(EN)

INSPEK

User Manual

DINACELL®

Dinacell Electrónica S.L.

Dinacell Electrónica S.L.

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Product Notice

This document describes the features corresponding to the product in its most up-to-date version. The resources and functions included in this document apply to the family of models of this product (not all models incorporate all functions). Not all resources are available in all editions or versions of the product.

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VM05.04

For more information

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Introduction

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1.1 Product Description

Load control device for elevators, with individual inputs for 4 to 8 load cells depending on the model.

This solution offers efficient control and maintenance of the installation, with immediate detection of any belt core breakage. It is necessary to combine this device with our broken belt connectors.

Thanks to NG technology, the device can be combined with a GD-WiFi dongle to monitor data in real time through the Dinacell Tools NG application. The device is equipped with an alarm featuring an LED light signal. It integrates an associated relay or CanOpen-Lift CIA 417, depending on the model.

1.2 Features by model

Model				INSPEK STD					
				4-5Ra	4C	4Ca	8-5Ra	8C	8Ca
Input channel			-	4	4	4	8	8	8
Temperature range	**Working**		°C (°F)	-10 ... +65 (+14 ...+149)					
	Storage			-20 ... +70 (-4 ... +158)					
Relay	**Contact**	**Max. voltage**	VAC/ VDC	48	-		48	-	
		Max. current	A	2A	-		2A	-	
		Type	-	NA	-		NA	-	
	Quantity		-	5	-		5	-	
Analog outputs 0-10V / 4-20mA			-	✓	-	✓	✓	-	✓
CANopen-Lift CIA 417 (Isolated)			-	-	✓	✓	-	✓	✓
Cabin display output (MB & IDS)			-	✓	✓	-	✓	-	-
NG technology (with USB for firmware upgrade)			-	✓	✓	✓	✓	✓	✓

1.3 Electrical specifications

Parameter	**Units**	**Description**
Power supply	-	Power supply (Short circuit protected. It is not necessary to replace any fuse)
Nominal Voltage	VDC	12-40
Maximum current	mA	<200
Hold Input	VAC	24-48
Casing material	-	Fireproof V0
Protection class	-	IP50

Technical data for installation

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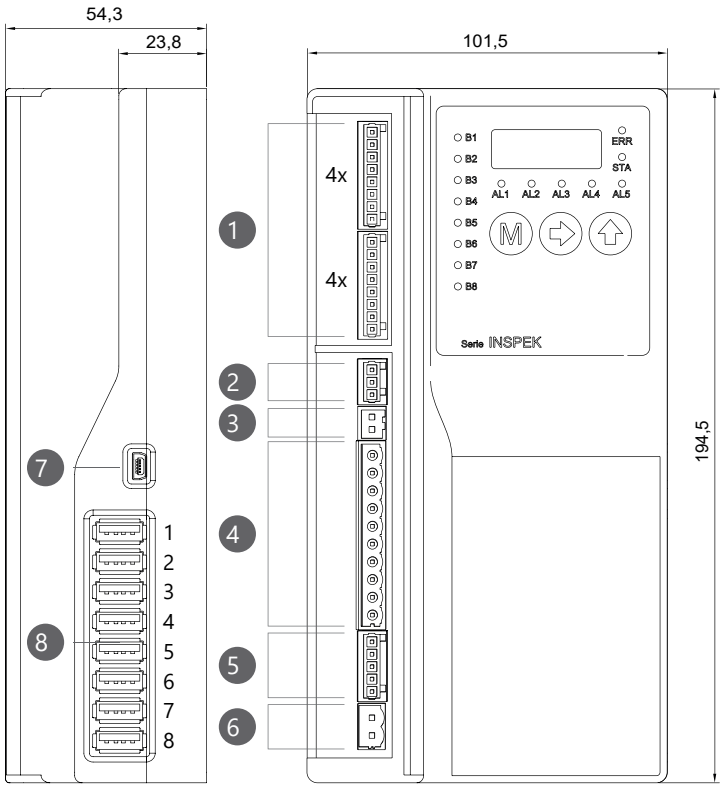
2.1 Dimensions (mm) and connections



