Model 5100e

100 mm graphics recorder

User guide

EUROTHERM

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EUROTHERM

Declaration of Conformity

Manufacturer's name:	**Eurotherm Limited**
Manufacturer's address	**Faraday Close, Worthing, West Sussex, BN13 3PL, United Kingdom.**
Product type:	**Industrial graphics recorder**
Models:	**5100e Status level A1 and above**
Safety specification:	**EN61010-1: 1993 / A2:1995**
EMC emissions specification:	**EN61326**
EMC immunity specification:	**EN61326**

Eurotherm Limited hereby declares that the above products conform to the safety and EMC specifications listed. Eurotherm Limited further declares that the above products comply with the EMC Directive 89 / 336 / EEC amended by 93 / 68 / EEC, and also with the Low Voltage Directive 73 /23 / EEC

Signed: _____   Dated: _____

Signed for and on behalf of Eurotherm Limited
Peter de la Nougerède
(Technical Director)

CE

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GRAPHICS RECORDER

USER MANUAL

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SAFETY NOTES

WARNING

Any interruption of the protective conductor inside or outside the apparatus, or disconnection of the protective earth terminal is likely to make the apparatus dangerous under some fault conditions. Intentional interruption is prohibited.

Note: in order to comply with the requirements of safety standard BS EN61010, the recorder shall have one of the following as a disconnecting device, fitted within easy reach of the operator, and labelled as the disconnecting device.

a   A switch or circuit breaker which complies with the requirements of IEC947-1 and IEC947-3

b.   A separable coupler which can be disconnected without the use of a tool

c.   A separable plug, without a locking device, to mate with a socket outlet in the building.

1. Before any other connection is made, the protective earth terminal shall be connected to a protective conductor. The mains (supply voltage) wiring must be terminated within the connector in such a way that, should it slip in the cable clamp, the Earth wire would be the last wire to become disconnected.

2. In the case of portable equipment, the protective earth terminal must remain connected (even if the recorder is isolated from the mains supply), if any of the I/O circuits are connected to hazardous voltages*.

3. The mains supply fuse within the power supply is not replaceable. If it is suspected that the fuse is faulty, the manufacturer's local service centre should be contacted for advice.

4. Whenever it is likely that protection has been impaired, the unit shall be made inoperative, and secured against accidental operation. The manufacturer's nearest service centre should be contacted for advice.

5. Any adjustment, maintenance and repair of the opened apparatus under voltage, should be avoided as far as possible and, if inevitable, shall be carried out only by a skilled person who is aware of the hazard involved.

6. Where conductive pollution (e.g. condensation, carbon dust) is likely, adequate air conditioning/filtering/sealing etc. must be installed in the recorder enclosure.

7. Signal and supply voltage wiring should be kept separate from one another. Where this is impractical, shielded cables should be used for the signal wiring.

8. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.

* A full definition of 'Hazardous' voltages appears under 'Hazardous live' in BS EN61010. Briefly, under normal operating conditions, hazardous voltages are defined as being > 30V RMS (42.2V peak) or > 60V dc.

SYMBOLS USED ON THE RECORDER LABELLING

One or more of the symbols below may appear as a part of the recorder labelling.

⚠	Refer to the manual for instructions
⏚	Protective earth
∿	This recorder for ac supply only
- - -	This recorder for dc supply only
∿	This recorder for either ac or dc supply
⚡	Risk of electric shock

USER GUIDE

1 INTRODUCTION

This document describes the installation, operation and configuration of a 100mm graphics recorder. The recorder has the facility for FTP transfer and Remote viewer connection if the Ethernet option is fitted.

1.1 UNPACKING THE RECORDER

The recorder is despatched in a special pack, designed to give adequate protection during transit. Should the outer box show signs of damage, it should be opened immediately, and the recorder examined. If there is evidence of damage, the instrument should not be operated and the local representative contacted for instructions. After the recorder has been removed from its packing, the packing should be examined to ensure that all accessories and documentation have been removed. The packing should then be stored against future transport requirements.

2 INSTALLATION

2.1 MECHANICAL INSTALLATION

Figures 2.1a gives installation details.

> Note: It is recommended that the rear face of the panel be centre-punched at suitable positions to locate the tips of the case clamps. Otherwise, particularly on smooth surfaces, the clamps can 'wander' as they are tightened, leading to inefficient clamping and possible damage to the recorder mounting slots.

The unit is inserted through the panel aperture from the front of the panel. With the weight of the recorder supported, a panel clamp is inserted into each of the mounting slots (one each on the left- and right-hand sides). The jacking screws are then tightened sufficiently to clamp the recorder into position. EXCESS FORCE SHOULD NOT BE USED IN TIGHTENING THESE SCREWS.

2 INSTALLATION (Cont.)

144mm (5.67in)

144mm (5.67in)

25mm (0.99 in)

Gland {approx 4 mm (.1875 in)}

247.5mm (9.75in)

213mm (8.39in)

View on right hand side

103 mm (4.1 in)

137mm (5.4in)

Mounting slot (Left hand side)

Lift then pull to open flap for mass storage access

Panel thickness (25.4mm (1 in) max)

x

138 x 138mm (-0.0 + 1.0)

5.44 x 5.44 in (-0.00 + 0.04)

y

Panel cutout

View on under side

137mm (5.4in)

Minimum recommended spacing	
Side clamps	Top/bottom clamps
x = 15mm (0.6 inch) y = 10 mm (0.4 in)	x = 10 mm (0.4 in) y = 15mm (0.6 inch)

Vertical

a° b°

MAXIMUM INSTALLED ANGLE
a = b = 15 degrees max

Panel clamping

Figure 2.1a Mechanical installation details - small frame unit

2.2 ELECTRICAL INSTALLATION

2.2.1 Signal wiring

Figure 2.2.1a shows connector locations for the input channel and for the optional relay output/ethernet board

CONNECTOR WIRING DETAILS

Maximum wire size (inputs) = 4.13mm² (11 AWG)
Maximum wire size (relay) = 1.5 mm² (16 AWG)
Minimum wire size = 0.081mm² (28 AWG)
Design torque = 0.8Nm.

Figure 2.2.1b shows details of input board wiring and figure 2.2.1c shows relay output wiring.
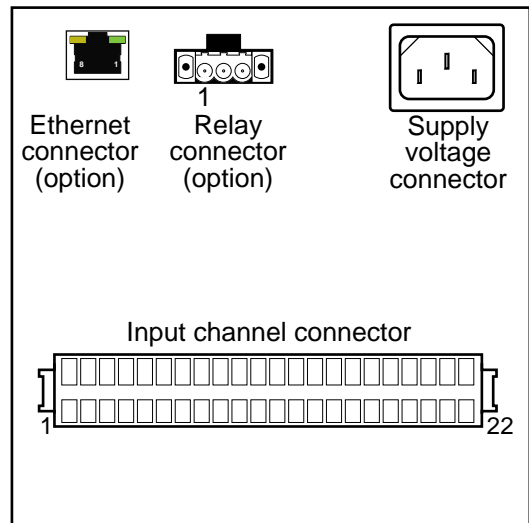
Figure 2.2.1a Connector locations - small frame units
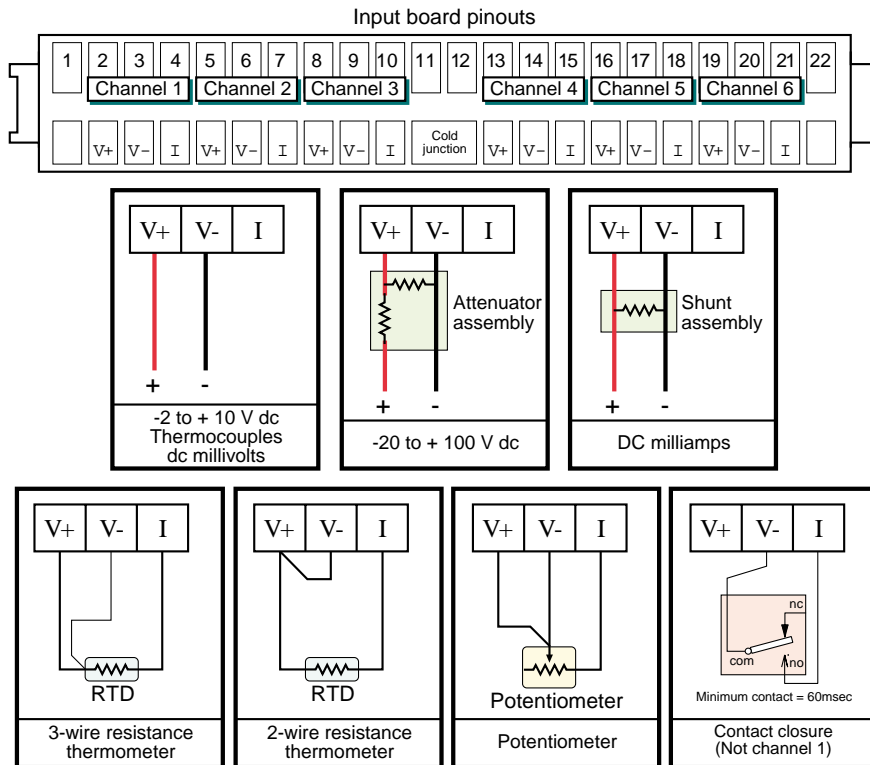
Figure 2.2.1b Input board wiring details
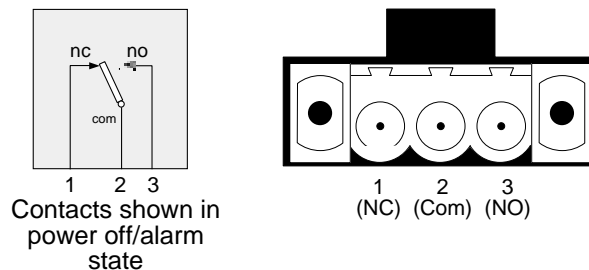
Figure 2.2.1c Relay wiring details

2.2.2 Supply voltage wiring

AC SUPPLY

The supply voltage to the recorder is terminated using an IEC socket which is connected to the mating plug at the rear of the recorder. The recorder is suitable for use with all ac voltages between 85 and 265 V RMS (47 to 63 Hz), and requires 60 VA max. power.

The minimum recommended wire size is 16/0.2 (0.5mm^2).

2.3 DISK INSERTION AND REMOVAL

The disk slot is located below the recorder screen, and is protected by a flap as shown in figure 2.1, above.

In order to access the disk slot, the bottom of the central part of the flap is lifted (figure 2.3a) and then used as a handle to pull the main flap open.

If a disk is already fitted, it is removed by pressing on the eject button (figure 2.3b).

Note: Before disk removal, archiving should be suspended (section 4.1) (wait for the green LED on the disk drive to be extinguished), otherwise data might be lost.
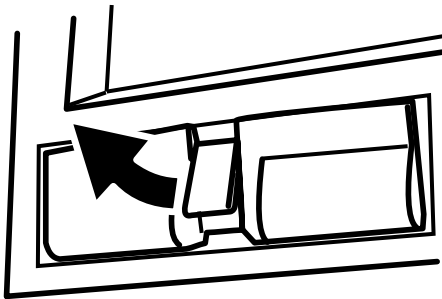
Figure 2.3a Disk access
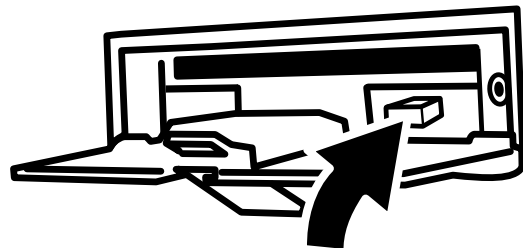
Figure 2.3b Disk eject

3 PROCESS VARIABLE DISPLAY

The operator interface consists of a touch-sensitive screen, showing either process variable values in one of a number of formats, or, showing configuration or operational details for use in setting up the recorder. This section (3) describes the process variable displays. Section 4 describes the Configuration displays.

Figure 3, below, depicts a typical trend display and gives details of the various areas of the display page.

TRUNCATION OF NUMERIC VALUES

If the amount of space on the display page is insufficient to display the full width of the process variable or scale value, then the displayed value is rounded down and the number of decimal places reduced.

CURRENT TRACE ALARM ICONS

In each of the different types of PV display, each channel's faceplate give the status of the channel's two alarms. This status is shown by a red arrow head, pointing upwards if the alarm is absolute high, or downwards if absolute low. As described in section 4.3.2 (Channel/alarm configuration) the alarms may be both high, or both low, or one may be high and the other low. If the arrow head is flashing it is active and unacknowledged; if it is on continuously, the alarm is active and acknowledged. See section 3.1.3, below, for a description of how to acknowledge alarms.
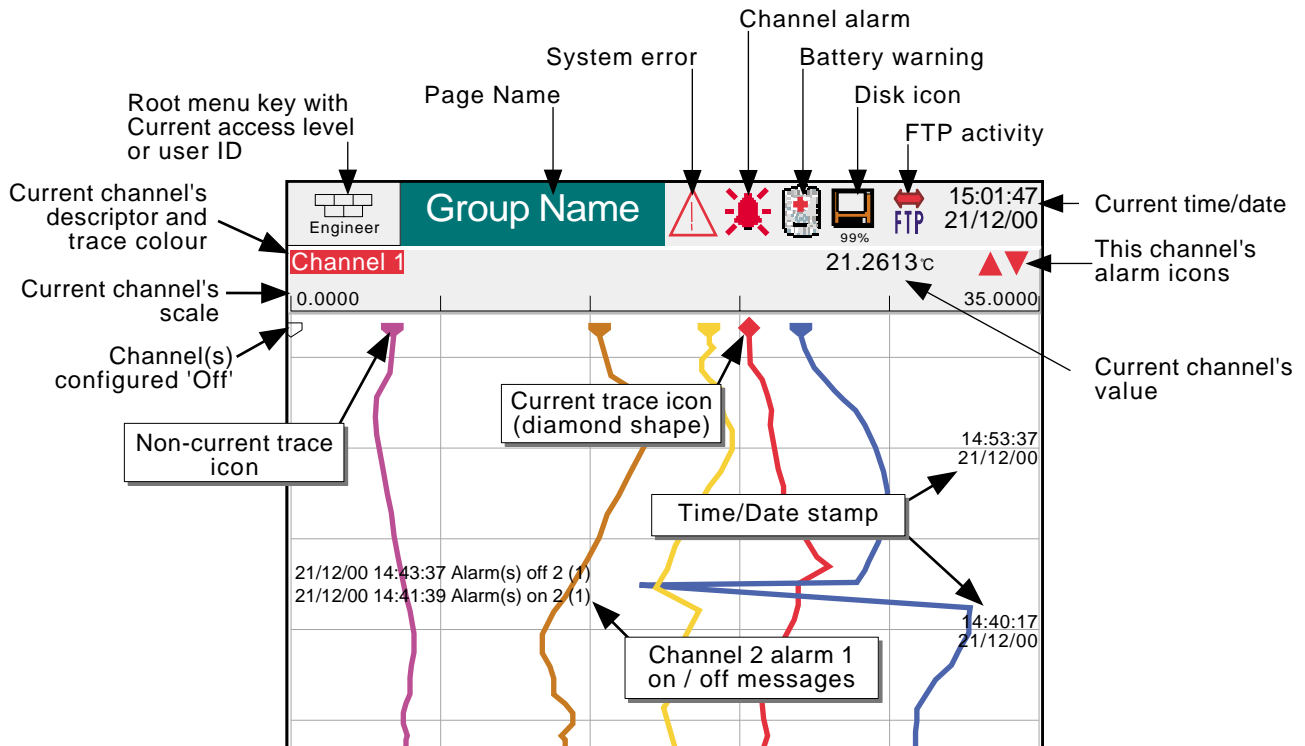
Figure 3 Trend display definitions

3.1 STATUS BAR
This appears across the top of the display, and contains the items described below.

3.1.1 Current access level

There are four access levels available (Logged out, Operator, Engineer and Service), and the current level is displayed in this key at the top left hand corner of the display. Touching this key calls the root menu as described in section 3.2.1 (Key functions) below. If 'user IDs' have been entered in the 'Add User' part of the Security setup, then the current user Id is displayed instead of the access level.

3.1.2 Page name

Initially this shows the current group's descriptor. The name changes according to context for example 'Operator' or 'Config-Archive'.

3.1.3 Error/alarm indicators
This area of the display can contain up to four icons: System error, Channel alarm, Battery change, Disk status. Pressing this area of the screen calls a pop-up display (figure 3.1.3) giving the option to view messages or to acknowledge channel alarms. Also incorporated in this display is a slider control allowing the user to optimise the display contrast for the local environment.
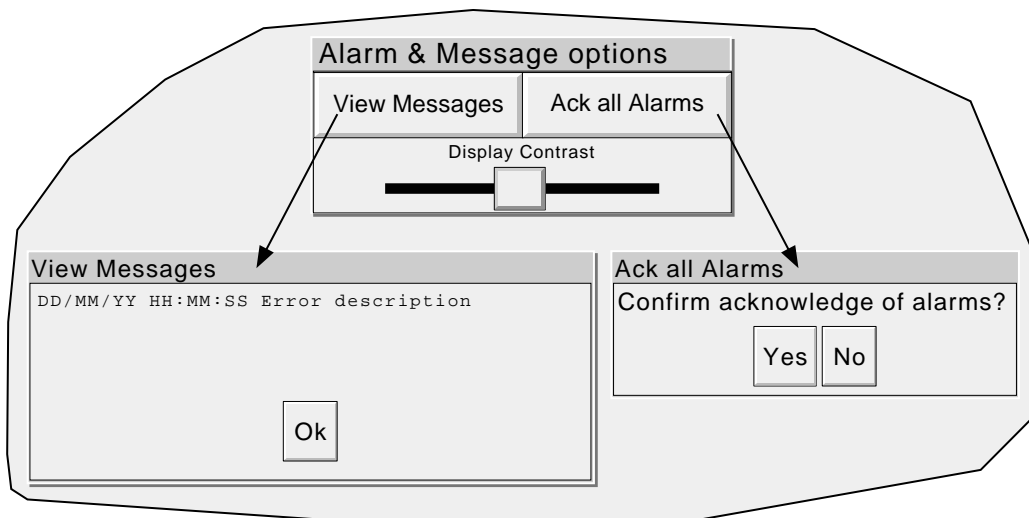
Figure 3.1.3 Alarm acknowledgement /System error display / Display contrast pop-up

3.1.3 ERROR/ALARM INDICATORS (Cont.)

SYSTEM ERROR

This indicator appears, flashing, if any of the following errors are active. The view messages page shows any active errors:

Archive failed -(message)	Message explains archive failure - due to disk being missing, write protected, faulty, full etc.
Clock failure	Internal clock was corrupt at power up, or the time has never been set. Can be caused by battery failure, in which case the battery icon will also be visible. The error is cleared by setting the time and date.
Battery-backed RAM cleared	This message appears if the battery has failed, and the unit has been switched off.
Channel failure	Indicates a hardware failure in the channel circuit
Channel error	Indicates a hardware failure in the channel circuit or in the internal CJ temperature measurement

Failed to authenticate the user name and/or password supplied

Appears if an incorrect user name or password has been entered whilst trying to establish remote viewer connection.

Floppy disk worn	Appears if a number of attempts had to be made before write to the disk was successful. No data is lost, but the disk should be replaced as soon as is practicable.
Floppy disk corrupt	This appears if all attempts to write to the disk fail. In such a case, some data may be lost. If the damaged area of the disk is in the system part of the disk, it might appear to the recorder that it is unformatted, and the disk icon will disappear. The disk should be replaced immediately.
Internal flash: \user\ required repair	Error found (in the internal file system) at power-up, and corrected.
Internal flash: \system\ required repair	Error found (in the internal file system) at power-up, and corrected.
Internal flash: \history\ required repair	Error found (in the internal file system) at power-up, and corrected.

Maximum Remote Viewers already connected to ...

Appears if an attempt is made to connect more remote viewers to the recorder than are configured in the Options menu.

Network connection has timed out	Appears if no connection can be established between the remote viewer and the recorder. This might be caused by, for example, cable failure, network hardware failure, etc.
Unable to connect to host ...	As for 'Network connection has timed out' message above, but with the addition of 'incorrect host address' as a possible cause.
Unable to resolve hostname	Message appears if an incorrect host address is entered or if there is a network failure whilst trying to establish remote viewer connection.

