

cegard/Smart controller

Installation and Operation Manual



cegard/Smart-CGSM-B
together with EasyGate IP



cegard/Smart-CGSM-C



cegard/Smart-CGSM-E
together with EComgard



CEDES AG is certified according to ISO 9001: 2015

English

Pages

1 – 29

Original version

Contents

1. About this manual

1.1 Measurements

1.2 Related documents

1.3 CEDES headquarters

1.4 List of abbreviations

2. Safety information

2.1 Non-intended use

3. Symbols, safety messages

3.1 Safety messages categories

4. Introduction

4.1 cegard/Smart system overview

4.2 ASME A17.1 / CSA B44 compliance

4.3 Cybersecurity

4.4 Type descriptions

4.5 System block diagrams

4.6 Intended use

5. cegard/Smart controller

5.1 Overview

5.2 Features

5.3 Variants

5.4 Safety instructions

5.5 Mechanical installation

5.6 Electrical connections

6. Controller sensor configuration

6.1 Overview

6.2 3D mounting position

6.3 Render inoperative means

6.4 Door opening height

6.5 Settings for 3D active

6.6 Output logic selector

6.7 3D operational frequency selector

6.8 Reduced region of interest

7. Timing diagram

8. System installation / integration

9. Startup cegard/Smart controller

10. Onboarding cegard/Smart for IoT connectivity

11. Troubleshooting

11.1 Over the Air Update

11.2 Sensor interface PCB LED status description

11.3 Gateway PCB LED status description

12. Maintenance

13. Disposal

14. Product label

14.1 Product label cegard/Smart controller

15. Delivery package

15.1 North American Kits

15.2 European Kits

16. Accessories

16.1 Magnetic Switch

17. Technical data

17.1 cegard/Smart controller

17.2 cegard/Smart extension module

17.3 2N EasyGate IP Gateway

17.4 EComgard

17.5 Connectors

18. Communication interfaces

18.1 EasyGate IP (utilized with cegard/Smart B variants)

18.2 EComgard controller (utilized with cegard/Smart-E variant)

19. Dimensions

19.1 cegard/Smart CGS-B / C / E variants

19.2 Dimensions cegard/Smart extension module

19.3 Dimensions Easygate IP

19.4 Dimensions EComgard

1. About this manual

This installation and operation manual in English, with metric measurements is the **original version**.

The version number is printed at the bottom of each page. To make sure you have the latest version, please visit our product page at www.cedes.com/en/products-for-elevators-escalators/.

1.1 Measurements

Measurements are, if not stated otherwise, given in mm (non-bracketed numbers) and imperial dimensions (numbers in brackets).

1.2 Related documents

116 101	CE/UKCA confirmation
117 940	Operating manual CabSafe 3D
117 941	Operating manual cegard/Smart light curtain
117 942	Brief installation manual EasyGate IP
117 770	Brief installation guide EComgard controller

1.3 CEDES headquarters

CEDES AG
Science Park
CH-7302 Landquart
Switzerland

1.4 List of abbreviations

Abbr.	Description
ESD	Electrostatic discharge
PCB	Printed circuit boards
LC	Light curtain
Tx	Transmitter edge
REMARK: In the manual, for the expression transmitter - emitter is used.	
Rx	Receiver edge
NA	North America
EU	European Union

2. Safety information

IMPORTANT
READ BEFORE INSTALLATION!

The cegard/Smart system was developed and manufactured using state-of-the-art systems and technologies. However, injury and damage to the sensor can still occur.

To ensure safe conditions:

- ▶ Read all enclosed instructions and information.
- ▶ Follow the instructions given in this manual carefully.
- ▶ Please note that objects thinner than the beam spacing may not be detected.
- ▶ Observe all warnings included in the documentation and attached to the sensor.
- ▶ Do not use the sensor(s), controller or cables if any of these items has been damaged.
- ▶ Keep the instruction manual on site.

The cegard/Smart system should only be installed by authorized and fully trained personnel! The installer or system integrator is fully responsible for the safe integration of the sensor. It is the sole responsibility of the planner and/or installer and/or buyer to ensure that this product is used according to all applicable standards, laws, and regulations to ensure safe operation of the whole application.

Any alterations to the device(s) by the buyer, installer or user may result in unsafe operating conditions. CEDES is not responsible for any liability or warranty claim that results from such manipulation.

In North American applications, voltages greater than 42 Volts require that the wiring to the power supply and/or the door drive must be made through a Greenfield fitting. Ensure that the electrical installation complies with all applicable standards, laws, and regulations that apply.

Failure to follow instructions given in this manual and/or other related documents related to the cegard/Smart system may cause customer complaints, serious call backs, damage, injury, or death.

2.1 Non-intended use

The cegard/Smart system **must not** be used for:

- Protection of dangerous machine such as presses
- Equipment in explosive atmospheres
- Equipment in radioactive environments
- Outside the specified environments



Use only specific and approved safety devices for such applications, otherwise serious injury or death or damage to property may occur!

3. Symbols, safety messages

Symbol	Meaning
▶	Single instruction or measures in no particular order
1. 2. 3.	Sequenced instructions
•	List, in no order of importance
→	Reference to a chapter, illustration or table within this document
Important	Important information for the correct use of the sensor

3.1 Safety messages categories

Warning of serious health risks

**WARNING**
Serious health risks

Highlights critical information for the safe use of the sensor. Disregarding these warnings can result in serious injury or death.

- ▶ Follow the measures highlighted by the triangle-shaped arrows
- ▶ Consult the safety information in Chapter 2 of this manual

Caution of possible health risk

**CAUTION**
Possible health risks

Highlights critical information for the safe use of the sensor. Disregarding these warnings can result in injury.

- ▶ Follow the measures highlighted by the triangle-shaped arrows
- ▶ Consult the safety information in Chapter 2 of this manual

Notice of damage risk

NOTICE
Risk of damage

Disregarding these notices can lead to damage to the sensor, the door controller and/or other devices.

- ▶ Follow the measures highlighted by the triangle-shaped arrows

4. Introduction

4.1 cegard/Smart system overview

The cegard/Smart is an IoT-enabled (Internet of Things) elevator door protection solution that complies with the requirements of:

- EN 81-20 (2020) Protective Light Curtain Device,
- ASME A17.1-2016 / CSA B44:16 and earlier as a reopening device(s) for Power-Operated Horizontally Sliding Doors and Gates,
- ASME A17.1-2019 / CSA B44:19 and later as a reopening device(s) for Power-Operated Horizontally Sliding Doors and Gates with CabSafe 3D sensor included

when installed in compliance with these operating instructions.

A cegard/Smart system consists of a combination of the following components, depending on your application needs:

- A cegard/Smart controller,
- A cegard/Smart light curtain for detection of a person or object in the path of elevator doors
- A CabSafe 3D sensor for approaching detection of a person(s) or object(s)
- A cegard/Smart extension module,
- Communication capability of data to the IoT Cloud via 4G/LTE cellular communication (e.g., 2N EasyGate IP, CEDES EComgard, or with the communication integrated directly into the controller)

Elevator comfort improves due to contactless detection of approaching persons while simultaneously increasing the availability of the elevator. The CabSafe 3D sensor detection field is automatically adjusted during movement of the door(s). When installed correctly, the optional CabSafe 3D sensor is rendered inoperative less than 450 mm (17.72 in) before full door closure based on the

- the CabSafe 2D light curtain (only in dynamic light curtain installations),
- a door position signal from the door control; or
- a door position switch (e.g. magnetic or optical sensor)

The cegard/Smart system is designed and developed to fulfill the requirements of EN 81-20 as well as ASME A17.1-2019 and later / CSA B44:19 and later as well as previous versions of the North American Elevator and Escalator Safety Code. For correct function, only system components described in this Installation and Operation Manual shall be used.

The cegard/Smart can be used in center, left- or right-side opening elevator door applications. It is most suitable for dynamic light curtain installations (light curtain edges mounted on the moving door panels). The cegard/Smart can also be used in static light curtain installations, but not all IoT data will be available in these applications.

The cegard/Smart control unit:

- Performs continuous monitoring and testing of connected cegard/Smart light curtain(s),
- Performs continuous monitoring and testing of connected CabSafe 3D sensor(s),
- Manages configuration parameters for system components, e.g., CabSafe 3D sensor(s)
- Logically combines sensor signals into a single output that represents the system state, and
- Communicates data via 4G/LTE to IoT Cloud platforms

When persons or objects are detected, either by the cegard/Smart light curtain or the CabSafe 3D sensor, or both, the cegard/Smart controller signals the door controller. This allows the door controller to hold the door open, indicate a door reversal is necessary, or allow the doors to close.

With the built-in IoT functionality, diagnostic data of the elevator doors and other elevator parameters can be monitored by CEDES Elevate. Consult with your local CEDES representative for details.

This document contains the technical specifications of the cegard/Smart controller and its installation procedure.

