



Gallagher

T20 Terminal

Installation Note

T20 Alarms Terminal Black: C300463

T20 Alarms Terminal White: C300464

T20 PIV Reader Black: C305450

T20 PIV Reader White: C305451

T20 PIV Multi Tech Reader Black: C305460

T20 PIV Multi Tech Reader White: C305461

T20 Mifare Terminal Black: C300450

T20 Mifare Terminal White: C300451

T20 Multi Tech Terminal Black: C300460

T20 Multi Tech Terminal White: C300461



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1 The Gallagher T20 Terminal

The Gallagher T20 Terminal is available in a variety of variants. The variant you have purchased determines the available functionality and supported card technologies for the terminal. For variant details, refer to the *"Terminal variants feature summary"* on page 16 of this note.

The Alarms Terminal variants (C300463 and C300464) are used for alarms management only, (i.e. do not contain a smart card proximity reader).

The terminal 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, a Gallagher Mounting Block (C300930 or C300931) or any solid flat surface.

The terminal sends information to the Gallagher Controller and acts upon information sent from the Gallagher Controller. The terminal itself does not make any access decisions.

For instructions on how to use this product, refer to the *"3E3685 Gallagher T20 Terminal User Guide"* which can be downloaded from here: <https://security-support.gallagher.com>

2 Before you begin

2.1 Shipment contents

Check the shipment contains the following items:

- 1 x Gallagher T20 Terminal facia assembly
- 1 x Gallagher T20 Terminal base
- 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 T20 Terminal 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 terminal.

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

2.3 Cabling

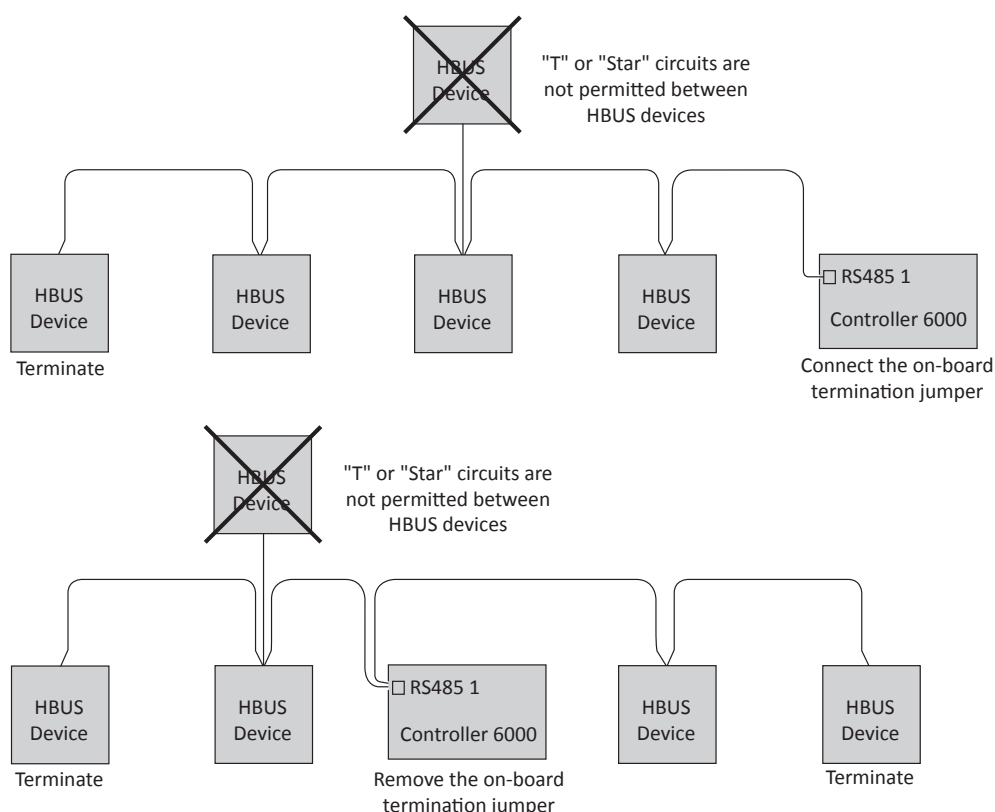
The Gallagher T20 Terminal requires a minimum cable size of 4 core 24 AWG (0.2 mm²) stranded security cable. This cable allows the transmission of data (2 wires) and power (2 wires). When using a single cable to carry both power supply and data, both the power supply voltage drop and data requirements must be considered. Although the terminal is specified to operate at 9 Vdc, for good engineering design it is recommended that the voltage at the terminal should be approximately 12 Vdc.

