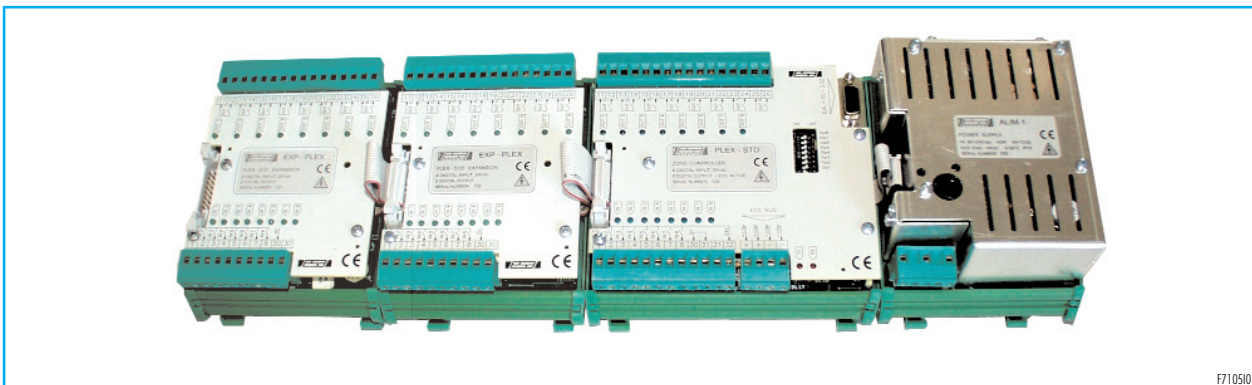


# MULTIZONE SERIAL CONTROLLER FOR MANAGEMENT OF ESA ESTRO ESA PLEX-STD SERIES



E7105/01

## FEATURES

- Supply voltage: 90÷240Vac
- Supply frequency: 40÷70Hz
- Max. absorption: 40VA
- Operating temperature: 0÷50°C
- Storage temperature: -10÷70°C
- Fixing: on 35 mm-DIN guide (EN50022)
- Mounting position: any
- Protection degree: IP10
- Atmospheres: not suitable for use in explosive or corrosive atmospheres
- Dimensions PLEX-8S/7T/4D: 220X125 H80mm
- Dimensions PLEX-16S/15T/8D: 315X125 H80mm
- Dimensions PLEX-24S/23T/12D: 410X125 H80mm
- Weight PLEX-8S/7T/4D: 900g
- Weight PLEX-16S/15T/8D: 1100g
- Weight PLEX-24S/23T/12D: 1300g
- Digital input voltage: 24Vdc
- Digital input length line: max 5 mt
- Maximum output capacity: 2A @ 230V cosφ=1  
1A @ 230V cosφ=0.5
- Fieldbus voltage: max 25Vdc
- Data transmission speed: max 9600 baud
- Length ECS line: max 200mT with ECS cable or busway
- Units connectable to active output: max 70 4800 baud  
max 60 9600 baud

## APPLICATIONS

- Converter of digital commands into serial communication for management of zones or burners by means of ECS bus.
- Communication interface for ESA ESTRO flame control devices.
- Multizone controller with digital outputs indicating the status of individual zones or burners.

## DESCRIPTION

PLEX-STD is a zone controller which, using the ECS communication bus, is able to control the ignition and shutdown of burners as well as signalling their status on the control device. PLEX-STD is available in different versions according to the number of zones or the requirements of the system and, by means of a dip-switch bank, its operation can be easily configured by selecting the most appropriate for the application.

There are three main versions: PLEX-8S/7T/4D comprising a main board with eight inputs and eight outputs available, PLEX-16S/15T/8D comprising the main board and an expansion board with sixteen inputs and sixteen outputs available, and finally PLEX-24S/23T/12D comprising the main board and two expansion boards with twenty four inputs and twenty four outputs available. In each version three types of operation can be selected: type S (single) with a single output for each zone corresponding to the ignited burner or burner in lockout status, type T (TCU24) with two cumulative outputs to all zones corresponding to the ignited burner or burner in lockout status and type D (double) with two outputs for each zone corresponding to the ignited burner or burner in lockout status.



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PLEX-STD receives commands by means of 24Vdc digital inputs and transduces them into serial commands towards the flame control devices: with 24 inputs available, up to 24 burner zones can be controlled. A letter from A to Z is associated to each input corresponding to the segment to be configured on the flame control devices installed in the zone to be controlled. With this control logic, in the flame control device address, the node has no value and in the same zone instruments may have the same node or different nodes.

The outputs are voltage-free contacts and according to the operation selected can correspond to the ignited burner or burner in lockout status. These outputs are cumulative per zone, and are therefore activated as soon as the PLEX-STD detects at least one ignited burner and/or at least one burner in lockout in that zone. If a burner is put in manual lockout (0 flashing), it is not identified as a lockout status, enabling the operator to disable the burners manually.

The ECS bus offers good immunity to electromagnetic interference, making use of high electrical signal levels and medium speeds of communication; it provides connection in parallel for all devices, allowing the combined use of busways and cables, with the additional advantage of being able to connect or disconnect devices without having to close the communication loop. If the number of flame control devices used exceeds the number supported by the active ECS output, an ECS signal repeater must be used (ECS-DRIVER).

The power section, consisting of a universal ESA ALIM1 (switching) power supply, accepts a wide range of voltages to ensure that the device works in hostile environments. PLEX-STD is supplied with a DIN rail connector for its installation in electric panels and the connections are made with quick extraction connectors for easier maintenance and wiring operations.

PLEX-STD has a pair of LEDs for each input and output, indicating the status, and two LEDs to indicate the data flow direction on the ECS line: one lights up when the interface is transmitting and the other when it is receiving. PLEX-STD also allows direct communication between the PC and the flame control devices, acting as an interface for the ECS by means of the EIA-RS-232 communication port. This possibility can be useful during installation and inspection of the system when the communication via a PC needs to be verified directly.

PLEX-STD can detect anomalies on the ECS communication line, such as a short-circuit or a reversal of the connection on one or more of the flame control devices, and when these occur, the device commands all burners to shutdown because the application cannot be controlled, and activates as an alternative the digital outputs to signal the problem to the remote control device.

## SETTING THE PARAMETERS

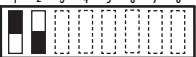
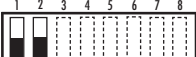
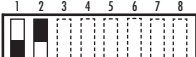
PLEX-STD enables the operating parameters to be set by means of a Dip switch bank situated on its front section. **The parameters can only be changed (Dip switch) when the device is switched off.**

### Setting the type of operation

The type of operation (S,T or D) is selected with Dip1 and Dip2. For more detailed information, see the following chapters.

Operation as a serial interface for ECS bus is selected with Dip6. For more detailed information, see the relevant chapter.

**PLEX-STD DIP-SWITCH BANK**

S operation type	ON OFF 
T operation type	ON OFF 
D operation type	ON OFF 

### Setting the speed of communication

The speed of data transmission on the ECS bus is selected with Dip3 and Dip4. Naturally, this setting must respect the baud rate selected in the flame control devices connected to the ECS bus.

#### DIP-SWITCH PLEX-STD BANK

Speed 4800 Baud	ON OFF	
Speed 9600 Baud	ON OFF	

### Selecting the version

One of the three board versions is selected with Dip7 and Dip8 of the Dip Switch bank of the PLEX-STD device. In the versions with the EXP-PLEX expansion boards, their address, defining the position, must also be selected. The selection is made on the Dip switch bank situated on the front part of the EXP-PLEX expansion boards.

#### DIP-SWITCH PLEX-STD BANK

Version PLEX-8S/7T/4D	ON OFF	
Version PLEX-16S/15T/8D	ON OFF	
Version PLEX-24S/23T/12D	ON OFF	

#### DIP-SWITCH EXP-PLEX BANK

Selection for EXP-PLEX1	ON OFF	
Selection for EXP-PLEX2	ON OFF	

### Serial addresses for flame control devices

PLEX-STD sends serial commands to individual zones, specifying only the segment of the serial address. For this reason, the flame control device belonging to the same zone or those which respect the commands from an input of the device, must be configured with the serial segment relative to the PLEX-STD device input; while the node has no value and in the same zone instruments may have the same node or different nodes.