3.1.3 ERROR/ALARM INDICATORS (Cont.)

CHANNEL ALARM

This red 'bell' indicator appears if any channel is in alarm. The symbol is illuminated continuously if all alarms are acknowledged or flashes if any active alarm is unacknowledged. To acknowledge all unacknowledged alarms, the flashing indicator is touched, and the 'Ack all Alarms' key in the resulting 'pop-up' page is touched.

CHANGE BATTERY

This flashing indicator first appears when the battery voltage indicates that the battery is approaching the end of its useful life. The indicator continues to flash until the battery is replaced (Section 7.3.2).

3.1.4 Disk icon

This shows the free space available on the disk. The disk icon appears soon after a disk is inserted.

Only archiving activity is indicated; during archiving, the central area of the disk icon flashes green, regularly. No other disk activity is indicated.

This area of the icon flashes green/white during archive.
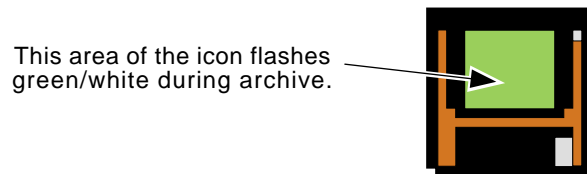
Figure 3.1.4 Archive activity indication

3.1.5 FTP Icon

For those recorders fitted with Ethernet option, the File Transfer Protocol (FTP) icon appears to the right of the disc icon position, whenever transfer activity is taking place.

3.2 NAVIGATION KEYS

These keys allow the user to perform various context-related tasks such as to access the recorder configuration, to archive data etc. In addition to this, left and right arrow keys or open/close folder keys appear where relevant.

Close folder	Open folder	Left cursor	Right cursor	Root
📁	📁	←	→	Engineer
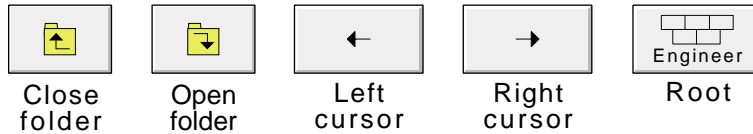
3.2.1 Key functions

Close folder   Used, where appropriate, to recall the previous (higher level) display page.

Open folder   Used, where appropriate, to call a further (lower level) display page.

Left cursor   Used to navigate backwards through a text string, when editing.

Right cursor   Used to navigate forwards through a text string, when editing.

Root   Calls the 'Root Menu' as shown.

ROOT MENU KEYS

Home   Causes a return to the 'Home' page from any page in the recorder. As delivered, the 'Home' page is the vertical trend display as depicted in figure 3, but this can be edited (in Operator/System - Setup) to be any of the available display modes - Horizontal trend, Vertical bargraph, Horizontal bargraph, Numeric etc.

Root Menu	
Home	Operator
File	Cycle
Login	Options

Operator   Causes the top level Operator page to appear. The appearance of this display is dictated by the security level that the recorder is set to, and by the access level of the user. As despatched from the factory, the recorder is in 'logged out' mode and the Operator page contains only the buttons labelled 'Archive', 'Security' and System. Further details appear in 'Access to configuration' below.

File   Allows the file system in that area of Flash memory that is accessible to the user, and the file system on any floppy disk fitted to be viewed. See section 5 for details.

Cycle   Causes the next display mode to be selected for process variable display.   Initially, the sequence is Trace (on white background), vertical bargraph, horizontal bargraph, numeric. Though the order in which these displays appear cannot be changed, all modes can be enabled/disabled in the Operator/System-Setup configuration page. Tracing on a dark background is an alternative mode to tracing on a white background, not an additional mode.

Login   Calls the login page described in section 3.3.1, below

Options   Used for a number of functions depending on the context. For example, entering or exiting trend review mode, or calling the filer option pop-up.

To quit the Root menu, touch the root key again.

3.3 FIRST SWITCH-ON

There is no on/off switch associated with the recorder.

When power is applied the recorder initialises, and once this process is complete, the home page is displayed. It is unlikely that this will contain any useful information because the input channels will not, as yet, have been configured to suit the type of input signals being applied to them, as described in section 4.

The recorder has four security levels as follows

Logged out   Initially, no access to recorder configuration is possible. Only Archive, Login/security and the System 'About' functions can be accessed - via the root menu. Limited or full access can be permitted from 'Engineer' level.

Operator   No access to recorder configuration is possible until access permission has been set up. Limited or full access can be permitted from 'Engineer' level, either with or without a separate password.

Engineer   Accessed initially, by entering '10' as the password. Full access to all recorder functions is available. The Engineer password can be edited and an Operator level password can be entered. Access permission to some or all of the recorder functions can be granted, or not, to the operator and/or logged out security levels.

Service   Full access to all recorder functions and to areas of recorder memory for diagnostic purposes. For use only by Service Engineers.

3.3.1 Access to Configuration

1   Once the recorder has initialised, touch the Root key, followed by 'Login'. Touching the 'Logged out' field in the resulting display, calls the access level picklist as shown in figure 3.3.1a.
2   Press 'Engineer' to call the Password request page.
3   Touching the blank Password area calls the keyboard display (see figure 3.3.1b).
4   Touch <Numeric><1><0><OK> to enter the password '10'. The screen reverts to the 'Home' page.
5   Operation of the Root key followed by a touch on the Operator key calls the top level page allowing access to the Archive, Save/Restore, Config, Security, Network*, and System areas described in section 4 below.

<div style="border:1px solid">

Login

Select the required access level and enter the password if required.

User **Logged out** ▼

> **Logged out**
>
> **Operator**
>
> **Engineer**
>
> **Service**

Cancel

</div>
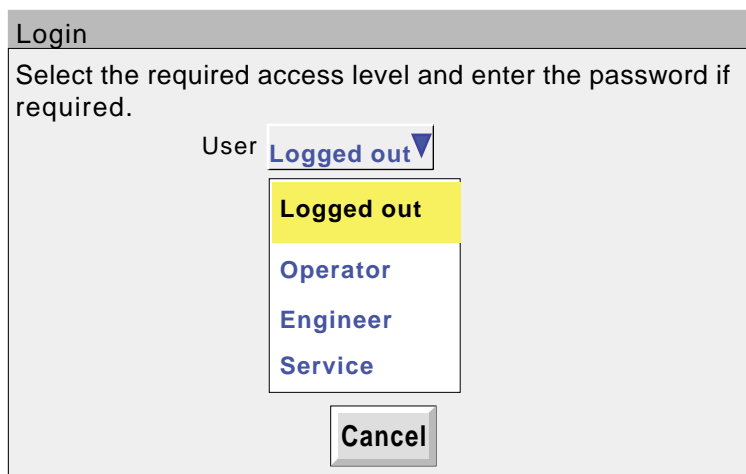
Figure 3.3.1a Access to configuration

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* Network configuration appears only if the Ethernet option is fitted.

3.3.1 ACCESS TO CONFIGURATION (Cont.)

TEXT STRING ENTRY

The keyboard which appears when the password area is touched is the same as that which appears when any non-numeric text string entry is required (e.g. channel descriptor). Figures 3.3.1b and 3.3.1c below are an attempt, within the limitations of the illustrating process, to depict the available keyboards and thus the available character set. Actual entry of the text string is by touching the relevant key.   For items which require only a numeric entry (e.g. channel range) the numeric keyboard appears.

When editing existing text strings, the existing text string appears highlighted, and will be replaced in its entirety by the first character entered. To avoid this, the left arrow key can be touched to 'unhighlight' it.

Immediately below the keyboard are six keys with the functions listed below. When active, the background colour changes to yellow for as long as the key is active.

Shift*   Once the shift key has been pressed, the next-entered letter appears as a capital; subsequent letters are in lower case.

Caps*   When pressed, all subsequent letters appear as capital letters until the Caps key is operated again

BSpc   This backspace key deletes character to the left of the cursor.

Ovr   If selected, the next-entered character replaces (overwrites) the existing character to the right of the cursor position. If not selected, the next-entered character in inserted into the existing text string at the cursor position.

Ok   Used to save the new text string and to return to the page from which the keyboard was called.

Cancel   Causes a return to the page from which the keyboard was called without saving the new string.

*Note: The character on each display key is always a capital letter, whether or not the actual character being entered is in capitals or lower case.
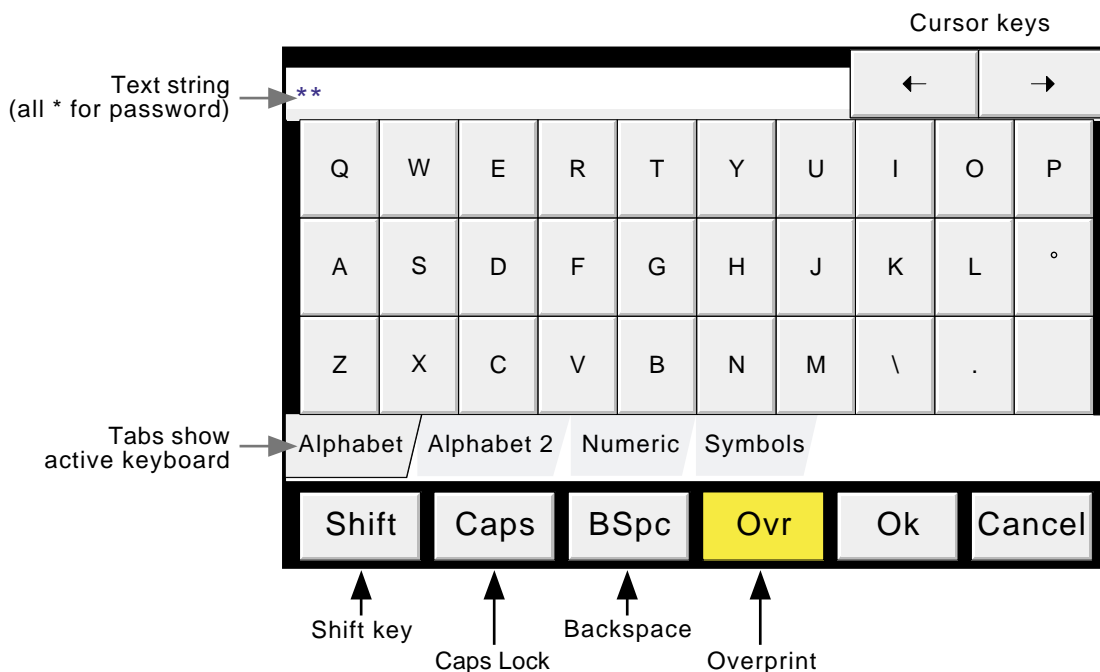
Figure 3.3.1b Alphabet 1 keyboard

3.3.1 ACCESS TO CONFIGURATION (Cont.)

TEXT STRING ENTRY (Cont.)
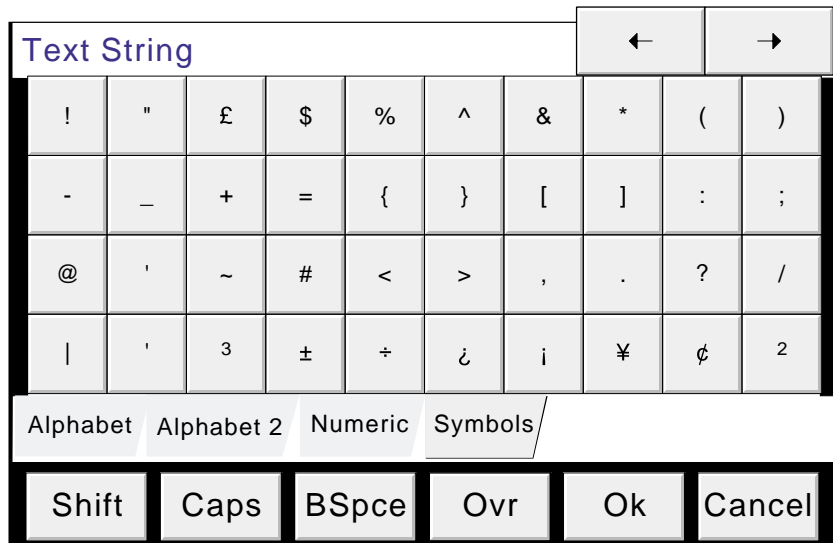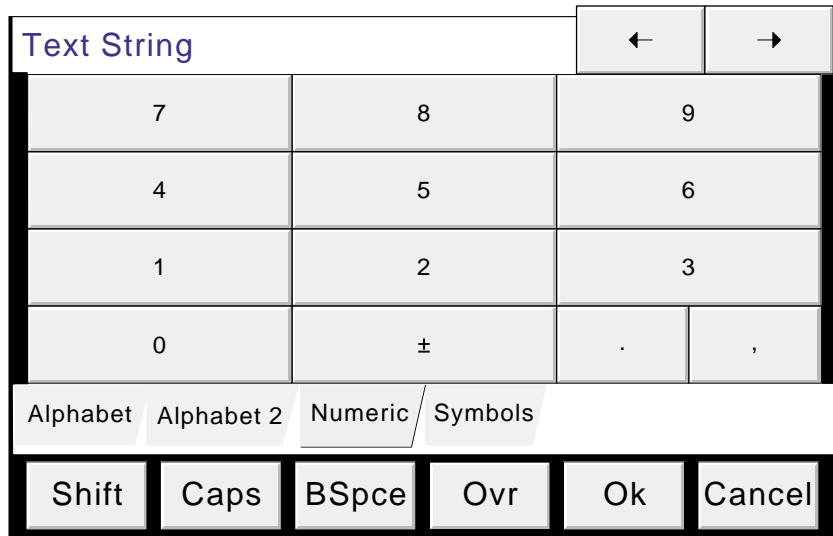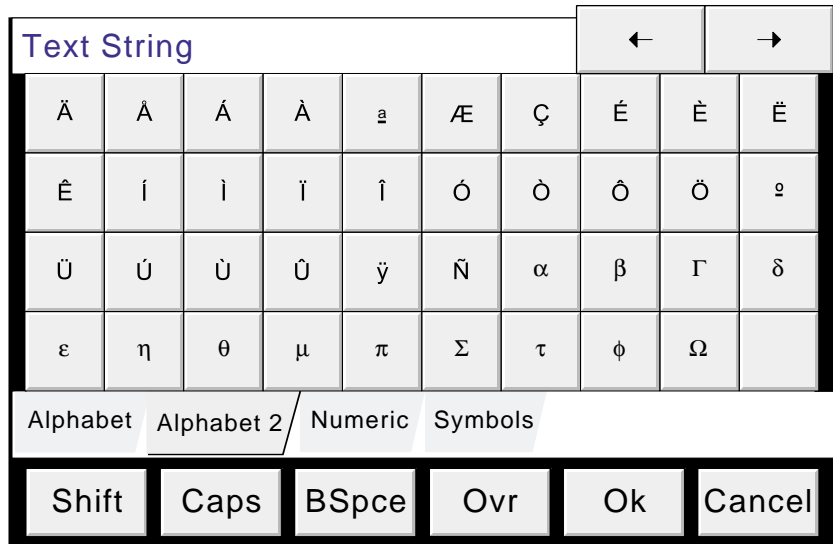
Figure 3.3.1c Alternative keyboards

3.4 DISPLAY MODES

The display modes described below allow process values (also known as points) to be displayed as vertical or horizontal 'chart' traces (Trend modes), as bargraphs (vertical or horizontal) or as numeric values. The various display modes are cycled-through using the Root menu\Cycle key.   The Home key returns the user to the Home page from anywhere in the Operator or Configuration pages in the recorder. The display mode associated with the home page is Vertical Trend when dispatched, but any of the other display modes can be selected as the home page in System - Setup.

3.4.1 Vertical Trend display

This (default) display (figure 3.4.1) shows each point in the display group as though it were being traced on a white chart. (It is possible to display on a black 'chart' instead, by selecting Dark Trend Background in System - Setup.) In either case, some thought should be given to trace colours selected in channel configuration. When selected, dark background applies to both vertical and horizontal trend display modes.

One of the channels is defined as being the 'current' or 'scale' channel, and this is identified on the chart by its diamond shaped pen icon. The current channel's descriptor, digital value and scale are displayed on a channel faceplate which lies between the chart and the status bar. To scroll through the channels, this faceplate area is repeatedly touched, with each touch increasing the channel number by one. To select a particular channel to be the current channel, the relevant pen icon can be touched (briefly, otherwise Trend Review mode will be entered). In either case, the background colour of the channel descriptor takes the colour of the current channel. If a channel is included in the display group but its status is 'not good' for some reason, then its pen icon is hollow.

TREND REVIEW

Trend review, or trace history, allows the user to view the history of the display group. The maximum amount that can be reviewed depends on a number of factors, including how many points are configured, how rapidly the traces are changing and so on. At a recording rate of 20mm/hour (see group configuration - section 4.3.3), with all channels configured, a minimum of 30 day's worth of traces is available for viewing, provided that the group contents are not re-configured during this period (in which case, the history starts at the end of the re-configuration). The amount of trace visible on the screen depends on the recording rate - the higher the rate, the less trace is visible at any one time.

To enter trend review, the option key can be used (as shown in figure 3.4.1), or the trace area of the screen can be continuously touched until the screen blanks prior to re-drawing. A 'Preparing History, please wait' message appears whilst the re-drawing calculation is taking place. Although tracing stops during trend review, no data is lost - Process Variable values are still saved in the recorder memory and alarms are still scanned-for and any associated action taken.

The trend review display is similar to the real-time vertical trend display, with the addition of a slider control and of up and down keys for selecting that part of trend history which is to be displayed. The controls are used as follows:
1   Touching the up/down key causes the trace history to move an incremental amount.
2   Holding the up/down key continuously, causes continuous movement.
3   Touching the bar above or below the slider causes a page-height shift.
4   Touching and dragging the slider, whilst observing the time/date display, allows the user to select the section of history exactly.

On first entry to the trend review mode, the channel value and the time and date shown in the faceplate are those at the top edge of the chart. Touching the screen causes a cursor to appear at point of screen contact. This cursor can be touched and dragged up and down the screen to provide a reference point on the current trace. The displayed value date and time refer to the cursor intersection with the current channel. To return to real-time trending, the Options key in the root menu is operated, followed by 'Exit Review'.

To call the Horizontal trend display, press the root key, followed by 'Cycle'.

3.4 DISPLAY MODES (Cont.)

Entry to trend mode from Home
key or by cycling screens.

Faceplate for
current channel.
Touch faceplate
to increment
channel

(or touch pen to
select channel).

Root Menu

Home	Operator
File	Cycle
Login	Options

Option Menu

Enter Review

Preparing History, please wait

Trend review mode

Real
time/date

Cursor
time/date

Value at cursor
time/date

Press bar
to move
one pageful

Press
arrow keys
to move
minimum
amount

Cursor

Move slider
to required
date/time

Root Menu

Home	Operator
File	Cycle
Login	Options

Option Menu

Exit Review

Figure 3.4.1 Vertical Trend display mode and trend review mode

3.4 DISPLAY MODES (Cont.)

3.4.2 Horizontal Trend display

Entered from the Vertical Trend display by use of the Root Menu 'Cycle' key, this display (figure 3.4.2a) is similar to the Vertical Trend display described above,except that the traces are produced horizontally rather than vertically.

