GUARDIAN *E515*

## Supermarket Case & Coldstore Control

Combines energy efficient control of temperature, lighting, fans and defrost for a single supermarket display case or cold room with 230VAC modulating valve and RS485 Modbus protocol communication facilities.

RS485 Modbus

GC-E515   L155 x W 115 x D59mm

- **Individual case control of AKV or Solenoid valve**
- **Energy saving superheat control** using designated pack system optimizer to modulate AKV10 valve.
- **Time scheduled defrosts** with temperature termination
- **Cooling, Fans, defrost and Lighting** outputs
- **Five Temperatures**:-
  Product /Coil, Discharge Air, Return Air, Coil-In and Coil-Out.
- **Supports PT1000 or 2k2 Thermistor probes**
- **Contact alarm input** for door or compressor
- **Alarm monitoring and data logging** is available using Modbus protocol via an RS485 communication network to a '*Consultant*' or other Supervisory PC
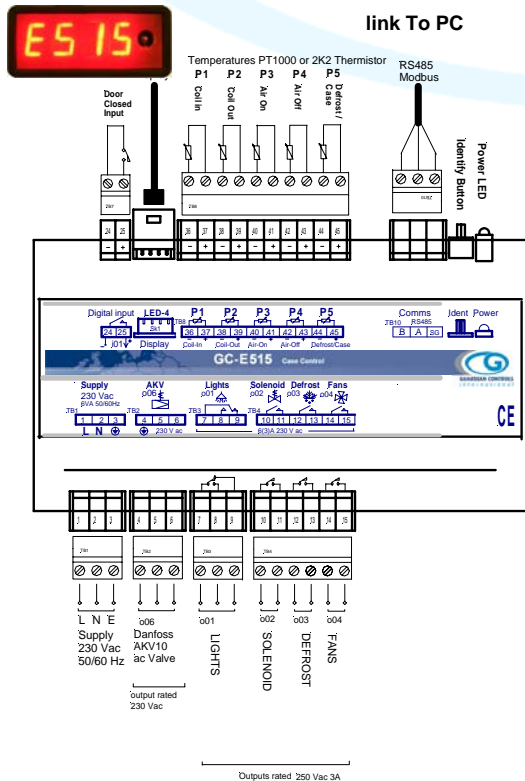- **Optional LED-4 panel** for display, alarms & setup

LED-4 Display
is mounted in the display case fascia and provides calculated product temperature and case status. Optional LED-4 version with aisle Dewpoint Sensor is available.
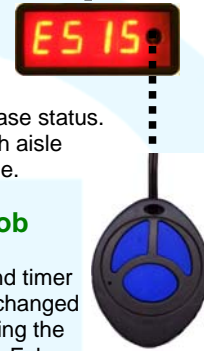
SKF-3 Service Key Fob
Case temperatures, control strategy, control setpoint and timer settings may be viewed or changed locally at the case by plugging the optional **SKF-3** Service Key Fob button unit into the LED-4 display.

GC-515 Case / Cold room Controller

link To PC

Temperatures PT1000 or 2K2 Thermistor
P1 P2 P3 P4 P5
Coil In / Coil Out / Air On / Air Off / Defrost/Case

RS485 Modbus

Door Closed Input

Power LED
Ident Button

Communications
An RS485 serial link communicates all values and settings to a Guardian '*Consultant*' SCADA system using MODBUS RTU protocol at 19200 baud. A **'SET'** lamp and button at the end of each unit allows easy setup of the Modbus Address.

Specification

Power	230vac 5 VA 50/60HZ
Operation	0 to 55 °C
Dimensions	L 155 mm W 115mm D 59 mm
Mounting	DIN rail
Terminals	2-part screw clamp
Approvals	**CE**

5	**Temperatures PT1000 ,2K2 Thermistor**	
	Product%, Coil-in, Coil-out, Air On, Air Off, Defrost	
1	**Digital inputs contact**	
	coldroom door	
5	**Relay outputs**	
	5 n/o @ 3A Fans, Defrost, Lights, Solenoid	
	1 SSR @ 230VAC 0.5A for AKV10 valve	

