

5721 OPERATOR STATION

PRODUCT MANUAL

HA058017

Issue 3



WARNING

This equipment contains hazardous voltages and hazardous rotating mechanical components.

Loss of life, severe personal injury or property damage can result if instructions contained in this manual are not followed.

Only qualified personnel should work on this equipment, and only after becoming familiar with all safety instructions regarding installation, operation and maintenance procedures contained in this manual. The successful and safe operation of this equipment is dependent on proper handling, installation, operation and maintenance of the equipment



CONTROLLER WARRANTY

For Controller Warranty and Repair
refer to Eurotherm Drives Standard Conditions of Sale IA058393C

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1 INTRODUCTION

The Eurotherm Drives operator station (product code 5721) is a tool designed to enable process line operators to monitor and, if required, to change the value of process variables. A user-friendly menu can be set up on a need-to-know basis. If the operator needs to know the value of some variables in the day to day running of the process line, then these variables, and no more, can be made available to him. Each item on the menu can be configured to be as helpful as possible; the format of information presented to the operator is defined during installation, and may be re-defined while the operator station is in service with no special tools.

The operator station can monitor variables in either the Eurotherm Drives Quadraloc (product code 5720) or the 570 range of Eurotherm Drives drives.

The operator station may be used also as a diagnostic tool. A site engineer or field service engineer has access to every variable in the processing device. This feature is intended for use only with the Eurotherm Drives Quadraloc.

When used with Quadraloc, the operator station draws its power from Quadraloc. When used with a 570 drive, an external 24 volt power supply must be provided.

2 SPECIFICATIONS

2.1 MECHANICAL

Overall Dimensions:	Length 192 mm Height 96 mm Depth including mounting studs 57.5 mm
Panel Cut-out Dimensions:	Length 185mm Height 90 mm
Depth behind panel top surface:	54 mm max

2.2 ELECTRICAL

Power Requirement:	24v +/- 2v
Current Consumption:	Less than 250 mA
Interface:	Conforms to RS422
Interface protocol:	Eurotherm BISYNCH

2.3 ENVIRONMENTAL

Operating temperature:	0°C to 45°C
Humidity:	10% to 90% RH Non condensing
IP rating:	IP54
Storage:	-20°C - +50°C short term (100 hours) 0°C - +50°C long term.
	Protect from direct sunlight Ensure dry, corrosive free environment

2.4 FRONT PANEL

Display	Liquid Crystal (L.C.D.) 16 characters x 2 lines 5 x 8 dot matrix per character
Keys	18 keys composed as : 4 menu selection keys 10 numeric keys decimal point sign toggle (+/-) erase last entry enter

NOTE: The membrane keys are designed to be operated by the finger tip. Any sharp object will pierce the surface and destroy the internal switch. Evidence of misuse will invalidate warranty.

Cleaning A damp cloth can be used to remove most deposits.

In extreme circumstances use a cloth moistened with Isopropyl Alcohol.

WARNING : THIS SUBSTANCE IS HIGHLY FLAMMABLE DO NOT USE NEAR NAKED FLAMES

2.5 SERIAL LINK

Protocol	Eurotherm ASCII Bisynch
Baud rate	9600 fixed
Group ID (GID)	0 fixed
Unit ID (UID)	0 fixed

3 DEFINITIONS

The following definitions are used in this document:

- Operator Station - The Eurotherm Drives operator station: product code 5721
- System Device - The device to which the operator station is connected (either Quadraloc or 570 drive range)

CONVENTIONS

The following conventions are used in this document.

- Key Presses - Are shown by the key inside a keycap symbol, e.g. **E**
- Displays - The display contents are shown inside a rectangular box, e.g.

OPERATOR STATION
RELEASE x.x

4 FEATURES

Fig 1 illustrates the main features.

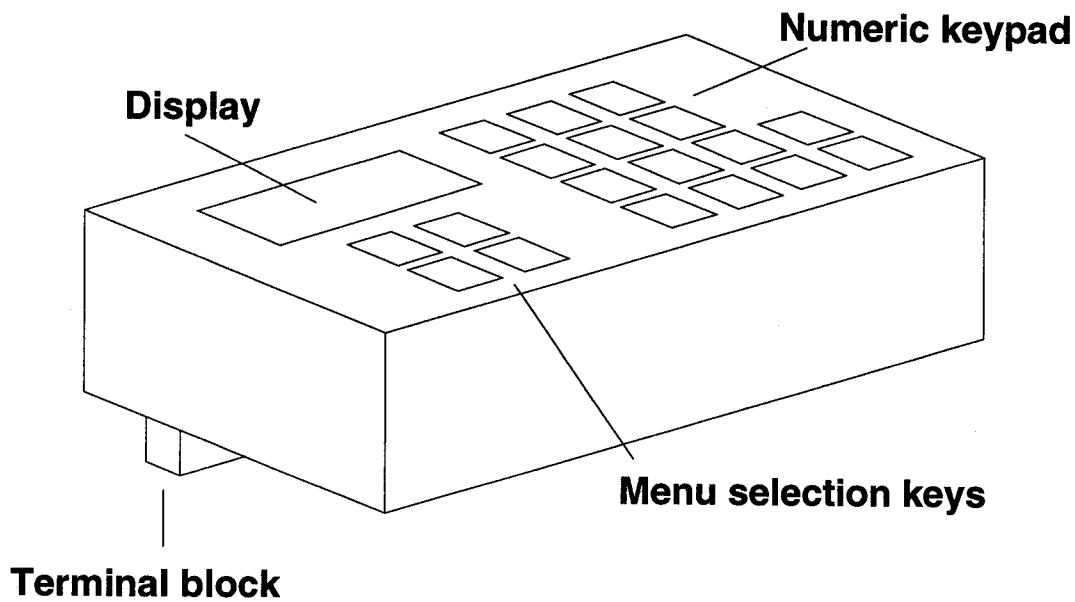


Fig 1 Main Features

4.1 KEYBOARD

The keyboard is a membrane type with tactile feedback and embossed rims to all keys. Fig 2 shows the keyboard layout.

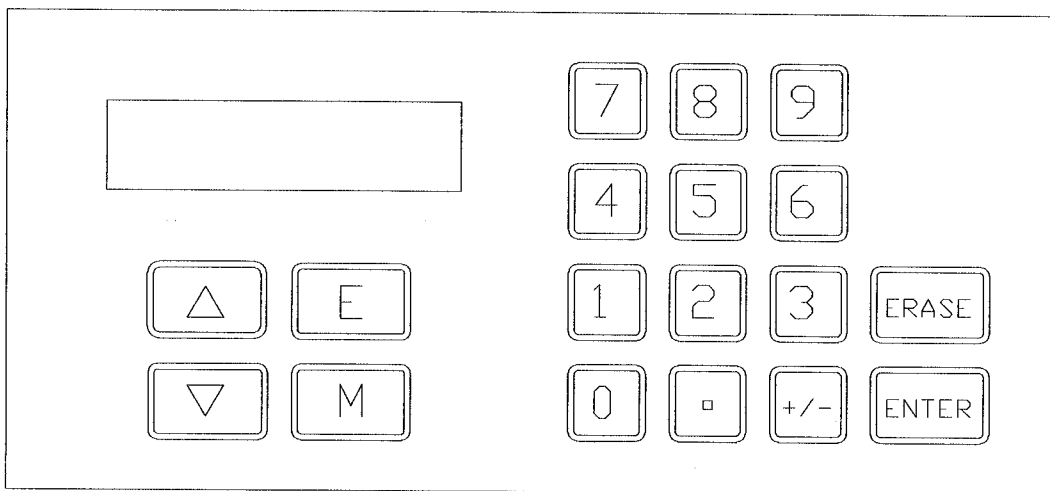


Fig 2 Keyboard Layout

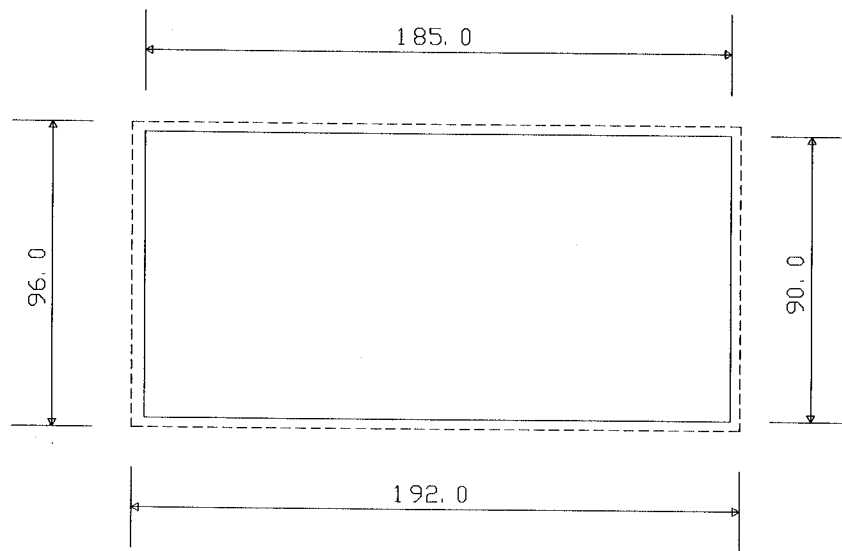
4.2 DISPLAY

The display is an alpha-numeric liquid crystal type (LCD), with two rows of 16 characters each. In order to allow for either vertical or horizontal mounting, the optimum viewing angle (contrast) can be changed via the keyboard.

5 INSTALLATION

5.1 MECHANICAL

The operator station mounts in an aperture in a control panel. Make a rectangular hole in the control panel as shown in Fig 3.



Note: Solid line = cut-out
Dashed line = clearance for bezel

Fig 3 Panel cut-out details.

Referring to Fig. 4, undo the four nuts which retain the mounting brackets on the underside of the operator station and remove the brackets. Insert the operator station into the cut-out in the control panel from the front. Replace the two mounting brackets on the rear of the operator station, and tighten the four nuts to retain the operator station in the panel.

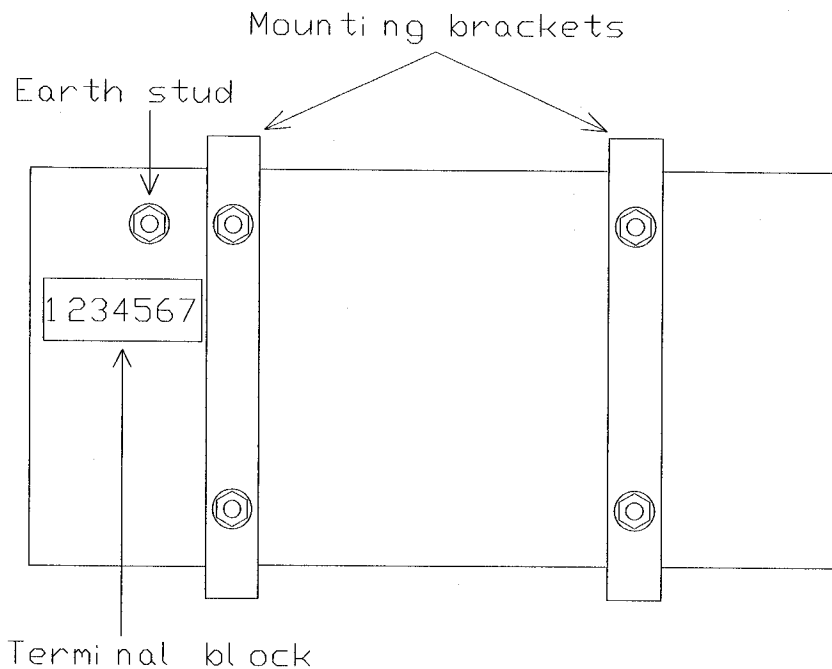


Fig 4 Rear view of the operator station

5.2 ELECTRICAL

The connections to be made depend on the system device. Refer to the tables below.

5.2.1 CONNECTIONS TO QUADRALOC

Connect the operator station to Quadraloc as shown in Table 1.

Signal Name	Operator Station Terminal Number	Quadraloc Terminal Number
+24 volts	1	TBB/3
0 volts	2	TBB/1
XMT+	3	TBB/5
XMT-	4	TBB/7
RCV-	5	TBB/13
RCV+	6	TBB/11
COMMON	7	TBB/15

Table 1 Connections to Quadraloc

Connect the earth stud on the operator station to a convenient safety earth point.

5.2.2 CONNECTIONS TO A 570 DRIVE

A 24 volt power supply must be provided to supply the operator station when used with a 570 drive. It must be rated at 0.25 amps or greater.

Connect terminal number 1 on the operator station to the positive terminal of the power supply, and terminal number 2 to the negative terminal.

Connect the remaining terminals to a 570 drive as shown in Table 2.

Signal Name	Operator Station Terminal Number	570 Drive Terminal Number
XMT+	3	TBH/6
XMT-	4	TBH/5
RCV-	5	TBH/1
RCV+	6	TBH/2
COMMON	7	TBH/4

Table 2 Connections to 570 drive.

Connect the earth stud on the operator station to a convenient safety earth point.

6 GETTING OPERATIONAL

- AN EXAMPLE

6.1 OVERVIEW

The operator station may contain two menu structures, nominally the Operator's Menu and the Engineer's Menu. The Engineer's Menu is a structure which is fixed for each system device and is ready to use immediately. The Operator's Menu must be configured before it can be used.

The Operator's Menu, once configured, is designed for day-to-day use by a process operator to examine and change those parameters in the system device which he needs in order to run the process.

The Engineer's Menu is used to configure the Operator's Menu, and as a diagnostic tool.

The Engineer's and Operator's menus are linked as shown in Fig 5.

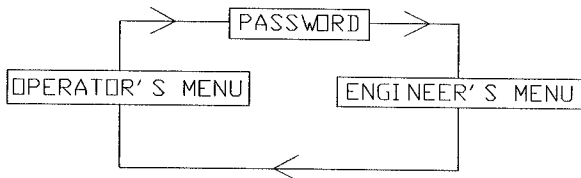


Fig 5. Relationship between the Operator's and Engineer's Menu

An engineer may switch from the Operator's Menu to the Engineer's Menu by means of a password, but the reverse operation does not require a password.

6.1.1 THE ENGINEER'S MENU

The Engineer's Menu has three principal functions:

- To configure the Operator's Menu.
- To set up the man-machine interface (MMI).
- To enable an engineer to access all parameters in Quadraloc when this is the system device.

Full details of the Engineer's Menu are given in section 7.

6.1.2 THE OPERATOR'S MENU

The Operator's Menu consists of up to 16 items linked to form a ring, as shown in Fig 6.

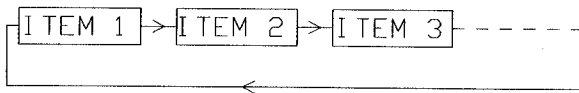


Fig 6. The Operator's Menu structure.

The 16 items in the Operator's Menu are chosen from a list of 16 parameters, in any order. Each parameter must be configured in the Configuration section of the Engineer's Menu, followed by the display sequence.

Display Formats

There are two possible formats for displayed parameters in the Operator's Menu.

Numeric Parameters

This type of parameter is displayed as follows:

```
PARAMETER NAME
VALUE UNITS
```

PARAMETER NAME is a text string (up to 16 characters long) which identifies the parameter being displayed, e.g. LINE SPEED, and is displayed on the top line of the L.C.D. display.

VALUE is the current value of the parameter. It may contain a decimal part as well as an integer part. Leading zeros in the integer part are suppressed, but trailing zeros in the decimal part are not. It is displayed on the bottom line of the L.C.D. display.