Figure 3.4.2a Horizontal trend display mode
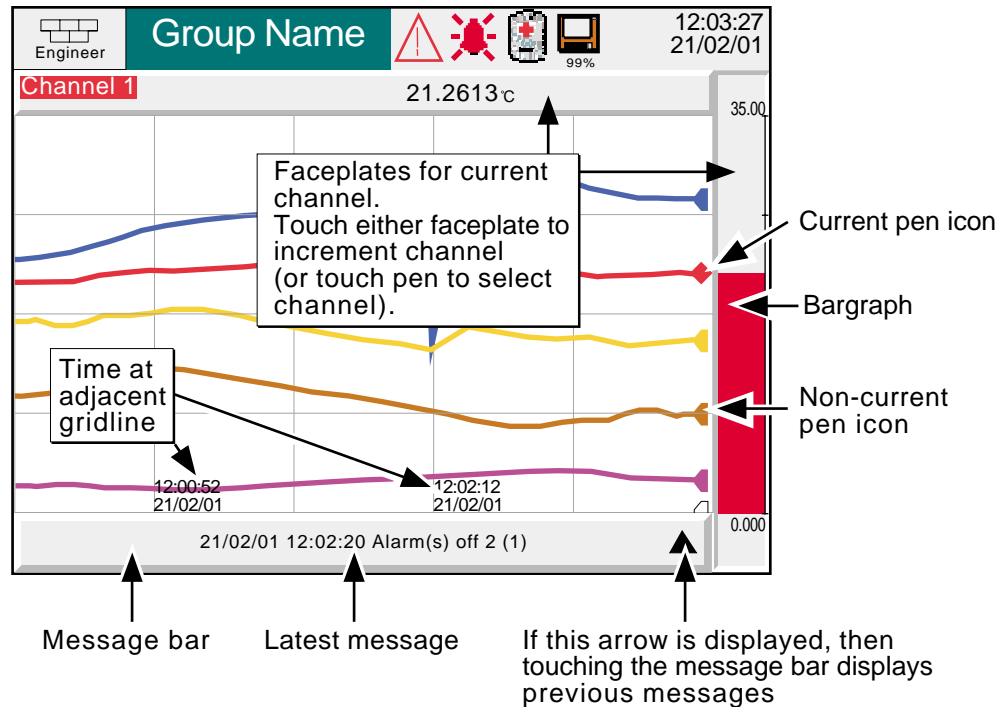
One of the channels is defined as being the 'current' or 'scale' channel, and this is identified on the chart by its pen icon being diamond shaped rather than triangular as used for non-current channels. If a channel is included in the display group but its status is 'not good' for some reason, then its pen icon is hollow.

There are two faceplates associated with this display, one above the 'chart', showing the current channel descriptor and its digital value; the other - to the right of the chart - showing a bargraph representation of the current channel's value together with a scale showing the low and high range values for the channel. Touching either of these faceplates causes the current channel number to increment. To select a particular channel to be the current channel, the relevant pen icon can be touched (briefly, otherwise Trend Review mode will be entered). In either case, the bargraph and the background colour of the channel descriptor takes the colour of the current channel.

There is no horizontal trace review function - touching the 'chart' for a few seconds (or using the Root menu Options key, then 'Enter Review') calls the vertical trend history page described in section 3.4.1, above.

Time and date are printed on the 'chart' immediately to the right of alternate vertical grid lines, and it is these grid lines to which the printed time relates.

3.4.2 HORIZONTAL TREND MODE (Cont.)

Below the 'chart', is a message bar, containing the latest message. If there is more than one message, an arrow head icon appears near the right hand end of this message bar, and if this appears, then touching the message bar calls a pop-up box (figure 3.4.2b) in which all relevant messages are displayed.

```
┌────────────────────────────────────────────────┐
│ View Messages                                    │
├────────────────────────────────────────────────┤
│ 21/02/01 12:02:20 Alarm(s) off 2 (1)            │
│ 21/02/01 12:00:22 Alarm(s) on 2 (1)             │
│ 21/02/01 11:16:04 Alarm(s) 0ff 1 (1)            │
│ 21/02/01 10:28:49 Alarm(s) on 1 (1)             │
│                                                  │
│                                                  │
│                                                  │
│                           ┌──────┐               │
│                           │  Ok  │               │
│                           └──────┘               │
│                                                  │
└────────────────────────────────────────────────┘
```
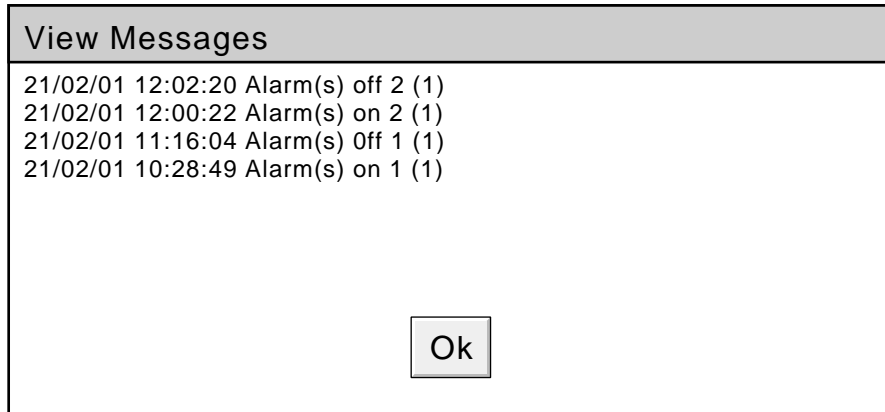
Figure 3.4.2b Horizontal trend mode message dialogue box

To call the Vertical Baraph display, press the root key, followed by 'Cycle'.

3.4 DISPLAY MODES (Cont.)

3.4.3 Vertical bargraph

Entered from Horizontal Trend mode by means of the Root Menu 'Cycle' key, this display mode shows the Process Variable (PV) values as vertical bars with faceplates containing digital values and alarm data. Review mode is not available from this display mode.

Operation of the Root menu Options key calls the Option menu display for this display page, allowing faceplates to be selected on or off. This selection is not 'saved' at power down - the recorder always powers-up with faceplates selected 'On'. This feature is available for vertical bargraph displays only.

To call the Horizontal Bargraph display, press the root key, followed by 'Cycle'.
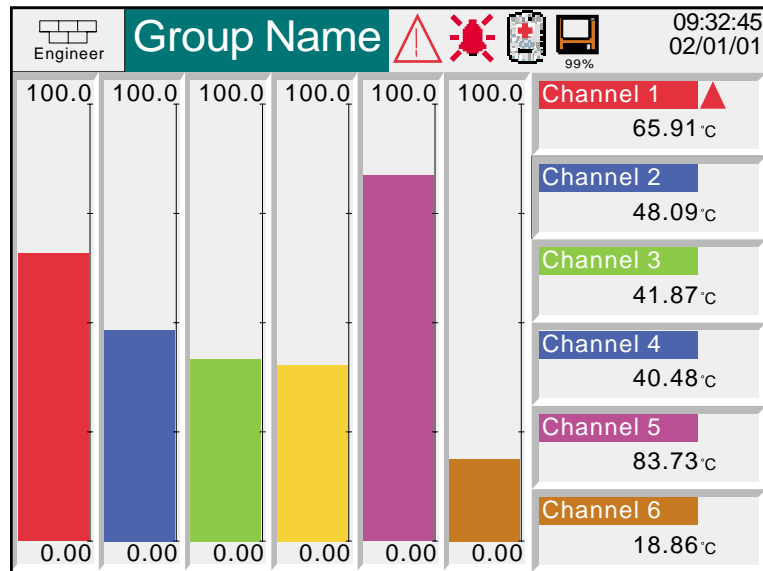
Figure 3.4.3a Vertical bargraph display (with faceplates)
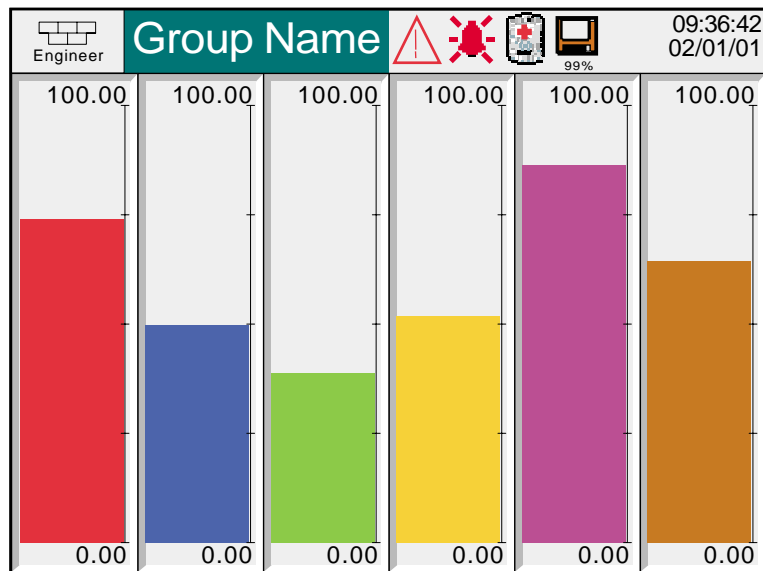
Figure 3.4.3b Vertical bargraph display (faceplates off)

3.4.4 Horizontal bargraph

Entered from Vertical bargraph mode by means of the root menu 'Cycle' key, this display mode shows the Process Variable (PV) values as horizontal bars with digital values and alarm data displayed, as shown in figure 3.4.4. Review mode is not available from this display mode.

To call Numeric display mode, press the root key, followed by 'Cycle'.
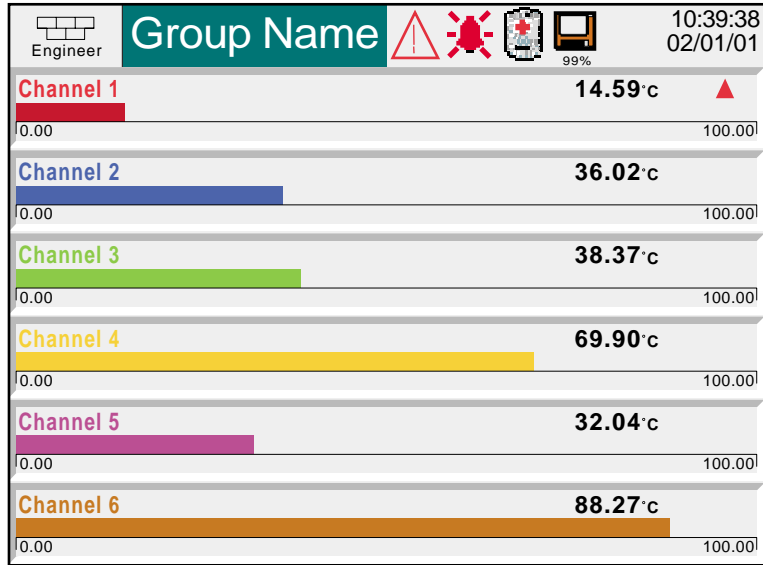
Figure 3.4.4 Horizontal bargraph display

3.4 DISPLAY MODES (Cont.)

3.4.5 Numeric

Entered from Horizontal bargraph mode by means of the root menu 'Cycle' key, this display mode shows the Process Variable (PV) values as digital values. The format (which is automatically selected) is based on the number of channels in the display group. Figures 3.4.5a and 3.4.5b, show typical examples of the one column (up to four channels) and two column versions (five or six channels) of this display mode, respectively. Within each version, the process variable display areas expand or contract to fill the screen. Review mode is not available from this display mode.

A further operation of the Cycle key in the Root menu returns to Vertical Trend Display mode described above.
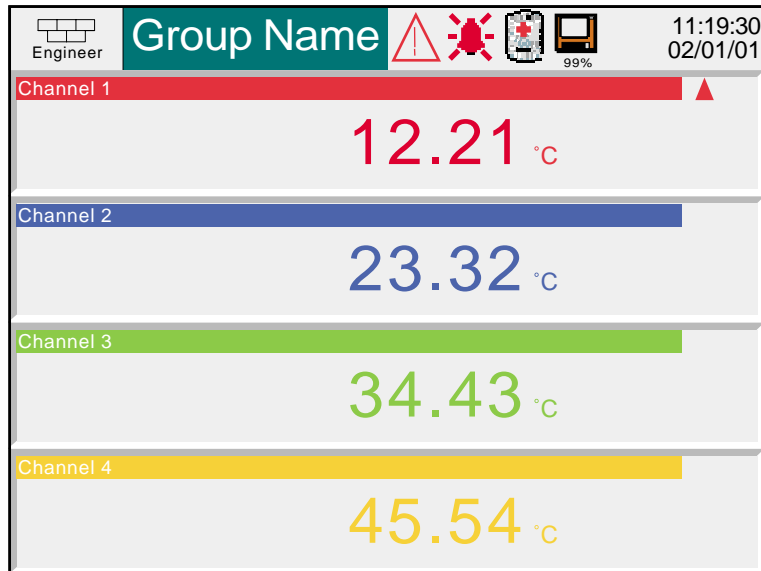
Figure 3.4.5a Numeric display mode (1 to 4 channels)
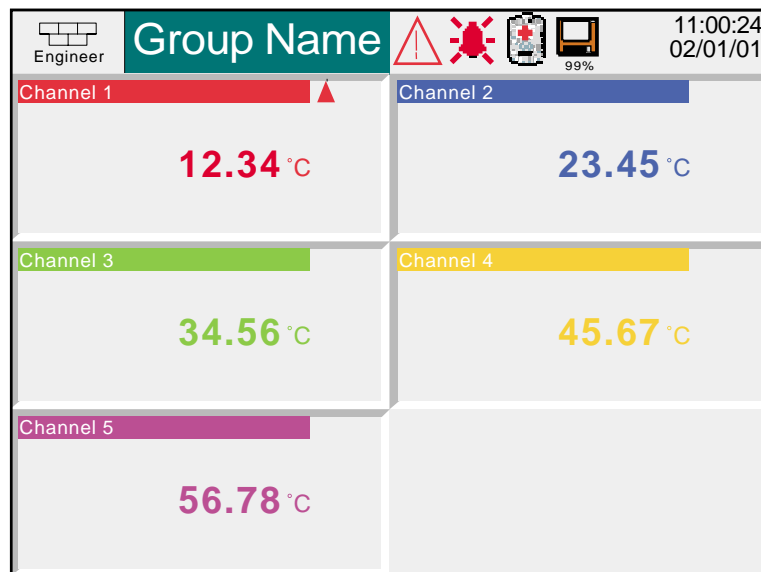
Figure 3.4.5b Numeric display mode (5 or 6 channels)

4 SETTING UP THE RECORDER

As described in the 'Access to Configuration' (section 3.3.1) above, the setting-up of the recorder is divided into the following areas:

Archive Section 4.1 - Allows manual archiving of data to disk or (if the Ethernet option is fitted) to a remote host (FTP transfer).

Save/restore Section 4.2 - Allows new configurations to be created and saved, and saved configurations to be 're-stored'.

Config Section 4.3 - This is the major channel/alarm/option etc. area of configuration.

Security Section 4.4 - Allows passwords to be entered and edited and allows the Engineer-level password holder to enable/disable areas of configuration to Operator-level password holders. New users can be added, with their own user names, passwords and access level permissions.

Network Section 4.5 - This area sets up the IP / mac address/host names etc. used in FTP transfer and Bridge 5000 applications (if the Ethernet option is fitted).

System Section 4.6 - Allows time and date functions to be set and edited (including daylight saving start and finish dates, time zones etc.) The system key also allows the display language to be chosen, Option key codes to be entered, and contains an 'About' screen describing the software/hardware status of the recorder.

Note: In all the following descriptions, if a change is made to a menu item, then the item text changes from black to red, until it is 'saved'.

4.1 ARCHIVE

4.1.1 Archive to disk

This allows the user to initiate data transfer to a floppy disk, by touching the relevant key for

    Archive Last Hour, Last Day, Last week, Last Month, All

to define which files are to be transferred. Archiving starts as soon as the selection is made, and cannot be stopped until completed, unless the Cancel archive key is operated, in which case the archive will be stopped after a confirmatory message has been responded to. The Cancel key is active only if 'Archiving Control' is enabled in Security/Access (section 4.4 of this manual). Figure 4.4.1 shows the archive to disk menu.
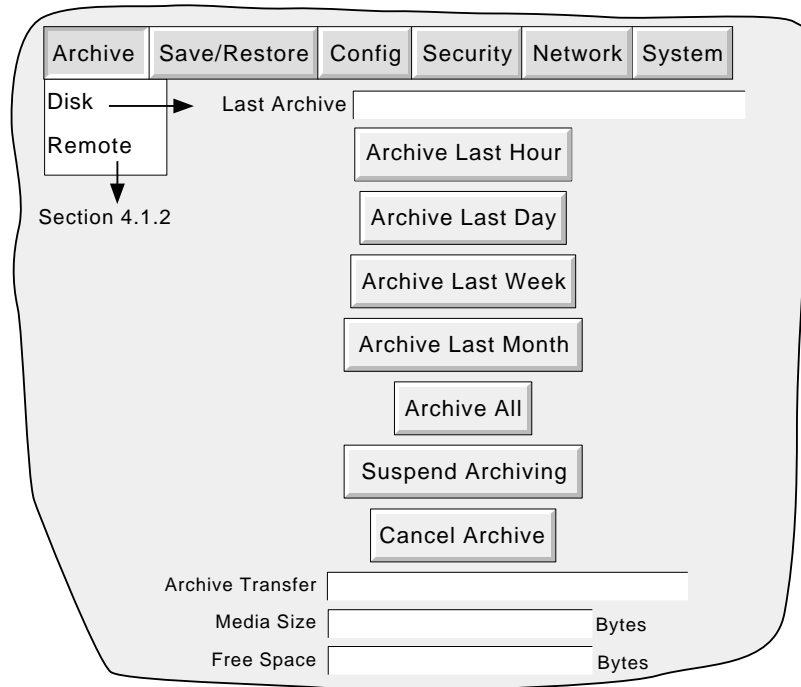
Figure 4.1.1 Disk archive strategy configuration

If the disk becomes full before archiving is complete, archiving will pause and a pop-up request appears, asking for the disk to be replaced. If this request is not responded-to within 10 minutes of its appearance, archiving is aborted.

Unattended archiving can be paused by the user (e.g. to change disks without losing data) by operating the 'Suspend Archiving' button. Transfer activity is indicated in the 'Archive transfer' window. Should the disk become full, the user will be prompted to replace it with a different one.

Below the selection buttons are a number of status windows relating to the disk.

If automatic archiving is active (section 4.3.6), then this and the manual archive will operate on a first come-first served basis. Some files will be saved twice in such a circumstance, the later archive's files overwriting any earlier archive's files which have the same name.

4.1.2 Remote archiving (FTP transfer)

Note: Remote archiving is available only if the Ethernet option is fitted.

This allows archiving of recorder files to a remote computer, connected (using the RJ45 telephone type connector at the rear of the recorder) either directly, or via a network .

In order to carry out a successful transfer, details of the remote host must be entered in the Archive section of the 'Config' menu (section 4.3.6).

Note: An FTP server must be running on the remote host.

Figure 4.1.2 shows the archive menu for remote archiving. The Archive last hour/day/week etc. keys allow the user to determine which files are to be archived. The 'Last Archive' window shows the time and date of the previous archive. The Archive Transfer window shows archive status as 'Active' or 'Inactive'.
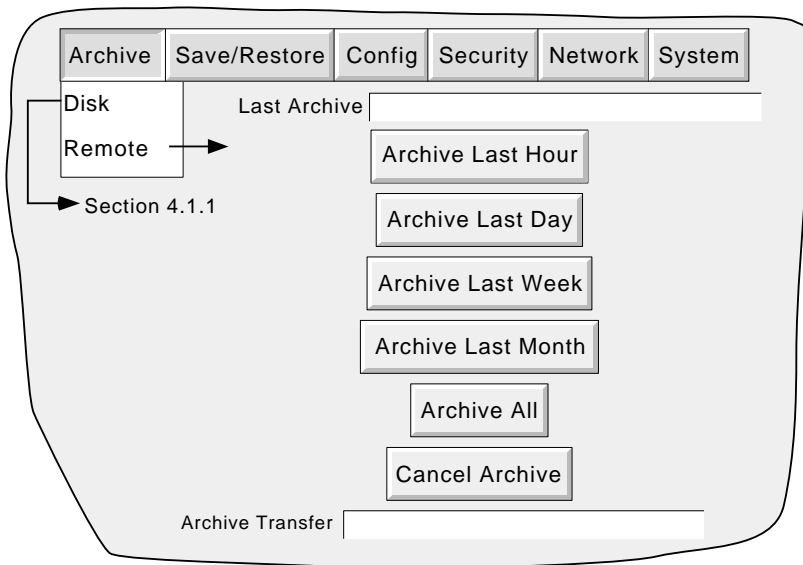
Figure 4.1.2   Remote archive strategy configuration

Additionally, a user on a remote PC has full viewing capabilities, can extract recorder files at any time, and can access those items of recorder configuration that are associated with the user's login. For successful connection, 'Connect from Remote' must be enabled and the 'Remote user name' and 'Remote password' must be defined in one of the accounts (all in the Security access menu (section 4.4.1)).

