

# INSTALLER MANUAL

# CUST

## Kennis-KSS06

**Input State**

Test Equipment

**Output State**

EV Crane

EV Stab

OTE

**Led State**

90%

100%

Power

**Stab State**

Stab 1 Down

Stab 2 Down

**Current Tilting**

**Crane**

Val rel [°]

Val abs [°]

Max rel [°]

Max abs [°]

Min rel [°]

Min abs [°]

Offset [°]

Crane Current Angle

**Axle**

Val rel [°]

Val abs [°]

Max rel [°]

Max abs [°]

Min rel [°]

Min abs [°]

Offset [°]

Axle Current Angle

**Lever State**

SLW	1B	2B	Ext	CLA	Rot	DR
Min	Err	Err	Err	Max	Min	Max

Calibration    Configuration    Devices    Factory Test    Troubleshooting



# Installer Manual

## CUST

### MANUFACTURER:

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## CUST

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## CUST

### INTRODUCTION

Scope of this guideline is to provide information on how to install and use the CUST software for setting Kennis cranes that comply with EN12999:2020 and EN13849.

In addition, this manual aims also to:

- improve the user experience by making it easier to learn how to use your software.
- explain the crane's configuration concepts as well as the procedure for stability calibration.
- reduce the support burden by giving the user the ability to solve his own problems.

### MENU OVERVIEW

HOMEPAGE	LEVEL 1	LEVEL 2	
CALIBRATIONS	Stability Calibration	-	
	Installed Test	-	
	Tilt Sensor Zero	-	
	Crane Rest Pressure Autosetting	-	
	Rotation Calibration	-	
	Extensions Cable Reel Setting	-	
CONFIGURATIONS	Machine Configuration	-	
	Speed Reductions	Stabilizer Speed	
		Above Horizontal	
		End Stroke Cylinders	
		Ramps	
		Boom Crane Empty	
		Boom Crane Loaded	
		End of Inclination Limit (Booms)	
		End of Inclination Limit (Ext/Rot)	
		End of High Capacity Area CCW/CW	
		End of High Capacity Area B1/B2/Ext	
DEVICES	Parameters and Firmware Loading	-	
FACTORY TEST	N/A	-	
TROUBLESHOOTING	Keypad	-	

# Installer Manual

## CUST : Installation

### A INSTALLATION OF CUST

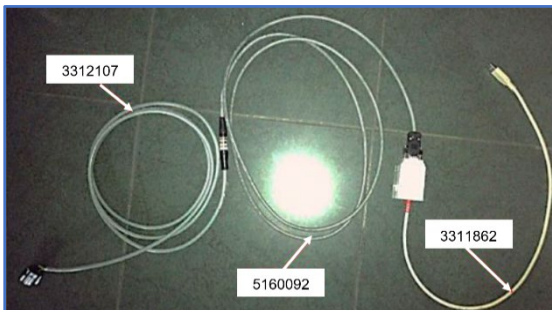
#### A.1 SYSTEM REQUIREMENTS

- Operating system: Microsoft Windows 10 or higher
- Communication interface: USB port 2.0 or higher

#### A.2 HOW TO CONNECT TO THE CRANE

The following parts are needed to connect the PC to the crane's electronic system:

CODE	DESCRIPTION
3311862	USB programmer
5160092	Cable from DB9 to M12 (L=10m)
3312107	Cable from M12 to multilink connector (L=1m)



The end of cable 3312107 shall be connected to the multilink connector on the crane.

# Installer Manual

## CUST : Installation

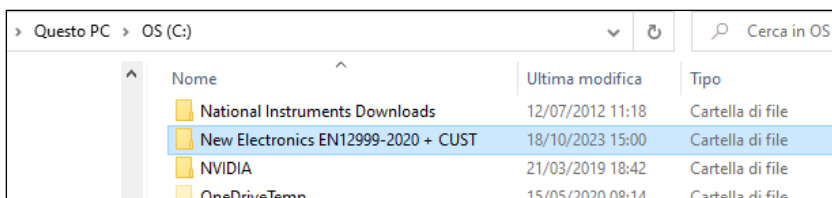
### A.3 INSTALLATION AND ACTIVATION OF CUST

Follow the steps below to install and activate the software.

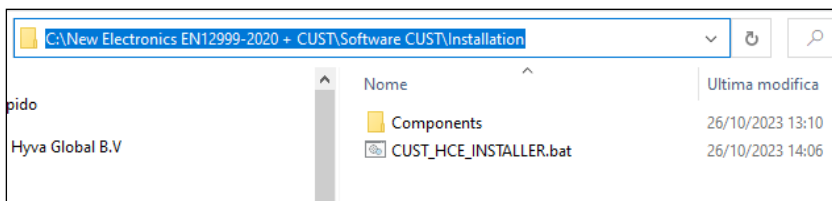
1. Copy the archive "**New Electronics EN12999-2020 + CUST**" on your desktop and extract it.



2. Copy the entire folder "**New Electronics EN12999-2020 + CUST**" in your "C:" disk.




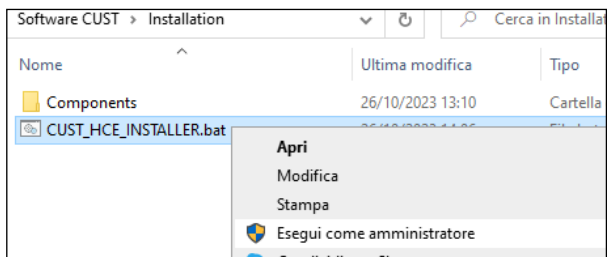
3. Open this folder and browse subfolders to "**...Installation**".



# Installer Manual

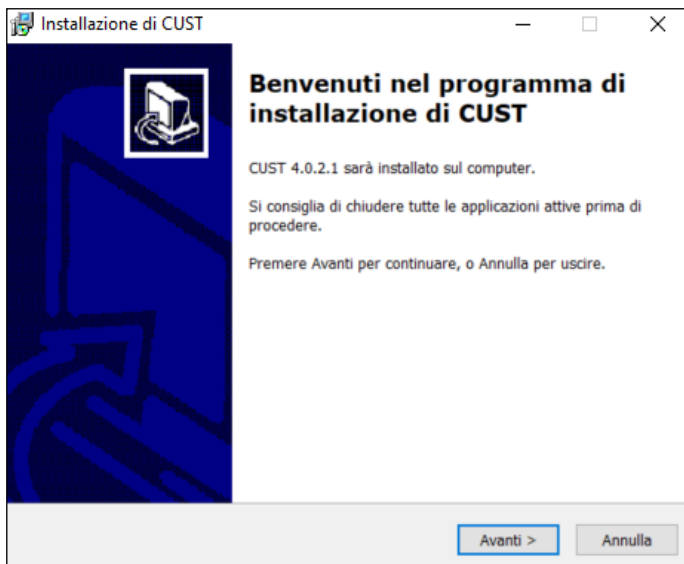
## CUST : Installation

4. Launch the "CUST\_HCE\_INSTALLER.bat" installation file, using "right-click" and "  Run as administrator" (Esegui come amministratore).



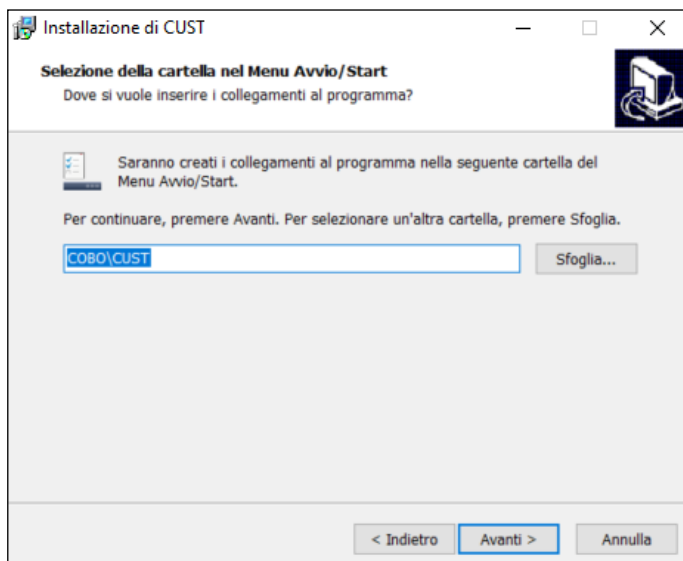
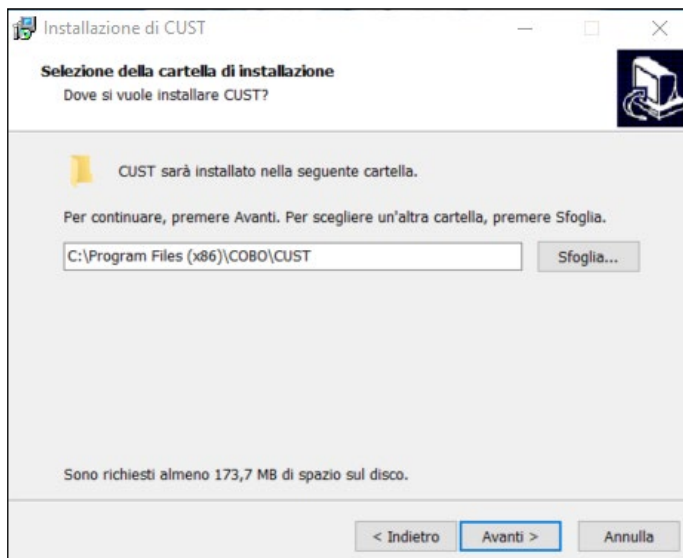
Administrator rights account is needed: please ask to your local IT support.

5. The CUST installer will start.
6. Click **Next >** (Avanti >) at every step.



# Installer Manual

## CUST : Installation

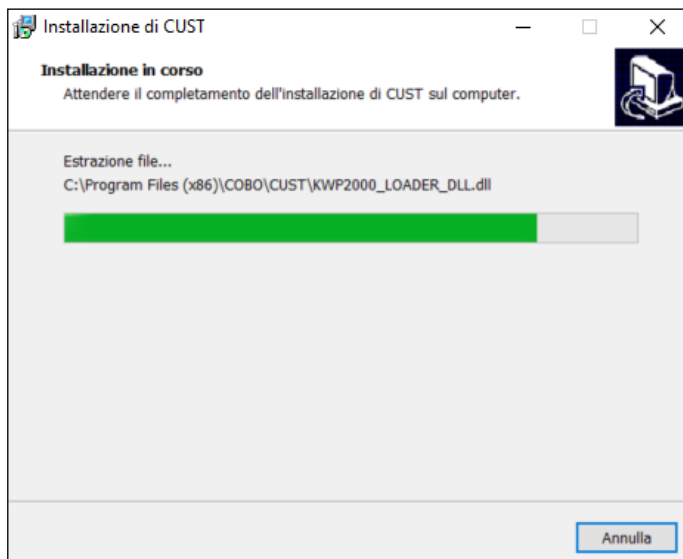
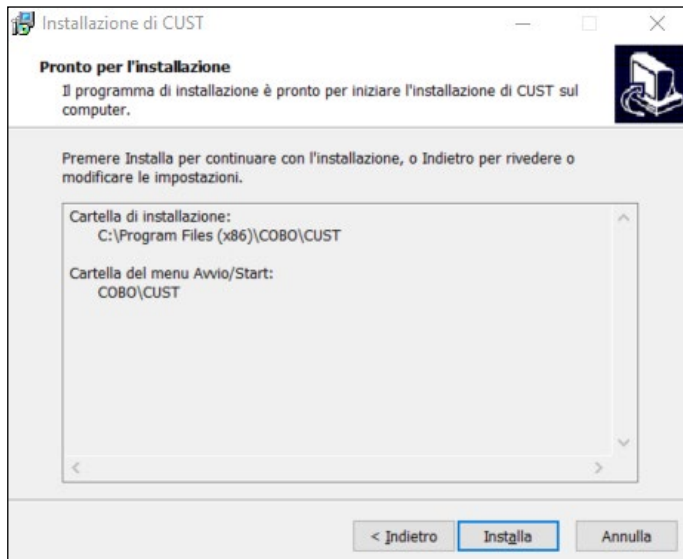




# Installer Manual

## CUST : Installation

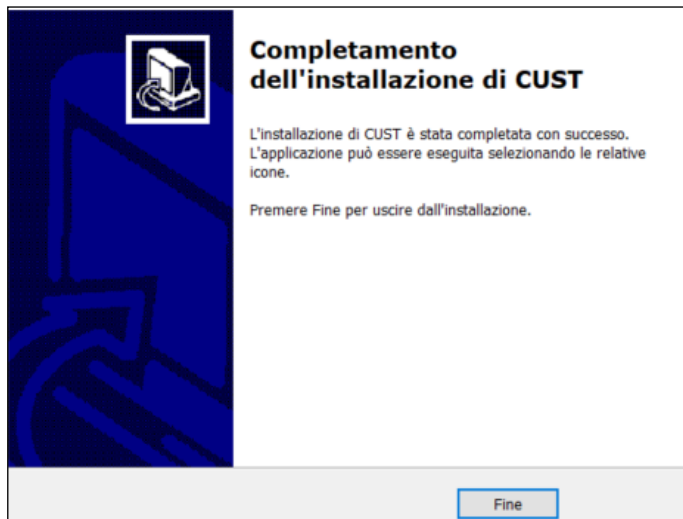
- Click **Install** (Installa).