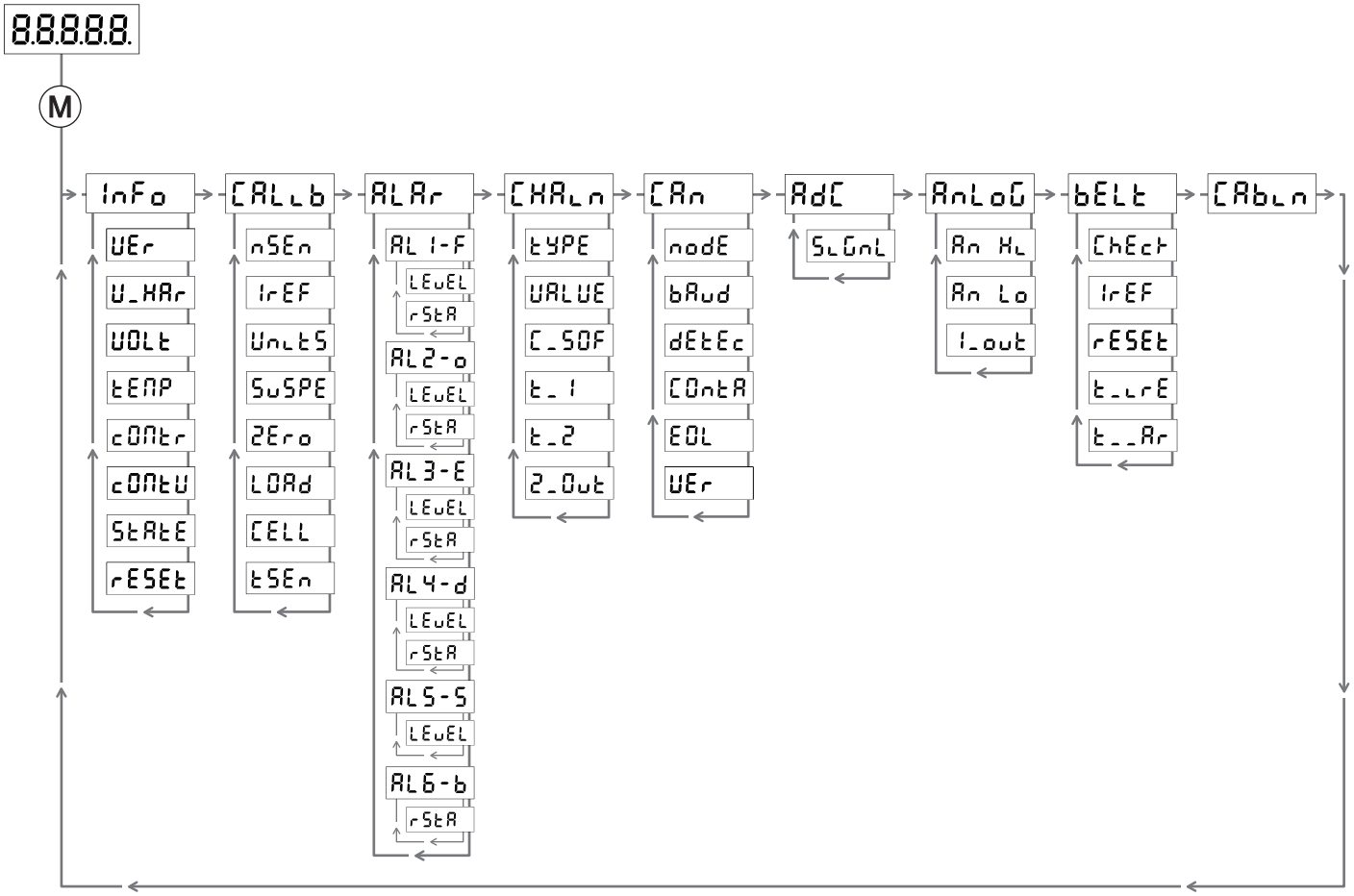
1	8 Sensor inputs for individual broken belt detection.
2	Analogue outputs over the range 0-10V for voltage and 4-20mA or 0-20mA for current. Common signal is GND
3	Output Cabin Display, with two types: INC: Progressive MB-D display (two-wire connection without polarity). LED: In case of overload, it will be a flashing voltage of 5V (max. 30mA) with the polarity indicated in the figure.
4	5 Alarm relay connections
5	Can BUS, 24VDC with Open Style connector
6	HOLD input: Activation with a voltage of 24 to 125V (DC or AC).
7	Mini USB input for firmware update
8	8 USB inputs for individual reading of each sensor. Connection order from 1 to 8.