UNITS are the units associated with the parameter, e.g. M/MIN. It also is displayed on the bottom line of the L.C.D. display.

For example, a numeric parameter might be displayed as

```
LINE SPEED
123.4 M/MIN
```

Parameters 1 to 4 are read-only numeric parameters. Parameters 5 to 8 are read/write numeric parameters.

Named Parameters

This type of parameter is displayed as follows:

```
PARAMETER NAME
TEXT STRING
```

PARAMETER NAME is a text string (up to 16 characters long) which identifies the parameter being displayed, e.g. LINE CONTROL and is displayed on the top line of the L.C.D. display.

TEXT STRING is a name associated with the value of the parameter. For example, a parameter may have values, 0, 1, 2 or 3. Meaningful names can be assigned to each value, such as

- 0 = OFF
- 1 = LOW
- 2 = MEDIUM
- 3 = HIGH

The bottom line of the display contains just the name assigned to the current value of the parameter, e.g.

```
LINE CONTROL
HIGH
```

Parameters 9 to 12 are read-only named parameters. Parameters 13 to 16 are read/write named parameters.

Selecting a Menu Item

After the Operator's Menu has been configured, the first item to appear on the display when entering the Operator's Menu, either after power on, or after exiting the engineer's menu, will be item 1. To select the next item in the list, press **[M]**. Repeat this until the desired menu item is displayed.

6.2 EXAMPLE CONFIGURATION

This example configures an Operator's Menu, for use with Quadraloc, and which contains three items. It assumes that the operator station has not been configured in any way.

This exercise should take 30 to 45 minutes. With practice a menu with three items would take about 15 minutes to configure.

Item 1 will display the line speed (i.e. the master drive speed) in units of metres per minute.

Item 2 will display the state of the START/QUENCH digital input.

Item 3 will display, and allow changes to, the draw of the system (a function of speed ratio).

It is important to follow the order in which configuration is performed.

Configuration can be time-consuming especially if there is a large number of parameters to configure. Reducing the MESSAGE DELAY under MMI SETUP will speed up some parts of the configuration. This example reduces the MESSAGE DELAY.

6.2.1 GETTING STARTED

Connect the operator station to Quadraloc, as in section 5.2, and switch on. The display shows:

SELF TEST
IN PROGRESS

After approximately 1 second the display should change to :

OPERATOR'S MENU
NOT CONFIGURED

In order to configure the Operator's Menu, it is necessary to enter the Engineer's Menu. Press **(E)**. The display now shows :

PASSWORD

The default password is 5721.

Press **(5)**:

PASSWORD
*

Press **(7)**, then **(2)**, then **(1)** :

PASSWORD

Press
(ENTER):

OPERATOR STATION
RELEASE x.x

The operator station is now in the Engineer's Menu.

Press **(M)**:

MENU LEVEL
SALES & SERVICE

Using **(↑)** and **(↓)** scrolls round the Engineer's Menu at this level. The two keys scroll round the list in opposite directions. (The Engineer's Menu is several layers deep, but it is not necessary to understand all the lower layers for this example). If the operator station has not been configured, there will be five menu items available.

Use **(↑)** or **(↓)** to obtain the following menu item:

MENU LEVEL
MMI SETUP

Select this item by pressing **(M)** (Menu select) :

MMI SETUP
MESSAGE DELAY

Using **(↑)** and **(↓)** again scrolls round the list of three menu items available at this level. Select MESSAGE DELAY by pressing **(M)** from the display above.

MESSAGE DELAY
500 mS

Message Delay defines the time period between auto-repeats when a key is held down. Press and hold **(↓)**. The value decreases in steps of 100 mS. Release **(↓)** when a suitable value is reached. 200 mS is recommended. If the value becomes too small, use **(↑)** key instead.

Exit from this menu position by pressing **(E)** (Exit):

MMI SETUP
MESSAGE DELAY

Again, exit from this menu position by pressing **(E)**:

MENU LEVEL
MMI SETUP

Use **(↑)** or **(↓)** (if held down the display now changes between items at the speed set up at the message delay) to obtain the following display:

MENU LEVEL
CONFIGURATION

This point in the Engineer's Menu is the starting point for configuring the Operator's Menu.

So far, the functions of **(↑)** and **(↓)** have shown how to display the list of menu items available. **(M)** selects the menu item shown on the bottom line of the display, and **(E)** is used to exit from a menu position to the next highest menu level. **(↑)** and **(↓)** are used also to increase and decrease the value of a displayed parameter.

6.2.2 DEFINE THE SYSTEM DEVICE

This section defines whether the operator station is connected to Quadraloc or to a 570 drive.

Press **(M)**:

CONFIGURATION
SYSTEM DEVICE

This example will configure the Operator Station for use with Quadraloc.

Press **[M]** again. As the system device has not been configured, the display shows briefly:

SYSTEM DEVICE
NOT CONFIGURED

This is replaced by:

SYSTEM DEVICE
5720 QUADRALOC

This is the correct system device, so press **[M]**. A confirmation message is displayed. The system device has now been selected.

Press **[E]**:

CONFIGURATION
SYSTEM DEVICE

6.2.3 CONFIGURE ITEM 1

Item 1 is a read only parameter, and it can be defined as any of parameters 1, 2, 3 or 4. In this example it will be defined as parameter 2.

Press **[↓]** twice:

CONFIGURATION
PARAMETER 2

Press **[M]**:

PARAMETER 2
NAME

Name

The name is the text which will appear on the top line of the Operator's Menu display for this parameter. This section will enter the name LINE SPEED.

Press **[M]**. The top line displays NAME, the bottom line is garbage. This would normally be the current name, but because the operator station is unconfigured, the name is garbage.

In order to enter the text entry routine, press **[M]** again, the bottom line clears, and a cursor appears at the first character position on the bottom line.

The cursor identifies the character position to be entered.

The name for item 1 is to be LINE SPEED, and this name is to be positioned centrally on the display. The name is 10 characters long (including one space), and the display is 16 characters long. Therefore three leading spaces are required to position the name centrally.

Press **[M]** three times. The cursor moves to the fourth character position. If the cursor goes too far, use **[ERASE]** to move the cursor to the left.

Press and hold **[↑]**. The character at the cursor scrolls through the list of available characters. Release **[↑]** when then letter L appears. Use **[↓]** if you go past letter L.

Press **[M]** to accept this character. The cursor moves to the right. The display now looks like this:

NAME
L_

Continue entering the name in this manner until the display looks like this:

NAME
LINE SPEED

The name is complete. Press **[ENTER]** to accept the complete name:

PARAMETER 2
NAME

Units

At this point, the layout of the bottom line of the display must be planned. This example will configure the display thus:

LINE SPEED
xxx.x M/MIN

Looking at the display in more detail:

			L	I	N	E		S	P	E	E	D			
			x	x	x	.	x		M	/	M	I	N		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

The value part of the bottom line (xxx.x) will occupy character positions 4 to 8, and the units (M/MIN) will occupy positions 10 to 14.

Press **[↓]** followed by **[M]** twice. The display now looks like this:

UNITS
_

Press **[M]** nine times to position the cursor at character position 10. As a reference, this is the character below the S in UNITS. Then use **[↑]** to select letter M. The procedure now is similar to that used to define the name in the previous section. When the units have been entered completely, press **[ENTER]**:

PARAMETER 2
UNITS

Mnemonic

The mnemonic chosen here will direct the operator station to the desired parameter in Quadraloc. Line speed will direct the operator station to the master drive speed, for which the mnemonic is 's2'. A full list of mnemonics can be found in the Quadraloc user's manual.

Press **[↓]**, and then **[M]**. The display shows briefly:

MNEMONIC
NOT CONFIGURED

This is followed by:

MNEMONIC
a1

Use \uparrow or \downarrow key to scroll through the list of mnemonics available until 's2' appears on the bottom line of the display, thus:

MNEMONIC
s2

Press M . The following message appears briefly :

MNEMONIC
CONFIRMED

Press E :

PARAMETER 2
MNEMONIC

The mnemonic has now been selected.

Display Format

This section will define how the number is displayed on the bottom line of the display. Previously it was decided that the number would occupy character positions 4 to 8 inclusive, and consist of 3 integer digits and one decimal digit.

Press \downarrow followed by M :

LINE SPEED
i.d M/MIN

Note that the top line displays the previously defined name and the bottom line displays the units.

The display format is shown as 'i.d'. This is the default format, and indicates that there will be one integer digit and one decimal digit in the display.

On the numeric keypad, type $3 \text{ } 0 \text{ } 1 \text{ } \text{ENTER}$:

LINE SPEED
iii.d M/MIN

Note that the position of 'iii.d' may be different from the example shown, but is irrelevant at this point.

Use \uparrow or \downarrow to shift 'iii.d' to the correct position:

LINE SPEED
iii.d M/MIN

Press E :

PARAMETER 2
DISPLAY FORMAT

The display format has now been defined.

Formula

The mnemonic 's2' just defined points to a value which is measured as a number of tachometer counts per loop time, but with a suitable conversion factor this can represent the line speed in metres/minute.

Let us suppose that the master motor, with an operating speed of 1800 r.p.m., drives a print roller with 0.5 metre circumference through a 5:1 gearbox. Then one revolution of the motor moves the web by 0.1 metre, and at 1800 r.p.m. the web speed is 180 m/min.

The motor speed will be sensed by a Microtach; which produces 4000 counts/revolution, and the loop time is 10 mS (or 0.01 seconds). (Refer to the Quadraloc user's manual for the actual loop time). Then at 1800 r.p.m. (or 30 revs per second), the Microtach generates

$$30 \times 4000 \times 0.01 = 1200 \text{ counts/loop time}$$

Therefore 1200 counts per loop time is equivalent to 180 m/min web speed, and a scaling factor of $180 / 1200 = 0.15$ is required to convert counts per loop time into web speed in metres/min.

In the Operator's Menu, the operator station will request the value of master drive speed. The operator station will then apply a transformation formula to the value and display the result.

Three transformation formulae are available. The one which applies here is $\text{DISPLAY} = ax + b$, where x is the value sent by Quadraloc. In this example, $a = 0.15$, and $b = 0$.

Press \downarrow and M . The display shows briefly:

FORMULA
NOT CONFIGURED

This is followed by the default formula:

FORMULA
DISPLAY=ax+b

This is the correct formula. (The other choices can be found by pressing \uparrow or \downarrow). Ensure that the correct formula is displayed, and then press M . A confirmation message is displayed, and then the display shown above reappears. The transformation formula has now been defined.

Press E :

PARAMETER 2
FORMULA

Coefficient a

The transformation formula just defined has two coefficients, a and b. This section defines the value of coefficient a.

Press \downarrow and M . The top line of the display shows COEFFICIENT a and the bottom line contains the current value of a, or an error message. Enter $0 \text{ } . \text{ } 1 \text{ } 5 \text{ } \text{ENTER}$:

COEFFICIENT a
0.150000

Press E :

PARAMETER 2
COEFFICIENT a

Coefficient b

This section defines the value of coefficient b.

Press **(↓)** and **(M)**. The top line of the display shows COEFFICIENT b and the bottom line contains the current value of b, or an error message. Press **(0)** and **(ENTER)**:

```

COEFFICIENT b
0.000000
    
```

Press **(E)**:

```

PARAMETER 2
COEFFICIENT b
    
```

The configuration for item 1 is now complete.

Press **(E)**:

```

CONFIGURATION
PARAMETER 2
    
```

6.2.4 CONFIGURE ITEM 2

Item 2 displays the state of the START/QUENCH digital input. The top line of the display will display 'LINE CONTROL', and the bottom line will display either 'GO' or 'STOP', i.e.

```

LINE CONTROL OR LINE CONTROL
GO              STOP
    
```

This item is a read only named variable, because the variable as interrogated from Quadraloc returns either 0 or 1 (0 = QUENCH or STOP, and 1 = START or GO). Item 2 must be chosen from parameters 9, 10, 11 or 12. Parameter 9 will be chosen for this example.

Use **(↑)** or **(↓)** to obtain the following display:

```

CONFIGURATION
PARAMETER 9
    
```

Press **(M)**:

```

PARAMETER 9
NAME
    
```

Name

Follow the same procedure as for item 1 so that the display shows:

```

NAME
LINE CONTROL
    
```

Mnemonic

The mnemonic for the START/QUENCH digital input is 'd6'. Follow the same procedure as for item 1 so that the display shows:

```

MNEMONIC
d6
    
```

Text for value 0

A value of 0 indicates the START/QUENCH input is in the START condition. Use the text entry procedure (as used to enter NAME and UNITS) to obtain the following display:

```

TEXT FOR VALUE 0
GO
    
```

Text for value 1

A value of 1 indicates the START/QUENCH input is in the QUENCH condition. Use the text entry procedures to obtain the following display:

```

TEXT FOR VALUE 1
STOP
    
```

The configuration for item 2 is now complete.

6.2.5 CONFIGURE ITEM 3

Item 3 is a read/write numeric parameter, and it can be defined as any of parameters 5, 6, 7 or 8. In this example it will be defined as parameter 5.

This parameter will be configured to produce displays in the Operator's Menu thus:

```

DRAW
xxx.xx %
    
```

Draw is defined for this example as a function of the ratio of the slave drive speed to that of the master drive thus:

$$DRAW = (RATIO - 1) \times 100$$

Use the menu selection keys to obtain the following display:

```

CONFIGURATION
PARAMETER 5
    
```

Name

Follow the same procedure as for item 1 so that the display shows:

```

NAME
DRAW
    
```

Units

Follow the same procedure as for item 1 so that the display shows:

```

UNITS
%
    
```

Mnemonic

A speed ratio measurement is obtained by using mnemonic 'sb'. Follow the procedure as for item 1 so that the display shows:

```

MNEMONIC
sb
    
```

Display Format

Follow the procedure as for item 1 so that the display shows:

```

DRAW
iii.dd %
    
```

Lower Limit

In this section, a number will be entered which defines the lower limit of numbers which may be entered in the Operator's Menu for the draw parameter. In this example, the lower limit will be set to -25%, which corresponds to a speed ratio of 0.75.

Use the menu selection keys to obtain the following display:

```
PARAMETER 5
LOWER LIMIT
```

Press **(M)**. The top line of the display will show 'LOWER LIMIT' and the bottom line will show a random number, or an error message, depending on any previous contents of a memory in the operator station.

On the numeric keypad, enter **(2)(3)(+/-)** (note that at least one number key must be pressed before the sign), and then press **(ENTER)**. A confirmation message appears briefly, and then the lower limit re-appears with trailing zeros added thus:

```
LOWER LIMIT
-25.000000
```

Upper Limit

In this section, a number will be entered which defines the upper limit of numbers which may be entered in the Operator's Menu for the draw parameter. In this example, the upper limit will be set to +25%, which corresponds to a speed ratio of 1.25.

Use the menu selection keys to obtain the following display:

```
PARAMETER 5
UPPER LIMIT
```

Press **(M)**. The top line of the display will show 'UPPER LIMIT' and the bottom line will show a random number, or an error message, depending on any previous contents of a memory in the operator station.

On the numeric keypad, enter **(2)(3)** and then press **(ENTER)**. A confirmation message appears briefly, and then the upper limit re-appears with trailing zeros added thus:

```
UPPER LIMIT
25.000000
```

Formula and Coefficients

The formula to be generated is:

$$\begin{aligned} DRAW &= (RATIO - 1) \times 100 \\ &= (100 \times RATIO) - 100 \end{aligned}$$

Therefore the formula to be used is $DISPLAY = ax+b$, and the value to be entered for COEFFICIENT a is 100, and the value for COEFFICIENT b is -100.