# Installer Manual

## CUST : Installation

8. Click **Finish** (Fine).

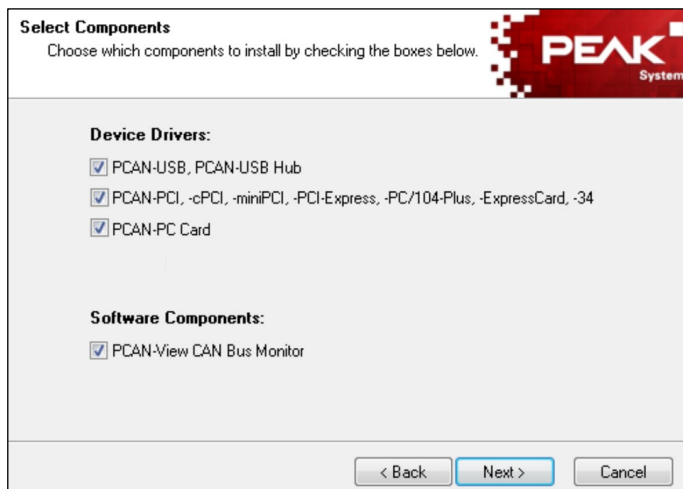


9. The USB driver installation files will start. They are 3 files, and it will start 3 times.  
10. Proceed with all the steps installation wizards, always clicking **Next >** and selecting all the components proposed.



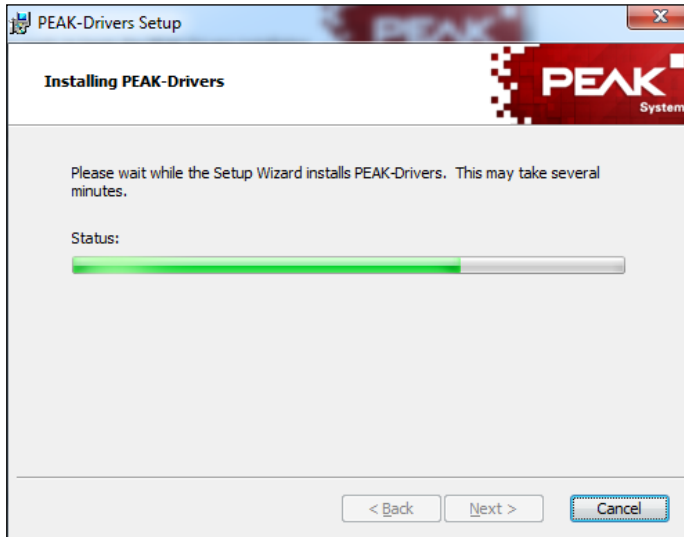
# Installer Manual

## CUST : Installation

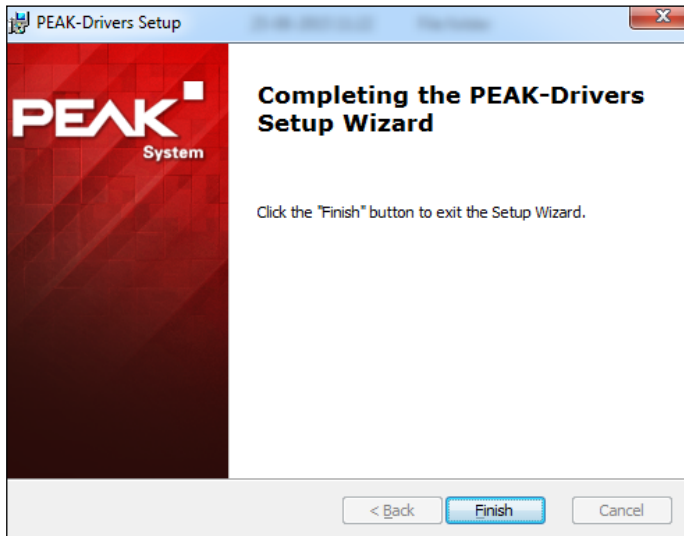


# Installer Manual

## CUST : Installation



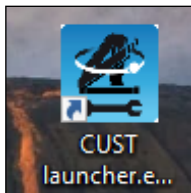
11. Click **Finish** (Fine).



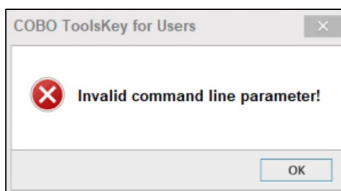
# Installer Manual

## CUST : Installation

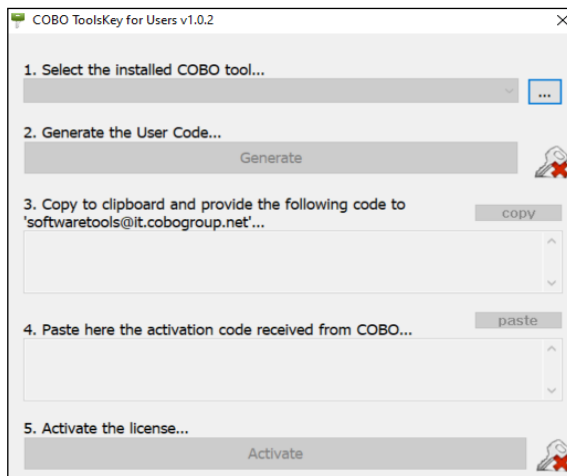
12. The CUST launcher application will be installed and a desktop shortcut will be created. For more information please see A.5.



13. Then the licensing program will start. An error could occur, but it can be ignored: click **OK**.



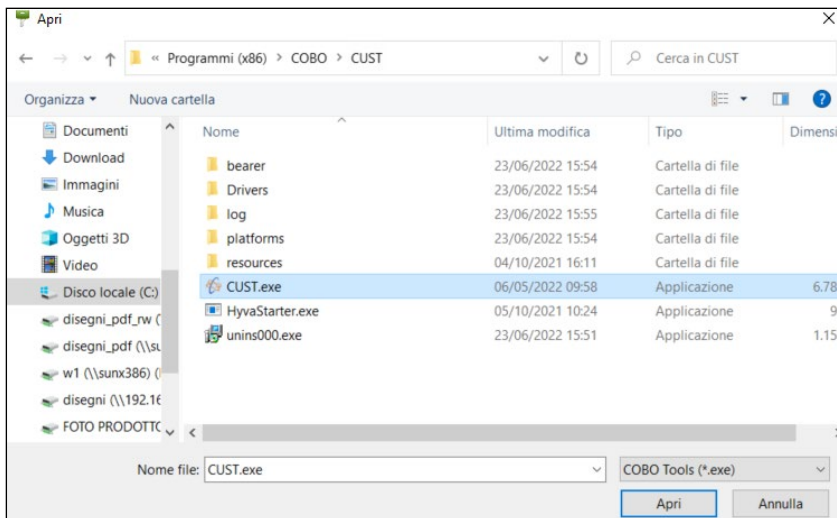
14. Click the 3-dot button **...** on the top right corner.



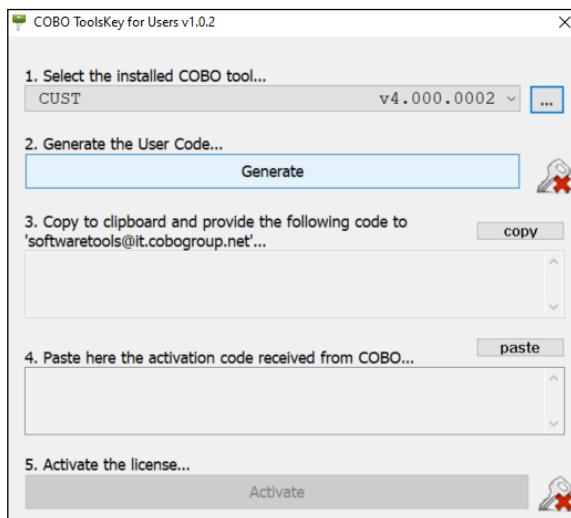
# Installer Manual

## CUST : Installation

15. Select the path where the CUST is installed, "C:\Programs (x86)\COBO\CUST", and select the file "CUST.exe".



16. Click **Generate** to generate the User Code.



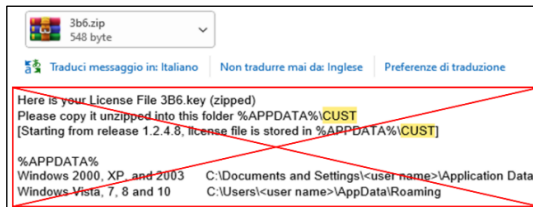
# Installer Manual

## CUST : Installation

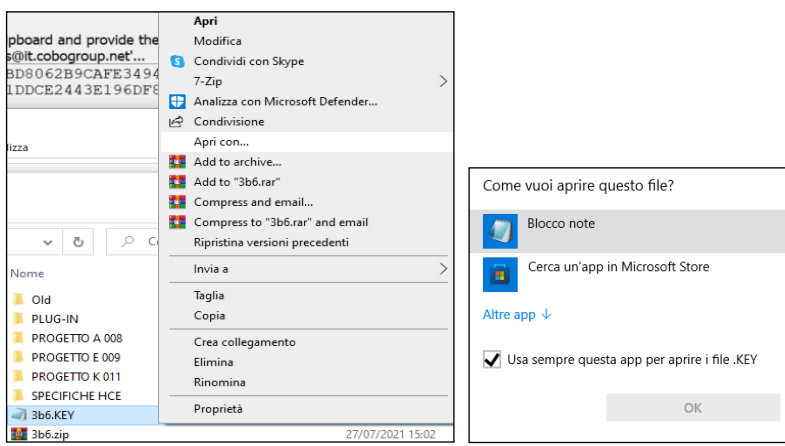
17. Copy the Code and send it by email to “[softwaretools@it.cobogroup.net](mailto:softwaretools@it.cobogroup.net)”, by specifying that the license request is for HCE.



18. COBO Group will then reply by sending a zip file containing an activation code and instructions about how to copy the entire file on your laptop. Do NOT follow the instructions below but proceed please with the next steps in this document. Save the file anywhere on your PC.



