Gallagher

Controller 7000

Installation Note

Controller 7000 Standard:	C400100
Controller 7000 Enhanced:	C400101
High Sec Controller 7000:	C405101
Controller 7000 Starter Kit - Standard:	C400110
Controller 7000 2 Door Standard:	C400111
Controller 7000 2 Door - Enhanced:	C400112

Introduction

The Gallagher Controller 7000 is a processing board for an intruder alarm and access control system. The Controller is available in six variants: Standard, Starter Kit Standard, Enhanced, 2 Door Standard, 2 Door Enhanced and High Sec.

The Controller authenticates user access, logs it and carries out the required function, (e.g. opens the corresponding door). It is an Ethernet attached device which connects to the Gallagher Command Centre server, however it can operate autonomously.

Features specific to each variant are shown in the table below:

Feature	Standard / Starter Kit Standard / 2 Door Standard	Enhanced / 2 Door Enhanced	High Sec
Ethernet 10/100 port	1	0	0
Ethernet Gbps port	0	2	2
Ethernet redundancy	N/A	Yes	Yes
Security Processor	Yes	Yes	Yes
Temperature Sensor	No	Yes	Yes
In service relay	No	Yes	Yes
FIPS201 compliant	No	No	Yes
FIPS 140-3 compliant	No	No	Yes
USB Port	Yes	Yes	Yes
RS232 Port	No	Yes	Yes
RS485 Powered Efuses	No	Yes	Yes

The Controller can operate on its own or can have an optional Gallagher Plug-in Module connected. When the Controller has a module connected, (i.e. Reader Module or HBUS Module), it receives information from the module about access requests and instructs the module to carry out the required function. Only one module can be connected to a Controller. Both units are designed to fit into a standard Gallagher Cabinet (C200100).

Notes:

- Compatibility of Controller 7000 variants with Controller code and Command Centre versions:

Controller 7000 variant	Compatible Controller code version	Compatible Command Centre version
Standard	vCR9.00.231018c (Full Release or later)	vEL9.00.1291 (Full release or later)
Enhanced	vCR9.00.241108a (MR5 or later) and vCR9.10.241108a (MR4 or later)	vEL9.00.1291 (Full release or later)
High Sec	vCR9.20.250213a (MR2 or later)	vEL9.20.1043 (Full release or later)
Starter Kit Standard, 2 Door Standard, 2 Door Enhanced	vCR9.00.250529a (MR7 or later), vCR9.10.250530a (MR6 or later), vCR9.20.250530a (MR3 or later), and vCR9.30.250528a (MR1 or later)	vEL9.00.3371 (MR7 or later), vEL9.10.3194 (MR6 or later), vEL9.20.2337 (MR3 or later), and vEL9.30.1871 (MR1 or later)

- All unused access ports must be disabled or disconnected internally.
- The High Sec Controller 7000 FIPS201 compliance is under evaluation but is currently compliant with FIPS 140-3.
- From 9.20, the Controller can be configured to use 802.1x authentication. This is described in the topic *"Configuring a Controller 7000 or 7000 Single Door for 802.1x"* in the Command Centre Configuration Client Online Help.
- From 9.30, the Controller can be configured to connect to Command Centre over the internet via OneLink. This is described in the topic *"OneLink Configuration"* in the Command Centre Configuration Client Online Help.

Before you begin

Shipment contents

Check the shipment contains the following items:

- 1 x Gallagher Controller 7000
- 1 x Gallagher Controller 7000 component identification decal (3E5809)
- 1 x rear tamper white reflective sticker
- 4 x 16 mm M3 screws

Power supply

The Controller requires 13.6 Vdc ± 15%. Ports RS485 1 and RS485 2 provide power out connection points rated to a maximum of 0.75A each, they are protected by fuses. However, this DC voltage out will be approximately 1 volt lower than the voltage supplied to the Controller. When using these connection points, ensure the power supply to the Controller is capable of supplying the extra current required.

Ethernet cabling

The communications between the Controller and the Command Centre server must be via a permanent Ethernet connection. For optimum performance 100BaseT (or 1000BaseT for the Enhanced and High Sec variants) unshielded twisted pair (UTP) (CAT5e or better) cable should be used. The Controller is provided with an RJ45 socket for Ethernet connection.

Note: Secondary ethernet connection (link) is operational from 9.20 MR1.