Notes:
1. In order to view history files when accessing the instrument remotely, the recorder's address, the 'Remote user name' and the 'Remote password' must be supplied to an FTP client such as PC Review or Microsoft® Internet Explorer.
2. When accessing files using Microsoft® Internet Explorer, the address (URL) field can be in one of two forms:
    a   ftp://<instrument IP address>. This allows the user to log in as the anonymous user (if the instrument has any account with 'Remote user name' set to 'Anonymous' and a blank password).
    b   ftp://<user name>:<password>@<instrument IP address> to log in as a specific user.
3. For IE5 users only: Microsoft® Internet Explorer displays, by default, history files only. To exit the history folder, either uncheck the Tools/Internet Options/Advanced/Browsing/"Enable folder view for FTP sites" option, or check the Tools/Internet Options/Advanced/Browsing/"Use Web based FTP" option.

4.2 SAVE / RESTORE

As shown in figure 4.2a, touching the Save/Restore key calls the picklist: Save, Restore, New, Text.
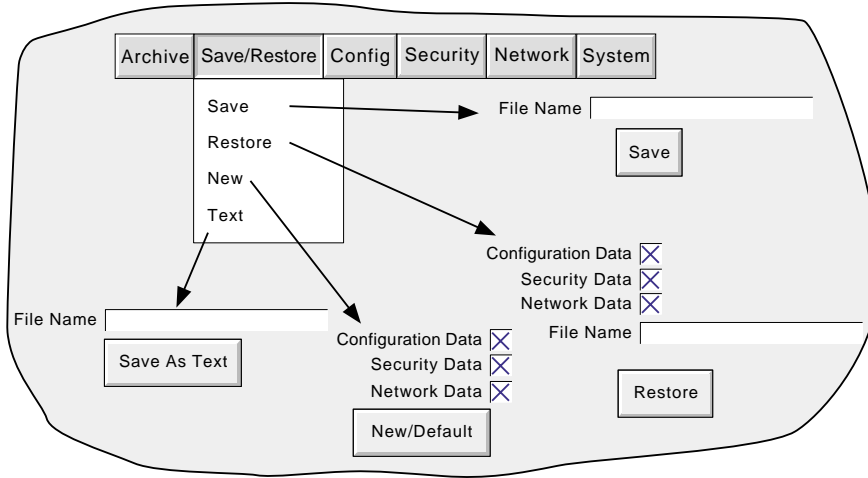
Figure 4.2a Save/Restore menu

For 'Save', 'Restore' and 'Text' (all described below) if the filename which appears is suitable, then operation of the 'Save' or 'Restore' key will initiate the action. If a filename has to be entered, this is carried out as follows:

Touching the filename window causes a pop-up menu to appear, giving a list of 'Volumes' in the Flash memory or on the floppy disk (if inserted). Figure 4.2b shows an imaginary Volume contents list, displayed by touching the name 'user', then operating the 'open folder' key. (See section 5, below for more details). Once the correct folder is open, either select an existing file, or enter a new filename, by touching the FileName window and entering the name using the pop-up keyboard(s) as described in section 3.3.1 above. Operation of the Save or Restore key initiates the action.

Figure 4.2b typical volume contents page

4.2.1 Save

Touching this item allows the current configuration to be saved in the recorder's memory. Files saved in this way are not in a 'readable' format and are used only for archive /security purposes or for transfer to another, similar, recorder.

4.2.2 Restore

Touching this item allows the user to select or type-in a previously saved configuration file name, which will then be used as the current configuration. Touching the 'Restore' key completes the operation. Tick boxes allow one or more of Configuration, Security or Network data to be chosen to be restored.

4.2.3 New

Touching this item causes the factory entered default configuration to be loaded for use, or for editing. Operation of the New/Default key completes the operation. Tick boxes allow one or more of Configuration, Security or Network data to be chosen to be restored.

4.2.4 Text

This is identical to the 'Save' function described above, but the configuration is saved in ASCII format, and can be transferred to a computer and read, printed etc. as required. It is not possible, using this means, to modify the configuration and then re-load it.

4.3 CONFIGURATION

Touching this key calls the top level configuration pick list: Options, Channels, Groups, Events, Instrument, Archive, as shown in the overview figure (figure 4.3b) below.

When making changes to the configuration the name of each changed parameter is displayed in red (instead of the normal black) until the 'Apply/Discard' key has been operated. For example, in channel configuration, if a thermocouple were to be changed from Type J to Type K, 'Lin Type' would appear in red, until the Apply key was operated.

Should an attempt be made to leave configuration with unsaved changes, a warning message appears, allowing the user to apply the changes, to discard the changes or to return to configuration (Cancel).

Figure 4.3a Data modification warning

4.3.1 Options
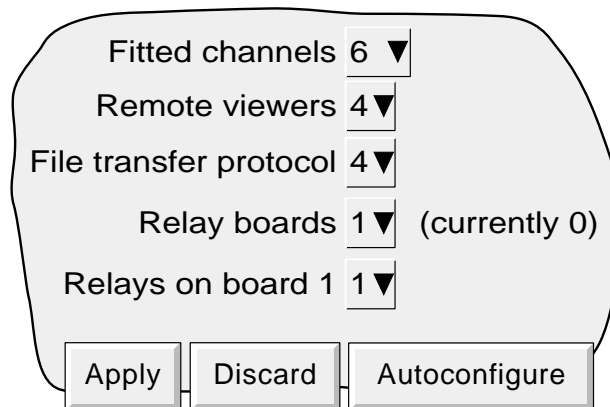
Figure 4.3.1 Options menu layout

Touching this key calls a display showing the current recorder hardware/software setup, for example the number of input channels fitted, whether or not an Ethernet/Relay output board is fitted. This page shows any differences between the hardware actually fitted and the hardware the recorder software is configured for (currently ...). Whenever there is a difference, the 'Autoconfigure' key can be pressed to alert the recorder to the fact that an option has been added (or removed).

If no changes have occurred since last switch-on, then the '(currently ...)' fields and the 'Autoconfigure' key do not appear.

4.3 CONFIGURATION (Cont.)

CONFIG\OPTIONS

Fitted channels 6
Remote viewers 4
File transfer protocol 4
Relay boards 1
Relays on board 1 1
Apply   Discard

CONFIG\CHANNELS

Channel Number 1) TurbineTempA — Select channel number
Input Type Thermocouple — Off, T/C, mV, V, mA, RTD, Ohms, Digital or Test
Lin Type Type K — Select Linearisation type (e.g.Type K)
Range Low 0 °C
Range High 1 °C
Range Units °C — Select: Celsius, Fahrenheit, Kelvins or Rankine
Scaled X
Scale Low 0 V
Scale High 1 V
Units V
Offset 0 V
Filter None — Select: None, 2, 4, 8, 16, 32, 64, 128, 256 seconds
Break Response None — Select: None, High or Low
Cold Junction Type Off — Select: Off, Internal, External
Descriptor TurbineTempA
Spanned X
Span Low 0 V
Span High 1 V
Zone Low 0 %
Zone High 100 %
Max Decimal Digits 4
Colour 22 — Select: 1 or 2
Alarm Number 1 — Select:Off, Unlatched, Latched, Trigger
Enable Unlatched
Type Absolute High — Select: Absolute Low, Absolute High
Threshold 0 V
Hysteresis 100 V
Dwell 0 s
Job Number 1 — Select: 1 or 2
Category No Action — Select: No action, Drive Relay
Apply   Discard

CONFIG\GROUPS

Trend Units mm/hr — Select mm/hr or in/hr
Descriptor Group 1
Trend Speed 1,200 mm/hr
Trend Interval 1 s
Recording Speed 1,200 mm/hr
Recording Interval 1 s
Alarm Message X
Ack Message X
TurbineTempA X
TurbineTempB X
TurbineTempC X
Etc.
X = Enabled
Apply   Discard

CONFIG\EVENTS

Event Number 1) Event 1 — Select 1 or 2
Source Off — Select: Off, Global alarm, Global Unack'd Alarm
Descriptor Event 1
Job Number 1 — Select: 1 or 2
Category No Action — Select: No action, Drive Relay
Apply   Discard

CONFIG\INSTRUMENT

Instrument Name Instrument
Normal Display 100 %
Saver Display 100 %
Save After 10 Minutes
Apply   Discard

CONFIG\ARCHIVE

Compression Normal — Select: Normal or High
Flash Size 17.75 Mb
Trend History Duration 8.22 Days
Archive to Media None — Select:Hourly, Daily, Weekly, Monthly, Automatic
Show Disk settings — Select Disk settings or Remote settings
On Media Full Overwrite — Select: Overwrite or Stop
Media Size 1.38 Mb
Disk Archive Capacity 0.64 Days
Apply   Discard

Archive | Save/Restore | Config | Security | Network | System

Options
Channels
Groups
Events
Instrument
Archive

Figure 4.3b Configuration menu overview

4.3.2 Channel/Alarm configuration

Figure 4.3.2a below, shows a typical configuration menu. The actual fields that appear depend on what input type is selected, what linearisation type is selected, and so on.

Field	Value		Annotation
Channel Number	1) TurbineTempA ▼		Select channel number
Input Type	Thermocouple ▼		Off, T/C, mV,V, mA, RTD, Ohms, Digital or Test
Lin Type	Type K ▼		Select Linearisation type (e.g.Type K)
Range Low	0	°C	
Range High	1	°C	
Range Units	°C ▼		Select: Celsius, Fahrenheit, Kelvins or Rankine
Scaled	☒		
Scale Low	0	V	
Scale High	1	V	
Units	V		
Offset	0	V	
Filter	None ▼		Select: None, 2, 4, 8, 16, 32, 64, 128, 256 seconds
Break Response	None ▼		Select: None, High or Low
Cold Junction Type	Off ▼		Select: Off, Internal, External
Descriptor	TurbineTempA		
Spanned	☒		
Span Low	0	V	
Span High	1	V	
Zone Low	0	%	
Zone High	100	%	
Max Decimal Digits	4		
Colour	26		
Alarm Number	1 ▼		Select: 1 or 2
Enable	Off ▼		Select:Off, Unlatched, Latched, Trigger
Job Number	1 ▼		Select: 1 or 2
Category	No Action ▼		Select: No action, Drive Relay

Apply   Discard

Figure 4.3.2a   Channel/alarm configuration menu (typical)

Notes
1.   Numeric values (e.g. 'input low') can be up to 10 characters including decimal point
2.   Refer to section 3.3.1 for numeric and text entry techniques.

4.3.2 CHANNEL/ALARM CONFIGURATION (Cont.)

Example: A type J thermocouple is used to measure a temperature range of 100 to 200 degrees Celsius. This thermo-couple output is transmitted to the recorder by a 4 to 20 mA transmitter, for display as an efficiency value between 0 and 100%. In such a case, the following values would be set up:

$$
\begin{aligned}
\text{Input type} &= \text{milliamp} \\
\text{Input range low} &= 4.0 \\
\text{Input range high} &= 20.0 \\
\text{Scale low} &= 0.0 \\
\text{Scale high} &= 100 \\
\text{Scale units} &= \% \\
\text{Linearisation range low} &= 100 \\
\text{Linearisation range high} &= 200 \\
\text{Linearisation type units} &= \text{degrees C} \\
\text{Linearisation type} &= \text{Type J thermocouple.} \\
\text{Input shunt value} &= 250 \text{ ohms}
\end{aligned}
$$

> Note: The following description shows all possible fields. The recorder itself edits the list and shows only those fields appropriate to the setup so far. For example, the 'Shunt' field appears only for mA input type.

CHANNEL NUMBER

The current channel and its descriptor are displayed. Touching the window area allows another channel to be selected for configuration.

INPUT TYPE

Select thermocouple, millivolt, Volt, milliamp, RTD, Ohms, Test or Digital as input type.

LIN TYPE

The following linearisation tables are available as standard:

Linear, square root, $x^{3/2}$, $x^{5/2}$.

Thermocouple types B, C, D, E, G2, J, K, L, N, R, S, T, U, NiMo/NiCo, Platinel

Resistance thermometer (RTD) types Cu_{10}, Pt_{100}, $Pt_{100}A$, JPT_{100}, Pt_{1000}, Ni_{100}, Ni_{120}.

For input ranges, accuracies etc. associated with the above, see the specification section of this manual.

INPUT LOW

Enter the lowest value to be applied to the input terminals (e.g.4.00).

INPUT HIGH

Enter the highest value to be applied across the input terminals (e.g. 20.00).

SHUNT

Allows a shunt resistor value to be entered for input type = mA. Commonly used values are 100 ohms and 250 ohms. Note that shunt resistors are connected to the input connector. The recorder cannot detect whether a shunt is fitted, or if one is, what value it has. Therefore it is the responsibility of the user to ensure that the ohmic value of any shunt fitted matches the shunt value entered in this field.

4.3.2 CHANNEL/ALARM CONFIGURATION (Cont.)

RANGE LOW

Enter the lowest value of the required linearisation range (e.g. 100)

RANGE HIGH

Enter the highest value of the required linearisation range (e.g. 200)

RANGE UNITS

Selectable from degrees Celsius, degrees Fahrenheit, Kelvin or Rankine.

SCALED

This box allows the user to select low and high values and units for a scale.

SCALE LOW

Enter the scale value to correspond with input range low (e.g. 0).

SCALE HIGH

Enter the scale value to correspond with input range high (e.g. 100).

SCALE UNITS

Enter up to eight characters of unit descriptor (e.g.%).

OFFSET

Allows a fixed value to be added to or subtracted from the process variable. Recorder accuracy figures no longer apply if an offset is included.

FILTER

For 'noisy' slowly changing signals, damping can be used to filter noise so that the underlying trend can be seen more clearly. None, 2, 4, 8, 16, 32, 64, 128 or 256 seconds can be selected.

It is not recommended that damping be used on quickly changing signals.
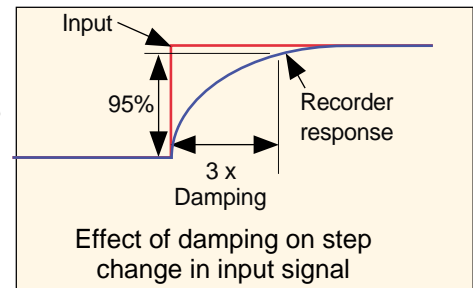
Figure 4.3.2b Channel filter

INPUT BREAK RESPONSE

For thermocouples and other low level inputs (i.e. input voltages less than 150mV), the recorder can be made to respond in one of the following ways, if a break in the input circuit is detected.

None   trace drifts with the input wiring acting as an aerial.
Drive hi   trace placed at full scale
Drive lo   trace placed at scale 'zero'

COLD JUNCTION COMPENSATION (CJC)

For input type = thermocouple, None, internal or external can be selected for cold junction compensation. Internal CJC is by means of an RTD connected across pins 11 and 12 of the input board connector. If the cold junction is maintained (by the user) at a known, fixed temperature, 'external' should be selected.

EXTERNAL CJ TEMPERATURE

If 'external' is selected as cold junction compensation, enter the temperature at which the cold junction is maintained.

4.3.2 CHANNEL/ALARM CONFIGURATION (Cont.)

DESCRIPTOR

Allows a text string of up to 20 characters (including spaces) to be entered for the channel descriptor. (E.G. 'Turbine 2 tempA').

SPANNED

This box, when selected, allows span low and high values to be entered. For example, in an input range of 0 to 600 deg C, it may be that the temperature range between 500 and 600 degrees is of most interest. In such a case, setting span low to 500 and span high to 600 will cause the recorder to display only that part of the input range, and this will fill the zone width (which is selected next), effectively magnifying the area of interest.

ZONE

This allows the portion of the chart which the channel occupies to be defined in terms of percent, where the left edge of the chart is 0% and the right hand edge is 100%. For example, setting a low value of 50 and a high value of 100 causes the channel trace to be confined to the right hand half of the chart.

MAXIMUM DECIMAL DIGITS

This defines the number of decimal places in the process value. Settable between zero and nine. Leading and trailing zeros are not displayed. Values too long for the available displaying width are truncated as described in section 3.

COLOUR

Allows the trace colour to be selected from a colour chart. Each of the 56 available colours is displayed with a number, and it is this number which is entered. The background colour to the selection box changes to the selected colour.

ALARM NUMBER

Allows alarm one or alarm two to be selected for the channel. See the figure for definitions.
There are two alarm thresholds available per input channel. Each threshold can be defined as absolute high or absolute low. When the value lies above an absolute high threshold or below an absolute low threshold, an internal event becomes active and this event can be used to trigger a 'job' such as 'drive relay output'.
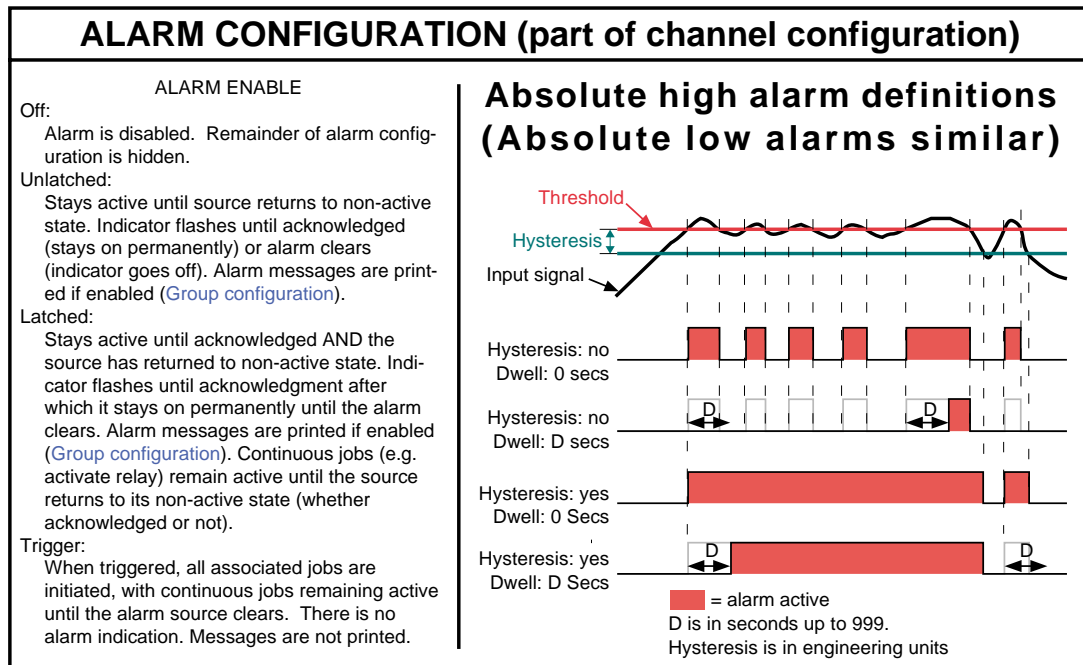

Figure 4.3.2c Absolute alarm definitions

4.3.2 CHANNEL/ALARM CONFIGURATION (Cont.)

ENABLE

Select Off, Unlatched, Latched or Trigger from the pick list. See figure 4.3.2c above for definitions

TYPE

Select absolute high or absolute low for this alarm.

THRESHOLD/HYSTERESIS

Allows values to be entered for the trigger setpoint and for hysteresis, both in engineering units.

EXAMPLE

Threshold = 100 units; Hysteresis = 5 units
A high alarm becomes active when its input rises above 100 and remains active until its value falls below 95 units. A low alarm becomes active when its input falls below 100 units, and remains active until its input rises above 105 units.

DWELL

Allows a dwell value to entered as seconds. If an alarm trigger returns to a non-active state before the dwell period expires, then it is ignored.

JOB NUMBER

Select job one or two for this alarm.

CATEGORY

Select the required job to be carried out when the channel is in alarm (e.g. Drive relay)

> Note: the relay is normally energised (common to normally open) and is de-energised (common to normally closed) in alarm or power off conditions.

WHILE

Allows the action of the alarm job to be chosen as whilst active, whilst inactive or whilst unacknowledged.

ALARM MESSAGES

Alarm on/off and alarm acknowledge message printing on the chart can be enabled/disabled as a part of 'Group configuration' described below. Alarms are acknowledged by touching the (flashing) alarm icon at the top of the screen, then touching the 'Ack all Alarms' key followed by the confirmation 'Yes' key (section 3.1.3).