6.2.6 DISPLAY SEQUENCE

The three items in the Operator's Menu have been configured; all that remains is to define the sequence in which they appear.

Use the menu selection keys to obtain the following display:

```
CONFIGURATION
DISPLAY SEQUENCE
```

Press **(M)**:

```
DISPLAY SEQUENCE
NUMBER OF PARAMS
```

Press **(M)**:

```
NUMBER OF PARAMS
```

In the example, the Operator's Menu consists of three items. Press **(3)(ENTER)**. The top line of the display shows 'MENU ITEM 1', and the bottom line may contain garbage. Use **(↑)** or **(↓)** to scroll through the list of parameters until the bottom line displays LINE SPEED, which is the name given to item 1, thus:

```
MENU ITEM 1
LINE SPEED
```

Press **(M)**. The top line shows 'MENU ITEM 2', and the bottom line may show garbage again. Use **(↑)** or **(↓)** so that the bottom line displays 'LINE CONTROL', which is the name given to item 2, thus:

```
MENU ITEM 2
LINE CONTROL
```

Press **(M)**. The top line shows 'MENU ITEM 3', and the bottom line may show garbage again. Use **(↑)** or **(↓)** so that the bottom line displays 'DRAW', which is the name given to item 3, thus:

```
MENU ITEM 3
DRAW
```

Press **(M)**. The configuration is now complete. The display is now:

```
CONFIGURATION
DISPLAY SEQUENCE
```

6.2.7 TESTING THE CONFIGURATION

Press **(E)** twice:

```
OPERATOR STATION
RELEASE x.x
```

Press **(E)** again:

```
DON'T FORGET TO
SAVE PARAMETERS
```

This message is displayed because the MESSAGE DELAY has been changed, but the change has not been stored permanently. The change will not be stored in this example, so press **[E]** again. If Quadraloc is connected correctly, the display should be the first item on the Operator's Menu :

LINE SPEED
xxx.x M/MIN

If Quadraloc is not connected correctly, the display will appear thus:

LINE SPEED
COMMS ERROR

This message indicates that the serial link between the operator station and Quadraloc is not wired up correctly.

Press **[M]**. The display should change to the second item on the Operator's Menu:

LINE CONTROL GO OR LINE CONTROL STOP

Press **[M]**. The display should be the third item on the Operator's Menu:

DRAW
xx.xx %

Enter **[2][5][ENTER]**. The display will fill out trailing zeros:

DRAW
25.00 %

Enter **[2][6][ENTER]**. As this value is greater than the upper limit entered, an OUT OF RANGE message will appear briefly, and then the display will revert to its previous value, 25.00 %

7 REFERENCE

7.1 ON FIRST APPLYING POWER

When first applying power to a new operator station, the following message will appear on the L.C.D. display:

SELF TEST
IN PROGRESS

After approximately 1 second, the self test should complete, and, if the self test is successful, the display changes to:

OPERATOR'S MENU
NOT CONFIGURED

The only operation possible at this point is to enter the Engineer's Menu. Once in the Engineer's Menu, the Operator's Menu may be configured, or the operator station may be used by an Engineer as a diagnostic tool for Quadraloc (refer to the Quadraloc manual).

7.2 ENTERING THE ENGINEER'S MENU

It is possible to enter the Engineer's Menu from either of the following conditions:

On first applying power i.e. before the Operator's Menu has been configured.

From any position in the Operator's Menu except during number entry.

From either of these conditions, press **[E]**. The display changes to:

PASSWORD

Pressing any of the menu selection keys (**[↑]** **[↓]** **[E]** or **[M]**) restores the display to item 1 in the Operator's Menu, or the configuration error message.

Enter the password using the numeric entry procedure. The operator station is supplied with a password of 0. This may be changed in the Engineer's Menu if desired. The display changes to:

OPERATOR STATION
RELEASE x.x

This is the entry level menu of the Engineer's Menu.

7.3 STANDARD PROCEDURES

There are two procedures which are used at many points in the menus.

7.3.1 CHANGING THE VALUE OF A PARAMETER

There are two ways to change the value of a parameter displayed on the operator station. These are by numeric entry, or by increment / decrement.

Number entry procedure

There are many instances where it is required to enter a number into the operator station. The numeric keys are used for this purpose. The numeric keys are **[0]** to **[9]** **[.]** **[+/-]** **[ERASE]** and **[ENTER]**.

During number entry the operator station checks for the number of digits entered, and displays an error message if the number becomes too long. When the number entry is terminated, it checks the number entered against limits, and again displays an error message if the number is outside those limits.

The rules for number entry are as follows:

The first key press may be a number (**[0]** to **[9]**) or **[.]** if the number is allowed to have a decimal part. If the number is not allowed to have a decimal part then the decimal point key has no effect.

If the number has a decimal part, it is not necessary to enter trailing zeros. They are added automatically by the operator station.

[+/-] toggles values between positive and negative and can be used at any time after the first key press. If the number is not allowed to be negative, this key may have no effect.

[ERASE] erases the rightmost digit displayed. It may be used repeatedly, and may cross a decimal point.

Number entry may be aborted at any time by pressing **[E]**. The original value of the parameter is restored to the display.

Number entry is terminated by pressing **[ENTER]**.

If the number entered is within the limits then the display will show CONFIRMED and then the number entered will re-appear.

If the number entered is outside the limits then the display will show OUT OF RANGE and then the original value of the parameter is restored to the display.

If too many integer digits are entered, the display will show either +ve OVERFLOW or -ve OVERFLOW. Either abort entry by pressing **[E]** or erase the last digit by pressing **[ERASE]** repeatedly if necessary.

Increment / decrement

[↑] and **[↓]** serve two functions, depending on the message displayed on the operator station.

During menu selection in the Engineer's Menu, the keys serve to scroll through a list of menu options.

When the display shows the value of a parameter (which must be a read/write parameter), **[↑]** and **[↓]** respectively increment and decrement the value of the parameter. On first pressing one of these two keys, the least significant displayed digit changes. If the key is held down, then after 9 increments (or decrements) the next least significant digit changes. This process repeats for

all displayed digits. If \uparrow (or \downarrow) is released and pressed again, the sequence starts again from the least significant digit.

7.3.2 TEXT ENTRY PROCEDURE

At many points in the configuration menu, a text string must be entered. The operator station contains a text entry procedure. The rules for which are as follows:

Initially, the bottom line of the display must show the current text string, which may be garbage depending on the contents of the EEPROM in the operator station.

Press M . The bottom line of the display blanks (it actually contains all spaces), and a cursor appears at the first character position on the bottom line.

Use the following keys to enter the text string:

- \uparrow Scroll forwards through the list of characters at the cursor position.
- \downarrow Scroll backwards through the list of characters at the cursor position.
- M Accept the character shown at the cursor position, and move the cursor one place to the right.
- ERASE Erase the character at the cursor position and move the cursor one place to the left without changing the character at the new cursor position.
- E Abort text entry.
- ENTER Accept the complete text string and terminate text entry.

The characters available for text entry are:

Space (default character), upper case alpha (A to Z), numeric (0 to 9) / . % + - () ?

The text string which will appear in the Operator's Menu will be exactly as entered. If leading spaces are required to position the string centrally, then they must be entered.

7.4 ENGINEER'S MENU

The Engineer's Menu is a tree-like structure, as shown symbolically in Fig 7.

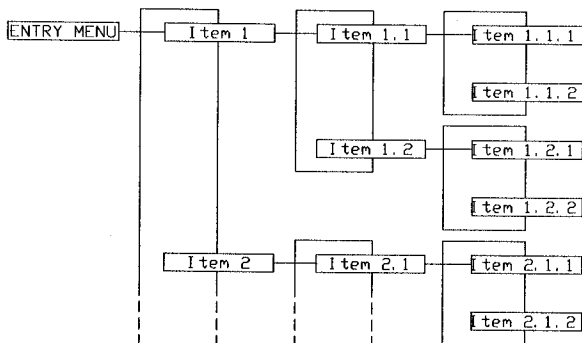


Fig 7. Structure of Engineer's Menu

The Engineer's Menu consists of an entry menu and several primary menus (diagnostics, setup parameters etc). The Engineer's Menu is shown in detail in Appendix A.

The Engineer's Menu is accessed by entering a password in the Operator's Menu.

7.4.1 MENU SELECTION

Except at the entry menu, menu selection is performed by using the four menu selection keys, \uparrow \downarrow E and M

On entering the Engineer's Menu, the entry level menu is displayed. Access to the rest of the menu structure is by use of the menu selection keys.

Each operation of a menu selection key causes a new menu position to be selected; normally it will switch to one of the adjacent menu positions. Figs 8 to 11 show the effect of each of these keys during menu selection, referred to the menu structure in appendix A.

M (Menu select) allows entry to the menu function offered in the second line of the display. Use of this key will not alter the value of any parameter. Fig 8 shows the direction taken in the menu structure by pressing M .

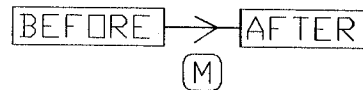


Fig 8. Menu Selection. M Function

E (Escape or Exit) allows selection of the preceding menu, i.e. that towards the entry level menu. Use of this key will not alter the value of any parameter. Fig 9 shows the direction taken in the menu structure by pressing E .

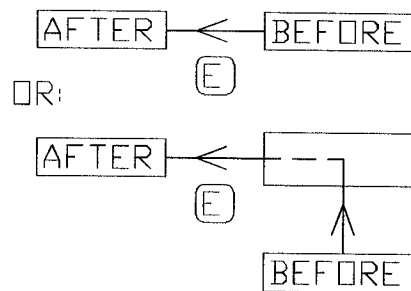


Fig 9. Menu Selection. E Function

\uparrow allows movement in a forward fashion to explore the options available in any selected menu. The selected menu is always shown on the top line of the display. Fig 10 shows the direction taken in the menu structure by pressing \uparrow .

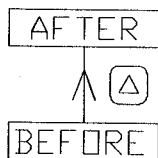


Fig 10. Menu Selection. \uparrow Function

\uparrow allows movement in a reverse fashion to explore the options available in any selected menu. The selected menu is always shown on the top line of the display. Fig 11 shows the direction taken in the menu structure by pressing \downarrow .

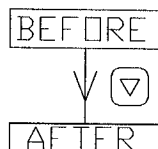


Fig 11. Menu Selection. \downarrow Function.

The actual structure of the Engineer's Menu depends on the system device selected in the Configuration section. The detailed structure of the Engineer's Menu applicable to 570 drives is given in appendix A of this document. The detailed structure of the Engineer's Menu applicable to Quadraloc may be found in the Quadraloc user's manual.

7.4.2 ENTRY MENU

This is the only entry point into the Engineer's Menu. The display shows:

OPERATOR STATION
RELEASE x.x

The bottom line of the display shows the release number of the software fitted in the operator station.

At this menu position the following functions are available:

- \uparrow changes the optimum viewing angle of the display towards the normal, i.e. for use with the operator station viewed 'head on'.
- \downarrow changes the optimum viewing angle of the display away from the normal, i.e. for use with the operator station viewed obliquely.
- M enters the main part of the Engineer's Menu. In the Engineer's Menu, there are up to ten primary menus, depending on the system device. On pressing M in the entry level menu, the first primary menu (Diagnostics for Quadraloc, or Sales & Service for other system devices) is displayed. From here, the other primary menus may be accessed by using \uparrow or \downarrow .

E is the route to the Operator's Menu. If no changes have been made to parameters, then this key press will cause the operator station to switch directly to the Operator's Menu. If changes have been made to parameters but not saved in EEPROM, the following message is displayed to remind the user to do so :

DON'T FORGET TO
SAVE PARAMETERS

This message will be displayed if changes have been made to any of the following parameters:

- MMI SETUP parameters
- Password
- Alarm enable/disable
- Quadraloc parameters

If the parameters are to be saved, then press M to return to the Engineer's Menu. If the parameter changes are not to be saved, then press E again. This returns the user to the Operator's Menu.

7.4.3 DIAGNOSTICS (PRIMARY MENU)

This primary menu is available only when the system device has been configured to Quadraloc. Refer to the Quadraloc User's Manual for full details of the Diagnostics menu.

7.4.4 SETUP PARAMETERS (PRIMARY MENU)

This primary menu is available only when the system device has been configured to Quadraloc. Refer to the Quadraloc User's Manual for full details of the Setup Parameters menu.

7.4.5 SALES & SERVICE (PRIMARY MENU)

This section contains a list of telex numbers to assist in sales enquiries or for use in the event of service assistance being required.

Telex numbers are given for Eurotherm companies in the following countries:

- France
- Italy
- United Kingdom
- United States

If service or sales assistance is required, telex the number given in the nearest country.

Use the menu selection keys to obtain the following display:

MENU LEVEL
SALES & SERVICE

Press M . The list of countries is then accessible by using \uparrow or \downarrow . At the desired country, press M and the sales and service telex number for that country will appear.

7.4.6 ALARMS (PRIMARY MENU)

All System Devices

It is possible to enable or disable the checking of alarm conditions in the system device. It is recommended that alarms are disabled, for example, if a Quadraloc has two operator stations connected, one normally, and one on the host serial link. This would otherwise confuse both Quadraloc and the two operators when acknowledging alarms.

Use the menu selection keys to obtain the following display :

ALARMS
ALARM ENABLE

Press **[M]**. The top line of the display shows ALARMS, and the bottom line of the display shows either ENABLED or DISABLED. Use **[↑]** or **[↓]** to enable or disable alarms. To make a change permanent, use the PARAMETER SAVE section.

The factory default state is alarms disabled.

Quadraloc

When used with Quadraloc, all alarm status flags may be displayed, even if alarms are disabled (see above). Refer to the Quadraloc user's manual for details.

7.4.7 MMI SETUP (PRIMARY MENU)

Under this section are three items which control features relating to the MMI (man-machine interface) on the operator station.

If one of the MMI SETUP parameters is changed, it takes effect immediately but if the operator station is turned off and on again, the new parameter values will be lost. To make the new values permanent, use the SAVE ALL function under PARAMETER SAVE. If this is not done, the user will be prompted to do so if he attempts to exit from the Engineer's Menu.

Message Delay

There are many instances when a warning or confirmation message is displayed. The duration of such a display is controlled by the value defined at this menu position. The message delay can be between 100mS and 9900mS in increments of 100mS.

When a key on the operator station is pressed and held, the effect of the key repeats periodically, i.e. it auto-repeats. Message delay also controls the period between auto-repeats.

If the message delay is less than 500mS then the first auto-repeat is 500mS, and subsequent ones are at the rate defined. This makes it easier to perform single step operations.

Use the menu selection keys to obtain the following display:

MMI SETUP
MESSAGE DELAY

Press **[M]**. The top line of the display shows 'MESSAGE DELAY' and the bottom line shows the current value in milliseconds. Use **[↑]** or **[↓]** respectively to increase or decrease the message delay. Alternatively, use the numeric keypad to enter a new value. Values entered are rounded down to the nearest multiple of 100mS.

The default message delay is 500mS.

Value Delay

In the Engineer's Menu under diagnostics, or in the Operator's menu, a value displayed at the operator station is refreshed periodically. The minimum period between refreshes may be defined at this point between 200mS and 9900 mS in increments of 100 mS.

The actual period between refreshes may be longer than the value displayed, and depends on the resolution of the parameter displayed. In order to display a value, the operator station interrogates Quadraloc. The time taken to interrogate and subsequently, in the Operator's Menu, to process a formula may exceed the minimum time defined. In this case, the display is refreshed as quickly as is possible.

