STUDIO 1800

OPERATING INSTRUCTIONS

MANUFACTURED IN THE UK $C\epsilon$

The Studio 1800 is a combined Programmer and Temperature Controller which has been specifically designed for use with pottery kilns. Control of the entire firing cycle is fully automatic, to provide simply set, accurate and repeatable firings. The creation and progress of a firing program can be easily followed using the Mimic Display.

PLEASE READ THIS

This manual describes all aspects of the use of your STUDIO 1800 controller. It is split into three sections. Page one should be read by all users as it covers important SAFETY information. If you are a non technical user you are advised to fully read pages 1,2 and 3 which give a pictorial view of the basic use of the controller. There is a fault finding section at the rear of this manual should you have any problems.

CONTENTS

Installation

Mounting

The controller should be mounted on a flat vertical surface away from the heat of the Kiln, so it cannot be affected by the heat that will radiate during the firing of the kiln. A removable bracket (A) at the rear of the controller is used for fixing. Slide the bracket from the rear of the controller (B) and fix to the wall using the two No 8 Screws provided.

A   B

To Lock in Position
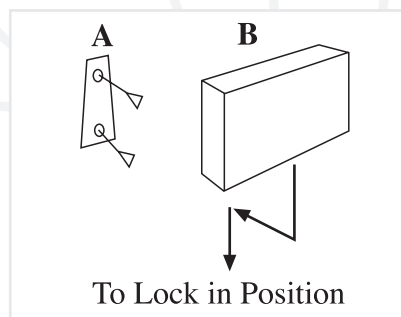
Connection

It is vital that all electrical installation is carried out in a professional manner. We do not recommend DIY installation of this product. Before using the controller ensure the 'Sensor Type (shown on the rear of the controller), and the Thermocouple fitted to the Kiln are the same.
In most instances the Controller will either have a plug which matches your Kiln, or will be connected by your supplier. If a plug is fitted check that the pin layout of the plug and socket are an exact match before plugging in. If in doubt contact your Kiln supplier.

Safety

It is strongly recommended that where a kiln is to be fired unattended, that an additional totally independent over temperature safety system is fitted.
Ensure there is no risk of water entering the controller or its connecting leads. If you have not bought the kiln & controller as a package, be sure you have read and followed EVERY part of the manual.

Declaration

This equipment conforms to European Standards for Electrical Interference EN50081-1 and EN50082-2. When installed as described in this manual ("See Electrical Connections")
compliance dated 1st December 1995.

Problems

In the unlikely event that your controller does not function correctly;-
Refer to the "fault finding" section.
Check that your firing sequence has been correctly entered.
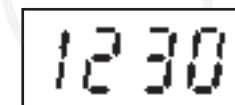Contact your local distributor for further assistance.

THE CONTROLS & 'AT SWITCH ON'
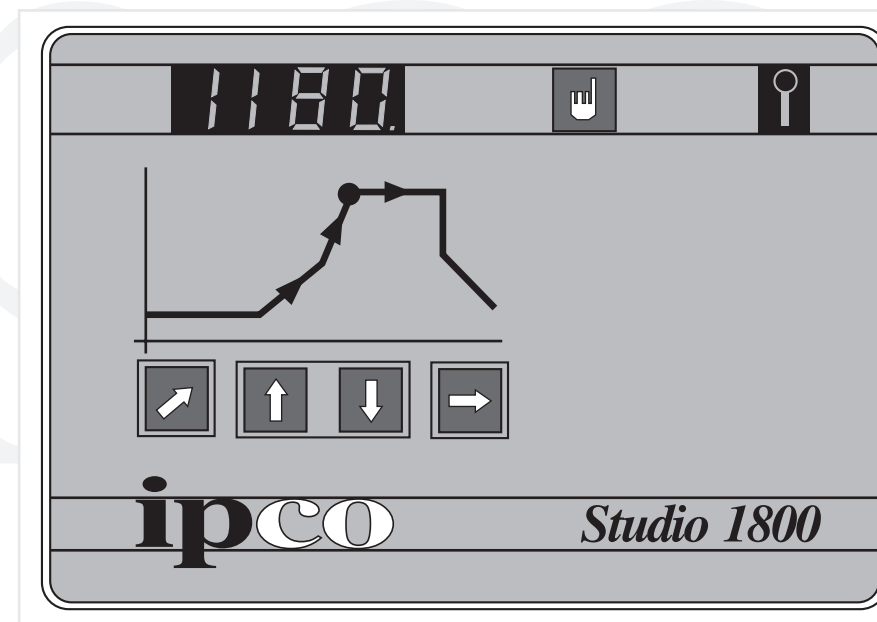
THE CONTROLS

