

User guide

# 5100/5180

100 and 180 mm video-graphics recorders





EUROTHERM

## Declaration of Conformity

<b>Manufacturer's name:</b>	<b>Eurotherm Limited</b>
<b>Manufacturer's address</b>	<b>Faraday Close, Worthing, West Sussex, BN13 3PL, United Kingdom.</b>
<b>Product type:</b>	<b>Industrial video-graphic recorder</b>
<b>Models:</b>	<b>5100V      Status level A1 and above 5180V      Status level A1 and above</b>
<b>Safety specification:</b>	<b>EN61010-1: 1993 / A2:1995</b>
<b>EMC emissions specification:</b>	<b>EN50081-2</b>
<b>EMC immunity specification:</b>	<b>EN50082-2</b>

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:

*P. de la Nougerède*

Dated:

*18-July-2000*

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



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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 video-graphic, chart-less recorder. The recorder comes in two versions, which differ in physical size, and in the number of I/O channels available, but which are otherwise identical (i.e. the operation and configuration procedures are the same for both). The recorder comes, as standard, equipped for FTP transfer and Remote viewer connection.

### 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](#) and [2.1b](#) give installation details for the 137x137mm case and for the 277x277mm case respectively.

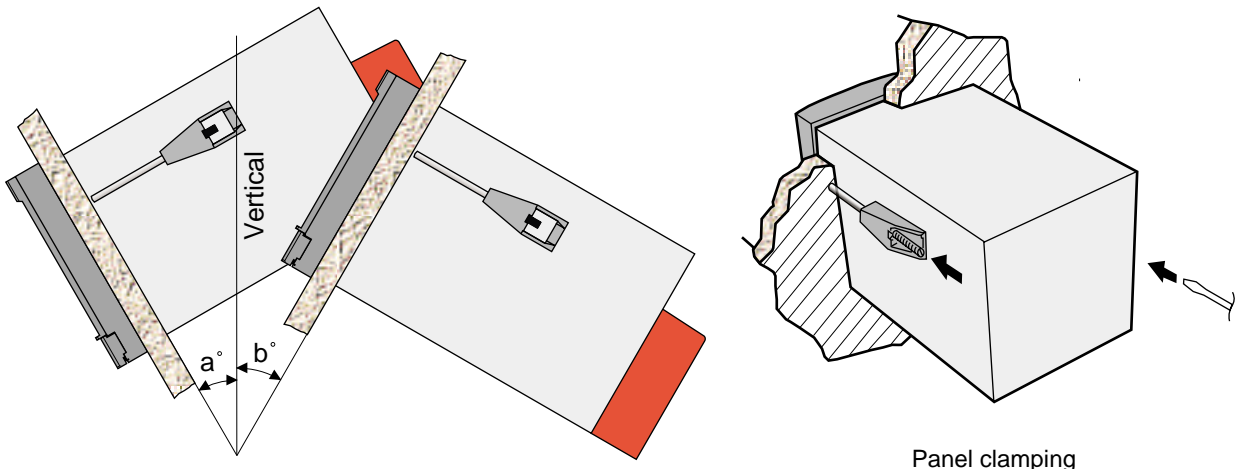
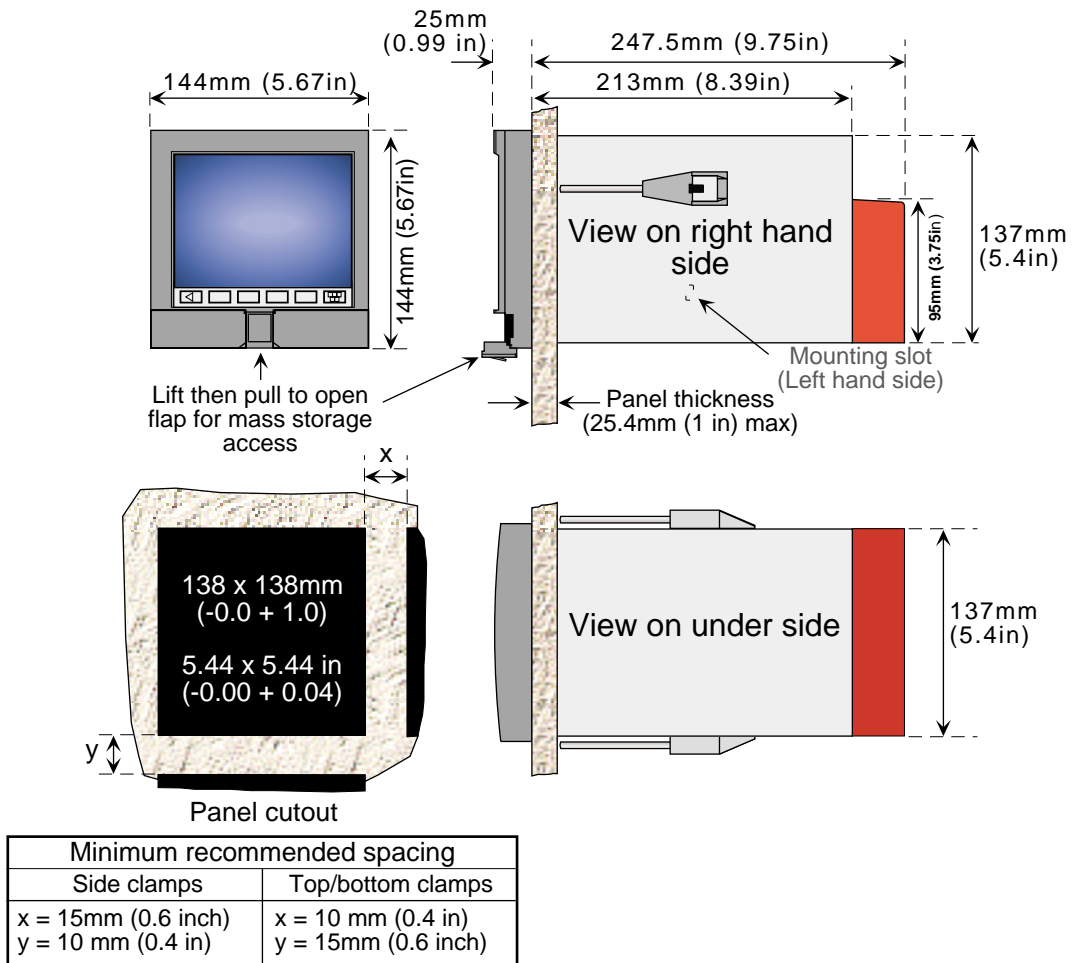
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**Note:** It is recommended that the rear face of the panel be centre-punched at suitable positions to locate the tips of the case clamps. Otherwise, particularly on smooth surfaces, the clamps can 'wander' as they are tightened, leading to inefficient 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.)



**MAXIMUM INSTALLED ANGLE**  
 Hard disk option: vertical panels only  
 Floppy disk option: a = b = 15 degrees max  
 Otherwise: a = b = 45 degrees max

Figure 2.1a Mechanical installation details - small frame unit

2 INSTALLATION (Cont.)

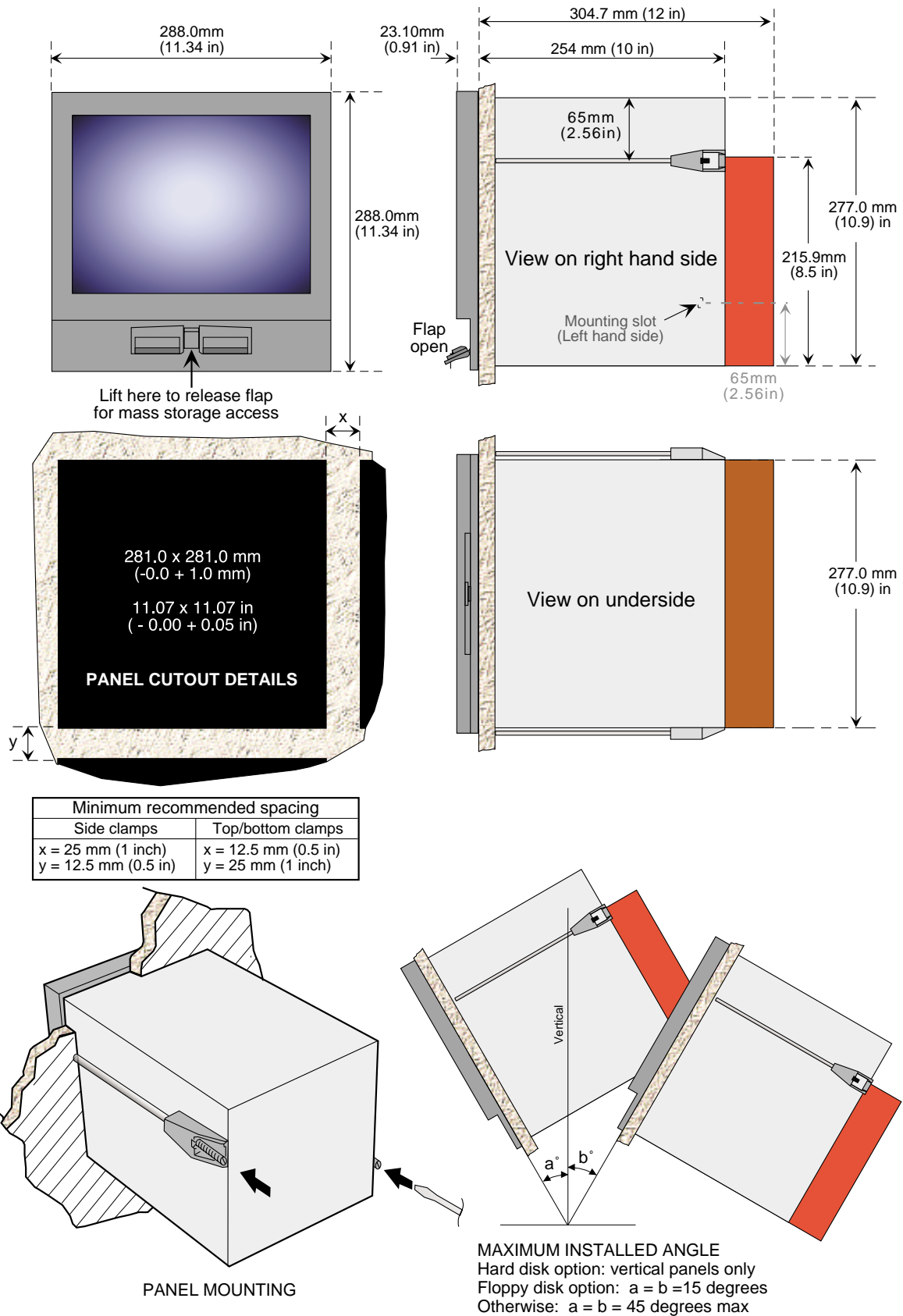


Figure 2.1b Mechanical installation details -large frame unit

## 2.2 ELECTRICAL INSTALLATION

### 2.2.1 Signal wiring

Figures 2.2.1a and 2.2.1b show connector locations for the input channel wiring and optional relay output wiring for the basic small and large-frame recorders respectively. The figures are not to the same scale.

#### CONNECTOR WIRING DETAILS

- Maximum wire size = 4.13mm<sup>2</sup> (11 AWG)
- Minimum wire size = 0.081mm<sup>2</sup> (28 AWG)
- Design torque = 0.8Nm.

Figure 2.2.1c shows details of input board wiring and figure 2.2.1d shows relay output wiring.

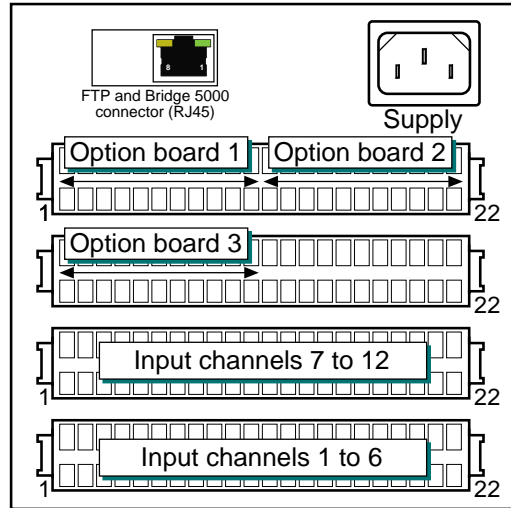


Figure 2.2.1a Connector locations - small frame units

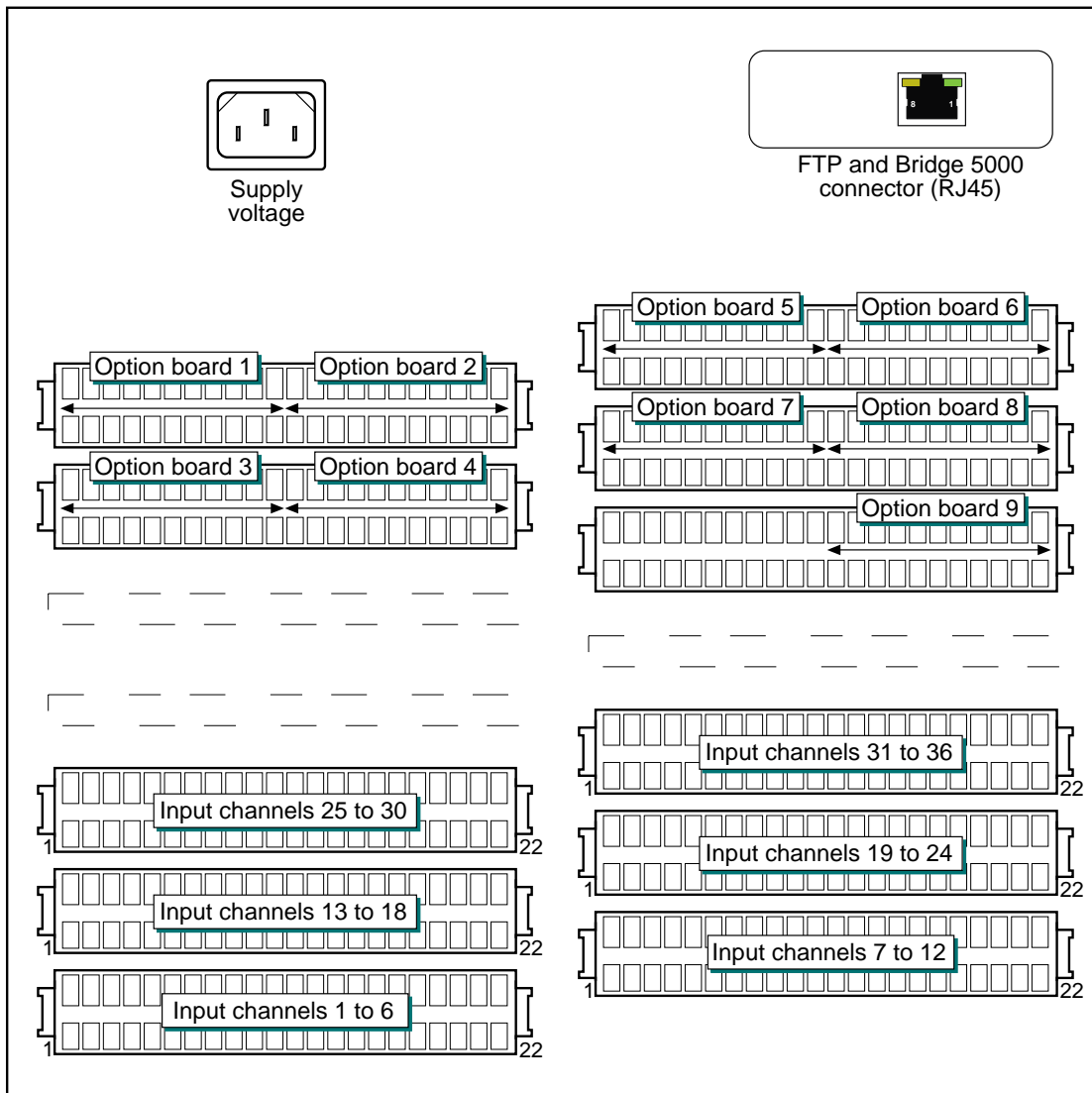


Figure 2.2.1b Connector locations - large frame units

2.2.1 SIGNAL WIRING (Cont.)

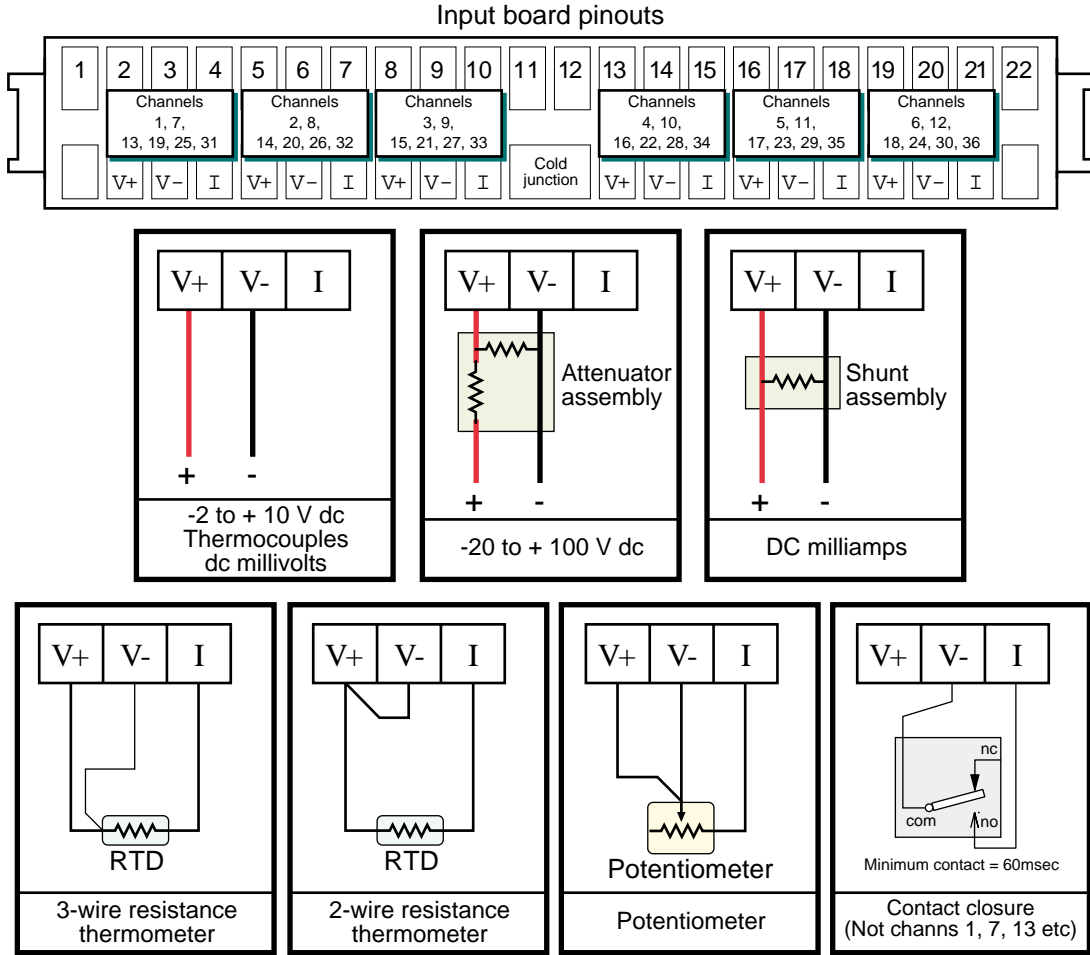


Figure 2.2.1c Input board wiring

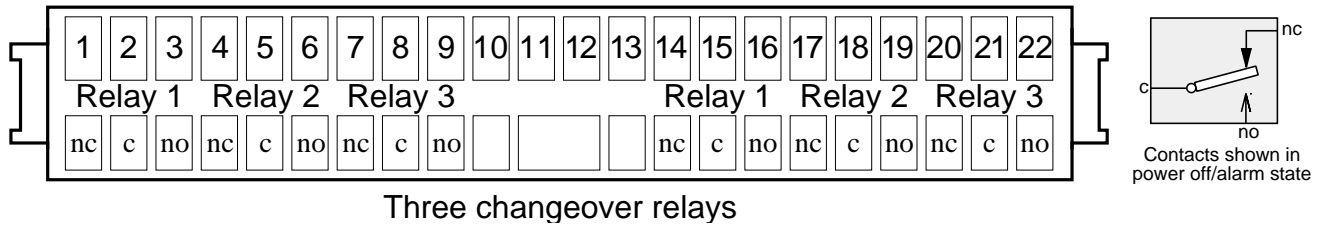


Figure 2.2.1d Relay board wiring

## 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<sup>2</sup>).

## 2.3 DISK/PC CARD INSERTION AND REMOVAL

The disk/PC card slot is located below the recorder screen, and is protected by a flap as shown in figures 2.1a and 2.1b, above.

The bottom of the central part of the flap is lifted and then used as a handle to pull the main flap open (figure 2.3a).

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

---

**Note:** Before disk/pc card 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.

---

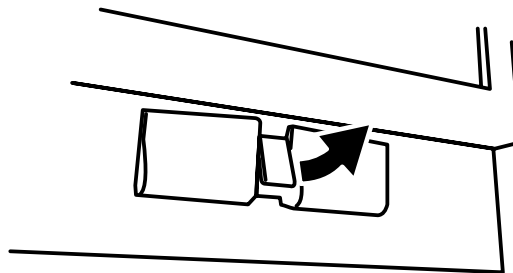


Figure 2.3a Disk/PC card access

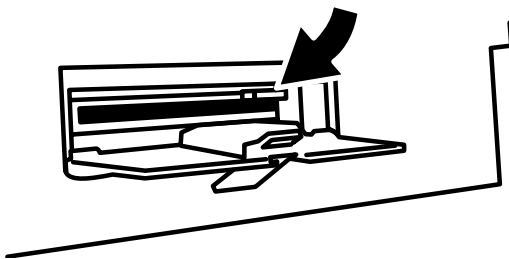


Figure 2.3b Disk eject

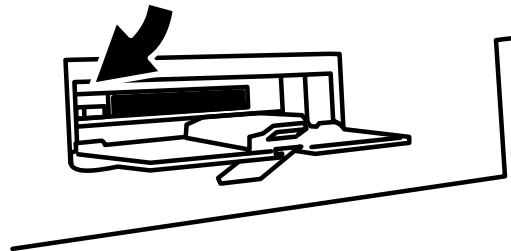


Figure 2.3c PC Card eject



### 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. If the width is still too restricted, the final character of the integer part of the value is replaced by a '?' (as depicted in figure 3.4.3b)

#### 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.

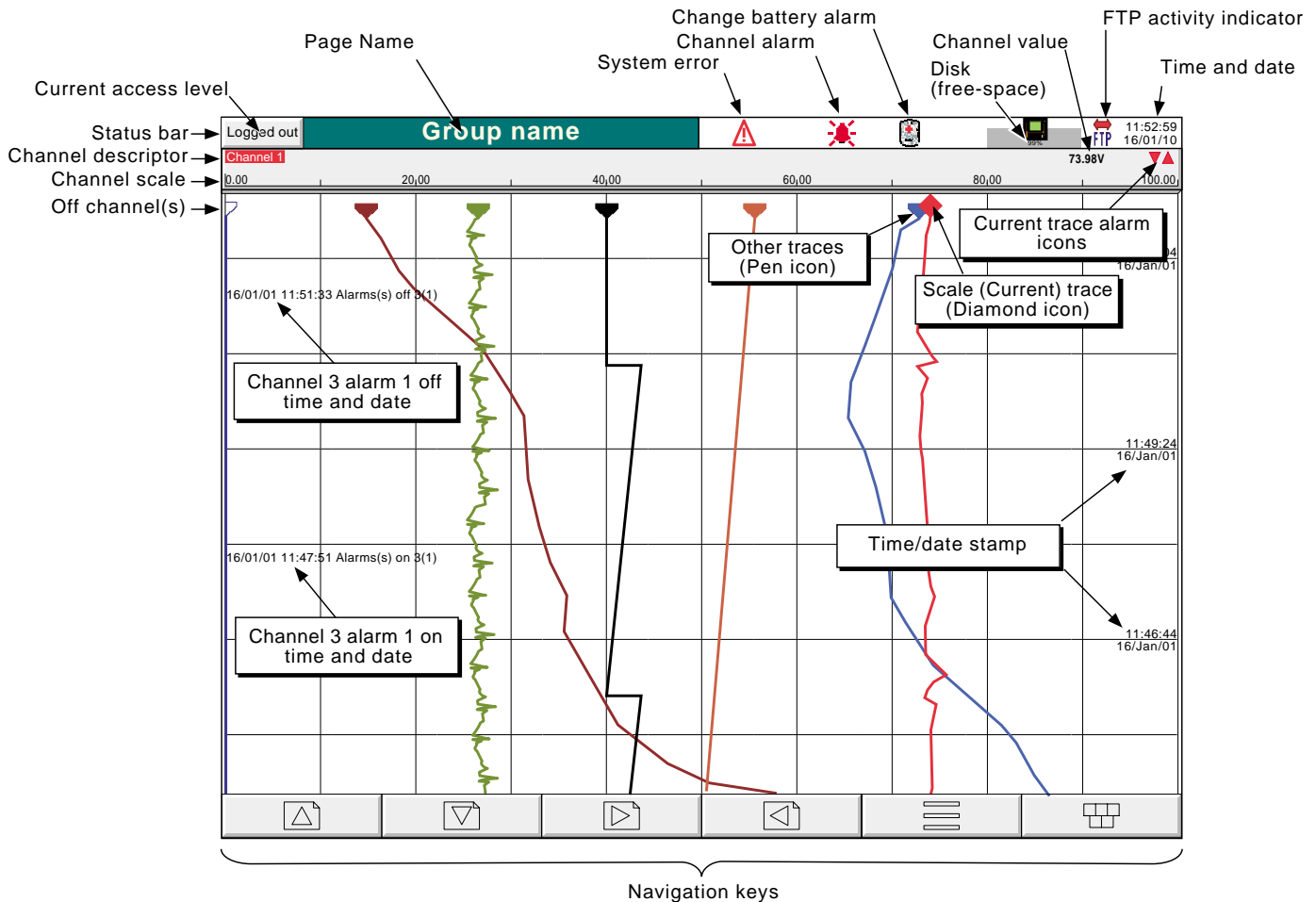


Figure 3 Trend display definitions

### 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 login page as described in section 3.3.1 ([Access to configuration](#)) 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'. If the Batch option is fitted, this area contains batch information as well as the page name. Touching the area calls the Batch Status page. See Section 8 for further Batch details.

#### 3.1.3 Error/alarm indicators

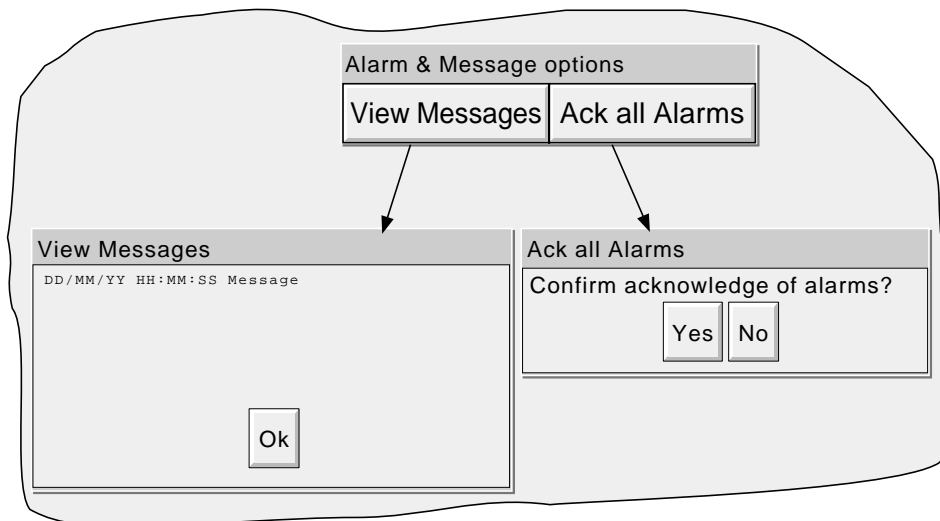


Figure 3.1.3 Alarm acknowledgement and System error display

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.

