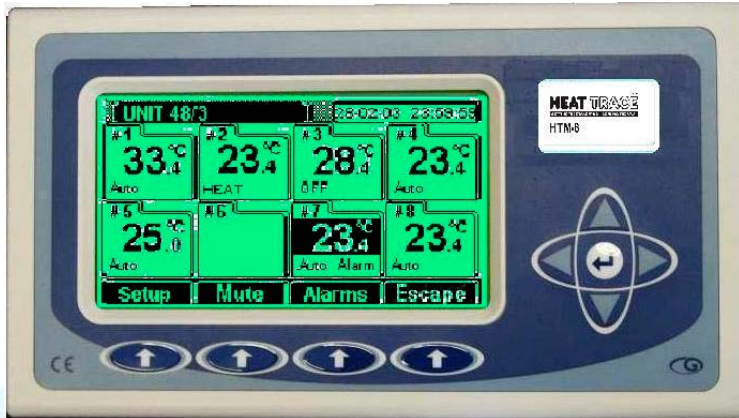


# Guardian HTM-8

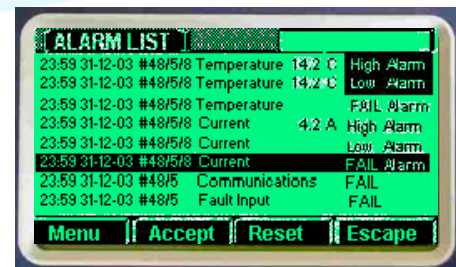
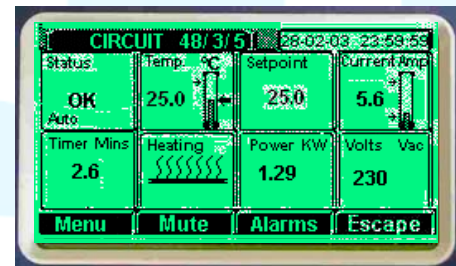
## Heat Trace Monitor



This LCD monitor panel provides the local operator interface for value display, parameter setup and alarm monitoring of up to **sixty-four** Trace Heating control circuits via **eight** HT919 controllers. Easily read, large character LCD displays of temperature and alarm states immediately highlight any abnormal plant operating conditions.

Optional internet protocol (IP) facilities allow Local Area Network (LAN) connection to the internet for remote TCP/IP monitoring, email alarm messages and web page displays

- Overview & alarm status for eight HT919 units.
- Large LCD displays for circuit temperature values.
- Detail display for each circuit shows temperature, alarm status, heater state, kWh and load current.
- Alarm List with date, time and alarm description of out of limit measured values or fault inputs.
- Simple cursor and menu selection for local setup of individual Circuit Setpoints, Limits & Control Mode.
- RS485 Modbus communications of all settings and values to remote supervisory PC.
- Optional rail mounting Internet Protocol module provides Modbus over TCP / IP and HTTP for Web pages and Email alarm messages.



Guardian Products incorporate the experience accumulated during two decades of microprocessor control of commercial & industrial systems and refrigeration.

Rugged, reliable, cost-effective products with a high immunity to electrical noise provide flexible system configurations & facilities for Heat Trace circuit control and monitoring.



HT 919 Plant Control

### HTM-8 Overview

Guardian Controls International Ltd.

56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

mtm issue J 28/06/04

Email sales@guardian-controls.com  
Tel +44(0)1270760599 Fax +44(0)1270766804

## SYSTEM OVERVIEW

### HPM-8 Heat Trace Monitor

One monitor unit is fitted to the door of each heat trace electrical panel. The HPM-8 has cursor and menu function buttons and a LCD screen for selection, display and changes to heater circuit parameters locally at the panel. Each electrical panel may contain up to a maximum of eight HT 919 controller units.

### HT919 Plant Control

Each HT 919 unit provides temperature control for up to eight heat trace circuits. This gives a maximum of 64 heat trace control circuits per panel.

When requested by the central PC or the HTPM-8 Monitor, the HT919 units communicate latest states, measured values and any alarm conditions for all its heat trace circuits.