2.2 Leds functions

LEDs	Description	Status indicators	
AL1	Full Load Alarm Indicator	Led ON (Activado) / Led OFF (Deactivated)	
AL2	Overload Alarm Indicator		
AL3	Zero Load Level Indicator (Empty Cabin)		
AL4	Difference and Slack Rope tension indicator		
AL5	Belt Core brake detection	Led ON (fix light)	Belt In good State
		Led Slow Blinking	Belt In Warning State
			"Check" in the display
		Led Fast Blinking	Broken Core Belt
			"Err15" in the display
		Led OFF	Belt not connected
STA	Led status (For CanOpen: Status Led)		
ERR	Error (For CanOpen: Error Led)		

Internal structure & device management 3

3.1 Menu structure



3.2 Button functions

Buttons	Situation	Functions
M	From Load display	Press to navigate through the different submenus or parameters.
	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.

Note: After two minutes without any operation, the unit automatically returns to the total weight measure display, independent of the menu item previously selected.

Settings Menu

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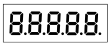
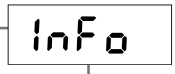
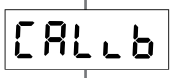
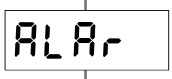
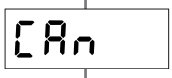
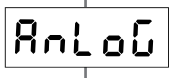
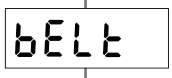
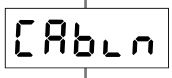
4.1 Setting Menu

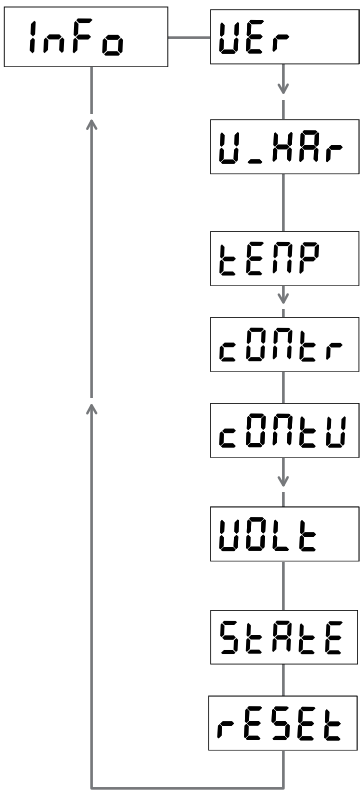
The display of your device will show you, by default, the weight indicator  . In order to enter or exit the settings menu you have to keep the button Ⓜ pressed.

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
	Device information Submenu.
	Device calibration submenu.
	Alarms submenu.
	Chain compensation submenu.
	Can communication submenu. ⚠ Only for models with CANopen-Lift CIA 417, see section 1.2.
	Submenu for displaying the signal of the sensors in mV/V.
	Submenu of analog output. ⚠ Only for models with analog output, see section 1.2.
	Belt submenu.
	Parameter of cabin display. ⚠ Only for models with output for MB cabin display, see section 1.2.

4.2 Information submenu

Options submenu	Description
	**Firmware Version (Read-only).** Valid firmware : v1.00 and above.
	Hardware Version (Read-only). The device will show you the hardware version of the unit.
	Ambient temperature.
	Internal memory recoveries counter.
	Internal memory updates counter.
	Unit voltage (Read-only). Valid values around 24 VDC.
	Eeprom status. (Read only).
	Reset operation. -No To cancel the operation. -ALL To restore all values to the factory state. ⚠ All calibration information will be lost.