Use the menu selection keys to obtain the following display:

MMI SETUP
VALUE DELAY

Press **[M]**. The top line of the display shows 'VALUE DELAY' and the bottom line shows the current value in milliseconds. To change the message delay, use **[↑]** or **[↓]** respectively to increase or decrease the minimum time between display refreshes. Alternatively, use the numeric keypad to enter a new value. Values entered are rounded down to the nearest multiple of 100mS.

The default value delay is 500mS

Contrast

The contrast or optimum viewing angle of the display may be adjusted to suit each installation. For example, if the operator station is to be mounted vertically at eye level, then the viewing angle is normal to the display, whereas if the operator station is to be mounted horizontally on a console, then the viewing angle may be up to 60° from normal.

The optimum viewing angle may be adjusted at this point in the menu structure. Use the menu selection keys to obtain the following display:

MMI SETUP
CONTRAST

Press **[M]**. The top line of the display shows 'CONTRAST' and the bottom line shows a number in the range 0 to 16, which is a measure of the optimum viewing angle. The higher the number, the nearer to normal is the viewing angle. At small values of viewing angle the display may become illegible.

In order to change the optimum viewing angle, use **[↑]** or **[↓]** respectively to increase or decrease the contrast number. Alternatively use the numeric keypad to enter a new value.

The optimum viewing angle may be changed also at the entry level menu of the Engineer's Menu.

The default contrast number is 16.

7.4.8 PARAMETER SAVE (PRIMARY MENU)

The functions available under this menu branch depend on the system device set up in the Configuration section.

For Use With Quadraloc

The operator station contains a non-volatile read/write memory (EEPROM) which is used to store information such as the MMI SETUP values and the configuration details of the Operator's Menu. Quadraloc contains a similar memory which is used to store default values of parameters.

If the value of any parameter in Quadraloc is changed, and it is required that the new values should be permanent, to be re-used when the system is next powered up, then they must be saved into EEPROM. Similarly, if any of the MMI SETUP parameters are changed, they too must be saved in EEPROM.

The two EEPROMs (in the Operator Station and in Quadraloc) are designed to be copies of each other. Then in the event of Quadraloc being replaced, the EEPROM contents may be copied into the new Quadraloc from the operator station. Similarly if the operator station is replaced, the EEPROM contents may be copied from Quadraloc into the new operator station.

Each EEPROM can be considered as being in two halves, one half each for storing Quadraloc and operator station data.

Fig. 12 shows a block diagram of the relevant memory devices, and the data transfer routes.

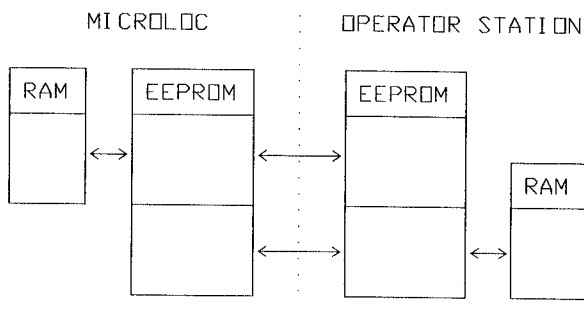


Fig 12. Relationship Between Memory Devices.

The following sections detail the functions available.

Save All

At this menu position all parameters are stored into EEPROM. Fig 13 shows the data transfers which take place. All parameters are stored with this instruction, so care must be taken to ensure that any parameters, which may have been changed experimentally, are first restored to their proper value.

Note that changes to the Operator's Menu configuration are stored into EEPROM as changes are made; it is not necessary to perform a Save All operation after making changes only to the Operator's Menu configuration.

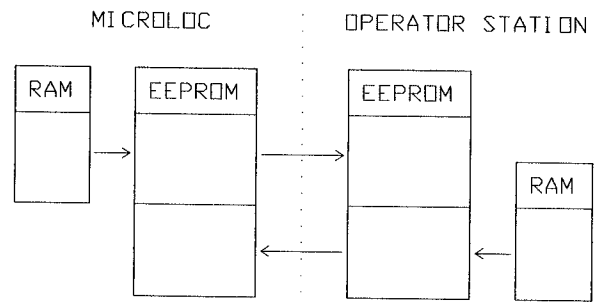


Fig 13. Data Transfers During Save All Operation

To invoke the Save All function, use the menu selection keys to obtain the following display:

PARAMETER SAVE
SAVE ALL

Press (M)

CLOSE QUADRALOC
PARAMETER SWITCH

Set the dual-in-line switch on the Quadraloc control unit to ON, and then press (M). The bottom line of the display shows a 'WORKING' message until the operation is complete, which takes about 30 seconds, and is then replaced by the following display.

OPEN QUADRALOC
PARAMETER SWITCH

Set the dual in line switch on the Quadraloc control unit to OFF and then press (E).

PARAMETER SAVE
SAVE ALL

Restore All

Value changes may be made to parameters for experiment. After the experiment it may be required to restore all values to their defaults, i.e. those stored in EEPROM. The Restore All operation performs this task. Fig 14 shows details of the operations that take place.

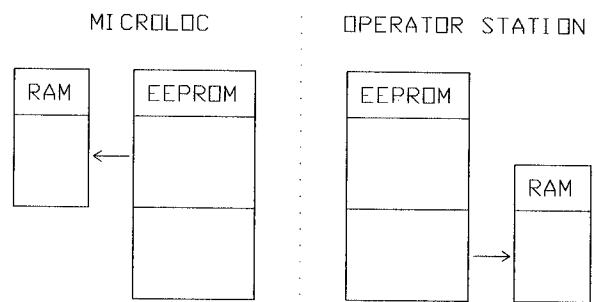


Fig 14. Data Transfers During Restore All Operation

To invoke the Restore All operation, use the menu selection keys to obtain the following display:

PARAMETER SAVE
RESTORE ALL

Press **[M]**. The bottom line of the display shows a 'WORKING' message for about 2 seconds, and then the message shown above is restored to the display.

Factory Defaults

Quadraloc parameters may be restored to factory default values by entering this menu position.

Use the menu selection keys to obtain the following display :

PARAMETER SAVE
FACTORY DEFAULTS

Press **[M]**. A working message is displayed briefly, and then the message shown above is restored to the display.

Opstn to Qloc

This operation is used after Quadraloc has been replaced, perhaps during servicing, to restore the default parameters into the EEPROM in the new Quadraloc. Fig 15 shows details of the operations that take place.

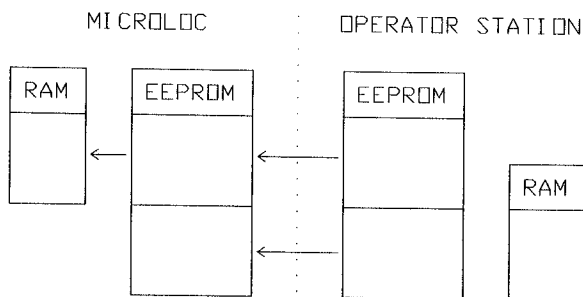


Fig 15. Data Transfers During Opstn to Qloc Operation

To invoke the Opstn to Qloc operation, use the menu selection keys to obtain the following display:

PARAMETER SAVE
OPSTN TO QLOC

Press **[M]**

CLOSE QUADRALOC
PARAMETER SWITCH

Set the dual-in-line switch on the Quadraloc control unit to ON, and then press **[M]**. The bottom line of the display shows a 'WORKING' message until the operation is complete, which takes 25 to 30 seconds, and is then replaced by the following display.

OPEN QUADRALOC
PARAMETER SWITCH

Set the dual-in line switch on the Quadraloc control unit to OFF and then press **[E]**.

PARAMETER SAVE
OPSTN TO QLOC

If the EEPROM in the Operator Station is blank, then this operation has no effect; a blank EEPROM cannot be copied.

Qloc to Opstn

This operation is used after the operator station has been replaced, perhaps during servicing, to restore the default parameters into the EEPROM in the new operator station. Fig 16 shows details of the operations that take place.

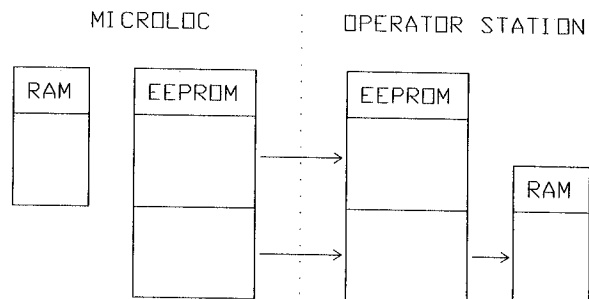


Fig 16. Data Transfers During Qloc to Opstn Operation

To invoke the Qloc to Opstn operation, use the menu selection keys to obtain the following display:

PARAMETER SAVE
QLOC TO OPSTN

Press **[M]**. The bottom line of the display shows a 'WORKING' message for 25 to 30 seconds, and then the message shown above is restored to the display.

If the EEPROM in Quadraloc, then this operation has no effect; a blank EEPROM cannot be copied.

Erase EEPROM

There is a facility to erase the entire EEPROM in the Operator Station. Unless Quadraloc contains a backup, this erases irrecoverably the following:

MMI SETUP parameters :

- Message delay
- Value delay
- L.C.D. contrast
- Password
- Alarm enable/disable control
- Operator's menu configuration
- Backup of Quadraloc EEPROM

Use the menu selection keys to obtain the following display:

PARAMETER SAVE
ERASE EEPROM

Press **[M]**

ERASE EEPROM
ARE YOU SURE?

Press **[↑]** to execute, or **[↓]** or **[E]** to abort. A WORKING message appears for about 2.5 seconds if **[↑]** is selected.

On next power up, factory defaults will apply to all the items normally stored in the Operator Station EEPROM.

For Use With 570 Drives

The operator station contains a non-volatile read/write memory (EEPROM) which is used to store information such as the MMI SETUP values and the configuration details of the Operator's Menu.

If any of the MMI SETUP parameters are changed, and it is required that the new values should be permanent, to be re-used when the system is next powered up, then they must be saved into EEPROM.

Save All

At this point in the menu structure, the MMI SETUP parameters are stored into EEPROM.

To invoke the save all function, use the menu selection keys to obtain the following display:

```
PARAMETER SAVE
SAVE ALL
```

Press **[M]**. The bottom line of the display shows a 'WORKING' message until the operation is complete, which takes about 5 seconds, and is then replaced by the display shown above.

Restore All

Value changes may be made to parameters for experiment. After the experiment it may be required to restore all values to their defaults, i.e. those stored in EEPROM. The Restore All operation performs this task.

To invoke the Restore All operation, use the menu selection keys to obtain the following display:

```
PARAMETER SAVE
RESTORE ALL
```

Press **[M]**. The bottom line of the display shows a 'WORKING' message for about 2 seconds, and then the message shown above is restored to the display.

Erase EEPROM

There is a facility to erase the entire EEPROM in the Operator Station. This erases irrecoverably the following:

- MMI SETUP parameters :
- Message delay
- Value delay
- L.C.D. contrast
- Password
- Alarm enable/disable control
- Operator's menu configuration

Use the menu selection keys to obtain the following display:

```
PARAMETER SAVE
ERASE EEPROM
```

Press **[M]**

```
ERASE EEPROM
ARE YOU SURE?
```

Press **[↑]** to execute, or **[↓]** or **[E]** to abort. A WORKING message appears for about 2.5 seconds if **[↑]** is selected.

On next power up, factory defaults will apply to all the items normally stored in the Operator Station EEPROM.

7.4.9 SERIAL LINKS (PRIMARY MENU)

The serial link which the operator station uses to communicate with the system device conforms to the Eurotherm ASCII BISYNCH protocol. Under this protocol, a prime set of parameters is provided by all devices.

The functions available under this primary menu depend on the system device selected in the Configuration section. The prime set of parameters is available for all system devices. In addition there are three parameters available for Quadraloc.

For Use With All System Devices

The following six sections relate to members of the prime set of parameters defined in the Eurotherm ASCII BISYNCH communications handbook.

Instrument Ident

This menu position allows access to an instrument identifier, mnemonic II.

Use the menu selection keys to obtain the following display:

```
SERIAL LINKS
INSTRUMENT IDENT
```

Press **[M]**. The top line of the display shows INSTRUMENT IDENT and the bottom line shows the Eurotherm Drives product number for the system device connected.

Version No.

This menu position allows access to the basic version number of the system device connected, mnemonic VO.

Use the menu selection keys to obtain the following display:

```
SERIAL LINKS
VERSION NO.
```

Press **[M]**. The top line of the display shows VERSION NO. and the bottom line shows the version number of the software running in the system device as a hexadecimal number.

Config Info.

This menu position allows access to configuration information on the system device connected, mnemonic CI.

Use the menu selection keys to obtain the following display:

```
SERIAL LINKS
CONFIG INFO.
```

Press **[M]**. The top line of the display shows CONFIG INFO and the bottom line shows the configuration information as a hexadecimal number.

Buffer Length

This menu position allows access to the buffer lengths in the system device, mnemonic BL.

Use the menu selection keys to obtain the following display:

SERIAL LINKS
BUFFER LENGTH

Press **[M]**. The top line of the display shows BUFFER LENGTH and the bottom line shows a four digit hexadecimal code. The first two digits, taken as a pair, show the size of the transmit buffer in bytes. The last two digits, taken as a pair, show the size of the receive buffer in bytes.

Error Report

This menu position allows access to an error report on the last communication between the host computer and Quadraloc (Quadraloc only) or between the Operator Station and System Device (other system devices), mnemonic EE.

Use the menu selection keys to obtain the following display:

SERIAL LINKS
ERROR REPORT

Press **[M]**. The top line of the display shows ERROR REPORT and the bottom line shows the report as a hexadecimal number.

Mode No.

This menu position allows access to a mode number, mnemonic MN.

Use the menu selection keys to obtain the following display:

SERIAL LINKS
MODE NO.

Press **[M]**. The top line of the display shows MODE NO. and the bottom line shows the current mode as a hexadecimal number.

For Use With Quadraloc Only

Quadraloc has a serial link intended to be connected to a host computer. Through the operator station, the host serial link may be configured and interrogated. The host serial link conforms to the standard laid down in the Eurotherm BISYNCH communications manual. The serial link between Quadraloc and the Operator Station has fixed configuration and cannot be changed.

User ID (UID)

The UID is defined in the Eurotherm BISYNCH communications handbook. Use the menu selection keys to obtain the following display:

SERIAL LINKS
USER ID (UID)

Press **[M]**. The top line of the display shows 'USER ID (UID)' and the bottom line shows the current value, which is a number in the range 0 to 9.

The UID may be changed using **[↑]** or **[↓]** respectively to increment or decrement the value. Alternatively a new value may be entered using the numeric keypad.

The default UID is 0.

Group ID (GID)

The GID is defined in the Eurotherm BISYNCH communications handbook. Use the menu selection keys to obtain the following display:

SERIAL LINKS
GROUP ID (GID)

Press **[M]**. The top line of the display shows 'GROUP ID (GID)' and the bottom line shows the current value, which is a number in the range 0 to 9.

The GID may be changed using **[↑]** or **[↓]** respectively to increment or decrement the value. Alternatively a new value may be entered using the numeric keypad.

The default GID is 0.

Baud Rate

In order to examine the baud rate of the host serial link, use the menu selection keys to obtain the following display:

SERIAL LINKS
BAUD RATE

Press **[M]**. The top line of the display shows 'BAUD RATE' and the bottom line shows the current value. To change the value, either use **[↑]** or **[↓]** to scroll through the list of available baud rates, or enter the required value using the numeric keypad. If the value entered is not available, then an 'OUT OF RANGE' message appears briefly. The baud rates available are:

75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200.

The default baud rate is 9600.

7.4.10 LOOP TYPE (PRIMARY MENU)

This menu position is available only when the system device is Quadraloc. Refer to the Quadraloc User's Manual for details.

