Installation Note

Gallagher Controller 3000-8R

CAUTION

This equipment contains components that can be damaged by electrostatic discharge. Ensure both you and the equipment are earthed before beginning any servicing.

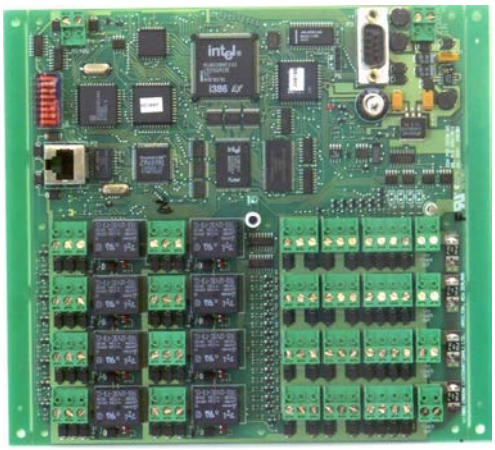
IMPORTANT

If a Controller has been upgraded to version 7.10 (or later) for any reason, it cannot be used on a previous version of Command Centre until it has first been downgraded, and it must be downgraded using Command Centre 7.10 (or later). See the *Downgrading the Controller* section later for instructions.

Introduction

The Gallagher Controller 3000-8R is a network compatible device that interfaces Cardax IV and Wiegand readers into the Gallagher Command Centre system.

The Gallagher Controller 3000-8R integrates the functionality of the original Gallagher Controller 5000 with Reader and I/O functionality into a single product. Gallagher Local BUS connections are not supported.



Reader Interface

Interfaces to readers and associated I/O are set up as four distinct groups (numbered 1 to 4). Each group is the same and provides connection to either one Wiegand **or** two Cardax IV readers, and four balanced (4-state) inputs and two general purpose relay outputs capable of switching 24 volts DC/AC, 5 A resistive loads. Each group is also provided with a 12 V DC 500mA (resettable fuse) power output.

The Wiegand and Cardax IV interconnections share a common connector such that either one Wiegand or two Cardax IV readers can be connected to each port. The following are examples of possible combinations over the four groups:

- 4 x Wiegand readers only
- 2 x Cardax IV + 3 x Wiegand readers
- 8 x Cardax IV readers only

Shipment contents

Check the shipment contains the following items:

Gallagher Controller 3000-8R

- 1 x Gallagher Controller 3000-8R
- 1 x Gallagher Controller 3000-8R Installation Note (this document)
- 1 x Gallagher Product Label
- 1 x Gallagher Controller 3000-8R component identification decal
- 9 x M3 screws
- 32 x 4k7 ohm resistors

Gallagher Cabinet

Refer to the enclosed Gallagher Cabinet Installation Note (part number 3C4513) for the shipment contents despatched with the Gallagher Cabinet.
The cabinet for the Gallagher Controller 3000-8R has a label on the inside back surface, indicating it has been configured specifically for this product. The cabinet can be rotated, however the door must not be re-hinged as the Run LED will not shine through the door.

Power supply

The Gallagher Controller 3000-8R requires a 13.6 V DC ± 15% at 1.0 Amps. For further detail regarding power supply refer to the "Technical specifications" section at the end of this installation note.

Plugs PA1, PA2, PA3 and PA4 provide power out connection points via 500mA fuses. However, this DC voltage out will be approximately 0.5 V DC lower than the voltage supplied to the Gallagher Controller 3000-8R. The fuses are resettable, (i.e. under fault conditions, fuses go high resistance. When the fault subsides or power is removed, then the fuses will cool and reset themselves).

The current load on these connection points (PA1 to PA4) is in addition to the 1.0A required by the Gallagher Controller 3000-8R. When using these connection points, ensure the Power Supply to the Gallagher Controller 3000-8R is capable of supplying the extra current required.

Cabling

For full details on site cabling and recommended cable specifications refer to Chapter 2 of the *Gallagher Installation Manual*.

Ethernet cabling

The communications between the Gallagher Controller 3000-8R and the Gallagher Command Centre Server can either be via a dial up modem or, preferably, via a permanent Ethernet connection.

For optimum performance 10BaseT unshielded twisted pair (UTP) (CAT5 or better) cable should be used for Ethernet connections. The Gallagher Controller 3000-8R is provided with an RJ45 socket (P2) for 10BaseT connection.