ZONE	FLAME CONTROLS ADDRESSES
A	A0...A9, AA...AZ
B	B0...B9, BA...BZ
C	C0...C9, CA...CZ
D	D0...D9, DA...DZ
Z	Z0...Z9, ZA...ZZ
ALL	all possible combinations

## PLEX-8S OPERATION

The 8S type operation offers, for each zone to be controlled, one input for burner control and one output corresponding to their status, for up to a maximum of 8 zones. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the output can correspond at status of "burners ignited" (at least one in the zone) or "burners in lockout" (at least one in the zone). The selection between one or another output corre-

spondence is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. Here below we will show the two possible configurations of the Dip-Switch bank of the PLEX-STD device and the correspondence between inputs and outputs and controlled zones.



FURNACE ZONES	INPUT PLEX-8S → "Commands"	OUTPUT PLEX-8S → "Status"
ZONE A	IN1 PLEX-STD → on / off	OUT1 PLEX-STD → ignited burners
ZONE B	IN2 PLEX-STD → on / off	OUT2 PLEX-STD → ignited burners
ZONE C	IN3 PLEX-STD → on / off	OUT3 PLEX-STD → ignited burners
ZONE D	IN4 PLEX-STD → on / off	OUT4 PLEX-STD → ignited burners
ZONE E	IN5 PLEX-STD → on / off	OUT5 PLEX-STD → ignited burners
ZONE F	IN6 PLEX-STD → on / off	OUT6 PLEX-STD → ignited burners
ZONE G	IN7 PLEX-STD → on / off	OUT7 PLEX-STD → ignited burners
ZONE H	IN8 PLEX-STD → on / off	OUT8 PLEX-STD → ignited burners



FURNACE ZONES	INPUT PLEX-8S → "Commands"	OUTPUT PLEX-8S → "Status"
ZONE A	IN1 PLEX-STD → on / off	OUT1 PLEX-STD → burners in lockout
ZONE B	IN2 PLEX-STD → on / off	OUT2 PLEX-STD → burners in lockout
ZONE C	IN3 PLEX-STD → on / off	OUT3 PLEX-STD → burners in lockout
ZONE D	IN4 PLEX-STD → on / off	OUT4 PLEX-STD → burners in lockout
ZONE E	IN5 PLEX-STD → on / off	OUT5 PLEX-STD → burners in lockout
ZONE F	IN6 PLEX-STD → on / off	OUT6 PLEX-STD → burners in lockout
ZONE G	IN7 PLEX-STD → on / off	OUT7 PLEX-STD → burners in lockout
ZONE H	IN8 PLEX-STD → on / off	OUT8 PLEX-STD → burners in lockout

## PLEX-16S OPERATION

The 16S type operation offers, for each zone to be controlled, one input for burner control and one output corresponding to their status, for up to a maximum of 16 zones. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the output can correspond at status of "burners ignited" (at least one in the zone) or "burners in lockout" (at least one in the zone). The selection between one or another output

correspondence is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. Here below we will show the two possible configurations of the Dip-Switch bank of the PLEX-STD device and the correspondence between inputs and outputs and controlled zones.



FURNACE ZONES	INPUT PLEX-16S → "Commands"	OUTPUT PLEX-16S → "Status"
ZONE A	IN1 EXP-PLEX1 → on / off	OUT1 EXP-PLEX1 → ignited burners
ZONE B	IN2 EXP-PLEX1 → on / off	OUT2 EXP-PLEX1 → ignited burners
ZONE C	IN3 EXP-PLEX1 → on / off	OUT3 EXP-PLEX1 → ignited burners
ZONE D	IN4 EXP-PLEX1 → on / off	OUT4 EXP-PLEX1 → ignited burners
ZONE E	IN5 EXP-PLEX1 → on / off	OUT5 EXP-PLEX1 → ignited burners
ZONE F	IN6 EXP-PLEX1 → on / off	OUT6 EXP-PLEX1 → ignited burners
ZONE G	IN7 EXP-PLEX1 → on / off	OUT7 EXP-PLEX1 → ignited burners
ZONE H	IN8 EXP-PLEX1 → on / off	OUT8 EXP-PLEX1 → ignited burners
ZONE I	IN1 PLEX-STD → on / off	OUT1 PLEX-STD → ignited burners
ZONE L	IN2 PLEX-STD → on / off	OUT2 PLEX-STD → ignited burners
ZONE M	IN3 PLEX-STD → on / off	OUT3 PLEX-STD → ignited burners
ZONE N	IN4 PLEX-STD → on / off	OUT4 PLEX-STD → ignited burners
ZONE O	IN5 PLEX-STD → on / off	OUT5 PLEX-STD → ignited burners
ZONE P	IN6 PLEX-STD → on / off	OUT6 PLEX-STD → ignited burners
ZONE Q	IN7 PLEX-STD → on / off	OUT7 PLEX-STD → ignited burners
ZONE R	IN8 PLEX-STD → on / off	OUT8 PLEX-STD → ignited burners

<p>PLEX-16S</p> <p>with output of at least one burner in lockout</p>	
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FURNACE ZONES	INPUT PLEX-16S → "Commands"	OUTPUT PLEX-16S → "Status"
ZONE A	IN1 EXP-PLEX1 → on / off	OUT1 EXP-PLEX1 → burners in lockout
ZONE B	IN2 EXP-PLEX1 → on / off	OUT2 EXP-PLEX1 → burners in lockout
ZONE C	IN3 EXP-PLEX1 → on / off	OUT3 EXP-PLEX1 → burners in lockout
ZONE D	IN4 EXP-PLEX1 → on / off	OUT4 EXP-PLEX1 → burners in lockout
ZONE E	IN5 EXP-PLEX1 → on / off	OUT5 EXP-PLEX1 → burners in lockout
ZONE F	IN6 EXP-PLEX1 → on / off	OUT6 EXP-PLEX1 → burners in lockout
ZONE G	IN7 EXP-PLEX1 → on / off	OUT7 EXP-PLEX1 → burners in lockout
ZONE H	IN8 EXP-PLEX1 → on / off	OUT8 EXP-PLEX1 → burners in lockout
ZONE I	IN1 PLEX-STD → on / off	OUT1 PLEX-STD → burners in lockout
ZONE L	IN2 PLEX-STD → on / off	OUT2 PLEX-STD → burners in lockout
ZONE M	IN3 PLEX-STD → on / off	OUT3 PLEX-STD → burners in lockout
ZONE N	IN4 PLEX-STD → on / off	OUT4 PLEX-STD → burners in lockout
ZONE O	IN5 PLEX-STD → on / off	OUT5 PLEX-STD → burners in lockout
ZONE P	IN6 PLEX-STD → on / off	OUT6 PLEX-STD → burners in lockout
ZONE Q	IN7 PLEX-STD → on / off	OUT7 PLEX-STD → burners in lockout
ZONE R	IN8 PLEX-STD → on / off	OUT8 PLEX-STD → burners in lockout

## PLEX-24S OPERATION

The 24S type operation offers, for each zone to be controlled, one input for burner control and one output corresponding to their status, for up to a maximum of 24 zones. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the output can correspond at status of "burners ignited" (at least one in the zone) or "burners in lockout" (at least one in the zone). The selection between one or another output

correspondence is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. Here below we will show the two possible configurations of the Dip-Switch bank of the PLEX-STD device and the correspondence between inputs and outputs and controlled zones.



