(EN)

OMEGA

User Manual

OMEGA6-4RMA	OMEGA12-4RMA	OMEGA16-4RMA
OMEGA6-4R5V	OMEGA12-4R5V	OMEGA16-C
OMEGA6-C	OMEGA12-C	OMEGA16-Ca
OMEGA6-Ca	OMEGA12-Ca	

Dinacell Electrónica S.L.

Product notice

This manual describes the characteristic of the products in its most updated version.
The resources and functions includedin this manual applies to the OMEGA family of models (not all models incorporate all functions).

Not all resources are available in all editions or versions of the OMEGA.

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For more information

www.elevatormotors.com

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Introduction

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1.1 Product description

The OMEGA is a load limiter and rope tension measurement device.
Depending on the model, it supports one individual reading of up to 16 sensors. The device can be connected to any controller via relay alarms or analog outputs as well as Can Bus.

1.2 Features by model

⚠ In this manual you will find the resources and functions that include the OMEGA family model set (not all models incorporate all the functions).

Check or verify the functions included in your model, with the table below.

Models		OMEGA6-4RMA	OMEGA6-4R5V	OMEGA6-C	OMEGA6-Ca	OMEGA12-4RMA	OMEGA12-4R5V	OMEGA12-C	OMEGA12-Ca	OMEGA16-4RMA	OMEGA16-C	OMEGA16-Ca
Input channel	-	6				12				16		
Temperature range Working	°C *(°F)*	-10 ... +65 *(+14 ...+149)*										
Temperature range Storage	°C *(°F)*	-20 ... +70 *(-4 ... +158)*										
Relay	-	4		-		4		-		4	-	
Alarms	-	5										
Analog outputs 0-10V / 4-20mA / 0-20mA	-	✓	-	-	✓	✓	-	-	✓	✓	-	✓
Analog outputs 0-5V		-	✓	-	-	-	✓	-	-	-	-	-
CANopen-Lift CIA 417 (Isolated)	-	-	-	✓	✓	-	-	✓	✓	-	✓	✓
Cabin display MB output	-	✓	-	-	-	✓	-	-	-	✓	-	-
NG technology (with USB for firmware upgrade)	-	✓										

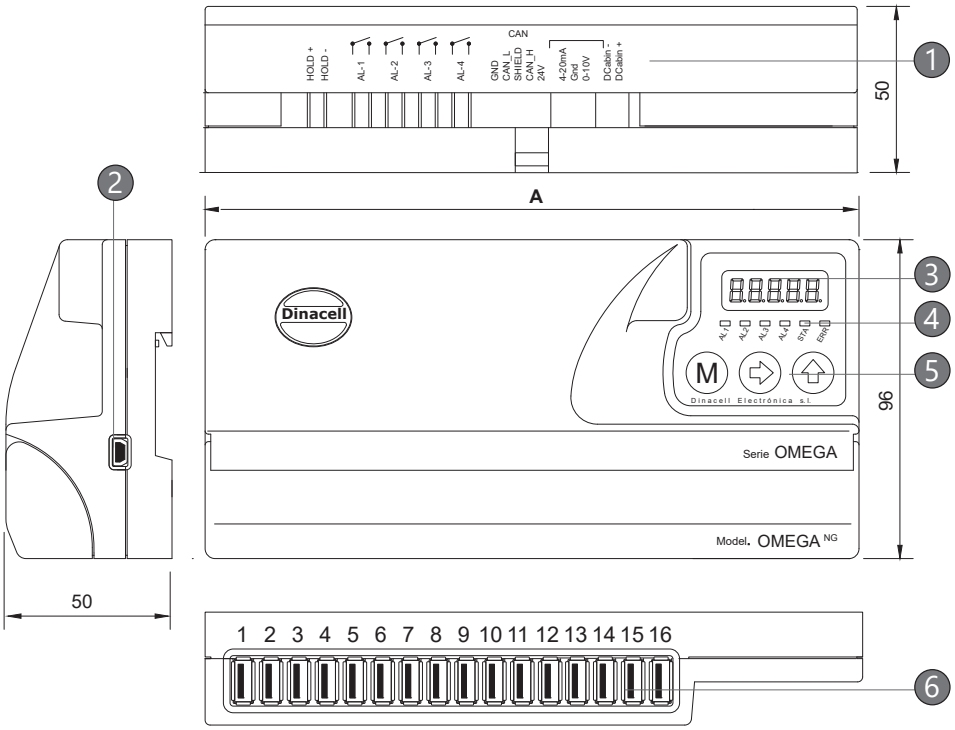
1.3 Electrical specifications

Parameter		Units	Specifications
Power supply (Short circuit protected. It is not necessary to replace any fuse)		VDC	10 ... 40
Maximum current consumption		mA	< 200
Relay contact	Max. voltage	VAC	250
	Max. current	A	3
	Type	-	NO
Hold Input		VAC/DC	12 ... 125
Casing material		-	IP50 Fireproof plastic ABS

