



Gallagher

T21 PIV Reader

Installation Note

T21 PIV Reader Black: C305500

T21 PIV Reader White: C305501

T21 PIV Reader- Multi Tech Black: C305510

T21 PIV Reader- Multi Tech White: C305511



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1 Introduction

The Gallagher T21 PIV Reader is available in four variants. The variant you have purchased determines the supported card technologies for the reader, refer to the topic "*Reader variants feature summary*" below. The reader's contact slot reads PIV card data, for PIV PIN validation.

The reader is compatible with the Gallagher Command Centre software vEL7.50 (or later). The reader connects to a Gallagher Controller 6000 High Spec PIV (C305101). The reader sends information to the Controller and acts upon information sent from the Controller. The reader itself does not make any access decisions

The reader can be mounted on a rectangular 50 mm x 75 mm (2 in x 3 in) flush box, a BS 4662 British Standard square flush box, or any solid flat surface.

For instructions on how to use this product, refer to the "*3E3685 User Guide T2x Terminal*" which can be downloaded from here: <https://security-support.gallagher.com>

Reader variants feature summary

The available functionality and supported card technologies for each variant are shown below.

Reader Variant	Product Codes	Cardax IV	HBUS Functionality	HBUS Supported From	Cards Supported	Bluetooth® Supported From
T21 PIV Reader	C305500 C305501	None	Access Control Alarms Management Fence Zone Management	vHT4.2//b48 (vEL7.50)	PIV, PIV-I, CAC, TWIC, Mifare DESFire EV1, Mifare Plus and Mifare Classic cards	None
T21 PIV Reader Multi Tech	C305510 C305511	None	Access Control Alarms Management Fence Zone Management	vHT4.2//b48 (vEL7.50)	PIV, PIV-I, CAC, TWIC, Mifare DESFire EV1, Mifare Plus, Mifare Classic and 125 KHz cards	vHT4.2//b48 (vEL7.60)

The following is not supported by the T21 PIV Reader:

- PIV PIN to PACS
- PIN is User Code (for PIV card access)
- Duress (for PIV card access)

Note: To view the vHT software version used by the reader, press and hold the '#' key for 3 seconds.

2 Before you begin

2.1 Shipment contents

Check the shipment contains the following items:

- 1 x Gallagher T21 PIV Reader fascia assembly
- 1 x Gallagher T21 PIV Reader bezel
- 2 x 6-32 UNC (32 mm) Phillips drive fixing screws
- 2 x M3.5 (40 mm) Phillips drive fixing screws
- 5 x 25 mm No.6 self tapping, pan head, Phillips drive fixing screws
- 5 x 40 mm No.6 self tapping, pan head, Phillips drive fixing screws
- 1 x M3 Torx Post (T10) Security screw

2.2 Power supply

The Gallagher T21 PIV Reader is designed to operate over a supply voltage range of 9 - 16 Vdc measured at the readers terminals. The operating current draw is dependent on the supply voltage at the reader.

The power source should be linear or a good quality switched-mode power supply. The performance of the reader may be affected by a low quality, noisy power supply.

