GALLAGHER T10 MIFARE Reader Installation Guide

Contents

Gallagher

GALLAGHER T10 MIFARE Reader

Product Information

The Gallagher T10 Reader is a smart card proximity reader that can be installed as either an entry reader or exit reader. It sends information to the Gallagher Controller and acts upon information sent from the Gallagher Controller. The reader is available in four variants, and the supported technologies and compatibility for each variant are shown in the table below:

Reader Variant	Product Codes	Card Technologies Supported	Compatibility
T10 MIFARE Reader	C300400 C300401	MIFARE DESFire EV2 and EV3	vEL7.70 or later for EV2, vEL8.30.1458 or later for EV3
High Sec T10 Reader	C305400 C305401	NFC Access for Android, HBUS Comms	vEL7.00 or later for HBUS Comms, vEL7.80 or later for NFC Access for Android

Product Usage Instructions

Before You Begin

Shipment Contents

Check that your shipment contains the Gallagher T10 Reader, power supply, and necessary cables.

Power Supply

The Gallagher T10 Reader requires a power supply voltage range of 9-16 Vdc measured at the terminals. The power source should be linear or a good quality switched-mode power supply. It is recommended that the voltage at the reader should be around 12 Vdc for good engineering design.

Cabling

The Gallagher T10 Reader requires a minimum cable size of 4 core 24 AWG (0.2 mm2) stranded security cable to transmit both data and power. When using a single cable to carry both power supply and data, both the power supply voltage drop and data requirements must be considered.

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. 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.

Installation Note

Disclaimer

Installation Note

- **T10 MIFARE® Reader, Black:** C300400
- **T10 MIFARE® Reader, White:** C300401 High Sec
- **T10 Reader, Black:** C305400 High Sec
- **T10 Reader, White:** C305401

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 supported technologies and compatibility for each variant is shown in the table below.

Reader Variant	Product Codes	Card Technologies Supported	NFC Access for Android Supported From	HBUS Comms Supported From	Cardax IV Comms Supported From
T10 MIFARE Reader	C300400 C300401	ISO 14443A MIFARE® DESFire® EV1/EV2*/EV3**, MIFARE Plus®, and MIFARE Classic® cards	vEL7.80 HBUS only	vEL7.00	vEL1.02
High Sec T10 Reader	C305400 C305401	ISO 14443A PIV, PIV-I, CAC, TWIC, MIFARE DESFire EV1/EV2*/EV3**, MIFARE Plus, and MIFARE Classic cards	vEL7.80 HBUS only	vEL7.10	None

- MIFARE DESFire EV2 is supported from vEL7.70.
- MIFARE DESFire EV3 is supported from vEL8.30.1458 (or later).