EMI Cable Shields

To comply with CE requirements and improve noise supression, an EMI Cable Shield (ferrite core) should be applied to both the ethernet cable (P2) and the power in cable (P1). There are two types of shields, (i.e. those that are split and those that are not). The ethernet cable needs to use a hinged clamp core, (i.e. a split shield), while the power in cable can use either type.

In the case of the power in (P1) EMI cable shield, the cable must turn through the core twice. Each extra turn through the core markedly increases the impedance associated with the core and provides more protection.

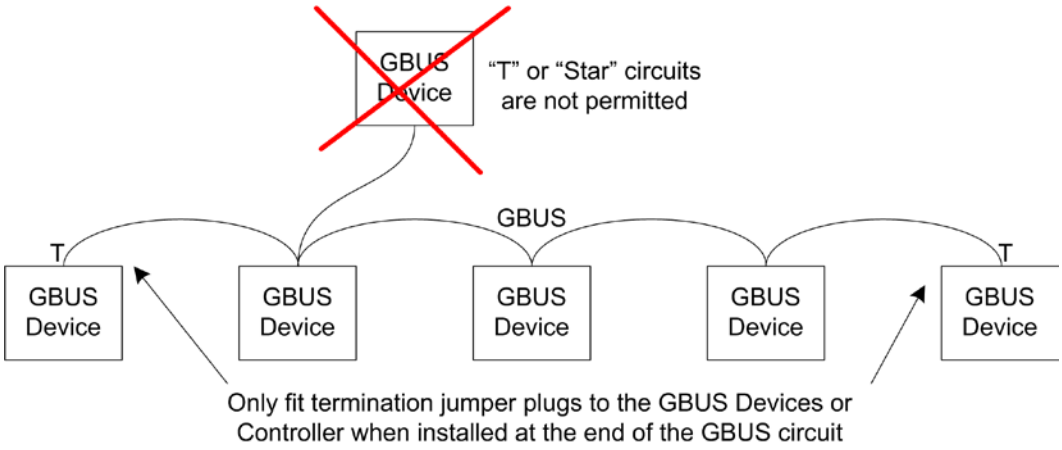
Position the EMI cable shield as close to the entry point of the cabinet as possible.

GBUS Communication

The Gallagher Command Centre communication circuit between the Gallagher Controller and all sub-units is referred to as GBUS Communications. The electrical specification for GBUS meets the standard for RS485.

The cable type used should be a low capacitance cable such as RS485 data cable or CAT 5 cable. Note that this cable type is only suitable for the communications circuit. The power supply cable must be of sufficient size to ensure that the voltage at the GBUS unit terminals is the recommended 12 Vdc.

The cabling between GBUS devices should be done in a “daisy chain” or serial format, (i.e. a “T” or “star” format should not be used). The end devices on the GBUS cable should have the terminating jumper plug fitted, to terminate the GBUS circuit in 120 ohms resistance.



Cable Termination

If this GBUS unit is installed:

- At either end of a GBUS circuit, ensure J5 is fitted.
- Anywhere else on the GBUS circuit, ensure J5 in not fitted.

RS232 cabling

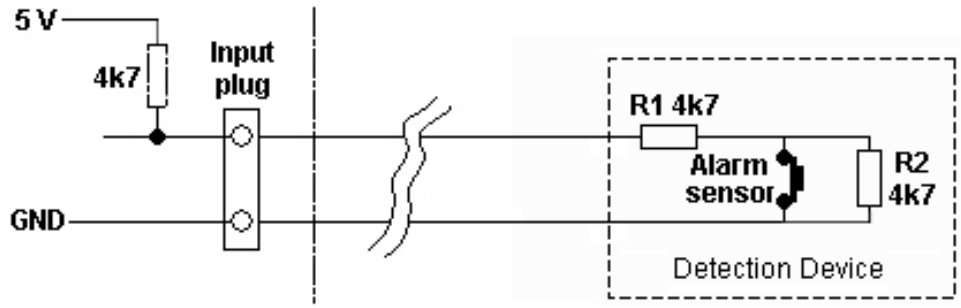
Communication via modem requires the RS232 cabling to be terminated in a DE9 socket and connected to plug P3.

Balanced Inputs

Cabling should be a minimum size of 0.2 mm^2 for all inputs. For UL compliant installations, the minimum cable size shall be 22 AWG.

To ensure correct tamper detection (short or open circuit), the balanced inputs require 4k7 ohm resistors to be connected as close as possible to the device being monitored.

When the monitored device incorporates a normally-closed tamper switch, it can be wired in series with resistor R1.



