Gallagher
T10 Reader

Installation Note

T10 Mifare Reader Black: C300400
T10 Mifare Reader White: C300401
T10 PIV Reader Black: C305400
T10 PIV Reader White: C305401

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Contents

1   Introduction

The Gallagher T10 Reader is a smart card proximity reader. It can be installed as either an entry reader or exit reader. The reader sends information to the Gallagher Controller and acts upon information sent from the Gallagher Controller. The reader itself does not make any access decisions.

The reader is available in four variants. The card technologies for each variant are shown below.

Reader	Product codes	Supported card technologies
T10 Mifare Reader Black T10 Mifare Reader White	C300400 C300401	Mifare DESFire EV1, Mifare Plus and Mifare Classic
T10 PIV Reader Black T10 PIV Reader White	C305400 C305401	PIV, PIV-I, Mifare DESFire EV1, Mifare Plus and Mifare Classic

The reader can be connected as an HBUS Reader or Cardax IV Reader. An HBUS Reader uses the HBUS communications protocol to communicate with the Gallagher Controller. A Cardax IV Reader uses the Cardax IV Reader communications protocol to communicate with the Gallagher Controller.

IMPORTANT: HBUS compatibility
HBUS communications are supported with sites running Gallagher Command Centre vEL7.00 software (or later).

IMPORTANT: PIV readers
Gallagher PIV readers connect to the Gallagher Controller 6000 High Spec PIV (C305101) only (referred to as the Controller). Gallagher PIV readers can only be used with sites running Gallagher Command Centre vEL7.10 software (or later). Gallagher PIV readers are connected as HBUS Readers only.

2   Before you begin

2.1   Shipment contents

Check the shipment contains the following items:

- 1 x Gallagher T10 Reader facia assembly
- 1 x Gallagher T10 Reader bezel
- 1 x M3 Torx Post Security screw
- 2 x 25 mm No.6 self tapping, pan head, Phillips drive fixing screws
- 2 x 40 mm No.6 self tapping, pan head, Phillips drive fixing screws

2.2   Power supply

The Gallagher T10 Reader is designed to operate over a supply voltage range of 9 - 16 Vdc measured at the reader terminals. The operating current draw is dependant 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 T10 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 Gallagher Controller 6000, connect the supplied on-board termination jumpers to the Controller. To terminate a 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).

