econox
Measuring & control systems

Operating Manual

ControX

Display and control module
(%O_2, ppm O_2, LOG O_2)

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Table of Content

1 ControX O_2 module

1.1 Start-up view

The "**language**" page enables you to choose the ControX interface language. It also displays the date and time as well as the version number currently installed.

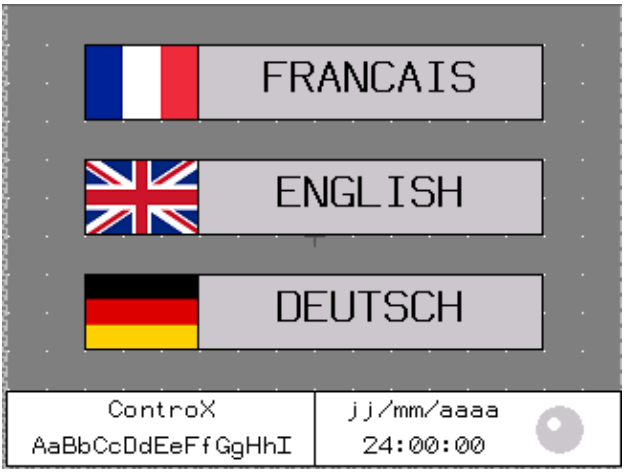


Fig 1: Main page, language selection and version number

You can click on each language, which takes you directly to the "home" page in the language specified.

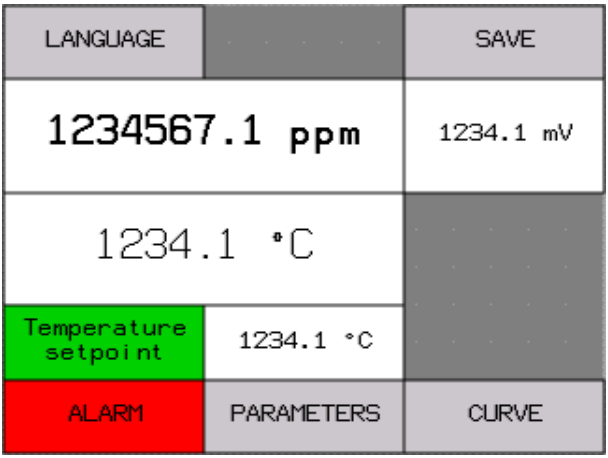
Note: A green light is flashing when the system is running.

1.2 Main page

The "**Home**" button takes you to the main page of the ControX.

This main page displays the oxygen concentration (in %, ppm or log), the temperature (°C or °F) as well as the mV O_2 generated by the connected probe.

It also gives you access to the other pages of the interface.



* Temperature setpoint is shown only if "heated probe" option is used.
** Alarm is displayed in RED when at least one alarm is active.

Fig 2: Overview of the "Home" page

1.3 List of alarms

The "**Alarm**" button takes you to a page with all the alarms. Acknowledged alarms are in yellow and unacknowledged ones are in red.
Inactive alarms are in green.

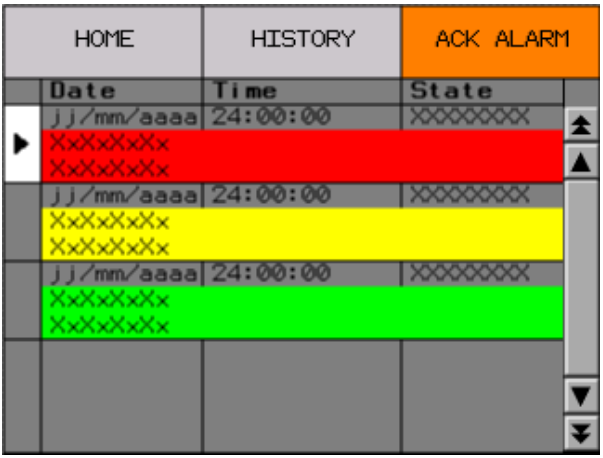


Fig 3: Overview of the "Alarm" page

Tip:
To acknowledge all alarms, simply press on the orange "**ACK ALARM**" button when it flashes.

1.4 Alarm history

On the "**History**" page you can have an overview of all the alarms that have occurred in the past (inactive ones are in green).