Technical data for installation

2

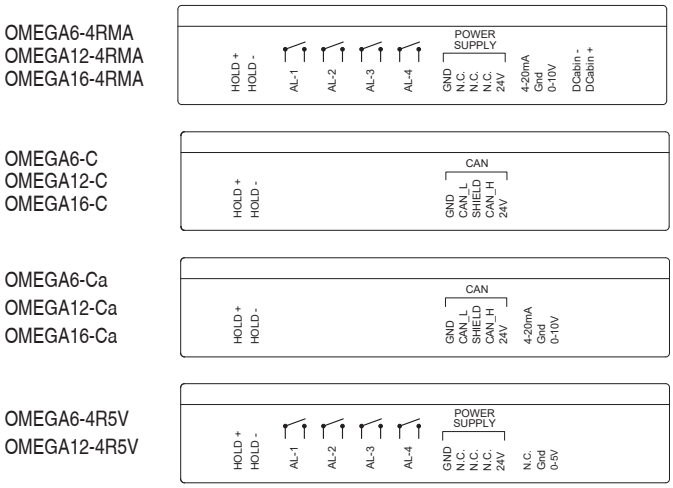
2.1 Dimensions (mm) and connections



Models	OMEGA6 OMEGA12	OMEGA16
A	165	200

(1) Connection diagram.

⚠ Varies by model



HOLD + HOLD -	Hold signal input.
AL-1 AL-2 AL-3 AL-4	Relays alarm connections
POWER SUPPLY: GND N.C. N.C. 24V — CAN: GND CAN_L SHIELD CAN_H 24V	Power supply of the device or power and connection of the CAN network.
4-20mA Gnd 0-10V	Analog output.
DCabin - DCabin +	Cabin display output. 5V (max. 30mA)

(2) NG connection port.

Mini USB input for firmware update.

(3) Display.

(4) LED Indicators

- AL1 Full load alarm
- AL2 Overload alarm
- AL3 Empty or auxiliary alarm
- AL4 Rope / Belt tension unbalance or slack alarm
- STA LED Status
- ERR Led error indicator

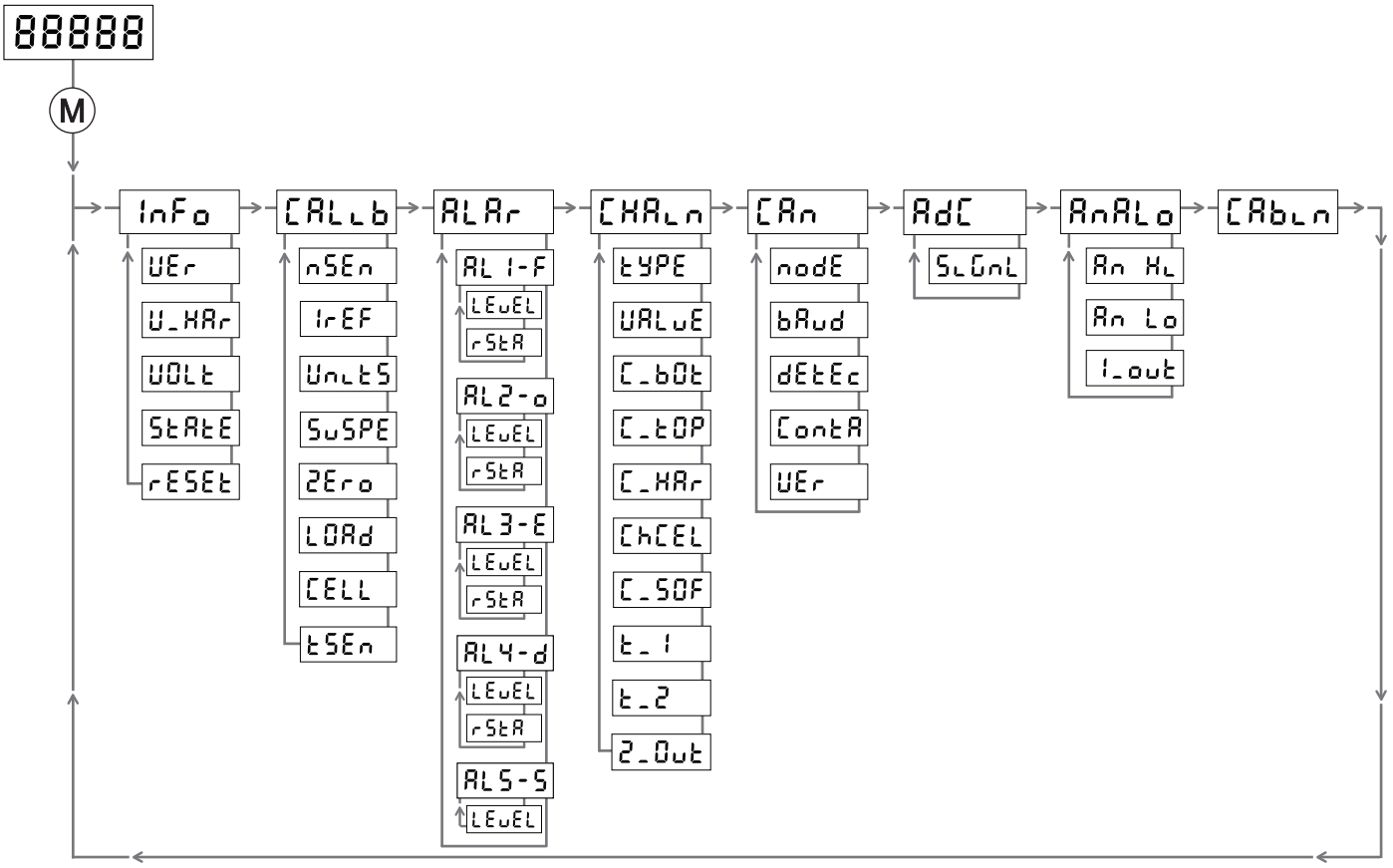
(5) Button keyboard.