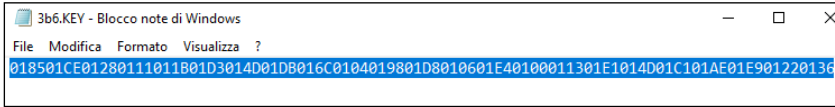
19. Unzip and open the “3b6.KEY” file with Notepad: right click → “Open with...” → “Notepad”.



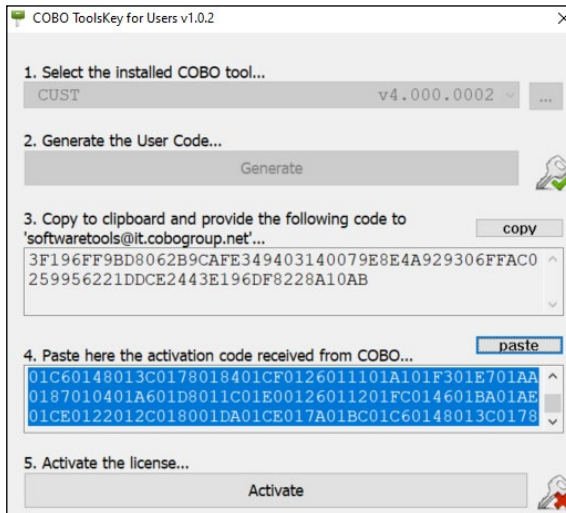
# Installer Manual

## CUST : Installation

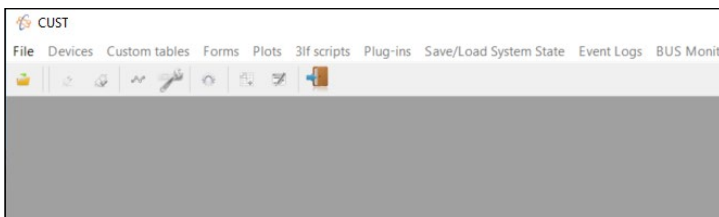
20. Select the entire text and copy it.



21. Click **paste** at step "4." in the window and then click **Activate**.



22. Run the program "CUST.exe" and check that the screen appears like below.





# Installer Manual

## CUST : Installation

**Note 1 :** The errors related to the program are shown in the lower left corner.  
If the USB device is not connected, the following message will appear:

A screenshot of a software interface showing an error message. The message is displayed on a red background bar at the bottom of a grey rectangular area. The text reads "Dongle device not found!".

Dongle device not found!

**Note 2 :** If the USB device is connected but the crane is not connected or powered off, or in case of any other CAN-Bus line failure, the following message will appear:

A screenshot of a software interface showing an error message. The message is displayed on a red background bar at the bottom of a grey rectangular area. The text reads "BUSHEAVY on connection(s) first,".

BUSHEAVY on connection(s) first,

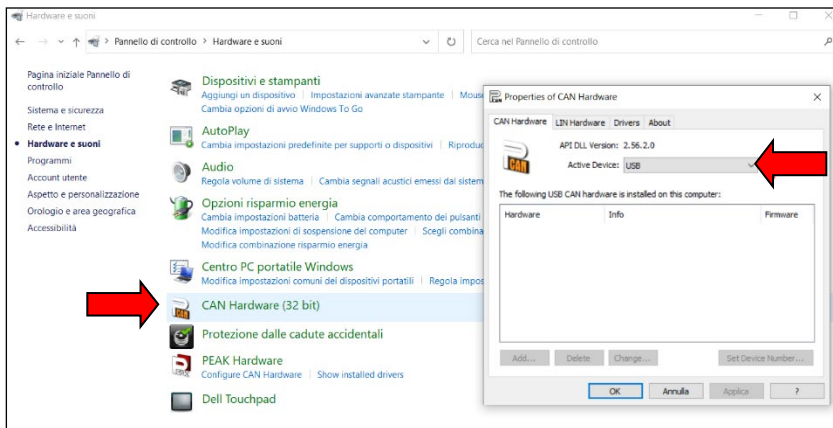
# Installer Manual

## CUST : Installation

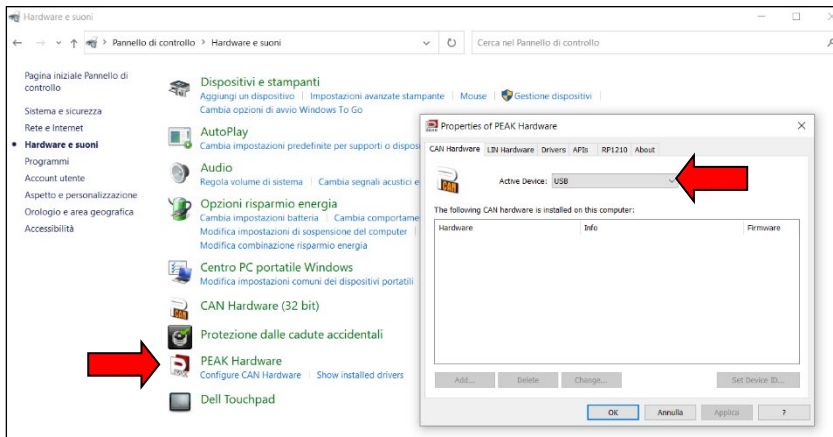
### A.4 CONFIGURATION OF USB HARDWARE

It is possible that the drivers are correctly installed but the USB device is not configured automatically. In this case the led on the dongle is not flashing. In this case proceed as follows.

1. Open "**Control panel > Hardware and sounds > CAN Hardware**".
2. If Active Device "**USB**" is not selected, please select it. Click **OK**.



3. Open "**Control panel > Hardware and sounds > Peak Hardware**".
4. If Active Device "**USB**" is not selected, please select it. Click **OK**.



# Installer Manual

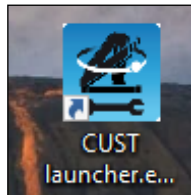
## CUST : Installation

### A.5 CONFIGURATION OF CUST LAUNCHER

The CUST software is the platform where the Graphical User Interface (GUI) runs. The GUI is composed of many project files (one for each different crane hardware) and one plug-in file: all these files are used by CUST.

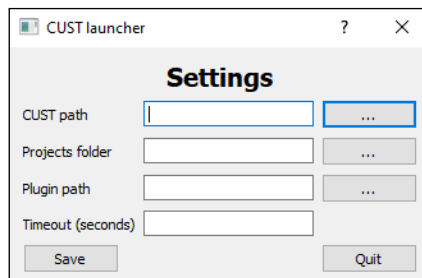
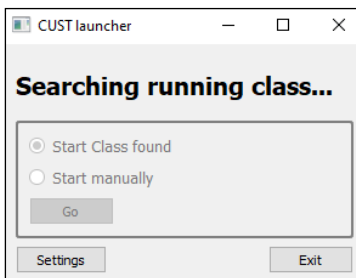
A launcher application was created to run the CUST and all these files: it can scan the network, identify the software embedded in the crane's system and finally link the correct project file. All these files shall be collected in a single folder and the Launcher must point to them. These files have been put in "C:" disk together with the files archive.

The Launcher is automatically installed and a desktop shortcut is created. It is pointing to these files by default in the "C:" disk. If the Launcher runs properly, then you can skip this part.




If the Launcher does not work or it is not pointing to the correct files, because installed a long time ago and pointing other folders, then proceed with the following manual procedure.

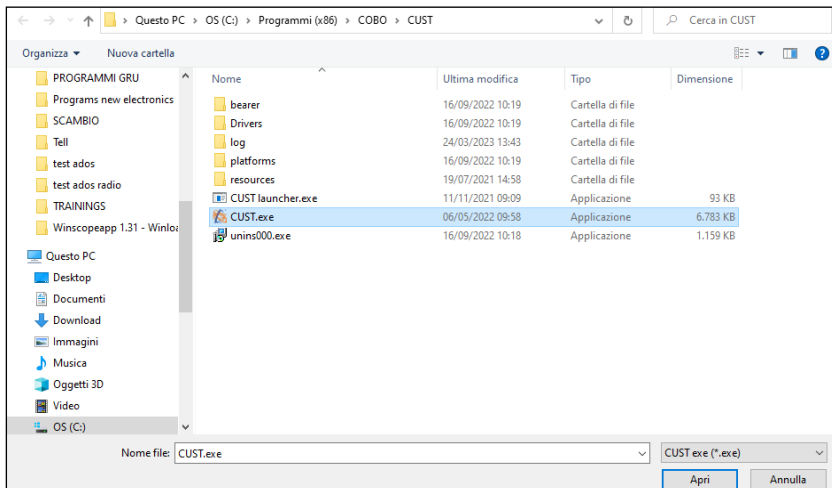
1. Open the CUST Launcher without any USB dongle connected and click **Settings**.




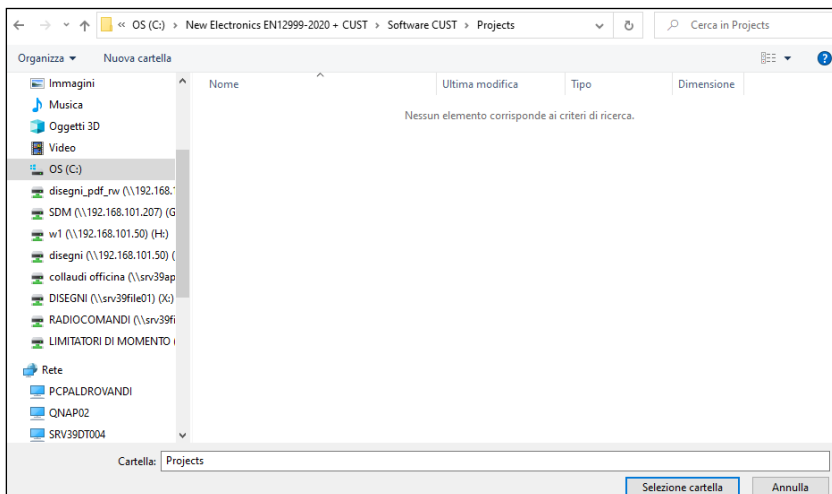
# Installer Manual

## CUST : Installation

2. Click the 3-dot button  on the right of "CUST path" textbox and link the "CUST.exe" file in your local "C:" disk. Alternatively, just copy this path "C:\Program Files (x86)\COBO\CUST\CUST.exe". Then click **Open** (Apri).



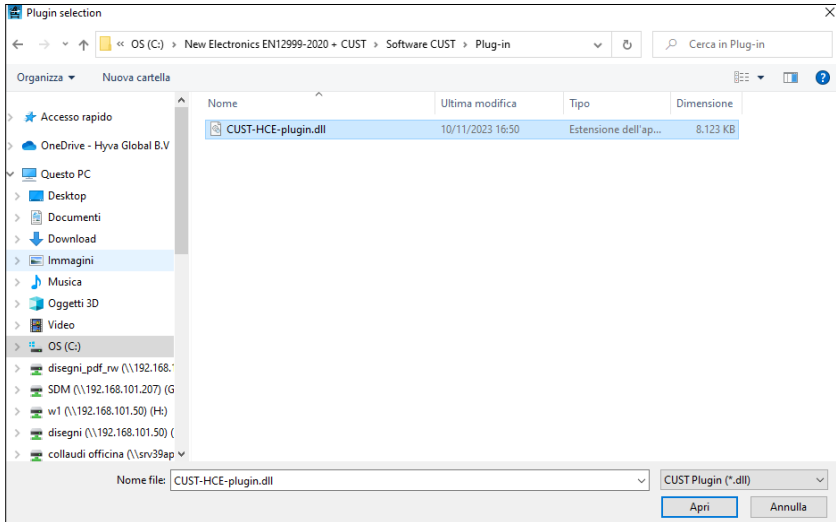
3. Click the 3-dot button  on the right of "Projects folder" textbox and link the folder "Projects" located in "C:" disk in the archive. Alternatively, just copy this path "C:\New Electronics EN12999-2020 + CUST\Software CUST\Projects". Then click **Select folder** (Selezione cartella).