The following chapters provide a description for:

- cegard/Smart controller: See Chapter 5
- Controller configuration: See Chapter 6

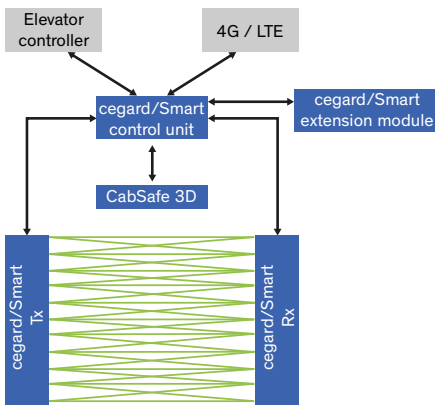


Figure 1: Principal cegard/Smart system architecture

Consult the operating instructions of connected cegard/Smart components for additional information and requirements:

- 117 941 cegard/Smart light curtain Installation and Operation Manual
- 117 940 CabSafe 3D sensor Installation and Operation Manual
- 117 942 EasyGate IP brief manual
- 118 290 EComgard controller brief installation guide

**WARNING**

Door protection systems, such as the cegard/Smart system, do not provide absolute safety for elevator passengers passing through the doorway. They cannot be used as failsafe devices of the door mechanism. This safety function must be provided by a fail-safe force and a kinetic energy limiter in the door drive.

4.2 ASME A17.1 / CSA B44 compliance

The cegard/Smart system provides a complete elevator door protection solution that complies with ASME A17.1-2019 / CSA B44:19 and ASME A17.1-2022 / CSA B44:22 Safety Code for Elevators and Escalators when installed in accordance with this manual and consists of the following components:

- A cegard/Smart controller
- a cegard/Smart light curtain to detect persons or objects between the elevator doors; and
- a CabSafe 3D sensor to detect a person or object approaching the elevator entrance.

The approaching object detection means of the cegard/Smart begins with the opening of the elevator door(s). When this occurs, the cegard/Smart System is initialized by a signal from one of the following:

- The cegard/Smart light curtain (dynamic installation only).
- The elevator control; or
- a door position sensor (e.g. a magnet switch or a fork type light barrier).

The CabSafe 3D detection field is calibrated within one second of the doors reaching their fully open position, and the opening also causes the cegard/Smart controller to start monitoring both the cegard/Smart light curtain and CabSafe 3D sensor for the presence of persons or objects between the elevator doors or approaching the elevator doors. When a person or object is detected, the output changes state so that the door operator will either reverse or hold the doors in their open state.

A timer (greater than 5 s per ASME A17.1-2019 / CSA B44:19) is implemented in the cegard/Smart controller that minimizes the effects of cross-traffic. The timer starts when a person or object is detected approaching the elevator cab. If this timer expires before an infringement of the cegard/Smart light curtain (i.e. person or object actually entered the elevator cab), the CabSafe 3D sensor will be rendered inoperative. If the cegard/Smart light curtain

detects a person or object, this timer is reset.

The CabSafe 3D sensor is also rendered inoperative when the elevator doors are less than 450 mm (17.72 in) from the fully closed position. This distance is monitored based on a signal from one of the following:

- The cegard/Smart light curtain (dynamic installation only).
- The elevator control; or
- a door position switch (e.g. a magnet switch or a fork type light barrier).

After the doors have reached their fully closed state, this sequence starts over on the next door opening.

4.3 Cybersecurity

The cegard/Smart controller conforms to the following cybersecurity requirements:

- safety category SLC-2 in accordance with the applicable requirements of IEC 62443-2-4, IEC 62443-3-3, IEC 62443-4-1 and IEC 62443-4-2; and
- the foundational requirement SR 1.1 RE2 in accordance with IEC 62443-3-3.

**WARNING**

Specialized buildings, structures, or use environments (e.g., government facilities, critical care facilities) may require that the application of the facility be considered to determine if higher levels of cybersecurity or complete isolation from the internet are required. Contact your local CEDES representative to determine if the cegard/Smart can be suitable for these applications.

4.4 Type descriptions

4.4.1 cegard/Smart controller

CGSM – a

a:	cegard/Smart controller type	
	Controller with EasyGate IP	B
	Controller integrated 4G/LTE	C
	Controller with EComgard	E
b:	System variants	
	Universal	Omitted
	North America	1
	Europe	2

4.4.2 System

CGS – SY – ab – cccccdd – e, fffff

a: cegard/Smart controller type
Controller with EasyGate IP B
Controller Integrated 4G/LTE C
Controller with EComgard E

b: System Variants
Universal Omitted
North America 1
Europe 2

cccc: Sensors included
For one door 2D/3D
2D Only 12D000
3D Standard Black 13DBST
3D Tall Door Left-side (TDL) 13DBTL
Mounting, Black
3D Tall Door Right-side (TDR) 13DBTR
Mounting, Black

Note: The left- and right-side references for TDL and TDR are based on mounting location as you look into the elevator from the lobby (Chapter 6.2 for a graphical representation of the mounting position).

For two door 2D/3D
2D Only 22D000
3D Standard Black 23DBST
3D TDL Black x 1 +
TDR Black x 1 23DBTD

dd: 3D Mounting Type
3D Flush Mount FL
3D Back of Transom Mount BT

e: North America Mounting Hardware
(omitted for European kits)
No VS / MP / SP 0
2.1 m / 7 ft VS / MP / SP 2
3 m / 10 ft VS / MP / SP 3

VS: Vision Shield
MP: Mounting Profile
SP: Spacer Profile

ffff: Special configurations*

* Special configurations of future variants are anticipated. Contact CEDES for additional accessories

Example 1:

CGS-SY-B2-12D000 is a cegard/Smart system with a cegard/Smart controller that uses 4G/LTE communication through a 2N EasyGate IP interface (European Version), includes one (1) light curtain and associated mounting hardware.

Example 2:

CGS-SY-B1-23DBSTBT-2 is a cegard/Smart system with a cegard/Smart controller that uses 4G/LTE communication through a 2N EasyGate IP interface (North American Version), includes two (2) light curtains, two (2) CabSafe 3D sensors (black bezel, back of transom-mounting), a cegard/Smart extension module, and 7 ft mounting hardware.

4.5 System block diagrams

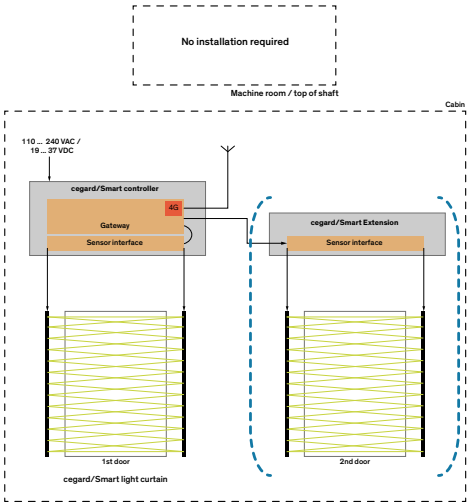


Figure 2: cegard/Smart 2D system - 1 door (in the blue bracket - 2 doors)

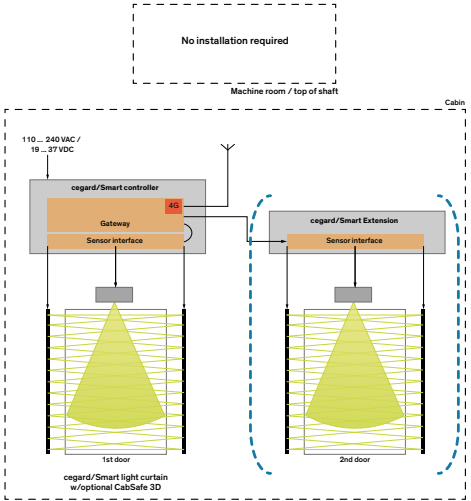


Figure 3: cegard/Smart 3D system - 1 door (in the blue bracket - 2 doors)

4.6 Intended use

cegard/Smart system is an elevator door reopening device that also gathers performance data related to elevator cab, and data specifically related to the elevator cab door(s) operation.

The minimum configuration is intended to detect the presence of persons or objects in the path between the elevator car and landing door(s) and fulfills the elevator door reopening device requirements defined in:

- EN 81-20, and
- ASME A17.1-2016 / CSA B44-16 and earlier versions.

This configuration consists of a:

- one (1) cegard/Smart controller and
- one (1) cegard/Smart light curtain.

Another typical configuration is intended to detect persons or objects in the path between the elevator car and landing doors as well as persons approaching the elevator cab entrance. This cegard/Smart system fulfills the elevator door reopening device requirements defined in:

- EN 81-20
- ASME A17.1-2019 / CSA B44-19, ASME A17.1-2022 / CSA B44-22 and earlier versions.

For this configuration, a typical cegard/Smart system consists of:

- one (1) cegard/Smart controller,
- one (1) cegard/Smart light curtain, and
- one (1) CabSafe 3D sensor.

All other applications must be approved by CEDES.

Components and accessories not specifically addressed by this document or in the related documents listed in Chapter 1.2 must be approved by CEDES.

5. cegard/Smart controller

5.1 Overview

The cegard/Smart controller is responsible for the communication with the individual components (cegard/Smart light curtain and CabSafe 3D sensor). It provides a signal to the elevator controller that indicates when the elevator door(s) can be closed. The cegard/Smart controller continuously tests the attached sensor components, including when the door has reached its fully open position. If a component fails, the cegard/Smart controller provides a signal to hold the door open and indicates that a fault has occurred.