### 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: \user\ is full	Appears if the User partition is full. To clear, either user screens must be simplified or files must be deleted from \User\, or both.
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 mass storage medium (disk or data card as fitted). The disk icon appears soon after a disk or data card 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.

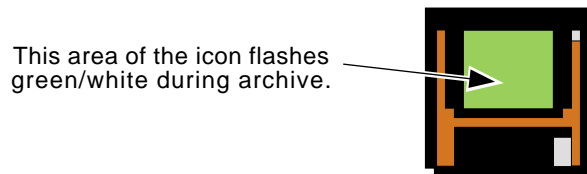


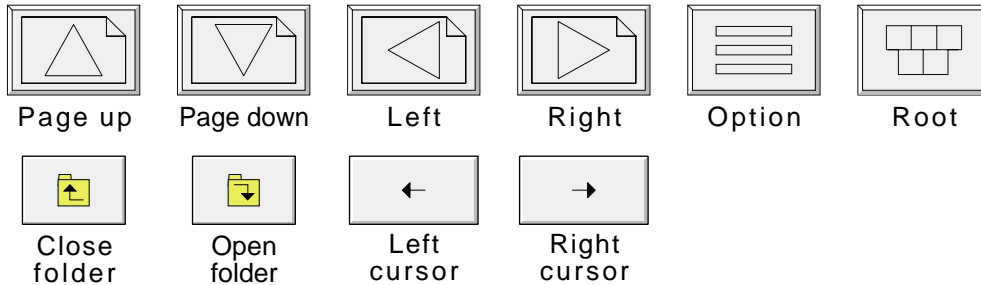
Figure 3.1.4 Archive activity indication

### 3.1.5 FTP Icon

The FTP icon appears to the right of the disc icon position whenever transfer activity is taking place.

## 3.2 NAVIGATION KEYS

Above the lower edge of the display screen are six keys (as shown below) which allow the user to perform various context-related tasks such as to change the display mode ([section 3.4](#)), 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.



### 3.2.1 Key functions

Page up	Used, as appropriate, to recall the previous (higher level) display page, to call the previous display mode and to scroll through previous text entries. Where relevant, the function of this key is mimicked by the 'Close folder' key.
Page down	Used, where appropriate, to call a further (lower level) display page, to call the next display mode (as for 'Cycle' below) and to scroll through previous text entries. Where relevant, the function of this key is mimicked by the 'Open folder' key.
Left arrow	Used to navigate backwards through a text string, when editing. Where relevant, the function of this key is mimicked by the 'Left cursor' key.
Right arrow	Used to navigate forwards through a text string, when editing. Where relevant, the function of this key is mimicked by the 'Right cursor' key.
Option	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.
Root	Calls the 'Root Menu' as shown. To quit the Root menu, touch the root key again.

#### 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 <a href="#">Operator/System - Setup</a> ) to be any of the other available display modes - Horizontal trend, Vertical bargraph, Horizontal bargraph, Numeric etc.	<table border="1"> <thead> <tr> <th colspan="2">Root Menu</th> </tr> </thead> <tbody> <tr> <td>Home</td> <td>Operator</td> </tr> <tr> <td>File</td> <td>Cycle</td> </tr> </tbody> </table>	Root Menu		Home	Operator	File	Cycle
Root Menu								
Home	Operator							
File	Cycle							
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 two buttons, one labelled 'Archive'; the other 'Security'. Further details appear in <a href="#">'Access to configuration'</a> 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 or data card fitted to be viewed. See <a href="#">section 5</a> for details.							
Cycle	Causes the next display mode to be selected for process variable display. Initially, the sequence is Vertical Trend, Horizontal Trend (both on white background), Vertical Bargraph, Horizontal Bargraph and Numeric. Though the order in which these displays appear cannot be changed, all modes can be enabled/disabled in the <a href="#">Operator/System-Setup</a> configuration page. Tracing on a dark background is an alternative mode to tracing on a white background, not an additional mode.							

**Note:** The down arrow key can be used as an alternative to the Root/Cycle operation to call the next display mode. The up arrow key can similarly be used to call the previous display mode.

### 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 <a href="#">root</a> 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 As shown in figure 3.3.1a, once the recorder has initialised, touch the current access level key
- 2 The word Engineer is touched 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 [Disk](#), [Save/Restore](#), [Config](#), [Security](#), [Network](#) and [System](#) areas described in [section 4](#) below.

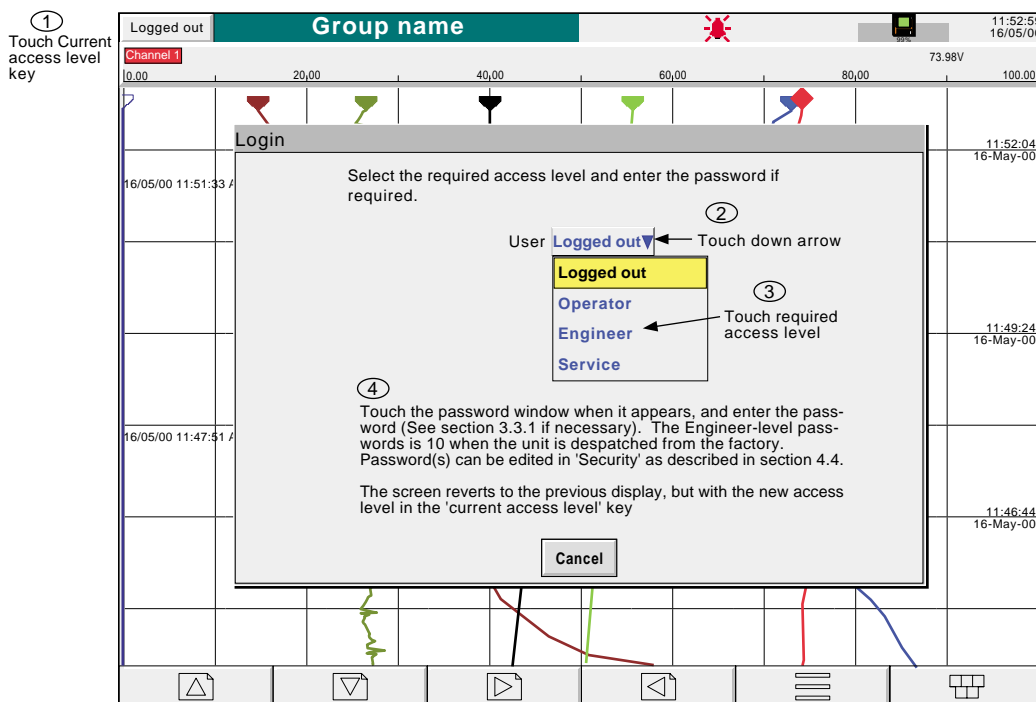


Figure 3.3.1a Access to configuration

### 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. The down and up arrow keys can be used to scroll through previously entered text strings.

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 is 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.

**\*Notes**

1. 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.
2. The cursor keys mimic the function of the left and right arrow keys.

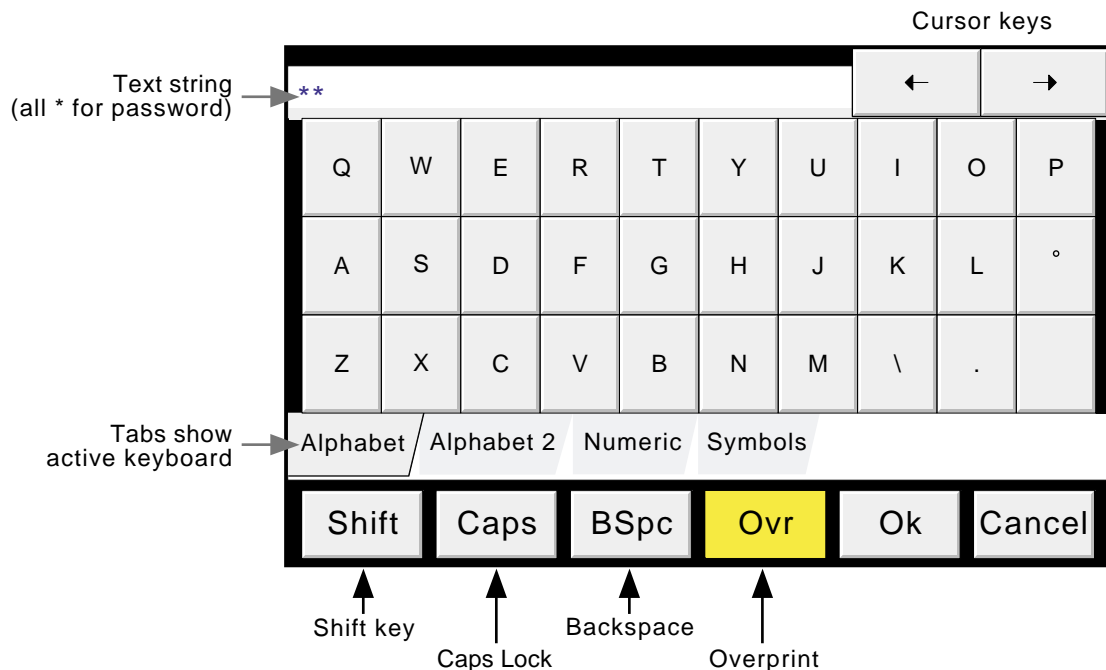


Figure 3.3.1b Alphabet 1 keyboard

3.3.1 ACCESS TO CONFIGURATION (Cont.)

TEXT STRING ENTRY (Cont.)

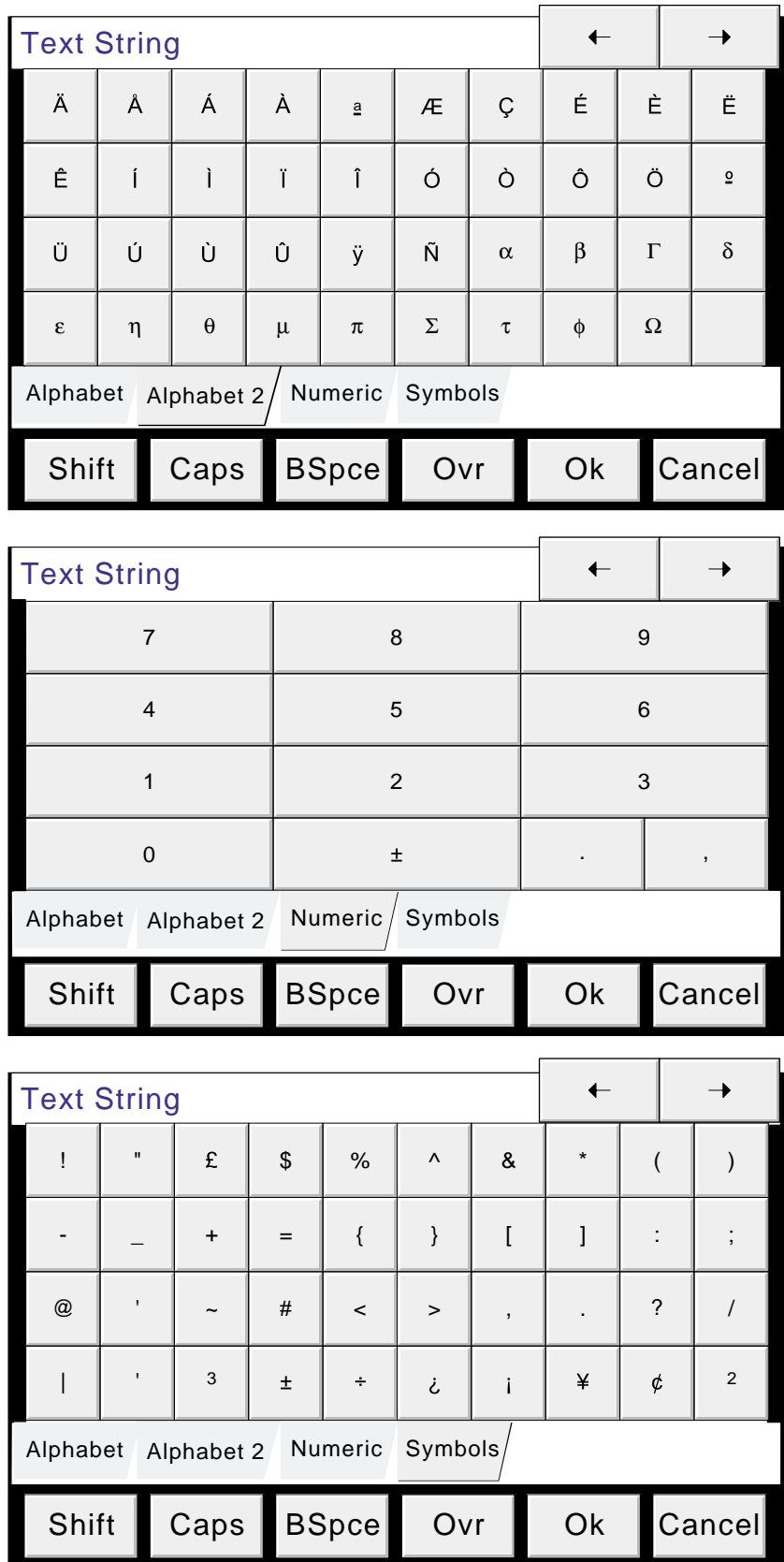


Figure 3.3.1c Alternative keyboards



## 3.4 DISPLAY MODES

The display modes described below allow process values (channels, totalisers etc.- known collectively as points) to be displayed as vertical or horizontal 'chart' traces, as vertical or horizontal bargraphs or as a numeric value. The various display modes are cycled-through using the [Home\Cycle](#) key, or the up/down arrow keys. 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 trend display when dispatched, but any of the other display modes can be selected in [System - Setup](#). See also the User Screens description at section 9.

### 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 both to 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. 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 saved in the recorder memory. Alarms are still scanned-for and any associated action taken.

The trend review display is similar to the real-time trend display, with the addition of a slider control and an up and down keys for selecting that part of trend history which is on display. 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. The Page up and Page down keys can also be used to provide this function
- 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 Option key is operated, followed by 'Exit Review'.

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

3.4 DISPLAY MODES (Cont.)

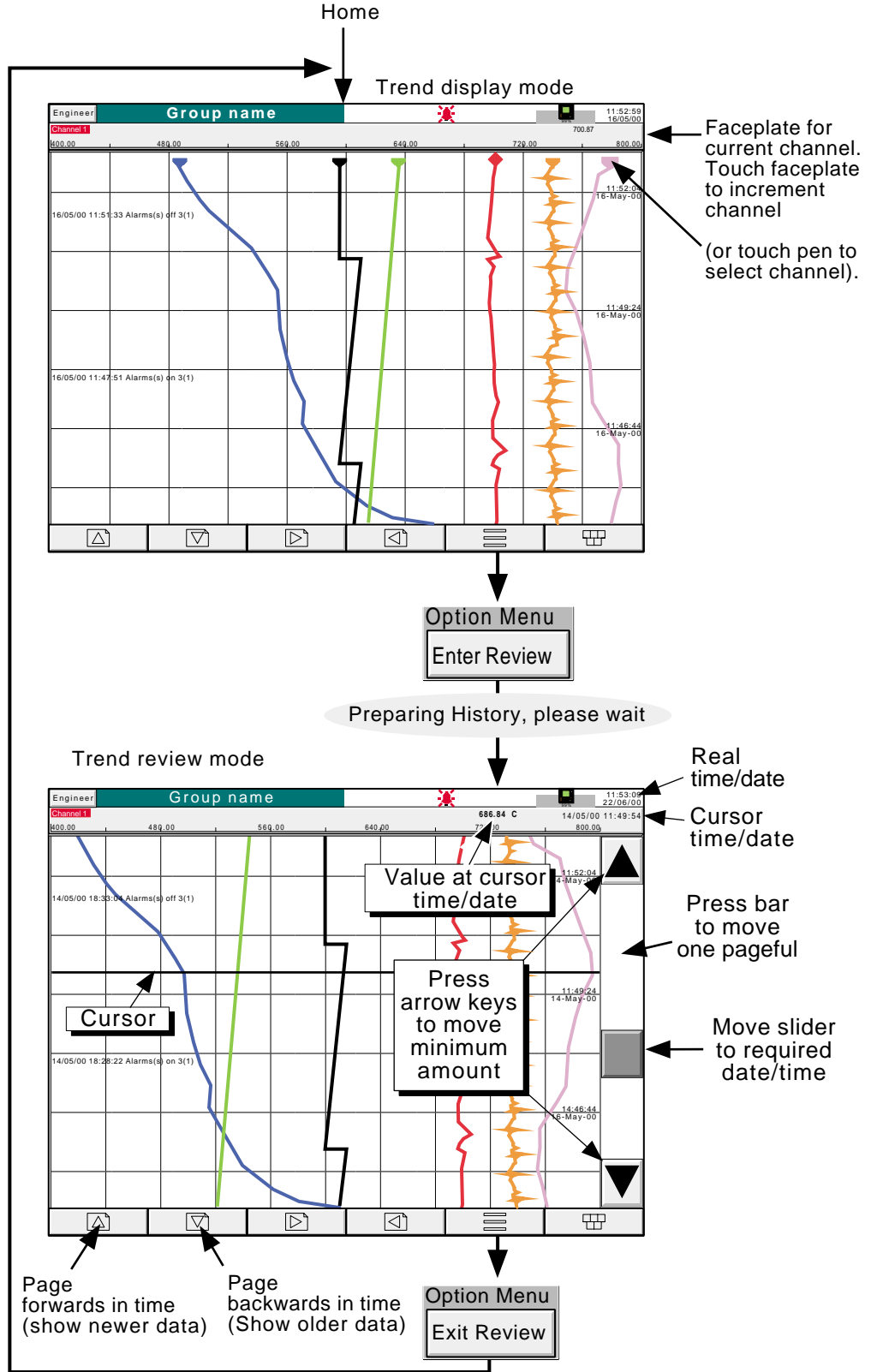


Figure 3.4.1 Trend display mode and trend review mode

### 3.4 DISPLAY MODES (Cont.)

#### 3.4.2 Horizontal Trend display

Entered from the Vertical Trend display by means of the Cycle, or down arrow key, this display mode (figure 3.4.2a) is similar to the Vertical Trend display described in section 3.4.1 above, except that the traces are produced horizontally rather than vertically.

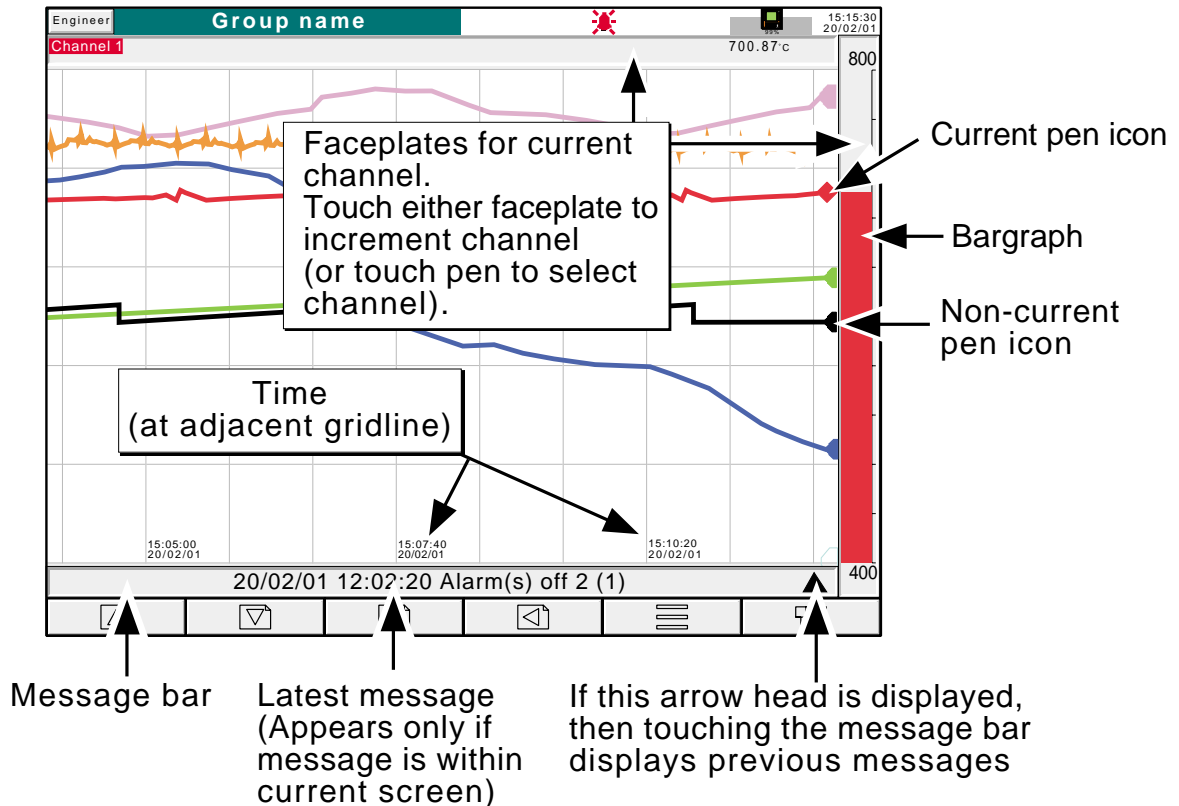


Figure 3.4.2a Horizontal Trend Display

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 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 mode, one above the 'chart', showing the current channel's 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. In either case, the bargraph and the background colour of the channel descriptor take the colour of the new current channel.

There is no horizontal trace review function. Touching the trace for a few seconds, or using the Option 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 grid lines, and it is to these grid lines that the printed time and date relate.

### 3.4.2 HORIZONTAL TREND MODE (Cont.)

Below the 'chart' is a message bar, containing the latest message to become active within the current screen's width. If there is more than one message, or, if a message relates to a time no longer on display, an arrow head icon appears near the right-hand end of the message bar. If this arrow head appears, then touching the message bar calls a pop-up box (figure 3.4.2b) which displays the latest messages. If there are more messages than can be displayed in the box, a slider control appears, which can be used to access previous messages, up to a total of 60 messages. Further messages, cause the oldest messages to be discarded to keep the total to 60.

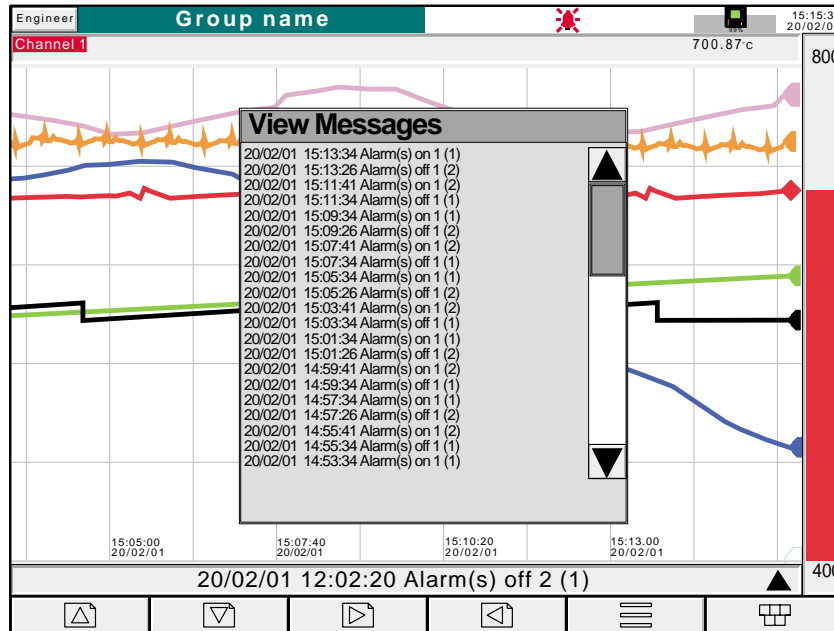


Figure 3.4.2b Horizontal Trend mode message dialogue box

To call the vertical bargraph display mode, use the Cycle key or the down arrow key.

## 3.4 DISPLAY MODES (Cont.)

### 3.4.3 Vertical bargraph

Entered from Horizontal Trend mode by means of the 'Cycle' or down arrow key, this display mode shows the Process Variable (PV) values as vertical bars with faceplates containing digital values and alarm data. There are two versions, one with faceplates above the bars (1 to 6 channels - figure 3.4.3a); the other (with faceplates at the right hand edge of the display - figure 3.4.3b) is used where there are more than six channels (note 1).

Operation of the option 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.

#### FACEPLATES ABOVE THE BARS

As the number of channels in the display group increases, the bars and their faceplates get narrower,

#### FACEPLATES AT RIGHT-HAND EDGE

As the number of PVs increases, the bars get narrower, and the faceplates reduce in height to a minimum readable height (13 complete faceplates). If there are more than thirteen channels in the group, a slider bar appears at the right hand edge of the screen, allowing hidden faceplates to be displayed as required. As the bars get narrower, so the scale values become truncated as shown in figure 3.4.3b)

Review mode is not available from this display mode.