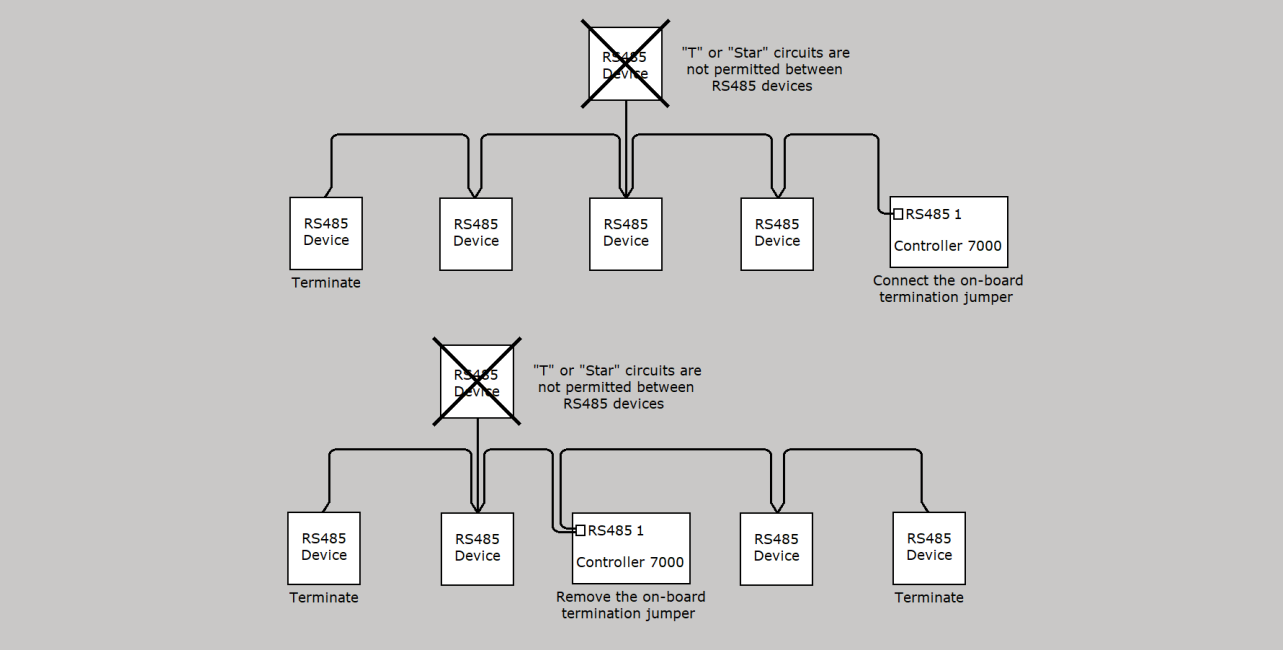
RS485 cabling

The Controller is equipped with two (non-isolated) RS485 communication ports. Any Gallagher RS485 device, (e.g. HBUS or OSDP) can connect to either RS485 port.

The RS485 device attached to the Controller must be assigned a unique "address" in relation to the other RS485 devices attached to the Controller.

The cable type used should be a low capacitance cable such as RS485 data cable or CAT5e cable.
The power supply cable must be of sufficient size to ensure the voltage at the RS485 device is the recommended 12 Vdc.

The cabling between RS485 devices should be done in a "daisy chain" or serial format, (i.e. A "T" or "Star" topology should not be used between devices). Should "Star" or "Home-Run" wiring be required, the HBUS 8H/4H Modules and HBUS 8 In 2 Out Door Module allow multiple devices to be individually wired to the one physical location. The end devices on the RS485 cable should be terminated using 120 ohms resistance.



RS485 device limits

Device specific limitations that apply are:

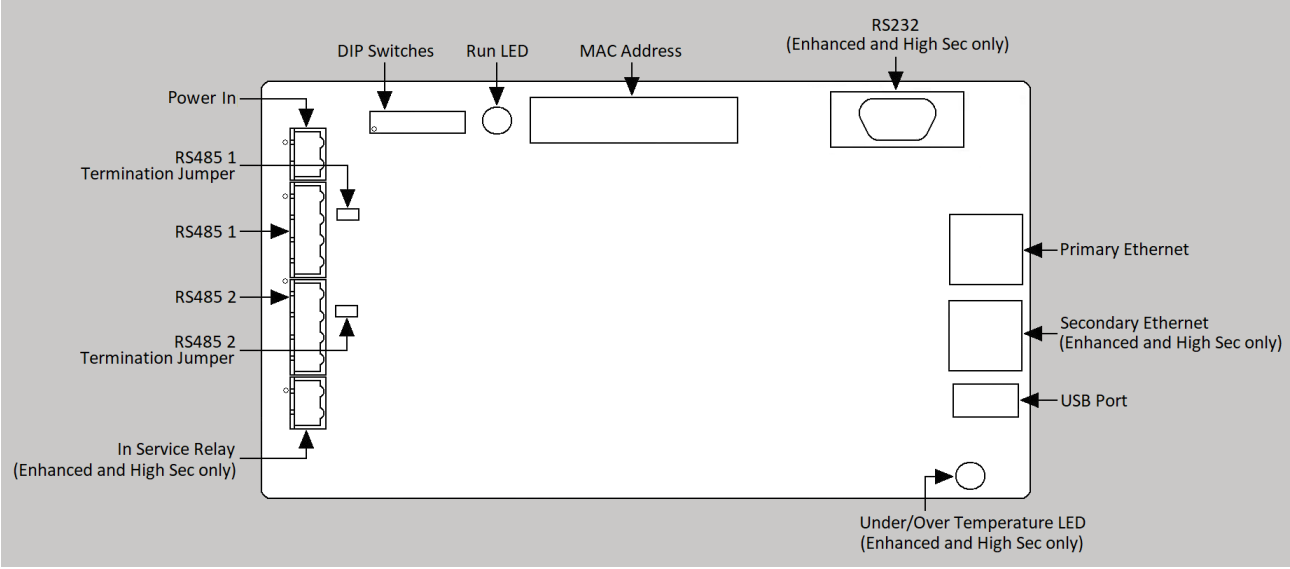
- Maximum of 80 Z10 Tension Sensors
- Maximum of 64 Z20 and D10 Sensors (32 per RS485 port)
- Maximum of 24 HBUS Fence Controllers (F22/F31/F32/F41/F42)
- Maximum of 48 T Series Readers (maximum of 24 Doors per Controller)
- Maximum of 20 T2x Terminals (when used for alarms management). A terminal is configured for alarm zone management when it has either Alarm Zones configured on the Alarm Zones properties page or items configured upon its mimic panel.
- Maximum of 32 HBUS 8 In 2 Out Door Modules, HBUS 16 In 16 Out Boards, HBUS 8 In 4 Out Boards, or HBUS 8 In Boards
- Maximum of 32 Aperio devices per Controller (16 per RS485 port)
- Maximum of 32 OSDP Readers per Controller (16 per RS485 port)
- Maximum of 50 HBUS End of Line Modules - Class 5, and only with the High Sec Controller 7000 variant (C405101)

Important: The recommended maximum number of RS485 devices that should be connected to a Controller 7000 is 80.

RS232 cabling (Enhanced and High Sec variants only)

An RS232 serial port uses a DB9 connector to the serial socket. Refer to the "Component Layout" (next) for the location of the serial socket. This port allows external communications to be connected to the system.