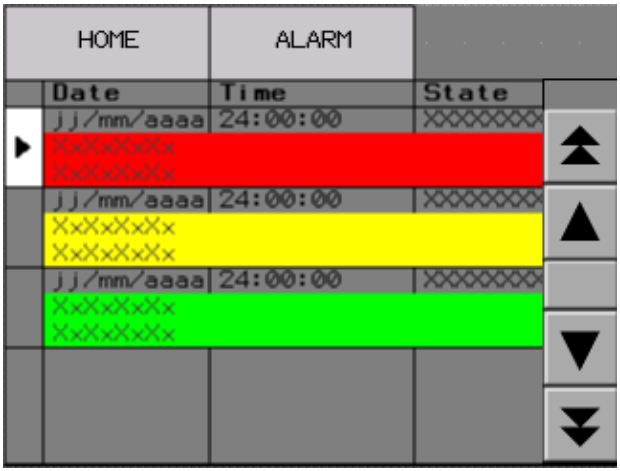


Fig 4: Overview of the "Alarm" page

1.5 Parameters

The "**Parameters**" page gives you access to all the ControX settings.

This page can be accessed from the Main "**Home**" page.

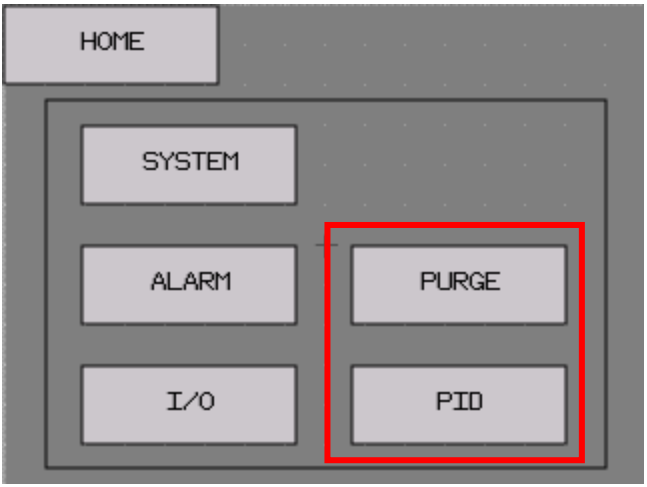


Fig 5: Overview of the "Parameters" page

*__Purge__ and __PID__ are only displayed if the system is operating a heated probe.

** Views that have a lock (such as "I/O" and "PID") are password-protected.

You can click on each button to go to the corresponding parameter.

1.5.1 "System"

The "**System**" page shows all the parameters regarding the reference gas used, the pressure of the gas inside your kiln/furnace as well as parameters about the temperature measured by your probe.

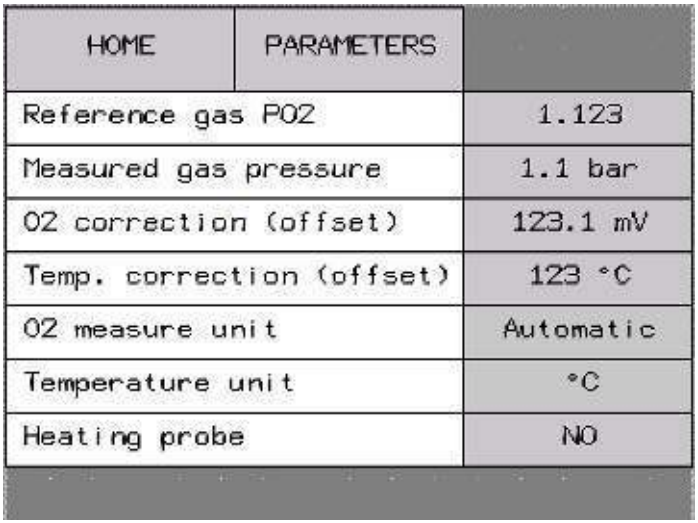


Fig 6: Overview of the "System" parameters

1: Partial pressure value of the reference gas. Always use 0.209 when air is used.

2: Pressure value of the gas inside your kiln/furnace (in bar).

3: Correction offset to be applied to the measured O_2 value (in mV).

4: Correction offset to be applied to the measured temperature value (in °C).

5: Choice of unit for O_2 measure. The "automatic" option continuously checks and chooses the best unit according to the value measured (%, ppm, or log).

6: Choice of temperature range (°C or °F).

7: Activation of the heating option for probes which require to be heated.

1.5.2 "Alarm"

The "**Alarm**" page shows all the settings regarding alarms.