7.4.11 PASSWORD (PRIMARY MENU)

In order to switch from the Operator's Menu to the Engineer's Menu it is necessary to enter a password. When the operator station is supplied to a customer, the default password is 5721. The password may be changed under this menu heading to a number which the customer may find easier to remember.

Use the menu selection keys to obtain the following display:

PASSWORD
CHANGE PASSWORD

Press **[M]**. The top line of the display shows 'CHANGE PASSWORD' and the bottom line shows the current password. To change the password, enter the new number using the numeric entry procedure.

The new password takes effect immediately, but at this point it is stored in a volatile memory. If the operator station is turned off and on again, the original password would once more be effective, the new one would have been lost. To make the new password permanent, use the SAVE ALL function under PARAMETER SAVE.

It is the customer's responsibility to record the password if it is changed, however if the password is forgotten, the following procedure can be used to discover it.

Load the factory defaults (see 7.6).

Enter the Engineer's Menu using the default password.

Perform a RESTORE ALL operation (7.4.8).

Examine the password under this menu heading.

7.4.12 CONFIGURATION (PRIMARY MENU)

This section of the Engineer's Menu configures the Operator's Menu. Configuration must be done before the Operator's Menu is usable.

The Operator's Menu consists of up to 16 items, selected from a list of 16 parameters, in any order. The parameters, numbered 1 to 16, are made up as follows:

Parameters 1, 2, 3, 4	Read only numeric parameters, i.e. the display will consist of a parameter name, the value of the parameter, and its units (if any). The value of the parameter cannot be changed in the Operator's Menu.
Parameters 5, 6, 7, 8	Read/write numeric parameters. The display format is the same as parameters 1 to 4, but the value can be modified in the Operator's Menu.
Parameters 9, 10, 11, 12	Read only named parameters. The display consists of a parameter name, and a name associated with the value of the parameter. The value of the parameter cannot be changed in the Operator's Menu.
Parameters 13, 14, 15, 16	Read/write named parameters. The display format is the same as parameters 9 to 12, but the value can be modified in the Operator's Menu.

The number of items in the Operator's Menu is selectable, as is the sequence in which the parameters are to be displayed.

Appendix B contains a form which may be completed according to the configuration.

There are some restrictions on the order in which configuration is performed:

The system device must be selected before selecting any mnemonics.

The display sequence must be the last item to be configured.

The name and units of numeric parameters must be entered before display format.

System Device

The operator station is capable of interfacing to a variety of system devices. This point in the menu defines which device is to be used. Use the menu selection keys to obtain the following display:

CONFIGURATION
SYSTEM DEVICE

Press **[M]**. The top line of the display shows SYSTEM DEVICE. If the System Device has not been configured, then the bottom line of the display shows briefly a NOT CONFIGURED warning, and then one of the selection of system devices. Otherwise the bottom line shows the system device currently selected. Use **[↑]** or **[↓]** to scroll through the list of devices. When the chosen device name is displayed, press **[M]**. A confirmation message is displayed briefly.

Parameters 1 to 4

These parameters are read only numeric parameters. It is necessary to configure only those parameters which will be used in the Operator's Menu. For example if only one read only numeric parameter is to appear in the Operator's Menu, then only one of these four parameters needs to be configured.

Each parameter used must be configured for parameter name, units, mnemonic, display format, formula and coefficients.

Use the menu selection keys to obtain the following display:

CONFIGURATION
PARAMETER n

where n is the number of the parameter to be configured (1 to 4).

Parameter Name

The parameter name is the text which will appear on the top line of the Operator's Menu.

From the display shown above, press **[M]** to obtain the following display:

PARAMETER n
NAME

Press **[M]**. The top line of the display shows NAME, and the bottom line of the display shows the current parameter name, or it may show garbage, depending on the previous contents of the EEPROM in the operator station.

A new parameter name may be entered using the Text Entry procedure detailed in section 7.3.2.

Units

Units are associated with the parameter, e.g. metres/minute. They will appear in the Operator's Menu on the bottom line of the display after the value of the parameter.

Use the menu selection keys to obtain the following display:

PARAMETER n
UNITS

Press **(M)**. The top line of the display shows UNITS, and the bottom line of the display shows the current units, or it may show garbage, depending on the previous contents of the EEPROM in the operator station.

The units must be entered in the same position on the display as they will appear on the display in the Operator's Menu using the Text Entry procedure defined in section 7.3.2.

Mnemonic

The mnemonic is a two character code used to identify which point in the system device will be interrogated when this parameter is displayed in the Operator's Menu.

Use the menu selection keys to obtain the following display:

PARAMETER n
MNEMONIC

Press **(M)**. The top line of the display shows MNEMONIC. If the mnemonic has not been configured, then the bottom line of the display shows briefly a NOT CONFIGURED warning, followed by one of the mnemonics. Otherwise the bottom line of the display shows the current mnemonic.

Use **(↑)** or **(↓)** to scroll respectively forwards or backwards through the list of mnemonics available. The list depends on the system device selected. Refer to the manual for the relevant system device for details. Press **(M)** when the correct mnemonic is displayed. A confirmation message is displayed briefly, and then the mnemonic re-appears.

Display Format

This point in the menu is used to define the number of integer and decimal places used to display the value of the variable in the Operator's Menu.

The bottom line of the display has a maximum 16 characters. Of these some will usually be occupied by the units, one is always allowed for a negative sign (even if the parameter cannot be negative), and one will be occupied by a decimal point if the number is to contain a decimal part. The remaining character places may be used to display the magnitude of the parameter.

Use the menu selection keys to obtain the following display:

PARAMETER n
DISPLAY FORMAT

Press **(M)**. The top line of the display shows the current name, and the bottom line of the display shows the current units. The bottom line will also include the display format. The number of 'i' characters indicates the number of integer digits that will be displayed in the Operator's Menu and the number of 'd' characters indicates the number of decimal digits. If the number of decimal digits is zero, then the decimal point is suppressed. For example iii.dd indicates that the display will consist of three integer digits and two decimal digits. The display format shown depends on the previous contents of the EEPROM in the operator station, and may differ from the example.

If the display format is not correct use the following keys to enter the correct format:

(0) to **(9)** and **(.)** Enter the correct display format. For example if the correct format is four integer places and one decimal place, enter 4.1 followed by **(ENTER)**. If the display format entered will fit on the display, then it will be displayed as iii.d, and positioned centrally in the available display area. Otherwise the previous display format will re-appear.

The following restrictions apply:

The number of integer places must be between 1 and 9 inclusive.

The number of decimal places must be between 0 and 6 inclusive.

The sum of integer and decimal places must be 14 or less.

(←) Move the display format one place to the left.

(→) Move the display format one place to the right.

The value of a parameter transferred from the system device is transformed using a formula. If the result and display format cause the displayed number to be truncated, then the number is rounded to the nearest least significant digit.

Formula

When a numeric parameter is displayed in the Operator's Menu, the system device is interrogated and returns a value to the operator station. The value is applied to a transformation formula before it is displayed. The purpose of this item in the Engineer's Menu is to define the transformation formula.

Three transformation formulae are available:

$$\text{Displayed value} = (a \times \text{interrogated value}) + b$$

$$\text{Displayed value} = (a / \text{interrogated value}) + b$$

$$\text{Displayed value} = a / (\text{interrogated value} + b)$$

Note that a and b are signed numbers, i.e. they may be positive, negative or zero.

Use the menu selection keys to obtain the following display:

PARAMETER n
FORMULA

Press **[M]**. The top line of the display shows FORMULA. If the formula has not been configured, the top line of the display shows a NOT CONFIGURED warning, followed by one of the formulae available. Otherwise the display shows the currently selected formula.

Use **[↑]** or **[↓]** to scroll respectively forwards or backwards through the list of formulae until the correct one is displayed. Then press **[M]**. A confirmation message is displayed briefly.

Coefficient a

This point in the Engineer's Menu is used to define coefficient a of the formula selected.

Use the menu selection keys to obtain the following display:

PARAMETER n
COEFFICIENT a

Press **[M]**. The top line of the display shows COEFFICIENT a and the bottom line shows its current value.

If the value displayed is incorrect or out of range, then use the number entry procedure to enter the correct value of coefficient a.

The range of numbers for coefficient a is -99999999.999999 to +99999999.999999.

Coefficient b

This point in the Engineer's Menu is used to define coefficient b of the formula selected.

Use the menu selection keys to obtain the following display:

PARAMETER n
COEFFICIENT b

Press **[M]**. The top line of the display shows COEFFICIENT b and the bottom line shows its current value.

If the value displayed is incorrect or out of range, then use the number entry procedure to enter the correct value of coefficient b.

The range of numbers for coefficient b is -99999999.999999 to +99999999.999999.

Parameters 5 to 8

These parameters are read/write numeric parameters. It is necessary to configure only those parameters which will be used in the Operator's Menu. For example if only one read/write numeric parameter is to appear in the Operator's Menu, then only one of these four parameters needs to be configured.

Each used parameter must be configured for parameter name, units, mnemonic, display format, lower limit, upper limit, formula and coefficients.

Use the menu selection keys to obtain the following display:

CONFIGURATION
PARAMETER n

where n is the number of the parameter to be configured (5 to 8).

Parameter Name

The parameter name must be configured in the same way as for read only numeric parameters.

Units

The units must be configured in the same way as for read only numeric parameters.

Mnemonic

The mnemonic must be configured in the same way as for read only numeric parameters.

Display Format

The display format must be configured in the same way as for read only numeric parameters.

CAUTION: Ensure that the resolution of the display format is less than, or equal to, that of the parameter itself.

Read/write parameters use a transformation formula in the same way as read only parameters, but with the addition that a parameter modified at the operator station has an inverse transformation applied to it before transmitting a value to the system device. Both transformations may result in rounding. The potential problem caused by this is best explained by an example:

The parameter is an integer number in the range 0 to 65535.

The forward transformation (system device to display) is:

$$DISPLAY = (0.333333 \times x) + 0$$

The display format is iiiii.d (five integer places and one decimal place).

If $x = 1$, then the display is 0.3.

Use **[↑]** to attempt to increment the displayed value, to 0.4.

Apply the inverse transformation:

$$(x = (DISPLAY - 0) / 0.333333)$$

and reduce it to an integer for transmitting to the system device. This gives a value of 1, i.e. it is unchanged. Therefore the increment function has had no effect. Note however that the operator station always interrogates the system device after attempting to modify a parameter so that the display always shows the current value of the parameter. In this example, the symptom would be that **[↑]** has no effect.

In the example, the effect can be overcome by reducing the display format to 5.0.

Lower Limit

This item in the menu defines a lower limit to numbers entered in the Operator's Menu for the read/write numeric parameter.

If an attempt is made in the Operator's Menu to enter a value through the numeric keypad which is less than the lower limit, an OUT OF RANGE message is displayed. If an attempt is made to decrement a value through the lower limit, the value remains at the lower limit, and no message is displayed.

If a value has been set below the lower limit by means other than the Operator's Menu (e.g. in the Engineer's Menu), then an OUT OF RANGE message will appear in the Operator's Menu for the parameter, and any attempt to change the value will be ignored.

The lower limit entered must be equal to, or greater than, the lower limit specified in the Quadraloc or 570 handbook for the particular parameter. When entering a value in the Operator's Menu the operator station checks only against the limit entered here, and not against the limit specified in the handbook.

Using the menu selection keys, obtain the following display:

PARAMETER n LOWER LIMIT

Press **[M]**. The display shows 'LOWER LIMIT' on the top line, and the current value of the lower limit on the bottom line. If a lower limit has not been set then an error message may appear on the bottom line instead of a value.

If the value is incorrect, or there is an error message, use the number entry procedure to enter the correct value.

The range of values for the lower limit is -99999999.999999 to +99999999.999999.

Upper Limit

This item in the menu defines an upper limit to numbers entered in the Operator's Menu for the read/write numeric parameter.

If an attempt is made in the Operator's Menu to enter a value through the numeric keypad which is greater than the upper limit, an OUT OF RANGE message is displayed. If an attempt is made to increment a value through the upper limit, the value remains at the upper limit, and no message is displayed.

If a value has been set above the upper limit by means other than the Operator's Menu (e.g. in the Engineer's Menu), then an OUT OF RANGE message will appear in the Operator's Menu for the parameter, and any attempt to change the value will be ignored.

The upper limit entered must be equal to, or less than, the upper limit specified in the Quadraloc or 570 handbook for the particular parameter. When entering a value in the Operator's Menu the operator station checks only against the limit entered here, and not against the limit specified in the handbook.

Using the menu selection keys, obtain the following display:

PARAMETER n UPPER LIMIT

Press **[M]**. The display shows 'UPPER LIMIT' on the top line, and the current value of the upper limit on the bottom line. If an upper limit has not been set then an error message may appear on the bottom line instead of a value.

If the value is incorrect, or there is an error message, use the number entry procedure to enter the correct value.

The range of values for the upper limit is -99999999.999999 to +99999999.999999.

Formula

The formula must be configured in the same way as for read only numeric parameters.

The transformation formula is applied to parameter values received from the system device before the value is displayed at the operator station. When numbers are entered through the numeric keypad, an inverse transformation is applied before the value is transmitted to the system device. The inverse transformation is calculated automatically by the operator station from the forward transformation.

Coefficient a

Coefficient a must be configured in the same way as for read only numeric parameters.

Coefficient b

Coefficient b must be configured in the same way as for read only numeric parameters.

Parameters 9 to 12

These parameters are read only named parameters. It is necessary to configure only those parameters which will be used in the Operator's Menu. For example if only one read only named parameter is to appear in the Operator's Menu, then only one of these four parameters needs to be configured.

Each used parameter must be configured for parameter name, mnemonic, and text associated with each value of the parameter.

Most named parameters may take a value of 0 or 1 (i.e. boolean parameters) and therefore two different text strings may be applied to such parameters. There are a few named parameters in Quadraloc which may have any integer value in the range 0 to 255, but in these cases the value is reduced to modulus 4 before applying a text string to the value. Thus four different text strings may be applied to such parameter. These are the parameters associated with loop type and digital output selection.

Parameter Name

The parameter name must be configured in the same way as for numeric parameters.

Mnemonic

The mnemonic must be configured in the same way as for numeric parameters.

Text For Value 0

This point in the menu structure defines the text string which will appear on the bottom line of the display in the Operator's Menu when the value of the parameter is a multiple of 4, i.e. 0, 4, 8, ..., 252.

Use the menu selection keys to obtain the following display:

PARAMETER n TEXT FOR VALUE 0

where n is the number (9 to 12) of the read only named parameter being configured. Press (M). The top line of the display shows 'TEXT FOR VALUE 0' and the bottom line of the display may be garbage depending on the previous contents of the EEPROM in the operator station.

Use the text entry procedure to enter the text string.

Text For Value 1

This point in the menu structure defines the text string which will appear on the bottom line of the display in the Operator's Menu when the value of the parameter is 1 plus a multiple of 4, i.e. 1, 5, 9, ..., 253.

Follow the same procedure as for value 0 above to enter the correct text.

Text For Value 2

This point in the menu structure defines the text string which will appear on the bottom line of the display in the Operator's Menu when the value of the parameter is 2 plus a multiple of 4, i.e. 2, 6, 10, ..., 254.

Follow the same procedure as for value 0 above to enter the correct text.

Text For Value 3

This point in the menu structure defines the text string which will appear on the bottom line of the display in the Operator's Menu when the value of the parameter is 3 plus a multiple of 4, i.e. 3, 7, 11, ..., 255.

Follow the same procedure as for value 0 above to enter the correct text.