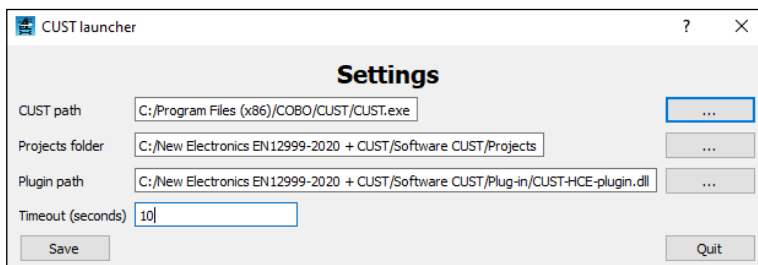
# Installer Manual

## CUST : Installation

- Click the 3-dot button **...** on the right of "Plugin path" textbox and link the file "**CUST-HCE-plugin.dll**" located on "**C:**" disk in the archive. Alternatively, just copy this path "**C:\New Electronics EN12999-2020 + CUST\Software CUST\Plug-in\CUST-HCE-plugin.dll**". Then click **Open** (Apri).



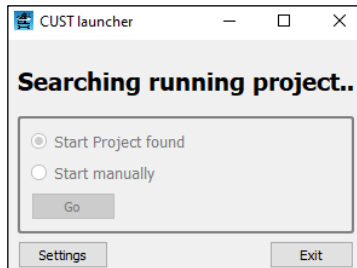
- Enter Timeout value (10 is ok) and click **Save**.



# Installer Manual

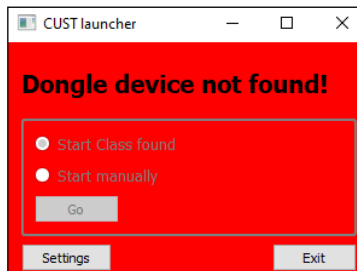
## CUST : Installation

6. The CUST will now start with correct project based on crane connected.

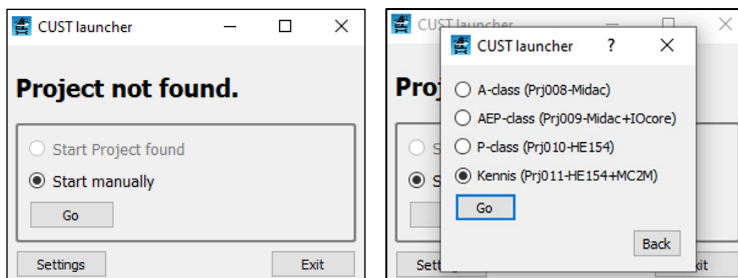


**Note 1 :** From now on the operations above mentioned are not needed anymore. In case of update we will share new projects and new plug-in files, to replace the existing ones in the same position. Attention! Do NOT move or delete these files and folders!

**Note 2 :** If the dongle is not connected, the following error will appear.



If the crane is not connected, the project can be selected manually, clicking **Go**.



- Prj011: Kennis cranes

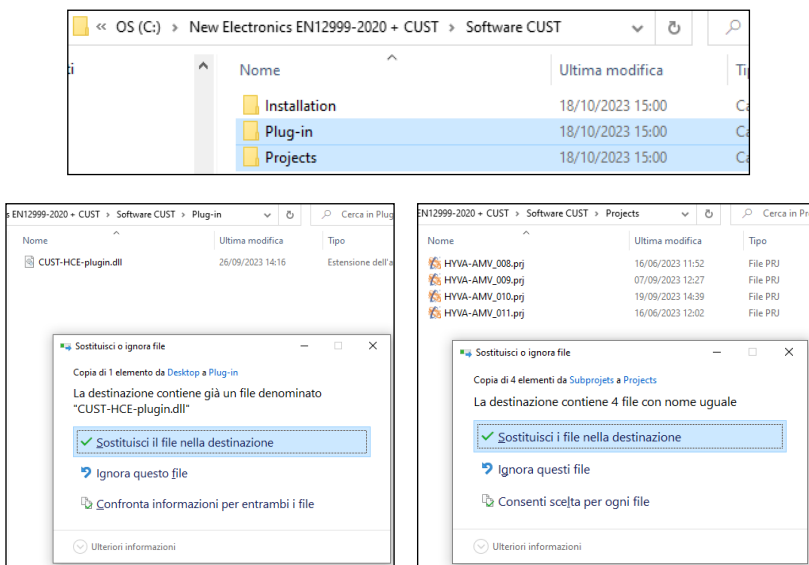
# Installer Manual

## CUST : Update

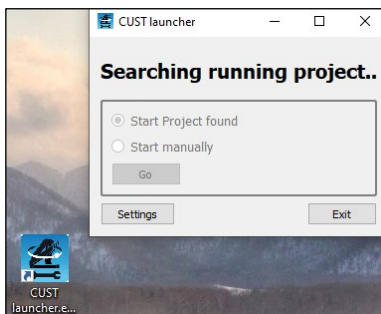
### A.6 UPDATING THE CUST

Generally, you shall not update the CUST, except if requested by our Aftersales Service (see Note 2). However, to update the application just replace the project files and/or the plug-in file: the project files manage the communication with the crane software; the plug-in file manages the Graphical User Interface of the CUST. Proceed as follows.

1. Download the new files from the server or received directly.
2. Copy all the files into the CUST software package folder, overwriting the existing ones (delete all existing Projects/Subprojects ".prj" files and Plug-in ".dll" files). Keep the same folder names and **"Replace the files in the destination"** (Sostituisci i file nella destinazione).



3. Run the CUST Launcher and check that the program runs properly.



# Installer Manual

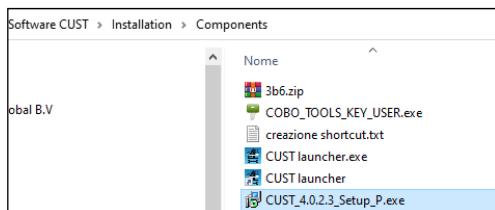
## CUST : Update

4. In case there is a problem, i.e. the launcher does not point to the updated files due to the wrong name of folders/files, please re-check the launcher configuration clicking "Settings" and follow the instructions given in A.5.

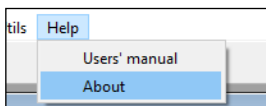
**Note 1 :** The last update dates of ".prj" and ".dll" files running with the application are shown on the CUST Home Page so you can compare them with the dates of files present on server.

CUST Prj Last Update	230616
CUST Plugin Last Update	230919
CUST Plugin Vers	1.0.1.0

**Note 2 :** Software versions of September 2023 and later require CUST version 4.0.2.3 or higher. If you are using a plug-in more recent you shall install the latest CUST version to get all needed components. Please download and run the latest installation file: follow all the steps described in the first installation (see A.3) till the end to update the existing files. Alternatively, you can install the CUST following the instructions given in C.1.1.



You shall not activate the License Code once again.  
To check if the CUST needs an update, click "**Help**" → "**About**" to retrieve the current version.





# Installer Manual

## CUST : Login

### A.7 LOGIN

When the crane project is detected/selected and the plug-in is launched then it is necessary to login. Please proceed as follows.

1. First select your access level (User name).

A dialog box titled "User name" with a dropdown menu showing "USER" selected. Below it is a text input field for "Password" which is currently empty. At the bottom are "Ok" and "Exit" buttons.

Operator	Password request	Pin1+Pin2 request	Accessible Menus
USER	No	No	Home Page
INSTALLER	No	Yes	Homepage, Calibration, Configuration, Devices, Troubleshooting
FACTORY	Yes	No	Factory test
ADMIN	Yes	No	All menus and options

2. Select "INSTALLER".

The same dialog box as above, but the "User name" dropdown menu is open, showing a list of options: "USER", "INSTALLER", "FACTORY", and "ADMIN". The "INSTALLER" option is highlighted with a mouse cursor.

3. Type spacebar " " as password.
4. Click **OK**. The plug-in will be activated (this will take a few seconds).
5. Enter Pin1 and Pin2 codes, then click **Submit**. These codes are personal, and they are the same used in the past for other systems: if you do not have, please contact our Aftersales Service.

A dialog box for entering PIN codes. It has two text input fields labeled "Pin 1" and "Pin 2". Below the fields are "Submit" and "Exit" buttons.

# Installer Manual

## CUST : Homepage

### B HOW TO USE THE CUST AND SET THE CRANE

#### B.1 HOMEPAGE















The Homepage shows the main crane's data in real time: these parameters cannot be changed.

#### KENNIS



# Installer Manual

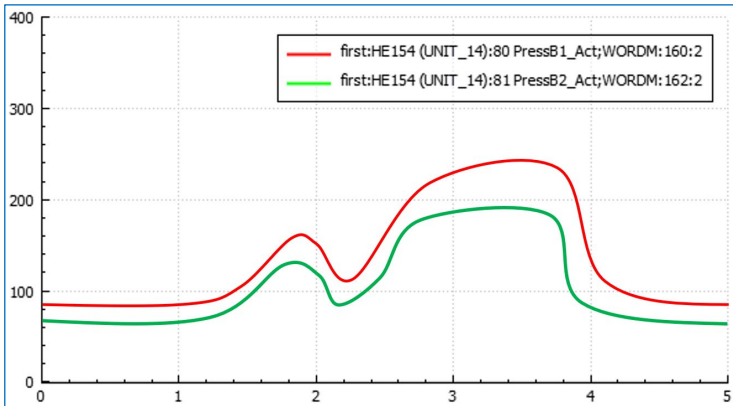
## CUST : Homepage

INDICATORS	DESCRIPTIONS
<b>Input State</b>  Test Equipment	If OFF the crane is working: the pressure at distr. inlet exceeds a given threshold.
<b>Output State</b>  EV Crane  EV Stab  OTE	Status of electrovalve on crane distr. If ON, all crane movements are permitted. Status of electrovalve on stab. distr. If ON, all stab. movements are permitted. Status of auxiliary electrovalve, OTE. If ON, the crane can be operated.
<b>Led State</b>  90%  100%  Power	If ON, "P1 Current" exceeds 90%/100% "P1 Max" If ON, the crane is powered and connected.
<b>Stab State</b>  Stab 1 Down  Stab 2 Down	If ON, the stabilizer foot 1 is down If ON, the stabilizer foot 2 is down
<b>Tilting angle - Crane/Axle</b> 	Relative and absolute current tilt angles (Val) detected by the crane tilt sensor and the axle tilt sensor (only with KSS07). On the left and on the right the Min/Max values allowed are shown. "Offset" is the difference between "Val rel" and "Val abs".
<b>Lever State</b> 	Bar indicators showing the travels of control levers. SLW : crane slewing 1B : 1st boom articulation 2B : 2nd boom articulation Ext : hydraulic boom extensions CLA : clamp Rot : rotor DR : driving on trailer Manual cranes have digital indicators ON/OFF. Radio-controlled cranes have indicators showing the exact lever travel.
Maintenance expired 	<i>(Not Available)</i> If ON, planned maintenance is required
P1 Max [bar]	Pressure limit for 1st boom cylinder (constant value).
P1 Current [bar]	Current pressure detected in the 1st boom cylinder.
P1 %	Ratio between "P1 Current" and "P1 Max", expressed as percentage
B2 Angle [°]	Current inclination angle of 2nd boom with respect to the horizontal
B1 Angle [°]	Current inclination angle of 1st boom with respect to the horizontal
Rot Angle [°]	Current slewing angle of column: 0° is towards the opposite direction of frontboard
P2 Max [bar]	Pressure limit for 2nd boom cylinder (constant value).
P2 Current [bar]	Current pressure detected in the 2nd boom cylinder
P2 %	Ratio between "P2 Current" and "P2 Max", expressed as percentage
Extensions %	Current extension of 2nd boom (if sensor is present)
Main Unit Sw Vers.	Current software version on the master controller (HE154)
Aux. Unit Sw Vers.	Current software version on the slave controller (MC2M)
Display Sw Vers.	Current software version on the display (Tera7).
 Alarm Code	Current alarm code
 Warning Code	Current warning code
A Description	Description of current alarm
W Description	Description of current warning
<b>Movements State</b>	Indicators for the logic state signal of movements while using a lever. For manual and radio cranes the indicator is ON when the relevant movement is active (see legend of control levers for Lever State).