FURNACE ZONES	INPUT PLEX-24S → "Commands"	OUTPUT PLEX-24S → "Status"
ZONE A	IN1 EXP-PLEX2 → on / off	OUT1 EXP-PLEX2 → ignited burners
ZONE B	IN2 EXP-PLEX2 → on / off	OUT2 EXP-PLEX2 → ignited burners
ZONE C	IN3 EXP-PLEX2 → on / off	OUT3 EXP-PLEX2 → ignited burners
ZONE D	IN4 EXP-PLEX2 → on / off	OUT4 EXP-PLEX2 → ignited burners
ZONE E	IN5 EXP-PLEX2 → on / off	OUT5 EXP-PLEX2 → ignited burners
ZONE F	IN6 EXP-PLEX2 → on / off	OUT6 EXP-PLEX2 → ignited burners
ZONE G	IN7 EXP-PLEX2 → on / off	OUT7 EXP-PLEX2 → ignited burners
ZONE H	IN8 EXP-PLEX2 → on / off	OUT8 EXP-PLEX2 → ignited burners
ZONE I	IN1 EXP-PLEX1 → on / off	OUT1 EXP-PLEX1 → ignited burners
ZONE L	IN2 EXP-PLEX1 → on / off	OUT2 EXP-PLEX1 → ignited burners
ZONE M	IN3 EXP-PLEX1 → on / off	OUT3 EXP-PLEX1 → ignited burners
ZONE N	IN4 EXP-PLEX1 → on / off	OUT4 EXP-PLEX1 → ignited burners
ZONE O	IN5 EXP-PLEX1 → on / off	OUT5 EXP-PLEX1 → ignited burners
ZONE P	IN6 EXP-PLEX1 → on / off	OUT6 EXP-PLEX1 → ignited burners
ZONE Q	IN7 EXP-PLEX1 → on / off	OUT7 EXP-PLEX1 → ignited burners
ZONE R	IN8 EXP-PLEX1 → on / off	OUT8 EXP-PLEX1 → ignited burners
ZONE S	IN1 PLEX STD → on / off	OUT1 PLEX STD → ignited burners
ZONE T	IN2 PLEX STD → on / off	OUT2 PLEX STD → ignited burners
ZONE U	IN3 PLEX STD → on / off	OUT3 PLEX STD → ignited burners
ZONE V	IN4 PLEX STD → on / off	OUT4 PLEX STD → ignited burners
ZONE W	IN5 PLEX STD → on / off	OUT5 PLEX STD → ignited burners
ZONE X	IN6 PLEX STD → on / off	OUT6 PLEX STD → ignited burners
ZONE Y	IN7 PLEX STD → on / off	OUT7 PLEX STD → ignited burners
ZONE Z	IN8 PLEX STD → on / off	OUT8 PLEX STD → ignited burners



FURNACE ZONES	INPUT PLEX-24S → "Commands"	OUTPUT PLEX-24S → "Status"
ZONE A	IN1 EXP-PLEX2 → on/off	OUT1 EXP-PLEX2 → burners in lockout
ZONE B	IN2 EXP-PLEX2 → on/off	OUT2 EXP-PLEX2 → burners in lockout
ZONE C	IN3 EXP-PLEX2 → on/off	OUT3 EXP-PLEX2 → burners in lockout
ZONE D	IN4 EXP-PLEX2 → on/off	OUT4 EXP-PLEX2 → burners in lockout
ZONE E	IN5 EXP-PLEX2 → on/off	OUT5 EXP-PLEX2 → burners in lockout
ZONE F	IN6 EXP-PLEX2 → on/off	OUT6 EXP-PLEX2 → burners in lockout
ZONE G	IN7 EXP-PLEX2 → on/off	OUT7 EXP-PLEX2 → burners in lockout
ZONE H	IN8 EXP-PLEX2 → on/off	OUT8 EXP-PLEX2 → burners in lockout
ZONE I	IN1 EXP-PLEX1 → on/off	OUT1 EXP-PLEX1 → burners in lockout
ZONE L	IN2 EXP-PLEX1 → on/off	OUT2 EXP-PLEX1 → burners in lockout
ZONE M	IN3 EXP-PLEX1 → on/off	OUT3 EXP-PLEX1 → burners in lockout
ZONE N	IN4 EXP-PLEX1 → on/off	OUT4 EXP-PLEX1 → burners in lockout
ZONE O	IN5 EXP-PLEX1 → on/off	OUT5 EXP-PLEX1 → burners in lockout
ZONE P	IN6 EXP-PLEX1 → on/off	OUT6 EXP-PLEX1 → burners in lockout
ZONE Q	IN7 EXP-PLEX1 → on/off	OUT7 EXP-PLEX1 → burners in lockout
ZONE R	IN8 EXP-PLEX1 → on/off	OUT8 EXP-PLEX1 → burners in lockout
ZONE S	IN1 PLEX STD → on/off	OUT1 PLEX STD → burners in lockout
ZONE T	IN2 PLEX STD → on/off	OUT2 PLEX STD → burners in lockout
ZONE U	IN3 PLEX STD → on/off	OUT3 PLEX STD → burners in lockout
ZONE V	IN4 PLEX STD → on/off	OUT4 PLEX STD → burners in lockout
ZONE W	IN5 PLEX STD → on/off	OUT5 PLEX STD → burners in lockout
ZONE X	IN6 PLEX STD → on/off	OUT6 PLEX STD → burners in lockout
ZONE Y	IN7 PLEX STD → on/off	OUT7 PLEX STD → burners in lockout
ZONE Z	IN8 PLEX STD → on/off	OUT8 PLEX STD → burners in lockout

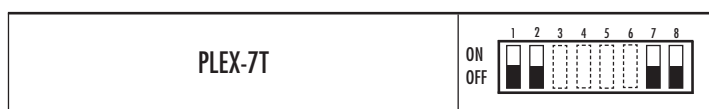


## PLEX-7T OPERATION

The 7T type operation offers, for each zone to be controlled, a burner control input for up to a maximum of 7 zones and two cumulative outputs for all the zones corresponding to the ignited burner status and the burner in lockout. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the "ignited burners" output is activated when at least one is ignited and the output of "burners in lockout" is activated when at least one is in lockout. Each output uses two physical outputs of the board, so that both the N.O. contact and the N.C. contact are

available. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. PLEX-7T makes a cumulative quick shutdown input available which, when on, shuts down all burners without taking into consideration the status of the individual control inputs.

Here below we will show the correspondence between the inputs and outputs and the controlled zones.



FURNACE ZONES	INPUT PLEX-7T → "Commands"
ZONE A	IN1 PLEX-STD → on/off
ZONE B	IN2 PLEX-STD → on/off
ZONE C	IN3 PLEX-STD → on/off
ZONE D	IN4 PLEX-STD → on/off
ZONE E	IN5 PLEX-STD → on/off
ZONE F	IN6 PLEX-STD → on/off
ZONE G	IN7 PLEX-STD → on/off
Shut down all zones	IN8 PLEX-STD → off

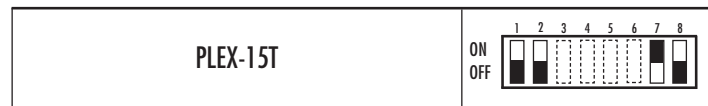
FURNACE ZONES	OUTPUT PLEX-7T → "Status"
Burners in lockout	OUT1 PLEX-STD → N.C. contact
	OUT2 PLEX-STD → N.O. contact
Ignited burners	OUT3 PLEX-STD → N.C. contact
	OUT4 PLEX-STD → N.O. contact

## PLEX-15T OPERATION

The 15T type operation offers, for each zone to be controlled, a burner control input for up to a maximum of 15 zones and two cumulative outputs for all the zones corresponding to the ignited burner status and the burner in lockout. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the "ignited burners" output is activated when at least one is ignited and the output of "burners in lockout" is activated when at least one is in lockout. Each output uses two physical outputs of the board, so that both the N.O. contact and the N.C. contact are

available. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. PLEX-15T makes a cumulative quick shutdown input available which, when on, shuts down all burners without taking into consideration the status of the individual control inputs.

Here below we will show the correspondence between the inputs and outputs and the controlled zones.



FURNACE ZONE	INPUT PLEX-15T → "Commands"
ZONE A	IN1 EXP-PLEX1 → on/off
ZONE B	IN2 EXP-PLEX1 → on/off
ZONE C	IN3 EXP-PLEX1 → on/off
ZONE D	IN4 EXP-PLEX1 → on/off
ZONE E	IN5 EXP-PLEX1 → on/off
ZONE F	IN6 EXP-PLEX1 → on/off
ZONE G	IN7 EXP-PLEX1 → on/off
ZONE H	IN8 EXP-PLEX1 → on/off
ZONE I	IN1 PLEX STD → on/off
ZONE L	IN2 PLEX STD → on/off
ZONE M	IN3 PLEX STD → on/off
ZONE N	IN4 PLEX STD → on/off
ZONE O	IN5 PLEX STD → on/off
ZONE P	IN6 PLEX STD → on/off
ZONE Q	IN7 PLEX STD → on/off
Shut down all zones	IN8 PLEX STD → off

FURNACE ZONE	OUTPUT PLEX-15T → "Status"
Burners in lockout	OUT1 EXP-PLEX1 → N.C. contact
	OUT2 EXP-PLEX1 → N.O. contact
Ignited burners	OUT3 EXP-PLEX1 → N.C. contact
	OUT4 EXP-PLEX1 → N.O. contact

## PLEX-23T OPERATION

The 23T type operation offers, for each zone to be controlled, a burner control input for up to a maximum of 23 zones and two cumulative outputs for all the zones corresponding to the ignited burner status and the burner in lockout. In particular, the command is "ignite burners" when the input is active and "shutdown burners" with the input inactive; while the "ignited burners" output is activated when at least one is ignited and the output of "burners in lockout" is activated when at least one is in lockout. Each output uses two physical outputs of the board, so that both the N.O. contact and the N.C. contact are

available. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button. PLEX-23T makes a cumulative quick shutdown input available which, when on, shuts down all burners without taking into consideration the status of the individual control inputs.