OPTIONAL   LED-4 display

Supply 230 Vac 50/60 Hz
Danfoss AKV10 ac Valve
LIGHTS
SOLENOID
DEFROST
FANS

Outputs rated 250 Vac 3A
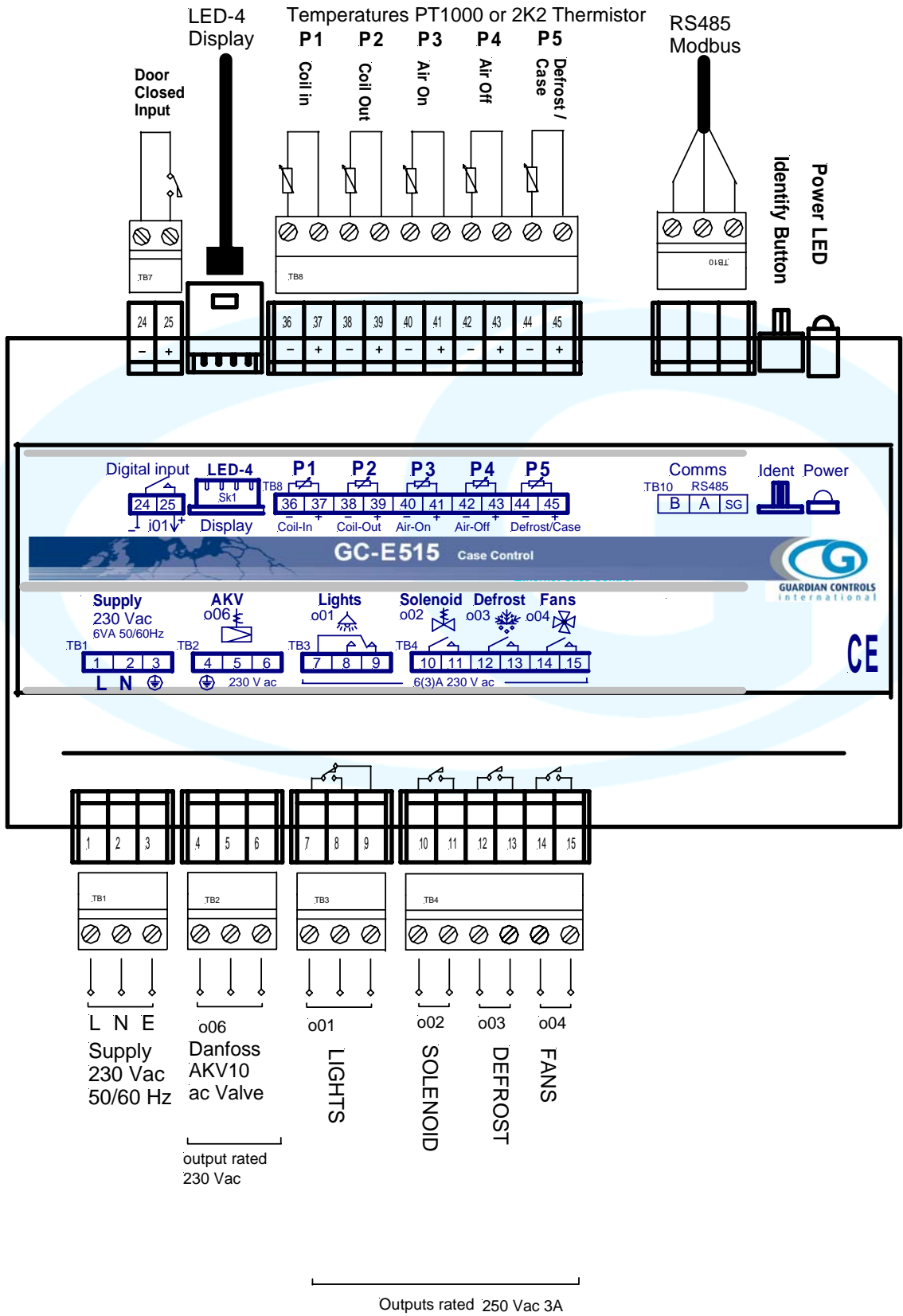
GC-E515 Overview
Guardian Controls International Ltd.
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

