LCD-8 RAM

Refrigeration Alarm Monitor

This Liquid Crystal Display (LCD) panel provides the local operator interface for up to **eight** Guardian GC1719 plant controllers.

Refrigeration Alarm Monitoring and display of temperatures, alarm status, control mode, relay states and zone parameter settings are selectable for a maximum of **sixty-four** refrigeration control zones.

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 GC1719 units.*
- *Large LCD displays for zone temperature values.*
- *Detail display for each zone shows temperatures, alarm status, relay states.*
- *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 zone 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 systemm configurations & facilities for Refrigeration Control and Monitoring.

GC1719 Plant Control

LCD-8 RAM Overview
mtm issue C 03/05/04
Guardian Controls International Ltd.
Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

GUARDIAN CONTROLS
international

REFRIGERATION CONTROL & MONITORING

SYSTEM OVERVIEW

LCD-8 Refrigeration Monitor

The LCD-8 monitor panel is normally fitted in the door of the appropriate electrical control panel.

The LCD-8 panel has cursor and menu function buttons and a LCD screen for selection, display and changes to control parameters locally at the electrical panel.

Each monitor panel supports up to a maximum of eight GC1719 controller units.

GC1719 Plant Control

Each GC1719 unit provides temperature control and monitoring for up to eight refrigeration zones.

This gives a maximum of 64 control zones for each LCD-8 monitor panel.

The GC1719 units communicate latest states, measured values and any alarm conditions for all zones when requested by the central PC or the LCD-8 Monitor,

These communications require a two wire serial RS485 (Modbus RTU protocol 19200 baud) connection from each of up to eight controllers to both the central PC and the LCD-8 Monitor.
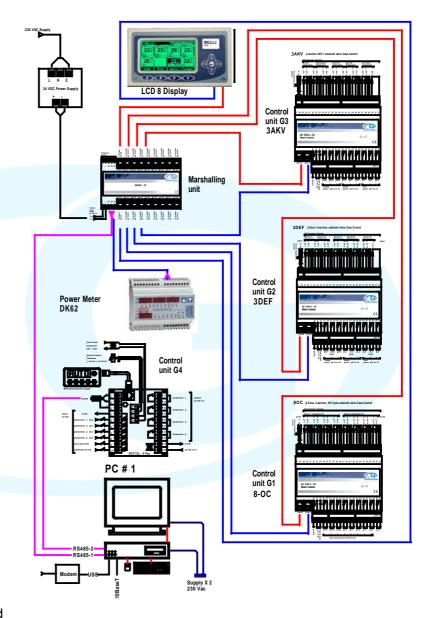
MU20 Marshalling unit

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

DR 4524 Power Supply

Provides Power support at 24vdc 45 W for eight 'GC' Range units and an LCD-8 display.

DK62 Power Multimeter

Measures and communicates voltages, currents, frequency, power and energy used by the system.

230 VAC Supply

24 VDC Power Supply

LCD 8 Display

Marshalling unit

Power Meter DK62

Control unit G4

PC # 1

RS485-2
RS485-1

Modem — USB

10BaseT

Supply X 2
230 Vac

3AKV   3-section AKV / solenoid valve Case Control

Control unit G3
3AKV

3DEF   3-Zone, 3-section, solenoid valve Case Control

Control unit G2
3DEF

8OC   3-Zone, 2-section, Off Cycle solenoid valve Case Control

Control unit G1
8-OC

SPECIFICATIONS	LCD-8 Panel Monitor	GC1719 Plant Controller		
Power	24 V dc	24 V dc	**Analog Inputs**	
Operation	0 to 50 C	0 to 50 C	0-5A	1	current from CT
Dimensions Height Length Depth	125 mm 210 mm 45 mm	86 mm 156 mm 59 mm	2-wire thermistor	16	2k2 thermistor temperatures -40.0 C to +40.0 C
Mounting Door Cutout	**115 x200** mm	Rail Mounting	**Fault Input**	1	Fault Contact closure
Communications Links Modbus RS484 @ 19200 baud	COM A, COM B 4-way sockets	COMA, COMB 4-way sockets	**Relays** 5A 230vac	6	Control outputs (n/o)