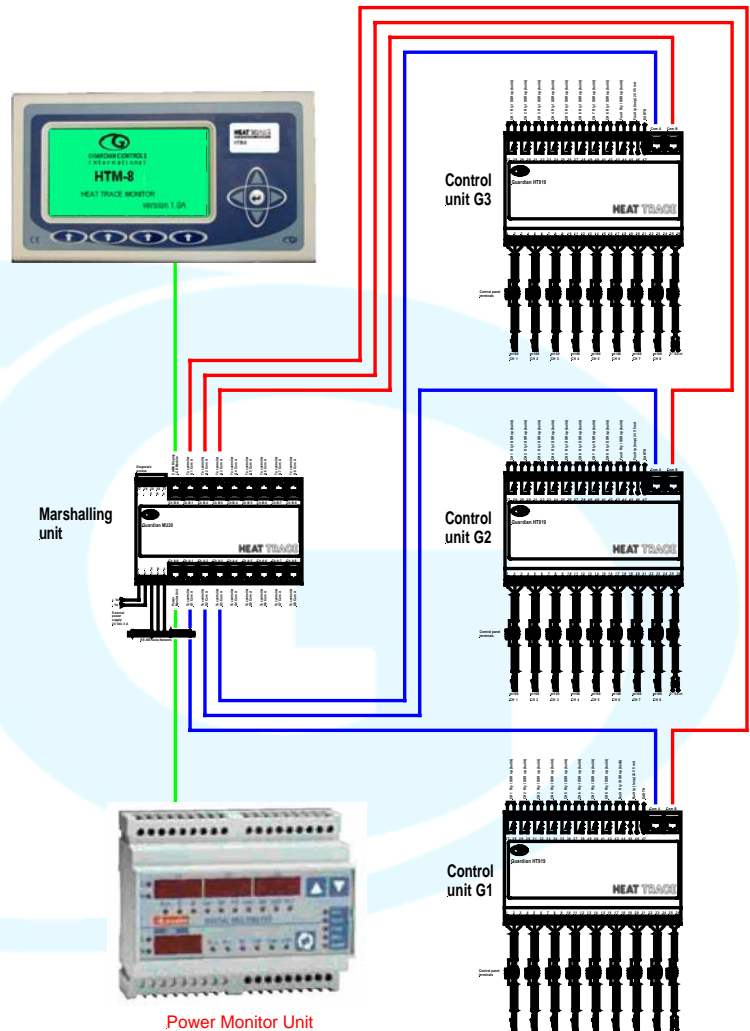
These communications require a two wire serial RS485 (Modbus RTU protocol) connection from each of up to eight controllers to both the central PC and the HTPM-8 Monitor.

### MU20 Marshalling unit

The Marshalling unit provides multiple 4-way connectors to simplify the wiring of the RS485 and power connections within the panel.

### Power Monitor Unit

An optional power monitoring unit may be fitted within the panel to provide 3-phase voltages, currents, power, energy, frequency and power factors to the SCADA system.



SPECIFICATIONS		HTPM-8 Panel Monitor	HT919 Plant Controller		
<b>Power</b>		24 V dc	24 V dc	<b>Analog Inputs</b>	
<b>Operation</b>		0 to 50 C	0 to 50 C	0-5A	1 current from CT
<b>Dimensions</b>	Height	125 mm	86 mm	3-wire PT100	8 PT100 temperatures -100.0 C to +200.0 C
	Length	210 mm	156 mm		
	Depth	45 mm	59 mm		
<b>Mounting</b>	Door Cutout	<b>115 x200 mm</b>	Rail Mounting	<b>Fault Input</b>	1 Fault Contact closure
<b>Communications Links</b>		COM A, COM B	COMA, COMB	<b>Relays</b>	8 Heater outputs (n/o)
Modbus RS484 @ 19200 baud		4-way sockets	4-way sockets	5A 230vac	
<b>Approvals</b>		<b>CE</b>			1 Alarm relay (n/o)

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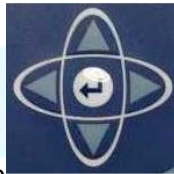
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Tel +44(0)1270760599 Fax +44(0)1270766804

# HTM-8

The HTM-8 operator display panel has five cursor control buttons, four menu function buttons and a LCD screen. The buttons are used to select, display and change chiller parameters locally at the panel.