(6) Cell signal input

USB input for the sensors. OMEGA6 models up to six sensors OMEGA12 up to twelve sensors and OMEGA16 up to sixteen sensors.

Internal structure & device management 3

3.1 Menu Structure



3.2 Button functions

Buttons	State	Functions
M	From Load display	Keep pressed to enter or exit from the settings menu.
	Inside Menu	Press to navigate through the different submenus or parameters.
	Setting any parameter	Double-click to confirm and save the value. If you confirm but do not save the value after 10 seconds, the value will not be saved.
➡	Inside Menu	Press to enter inside a submenu or parameter.
	Setting any parameter	Press to select the digit to modify.
⬆	Inside Menu	Press to visualize the value of the parameter selected.
	Setting any parameter	Press to change the value of the blinking digit.

Settings Menu

4

4.1 Settings Menu

The display of your device will show you, by default, the weight indicator 88888 . In order to enter or exit the settings menu you have to keep the button (M) pressed.

The menu has a cyclic structure composed of different submenus as shown in the diagram below.

⚠ Some models may not integrate all menus or funtions, see section 1.2.

Settings menu	Description
InFo	Device information Submenu.
CALib	Device calibration submenu.
ALAr	Alarms submenu.
CHAin	Chain compensation submenu.
CAn	Can communication submenu. ⚠ Only for models with CANopen-Lift CIA 417, see section 1.2.
AdC	Submenu for displaying the signal of the sensors in mV/V.
AnALo	Submenu of analog output. ⚠ Only for models with analog output, see section 1.2.
CAbin	Parameter of cabin display. ⚠ Only for models with output for MB cabin display, see section 1.2.

4.2 Information submenu

Options submenu	Description
InFo → UEr	**Firmware Version (Read-only).** Valid firmware : v1.00 and above.
U_HAr	**Hardware Version (Read-only).** The device will show you the hardware version of the OMEGA unit.
UOLt	**Unit voltage (Read-only).** Valid values around 24 VDC.
StAtE	**Eeprom status. (Read only).**
rESEt	**Reset operation.** _nO To cancel the operation. _ALL To restore all values to the factory state. ⚠ All calibration information will be lost.

