Connected Services Gateway Installation Instructions

01/2024

Introduction

Use this information to install the Connected Services Gateway Module (CSG) for use with Fireclass FC501 series, FC503, FC506, FC600 series and FC700 series fire alarm control panels.

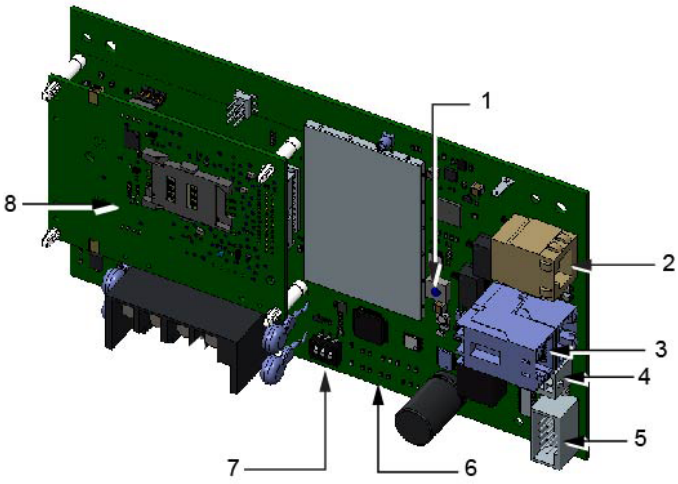
Overview

The CSG provides permanent connected services, central station reporting, or both for fire panels. You can mount the CSG internally (Model CSG-F-Internal) in the fire panel or externally (Model CSG-F). The CSG connects with a LAN Ethernet or cellular connection.

The CSG provides the following capabilities:

- Central station reporting features: IP, and cellular.
- Enterprise server monitoring features: IP and cellular capabilities.

Figure 1: Connected Services Gateway module



Callout	Description
1	Reset switch
2	LAN Ethernet: connects to the building LAN ⓘ **Note:** Use a shielded Ethernet cable.
3	Panel Side Ethernet 1/2: fire panel side Ethernet ports: connects to fire panel
4	4 pin power connector
5	Serial port: connects CSG module to the fire panel over a serial interface
6	Status LEDs
7	Configuration DIP switches
8	**Optional**: Cellular module

Shipping box contents

The External Gateway (CSG-F)

- Connected Services Gateway module (PCBA)
- Connected Services Gateway metal enclosure
- 3.0 m RS232 serial cable
- 3.0 m RJ11 serial cable
- 3.0 m power harness

Internal Gateway (CSG-F-Internal)

You can install the CSG-F-Internal module inside a FC503 or FC506 panel. The CSG-F-Internal ordering kit contains the following items:

- Connected Services Gateway module (PCBA)
- 0.5 m power cable
- 0.6 m RS232 serial Cable
- Screws for mounting

ⓘ **Note:**

- An optional cellular module is required for cellular connections. It is supplied with an antenna that mounts on the external CSG enclosure. An additional antenna extension kit can be used with the external CSG-F if there is poor signal strength at the fire alarm control panel. For additional information about the cellular module and antenna extension kits, refer to the *Connected Services Gateway Cellular Module and Antenna Installation Instructions A16382BPLW*.
- To use cloud and central station features with FC501 series, FC503, and FC506 panels, you must have a RS232 serial cable for panel to CSG communication.

- To use cloud applications in the FC600 series and FC700 series panels, you must have a RJ11 serial cable or Ethernet for panel to CSG communication.
- To use central stations features with the FC600 series and FC700 series panels, you must use Ethernet.

Installation prerequisites

The firmware must be at the stated version, or higher, to be compatible with the CSG. See Table 1.

⚠ **CAUTION:** Electrical voltage is present during installation, ensure safe isolation of the mains supply before commencing work.

Table 1: Compatible fire alarm control panel firmware

Panel interface	FC501 series panels	FC503 and FC506 panels	FC600 and FC700 series panels
Ethernet	—	—	v29.2
COM1 (third party interface)	—	—	v29.2
Serial port RS 232 (PC LINK)	1.14.08	1.02.09	—

- Internet connection:
  - For LAN Ethernet connections to cloud services, use a wired Internet connection.
  - For communication on the Ethernet port, use a shielded Ethernet cable.
  - For cellular connections to cloud services, strong cellular signal reception must be available.