Parameters 13 to 16

These parameters are read/write named parameters. It is necessary to configure only those parameters which will be used in the Operator's Menu. For example if only one read/write named parameter is to appear in the Operator's Menu, then only one of these four parameters needs to be configured.

Each used parameter must be configured for parameter name, mnemonic, maximum value, and text associated with each value of the parameter.

Most named parameters may take a value of 0 or 1 (i.e. boolean parameters) and therefore two different text strings may be applied to such parameters. There are a few named parameters in Quadraloc which may have any integer value in the range 0 to 255, but in these cases the value is reduced to modulus 4 before applying a text string to the value. Thus four different text strings may be applied to such parameter. These are the parameters associated with loop type and digital output selection.

Parameter Name

The parameter name must be configured in the same way as for numeric parameters.

Mnemonic

The mnemonic must be configured in the same way as for numeric parameters.

Maximum Value

This point in the menu defines a maximum value which the parameter may have. For example, a parameter with two states, 0 and 1 (i.e. a flag) has a maximum value of 1.

This value is used in the Operator's Menu to halt the increment function (↑) when the maximum value is reached.

Use the menu selection keys to obtain the following display:

PARAMETER n MAXIMUM VALUE

where n is the number of the parameter (13 to 16) being configured. Press (M). The top line of the display shows 'MAXIMUM VALUE' and the bottom line shows the current maximum value, or an error message depending on the previous contents of the EEPROM in the operator station.

If the value is incorrect, use the number entry procedure to enter the correct value.

The range of values is 1 to 3.

Text For Value 0

The text for value 0 must be configured in the same way as for read only named parameters.

Text For Value 1

The text for value 1 must be configured in the same way as for read only named parameters.

Text For Value 2

The text for value 2 must be configured in the same way as for read only named parameters.

Text For Value 3

The text for value 3 must be configured in the same way as for read only named parameters.

Display Sequence

Under this menu heading, the number of parameters to be displayed in the Operator's menu is set up, and also the order in which they will appear.

Entering this section of the Engineer's Menu takes the user through a sequence of events which, once started, cannot be abandoned.

Number of parameters

Use the menu selection keys to obtain the following display:

DISPLAY SEQUENCE NUMBER OF PARAMS

Press (M). The top line of the display shows NUMBER OF PARAMS and the bottom line is blank. Using the numeric entry procedure, enter the number of parameters that will appear in the Operator's Menu. The number of parameters must be in the range 1 to 16. Up to this point, the sequence can be abandoned by pressing (E) but after the number of parameters has been entered, and (ENTER) has been pressed, the sequence cannot be abandoned.

Having entered the number of parameters, the top line of the display now shows MENU ITEM 1, and the bottom line shows the name of parameter 1. If parameter 1 has not been configured, then the bottom line may be garbage.

Select Menu Items

Menu item 1 is the item which will appear first in the Operator's Menu after entry to it. It may be selected from any of the parameters which have been configured. Menu item 2 will be the second item to appear in the Operator's Menu etc.

If parameter 1 is not to be displayed first, then use \uparrow or \downarrow to scroll respectively forwards (parameters 2, 3 etc) or backwards (parameters 16, 15 etc) through the list of parameters. Unless all sixteen parameters have been configured, some of the names displayed may be garbage. When the name of the desired parameter is displayed, press \mathbb{M} . The top line of the display now shows MENU ITEM 2, and the bottom line again shows the name of parameter 1. Repeat the procedure that was used to select menu item 1 in order to select menu item 2.

Repeat this procedure until all menu items have been selected. The operator station will terminate this sequence when the requisite number of menu items has been selected, according to the number of parameters entered.

After the last menu item has been selected, the display shows:

CONFIGURATION
DISPLAY SEQUENCE

Configuration is now complete.

7.4.13 ENTERING THE OPERATOR'S MENU

To switch from the Engineer's Menu to the Operator's Menu, proceed as follows:

Use the menu selection keys to display the entry level menu:

OPERATOR STATION
RELEASE x.x

Press \mathbb{E} . If no changes have been made to parameters, or a SAVE ALL function has been performed, then the operator station enters the Operator's Menu, displaying item 1.

If changes have been made to parameters and not saved into EEPROM, then the following prompt will appear:

DON'T FORGET TO
SAVE PARAMETERS

If the changes are not to be saved, then press \mathbb{E} again. The operator station enters the Operator's Menu, displaying item 1. Otherwise press \mathbb{M} . The operator station returns to the Engineer's Menu so that the SAVE ALL function may be invoked.

7.5 OPERATOR'S MENU

The Operator's Menu consists of up to 16 items linked to form a loop, as shown in Fig 17.

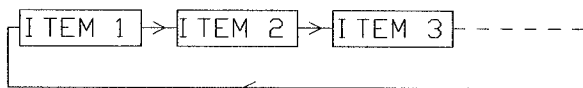


Fig 17. Operator's Menu Structure.

Before use, the Operator's Menu must be configured in the Configuration section of the Engineer's Menu.

Because the Operator's Menu is configurable, it is possible only to give general guidelines on operation in this manual. It is the user's responsibility to write application specific instructions.

7.5.1 DISPLAY FORMATS

There are two possible formats for displayed parameters.

Numeric Parameters

This type of parameter is displayed as follows:

PARAMETER NAME
VALUE UNITS

PARAMETER NAME is a text string (up to 16 characters long) which identifies the parameter being displayed, e.g. LINE SPEED, and is displayed on the top line of the L.C.D. display.

VALUE is the current value of the parameter. It may contain a decimal part as well as an integer part. Leading zeros in the integer part are suppressed, but trailing zeros in the decimal part are not. It is displayed on the bottom line of the L.C.D. display.

UNITS are the units associated with the parameter, e.g. M/MIN. It also is displayed on the bottom line of the L.C.D. display.

Named Parameters

This type of parameter is displayed as follows:

PARAMETER NAME
TEXT STRING

PARAMETER NAME is a text string (up to 16 characters long) which identifies the parameter being displayed, e.g. LINE CONTROL and is displayed on the top line of the L.C.D. display.

TEXT STRING is a name associated with the value of the parameter.

For example, a parameter may have values, 0, 1, 2 or 3. Meaningful names can be assigned to each value, such as

- 0 = OFF
- 1 = LOW
- 2 = MEDIUM
- 3 = HIGH

The bottom line of the display contains just the name assigned to the current value of the parameter, e.g.

LINE CONTROL
HIGH

7.5.2 SELECTING A MENU ITEM

After then Operator's Menu has been configured, the first item to appear on the display when entering the Operator's Menu, either after power on, or after exiting the engineer's menu, will be item 1. To select the next item in the list, press \mathbb{M} . Repeat this until the desired menu item is displayed.

If the Operator's Menu has not been configured, the following message will appear:

OPERATOR'S MENU
NOT CONFIGURED

Press **[E]**. The PASSWORD menu will appear. Enter the password to gain access to the Engineer's Menu in order to configure the Operator's Menu.

7.5.3 CHANGING THE VALUE OF A PARAMETER

Displayed parameters may be either read only (they cannot be changed), or read/write (they can be changed). An attempt to change a read only parameter is ignored. The method of changing the value of a read/write parameter depends on its type, i.e. numeric or named.

Numeric Parameters

Numeric parameters in the Operator's Menu may be changed as defined under the Standard Procedures section (7.3). The values of parameters are checked against the lower and upper limits entered during configuration, not against the limits defined in the manual for the appropriate System Device. An attempt to enter a value outside the configuration limits causes an OUT OF RANGE error display, and the parameter value remains unchanged.

Named Parameters

Named parameters may be changed by pressing either **[↑]** or **[↓]**. The value of the parameter is incremented or decremented, and the text string associated with the new value is displayed.

7.5.4 ON ENTRY

In both Quadraloc and 570 series drives, some parameters require 'soft' switches to be set before they can be written. For example, on the 570 drives, the ENABLE input (serial link mnemonic 'qu') requires switch 'x6' to be set before it can be written.

The operator station handles these parameters by scanning the list of parameters used in the Operator's Menu, and if any of them require a soft switch to be set, then the switches are set automatically.

This action takes place on power up and on entry to the Operator's Menu from the Engineer's Menu, or from aborting password entry.

In order to ensure that the switches are set, the operator station checks that the system device responds correctly. If the correct response is not received (for example the system device is not powered), the operator station displays the following message:

SYSTEM DEVICE
NOT RESPONDING

If this condition is acceptable, for example if a configured operator station has been taken off line to be re-configured, then press **[E]**. This allows password entry into the Engineer's Menu.

The following parameters have soft switches:

<u>Quadraloc</u>	<u>570 Drive</u>
ls	d1
s5	d2
w4	d3
w8	id
w9	o1
wg	o2
wh	o3
	qu
	r1
	s1
	s2
	sd
	sp
	st

7.5.5 ENTERING THE ENGINEER'S MENU

If a number entry has been started, it is necessary first to complete the entry or to abort it. Then from any position in the Operator's Menu press **[E]**. The display then shows:

PASSWORD

At this point, pressing any of the menu selection keys (**[↑]**, **[↓]**, **[E]** or **[M]**) returns the display to item 1 in the Operator's Menu. Otherwise enter the password using the numeric entry procedure. An asterisk is displayed for each digit entered. Press **[ENTER]** to complete the password entry.

If the password is valid, then the display shows the entry level menu of the Engineer's Menu. If the password is invalid, the bottom line of the display shows INVALID PASSWORD briefly, and then blanks in order that the password may be re-entered.

If a mistake is made during password entry, use either **[E]** to abort the entry, or **[ERASE]** to erase one digit at a time.

The operator station is supplied with the password 5721. This may be changed by the customer if desired in the Engineer's Menu.

7.6 RESTORING FACTORY DEFAULTS

It is possible to restore factory default values to all MMI parameters and the password.

Remove power from the operator station.

Press and hold **[↑]** and **[↓]**

Restore power to the operator station.

Release **[↑]** and **[↓]** after the self test is complete.

This procedure restores the factory defaults, but it does not store them into EEPROM. Follow the normal procedure to do this if required.

automatically to an alarm message, e.g.

SELF TEST FAIL

7.7 ALARM CONDITIONS

If alarms are enabled, the operator station regularly polls the system device for its health word. The health word contains sixteen bits (some of which may not be used) which indicate the health, or otherwise, of various critical parameters in the system device. If any one of these bits become set, then the display switches

The message at the operator station is a warning only: it is still operable, but the system device may cease operating. To restore the operator station to its condition prior to the alarm display, press **[E]**.

Refer to the relevant system device manual for detailed information on the alarm conditions.

8 ERROR MESSAGES

Error messages appear usually on the lower line of the L.C.D. display.

<u>ERROR MESSAGE</u>	<u>CAUSE</u>	<u>REMEDY</u>
+ve OVERFLOW	While entering a number, too many integer digits have been entered, and the number entered so far is positive. The message remains until action is taken to correct the error.	Press either [E] to escape or [ERASE] to erase the last digit(s) until the message disappears.
-ve OVERFLOW	While entering a number, too many integer digits have been entered, and the number entered so far is negative. The message remains until action is taken to correct the error.	Press either [E] to escape or [ERASE] to erase the last digit(s) until the message disappears.
OUT OF RANGE	A number has been entered outside the range for the parameter. In the Operator's Menu this message may appear when the value of a parameter has been set outside the configuration limits. This may be caused by a value being entered in the Engineer's Menu, where different limits may apply, or the parameter has been written over the host serial link on Quadraloc.	No action necessary. The message remains for a short period, and then the original value of the parameter re-appears. No corrective action can be taken in the Operator's Menu. It is necessary either to enter the Engineer's Menu and change the value, or to change the value over the host serial link.
COMMS ERROR	An attempt has been made to transfer a parameter value from the System Device to the Operator Station, but has failed. The message remains until action is taken to correct the error. Possible causes are : There is a fault in the communications wiring. The parameter selected is not available. For example the wrong system device, and therefore the wrong set of mnemonics may have been selected.	Rectify the wiring fault. Select the correct System Device, and then re-select all mnemonics for that device.
FORMULA ERROR	An attempt has been made to use the Operator's Menu without having configured the formula for one of the used parameters.	Configure the formula.
MNEMONIC ERROR	An attempt has been made to use the Operator's Menu without having configured the mnemonic for one of the used parameters.	Configure the mnemonic.
SYSTEM DEVICE NOT RESPONDING	On entry to the Operator's Menu, the operator station has been unable to communicate with the system device.	Either connect the system device correctly, or press [E] to allow entry into the Engineer' Menu through the password.
SELF TEST FAIL	An internal fault has been detected during the power-on self test.	No action possible. Contact Eurotherm Drives Service Department.

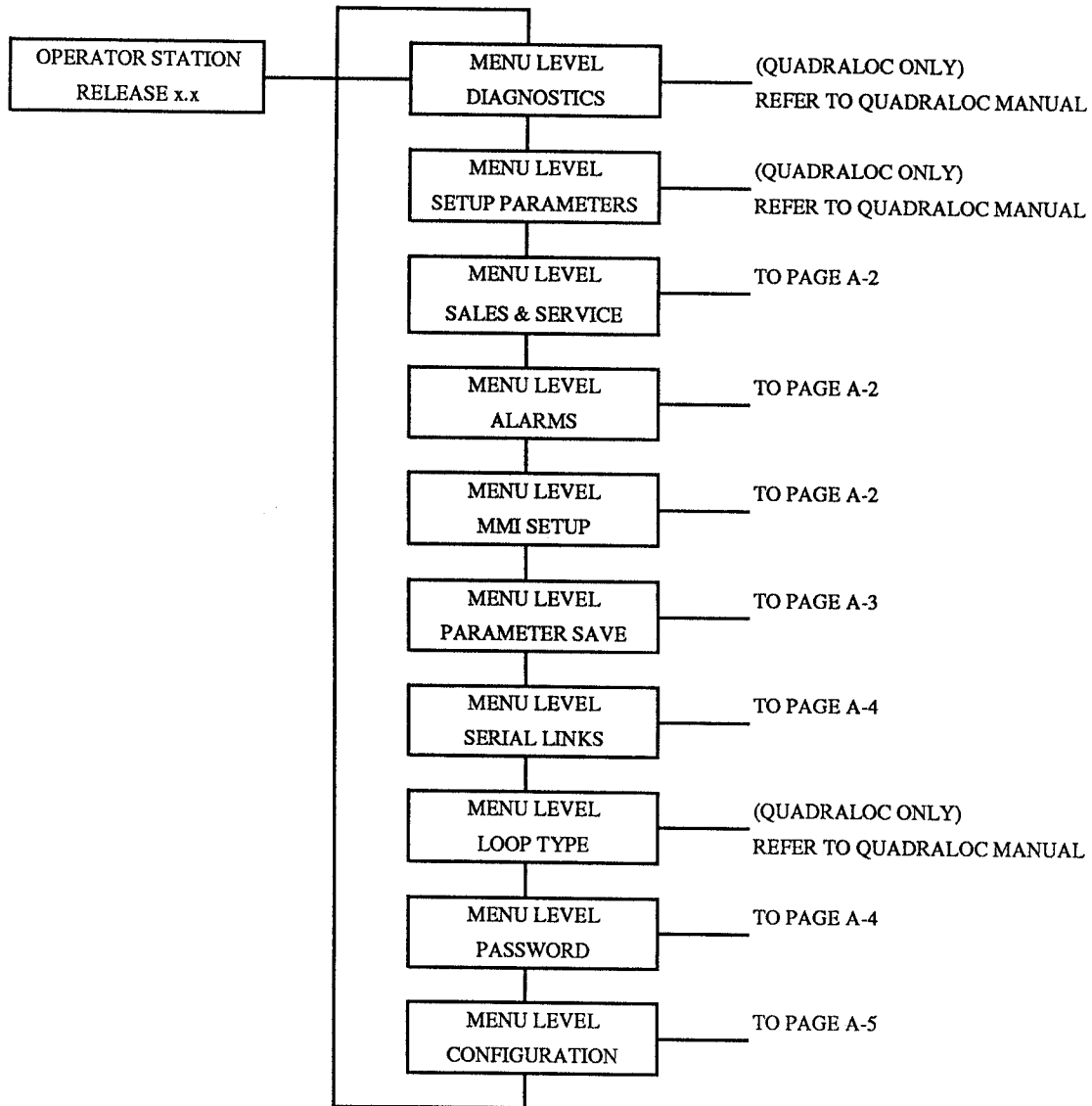
9 RELATED DOCUMENTS

<u>Document</u>	<u>EI Part number</u>
Eurotherm Drives Quadraloc Users Manual	HA057378C
Eurotherm Drives 570 drive Users Manual	HA056929C
Eurotherm International BISYNCH Communications Handbook	HP022047C