# Installer Manual

## CUST : Homepage

<b>Pressure graph</b>	Timeline of P1 and P2 pressures (see below).
-----------------------	--

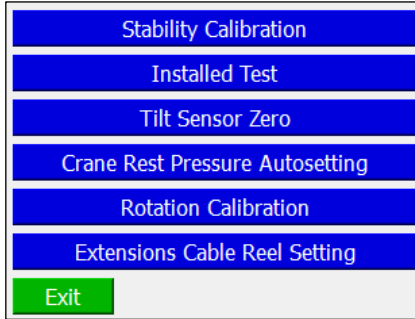



# Installer Manual

## CUST : Calibrations

### B.2 CALIBRATIONS

This section allows to perform the calibration of the stability and the sensors.



BUTTONS	DESCRIPTIONS
	It exits the calibration.

#### B.2.1 STABILITY CALIBRATION

The Annex D describes the procedure to perform the stability calibration.

# Installer Manual

## CUST : Calibrations

### B.2.2 INSTALLED TEST

This function allows to perform the Installed Test with increased load capacity.

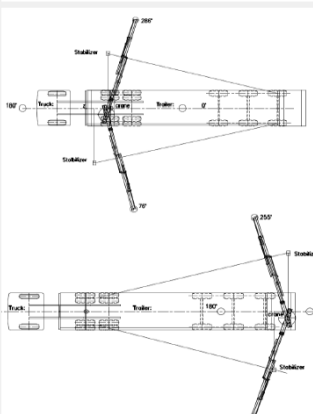
**ATTENTION:**  
DURING THE INSTALLED TEST  
THE CAPACITY LIMIT IS INCREASED

OK

Crane Speed @0%	9
Crane Speed @93%	76
B1 Max Angle	25.0
B2 Max Angle	28.0
P1 Max factor	1.25
P2 Max factor	1.25

PARAMETERS	DESCRIPTIONS
Crane Speed @0%	Speed percentage for all crane movements, with engine at 0% rpm.
Crane Speed @93%	Speed percentage for all crane movements, with engine at 93% rpm.
B1 Max Angle	Max. allowed inclination angle for 1st boom.
B2 Max Angle	Max. allowed inclination angle for 2nd boom.
P1 Max factor	Increase factor for the 1st boom cylinder pressure limit. P1 Test = P1 Nom x P1 Max factor.
P2 Max factor	Increase factor for the 2nd boom cylinder pressure limit during calibration. P2 Test = P2 Nom x P2 Max factor.

#### INSTALLED TEST



Stab1 DW

Stab2 DW

P1 =	<input type="text" value="0.0"/>	P1 Nom =	<input type="text" value="0.00"/>
P2 =	<input type="text" value="0.0"/>	P2 Nom =	<input type="text" value="0.00"/>
A1 =	<input type="text" value="0.0"/>	A2 =	<input type="text" value="0.0"/>
Rot =	<input type="text" value="0.0"/>		
Ext =	<input type="text"/>		
Tilt Crane =	<input type="text" value="0.00"/>	Tilt Trailer =	<input type="text" value="0.00"/>
Tilt Crane Th R =	<input type="text" value="0.00"/>	Tilt Trailer Th R =	<input type="text" value="0.00"/>
Tilt Crane Th L =	<input type="text" value="0.00"/>	Tilt Trailer Th L =	<input type="text" value="0.00"/>

LIMITS OF PRESSURE AND TILT ARE CURRENTLY INCREASED BY DEFINED FACTOR.  
PERFORM THE DYNAMIC TEST AND LATER EXIT FROM PROCEDURE.

Exit

# Installer Manual

## CUST : Calibrations

### B.2.3 TILT SENSOR ZERO

This function allows to eliminate the difference between two redundant signals given by the tilt sensors. It is recommended to perform this procedure in case of replacement of a sensor.

### Tilt Sensor Zero

Crane Sensor

Set Crane Zero

X:  Y:

Save

Axle Sensor

Set Axle Zero

X:  Y:

Exit

The test must be performed with crane and vehicle in horizontal position and without oscillations.

BUTTONS	DESCRIPTIONS
<span style="background-color: orange; color: white; padding: 2px 10px; border: 1px solid black;">Set Crane Zero</span>	It sets the crane tilt sensor to zero.
<span style="background-color: orange; color: white; padding: 2px 10px; border: 1px solid black;">Set Axle Zero</span>	It sets the axle tilt sensor to zero.
<span style="background-color: green; color: white; padding: 5px 20px; border: 1px solid black;">Save</span>	It saves the setting.
<span style="background-color: green; color: white; padding: 5px 20px; border: 1px solid black;">Exit</span>	It exits this function.
X: <input style="width: 50px;" type="text" value="0.00"/> Y: <input style="width: 50px;" type="text" value="0.00"/>	Difference in degrees between the two redundant signals from a tilt sensor, along the X-axis and the Y-axis, respectively. If a value is higher than 1.0°, then it is not possible to set to zero: in this case you must re-mount the sensor, paying most attention to tightening torque of bolts. If the problem persists, you must replace the sensor.

# Installer Manual

## CUST : Calibrations

### B.2.4 CRANE REST PRESSURE AUTOSETTING

This section allows to re-set the pressure limit below which the crane is considered unloaded.

**Crane Rest Pressure Autosetting**

Image  
to be defined

P1 =

- CRANE WITHOUT LOAD ATTACHED. IN CASE OF JIB OR SPECIAL TOOL ATTACH IT TO THE CRANE.  
 - OPEN THE CRANE AND PLACE IT IN USUAL REST POSITION (WHETHER FOLDED OR OVER THE TRAILER).  
 - PRESS "SET VALUE"

Exit

Current Value

New Value

Set Value

DATA	DESCRIPTIONS
P1	Current pressure in the 1st boom cylinder.
Current Value	Current pressure limit for crane folded in rest position.
New Value	New pressure limit for crane folded in rest position (= P1+10).

BUTTONS	DESCRIPTIONS
<div style="background-color: #FF9800; color: white; padding: 5px 10px; border-radius: 3px; display: inline-block;">Set Value</div>	It sets and saves the New Value as new pressure limit for crane folded in rest position.
<div style="background-color: #4CAF50; color: white; padding: 5px 10px; border-radius: 3px; display: inline-block;">Exit</div>	It exits this function.



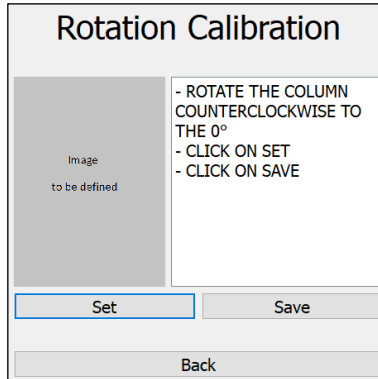
# Installer Manual

## CUST : Calibrations

### B.2.5 ROTATION CALIBRATION

This section allows to set the slewing sensor to 0°.

It is necessary to perform this procedure in case of replacement of the sensor.



**Note:** "Rotate the column counterclockwise to the 0°" means rotating the booms towards the center of trailer, on the opposite side of the frontboard.

BUTTONS	DESCRIPTIONS
Set	It re-sets the current slewing angle as reference.
Save	It saves the parameters.
Back	It returns to previous window.

# Installer Manual

## CUST : Calibrations

### B.2.6 EXTENSIONS CABLE REEL SETTING

This section allows to re-set the boom extension to 0% and 100% length. It is necessary to perform this procedure in case of replacement of the sensor.

### Extension Cable Reel Setting

Image  
to be defined

- CLOSE EXTENSIONS
- SELECT 0%
- CLICK ON SET
- OPEN EXTENSIONS COMPLETELY
- SELECT 100%
- CLICK ON SET
- CLICK ON SAVE

0 %

Set

Save

Back

BUTTONS	DESCRIPTIONS
<span style="border: 1px solid gray; padding: 2px 5px;">0 %</span>	Select 0% to set the extensions fully IN. Select 100% to set the extensions fully OUT.
<span style="border: 1px solid gray; padding: 2px 10px;">Set</span>	It re-sets the current length as reference.
<span style="border: 1px solid gray; padding: 2px 10px;">Save</span>	It saves the parameters.
<span style="border: 1px solid gray; padding: 2px 10px;">Back</span>	It returns to previous window.

### B.2.7 FACTORY TEST

This section is allowed only for Factory login.

# Installer Manual

## CUST : Configurations

### B.3 CONFIGURATIONS

#### B.3.1 MACHINE CONFIGURATION

This page allows the installer to change the main configuration parameters.  
For greater clarity we will divide the window into 5 parts:

- Upper checkboxes
- Left part
- Central part
- Right part
- Lower buttons

#### - CRANE CONFIGURATION: UPPER CHECKBOXES

CHECKBOXES	DESCRIPTIONS
<input type="checkbox"/> KSS05 <input type="checkbox"/> KSS06 <input type="checkbox"/> KSS07	These read-only checkboxes indicate the stability control system of crane.

#### - CRANE CONFIGURATION: LEFT PART

Nominal Press B1 [bar]	<input type="text" value="285.0"/>	Distributor Type	<input type="text" value="Manual"/>
Nominal Press B2 [bar]	<input type="text" value="300.0"/>	Out Trigger Type	<input type="text" value="Pantographic"/>
Press Crane loaded [bar]	<input type="text" value="110.0"/>	Out Trigger Sensor	<input type="text" value="Absent"/>
Press Pump Crane Move [bar]	<input type="text" value="25.0"/>	Extension Cable Reel	<input checked="" type="checkbox"/> Enabled
Engine Type	<input type="text" value="Canbus"/>	Axle Plan Sensor	<input type="checkbox"/> Enabled
Timer autorpm [s]	<input type="text" value="8.0"/>	Tiltable Stab 1 Timer [s]	<input type="text" value="10.0"/>
Timer seat [s]	<input type="text" value="1.0"/>	Tiltable Stab 2 Timer [s]	<input type="text" value="10.0"/>
Timer clamp enable [s]	<input type="text" value="600.0"/>	Rotation Control	<input type="text" value="Endless (BTS)"/>
Torque max 25% [Nm]	<input type="text" value="20"/>	Max tilt drive [%]	<input type="text" value="70"/>
Torque max 60% [Nm]	<input type="text" value="110"/>	Max tilt stab [%]	<input type="text" value="70"/>
Torque max 75% [Nm]	<input type="text" value="115"/>		
Torque max 93% [Nm]	<input type="text" value="105"/>		
Torque max [Nm]	<input type="text" value="0"/>		

The descriptions of parameters are on the next page.