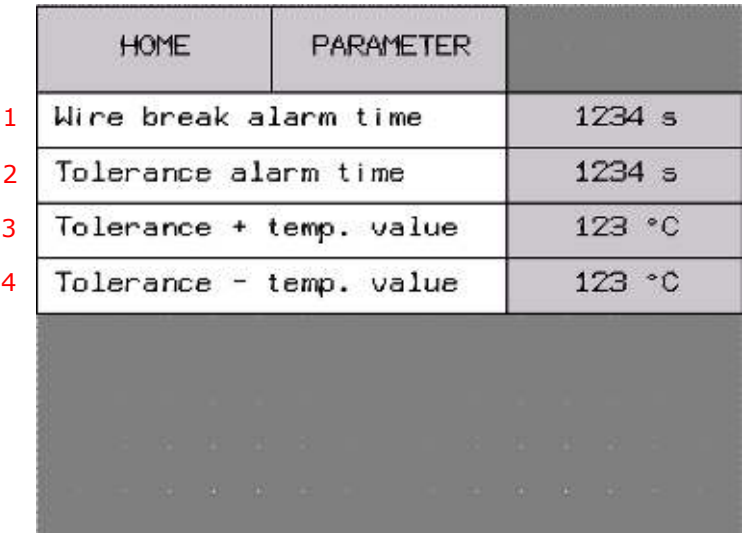


Fig 7: Overview of the "Alarm" parameters

1: Waiting time before an alarm is raised when a thermocouple wire break is detected.

2: Waiting time before an alarm is raised when the tolerance setpoint has been exceeded.

3: Maximum value of the tolerance area between the temperature measured and the set point.

4: Minimum value of the tolerance area between the temperature measured and the set point.

1.5.3 "I/O", page 1

The "**I/O**" parameter page allows you to manage the analog inputs and outputs related to the O_2 content.

	HOME	PARAMETERS	→
1	Input min mV		1234 mV
2	Input max mV		1234 mV
3	Output min %		123 %
4	Output max %		123 %
5	Output min ppm		1234 ppm
6	Output max ppm		1234 ppm
7	Output min log		123.12 log
8	Output max log		123.12 log

Fig 8: Overview of the "I/O" O2 related parameters

1: Minimum scaling value, analog O_2 input
2: Maximum scaling value, analog O_2 input
3: Minimum scaling value, analog O_2 output, if unit = "%"
4: Maximum scaling value, analog O_2 output, if unit = "%"
5: Minimum scaling value, analog O_2 output, if unit = "ppm"
6: Maximum scaling value, analog O_2 output, if unit = "ppm"
7: Minimum scaling value, analog O_2 output, if unit = "log"
8: Maximum scaling value, analog O_2 output, if unit = "log"

ControX has a 4 to 20 mA O_2 output, this means the minimum scaling value is equal to 4mA and the maximum scaling values is equal to 20 mA.

The black arrow takes you to the "I/O" parameter, page 2 concerning system temperature.

1.5.4 "I/O", page 2

The "**I/O**" parameter page 2 allows you to manage the analog inputs and outputs related to the probe temperature.

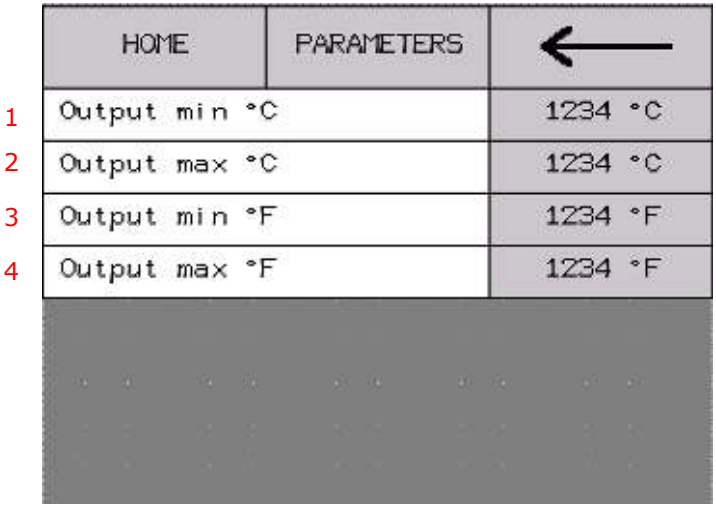


Fig 9: Overview of the "I/O" temperature related parameters

1: Minimum scaling value, analog temperature output, if unit = "°C"

2: Maximum scaling value, analog temperature output, if unit = "°C"

3: Minimum scaling value, analog temperature output, if unit = "°F"

4: Maximum scaling value, analog temperature output, if unit = "°F"

ControX has a 4 to 20 mA temp. output, this means the minimum scaling value is equal to 4mA and the maximum scaling values is equal to 20 mA.