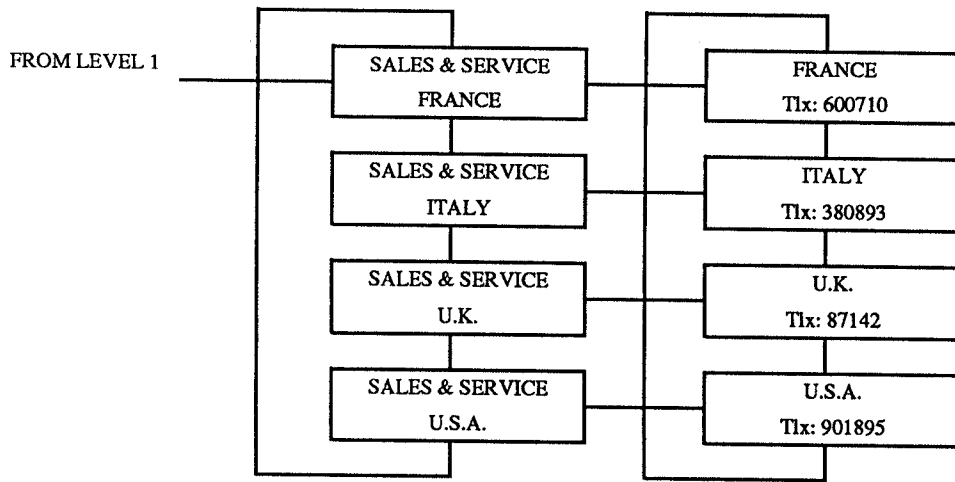
APPENDIX A

ENGINEER'S MENU STRUCTURE

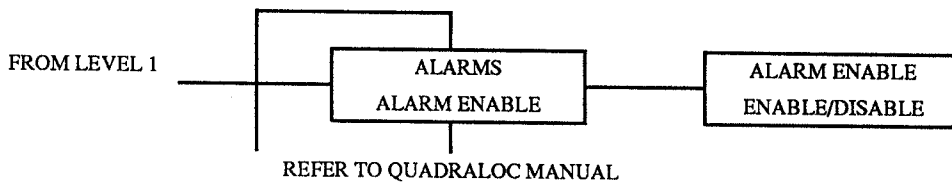
LEVEL 1



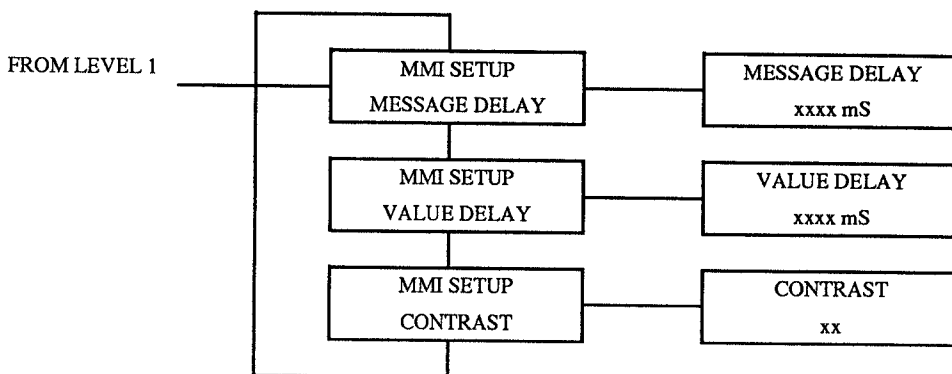
LEVEL 2 Menu Path = SALES & SERVICE



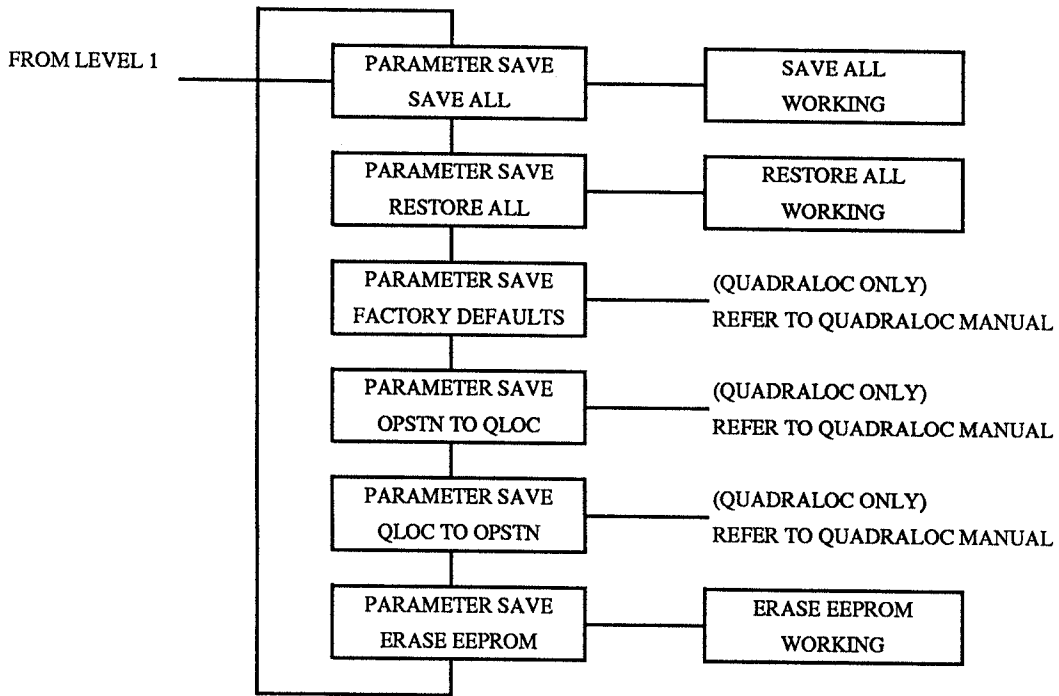
LEVEL 2 Menu Path = ALARMS



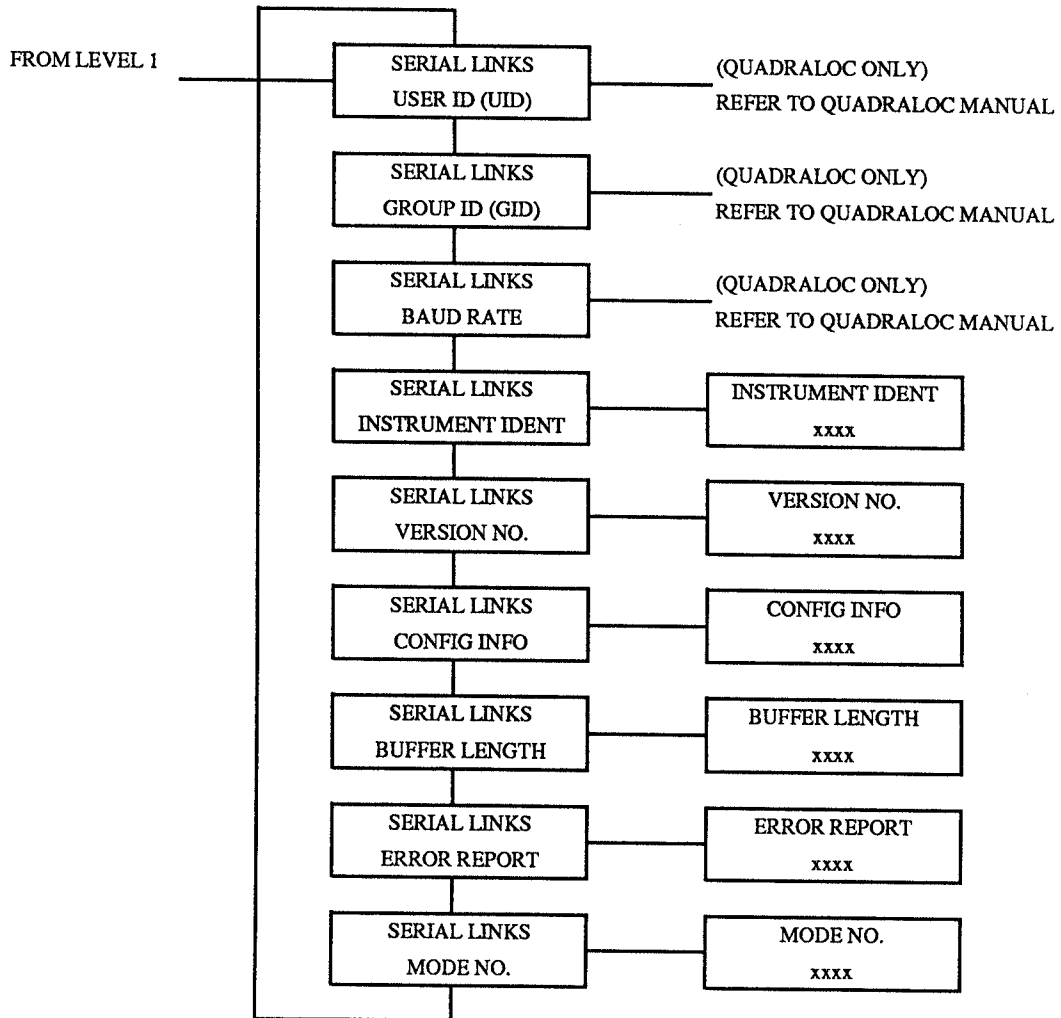
LEVEL 2 Menu Path = MMI SETUP



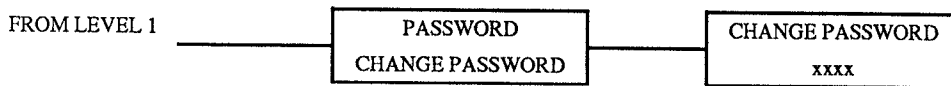
LEVEL 2 Menu Path = PARAMETER SAVE



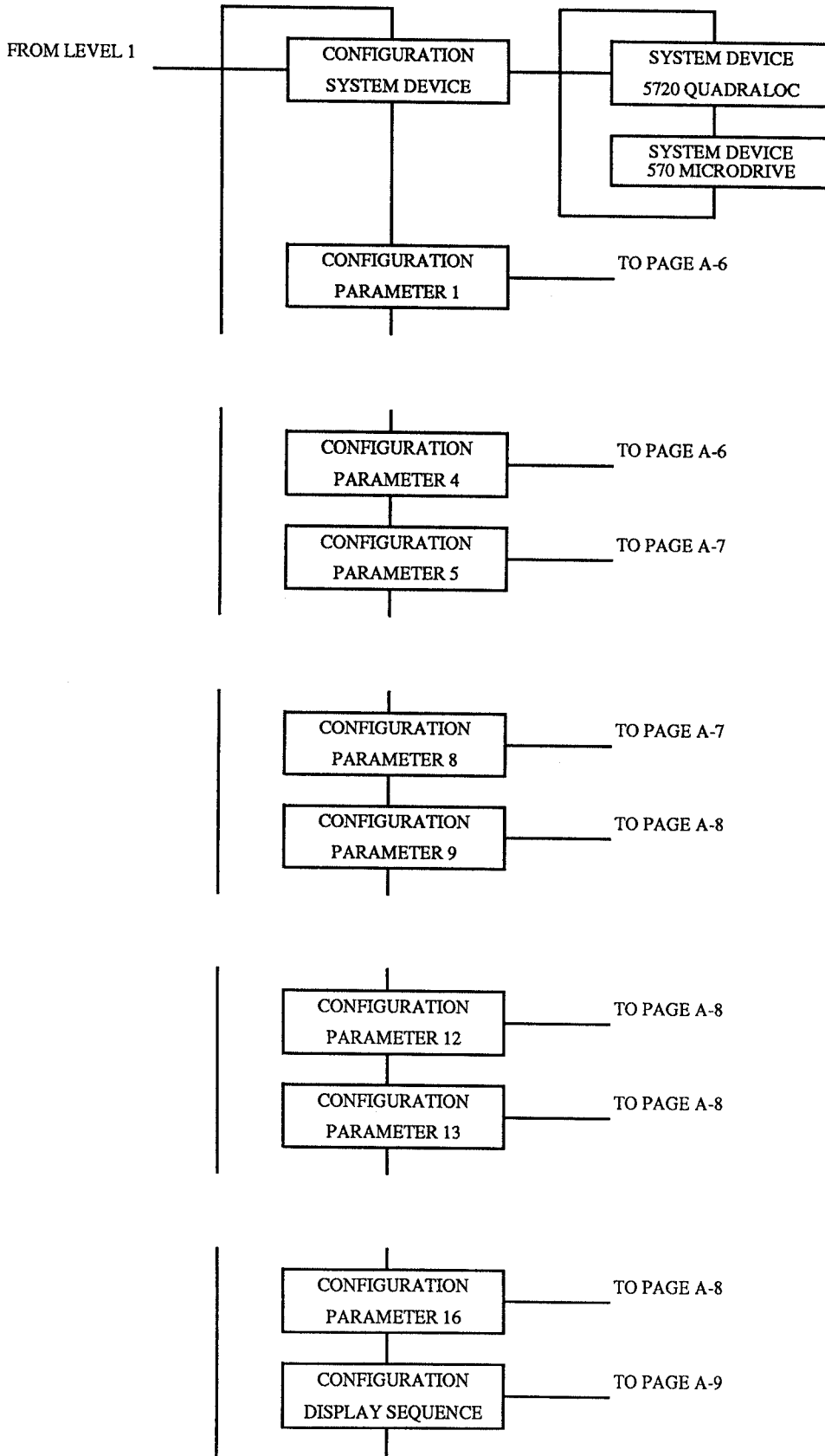
LEVEL 2 Menu Path = SERIAL LINKS



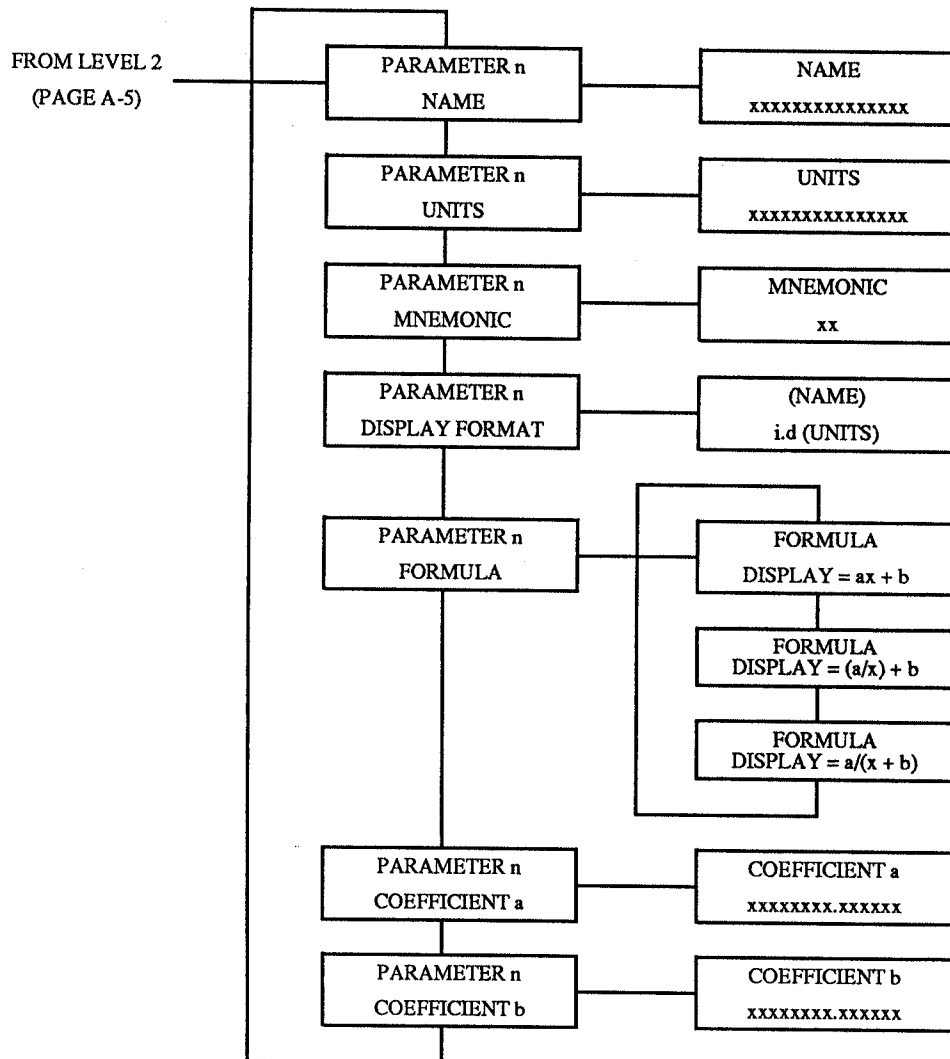
LEVEL 2 Menu Path = PASSWORD



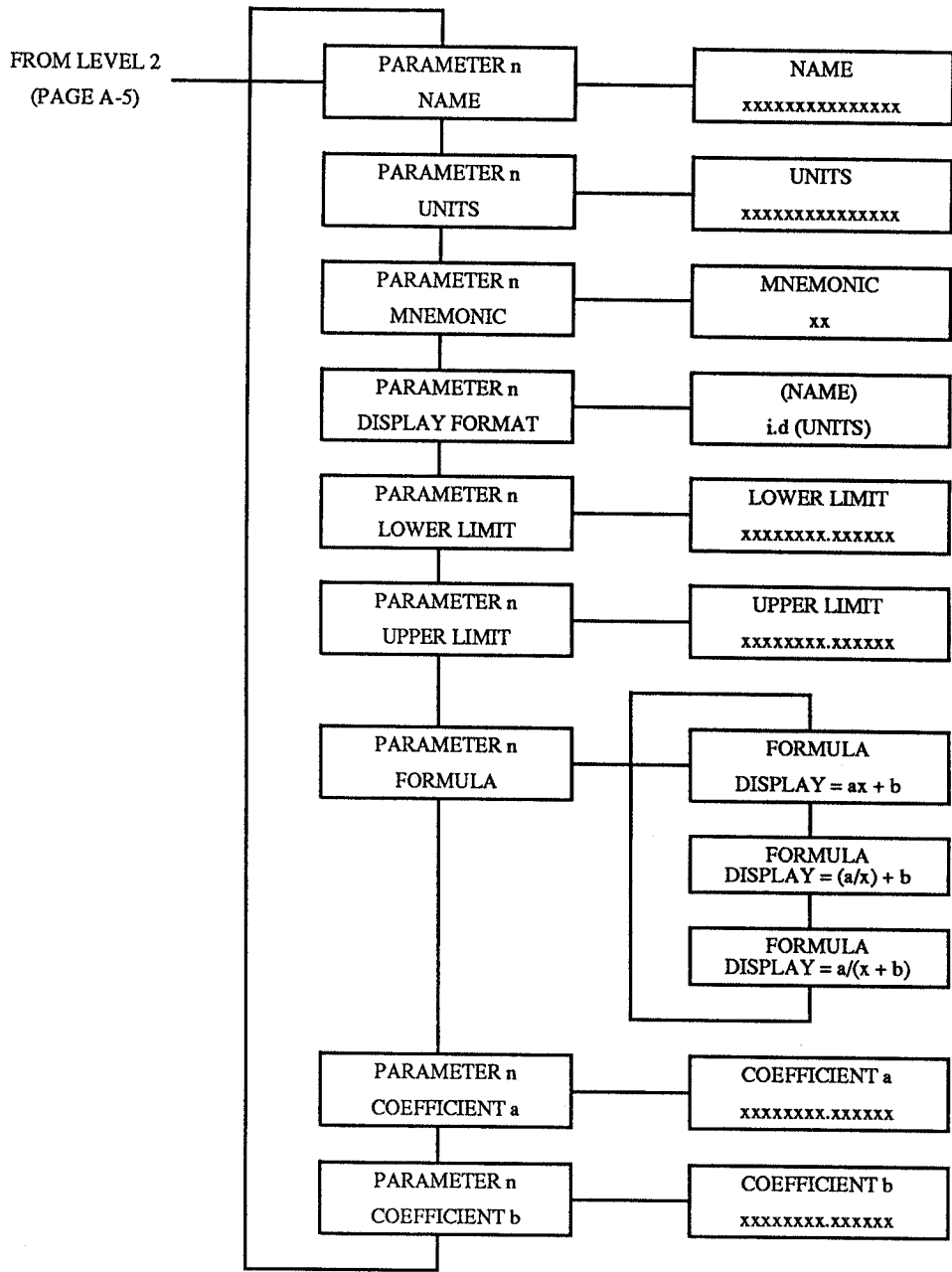
LEVEL 2 Menu Path = CONFIGURATION



LEVEL 3 Menu Path = CONFIGURATION : PARAMETERS 1 to 4

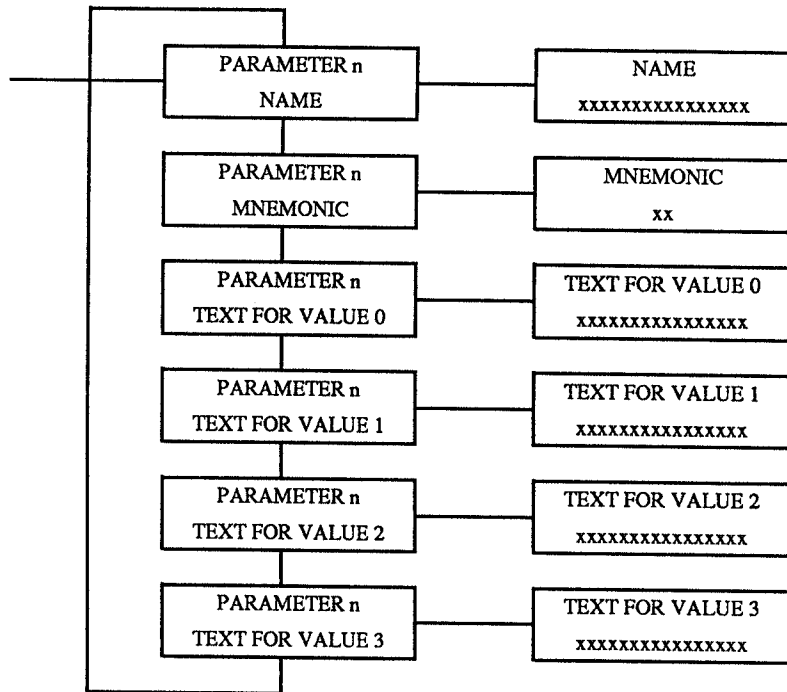


LEVEL 3 Menu Path = CONFIGURATION : PARAMETERS 5 to 8



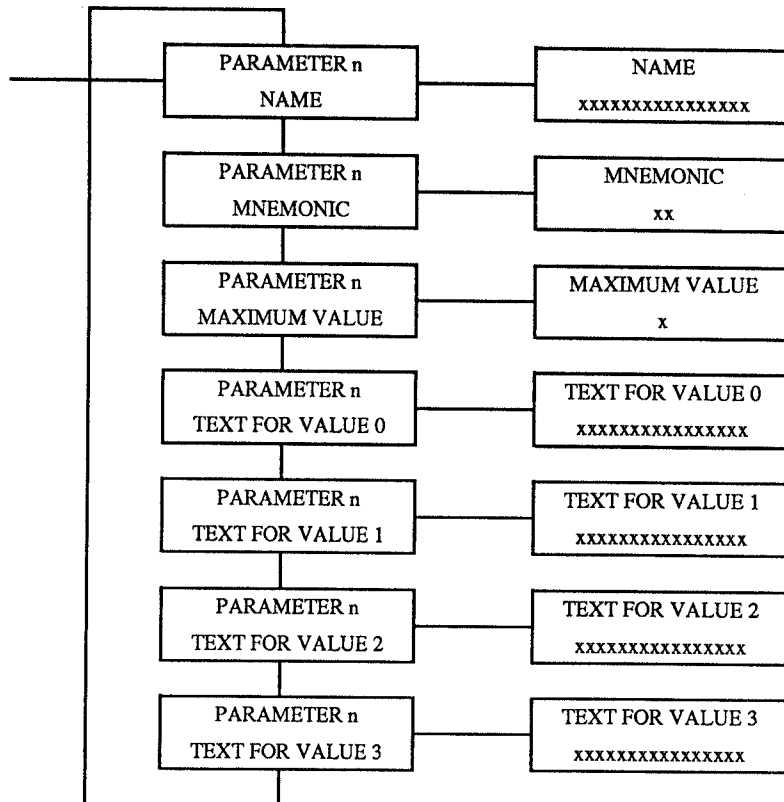
LEVEL 3 Menu Path = CONFIGURATION : PARAMETERS 9 to 12

FROM LEVEL 2
(PAGE A-5)

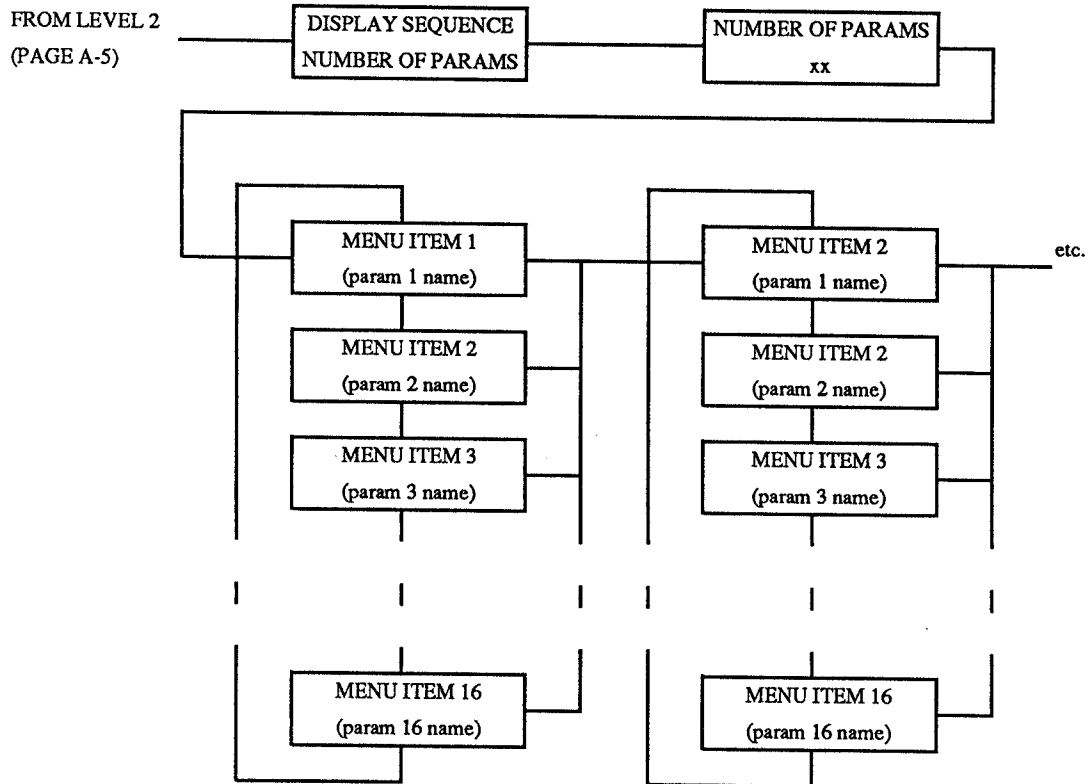


LEVEL 3 Menu Path = CONFIGURATION : PARAMETERS 13 to 16

FROM LEVEL 2
(PAGE A-5)



LEVEL 3 Menu Path = CONFIGURATION : DISPLAY SEQUENCE



APPENDIX B
OPERATOR'S MENU CONFIGURATION TABLE

SYSTEM DEVICE

DISPLAY SEQUENCE

Number of parameters :

Item number	Parameter name	Parameter number
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Parameter 3

Name

Display format & units

Mnemonic

Formula

DISPLAY=ax+b

DISPLAY=(a/x)+b

DISPLAY=a/(x+b)

Coefficient a

Coefficient b

Parameter 4

Name

Display format & units

Mnemonic

Formula

DISPLAY=ax+b

DISPLAY=(a/x)+b

DISPLAY=a/(x+b)

Coefficient a

Coefficient b

Parameter 5

Name

Display format & units

Mnemonic