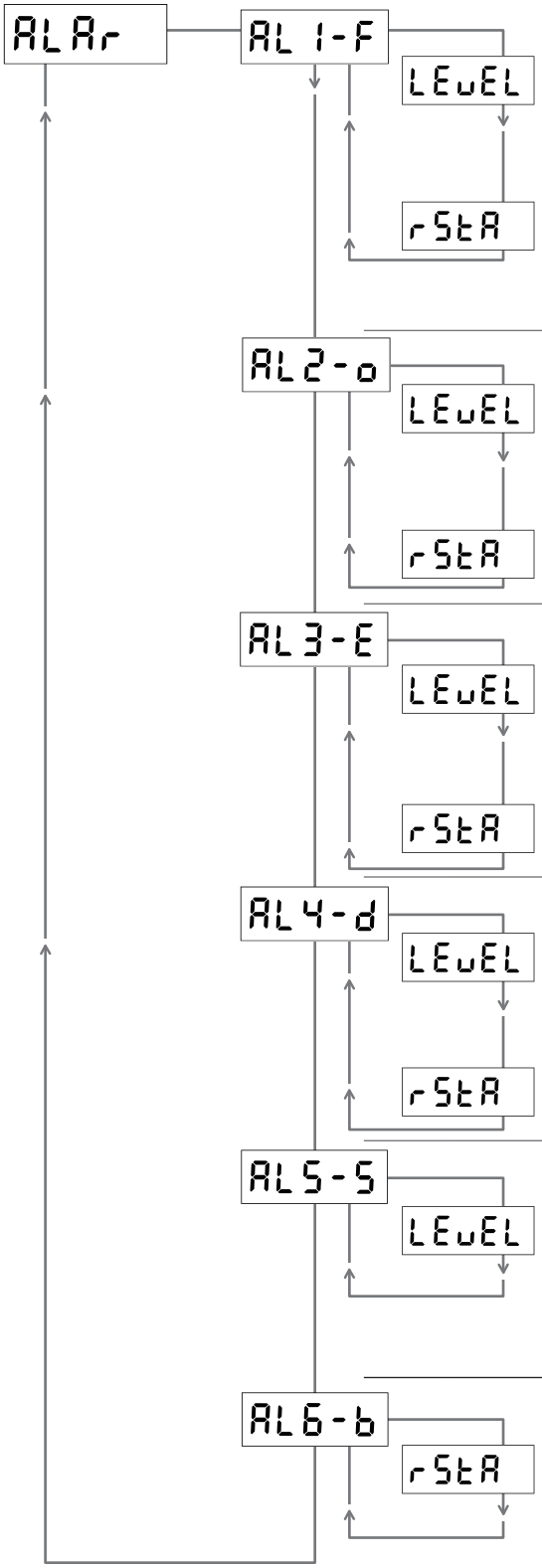
4.3 Calibration submenu

Options submenu	Description
CALLb → nSEn	Parameter to indicate the number of sensors connected to the device.
IrEF	Operation Iref allows the device to make an initial reference of the individual signal from each sensor. _nonE Selected by default, select this option if the sensors to be installed are to be used only as load cells or if they are Plug & Play sensors (sensors with a cell value on their label). _ALL Select for an individual tension for each rope or belt. ⚠ In case of selecting "_ALL" it is necessary that the sensors are connected to the device but not installed on the elevator cables / belts. In case they are installed and it is not possible to uninstall them, select the option "_NonE".
UnLtS	Parameter to indicate the weighing 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	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 make 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. ⚠ In case of calibration with a "Zero" and a "Load" this value is auto-calculated and it is recommended not to change it in order 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

The device feature alarm LEDs (chapter 2.2). These LEDs are not linked to the state of the relay but with the alarms.

To deactivate any alarm set the parameter value to "00000".

Options submenu	Description
	Alarm 1: FULL LOAD. Parameter to indicate the alarm level. Set value to trigger alarm. When the set value is OVER PASSED, the alarm is activated and the relay status changes. Parameter to indicate the status of the relay. _CLOS Normally closed (by default). _OPEn Normally open. Alarm 2: OVERLOAD. Parameter to indicate the alarm level. Set value to trigger alarm. When the set value is OVER PASSED, the alarm is activated and the relay status changes. Parameter to indicate the status of the relay. Same as Alarm 1. Alarm 3: EMPTY OR AUXILIARY Parameter to indicate the alarm level. Set value to trigger alarm. When it FALLS BELOW the set value, the alarm is activated and the relay status changes. Parameter to indicate the status of the relay. Same as Alarm 1. 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. Same as Alarm 1. Alarm 5: SLACK rope or belt When the measured value is BELOW the set value, the alarm is activated and the relay status changes. ⚠ This alarm shares relay with alarm 4, when the rope or broken belt alarm is activated, the display will show you SLACK. Alarm 6: BROKEN rope or belt If any core in the belt breaks and continuity is lost, the relay #5 and LED #5 will activate. Once belt continuity is restored, LED #5 will remain on until the user resets the alarm in the BELT submenu (Reset Alarm).

4.5 Chain compensation submenu

⚠ In case you need 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
CHALn → 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 next to 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_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	AUTO-ZERO function AUTO-ZERO-SHORT: When the device does not detect any weight change of more than 20kg, for 2 minutes, it will eliminate the possible error that may appear below the configured maximum compensation value. AUTO-ZERO-LONG: After 30 minutes of rest, it can make corrections of any weight.