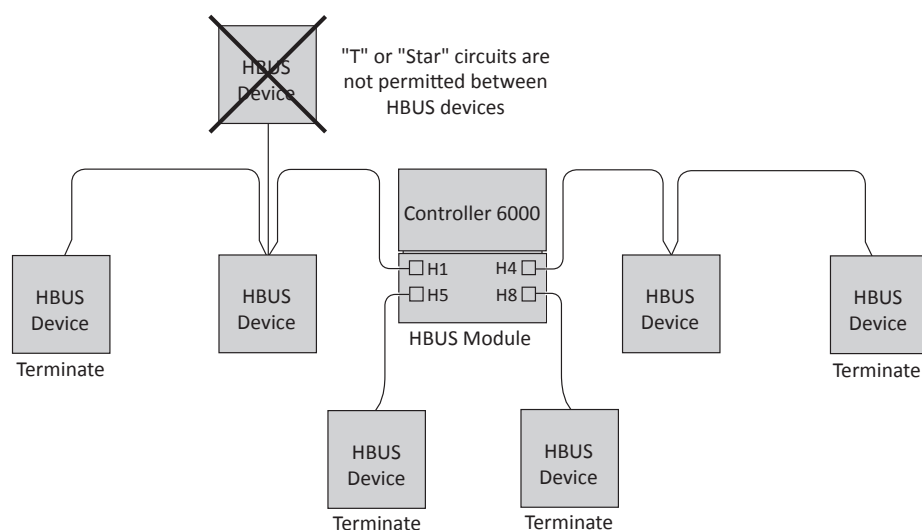
HBUS cabling topology

The HBUS communications protocol is based on the RS485 standard and allows the terminal 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 the Gallagher T20 Terminal, 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 terminal connected using HBUS data only in a single cable	Single terminal connected using Cardax IV data only in a single cable***	Single terminal 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)	200 m (650 ft)	50 m (165 ft)
BELDEN 9842** (shielded)	2 twisted pair Each 2 x 0.2 mm ² (24 AWG)	500 m (1640 ft)	200 m (650 ft)	50 m (165 ft)
SEC472	4 x 0.2 mm ² Not twisted pairs (24 AWG)	400 m (1310 ft)	200 m (650 ft)	50 m (165 ft)
SEC4142	4 x 0.4 mm ² Not twisted pairs (21 AWG)	400 m (1310 ft)	200 m (650 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.

*** Not applicable for PIV or Alarm Terminal installations.

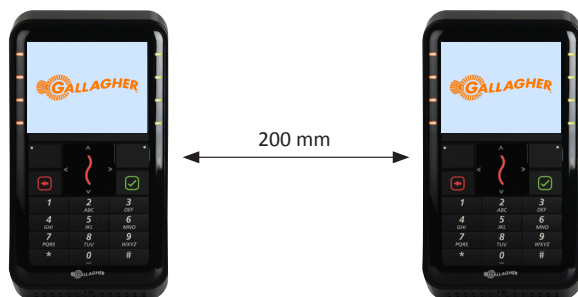
Notes:

- 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 T20 terminals can be connected to one Controller 6000. Of these 20 terminals, up to 4 could be configured for alarm zone (or fence controller) management.

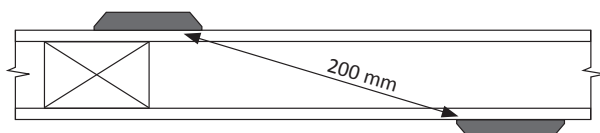
A terminal is configured for alarm zone management when it has either Alarm Zones configured on the **Alarm Zones** properties page or items configured upon its mimic panel.