4.3.3 Group configuration

This section allows the user to define trend speed/interval, recording speed/interval, a group descriptor and the group contents. Alarm messages can also be enabled or disabled in this area.

TREND UNITS

Allows mm/hr or inches per hour to be selected for the 'chart' speed. Automatically converts the trend speed field below.

DESCRIPTOR

Allows the group name to be edited. See section 3.3.1 for text entry techniques.

Figure 4.3.3 Group configuration menu layout

TREND SPEED/TREND INTERVAL

Allows the 'chart' speed to be selected either as mm or in per hour, or as an interval. Entering a value in one field automatically converts the value in the other field. A trend interval of N seconds is equivalent to 1200/N mm/hr chart speed; a chart speed of P mm/hr is equivalent to a trend interval of 1200/P seconds.

RECORDING SPEED/RECORDING INTERVAL

As for trend speed/interval but defines the rate at which data is saved to Flash memory. This value also affects how much trace history appears per screen height in trend review mode (section 3.4.1).

ALARM MESSAGE

This box allows the printing of alarm on and off messages on the 'chart' to be enabled or disabled as required. Alarm messages appear on the trend display and in PC Review in the form HH:MM:SS Alarm ON n/m and HH:MM:SS Alarm OFF n/m, where 'n' is the relevant channel number and 'm' is the alarm number (1 or 2).

ACK MESSAGE

This tick box allows the printing of alarm acknowledgement messages on the 'chart' to be enabled or disabled as required. Acknowledge messages appear on the trend display and in PC Review in the form HH:MM:SS

ALARM ACKNOWLEDGE
Alarms are acknowledged by touching the (flashing) alarm icon at the top of the screen, then touching the 'Ack all Alarms' key.

GROUP CONTENTS

This appears as a number of tick-boxes, to include the ticked items in, or to exclude non-ticked items from, the group, as required.

4.3.4 Event configuration

Two internal alarm sources (events) are available for use in running a job list when triggered.

Figure 4.3.4 Event configuration menu layout

EVENT NUMBER

Allows the required event to be selected for configuration.

SOURCE

Off	The event is disabled.
Global alarm	The event is active whist any one or more alarms is active.
Unacknowledged alarm	The event is active as long as there is an unacknowledged alarm present.

DESCRIPTOR

Allows a text string to be entered as the event title. See section 3.3.1 for text entry techniques.

JOB NUMBER

Select job one or two for this event.

CATEGORY
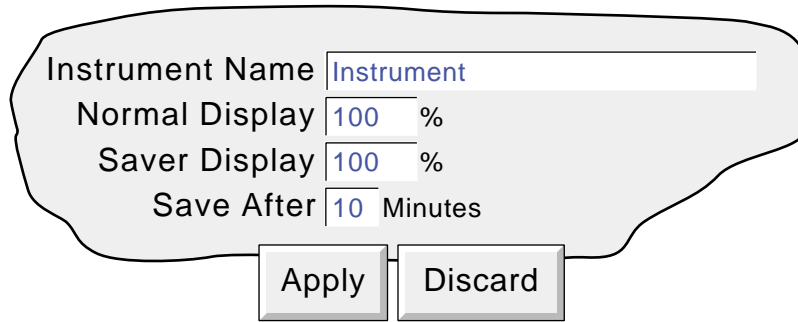
Select the required job to be carried out when the channel is in alarm (e.g. Drive relay).

> Note: the relay is normally energised (common to normally open) and is de-energised (common to normally closed) in alarm or power off conditions.

WHILE

Allows the action of the alarm job to be chosen as whilst active, whilst inactive or whilst unacknowledged.

4.3.5 Instrument configuration

Figure 4.3.5a Instrument Configuration menu

INSTRUMENT NAME

Allows the entry of an alphanumeric name for the recorder, up to 20 characters long. See section 3.3.1 for text entry techniques.

NORMAL/SAVER DISPLAY

Allows normal and 'saver' display brightnesses to be defined. Defaults are both 100%

SAVE AFTER

The number of minutes (between 1 and 99 inclusive), which are to elapse after a screen operation, before the screen brightness changes from 'normal' to 'saver'.

4.3.6 Archive configuration

This allows an archive strategy to be set up for saving data to disk or (if the Eternet option is fitted) to a remote PC. The disk strategy includes archive period, disk full operation, compression factor and an estimate of how much archive period is left in the recorder memory and on the disk. The recorder uses a dedicated area of its Flash memory as an archive data buffer; data is written to the disk or remote PC only when required, rather than continuously.

In order to carry out a successful remote archive, details of the remote host must be entered both in this Archive section of the 'Config' menu, and in Network configuration (section 4.5). Further, the current access level must have 'Connect from remote' enabled in the Security/Access menu (section 4.4.1).

Figure 4.3.6a Archive configuration menu (Disk settings)

Figure 4.3.6b Archive configuration menu (Remote settings)

4.3.6 ARCHIVE CONFIGURATION (Cont.)

COMPRESSION

Select Normal or high compression. 'Normal' compresses the data but still provides an exact copy. 'High' compresses more, but channel values are saved only to 1 part in 10^8 resolution.

FLASH SIZE

Allows the size of the Flash memory to be viewed by the user.

TREND HISTORY DURATION

Gives an estimated time to fill the trend history area of the Flash memory. The calculation is based on the archive rate, the compression ratio, the flash size and on the exact nature of the data. (Rapidly changing values use more space than static/slowly changing values.)

SHOW

This allows the fields which are to appear below 'Show' to be applicable to disk (Disk Settings), or to the setting up of a remote host path for archiving purposes (Remote settings). The following descriptions contain all the fields which may appear in either menu.

ARCHIVE TO MEDIA

For Disk Settings only:

None   Archive to disk is initiated by the operator (section 4.1)
Hourly   Archive to disk occurs on the hour every hour
Daily   Archive to disk occurs at 00:00* hrs each day
Weekly   Archive to disk occurs at 00:00* hrs every Monday
Monthly   Archive to disk occurs at 00:00* hrs on the 1st of each month
Automatic The recorder selects the slowest out of Hourly, Daily, Weekly or Monthly, which is guaranteed not to lose data. This is calculated according to which of the trend history buffer or the disk is the smaller. The recorder assumes that the disk is 'empty' when making these calculations.

MEDIA FULL OPERATION

For Disk Settings only:

Overwrite Oldest data replaced with latest data when disk is full
Stop   Archiving stops when the disk is full

MEDIA SIZE

For Disk Settings only:

Allows the size of the Disk to be entered, for user information only. This item is not saved as part of the configuration.

DISK ARCHIVE CAPACITY

For Disk Settings only:

Gives an estimated time to fill the disk, based on the archive rate, the compression ratio, the disk size and on the exact nature of the data. (Rapidly changing values use more space than static/slowly changing values.)

*Note: Archive times are not adjusted for Daylight Saving hour changes. Thus if the archive is set to 'daily', 'weekly' or ' monthly' then, during 'Summer Time', the archive will occur an hour late (i.e. at 01:00 hrs. instead of midnight).

4.3.6 ARCHIVE CONFIGURATION (Cont.)

ARCHIVE TO REMOTE

Note: Archive to remote is available only if the Ethernet option is fitted

For Remote settings only:

None	Archive to host is initiated by the operator (section 4.1.2)
Hourly	Archive to host occurs on the hour every hour
Daily	Archive to host occurs at 00:00* hrs each day
Weekly	Archive to host occurs at 00:00* hrs every Monday
Monthly	Archive to host occurs at 00:00* hrs on the 1st of each month
Automatic	The recorder selects the slowest out of 'Hourly', Daily, Weekly or Monthly, which is guaranteed not to lose data (depends on the size of the Trend History Buffer).

*Note: Archive times are not adjusted for Daylight Saving hour changes. Thus if the archive is set to 'daily', 'weekly' or ' monthly' then, during 'Summer Time', the archive will occur an hour late (i.e. at 01:00 hrs. instead of midnight).

REMOTE PATH

For Remote settings only:

The route to a folder or directory on the remote host, set up as a part of that host's FTP configuration

PRIMARY REMOTE HOST

For Remote settings only:

If a Domain Name Server (DNS) is specified in the Network key 'Name' page (fig 3.2.3b), then the Primary Remote Host is the server name. If DNS is not selected, then the Primary Remote Host is the IP address of the remote host, set up in the host's Control Panel\Network.

PRIMARY LOGIN NAME/PASSWORD

For Remote settings only:

Login name and password of the remote host account assigned either by the Network administrator, or in the Guest account of the remote host's FTP services or User Manager configuration. The password, which must be of between eight and 20 characters, must be entered twice to ensure integrity.

SECONDARY REMOTE HOST/LOGIN/PASSWORD

For Remote settings only:

As for primary versions, but for a secondary host. The secondary route is used only if the primary route fails.

4.4 SECURITY

Touching this key allows the operator to select 'Login' (described in section 3.3.1) 'Access' or 'Add/Remove User' for configuration. Selecting 'Access' displays the current user level. Touching this area allows the user to select 'Logged out', 'Operator' or 'Engineer'. The user may also go directly to logged out mode by operating the 'Logout' key.
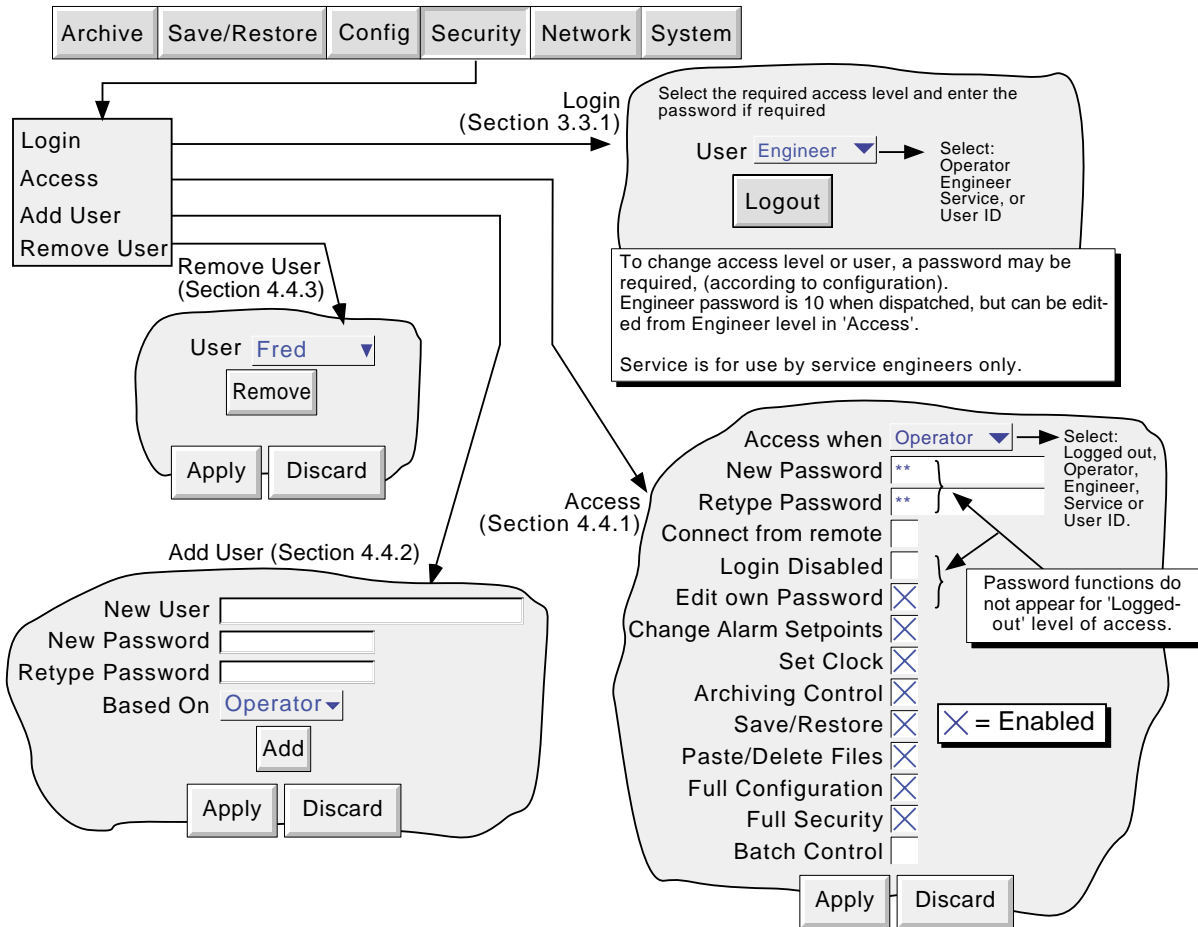
Figure 4.4 Security configuration menus

4.4.1 Access levels

There are essentially three levels of security associated with the recorder viz: Engineer, Operator and Logged out. (The fourth level - Service - is available only to service engineers).   When logged-in at engineer level, the user can set access permissions for Operator and logged-out levels, and can enter or edit passwords for Operator and Engineer levels . The password for Engineer level is set to 10 at the factory. The password for Operator level is set to zero at the factory.

> Note: To allow free access to the recorder configuration, the password can be set to 0 (zero). This allows subsequent access without a password having to be entered.

Users with Full Security permission can Add (and Delete) users (sections 4.4.2, 4.4.3) and assign them individual passwords and access permissions. User names (IDs) appear in the 'Login' and 'Access When' picklists.

SETTING PERMISSIONS

Once logged in at Engineer level, operate the 'Security' key and select 'Access'. A page similar to that shown in figure 4.4.1 appears, allowing the permissions to be set for the various access level and for individual users. The list of parameters is the same for all access levels except for 'Logged out', for which the password parameters and 'login disabled' items do not appear.

4.4.1 ACCESS LEVELS (Cont.)

Access when   Fred ▼

New Password   *

Retype Password   *

> Password functions do not appear for 'Logged-out' level of access.

Connect from remote ✕

Remote user name   Fred

Remote password

> Remote user fields appear only if 'Connect from remote' is enabled

Retype remote password

Login Disabled

Edit own Password ✕

> Password functions do not appear for 'Logged-out' level of access.

Change Alarm Setpoints ✕

Set Clock ✕

Archiving Control ✕

Save/Restore ✕

Paste/Delete Files ✕

Full Configuration ✕

Full Security ✕

Batch Control

Apply   Discard

Figure 4.4.1 Access permissions menu

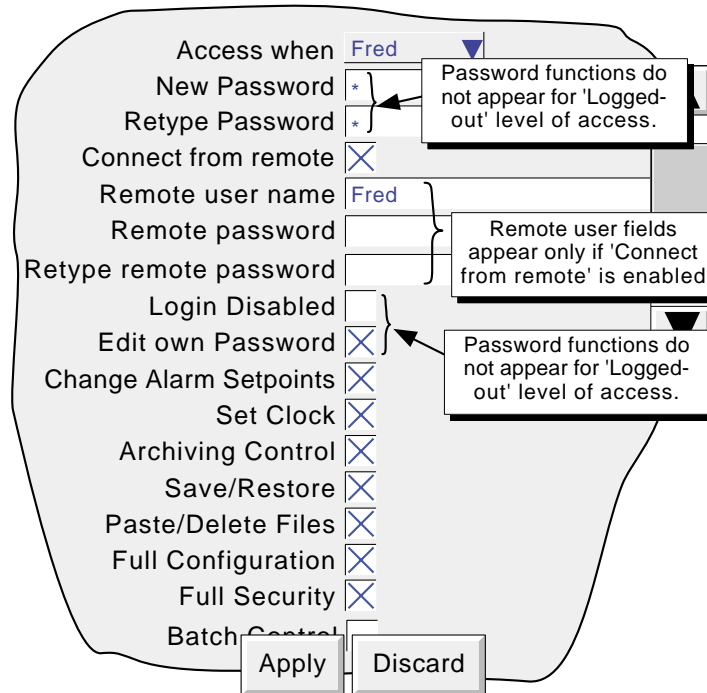### ACCESS WHEN:

Allows an access level or an individual user ID to be selected from a pick list.

NEW PASSWORD/RETYPE PASSWORD

For all levels except Logged Out, these fields allow a new password to be entered for the selected access level or User. The password must be entered in the 'Re-type Password' field. If the two differ, a warning message (Passwords did not match) appears when the APPLY key is operated, and password entry must be repeated.

CONNECT FROM REMOTE

Enabling this field, calls the Remote user name and Remote user password entry boxes.

REMOTE USER NAME/PASSWORD

These two entry boxes allow user name and password to be entered for use by the remote host operator. The remote user will be able to access the recorder configuration according to the other access permissions enabled in this page. The password must be entered twice to ensure integrity.

To allow unrestricted view-only to the host, 'Logged out' permission level should be selected and then a user name of 'anonymous' entered, and the password field left blank.

Note: Remote login will be refused if the user account is disabled for any reason.

LOGIN DISABLED

For all levels except Logged Out, this allows any one or more of the access levels do be removed from the 'Access when' picklist.

Note: This feature should be used with discretion, or the situation might arise in which the recorder cannot be logged onto, either at a particular access level or at all. It is recommended that at least one user with Engineer-level access is retained with login enabled, or it may become necessary to return the recorder to the manufacturer, or to arrange for a service visit.

4.4.1 ACCESS LEVELS (Cont.)

EDIT OWN PASSWORD

Allows each user, with this permission enabled, to edit his/her password.

CHANGE ALARM SETPOINTS

Allows each user with this permission enabled, to edit alarm parameters under Configuration/Channel

SET CLOCK

Allows each user, with this permission enabled, to set the recorder time and date functions under System/Clock

ARCHIVING CONTROL

Allows each user, with this permission enabled, full access to disk archive control.

SAVE/RESTORE

Allows each user, with this permission enabled, full access to saving and restoring functions as described in section 4.2, above. Without this permission, the SAVE/RESTORE key does not appear.

PASTE/DELETE FILES

Allows each user, with this permission enabled, to Paste and delete files as described in section 5 of this manual.

FULL CONFIGURATION

Allows each, user with this permission enabled, full access the recorder configuration.

FULL SECURITY

Allows each user, with this permission enabled, full access to all recorder security functions.

4.4.2 Add user

Figure 4.4.2 shows that the selecting of 'Add User' from the SECURITY picklist allows new user IDs to be entered, together with passwords, and a chosen set of access permissions, which can subsequently be edited under Security/ Access. The ADD key and the APPLY key must both be used to write the change to the recorder data base. The user must have Full Security access in order to add a new user.

NEW USER/NEW PASSWORD/RETYPE PASSWORD
These fields allow a user name (of up to 20 characters) and a password to be entered and confirmed.

BASED ON
This picklist allows another user or access level to be used as a permissions template, to simplify the configuration if several operators are to have identical permissions.
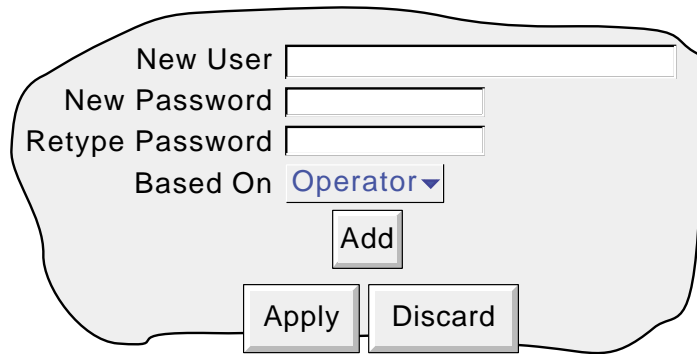
Figure 4.4.2 Add User display page

4.4.3 Remove user

Selecting 'Remove User' from the SECURITY picklist allows user IDs to be removed from the user list. The 'Remove' key and the 'Apply' key must both be used to write the change to the recorder data base. Figure 4.4.3 depicts the display page.
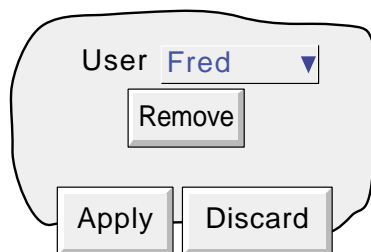
Figure 4.43 Remove User display page

4.5 NETWORK CONFIGURATION

Note: The Network key appears only if the Ethernet option is fitted

Operating the Network key calls a selection box to the display, allowing 'Address' or 'Name' to be selected for configuration.

