4.5 Programming block (electronic key)

In order to prevent a non-authorised operator from altering the values of the parameters and, if necessary, also of the operating States (Auto/Man, Loc/Rem, ...) and set point, a procedure is provided which blocks access to the alterations, without preventing the display of the values set. Knowledge of the **password** (numerical) is required in order to "block" or "release" the keys.

Procedure:

Starting with the controller in normal working conditions:

1 - Press the key ▶▶
The following will appear

X | 0

PASS | nn.
W Y

2 - Press the keys ▼ and ▲ to input the order word in "X":

Complete block of keys
In oder to prevent any alteration.
X | 1111

Partial block of keys
In order to prevent the parameters only from being altered.
X | 2222

Complete access to the keys
In order to allow any modification to be made: Parameters, Set point, Auto/Man, Loc/Rem, ...
X | 6666

3 - Press ▶▶ again within 5 seconds in order to confirm the password. This will remain indefinitely memorized, even if the equipment is switched off.

4.6 Configuration of the controller

The controller is supplied ready configured as requested during the order stage (see page 4). The controller needs to be, reconfigured only if it is necessary to modify the original configuration mainly when it is supplied with UNiversal input.

The configuration is carried out using the keys as described in 4.6.1 (page 26), and respectively involves.

A - The input feature (thermocouple, RTD or linear in mA and mV). It is possible to configure the type of input only for models with universal input (UN).
B - The scale range in engineering units, only for the models with linear input in current or voltage.
C - The control action (direct or inverse) and the safety state to which the output Y_1 goes if there are any anomalies in the input circuit.
D - The type of set point (deviation, independent or deviation band) and the control mode (active high or active low) of the auxiliary output Y_2.
E - The type of set point and control mode of Y_3.
F - The number of programmes.

By means of microswitches, it is also possible to configure the output range Y_1 for the models with continuous output (0...10V, 0...20mA, 4...20mA, etc.).
These operations are easily carried out, but subsequent re-calibration is required (see point 4.6.3. page 31).

4.6.1 Software configuration procedure (by keying)

1 - Position switch 1 of group SW03 of the card YRE (see page 32) in the off position. This is the "key" for access to the configuration and calibration.

A - Configuration of input X

2 - Withe the instrument switched on press ▶ and then ▶▶ repeatedly until after the last parameter group, the following appears in the display W and Y.

End | –

3 - At the same time press ▼ and ▲ and then ▶ alone to enter into the configuration sequence.
The following will appear in W and Y:

Conf. | In.

whereas in "X" there will be a numerical code between 0 and 13 which represents the memorized input feature.

Table of the numerical indices which identify the input feature.

Index	Input	Scale		Resolution
		Code	Range	
0	Thermocouple Fe-Cost DIN	F3	0...600°C	1°C
1	Thermocouple K (Ni-Cr-Ni)	K2	0...1200°C	1°C
2	Thermocouple R (Pt 13% Rh-Pt)	R2	0...1600°C	1°C
3	Thermocouple S (Pt 10% Rh-Pt)	S2	0...1600°C	1°C
4	RTD Pt100	P10	-99.9...100.0°C	0.1°C
5	RTD Pt100	P9	-200...600°C	1°C
6	Linear current	A	r.l....r.h. config.	1 unit
7	Linear current	A	r.l....r.h. config.	0.1 unit
8	Linear current	A	r.l....r.h. config.	0.01 unit
9	Linear current	A	r.l....r.h. config.	0.001 unit
10	Linear voltage	V	r.l....r.h. config.	1 unit
11	Linear voltage	V	r.l....r.h. config.	0.1 unit
12	Linear voltage	V	r.l.....r.h. config.	0.01 unit
13	Linear voltage	V	r.l....r.h. config.	0.001 unit

Notes:

1. In the models with universal input UN, all these features are present and are already calibrated. Selection of the required features is made by setting the corresponding index (software configuration) by means of the keys ▼ and ▲. First, however,

it is necessary to personalise the card Y_{IN} by positioning some jumpers as indicated in point 4.6.3 (page 31). (Hardware configuration).

2 - For the models ordered with a single calibrated input, the configuration of the input feature must never be touched except for the linear inputs in mA (A) or voltage (V) for which it is wished to re-configure the scale resolution.

3 - For the models with a single calibrated input different from those listed in the above table (i.e. C_1, J_1, E_1, N_1, B_1, P_{10}, RA_4, RA_5, RV_{10},...) the index is always zero unless otherwise specified, and in any case it should never be changed unless an agreement to the contrary has been made.

B - Configuration of the scale range (only for linear inputs)

4 - Press ▶, and Conf. r.l. (range low) will appear in the displays W and Y, and the start of scale value will appear in X.
Press ▼ and ▲ to set the required value.