3 Distance between proximity 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 T20 Terminal can be mounted on:

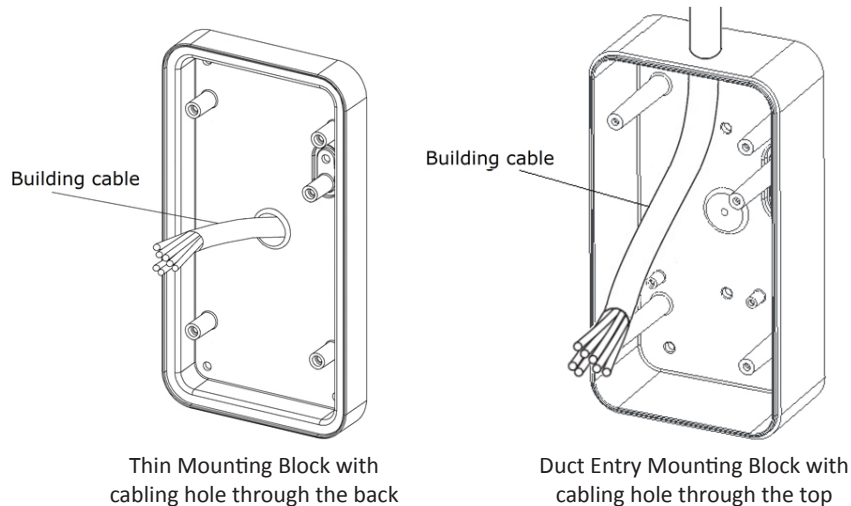
- a vertical, rectangular 50 mm x 75 mm (2 in x 3 in) flush box
- a BS 4662 British Standard square flush box
- a Gallagher Mounting Block (C300930 or C300931)
- any solid flat surface

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

Notes:

- 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. A spacer (C300306 or C300307) can be used to help mitigate this issue.
- A black dress plate (C300323) can be used to cover previously installed terminals ensuring a clean finish for sites handling an upgrade.
- 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. Are you installing the T20 Terminal on a Gallagher T20 Mounting Block?
If no, then go to Step 2.
If yes, then complete the following:
 - A. If using the Duct Entry variant (C300931) of the T20 Mounting Block, take the cover off it.
 - B. Mark the holes for the mounting screws on the mounting surface.
 - C. Drill the holes for the mounting screws.
 - D. Make a cabling hole in the Mounting Block and run the building cable through the hole, as demonstrated next.



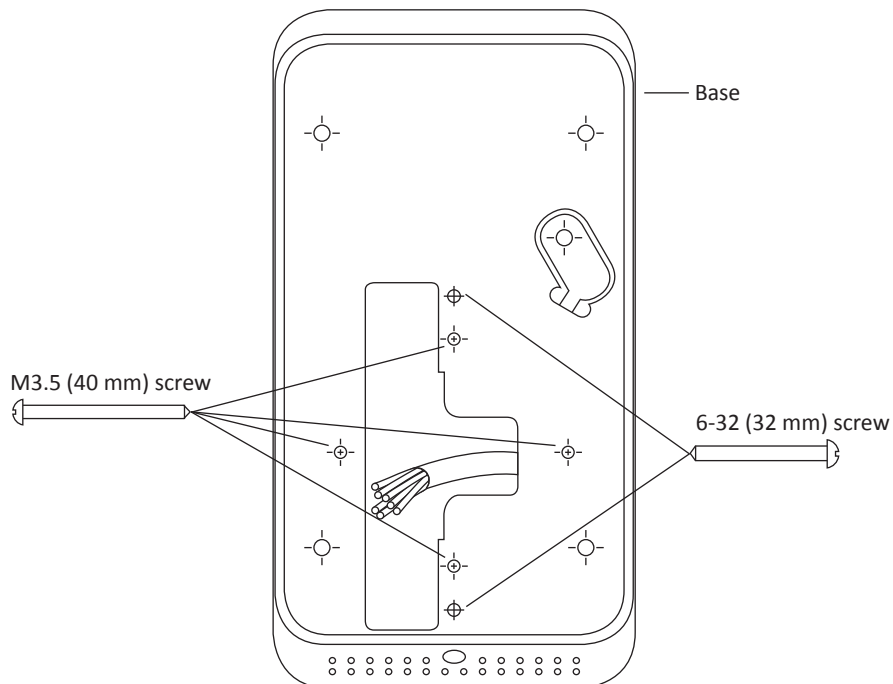
- E. Fit the terminal base (pictured at Step 5) to the Mounting Block as appropriate for the Mounting Block variant you are installing, as follows:
 - Duct Entry variant (C300931)**
 - Secure the T20 Mounting Block to the mounting surface using the screws provided.
 - Position the terminal over the Mounting Block cover, and secure them both to the Mounting Block using the screws provided.
 - Thin variant (C300930)**
 - Position the terminal base over the T20 Mounting Block.
 - Secure them both to the mounting surface using the screws provided.
 - F. Go to Step 6.
2. Ensure the building cable has been run out through the flush box.