4.5.1 Address

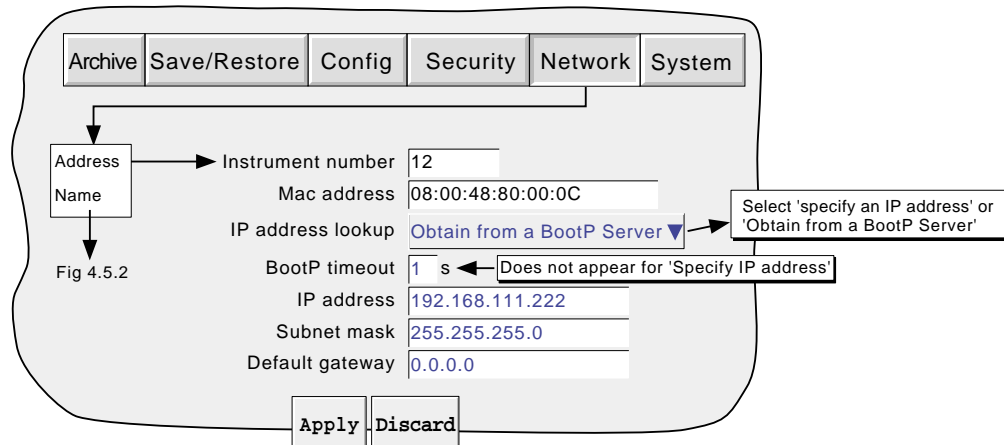Figure 4.5.1 shows the address menu fields.

Figure 4.5.1 Network addressing

INSTRUMENT NUMBER/MAC ADDRESS

Unique numbers set up during manufacture to identify the recorder to a remote host, or to the recorder manufacturer/distributor, in case of query.

IP ADDRESS LOOKUP

This field allows an address to be entered for the recorder. This can be done either by manually entering an address (IP address field - below), or the network service BootP can be used to assign an IP address to the recorder.

BOOTP TIMEOUT

This is the maximum time the recorder will wait, at power-up, for a response from the BootP server. If no response is received within this time, the IP address, Subnet mask and Default gateway are all set to, or remain at 0.0.0.0

IP ADDRESS

Allows manual entry of the recorder's internet protocol (IP) address only if 'Specify an IP address' is selected in the 'IP address lookup' picklist above.

SUBNET MASK

This field is editable only if 'Specify an IP address' is selected in the 'IP address lookup' picklist above. The subnet mask is the network address plus the bits in the host address reserved for sub-network identification. By convention, all the network address bits are set to 1. The subnet mask is used to identify the subnet to which an IP address belongs by performing a bitwise AND on the mask and the IP address.

DEFAULT GATEWAY

To deliver traffic from one subnet to another, devices called 'routers' or 'gateways' are placed between segments. The default gateway address informs each network device where to send data if the target station does not reside on the same subnet as the source.

4.5 NETWORK KEY (Cont.)

4.5.2 Name

Figure 4.5.2 shows the 'Name' fields

Figure 4.5.2 network name fields

LOCAL HOST

English language name for the recorder - Assigned to the IP Address

DOMAIN

The name of the Group or area of networked units which contains the recorder

DOMAIN NAME SERVICE (DNS)

Enables the mapping of host names to IP addresses and *vice-versa.*

PRIMARY/SECONDARY DNS SERVER

IP addresses supplied by IT department or the Domain manager or Supervisor.

Note: Any one or more of the above items may be overwritten if 'IP address lookup' is set to 'Obtain from Bootp Server' as described under 'Address' above.
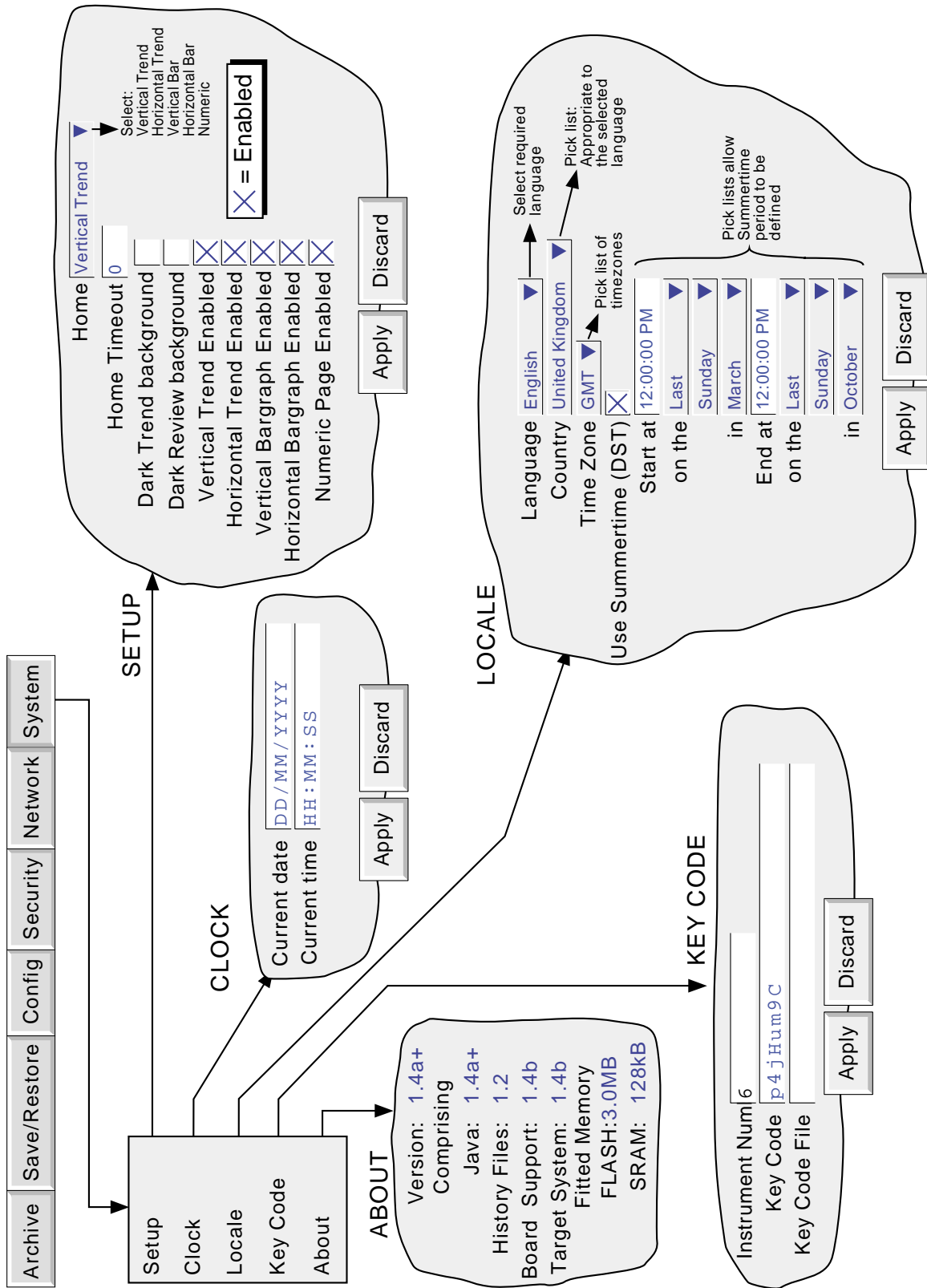
4.6 STSTEM

Figure 4.6 System configuration menu layout

4.6 SYSTEM (Cont.)

Touching the System key calls the pick list:

Setup

Clock

Locale

Keycode

About

Figure 4.6 above, shows an overview of the System Menus.

4.6.1 Setup

This allows the various display modes described in section 3.4, above to be enabled or disabled, using 'check' boxes. When enabled, a display mode is added to the Cycle key's menu. The 'Home' window allows any one of the enabled display modes to be selected for display when the Home button is pressed in the Root menu, or when other display pages time-out.

HOME TIMEOUT

The recorder returns to the specified home page after the timeout value of minutes has elapsed since the last touch on the display. Time-out action is inhibited if a configuration is incomplete (there are changes which have not been 'Applied'), or if a system-generated message (e.g. 'Clock Failure') is on display. User displays (e.g. Root menu) are time-out after approximately 50 seconds.

A value of zero disables the time-out function. Valid entries are between 1 and 9999 minutes.

4.6.2 Clock

Selecting 'clock' causes the recorder's date and time to be displayed. To edit the date, touch the current date area, to call the keyboard and enter the new numbers. The date is edited in a similar way. The settings apply as soon as the 'Apply settings' button is touched.

4.6.3 Locale

This allows the setting of the following items:

Language	Choose the required language from the picklist
Country	Displays a pick list of countries associated with the selected language
Time zone*	Select GMT, UTC, ECT, EET, ART, EAT, MET, NET, PLT, IST, BST, VST, CTT, JST, ACT, AET, SST, NST, MIT, HST, AST, PST, PNT, MST, CST, EST, IET, PRT, CNT, AGT, BET, CAT from picklist.
Use Summertime (DST)*	Select box if daylight saving is to be used, If 'Use Summertime (DST)' is selected, the times and dates for the start and end of summertime can be entered using picklists - see figure 4.6

Notes:
1. Date format DD/MM/YY or MM/DD/YY is defined by the language and country selected. Time format (e.g. 12/24 hr clock) is defined by the country selected.
2. When using Bridge 5000, the host PC's locale information and the recorder locale information should match, or the displayed time will not be correct.

*Note: For more information, see http://www.timeanddate.com

4.6.4 Keycode

This is a means of allowing new options to be enabled, by the entering of a code, using standard text entry techniques, or by reading a file from a floppy disk. If a File is specified, the first line of the file must be the Key Code. To select the file for reading, the Key Code File field is touched, to display the file list - if necessary, refer to section 5, below, for more details

The Instrument Number, which must be quoted if ordering upgrades, is unique to the instrument and is not user editable.

4.6.5 About

Selecting 'About' gives details of the version numbers of different aspects of the recorder, and details of the amount of memory fitted.

5 FILE

Figure 5, below, gives an overview of the File Menus. The area is entered by touching the 'File' key of the root menu, and can be used to display the contents of directories stored both in the user area of flash memory and on any disk currently inserted.

The first display page shows the 'volume' or 'device' names associated with the various areas of memory available to the user. If one of these volume names is selected (touched), and the 'open-folder' key operated, the contents of the selected volume is displayed. This would typically consist of a list of folders. Similarly, if a folder name is selected and the 'open folder' key is touched, the contents of the folder is displayed and so on.

To return to higher levels, the 'close-folder' key is used.

The path name of the current window is shown at the top of the window.

5.1 FILER OPTION MENU KEYS

These keys appear in a pop-up menu when the root menu Options key is pressed. The pop-up menu appears only when an actual file has been selected (i.e. it does not appear if a directory (folder) or volume is selected.) Cut and paste functions are available only to users with the relevant access permissions (section 4.4).

Cut	Removes a file from the list, ready for 'pasting' to another destination.
Copy	Copies a file from the list, ready for 'pasting' to another destination.
Delete	Removes a file from the memory.
New	Allows a new directory (folder) to be created
Paste	Places a 'cut' or 'copy' file into the new destination.
Refresh	Refreshes the display.

A key's legend is hidden (displayed in white) if at any time its function is not applicable.

5.2 THE HIDE KEY

The Hide key at the top right corner of the display screen is used to hide (show) Type, Date and Bytes information, allowing the full filename text string to appear.
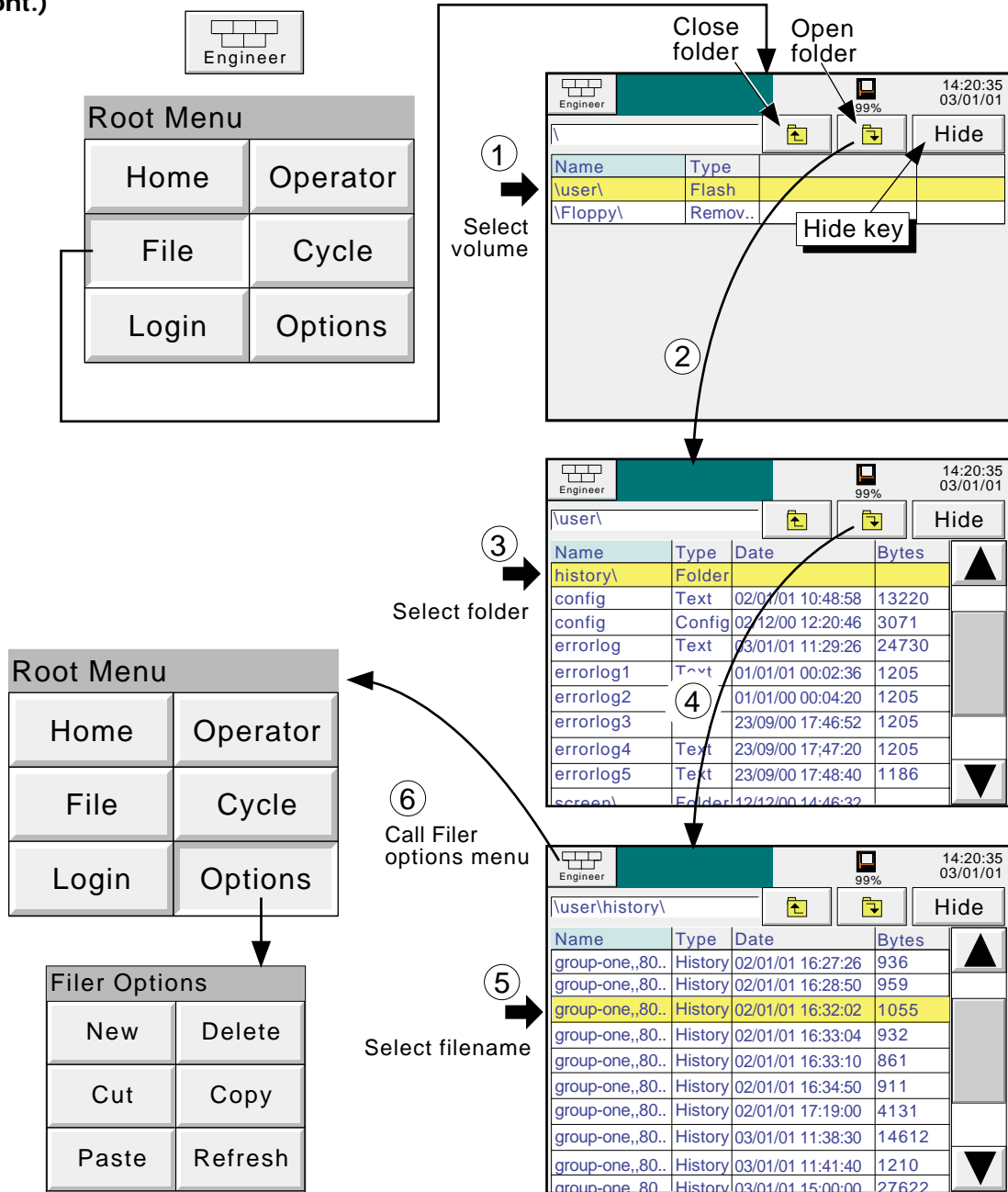
5 FILE (Cont.)

Figure 5 File system overview

6 BRIDGE 5000 REMOTE VIEWER

Note: Bridge 5000 is available only if the Ethernet option is fitted

6.1 INTRODUCTION

This feature allows the user to view recorder standard screens, dynamically, on-line, from any PC which meets or exceeds the minimum requirements listed below. The software is supplied on a CD ROM, which also includes PC review, PC Configuration and Acrobat reader software and various manuals relevant to the recorder.

The Remote viewer software is suitable for any physical hardware configurations, some common examples being:
1. A single PC connected directly to a recorder
2. Multiple PCs connected via a network to one or more recorders. (Each recorder can be accessed by a maximum of four PCs, but one PC can look at a number of recorders depending on available memory. For example, a minimum specification computer (section 6.1.1) running Windows NT can 'look at' up to three recorders.)
3. A single PC connected via a telephone line to a remote recorder.

This manual does not attempt to describe network setup in detail, as each network is different. In most cases, the help of the network administrator or supervisor will be required, for example, in the allocation of valid addresses and passwords.

6.1.1 Minimum PC requirements

1. P90 running Windows 95/98/NT
2. 32MB RAM
3. 50MB free hard disk space
4. Graphics drive capable of displaying > 256 colours (recommended)

6.2 CONNECTION DETAILS

The connection to the recorder is terminated at the RJ45 connector located as shown in figures 2.2.1a, 2.2.1b). The other end of the cable may be terminated, for example, at a hub, a dial-up router or a PC, and it is up to the user to obtain a suitable cable (normally available from a computer supplier or electronic component distributor.)

Note: For direct connection between a PC and the recorder, a crossover cable is required. For all other connections, a 'straight-through' connection is required.

6.2.1 Direct PC connection

The RJ45 connector at the rear of the recorder is connected via a crossover cable to the PC network card connector.

6.2 CONNECTION DETAILS (Cont.)

6.2.2 PC To remote recorder

As shown in figure 6.2.2, one or more recorders' Ethernet connector can be connected to a Dial Up Router, plugged into a telephone socket. The PC must similarly be connected to a telephone socket via a modem (shown external in the figure, but often built-in with modern computers.)

The dial-up router (available from computer suppliers etc.) has an associated telephone number, and can also have a security password system. Both the telephone number and any password(s) must be known to the PC user before any attempt at communication is made.

The PC can be set up to dial the number automatically, or the number may be dialled manually. Reference should be made to the computer documentation or help pages if necessary.

Once communication has been established, the software can be run.
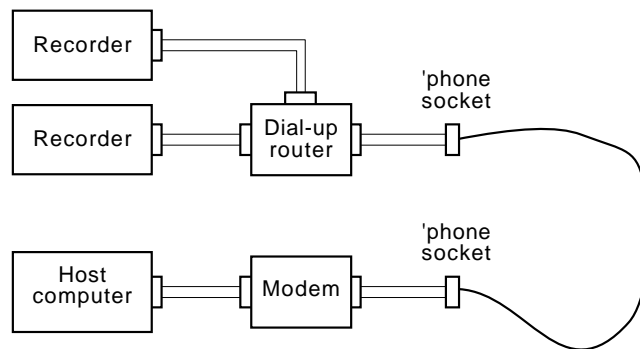
Figure 6.2.2 Remote connection example

6.2.3 Networked systems

For PCs and recorders connected into an internal network, it is necessary only to obtain an IP address (or name) and the required passwords in order to establish connections between the PC(s) and the recorder(s).

For PCs remote from a networked system which is permanently connected to the internet, it is necessary to obtain an IP address (or name) and the required passwords in order to establish connections between the PC and the recorder(s). In many cases it is also necessary that the internal network and 'firewall' (if such exists) be configured to allow access.

For PCs remote from a networked system which is not connected to the internet, a system similar to that shown in figure 6.2.2 is needed.

6.3 SOFTWARE INSTALLATION

Insert the CD ROM into the PC slot, and in 'My Computer' open the CD drive. A number of items appear, including a 'Read-me' file, which gives instruction on how to install the software.

Press setup.exe.

When the Bridge 5000 display appears, the installation procedure can be completed. Refer to the 'Read-me' file as required.

6.4 RECORDER CONFIGURATION

The recorder configuration is in three areas: Network, Options and Access,

6.4.1 Network

The Network key fields are fully described in section 4.5 of this manual

6.4.2 Options

In order to make the option accessible, it must first be correctly entered in the Options Menu.

If the number of Remote Viewers displayed does not match the 'currently' number (if displayed), operation of the 'Autoconfigure' key will add the option to the database.

If all options are correctly entered, the 'Currently' fields and the Autoconfigure key do not appear.

Root/Operator/Config/Options

Fitted channels 6 ▼

Remote viewers 4▼ ← Check that the number of remote viewers is correct. If not press Autoconfigure.