The black arrow takes you back to the "I/O" parameter, page 1 concerning system O_2.

1.5.5 "Purge" (CarboProbe™ LT only)

The "**Purge**" page gives you access to all the settings concerning the purging of a heated probe.

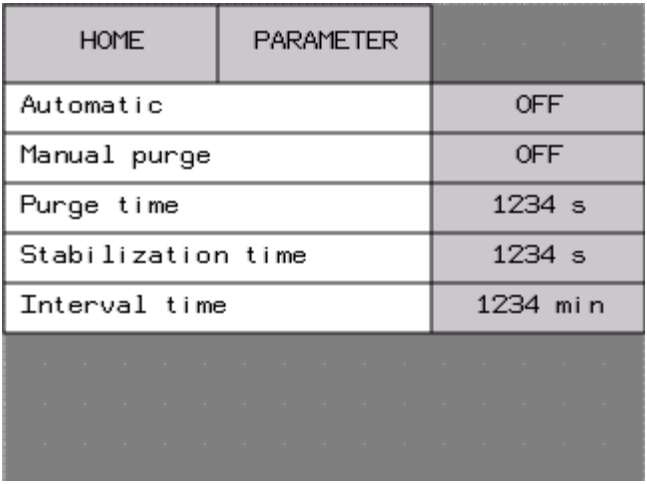


Fig 10: Overview of the "Purge" parameters

1: Enables automatic purging of the CarboProbe™ LT

2: Manual forcing of purge

3: Purge duration

4: Period post-purge during which the O_2 measure is frozen

5: Period between two automatic purges

1.5.6 "PID" (CarboProbe™ LT only)

The "**PID**" page allows you to fine-tune all the PID data for the heater of the heated probe.

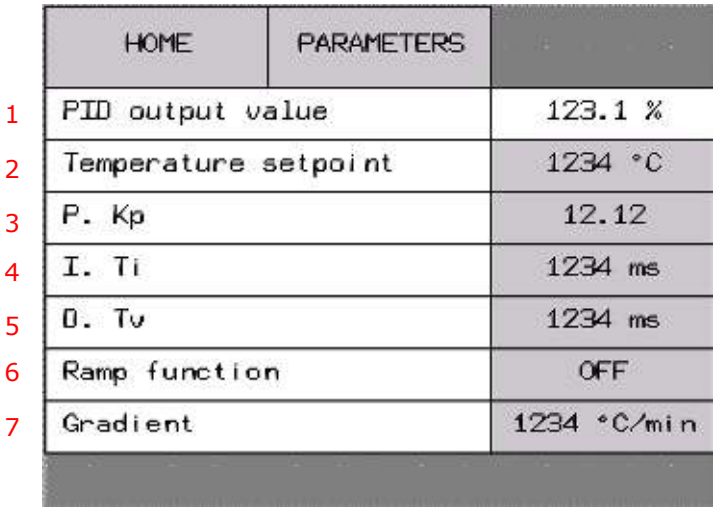


Fig 11: Overview of the "PID" parameters

1: Current value of the PID output (cannot be changed)

2: Temperature set point, CAUTION**! This should be set into "°C" only!**

3: Value of the "Proportional" action

4: Duration of the "Integral" action

5: Duration of the "Derived" action

6: Enables the temperature "Gradient" function in order to limit heating acceleration

7: Temperature rise acceleration value of the "Ramp" function

1.5.7 Access and user rights

In order to protect access to certain parameters, password protection is implemented.

There is 1 user level:

Level	Username	Password	Privileges
0	-	-	Basic display and configuration functions
1	admin	adm	Advanced display and configuration functions

Authentication log-in:

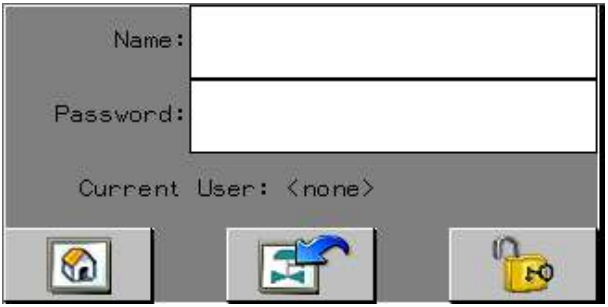


Fig 12: Login window

- Once the fields "name" and "password" are entered, press the lock to log in.
- The button with a house link on it navigates to the start-up page ("language" view).
- The button with a blue arrow navigates to the previous page ("settings" view).