Refer to Chapter 2 of the *Gallagher Installation Manual* for further information on connecting inputs and resistors.

Output relays

The Gallagher Controller 3000-8R has eight relay outputs, (i.e. two per group), PE1 to PE4 and PF1 to PF4. Refer to the Component Layout within this Installation Note for wiring this plug.

The cabling to and from this relay plug must be capable of carrying sufficient current for the device the relay is controlling. The relay contact can carry 5 Amps at 24 V DC/AC resistive load.
Note: The connectors on the Gallagher Controller 3000-8R accommodate both horizontal and vertical wiring entry.

Installation

1. The "Gallagher Cabinet" Installation Note (part number 3C4513) details the procedures involved to mount the Gallagher Cabinet:
   - positioning the Gallagher Cabinet door
   - removing the appropriate cutouts
   - securing the Gallagher Cabinet to the building.

   Note: The Gallagher Cabinet should be installed in a secure, internal situation. The security of the installation ultimately depends on the way you install the Gallagher Cabinet.

2. Using the 9 x M3 screws, fit the Controller PCB to the rear face of the Gallagher Cabinet, ensuring that the rear tamper sensor aligns with the light pipe. Also ensure that the front LED lines up.


Rear Tamper Sensor

3. Install all the system and power cables. The cables should stow neatly and be held in place by the cable clamps fitted into the base of the Cabinet.

   Refer to the next section "Component layout" for the location of the plugs.

   PA1 to PA4 = Power out
   PB1 to PB4 = Reader ports
   PC1 to PC4 = Balanced inputs
   PD1 to PD4 = Balanced inputs
   P1 = Power in
   P2 = 10BaseT Ethernet port
   P3 = Dial-up RS232 port
   P4 = RS485
   PE1 to PE4 = Relay outputs
   PF1 to PF4 = Relay outputs

   Remember: The balanced inputs require the 4k7 ohm resistors to be connected as close as possible to the device being monitored.

4. Install the component identification decal inside the Gallagher Cabinet door. This decal enables you to enter wiring and connection details and identifies the location and designation of cable connections, fuses, LEDs, etc.

5. Initialise the Gallagher Controller 3000-8R.
   The following initialisation procedures are detailed in the later section titled "Initialisation":
   - Setup details
   - Optical tamper detectors