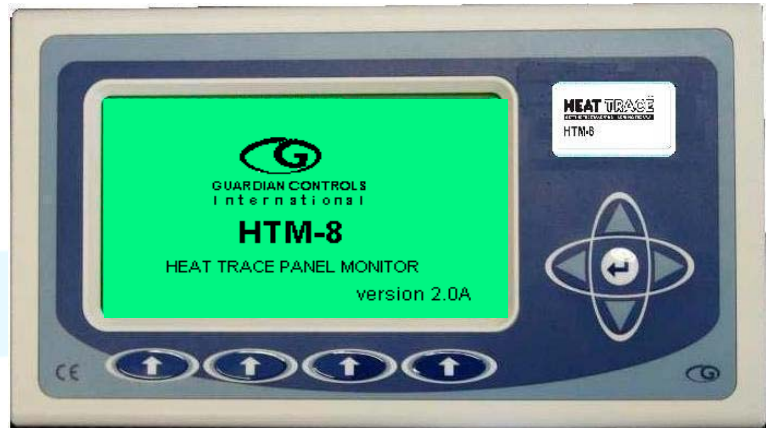
Cursor control buttons are

vertical **Up** Arrow  
vertical **Down** Arrow  
horizontal **Left** Arrow  
horizontal **Right** Arrow  
and a central **Enter** button.



The actions of the four Menu buttons are dependent on the LCD display screen text immediately above.

# PANEL OPERATION



On power up the **Product Startup** screen above is briefly displayed with product name and software version number.

## OVERVIEW



### Panel Overview

The default display is an overview of Heat trace Panel operating conditions with alarm status for HT919 Units #1 to #8.

Time and date is displayed at the top right of the display.

Units operating normally display **OK**.

Unused controllers display blank.

Units with alarms display the following status messages:-

- COMMS** – the unit is not communicating with the display
- FAULT** – the unit has a fault input alarm or faulty probe.
- ALARM** -- a circuit in the unit has an alarm

Units with unaccepted alarms flash and go steady black when accepted. When **Mute** is pressed, the Alarm beeper is muted and any external flashing beacon is stopped.

Pressing **Alarms** displays the alarm list (see below)

Repeatedly pressing **Escape** or always reverts back to this display.

## MUTE



### Mute

To silence Alarm Sounder press **Mute** button

To inhibit alarm beeper use Menu, System, Sounder as below

### HTM-8 Overview

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56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

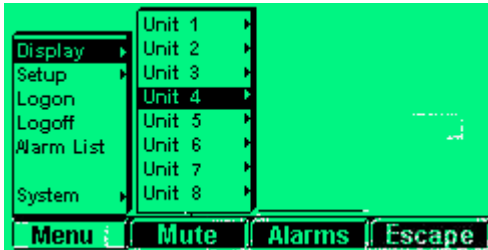
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Email sales@guardian-controls.com  
Tel +44(0)1270760599 Fax +44(0)1270766804

## MENU



## DISPLAY – Unit, Circuit, Etc.



### Unit Selection

Further details of a particular unit are selected by using the keypad vertical and horizontal arrows to highlight the **Unit #** on the Overview display followed by pressing **Enter**.

Alternatively, pressing the **Menu** button and then using the vertical and horizontal arrow buttons to select **Display, Unit 'n'**, followed by pressing the **Enter** button, also displays more details for the selected Unit.

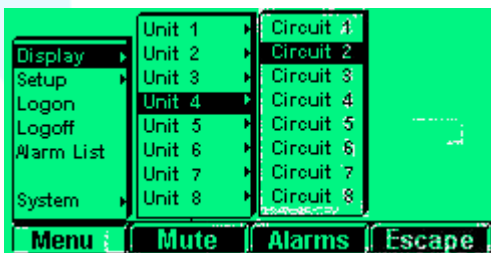


### Unit Display

The Unit display is an overview of the eight circuits on the selected HT919 unit. e.g. Panel 48 / Unit 3/ Circuits #1-8. The display provides large number display of measured temperatures with alarm status and operating control mode for each heater circuit #1 to #8.