# Installer Manual

## CUST : Configurations

PARAMETERS	DESCRIPTIONS
Nominal Press B1 [bar]	Nominal pressure limit for 1st boom cylinder.
Nominal Press B2 [bar]	Nominal pressure limit for 2nd boom cylinder.
Press Crane loaded [bar]	Pressure limit for 1st boom cylinder. If "P1 current" is less than this limit, the crane is considered unloaded.
Press Pump Crane Move [bar]	Pressure limit at distributor inlet. If the pressure at distr. inlet exceeds this limit, the crane is working.
Engine Type	It defines the engine mounted on the crane. Canbus Analog
Timer autorm [sec]	Timer for autorm high period.
Timer seat [sec]	Time interval for operator seat detection. Interval in which the operator is still considered to be seated on the seat after the deactivation of sensor.
Timer clamp enable [sec]	Time interval for operator seat detection bypass. When the "clamp enable" button is pressed, this is the interval for which the operator can control only extra functions without being seated on the seat. If the operator seats within this interval, the timer is set to zero, and all movements are enabled.
Torque max 25%	Maximum engine torque at 25% rpm (CAN-Bus engine)
Torque max 60%	Maximum engine torque at 60% rpm (CAN-Bus engine)
Torque max 75%	Maximum engine torque at 75% rpm (CAN-Bus engine)
Torque max 93%	Maximum engine torque at 93% rpm (CAN-Bus engine)
Torque max par	Maximum engine torque at 93% rpm (analog engine)
Distributor Type	It defines the crane distributor. Manual Radio
Outrigger Type	It defines the crane outriggers. Absent Tilttable Pantographic Mechanical
Outrigger Sensor	It defines if the outrigger IN-OUT sensor is present or not. Absent Present
Extension Cable Reel	It enables/disables the boom extension cable sensor.
Axle Plan Sensor	It enables/disables the trailer axle tilt sensor (KSS07).
Tilttable Stab 1 Timer	Min. execution time of the stab. Down control, over which the stabilizer 1 is considered deployed (tiltable stab. only). If this control is interrupted the timer holds the value. If the stab. Up control is performed, the timer counts back.
Tilttable Stab 2 Timer	Min. execution time of the stab. Down control, over which the stabilizer 2 is considered deployed (tiltable stab. only). If this control is interrupted the timer holds the value. If the stab. Up control is performed, the timer counts back.
Rotation Control	It defines the rotation sensor. Endless (BTS) Rack/pinion (Baumer) Rack/pinion (Posital)
Max tilt drive [%]	Max. tilt percentage over which the "drive" movement is blocked.
Max tilt stab [%]	Max. tilt percentage over which the stab. Up control is blocked on the working side, and the stab. Down control is blocked on the opposite side.

# Installer Manual

## CUST : Configurations

### - CRANE CONFIGURATION: CENTRAL PART

Pressure correction P1 dw [bar]	<input type="text" value="40.0"/> <input type="text" value="40.0"/>	Low Capacity	<input checked="" type="checkbox"/> Enabled
Pressure correction P1 up [bar]	<input type="text" value="0.0"/> <input type="text" value="0.0"/>	LC P1 Max [bar]	<input type="text" value="138.0"/>
Pressure correction P1 time [s]	<input type="text" value="5.0"/>	LC P2 Max [bar]	<input type="text" value="140.0"/>
Pressure correction P2 dw [bar]	<input type="text" value="40.0"/> <input type="text" value="40.0"/>	LC B2 Angle Max [°]	<input type="text" value="20.0"/>
Pressure correction P2 up [bar]	<input type="text" value="0.0"/> <input type="text" value="0.0"/>	LC Extension Max [%]	<input type="text" value="90.0"/>
Pressure correction P2 time [s]	<input type="text" value="5.0"/>	Crane Tilt stop 0-180 [°]	<input type="text" value="5.00"/>
Crane close slew left [°]	<input type="text" value="260.0"/>	Crane Tilt stop 180-360 [°]	<input type="text" value="-5.00"/>
Crane close slew right [°]	<input type="text" value="280.0"/>	Crane Tilt max 0-180 [°]	<input type="text" value="7.00"/>
Crane close max angle 1 [°]	<input type="text" value="20.0"/>	Crane Tilt max 180-360 [°]	<input type="text" value="-7.00"/>
Crane close max angle 2 [°]	<input type="text" value="-65.0"/>	Axle Tilt stop 0-180 [°]	<input type="text" value="3.00"/>
		Axle Tilt stop 180-360 [°]	<input type="text" value="-3.00"/>
		Axle Tilt max 0-180 [°]	<input type="text" value="6.00"/>
		Axle Tilt max 180-360 [°]	<input type="text" value="-6.00"/>
		Tilt autocal. Timer [s]	<input type="text" value="3.0"/>

PARAMETERS	DESCRIPTIONS
Press Correction P1 dw [bar]	Pressure correction to apply when closing the 1st boom cylinder. The left box (1) gives the increase for pressure close to zero. The right box (2) gives the increase for pressure close to the nominal one.
Press Correction P1 up [bar]	Pressure correction to apply when opening the 1st boom cylinder. The left box (1) is the increase for pressure close to zero. The right box (2) is the increase for pressure close to the nominal one.
Press Correction P1 time [s]	Time interval in which the pressure correction for P1 applies. After this period, the correction will not apply.
Press Correction P2 dw [bar]	Pressure correction to apply when closing the 2nd boom cylinder. The left box (1) gives the increase for pressure close to zero. The right box (2) gives the increase for pressure close to the nominal one.
Press Correction P2 up [bar]	Pressure correction to apply when opening the 2nd boom cylinder. The left box (1) is the increase for pressure close to zero. The right box (2) is the increase for pressure close to the nominal one.
Press Correction P2 time [s]	Time interval in which the pressure correction for P2 applies. After this period, the correction will not apply.
Crane close slew left [°]	Min. slewing angle allowed for crane folded in rest position (CCW limit).
Crane close slew right [°]	Max. slewing angle allowed for crane folded in rest position (CW limit).
Crane close max angle 1 [°]	Max. 1st boom inclination angle for crane folded in rest position.
Crane close max angle 2 [°]	Max. 2nd boom inclination angle for crane folded in rest position.

The table continues on the next page.

# Installer Manual

## CUST : Configurations

Continued from the previous page.

PARAMETERS	DESCRIPTIONS
Low Capacity	It enables/disables the LC function (KSS06)
LC P1 max [bar]	Pressure limit for 1st boom cylinder, over which LC speed reduction applies.
LC P2 max [bar]	Pressure limit for 2nd boom cylinder, over which LC speed reduction applies.
LC B2 Angle Max [°]	Angle limit for 2nd boom, beyond which LC speed reduction applies if the crane is loaded.
LC Extension Max [%]	Extension percentage for boom extensions, over which LC speed reduction applies if the crane is loaded (for cranes with cable reel only).
Crane Tilt stop 0-180	Max. positive crane tilt angle allowed during crane operations within the slewing sector 0°-180°.
Crane Tilt stop 180-360	Min. negative crane tilt angle allowed during crane operations within the slewing sector 180°-360°.
Crane Tilt max 0-180	Max. positive crane tilt angle allowed before crane operations and during stability calibration within the slewing sector 0°-180°.
Crane Tilt max 180-360	Min. negative crane tilt angle allowed before crane operations and during stability calibration within the slewing sector 180°-360°.
Axle Tilt stop 0-180	Max. positive trailer tilt angle allowed during crane operations within the slewing sector 0°-180° (KSS07).
Axle Tilt stop 180-360	Min. negative trailer tilt angle allowed during crane operations within the slewing sector 180°-360° (KSS07).
Axle Tilt max 0-180	Max. positive trailer tilt angle allowed before crane operations and during stability calibration within the slewing sector 0°-180° (KSS07).
Axle Tilt max 180-360	Min. negative trailer tilt angle allowed before crane operations and during stability calibration within the slewing sector 180°-360° (KSS07).

# Installer Manual

## CUST : Configurations

### - CRANE CONFIGURATION: RIGHT PART

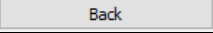

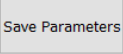
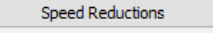
Slew trailer limit RL @ext0% [°]	13.0
Slew trailer limit FL @ext0% [°]	173.0
Slew trailer limit FR @ext0% [°]	197.0
Slew trailer limit RR @ext0% [°]	347.0
Slew trailer limit RL @ext100% [°]	9.0
Slew trailer limit FL @ext100% [°]	178.0
Slew trailer limit FR @ext100% [°]	191.0
Slew trailer limit RR @ext100% [°]	352.0

PARAMETERS	DESCRIPTIONS
Slew trailer limit RL @ext0% [°]	Rear-Left limit slewing angle delimiting the trailer. This parameter is used with extensions fully IN or without cable reel for LC function, zero calibration and vertical speed reduction.
Slew trailer limit FL @ext0% [°]	Front-Left limit slewing angle delimiting the trailer. This parameter is used with extensions fully IN or without cable reel for LC function, zero calibration and vertical speed reduction.
Slew trailer limit FR @ext0% [°]	Front-Right limit slewing angle delimiting the trailer. This parameter is used with extensions fully IN or without cable reel for LC function, zero calibration and vertical speed reduction.
Slew trailer limit RR @ext0% [°]	Rear-Right limit slewing angle delimiting the trailer. This parameter is used with extensions fully IN or without cable reel for LC function, zero calibration and vertical speed reduction.
Slew trailer limit RL @ext100% [°]	Rear-Left limit slewing angle delimiting the trailer. This parameter is used with extensions fully OUT for LC function, zero calibration and vertical speed reduction.
Slew trailer limit FL @ext100% [°]	Front-Left limit slewing angle delimiting the trailer. This parameter is used with extensions fully OUT for LC function, zero calibration and vertical speed reduction.
Slew trailer limit FR @ext100% [°]	Front-Right limit slewing angle delimiting the trailer. This parameter is used with extensions fully OUT reel for LC function, zero calibration and vertical speed reduction.
Slew trailer limit RR @ext100% [°]	Rear-Right limit slewing angle delimiting the trailer. This parameter is used with extensions fully OUT for LC function, zero calibration and vertical speed reduction.

# Installer Manual

## CUST : Configurations

### - CRANE CONFIGURATION: LOWER BUTTONS

BUTTONS	DESCRIPTIONS
	It closes the window without saving.
	It applies the parameters to the system. Any changes will be lost after switching off the crane.
	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.
	It opens the section for speed reductions.



# Installer Manual

## CUST : Configurations

### B.3.2 SPEED REDUCTIONS

#### B.3.2.1 SPEED REDUCTION FOR STABILIZERS

This function is available only for cranes with pantographic or tiltable stabilizers.

This section allows to adjust the speed of each stabilizer operation for different engine rpm values.

Stabilizers Speed	Stabilizers Speed					
Above Horizontal	Stab In @rpm 25%	44		Stab In @rpm 60%	33	
End Stroke Cylinders	Stab Out @rpm 25%	44		Stab Out @rpm 60%	33	
Ramps	Stab Fold @rpm 25%	100		Stab Fold @rpm 60%	100	
Boom Crane Empty	Stab Unfold @rpm 25%	100		Stab Unfold @rpm 60%	100	
Boom Crane Load	Stab Up @rpm 25%	100		Stab Up @rpm 60%	100	
End of Inclination Limit (Booms)	Stab Dw @rpm 25%	33		Stab Dw @rpm 60%	21	
End of Inclination Limit (Ext/Rot)	Stab In @rpm 75%	33		Stab In @rpm 93%	27	
End of High Capacity Area CCW/CW	Stab Out @rpm 75%	33		Stab Out @rpm 93%	27	
End of High Capacity Area B1/B2/Ext	Stab Fold @rpm 75%	100		Stab Fold @rpm 93%	100	
	Stab Unfold @rpm 75%	100		Stab Unfold @rpm 93%	100	
	Stab Up @rpm 75%	100		Stab Up @rpm 93%	100	
	Stab Dw @rpm 75%	16		Stab Dw @rpm 93%	15	

Note: 25%, 60% and 75% are available for CAN-Bus engine only.

Note: by default, the speed is always set to 100% at 0% rpm.