6. Fix the Gallagher Product Label to the outside of the Gallagher Cabinet door and enter the relevant details.

Downgrading the Controller

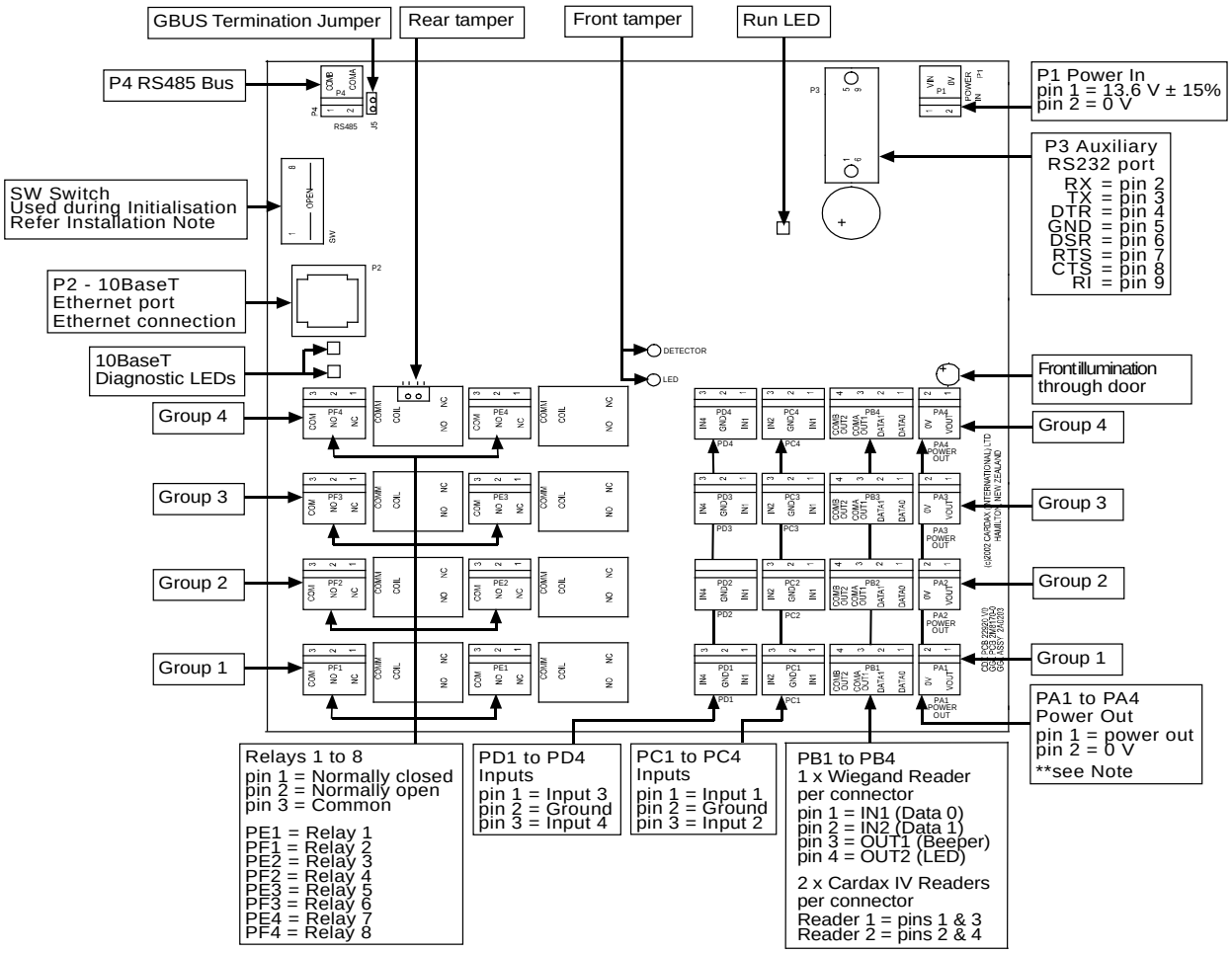
The version of Controller code you use needs to be compatible with the version of Gallagher Command Centre you have running, (e.g. vEL6.xx of Gallagher Command Centre requires vBT6.xx of Controller code). Therefore, if your site has an earlier version of Gallagher Command Centre installed than the Controller version, you will need to downgrade the Controller to the appropriate version of Controller software, using the following procedure:

1. If the required Controller version does not already exist in your Command Centre device software, browse on your Gallagher Command Centre Installation DVD to find the compatible Controller Device Software, (e.g. vBT6xxxx.fts).
2. Create a new Controller device software using the device software found in Step 1.
3. Assign this device software to your new Controller.
   The download will take approximately five minutes. Watch the Event Viewer, and when the Controller resets the correct version number should display.

Notes:

- A version 7.10 (or later) Controller can only be downgraded if it is connected and brought on-line to a 7.10.xxx (or later) Command Centre, one with 6.01 - 7.05 device software versions loaded, and the Controller downgraded via its **Software** tab to this version.
- If you wish to downgrade a 7.10 Controller to pre v6, you must first downgrade the Controller to a v6.01-7.05 version software first (as you cannot load v5 or lower of Controller software into v6 or higher Command Centres), then connect your Controller to the pre-v6 Command Centre and further downgrade from there.
  The only exception to this is if you have upgraded to v7.10 from a v5 or earlier Command Centre. In this case there will be pre-v6 device software already in Command Centre that can be used to downgrade the Controller.

Component layout



Initialisation

Ethernet setup details

Each Gallagher Controller 3000-8R has a pre-programmed, unique Ethernet address (MAC address). When the Gallagher Controller 3000-8R is connected to the Ethernet, the Gallagher Command Centre Server (when configured) will recognise and acknowledge this Ethernet address.

Note: The Gallagher Command Centre Server must be configured to recognise the Controller's MAC address (refer to the Gallagher Command Centre documentation).

The Server then transmits the following information to the Controller 3000-8R:
- IP address for the Controller 3000-8R
- IP address of the Server the Controller is to communicate with

The Server can then send data to, and receive data from, the Controller 3000-8R.

Procedure to receive an IP address from the server

1. Check the power and Ethernet cabling to the Gallagher Controller 3000-8R are correctly installed.
2. Locate DIP switch 2 (SW2) on the Gallagher Controller PCB.
   Set switch 2 to ON (closed).
3. Switch on power to the Gallagher Controller 3000-8R. The red LED (D1) flashes in the following sequence:
   (The sequence completes fairly quickly but it is important you ensure the LED finishes indicating the "normal running" sequence.)
   - The red LED flashes fairly fast during startup.
   - The red LED flashes three times per second. The Gallagher Controller 3000-8R is waiting for its IP address.
   - When the Gallagher Controller 3000-8R has received its IP number, the red LED flashes twice per second. This indicates the Gallagher Controller 3000-8R is waiting for database information to be downloaded from the Server.
   - When initialisation is complete, the LED flashes approximately once per second indicating a normal running sequence.