ⓘ **Note:** At the fire alarm control panel, use the CSG cellular LEDs to check the cellular signal strength, see Table 10. If there is a poor cellular signal at the fire alarm control panel, you can install the CSG in an area with better signal quality up to a maximum Ethernet cable length of 3.0 m. You can use an optional antenna extension kit to mount the antenna remotely in an area with better cellular signal and greater mounting space.

Interfacing with the fire alarm control panel

- **Ethernet connection**: FC600 series and FC700 series
- **Serial connection**: FC501 series, FC503, FC506, FC600 series, and FC700 series

Preparing for the CSG-F installation

1. Select an appropriate installation location for the CSG-F enclosure.
2. Couple the panel and the CSG-F enclosure either less than a palm's distance apart, or at the maximum supported distance specified for the wiring in a metal conduit.
3. Mount the CSG-F enclosure.
4. **Optional**: Mount the cellular module and antenna if required.
5. Connect the CSG-F to the fire alarm control panel. The CSG-F connects to the panel with an Ethernet connection or a serial connection.
6. Use the provided power harness (see CSG-F to panel communication, long cable details) to connect the CSG to the power supply of the fire alarm control panel.
7. The CSG-F connects automatically to cloud services by a LAN Ethernet connection or the optional cellular module.
8. Check the status LEDs on the CSG-F board to confirm that the CSG-F is connected and operates correctly.
9. Fit the lid of the CSG-F enclosure.

CSG-F to panel communication, long cable details

- 0734-381 Ext Gateway serial cable
- 0734-382 Ext Gateway power cable
- 0734-385 Ext Gateway RJ11 serial cable

Notes:

- The 0734-382 Ext Gateway power cable ships with the product and must be assembled by an installer, with one side of the connector connecting to the 4 pin power connector, shown in Figure 1.
- The FC501, FC503 and FC506 panels use the 0734-381 Ext Gateway RS232 serial cable.
- If using a serial connection, the FC600 and FC700 series panels use the 0734-385 Ext Gateway RJ11 serial cable.
- The 0734-381 and 0734-385 cables both ship with the product and need to be assembled by an installer, with one side of the connector connecting to the serial port, shown in Figure 1. This connects the CSG-F to the fire panel over a serial interface.

Mounting the external CSG-F enclosure

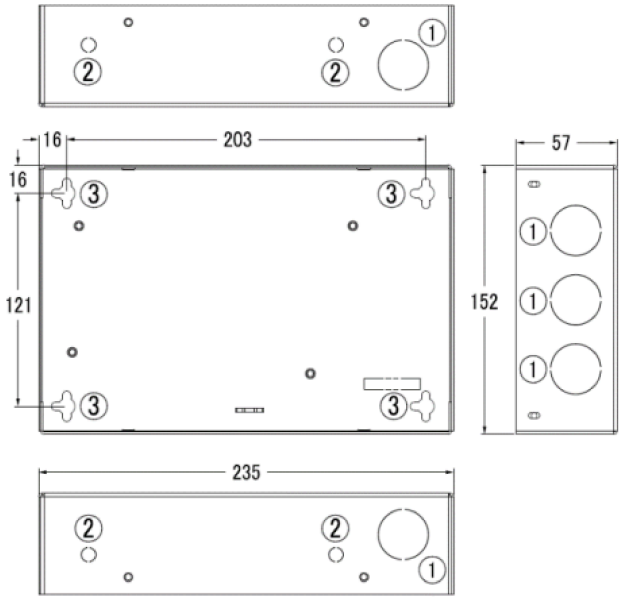
Before mounting the CSG-F enclosure, ensure compliance with local regulations. Consult local regulations for the following information, for example:

- Wiring specification
- Enclosure siting restrictions
- Environmental conditions
- Qualifications of personnel

To mount the CSG-F enclosure, complete the following steps:

1. Check the mounting location and position.
   - The enclosure is not weatherproof. Check that the location is indoors, dry, and free from excessive dust.
   - Use the dimensions in Figure 2 to double-check the enclosure mounting position. Figure 2 provides guidance on the cable entry points through the enclosure walls.
   - The area selected for mounting must have strong cellular signal reception and must not exceed the maximum Ethernet cable run of 3 m from the fire alarm control panel.
2. Where necessary, as required by the cabling runs, remove knockouts from the CSG-F enclosure walls.
3. Decide on a wall mounting method and assess the required sizes of the fastenings and lengths of the harnesses. Consider the type of wall and the weight of the assembled enclosure.
4. Remove the CSG-F board from the enclosure.
5. Mark the #3 holes shown on Figure 2 positions on the wall. Drill and plug these holes.
6. Insert screws to suspend the enclosure.
7. Fix the enclosure to the wall using provided screws.
8. **Optional:** If you use the cellular module, mount it on to the CSG-F board. For more information, refer to the *Connected Services Gateway Cellular Module and Antenna Installation Instructions A16382BPLW*.
9. Replace the CSG-F board in the enclosure, see Figure 3.

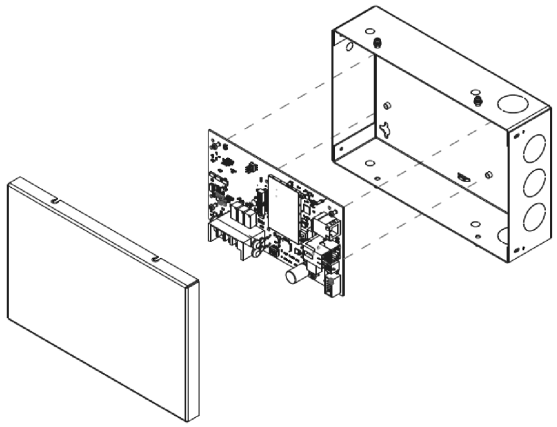
Figure 2: Overall and fixing dimensions



Note: All dimensions are in mm.

Callout	Description
1	Knockout (4X)
2	Knockouts (5X)
3	Mounting hole #10-32 screw (4X)

Figure 3: CSG-F PCA mounting

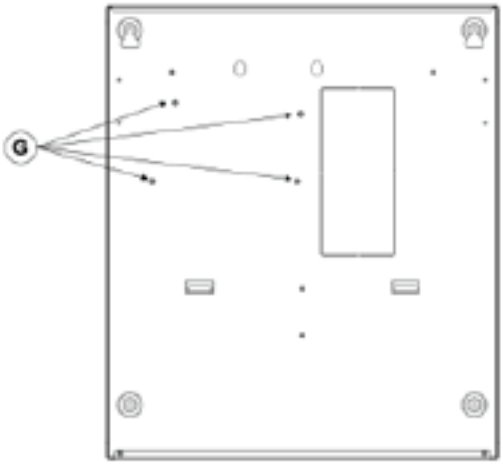


Mounting the CSG-F-Internal in FC506 and FC503 panel enclosures

The FC501 panel supports the external CSG-F only. Install the CSG-F outside the FC501 panel enclosure.

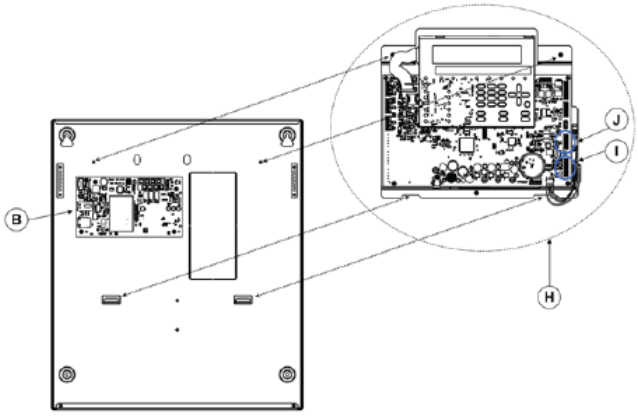
Before you install a PCA in the CSG-F housing, turn off the module and disconnect respective wiring connections.

Figure 4: Mounting Features on Backbox for mounting the CSG-F-Internal



Callout	Description
G	Four stand-offs to mount CSG-F-Internal

Figure 5: Installing the CSG-F-Internal inside the panel



Callout	Description
B	0566-1387 CSG-F-Internal, PCA
H	Subassembly including the items C, D & E (From Figure 6)
J	FC503/506 Terminal M4 – For CSG Shield termination
I	FC503/506 Terminal M8 - Auxiliary output for CSG Power termination.