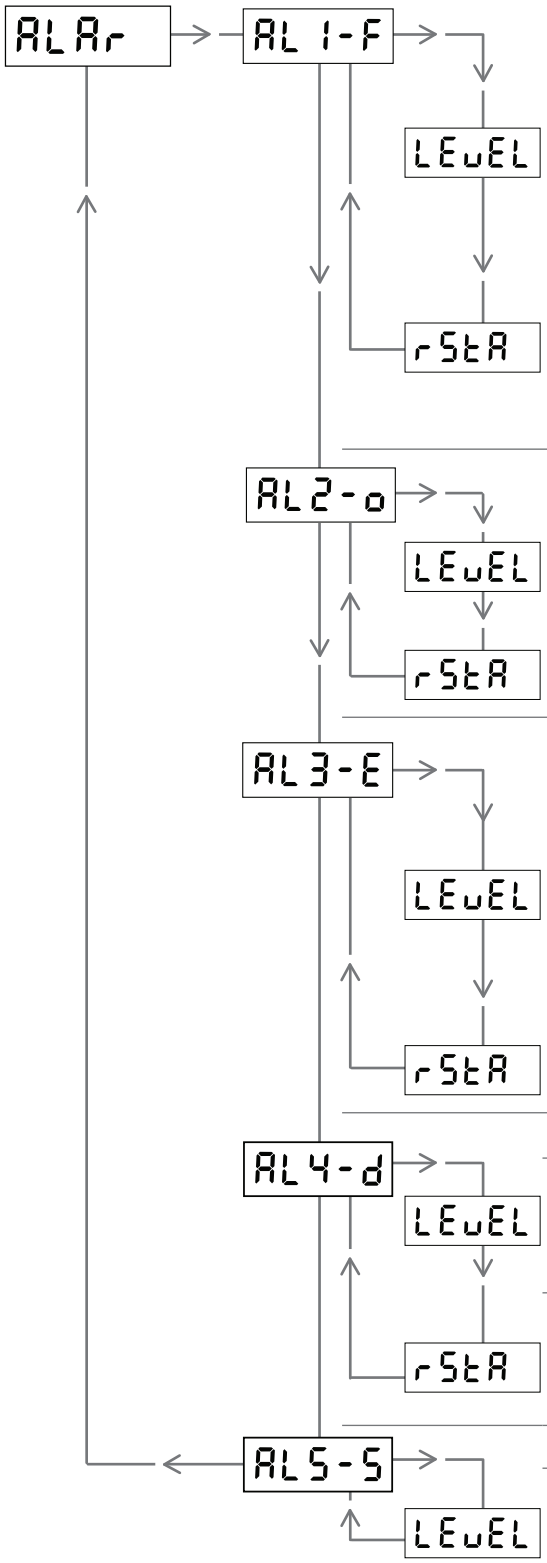
4.3 Calibration submenu

Options submenu	Description
CALLb → nSEn	**Parameter to indicate the number of sensors connected to the device.**
IrEF	**Operation Iref allows the device to take an initial reference of the individual signal from each sensor.** _nonE Selected by default. You should not modify this selection if the sensors to be installed will only be used as weight load devices or if the sensors are Plug & Play (sensors with a cell value on their label). _ALL Select for an individual tension for each rope or belt. ⚠ If you select "_ALL" it is necessary that the sensors are connected to the device but not installed on your elevator. In case they are installed and it is not possible to uninstall them, select the "_NonE" option.
UnitS	**The Parameter to indicate the weight units. (kilos or pounds).** ⚠ All parameters with weight values will be displayed in the selected units but internal calculations are done in kg, so rounding errors may occur.
SuSPE	**Parameter to indicate the roping of the installation.** 1:1 2:1 3:1 4:1
2Ero	**The Operation for Zeroing.** ⚠ This operation must be performed with the elevator cabin empty. The display will show you a value in seconds, this value allows to start a countdown to be able to perform the operation with an empty car.
LOAd	**Parameter to indicate a known weight.** ⓘ To indicate the weight it is recommended to enter a known weight in the elevator, preferably 100% or at least 60% of the maximum load capacity. Then indicate and confirm the value of that weight.
CELL	**Sensor sensitivity.** ⓘ If the load cells are plug & play, it is possible to do a calibration without indicating a known weight in the "Load" parameter. This type of cell will carry on the label the value of Cell, which after performing the "zero"operation, you will need to enter in the "Zero" parameter. ⚠ If calibrating with a "Zero" and a "Load" this value is autocalculated and it is recommended not to modify it so as not to overwrite the calibration data.
tSEn	**Raw load of each sensor (Read-only).** If you have multiple sensors connected, you can display within this parameter the weight measured by each one.

4.4 Alarm submenu

In this submenu you can set alarms. If a value is applied to the alarm, when that value is exceeded, the alarm will be activated and the state of the relay will change. The status of each relay can be configured individually as open or closed.