2.3 Cabling

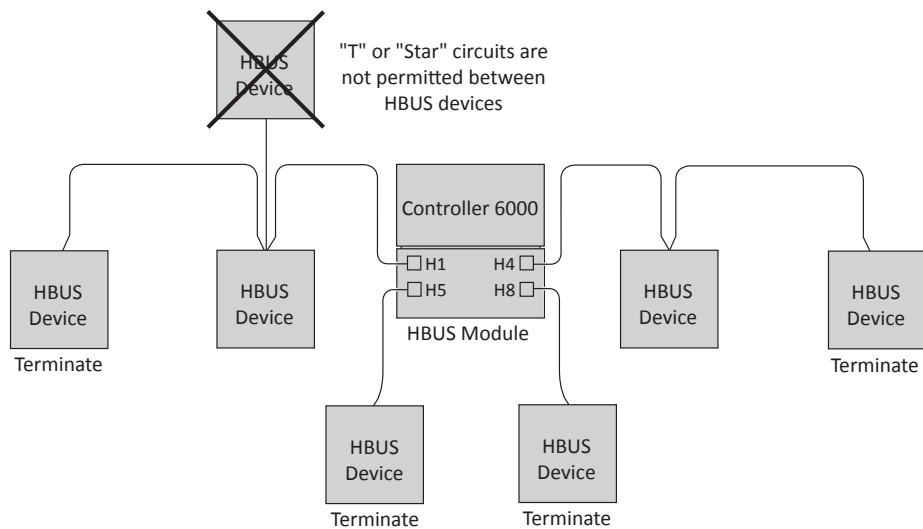
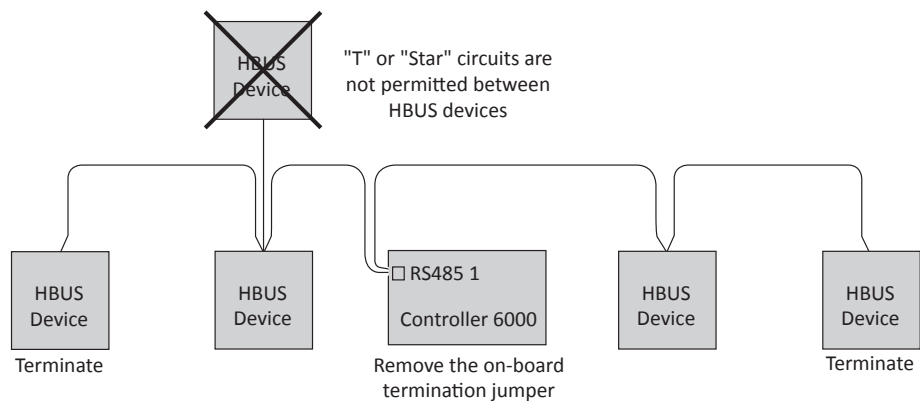
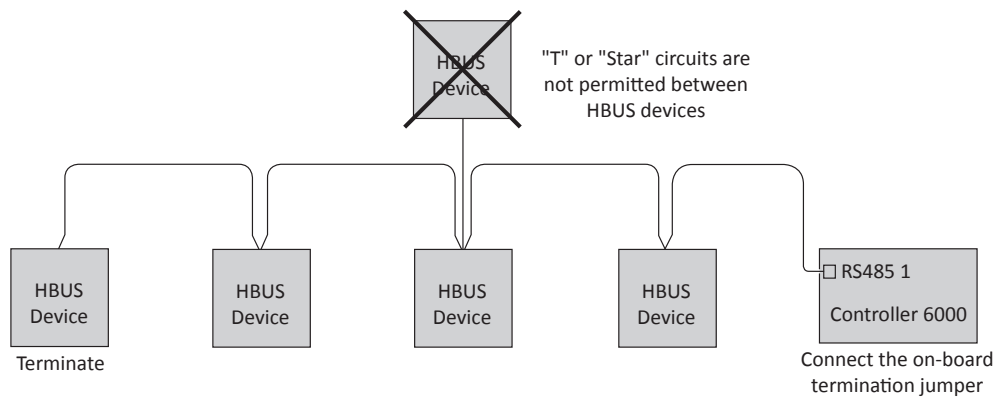
The Gallagher T21 PIV Reader requires a minimum cable size of 4 core 24 AWG (0.2 mm²) stranded security cable. This cable allows the transmission of data (2 wires) and power (2 wires). When using a single cable to carry both power supply and data, both the power supply voltage drop and data requirements must be considered. Although the reader is specified to operate at 9 Vdc, for good engineering design it is recommended that the voltage at the reader should be approximately 12 Vdc.

HBUS cabling topology

The HBUS communications protocol is based on the RS485 standard and allows the reader to communicate over a distance of up to 500 m (1640 ft).

The cabling between HBUS devices should be done in a "daisy chain" topology, (i.e. A "T" or "Star" topology should not be used between devices). Should "Star" or "Home-Run" wiring be required, the HBUS 4H/8H Modules and the HBUS Door Module allow multiple HBUS devices to be individually wired to the one physical location.

The end devices on the HBUS cable should be terminated using 120 ohms resistance. To terminate the Controller, connect the supplied on-board termination jumpers to the Controller. To terminate the Gallagher T21 PIV Reader, connect the orange (termination) wire to the green (HBUS A) wire. Termination is already included at the HBUS Module, (i.e. each HBUS port is permanently terminated at the module).