Lower limit

Upper limit

Formula

DISPLAY= $ax+b$

DISPLAY= $(a/x)+b$

DISPLAY= $a/(x+b)$

Coefficient a

Coefficient b

Parameter 6

Name

Display format & units

Mnemonic

Lower limit

Upper limit

Formula

DISPLAY= $ax+b$

DISPLAY= $(a/x)+b$

DISPLAY= $a/(x+b)$

Coefficient a

Coefficient b

Parameter 7

Name

Display format & units

Mnemonic

Lower limit

Upper limit

Formula

DISPLAY=ax+b

DISPLAY=(a/x)+b

DISPLAY=a/(x+b)

Coefficient a

Coefficient b

Parameter 8

Name

Display format & units

Mnemonic

Lower limit

Upper limit

Formula

DISPLAY=ax+b

DISPLAY=(a/x)+b

DISPLAY=a/(x+b)

Coefficient a

Coefficient b

Parameter 9

Name

Mnemonic

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 10

Name

Mnemonic

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 11

Name

Mnemonic

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 12

Name

Mnemonic

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 13

Name

Mnemonic Maximum Value

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 14

Name

Mnemonic Maximum Value

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 15

Name

Mnemonic

Maximum Value

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

Parameter 16

Name

Mnemonic

Maximum Value

Text for Value 0

Text for Value 1

Text for Value 2

Text for Value 3

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1	Initial Issue	6501	24.04.1991	GDR
2	Added warning note to Section 2.4. Replaced SSD with Eurotherm Drives.	8270	07.05.93	GDR
3	Corrected password from 5721 to 0 on page 14.	9064	29.11.94	<i>AFL</i>
FIRST USED ON		MODIFICATION RECORD		
 EUROTHERM DRIVES		DRAWING NUMBER ZZ058017C		Sht. 1 of 1 Shts.