Component layout

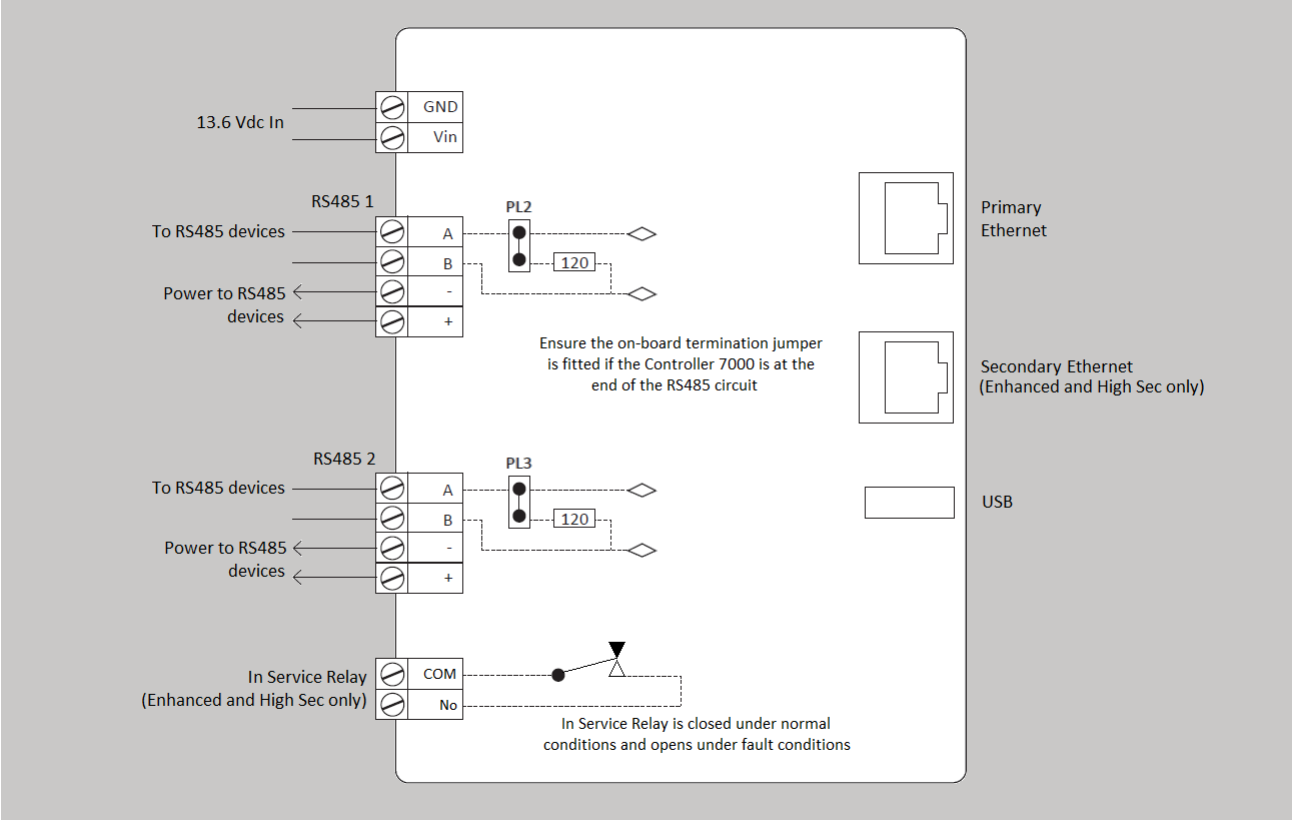


In Service Relay (Enhanced and High Sec variants only)

The Controller has an external in Service Relay. Refer to the "Wiring Diagram" (next) for wiring this port. These contacts close when the Controller is powered up, and remain closed until either the power is removed or there is a catastrophic failure. In the event of a catastrophic failure, after approximately 60 seconds the In Service Relay opens.

The In Service Relay is used to signal an external alarm if the Controller fails.

Wiring Diagram



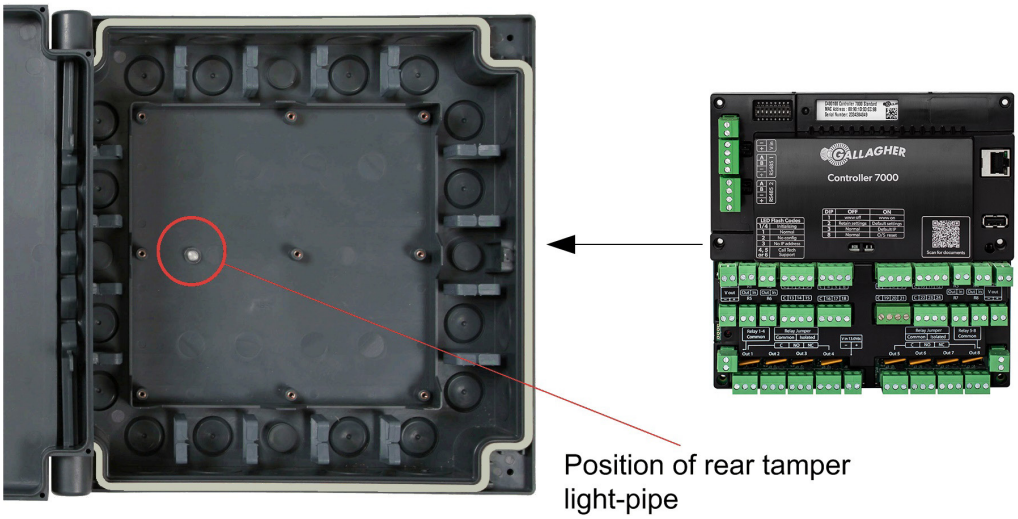
Note: A negative or common ground is required for each RS485 run.