Before you begin

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

Power supply

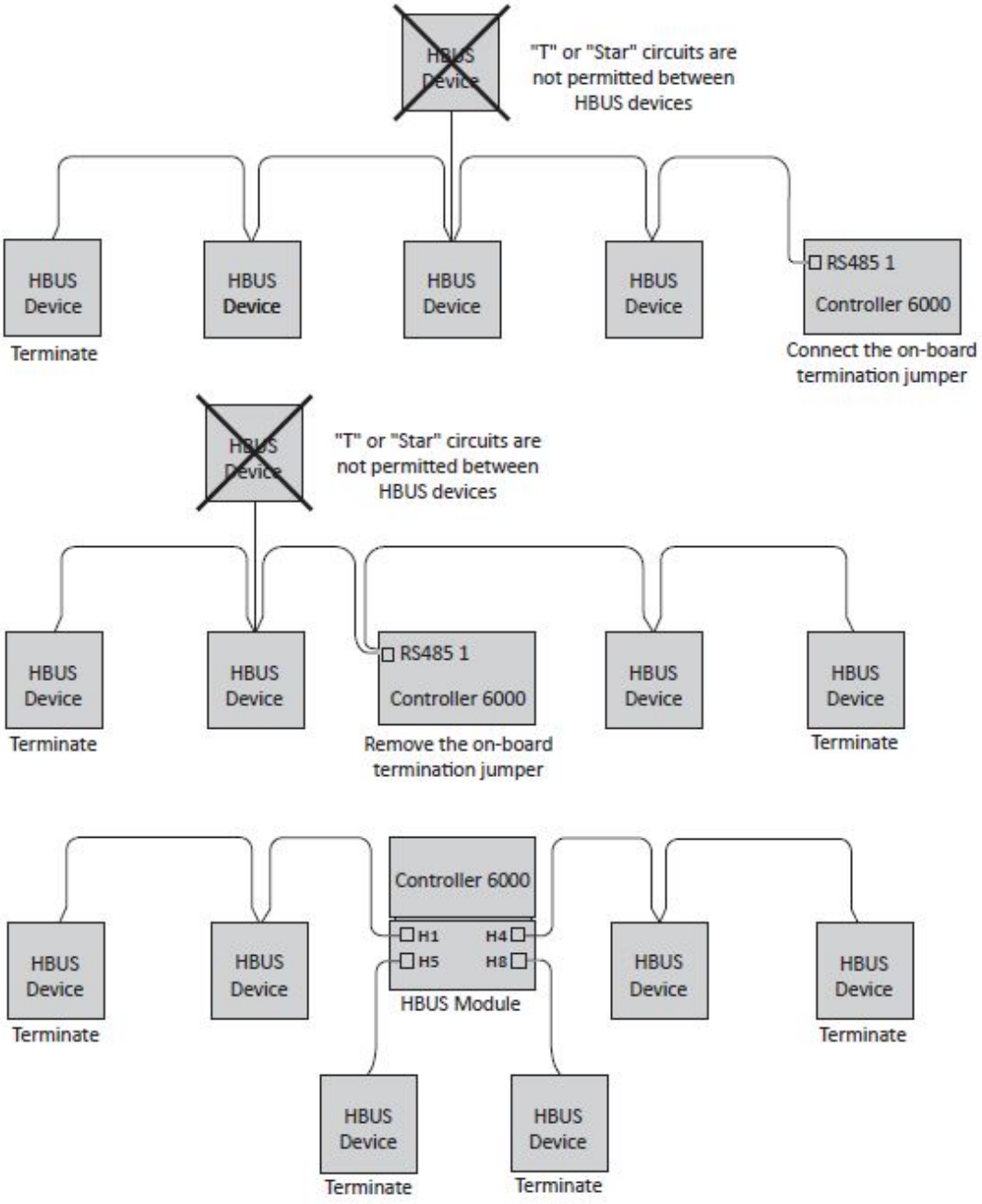
The Gallagher T10 Reader is designed to operate over a supply voltage range of 9 – 16 Vdc measured at the terminals. The operating current draw is dependant on the supply voltage at the reader. The power source should be linear or a good quality switched-mode power supply. The performance of the reader may be affected by a low quality, noisy power supply.

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).



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/CDX IV single reader connected using power & 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)
C303900/ C303901 Gallagher HBUS Cable	2 Twisted pair each 2 x 0.4 mm2 (21 AWG, Data) and 2 x 0.75 mm2 Not Twisted Pair (~18 AWG, Power)	500 m (1640 ft)	200 m (650 ft)	500 m (1640 ft)

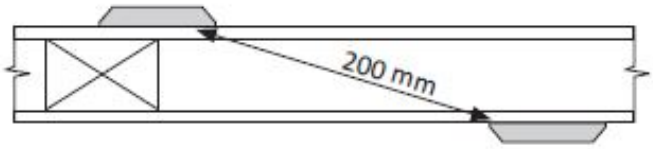
- The matching of wire sizes to equivalent wire gauges are only approximate.
- Recommended cable types for optimal HBUS RS485 performance.
- Tested with 13.6V at start of cable.

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.

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.