If you are not mounting to a flush box, use the terminal base 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 terminal fascia can clip into the base.

Note: There is no room for the building cable to be squeezed into the terminal base. The building cable must remain within the flush box or wall cavity.
 3. Run the building cable through the terminal base.

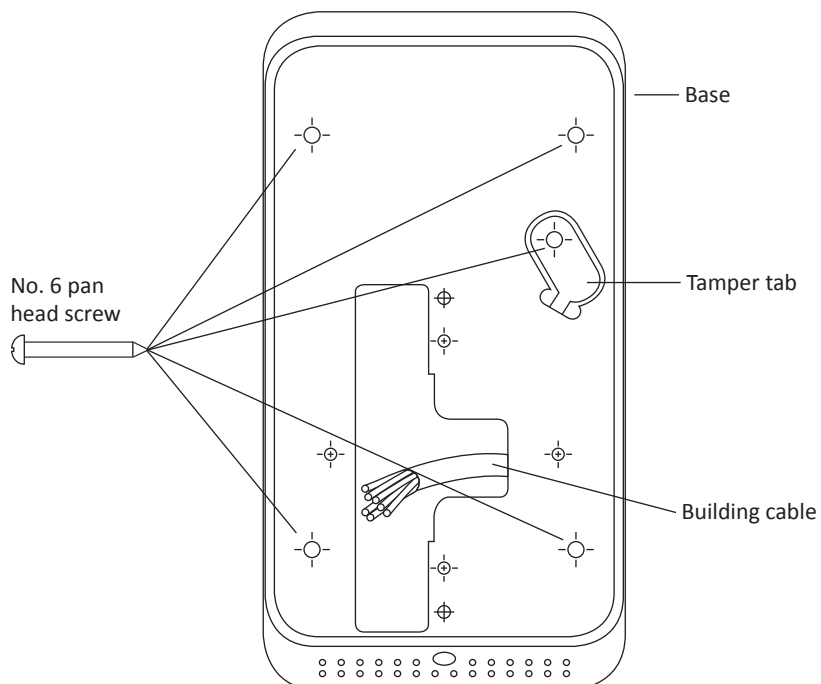
Note: If the terminal has already been connected to the building cable, you can pass the fascia through the base. Care must be taken to avoid scratching the screen and keypad when passing the fascia through the base.
 4. Secure the base to the flush box using the two screws provided.

When securing the base to a vertical, rectangular flush box, use the 6-32 UNC screws provided. When securing the base to a BS 4662 British Standard square flush box, use the M3.5 screws provided.