Circuits with unaccepted alarms flash and go steady black when accepted. When **Mute** is pressed, the Alarm beeper is muted and any external flashing beacon is stopped.

Pressing **Escape** reverts back to the previous screen display..

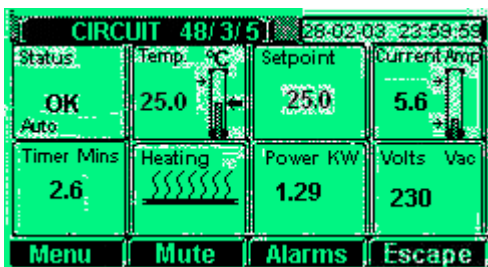


### Circuit Selection

Further details of a particular circuit are selected by using the keypad vertical and horizontal arrows to highlight the **Channel number #1 to #8** followed by pressing **Enter**.

Alternatively, pressing the **Setup** menu button and then using the vertical and horizontal arrow buttons to select **Display, Details, Unit 'n', Circuit 'x'** followed by pressing the Enter button, displays further details for the selected Circuit.

Similar data for other Circuits in sequence may be displayed using the horizontal arrow buttons.



### Circuit Display

The Circuit display gives heater circuit control mode and status, the measured values of the control temperature and alarm state. Additional items displayed include the appropriate icon when the heater relay output is energized, current, voltage and Power with bar graph icons and the control setpoint value. Pressing **Alarms** gives the Alarm List below.

Pressing **Escape** reverts back to the previous screen display.



### Circuit Control Mode

If Login has been selected then the Control Mode may be changed by pressing **Enter** with the Circuit on display.

When the circuit parameter settings are displayed, use the vertical arrows until Circuit Control Mode is highlighted.

Pressing **Enter** displays the mode change icon:-**Auto, Steam Out, OFF**. The required new mode is selected using the vertical arrows followed by pressing **Enter**. The new control mode is displayed at the bottom of the **Status** tile.

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Email sales@guardian-controls.com  
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# ALARMS

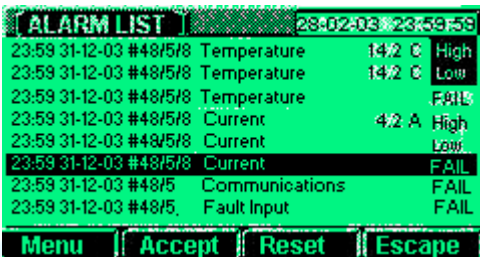



Display  
Setup  
Logon  
Logoff  
Alarm List  
System



## Alarm List Selection

The first page of the **Alarm List** is displayed by pressing the **Alarms** menu button on the Menu Bar. Pressing the **Menu** button and then using the vertical arrow buttons to select **Alarm List** followed by pressing the **Enter** button has the same result.



ALARM LIST		23-02-03 23:59:59	
23:59	31-12-03 #48/5/8	Temperature	14.2 °C High
23:59	31-12-03 #48/5/8	Temperature	14.2 °C Low
23:59	31-12-03 #48/5/8	Temperature	FAIL
23:59	31-12-03 #48/5/8	Current	4.2 A High
23:59	31-12-03 #48/5/8	Current	Low
23:59	31-12-03 #48/5/8	Current	FAIL
23:59	31-12-03 #48/5	Communications	FAIL
23:59	31-12-03 #48/5	Fault Input	FAIL

Menu Accept Reset Escape

## Alarm List

The **Alarm List** is displayed with most recent alarms at the top with eight messages per page. The alarm list holds the last 100 alarm messages generated for the system. Each message includes the time and date of occurrence, the system reference number and the reason for the alarm.

Accepted alarms have the alarm reason in black. Unaccepted alarms are flashing.

Alarms are selected by the vertical arrow buttons prior to selecting the **ACCEPT** or **RESET** menu buttons.

Selecting the **down** arrow on the last item of the list displays the next eight messages.