ⓘ The OMEGAs feature alarm LEDs (chapter 2.1). These LEDs are not linked to the state of the relay but with the alarms.

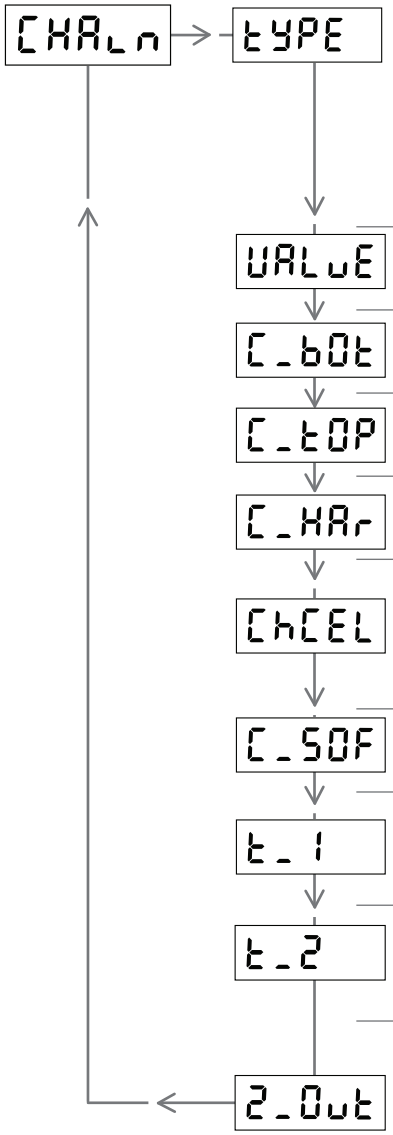
Options submenu	Description
	**Alarm 1: FULL LOAD.** **Parameter to indicate the alarm level.** If we set a value to the alarm, we enable it. When the load value is EXCEEDED, the alarm is activated and the relay will change its state. When the alarm is active, the alarm LED indicates.If the set value is "00000", this value disables the alarm and the relay will be deactivated. **Parameter to indicate the status of the relay.** This parameter allows you to configure the relay status concerning the alarm when it is deactivated. _CLOS Normally closed (set by default). _OPEn Normally open. **Alarm 2: OVERLOAD.** **Parameter to indicate the alarm level.** This parameter works the same as in alarm 1 but applied to alarm 2. **Parameter to indicate the status of the relay.** _CLOS Normally closed (set by default). _OPEn Normally open. **Alarm 3: EMPTY OR AUXILIARY** **Parameter to indicate the alarm level.** If we set a value to the alarm, we enable it. When the value DROPS below the set value, the alarm is activated and the relay will change state. When the alarm is active, the alarm LED will light up. If the set value is "00000", this value disables the alarm and the relay will be deactivated. **Parameter to indicate the status of the relay.** _CLOS Normally closed (set by default). _OPEn Normally open. **Alarm 4: TENSION DIFFERENCE on ropes or belts.** Parameter to indicate the percentage value needed to detect if any rope or belt diverts from the average of all others. This alarm allows you to set a value from 0 (alarm off) to 100. **Parameter to indicate the status of the relay.** _CLOS Normally closed (set by default). _OPEn Normally open. **Alarm 5: BROKEN rope or belt** Value to set a weight threshold. When that threshold drops below the set value, it will be activated. By default this alarm is disabled with a value of 0. ⚠This alarm shares relay with alarm 4, when the rope or broken belt alarm is activated, the display will show you SLAcA .

4.5 Chain compensation submenu

⚠ In case you want chain compensation you must connect the HOLD signal to the device.

In this submenu you can activate or deactivate the possible chain compensations for software or hardware. This function makes it possible to compensate weight difference between floors produced by the chain.
Once the compensation has been set up, after the activation of the HOLD signal with the closing of the doors, the device performs the calculation to compensate the weight during the movement of the elevator.
In some installations, especially the larger ones, the chain compensation via software does not work with maximum precision due to the friction of the rails between floors and the weight changes during long trips. For this type of installation, compensation via hardware is recommended. This compensation requires an auxiliary sensor specially designed for chain compensation.

⚠ If a sensor is used for chain compensation, you must NOT include this sensor in the number of sensors section of the calibration (chapter 4.3).