Here below we will show the correspondence between the inputs and outputs and the controlled zones.



FURNACE ZONE	INPUT PLEX-23T → "Commands"
ZONE A	IN1 EXP-PLEX2 → on/off
ZONE B	IN2 EXP-PLEX2 → on/off
ZONE C	IN3 EXP-PLEX2 → on/off
ZONE D	IN4 EXP-PLEX2 → on/off
ZONE E	IN5 EXP-PLEX2 → on/off
ZONE F	IN6 EXP-PLEX2 → on/off
ZONE G	IN7 EXP-PLEX2 → on/off
ZONE H	IN8 EXP-PLEX2 → on/off
ZONE I	IN1 EXP-PLEX1 → on/off
ZONE L	IN2 EXP-PLEX1 → on/off
ZONE M	IN3 EXP-PLEX1 → on/off
ZONE N	IN4 EXP-PLEX1 → on/off
ZONE O	IN5 EXP-PLEX1 → on/off
ZONE P	IN6 EXP-PLEX1 → on/off
ZONE Q	IN7 EXP-PLEX1 → on/off
ZONE R	IN8 EXP-PLEX1 → on/off
ZONE S	IN1 PLEX STD → on/off
ZONE T	IN2 PLEX STD → on/off
ZONE U	IN3 PLEX STD → on/off
ZONE V	IN4 PLEX STD → on/off
ZONE W	IN5 PLEX STD → on/off
ZONE X	IN6 PLEX STD → on/off
ZONE Y	IN7 PLEX STD → on/off
Shut down all zones	IN8 PLEX STD → off

FURNACE ZONE	OUTPUT PLEX-23T → "Status"
Burners in lockout	OUT1 EXP-PLEX2 → N.C. contact
	OUT2 EXP-PLEX2 → N.O. contact
Ignited burners	OUT3 EXP-PLEX2 → N.C. contact
	OUT4 EXP-PLEX2 → N.O. contact

## PLEX-4D OPERATION

The 4D type operation offers, for each zone to be controlled, two burner control inputs and two outputs corresponding to their status, for up to a maximum of 4 zones. In particular, the command is "ignite burners" when the first input is active and "shutdown burners" with the input inactive; while the second input can be configured as a Main ON / Main OFF input or a burners unlock input. In the first case the command is "Main ON" when the second input is active and "Main OFF" when this is inactive. In the second case, the command is "unlock burners" with the second input active. The selection between one or another command is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The first output corresponds to the status "burners ignited" and is activated when at least one burner in the

zone is ignited, while the second output corresponds to the status "burners in lockout" and is activated when at least one burner in the zone is in lockout. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button or by the command "unlock burners". Naturally this command is carried out only by burners in lockout, while burners shut down by a serial command remain that way. Here below we will show the two possible configuration of the PLEX-STD device Dip-Switch bank and the correspondence between inputs and outputs and the controlled zones.

PLEX-4D with Main ON/Main OFF command		
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FURNACE ZONES	INPUT PLEX-4D → "Commands"	OUTPUT PLEX-4D → "Status"
ZONE A	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → Main ON/Main OFF	OUT2 PLEX-STD → burners in lockout
ZONE B	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → Main ON/Main OFF	OUT4 PLEX-STD → burners in lockout
ZONE C	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → Main ON/Main OFF	OUT6 PLEX-STD → burners in lockout
ZONE D	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → Main ON/Main OFF	OUT8 PLEX-STD → burners in lockout

PLEX-4D with burner unlock command		
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FURNACE ZONES	INPUT PLEX-4D → "Commands"	OUTPUT PLEX-4D → "Status"
ZONE A	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → unlock	OUT2 PLEX-STD → burners in lockout
ZONE B	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → unlock	OUT4 PLEX-STD → burners in lockout
ZONE C	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → unlock	OUT6 PLEX-STD → burners in lockout
ZONE D	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → unlock	OUT8 PLEX-STD → burners in lockout

## PLEX-8D OPERATION

The 8D type operation offers, for each zone to be controlled, two burner control inputs and two outputs corresponding to their status, for up to a maximum of 8 zones. In particular, the command is "ignite burners" when the first input is active and "shutdown burners" with the input inactive; while the second input can be configured as a Main ON / Main OFF input or a burners unlock input. In the first case the command is "Main ON" when the second input is active and "Main OFF" when this is inactive. In the second case, the command is "unlock burners" with the second input active. The selection between one or another command is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The first output corresponds to the status "burners ignited" and is activated when at least one burner in the

zone is ignited, while the second output corresponds to the status "burners in lockout" and is activated when at least one burner in the zone is in lockout. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button or by the command "unlock burners". Naturally this command is carried out only by burners in lockout, while burners shut down by a serial command remain that way. Here below we will show the two possible configuration of the PLEX-STD device Dip-Switch bank and the correspondence between inputs and outputs and the controlled zones. .

PLEX-8D with Main ON/Main OFF command		
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FURNACE ZONES	INPUT PLEX-8D → "Commands"	OUTPUT PLEX-8D → "Status"
ZONE A	IN1 EXP-PLEX1 → on/off	OUT1 EXP-PLEX1 → ignited burners
	IN2 EXP-PLEX1 → Main ON/Main OFF	OUT2 EXP-PLEX1 → burners in lockout
ZONE B	IN3 EXP-PLEX1 → on/off	OUT3 EXP-PLEX1 → ignited burners
	IN4 EXP-PLEX1 → Main ON/Main OFF	OUT4 EXP-PLEX1 → burners in lockout
ZONE C	IN5 EXP-PLEX1 → on/off	OUT5 EXP-PLEX1 → ignited burners
	IN6 EXP-PLEX1 → Main ON/Main OFF	OUT6 EXP-PLEX1 → burners in lockout
ZONE D	IN7 EXP-PLEX1 → on/off	OUT7 EXP-PLEX1 → ignited burners
	IN8 EXP-PLEX1 → Main ON/Main OFF	OUT8 EXP-PLEX1 → burners in lockout
ZONE E	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → Main ON/Main OFF	OUT2 PLEX-STD → burners in lockout
ZONE F	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → Main ON/Main OFF	OUT4 PLEX-STD → burners in lockout
ZONE G	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → Main ON/Main OFF	OUT6 PLEX-STD → burners in lockout
ZONE H	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → Main ON/Main OFF	OUT8 PLEX-STD → burners in lockout



FURNACE ZONES	INPUT PLEX-8D → "Commands"	OUTPUT PLEX-8D → "Status"
ZONE A	IN1 EXP-PLEX1 → on/off	OUT1 EXP-PLEX1 → ignited burners
	IN2 EXP-PLEX1 → unlock	OUT2 EXP-PLEX1 → burners in lockout
ZONE B	IN3 EXP-PLEX1 → on/off	OUT3 EXP-PLEX1 → ignited burners
	IN4 EXP-PLEX1 → unlock	OUT4 EXP-PLEX1 → burners in lockout
ZONE C	IN5 EXP-PLEX1 → on/off	OUT5 EXP-PLEX1 → ignited burners
	IN6 EXP-PLEX1 → unlock	OUT6 EXP-PLEX1 → burners in lockout
ZONE D	IN7 EXP-PLEX1 → on/off	OUT7 EXP-PLEX1 → ignited burners
	IN8 EXP-PLEX1 → unlock	OUT8 EXP-PLEX1 → burners in lockout
ZONE E	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → unlock	OUT2 PLEX-STD → burners in lockout
ZONE F	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → unlock	OUT4 PLEX-STD → burners in lockout
ZONE G	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → unlock	OUT6 PLEX-STD → burners in lockout
ZONE H	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → unlock	OUT8 PLEX-STD → burners in lockout

