

## Installation and Operation Manual *(North American Version)*

### cegard/Mini-2000-32-NA

### Light Curtain for Dynamic Mounting on Elevator Doors



*Criss cross beams to full door closure*



## ⚠ IMPORTANT NOTICES ⚠

FOLLOW THE INSTRUCTIONS GIVEN IN THIS MANUAL CAREFULLY. FAILURE TO DO SO MAY CAUSE CUSTOMER COMPLAINTS AND SERIOUS CALL BACKS. KEEP INSTRUCTION MANUAL ON SITE.

WHEN THE CEGARD/MINI LIGHT CURTAIN IS USED AS A REPLACEMENT FOR MECHANICAL SAFETY EDGES, IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT ON COMPLETION, THE INSTALLATION COMPLIES WITH ALL THE RELEVANT CODES AND REGULATIONS THAT PERTAIN TO THE APPLICATION OF THIS SYSTEM (E.G. INFRARED AND PHOTOELECTRIC DOOR PROTECTION DEVICES)!

PARTICULAR ATTENTION SHOULD BE GIVEN TO CLAUSE 2.13.5 REOPENING DEVICES FOR POWER-OPERATED CAR DOORS OR GATES OUTLINED IN ASME A17.1-2007 / CSA B44-07 SAFETY CODE FOR ELEVATORS AND ESCALATORS OR THE APPLICABLE PARAGRAPHS FROM SUBSEQUENT REVISION(S).

CEGARD/MINI MUST ONLY BE INSTALLED BY AUTHORIZED AND FULLY TRAINED PERSONNEL.

PLEASE TAKE NOTE THAT OBJECTS THINNER THAN THE SENSOR SPACING MAY NOT BE DETECTED.

**DO NOT USE THIS PRODUCT FOR THE PROTECTION OF DANGEROUS MACHINERY OR IN EXPLOSIVE ATMOSPHERES OR RADIOACTIVE ENVIRONMENTS! USE ONLY SPECIFIC AND APPROVED TYPES OF SAFETY DEVICES FOR SUCH APPLICATIONS, OTHERWISE SERIOUS INJURY OR DEATH OF PERSONNEL MAY OCCUR!**



## 1. Introduction

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The infrared light curtain cegard/Mini consists of a transmitter (Tx) and a receiver (Rx) edge, both of which have a built-in controller. These two active parts are electrically connected directly to the door drive unit of the elevator and mechanically mounted either to the car door wings and/or to the slam post. There are various types of optional mounting kits available from **CEDES**. These kits are optimized to a specific door drive or car type.

The transmitter and the receiver edge build up a grid of infrared beams, which cover the door entrance to a height of 1,800 mm (6 feet). The number of beams covering the entrance area is dependent on the model in use. The number after the product name cegard/Mini indicates the maximum number of active beams. The higher the number, the more beams are active and therefore smaller objects can be detected. However, product cost increases with the number of beams.

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The criss cross beams remain active until full door closure. The transmitter and receiver must be mounted more than 25.4 mm (1 inch) from the edge of the elevator cab door.

The transmitter and the receiver require a power supply of 14 to 30 VDC. The output of the receiver is a push/pull (PNP/NPN) stage, which is compatible with loads connected to either positive (PNP) or negative (NPN) power.

If a power supply with 14 to 30 VDC is not available, two different state-of-the art power supplies available from CEDES.

- A universal power supply with relay output and integrated EMC filter accepts any voltage available from 20 to 265 VAC or DC without any special wiring or adjustments. The polarity of DC voltage is irrelevant. This product is especially useful in modernization applications where the supply voltage is not standardized or known.
- A simple power supply which accepts AC voltages from 85 to 265 VAC with integrated EMC filter. This device has also a relay output.

Please refer to Section 8 Relay and Power Supply Accessories section for ordering information.