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

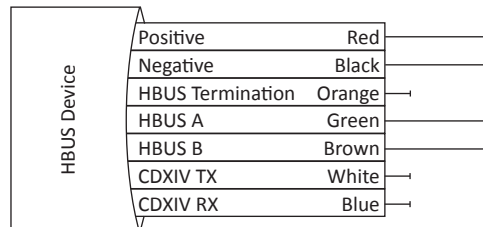
Note: It is strongly recommended that you use the screws provided. If an alternative screw is used, the head must be no larger nor deeper than that of the screw provided.



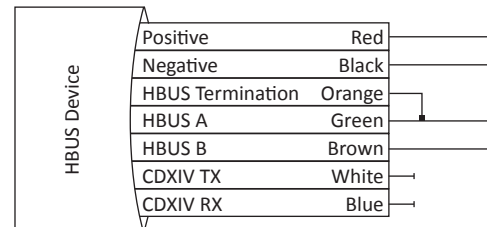
6. Connect the terminal tail extending from the facia assembly to the building cable. Connect the wires for the appropriate device you wish to interface, either an HBUS device or a Cardax IV device, as shown:

Note: T20 Terminals using alarms management functionality and T20 PIV Readers must be connected as HBUS devices.

HBUS connections:

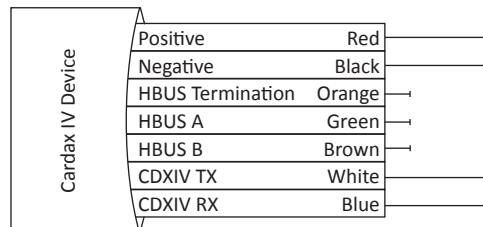


HBUS connections terminated:



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

Cardax IV connections:

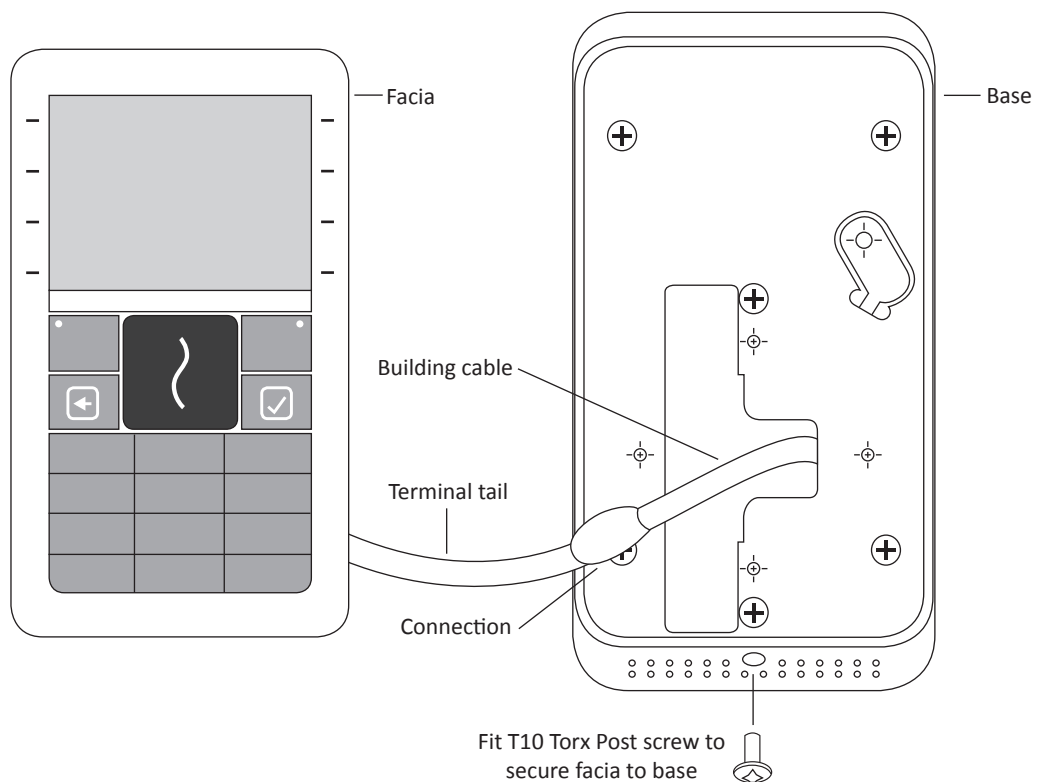


7. Fit the facia assembly into the base by clipping the small lip, into the top of the base and holding the top, press the bottom of the facia assembly down into the base.