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LED-4
Display

Temperatures PT1000 or 2K2 Thermistor

P1 **P2** **P3** **P4** **P5**

RS485
Modbus

Door Closed Input

Coil in   Coil Out   Air On   Air Off   Defrost / Case

Identify Button

Power LED

24	25		36	37	38	39	40	41	42	43	44	45
−	+		−	+	−	+	−	+	−	+	−	+

.TB7   .TB8   .TB10

Digital input   **LED-4**   **P1**   **P2**   **P3**   **P4**   **P5**   Comms   Ident Power

.Sk1   TB8   .TB10   RS485

24	25		36	37	38	39	40	41	42	43	44	45		B	A	SG

i01   Display   Coil-In   Coil-Out   Air-On   Air-Off   Defrost/Case

GC-E515   Case Control

Supply   **AKV**   **Lights**   **Solenoid** **Defrost** **Fans**
230 Vac   o06   o01   o02   o03   o04
6VA 50/60Hz

.TB1   .TB2   .TB3   .TB4

1	2	3		4	5	6		7	8	9		10	11	12	13	14	15

L N   230 V ac   6(3)A 230 V ac

CE

1	2	3		4	5	6		7	8	9		10	11	12	13	14	15

.TB1   .TB2   .TB3   .TB4

L N E   o06   o01   o02   o03   o04
Supply   Danfoss   LIGHTS   SOLENOID   DEFROST   FANS
230 Vac   AKV10
50/60 Hz   ac Valve

output rated
230 Vac

Outputs rated 250 Vac 3A

GC-E515 Overview   **mtm Issue c 11/06/09**
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GUARDIAN CONTROLS
international

REFRIGERATION CONTROL & MONITORING

Guardian GC-E515 Case & Coldroom Controller
Basic Controller Set-up   Controller Part No. GC0105, Software v1.0
For Defaults: - Power-up the controller whilst pressing both Buttons ⊗⊛

| Version 1 a | | 04 sept 2006 | READ ONLY | **Not Available on GC515.** |
| M.T.Murphy | | | Set according to Requirements | |

Function	LED-4		Setting				Defaults
Case Control Setpoint (Cut-out)	c01	°C	As Required (-40.0 to +40.0 C)				**-3.0**
Cooling differential(Cutin=c01+c02)	c02	°K	As Required (0.1 to 9.9 K)				**1.0**
Control Probe	c03		3= P3 Air-on Probe	4= P4 Probe Air Off.	5=P5 Defrost Probe.	6 =Control % temp	**6**
Control % of S4 Air Off	c04	%	Cases Set @100% for Air Off. Coldrooms Set @ 0% for Air On.				**100**
Display % of S4 Air Off	c05	%	Produce 60%	F/Food & Meat/Dairy 50%	Coldrooms 0% for Air On.		**50**
Expansion Valve Type	c06		1 = AKV	2 = TEV			**1**
Light Function Definition	c07		0 = Lighting OFF	1 = Lighting ON	2 = Remote Control	3=schedule	**3**
Lighting Relay wiring	c08		0 = wired to N/C output	1 = wired to N/O output			**0**
Defrost Termination Probe	d01		4 = P4 Probe Air Off.	5 =P5 Defrost Probe.	6 = Time Only		**4**
Defrost Termination Temperature	d02	°C	As Required (0 to 40 C)				**10**
Maximum Defrost duration	d03	min	As Required				**45**
Defrost Schedule Automatic	d04		As Required (0=no, 1=yes)				**1**
Fans on during defrost	d05		As Required (0=no, 1=yes)				**1**
Heater on during defrost	d06		As Required (0=no, 1=yes)				**0**
Pump Down Period	d07	min	As Required (0 to 60)				**0**
Drain Down Period	d08	min	As Required (0 to 60)				**5**
Fan Delay Period	d09	min	As Required (0 to 60)				**5**
Fan Start Temperature	d10	°C	As Required (-10 to +10C)				**0**
Number of defrosts per day	d11		As Required (0 to 12)				**6**
First Defrost Time	dt01		As Required (00:01 to 23:59) HH:MM,		0 = not used		**0000**
2nd Defrost Time	dt02		If Defrost schedule automatic d04=1 then defrost times values dt2 to dt12 are calculated using dt01 first time and d11 number of defrosts per day. Unused times are set to 0000.				**0000**
	etc.						
12th Defrost Time	dt12						**0000**
Maximum Superheat	h01	°K	Cases 5°C		Coldrooms 8°C		**12**
Minimum Superheat	h02	°K	As Default				**3**
Alarm Delay for di01 input (door)	A01	min	5 Mins				5
di01 Door input use (contact)	A02		0=none	1= Door N/C	2=Door N/O	3=Stop input	0
di02 Fan Fuse input use 230vac	A03		0=none	1=Fans N/C	2=Fans N/O		**1**
di03 Heater Fuse input use 230vac	A04		0=none	1=Heaters N/C	2=heaters N/O		**1**
P1 Coil In Temperature in Use	A05		As Required (0=no, 1=yes)				**1**
P2 Coil Out Temperature in Use	A06		As Required (0=no, 1=yes)				**1**
P5 Defrost Temperature in Use	A07		As Required (0=no, 1=yes)				**1**
Air Off High A;arm Limit	A08	°C	As Required				**3**
Air On High Alarm Limit	A09	°C	As Required				**0**
Alarm delay	A10	min	As Required				**10**
Defrost pulldown Alarm Delay	A11	min	As Required				**75**
System No. / RS485 Address	u01		Set to the System ID (0 to 240).				0
Pack No. Panel No.	u02		As Required				5
Power on delay	u03		As Required				3
Wait for clock update for defrost before start	u04		0=no, 1=yes				0
	u05		Not used				0
Real Time Clock	u06		As Required (00:00 to 23:59) HH:MM,				0000
Real Time Clock Weekday	u07		1=sunday; 2=monday, 3=tuesday, 4=wednesday, 5=Thursday, 6=Friday, 7=saturday				2
MAC Address - **READ ONLY**	u08		Unique IP hardware identity code (eg - Last 4 digits shown				XXXX
Sensor Type	U09		0=PT100 3-wire, 1=PT1000 3-wire, 2=PT1000 2-wire, 3=Thermistor (2k2) 2-wire				