## 2. Features of cegard/Mini

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- Very robust and extremely compact design
- No earth connection necessary
- Designed lifetime of more than 20 years due to
  - gold plated contacts
  - special cable that withstands more than 20 million door openings (when properly installed)
- Plug'n-play edges with integrated controller
- No link connection between transmitter and receiver due to optical synchronization principle
- Suitable for side or center opening doors
- Suitable for metal or glass doors
- Mechanically compatible to **CEDES** cegard/Max and **CEDES** MiniMax light curtains

### 3. Installation

The installation should be implemented using the following sequence:

#### 3.1. Switch main power off and mark clearly that this elevator is out of service

For your own safety, turn the power off before you start working on the elevator! Clearly mark that this elevator is out of service.


#### 3.2. Mount the transmitter and receiver


The transmitter and receiver edges can be mounted either to the elevator cab doors (center opening) or to the elevator cab door and the slam post (side opening).

The black “eyes” in the aluminum profile are the optical elements that form the front of the edge. This front side must “look” at its companion piece, which is mounted on the opposite door or on the slam post.

Please note that the receiver (the edge with the blue connector) can be sensitive to “foreign” light. Avoid other sources of external light, including the transmitter of a different light curtain or single beam photo-electric system.

The cegard/Mini is designed to be tolerant of bright sunlight. That said, it is better to mount the receiver edge so that sunlight does not shine directly into the receiver lenses. This minimizes the possibility that the receiver will be “blinded” by direct sunlight.

 Objects smaller than the sensor spacing may not be detected! For this reason, we recommend that the cegard/Mini with 32 elements be used.

 When mounted, the transmitter and receiver **must be at least 50 mm (2 inches) apart** when the door is fully closed. This allows the criss cross beams to remain active through full door closure.


Additional mounting hardware is available (e.g. mounting profiles, spacer profiles and vision shields). The transmitter and receiver can be mounted directly to the elevator cab door or slam post. For a more aesthetic installation, the additional mounting hardware can be used in your application.

Please observe the following mounting guidelines:

1. Never scratch or paint the optical lenses because they form the light path!
2. Do not drill additional holes into the light curtain transmitter or receiver as this may cause internal damage to the device.
3. Do not bend or twist the transmitter or receiver edges!
4. Oil may damage the cable. Contamination must therefore be avoided at all times!
5. Avoid external light from other infrared light sources like photo eyes, light barriers or direct sunlight!
6. For installation of the transmitter and receiver:
  - Exit both cables in the same direction
  - Do not over-bend the cables or expose them to tension
  - Ensure that the cables are kept as far as possible from AC main power or sources of high voltage
  - Do not force, stretch or squeeze the cables
  - Ensure that the cable is well fastened and routed
  - Keep the transmitter and receiver clean from dust and dirt
  - Avoid contamination by oil or greasy liquids
  - Avoid obstructions caused by objects entering the detection area (e.g. cables, door hardware).

#### 3.3. Route the cables properly to prevent damage

Route the cables properly using appropriate mounting material, e.g. cable protection tubes, neoprene cable ties and cable guide wires (depending on the type of mounting kit used).

 If the cables are not properly fixed and guided, their lifetime could be reduced greatly. Cables can also be damaged due to swing or snag in the hoistway! Always follow the cable guide instructions carefully, which can be found in this installation and operation manual.

### 3.4. Connect the transmitter and the receiver cables

Make sure that the power supply voltage available for cegardMini is between 14 and 30 Volts DC. The power supply has to provide at least 100 mA for proper operation.

cegard/Mini meets all standards for resistance to electromagnetic interference (EMI). However, it is prudent to guard against interference. Therefore, do not guide cegard/Mini connection cables close to cables carrying high voltage and/or high current.

The cegard/Mini cables should also be mounted as far away as possible from the door drive motor or motor inverter (VVVF-drives) to avoid EMI.