Pressing **Escape** reverts back to the previous screen display.

## Alarm Messages

When abnormal temperature conditions are detected the following alarm messages are displayed in the Alarm List

**High** - temperature or current above High Limit for longer than the Guardtime

**Low** - temperature or current below Low Limit for longer than the Guardtime

**Fault 01** - probe giving open circuit reading

**02** - probe giving Short circuit reading

**03** - probe wiring incorrect

## Mute

To silence Alarm Sounder press **Mute** button

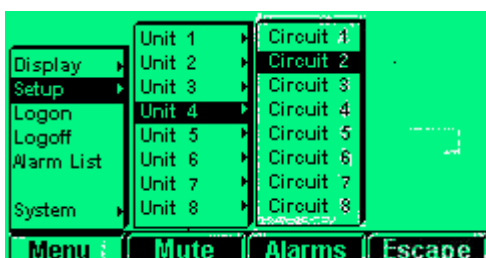
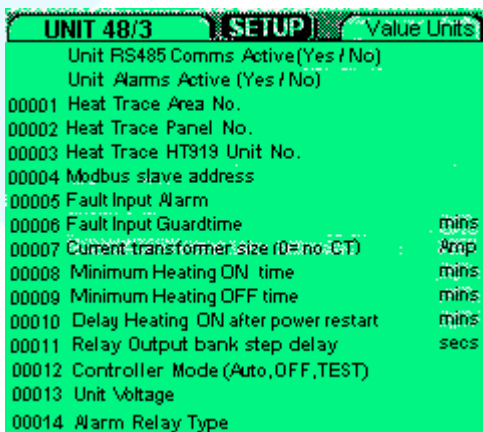
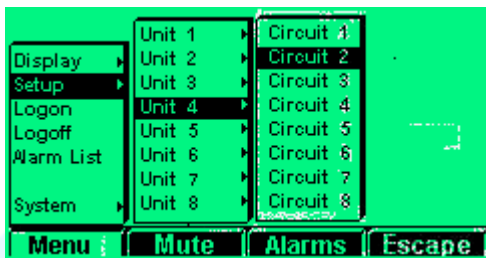
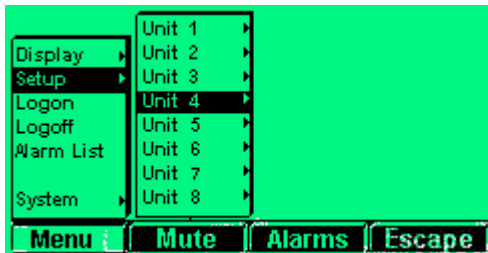
To inhibit alarm beeper use Menu, System, Sounder as below

## Clear Alarm List

The contents of the Alarm List may be cleared by simultaneously holding down the **Accept** and **Reset** buttons for 10 seconds when the Alarm List is on display.

## MENU

Menu



## SETUP - Change Settings

### General

Pressing the **Menu** button allows vertical and horizontal arrow selection of **Setup** parameters for

**Units 1 to 8**

and **Circuits 1 to 8** within the selected unit.

e.g.

Pressing **Enter** with **Setup, Unit 4** selected displays the Unit 4 **Setup** screen.

Pressing **Enter** with **Setup, Unit 4, Circuit 2** selected displays the Unit 4, circuit 2 **Setup** screen.

Prior to any change of settings the correct Logon passcode must have been entered.

If the logon passcode is entered incorrectly then the settings may be displayed but not changed.

Language and other system settings such as time & date and display contrast etc. are changed using the **System** menu selection.

### Setup UNIT Selection

Use horizontal and vertical arrows to select the required parameter group:- **Menu, Setup, Unit 'n'**, and then press **Enter**.

Pressing **Enter** with **Unit 'n'** highlighted accesses **Unit Setup** settings for the appropriate unit.

The appropriate **Setup** screen is then displayed with all parameters associated with the item.

The five digit number in front of each parameter line is the **Modbus Point Number** for the setup parameter.

Additional pages of eight settings are displayed when the vertical up arrow is used on the first line and the vertical down arrow on the last line.