Alarm Display   Press ⏎ to display alarms. press ⊛ Button to display alarms in severity sequence.

No Communications	E0	Error Probe 4	E4	Air-On High Alarm	A03	di01 Door Alarm after time	A21
Error Probe 1	E1	Error Probe 5	E5	**Air-Off High Alarm**	A04	di02 Fan Fuse Alarm	A22
Error Probe 2	E2	Error Probe 6	E6			di03 Trim Heater Fuse Alarm	A23
Error Probe 3	E3			t03 superheat warning	A17	End of list	End

Display & Control   repeatedly press ⊛ Button to display following in sequence. Press ⏎ to select commands

Status / Display %		Coil-In Probe P1	P1	Superheat	t3	Fans relay state	o04
Setup Mode	SEt	Coil-Out Probe P2	P2	Superheat S.P	t4	Trim Heater relay state	o05
Test Mode	tESt	Air-On Probe P3	P3	Control State	t5	ESV Valve position %	o06
Case Automatic	Auto	Air-Off Probe P4	P4	Defrost elapsed time	t6	Digital Output o07 state	o07
Case Fans only	FAnS	Defrost Probe P5	P5	Lighting relay state	o01	Digital Input i01 state(door)	i01
Case clean Stop	StoP	Control % of P4	t1	Cooling relay state	o02	Digital Input i02 state (Fans)	i02
Manual defrost	idEF	Display % of P4	t2	Defrost relay state	o03	Digital Input i03 state (Trims)	i03

tESt Outputs press ⏎	tESt	o01 = Light	o02 = TEV	o03= Defrost	o04 = Fan	o05= Trim Htr	o06= AKV 100%	0
		o07= alarm output			O10= All outputs ON except defrost, AKV 100%,			

Change Settings - Select	Press ⊛, Press ⏎ on SEt, ⊗≫⊛ for item to change e.g c01, Press ⏎.
Change value	Value Flashes, Press ⊗⊛ for new value. Press ⏎. Press ⊛≫⊛ until End, Press ⏎.

FOR ALL OTHER SETTINGS CONSULT THE MAIN MANUAL