5.2 Features

Regardless of which cegard/Smart controller configuration used, the following features are available:

- IoT (Internet of Things) enabled
- Suitable for both new and modernization
- 100 ... 240 VAC 50/60 Hz or 24 V DC incoming power
- Relay output that combines the signals from
 - cegard/Smart light curtain, and
 - CabSafe 3D sensor
- DIP switch hardware configuration
- Extension modules for two-door e.g., front/rear applications

5.3 Variants

Several cegard/Smart controller configurations possible:

- [B Variant] cegard/Smart controller for use with EasyGate IP

- [C Variant] cegard/Smart controller with integrated 4G/LTE
- [E Variant] cegard/Smart controller for use with EComgard



Figure 4: [Bx Variant] cegard/Smart controller with EasyGate IP



Figure 5: [Cx Variant] cegard/Smart controller with integrated 4G/LTE

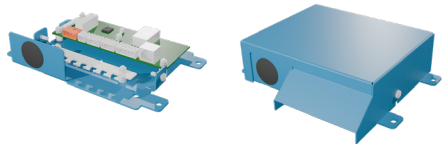


Figure 6: cegard/Smart extension module



Figure 7: [Ex Variant] cegard/Smart controller with EComgard

5.4 Safety instructions



WARNING

- ▶ Follow all applicable safety measures.
- ▶ Switch off main power to the elevator control system and mark clearly that the elevator is out of service.
- ▶ Do not mount the cegard/Smart controller on the moving door panel.
- ▶ Make sure that your installation complies with all applicable regulations and safety measures.
- ▶ Avoid any damage to the cegard/Smart controller.
- ▶ Observe the ESD protection protocol when removing the controller from the packaging and during installation.
- ▶ Don't drill additional holes into the PCB.
- ▶ Don't touch the PCB during operation.
- ▶ To avoid mechanical stress to the PCB, plug/unplug the connectors only when the PCB is mounted to the PCB carrier or PCB box.
- ▶ Use only appropriate connections to the cegard/Smart controller.
- ▶ It is prohibited to make any changes to the cegard/Smart Controller itself (other than DIP switch settings).
- ▶ Only the CEDES cegard/Smart light curtains and CabSafe 3D sensors can be connected to a cegard/Smart controller.
- ▶ Connection cords with a length exceeding 2 m shall be protected in a raceway.
- ▶ An electrical protective device must installed e.g., fuse or circuit breaker, for the circuit that provides power to the cegard/Smart controller.
- ▶ Power shall be limited to 100 W. e.g., DC input power fused at 2 A.
- ▶ Maximum DC power cable length is 3 m (9.8 ft).

- An electrical protective device must installed e.g., fuse or circuit breaker, for the circuit that provides power to the cegard/Smart controller.
- Power shall be limited to 100 W.



WARNING

Serious health risks

- ▶ **For the USA and Canada:** Connect all wiring with more than 42 V through a Greenfield fitting.
- ▶ Disconnect power before opening the control unit to prevent electrical shock. Otherwise serious injury or death may occur!

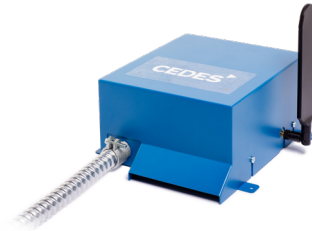


Figure 8: Connection of Greenfield fitting and cable protection

5.5 Mechanical installation

The cegard/Smart controller may be mounted in any orientation on a flat surface.

The mounting holes for the cegard/Smart controller are shown in the dimensional information presented in Chapter 19. Ensure that the mounting location provides a stable and robust installation.

Refer to the relevant documents below for installation of other components included with your cegard/Smart system:

- 117 941 Operating Manual cegard/Smart light curtain
- 117 940 Operating Manual CabSafe 3D sensor
- 2N EasyGate IP brief installation instructions
- EComgard brief installation instructions

5.5.1 Two entrance applications

Elevators with two entrances can be supported by a single cegard/Smart controller using an extension module. Different mounting arrangements are possible.

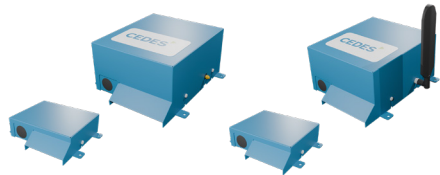


Figure 9: cegard/Smart with separate extension module on the car roof surface

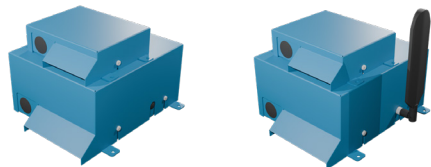


Figure 10: cegard/Smart extension module on top of controller
Included with each extension module is a 5 m (16.4 ft) interconnect cable that connects the extension module to the cegard/Smart controller.

5.6 Electrical connections

5.6.1 cegard/Smart controller

The components included inside the control box vary depending on the model of controller used. Different board components make up the controller system as shown in Figure 10 below. The external electrical connections for each of these board components are further defined in the sections that follow.

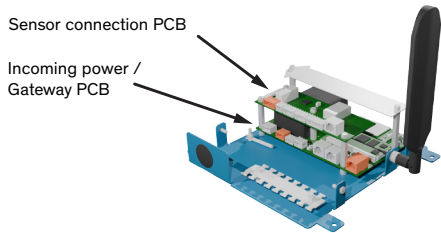
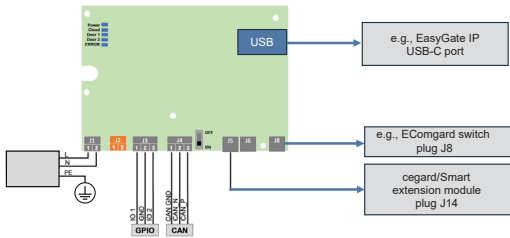


Figure 11: cegard/Smart board components for cegard/Smart controller

5.6.1.1 Incoming power / Gateway

All variants include an incoming power / Gateway printed circuit board. External connections are shown in Figure 11 below. Connections internal to the cegard/Smart controller are not shown.



Please note:

- Connector J2 is reserved for future use.
- Connector J5 shall only be connected to a CEDES cegard/Smart Extension Module.
- Connector J6 shall only be connected to the CEDES Sensor Interface Board inside the housing.

Figure 12: cegard/Smart incoming power and Gateway PCB

The General Purpose Inputs/Outputs (J3), CAN connector (J4) and associated termination switch (ON/OFF) shown in Figure 14 are reserved for future use and do not presently have any function. Connector J6 is used for internal connection of the Sensor interface board inside the controller. Connector J8 is used for internal connection of the EComgard Switch to the Gateway PCB. The ethernet port (J8) is reserved for administrative purposes (CGSM-B and CGSM-C variants) or for connection of the EComgard Switch (CGSM-E variant).

5.6.1.2 Sensor interface board / extension module

All cegard/Smart controllers and cegard/Smart extension modules include a sensor interface board that provides connection for the cegard/Smart light curtain, the CabSafe 3D sensor and a relay output that represents the system state. For elevators with two sets of doors (e.g., front and rear entry), a cegard/Smart extension module is used for the second set of sensors and connected to the incoming power / Sensor Interface Board as shown in Figure 12.

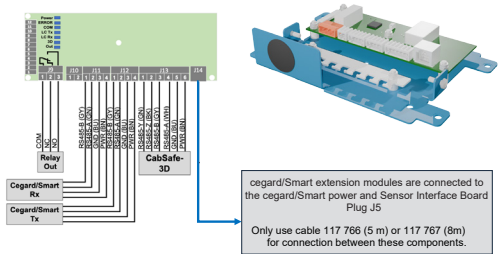


Figure 13: cegard/Smart sensor interface PCB / extension module

6. Controller sensor configuration

6.1 Overview

The cegard/Smart system is configured using twelve (12) DIP switches. The DIP switches are located on the sensor connection PCB as shown in Figure 13 below. For light curtain only (2D) operation, refer to Chapter 6.5.

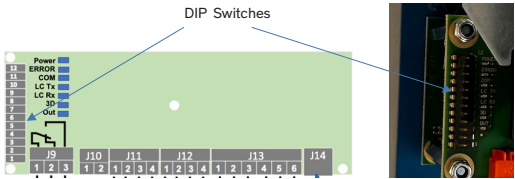


Figure 14: DIP switch location on sensor connection PCB

The functions associated with these DIP switches are summarized below and further described in subsequent sections of this chapter.

DIP	Function
1	3D mounting position
2	
3	
4	
5	Render inoperative means
6	
7	Door height
8	
9	2D/3D versus 2D only functionality
10	Logic
11	Frequency
12	Special function – reduced region of interest

Table 1: Overview functional settings

**CAUTION**

▶ Do not change settings of any switch if the cegard/Smart controller is powered on. Damage can occur!

6.2 3D mounting position

Mounting position	DIP 1	DIP 2
No function *	0	0
Left (Figure 15)	1	0
Right (Figure 16)	0	1
Center (Figure 14)	1	1

Table 2: Mounting position of sensor as seen from the hallway into the elevator entrance (* = factory default)

DIP 1 and DIP 2 define the elevator entrance type. The mounting position referenced in Table 3 is the location of the CabSafe 3D sensor as you look into the elevator cabin from the lobby (Figure 15, Figure 15 and Figure 16 for graphical representation of each position type). When DIP 9 = 0 / “OFF” (2D/3D functionality is active), DIP 1 and DIP 2 must be set for left, right or center mounting position. A configuration fault occurs if this is not the case.

Notes:

- When DIP 9 is “1” / ON (2D operation only), the state of DIP 1 and DIP 2 is not monitored.
- If DIP 1 and DIP 2 are both 0 / “OFF”, a configuration fault occurs.