PARAMETERS	DESCRIPTIONS
Stab In @rpm XX%	Speed percentage for stabilizer beams retraction, with engine at XX% rpm.
Stab Out @rpm XX%	Speed percentage for stabilizer beams extension, with engine at XX% rpm.
Stab Fold @rpm XX%	Speed percentage for stabilizer folding (tilting up for tiltable, folding up for pantographic - from sensor detection to fully folded), with engine at XX% rpm.
Stab Unfold @rpm XX%	Speed percentage for stabilizer unfolding (tilting down for tiltable, unfolding up for pantographic - from fully folded to sensor detection), with engine at XX% rpm.
Stab Up @rpm XX%	Speed percentage for stabilizer lifting movement (up to sensor detection), with engine at XX% rpm.
Stab Dw @rpm XX%	Speed percentage for stabilizer lowering movement (from sensor detection), with engine at XX% rpm.

Note: XX% is the generic rpm value: 25%, 60%, 75% or 93%.

BUTTONS	DESCRIPTIONS
Back	It closes the window without saving.
Apply	It applies the parameters to the system. Any changes will be lost after switching off the crane.
Save	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

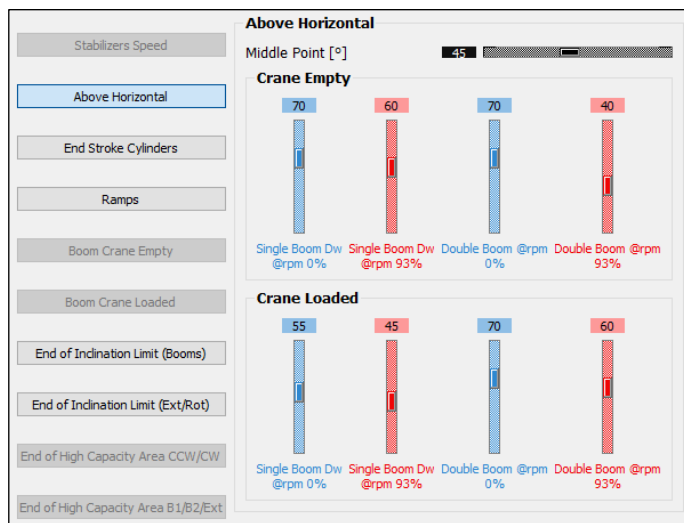
# Installer Manual

## CUST : Configurations

### B.3.2.2 SPEED REDUCTION FOR BOOMS ABOVE HORIZONTAL

This section allows to adjust the lowering speed of booms above the horizontal (referring to 2nd boom inclination angle), when the crane boom is slewed towards the trailer sides.

The reduction parameters are defined for Crane Empty (P1 < Press Crane Loaded) and Crane Loaded (P1 > Press Crane Loaded). Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation.



PARAMETERS	DESCRIPTIONS
Middle point [°]	Middle inclination angle of 2nd boom: - Beyond this angle the speed reduction applies when lowering at least a boom; - Below this angle the speed reduction applies only when lowering both booms.
Single Boom Dw @rpm XX%	Speed percentage when lowering a boom from the top up to the middle point, with engine at XX% rpm.
Double Boom Dw @rpm XX%	Speed percentage when lowering both booms from the middle point up to the horizontal, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

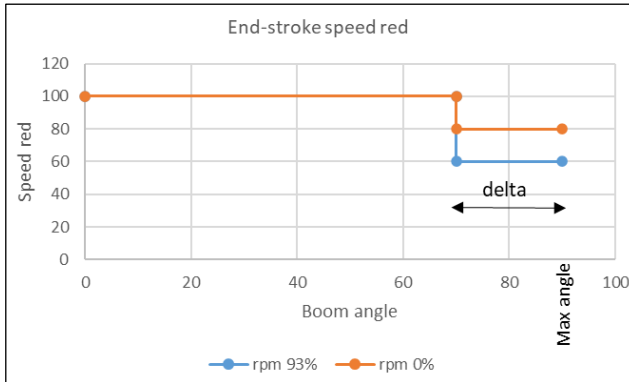
BUTTONS	DESCRIPTIONS
Back	It closes the window without saving.
Apply	It applies the parameters to the system. Any changes will be lost after switching off the crane.
Save	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

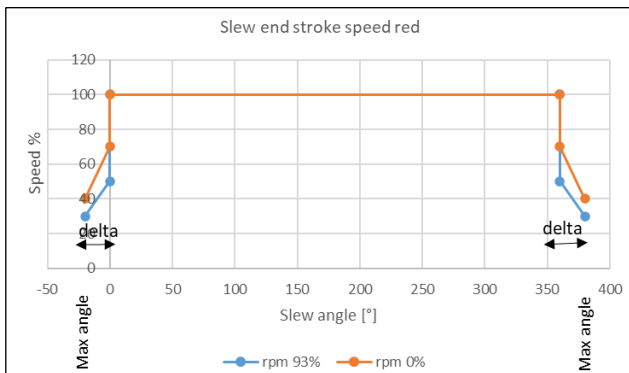
## CUST : Configurations

### B.3.2.3 SPEED REDUCTION AT END-OF-STROKE

This section allows to adjust the movement speed when approaching the end-of-stroke of cylinders. Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation. Booms speeds are constant within the approach range (delta angle): for this reason, only a setting parameter is needed (see example below):



Instead, slewing speeds vary proportionally within the approach range (delta angle) to avoid sudden changes in speed: in this case two setting parameters are needed (see example below):



Note: slewing speed reductions are available only to cranes with rack and pinion.

# Installer Manual

## CUST : Configurations



PARAMETERS	DESCRIPTIONS
B1 Max Angle [°]	Max. inclination angle of 1st boom, with respect to the horizontal.
B1 Approach Angle [°]	Approach angle for the 1st boom below which the speed of 1st boom cylinder is reduced (delta). Speed reduction starts when: $A1 = B1 \text{ Max Angle} - B1 \text{ Approach Angle}$
B1 Up @rpm XX%	Speed percentage of the 1st boom cylinder within the reduction range, with engine at XX% rpm.
B2 Min Relative Angle [°]	Min. relative angle between 1st boom and 2nd boom (A1-A2).
B2 Approach Angle [°]	Approach angle for the 2nd boom beyond which the speed of 2nd boom cylinder is reduced. Speed reduction starts when: $A2 = A1 - (B2 \text{ Min Relative Angle} - B2 \text{ Approach Angle})$
B2 Up @rpm XX%	Speed percentage of the 2nd boom cylinder within the reduction range, with engine at XX% rpm.

A1 and A2 are the inclination angles with respect to the horizontal of 1st boom, 2nd boom, respectively

Note: XX% is the generic rpm value: 0% or 93%.

The table continues on the next page.

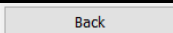
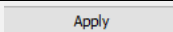
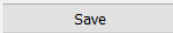
# Installer Manual

## CUST : Configurations

Continued from the previous page.

PARAMETERS	DESCRIPTIONS
CW Stop Angle [°]	Clockwise slewing stop angle. It should be set 2-3 degrees before the mechanical stop.
CW Approach Angle [°]	Angle of working arc adjacent the CW slewing stop where the slewing speed is reduced.
CCW Stop Angle [°]	Counterclockwise slewing stop angle. It should be set 2-3 degrees before the mechanical stop.
CCW Approach Angle [°]	Angle of working arc adjacent the CCW slewing stop where the slewing speed is reduced.
CW Start @rpm XX%	Clockwise slewing speed percentage at the start of CW Approach Angle, with engine at XX% rpm.
CW Stop @rpm XX%	Clockwise slewing speed percentage at the end of CW Approach Angle, with engine at XX% rpm.
CCW Start @rpm XX%	Counterclockwise slewing speed percentage at the start of CCW Approach Angle, with engine at XX% rpm.
CCW Stop @rpm XX%	Counterclockwise slewing speed percentage at the end of CCW Approach Angle, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

BUTTONS	DESCRIPTIONS
	It closes the window without saving.
	It applies the parameters to the system. Any changes will be lost after switching off the crane.
	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

## CUST : Configurations

### B.3.2.4 SPEED RAMPS

This section allows to adjust the speed ramps used for reducing the starting accelerations of all crane movements.

Stabilizers Speed	<b>Ramps</b>
Above Horizontal	Start rotation ramp <input type="text" value="0"/>
End Stroke Cylinders	Start booms ramp <input type="text" value="0"/>
<b>Ramps</b>	Start drive ramp <input type="text" value="0"/>
Boom Crane Empty	
Boom Crane Loaded	
End of Inclination Limit (Booms)	
End of Inclination Limit (Ext/Rot)	
End of High Capacity Area CCW/CW	
End of High Capacity Area B1/B2/Ext	

PARAMETERS	DESCRIPTIONS
Start rotation ramp	Ramp parameter for slewing movement. The lower this parameter, the smoother the slewing start. If zero, the ramp is disabled.
Start booms ramp	Ramp parameter for lifting/lowering of booms and extending/retracting of hydraulic extensions. The lower this parameter, the smoother the movements start. If zero, the ramp is disabled.
Start drive ramp	Ramp parameter for driving movement. The lower this parameter, the smoother the driving start. If zero, the ramp is disabled.

BUTTONS	DESCRIPTIONS
Back	It closes the window without saving.
Apply	It applies the parameters to the system. Any changes will be lost after switching off the crane.
Save	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

## CUST : Configurations

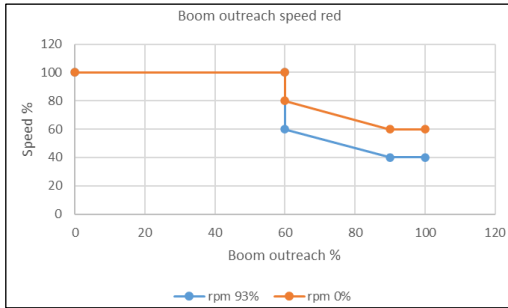
### B.3.2.5 SPEED REDUCTIONS DUE TO BOOM OUTREACH

These functions are available only for cranes equipped with cable reel sensor.

These sections allow to adjust the movements speed depending on the current boom outreach percentage for empty and loaded crane.

Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation.

The speeds vary proportionally within the approach range, i.e. between the Start Point and the End Point (see example below).



#### Speed Related To Boom Outreach

Stabilizers Speed

Above Horizontal

End Stroke Cylinders

Ramps

**Boom Crane Empty**

**Boom Crane Loaded**

End of Inclination Limit (Booms)

End of Inclination Limit (Ext/Rot)

End of High Capacity Area CCW/CW

End of High Capacity Area B1/B2/Ext

Start Point [%]

End Point [%]

#### Crane Empty / Loaded

Category	Start Point [%]	End Point [%]	Start Point [%]	End Point [%]
Rot	60	45	50	45
B1 Dw	60	45	50	45
B2 Dw	55	45	50	45

# Installer Manual

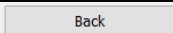

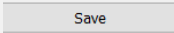
## CUST : Configurations

PARAMETERS	DESCRIPTIONS
Start Point [%]	Outreach percentage where the speed reduction starts, with empty/loaded crane.
End Point [%]	Outreach percentage where the speed reduction ends, with empty/loaded crane. Usually, it is = 100%.
Rot Start Point @rpmXX%	Slewing speed percentage at the outreach start point, with engine at XX% rpm
Rot End Point @rpmXX%	Slewing speed percentage at the outreach end point, with engine at XX% rpm
B1 Dw Start Point @rpmXX%	Speed percentage for 1st boom lowering at the outreach start point, with engine at XX% rpm
B1 Dw End Point @rpmXX%	Speed percentage for 1st boom lowering at the outreach end point, with engine at XX% rpm
B2 Dw Start Point @rpmXX%	Speed percentage for 2nd boom lowering at the outreach start point, with engine at XX% rpm
B2 Dw End Point @rpmXX%	Speed percentage for 2nd boom lowering at the outreach end point, with engine at XX% rpm

Note: XX% is the generic rpm value: 0% or 93%.