Display

This will show the Kiln temperature in °C, Ramp temperature in °C/hour and minutes for Soak time.
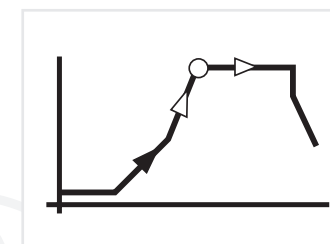(Equivalent °F can be selected see configuration)

On / Off

This switches power to the controller.

Mimic Display

When the program is running the progress of the firing cycle is indicated by the red LED's on the mimic display
When entering Ramp, Temperature and Soak values, the relevant LED on the Mimic Display will flash.

Operator Keys

These keys are used for selecting the Ramp, Soak Temperature and Soak Time.

RAMP   TEMPERATURE   SOAK
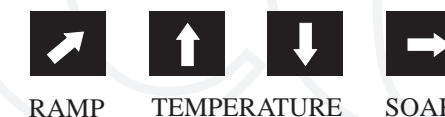
Start / Stop

This key Starts / Stops the program running.

At Switch ON

The initial display when you switch ON gives useful information about your controller.
The display is in the form $X^1 N^1 N^2 X^2$ where X is a letter and N are numbers.
X^1 is the thermocouple type - **R, S, N** or **K**
$N^1 N^2$ is the software version
X^2 is the model type of your controller - **L = ST1800**
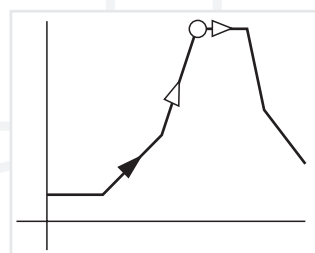
Switch on the Controller

Set the Ramp Rate

Press the RAMP key repeatedly until the desired ramp value is displayed.

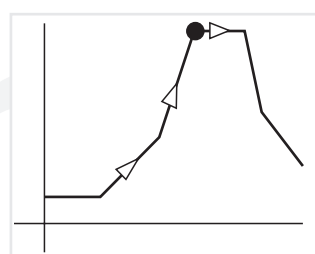| Key	Mimic Display	Display °C/hr (or equiv. °F)
		25
		40
		60
↗		90
		130
		200
		300
		Full

Set the Soak Temperature

Press either the raise or lower keys until the desired SOAK TEMPERATURE value is displayed.

Key	Mimic Display	Top Temperature °C
↑ ↓		Ramp End to Setpoint Limit

Set the Soak Time

Press the Soak key repeatedly until the desired time value is displayed.

| Key	Mimic Display	Soak Time (Mins)
		0
		5
		10
➡		20
		25
		30
		60

Start Program

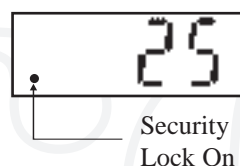Press hand Key.

Viewing A Program

While the program is running the RAMP, TOP TEMPERATURE and SOAK TIME can be reviewed by pressing the relevant key, the display will then show the value which has been stored. You cannot alter a program which is running.

Once the program has been started, the progress of the firing can be monitored by following the Digital Display and the Display lights on the Mimic Diagram. As each segment of the firing is reached the appropriate light on the display will illuminate.
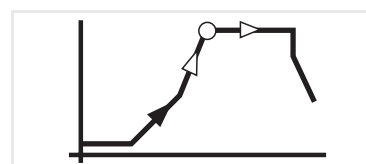
Security Lock

To avoid unauthorised tampering with the controller while a program is running, a security lock can be engaged. Press the hidden key under the **'P'** of the **IPCo** Logo. (on the front face of the controller) This disables the Ramp, Soak Temperature, Soak and Start / Stop keys. The left decimal point will come on to indicate the Security lock is active.

To disengage the security lock, press the **'P'** once more.