CAUTION: Make sure Caps Lock is disabled.

To log in, enter the following credentials:

User Name: *"admin"*
Password: *"adm"*

1.6 Save

The "**Save**" page enables you to export the history of the last 10,000 measurement points recorded. They can be exported to a FAT 32 formatted USB key.

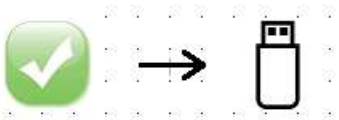
!! Do not switch off ControX before saving your data !!

ControX does not have a hard disk so switching it off will erase data recorded in its memory. Make sure you always export them to the USB disk drive before turning ControX off.

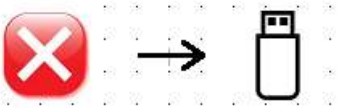
As the sampling frequency is 1 record per minute, this represents approximately 1 week of entries.

Insert a FAT 32 formatted USB key and press the  button to run the save procedure.

- A pop-up window appears, and a flashing green icon tells you that the operation is in progress.
- When the icon glows green, the saving is complete. An CSV file is created and copied to your USB key.



- If it turns red, then the save operation has failed (see the error on the screen for more information).



1.7 Oxygen curve

The "**O_2 curve**" page displays the last 60 O_2 measurements recorded by the system, if the system has not been turned off.

As the sampling frequency is 1 record per minute, this represents approximately 1 hour of recording.

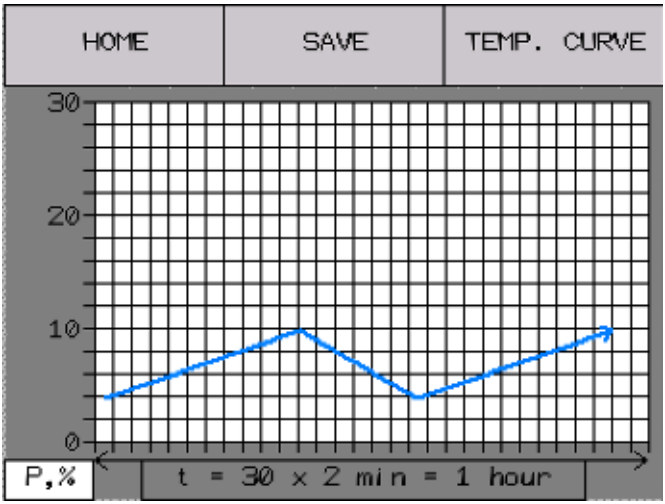


Fig 13: Overview of the "O2 curve"

The scale of the graph adapts itself depending on the unit used (%, ppm or log). It also displays the units chosen in system settings.

1.8 Temperature curve

The "**Temp. curve**" page displays the last 60 temperature measurement points recorded by the system, if the system has not been turned off.

As the sampling frequency is 1 record per minute, this represents approximately 1 hour of recording.