Cable distance

Cable type	Cable format*	Single reader connected using HBUS data only in a single cable	Single reader connected using power and data in a single cable
CAT 5e or better**	4 twisted pair Each 2 x 0.2 mm ² (24 AWG)	500 m (1640 ft)	50 m (165 ft)
BELDEN 9842** (shielded)	2 twisted pair Each 2 x 0.2 mm ² (24 AWG)	500 m (1640 ft)	50 m (165 ft)
SEC472	4 x 0.2 mm ² Not twisted pairs (24 AWG)	400 m (1310 ft)	50 m (165 ft)
SEC4142	4 x 0.4 mm ² Not twisted pairs (21 AWG)	400 m (1310 ft)	100 m (330 ft)

* The matching of wire sizes to equivalent wire gauges are only approximate.

** Recommended cable types for optimal HBUS RS485 performance.

Notes:

- Shielded cable may reduce the obtainable cable length. Shielded cable should be grounded at the Controller end only.
- If other cable types are used, operating distances and performance may be reduced depending on the cable quality.
- The recommendation for optimal performance is up to 20 x T21 PIV Readers can be connected to one Controller. Of these 20 readers, up to 4 could be configured for alarm zone (or fence controller) management.

A reader 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.

3 Distance between readers

The distance separating any two proximity readers must not be less than 200 mm (8 in) in all directions. When mounting a proximity reader on an internal wall, check that any reader fixed to the other side of the wall is not less than 200 mm (8 in) away.



4 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.

The Gallagher T21 PIV Reader can be mounted on:

- a vertical, rectangular 50 mm x 75 mm (2 in x 3 in) flush box
- a BS 4662 British Standard square flush box
- any solid flat surface

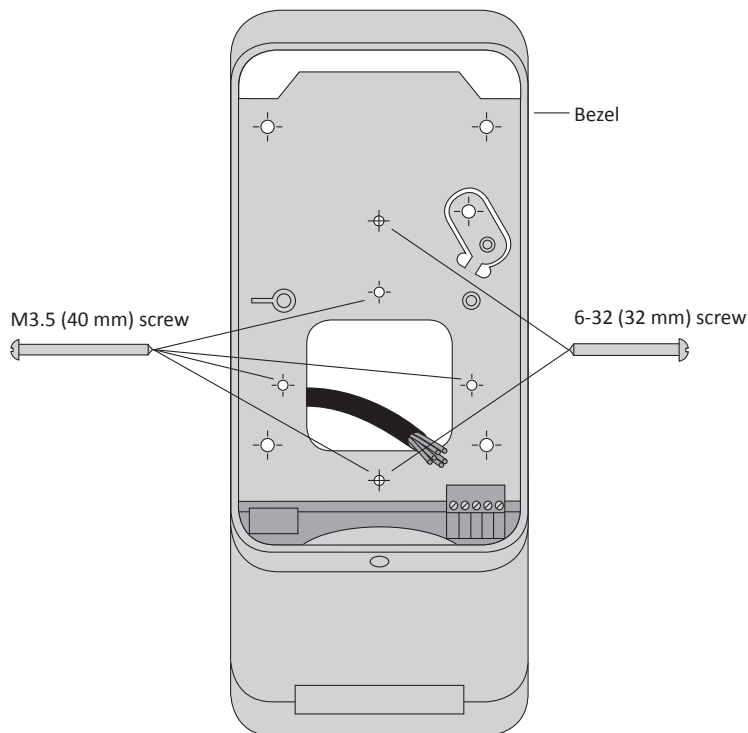
The recommended mounting height for the reader is 1.1 m (3.6 ft) from the floor level to the centre of the reader. However this may vary in some countries and you should check local regulations for variations to this height.

Notes:

- Consideration should be given to the installation environment when using Gallagher mobile credentials, as the Bluetooth® wireless technology read range may be reduced.
 - Installation on metal surfaces, particularly those with a large surface area will reduce read range. The extent to which the range is reduced will depend upon the type of metal surface.
 - When mounting on a flush box, the corner screws must be used as well as the flush box screws. Without corner screws the top of the product is vulnerable to separation from the wall.
1. Ensure the building cable has been run out through the flush box.