Security Lock On

LK1

COM —
ALARM —
HEAT —
SWITCH {
230V INPUT L N E

G + −
T/C INPUT

SCREEN CONNECTOR

Please Note
The Industrial Pyrometer Company does not supply specific wiring diagrams for individual kilns since the accuracy of such information cannot be confirmed.

NB: COM IS INTERNALLY LIKED TO THE 230v INPUT VIA THE ON / OFF SWITCH (See Control Outputs)
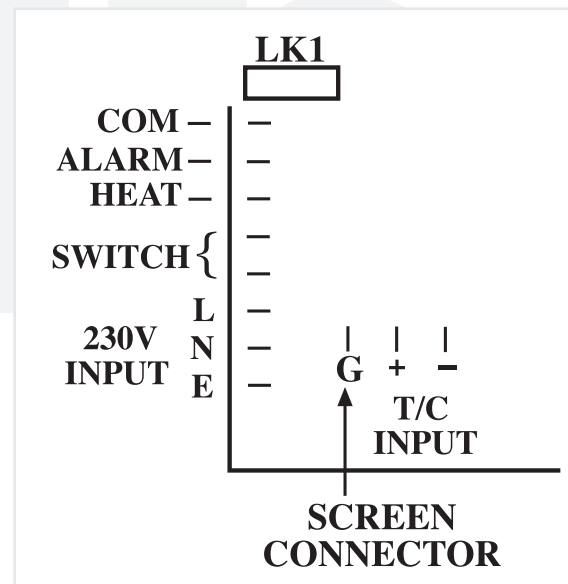
Incoming Supply

This should be connected to a 230V supply via a fuse of 1A rating. An Earth connection is essential.

Thermocouple Inputs

Ensure that the Studio 1800 Controller and the Thermocouple are of the same type, otherwise accurate control of temperature in the Kiln will not be possible. The letter prefix on the Serial Number Label (N, K, R or S) will indicate the thermocouple type that has been programmed into your Controller.
All input wiring should use screened cable of the appropriate compensating type, with correct polarity maintained throughout.

See also   'At switch On' for explanation of the initial identification message.
'Configuration' to change the instrument thermocouple type.

Control Outputs

NB   ALL outputs are low current and MUST drive remote relays or contactors which in turn drive the load.
The 'C' (Common) terminal is internally connected to 230V via the ON/OFF switch.
To isolate the relays from this 230V feed remove link LK1 **The maximum switching voltage is still 230V.**
MAIN OUTPUT (Relay 1)   This output feeds the kiln contactor coil
ALARM RELAY 2 (Option)

EMC

To comply with current EMC regulations the system, of which this controller is a part, must conform to the relevant standards for electrical emissions. It is the responsibility of the end supplier to ensure this is achieved.

FEED FROM CONTROLLER

INCOMING SUPPLY

NEUTRAL   TO ELEMENTS
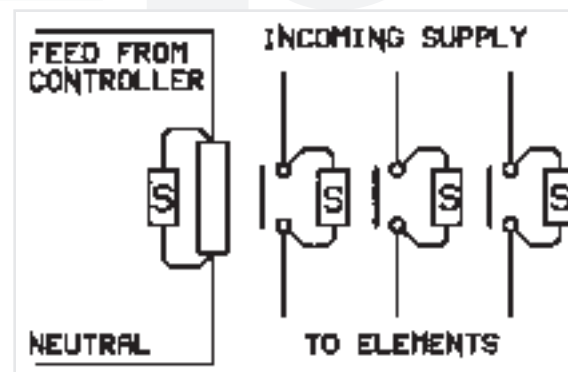
(This means that they cannot be relied upon for safety isolation)

The coil should be fitted with a suppressers.
S = Suppression Device
e.g. Farnell   218-913
R.S.   210-364,210-370

Where slave relays are used these should also be suppressed.
Do not fit suppressers to over temperature controllers, or safety isolation contactors.

Configuration

The controller operation may be modified to satisfy a variety of situations by amending the parameters.
This information is given for completeness and should only be modified by experienced personnel.