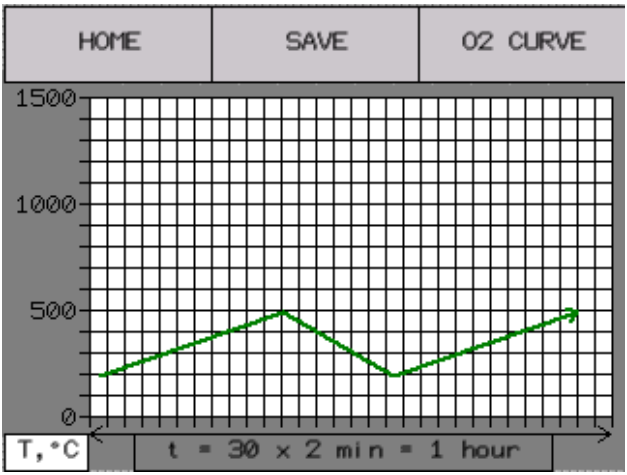
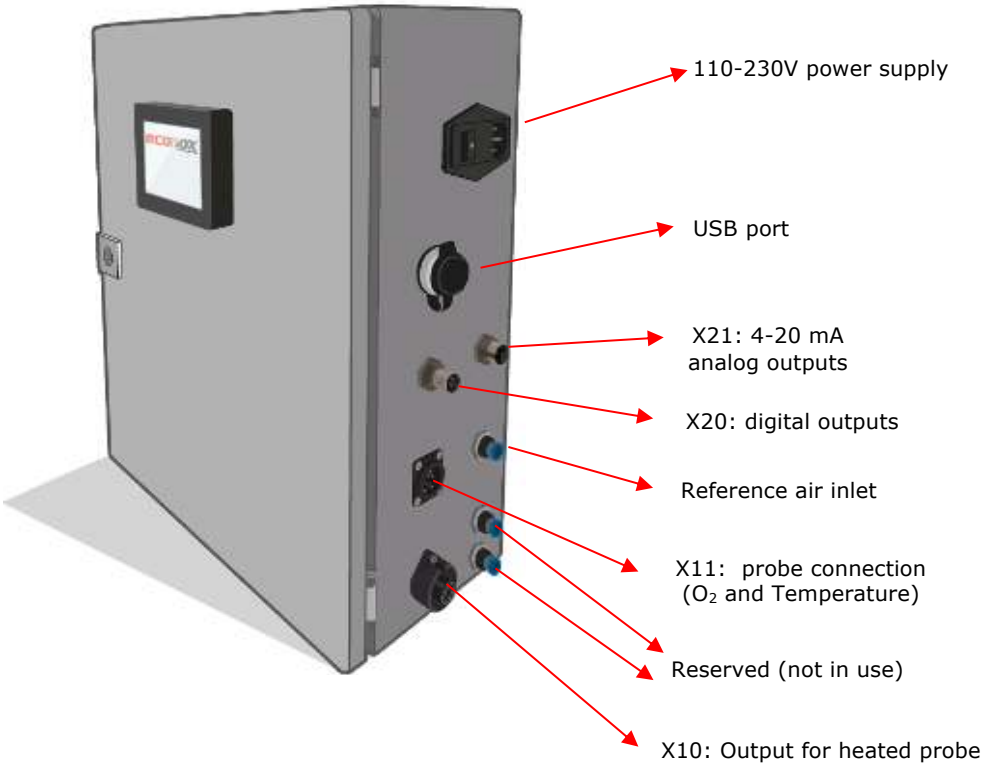


Fig 14: Overview of the "temperature curve"

The graph is displayed in the units chosen beforehand in system settings.

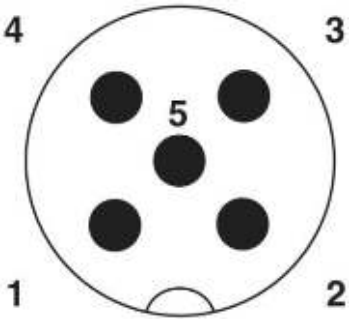
2 ControX box description

2.1 Details of ControX connectors



2.2 Connectors details

2.2.1 X20: Digital outputs



1: 24 V input

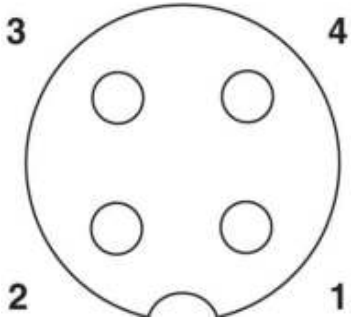
2: O_2 output value currently in %

3: Reserved

4: O_2 output value currently in ppm

5: O_2 output value currently in log

2.2.2 X21: Analog outputs



1: 4-20 mA O_2 value output

2: 4-20 mA temperature output

3: 0V output

4: Reserved

2.2.3 X10: Heated probe output

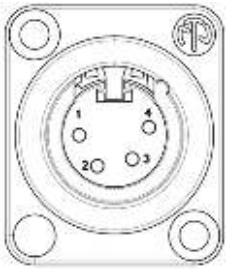
1: Heating output

2: Heating output

3: Reserved

4: Reserved

2.2.4 X11: O_2 value and thermocouple input

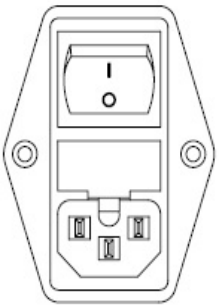


1: Thermocouple +

2: Thermocouple -

3: O_2 +

4: O_2 -



2.2.5 F1: 110-230V power supply

10A fuse, 50x20

2.3 Software update

Econox releases software updates to correct bugs or add functionality to the ControX box. Follow this procedure to update your ControX to the latest software:

- Make sure you have a FAT 32 formatted USB drive.
- Extract the zip file received from Econox or downloaded from the Econox.com website.
- Copy the files to the FAT 32 formatted USB drive.
- Plug it in the USB port located on the side of the ControX box and wait for the screen to show the following information:

- Click on "Yes" and wait a few minutes until your ControX is updated.

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Notes :

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