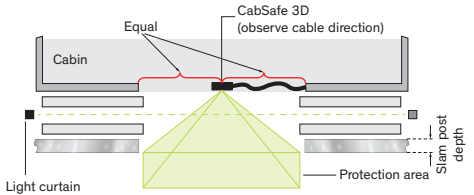


Figure 14: CabSafe 3D sensor mounted in center of opening

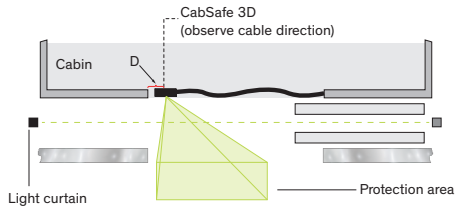


Figure 15: CabSafe 3D sensor mounted on left side

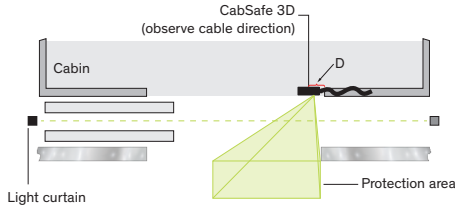


Figure 16: CabSafe 3D sensor mounted on right side

6.3 Render inoperative means

Door closing detection	DIP 1	DIP 2
No function *	0	0
Dynamic installation of the cegard/Smart light curtain	1	0
Using an external contact or an elevator control signal (*)	0	1

Table 3: Method used to determine render inoperative function (* = factory default)

DIP 3 and DIP 4 define how the CabSafe 3D sensor is rendered inoperative during the door closing process. The render inoperative function is allowed to occur when the doors have reached a position less than 450 mm (17.71 in) from the fully closed position in accordance with ASME A17.1 -2019 / CSA B44:19 and later versions of the North American Elevator Safety Code.

If DIP 3 and DIP 4 are both 0 / "OFF", a configuration fault occurs.

6.3.1 Render inoperative using the light curtain

When DIP 3 = 1 / "ON" and DIP 4 = 0 / "OFF" the cegard/Smart light curtain is used to render the CabSafe 3D sensor inoperative. This can be the case when the cegard/Smart light curtain is mounted on, and moves with, the elevator door(s). The cegard/Smart light curtain then indicates to the cegard/Smart controller when the doors have reached a point less than 450 mm (17.71 in) from the fully closed position in accordance with ASME A17.1-2022 / CSA B44-22 and earlier versions of the North American Elevator Safety Code.

6.3.2 Render inoperative using an external signal

When DIP 3 = 0 / "OFF" and DIP 4 = 1 / "ON", an external signal can perform the render inoperative function. In certain applications e.g., elevators with glass doors or in static installations where the light curtain does not move with the doors, this connection is needed to reliably render the CabSafe 3D sensor inoperative. The external signal should be connected to connector J10 to perform this function.

An external signal can consist of either

- a retentive contact (e.g., a magnetic switch), or
- a 24 VDC signal from elevator control.

For the retentive contact solution, the contact must be able to reliably switch 24 VDC, 2.3 mA.

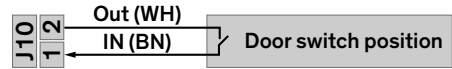


Figure 17: Door position signal from retentive door position switch

CEDES offers an optional magnetic reed switch that fulfills this retentive door position switch requirement. In this case, the magnetic reed switch and the actuator must be positioned so that the actuation occurs when the elevator door position ("W" in Figure 18 and Figure 19) fulfills:

$$300\text{ mm (11.81 in)} \leq \text{triggering position} \leq 450\text{ mm (17.71 in)}$$

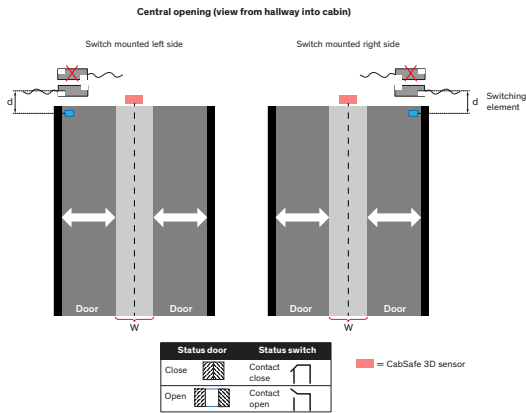


Figure 18: Magnet switch in case of central opening

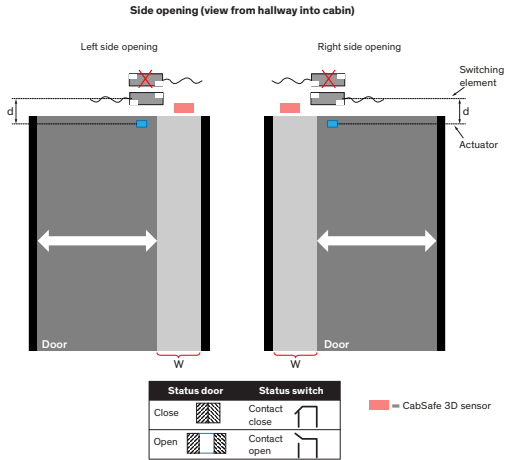


Figure 19: Magnet switch in case of side opening

The cable outlet of the sensor must always be positioned towards the door opening direction at the installed door as indicated in Figure 19. It is only one switch required per elevator (for central and for side opening).

Alternatively, an external signal e.g., from elevator control can provide the render inoperative function. In this case, the 24 VDC signal connected to Pin 2 on plug J10 must have the same signal common (0 VDC) as the cegard/Smart controller.

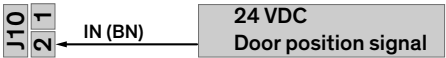


Figure 20: Door position signal from elevator controller to cegard/Smart controller

In general: The signal at pin 2 of the plug J10 shall be HIGH (+24 VDC) when the door has reached the point when the CabSafe 3D sensor can be rendered inoperative. This signal must occur and then remain high when the elevator doors $\leq 450\text{ mm (17.71 in)}$ from the fully closed position.

6.4 Door opening height

Door height range	DIP 5	DIP 6	DIP 7	DIP 8
No function *	0	0	0	0
6.66 ft to 7.5 ft (2.03 m to 2.3 m)	1	0	0	0
>7.5 ft to 8.5 ft (>2.3 m to 2.6 m)	0	1	0	0
>8.5 ft to 9 ft (>2.6 m to 2.74 m)	0	0	1	0
>9 ft to 10 ft (>2.74 m to 3.05 m)	0	0	0	1

Table 4: Door height range (* = factory default)

At least the position of one DIP must be changed to enter operation mode.

A configuration fault will occur if:

- More than one of these DIP switches is set to 1 / "ON"
- If DIP 9 is 0 / "OFF" (2D/3D is active) and DIP 5 through DIP 8 are all set to 0 / "OFF"

6.5 Settings for 3D active

Bypass 3D sensor	DIP 9
2D/3D active *	0
3D inactive (2D only)	1

Table 5: DIP settings to bypass 3D sensor (* = factory default)

The setting of DIP 9 = 1/"ON" causes that the cegard/Smart controller to only operate with cegard/Smart light curtain (2D only mode). This functionality requires that the CabSafe 3D sensor be physically disconnected from the cegard/Smart controller, otherwise a configuration fault occurs.

6.6 Output logic selector

Output logic selection	DIP 10
Standard (NO-COM)*	0
Inverted (NC-COM)	1

Table 6: DIP settings to change output logic (* = factory default)

With DIP 10 = 1 / "ON", the output logic is inverted from what is shown in Figure 21.

The control unit provides a relay output a Normally-Open (NO) contact, a Normally-Closed (NC) contact, and Common (COM). The contact rating of the cegard/Smart controller output relay is provided in Chapter 17.

Normally Open (NO-COM)



Normally Closed (NC-COM)



Figure 21: Controller output logic with DIP 10 = 0 / "OFF"

6.7 3D operational frequency selector

Operation frequency selection	DIP 11
Standard*	0
Modified	1

Table 7: DIP settings to 3D sensor operation frequency. (* = factory default)

For elevator banks that have elevators that face each other, interference between approaching object sensors can occur. To prevent such interference, the operation frequency of the CabSafe 3D sensor should be configured using DIP11 on the cegard/Smart controller.

For example, Figure 22 shows a bank of elevators where there are three elevators on one side of a hallway and three elevators on the opposite side of the hallway. For these applications, DIP11 is set to “0” on the one side (i.e. top elevators shown in the diagram) and to “1” on the other side (i.e. bottom elevators shown in the diagram) as shown in Figure 22. DIP 11 can also be used in e.g., front and rear door applications.

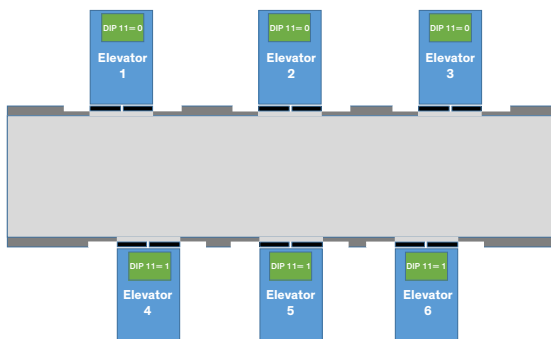


Figure 22: DIP 11 settings for multiple elevators positioned face to face

6.8 Reduced region of interest

In elevator applications with a deep entrance depth (see Figure 23), a permanent door open signal can occur, especially with elevators that have narrower openings. In such cases, a different algorithm can be used by the CabSafe 3D sensor to address this issue by setting DIP 12 = 1 / "ON".