Options submenu	Description
CHAin → tYPE	**Parameter to select the type of chain compensation.** _HArd Compensation via hardware. ⚠ This compensation requires an additional sensor to measure the weight of the chain. You will need to place it after the last connected sensor. _SoFt Compensation via software _nonE No chain compensation
VALuE	**Maximum value of chain compensation. (For hardware and software).** Select a maximum value to compensate from 0 ... 600
C_bOt	**The Operation to set the weight on the lower floor. (Only via hardware).** _YES With the elevator on the lower floor select and confirm.
C_tOP	**The Operation to set the weight on the upper floor. (Only via hardware).** _YES With the elevator on the top floor select and confirm.
C_HAr	**Actual compensated chain load via hardware. (Read-only)** This value is shown in the selected units (chapter 4.3)
ChCEL	**Sensitivity of the cell to the nominal load of the chain. (Read-only)** It is selfcalculated when taking a weight value on the lower and upper floors. ⚠ It is recommended not to modify this value, in case of doing so the data of chain compensation via hardware will be overwritten and lost.
C_SOF	**Compensated value of the chain by software estimate. (Read only)** This value is shown in the selected units (chapter 4.3)
t_1	**Time to measure the weight before the HOLD signal triggers.** This parameter is measured in tenths of a second and serves to be able to take a stable measure of the weight before closing doors.
t_2	**Delay time to update the weight when the HOLD signal is released.** This parameter is marked by tenths of a second and serves to be able to update a stable measure of weight after opening doors.
2_Out	The OMEGA devices integrate a function called AUTO-ZERO-SHORT. When the device does not detect any weight changes of more than 20kg, for 2 minutes, it will eliminate any error that may appear below the value set as maximum compensation value. It also integrates the AUTO-ZERO-LONG function which after a 30 minutes pause, can make corrections of any weight.

	AUTO-ZERO-SHORT	AUTO-ZERO-LONG
A_1	ON	ON
A_2	ON	OFF
A_3	OFF	ON
A_4	OFF	OFF

ⓘ If the maximum compensation value is set to 00000, the AUTO-ZERO-SHORT function will be disabled.

4.6 CanOpen submenu

Some of the OMEGA models integrate CanOpen-Lift CiA 417 profile. In this submenu you will find some important parameters that can be configured such as the transmission baud rate of the device and the identification of the node.

⚠ If the device is placed as the end of the line in the CAN installation, the 120 ohm resistor must be activated in the "End of line" parameter [EoL].

Options submenu	Description
[CAn] → [nodE]	**CanOpen device node identification.** NOTE: If more than one OMEGA unit is connected to the same Can Bus line, each Can node identification must be different , and each COB_ID must be changed and saved in the CanOpen Dictionary. (COB_ID = 0x40000188 (for lift #1), COB_ID = 0x40000198 (for lift #2),etc...)
[bAud]	**Baud Rate of the device.** In this parameter you can select the transmission baud rate in your device. The baud rates of the device are 125 or 250kb supported by 417.
[EoL]	**End of line.** The OMEGA's that integrate this parameter have an internal resistor that must be activated when the device is positioned as the end of line. [_YES] If the device is positioned as the end of the line select and confirm to activate the 120 ohm resistor.
[dEtEc]	**Weight change detection.** Minimum value needed to detect and send a weight change in the cabin. When you exceed a weight change, a PDO message is sent. This parameter is used to not saturate the communications of the can. Selectable units are: 1,2,5,10,20,25,50,100,250 or OFF (Default is set to 1).
[ContA]	**Contact control of elevator doors.** In case of not having a HOLD signal it is possible to detect the movement of the elevator or the state of the doors through the information on the bus. [_No] If the installation integrates HOLD signal. [_MoVE] If the installation does not integrate a HOLD signal, select this option to read the controller's motion signal. (Recommended value) [_StAt] If the installation does not integrate a HOLD signal, select this option to read the Door statusword. [_Cont] If the installation does not integrate a HOLD signal, select this option to read the information of the elevator door controller (Door controlword).
[UEr]	**CanOpen version (Read-only)** The current version is 2.0

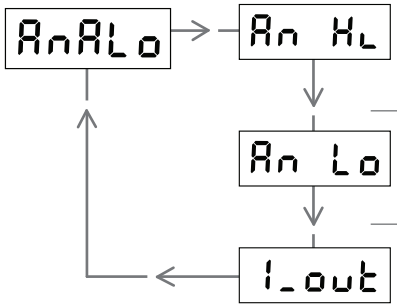
4.7 ADC submenu

Options submenu	Description
[AdC] → [SLGnL]	**Sensor signal in mV/V. (Read-only).**

4.8 Analog output submenu

⚠ There are two types of analog configurations depending on the model chosen (paragraph 1.2).
- An analog voltage with an output of 0-10V plus an analog current output of 4-20mA or 0-20mA.
- Single analog voltage output 0-5V.