## PLEX-12D OPERATION

The 12D type operation offers, for each zone to be controlled, two burner control inputs and two outputs corresponding to their status, for up to a maximum of 12 zones. In particular, the command is "ignite burners" when the first input is active and "shutdown burners" with the input inactive; while the second input can be configured as a Main ON / Main OFF input or a burners unlock input. In the first case the command is "Main ON" when the second input is active and "Main OFF" when this is inactive. In the second case, the command is "unlock burners" with the second input active. The selection between one or another command is made using Dip5 of the Dip Switch bank of the PLEX-STD device. The first output corresponds to the status "burners ignited" and is activated when at least one burner in the

zone is ignited, while the second output corresponds to the status "burners in lockout" and is activated when at least one burner in the zone is in lockout. The ignite command activates all burners which were previously shut down with the serial command, while a burner in lockout or standby can be ignited only by pressing the local unlock push-button or by the command "unlock burners". Naturally this command is carried out only by burners in lockout, while burners shut down by a serial command remain that way. Here below we will show the two possible configuration of the PLEX-STD device Dip-Switch bank and the correspondence between inputs and outputs and the controlled zones.



FURNACE ZONES	INPUT PLEX-12D "Commands"	OUTPUT PLEX-12D "Status"
ZONE A	IN1 EXP-PLEX2 → on/off	OUT1 EXP-PLEX2 → ignited burners
	IN2 EXP-PLEX2 → Main ON/Main OFF	OUT2 EXP-PLEX2 → burners in lockout
ZONE B	IN3 EXP-PLEX2 → on/off	OUT3 EXP-PLEX2 → ignited burners
	IN4 EXP-PLEX2 → Main ON/Main OFF	OUT4 EXP-PLEX2 → burners in lockout
ZONE C	IN5 EXP-PLEX2 → on/off	OUT5 EXP-PLEX2 → ignited burners
	IN6 EXP-PLEX2 → Main ON/Main OFF	OUT6 EXP-PLEX2 → burners in lockout
ZONE D	IN7 EXP-PLEX2 → on/off	OUT7 EXP-PLEX2 → ignited burners
	IN8 EXP-PLEX2 → Main ON/Main OFF	OUT8 EXP-PLEX2 → burners in lockout
ZONE E	IN1 EXP-PLEX1 → on/off	OUT1 EXP-PLEX1 → ignited burners
	IN2 EXP-PLEX1 → Main ON/Main OFF	OUT2 EXP-PLEX1 → burners in lockout
ZONE F	IN3 EXP-PLEX1 → on/off	OUT3 EXP-PLEX1 → ignited burners
	IN4 EXP-PLEX1 → Main ON/Main OFF	OUT4 EXP-PLEX1 → burners in lockout
ZONE G	IN5 EXP-PLEX1 → on/off	OUT5 EXP-PLEX1 → ignited burners
	IN6 EXP-PLEX1 → Main ON/Main OFF	OUT6 EXP-PLEX1 → burners in lockout
ZONE H	IN7 EXP-PLEX1 → on/off	OUT7 EXP-PLEX1 → ignited burners
	IN8 EXP-PLEX1 → Main ON/Main OFF	OUT8 EXP-PLEX1 → burners in lockout
ZONE I	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → Main ON/Main OFF	OUT2 PLEX-STD → burners in lockout

ZONE L	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → Main ON/Main OFF	OUT4 PLEX-STD → burners in lockout
ZONE M	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → Main ON/Main OFF	OUT6 PLEX-STD → burners in lockout
ZONE N	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → Main ON/Main OFF	OUT8 PLEX-STD → burners in lockout

PLEX-12D with burner unlock command	
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FURNACE ZONES	INPUT PLEX-12D → "Commands"	OUTPUT PLEX-12D → "Status"
ZONE A	IN1 EXP-PLEX2 → on/off	OUT1 EXP-PLEX2 → ignited burners
	IN2 EXP-PLEX2 → unlock	OUT2 EXP-PLEX2 → burners in lockout
ZONE B	IN3 EXP-PLEX2 → on/off	OUT3 EXP-PLEX2 → ignited burners
	IN4 EXP-PLEX2 → unlock	OUT4 EXP-PLEX2 → burners in lockout
ZONE C	IN5 EXP-PLEX2 → on/off	OUT5 EXP-PLEX2 → ignited burners
	IN6 EXP-PLEX2 → unlock	OUT6 EXP-PLEX2 → burners in lockout
ZONE D	IN7 EXP-PLEX2 → on/off	OUT7 EXP-PLEX2 → ignited burners
	IN8 EXP-PLEX2 → unlock	OUT8 EXP-PLEX2 → burners in lockout
ZONE E	IN1 EXP-PLEX1 → on/off	OUT1 EXP-PLEX1 → ignited burners
	IN2 EXP-PLEX1 → unlock	OUT2 EXP-PLEX1 → burners in lockout
ZONE F	IN3 EXP-PLEX1 → on/off	OUT3 EXP-PLEX1 → ignited burners
	IN4 EXP-PLEX1 → unlock	OUT4 EXP-PLEX1 → burners in lockout
ZONE G	IN5 EXP-PLEX1 → on/off	OUT5 EXP-PLEX1 → ignited burners
	IN6 EXP-PLEX1 → unlock	OUT6 EXP-PLEX1 → burners in lockout
ZONE H	IN7 EXP-PLEX1 → on/off	OUT7 EXP-PLEX1 → ignited burners
	IN8 EXP-PLEX1 → unlock	OUT8 EXP-PLEX1 → burners in lockout
ZONE I	IN1 PLEX-STD → on/off	OUT1 PLEX-STD → ignited burners
	IN2 PLEX-STD → unlock	OUT2 PLEX-STD → burners in lockout
ZONE L	IN3 PLEX-STD → on/off	OUT3 PLEX-STD → ignited burners
	IN4 PLEX-STD → unlock	OUT4 PLEX-STD → burners in lockout
ZONE M	IN5 PLEX-STD → on/off	OUT5 PLEX-STD → ignited burners
	IN6 PLEX-STD → unlock	OUT6 PLEX-STD → burners in lockout
ZONE N	IN7 PLEX-STD → on/off	OUT7 PLEX-STD → ignited burners
	IN8 PLEX-STD → unlock	OUT8 PLEX-STD → burners in lockout