For further details and ranges of all parameters that can be changed see HT919 **specification - MODBUS**

### Setup UNIT Parameter Selection and Change

Use the **up, down** vertical arrows to select the parameter setting to be changed and press **Enter**.

Provided Logon is selected, the setting change icon is displayed with either latest setting value, maximum and minimum limits or selection names text e.g. Yes/ No.

Use vertical arrows to increase or decrease value or select text. Press **Enter** to enter new setting.

Press **Escape** to ignore changes

Press **Escape** again to return to previous screen.

### Setup CIRCUIT Selection

Use horizontal and vertical arrows to select the required circuit parameters:- **Menu, Setup, Unit 'n', Circuit 'x'** and then press **Enter**.

The appropriate **Setup** screen is then displayed with all parameters associated with the item.

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mtm issue J 28/06/04

Email sales@guardian-controls.com  
Tel +44(0)1270760599 Fax +44(0)1270766804

CIRCUIT # 48/3/5	SETUP	Value	Units
00031	Circuit In Use (Yes / No)	Yes	
00032	Circuit Control Mode (Auto / ON / OFF)	Auto	
00033	Heating Setpoint (cutin)	12.0	°C
00034	Heating Deadband (cutout-cutin+db)	4.0	°C
00035	Temperature Alarm State		
00036	High Temperature Alarm Limit		°C
00037	High Temperature Alarm Guardtime		mins
00038	Low Temperature Alarm Limit		
00039	Low Temperature Alarm Guardtime		mins
00040	Startup Temp Alarm Guardtime		mins
00041	Current Alarm State		
00042	Amps High Alarm Limit		Amp
00043	High Current Alarm Guardtime		mins
00044	Amps Low Alarm Limit		Amp
00045	Low Current Alarm Guardtime		mins
00046	Last Measured Current		Amp
00047	Steamout setpoint (out-in)		°C
00048	Steam Out Alarm State		
00049	Steam Out High Alarm Limit		°C
00050	Steam Out High Alarm Guardtime		mins

The five digit number in front of each parameter line is the **Modbus Point Number** for the setup parameter.

Additional pages of eight settings are displayed when the vertical up arrow is used on the first line and the vertical down arrow on the last line.

For further details and ranges of all parameters that can be changed see HT919 **specification - MODBUS**

CIRCUIT # 48/3/5	SETUP	Value	Units
00031	Circuit In Use (Yes / No)	Yes	
00032	Circuit Control Mode (Auto / ON / OFF)	Auto	
00033	Heating Setpoint (cutin)	12.0	°C
00034	Heating Deadband (cutout-cutin+db)	4.0	°C
00035	Temperature Alarm State		
00036	High Temperature Alarm Limit		°C
00037	High Temperature Alarm Guardtime		mins
00038	Low Temperature Alarm Limit		

Menu Mute Alarms Escape

### Setup CIRCUIT Parameter Selection and Change

Use the **up, down** vertical arrows to select the parameter setting to be changed and press **Enter**.

Provided Logon is selected, the setting change icon is displayed with either latest setting value, maximum and minimum limits or selection names text e.g. Yes/ No.

Use vertical arrows to increase or decrease value or select text. Press **Enter** to enter new setting.

Press **Escape** to ignore changes

Press **Escape** again to return to previous screen.

## LOGON

Display	▶
Setup	▶
Logon	■
Logoff	■
Alarm List	▶
System	▶

Menu Alarms Escape

### LOGON

The correct Logon code must be entered prior to any change of passcode protected settings or control action.

The passcode is entered after pressing **Menu** followed by vertical arrow selection of **Logon** followed by Enter.

This displays the passcode change icon with setting value, maximum and minimum limits.

Use the vertical arrows to increase or decrease the displayed number to the correct passcode value.

Press **Enter** to set the passcode. A marker block next to Logon indicates that the passcode has been successfully entered.

Pressing **Escape** reverts back to the previous screen display.