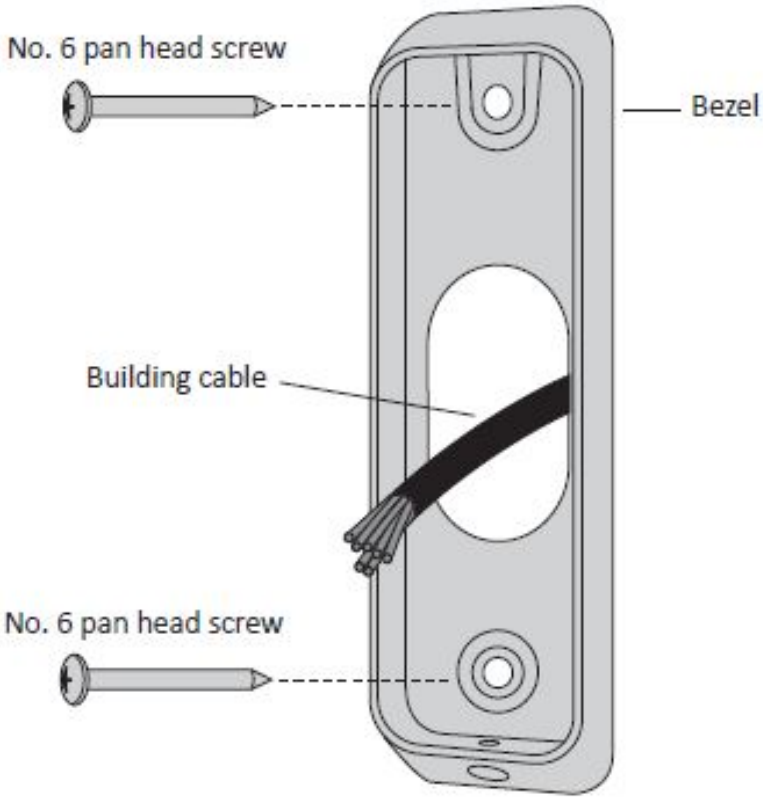
Installation

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.

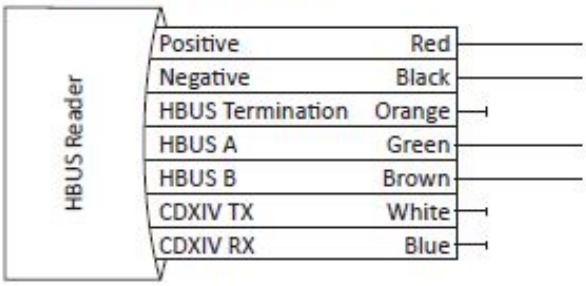
   Note: It is strongly recommended that you use the screws provided. If an alternative screw is used, the head must be no larger nor deeper than that of the screw provided.

   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.

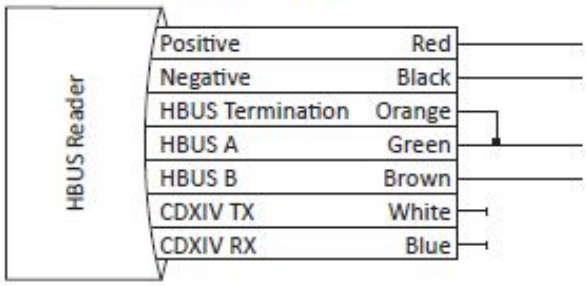


4. Connect the reader tail extending from the facia assembly to the building cable. Connect the wires for the appropriate reader you wish to interface, either an HBUS Reader or a Cardax IV Reader, as shown.
   Note: Gallagher High Sec readers must be connected as HBUS Readers. Gallagher High Sec readers connect to the Gallagher High Sec Controller 6000 (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) or a Gallagher GBUS Universal Reader Interface (Gallagher GBUS URI).
   A Cardax IV Reader connects to a Gallagher Controller 6000, Gallagher 4R/8R Module (attached to a Controller 6000) or a Gallagher GBUS Universal Reader Interface (Gallagher GBUS URI).

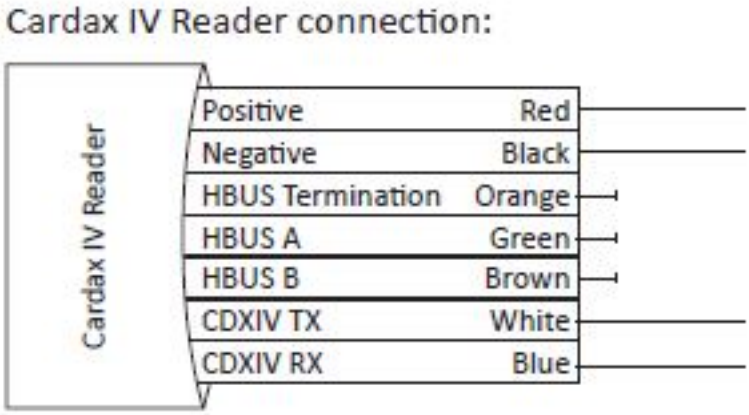
HBUS Reader connection:



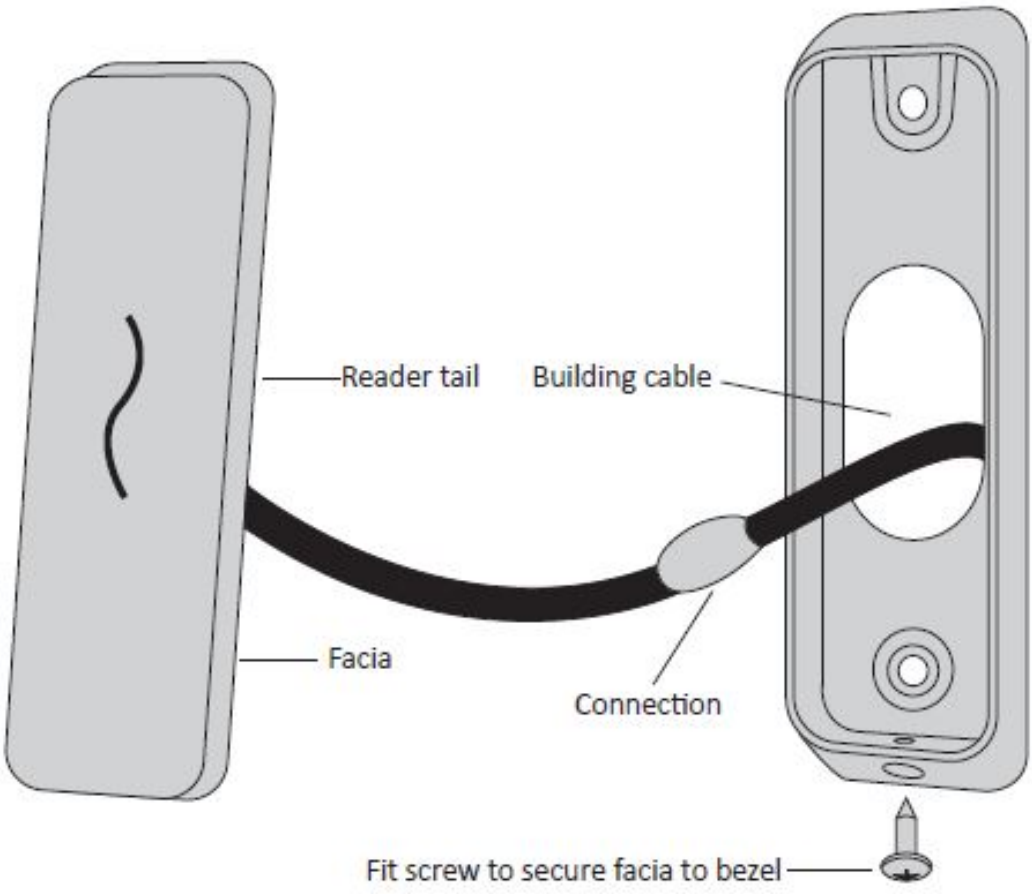
HBUS Reader terminated:



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



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.



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.

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. Reading a Gallagher mobile credential.

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.

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

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		
Current4:		Idle1	Maximum2
	at 9 Vdc	74 mA	117 mA
	at 13.6 Vdc	51 mA	78 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-condensing3		
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. Maximum reader current during card read.
3. Gallagher T Series readers are UL humidity tested and certified to 85% and have been independently verified to 95%.
4. Reader currents verified by UL are provided in the document “3E2793 Gallagher Command Centre UL Configuration Requirements”.

   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.

Approvals and Compliance 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.

This product complies with the environmental regulations for the Restriction of Hazardous Substances in electrical and electronic equipment (RoHS). The RoHS directive prohibits the use of electronic equipment containing certain hazardous substances in the European Union.

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.

Please refer to document "3E2793 Gallagher Command Centre UL Configuration Requirements" for a guide to

configuring the Gallagher system to the appropriate UL Standard. Installers must ensure these instructions are followed to ensure the installed system is UL compliant.
AS/NZS IEC 60839.11.1:2019 Grade 4, Class II