5 - Press ▶, and Conf. r.h. (range high) will appear in the displays W and Y, and the end of scale and value will appear in X.
Press ▼ and ▲ to set the required value.

Note: r.l. and r.h. must be set within the established limits.

C - Configuration of the output Y_1

6 - Press ▶, Conf. y1 will appear in the displays W and Y whereas in X a numerical index will appear between 0...15 which determines the control action (inverse or direct) and the safety value assumed by the output of Y_1 if there is an anomaly of the input circuit. Press ▼ and ▲ to select the required index.

Table of the numerical indices which identify the control action and the safety value assumed by Y_1.

Index	Action	Safety (Y_1 in %)
0	Inverse	0
1	Direct	0
2	Inverse	14
3	Direct	14
4	Inverse	29
5	Direct	29
6	Inverse	43
7	Direct	43
8	Inverse	57
9	Direct	57
10	Inverse	71
11	Direct	71
12	Inverse	86
13	Direct	86
14	Inverse	100
15	Direct	100

Notes:

The output goes into the safety state if:
- The values measured are slightly off the scale (for all the inputs)
- Failure of the thermocouple
- Failure and short circuit of the RTD
- Failure and short circuit of the signal for input 4...20mA and 2...10V.

D - Configuration of the alarm output Y_2

7 - Press the key ▶. Conf. y2. will appear at W and Y and X there will be an index number between 0...5 which will establish the type of set point and control mode of Y_2.
Press ▼ and ▲ to select the required feature.

Index	Type of set point	Control mode
0	Deviation	Minimum (active high)
1	Deviation	Maximum (active low)
2	Independent	Minimum (active high)
3	Independent	Maximum (active low)
4	Deviation band	Minimum (active high)
5	Deviation band	Maximum (active low)

Note:

In the models with Heating-Cooling action (F), Y_2 is associated with the main control, and this index should be 6.

E - Configuration of the alarm output Y_3

8 - Press the key ▶. Conf. | y3 | will appear at W and Y, and at X a numerical index will appear, between 0...5 which established the type of set point and control mode of Y_3.
Press ▼ and ▲ to select the required feature.

Index	Type of set point	Control mode
0	Deviation	Minimum (active high)
1	Deviation	Maximum (active low)
2	Independent	Minimum (active high)
3	Independent	Maximum (active low)
4	Deviation band	Minimum (active high)
5	Deviation band	Maximum (active low)
6	Logic Output	Programme Deviation

F - Configuration of the programmes and sections

9 - Press ▶, Conf. | tr. | will appear at W and Y and a numerical index between 0...4 at X which determines the number of programmes.
Press ▼ and ▲ to make the selection.

Index	No. of Programmes	No. of sections max.
0	1	64
1	2	32
2	4	16
3	8	8
4	16	4

Note: A section = 1 ramp + 1 dwell.

G - Exit from the configuration procedure

Pressing ▶, returns to the beginning of the configuration sequence, and by pressing this key repeatedly it is possible to check, one by one, all the configured features.

10 - If ▶▶ is pressed | End | | – |.

11a - If ▶▶ is pressed again, the controller exits from the configuration phase and returns to normal operation.

11b - If however ▼ and ▲ are pressed at the same time, and then ▶ alone, the controller enters into the "calibration" sequence (see chapter 4.7 page 33).

4.6.2 Summary of the keying configuration sequence

Operation	Keys to press	Mnemonic code W	Mnemonic code Y	Setting range X
1 Access to configuration	Switch 1 of SW3 of the YRE card in Off position			
2 Entry to configuration	▶ and repeated ▶▶ ... ▶▶ until	End	–	
3 Input feature X	▼ and ▲ together and ▶	Conf.	In.	Index 0...13
4 Start of scale value	▶	Conf.	r.l.	Value -999 to 9899
5 End off scale value	▶	Conf.	r.h.	Value (r.l. + 100) to 9999
6 Action and safety Y_1	▶	Conf.	y1	Index 0...15
7 Set and control mode Y_2	▶	Conf.	y2	Index 0...5 (6)
8 Set and control mode Y_3	▶	Conf.	y3	Index 0...6
9 No. of programmes	▶	Conf.	y4	Index 0...4
10 End of configuration	▶▶	End.	–	
11a Return to normal	▶▶			The 1st parameter will appear
or 11b Entry into calibration	▼ and ▲ together and ▶	Cal.	C.I.	See calibration procedure

Notes: 4) and 5) Occur only for configurable linear inputs.

Important:

At the end of the configuration check the setting of all the parameters of all the groups and re-position switch 1 of the group SW3 of card YRE in the On position (see page 31).