## LOGOFF

Display	▶
Setup	▶
Logon	■
Logoff	■
Alarm list	▶
System	▶

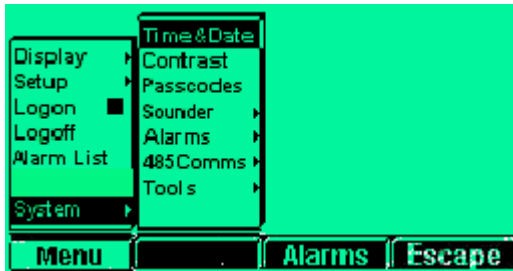
Menu

### LOGOFF

To logoff, press **Setup** and use vertical arrows to select **Logoff** and press **Enter**. A marker block next to Logon moves to Logoff to indicate that the system is now passcode protected.

The panel automatically reverts back to the previous screen display.

# SYSTEM

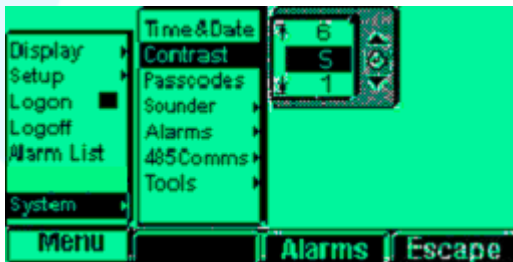


## Change TIME and DATE

The Time and Date is normally displayed in the box at the top right of the display screen.  
To change Time and Date, press **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Time & Date** and then press **Enter**.  
This displays the TIME & DATE screen with latest time and date clock values.

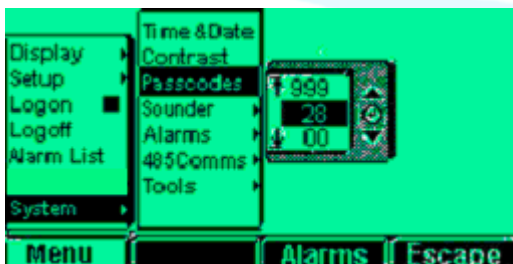


Use vertical arrows to select parameter setting to be changed and press **Enter**. This displays the setting change icon with setting value, maximum and minimum limits.  
Use vertical arrows to increase or decrease value.  
Press **Enter** to enter new setting.  
Press **Escape** to ignore change  
Pressing **Escape** again reverts back to the previous screen display.



## Change LCD Display CONTRAST

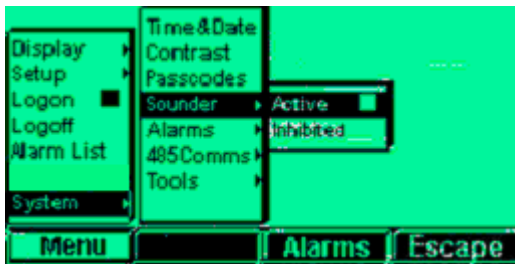
The LCD Panel contrast can be altered by pressing **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Contrast** and then press **Enter**.  
This displays the setting change icon with setting value, maximum and minimum limits.  
Use vertical arrows to increase or decrease new contrast value.  
Press **Enter** to enter new passcode setting.  
Press **Escape** to ignore change



## Change PASSCODE

To change the passcode, press **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Passcode** and then press **Enter**.  
This displays the setting change icon with setting value, maximum and minimum limits.  
Use vertical arrows to increase or decrease new passcode value.  
Press **Enter** to enter new passcode setting.  
Press **Escape** to ignore change  
Pressing **Escape** again reverts back to the previous screen display  
Subsequent Logon passcode entries will only work with the new passcode.  
If the passcode is set to 00 or default -01 then Logon is permanently active and passcode protection facilities are ignored.





### Change System settings for Sounder,

To activate or deactivate the Alarm sounder in the panel, press **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Sounder, Active** or **Inhibited** and then press **Enter**.

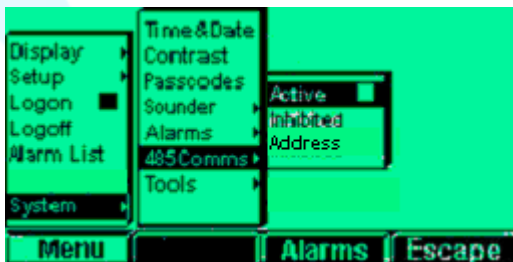
This activates or inhibits the Sounder and indicates the current selection with a marker block.