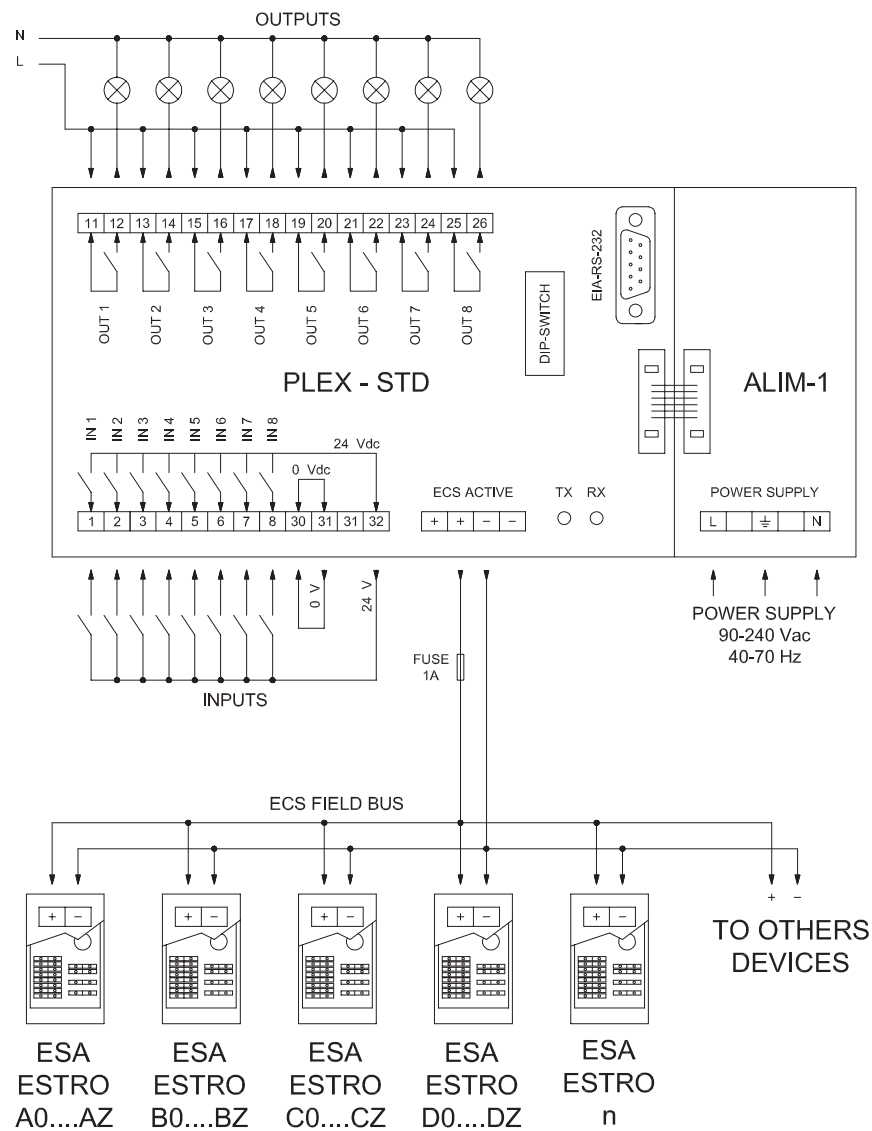
## INTERFACE OPERATION FOR ECS BUS

The device's operation as an interface for the ECS bus allows direct communication with the ESA ESTRO flame control devices by using the EIA-RS-232 communication port. In this case, when PLEX-STD receives the serial signal from the PC, it transmits it directly on the ECS bus using the active input. This function is useful in the installation phase of the system when communication with the flame control

device via a PC needs to be verified, or if the configuration of the flame control devices need to be changed. In this last case, only one flame control device to be configured at a time must be connected to the active output and the appropriate configuration software should be used. This operation is selected with Dip6 of the Dip Switch bank of the PLEX-STD device and must be carried out with the device off.