"T" or "Star" circuits are not permitted between HBUS devices
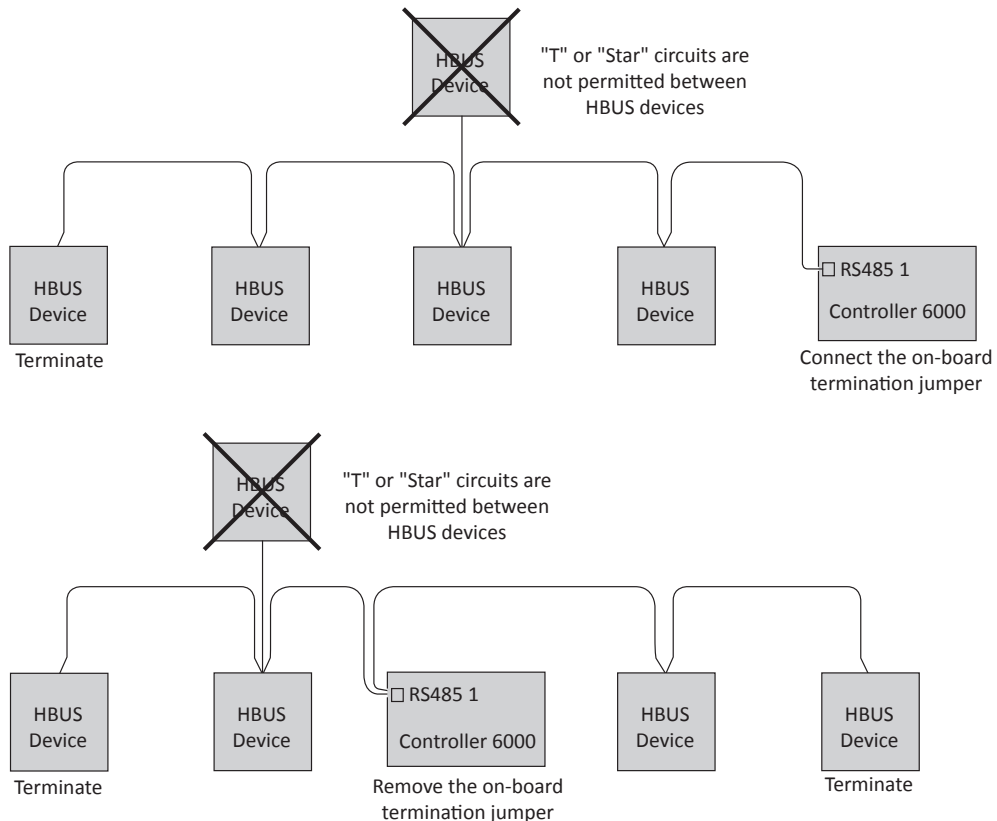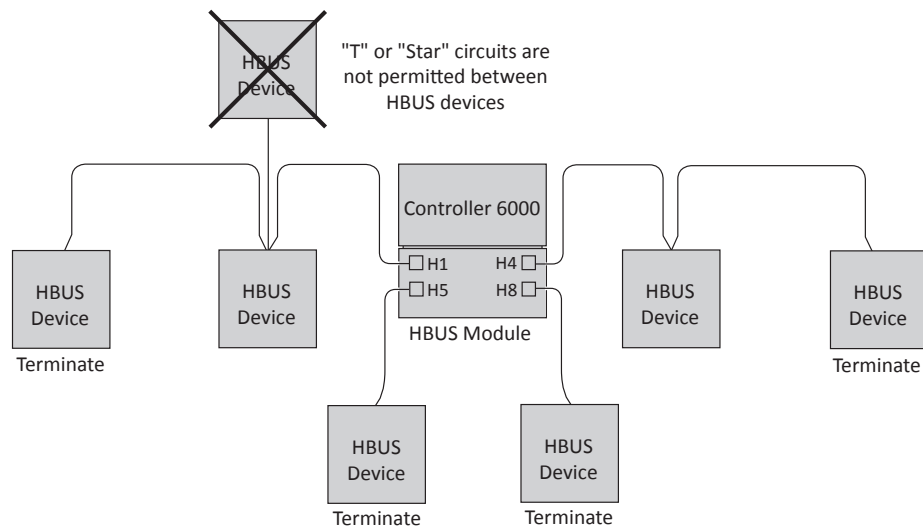
Cable distance

Cable type	Cable format*	HBUS single reader connected using data only in a single cable	Cardax IV single reader connected using data only in a single cable	HBUS/Cardax IV single reader connected using power and data in a single cable
CAT 5e or better**	4 twisted pair Each 2 x 0.2 mm² (24 AWG)	500 m (1640 ft)	200 m (650 ft)	100 m (330 ft)
BELDEN 9842** (shielded)	2 twisted pair Each 2 x 0.2 mm² (24 AWG)	500 m (1640 ft)	200 m (650 ft)	100 m (330 ft)
SEC472	4 x 0.2 mm² Not twisted pairs (24 AWG)	400 m (1310 ft)	200 m (650 ft)	100 m (330 ft)
SEC4142	4 x 0.4 mm² Not twisted pairs (21 AWG)	400 m (1310 ft)	200 m (650 ft)	150 m (500 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.

- HBUS allows up to 20 readers to be connected to a single cable. Each reader requires at least 9 Vdc to function correctly. The cable length and the number of readers connected will have an impact on the voltage at each reader.

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.
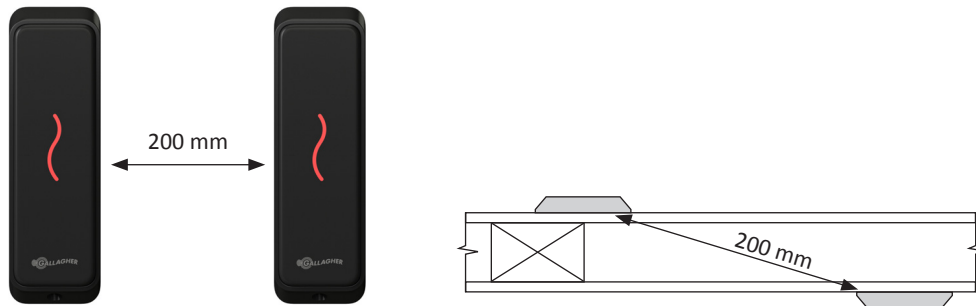
4 Installation

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 T10 Reader is designed to be mounted on any solid flat surface. However 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.

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

1. Use the reader bezel as a guide to drill all three 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 two fixing holes.

2. Run the building cabling out through the centre hole and through the reader bezel.

3. Secure the bezel to the mounting surface using the two fixing screws provided. It is important the bezel of 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.