Installation

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

1. The Gallagher Cabinet Installation Note (3C4513) details the procedures involved to mount the standard Gallagher Cabinet (C200100):
   - Positioning the Cabinet door
   - Removing the appropriate cutouts
   - Securing the Cabinet to the building

   Note: The Cabinet should be installed in a secure internal location. The security of the installation ultimately depends on the way the Cabinet is installed.
2. If you are connecting a Gallagher Plug-in Module, connect the module to the Controller before screwing it into the Cabinet. Refer to the *"Installation"* procedure from the relevant Plug-in Module Installation Note (3E2092 or 3E3110).
3. Using the 16 mm M3 screws, fit the Controller within the Cabinet, ensuring that the rear tamper sensor aligns with the light pipe.



4. 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.
5. Install the component identification decal inside the Cabinet door. This decal enables you to enter wiring and connection details, and identifies the location and designation of cable connections, LEDs, etc.
6. Initialise the Controller. The following initialisation procedures are detailed in the later topic titled *"Initialisation"*:
   - Setup details
   - Optical tamper detectors
7. Fix the Gallagher Product Label to the outside of the Cabinet door and enter the relevant details.

Upgrading/downgrading Controllers without Command Centre

The version of Controller software can be upgraded/downgraded via a USB Flash Drive, without connecting to Command Centre Configuration Client.

Refer to the *Compatibilty table* in the "Introduction" (earlier) to see the earliest supported version for each Controller variant.

1. Locate DIP switch 2 on the Controller, and set DIP switch 2 to ON.
2. Power up the Controller.
   Note: We recommend that the ethernet cable not be plugged in.
3. Wait for the Controller Run LED (D9) to get to the 3-flash state.
4. Insert a USB flash drive formatted with a single vCR9.xx. xxxxxxx.gglsec file present, into the USB slot on the Controller.
   The Controller will go into a slow 1-flash state for up to a minute, and then a 7-flash state to indicate that it has finished downloading the software
5. Remove the USB Flash Drive. The Controller will restart to run the new software.

Command Centre support for Controller software

The version of Controller software needs to be compatible with the version of Command Centre software, (e.g. vEL9.00 of Gallagher Command Centre requires vCR9.00 of Controller code).

Initialisation

Note: This document covers IPv4 configuration and DIP switch settings. For IPv6 configuration, refer to the document *"Command Centre IPv6 Support.pdf"* located in the *"Documentation"* directory on the Command Centre installation media.

Ethernet setup details

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

Notes:

- The Command Centre server must be configured to recognise the Controller's Ethernet address, refer to the Command Centre Configuration Client Online Help.
- For dual ethernet variants only the primary MAC should be configured in Command Centre and only the primary adaptor can be used to bring the controller online for the first time.

The Command Centre server then transmits the following information to the Controller:

- IP address for the Controller
- IP address of the server the Controller is to communicate with

The Command Centre server can then send data to, and receive data from the Controller.

The Command Centre BootP Service transmits IP addresses to Controllers.

The Controller and BootP Service uses DHCP style IP broadcast packets to transmit a DHCP request and response. This will only function within the network where such packets are routed which is generally only on the same subnet as the Command Centre Server machine and often routers and switches may block such packets.

Procedure to receive an IP address from the server

Notes:

- The Controller will accept IP address offers from standard DHCP servers by default. You can use DIP switch 4 to disable this behaviour, which may be necessary if you want to use BootP to set up a Controller and there is a DHCP server on the network.
- To bring a Controller online using DHCP, give your Command Centre server the name "gallagherserver" (or alias) in DNS. The Controller will automatically find the server and come online.
  Note: The Command Centre server address can also be configured using DHCP rather than DNS. This is described in the topic *"Configuring a Controller for DHCP"* in the Command Centre Configuration Client Online Help.

1. Check the power and Ethernet cabling to the Controller is correctly connected.
2. Locate DIP switch 2 on the Controller. Set DIP switch 2 to ON.
3. Switch on power to the Controller. The Run LED 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 Controller is waiting for its IP address.
   - When the Controller has received its IP address, the Run LED flashes twice per second. This indicates the Controller 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 topic titled "Run LED Diagnostic Indications" (later in this document) details the different meanings of the various flash seqences.
4. Locate DIP switch 2 on the Controller. Set DIP switch 2 to OFF.
5. Perform a reset override on the Controller from Command Centre, to ensure DIP switch 2 is registered as OFF and to disable access to the Config web page.