GUARDIAN CONTROLS
international

REFRIGERATION CONTROL & MONITORING

Approvals	CE		Solid state relay 0.5 A 230vac	3	Control outputs (n/o)

LCD-8 RAM

The LCD-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.
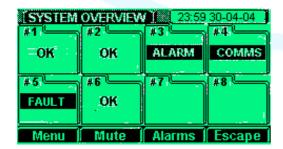
PANEL OPERATION

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

OVERVIEW Escape

System Overview
The default display is an overview of operating conditions with alarm status for GC1719 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 zone 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

Mute
To silence Alarm Sounder press **Mute** button
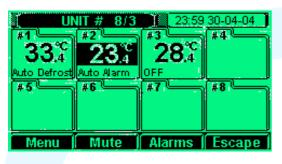To inhibit alarm beeper use Menu, System, Sounder as below

LCD-8 RAM Overview   mtm issue C 03/05/04
Guardian Controls International Ltd.   Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

MENU   Menu   DISPLAY – Unit, Zone, 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.
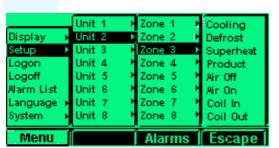

Unit Display
The Unit display is an overview of the zones on the selected GC1719 unit. e.g. Panel 8 / Unit 3/ Zone #1-3.
The display provides large number display of the zone controlling temperatures with alarm status and operating control mode for each zone #1 to #8.
Zones with unaccepted alarms flash and go steady black when accepted. When **Mute** is pressed, the Alarm beeper is muted and any external flashing beacon is stopped.
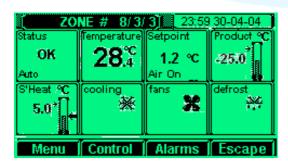Pressing **Escape** reverts back to the previous screen display.

Zone Selection
Further details of a particular zone are selected by using the keypad vertical and horizontal arrows to highlight the **Zone #** followed by pressing **Enter.**
Alternatively, pressing the **Menu** button and then using the vertical and horizontal arrow buttons to select **Display, Unit 'n'**, **Zone 'x'** followed by pressing the Enter button, displays further details for the selected Zone.
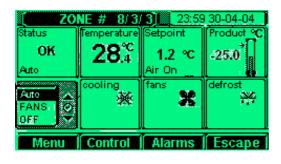

Zone Display
The Zone display gives zone control mode and status, the measured values of the control temperature and alarm state.
Additional items displayed include appropriate icons when cooling, fans, defrost relay outputs are energized, superheat with bar graph icon and the control setpoint value.
Pressing **Alarms** gives the Alarm List below.
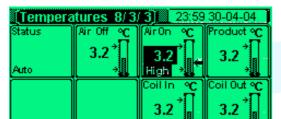Pressing **Escape** reverts back to the previous screen display.

Zone Control
If Login has been selected then a pop-up icon for changing control mode is displayed when **Control** is pressed on the **Zone** display.
Control Mode is changed by using the vertical arrows to select the new mode:- **Auto, Fans, OFF**, **Defrost** followed by **Enter.**
The new control mode is displayed at the bottom of the **Status** tile.

GUARDIAN CONTROLS
international

REFRIGERATION CONTROL & MONITORING

Temperature or Superheat Selection

Further details of the temperatures for a particular zone are selected by using the keypad vertical and horizontal arrows to highlight the **Superheat** or **Temperature** followed by pressing **Enter.**

Alternatively, pressing the **Menu** button and then using the vertical and horizontal arrow buttons to select **Display, Unit 'n'**, **Zone 'x'** , and required superheat or Temperature followed by pressing the **Enter** button, displays further details of Zone Temperatures.
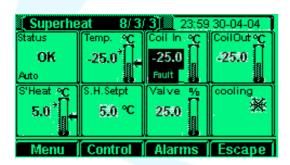.