---

#### Notes:

- 1 The description above refers to the 180 mm version of the recorder. For the 100 mm version, faceplates appear above the bars for one or two channel displays, and to the right of the bars for three to six channels.
  2. No more than 30 channels can be displayed at any one time. If more than 30 channels are configured, a horizontal scroll bar appears at the bottom of the screen to allow currently non-displayed channels to be viewed.
-

### 3.4.3 VERTICAL BARGRAPH (Cont.)

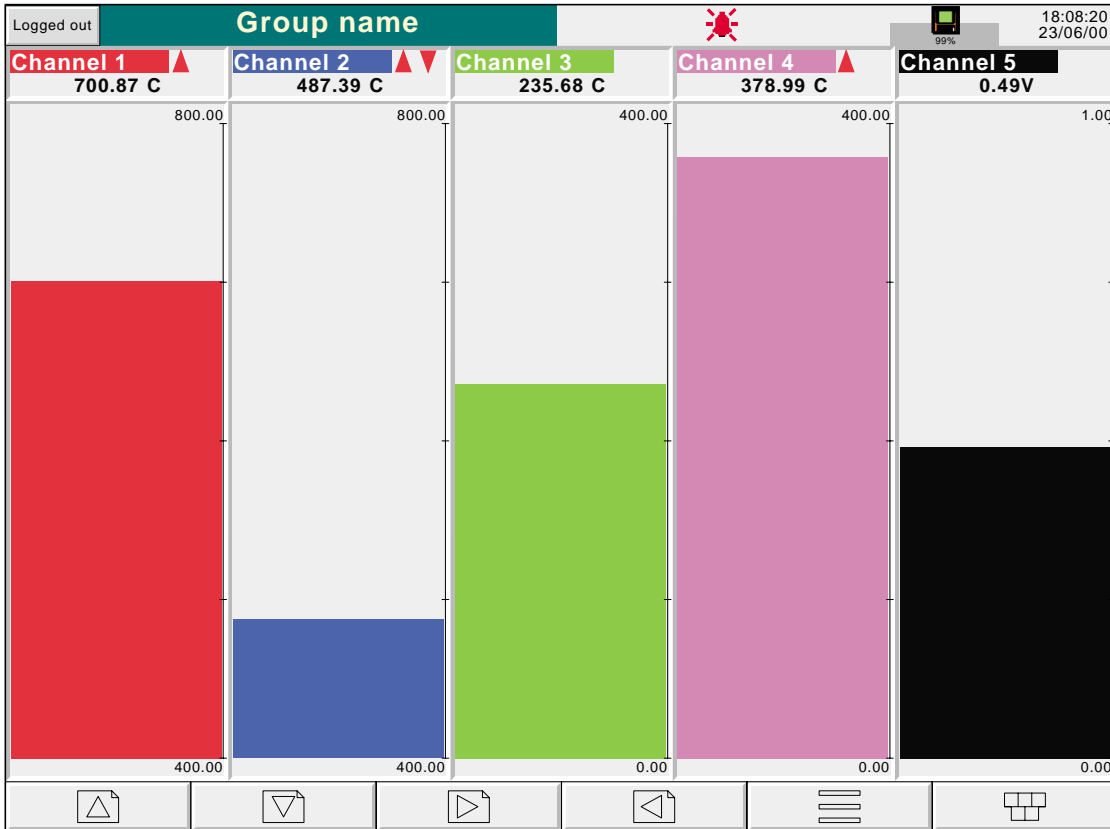


Figure 3.4.3a Vertical bargraph display (1 to 6 channels)

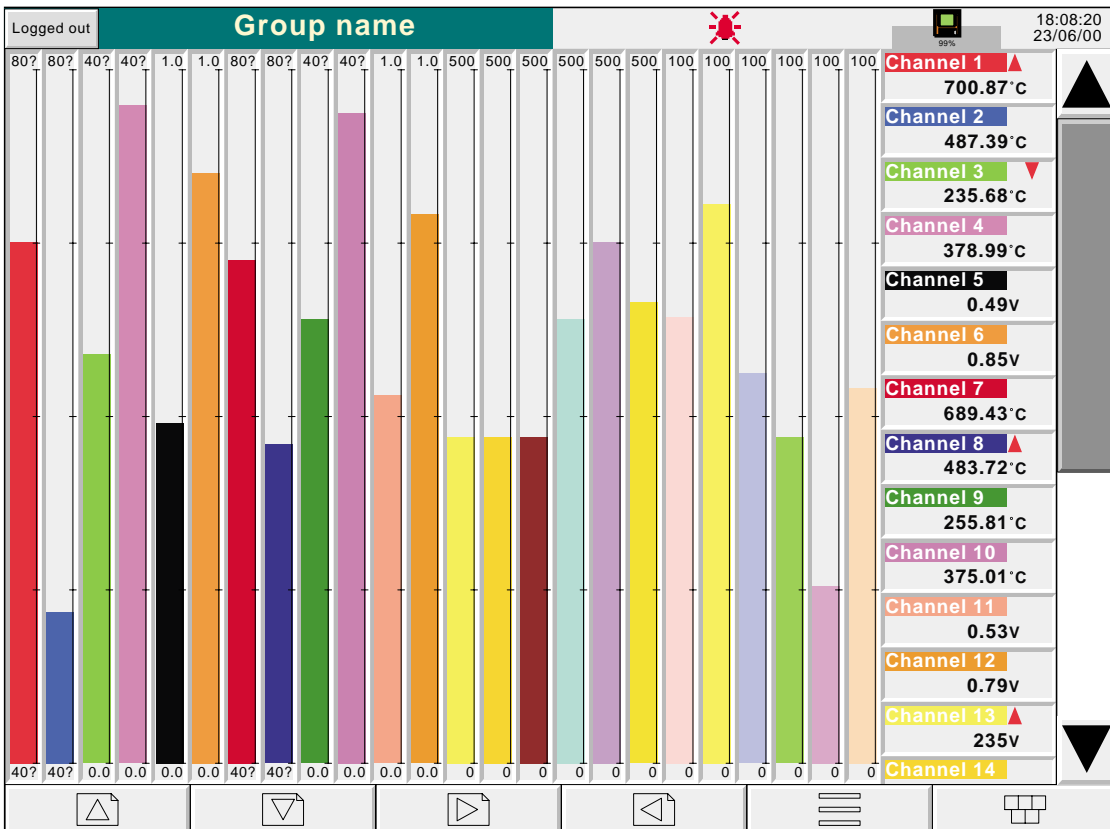


Figure 3.4.3b Vertical bargraph display (more than 6 channels)

### 3.4 DISPLAY MODES (Cont.)

#### 3.4.4 Horizontal bargraph

Entered from Vertical bargraph mode by means of the 'Cycle' or down arrow key, this display mode shows the Process Variable (PV) values as horizontal bars with digital values and alarm data displayed, as shown in figures 3.4.4a and 3.4.4b. Single column format is used when there are up to 12 channels in the display group; double column for more than 12 channels.

Review mode is not available from this display mode.

---

Note: No more than 26 channels can be displayed on one page. If more than 26 channels are configured, a vertical scroll bar appears allowing currently hidden channels to be displayed.

---

### 3.4.4 HORIZONTAL BARGRAPH (Cont.)

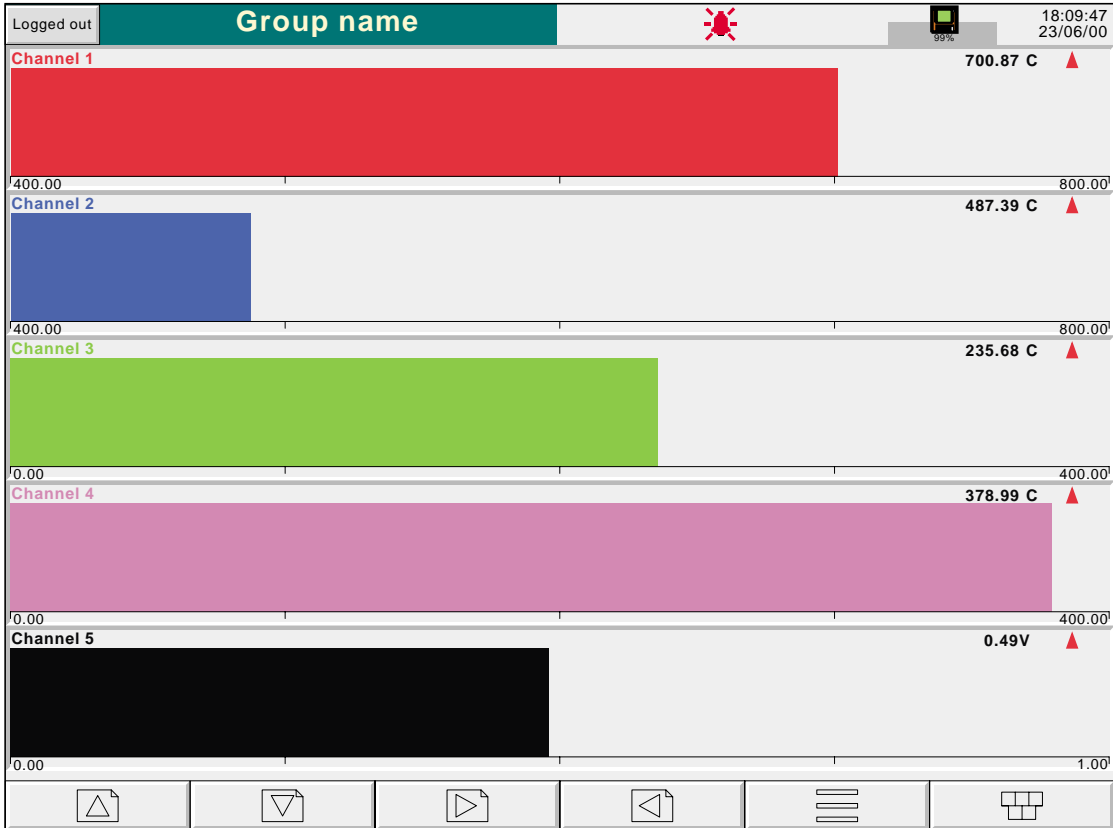


Figure 3.4.4a Horizontal bargraph display (1 to 12 channels)

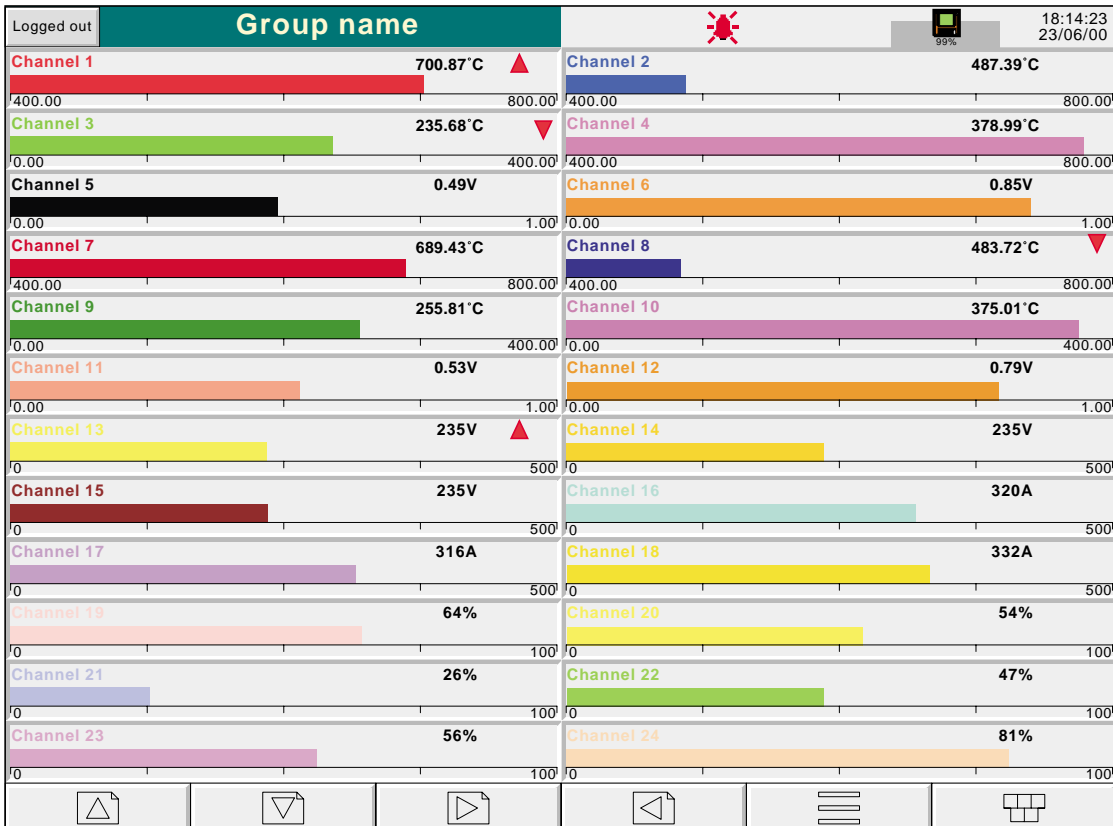


Figure 3.4.4b Horizontal bargraph display (more than 12 channels)



### 3.4 DISPLAY MODES (Cont.)

#### 3.4.5 Numeric

Entered from Horizontal bargraph mode by means of the 'Cycle' or down arrow 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, 3.4.5b and 3.4.5c, show typical examples of the one column (up to five channels), two column (six to 18 channels) and three column versions (19 to 24 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 or down arrow key in the Root menu returns to Trend Display mode described above.

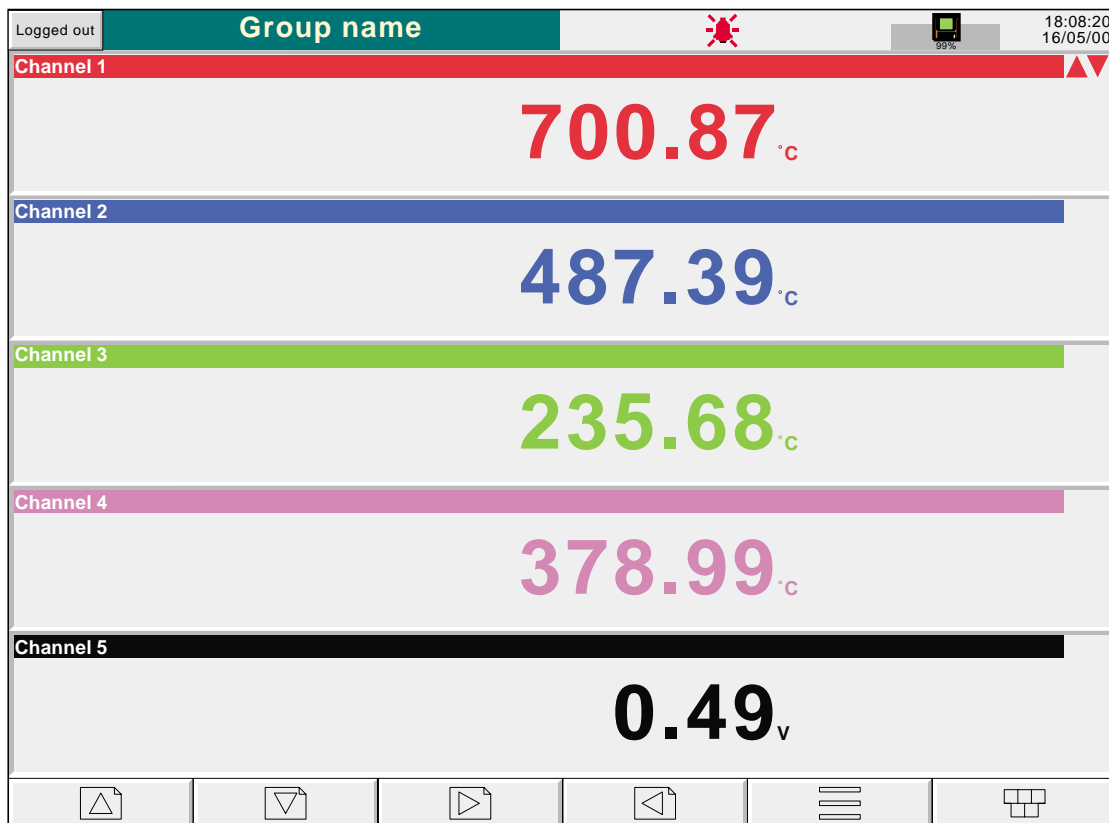


Figure 3.4.5a Numeric display mode (1 to 5 channels)

### 3.4.5 NUMERIC DISPLAY MODES (Cont.)

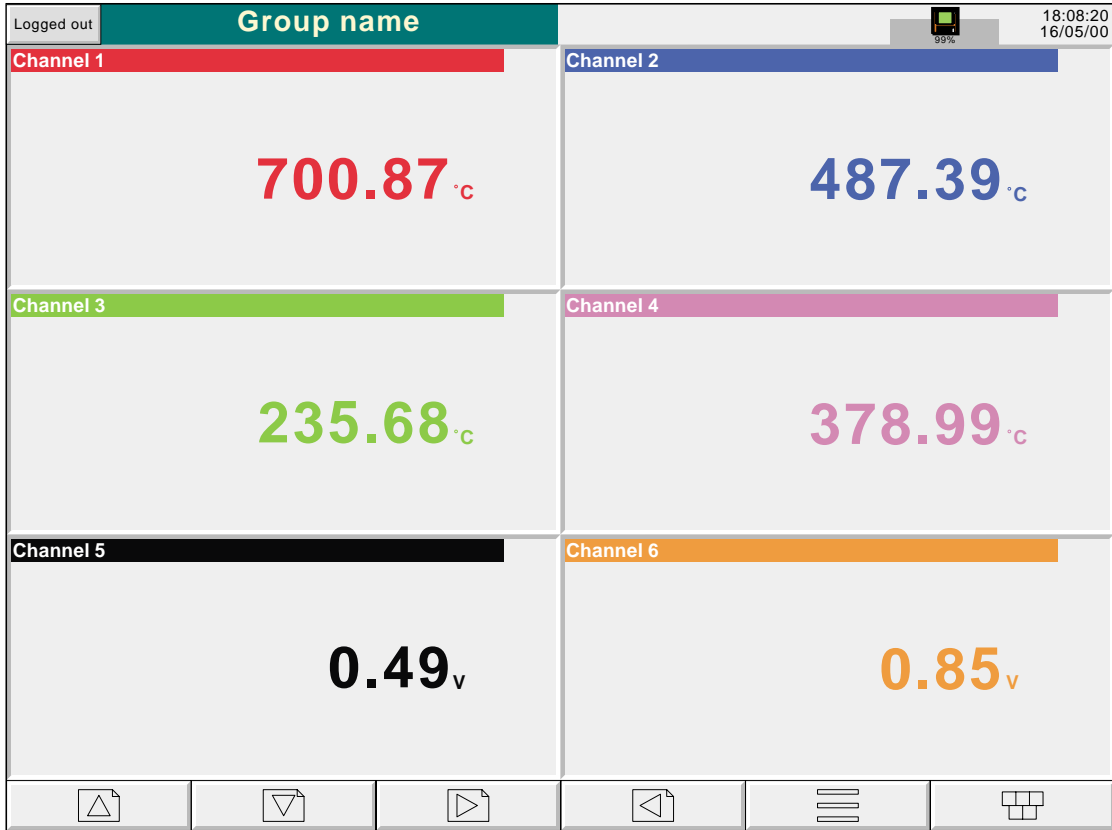


Figure 3.4.5b Numeric display mode (6 channels)

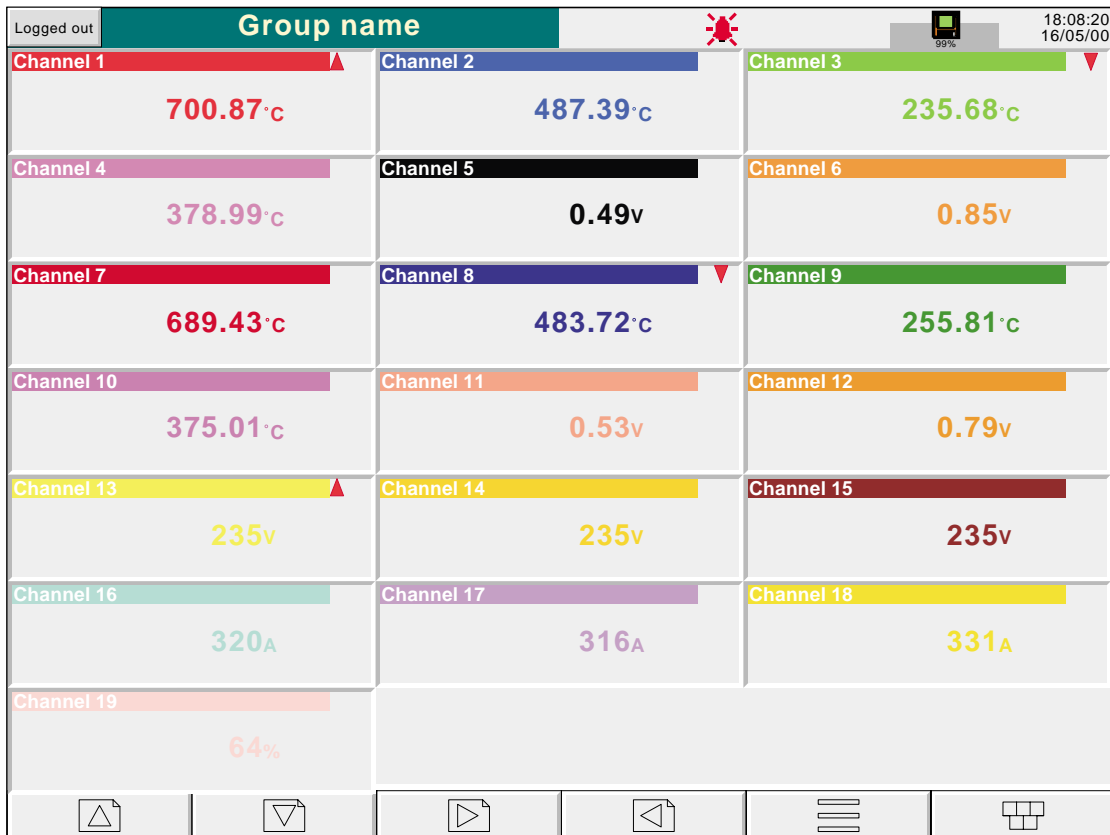


Figure 3.4.5c Numeric display mode (19 channels)

## 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:

<a href="#">Archive</a>	Section 4.1 - Allows manual archiving of data <a href="#">to disk</a> or to a remote host ( <a href="#">FTP transfer</a> ).
<a href="#">Save/restore</a>	Section 4.2 - Allows new configurations to be created and saved, and saved configurations to be 're-stored'. Save/Restore also allows the importing and exporting of User Screens can be carried out if the User Screens option is fitted.
<a href="#">Config</a>	Section 4.3 - This is the major channel/alarm option etc. area of configuration.
<a href="#">Security</a>	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.
<a href="#">Network</a>	Section 4.5 - This area sets up the IP / MAC address/host names etc. used in FTP transfer and Bridge 5000 applications.
<a href="#">System</a>	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 mass storage medium such as 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.

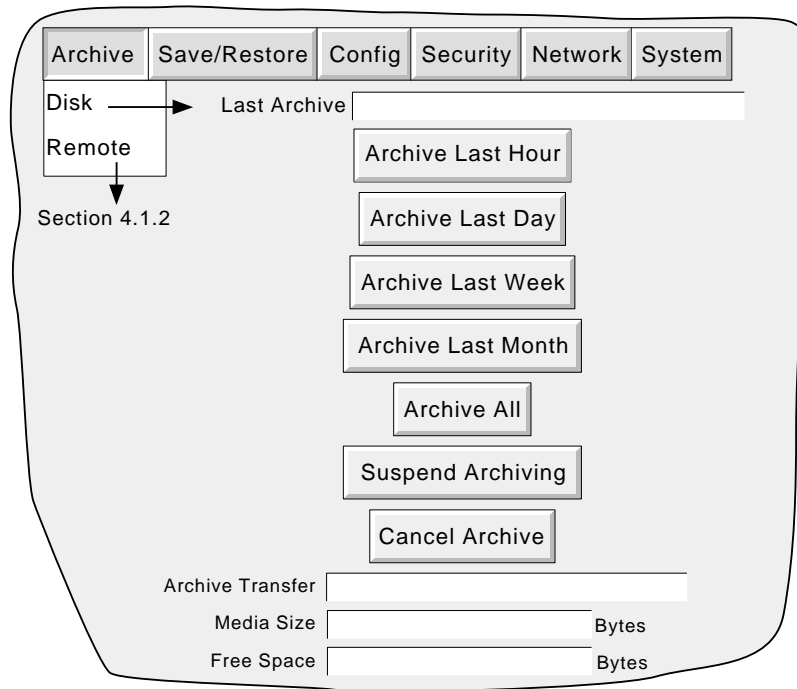


Figure 4.1.1 Disk archive strategy configuration

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 mass storage medium.

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)

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'.

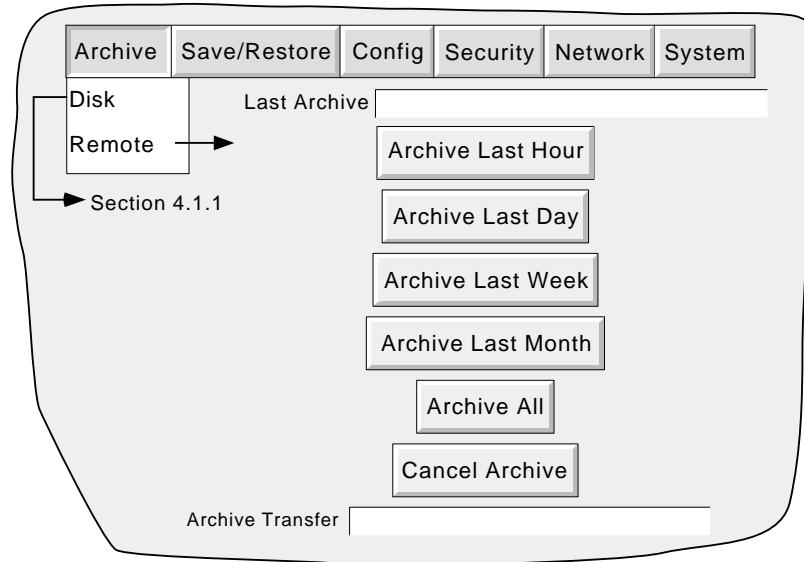


Figure 4.1.2 Remote archive strategy configuration

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.

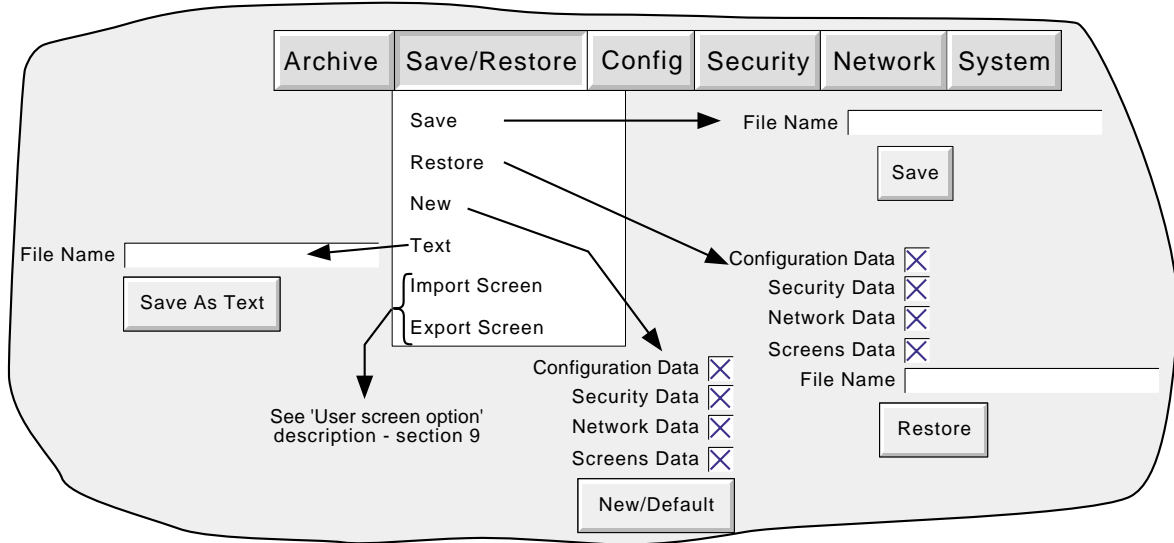


Figure 4.2a Save/Restore menu

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 mass storage medium (if inserted). Figure 4.2b shows an imaginary Volume contents list, displayed by touching the name 'user', then operating the down arrow or '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/Restore key initiates the action.

Name	Type	Date	Bytes
cal\	Folder	03/06/00 12:35:08	
config\	Folder	01/05/00 10:27:13	
Filter1a	Config	05/07/00 10:22:23	4445
lib\	Folder	05/07/00 10:23:14	
sdb\	Folder	11/05/00 14:01:08	
user\	Folder	05/06/00 17:30:29	

FileName

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. Checkboxes allow one or more of Configuration Data, Security data and Network data to be chosen for the restore function.

For recorders with the user screen option (section 9), a further tick box is displayed - 'Screen Data'

### **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. Touching the 'Restore' key completes the operation. Checkboxes allow one or more of Configuration Data, Security data and Network data to be chosen for the restore function.

For recorders with the user screen option (section 9), a further tick box is displayed - 'Screen Data'

### **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.

### **4.2.5 Import screen**

This field appears only if the User Screens option (section 9) is fitted, and allows a previously exported User Screen file to be imported.

### **4.2.6 Export screen**

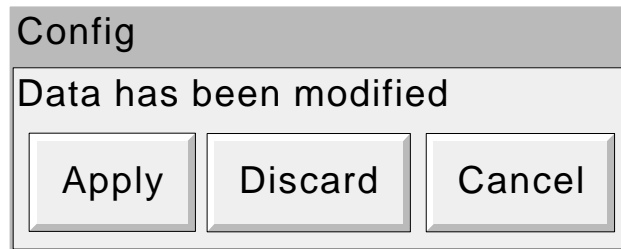
This field appears only if the User Screens option (section 9) is fitted, and allows a User Screen to be exported to disk or Flash memory. The exported screen can subsequently be imported either into this recorder or into a different recorder.

## 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 4.3) below. If the Batch option is fitted, a further category (Batch) appears.

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).