   Note: 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.

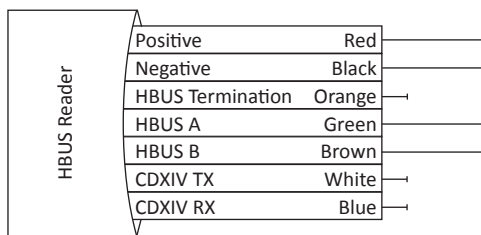No. 6 pan head screw — Bezel

Building cable

No. 6 pan head screw
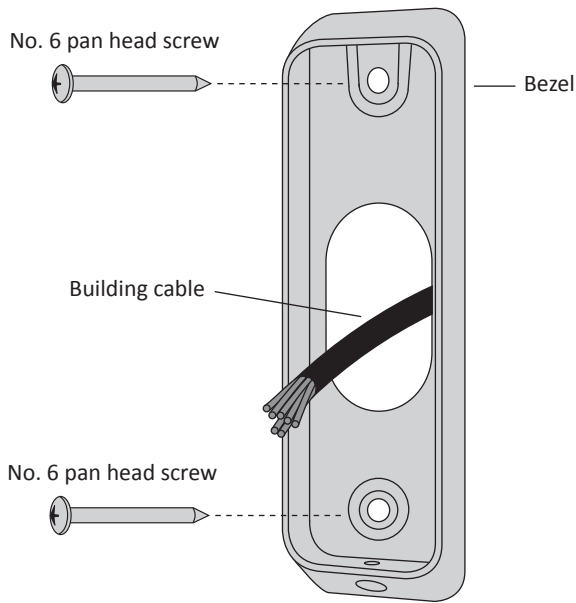
4.   Connect the reader tail extending from the facia assembly to the building cable. Connect the wires for the appropriate reader you wish to interface, either an HBUS Reader or a Cardax IV Reader, as shown.

Note: Gallagher PIV readers must be connected as HBUS Readers. Gallagher PIV readers connect to the Gallagher Controller 6000 High Spec PIV (C305101) only.
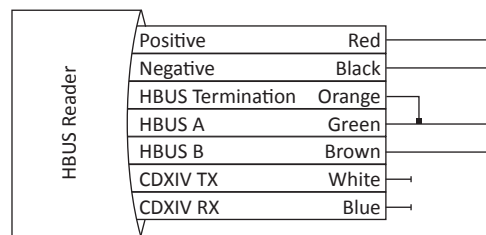
An HBUS Reader connects to a Gallagher Controller 6000, Gallagher 4H/8H Module (attached to a Controller 6000) or a Gallagher HBUS Door Module (connected to a Controller 6000).

A Cardax IV Reader connects to a Gallagher Controller 6000, Gallagher 4R/8R Module (attached to a Controller 6000), Gallagher GBUS Universal Reader Interface (Gallagher GBUS URI), Gallagher Controller 3000-8R or 3000-4R, Gallagher Local Bus Universal Reader Interface (Gallagher URI) or a Gallagher Local Bus Reader I/O Interface.
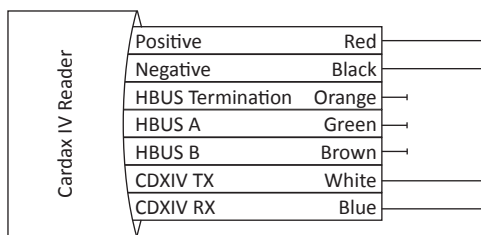
HBUS Reader connection:

HBUS Reader		
Positive	Red
Negative	Black
HBUS Termination	Orange
HBUS A	Green
HBUS B	Brown
CDXIV TX	White
CDXIV RX	Blue

HBUS Reader terminated:

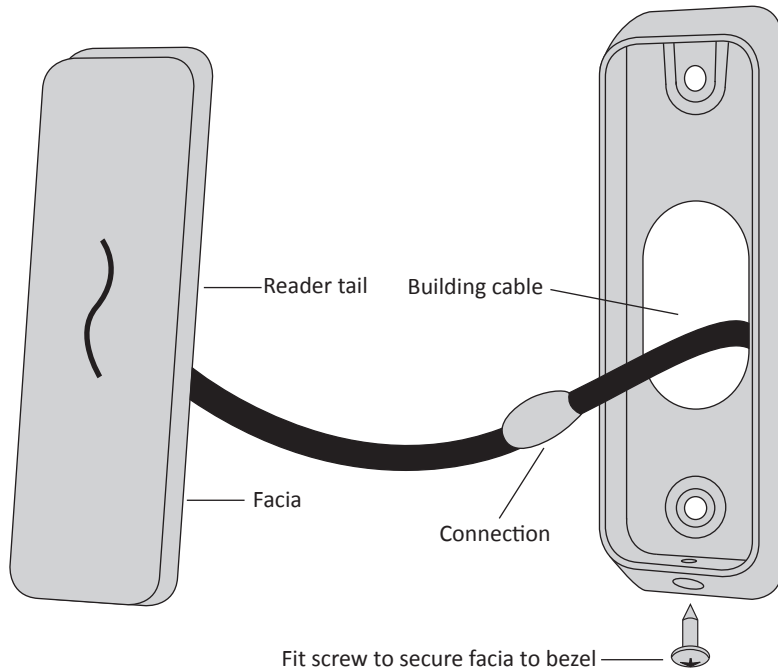| HBUS Reader		
Positive	Red
Negative	Black
HBUS Termination	Orange
HBUS A	Green
HBUS B	Brown
CDXIV TX	White
CDXIV RX	Blue

Note: To terminate an HBUS Reader, connect the **Orange** (HBUS Termination) wire to the **Green** (HBUS A) wire.

Cardax IV Reader connection:

Cardax IV Reader		
Positive	Red
Negative	Black
HBUS Termination	Orange
HBUS A	Green
HBUS B	Brown
CDXIV TX	White
CDXIV RX	Blue

5. 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.

6. Insert the M3 Torx Post Security screw (using a T10 Torx Post Security screwdriver) through the hole at the bottom of the bezel to secure the facia assembly.

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

Fit screw to secure facia to bezel

7. Removal of the facia assembly is a simple reversal of these steps.

8. Configure the reader in Command Centre. If the reader is connected as an HBUS Reader, refer to the topic *"Configuring HBUS Devices"* in the Command Centre Configuration Client Online Help. If the reader is connected as a Cardax IV Reader, refer to the topic *"Creating Readers"* in the Command Centre Configuration Client Online Help.

5   LED indications

LED (squiggle)	HBUS indication
3 Flash (Amber)	No communications with the Controller.
2 Flash (Amber)	Communications with the Controller, but reader is not configured.
1 Flash (Amber)	Configured to a Controller, but reader is not assigned to a door or elevator car.
On (Green or Red)	Fully configured and functioning normally. Green = Access mode is Free Red = Access mode is Secure
Flashes Green	Access has been granted.
Flashes Red	Access has been denied.
Flashes (Blue)	Reading and validating a PIV card.

LED (squiggle)	Cardax IV indication
3 Flash (Amber)	No communications with the Controller.
On (Green or Red)	Fully configured and functioning normally. Green = Access mode is Free Red = Access mode is Secure
Flashes Green	Access has been granted.
Flashes Red	Access has been denied.

6   Accessories

Accessory	Product Code	Accessory	Product Code
T10 Dress Plate, Black, Pk 10	C300320	T10 Spacer, Black, Pk 10	C300300
T10 Bezel, Black, Pk 10	C300280	T10 Spacer, White, Pk 10	C300301
T10 Bezel, White, Pk 10	C300281	T10 Protective Cover Spacer	C300310
T10 Bezel, Silver, Pk 10	C300282	T10 Protective Cover	C300270
T10 Bezel, Gold, Pk 10	C300283	T10 Dress Plate Black - Pack 10	C300320

7   Technical specifications

Routine maintenance:	Not applicable for this reader		
Cleaning:	This reader should only be cleaned with a clean, lint free, damp cloth		
Voltage:	9 Vdc - 16 Vdc		
Current:		Idle [1]	Maximum [2]
	at 9 Vdc	110 mA	158 mA
	at 13.6 Vdc	74 mA	105 mA
Temperature range:	-35 °C to +70 °C Note: Direct sunlight may increase the internal reader temperature above the ambient temperature level		
Humidity:	0 - 95% non-condensing [3]		
Environmental protection:	IP68		
Impact rating:	IK07		
Unit dimensions:	Height 115 mm (4.5 inches) Width 35 mm (1.4 inches) Depth 12 mm (0.5 inches)		
Maximum number of readers on one HBUS cable:	20		

[1]   The reader is idle.
[2]   Peak current during card read.
[3]   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 for a reader in Command Centre. Changing the configuration may vary the current value.