Note: Ensure that there is no pressure upon the wire set as it exits the terminal. Ensure the wire set does not exit the reader at a sharp angle, as this may compromise the integrity of the wire set's water seal.

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

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.

10. Configure the terminal in Command Centre.

If the terminal is connected as an HBUS device, refer to the topic "*Configuring an HBUS Terminal*", "*Configuring an HBUS Alarms Only Terminal*" or "*Configuring the PIV Card Reader*" in the Command Centre Configuration Client Online Help.

If the terminal is connected as a Cardax IV device, refer to the topic "*Creating Readers*" in the Command Centre Configuration Client Online Help.

5 Connections

HBUS Connections

An HBUS terminal connects to one of the following devices:

- Gallagher Controller 6000
- Gallagher 4H/8H HBUS Module (attached to the Controller 6000)
- Gallagher HBUS Door Module (connected to a Controller 6000)

Refer to "*HBUS Connections*" in the applicable installation note, for details regarding HBUS terminal connections.

Cardax IV Connections

A Cardax IV terminal connects to one of the following devices:

- Gallagher 4R/8R Reader Module (attached to the 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)
- Gallagher Local Bus Reader I/O Interface

Refer to "*Cardax IV Reader Connections*" in the applicable installation note, for details regarding Cardax IV terminal connections.

6 HBUS LED indications

LED (squiggle)	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.

7 Cardax IV LED indications

LED (squiggle)	Indication
3 Flash (Amber)	No communications with the Controller. The reader screen displays the text 'Connecting...'
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.

8 T20 Terminal products

T20 Terminals	Product Code
T20 Mifare Terminal, Black	C300450
T20 Mifare Terminal, White	C300451
T20 Multi Tech Terminal, Black	C300460
T20 Multi Tech Terminal, White	C300461
T20 Alarms Terminal, Black	C300463
T20 Alarms Terminal, White	C300464
T20 PIV Reader, Black	C305450
T20 PIV Reader, White	C305451
T20 PIV Multi Tech Reader, Black	C305460
T20 PIV Multi Tech Reader, White	C305461

T20 Terminal Accessories	Product Code
T20 Dress Plate, Black, Pk 5	C300323
T20 Bezel, Black, Pk 5	C300292
T20 Bezel, White, Pk 5	C300293
T20 Bezel, Silver, Pk 5	C300294
T20 Bezel, Gold, Pk 5	C300295
T20 Spacer, Black, Pk 5	C300306
T20 Spacer, White, Pk 5	C300307
T20 Protective Cover	C300272
T20 Protective Cover Spacer	C300312
T20 Mounting Block, Thin, Pk 8	C300930
T20 Mounting Block, Duct Entry, Pk 8	C300931

9 Screen brightness

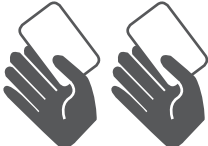
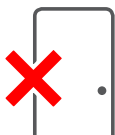
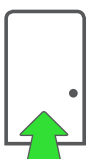
When the terminal is in use the screen brightness will be set to full. If the terminal hasn't been used for 30 seconds, the screen brightness is dimmed. If the terminal hasn't been used for 30 minutes, the screen is turned off.

HBUS Functionality vEL7.30 (or later): The terminal screen can be set to on at all times ('Always on' setting enabled on the items property page in Command Centre). If this setting is enabled, the terminal's screen will not turn off after 30 minutes, but will dim after 30 seconds of inactivity.