CONFIGURATION MENU

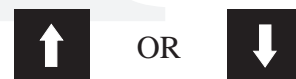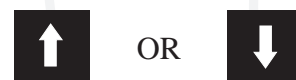| INSTRUCTIONS	KEYS / SWITCH	DISPLAY (Example)
Hold down the **Soak** and **Hand** key and then switch on. Wait for the display to read **CONF**.	➡ AND ✋	`ConF`
(OPTIONAL).Press the *UP and DOWN* keys simultaneously, to access the Thermocouple Selection Menu.	**OPTIONAL** ⬆ AND ⬇	(See Thermocouple Selection Menu)
Press **Ramp** key once to access Set Point Limit.	↗	`L 135`
Then use the **Arrow** keys to set the temperature.	⬆ OR ⬇	The above display indicates a setpoint limit of 1350ºC
Press **Ramp** key again to access end of Ramp temperature.	↗	`r 60`
Use the **Arrow** keys again to set this value.	⬆ OR ⬇	This display indicates 600ºC as the end of ramp Temperature
Press **Ramp** again to access alarm.	↗	`A 5`
Once again use the **Arrow** keys to set this value.	⬆ OR ⬇	This display indicates that the alarm is 50ºC above the soak temperature.
Press the **Hand** key to save configuration and exit.	✋	

THERMOCOUPLE SELECTION MENU

Press the **UP** or **DOWN** keys to select alternative thermocouple types.	⬆ OR ⬇	`tc -r`

The letter on the right of the display will change as shown below to indicate the new input range.

`5` Type S   `K` Type K   `N` Type N   `r` Type R

Press **Ramp** key to access the ºC and ºF menu..	↗	`F` OR `C`
Use the **UP** / **DOWN** keys to change.	⬆ OR ⬇	
Press the **Hand** key to store new Thermocouple Input and return to configuration menu.	✋	

Problems

The following list covers the most commonly encountered questions asked by users and some possible causes.

There is no display on the controller
> The ON/OFF switch on the controller (see fig 1) is in the OFF position.
> The kiln is switched off at an Isolator.
> A fuse has blown in the kiln or the supply which feeds the kiln.

The controller displays   OPEN
> The Thermocouple, or the wires between it and the controller, are damaged.
> For a quick check;-
> Switch OFF, Short + and - on the instrument T/C input, Switch ON. Display should show aprox 20ºC.

The controller displays   FAIL
> The wiring to the thermocouple is reversed.

The Kiln Under fires
> If the controller 'kiln' light is on but kiln is not heating the fault is in the kiln or it's wiring. Or;
> You have an energy regulator on the kiln which is not at 100%. Or;-
> The kiln has a faulty element. (See also 'During the Firing')
> The thermocouple type does not match the instrument. (See "Electrical connections")
> Loose wires to the thermocouple (The display may be erratic.)

The Kiln Over fires
> The thermocouple type does not match the instrument.
> You have a sticking contactor in the kiln - Refer to an electrician
> Loose wires to the thermocouple (The display may be erratic.)

When I attempt to enter a temperature in a program it will not go above a certain point.
> A safety limit is available to prevent excessive temperatures being programmed. Check that this is correct for your application. (See "Configuration" to change this value)

When I press a key nothing happens
> The security lock has been activated. You should refer to the 'Security Lock' instructions.

DISPLAY	MEANING
OPEN	Thermocouple open circuit.
FAIL	Thermocouple connection reversed.
Err3	Not in use.
Err4	Firing temperature has exceeded soak temperature program by 20ºC
Err5	Error reading internal memory. Refer to supplier.
Err6	Error reading internal memory. Refer to supplier.

Specifications

Size	W - 220mm x H - 168mm x D - 80mm
Ambient	0 to 50ºC maximum.
Supply	230V +/-15%
Thermocouple	Type R, S, K, or N. (See 'Configuration' for change information)
Outputs	Single pole 3 Amp contacts. All outputs give 230V output via internal link.
	(See 'Electrical Connections' if isolated switching is required)
Display	R or S -20ºC to +1600ºC, K or N 0 to 1300ºC
	Accuracy +/-3ºC over stated operational ambient.
Ramp Rates	25 - 300ºC per hour
Setpoints	0 to maximum of display (This depends upon thermocouple type selected.)
	(will be limited by Setpoint limit - See below.)
Soak time	0 - 60 minutes
Setpoint Limit	Adjustable over full range. (Ramp end to full scale)

Supplied By;-

Designed and manufactured by ;-

THE INDUSTRIAL

ipco

PYROMETER COMPANY

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