### 4.3.1 Options

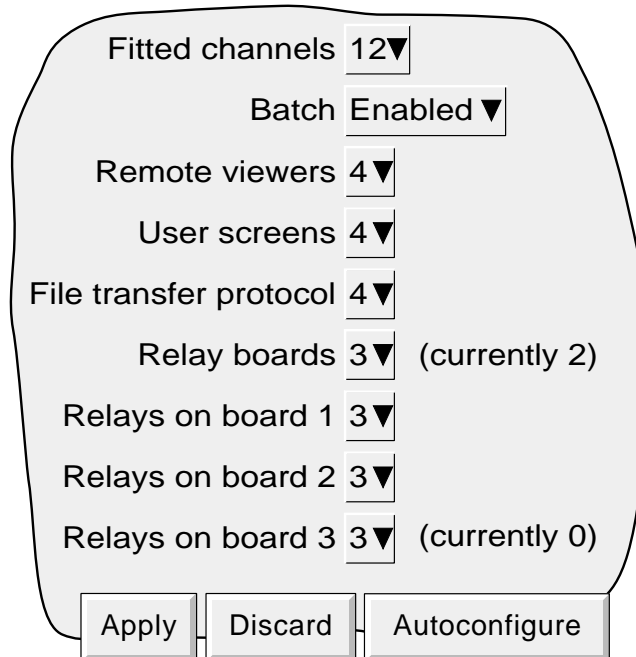


Figure 4.3.1 Options menu layout

Touching this key calls a display showing the current recorder hardware/software setup, for example the number of input channels fitted, the number of output relay boards fitted, and how many relays are fitted per card. Subsequently, should further options be fitted (relay board three in the above example), this page shows the difference 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 extra options have been added (or taken away).

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



4.3 CONFIGURATION (Cont.)

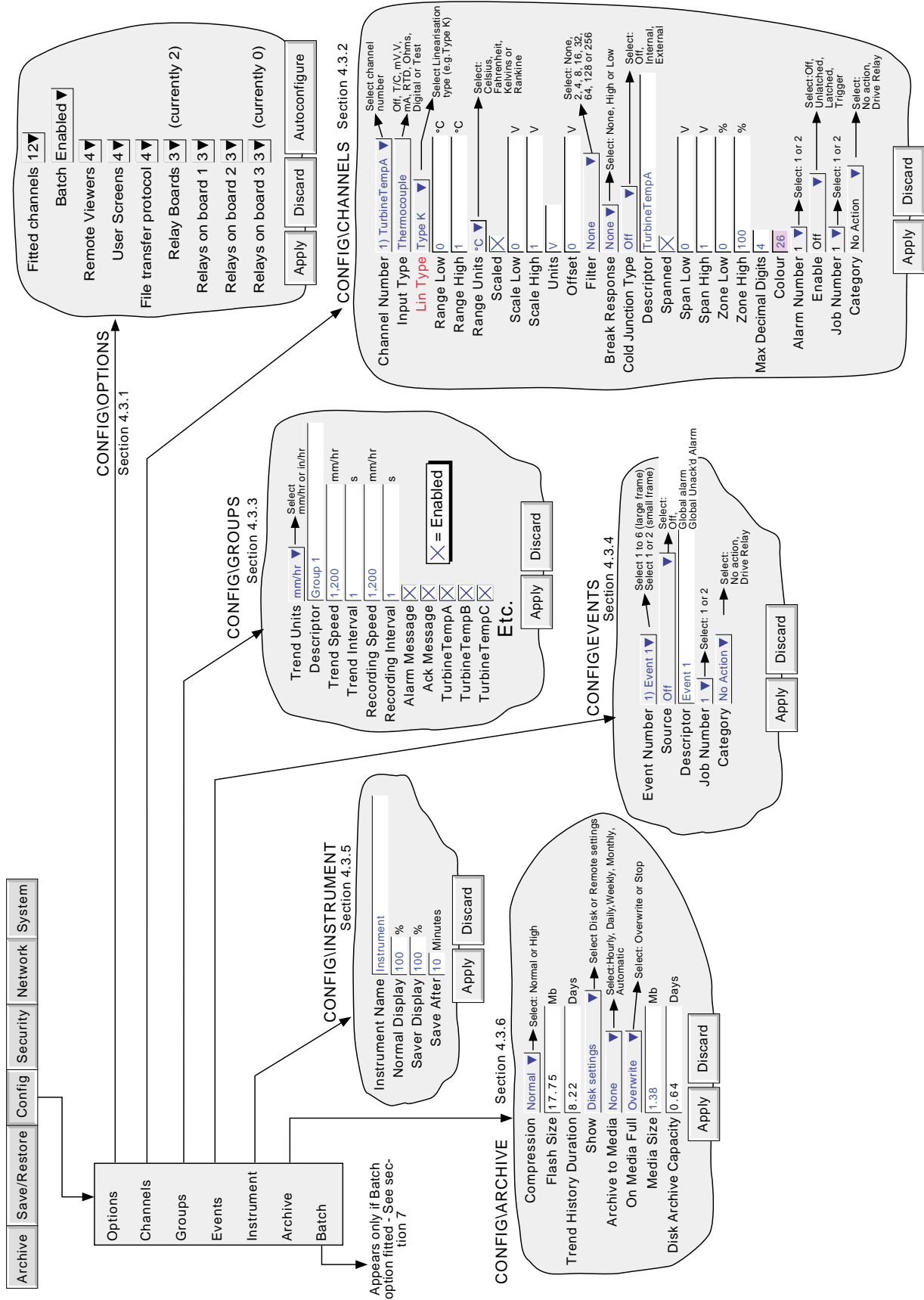


Figure 4.3 Configuration menu overview

### 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.

The screenshot displays a configuration menu for a channel named '1) TurbineTempA'. The settings are as follows:

- Channel Number:** 1) TurbineTempA (dropdown)
- Input Type:** Thermocouple (dropdown)
- Lin Type:** Type K (dropdown)
- Range Low:** 0 °C
- Range High:** 1 °C
- Range Units:** °C (dropdown)
- Scaled:**
- Scale Low:** 0 V
- Scale High:** 1 V
- Units:** V
- Offset:** 0 V
- Filter:** None (dropdown)
- Break Response:** None (dropdown)
- Cold Junction Type:** Off (dropdown)
- 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 (dropdown)
- Enable:** Off (dropdown)
- Job Number:** 1 (dropdown)
- Category:** No Action (dropdown)

Buttons at the bottom: **Apply** and **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 thermocouple 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:

Input type = milliamp  
 Input range low = 4.0  
 Input range high = 20.0  
 Scale low = 0.0  
 Scale high = 100  
 Scale units = %  
 Linearisation range low = 100  
 Linearisation range high = 200  
 Linearisation type units = degrees C  
 Linearisation type = Type J thermocouple.  
 Input shunt value = 250 ohms

---

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 Pt<sub>100</sub>, Pt<sub>1000</sub>, Ni<sub>100</sub>, Ni<sub>120</sub>, JPT<sub>100</sub>, Pt<sub>100</sub>A, Cu<sub>10</sub>

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.

#### 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.

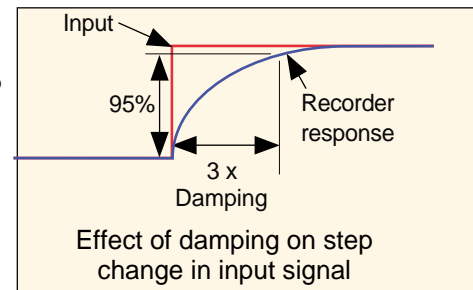


Figure 4.3.2b Channel filter

### 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'.

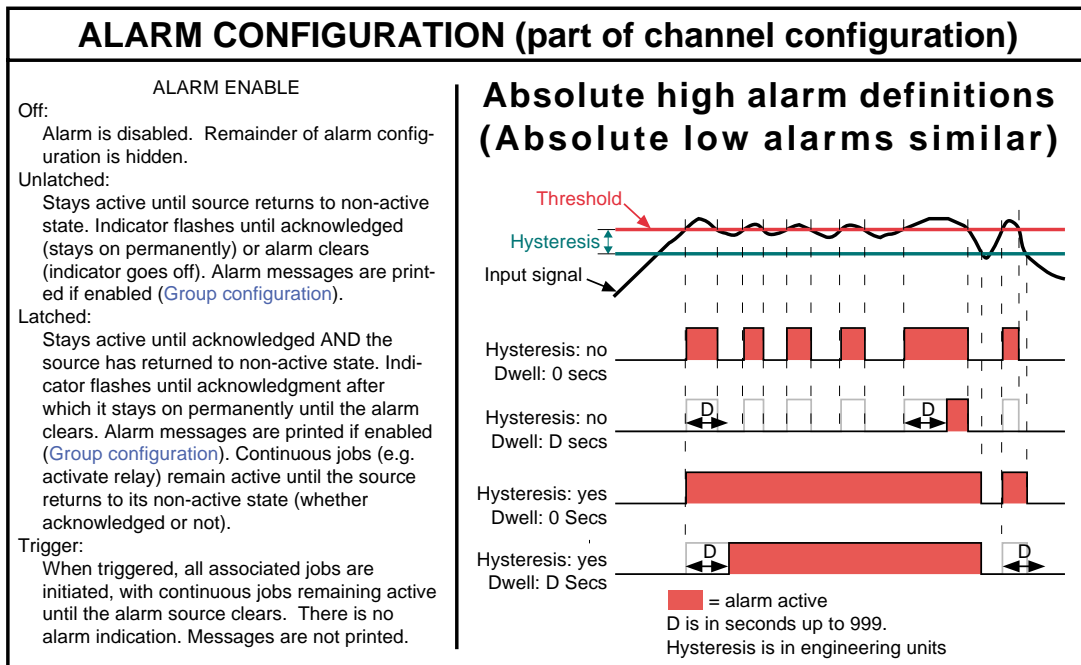


Figure 4.3.2c Absolute alarm definitions

### 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 be 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)

#### RELAY BOARD/RELAY NUMBER

For 'drive relay' jobs, allows the specific relay to be defined for action this alarm. The relays are normally energised (Common to normally open). They are 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.

#### 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 (cross) or disabled (no cross) 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 (tick) or disabled (no tick) 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.

The screenshot shows a configuration menu with the following items:

- Trend Units: mm/hr (dropdown menu with arrow pointing to 'Select mm/hr or in/hr')
- Descriptor: Group 1 (text field)
- 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:
- TurbineTempC:
- Etc.
- Buttons: Apply, Discard
- Legend:  = Enabled

Figure 4.3.3 Group configuration menu layout

Note: If a configuration has been generated on a recorder version 1.2 or later, and this configuration has been 'restored' into a version 1.1 recorder, a message "Invalid item" appears on entering group configuration unless an auto-configuration ([section 4.3.1](#)) has been carried out since the Restore operation. Operation of the "OK" key clears the message, and the recorder operates as normal.

### 4.3.4 Event configuration

Two (small frame) or six (large frame) 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 whilst 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)

#### RELAY BOARD/RELAY NUMBER

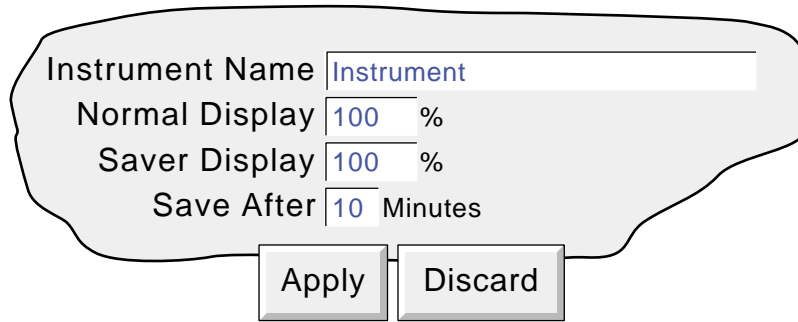
For 'drive relay' jobs, allows the specific relay to be defined for action this alarm. The relays are normally energised (Common to normally open). They are de-energised (common to normally closed) in alarm or power off conditions.

#### WHILE

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



### 4.3.5 Instrument configuration



The screenshot shows a configuration menu with the following fields and values:

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

Below the fields are two buttons: **Apply** and **Discard**.

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

For the sake of brevity, the word 'disk' is used for whatever mass-storage medium is fitted to the recorder.

This allows an archive strategy to be set up for saving data to disk or 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).

Compression **Normal** ▼ → Select: Normal or High  
Flash Size **17.75** Mb  
Trend History Duration **8.22** Days  
Show **Disk settings** ▼ → Select Disk or Remote 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 4.3.6a Archive configuration menu (Disk settings)

Compression **Normal** ▼ → Select: Normal or High  
Flash Size **3** Mb  
Trend History Duration **9.50** Days  
Show **Remote settings** ▼ → Select: Hourly, Daily, Weekly, Monthly, Automatic  
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**

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<sup>8</sup> 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 ( <a href="#">section 4.1</a> )
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/pc card, 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

For Remote settings only:

None	Archive to host is initiated by the operator ( <a href="#">section 4.1.2</a> )
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 Server 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.

### 4.3.7 Batch Configuration

Please see the Batch Recording option description at section 8 of this manual

## 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.

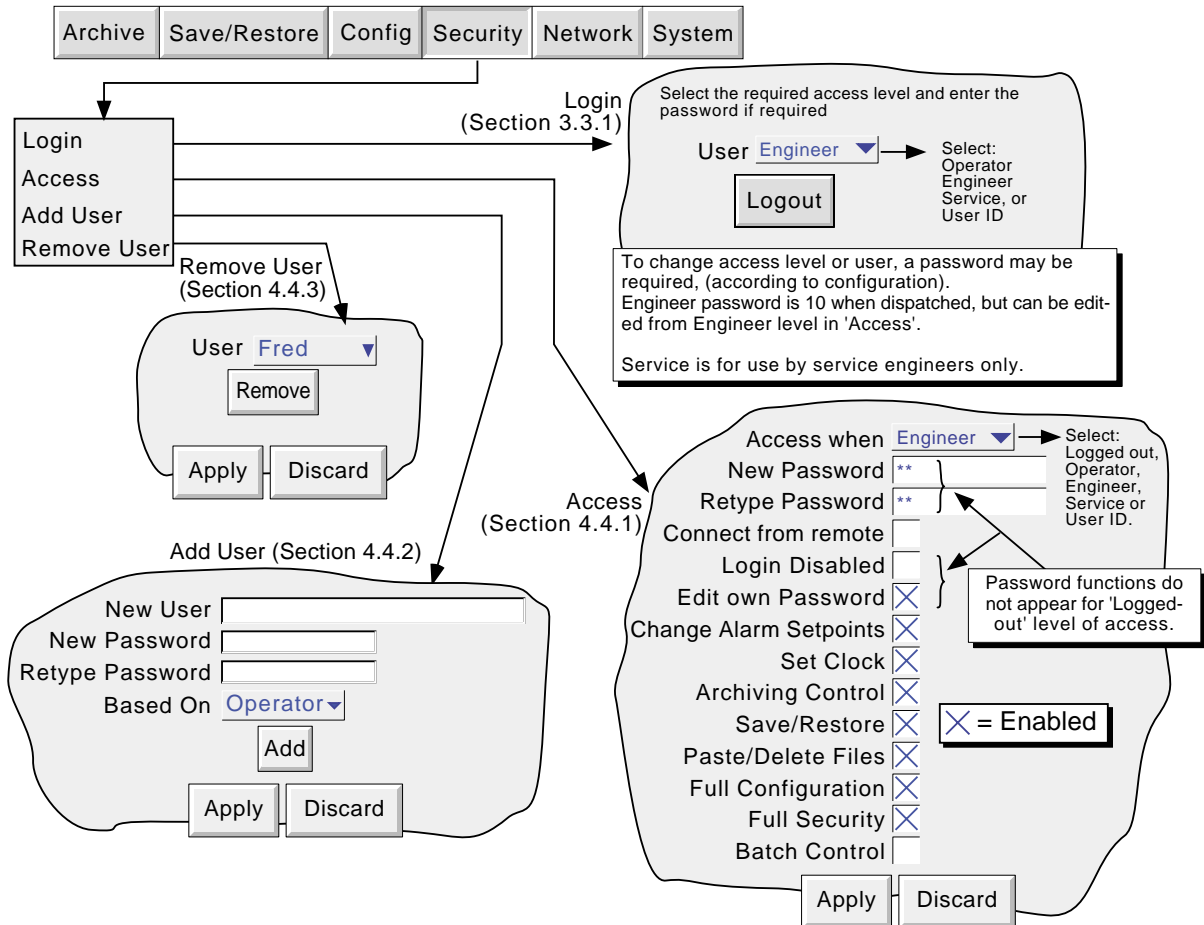


Figure 4.4 Security configuration menus

### 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.)

The screenshot shows a configuration window titled 'Access when' with a dropdown menu set to 'Fred'. Below this are several options, each with a status indicator (checkbox or 'X' in a box):

- New Password: \*\*
- Retype Password: \*\*
- Connect from remote: X
- Remote user name: Fred
- Remote password: [ ]
- Retype remote password: [ ]
- Login Disabled: [ ]
- Edit own Password: X
- Change Alarm Setpoints: X
- Set Clock: X
- Archiving Control: X
- Save/Restore: X
- Paste/Delete Files: X
- Full Configuration: X
- Full Security: X
- Batch control: X

At the bottom are 'Apply' and 'Discard' buttons. Three callout boxes provide additional information:

- Top right: Password functions do not appear for 'Logged-out' level of access. (Points to New Password and Retype Password)
- Middle right: Remote user fields appear only if 'Connect from remote' is enabled. (Points to Remote user name and Remote password)
- Bottom right: Batch Control appears only if the option is fitted. See section 8. (Points to Batch control)

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.

##### **BATCH CONTROL**

This field appears only if the Batch Option is fitted - Refer to section 8 for further details

## 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.

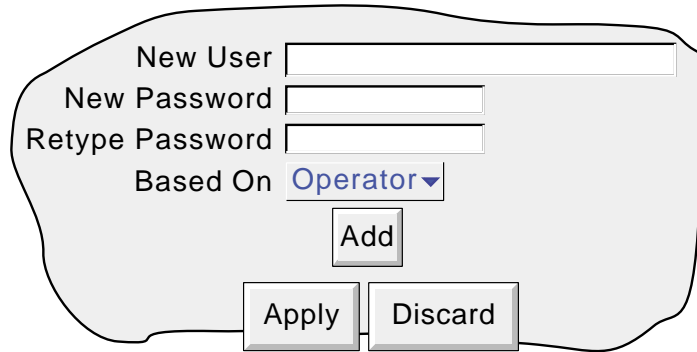


Figure 4.4.2 Add User display page

## 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.

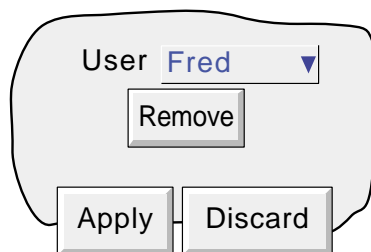


Figure 4.4.3 Remove User display page



## 4.5 NETWORK KEY

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.

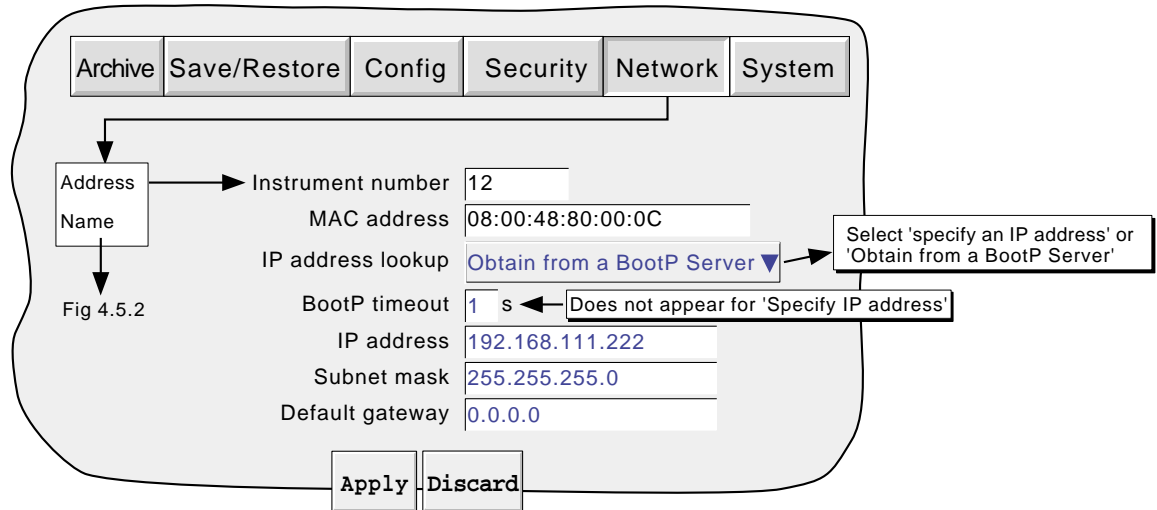


Figure 4.5.1 Network addressing

### 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

The screenshot shows a configuration window with the following fields and values:

Field	Value
Local Host	Andy136-4
Domain	FishesRus.co.uk
Domain Name Service	<input checked="" type="checkbox"/>
Primary DNS Server	149.121.164.11
Secondary DNS Server	149.121.165.14

Buttons: Apply, Discard

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 SYSTEM

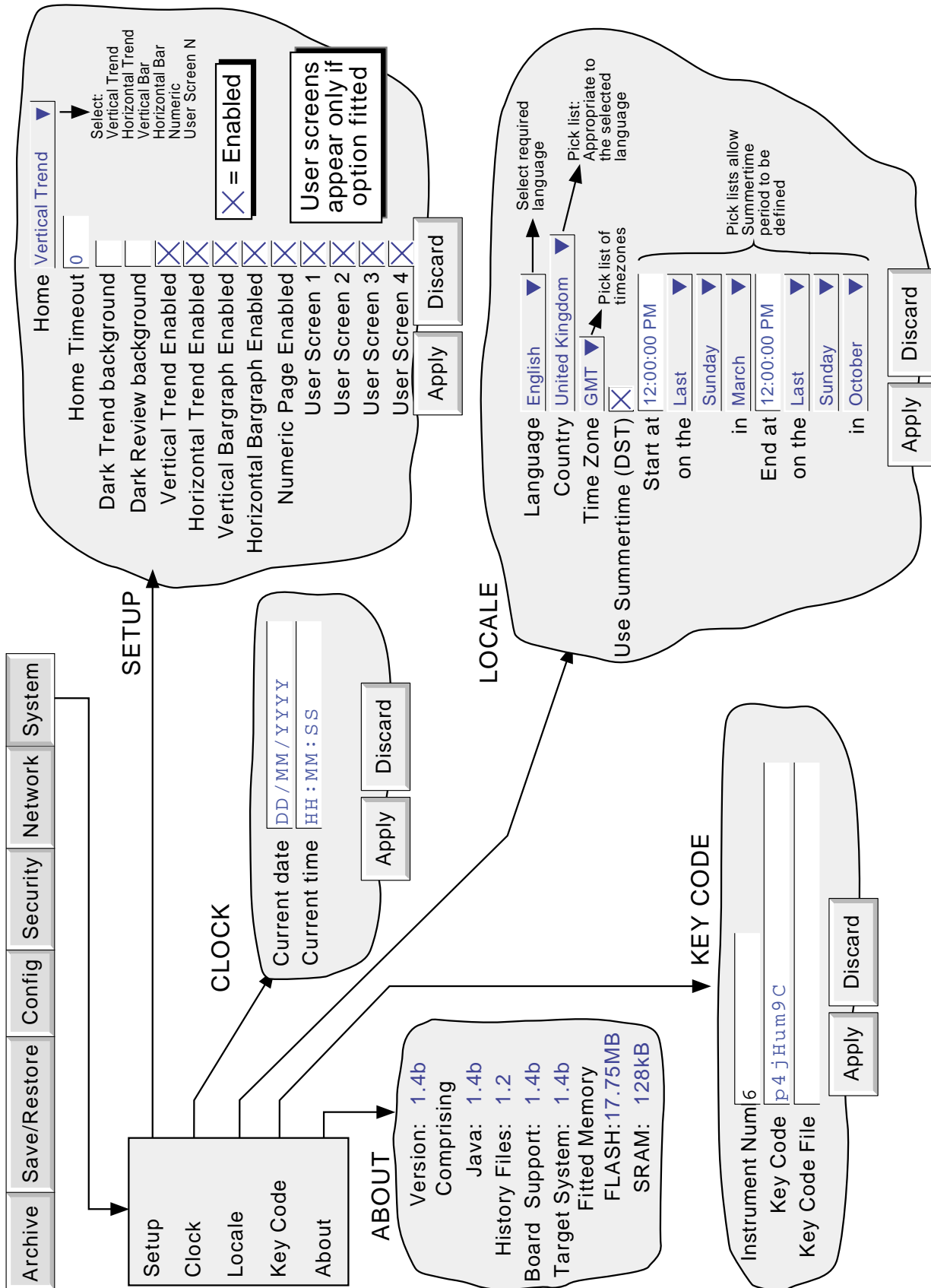


Figure 4.6 System configuration menu layout

## 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, and user screens (if fitted) to be enabled or disabled, using 'check' boxes. When enabled, a display mode is added to the Cycle key's menu. A '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.

#### 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. Timeout 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

#### USER SCREENS 1 to N

This field appears only for recorders with the User Screens Option fitted. This option is fully described Section 9 of this manual. Allows up to N user screens to be included in the 'cycle' list, where N is the number of User screens enabled in the Options menu.

### 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 or other source. 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 or memory card 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.

---

\*Note: The open-folder and close-folder key functions are the same as the down arrow and up arrow key functions respectively.

---

### 5.1 FILER OPTION MENU KEYS

These keys appear in a pop-up menu when the option key is pressed. This 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.)

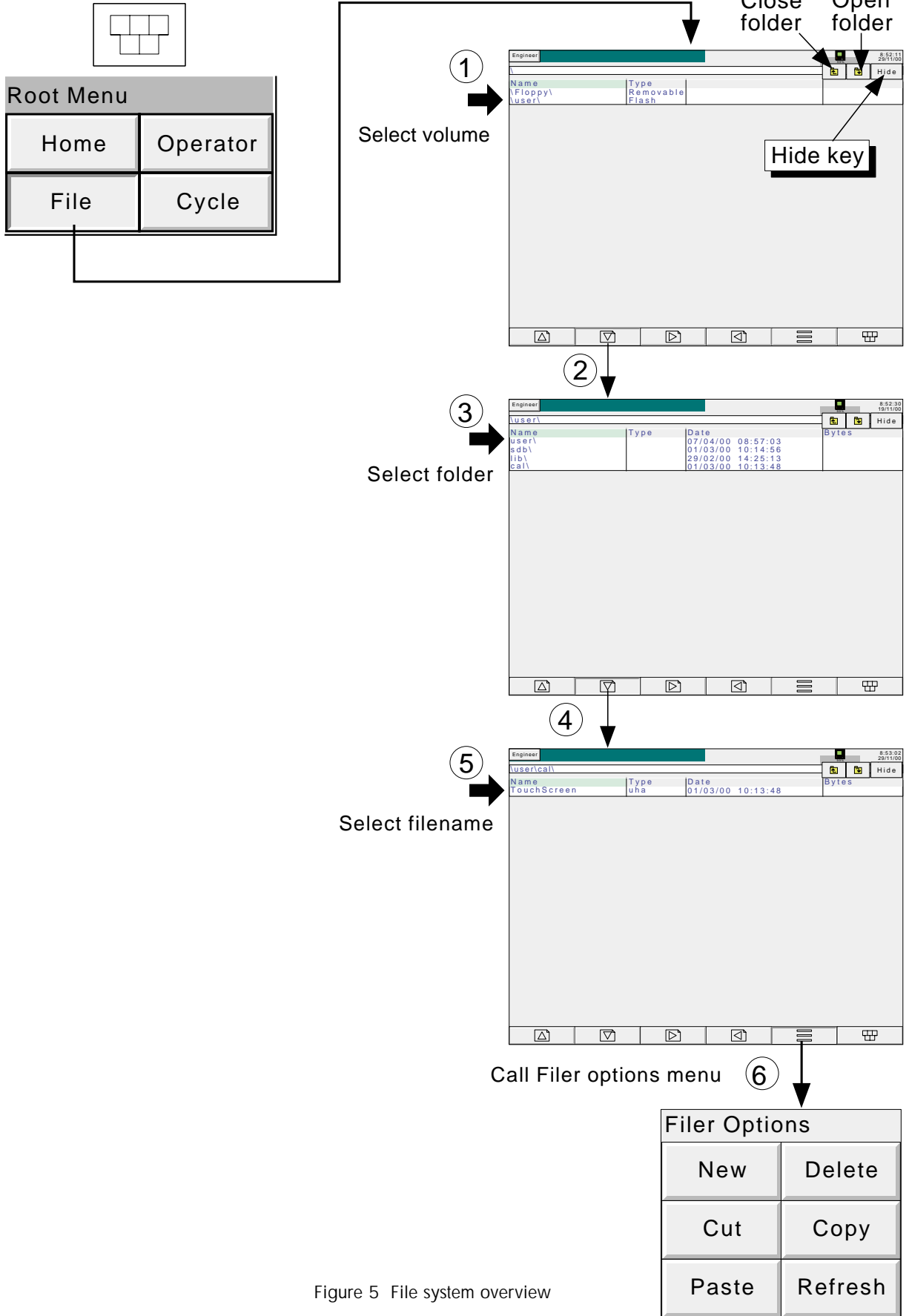


Figure 5 File system overview

## 6 BRIDGE 5000 REMOTE VIEWER

### 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 externally 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.