10 Information screen

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

11 Access control icons

Arming Failed (Cardax IV Reader only) 	Arming Succeeded (Cardax IV Reader only) 	Armed 
Present Card 	Present Two Cards 	Enter PIN/Code 
Access Granted 	Access Denied 	Wrong PIN/Code (Cardax IV Reader only) 
Free Access 	Not Allowed 	Card or Code 

12 Technical specifications

Routine maintenance:	Not applicable for this terminal.	
Cleaning:	This terminal should be cleaned with mild soapy water only. Do not use solvents or abrasives.	
Voltage:	9 Vdc - 16 Vdc	
Current:	Inactive ¹	Active ²
T20 Mifare Terminal (at 9 Vdc):	191 mA	300 mA
T20 Mifare Terminal (at 13.6 Vdc):	140 mA	200 mA
T20 Multi Tech Terminal (at 9 Vdc):	262 mA	335 mA
T20 Multi Tech Terminal (at 13.6 Vdc):	189 mA	282 mA
T20 Alarms Terminal (at 9 Vdc):	140 mA	250 mA
T20 Alarms Terminal (at 13.6 Vdc):	110 mA	190 mA
Temperature range:	-30 °C to +70 °C (-22 °F to +158 °F) Note: Direct sunlight may increase the internal terminal temperature above the ambient temperature level.	
Humidity:	95% non condensing ⁴	
Environmental protection:	IP66 (independently verified)	
Impact rating:	IK08 (independently verified)	
Unit dimensions:	Height 179.5 mm (7.1 in) Width 95.7 mm (3.8 in) Depth 23 mm (0.9 in)	
Maximum number of readers on one HBUS cable:	20	
Maximum number of alarms management terminals ³ on one Controller 6000:	4	
Maximum number of terminals on one Controller 6000:	20	

¹ The terminal is idle. The screen is on.

² A card is being read or the screen is at maximum brightness.

³ A terminal 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 terminal (HBUS Terminal or HBUS Alarms Only Terminal) in Command Centre. Changing the configuration may vary the current value.

13 Terminal variants feature summary

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

Terminal Variant	Product Codes	Cardax IV Functionality	Cardax IV Supported From:	HBUS Functionality	HBUS Access Supported From:	HBUS Alarms Management Supported From:	HBUS Fence Zone Management Supported From:	Card Variants Supported
T20 Mifare Terminal	C300450 C300451	Access Control	vHT1.0.69	Access Control Alarms Management	vHT2.0.121 (vEL7.20)	vHT3.0 (vEL7.30)	vHT4.0 (vEL7.40)	Mifare DESFire EV1, Mifare Plus and Mifare Classic cards
T20 Multi Tech Terminal	C300460 C300461	Access Control	vHT1.0.69	Access Control Alarms Management	vHT2.0.121 (vEL7.20)	vHT3.0 (vEL7.30)	vHT4.0 (vEL7.40)	Mifare DESFire EV1, Mifare Plus, Mifare Classic and 125 KHz cards
T20 Alarms Terminal	C300463 C300464	None	None	Alarms Management	None	vHT3.0 (vEL7.30)	vHT4.0 (vEL7.40)	None
T20 PIV Reader	C305450 C305451 C305460 C305461	None	None	Access Control Alarms Management	vHT2.01.02 (vEL7.21)	vHT3.0 (vEL7.30)	vHT4.0 (vEL7.40)	PIV, PIV-I, CAC, TWIC, Mifare DESFire EV1, Mifare Plus, Mifare Classic cards and 125 KHz cards (125 KHz are for C305460 only)

IMPORTANT: Gallagher Multi Tech Terminals

Using dual technology 125/Mifare cards with Gallagher Multi Tech terminals may cause both card technologies to be read, resulting in double card badges and unusual reader feedback. From Command Centre vEL7.00 a site can specify which technology a Multi Tech terminal should read from a dual technology card. Gallagher strongly recommends against using dual technology 125/Mifare cards with Gallagher Multi Tech terminals for sites running pre-Command Centre vEL7.00 software.

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

14 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.

RoHS COMPLIANT

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.

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.