DIP 12 = 1 / "ON" is only allowed in applications where the elevator door opening width is $\leq 1,100$ mm (43.31 in).

Region setting	DIP 12
Standard*	0
Additional filtering for special applications	1

Table 8: DIP settings to change filter settings (* = factory default)

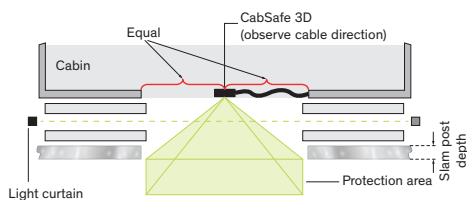


Figure 23: Mounting location and orientation - center opening door

7. Timing diagram

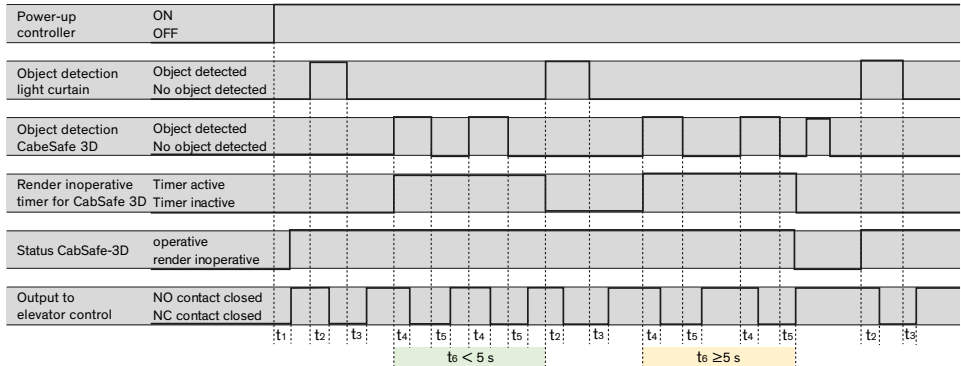


Figure 24: Timing diagram (output logic selection DIP 10 = 0)

Time	Value
t_1 Power-on time	<5 s
t_2 Typ. reaction time of the cegard/Smart controller output caused by an object entering the detection field of the cegard/Smart 2D sensor	<140 ms
t_3 Typ. release time of the CabSafe controller output after clearance of the detection field of the cegard/Smart 2D sensor	<20 ms + light curtain
t_4 Typ reaction time of the cegard/Smart controller output caused by an object detection of the CabSafe 3D sensor	<250 ms
t_5 Typ. release time of the cegard/Smart controller output after clearance of the detection field of the CabSafe 3D sensor	1.7 s
t_6 Rendering inoperative timer (Chapter 6.3). Resets on interruption of cegard/Smart 2D sensor or upon reopening of doors after closure. If end of timer is reached, CabSafe 3D sensor is rendered inoperative.	$\geq 5\text{ s acc. to A17.1-2019}$

Descriptions of the times provided in Figure 24.

8. System installation / integration

Use the following steps to implement the installation and integration of the cegard/Smart system after removal of the existing elevator door re-opening device

1. Mount the cegard/Smart controller on top of the elevator cab
2. Install the cegard/Smart light curtain:
 - Mount the emitter and receiver based on your application requirements. In dynamic installations, at least one component (the emitter or receiver) is mounted on the moving door(s). In static installations, the emitter and receiver are both stationary and do not move with the door(s).
 - For dynamic installations with center-opening doors, mount the light curtain emitter and receiver on the elevator doors;
 - For dynamic installations with side-opening doors, mount the light curtain emitter and receiver on the elevator door and strike jamb.
 - For static installations, mount the cegard/Smart light curtain in accordance with the manufacturer's instructions (e.g., European Universal Mounting Kit).

- Route and connect the cables from the cegard/Smart light curtain emitter and receiver to the mating connector on the cegard/Smart controller, taking care to avoid high voltage power sources.

Additional information regarding the installation and integration of the cegard/Smart light curtain can be found in 117 941 cegard/Smart light curtain Installation and Operation Manual.

3. For applications that require approaching object detection (3D), install the CabSafe 3D sensor in (for flush mounting) or on the back of (back of transom mounting) the elevator transom.
 - Determine proper mounting location of the CabSafe 3D sensor.
 - Prepare the mounting location.
 - Route and connect the cable from the CabSafe 3D sensor to the corresponding mating connector on the cegard/Smart controller, taking care to avoid high voltage power sources.
 - Connect the cable to the CabSafe 3D sensor and then secure the sensor in the mounting location.

- ▶ If your application utilizes a magnetic switch for the render inoperative function of the CabSafe 3D sensor, install the magnetic switch and actuator in accordance with Chapter 6.3.2.

Additional information regarding the installation and integration of the CabSafe 3D sensor can be found in 117 940 CabSafe 3D sensor Installation and Operation Manual.

4. Integrate the IoT gateway.
 - ▶ For cegard/Smart B variant, see Chapter 8.1
 - ▶ For cegard/Smart C variant, this function is integrated into the device, Attach the antenna to the controller and then continue to Step 5.
 - ▶ For cegard/Smart E variant, see Chapter 8.2
5. Configure the DIP switches in the cegard/Smart controller (Chapter 6 for details).
6. Connect the output relay on the cegard/Smart controller for controlling the door reversal function(s) (Chapter 6.6 for relay state information).
7. When an extension module is used (e.g., for front and rear opening doors),
 - ▶ Mount the extension module near the door which it will control.

Note: If space is limited, the extension module can also be attached to the top of the cegard/Smart controller using the push pins included. These pins insert into the top of the cegard/Smart controller into the corresponding holes under the CEDES sticker.

- ▶ Attach the interconnect cable between the extension module connector J14 and the cegard/Smart controller connector J5.
 - ▶ Configure the DIP switches in the extension module (Chapter 6 for details).
 - ▶ Connect the output relay on the extension module for controlling the door reversal function (Chapter 6.6 for relay state information).
8. Connect power to the cegard/Smart controller.
 9. Once power is applied, wait 5 s and then verify that the detection capabilities of all components (cegard/Smart light curtain, CabSafe 3D and cegard/Smart controller) fulfill your application requirements. When used, repeat this process for the components attached to the extension module (Chapter 9 for additional details).
 10. Onboard the cegard/Smart system into the IoT Cloud (Chapter 10).

Once these steps are complete, the cegard/Smart system is ready for use.

9. Startup cegard/Smart controller

1. Ensure that the controller, the light curtain and the 3D sensor are installed in accordance with their respective Installation and Operation Manuals and that the cegard/Smart controller DIP switches are set correctly. Verify that there is no visible damage to any of the devices.

2. If not already the case, switch on power to the system. The POWER LED on the cegard/Smart controller will change from OFF to green ON.
3. Wait 5 s after power cycle to ensure that components have completed the initial start-up sequence.
4. With the elevator door(s) in their fully open position and all detection fields clear of objects, ensure that the LEDs on the controller indicate the following:

LED states	Color
Gateway PCB power	green
Gateway PCB cloud	green
Gateway PCB door 1	green
Gateway PCB door 2	green (if extension module used)
Sensor Int PCB power	green
Sensor Int PCB COM	green

Refer to Chapter 11 for further information on LED states.

If any LED state(s) is different than shown above, verify that the installation of:

- ▶ The 2D light curtain is correct if the LED “Tx or Rx” is ON and should not be, and
 - ▶ the 3D Sensor is correct if the LED “3D” is ON and should not be (flashing LED is OK).
 - ▶ Correct any installation details and cycle power. Return to Step 3 above.
5. Verify that cegard/Smart light curtain and controller function correctly and as expected:
 - ▶ As the elevator doors are closing, infringe the cegard/Smart light curtain detection field using your hand. When this infringement occurs, the elevator door(s) must reverse to their fully open position.
 - ▶ As the elevator doors are closing, infringe the cegard/Smart light curtain detection field using your foot at sill level. When this infringement occurs, the elevator door(s) must reverse to their fully open position.
 6. Verify that CabSafe 3D sensor and controller function correctly and as expected:
 - ▶ Ensure that the CabSafe 3D sensor is active (LED on sensor is solid blue / not flashing blue). If the CabSafe 3D sensor is inoperative (blue flashing), infringe the cegard/Smart light curtain to change the CabSafe 3D sensor back to active.
 - ▶ Starting from 1.2 m (4.0 ft) from the landing side of the entrance, walk toward the entrance at a speed between 0.3 m/s and 1.0 m/s (1 ft/s and 3.3 ft/s) perpendicular to the center of the opening.
 - ▶ The CabSafe 3D sensor must indicate an approaching object has been detected (LED turns green) prior to reaching 225 mm (9 in) from the landing side of the landing door and the elevator door(s) must reverse to their fully open position.

As long as the above procedure is successful, the associated component basic functionality of the system has been verified. If the system is installed in accordance with this and the installation and operation manuals, the system fulfills Section 2.13.5 of ASME

A17.1 / CSA B44. A third-party certificate is available online in the downloads section of the corresponding product page at: <https://www.cedes.com/en/products-for/elevators-escalators/>.