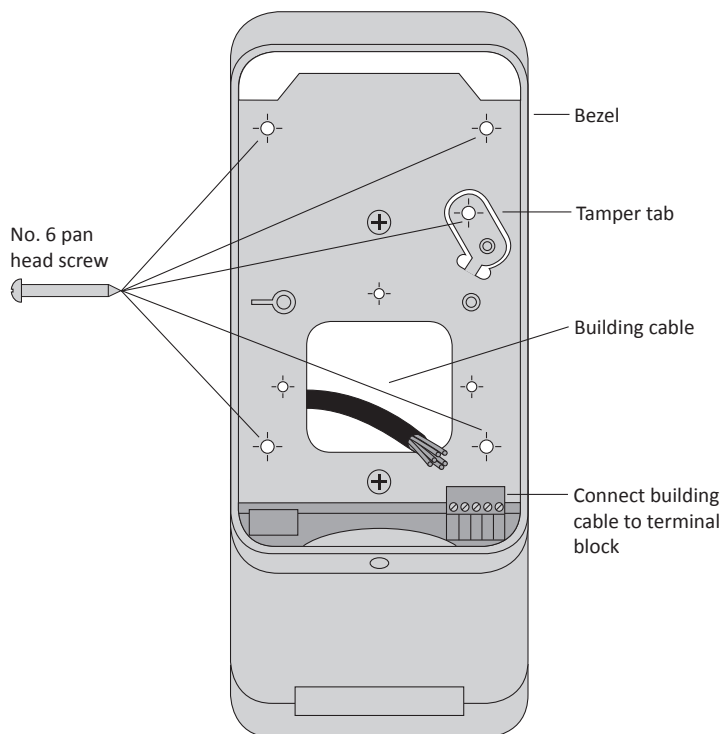
If you are not mounting to a flush box, use the reader bezel as a guide, to drill all five holes. Drill the 13 mm (1/2 inch) diameter centre hole (this is the centre hole for which the building cable will exit the mounting surface) and the four corner fixing holes. Ensure the centre hole allows the cable to run freely out through the mounting surface, so that the reader facia can clip into the bezel.

Note: There is no room for the building cable to be squeezed into the reader bezel. The building cable must remain within the flush box or wall cavity.
 2. Run the building cable through the reader bezel.
 3. Secure the bezel to the flush box using the two screws provided.
When securing the bezel to a vertical, rectangular flush box, use the 6-32 UNC screws provided. When securing the bezel to a BS 4662 British Standard square flush box, use the M3.5 screws provided.



4. Drill pilot holes for the four corner fixing holes and the tamper tab. Secure the bezel to the mounting surface using the four corner fixing screws provided. Secure the tamper tab (located in the bezel) to the mounting surface using the remaining fixing screw provided. It is important the four corner fixing screws are used to ensure the reader is flush with and tight against the mounting surface.

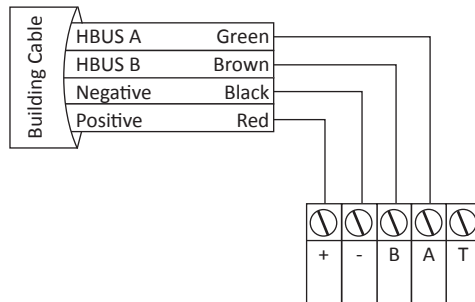
Note: It is strongly recommended that you use the screws provided. If an alternative screw is used, the head must be no larger nor deeper than that of the screw provided.



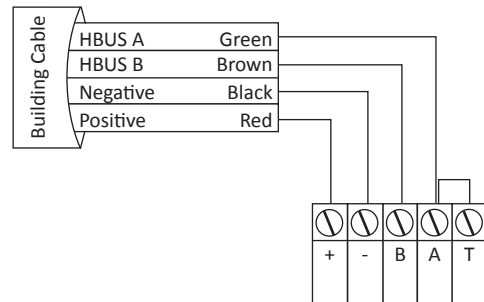
5. The reader connects to a Gallagher Controller 6000 High Spec PIV, a Gallagher 4H/8H HBUS Module (attached to the Controller 6000 High Spec PIV), or a Gallagher HBUS Door Module (connected to a Controller 6000 High Spec PIV).