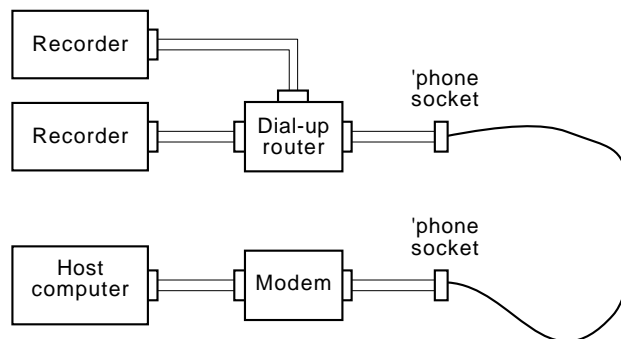


Figure 6.2.2 Remote connection example

### 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

Please refer to the CD box insert for details of software installation



## 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.

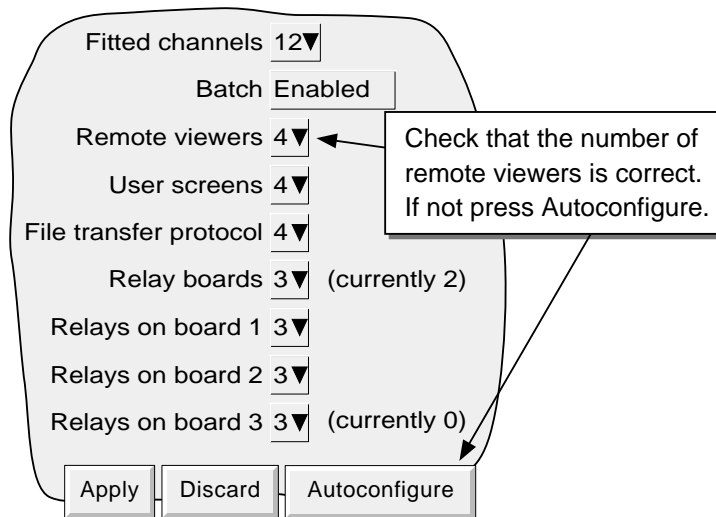
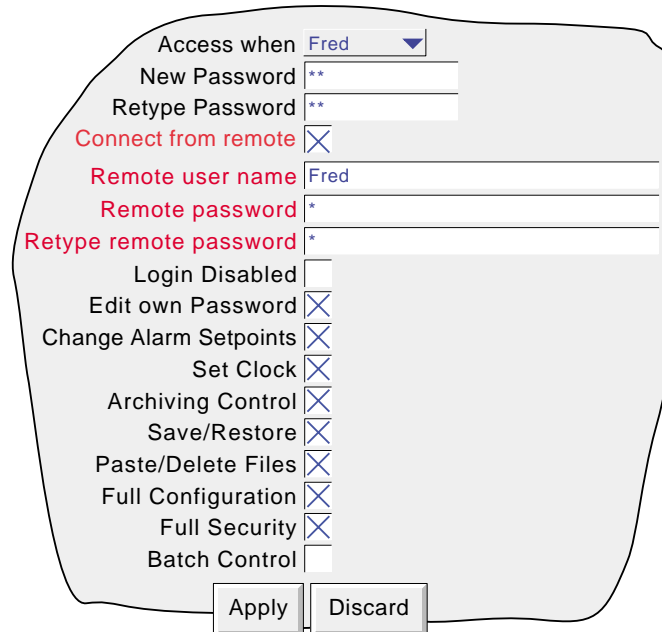


Figure 6.4.2 Options menu

### 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.



The screenshot shows a dialog box for configuring remote user access. It contains the following fields and controls:

- Access when:** A dropdown menu with 'Fred' selected.
- New Password:** A text input field containing two asterisks (\*\*).
- Retype Password:** A text input field containing two asterisks (\*\*).
- Connect from remote:** A checkbox that is checked (indicated by an 'X').
- Remote user name:** A text input field containing 'Fred'.
- Remote password:** A text input field containing one asterisk (\*).
- Retype remote password:** A text input field containing one asterisk (\*).
- Login Disabled:** An unchecked checkbox.
- Edit own Password:** A checked checkbox (indicated by an 'X').
- Change Alarm Setpoints:** A checked checkbox (indicated by an 'X').
- Set Clock:** A checked checkbox (indicated by an 'X').
- Archiving Control:** A checked checkbox (indicated by an 'X').
- Save/Restore:** A checked checkbox (indicated by an 'X').
- Paste/Delete Files:** A checked checkbox (indicated by an 'X').
- Full Configuration:** A checked checkbox (indicated by an 'X').
- Full Security:** A checked checkbox (indicated by an 'X').
- Batch Control:** An unchecked checkbox.

At the bottom of the dialog box are two buttons: **Apply** and **Discard**.

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.

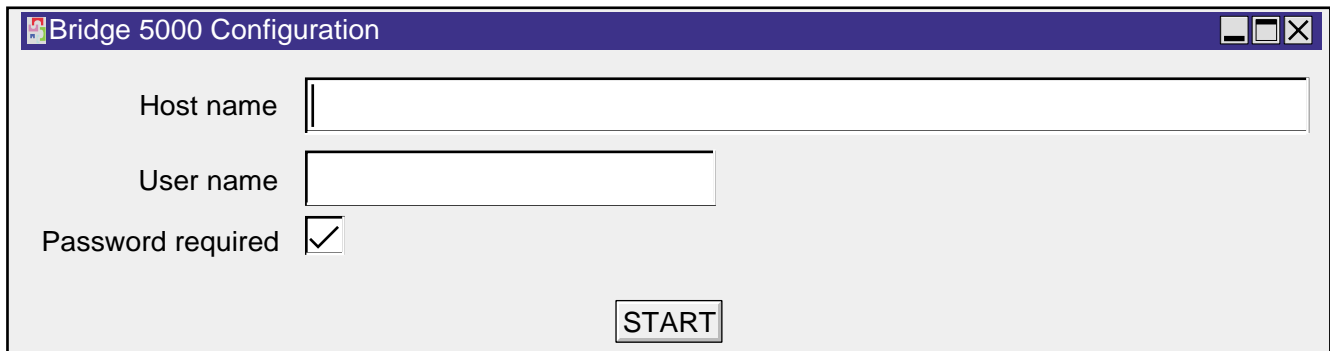


Figure 6.5a Host /User name selection



Figure 6.5b Bridge 5000 icon (approximation)

## 6.6 OPERATION

### 6.6.1 Display Modes

When the program starts, the Group 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. The Trend display can be returned-to at any time, by operating the Root Menu key followed by the Home key.

---

#### Notes

1. The above 'cycle' order and 'home' page selection always occur in Remote Viewer, overriding any user settings in the recorder's System/setup menu.
  2. Trend review is not available.
  3. 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 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 7.1a for large frame products and 7.1b for small frame products. If no further action takes place within approximately five minutes, the display times-out to the calibration display below.

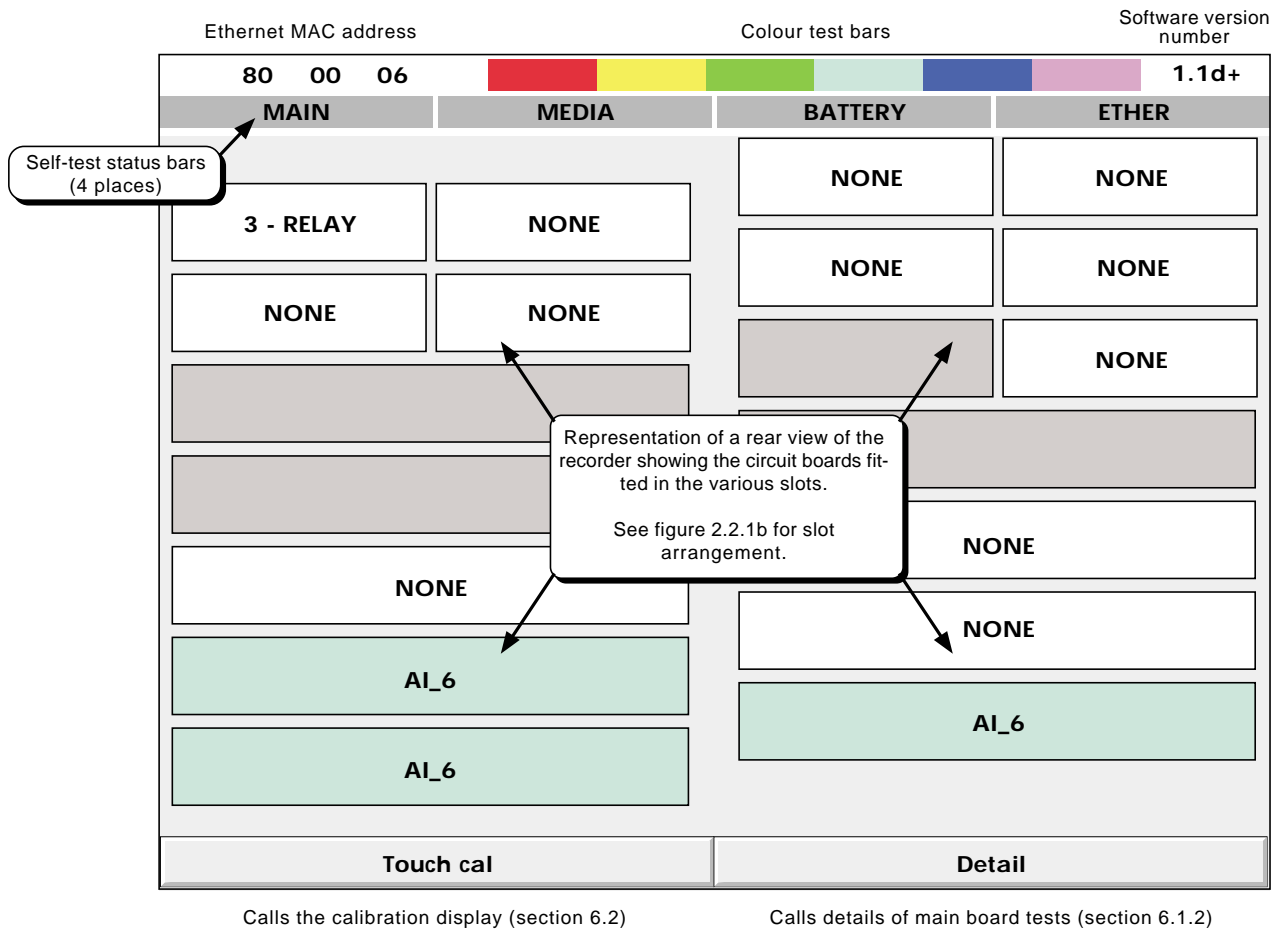


Figure 7.1a Top-level diagnostic display for large frame product

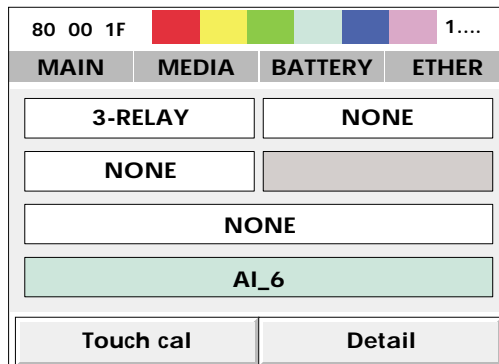


Figure 7.1b Top-level diagnostic display for small frame product

## 7.1.1 Display details

### MAC ETHERNET ADDRESS

This unique hex address is for factory use only. Refer to [section 4.5.1](#) for details of how to determine 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 or Card fitted (Media) the battery and the Ethernet (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.

#### MEDIA

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

1. No disk/card was fitted when the test was initiated.
2. The disk/card is unformatted or incorrectly formatted.
3. The disk/card 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 BOARD FIT

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. 3\_Relay is a three-relay output board; AI\_6 is a six channel analogue input 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

### 7.1.1 DISPLAY DETAILS (Cont.)

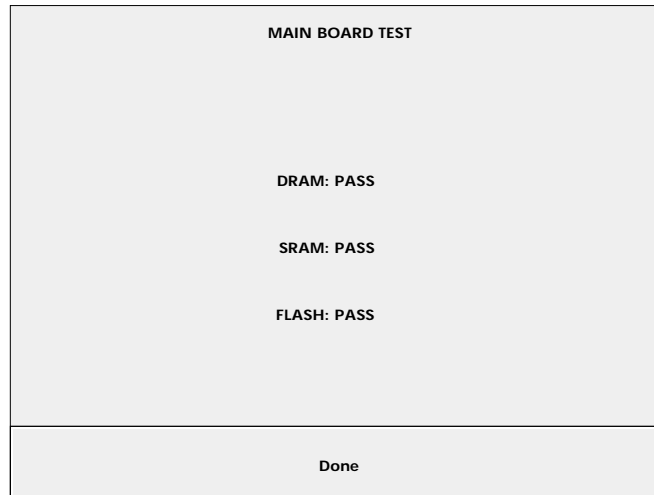


Figure 7.1.1 Main board self-test results display

## 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

---

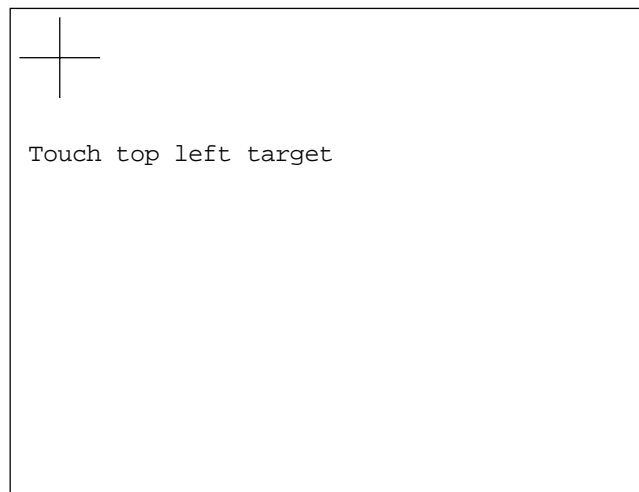


Figure 7.2 Initial calibration display

## 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

#### BATTERY REPLACEMENT PROCEDURE

During the life of this issue of the manual, the battery holder design will change. This change affects both the fitted battery and the way in which it is removed from the holder. Both versions are shown below.

Both batteries are of poly-carbonmonofluoride/lithium construction and should be disposed of according to local regulations covering this type of battery.

The battery board is located inside the recorder chassis and is accessed by removing the top plate. The battery can then be removed either by pressing down, as shown in figure 7.3.2a, or by pushing the battery out of its holder as shown in figure 7.3.2b. The new battery is installed by pushing it into position (+ uppermost).

**Note:** It is recommended that the recorder be switched off before the battery is replaced. All battery backed RAM data is lost during battery change.

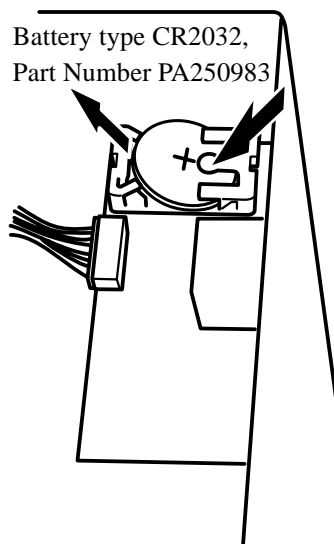


Figure 7.3.2a Battery removal (original design).

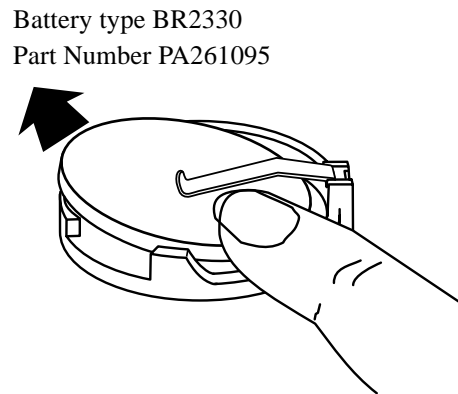


Figure 7.3.2b Battery removal (latest design).