Installing the CSG-F-Internal

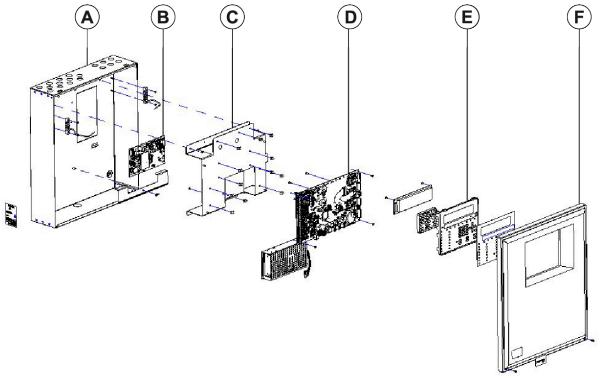
Note:

Before you start the installation of the CSG-F-Internal, take adequate precautions to prevent damage due to electrostatic discharge, as the electronic components on the display board and control board are sensitive.

Before installation, keep components wrapped in anti-static material at all times. Ground yourself before opening or installing components, by wearing anti-static wrist bands or shoes.

1. Remove the two screws from the cover (plastic door, see Figure 6, item F) and open the control panel. Lift the lower part of the cover and push upwards to fully remove the cover from the panel assembly.

Figure 6: Mounting the CSG-F-Internal



Callout	Description
A	120-135-084 enclosure cabinet
B	0566-1387 CSG-F-Internal, PCA
C	120-130-199 Chassis metal
D	120-685-243 PCBA
E	125-558-022 Plastic frame UI
F	120-136-077 Plastic door

2. Disconnect the earth cables from main board at the top left and right of the control panel chassis.
3. Remove any external loop wiring from the motherboard.
4. Remove the chassis, including power supply and control board (See Figure 5, Item H) from its fixings by unscrewing the screws on the chassis. Remove the top left and right screws completely. Push chassis upwards and remove. See Figure 5, item H.
5. Do not remove the power supply or control board from the chassis. Handle the chassis carefully to avoid damage and place it safely to one side.
6. Locate the four standoffs and #10-32 screws to mount the CSG-F-Internal PCA to the Cabinet. See Figure 6, item G.
7. Assemble the CSG-F-Internal PCA on these four standoffs with the #10-32 screw provided with the module.
8. Perform CSG wiring by connecting one end of cable with mating connector to 4 pin power connector on the CSG-F-internal board and the other open ended cables to the terminals on Panel Board.
9. In the Open end of power cables, connect the RED wire to 24A Terminal of M8, BLACK wire to GND of terminal M8 and GREEN earth wire to EARTH/ SHIELD on Terminal M4. Terminal M8 and M8 position highlighted in Figure 5.
10. After completing wiring of CSG, install the snap-in ferrite on the power cable. It should be near to CSG PCA.
11. Refit the chassis subassembly using the two resting features at the bottom of the cabinet and the top two mounting screws.
12. Reconnect the earth shield wire to the main board.
13. Refer the Control Panel Installation guide (120.515.873_FC-FC500-P-I) for rest steps from 11 to 16 in section “Installing the control panel” to complete the control panel installation.

To mount the CSG-F-Internal enclosure inside the FC503/ FC506 panel enclosure, complete the following steps:

1. Check the mounting location and position. Check that the location is dry, and free from excessive dust.
2. Use the dimensions in Figure 2 to double-check the CSG-F-Internal mounting position.
3. Use four standoffs and #10-32 screws to mount the CSG-F-Internal PCA (see item B in Figure 6) to the enclosure (see item A).
4. Use screws to mount the top of the bracket (item C in Figure 6) to the cabinet enclosure and snap on the lances at the bottom.
5. Use screws to mount the PCBA (item D) to the metal bracket (item C). Then attach the UI Assy (item E) to the PCBA.
6. Use snaps and screws to attach the door (item F) to the cabinet enclosure (item A).

Optional: Mounting the cellular module and antenna

If you are using the optional cellular module, refer to the *Connected Services Gateway Cellular Module and Antenna Installation Instructions A16382BPLW* for mounting instructions before you connect the CSG to the fire alarm control panel.