Unplug the reader's terminal block from the PCB. Connect the wires from the building cable to the terminal block as shown. Plug the terminal block back into the PCB.

HBUS connection:

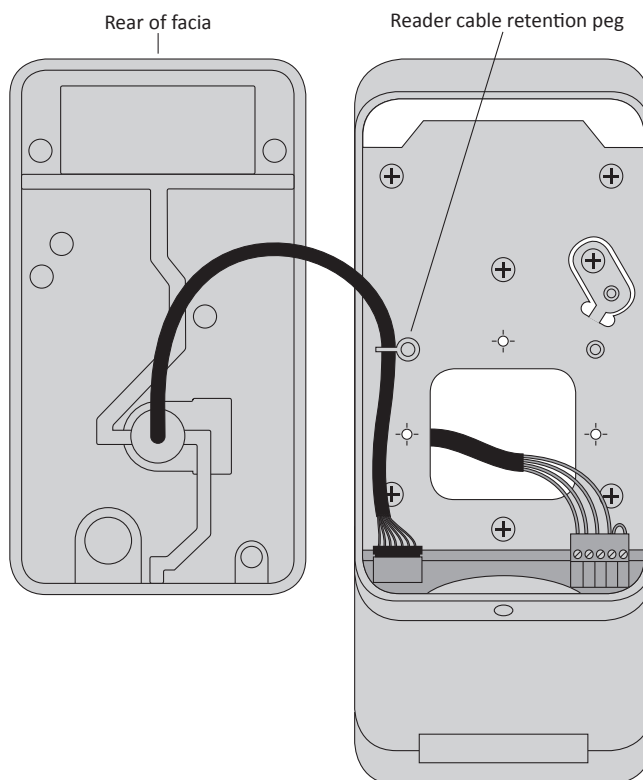


HBUS connection terminated:



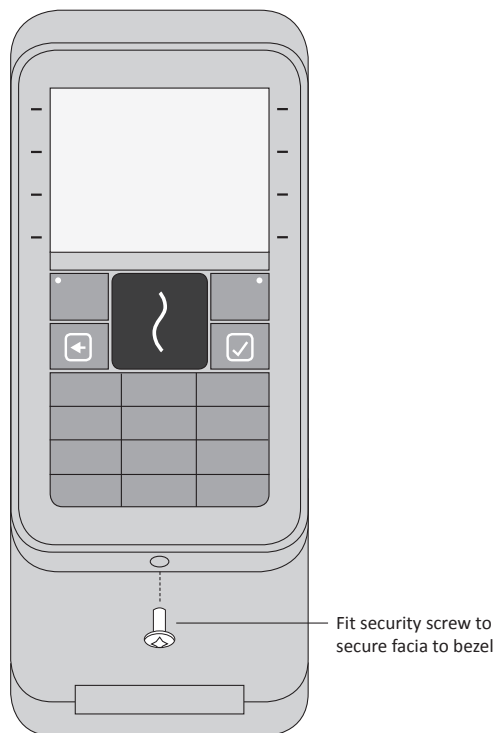
If the reader is the end device on the HBUS cable, terminate the reader by connecting a short piece of wire between terminals T and A.

6. Secure the reader cable using the cable retention peg, as shown in the following diagram. Plug the reader cable into the connector.



7. Fit the facia assembly into the bezel by clipping the small lip, into the top of the bezel and holding the top, press the bottom of the facia assembly down into the bezel.
8. Insert the M3 Torx Post Security screw (using a T10 Torx Post Security screwdriver) through the hole below the reader facia.

Note: The Torx Post Security screw needs only to be lightly tightened.



9. Removal of the facia assembly is a simple reversal of these steps.
Hint: After removal of the security screw, press the top of the facia. The bottom of the facia will exit the reader bezel. Alternatively, carefully use an electrical screwdriver to lever the bottom of the facia away from the bezel.
10. Configure the reader in Command Centre. Refer to the topic "*Configuring an HBUS Contact Card Reader*" in the Command Centre Configuration Client Online Help.
11. The reader's contact card slot is rated for 100,000 card insertions. Should the reader's contact card slot become blocked or wear over time, a replacement bezel including the contact card reader (C305280 or C305281) can be purchased.