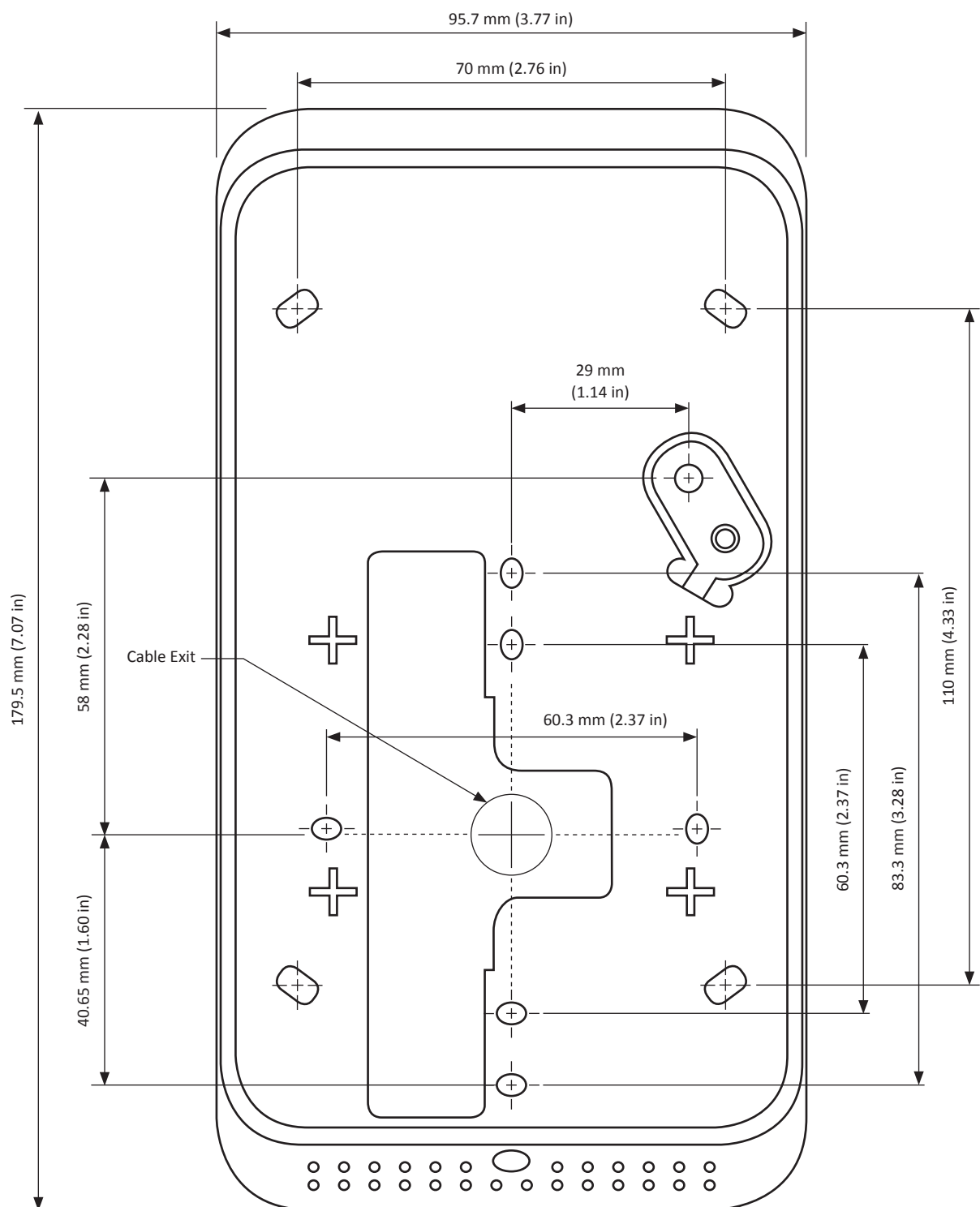
ETSI EN 300 330-2 V1.5.1:2011
EN50130-4:1996



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

Note: The Alarms Terminal variants (C300463 and C300464) have not been evaluated by UL. 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.

15 Mounting dimensions



IMPORTANT

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

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Version 2, June 1991

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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THE BASIC LIBRARY FUNCTIONS

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