Temperature Display

The measured values of all zone temperatures are displayed with latest values and bar-graph icon.

Temperatures in alarm inverse Flash and go steady when accepted. Alarm status displayed can be **High, Low** or probe **Fault** .

To display alarm settings for a particular temperature use cursor arrows to select the required temperature and press **Enter**

Superheat Display

The measured values of all zone superheat points are displayed with latest values and bar-graph icons. Temperatures in alarm show alarm status **High, Low** or probe **Fault**.

Use cursor arrows to select the required temperature and press **Enter** to display alarm settings for a particular temperature**.**
use cursor arrows to select **S.H.Setpoint** and press **Enter** to display Superheat settings**.**

LCD-8 RAM Overview   mtm issue C 03/05/04
Guardian Controls International Ltd.   Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

ALARMS   Alarms

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

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 above High Limit for longer than Guardtime

Low - temperature below Low Limit for longer than 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 **Rese**t buttons for 10 seconds when the Alarm List is on display.

LCD-8 RAM Overview   mtm issue C 03/05/04
Guardian Controls International Ltd.   Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

MENU `Menu` SETUP - Change Settings

UNIT # 8/3 | SETUP | Value Units

0010	Controller Mode	Auto
0001	Area Number	0
0002	Control Panel Reference No.	1
0003	Unit number in panel	3
0004	Modbus Slave address number	3

ZONE # 8/3/3 | SETUP | Value Units

1001	Zone in Use
1002	Zone Control Mode
1027	Zone Temperature Alarms Active

Cooling # 8/3/3 | SETUP | Value Units

1003	Cooling Control Input probe	Air Off	
1004	Cooling Control Setpoint (cutin)	-25	°C
1005	Cooling Deadband (cutout=cutin-db)	0.5	°C

Defrost # 8/3/3 | SETUP | Value Units

1008	Number of Defrosts per day
1009	Defrost Schedule Automatic
1010	Defrost Time T1

Superheat 8/3/3 | SETUP | Value Units

1501	Pack Evaporating temperature	°C
1502	Superheat High. Maximum	°C
1503	Superheat Low. Minimum	°C

Temperature 8/3/3 | SETUP | Value Units

1301	Product Temperature In Use	Yes	
1302	Temperature Alarm State	HiLo	
1303	High Temperature Alarm Limit	-22	°C
1304	High Temperature Alarm Guardtime	15	mins
1305	Low Temperature Alarm Limit	-28	°C
1306	Low Temperature Alarm Guardtime	15	mins

Menu | Control | Alarms | Escape

Menu table:

	Unit 1 ▶	Zone 1 ▶	Cooling
Display ▶	Unit 2 ▶	Zone 2 ▶	Defrost
Setup ▶	Unit 3 ▶	Zone 3	Superheat
Logon	Unit 4 ▶	Zone 4 ▶	Product
Logoff	Unit 5 ▶	Zone 5 ▶	Air Off
Alarm List	Unit 6 ▶	Zone 6 ▶	Air On
Language ▶	Unit 7 ▶	Zone 7 ▶	Coil In
System ▶	Unit 8 ▶	Zone 8 ▶	Coil Out

Menu | | Alarms | Escape

General

Pressing the **Menu** button allows vertical and horizontal arrow selection of **Setup** parameters for **Units** 1-8, and **Zone** 1-8 and detail settings for control and monitoring point parameters.

Pressing **Enter** displays the selected **Setup** screen.

These screens may also be selected by selecting the parameter group on the appropriate zone, temperature or superheat display and pressing **Enter**

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 parameter group Selection

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

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

Pressing **Enter** with **Zone 'x'** highlighted accesses **Zone x** Setup for the appropriate zone.