File transfer protocol 4▼

Relay boards 1▼ (currently 0)

Relays on board 1 1▼

Apply   Discard   Autoconfigure
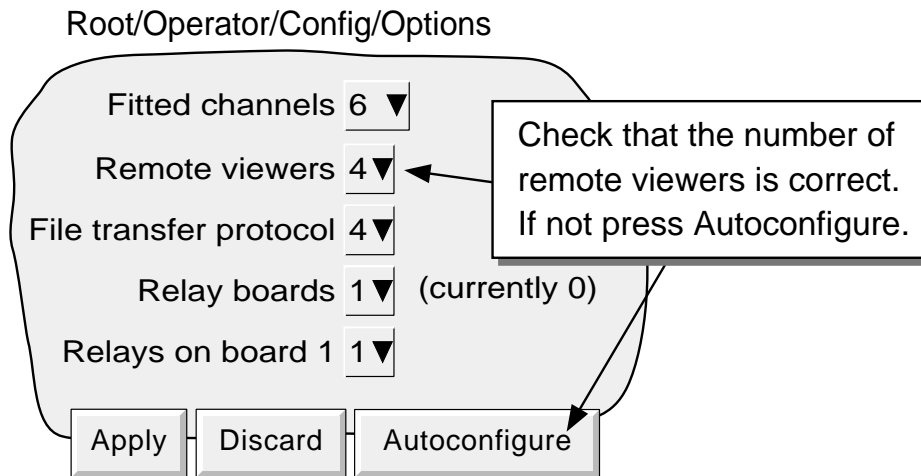
Figure 6.4.2 Options menu

6.4.3 Access

Each of the access levels and user IDs can have 'Connect from Remote' access enabled. When this box is checked, password entry fields appear as shown in figure 6.4.3. Initially, the Remote User Name is the same as the login name or access level. Enter the required User name and password (eight to 20 characters), then re-type the password to ensure it was entered correctly. This name and password are required when establishing connection with the host computer.

Figure 6.4.3 Remote user access fields

6.5 RUNNING THE PROGRAM

Click on the START key, and then on the program called 'Eurotherm' or 'Recorder'. Select 'Bridge 5000'.

Once the program starts, a Host name and User name will be requested as depicted in figure 6.5a.

Enter the Local host name found in the recorder Network/Name area, followed by a dot (full stop, period) followed by the domain name (also in the Network/Name area).

Notes

1   If frequent use is to be made of this option, it is recommended that a 'short-cut' be created, and placed on the computer desktop. To create a new bridge 5000 link: right click on the desktop, left click 'New' in the pop up menu which appears, then left click on the Bridge 5000 icon. When naming Bridge 5000 files, the extension .uhv must be used.

2   If there is no Bootp or other, similar, server associated with the system, the IP address (found in the recorder Network/Address area) should be used instead

3.   The PC locale setting (e.g. Daylight Saving Time) must match that set in the recorder (System/Locale) or the displayed time will be incorrect.

Enter the user name as entered in the recorder's Security/Access/Remote user name field (section 6.4.3).

If password entry is not required, disable the tick box (goes blank), then press 'Start' to start running the program

If a password entry is required, ensure that the password required tick box is enabled (tick visible). Press 'Start', then enter the password (as entered in the Security/Access/Remote User Name/Remote password field), followed by carriage return to start running the program.

Figure 6.5a Host /User name selection

Figure 6.5b Bridge 5000 icon (approximation)

6.6 OPERATION

6.6.1 Display Modes

When the program starts, the Vertical Trend page is displayed on the computer screen. Operating the Root Menu key, then 'Cycle' calls the Horizontal Trend display. Further operations of the above keys cycle through the remaining display modes described in Section 3, above, whether or not they are enabled in the recorder System Setup.. The Vertical Trend display can be returned-to at any time, by operating the Root Menu key followed by the Home key.

Notes
1. Trend review is not available.
2. Any changes to the recorder's group configuration are reflected immediately at the Remote Viewer screen.

By click-dragging on the bottom right hand corner of the display, the page size can be sized as required. It is thus possible for the computer to log on to, say four, different recorders and to display their values simultaneously in different parts of the display screen.

6.6.2 Alarm acknowledgement

The alarm acknowledgement/read messages function are as described in section 3.1.3, above

6.6.3 Status line

The status line at the top of the screen reflects the status of the instrument to which the recorder is connected - e.g. system messages, global alarm, FTP, clock etc.

6.6.4 Error messages

A number of error conditions may occur to prevent the remote viewer from 'viewing' the recorder. Any such conditions may be viewed by touching the alarm icon at the top of the screen, as described in section 3.1.3 of the Installation and Operation manual. The following messages can appear:

NETWORK CONNECTION HAS TIMED OUT
This message appears when no connection can be established between the remote viewer and the instrument. This might be caused by, for example, cable failure, the instrument's not being powered, network hardware failure etc.

UNABLE TO CONNECT TO HOST …
Similar to the timeout message above, but with the additional cause: incorrect host address.

UNABLE TO RESOLVE HOSTNAME
Caused by an incorrect host address, or network failure.

FAILED TO AUTHENTICATE THE USER NAME AND/OR PASSWORD SUPPLIED
Caused by incorrect user name or password.

MAXIMUM REMOTE VIEWERS ALREADY CONNECTED TO …
An attempt is being made to connect more remote viewers to the recorder than are configured in the Options menu.

7 REFERENCE

This section contains diagnostic and servicing details, and overview drawings of the recorder menu structure.

7.1 DIAGNOSTICS DISPLAY

At power-up, continuously hold a finger in contact with the screen until (after approximately 30 seconds) the diagnostic display appears as shown in figure 7.1 If no further action takes place within approximately five minutes, the display times-out to the calibration display
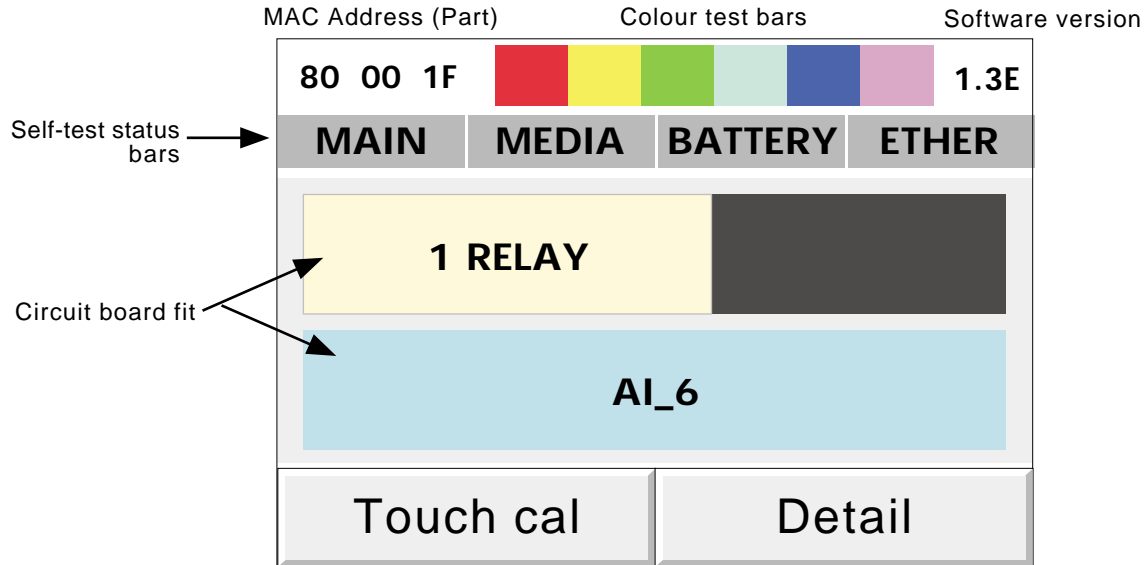
Figure 7.1 Top-level diagnostic display

7.1.1 Display details

MAC ETHERNET ADDRESS

This unique hex address is for factory use only. See section 4.5.1 for the instrument's full MAC address

COLOUR TEST BARS

This colour 'swatch' allows a judgement to be made as to the correctness of the display colour rendering

SOFTWARE VERSION NUMBER

This shows the version number of the software fitted to the recorder.

SELF-TEST STATUS BARS

These four areas show the status of the main circuit board (MAIN), the disk fitted (MEDIA) the battery and the Ethernet/relay option board (not yet implemented). In each case, if the bars are grey, then no faults have been detected; if any one or more of them is flashing red/white, then a fault has been found.

MAIN

This tests the Dynamic RAM (DRAM), the Static RAM (SRAM) and the flash memory. The results can be displayed by operating the 'Detail' key. See figure 7.1.1.

(Continued)

SELF-TEST STATUS BARS (Cont.)

MEDIA

This sends a message to the disk, and then tries to read it back. Failure to succeed might be any one or more of the following:

1. No disk was fitted when the test was initiated.

2. The disk is unformatted or incorrectly formatted.

3. The disk is too full (less than 1kB remaining) for the message to be written to it.

BATTERY

This area flashes when the battery needs to be replaced (section 7.3). The test is performed once every 15 minutes.

ETHER

Not applicable to this release.

CIRCUIT BOARDS FITTED

The major part of the display screen is taken up with a representation of the rear of the recorder, showing what input and output cards are fitted in each circuit board slot. 1_Relay represents the Ethernet/Relay output board; AI_6 represents the six analogue inputs on the main board.

TOUCH CAL

This key initiates the display calibration (offset correction) procedure, described in section 7.2 below.

DETAIL

Touching this key causes the main board test results to be displayed, as shown in figure 7.1.1 below.

To quit diagnostics, switch the recorder off, then, after a few seconds, switch it back on again
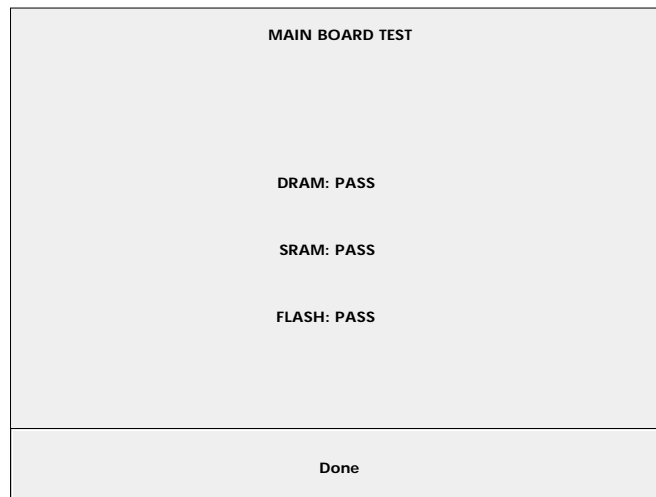

MAIN BOARD TEST

DRAM: PASS

SRAM: PASS

FLASH: PASS

Done

Figure 7.1.1 Main board self-test results display

7.2 SCREEN CALIBRATION (OFFSET CORRECTION)

This procedure ensures that the display screen image is positioned correctly, compared with the touch screen (so that 'what you touch is what you get'). The procedure, is necessary only rarely, if at all, and is included here only for the sake of completeness.

1. At power-up, continuously hold a finger in contact with the screen until (after approximately 30 seconds) the diagnostic display appears as shown in figures 7.1a/b. Operate the Touch cal key to call the first calibration screen, as depicted in figure 7.2*
2. Using a soft, small-diameter item (e.g. a pencil point) which will not damage the touch screen, touch the intersection of the upper set of crosshairs, as requested by the display and keep touching it until the next target appears..
3. Continue the process, according to the directions appearing on the screen. Once all the 'targets' have been accepted, the recorder returns to the diagnostic display.

Note: The diagnostic display times-out (to the screen calibration page) after about 5 minutes. The screen calibration pages time-out to the diagnostic page after a time which depends on how much of the calibration procedure has been completed

```
   +
   |
   |

Touch top left target
```
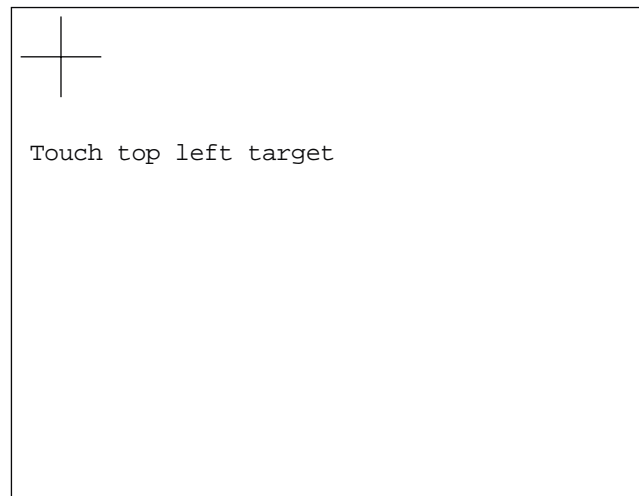
Figure 7.2 Initial calibration display

7.3 PREVENTIVE MAINTENANCE

7.3.1 Touch Screen Cleaning

CAUTION
The touch-sensitive screen used in this product is designed for use by hand only. The use of sharp or pointed implements such as pens, keys and fingernails to operate the instrument must be avoided, or irreparable damage will be done to the surface material. When cleaning the touch-screen, a moist cloth should be used, if necessary with a minimal amount of mild soap solution.

ALCOHOLS SUCH AS ISOPROPYL ALCOHOL MUST NEVER BE USED ON THE SCREEN.

7.3.2 Maintenance schedule

Battery replacement - Every three years

7.3.3 Battery replacement procedure

Notes:
1. The battery is of poly-carbonmonofluoride/lithium construction and should be disposed of according to local regulations covering this type of battery.
2. It is recommended that the recorder be isolated from mains (line) power before the battery is replaced. All battery backed RAM data is lost during battery change.

1. Remove the mains connector. For convenience, disconnect the relay and Ethernet connectors (if fitted).
2. Remove the rear terminal cover (A) by pressing down on the catch and lifting off. Remove the input connector (B), by pressing-in on the end clips and pulling on the connector (figure 7.3.2a).
3. Remove the three screws 'C' in figure 7.3.2b.
4. Carefully lift the front of the recorder case cover, and disconnect the two looms connecting it to the internal circuit board (figure 7.3.2c)
5. Push the battery out of its holder as shown in figure 7.3.2d.
6. Instal the new battery by pushing it into position (+ uppermost).
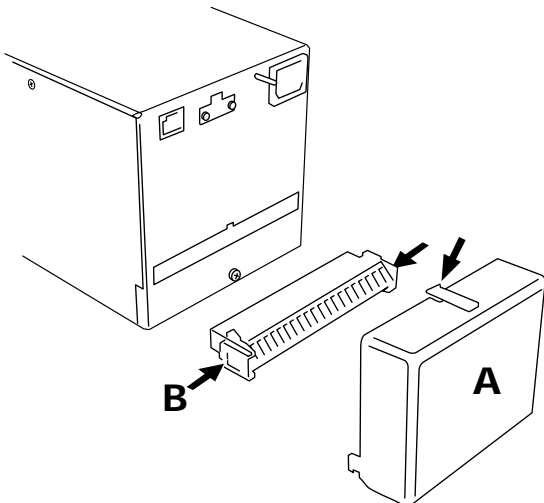7. Re-connect the two looms previously disconnected, then re-assemble the recorder.

Figure 7.3.2a Remove terminal cover and connector

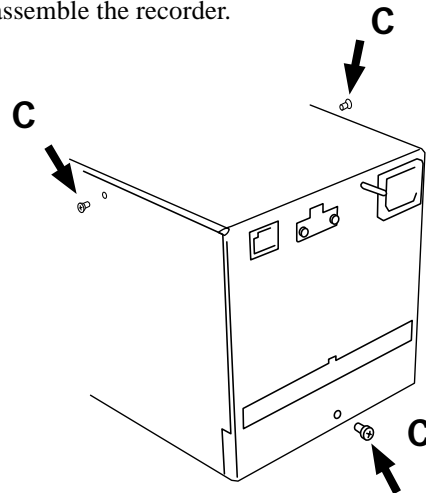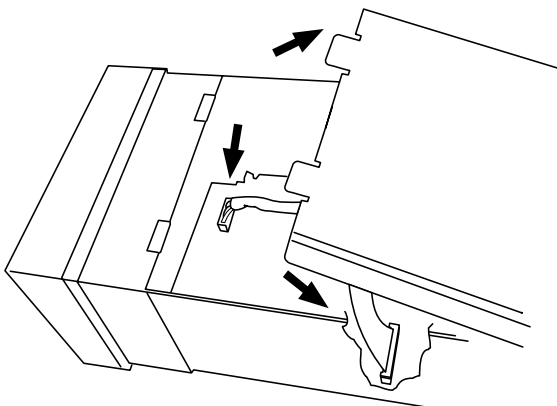Figure 7.3.2b Release cover plate

Figure 7.3.2c Disconnect looms; Remove cover plate

Battery type: BR2330
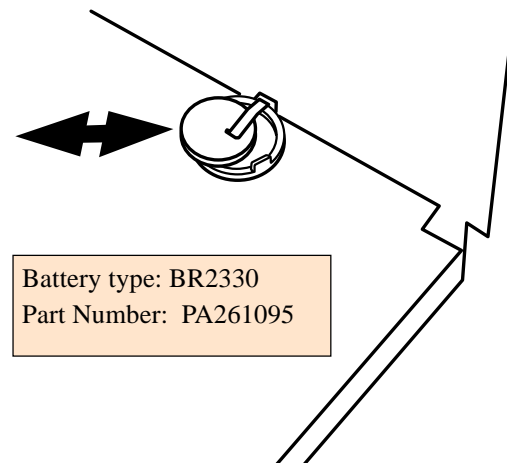Part Number: PA261095