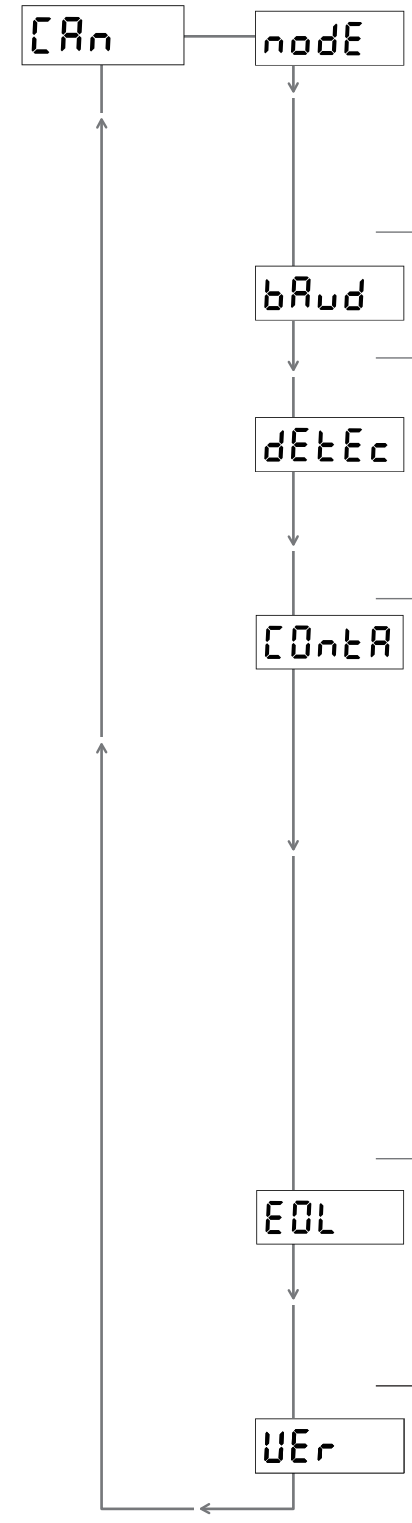
	AUTO-ZERO-SHORT	AUTO-ZERO-LONG
A_1	ON	ON
A_2	ON	OFF
A_3	OFF	ON
A_4	OFF	OFF

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

4.6 CanOpen submenu

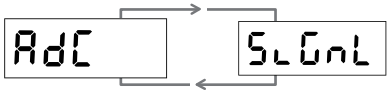
There are models that integrate the CanOpen-Lift CiA 417 profile. In this submenu, key parameters can be configured, such as the baud rate and node identification.

⚠ If the device is placed at 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
nodE	CanOpen device node identification. NOTE: If more than one device 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. 250/125 Kb.
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 HOLD signal is wired. _MoVE If the HOLD signal is not wired. Select this option to read the controller's motion signal (Recommended value). _StAt If the HOLD signal is not wired. Select this option to read the controller status (Door statusword). _Cont If the HOLD signal is not wired. Select this option to read door controlword information from the controller.
EOL	End of line. This parameter has an internal resistor that must be activated when the device is positioned at the end of line. _YES If the device is positioned at the end of the line select and confirm to activate the 120 ohm resistor.
UEr	CanOpen version (read only) The current version is 2.0

4.7 ADC submenu

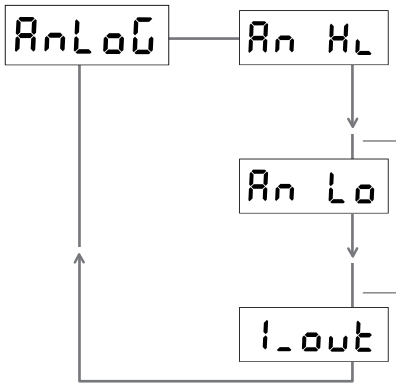
Options submenu	Description
	Sensor signal in mV/V. (Read-only).

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.

⚠ In case the HOLD signal is activated, the analog output does not change during the elevators trip 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). 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

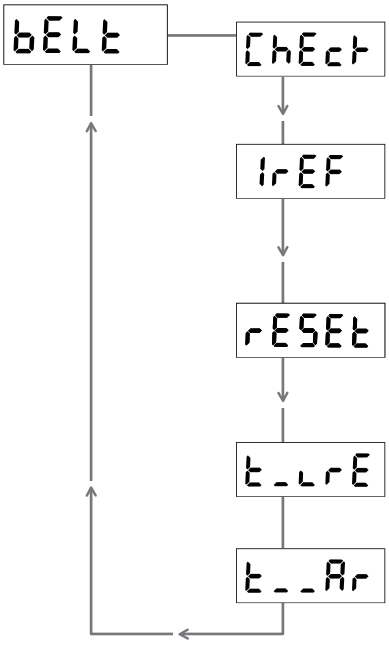
4.9 Belt status submenu

This device has continuous belt core breakage detection, which ensures the continuity of the core within the belt.