Pressing **Enter** with one of the **parameter groups** below highlighted accesses Setup for the appropriate zone parameter group. **Parameter groups** include Cooling, Defrost, Superheat and alarm settings for Product, Air Off, Air On, Coil In and Coil Out temperatures.

For details and ranges of all parameters that can be changed see GC1719 Overview **MOBDBUS specification**

Setup Parameter Selection

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.

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

LCD-8 RAM Overview mtm issue C 03/05/04
Guardian Controls International Ltd. Email sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN. Tel +44(0)1270760599 Fax +44(0)1270766804

Setup Parameter Change

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

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

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.
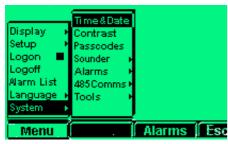
LANGUAGE

LANGUAGE

To change display screen Language, press **Menu** button and use vertical and horizontal arrows buttons to select **Language , English or Chinese** and then press **Enter.**
All subsequent display screens are in the selected Language.
Chinese is not yet available for this product.

LCD-8 RAM Overview   mtm issue C 03/05/04
Guardian Controls International Ltd.   Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

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.**

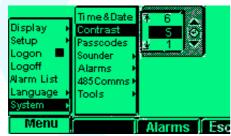This displays the TIME & DATE screen with latest time and date clock values.

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
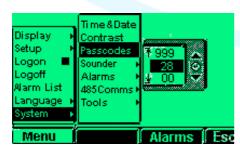
The LCD Panel contrast can be altered by pressing **Menu** button and use vertical and horizontal arrows buttons to select menus **System, Contrast** and then press **Enter.**

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.**

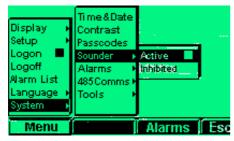This displays the setting change icon with setting value, maximum and minimum limits.

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.
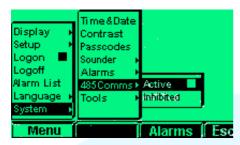
Change System settings for Sounder,

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.

LCD-8 RAM Overview   mtm issue C 03/05/04
Guardian Controls International Ltd.   Email   sales@guardian-controls.com
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.   Tel +44(0)1270760599 Fax +44(0)1270766804

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.

LCD-8 RAM Overview
Guardian Controls International Ltd.
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

mtm issue C 03/05/04
Email   sales@guardian-controls.com
Tel +44(0)1270760599 Fax +44(0)1270766804

Modbus Address for 'GC' units

For correct operation, 'GC' range units need to be setup with Modbus Address 1

This is done using the **SET** pushbutton and **LED** lamp on the 'GC' range front panel .
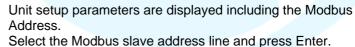
Address Change using LCD-8 Display
The Modbus address of a controller can only be changed from the LCD-8 display after the 'SET' button has been pressed
The LED normally flashes quickly each time it replies to a communication request.
After the 'SET' button has been pressed the LED lamp slowly pulses ON and OFF to indicate the unit is in 'address change' Mode.
With an LCD-8 is 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 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 setup parameters are displayed including the Modbus Address.
Select the Modbus slave address line and press Enter.
Use up down arrows to select the new address 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.
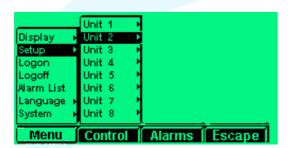Release the pushbutton. The LED goes out, waits and then flashes the current address eg 3 pulses for Modbus address 3, waits again and then goes steady.

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 , waits and then flashes the current address eg 3 pulses for Modbus address 3, waits again. Before the lamp comes on steady again, quickly depress the pushbutton the number of times for the new address e.g. press once for address 1. The Led lamp then waits, flashes the new address, waits and then goes steady.
The new address selection can be checked as above.

LCD-8 RAM Overview
Guardian Controls International Ltd.
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

mtm issue C 03/05/04
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 **Rese**t buttons for 10 seconds when the Alarm List is on display.

Forgotten Passcode

Powering up the SHC-3 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.**