5 Screen brightness

When the reader is in use the screen brightness will be set to full. If the reader hasn't been used for 30 seconds, the screen brightness is dimmed. If the reader hasn't been used for 30 minutes, the screen is turned off.

Note: The reader screen can be set to on at all times ('Always on' setting enabled on the HBUS Contact Card Reader item's property page in Command Centre). If this setting is enabled, the reader's screen will not turn off after 30 minutes, but will dim after 30 seconds of inactivity.

6 Information screen

To display the supported card technologies and the software version numbers of the reader, press and hold the '#' key for 3 seconds. The Information screen is displayed.

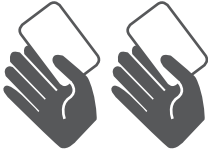
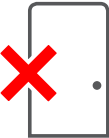
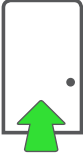
7 LED indications

LED (squiggle)	HBUS indication
3 Flash (Amber)	No communications with the Controller. The terminal screen displays the text 'Connecting...'.
2 Flash (Amber)	Communications with the Controller, but terminal is not configured. The terminal screen displays the text 'Not configured'.
1 Flash (Amber)	Configured to a Controller, but terminal is not assigned to a door or elevator car. Configured to a Controller but the Alarms Terminal has no Alarm Zone(s) assigned to the Alarms Zones property page. The terminal screen displays the text 'Not configured'.
On (Green or Red)	Fully configured and functioning normally. If assigned to a door or elevator car: Green = Access mode is Free Red = Access mode is Secure For the Alarms Terminal the LED is green when a user is logged on and red when logged off.
Flashes Green	Access has been granted.
Flashes Red	Access has been denied.
Flashing Blue	Reading and validating a PIV card. Reading a Gallagher mobile credential.

8 Accessories

Accessory	Product Code
T21 Bezel, Black	C305280
T21 Bezel, White	C305281

9 Icons

Insert Card 	Remove Card 	Armed 
Present Card 	Present Two Cards 	Enter PIN/Code 
Access Granted 	Access Denied 	Free Access 
Not Allowed 	Card or Code 	

10 Technical specifications

Routine maintenance:	Not applicable for this reader.	
Cleaning:	This reader should be cleaned with mild soapy water only. Do not use solvents or abrasives.	
Voltage:	9 Vdc - 16 Vdc	
Current:	Inactive ¹	Active ²
T21 PIV Reader (at 9 Vdc):	??? mA	??? mA
T21 PIV Reader (at 13.6 Vdc):	??? mA	??? mA
T21 PIV Reader - Multi Tech (at 9 Vdc):	??? mA	??? mA
T21 PIV Reader - Multi Tech (at 13.6 Vdc):	??? mA	??? mA
Temperature range:	-30 °C to +70 °C (-22 °F to +158 °F) Note: Direct sunlight may increase the internal reader temperature above the ambient temperature level.	
Humidity:	95% non condensing ⁴	
Environmental protection:	IP33 (independently verified)	
Impact rating:	IK08 (independently verified)	
Unit dimensions:	Height 231.9 mm (9.1 in) Width 95.8 mm (3.8 in) Depth 33 mm (1.3 in)	
Maximum number of readers on one HBUS cable:	20	
Maximum number of alarms management readers ³ on one Controller:	4	
Maximum number of readers on one Controller:	20	

¹ The reader is idle. The screen is on (dimmed).

² The screen is at maximum brightness.

³ A reader is configured for alarm zone management/fence controller management when it has either Alarm Zones configured on the **Alarm Zones** properties page or items configured upon its mimic panel.

⁴ Gallagher T Series readers are UL humidity tested and certified to 85% and have been independently verified to 95%.

Note: The current values stated above have been reported using the default configuration of an HBUS Contact Card Reader in Command Centre. Changing the configuration may vary the current value.

11 Approvals and standards



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.

Note: 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:

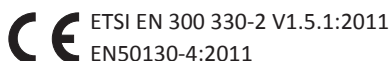
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Industry Canada

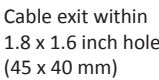
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Industrie Canada

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



Please refer to the document “3E2793 Gallagher Command Centre UL Configuration Requirements” for a guide to configuring the Gallagher system to the appropriate UL Standard.



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

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Version 2, June 1991

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