To use this function, the broken belt connectors must be installed on both ends of the belt and the top clip connector must be connected to the corresponding monitoring input of the belt. Follow the broken belt connector install guide for proper installation of the broken belt connectors.

Belt Core integrity detection:

When any core is broken the device will detect the faulty belt and indicate in its corresponding led. Additionally, AL-6 and relay #5 output will be activated. The Alarms will remain active regardless the core recovers its continuity until the user rearmed the relay from the Belt reset parameter.

Options submenu	Description
	(Yes/No): Set to Yes to activate the breaking core monitoring.
	Initial reference for the individual belt monitoring state. This operation should be performed when the broken belt connectors are installed at the ends of the belt.
	If the INSPEK detects an intermittent disconnection in the internal cores, it will generate a warning. The belt LED indicator will be blinking. This warning can be reset by setting this value to “YES” after operator visual inspection.
	Time (in hours) since the IREF operation (belt installation) was done.
	Time (in hours) since the reset warnings (visual belt inspection) was done.

⚠ If any core at any belt is broken the display will show “ERR 15” alternating with the number of the Belt causing the error.

4.10 Cabin parameter

This parameter is used to define the type of MB cabin display connected.
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

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5.1 Configuration from smartphone, tablet or laptop

The device requires 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 accessing it from the device. 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.

GET IT ON Google Play

Download on the App Store

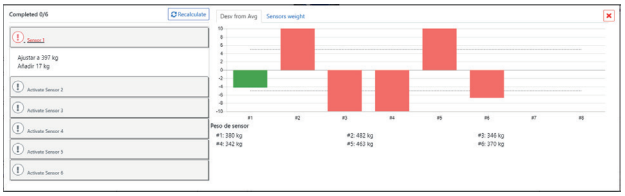
The application is available for Windows, IOS and Android.

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

5.2 Function for adjusting the rope/belt tension

Individual sensor reading. With the calibrated device you can adjust the tension of the cables or belts by means of a device containing the necessary software. 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 press the recalculate button. All sensors should appear green and with a correct signal on the left, move the lift up/down. If any of the cables or belts are not fully adjusted, repeat the operation and check again.



5.3 Firmware update

Requirements and Components needed for the upgrade:

(1) The device to be upgraded, must have a Mini USB input for the firmware upgrade (section 1.2).

(2) A female USB-A to Mini USB-A male cable adapter to connect the USB stick to the device.

(3) 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
Err 1	Improper connection. Sensor faulty or cable damaged.	Check the cable and the connections.
Err2	Negative signal overflow. The sensor is working in the opposite direction or it is incorrectly connected.	Check the sensors intallation and conection.
Err3	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.
Err4	Negative signal. The sensor cannot operate in this unit.	Identify and replace the sensor
Err5	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.
Err6	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 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).
Err7	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.
Err 11	The chain load cell is not properly connected, or its cable is damaged, or an incorrect number of sensors is set in the "nSens" parameter.	Check the chain load cell connection. If no Hardware chain compensation desired, change Type parameter at menu chain to "None" or "Soft".
Err 15	Chain Load cell is not properly connected, or its cable is damaged, or 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 installation

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⚠ 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.

7.1.8 In case of using broken belt clips, connect them.

7.2 Set up

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". 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.

7.2.5 The next step is to install the sensors on the ropes or belts.

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

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

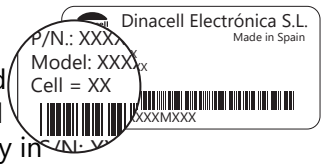
ⓘ Calibration can be completed in two different ways depending on the sensor type. Option (A) for all sensor types or option (B) for Plug and Play sensors (factory set).

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.

7.2.8 LOAd 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 CHALn 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 AnLoG Only if you need to configure analog outputs (Chapter 4.8).

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

7.4 Broken belt detection

7.4.1 Installation of the broken belt connectors (A and B) on belts, according to the corresponding manual.

7.4.2 Connect the broken belt connectors to the device.

7.4.3 Perform the "Iref" operation (see chapter 4.3) to check the initial state of the elevator belts.

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