### 3.5. Power-up and test for proper function

Turn on power after cegard/Mini has been correctly installed. There is an optical indicator (LED) in both the transmitter and receiver that provides light curtain status information.

Edge	LED Color	LED ON	LED OFF
Rx	Orange	Power OK; Object detected or Not Aligned	No Power or No Object
Tx	Green	Power OK	No Power

Receiver (Rx) Conductor Description (Blue Cable Plug)	Receiver (Rx) Connection Information (Blue Cable Plug)
Brown: Source Power $U_{SP} = +14 \dots 30 \text{ V DC}$ Blue: Common (COM/GND) = 0 V DC Black: Output (Used for Door Reopen Signal) White: Normally Open / Normally Closed Selector <ul style="list-style-type: none"> <li>Connect to 0 V DC for Normally Closed; or</li> <li>Connect to <math>U_{SP}</math> (24 V DC) for Normally Open; or</li> <li>Leave unconnected for Normally Open</li> </ul>	
<b>Normally Closed (NC) Operation</b> Rx White Wire Connected to 0 V DC	<b>Normally Open (NO) Operation</b> Rx White Wire Connected to $U_{SP}$ or Not Connected
Transmitter (Tx) Conductor Description (White Cable Plug)	Transmitter (Tx) Height Selection
Brown: Source Power $U_{SP} = +14 \dots 30 \text{ V DC}$ Blue: Common (COM/GND) = 0 V DC Black: No Connection White: Height Selector (optional) – The height of the detection field can be reduced when objects move through the detection field during the door closing process (e.g. when door cam / cables enter detection field). <ul style="list-style-type: none"> <li>Connect to 24 V DC for reduced height; or</li> <li>Connect to 0 V DC for full height; or</li> <li>Leave unconnected for full height.</li> </ul> This feature is model dependent and it is important to note that when the height of the light curtain is reduced, EN 81-70 requirements are not fulfilled.	

## 4. Troubleshooting

If cegard/Mini does not operate as expected, observe the following troubleshooting guide step by step:

1. Switch off the light curtain and then switch it on again (i.e. cycle power).
2. Check supply voltage both on transmitter and receiver. Is the green indicator LED in the transmitter edge on and is the orange LED in the receiver edge on when there are no obstacles between the emitter and the receiver? Is the supply voltage between 14 and 30 Volts DC? The ripple on the DC voltage should not exceed more than 10% of the mean voltage within the min/max range.
3. If output of the receiver (black wire) is high when the protected area is not obstructed, and in this case it should be low, connect the white wire of the receiver cable to 0 V DC (Rx Blue Wire).
4. If the output of the receiver (black wire) is low when the protected area is not obstructed, and in this case it should be high, connect the white wire of the receiver cable to  $U_{SP}$  (24 V DC) power (brown wire).
5. If the output signal of the receiver is not stable during the closing of the door, make sure that:
  - a. there is not excessive EMI-noise generated by the door drive or the door inverter or any other means that is disturbing the door edge. In such case, move the cable of the receiver so that the distance to the noise source is as far away as possible. In addition, filter the noise of the source by using the optional Power Supply (including Relay contact) available from CEDES.
  - b. there are no obstacles between the transmitter and the receiver. Make sure that the door lock or any other obstacle does not enter the light path during the door closing process.
  - c. the edges are properly installed so that they cannot swing or vibrate, thus causing misalignment.
  - d. the optical elements of the edges are clean and not full of dust or dirt. Although cegard/Mini is very tolerant to this condition, its performance is much better when it is clean.
6. If the doors are closing even with an obstacle<sup>1</sup>, there could be several reasons:
  - a. Output selector (white wire) not properly set. See Troubleshooting steps 2 and 3.
  - b. Output not correctly wired to door operator
  - c. Faulty/defective system wiring or defective receiver edge.<sup>2</sup>

<sup>1</sup> Due to the nature of door system designs, (which as complete systems are not fail safe), doors can close even with an obstacle present in extremely rare conditions. Therefore, there must be, by code, other safety means to prevent passengers from being hurt by the elevator doors. These dangerous situations should and can be detected by the elevator control, which should, in such a case, take the elevator out of service.