Connecting the CSG to the fire alarm control panel

The CSG connects to the fire alarm control panel with an Ethernet or serial connection depending on the fire panel type. See Table 2 to determine the applicable connection type.

Table 2: Fire panel to CSG connections

Fire panel to CSG connection	Fire panel models	Max mounting cable length between panel and CSG
Ethernet	FC702S FC702D FC708D FC718D FC602 FC602-SCAN FC604S FC604-SCAN	3.0 m
Serial (RS232)	FC501-H FC501-L FC501-HK FC503 FC506	3.0 m
Serial (RJ11)	FC702S FC702D FC708D FC718D FC602 FC602-SCAN FC604S FC604-SCAN	3.0 m

Note: The wiring must be in a metal conduit to support the specified maximum distance.

Connecting the CSG to the fire alarm control panel using an Ethernet connection

The CSG connects to the fire alarm control panel with an Ethernet connection using the panel side Ethernet 1/2. See item 3 in Figure 1. Connect the CSG to the fire alarm control panel using the Ethernet port or, if the Ethernet port is in use, an Ethernet switch.

Note: If you are using an Ethernet switch, you must use the PCS800: Fireclass Ethernet Switch, for more information see Ordering information.

For an Ethernet port, complete the following steps:

1. Insert the Ethernet cable into the panel side Ethernet 1/2 of the CSG.
2. Insert the other end of the Ethernet cable into the RJ45 Ethernet port on the CPU card of the fire alarm control panel.

For an Ethernet switch, complete the following steps:

1. Ensure that the Fireclass Ethernet Switch is inside the fire alarm control panel.
2. Connect the Ethernet switch to the Ethernet port of the fire alarm control panel.
3. Use another Ethernet cable to connect the panel side Ethernet 1/2 of the CSG to a port on the Ethernet switch.

See Table 3 for more details about connecting the CSG to the fire alarm control panel.

Table 3: For Fireclass panels to CSG ethernet connection

Fire alarm control panel connection		CSG connection		Description	Cable specifications
Panel 24 V supply	0 V 24 V	CSG supply port (P2)	0 V 24 V	Connect the cable from the fire alarm control panel 24 V supply to the CSG supply terminals.	Copper, 0.517 mm^2 AWG 20, 2 core (Red and Black)
Ethernet		Panel Side Ethernet 1/2		Connect the Ethernet cable between the fire alarm control panel RJ45 and Panel Side Ethernet 1/2.	Category 5 or higher

Connecting the CSG-F or CSG-F-Internal to the fire alarm control panel using serial RS232 port connection

The CSG-F or CSG-F-Internal connects to the Fireclass FC501 series, FC503, FC506, FC600 series, and FC700 series panels using the serial RS232 port for remote services. The CSG board serial port connects to COM1 port on the fire panel.

To connect the CSG to the fire alarm control panels, complete the following steps:

1. Insert the cable into the serial port of the CSG.
2. Insert the other end of the cable into the COM1 port on the fire alarm control panel.

See Table 4 for further details about connecting CSG to the fire alarm control panel.

Table 4: For Fireclass panels to CSG serial connection

Fire alarm control panel connection		CSG connection		Description	Cable specifications
Panel 24 V supply	0 V 24 V	CSG supply port (P2)	0 V 24 V	Connect the cable from the fire panel 24 V supply to the CSG supply terminals	Copper, 0.517 mm^2 AWG 20, 2core (red and black)
Serial		Serial port (P1)		Connect the serial cable between the serial port (RS232) and the COM1 port of the fire alarm control panel	—

Configuring the CSG IP address and fire alarm control panel

The CSG uses a fixed IP address: `192.168.1.109`.

Configure any available LNET node in Fireclass Express to connect the CSG. Set the IP address of the node as `192.168.1.109`.

Note:

If you configure the CSG set at LNET 8, and get the error message: *Error : 1100: (Panel 1) Primary GUI must exist at LNET 1*, set the CSG at LNET 1 using fixed IP address: `192.168.1.109`.

The error is cleared, and signalling using the CSG is not supported.

If you do not use Fireclass Express to configure the fixed IP address, the CSG cannot connect to the fire alarm control panel.