7.4 MENU STRUCTURE

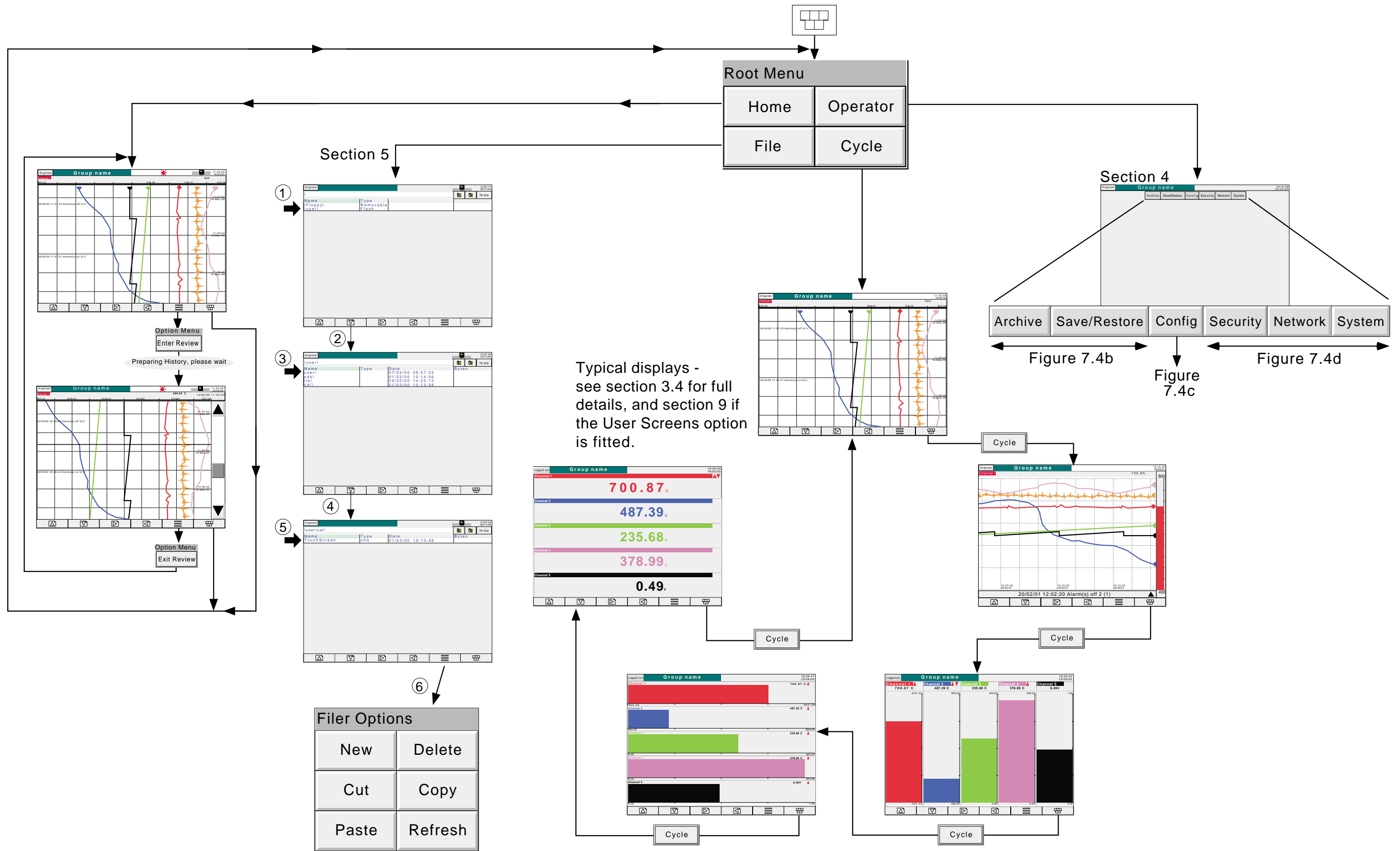


Figure 7.4a Menu structure sheet 1

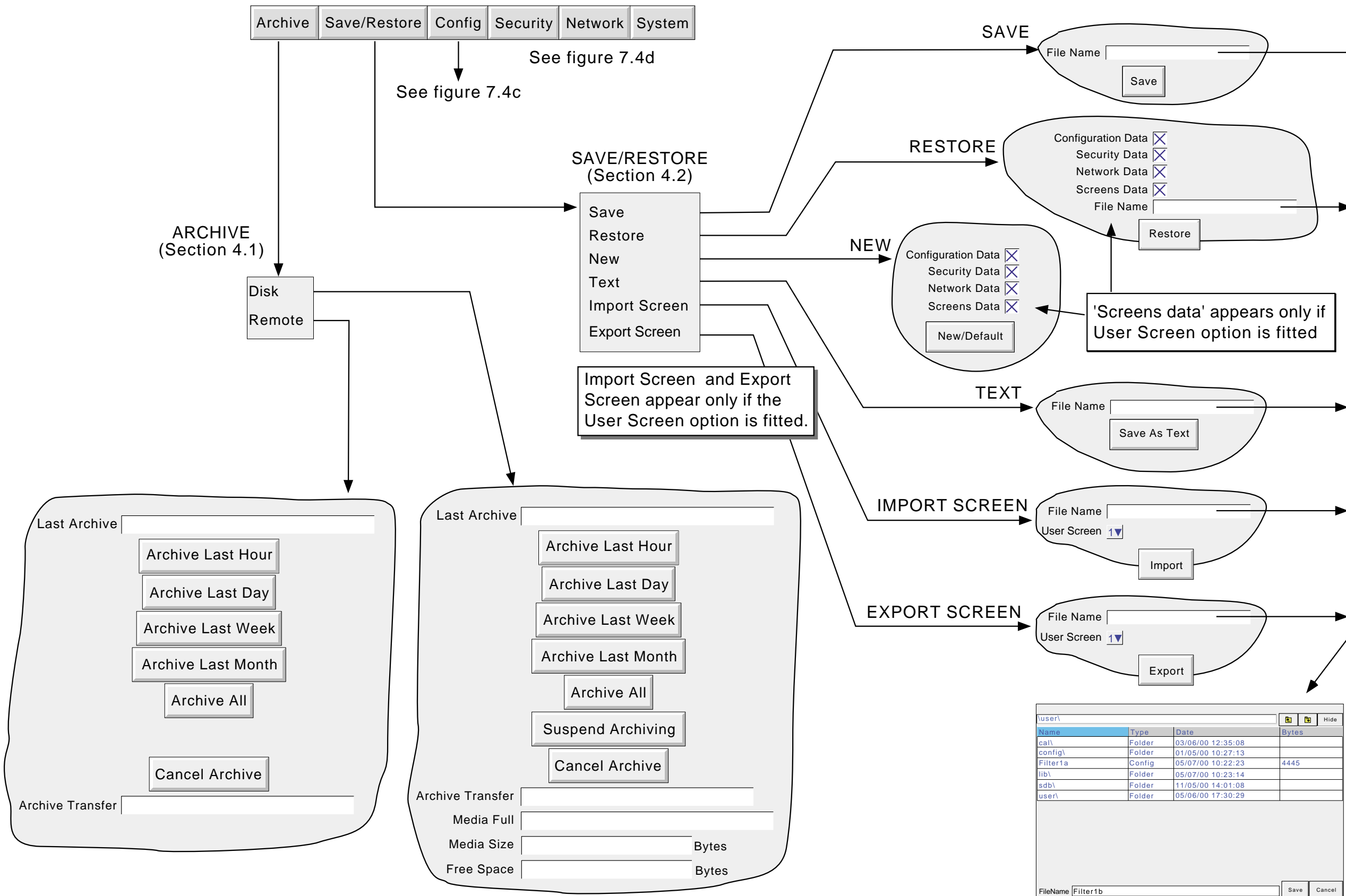


Figure 7.4b Menu structure sheet 2

7.4 MENU STRUCTURE (Cont.)

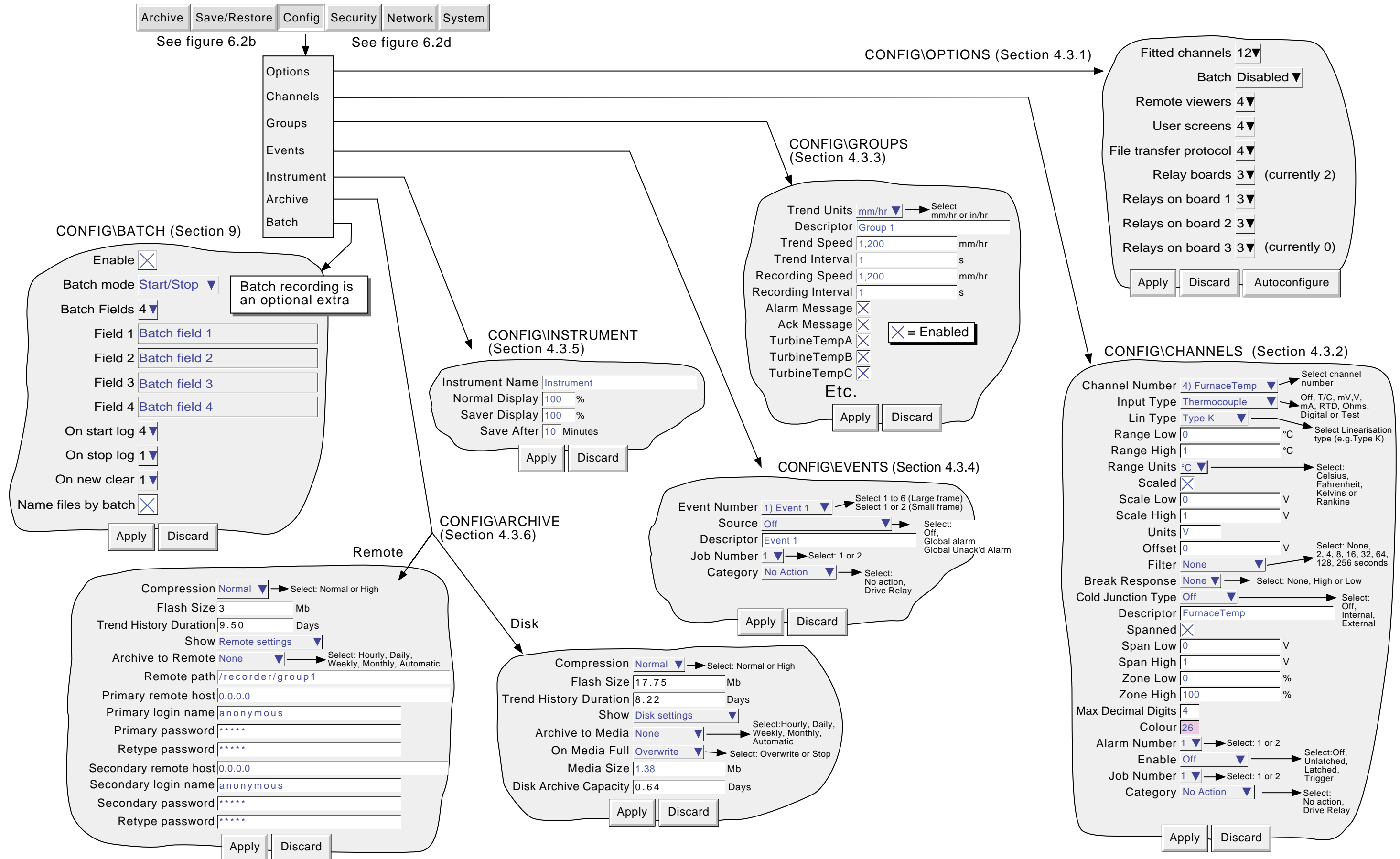


Figure 7.4c Menu structure sheet 3

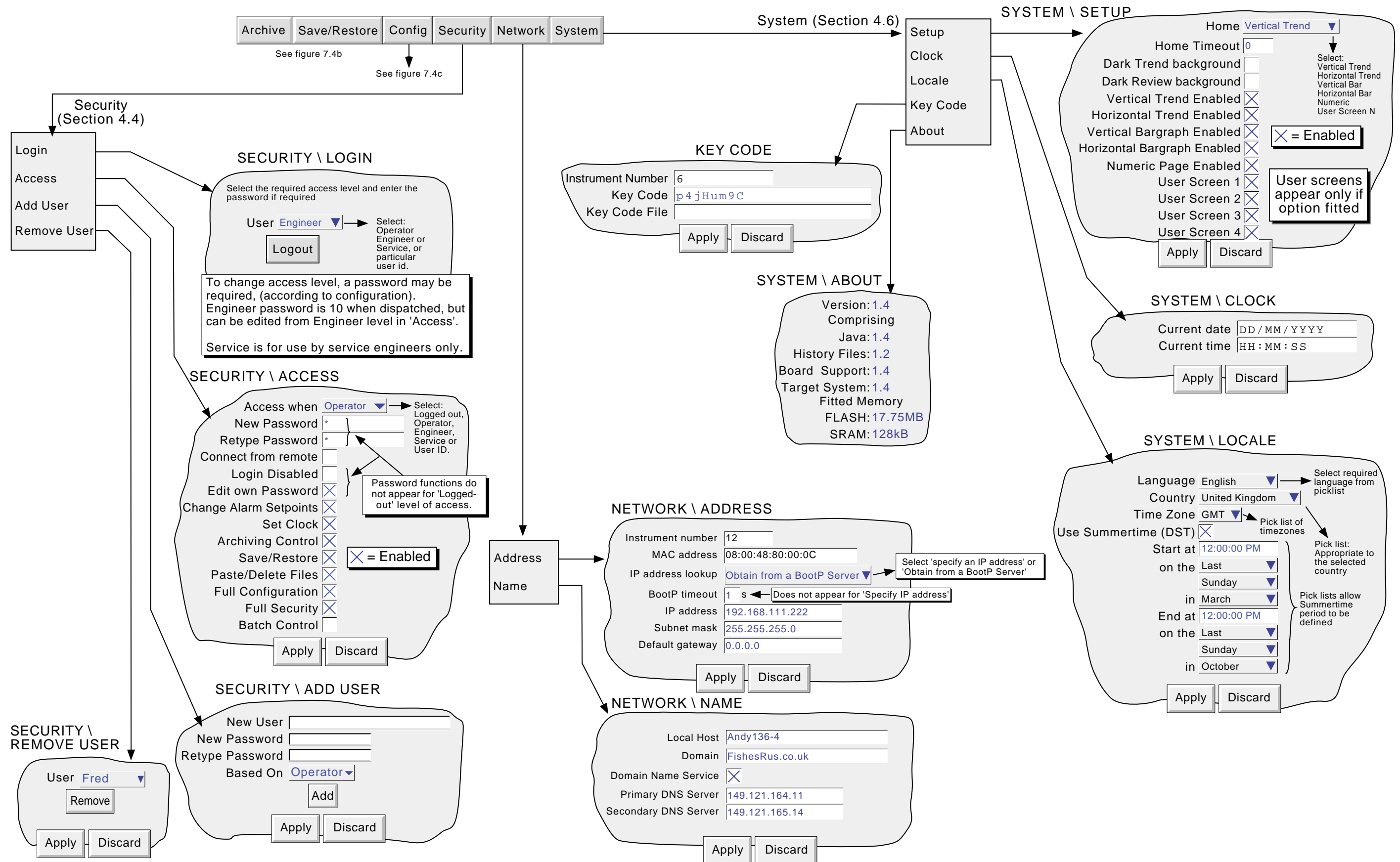


Figure 7.4d Menu structure sheet 4

## 7.5 OPTION ENABLING

In order to enable these software functions, a key code or filename, obtained from the manufacturer, must be entered in the System/Key code page (Figure 1.1).

**Note:** The key code is related to the instrument number, as displayed on the key code page. Please ensure that this instrument number has been noted before applying for a code or filename.

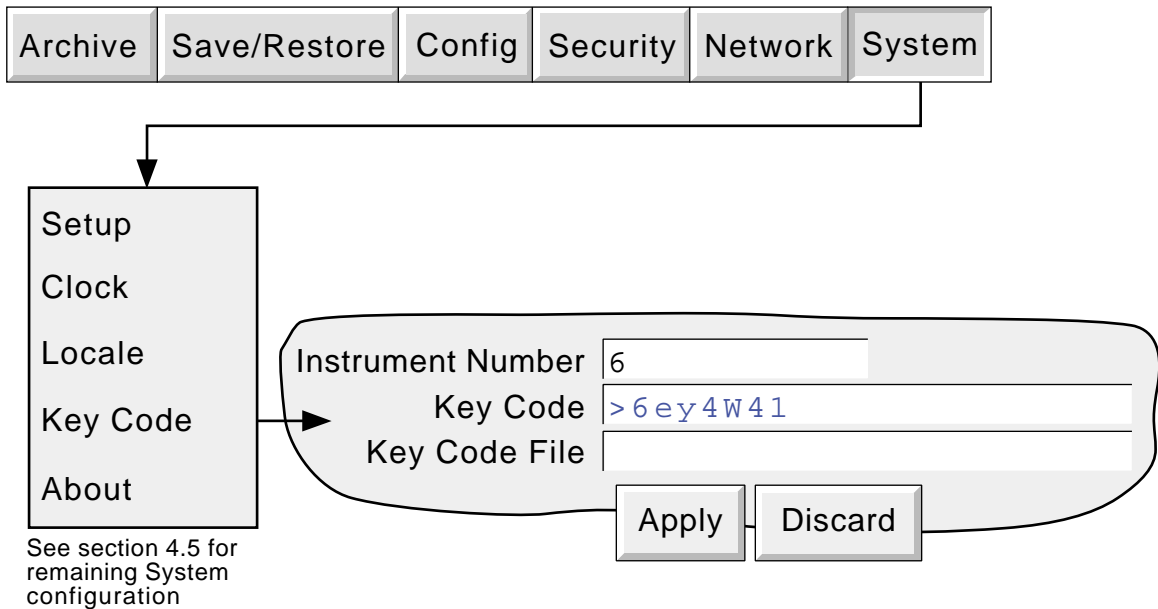


Figure 7.5 Option enable (key code) page

### 7.5.1 Instrument Number

This number, unique to each recorder, is used to identify the unit should any need arise for the user to contact the manufacturer or distributor of the instrument (if, for example, the user needs to enable one or more software options.)

### 7.5.2 Key Code

Touching this field causes a qwerty style keyboard to appear, allowing the user to enter the key code received from the manufacturer or distributor. This is an alternative to loading the Key Code File described below.

### 7.5.3 KeyCode File

The key code may be sent to the user by, for example, e-mail. By saving the code to a floppy disk, the key code can be transferred to the recorder, and the file read from the floppy disk. Alternatively, the code can be entered manually as described above.

## 8 BATCH RECORDING OPTION

### 8.1 INTRODUCTION

Batch records form a part of recording history and are included in the normal archiving process to 'disk' or to a remote PC (see section 4.1). Batches can be defined as start/stop, or continuous. For start/stop batches, the batch record starts when the batch is started, and continues until it is stopped. For continuous batches, the batch record starts when the batch is started and continues until the next batch is started, or until batch recording is disabled. When using 'PC review' software the 'Go to Batch' feature can be used to select a particular batch record.

If 'Name files by Batch' is enabled (section 8.2.8), a separate history file is created for each batch.

For each batch start, a start message is printed:

DD/MM/YY HH:MM:SS Batch start (User Id)

Where DD/MM/YY is the date, HH:MM:SS is the time, and User Id is either the current user name or security level (e.g. Engineer). A similar message is printed at Batch Stop. (There are no stop messages associated with continuous batch selection).

In addition to the above start/stop messages, up to six lines of text can, if required, be printed on the 'chart' at the start of a batch and, if required, at the end of a batch. The messages are in two parts, which for the sake of this document, are called 'Headings' and 'Values'. The Headings are entered in Fields 1 to 6 in Batch Configuration (section 8.2). The Values associated with these headings are entered by the operator at initiation of the start messages (section 8.3).

### 8.2 CONFIGURATION

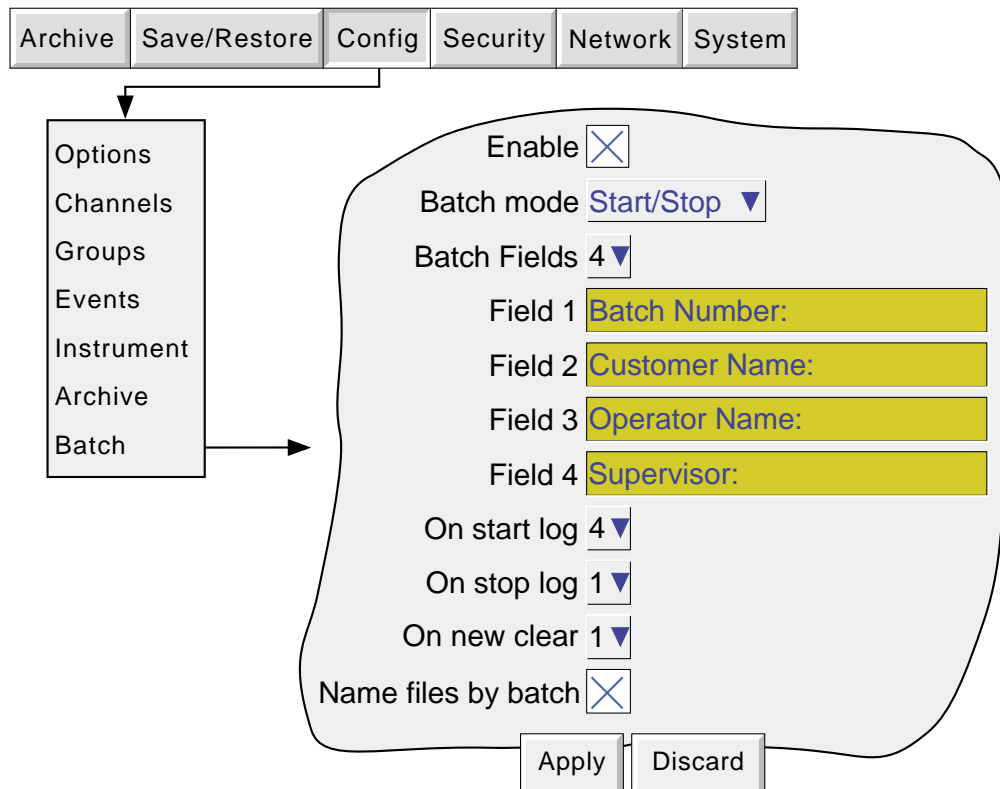


Figure 8.2 Batch configuration menu

As depicted in figure 8.2, the following configuration entries can be made:

### 8.2.1 Enable

Allows the batch function to be switched on or off.

### 8.2.2 Batch mode

Allows batch mode to be selected as Continuous or Start/Stop. The current recorder software version has no ability to start or stop batches - it can only record when the operator indicates that such events have happened.

### 8.2.3 Batch fields

Allows the maximum number of messages to be printed at batch start/stop to be selected between one and six.

### 8.2.4 Field 1 (2)(3)(4)

These fields (up to six in number) are used as headings for batch information. In the example shown in Figure 8.2, Heading 1 has been entered as 'Batch Number:'. When initiating the batch annotation the operator has to enter a value to be associated with this heading (see section 8.3 Operation, below). The remaining headings operate in a similar way. See also 'On new clear', below. Headings can be up to 20 characters long (including spaces).

### 8.2.5 On start log

This defines how many of the selected Fields are to be printed at batch start. An entry of '1' means that only Field 1 will be printed. An entry of '2' means that Fields 1 and 2 will be used, and so on. An entry of 0 means that only the 'Batch Start' message (section 8.1 above) will be printed. It is not possible to print only, say, Field 3. If Field 3 is required, it must be preceded by Fields 1 and 2.

### 8.2.6 On stop log

As for On start log, above, but for batch stop. This item appears only if Start/Stop is selected as batch mode.

### 8.2.7 On New Clear

Allows the user to clear none or more of the batch entries at each batch start. In the example above, if the user enters a batch number of say 001130.001, with Customer Name: FishesRus, Operator name: Marvin, Supervisor: Fred, then setting 'On New Clear' to '1', causes the batch number to be cleared, and to have to be re-entered, each time a new batch is started.

In a similar way, setting 'On New Clear' to '2' means that the batch number value and the Customer Name: value to be cleared. A new batch cannot be started without new values first being entered.

### 8.2.8 Name files by batch

As an aid to identification, if 'Name Files by Batch' is selected, the Batch Name, as entered by the operator (section 8.3.1), is inserted into the history file name.

For example, if a batch name of 001130.001 is amongst the items archived to disk, then this file will appear in the form:

Group Name~001130.001~DDDDDDDD DDDDDDDD,

Where DD----DD is a 16 digit code used by the recorder and by review software to identify the file.

If name files by batch is not selected, the Batch name is not included, and the file will appear as:

Group Name~DDDDDDDD DDDDDDDD,



## 8.3 OPERATION

This section describes how the operator initiates a new batch. Batches can be initiated from any of the trend, bargraph or numeric display modes, but the start/stop and other messages appear only on the Trend Graph screen, and its associated trace history (review mode) display. Batch information and status are retained whilst power is off.

### 8.3.1 Batch initiation

Either

- Operate the Option key, then press 'Batch' in the Option menu\* which appears, or
- Touch the (dark green) message area at the top of the screen.

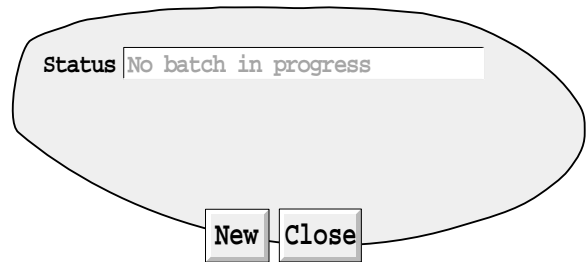


\*Note: The option menu is context sensitive, so the alternative to 'Batch' might not always be 'Enter Review' as shown here.

The batch Status page appears - in this example - with no batch running.

Press new.

A new display page appears (figure 8.3.1a), showing all the headings entered in Field 1 to Field 6 during configuration. If the Batch Fields entry (Section 8.2.3) is less than 6, then only the selected number appear (in our example, 4).



'Values' can now be entered for these headings by entering strings of up to 60 characters (including spaces). This is done, as usual, by touching the empty field and using the resulting pop-up keyboard to type-in the entry. Once the entries are complete, operation of the Start button initiates batch recording. The Values entry page is replaced by the batch status page (figure 8.3.1b), this time showing details of the batch in progress. This page allows the batch to be stopped or a new one triggered.

Batch	
Batch Number:	001130.001
Customer Name:	FishesRus
Operator name:	Marvin
Supervisor:	Fred
<input type="button" value="Start"/> <input type="button" value="Close"/>	

Figure 8.3.1a Batch values entry page



### 8.3.1 BATCH INITIATION (Cont.)

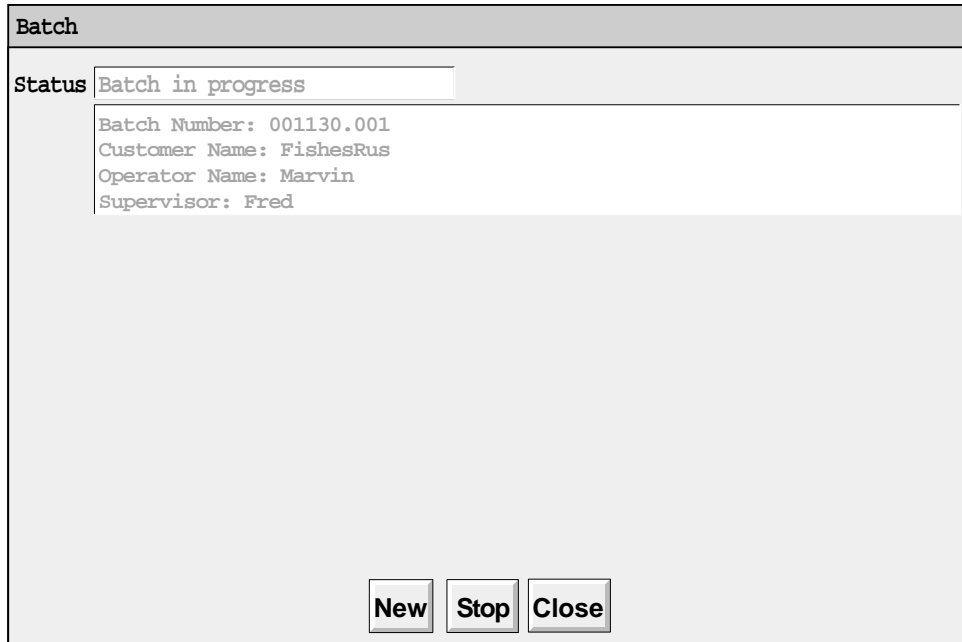


Figure 8.3.1b Status page (Batch running)

### 8.3.2 Batch message display

The messages are displayed on the Graph Trend display as shown in figure 8.3.2, below. This figure uses the example given in the previous sections, and uses only four messages. Further messages would appear below message 4. The figure also shows that time and date are added to the messages, and that the currently running batch number is given in the Group name area. Touching this area calls the Batch status page.

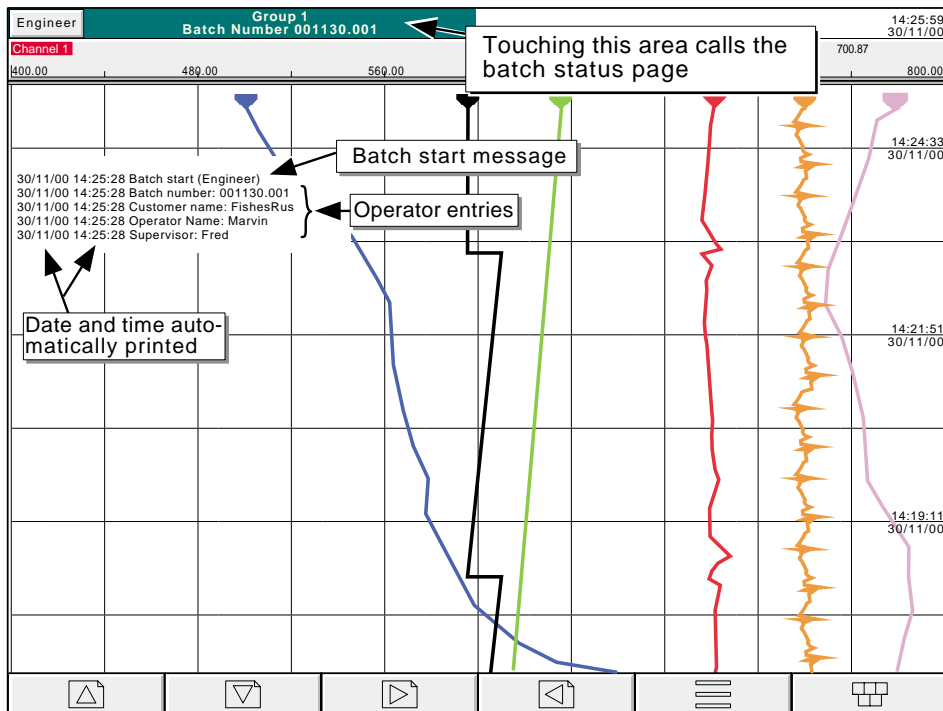


Figure 8.3.2 Typical Batch start messages

## 9 USER SCREENS

### 9.1 INTRODUCTION

This option allows the user to create screen layouts using recorder data, simple drawing tools, text and/or imported image files. As shown in figure 9.1 below, the user screens can be included in the cycle screens sequence, described in section 3.4, above, and a User screen can be selected as the 'Home page'..

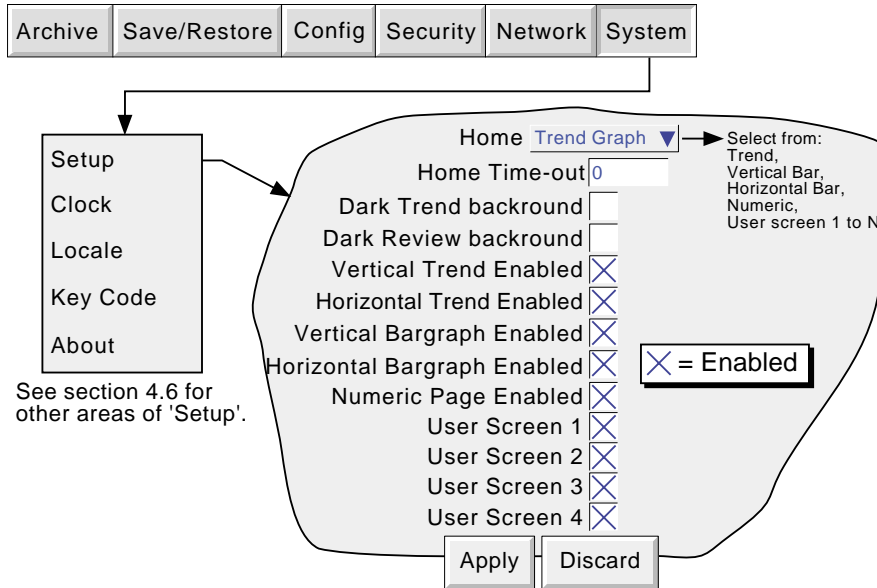


Figure 9.1 System setup menu

#### 9.1.1 Importing screens

The Save/Restore function includes the category 'Import screen'. Touching the filename area, allows a previously created user screen to be selected either from the Flash memory or from disk to be imported. The User Screen picklist allows the user to define which User screen is to be 'replaced' by the imported file.

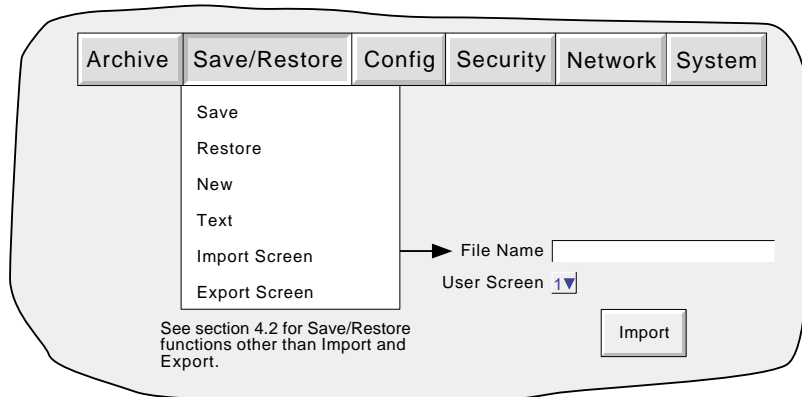


Figure 9.1.1 Importing user screens

#### 9.1.2 Exporting screens

Allows user screens to be exported to Flash memory, or disk, The operator can assign a suitable filename before exporting.

## 9.2 DISPLAY CREATION

The following description is an attempt to show how to create a simple screen layout. The technique used is to define an object, then to specify its size, and where its top left corner is to be located on the screen.

The option offers two levels of sophistication - basic and advanced. The basic system defines size, position, fill colour etc. for components (section 9.3.1). Advanced parameters allow a more sophisticated fine-tuning of the appearance of the components

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Note: X is horizontal, increasing rightwards. Y is vertical, increasing downwards.

---

As implied in figure 9.2.3, screen component position and dimensions can be specified as percentage, absolute pixels or relative pixels. Percentage is 'percentage of screen size'. Absolute pixels allow position and/or dimensions to be defined as an absolute number of pixels. Relative pixels are the same as absolute pixels, except that if the display is rescaled on, say, a pc screen, the absolute pixel object will remain unchanged, whereas the relative pixel object will scale appropriately. Similarly, for transfer from a VGA screen recorder to a 1/4VGA recorder or vice-versa.

### 9.2.1 Before starting

Before starting to lay the screen out:

1. The user must have 'full configuration' access permission.
2. One or more user screens must be enabled in System/Setup (section 9.1)
3. A layout plan is produced, with all the required screen's components listed with their top left corner co-ordinates, their widths and heights, and where appropriate background and foreground colours.

### 9.2.2 Screen components

Table 9.2.2 shows the selectable screen components and their default positions and widths/heights. All these items are described in section 9.4 below.

Item	X	Y	Width	Height
Group vertical trend	0	0	50	50
Group horizontal trend	0	0	50	50
Group vertical bargraph	0	0	50	50
Group horizontal bargraph	0	0	50	50
Group numeric	0	0	50	50
Channel vertical bargraph	0	0	10	40
Channel horizontal bargraph	0	0	50	30
Channel numeric	0	0	50	20
Channel data	0	0	0	0
Image	0	0	10	10
Text	0	0	0	0
Round rectangle	0	0	10	10
Rectangle	0	0	10	10
Polyline	0	0	N/A	N/A
Polygon - closed	0	0	N/A	N/A
Oval	0	0	10	10
Line	0	0	10	10
Arc	0	0	10	10

Table 9.2.2 User screen selectable item default values

### 9.2.3 Example

To produce a new display screen with channels one to four inclusive each displayed as an independent bar graph across the width of the screen, with a group trend display below. To achieve the above, the following items will be required:

1. Bar1: Horizontal bargraph with X = 0, Y = 0, Width = 100, Height = 10, channel = Channel 1
2. Bar2: Horizontal bargraph with X = 0, Y = 12, Width = 100, Height = 10, channel = Channel 2
3. Bar3: Horizontal bargraph with X = 0, Y = 24, Width = 100, Height = 10, channel = Channel 3
4. Bar4: Horizontal bargraph with X = 0, Y = 36, Width = 100, Height = 10, channel = Channel 4
5. Group 1: Vertical trend group with X = 25, Y = 48, Width = 50, Height = 50

#### ACCESS TO THE PROPERTIES PAGE

1. Ensure that one or more user screens is enabled in System/Setup (section 9.1). If necessary, operate the Cycle key in the root menu (or press the down arrow key) a sufficient number of times to call the required User screen to the display.
2. Press the Option key to call the Option Menu.
3. Press 'Edit Screen' to call the 'Component Property Editor' page to the display. This display contains the basic properties of the 'Main' (background) screen onto which the required components are to be overlaid.
4. A further press of the Option key calls the user screen Options display page.

For this example, only the basic attributes will be required, so the basic/advanced pick list can be ignored.

Component descriptions are not required for display, so the Component info on screen check box can be left un-selected.

The final check box (Quick entry to edit) can be selected. This allows direct entry from the user screen to the component properties page, without using the option menu.