8 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.
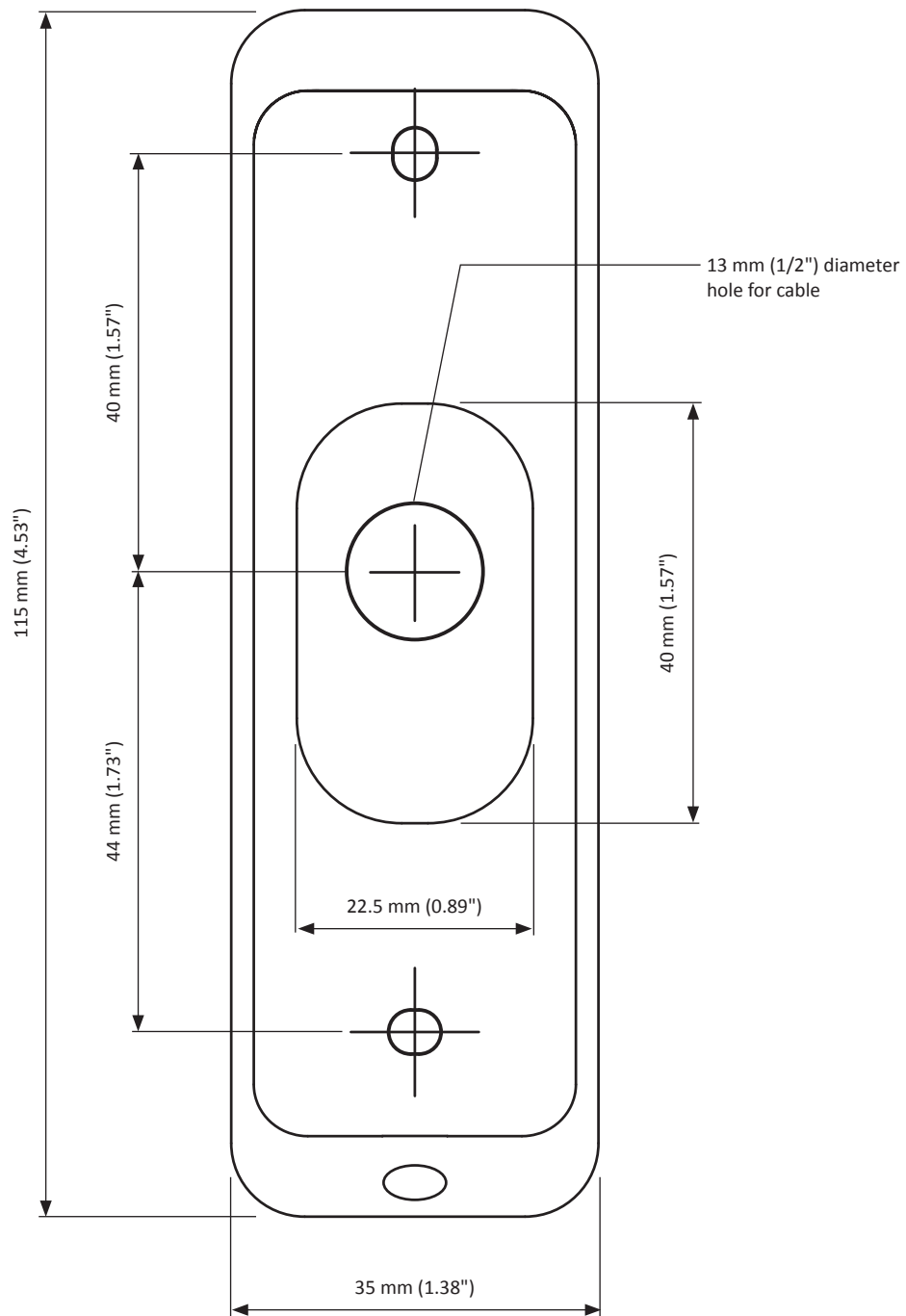
CE ETSI EN 300 330-2 V1.5.1:2011
EN50130-4:2011

RoHS COMPLIANT
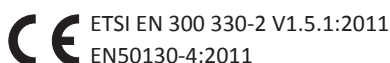
UL CERTIFIED — SAFETY SECURITY US·CA — BP8861
US - Equipment: com, burg and acc reader
CA - Equipment: com, burg reader

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.

9   Mounting dimensions

13 mm (1/2") diameter hole for cable

40 mm (1.57")

115 mm (4.53")

44 mm (1.73")

40 mm (1.57")

22.5 mm (0.89")

35 mm (1.38")

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