## 5. Maintenance

The cegard/Mini is designed for little or no maintenance. That said, **CEDES** strongly recommends that a functional check occur with every elevator maintenance check, or every 6 months. This periodic functional test should consist of the following:

- Test the reopening function over the whole door area. The door should reopen if an object is placed anywhere between the sill and up to 6 feet above the sill.
- Clean the front surface with a soft towel from dust or dirt. Especially when the door edges are installed before the construction of the building is finished (perhaps weekly during construction). To clean the surface with a towel, it must be either dry or slightly moist, but not wet.
- Confirm edges are fastened securely to the door wings and slam post.
- Confirm cables are routed properly as described in the appropriate mounting kit installation manuals.



### Important notices:

Never use any solvents, cleaners or mechanically abrasive towels to clean the edge. The optical lenses can be damaged!

Although the edges are water and weather resistant, never use lots of water to clean the edges! Never use high-pressure water to clean the edges! Do not scratch the surface when cleaning the edges!

Disregard of the mentioned precautions may lead to a loss of safety!

## 6. Disposal




The light curtain should only be replaced if a similar door protection device is installed. Disposal should be done using the most up-to-date recycling technology according to local rules and laws. There are no harmful materials used in the design and manufacture of this light curtain. Traces of such dangerous materials could be used in the electronic components but not in quantities that are harmful to health.

<sup>2</sup> This device (as well as all other door protection systems on the market) cannot – by its nature – provide absolute safety for elevator passengers passing through the doorway. It must not be used as the final fail safe device of the door mechanism. This ultimate safety function has to be provided by a fail safe force and kinetic energy limiter.