5. Use the option key again to return to the Component Properties display

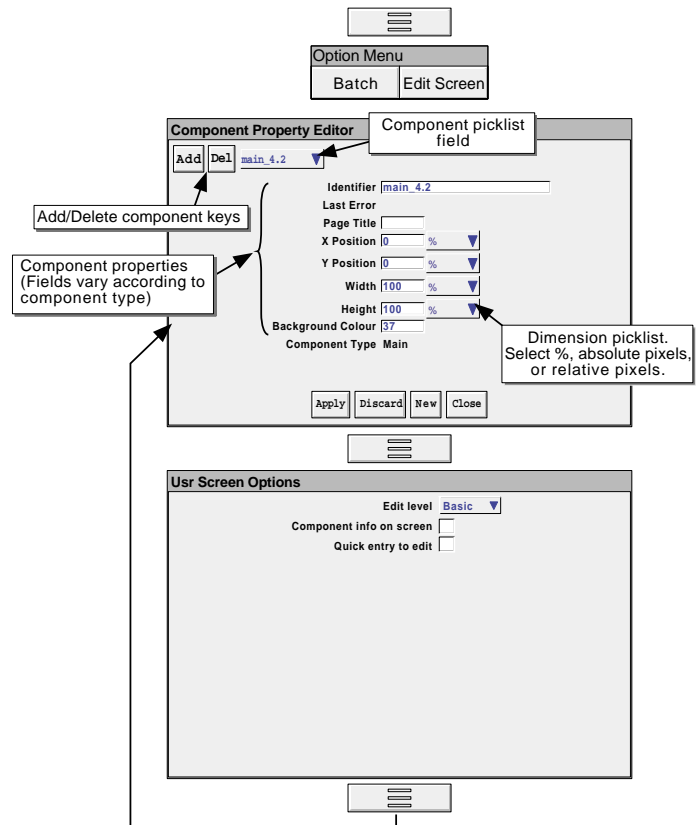


Figure 9.2.3a Component properties and User screen options pages

### 9.2.3 SCREEN CREATION PROCESS (Cont.)

#### KEY DESCRIPTIONS

- Add Calls the Component selection list
- Del Deletes (after confirmation) the component in the Identifier field (except the Main pane which cannot be deleted).
- Apply Causes all changes made since the last 'Apply' to be applied to the screen.
- Discard Causes all changes made since the last 'Apply' to be discarded, after confirmation.
- New Removes (after confirmation) all components from the current list and generates a new, empty background (main) page to be worked on. This change is permanent and cannot be 'Discarded'.
- Close Closes the component properties page and displays the screen currently being edited. If this key is operated whilst there are still unapplied changes, a confirmation pop-up appears (Apply, Discard, Cancel).

#### OPTIONS PAGE ITEMS

##### Edit level

Allows Basic or Advanced edit level to be selected for further use.

##### Component info on screen

Enabling this box causes a component description to appear at the top left corner of each component. This description is in the form: Identifier(X,Y)+[∂X,∂Y], where X and Y defines the top left corner position in pixels, and ∂X and ∂Y are the width and height of the component in pixels. The identifier is the component name as appears in the Identifier field of the Component Property Editor page.

##### Quick entry to edit

If selected, this function allows direct entry from the user screen being edited to the Component Property editor page, without the options menu first appearing offering the choice of 'Batch' or 'Edit Screen'.

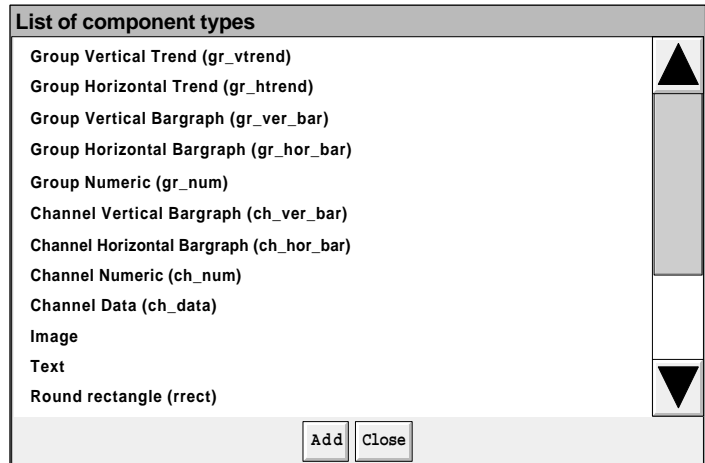
If Quick entry is selected, the Batch status page can be called by touching the 'Page Name' (Dark Green) area at the top of the screen.

Quick entry has no effect on screens other than user screens.

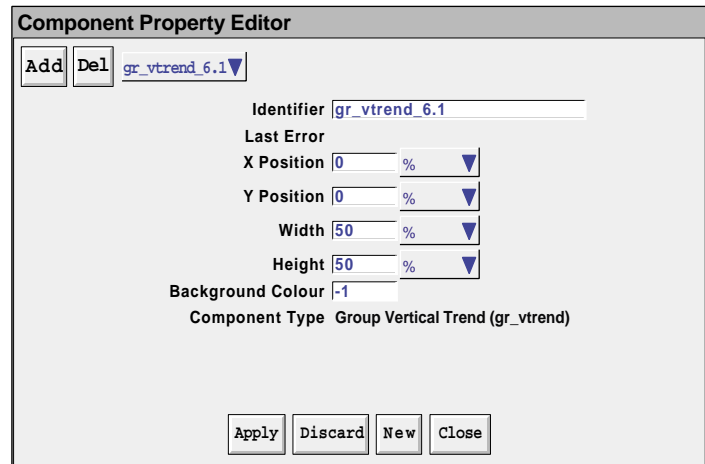
### 9.2.3 SCREEN CREATION PROCEDURE (Cont.)

#### PROCEDURE

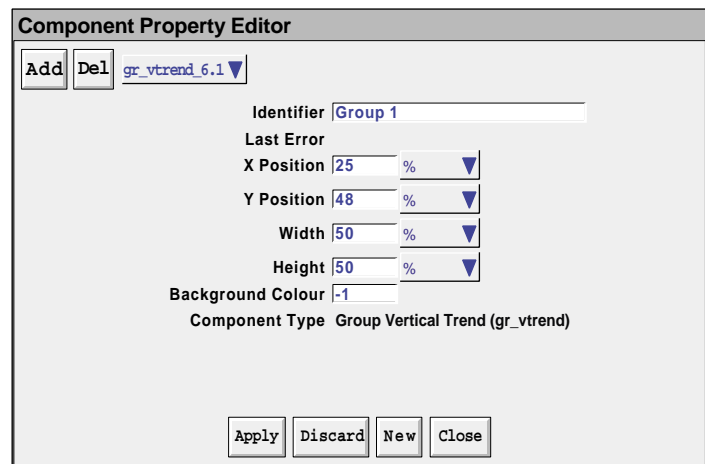
1. Operate the 'Add' key to call the Component selection list.
2. Touch Channel Horizontal Bargraph to highlight it, then press 'Add'.
3. Repeat step 2 three times then
4. Touch 'Group Vertical Trend', then 'Add', then 'Close'



5. The Component property editor page reappears with the default values for the most recently added component displayed.



5. Touch the Identifier field, then enter the name 'Group 1' 'Ok' using the pop-up keyboard which appears.
6. In a similar way enter the X and Y co-ordinates. The default dimensions (50 x 50%) are as required.
8. Press 'Apply'



9.2.3 SCREEN CREATION PROCEDURE (Cont.)

- 10 Touch the component picklist field, and highlight the topmost ch\_hor\_bar... field.
11. In the Identifier field, enter the name 'Bar 1' using the pop-up keyboard.
12. The channel number is as required
13. Touch the width field and enter a value of 100.
14. Touch the height field and enter '10'
15. Press 'Apply'
16. Touch the component picklist field and select another bargraph.
17. In a similar way as that described for Bar 1 above, enter the identifier 'Bar 2', a Y value of 12, a width of 100, a height of 10 and select Channel 2 from the picklist.
18. Similarly configure Bar 3 and Bar 4, using the appropriate Y values and Channel selection.
- 19 Finally, press 'Apply', then 'Close', to reveal the display page.

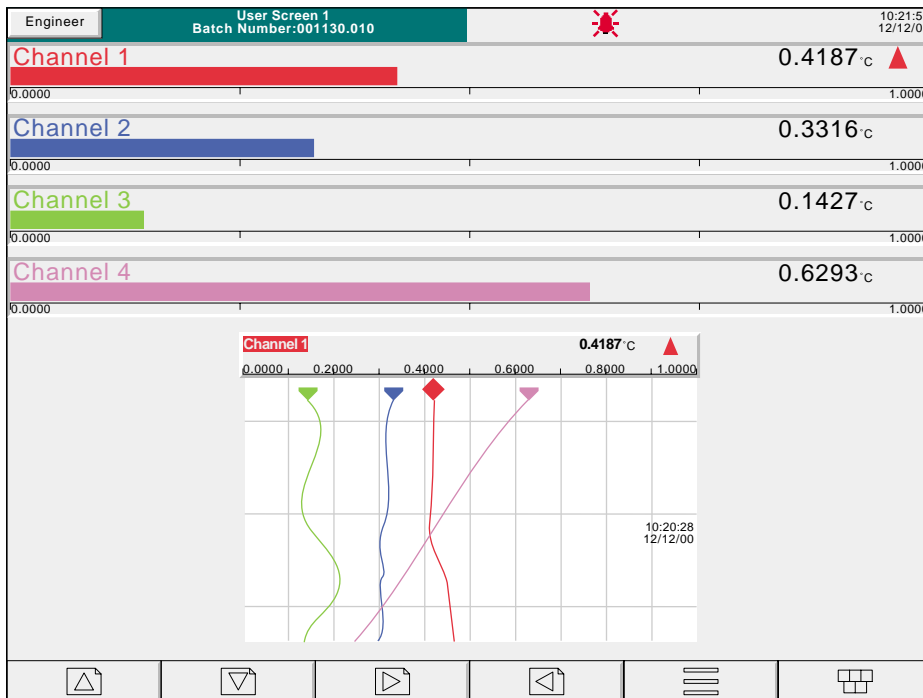
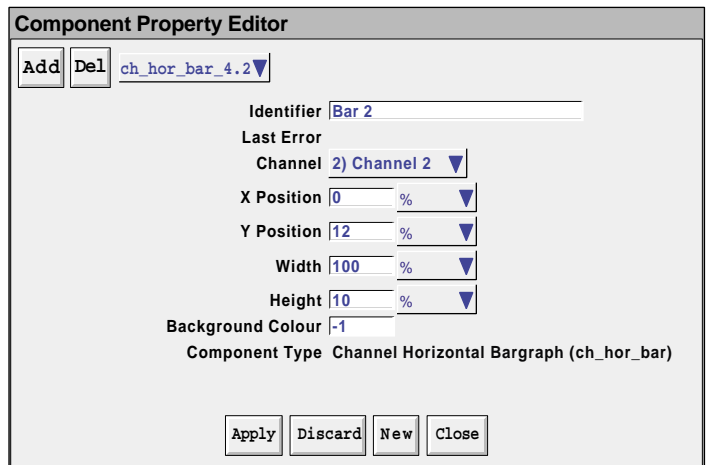
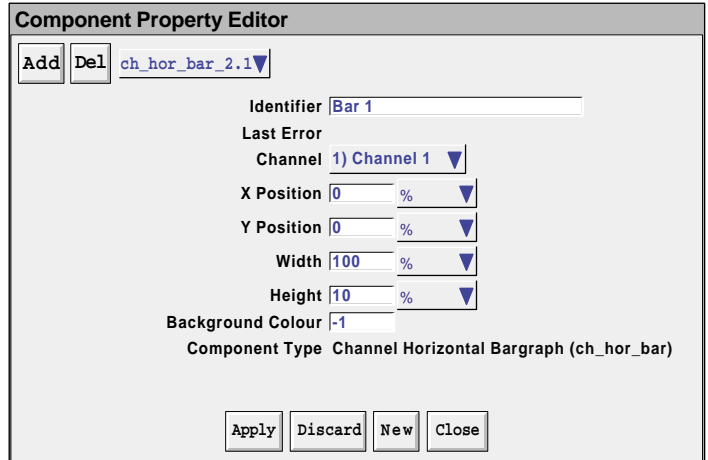


Figure 9.2.3b Complete user screen

### 9.2.3 SCREEN CREATION PROCEDURE (Cont.)

In order to provide a degree of contrast, the background colour of the 'Main' page can be changed to a darker colour. The figure overleaf shows the relevant component property pages.

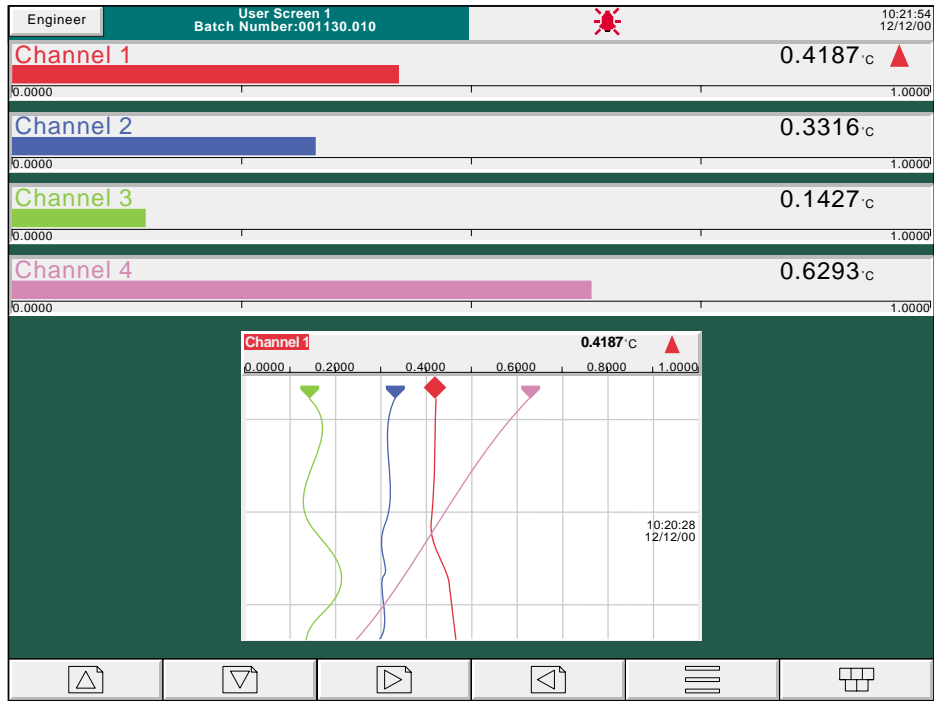


Figure 9.2.3 c User screen example with coloured background



9.2.3 SCREEN CREATION PROCEDURE (Cont.)

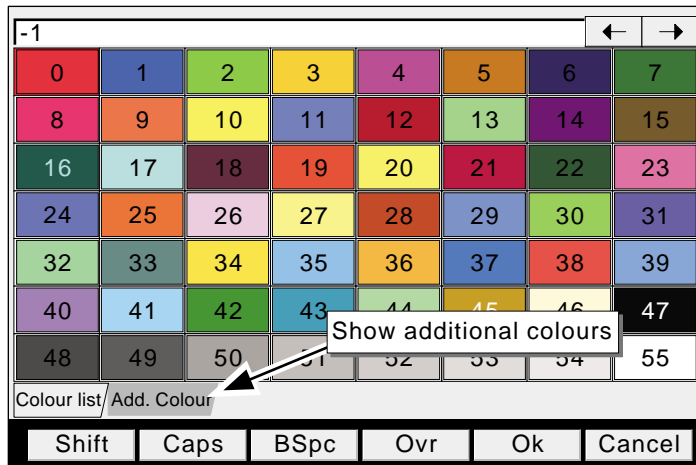
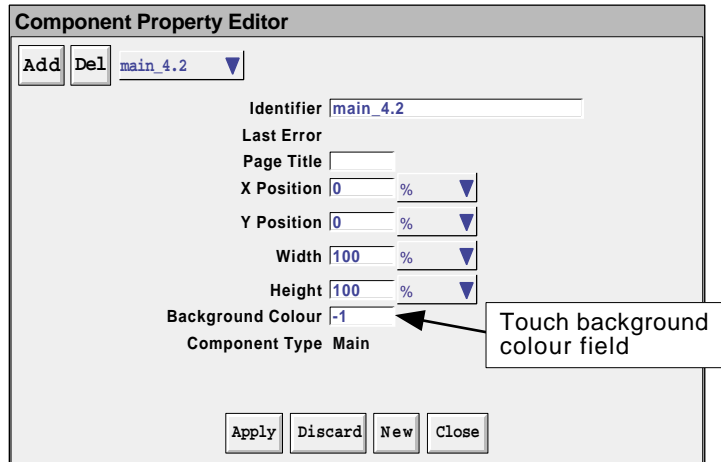


Figure 9.2.3d background colour selection pages

Note: The Add(itional) colours tab calls a supplementary palette to the display. This includes default colour (-1), flashing colours, and Windows® colours for use with user screens and Bridge 5000, to match recorder colours with Windows® colours. (For this issue of software, User Screens are not supported by Bridge 5000.)

## 9.3 PARAMETER DEFINITIONS

The following parameters are associated with the components listed in table 9.2.2. The list is divided into basic and advanced.

### 9.3.1 Basic parameters

Notes:

- 1 Not all components have all the following parameters associated with them. The component descriptions in section 9.4 define each component's parameters.
- 2 The generic term 'solid objects' as used in this description includes rectangles, lines, arcs, rounded rectangles, ovals, polygons and polylines. Lines and arcs do not have a background colour as they cannot be filled.
3. Default parameter units are in 'percentage of screen width/height'. The picklist next to each dimension field allows pixels to be used instead.

Parameter	Pick list content
Arc Angle	For Arcs only, the number of degrees of arc drawn anti-clockwise (counter-clockwise) from the Start Angle. Negative angles draw clockwise.
Arc Height	For Rounded Rectangles only, this is double the vertical distance from the corner of the (unrounded) rectangle at which the curve is to start. To draw 'circular' corners, this value must be 3/2 times the Arc Width. The Arc height value must be less than half the Rectangle height. Percent units are relative to the rectangle height, not the screen height.
Arc Width	For Rounded Rectangles only, this is double the horizontal distance from the corner of the (unrounded) rectangle at which the curve is to start. To draw 'circular' corners, this value must be 2/3 the Arc Height. The Arc width value must be less than half the Rectangle width. Percent units are relative to the rectangle width, not the screen width.
Background colour	The fill colour of solid objects; the background colour for the main page, trend charts, text messages etc.
Channel	Allows a channel to be selected for bargraph, numeric, value etc. display.
Draw edge	If set to 'Yes', this causes the outline shape of a solid object to be drawn in the foreground colour. If set to 'No', the object's outline is not drawn.
Feature	For 'Channel data' only, allows that item of data (e.g. Current value) which is to be displayed to be selected from a pick-list.
File	Allows a file name to be entered when importing GIF or JPG images.
Fill Area	If set to 'Yes', this causes a solid object to be filled with the background colour. If set to 'No', the inside of the object is transparent. If 'draw edge' is also set to 'No', the object is invisible.
Foreground Colour	The line colour of solid objects. The bar colour of bargraphs (if anything other than the default has been selected). The colour of Text and of numeric values. Where applicable, this overrides channel colour.
Height	Height of a component, measured downwards from the component's 'Y position'. Negative values measure upwards.
Identifier	Component name. Initially as in the Add Component list, but editable by the user.
Last error	A text message describing the last error to occur for this component. The component must be re-edited in order to clear the problem.
Start Angle	For Arcs only, defines a start point for 'Arc angle'. See figure 9.4.11a for definitions.
Text	Allows a text message to be entered for display on the screen.
Width	The width of a component, measured rightwards from the component's 'X position'. Negative values measure leftwards.
X points	Defines the X co-ordinates for Polylines and Polygons. Must match the number of Y points for correct drawing.
X position	Distance between the left edge of the screen and the left edge of the component.
Y points	Defines the Y co-ordinates for Polylines and Polygons. Must match the number of X points for correct drawing.
Y position	Distance between the top of the screen and the top of the component.

Table 9.3.1 Basic edit-level parameters

### 9.3.2 Advanced parameters

The selection of the Advanced properties set, is carried out from the Properties Options page as described in section 9.3.1, above. Advanced properties are in addition to the basic properties described above, not a replacement for them.

Parameter	Pick list content	Description
Bargraph style	Faceplate below bar	Produces coloured bar above channel descriptor, digital value and alarm indication. No scale is printed
	Just bar	Produces a colour bar with no textual information, or just the low and high scale values, according to component.
	Bar and scale	Produces a colour bar with a scale, but no digital value or alarm indication
	Default	Produces a colour bar with scale, with descriptor, digital value and alarm indication above.
	Default Vertical Bargraph	Produces a colour bar with a scale
	System Vertical Bargraph	Produces a colour bar with a scale
	Horizontal Bargraph	Produces a colour bar with scale, with descriptor, digital value and alarm indication above.
Colour channel	All channels	Allows a channel to be defined to be used in percentile or quartile filling (defined in 'Colour style').
Colour style	Background quartile	Background colour represents the value of the colour channel. Colour 0 appears for values below 25%, colour 1 for values between 25 and 50 %, colour 3 for values between 50 and 75% and colour 4 for values above 75 %. Foreground colour is default (-1).
	Foreground quartile	As background quartile but for the foreground colour. Background colour is default (-1).
	Background decimal	Background colour represents the value of the colour channel. Colour 0 appears for values below 10%, colour 1 for values between 10 and 20 %, colour 2 for values between 20 and 30% and so on up to colour 9. Foreground colour is default (-1).
	Foreground decimal	As background decimal but for the foreground colour. Background colour is default (-1).
Decimal places	None	Number of decimal places in Channel data display.
Display Bargraph	None	If selected, a vertical bargraph is drawn at the right hand edge of Horizontal Trend displays.
Display Faceplate	None	If selected, a faceplate is displayed at the top of a trend display. The faceplate contains the channel current channel's descriptor, its digital value and its alarm status.
Display messages	None	If selected, displays a message bar for Horizontal Trend displays.
Display Pens	None	If selected, pen representations appear at the top of a trend chart.
Draw Order	None	Allows a layer scheme to be introduced. Item with higher draw order values are overlaid on components with lower draw order values.
Faceplate Location	Dynamic, N, S, E, W	For vertical bargraphs, allows the position of the faceplates to be 'dynamic' (appears at best position for the number of channels), or to be located above, below, to the right or to the left of the bargraphs. Also allows faceplates to be turned off altogether.
Faceplate Style	Default	Produces a channel display with the descriptor and alarm indicators on the top line and with the digital value, and units on the bottom line.
	Just value	Shows only the channel value
	No alarms	As default, but without alarm display
	Value and Units	Produces a larger digital display of the channel value, with units.
	Single line Faceplate	As default, but all on a single line.
Font style	List of styles	Picklist holds a number of sizes, plain, bold and underlined bold.

Table 9.3.2 Advanced edit level parameters (sheet 1)

**9.3.2 ADVANCED PARAMETERS (Cont.)**

Parameter	Pick list content	Description
Grid Line colour	None	Allows a colour to be selected for trend chart gridlines (default = black)
Horizontal alignment	Left/centred/right	Allows text to be justified relative to its width setting
Horizontal Grid total	None	Number of vertical divisions of a trend chart.
Line thickness	None	Allows a pixel value to be entered for line thickness. It should be noted that the nature of the screen and of the drawing method means that curved lines of multi-pixel thickness can suffer from Moiré fringe, or interference effects.
Message Colour	None	Allows a colour to be selected for messages on a trend chart
Minimum height	None	For horizontal bargraphs
Minimum width	None	For vertical bargraphs,
Nominal height	None	535 (214) = height of large frame (small frame) display area in pixels
Nominal width	None	800 (320) = width of large frame (small frame) display area in pixels
Notes	None	Allows a note to be entered for the users convenience.
Number of Columns	None	Lays out group displays (other than trend) in the specified number of columns.
Number of Rows	None	Lays out group displays in the specified number of rows.
Numeric width	None	Number of characters in channel data display including decimal point.
Reversed colour	None	Allows text to be displayed in the background colour against a background of foreground colour.
Scale style	No Text	produces scale tick marks, but without values
	Decimal scale	Produces scale with 9 major divisions (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100% of scale width), each with 4 minor divisions (0, 20, 40, 60, 80, 100 % of major division). Zero and full scale values printed.
	Default	Produces a scale with 3 major divisions (0, 25, 50, 75, 100% of scale length). Zero and full scale values printed.
	Horizontal Bargraph	as default
	Horizontal Faceplate	Produces faceplate display with scale end points, descriptor, digital value and alarm indicator
	Vertical bargraph	as default
Time Marker colour	None	Allows a colour to be selected for time/date printing on a trend chart
Time Marker interval	None	Number of horizontal grid lines between successive time markers.
Trend Padding	None	For group trend only. Normal trends are 1 pixel wide. Setting a padding value of N, adds N pixels on each side of the central pixel. For example, a padding value of 2 would produce traces 5 pixels wide. Applies to all channels in the group.
Update when	Value changes	Action is taken when a specified value changes
	Always	Action takes place continuously at the display update rate.
Vertical alignment	Centred/bottom/top	Allows text to be positioned relative to its height setting
Vertical Grid Total	None	Number of vertical divisions for trend chart.
Visible	Yes/No	Allows the user to hide the component

Table 9.3.2 Advanced edit level parameters (sheet 2)

## 9.4 COMPONENT DEFINITIONS

This section defines all the available components listed in table 9.2.2 in terms of their parameters. The components occur in the order in which they appear in the list.

### 9.4.1 Group Vertical/Horizontal Trend

This produces a display which mimics a recorder chart. All the functions (e.g. trend review) described in sections 3.4.1 and 3.4.2 are available. Only one trend display can be displayed at a time. The following unique parameters (fully described in table 9.3.2) are available for configuration:

Background colour	Allows the 'chart' to be drawn in the selected colour.
Message Colour	The colour of messages printed on the 'Chart'.
Time Marker Colour	The colour of time/date printed on the 'Chart'.
Grid Line Colour	The colour of the 'Chart' grid lines.
Time Marker Interval	Selects the number of horizontal chart lines between successive time markers
Vertical Grid Total	Total number of vertical chart divisions.
Horizontal Grid Total	Total number of horizontal chart divisions.
Trend Padding	Sets thickness of traces.
Display Messages	Allows message printing to be enabled/disabled.
Display Bargraph	For Horizontal trending only, allows the vertical bargraph display to be switched on and off.
Display Pens	Allows the pen icons at the edge of the chart to be switched on and off.
Display Faceplate	Allows the channel faceplate to be switched on and off.

### 9.4.2 Group vertical bargraph

Produces a group vertical bargraph in a format defined by 'Bargraph Style' and 'Scale style' described in table 9.3.2. The number of rows of bars can also be defined by the user, according to the overall size of the display, number of channels etc. The default value of zero means that the recorder will display what it 'believes' to be the most ergonomic number of rows.

The recorder attempts to fit as many channel bars as possible into the width of the display. The default minimum width of a column is 6 mm. If there are more channels than can be fitted into the display, a scroll bar device appears at the bottom edge to allow 'hidden' bars to be accessed.

The recorder attempts to fit as many faceplates as possible into the height of the display. If there are more faceplates than can be fitted into the display, a scroll bar device appears at the right edge to allow 'hidden' faceplates to be accessed.

A picklist allows the user to force the faceplates to be located at the North, South, East or West edge (i.e. at the top, bottom, right or left edge of the display). The default value of 'Dynamic' allows the recorder to determine the best position for the faceplates. 'No faceplate' means that no faceplates are displayed, which in turn means that no channel descriptors, digital values or alarm displays are included.

### 9.4.3 Group horizontal bargraph

Produces a group horizontal bargraph in a format defined by 'Bargraph Style' and 'Scale style' described in table 9.3.2. The number of columns can also be defined by the user, according to the overall size of the display, minimum width, number of channels etc.

The recorder attempt to fit as many channels as possible into the height of the display, according to the specified minimum height (default = 12mm). If there are more channels than can be fitted into the display, a scroll bar appears at the right edge to allow 'hidden' channels to be accessed.

#### 9.4.4 Group numeric display

This produces a display of group numeric values to be displayed in one of a number of formats, as described in 'Faceplate Style' in table 9.3.2 above. The number of columns can also be defined by the user, according to the overall size of the display, number of channels etc. The default value of zero means that the recorder will display what it 'believes' to be the most ergonomic number of columns.

The recorder attempt to fit as many channels as possible into the height of the display, according to the specified minimum height (default = 12mm.) the If there are more channels than can be fitted into the display, a scroll bar appears at the right edge to allow 'hidden' channels to be accessed.