Assigning an IP address manually via a web browser

When the Controller is powered up with DIP switches 2 and 3 ON, the Controller uses 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 setting DIP switch 1 to ON, 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. not 192.168.1.199).

Follow the steps below to manually assign a Controller's IP address:

1. Set DIP switches 1, 2 and 3 to ON.
   Note: DIP switch 2 should remain ON, until the Controller's Run LED is in a 1 flash state (refer Step 14).
2. Reset the Controller by cycling the power.
3. Wait for the Controller's Run LED to enter a 2 flash state, and set DIP switch 3 to OFF.
4. Open an internet browser.
5. In the Address field enter the IP address of the Controller as follows: http://192.168.1.199/config.
6. Press the Enter key on your keyboard. The Enter Network Password screen displays.
7. Enter config for the 'User Name' (all in lower case) and CardaxFT for the 'Password'.
8. Click the OK button. The Gallagher Controller Configuration screen displays.
9. Click the link LAN Configuration page to allow the Controller's IP addresses to be changed and saved.
10. Select "Static IP Configuration".
11. Enter your new IP address and Command Centre server IP address details, then click the Save button.
12. Disconnect the Controller from the installer's PC, then connect the Controller to the network that will allow communication to the Command Centre server.
    Note: It is safe to remove power if the Controller needs to be moved. DIP switch 2 & 3 should be turned OFF before moving the Controller (and maybe cutting power).
13. The Controller's Run LED flashes in the following sequence:
    a. When you have updated the Controller's IP address, the Run LED flashes twice per second. This indicates the Controller is waiting for database information to be downloaded from the server.
    b. It may be necessary to update the Controller's software in order to complete initialisation. Refer to the topic "Device Software" in the Command Centre User Guide for instructions on how to perform this.
    c. Some Controller software updates will also update the Controller's operating system files. If this occurs the Controller will restart during the update process. If a restart does occur it will be necessary to reconfigure the Controller's IP again by repeating steps 1 to 11.
    d. When initialisation is complete, the Run LED flashes approximately once per second indicating a normal running sequence.
14. Once the Controller's Run LED flashes in a 1 flash state set DIP switch 2 to OFF.
15. If web browser access is no longer required, then DIP switch 1 should also be set to OFF.

Replacing a controller

The Controller will be at default firmware when first connecting to Command Centre. Ensure that the Software version is at -- None Selected -- before connecting the Controller and DIP switch 2 is ON.

The Controller needs DIP switch 2 to be ON when connecting to the server until the RUN LED is in 1 flash and at the correct firmware.

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 Controller is repowered after servicing and is operating correctly, the optical tamper detectors will be re-initialised.

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

1. Switch off the power supply to the Controller
2. Wait for the Run LED to stop flashing.
3. Turn on the power supply.
4. Close and lock the Controller Cabinet door within ten seconds, (i.e. Before the Controller goes into a two flash or normal running state).
   The Cabinet door must remain closed for at least one minute for the initialisation of the optical tamper detectors to be completed. Alternatively, an override reset on the Controller can be carried out in Command Centre (via the Status and Overrides tab of the Controller properties) with the Cabinet closed.

Removing the Controller

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

Note: If the Controller has a Plug-in Module connected, refer to the relevant Plug-in Module Installation Note (3E2092 or 3E3110) for details on how to remove the module.

1. Ensure that the power to the Controller is switched off and disconnected.
2. Wait for the Run LED to stop flashing.
3. Following full antistatic precautions, disconnect all cables from the Controller.
   Hint: Label each cable as you remove it.
4. Remove the 16 mm M3 securing screws that hold the Controller in place.
5. Carefully lift the Controller clear of the Cabinet.

DIP switch settings

The table below describes DIP switch settings. Default settings are in bold text:

DIP switch	Setting	Meaning
DS1	ON	Controller will accept WWW connections.
	OFF	**Controller will reject WWW connections.**
DS2	**ON**	**Initialise. On startup all site-specific data including configuration, site encryption keys and events are securely removed. The Controller uses DHCP with a DHCP server or BootP with Command Centre server to get a new IP address.**
	OFF	Normal Startup - Configuration will be retained.
DS3	ON	When DS2 is on in conjunction with DS3, the Controller will use the default IP address configuration as per the topic *"Ethernet setup details"*.
	OFF	**Controller will wait for IP configuration from the Command Centre server depending on DS2 setting.**
DS4	ON	Controller will reject IP address offers from standard DHCP servers. This should be switched on if you want to use Command Centre's BootP Service to configure the Controller's IP address and there is a DHCP server present on the network.
	OFF	**Controller will accept IP address offers from standard DHCP servers.**
DS5	ON	For factory testing only.
	OFF	**On startup, the main application is run.**
DS6	**OFF**	**Unused.**
DS7	**OFF**	When DS2 is on in conjunction with DS7, the Controller will attempt to connect to Command Centre over the internet (OneLink). See the topic *"OneLink Configuration"* in the Command Centre Configuration Client Online Help.
DS8	**OFF**	**Boot normally.**
	ON	Revert to the prior software if performed within a specified time of an upgrade, (i.e. within one hour on version 9.00, or within seven days on version 9.10 onwards), but still clear all configuration, events and alarms.

Note: The Firewall is always enabled on the Controller 7000.

Run LED diagnostic indications

The Run LED (D9) flashes to indicate the operating status of the Controller as detailed below:

Flash	Sequence timing	Meaning
Short flash Long flash (1 s cycle)	100 ms on, 250 ms off, 400 ms on, 250 ms off	Boot code monitor running, network unplugged..
Half flash	450 ms on, 50 ms off (2Hz flash)	Controller resetting.
Fast	130 ms 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, 1.2 s pause)	Controller has an IP but no configuration, or has been configured incorrectly. If the Controller does not come online, then having DIP switch 2 ON and restarting should fix the problem.
3 Flashes	3 flashes - pause (each flash is 50ms on, 400ms off , 1.2 s pause)	Controller requires an IP address - Ensure BootP Service (CCFTBPS.exe) is running, the Controller is configured correctly, and it is connected to the network.
4 Flashes	4 flashes - pause (each flash is 50ms on, 400ms off, 1.2 s pause)	No private key or certificate loaded.
5 Flashes	5 flashes - pause (each flash is 50ms on, 400ms off, 1.2 s pause)	Invalid private key or certificate loaded, or key and certificate do not match the Controller serial number (MAC).
6 Flashes	6 flashes - pause (each flash is 50ms on, 400ms off, 1.2 s pause)	The Controller does not have runnable firmware. A factory reset is required.
7 Flashes	7 flashes - pause (each flash is 50ms on, 400ms off, 1.2 s pause)	An upgrade of the Controller's firmware (via USB drive) is complete and the USB drive must be removed for installation to complete.
Slow Flash	2000ms on, 1000ms off	Controller is searching for software gglsec files.
802.1x Error (3 Quick Flashes)	1000ms on, 50ms off, 50ms on, 50ms off, 50ms on, 1.2s pause	Controller could not authenticate to the network using 802.1x. Verify the network authentication settings, credentials and network connectivity.