Connecting the CSG to the power supply

The CSG is powered through the power harness included in the shipped box. To connect the CSG-F to the power supply, complete the following steps:

1. Connect the power harness to the 4 pin power connector on the CSG. See item 4 in Figure 1.
2. Connect the other end of the power harness to the fire alarm control panel 24 V supply by following the wire sequence: red wire to the panel's 24 V supply and the black wire to 0 V.

Note: Trim off any excess cable from the unterminated end of the power cable. Do not coil-up and tie-off excess cable in the CSG enclosure.

To connect the CSG-F-Internal to the power supply, complete the following steps:

1. Connect the power harness to the 4 pin power connector on the CSG-F-Internal. See item 4 in Figure 1.
2. Connect the other end of the power harness to the fire alarm control panel's 24 V supply by following the wire sequence: red wire to the panel's 24 V supply and the black wire to 0 V.
3. For the CSG-F-Internal, install the hinged ferrite core on the power cable with one loop. You must place the ferrite close to the CSG-F-Internal power connector.

Figure 7: CSG EN 54-21 power supply connection

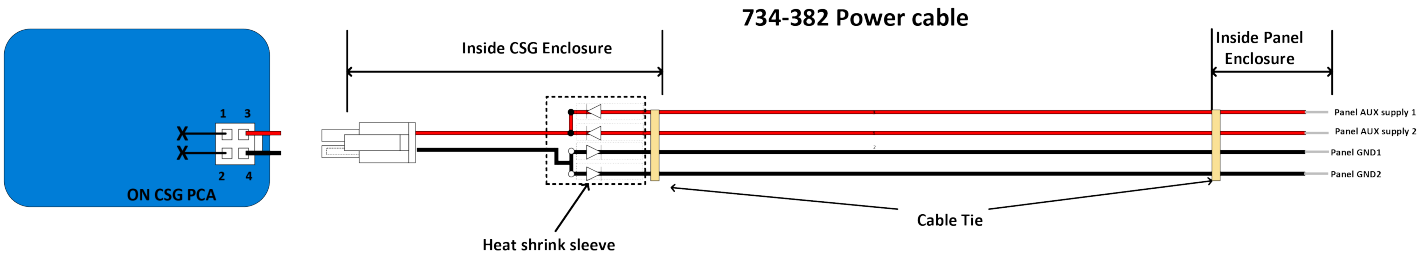
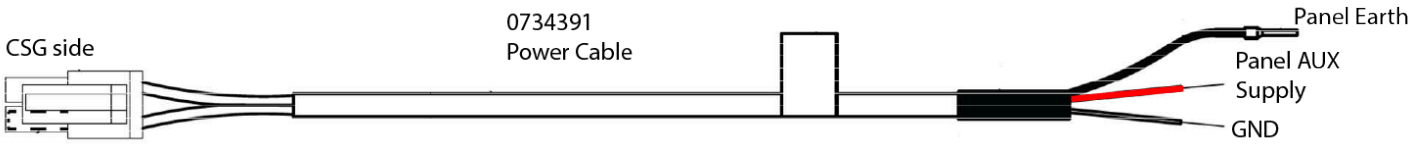


Figure 8: CSG-F-Internal power supply connection



Connecting the CSG to cloud services

The CSG connects automatically to cloud services when it is powered up with a connection to the Internet using a LAN Ethernet or cellular connection.

LAN connection requirements

- Install the provided snap ferrite on LAN cable inside the panel for the internal CSG.
- The LAN Ethernet ports are auto-crossover and compatible with 802.3u, 100Base-TX type standard RJ45 type connections.
- Crossover cables are not required.
- Use Category 5 Ethernet cable (CAT5) or higher for 100 Mbit operation.
- The maximum cable run between the panel and the CSG is 3 m. The cable run between the CSG and the building LAN can be greater than 3 m.
- **Important**: Do not connect a LAN to the Panel Side Ethernet 1/2 as this creates a security risk and can cause disruption to the building LAN. Only Panel Side Ethernet 1/2 can be used to connect the CSG to the fire system.
- The LAN configuration is DHCP. For further configuration details, see *Connected Services Gateway Setup Guide for Fireclass Fire Panels 579-1466*.
- The Communication is TCP on Port 443, outbound connections only.
- Secure communications using OpenSSL.

