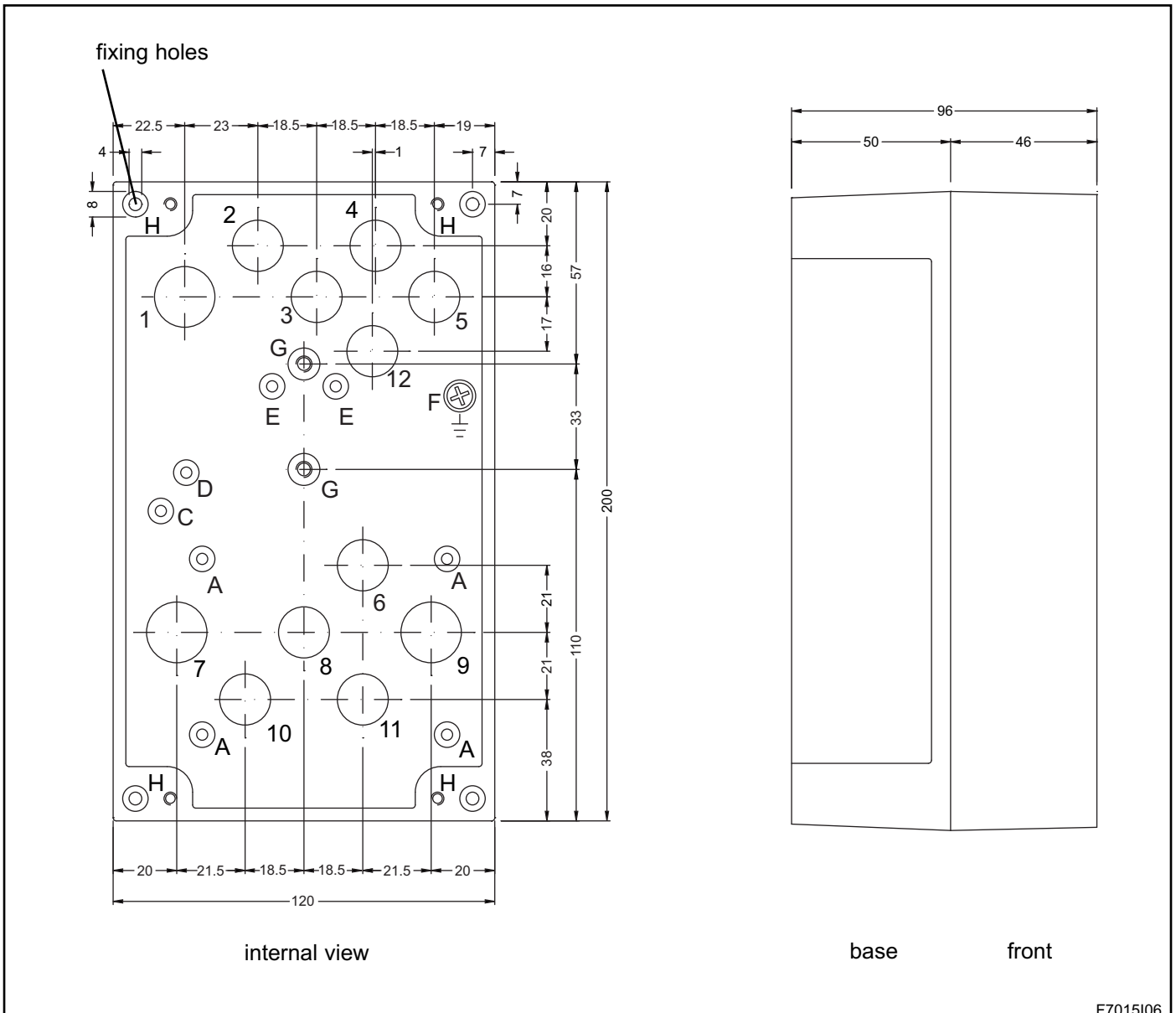
The fieldbus connection Profinet® coming from the supervisor takes place via a specific standard connector for the type of fieldbus.

This connector is not supplied with the equipment, on which just the female connector is mounted.

PIN	Description	View
1	Transmit Data+ → TX+	<p style="text-align: center;">FEMALE</p> <p style="text-align: center;">1 8</p> 
2	Transmit Data- → TX-	
3	Receive Data+ → RX+	
4	Not connected	
5	Not connected	
6	Receive Data- → RX-	
7	Not connected	
8	Not connected	
Housing	Shield	

D7015109

OVERALL DIMENSIONS ESA BRIFGE-F



PREFORMED HOLES	DIAMETER MM	CONNECTOR
1	19	PG11 - M20x1,5
2-3-4-5-6	16	PG9 - M16x1,5
8-10-11-12	16	PG9 - M16x1,5
7-9	19	PG11 - M20x1,5

POS.	DESCRIPTION
A	Not used
B	Not used
C	Not used
D	Not used
E	Not used
F	Support screw for grounding
G - G	Mounting plate or back collar (½" pipe) - Tapping

OVERALL DIMENSIONS ESA EXP-3

ESA EXP-3 is installed in the ESA ESTRO flame control or ESA REFLAM, so for the overall dimensions refer to

the documentation of the whole flame control device.

ESA BRIDGE ORDERING CODE

ESA BRIDGE - - - -

MODEL		01
Field Gateway	F	

TYPE OF FIELBUS		02
Profibus DP®	PDP	
DeviceNet®	DNT	
Ethernet®	ETH	
PROFINET®	PNT	

03 NUMBER OF BURNERS CONTROLLED	
Only one burner controlled	01
Eight burners controlled	08
Sixteen burners controlled	16

04 POWER VOLTAGE	
115 Vac	115
230 Vac	230

ESA EXP-3 ORDERING CODE

ESA EXP-3 is installed in the ESA ESTRO flame control or ESA REFLAM, for which the configuration parameters are added to that of the encapsulating flame control, in the four positions dedicated to the expansions.

ESA ESTRO o
ESA REFLAM -

X	X	X	X	X	X	X	X	X	X
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Flame control parameters

FIELDBUS TYPE		26
Profibus DP®	P	
DeviceNet®	D	
Ethernet®	E	
PROFINET®	R	

FIELDBUS TYPE		27
Control of only one burner	1	

28 AVAILABLE PARAMETER	
No associated function	/

29 AVAILABLE PARAMETER	
No associated function	/