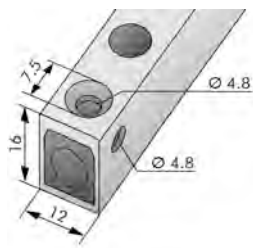
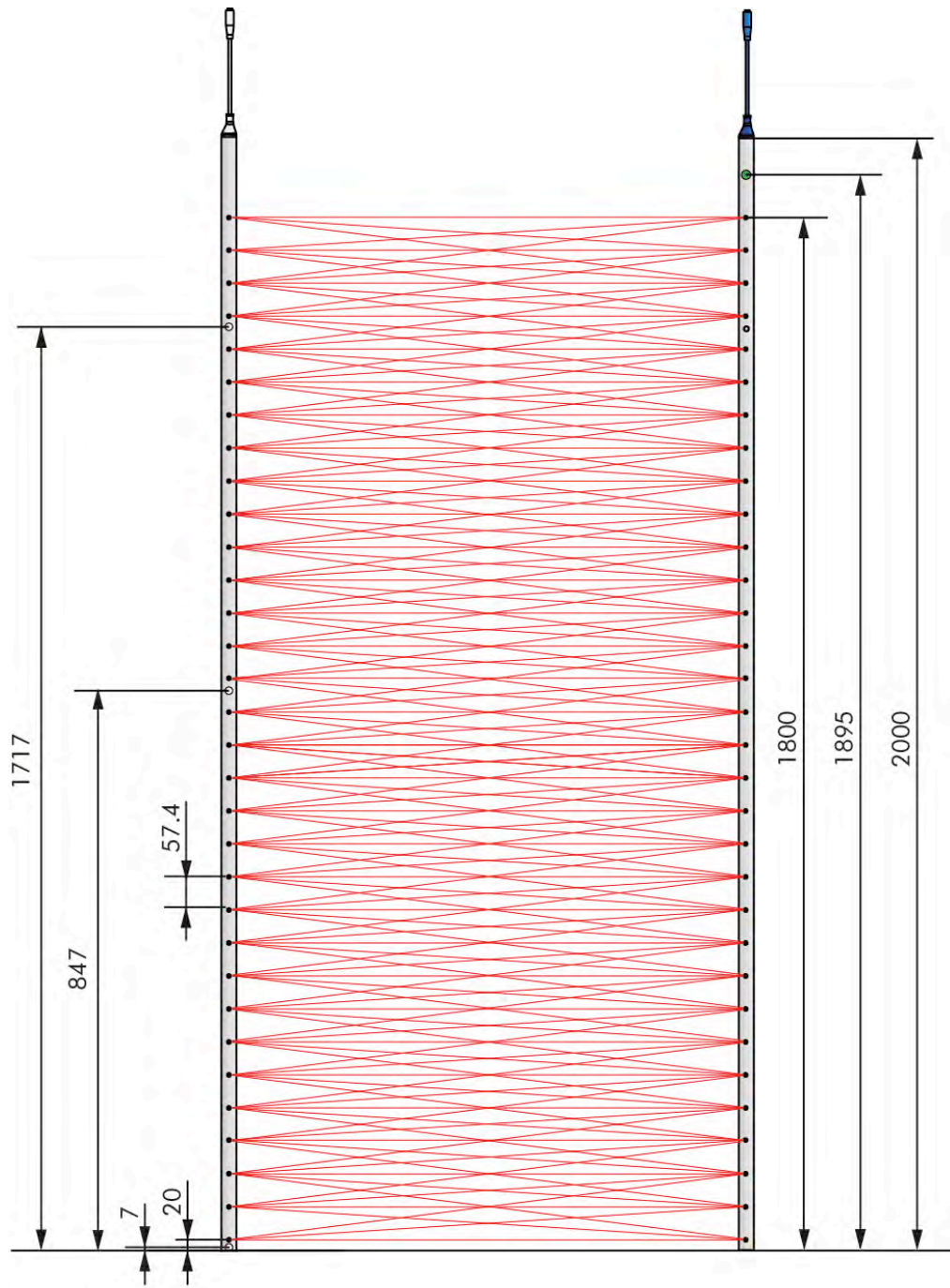
## 7. Technical Specifications

Description	Value
Supply voltage $U_{SP}$	14 ... 30 VDC
Maximum ripple at $U_{SP}$	10%
Supply current at 24 VDC	40 mA typical (without load)
Inrush current per edge	< 2 A
Output type	PNP/NPN (push-pull)
Output logic	NO/NC selectable
Output switching current	120 mA maximum, 100 nF maximum
Number of optical elements	32
Number of optical beams	154
Response time	120 ms, typical
Operating range	0.05 ... 3 m (2 inches ... 9.84 feet)
Dimensions	12 x 16 x 2,000 mm (.47 x .63 x 78.74 in)
Protection height	1,800 mm (6 ft) without hight selector reduction (see page 5)
First beam above lower end of edge	20 mm (0.78 in)
Weight	0.3 kg
Max. ambient light (DC light)	100,000 Lux
Protection class	IP 65 / NEMA 12
Temperature range	-40 ...+60 °C (-40 ...+140 °F)
Cable length	5 m, detachable, color coded
Cable lifetime	20 million door movements (when correctly installed)

## 8. Relay and Power Supply Accessories



	<p><b>Relay Module</b> Part Number: 103 602</p>	<p><b>Input Voltage:</b> 24 V DC <math>\pm</math> 15%</p> <p><b>Output Voltage:</b> 24 V DC <math>\pm</math> 10%</p>	<p><b>Output Relay Rating:</b> 12 A / 125 V AC 7 A / 30 V DC</p>
	<p><b>Universal Power Supply</b> Part Number: 103 600</p>	<p><b>Input Voltage:</b> 20 ... 265 V AC/DC</p> <p><b>Output Voltage:</b> 24 V DC <math>\pm</math> 10%</p>	<p><b>Output Relay Rating:</b> 8 A / 250 V AC 0.5 A / 125 V DC 8 A / 30 V DC</p>
	<p><b>Switching Power Supply / Power Line Converter</b> Part Number: 111 014</p>	<p><b>Input Voltage:</b> 85 ... 265 V AC</p> <p><b>Output Voltage:</b> 24 V DC <math>\pm</math> 10%</p>	<p><b>Output Relay Rating:</b> 9 A / 125 V AC 7 A / 277 V AC 7 A / 30 V DC</p>