Troubleshooting the LAN Ethernet cloud services connection

If the CSG does not automatically connect to cloud services, check the following:

- Ensure that the CSG is connected to the power supply and is turned on.
- Ensure that the building LAN Ethernet port is connected to the Internet.
- Ensure that the IP address fixed for the CSG and for the DHCP server are in different ranges.
- See Table 9 to check the status of the Ethernet connection.

Troubleshooting the cellular cloud services connection

The CSG auto-detects the cellular module and connects to cloud services automatically. If the cloud services do not automatically connect, check the following:

- Ensure that the CSG is connected to a power source.
- Ensure that no Ethernet cable is connected to the LAN Ethernet connector Port 3 on the CSG. See Item 2 in Figure 1. If the building LAN is connected, the CSG switches from cellular to LAN Ethernet connection automatically.
- See Table 10 to check the status of the cellular module connection.

Central station transmission paths

The module can perform central station reporting. You can configure central station reporting with one path, or dual paths with a Primary and Secondary path. You can configure the Primary and Secondary paths to use any of the external connections, cellular or LAN Ethernet connections.

IP (cellular and Ethernet) connection types can communicate with the digital alarm communications receiver (DACR) at the central station. See Table 5 for possible transmission path combinations.

You can connect the lines to other telecoms equipment, but you must wire the module electrically first in the chain. The Ethernet connections are standard Ethernet with access to the Internet. Central station communications are monitored for integrity.

For information about programming and CSG configuration for Fireclass panels, refer to *Connected Services Gateway Setup Guide for Fireclass Fire Panels 579-1466*.

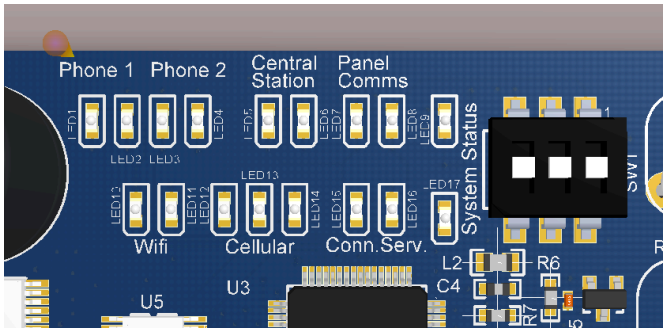
Table 5: Transmission path combinations

Scenario	Primary path	Secondary path
Scenario 1	IP*	IP*
* IP can be cellular or wired (1 maximum each).		

Confirming connections

Check the LEDs on the CSG and any Ethernet ports in use to confirm that the connections are operating correctly. See Figure 9 for the location of the LEDs. See Checking the LEDs for more information on the status of the different LEDs.

Figure 9: Location of the LEDs on the CSG

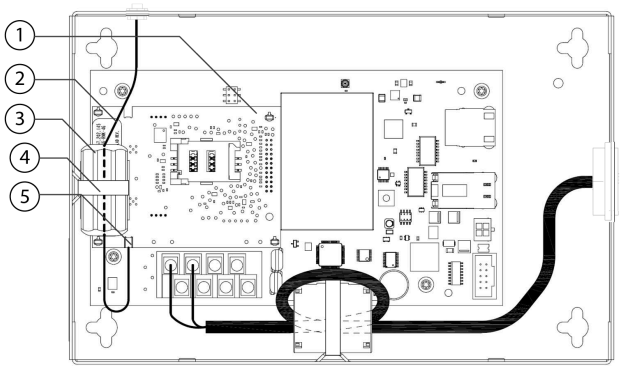


Central station receiver protocol support

The following protocols are supported for central station reporting:

- ADEMCO Contact ID Alarm Communication Protocol
- IP based transmission (cellular or Ethernet)
- DSC Fibro protocol

Figure 10: CSG-F wiring and ferrite clamp installation



Callout	Description
1	Cellular module
2	RF cable
3	Ferrite clamp for the antenna cable
4	Tie cable
5	JK2 MAIN ANT

Checking the LEDs

To confirm the CSG is connected and operating correctly, compare the LEDs with their expected behavior as specified in the following tables.