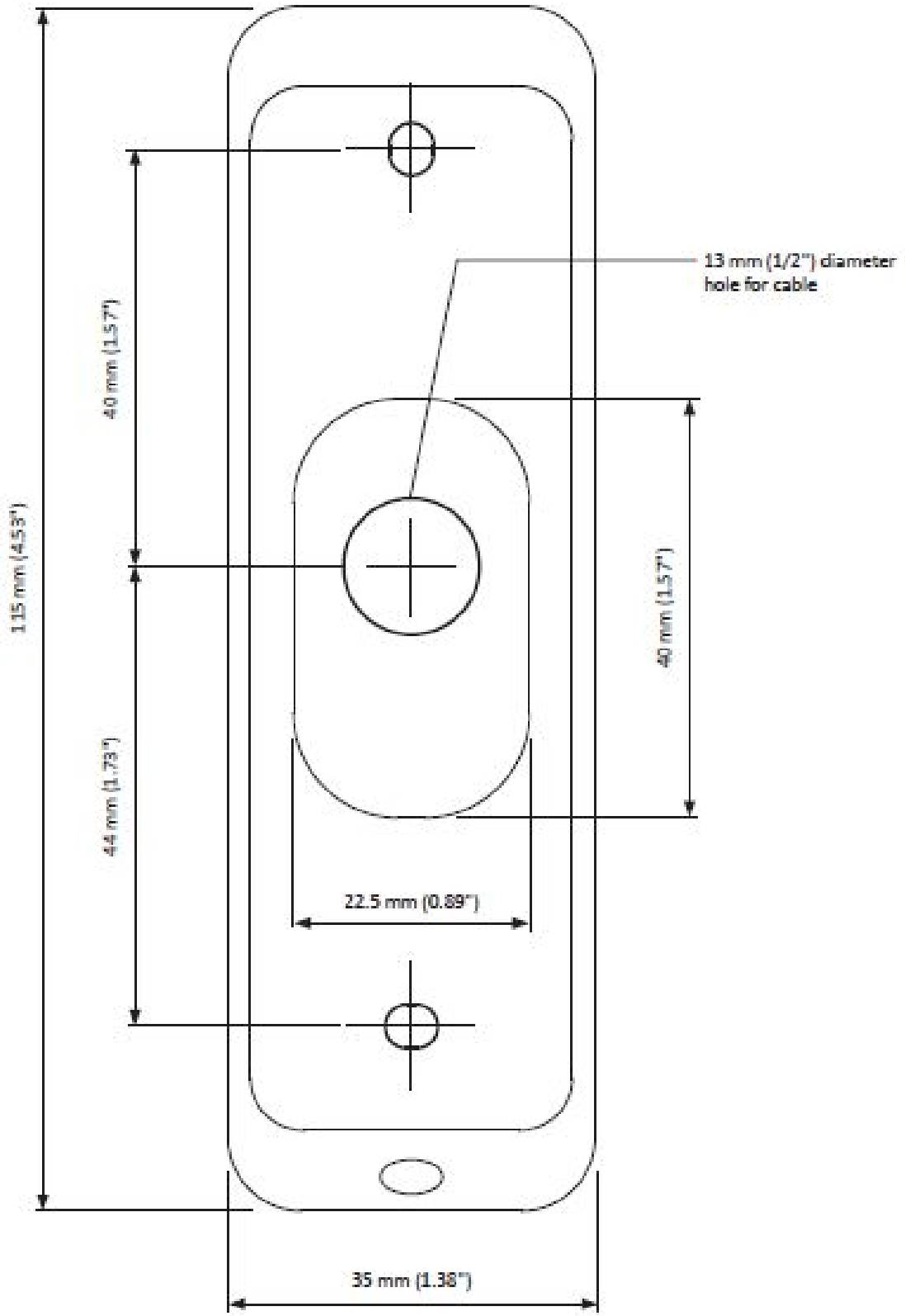
C300400 only

The C300400 variant of the T10 Readers is the only variant that complies with BIS.

HVIN	**FCC ID**	**IC ID**
C300400 T10 MIFARE Reader, Black C300401 T10 MIFARE Reader, White C305400 High Sec T10 Reader, Black C305401 High Sec T10 Reader, White	M5VC30040XA	7369A-C30020X
C300400- T10 MIFARE Reader, Black C300401- T10 MIFARE Reader, White	M5VC30040XB	7369A-C30020XB

US – Equipment: com, burg and acc reader
CA – Equipment: com, burg reader

Mounting Dimensions



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

3E4288 Gallagher T10 Reader
Edition 11

Documents / Resources

	**GALLAGHER T10 MIFARE Reader** [pdf] Installation Guide C30040XB, M5VC30040XB, T10 MIFARE Reader, MIFARE Reader