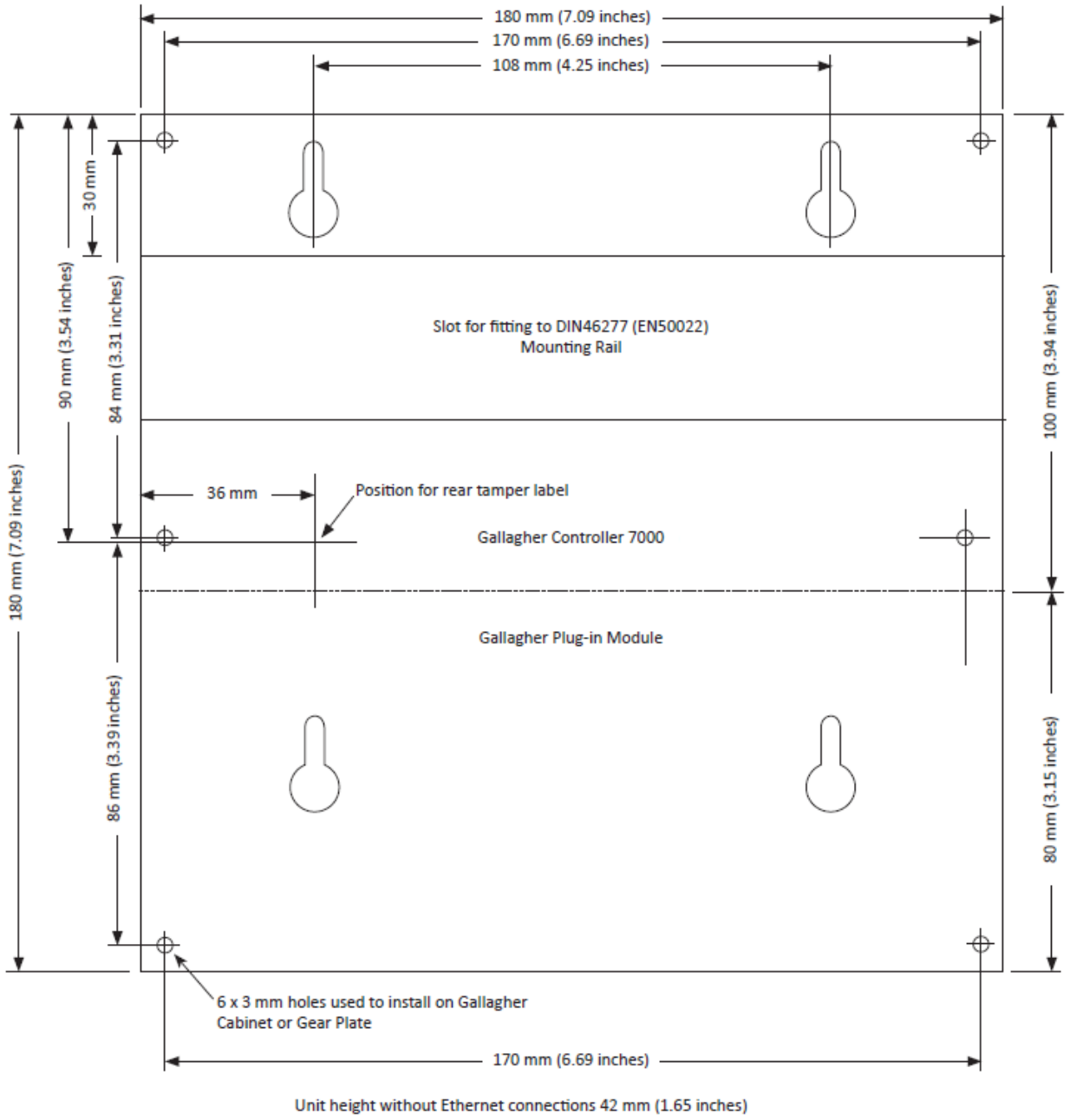
Decommissioning Controllers

To decommission a controller, power it up with DIP switch 2 ON to ensure all site-specific data is cleared prior to either returning it to Gallagher (in the event of a fault), or re-using on a different site.

Technical specifications

Measurement	Value		
Voltage	13.6 ± 15% Vdc		
Current	Without Plug-in Module or RS485 devices connected:	Standard / Starter Kit Standard / 2 Door Standard	130 mA
		Enhanced / 2 Door Enhanced / High Sec	200 mA
	Maximum current per RS485 port:		750 mA
Operating temperature	Independently Verified for: -10°C to +70°C (14°F to 158°F) UL Operating Temperature: 0°C to 49°C (32°F to 1208°F)		
Humidity	95% non-condensing		
RS485 ports	2		
RS232 port (Enhanced, 2 Door Enhanced and High Sec only)	1		
USB port	1		
10/100BaseT Ethernet port	1 x 10 Mbs/100 Mbs		
1000BaseT Ethernet port (Enhanced, 2 Door Enhanced and High Sec only)	2 x 10 Mbs/100 Mbs/1000 Mbs		
Standards and compliance	FCC, RCM, CE, UKCA, RoHS, SSF1014 - Alarm Class 3		
UL Installations	For a guide to configuring the Gallagher system to the UL Standard, please refer to the document appropriate to your location: - *"3E2793 Gallagher Command Centre UL Configuration Requirements"* (for USA), or - *"3E5960 Gallagher Command Centre ULC Configuration Requirements"* (for Canada). Installers must ensure these instructions are followed to ensure the installed system is UL compliant.		
UL CERTIFIED SAFETY SECURITY US-CA BP8861	UL294 - Access Control * UL2610 - Commercial Burglary * CAN/ULC-S304- Commercial Burglary * CAN/ULC 60839-11-1- Access Control *		
	This symbol on the product or its packaging indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.		
FCC	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. **Note:** Changes or modifications not expressly approved by Gallagher Limited could void the user's authority to operate this equipment.		

Mounting dimensions



IMPORTANT:

This picture is not to scale, therefore use the measurements provided.

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