⚠ In case the HOLD signal is activated, the analog output does not change during the elevators journey until the signal is deactivated.

Options submenu	Description
	**Maximum load for analog output.** In this parameter you must specify a maximum weight value, in the selected units, to equal (10V or 20mA) or to equal (5V) depending on the model.
	Minimum load for analog output. In this parameter you must set the minimum load value in the selected units (chapter 4.3) to equal 0V, 0mA or 4mA.
	Type of current output. With this parameter the output is set to 4-20 or 0-20mA.

- Example with Voltage (0-10V): For a configuration with a minimum load of 0kg (empty elevator car) and a maximum capacity of 100kg (full elevator car).

Configuration A		Configuration B	
An HL =100kg	100kg=10V	An HL =0kg	0kg=10V
An Lo =0kg	0kg=0V	An Lo =100kg	100kg=0V

- Example with Power (0-20mA / 4-20mA): For a configuration with a minimum load of 0kg (empty elevator car) and a maximum capacity of 100kg (full elevator car).

Configuration A		Configuration B	
An HL =100kg	100kg=20mA	An HL =0kg	0kg=20mA
An Lo =0kg	0kg=0/4mA	An Lo =100kg	100kg=0/4mA

4.9 Cabin display submenu

This parameter is used to define the type of MB cabin display you have.
In order to properly configure the cabin display, you must take into account that it takes as a reference the levels established in the full load and overload alarms. The LEDs of the silhouette will light up according to the full load level. On the other hand, when the weight on the elevator exceeds the over load limit, the MB will indicate both optically (LED blinking) and audibly (buzzer) that the elevator is overloaded.

Options submenu	Description
CAbLn	**Type of cabin display.** _LEd MB, cabin display with fixed LED overload. _INC MB, cabin display with progressive LED.

NG technology

5

5.1 Configuration from smartphone, tablet or laptop

OMEGAs require a dongle such as the GD-WiFi model to be able to link wirelessly to a phone, tablet or computer. Or from a male USB-A to Mini USB-B male cable to connect to a computer via USB cable.

The Dinacell devices designed with NG technology are mainly characterized by their possible connectivity to smartphones, tablets or computers. Allowing them to read all the parameters in real time, test the installation and calibrate the unit without having to access the computer keyboard. The process of calibrating NG-powered devices through a mobile device, tablet, or computer speeds up and reduces setup times. The steps and procedures when calibrating the device are the same (Chapter 7), but much faster and more intuitive. In order to enjoy these advantages you will need to download and connect the Tools ng2 application.

The application is available for Windows, IOS and Android.

For Windows download the application at www.dinacell.com in the software section.

5.2 Function for adjusting the rope/belt tension

OMEGA devices can have an individual readings of each sensor. With a calibrated device, you can adjust the tension of ropes or belts by using a device containing the Tools ng2 application. In the app click the Load Wizard. You will find this option on the menu bar, for the mobile version click ☰. The Load wizard will show you the load deviation of all ropes or belts. To start the configuration, click the home button. The wizard will calculate the load required for each sensor. By clicking on them, one by one, adjust each rope or belt according to the calculation made for each sensor.

To finish click the recalculate button 🔄. All sensors should appear in green and with a correct signal on the left. If any rope or belt is not fully adjusted, repeat the operation and check again.

5.3 Firmware update

Requirements and Components needed for the upgrade:

- The device to be upgraded, must have a Mini USB input for the firmware upgrade (section 1.2).
- A female USB-A to Mini USB-A male cable adapter to connect the USB stick to the device
- A FAT32 USB stick containing only the firmware to be updated (file. CYP)

The procedure to upgrade the device is the following:

(1) Copy the new firmware to the USB stick.

(2) Turn off or disconnect the power supply from the device.

(3) keep the (M) key pressed, and then apply power to the Unit. The STA LED will start flashing and the ERR LED will remain fixed.

(4) Now you can connect the USB stick with the new firmware into the mini USB port of the device using the USB cable adapter. The ERR LED will flash when the USB is detected.

(5) Wait for the device to re-flash the new firmware. The process can take up to a minute

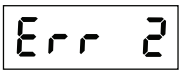
(6) When the upgrade is complete, the device will reboot automatically.