Note: Regarding ASME A17.1 / CSA B44 Force Testing of the Door(s):

Since the Approaching Object Detection Means can be rendered inoperative in accordance with Section 2.13.5.2 of ASME A17.1 / CSA B44, testing of the force of the door(s) can be accomplished by measuring the force at the landing door(s) after the approaching object detection means has been rendered inoperative. There are no special procedures required to accomplish this testing.

10. Onboarding cegard/Smart for IoT connectivity

To transmit and receive data from the IoT Cloud using 4G/LTE communication, the cegard/Smart controller must be onboarded. The onboarding should be done when installation is complete and when the unit is first powered

up.

To begin the onboarding process, scan the link below. During onboarding you will be prompted for the ID number 2D barcode (which is unique to each cegard/Smart device). This 2D barcode can be found on the controller itself, as well as on the controller packaging.



<https://elevate-m.cedes-connect.com/>

Figure 25: QR code for CEDES Elevate onboarding process



Figure 26: Example ID number label

11. Troubleshooting

There are two groups of LED indicators used for troubleshooting:

- Group one is next to the DIP switches on the sensor connection PCB as shown in Figure 27 below
- Group two is on the power / Gateway PCB shown in Figure 28.

11.1 Over the Air Update

The cegard/Smart supports over the air update capability to improve performance and add features. If an update occurs and the cegard/Smart no longer functions correctly, or if you have other issues and need support, please contact support at cegardsmart@cedes.com and provide details of the issue you are experiencing. CEDES will assist, to the best of our ability, to help you resolve your issue.

11.2 Sensor interface PCB LED status description

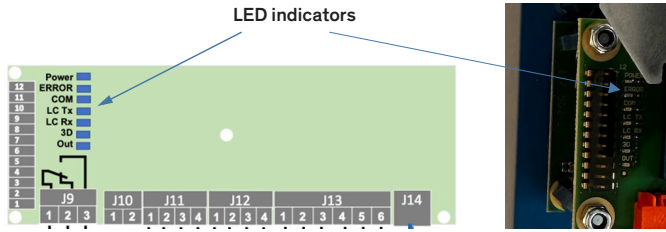


Figure 27: LED indicators sensor interface PCB

Power (green)	ERROR (red)	Out (orange)	3D (orange)	LC Tx / LC Rx (orange)	Action
OFF	OFF	OFF	OFF	OFF	▶ Check electrical connections from controller to power supply. ▶ Check supply voltage of the door controller.
ON	OFF	OFF	OFF	OFF	▶ No error, normal operation
ON	OFF	ON	OFF	ON	For LC Rx normal operation when cegard/Smart light curtain has detected an object / detection field interrupted. If cegard/Smart light curtain is not interrupted, follow troubleshooting instructions in corresponding manual.
ON	OFF	ON	ON	OFF	Normal operation when CabSafe 3D sensor detects approaching object. If CabSafe 3D sensor does not detect approaching objects, follow troubleshooting instructions in corresponding manual.
ON	OFF	OFF	Blinking	OFF	No error and normal operation. Two options ▶ 3D time out, 5 s timer active (Chapter 7) ▶ Door closed
ON	Blinking	ON	ON or OFF	ON or OFF	Check error code according to the table next page (Puls error definition)

Pulse error definition:

Error No	Pulse code	Description
1	1 flash, 1 pause	Internal CabSafe 3D sensor error or manipulation: Check if CabSafe 3D sensor is damaged or has been covered. If not, then please replace CabSafe 3D sensor.
2	2 flashes, 1 pause	Not used / reserved
3	3 flashes, 1 pause	Invalid cegard/Smart controller configuration (Chapter 6).
4	4 flashes, 1 pause	Internal error, replace cegard/Smart controller.
5	5 flashes, 1 pause	Not used / reserved
6	6 flashes, 1 pause	Communication issue between cegard/Smart controller and CabSafe 3D sensor.
7	7 flashes, 1 pause	Not used / reserved
8	8 flashes, 1 pause	Not used / reserved
9	9 flashes, 1 pause	General cegard/Smart controller system error (IC temperature, voltage, ...)

Blinking code:

Flash = 300 ms On / 300 ms Off

Pause = 1'800 ms

11.3 Gateway PCB LED status description

The Gateway PCB has LED indicators to provide system status. These LEDs are located as shown in Figure 28.

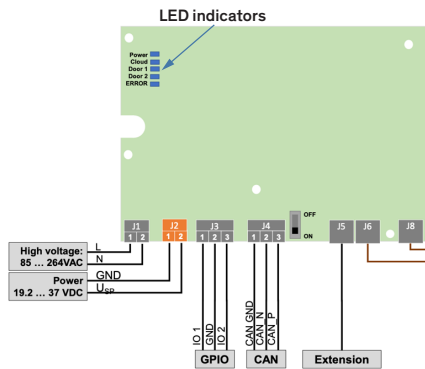


Figure 28: LED Indicators Gateway Interface PCB

Power (green)	Cloud (green)	Door 1 (green)	Door 2 (green)	Error (red)	Action
OFF	OFF	OFF	OFF	OFF	► Check electrical connections from controller to power supply.
FLASH	X	X	X	X	► Normal operation that indicates that an IoT edge software update is in progress. This does not affect SIB performance nor the output relay that indicates object presence.
ON	OFF	X	X	X	► Not connected to cloud.
ON	OFF or FLASH	X	X	X	► OFF: Not connected to cloud. ► 2 pulse / Pause: Connecting to Cloud. ► 3 pulse / Pause: Provisioned but no network connection.
ON	X	OFF	X	X	► Check connection to sensor connection PCB.
ON	X	X	OFF	X	► Check connection to extension module.
ON	X	X	X	OFF or FLASH	► ON: HW error – Contact CEDES. Hardware replacement may be required. ► 1 pulse / pause: IoT-HW configuration mismatch on internal SIB PCB. Check configuration. ► 2 pulse / pause: IoT-HW configuration mismatch on extension module. Check configuration. ► 3 pulse / pause: Network error during the onboarding process. Gateway tries to connect but fails. Move elevator so that LTE/ cellular coverage is sufficient for onboarding.

12. Maintenance

Although the cegard/Smart controller does not need regular maintenance, a periodic functional check is strongly recommended:

- Make sure the optical elements are clear of dirt and dust. If necessary, clean the front surface of the connected sensors with a soft towel.
- Make sure the edges are securely fastened.
- Check the mounting position, cable routing and connection of the sensors.

13. Disposal

The cegard/Smart System or components of the cegard/Smart system should only be replaced if a similar protection device is installed. Disposal should be done using the most up-to-date recycling technology according to local regulations and laws. There are no harmful materials used in the design and manufacture of the sensor. Traces of such dangerous materials may be found in electronic components but not in quantities that are harmful.

Waste Electrical and Electronic Equipment (WEEE):

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

14. Product label

14.1 Product label cegard/Smart controller



Figure 29: Product label examples for cegard/Smart controller and extension module

The information on the product label includes:

ON 1xx xxx	Part Number used for ordering
PN 1yy yyy	Internal CEDES component part number
cegard/Smart Controller CGSM-x	Description of the cegard/Smart controller variant
Lot Number	Manufacturing Date (yymmdd), manufacturing job number (mmmmmmmm), employee number responsible for final test (eeeeee), and incremented serialization (cccccc)
HW: a.bc	Increasing digits with the following meaning: a._.: Major changes, e.g. additional functionality _.b.: Changed configuration (e.g. timing), error correction, bug fix, new compilation, no additional functionality ._.c: 'Cosmetic' update, no functional influence
SW: x.yz	Increasing digits with the following mean: x._.: Major changes e.g. additional functionality on the non-IoT function _.y.: Changed configuration of the non-IoT functionality ._.z: Minor software change to the non-IoT functionality

15. Delivery package

The cegard/Smart controller is shipped with smaller accessories in one box. The longer items (i.e., cegard/Smart light curtain and associated accessories) are shipped in a separate box). Connection plugs associated with the sensors (i.e., cegard/Smart light curtain, CabSafe 3D sensor), that connect to the cegard/Smart controller, are shipped with the sensors.

Refer to Chapter 4.3 for a detailed breakdown of the model designations presented in the following sections.

15.1 North American Kits

cegard/Smart kits consist of two boxes that make up a system. The smaller box includes the controller, the communications interface, and depending on the kit ordered, an extension module and/or CabSafe 3D sensor(s). The larger box includes the light curtain and mounting accessories as shown below.

The more common North American cegard/Smart kits are:



Figure 30: Contents of typical North American light curtain kit

P/No	Model designation	Description
Light curtain only for front-only or front and rear doors:		
117 921	CGS-SY-B1-12D000-2	cegard/Smart One CGSM-B1 7' NA
117 922	CGS-SY-B1-22D000-2	cegard/Smart Two CGSM-B1 7' NA
Light curtain & TOF 3D for front-only or front and rear doors:		
117 923	CGS-SY-B1-13DBSTBT-2	cegard/Smart 3D One CGSM-B1 7' BOT NA
117 924	CGS-SY-B1-23DBSTBT-2	cegard/Smart 3D Two CGSM-B1 7' BOT NA
Light curtain & emergency communication for front-only or front and rear doors:		
117 925	CGS-SY-E1-12D000-2	cegard/Smart EComgard One 7' NA
117 926	CGS-SY-E1-22D000-2	cegard/Smart EComgard Two 7' NA
Light curtain, TOF 3D & emergency communication for front-only or front and rear doors:		
117 927	CGS-SY-E1-13DBSTBT-2	cegard/Smart EComgard 3D One 7' BOT NA
117 936	CGS-SY-E1-23DBSTBT-2	cegard/Smart EComgard 3D Two 7' BOT NA

Other cegard/Smart kit configurations are possible. Please contact your local CEDES representative for additional information.