### 9. Dimensional Information





## 10. Conformance

<b>Konformitätserklärung</b>	
<b>Déclaration de Conformité</b>	
<b>Declaration of Conformity</b>	
<b>Dichiarazione di Conformità</b>	
<b>Deklaracja zgodności</b>	
Wir / Nous / We / Noi / My	
erklären in alleiniger Verantwortung, dass déclarons sous notre propre responsabilité que declare in sole responsibility that dichiariamo sotto propria responsabilità che deklarujemy z pełną odpowiedzialnością, że	<b>CEDES AG</b> <b>Science Park</b> <b>CH-7302 Landquart / Switzerland</b> <b>www.cedes.com</b>
der Lichtvorhang unité de interface optique the Optical Interface	<b>cegard/Mini</b>
den Anforderungen der <b>Aufzugs-Richtlinie 95/16/EC</b> entspricht. remplit toutes les exigences de la <b>Directive d' Elévateur 95/16/EC</b> qui le concernent. meets all the provisions of the <b>Lift Directive 95/16/EC</b> . adempie a tutte le esigenze della <b>Direttiva di Elevatore 95/16/EC</b> che lo riguardano. odpowiada wszystkim wymaganiom <b>Dyrektywy Dźwigowej 95/16/EC</b> .	
Angewandte harmonisierte Normen Harmonized standards and specifications Normes harmonisées et spécifications Zastosowane normy zharmonizowane	<b>EMV 89/336/EWG</b> (Geändert, modified, modifié: 92/31/EWG, 93/68/EWG, 93/465/EWG)
Andere normative Dokumente D'autre normes Other standards Altre norme Inne dokumenty normatywne	<b>EN 12015:2004    EMC - Emission</b> <b>EN 12016:2004    EMC - Immunity</b> (Product family standard for lifts, escalators and moving walks)
Bericht Nummer Report No.	<b>CEDES                    PB-07-EL-017.doc</b>
Nr raportu technicznego	
Ort und Datum Lieu et date place and date luogo e data Miejsce i data	<b>CH-7302 Landquart, 2007-06-27</b>
Name und Funktion nome et fonciton name and function nome e funzione Nazwisko i stanowisko	 <b>Andreas Hartmann</b> Leiter Qualitätsmanagement Dirécteur de Qualité Head of Quality Management Direttore di Qualità



# Certificate of Compliance

Certificate: 1981231

Master Contract: 187273

Project: 1981231

Date Issued: May 21, 2008

Issued to: CEDES AG  
Weststrasse  
7301 Landquart  
SWITZERLAND

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'*

*Note: "CSA B44.1 / ASME A17.5" may appear adjacent to the CSA mark*



Issued by: G. Foulem

Authorized by: M.H.J. Hoendervangers

**PRODUCTS**

CLASS 2411 01 -ELEVATOR EQUIPMENT - Open and Enclosed Elevator Electrical Equipment  
CLASS 2411 81 -ELEVATOR EQUIPMENT - Open and Enclosed Elevator Electrical Equipment - CERTIFIED TO US STANDARDS.

Light Curtains System cegard/Mini, open types, emittor rated 10 to 30 Vdc and a receiver rated 10 to 30 Vdc 120 mA.

Note:

Certified for use only as components of other Certified equipment where the acceptability of the combination has to be determined by the CSA International.

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2004-06-30

Page 1