Errors

6

6.1 Error Codes

The device can detect errors showing the error codes listed in the table:

Error	Description	Action
	Improper connection. Sensor faulty or cable damaged.	Check the cable and the connections.
	Negative signal overflow. The sensor is working in the opposite direction or it is incorrectly connected.	Check the sensors intallation and conection.
	Positive overflow. The sensor is supporting a load greater than the nominal value.	-The load cell may be damaged or undersized. -Replace the load cell with a higher nominal value.
	Negative Signal. The sensor Cannot work in Omega Units	Identify and replace the sensor
	Short circuit in the output of the cabin display MB.	-Locate and eliminate the short circuit. -Turn off the power of the device and connect it again so that the display error 5 will disappear.
	Memory data loss. ⚠ When this error appears, the relays change to OPEN state.	You must reset your device (Chapter 4.2). all device configuration data, calibration, chain compensation alarms... will be lost (Chapter 4.2) ⓘ You will then need to restore your device by configuring all lost data. To avoid repeating the calibration process with a known weight,it is possible to memorize the "cell" value before resetting it. And then restore the calibration by doing the zero operation and entering the value of "cell" (Chapter 4.3).
	Load cell with very low sensibility. The unit was not properly adjusted or the load cell has a low nominal value.	-Adjust the zero and Load again. -Change the load cell by another with a lower nominal load.
	The chain Load cell is not properly connected, or its cable is damaged, or a wrong number of sensors set in parameter "nSens".	-Check the chain load cell connection. -If no Hardware chain compensation desired, change Type parameter at menu chain to "None" or "Soft".

⚠ Important: When an error appears, all alarms will be ACTIVATED and relay will change their status alarm. With ERROR 6 all the relay will be switched OPEN.

Quick guide for OMEGA installation 7

⚠ Some models may not integrate all menus or functions, see section 1.2.

ⓘ Before installing the sensors on the elevator, it is advisable to read all the points in this guide.

ⓘ The operation of the buttons on the device is indicated in Chapter 3.2.

7.1 Device Installation

7.1.1 Connect the sensors to the device. You must place them in consecutive order starting from channel one.

7.1.2 Connect the Hold signal taking into account its polarity.

7.1.3 For models with alarm relays, make the proper connections.

7.1.4 For models with "CAN" make the proper connections.

7.1.5 For models with "Analog Output" make the proper connections.

7.1.6 For models with "MB cabin display" make the proper connections taking into account their polarity.

7.1.7 Connect to power.

7.2 Set up CALIb

7.2.1 nSEn Configure the number of sensors, exluding the chain sensor in case of chain hardware compensation.

7.2.2 IrEF This parameter is set by default to "_NoNE" and should not be modified if the sensors are to be used as Load Weight Devices. But if you need to know the individual tension or weight of each rope or belt, and the sensors to be installed are not Plug & Play (sensors that carry on the label their Cell value such as PFC models, TCA and other calibrated sensors) within the "Iref" section, you must select "_ALL" with sensors not attached to elevator.

7.2.3 UnitS Set the weight units in kilos or pounds.

7.2.4 SuSPE Select the type of installation suspension (1:1, 2:1, 3:1, 4:1).

7.2.5 The next step is to install the sensors on the elevator.

7.2.6 2Ero Then perform the operation to indicate zero (This operation must be performed with the elevator empty).

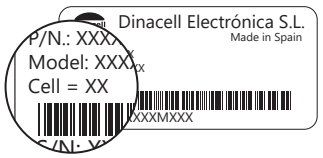
ⓘ Calibration can be completed in two different ways depending on the sensor type. Option (A) for all sensor types or option (B) for Plug and Play sensors (factory set).

7.2.7 LOAd Option (A)

You must indicate in the LOAd parameter a known weight. To do this, it is recommended to insert a weight of 100% or at least 60% of the maximum load capacity into the elevator.

7.2.7 CELL Option (B)

If the installed sensors are Plug and Play (these sensors provide the Cell value on the label) you must specify in the CELL parameter that value.



7.3 Device configuration

7.3.1 ALAr The next step is to set the alarms by checking the relay status and setting a weight level for full load alarms, overload, empty cabin and a percentage level for voltage difference alarm and broken rope alarm. If you need to know more about the types of alarms and how to set them refer to (Chapter 4.4).

7.3.2 CHAIn By default it is configured with a software chain compensation. If you need to change the chain compensation or for more information refer to Chapter 4.5.

7.3.3 CAn Only if you need to configure CanOpen parameters (Chapter 4.6).

7.3.4 AnALo Only if you need to configure analog outputs (Chapter 4.8).

7.3.5 CAbin Only if you have a cabin display connected and need to configure it (Chapter 4.9).

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