Table 6: System status LEDs

Status	Green LED	Red LED
No power	Off	Off
Power connected: software not running; Manual reset; System Failure	On	On
Power connected: software booting or restarting	On	Off
Normal: CSG application running	Blinking	Off

Table 7: Fire alarm control panel communication (panel comms.) LEDs

Status	Green LED	Yellow LED
Normal: connected to the fire panel	On	Off
Not connected to the fire panel	Off	On
Mismatch	Off	Blinking

Table 8: LAN connection (conn. serv.) LEDs

Status	Green LED	Yellow LED
Normal: connected to the Enterprise server	On	Off
Not connected to the Enterprise server, connected to external network only	Off	Blinking
Not connected to an external network	Off	On
Failure or error	Blinking	Blinking
Disabled	Off	Off

Table 9: Ethernet port LED

Status	LED behavior
Link up	On
Activity	Blinking
Not connected	Off

Table 10: Cellular LEDs

Status	Green LED 1	Green LED 2	Yellow LED
High quality signal	On	On	Off
Moderate quality signal	On	Blinking	Off

Table 10: Cellular LEDs

Status	Green LED 1	Green LED 2	Yellow LED
Low quality signal	On	Off	Off
Very poor quality signal	Blinking	Off	Off
Not connected	Off	Off	Blinking
Fault or error	Off	Off	On
Disabled	Off	Off	Off

Table 11: Central Station LEDs

Status	Green LED	Yellow LED
Normal	On	Off
Any one of the paths down	On	Blinking
Both paths down	Off	On
Failure or error	Blinking	Blinking
Disabled	Off	Off

Finishing the installation

To complete the installation, fit the lid of the CSG enclosure.

Electrical and environmental specifications

Table 12: Electrical specifications

Voltage DC	Nominal 24 V
	Minimum 21 V
	Maximum 28.8 V
CSG current	125 mA
Total current when the cellular module is used	145 mA

Table 13: Environmental specifications

Temperature	Normal operation with ambient temperature outside the cabinet at -5°C to 40°C
Humidity	Normal operation under non-condensing humidity conditions up to 93% relative humidity at 42°C

Table 14: Modem specifications

4G/LITE Modem Specification	
LTE Chipset	Telit LE910C1-EUX
Regions Supported	Europe, Middle East, Africa
LTE Frequency Bands supported	B1, B3, B7, B8, B20, B28A

Table 14: Modem specifications

4G/LITE Modem Specification	
Output Power	Class 3 (0.2 W, 23 dBm) @LTE

Table 15: Band max gain

Band	Max gain for RED (dbi)
GSM 900	5.96
DCS 1800	11.33
WCDMA Band VIII	5.96
WCDMA Band III	11.33
WCDMA Band I	11.83
LTE FDD 1	11.83
LTE FDD 3	11.33
LTE FDD 7	12.01
LTE FDD 8	5.96
LTE FDD 20	9.03
LTE FDD 28	8.68

Ordering information

Hereby, Tyco Fire and Security GmbH, declares that radio equipment type: CSG-Fl-E: Fireclass Profile Connected Services Gateway without Enclosure, is in compliance with Directive 2014/53/EU.

The full text of the EU Declaration of conformity is available at: https://www.fireclass.co.uk/

Table 16: Ordering information

SKU	Model number	Description
557.202.132	CSG-F	Fireclass Connected Services Gateway with Enclosure
557.202.141	CSG-F-Internal	Fireclass FC503/FC506 Connected Services Gateway (Internal)
557.202.142	CSG-AK15	Connected Services Gateway Antenna Extension Kit (15 ft/ 4.5 m)
557.202.143	CSG-AK25	Connected Services Gateway Antenna Extension Kit (25 ft/ 7.5 m)
557.202.144	CSG-AKS0	Connected Services Gateway Antenna Extension Kit (50 ft/ 15 m)
557.202.145	CSG 4G RADIO AND ANT KIT	4G Module and Antenna Kit
557.202.860	PCS800	FireClass Ethernet Switch

Approvals

Table 17: CPR information

CE **0051** **Tyco Fire and Security GmbH, Victor von Bruns-Strasse 21, 8212 Neuhausen am Rheinfall, Switzerland.** **23** **DoP-2023-4308**
CSG-F **EN 54-21: 2006 Essential Characteristics** Alarm transmission and fault warning routing equipment for fire alarm systems installed in buildings

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