   Note: The section titled "Run LED" (later in this installation note) details the different meanings of the various flash sequences.
4. Set switch 2 to OFF (open).

Assigning an IP address manually via a web browser

Important: This method is only an option if version 6.xx code is installed.

When the Controller is started (reset or power-up) with DIP switches 2 and 3 enabled, the Controller will use the following default addresses:

Controller IP: 192.168.1.199
Server IP: 192.168.1.198
Gateway: 192.168.1.198
Subnet: 255.255.255.0

This enables installers to configure a PC with an IP address in the same subnet as the Controller, and by turning on DIP switch 1, connect a web browser to the

Controller's **Config** web page and assign the desired addresses for the site.
Note: The installer's PC IP address should be different from the Controller's IP address, (i.e. 192.168.1.199).

Follow the steps below to access the Controller's **Config** web page:

1. Open the Internet Browser.
2. In the **Address** field enter the IP Address of the Controller as follows: http://192.168.1.199/config
3. Press the **Enter** key on your keyboard.
   The Enter Network Password screen displays.
4. Enter **config** for the 'User Name' (all in lower case), and **CardaxFT** for the 'Password'.
5. Click the **OK** button.
   The Cardax FT Controller Configuration screen displays.
6. The link to the 'LAN Configuration' page will allow the controllers IP addresses to be changed and saved.

Dial-up/Serial setup details

Refer to the "Dial-up/Null-Modem Initialisation" section of the Dial-up chapter in the *Gallagher Command Centre User Guide*, for the procedure.

Optical tamper detectors

The front optical tamper detector will sense when the Cabinet door is opened. The rear optical tamper detector will sense if the Cabinet is removed from its mounting position.

When the Gallagher Controller 3000-8R is re-powered after servicing and is operating correctly it will initialise the optical tamper detectors.

The following procedure will ensure that the optical tamper sensors are initialised correctly on power-up.

1. Switch off the 13.6 V DC ± 15% supply to the Gallagher Controller PCB.
2. Close and lock the Gallagher Controller cabinet door within three seconds, (i.e. before the Controller goes into a three flash or normal running state).
   Note: The Cabinet door must remain closed for at least 5 seconds for the initialisation of the optical tamper detectors to be completed.

Ethernet connection LEDs

Component	Function	LED will light when...
D9	LAN Activity LED	During normal operation, this active-low output goes low for 6ms whenever there is a receive packet, a transmit packet, or a collision. During Hardware Standby mode, this output is driven low when the receiver detects network activity.
D10	Link Good LED	This active-low output is low when the CS8900A detects the presence of valid link pulses.

Dip Switch Settings

The following table shows the Dip Switch Settings. The Settings in **bold** specify the default startup configuration.

Dip Switch	Setting	Meaning
DS1	ON **OFF**	Controller will accept WWW connecitons. **Controller will reject WWW connections.**
DS2	**ON** OFF	**Initialise. On startup configuration and the IP address is deleted.** Normal Startup - Configuration will be retained.
DS3	ON **OFF**	When DS2 is on, the Controller will use the default IP address configuration as per the “Ethernet setup details” section. **Controller will wait for IP configuration from the Command Centre server depending on DS2 setting.**
DS4	ON **OFF**	When DS2 is on this will cause the Controller to be configured with PPP (dial-up) as the default network interface. **When DS2 is on this will cause the Controller to be configured with Ethernet as the default network interface (default).**
DS5	ON **OFF**	On startup, the main code does not run. Instead, the local config program attempts to establish connection via serial COM port. **On startup, the main application (e.g. BT50023.exe) is run.**
DS6	**OFF**	**Unused**
DS7	**OFF**	**Unused**
DS8	**OFF**	**Unused**

Run LED

The red, Run LED (D1) flashes to indicate the operating status of the Gallagher Controller as detailed in the following table:

Flash	Sequence timing	Meaning
Fast	130ms on, 130 ms off (4Hz flash)	Initialising
1 flash	500ms on, 500ms off (1Hz flash)	Normal running
2 flashes	2 flashes - pause (each flash is 50ms on, 400ms off and the pause is 1.2s)	Gallagher Controller has an IP but no configuration, or has been configured incorrectly.
3 flashes	3 flashes - pause (each flash is 50ms on, 400ms off and the pause is 1.2s)	Gallagher Controller requires an IP address - Ensure BootP Service (CCFTBPS.exe) is running, the Controller is configured correctly, and it has connected to the network.
4 flashes	4 flashes - pause (each flash is 50ms on, 400ms off and the pause is 1.2s)	No private key or certificate loaded (*see note below for obtaining keys and certificates).
5 flashes	5 flashes - pause (each flash is 50ms on, 400ms off and the pause is 1.2s)	Invalid private key or certificate loaded, or key and certificate do not match the Gallagher Controller serial number.
6 flashes	6 flashes - pause (each flash is 50ms on, 400ms off and the pause is 1.2s)	The Gallagher Controller has dropped its code. Load code again via serial COM port.
	450ms on, 50ms off (2Hz flash)	Gallagher Controller resetting.
Short flash long flash (1s cycle)	100ms on, 250ms off (short) 400ms off, 250ms on (long)	Boot code monitor running.

***** Should an SSL key data file be lost or corrupted, requests for replacements should be made to your local Gallagher Group Limited office.
You will need to supply the last six digits of the Gallagher Controller MAC address.

Removing the PCB

Follow the steps below to remove the Gallagher Controller PCB from the Gallagher Cabinet:

1. Ensure that the power to the Gallagher Controller 3000-8R is switched off and disconnected.
2. Following full antistatic precautions, disconnect all cables from the Gallagher Controller PCB.
   Remember to label each cable as you remove it.
3. Remove the 9 x M3 securing screws that hold the PCB onto the Gallagher Cabinet fixing standoffs.
4. Carefully lift the PCB clear of the Cabinet.

Replacing the PCB

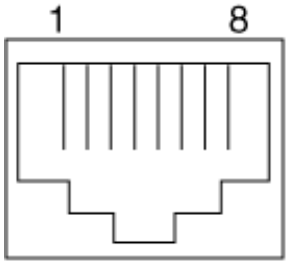
To replace the Gallagher Controller PCB, reverse the above procedure.
Note: You **must** then initialise the Gallagher Controller 3000-8R as detailed earlier in this Installation Note.

Connector wiring

Ethernet

10BaseT

The 10BaseT Ethernet connects to socket P2 via an RJ45 connector.



1	+TXD
2	-TXD
3	+RXD
4-5	Not used
6	-RXD
7-8	Not used
9-10	Not used (metal casing)

Approvals and Standards

FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Changes or modifications not expressly approved by Gallagher Group Limited could void the user's authority to operate the equipment.

For UL Installations:

Refer to the section in the Gallagher Command Centre Installation Note, *"Configuration Instructions to meet Underwriters Laboratory Inc Approved Installations"* for details covering specific requirements necessary to meet the specified UL Licences. The following Release Note version(s) contain these details:

vEL5.21.xxx May 2009
vEL6.01.xxx October 2009

Installers must ensure these instructions are followed to ensure the installed system is UL compliant.
UL temperature range tested and certified from 0 - 49^{0}C .
The voltage current values used and measured during testing are shown in the table “Voltage / Current measurements” included in the Gallagher Command Centre Installation Note, *"Configuration Instructions to meet Underwriters Laboratory Inc Approved Installations"*.

SECURITY
c UL us
LISTED

c UL
Type G

EN50130-4
EN55022

14RM

AS/NZ3548
CISPR22

ACN:002132943

Technical specifications

Power required:

Voltage	13.6 V DC ± 15%
Current	250mA (Without relays operated) 540mA (All relays operated) The above currents exclude external devices such as readers and alarm sounders.

Environmental:

Operating temperature	-10^0C to $+55^0$C
Humidity	95% non-condensing

Maximum number of...

Inputs	16 (4 state monitored)
Outputs	8 (relay contact current rating at 24 V DC/AC 5 A resistive)
RS485 ports	1
Ethernet ports	1
RS232 ports	1 (plus 1 dedicated diagnostic port)

Fuses

FS1 power in	1.5 A Resettable fuse (processor)
FSA1 to FSA4 power out	500mA Resettable fuse (power out for readers and monitoring devices)

EMI Cable Shields

Impedance at 25MHz must be greater than 60 Ohms
Impedance at 100MHz must be greater than 100 Ohms

Note: The Gallagher Controller 3000-8R has no replaceable parts.