### Change System settings for Alarms,

To activate or deactivate all alarms, press **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Alarms, Active** or **Inhibited** and then press **Enter**.

This activates or inhibits all Alarm actions and indicates the current selection with a marker block.



### Change System settings for RS485 Communications.

To activate or deactivate all RS485 communications, press **Menu** button and use vertical and horizontal arrows buttons to select menus **System, 485 Comms, Active** or **Inhibited** and then press **Enter**.

This activates or inhibits all RS485 communication scanning and indicates the current selection with a marker block.

### System Tools

System Tools is a selection for Future Facilities which are currently 'Not Available' on this product.



## Modbus Address for HT919 units

All HT 919 units need to be setup with the correct Modbus Address for correct operation with the remote SCADA system and the local HTM-8 LCD panel.

The LED on the front of the HT919 unit normally indicates that power is available on the unit. This LED also flashes every time the unit responds to a RS485 communication request on COM A ( SCADA system)

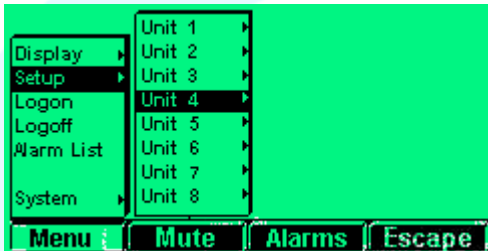
The Modbus address for the unit is setup using the **SET** pushbutton and **LED** lamp on the unit front panel.

### Address Change using HTM-8 Display

The Modbus address of a controller can only be changed from the HTM-8 display after the 'SET' button has been pressed. The LED normally flashes quickly each time it replies to a communication request from COM A ( SCADA system). After the 'SET' button has been pressed the LED lamp slowly pulses ON and OFF to indicate the unit is in 'address change' Mode. With an HTM-8 plugged directly into controller or communicating via a MU20 marshalling unit, the controller address can be changed from the LCD panel as follows:-

Press the 'Set' button. The LED lamp now pulses slowly to indicate the unit is in 'address change' mode.

Use the Menu button, select Setup and then Unit 'n' using selection arrows and then press Enter on required unit 'n'.



Unit setting parameters are displayed including the Modbus Address.

Use down arrow to select the Modbus slave address line and press **Enter**. The 'change value' icon is displayed.

Use up down arrows to select the new address (eg 28) and press Enter.

This sends the new Modbus address to the controller and the LED lamp stops flashing.



**\*\*\* Address changes from the LCD are ignored when the 'SET' LED is not flashing.**

### Address Check Procedure (without LCD-8)

For each unit power off, depress the pushbutton with a pencil or ballpoint pen and power on. The LED lights.

Release the pushbutton. The LED goes out, waits and then flashes the current address eg 3 pulses for Modbus address 3, waits again and then goes steady.

### Address Change Procedure (without LCD-8)

For each unit power off, depress the pushbutton with a pencil or ballpoint pen and power on. The LED lights.

Release the pushbutton. The LED goes out and waits. Before the lamp flashes the current address again, quickly depress the pushbutton the number of times for the new address e.g. press four times for address 4. The Led lamp then waits, flashes the new address, waits and then goes steady.

The new address selection can be checked as above.

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Guardian Controls International Ltd.

56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

mtm issue J 28/06/04

Email sales@guardian-controls.com  
Tel +44(0)1270760599 Fax +44(0)1270766804

## Special Functions

### Clear Alarm List

The contents of the Alarm List may be cleared by simultaneously holding down the **Accept** and **Reset** buttons for 10 seconds when the Alarm List is on display.

### Forgotten Passcode

Powering up the HTM-8 panel with the **Up** and **Down** vertical arrow buttons pressed for 5 seconds will clear a forgotten passcode and give a permanent Logon.

The following message is displayed:-

**"Passcode has been set to default. Release buttons to continue."**

A new passcode can be entered in the normal manner after selecting:- **Menu, System, Passcodes.**