Figure 7.3.2d Replace battery

7.4 MENU STRUCTURE
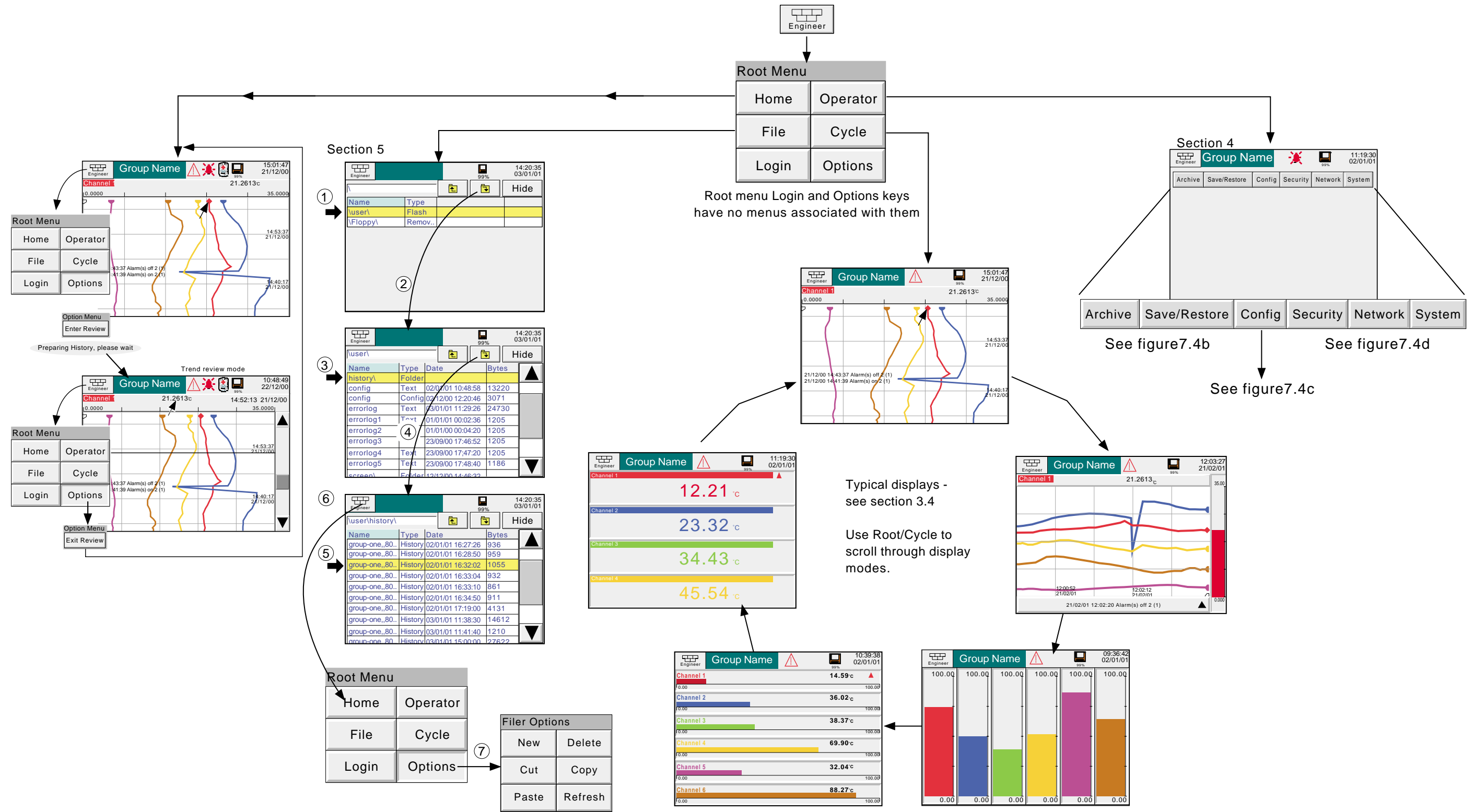

Figure 7.4a Menu structure sheet 1

Figure 7.4b Menu structure sheet 2
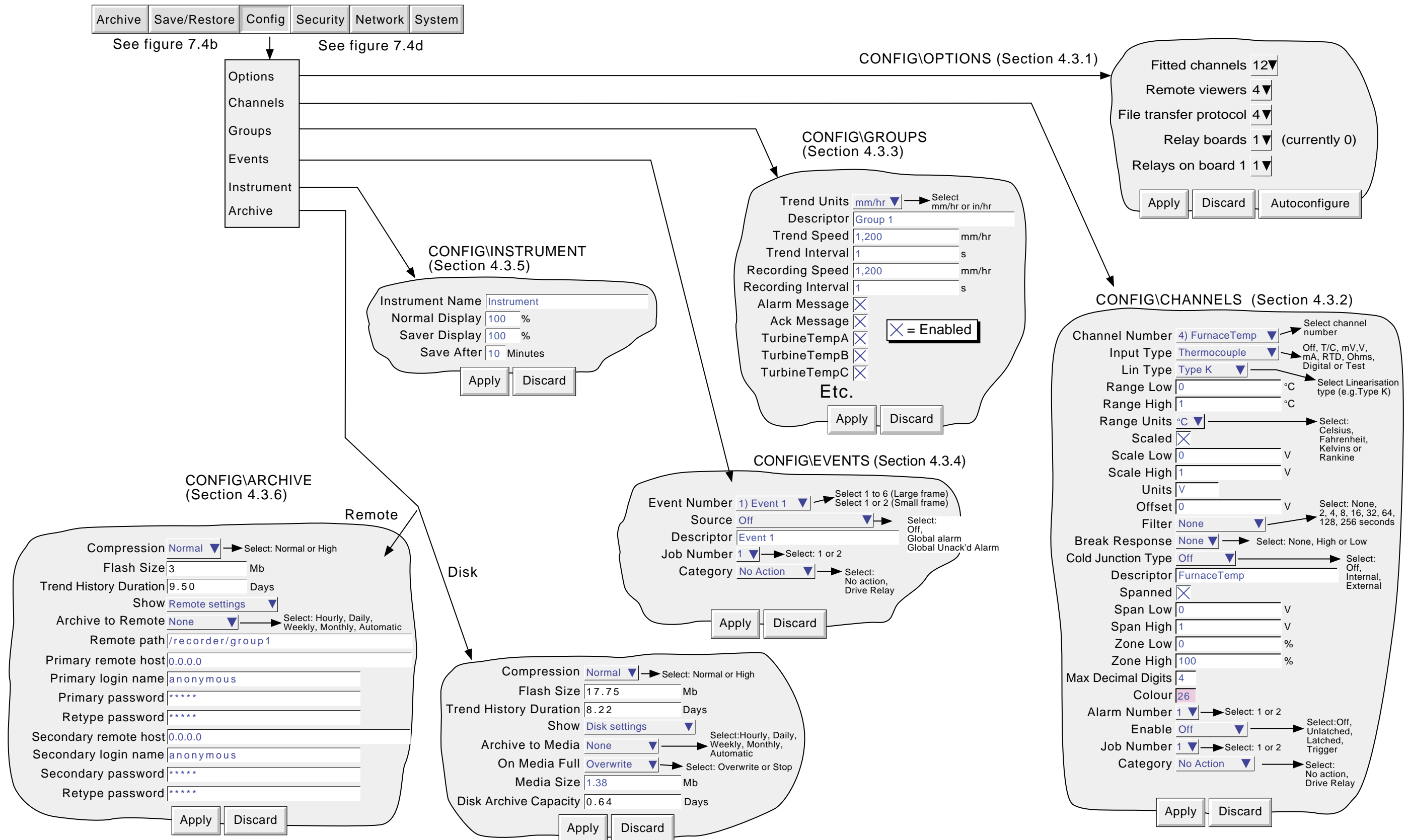
7.4 MENU STRUCTURE (Cont.)

Archive | Save/Restore | Config | Security | Network | System

See figure 7.4b   See figure 7.4d

Options
Channels
Groups
Events
Instrument
Archive

CONFIG\OPTIONS (Section 4.3.1)

Fitted channels 12▼
Remote viewers 4▼
File transfer protocol 4▼
Relay boards 1▼ (currently 0)
Relays on board 1 1▼

Apply | Discard | Autoconfigure

CONFIG\GROUPS (Section 4.3.3)

Trend Units mm/hr ▼ → Select mm/hr or in/hr
Descriptor Group 1
Trend Speed 1,200 mm/hr
Trend Interval 1 s
Recording Speed 1,200 mm/hr
Recording Interval 1 s
Alarm Message ☒
Ack Message ☒
TurbineTempA ☒
TurbineTempB ☒   ☒ = Enabled
TurbineTempC ☒

Etc.

Apply | Discard

CONFIG\INSTRUMENT (Section 4.3.5)

Instrument Name Instrument
Normal Display 100 %
Saver Display 100 %
Save After 10 Minutes

Apply | Discard

CONFIG\EVENTS (Section 4.3.4)

Event Number 1) Event 1 ▼ → Select 1 to 6 (Large frame) Select 1 or 2 (Small frame)
Source Off → Select: Off, Global alarm Global Unack'd Alarm
Descriptor Event 1
Job Number 1 ▼ → Select: 1 or 2
Category No Action ▼ → Select: No action, Drive Relay

Apply | Discard

CONFIG\CHANNELS (Section 4.3.2)

Channel Number 4) FurnaceTemp ▼ → Select channel number
Input Type Thermocouple ▼ → Off, T/C, mV,V, mA, RTD, Ohms, Digital or Test
Lin Type Type K ▼ → Select Linearisation type (e.g.Type K)
Range Low 0 °C
Range High 1 °C
Range Units °C ▼ → Select: Celsius, Fahrenheit, Kelvins or Rankine
Scaled ☒
Scale Low 0 V
Scale High 1 V
Units V
Offset 0 V → Select: None, 2, 4, 8, 16, 32, 64, 128, 256 seconds
Filter None ▼
Break Response None ▼ → Select: None, High or Low
Cold Junction Type Off ▼ → Select: Off, Internal, External
Descriptor FurnaceTemp
Spanned ☒
Span Low 0 V
Span High 1 V
Zone Low 0 %
Zone High 100 %
Max Decimal Digits 4
Colour 26
Alarm Number 1 ▼ → Select: 1 or 2
Enable Off ▼ → Select:Off, Unlatched, Latched, Trigger
Job Number 1 ▼ → Select: 1 or 2
Category No Action ▼ → Select: No action, Drive Relay

Apply | Discard

CONFIG\ARCHIVE (Section 4.3.6)

Remote

Compression Normal ▼ → Select: Normal or High
Flash Size 3 Mb
Trend History Duration 9.50 Days
Show Remote settings
Archive to Remote None ▼ → Select: Hourly, Daily, Weekly, Monthly, Automatic
Remote path /recorder/group1
Primary remote host 0.0.0.0
Primary login name anonymous
Primary password *****
Retype password *****
Secondary remote host 0.0.0.0
Secondary login name anonymous
Secondary password *****
Retype password *****

Apply | Discard

Disk

Compression Normal ▼ → Select: Normal or High
Flash Size 17.75 Mb
Trend History Duration 8.22 Days
Show Disk settings
Archive to Media None ▼ → Select:Hourly, Daily, Weekly, Monthly, Automatic
On Media Full Overwrite ▼ → Select: Overwrite or Stop
Media Size 1.38 Mb
Disk Archive Capacity 0.64 Days

Apply | Discard

Figure 7.4c Menu structure sheet 3

Archive	Save/Restore	Config	Security	Network	System

See figure 7.4b

See figure 7.4c

System (Section 4.6)

| Setup |
| Clock |
| Locale |
| Key Code |
| About |

The Network key appears only if the Ethernet option is fitted.

SYSTEM \ SETUP

Home Vertical Trend ▼
Home Timeout 0
Dark Trend background ☐
Dark Review background ☐
Vertical Trend Enabled ☒
Horizontal Trend Enabled ☒
Vertical Bargraph Enabled ☒
Horizontal Bargraph Enabled ☒
Numeric Page Enabled ☒

Select:
Vertical Trend
Horizontal Trend
Vertical Bar
Horizontal Bar
Numeric

☒ = Enabled

Apply Discard

Security (Section 4.4)

| Login |
| Access |
| Add User |
| Remove User |

SECURITY\LOGIN

Select the required access level and enter the password if required

User Engineer ▼ → Select: Operator Engineer or Service, or particular user id.

Logout

To change access level, a password may be required, (according to configuration). Engineer password is 10 when dispatched, but can be edited from Engineer level in 'Access'.

Service is for use by service engineers only.

SYSTEM \ KEY CODE

Instrument Number 6
Key Code p4jHum9C
Key Code File

Apply Discard

SYSTEM \ ABOUT

Version: 1.4a+
Comprising
Java: 1.4a+
History Files: 1.2
Board Support: 1.4b
Target System: 1.4b
Fitted Memory
FLASH: 3.00MB
SRAM: 128kB

SYSTEM \ CLOCK

Current date DD/MM/YYYY
Current time HH:MM:SS

Apply Discard

SECURITY\ACCESS

Access when Operator ▼ → Select: Logged out, Operator, Engineer, Service or User ID.
New Password *
Retype Password *
Connect from remote ☐
Login Disabled ☐
Edit own Password ☒
Change Alarm Setpoints ☒
Set Clock ☒
Archiving Control ☒
Save/Restore ☒
Paste/Delete Files ☒
Full Configuration ☒
Full Security ☒
Batch Control ☐

Password functions do not appear for 'Logged-out' level of access.

☒ = Enabled

Apply Discard

SYSTEM \ LOCALE

Language English ▼ → Select required language from picklist
Country United Kingdom ▼
Time Zone GMT ▼ Pick list of timezones
Use Summertime (DST) ☒
Start at 12:00:00 PM
on the Last ▼
Sunday ▼
in March ▼
End at 12:00:00 PM
on the Last ▼
Sunday ▼
in October ▼

Pick list: Appropriate to the selected country

Pick lists allow Summertime period to be defined

Apply Discard

NETWORK \ ADDRESS

Instrument number 12
Mac address 08:00:48:80:00:0C
IP address lookup Obtain from a BootP Server ▼
BootP timeout 1 s ← Does not appear for 'Specify IP address'
IP address 192.168.111.222
Subnet mask 255.255.255.0
Default gateway 0.0.0.0

Select 'specify an IP address' or 'Obtain from a BootP Server'

Apply Discard

Address
Name

SECURITY \ ADD USER

New User
New Password
Retype Password
Based On Operator ▼

Add

Apply Discard

NETWORK \ NAME

Local Host Andy136-4
Domain FishesRus.co.uk
Domain Name Service ☒
Primary DNS Server 149.121.164.11
Secondary DNS Server 149.121.165.14

Apply Discard

SECURITY \ REMOVE USER

User Fred ▼

Remove

Apply Discard

Figure 7.4d Menu structure sheet 4

ANNEX A: SPECIFICATION

INSTALLATION CATEGORY AND POLLUTION DEGREE

This product has been designed to conform to BS EN61010 installation category II and pollution degree 2. These are defined as follows:

Installation category II

The rated impulse voltage for equipment on nominal 230V ac mains is 2500V.

Pollution degree 2

Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected.

TECHNICAL SPECIFICATION (Recorder)

Inputs/Outputs

6-channel universal input

1 Change-over relay output board (optional)

3.5 inch floppy disk

Optional features

File transfer protocol (FTP)

Bridge 5000 Remote viewer

Environmental Performance

Temperature limits	Operation:	5 to 40˚C
	Storage:	-20 to + 50˚C
Humidity limits	Operation:	20% to 80% RH (non - condensing)
	Storage:	20% to 80% RH (non - condensing)
Altitude (maximum)		<2000 metres
Protection	Bezel and display:	IP65
	Sleeve:	IP20
Shock		BS EN61010
Vibration (10 Hz to 150Hz)		2g peak

Physical

Panel mounting	DIN43700
Bezel size	144mm x 144mm
Panel cutout	138mm x 138mm (-0.0 + 1.0) mm
Depth behind bezel	248 mm (213mm without terminal cover)
Weight	3 kg. max.
Mounting angle	±15 ˚ from vertical

Electromagnetic compatibility (EMC)

Emissions and immunity	BS EN61326

Electrical safety

BS EN61010. Installation category II, Pollution degree 2

Power requirements

Line voltage	47 to 63 Hz:	85 to 265V
Power (max.)		60 VA (Inrush current 36A)
Fuse type		None
Interrupt protection		Holdup >200msec. at 240V ac, with full load.

Back-up battery

Type	Poly-carbonmonofluoride/lithium (BR2330). Part Number PA261095
Support time	A fully-charged, new battery supports the Real-Time Clock for a minimum of 1 year with the recorder unpowered
Replacement period	3-years

Operator interface

Colour STN LCD with cold cathode backlighting, fitted with resistive, analogue, toughened touch panel.

Screen specification	1/4 VGA Resolution = 320 x 240 pixels

Update/archive rates

Input/relay output sample rate:	8 Hz.
Display update:	1 Hz,
Archive sample value:	Latest value at archive time
Trended/displayed value:	Latest value at display update time

TECHNICAL SPECIFICATION (Universal inputs)

General

Termination	Inputs:	22 - way Edge connector/terminal block
Max. number of inputs		six
Input ranges		-38 mV to +38mV; -150 mV to +150mV; -1 Volt to +1Volt; -10 Volts to + 10Volts
Input types		Dc volts, dc millivolts, dc milliamps, (with external shunt), thermocouple, 2/3 wire resistance temperature detector (RTD), Ohms, Contact closure (not channel 1) (Minimum contact closure = 60msec.)
Input type mix		Freely configurable
Sample rate		See 'Update information' above
Noise rejection (48 to 62Hz)		
	Common mode:	>140dB (Channel to channel and channel to ground)
	Series mode:	>60dB
Maximum common mode voltage		250Volts continuous
Maximum series mode voltage		45mV at lowest range; 12Volts peak at highest range
Isolation (dc to 65Hz; BS EN61010)		Installation category II; Pollution degree 2
		300V RMS or dc channel to channel (double insulation), channel to common electronics (double insulation) and channel to ground (basic insulation)
Dielectric strength	Channel to ground:	1350Vac for 1 minute.
	Channel to channel:	2300Vac for 1 minute
Insulation resistance		>10MΩ at 500V dc
Input impedance	10V range:	68.8kΩ
	Other ranges:	>10MΩ
Overvoltage protection		50V peak (150V with attenuator)
Open circuit detection		± 57nA max
	Recognition time:	500mSec
	Minimum break resistance:	10MΩ

DC input ranges

Shunt	Externally mounted resistor modules
Additional error due to shunt	0.1% of input
Performance	See table

Low Range	High Range	Resolution	Maximum error (Instrument at 20˚C)	Worst case temperature performance
-38 mV	38 mV	1.4 μV	0.085% input + 0.051% range	80ppm of input per deg C
-150 mV	150 mV	5.5 μV	0.084% input + 0.038% range	80ppm of input per deg C
-1 V	1 V	37 μV	0.084% input + 0.029% range	80ppm of input per deg C
-10 V	10 V	370 μV	0.275% input + 0.030% range	272ppm of input per deg C

TECHNICAL SPECIFICATION (Universal inputs) (Cont.)

Resistance inputs

Temperature scale   ITS90

Types, ranges and accuracies   See tables (values exclude influence of lead resistance)

Influence of lead resistance   Error: Negligible

             Mismatch: $1\Omega/\Omega$

Low Range	High Range	Resolu-tion	Maximum error (Instrument at 20˚C)	Worst case temperature performance
0Ω	150Ω	5mΩ	0.035% input + 0.110% range	35ppm of input per deg C
0Ω	600Ω	22mΩ	0.035% input + 0.065% range	35ppm of input per deg C
0Ω	6kΩ	148mΩ	0.035% input + 0.035% range	35ppm of input per deg C

RTD type	Overall range (˚C)	Standard	Max.linearisation error
Cu10	-20 to + 400	General Electric Co.	0.02˚C
JPT100	-220 to + 630	JIS C1604:1989	0.01˚C
Ni100	-60 to + 250	DIN43760:1987	0.01˚C
Ni120	-50 to + 170	DIN43760:1987	0.01˚C
Pt100	-200 to + 850	IEC751	0.01˚C
Pt100A	-200 to + 600	Eurotherm Recorders SA	0.09˚C
Pt1000	-200 to + 850	IEC751	0.01˚C

Thermocouple data

Temperature scale   ITS90

Bias current   0.05nA

Cold junction types   Off, internal, external, remote (Remote CJ is not currently implemented - check availability)

CJ error   1˚C max with instrument at 25˚C

CJ rejection ratio   50:1 minimum

Remote CJ   via any user-defined input channel (Remote CJ is not currently implemented - check availability)

Upscale/downscale drive   Types: 'High'. 'low' or 'none' selectable for each thermocouple channel.

          Additional error: Typically 0.01˚C - depends on wiring. (Detect current = 57nA.)

Types, ranges and accuracies   See table

T/C type	Overall range (˚C)	Standard	Max.linearisation error
B	0 to + 1820	IEC584.1	0 to 400˚C = 1.7˚C 400 to 1820˚C = 0.03˚C
C	0 to + 2300	Hoskins	0.12˚C
D	0 to + 2495	Hoskins	0.08˚C
E	-270 to + 1000	IEC584.1	0.03˚C
G2	0 to + 2315	Hoskins	0.07˚C
J	-210 to + 1200	IEC584.1	0.02˚C
K	-270 to + 1372	IEC584.1	0.04˚C
L	-200 to + 900	DIN43700:1985 (To IPTS68)	0.02˚C
N	-270 to + 1300	IEC584.1	0.04˚C
R	-50 to + 1768	IEC584.1	0.04˚C
S	-50 to + 1768	IEC584.1	0.04˚C
T	-270 to + 400	IEC584.1	0.02˚C
U	-200 to + 600	DIN43710:1985	0.08˚C
NiMo/NiCo	-50 to + 1410	ASTM E1751-95	0.06˚C
Platinel	0 to + 1370	Engelhard	0.02˚C

TECHNICAL SPECIFICATION (Ethernet/Relay output board option)

Network Communications

Type		IEEE802.3 10BaseT
Cable	Type:	CAT5
	Maximum length:	100 metres
	Termination:	RJ45 telephone connector
Transport protocol		TCP I/P, FTP

Relay

GENERAL

Number of relays per board	One
Maximum number of relay boards	One
Type	Single pole changeover (form C)
Termination	Three-way connector
Estimated mechanical life of relay	30,000,000 operations
Maximum switching power	500VA or 60W
Maximum contact voltage	250V providing this does not cause the maximum switching power (above) to be exceeded
Maximum contact current	2 Amps providing this does not cause the maximum switching power (above) to be exceeded
Update rate	See 'Update/archive rates' in 'Universal inputs specification' above

SAFETY ISOLATION

Isolation (dc to 65 Hz; BS EN61010)	Installation category II; Pollution degree 2
Relay to common electronics:	300V RMS or dc (double insulation)
Relay to ground:	300V RMS or dc (basic insulation)

DERATING

The figures given in 'General', above, are for resistive loads. For reactive or inductive loads, de-rate in accordance with the figure below, in which

F1 =	Actually measured results on representative samples
F2 =	Typical values (according to experience)
Contact life =	Resistive contact life x reduction factor.

INDEX

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