#### 9.4.5 Channel vertical/horizontal bargraph

For a specified channel, this produces a dynamic horizontal or vertical bargraph display of channel value, in a format defined by 'Bargraph Style' and 'Scale style' described in table 9.3.2

#### 9.4.6 Channel Numeric

For a specified channel, allows the channel faceplate to be displayed in one of a number of formats, as described in 'Faceplate Style' in table 9.3.2 above.

#### 9.4.7 Channel data

For a specified channel, allows one of : Current value, Descriptor, Units, Span low or Span high to be selected for display.

#### 9.4.8 Image

This allows a GIF or JPG image file to be loaded from (e.g.) the floppy disk drive. Once this has been done, the image size and shape can be edited to fill the screen area, and bargraphs, text messages etc. can be superimposed on the image.

#### 9.4.9 Text

If width and height are left with the default values of zero, the text will start at the specified start point and fit in the space between there and the right edge of the screen, in a single line (left justified (ranged) as a default). If the text string is too long, it is truncated. The text appears in the specified foreground colour, superimposed on a 'box' of background colour which is the same width of the text string.

If width and height are defined, then the text will fill the defined width and any remaining text is truncated. The text appears in the foreground colour (default black), over a field of background colour (default grey).

Advanced properties allow the text to be set to range left, range right or be centred, at the top, bottom or centre of the field, and for the foreground and background colours to be swapped.

### 9.4.10 Round rectangle

Similar to a rectangle described in section 9.4.11, but offers the user the opportunity to draw rectangles with curved corners. The horizontal and vertical curve angles are specified separately, and the aspect ratio of the screen should be taken into account when working in percentage units.

---

*Note: The rounded rectangle will draw incorrectly if either of the arc height /width settings are greater than half the rectangle height/width settings.*

---

### 9.4.11 Rectangle

This draws a rectangle on the display page. If the height and width of the rectangle are defined in the default 'percentage units', then entering equal values for height and width will result in a rectangle with the same aspect ratio as that of the screen, not a square as might be expected. Because the screen height is approximately  $2/3$  the width, the rectangle height should be  $3/2$  the rectangle width to produce a square. (The actual height/width ratio is  $535/800 = 0.669$  for large frame units or  $214/320 = 0.669$  for small frame units).

Using pixels as the measuring units obviates this problem as pixels are square.

- Draw edge** If set to 'Yes' this causes the outline of the rectangle to be drawn in the selected foreground colour (default = black). If set to 'No', the outline is not drawn.
- Fill area** If set to 'Yes', this fills the rectangle area with the background colour (default = grey). If set to no, the rectangle is transparent
- Line thickness** Allows the thickness of the outline to be defined in pixels.
- Colour style** Allows background or foreground colour to represent the value of a selected channel. This overrides any selected foreground/background colours.
- Colour channel** Allows a channel to be selected for use with colour style above.

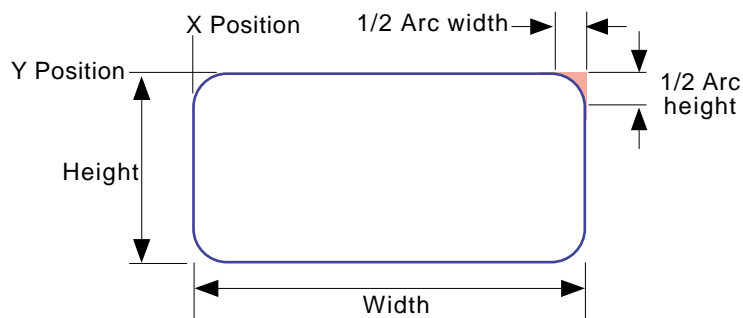


Figure 9.4.10 Round rectangle definitions

## 9.4.12 Polyline - series of points

Similar to closed polygons, described in section 9.4.13 below, but the first and last points are not automatically joined, and the drawn item cannot be filled and the line width cannot be specified - it is always one pixel.

**Note:** When working in percentage units, it should be remembered that vertical percentage units are only 2/3 the size of horizontal percentage units - this affecting the appearance of the drawn item.

Example: To draw an (old fashioned) electronic resistor icon (Units = Absolute pixels)

X position = 400, Y position = 236,

Foreground colour = 0

X points = 0,10,15,25,35,45,55,65,75,85,90,100

Y points = 0,0,-10,10,-10,10,-10,10,-10,10,0,0

Press 'Apply', then 'Close' to produce a red 'sawtooth' outline, as depicted in figure 9.4.12 below.

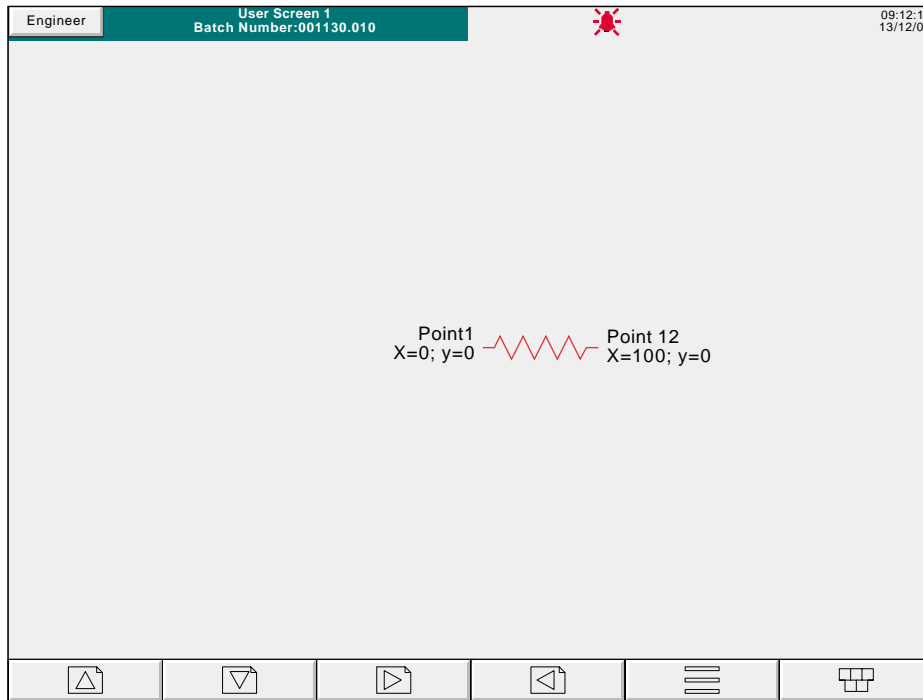


Figure 9.4.12 Polyline example



### 9.4.13 Polygon - closed area

This allows a number of pairs of points to be entered, which, if valid, will then be joined by straight lines. The first and last points are automatically joined, by the recorder. The shape, drawn in the specified foreground colour, with the specified line width, can be filled with the specified background colour.

**Note:** When working in percentage units, it should be remembered that vertical percentage units are only 2/3 the size of horizontal percentage units - this affecting the appearance of the drawn item

Example: To draw a left pointing solid arrow, positioned with its point at the centre of the screen.

Access the component page as described in section 9.2.3, select 'polygon - closed area' and press Ok. In the properties page, carry out the following configuration (units = %):

X position = 50, Y position = 50,  
 Background colour = 22, Foreground colour = 30  
 Draw edge = Yes, Fill area = Yes  
 X points = 0,10,10,30,30,10  
 Y points = 0, -15, -5, -5, 5, 5, 15

Press Apply, then Close to produce a dark green arrow, with pale green outline, as depicted in figure 9.4.13 below.

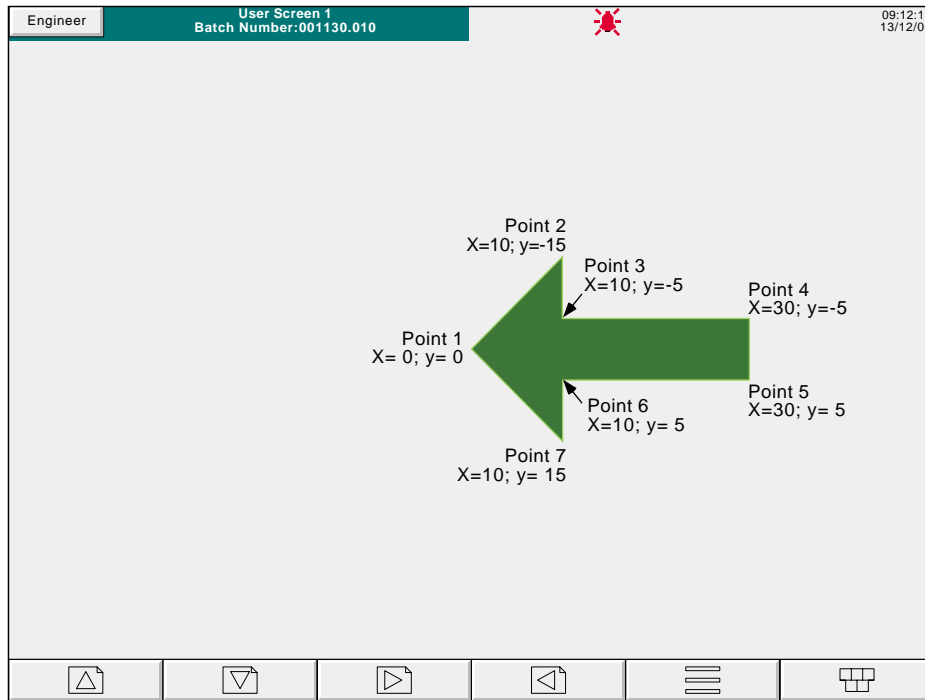


Figure 9.4.13 Polygon example

## 9.4.14 Oval

Similar to an [arc](#) with an arc angle of 360 degrees, but with the following additional configuration items

- Draw edge** If set to 'Yes' this causes the outline of the rectangle to be drawn in the selected foreground colour (default = black). If set to 'No', the outline is not drawn.
- Fill area** If set to 'Yes', this fills the rectangle area with the background colour (default = grey). If set to no, the rectangle is transparent
- Colour style** Allows background or foreground colour to represent the value of a selected channel. This overrides any selected foreground/background colours.

**Colour channel** Allows a channel to be selected for use with colour style above.

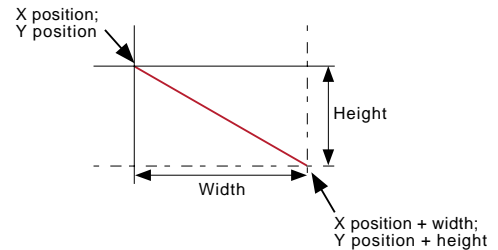
If the height and width of the oval are defined in the default 'percentage units', then entering equal values for height and width will result in an oval with the same aspect ratio as that of the screen, not a circle as might be expected. Because the screen height is approximately 2/3 the width, the oval height should be 3/2 its width to produce a circle. (The actual height/width ratio = 0.669).

## 9.4.15 Line

This causes a straight line of user-definable thickness to be drawn between the points (X position; Y position) and (X position + width; Y position + height)

Notes:

- 1 Y increases downwards; X increases rightwards
- 2 Height = 2/3 width if measuring in percent



### Example

To draw an approximation to a St. Andrew's cross (saltire):

Access the component page as described in section 9.2.3, select 'Line' and press Add, then Ok.

In the properties page, carry out the following configuration:

Main - set background colour to 6

Line 1 - Set Height to 100, Width to 100. Set Foreground colour to 55 and Line thickness to 35

Line 2 - Set X to 100, Height to 100, Width to -100. Set Foreground colour to 55 and Line thickness to 35

Press 'Apply', then 'Close'.

Note: because of the thickness of the lines takes the corners beyond the display area, an error message may appear in the 'Last error' field for the lines : position maybe out of bounds. This should not prevent the screen being drawn correctly.

## 9.4.16 Arc

This causes a curved line of user-definable thickness to be drawn anti-clockwise between start angle and (start angle + arc angle). The origin ('centre') of the arc is (X position + 1/2 Width) ; (Y position + 1/2 Height). Arcs cannot be filled.

### Notes:

- 1 Angle increases anticlockwise
- 2 Height = 2/3 width if measuring in percent
- 3 Arcs cannot be filled - the shading in the figure is included for clarity only

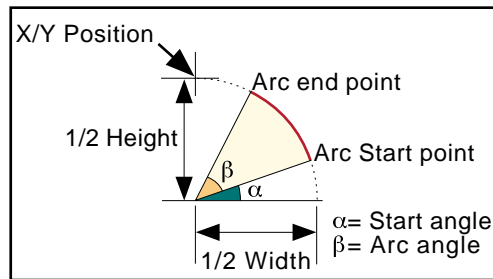


Figure 9.4.16a Arc dimension definitions

### Example

An arc definition of:

X position = 50%, Y position = 50%, Width = 50%, Height = 50%, Start angle = 0; Arc angle 270 would produce the curve depicted in figure 9.4.15b, below.

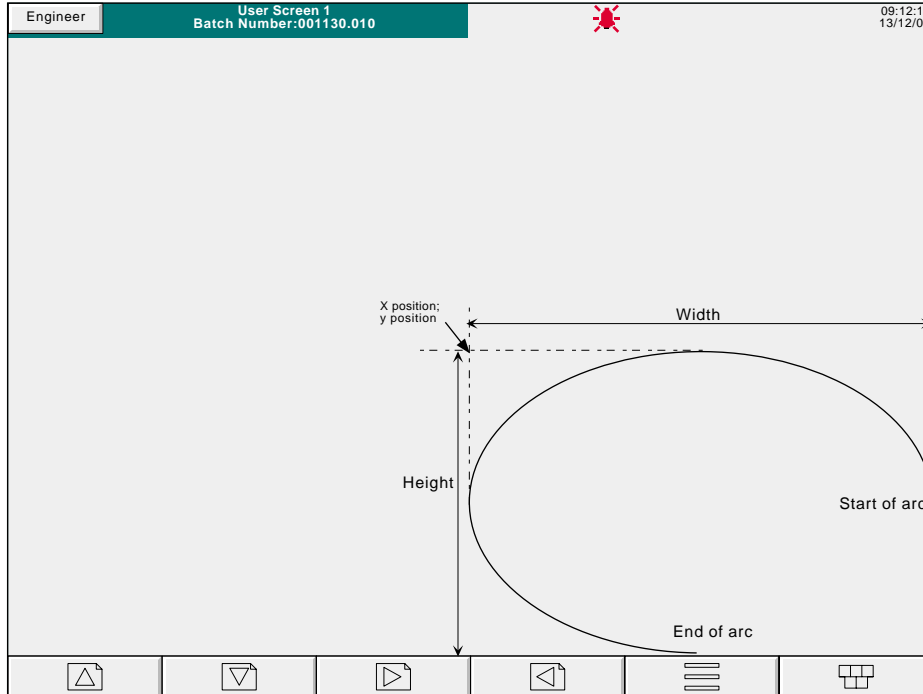


Figure 9.4.16b Sample arc

## 9.5 MEASURING UNIT COMPARISONS

Note: All the following figures are approximate

### 9.5.1 VGA screen

The physical display screen size is approximately 245 mm across and 164 mm high. For the purposes of the user screens option, this area can be divided into a 100 x 100 array for percentage measurement or into a pixel array, 800 across by 535 vertically.

Thus, horizontally, 10 mm = 4% = 32 pixels  
 or 1% = 2.45 mm = 8 pixels  
 or 10 pixels = 3 mm

and Vertically, 10 mm = 6% = 32 pixels  
 or 1% = 1.64 mm = 5.35 pixels  
 or 10 pixels = 3 mm

Centre of screen is given by X = 50%; Y = 50% or by X = 400 pixels; Y = 267 pixels

### 9.5.2 1/4VGA screen

The physical display screen size is approximately 100 mm across and 76 mm high. For the purposes of the user screens option, this area can be divided into a 100 x 100 array for percentage measurement or into a pixel array, 320 across by 214 vertically.

Thus, horizontally, 10 mm = 10% = 32 pixels  
 or 1% = 1 mm = 3 pixels  
 or 10 pixels = 3.2 mm

and Vertically, 10 mm = 13% = 28 pixels  
 or 1% = .76 mm = 2 pixels  
 or 10 pixels = 3.6 mm

Centre of screen is given by X = 50%; Y = 50% or by X = 160 pixels; Y = 107 pixels

## 9.6 ERROR CODES

Error codes 1 to F may appear at the top left corner of the screen. The following codes are currently implemented, and if more than one occurs at the same time, the code numbers are added. For example, Error code 6 would mean that codes 4 and 2 had both occurred.

- 1 Component error e.g. image does not exist, two or more trend screens superimposed on one another,
- 2 Error loading the Property.uhr file
- 4 Error loading the Style.uhr file
- 8 Error loading the usrscrn.uhu file

## **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)****Board types (I/O)**

Universal input board (standard)  
3 Change-over relay output board (optional)

**Standard features**

File transfer protocol (FTP)  
Bridge 5000 Remote viewer

**Software options**

Batch Recording  
User screens

**Environmental Performance**

Temperature limits	Operation:	0 to 50°C (5 to 40°C if Floppy disk drive fitted).
	Storage:	- 25°C to +70°C (-20 to + 50°C if floppy disk drive fitted)
Humidity limits	Operation:	5% to 80% RH (20% to 80% RH if floppy disk drive fitted) both non - condensing
	Storage:	5% to 90% RH (8% to 80% RH if floppy disk drive fitted) both 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	Small frame:	144mm x 144mm
	Large frame:	288mm x 288mm
Panel cutout	Small frame:	138mm x 138mm (-0.0 + 1.0) mm
	Large frame:	281mm x 281mm (-0.0 + 1.0) mm
Depth behind bezel	Small frame:	248 mm (213mm without terminal cover)
	Large frame:	305 mm (254mm without terminal cover)
Weight	Small frame:	3 kg. max.
	Large frame:	7 kg. max.
Mounting angle	Hard disk option:	Vertical
	Floppy disk version:	±15 ° from vertical
	Other versions:	±45 ° from vertical

**Electromagnetic compatibility (EMC)**

Emissions: BS EN50081-2  
Immunity: BS EN50082-2

**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	Current recorders:	Poly-carbonmonofluoride/lithium (BR2330). Part Number PA261095 - see section 7.3 above.
	Older recorders:	Lithium Manganese (CR2032). Part Number PA250983 - see section 7.3 above.
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



**TECHNICAL SPECIFICATION (Universal input board)****General**

Termination	Edge connector/terminal block
Max. number of inputs	Small frame: 12 (two 6-input boards) Large frame: 36 (six 6-input boards)
Input ranges	-8 to +38mV; -30 to +150mV; -0.2 to +1Volt; -2 to + 10Volts (0 to 10 Volts for channels 1, 7, 13 and 19)
Input types	Dc volts, dc millivolts, dc milliamps, (with external shunt), thermocouple, 2/3 wire resistance temperature detector (RTD), Ohms, Contact closure (not channels 1, 7, 13 and 19) (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)	<a href="#">Installation category II: Pollution degree 2</a> 300V RMS or dc channel to channel (double isolation), channel to common electronics (double isolation) and channel to ground (basic isolation)
Dielectric strength	Channel to ground: 1350Vac for 1 minute. Channel to channel: 2300Vac for 1 minute
Insulation resistance	>10M $\Omega$ at 500V dc
Input impedance	10V range: 68.8k $\Omega$ Other ranges: >10M $\Omega$
Overvoltage protection	50V peak (150V with attenuator)
Open circuit detection	$\pm$ 57nA max
Recognition time:	500mSec
Minimum break resistance:	10M $\Omega$

**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 (Instrument at 20 C)
-8mV	+38mV	1.4 $\mu$ V	0.085% input + 0.073% range	80ppm of input per deg C
- 30mV	150mV	5.5 $\mu$ V	0.084% input + 0.053% range	80ppm of input per deg C
-0.2V	1Volt	37 $\mu$ V	0.084% input + 0.037% range	80ppm of input per deg C
-2V	10 Volts	370 $\mu$ V	0.275% input + 0.040% range	272ppm of input per deg C



**TECHNICAL SPECIFICATION (Universal input board) (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:	1Ω/Ω

Low Range	High Range	Resolution	Maximum error (Instrument at 20°C)	Worst case temperature performance
0Ω	150Ω	5mΩ	0.045% input + 0.110% range	35ppm of input per deg C
0Ω	600Ω	22mΩ	0.045% input + 0.065% range	35ppm of input per deg C
0Ω	6kΩ	148mΩ	0.049% 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 (Relay output board)

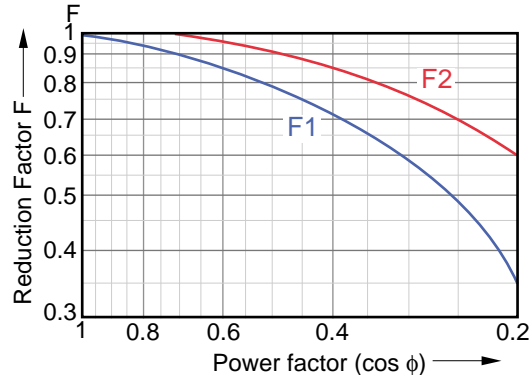
### Derating

The figures given below 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.



### General

Number of relays per board

Changeover board: Three

Estimated mechanical life 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

Maximum number of relay boards

Small-frame unit Two (maximum no. of relay outputs = 6)

Large-frame unit Four (maximum no. of relay outputs = 12)

Update rate

See ['Update rates'](#) in 'Recorder specification' above

### Safety isolation

Isolation (dc to 65 Hz; BS EN61010) [Installation category II; Pollution degree 2](#)

Relay to relay: 300V RMS or dc (double insulation)

Relay to ground: 300V RMS or dc (basic insulation)

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# Inter-Company sales and service locations

## Australia

Eurotherm Pty. Limited.  
Unit 10,  
40 Brookhollow Avenue,  
Baulkham Hills,  
NSW 2153

Telephone: 61 2 9634 8444  
Fax: 61 2 9634 8555  
e-mail: [eurotherm@eurotherm.com.au](mailto:eurotherm@eurotherm.com.au)  
<http://www.eurotherm.com.au>

## Austria

Eurotherm GmbH  
Geiereckstraße 18/1,  
A1110 Wien,

Telephone: 43 1 798 76 01  
Fax: 43 1 798 76 05  
e-mail: [eurotherm@eurotherm.at](mailto:eurotherm@eurotherm.at)  
<http://www.eurotherm.at>

## Belgium

Eurotherm BV,  
Kontichsesteenweg 54  
2630 Aartselaar  
Antwerpen

Telephone: 32 3 320 8550  
Fax: 32 3 321 7363

## Denmark

Eurotherm Danmark A/S  
Finsensvej 86,  
DK 2000 Fredriksberg,

Telephone: +45 (38) 871622  
Fax: +45 (38) 872124  
e-mail: [salesdk@eurotherm.se](mailto:salesdk@eurotherm.se)

## Finland

Eurotherm Finland,  
Aurakatu 12A,  
FIN-20100 Turku

Telephone: 358 2 25 06 030  
Fax: 358 2 25 03 201

## France

Eurotherm Automation Division Chessell  
Parc d'Affaires,  
6, Chemin des Joncs,  
BP55

F - 69574 Dardilly, CEDEX  
Telephone: 33 0 4 78 66 55 20  
Fax: 33 0 4 78 66 55 35

## Germany

Eurotherm Deutschland GmbH  
Ottostraße 1,  
65549 Limburg

Tel: +49 (0) 64 31/2 98 - 0  
Fax: +49 (0) 64 31/2 98 - 1 19  
e-mail: [info@regler.eurotherm.co.uk](mailto:info@regler.eurotherm.co.uk)  
<http://www.eurotherm-deutschland.de>

## Great Britain

Eurotherm Limited,  
Faraday Close,  
Worthing,  
West Sussex BN13 3PL

Telephone: +44 (0)1903 268500  
Fax: +44 (0)1903 265982  
e-mail: [Sales@recorders.eurotherm.co.uk](mailto:Sales@recorders.eurotherm.co.uk)  
or: [Support@recorders.eurotherm.co.uk](mailto:Support@recorders.eurotherm.co.uk)  
<http://www.eurotherm.co.uk>

## Hong Kong

Eurotherm Limited,  
Unit D, 18/F Gee Chang Hong Centre,  
65, Wong Chuk Hang Road,  
Aberdeen.

Telephone: 852 2873 3826  
Fax: 852 2870 0148  
e-mail: [eurotherm@eurotherm.com.hk](mailto:eurotherm@eurotherm.com.hk)

## India

Eurotherm DEL India Limited,  
152, Developed Plots Estate,  
Perungudi,  
Chennai 600 096,

Telephone: 91 44 4961129  
Fax: 91 44 4961831  
e-mail: [info@eurothermdel.com](mailto:info@eurothermdel.com)  
<http://www.eurothermdel.com>

## Italy

Eurotherm SpA,  
Via XXIV Maggio,  
I-22070 Guanzate,  
Como.

Telephone: 39 031 975111  
Fax: 39 031 977512  
e-mail: [info@eurotherm.it](mailto:info@eurotherm.it)  
<http://www.eurotherm.it>

## Japan

Densei Lambda K.K.,  
Strategic Products Dept.  
5F Nissay Aroma Square,  
37-1, Kamata, 5-Chome,  
Ohta-ku,  
Tokyo 144-8721

Telephone: 81 3 5714 0620  
Fax: 81 3 5714 0621  
e-mail (Sales): [k.iwama@densai-lambda.com](mailto:k.iwama@densai-lambda.com)  
e-mail (Technical): [v.rendle@densai-lambda.com](mailto:v.rendle@densai-lambda.com)  
<http://www.densei-lambda.com>

## Korea

Eurotherm Korea Limited,  
J- Building  
402-3  
Poongnab-Dong,  
Songpa-Ku  
Seoul, 138-040

Telephone: 82 2 478 8507  
Fax: 82 2 488 8508

## Netherlands

Eurotherm BV,  
Genielaan 4,  
2404CH Alphen aan den Rijn,  
The Netherlands

Telephone: 31 172 411 752  
Fax: 31 172 417 260  
e-mail: [Sales@eurotherm.nl](mailto:Sales@eurotherm.nl)  
<http://www.eurotherm.nl>

## Norway

Eurotherm A/S,  
Vollsveien 13D  
1366 Lysaker,  
Postboks 227  
NO-1326 Lysaker  
Norway,

Telephone: 47 67 592170  
Fax: 47 67 118301  
<http://www.eurotherm.no>

## Spain

Eurotherm España SA,  
Pol. Ind. De Alcobendas,  
Calle de la Granja 74,  
28108 Alcobendas,  
Madrid.

Telephone: 34 91 661 60 01  
Fax: 34 91 661 90 93  
<http://www.eurotherm.es>

## Sweden

Eurotherm AB,  
Lundavägen 143,  
S-21224 Malmö.

Telephone: 46 40 38 45 00  
Fax: 46 40 38 45 45  
e-mail: [info@eurotherm.se](mailto:info@eurotherm.se)  
<http://www.eurotherm.se>

## Switzerland

Eurotherm Produkte (Schweiz) AG,  
Schwerzistraße, 20,  
CH-8807 Freienbach.

Telephone: 41 55 415 44 00  
Fax: 41 55 415 44 15  
e-mail: [epsag@eurotherm.ch](mailto:epsag@eurotherm.ch)  
<http://www.eurotherm.ch>

## United States of America

Eurotherm Recorders Inc.  
741-F Miller Drive  
Leesburg  
VA 20175-8993

Telephone: 1 703 669 1342  
Fax: 1 703 669 1307  
e-mail (Sales): [sales@chessell.com](mailto:sales@chessell.com)  
e-mail (Technical): [support@chessell.com](mailto:support@chessell.com)  
<http://www.chessell.com>

Informações sobre programação  
[www.soliton.com.br](http://www.soliton.com.br) - e-mail: [soliton@soliton.com.br](mailto:soliton@soliton.com.br)

## SOLITON CONTROLES INDUSTRIAIS LTDA

Rua Alfredo Pujol, 1010 - Santana - São Paulo - SP. Tel: 11 - 6950-1834 / Fax: 11 - 6979-8980 - e-mail: [vendas@soliton.com.br](mailto:vendas@soliton.com.br)