15.2 European Kits

cegard/Smart kits consist of two boxes that make up a system. The smaller box includes the controller, the communications interface, and depending on the kit ordered, an extension module and/or CabSafe 3D sensor(s). The larger box includes the light curtain and mounting accessories as shown below.



Figure 31: Contents of typical European light curtain kit

The more common European cegard/Smart kits are:

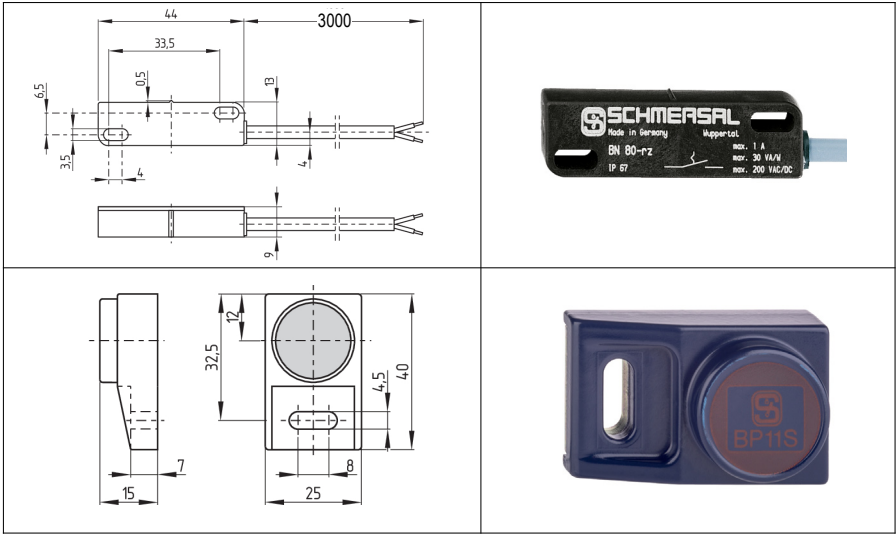
P/No	Model designation	Description
Light curtain only for front-only or front and rear doors:		
117 928	CGS-SY-B2-12D000	cegard/Smart One CGSM-B2 EU
117 929	CGS-SY-B2-22D000	cegard/Smart Two CGSM-B2 EU
Light curtain & TOF 3D for front-only or front and rear doors:		
117 930	CGS-SY-B2-13DBSTFL	cegard/Smart 3D One CGSM-B2 EU
117 931	CGS-SY-B2-23DBSTFL	cegard/Smart 3D Two CGSM-B2 EU
Light curtain & emergency communication for front-only or front and rear doors:		
117 932	CGS-SY-E2-12D000	cegard/Smart EComgard One EU
117 933	CGS-SY-E2-22D000	cegard/Smart EComgard Two EU
Light curtain, TOF 3D & emergency communication for front-only or front and rear doors:		
117 934	CGS-SY-E2-13DBSTFL	cegard/Smart EComgard 3D One EU
117 935	CGS-SY-E2-23DBSTFL	cegard/Smart EComgard 3D Two EU

Other cegard/Smart kit configurations are possible. Please contact your local CEDES representative for additional information.

16. Accessories

16.1 Magnetic Switch

A magnetic switch and actuator are available for use with the cegard/Smart controller to precisely render the CabSafe 3D sensor inoperative at a fixed point.



Technical data - magnet switch

Type	Switch: BN 80-RZ
Housing material	Thermoplastic enclosure
Contact type	Bistable, 1 reed contact
Enclosure rating	IP67
Range actuating magnet BP 11 S	10 ... 30 mm
Cable length and material	3 m, PVC
Operating temperature range	-25°C ... +75°C
Bounce time	0.5 ms
Switching current	0.5 A, 2.3 mA provided by CabSafe controller at U _{SP} = 24 VDC
Mechanical life (operations)	10 ⁹
Weight	26 g

Technical data - actuator

Type	BP 11 S
Housing material	Metal
Weight	40 g

17. Technical data

17.1 cegard/Smart controller

Mechanical

Dimensions (l × h × w)	250 × 191 × 110 mm (9.84 × 7.52 × 4.33 in)
Housing material	Metal
Housing color	Blue
Weight	2 kg
Enclosure rating	IP20
Temperature range	
- Operation	-30 °C ... +50 °C (-22 °F ... +122 °F)
Humidity	Max. 95%, non-condensing
Max. altitude	2,000 m above sea level

Electrical

Supply voltage Up	
High voltage (J1) AC input	100 ... 240 VAC
Supply voltage light curtain (J11 and J12)	26 VDC
Supply voltage 3D sensor (J13)	26 VDC
Max. power-up time	5 s
Typ. power consumption (cegard/Smart LC / CabSafe 3D sensor)	
- 1 LC	10 W
- 1 × LC + 1 × 3D	20 W
- 2 × LC + 2 × 3D	45 W
Inrush current (including cegard/Smart LC and CabSafe 3D sensor)	
- At 24 VDC	500 mA RMS
- At 115 VAC	350 mA
- At 230 VAC	200 mA
Output type	Relay
Max. relay current	250 VAC / 5 A 125 VDC / 0.5 A 30 VDC / 5 A
Min. switching current (relay)	0.1 A / 5 VDC
Max. number of mechanical relay operations	> 20 × 10 ⁶
Max. relay switching voltage	300 VDC
Typical system response time	
- CabSafe 3D	< 250 ms
- cegard/Smart 2D	20 ms + response time cegard/Smart LC
Protection class	Class I
Over-voltage classification	Class II

NOTICE

The use of some type of surge suppression to help protect and extend the operating life of the outputs is recommended when switching inductive load devices, such as motors or solenoids. The potentially high current surges that are created when switching inductive load devices requires this extra protection. By adding a suppression device directly across the coil of an inductive device, the life of the outputs is prolonged.



CAUTION

- ▶ The system response time can increase significantly when surge suppression diodes are used.
- ▶ Never install suppressors directly across the contacts of a connected relay.

The relay output of a cegard/Smart controller is not monitored. A stuck at high of a welded relay contact of a cegard/ Smart control unit may lead to a dangerous situation. To ensure detection of a stuck relay, the elevator control system should monitor that a change of state has occurred after a pre-determined number of door motions.

Telephone network - cegard/Smart - C variant

LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13 B18/B19/B20/B25/B26/B28/B66
LTE-TDD	B34/B38/B39/B40/B41
WCDMA	B1/B2/B4/B6/B8/B19
GSM	850/900/1800/1900 MHZ
PTCRB	IoT Network Certified – ID# 130961

General

EMC emission	EN 12015:2021
EMC immunity	EN 12016:2013 / ISO 22200:2009
Vibration	IEC 60068-2-6:2007
Shock	IEC 60068-2-27:2008
RoHS, REACH	2011/65/EU, 1907/2006 EU
FCC*	2014/30/EU, 2014/33/EU Class B
Certificates	
- Liftinstituut	ASME A17.1-2019 / CSA B44:19 ASME A17.1-2022 / CSA B44:22
- USA / Canada	cCSAus; CSA B44.1:19 / ASME A17.5-2019

* 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.)

17.2 cegard/Smart extension module

Mechanical

Dimensions (w × h × l)	153 × 148 × 45 mm (6.02 × 5.82 × 1.77 in)
Housing material	Metal
Housing color	Blue
Weight	45 g
Enclosure rating	IP20
Temperature range	
- Operation	-30 °C ... +50 °C (-22 °F ... +122 °F)
Humidity	Max. 95%, non-condensing
Max. altitude	2,000 m above sea level

General

EMC emission	EN 12015:2021
EMC immunity	EN 12016:2013 / ISO 22200:2009
Vibration	IEC 60068-2-6:2007
Shock	IEC 60068-2-27:2008
RoHS, REACH	2011/65/EU, 1907/2006 EU
FCC*	2014/30/EU, 2014/33/EU Class B
Certificates	
- Liftinstituut	ASME A17.1-2019 / CSA B44:19 ASME A17.1-2022 / CSA B44:22
- USA / Canada	cCSAus; CSA B44.1:19 / ASME A17.5-2019

17.3 2N EasyGate IP Gateway

Mechanical

Dimensions (w × h × l)	195 × 119 × 61 mm (7.68 × 4.69 × 2.41 in)
Housing material	Plastic
Housing color	Black
Weight	600 g
Enclosure rating	IP43

Cellular network - frequency bands

EU version (EC21-E)

- 4G LTE	B1/B3/B5/B7/B8/B20
- UMTS/WCDMA	850/900/2100 MHz
- GSM	EGSM 900 MHz, GSM 1800 MHz

US version (EC21-A)

- 4G LTE	B2/B4/B12
- UMTS/WCDMA	850/1700/1900 MHz
- GSM	Not supported
SIM cards	2 slots, both support 3 V and 1.8 V SIM cards

One SIM card is included
in a cegard/Smart kit

17.4 EComgard

Mechanical

Dimensions (w × h × l)	270 × 240 × 80 mm (10.63 × 9.45 × 3.15 in)
Weight	2.2 kg w/o battery pack, 4.7 kg with
Enclosure rating	IP30
Maximum altitude	2,000 m above sea level