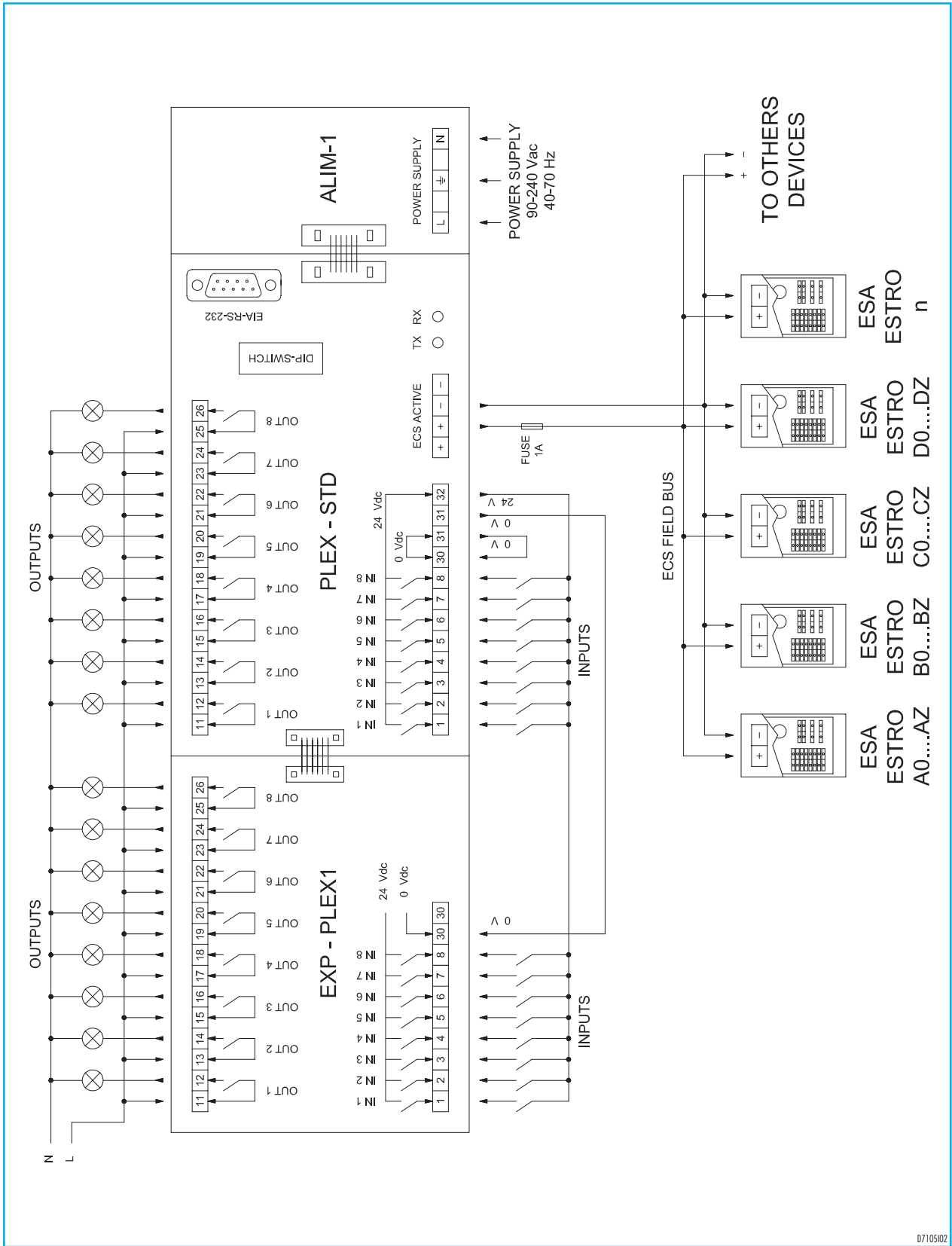


## ELECTRICAL CONNECTIONS PLEX-8S/7T/4D



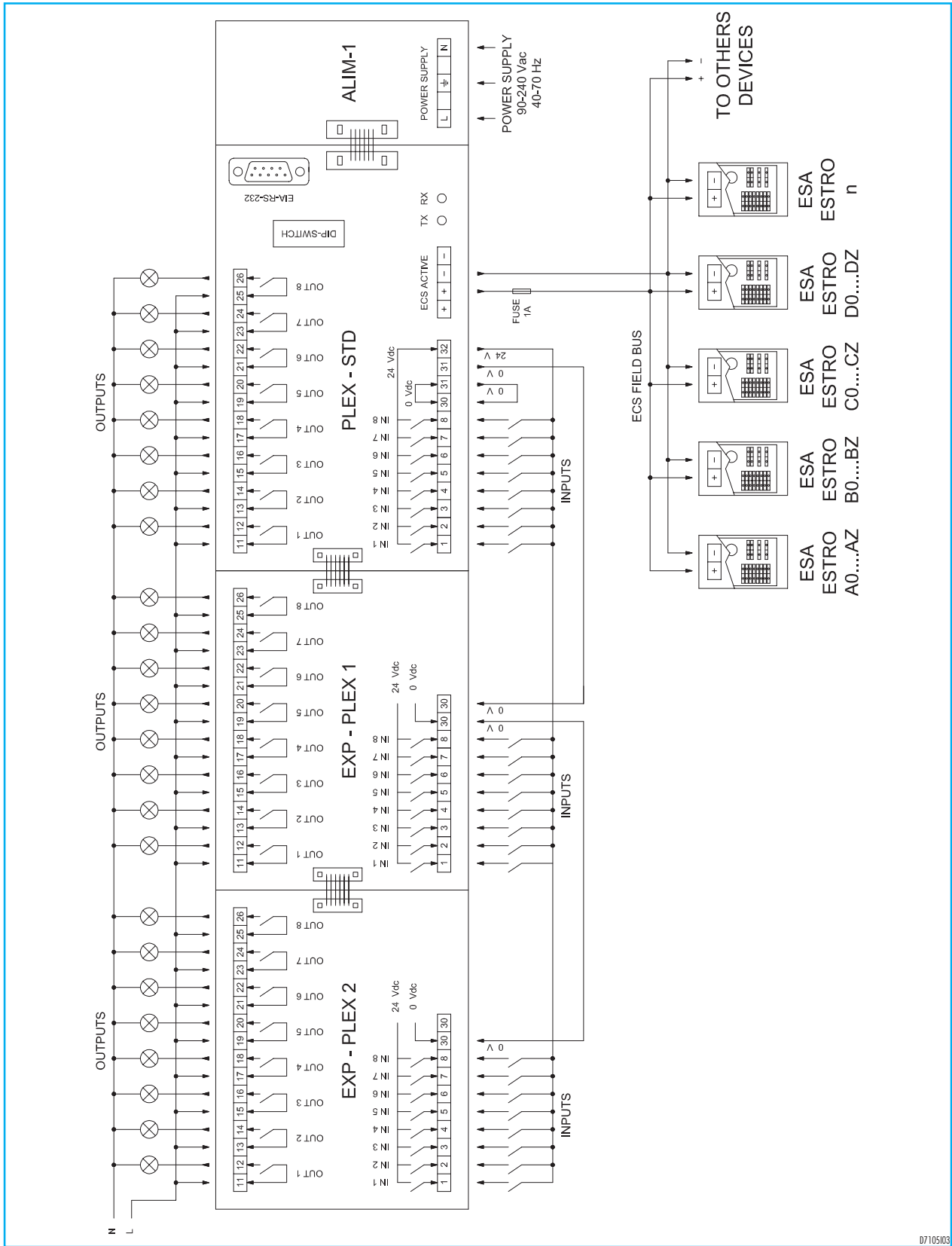
07105101

# ELECTRICAL CONNECTIONS PLEX-16S/15T/8D



07105102

# ELECTRICAL CONNECTIONS PLEX-24S/23T/12D



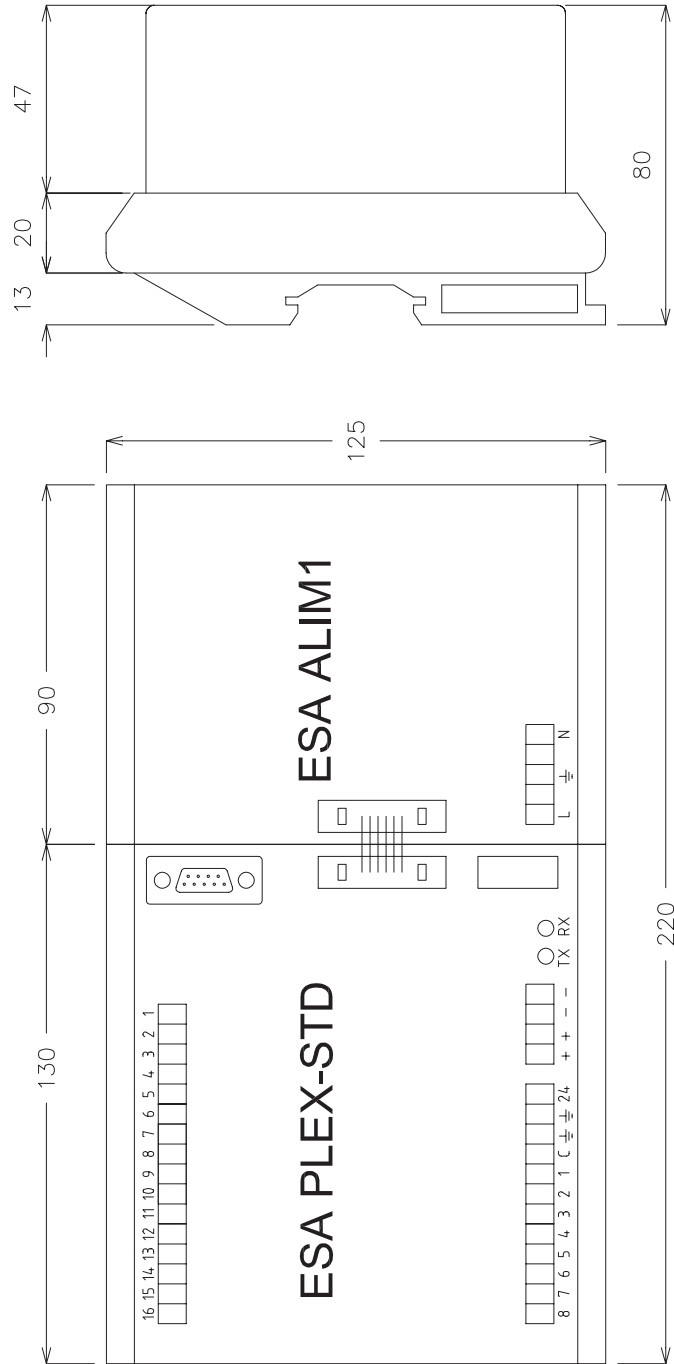
D710503

## INSTALLATION

Follow these instructions to install the device correctly:

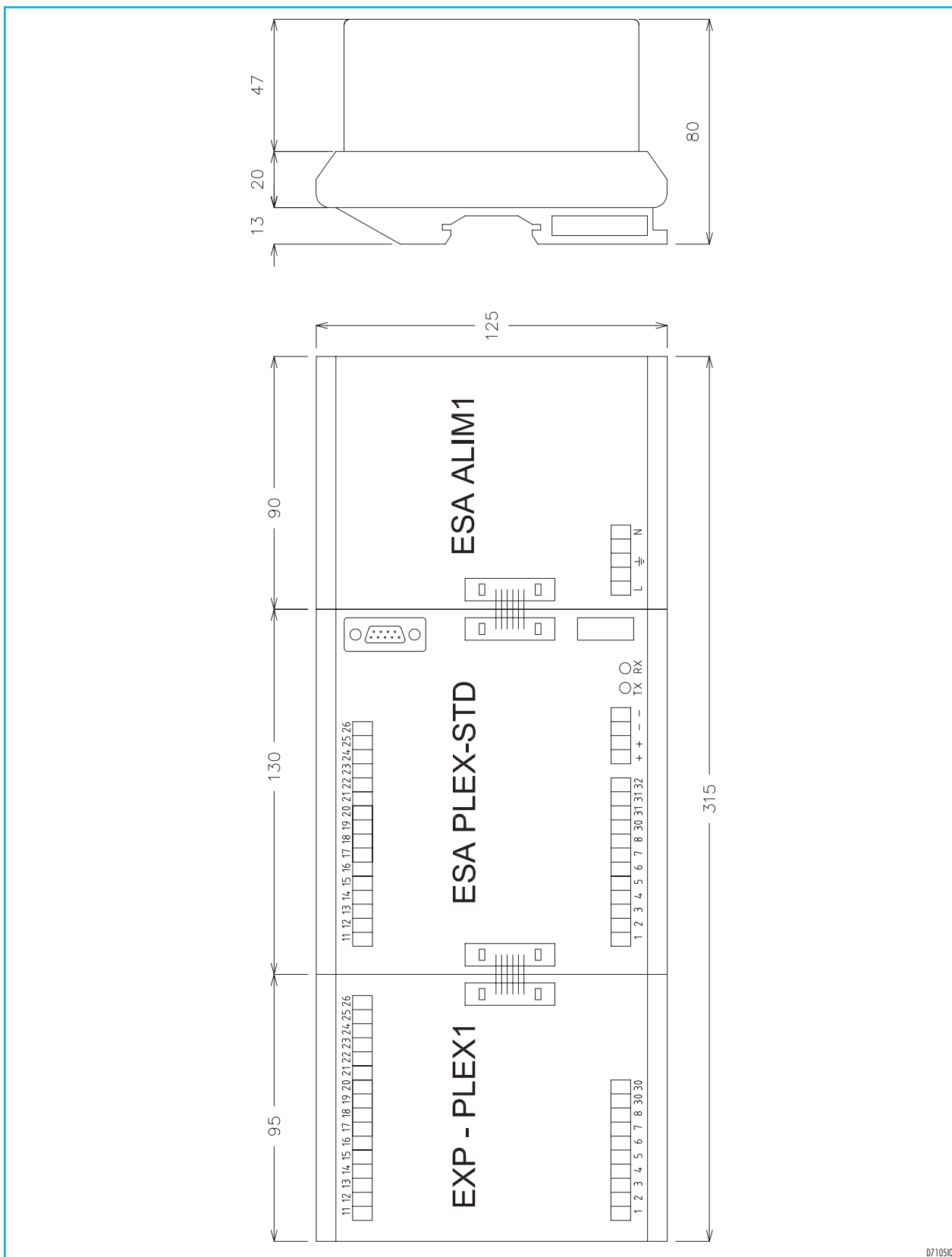
- Avoid placing the PLEX-STD near intense magnetic or electric fields and in conditions where it may be exposed to direct sources of heat or products from combustion, corrosive liquids, solvents or gases.
- Installation must be performed by qualified staff in compliance with regulations in force at the time and in the place of installation.
- The device must be placed inside electric panels and mounted on a DIN rail. The position must be accessible and have suitable ventilation.
- Carefully follow the technical documentation when carrying out the electrical wiring, observing the polarity of the conductors. The terminals used for electrical connection are screw type terminals and can accept conductors with cross sections from 0.5 to 2.5mm<sup>2</sup>.
- When the digital inputs are controlled by the free voltage contacts (relay), they can be powered with the 24Vdc generated by the PLEX-STD, while if they are controlled by the outputs of the PLC (Transistor), the 24Vdc power supply of the PLC must be used and the terminals 31 and 32 must not be connected to the PLEX-STD device. The length of the digital input lines must not exceed the specified limit.
- Check that loads connected to the digital outputs of the device do not have an absorption greater than the maximum capacity of the output contacts.
- The laying of the communication line must always be carried out separately from the power supply lines, motor control (inverter) and the mains voltage and in particular, neither MULTIPOLAR or SHIELDED cables must be used.
- Use the ECS CABLE or unipolar cables with a cross section greater than 0.5mm<sup>2</sup> for communication lines; as an alternative, we recommend using the busway system, bearing in mind that a maximum length of cable of 1 m must be used between the busway and the instrument for both communication and power supply lines.
- The length of the communication lines must not exceed the specified limit. If the controller is a long way from the system, we recommend positioning the PLEX-STD near the furnace or using an ECS signal repeater.
- We recommend placing a protection fuse on the active ECS line to prevent prolonged short-circuits from damaging the board; use 1 A quick blow fuses.
- The active output of only one PLEX-STD device can be connected to each trunk of the ECS bus. If the number of flame control devices installed exceeds the permitted number, an ECS signal repeater should be used; while, if the number of zones to be controlled exceeds the amount that can be controlled by one PLEX-STD device, several should be used, each one connected to its ECS bus trunk.
- If the polarities on one or more flame control devices are reversed, the entire ECS bus will fail to function. This will be signalled by the RX-LED lighting up and the alternate activation of the digital outputs of the PLEX-STD device. The same situation occurs with a short circuit on the communication line. If it persists, the malfunction will cause the device to break.
- Before supplying power to the device, check that the voltage, frequency and capacity are correct and ensure that the protection earth is connected to the appropriate terminal. As soon as the PLEX-STD is powered, we recommend checking that the RX LED is not fixed on. If it is, disconnect the active output and look for the cause of the anomaly on the ECS bus.
- Connecting equipment to the ECS bus when in operation could cause a brief interruption in communication.
- The operating parameters should only be set (Dip-switch) when the device is not being powered. We cannot guarantee that the device will work if the parameters are modified with the PLEX-STD powered.
- If the PLEX-STD fails to work properly, it must be sent back to the manufacturer for repair. Modifications or repairs carried out by third parties are not permitted.

# OVERALL DIMENSIONS OF PLEX-8S/7T/4D



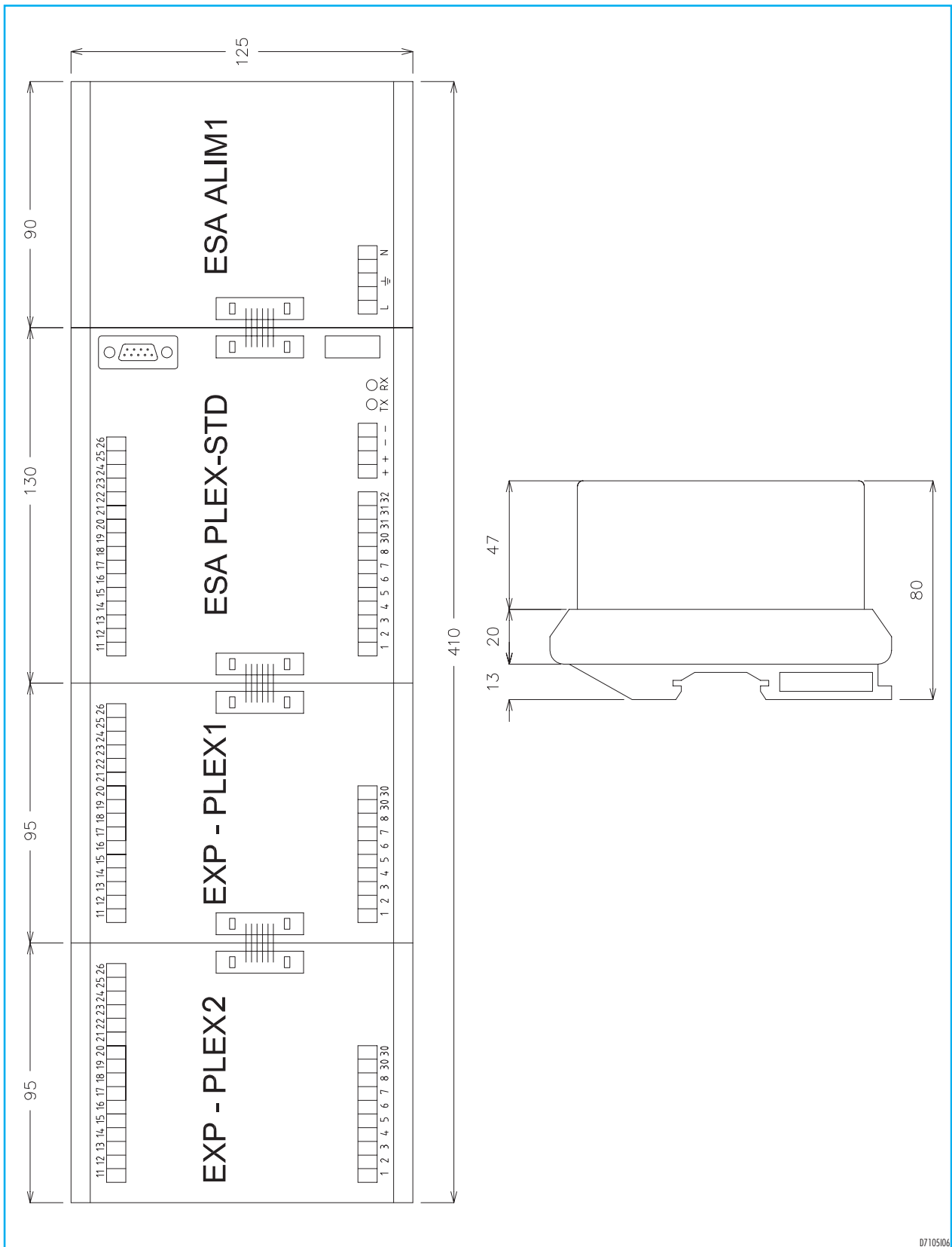
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# OVERALL DIMENSIONS OF PLEX-16S/15T/8D



07105105

# OVERALL DIMENSIONS OF PLEX-24S/23T/12D



D7105106

## ORDERING CODE

ESA PLEX

DEVICE VERSION	
8 inputs and 8 outputs	8S/7T/4D
16 inputs and 16 outputs	16S/15T/8D
24 inputs and 24 outputs	24S/23T/12D

TYPE OF OPERATION	
Single output for zones	S
Cumulative output for furnace	T
Double outputs for zones	D

ECS OUTPUT COMMUNICATION SPEED	
Baud rate 4800	4
Baud rate 9600	9

2nd INPUT CORRISPONDENCE (only for D type operation)	
Main ON/Main OFF command	M
Burners unlock command	U
For S or T operation	/

OUTPUT CORRESPONDENCE (only for S type operation)	
Status of ignited burners	O
Status of burners in lockout	L
For T or D operation	/