Cellular network - frequency bands

EU version

- LTE FDD	B1/B3/B5/B7/B8/B20
- LTE TDD	B38/B40/B41
- WCDMA	B1/B5/B8
- GSM	B3/B

US version

- LTE FDD	B2/B4/B12
- WCDMA	B2/B4/B5

SIM cards One SIM Card is included in a
cegard/Smart EComgard kit

17.5 Connectors

Connections	Type	Plug type
AC Power	2-pin (J1)	SAURO CIF02003 (*)
DC Power	2-pin (J2)	WAGO 231-302 (*)
GPIO	3-pin (J3)	SAURO CBF030L8 (*)
Reserved	3-pin (J4)	WAGO 734-103 (*)
Door 2	RJ-45 (J5)	Used for connection to cegard/Smart extension module
Door 1	RJ-45 (J6)	Internal connection to sensor connection PCB
Ethernet	RJ-45 (J8)	Reserved
Relay Output	3-pin (J9)	WAGO 231-303 (*)
External Signal	2-pin (J10)	WAGO 734-102 (*)
cegard/Smart 2D Rx	4-pin (J11)	WAGO 734-104 (*)
cegard/Smart 2D Tx	4-pin (J12)	WAGO 734-104 (*)
CabSafe 3D sensor	6-pin (J13)	WAGO 734-106 (*)
Gateway	RJ-45 (J14)	Internal connection to Gateway PCB (J6) or from an extension module to Gateway PCB (J6)

* or equivalent

18. Communication interfaces

18.1 EasyGate IP (utilized with cegard/Smart B variants)

The EasyGate IP is an analogue GSM/UMTS/VoLTE/LTE gateway used to communicate data from the cegard/Smart controller to the IoT cloud.

The brief manual for the EasyGate IP is included in the package with the device. Please refer to this document for a product introduction, connector layout and meaning, mechanical installation, LED status information and putting the EasyGate IP into operation.



Figure 32: EasyGate IP front and rear view

When an EasyGate IP gateway is used for communication to the IoT Cloud, mount this device in accordance with EasyGate IP brief installation manual included with the device. Then:

- ▶ Attach the cable from USB-C port on the EasyGate IP to the USB-C port on the cegard/Smart controller gateway PCB using the cable supplied with the system (Chapter 5.6.1).
- ▶ Ensure that at least one SIM card is inserted properly into the EasyGate IP



WARNING

Serious health risks

- ▶ The EasyGate IP used with cegard/Smart that is a modified variant suitable for mounting on the elevator cabin. Due to this mounting location, communication is subject to intermittent connectivity as the elevator transits the hoistway.
- ▶ This EasyGate IP variant cannot be used for emergency communications (e.g., POTS line replacement).
- ▶ If emergency communication is needed, use a separate EasyGate IP suitable for this purpose, or the CEDES EComgard version of cegard/Smart.

18.2 EComgard controller (utilized with cegard/Smart-E variant)

CEDES EComgard controller is hardware unit that provides cellular modem communication and ethernet router functionality. It should be located in the machine room or other location where the cellular signal is strong enough to provide consistent connectivity to the IoT Cloud. The version needed depends on the cellular technology used in your geography.

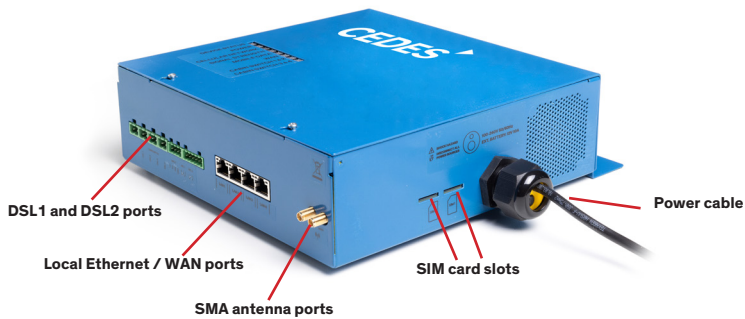


Figure 33: EComgard connections

The EComgard controller connects to the EComgard switch inside the cegard/Smart-E (CGSM-E) controller using two conductors (DSL-rated; ideally shielded, twisted pair) in the traveling cable. Up to two cegard/Smart-E controllers are supported using a single EComgard controller unit. EComgard switches can be connected to DSL1 or DSL2. Take note that DSL3 and DSL4 have no function.

The EComgard switch [LAN 4 connector] is connected to the cegard/Smart Gateway PCB [Connector J8]. Three additional ethernet devices can be connected to the EComgard switch using separate ethernet (RJ-45) cables on the LAN1-LAN3 connectors. Two (2) of these LAN connectors support Power over Ethernet (PoE) [LAN1 and LAN2] for connection e.g., of an internet-enabled camera and/or dialer. These additional ethernet ports can be used to fulfill the requirements for text, voice and video associated with multimedia emergency communications using Voice Over Internet Protocol (VOIP), or for connection of other IoT-enabled components.

The EComgard controller communicates to the outer world via LTE (cellular) or via the local wide-area network (WAN) port. It is recommended that the EComgard controller be installed in a room secured against unauthorized persons, (e.g., machine room, substation, etc.) to prevent manipulation. A SIM card is included that enables the cellular communication and should already be pre-installed in the SIM card Slot 1 as shown in the following figure.



Figure 34: EComgard SIM card

When an EComgard controller is used for communication to the IoT Cloud,

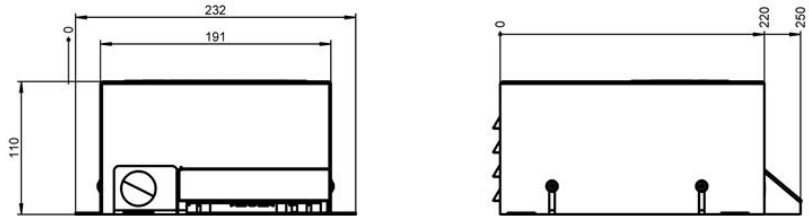
- ▶ Mount the EComgard controller on a wall using the provided hardware in accordance with the operating instructions for the device.
- ▶ Refer to the EComgard controller brief installation manual (included with the EComgard controller) for additional details, including LED status information and troubleshooting. Please contact your local CEDES representative if additional EComgard information is required.
- ▶ Connect the two-pole connector marked "[EComgard]" on the EComgard switch inside the cegard/Smart-E controller to the two-pole connector marked DSL1 or DSL2 on EComgard controller using compatible conductors (two-wires in the traveling cable). These conductors should be suitable for DSL (digital subscriber line) use, be shielded and twisted pair.
- ▶ Ensure that at least one SIM card is inserted properly into the EComgard SIM card slot 1 (see Figure 34 for SIM card slot location).
- ▶ Insert the battery into the EComgard housing and connect the +/- terminals to the corresponding wires.
- ▶ Connect the antenna to the SMA port "Main".
- ▶ Connect power to the EComgard controller.
- ▶ Return to step 5 in Chapter 8.

Integration and security of other connected devices are the responsibility of others. It may take a few minutes before LED indicators begin illuminating after power-up or power cycle.

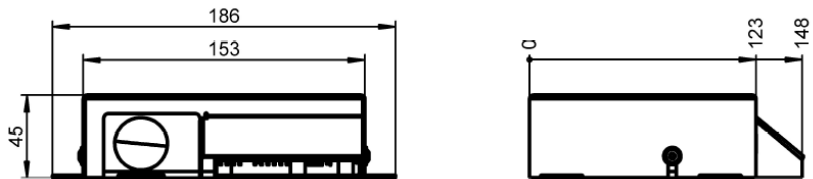
When a CEDES EComgard kit is purchased that includes the IP Dialer and Camera, please refer to 118 581 CEDES EComgard Integration Guide for a step-by-step approach to integrating the system, including the system settings and requirements.

19. Dimensions

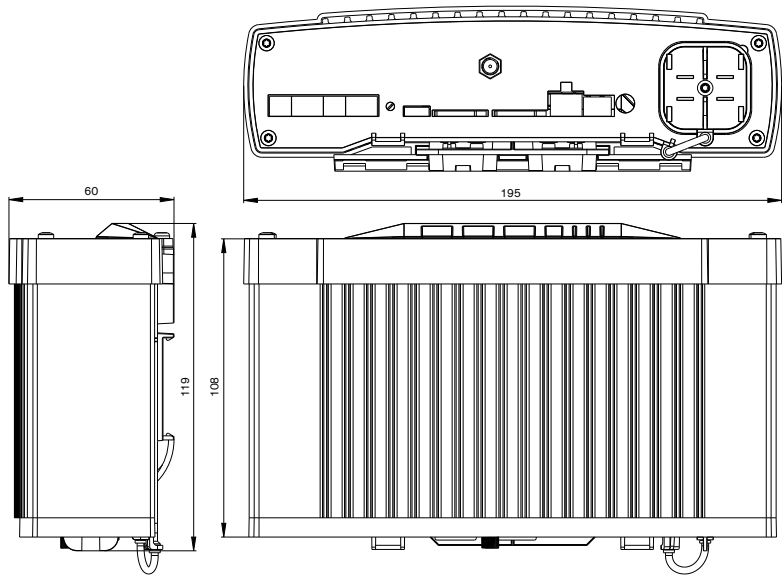
19.1 cegard/Smart CGS-B / C / E variants



19.2 Dimensions cegard/Smart extension module



19.3 Dimensions Easygate IP



19.4 Dimensions EComgard