Data must be defined for empty and loaded crane in the dedicated sections:

- "Boom Crane Empty"
- "Boom Crane Loaded"

BUTTONS	DESCRIPTIONS
	It closes the window without saving.
	It applies the parameters to the system. Any changes will be lost after switching off the crane.
	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

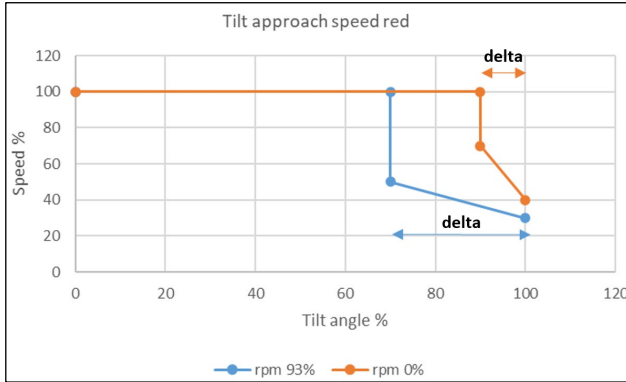


# Installer Manual

## CUST : Configurations

### B.3.2.6 SPEED REDUCTIONS FOR BOOMS DUE TO TILTING ANGLE

This section allows to adjust the boom lowering speed when approaching the Max Tilting Angle. Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation. The speeds vary proportionally within the approach range (see example below).



- Stabilizers Speed
- Above Horizontal
- End Stroke Cylinders
- Ramps
- Boom Crane Empty
- Boom Crane Loaded
- End of Inclination Limit (Booms)
- End of Inclination Limit (Ext./Rot)
- End of High Capacity Area CCW/CW
- End of High Capacity Area B1/B2/Ext

#### End of Inclination Limit (Booms)

1st Boom Approach tilt @rpm0%		1st Boom Approach tilt @rpm93%	
70	60	70	50
B1 dw Start Point @rpm0%	B1 dw Overload Point @rpm0%	B1 dw Start Point @rpm93%	B1 dw Overload Point @rpm93%
2nd Boom Approach tilt @rpm0%		2nd Boom Approach tilt @rpm93%	
70	60	70	50
B2 dw Start Point @rpm0%	B2 dw Overload Point @rpm0%	B2 dw Start Point @rpm93%	B2 dw Overload Point @rpm93%

# Installer Manual

## CUST : Configurations

PARAMETERS	DESCRIPTIONS
1st Boom Approach tilt @rpmXX%	Tilt percentage approach range (delta) where the 1st boom speed reduction starts, with engine at XX% rpm.
B1 dw Start Point @rpmXX%	Speed percentage for 1st boom lowering where the speed reduction starts, with engine at XX% rpm.
B1 dw Overload Point @rpmXX%	Speed percentage for 1st boom lowering at Max. tilting angle, with engine at XX% rpm.
2nd Boom Approach tilt @rpmXX%	Tilt percentage approach range (delta) where the 2nd boom speed reduction starts, with engine at XX% rpm.
B2 dw Start Point @rpmXX%	Speed percentage for 2nd boom lowering where the speed reduction starts, with engine at XX% rpm.
B2 dw Overload Point @rpmXX%	Speed percentage for 2nd boom lowering at Max. tilting angle, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

BUTTONS	DESCRIPTIONS
<input type="button" value="Back"/>	It closes the window without saving.
<input type="button" value="Apply"/>	It applies the parameters to the system. Any changes will be lost after switching off the crane.
<input type="button" value="Save"/>	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

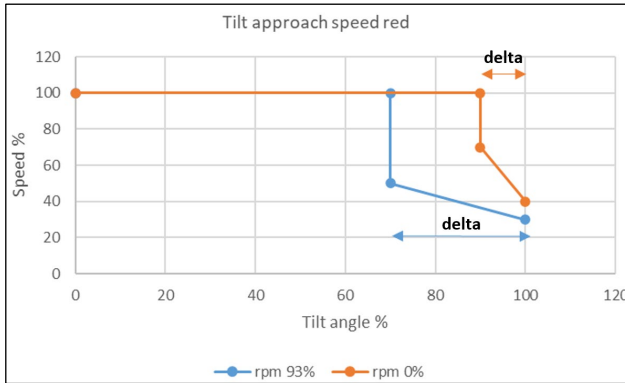
## CUST : Configurations

### B.3.2.7 SPEED REDUCTIONS FOR EXT/ROT DUE TO TILTING ANGLE

This section allows to adjust the speed of boom extension and of crane slewing when approaching the Max Tilting Angle.

Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation.

The speeds vary proportionally within the approach range (see example below).



**End of Inclination Limit (Ext/Rot)**

Configuration	rpm	Start Point (Tilt %)	Overload Point (Tilt %)
Extension Approach tilt @rpm0%	0%	70	45
Extension Approach tilt @rpm93%	93%	65	55
Rotation Approach tilt @rpm0%	0%	70	60
Rotation Approach tilt @rpm93%	93%	70	50

Left sidebar menu items:

- Stabilizers Speed
- Above Horizontal
- End Stroke Cylinders
- Ramps
- Boom Crane Empty
- Boom Crane Loaded
- End of Inclination Limit (Booms)
- End of Inclination Limit (Ext/Rot)**
- End of High Capacity Area CCW/CW
- End of High Capacity Area B1/B2/Ext

# Installer Manual

## CUST : Configurations

PARAMETERS	DESCRIPTIONS
Extension Approach tilt @rpmXX%	Tilt percentage approach range (delta) where the boom extension speed reduction starts, with engine at XX% rpm.
Ext Start Point @rpmXX%	Speed percentage for boom extension where the speed reduction starts, with engine at XX% rpm.
Ext Overload Point @rpmXX%	Speed percentage for boom extension at Max. tilting angle, with engine at XX% rpm.
Rotation Approach tilt @rpmXX%	Tilt percentage approach range (delta) where the slewing speed reduction starts, with engine at XX% rpm.
Rotation Start Point @rpmXX%	Speed percentage for slewing movement where the slewing speed reduction starts, with engine at XX% rpm.
Rotation Overload Point @rpmXX%	Speed percentage for slewing movement at Max. tilting angle, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

BUTTONS	DESCRIPTIONS
<input type="button" value="Back"/>	It closes the window without saving.
<input type="button" value="Apply"/>	It applies the parameters to the system. Any changes will be lost after switching off the crane.
<input type="button" value="Save"/>	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

## CUST : Configurations

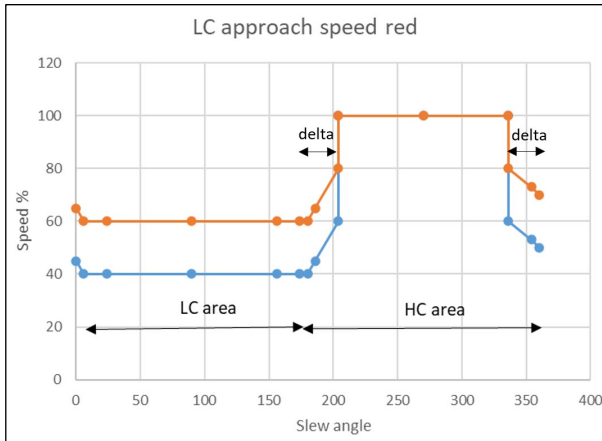
### B.3.2.8 SPEED REDUCTION FOR SLEWING OUTSIDE THE HC AREA

This function is available only for cranes equipped with KSS06.

This section allows to adjust the speed reduction parameters in approaching the end of High Capacity Area (HC area) where the slewing speed start reducing.

Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation.

The speeds vary proportionally within the approach range (see example below).



Stabilizers Speed

Above Horizontal

End Stroke Cylinders

Ramps

Boom Crane Empty

Boom Crane Loaded

End of Inclination Limit (Booms)

End of Inclination Limit (Ext/Rot)

**End of High Capacity Area CCW/CW**

End of High Capacity Area B1/B2/Ext

#### End of High Capacity Area CW/CCW

CCW Rotation Approach Slew [°]

30

55      50      60      35

CCW Start Point @rpm0%    CCW End Point @rpm0%    CCW Start Point @rpm93%    CCW End Point @rpm93%

CW Rotation Approach Slew [°]

30

55      50      60      35

CW Start Point @rpm0%    CW End Point @rpm0%    CW Start Point @rpm93%    CW End Point @rpm93%

# Installer Manual

## CUST : Configurations

PARAMETERS	DESCRIPTIONS
CCW Rotation Approach Slew [°]	CCW approach slewing angle (delta) close to the end of HC area.
CCW Start Point @rpmXX%	Slewing speed percentage at the start of CCW approach slewing range, with engine at XX% rpm.
CCW End Point @rpmXX%	Slewing speed percentage at the end of CCW approach slewing range, with engine at XX% rpm.
CW Rotation Approach Slew [°]	CW approach slewing angle (delta) close to the end of HC area.
CW Start Point @rpmXX%	Slewing speed percentage at the start of CW approach slewing range, with engine at XX% rpm.
CW End Point @rpmXX%	Slewing speed percentage at the end of CW approach slewing range, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

CCW End Point and CW End Point must be equal: this value defines the speed % outside the HC area.

It is good practice that CCW parameters and CW parameters have the same respective values.

BUTTONS	DESCRIPTIONS
Back	It closes the window without saving.
Apply	It applies the parameters to the system. Any changes will be lost after switching off the crane.
Save	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

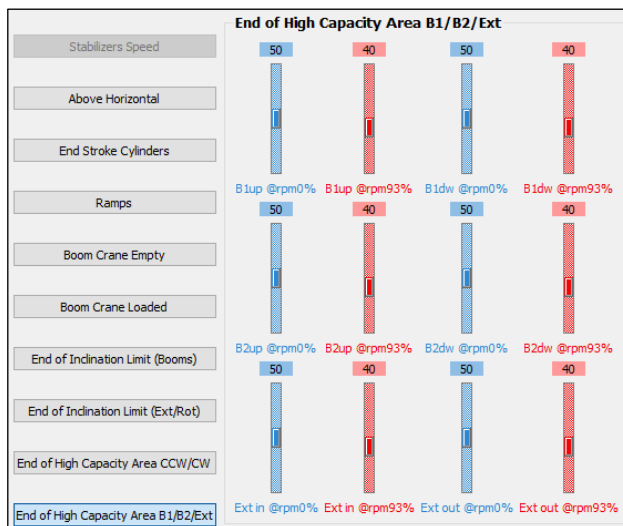
## CUST : Configurations

### B.3.2.9 SPEED REDUCTION FOR B1/B2/EXT OUTSIDE THE HC AREA

This function is available only for cranes equipped with KSS06.

This section allows to adjust the speed reduction parameters in approaching the end of High Capacity Area (HC area), where the booms and the extensions speed is reduced.

Speed regulations are available for 0% and 93% rpm: for cranes equipped with CAN-Bus engine the intermediate values for 25%, 60% and 75% rpm are obtained by linear interpolation.



PARAMETERS	DESCRIPTIONS
B1up @rpmXX%	Speed percentage for 1st boom lifting movement outside the HC area, with engine at XX% rpm.
B1dw @rpmXX%	Speed percentage for 1st boom lowering movement outside the HC area, with engine at XX% rpm.
B2up @rpmXX%	Speed percentage for 2nd boom lifting movement outside the HC area, with engine at XX% rpm.
B2dw @rpmXX%	Speed percentage for 2nd boom lowering movement outside the HC area, with engine at XX% rpm.
Ext in @rpmXX%	Speed percentage for boom retraction movement outside the HC area, with engine at XX% rpm.
Ext out @rpmXX%	Speed percentage for boom extension movement outside the HC area, with engine at XX% rpm.

Note: XX% is the generic rpm value: 0% or 93%.

BUTTONS	DESCRIPTIONS
Back	It closes the window without saving.
Apply	It applies the parameters to the system. Any changes will be lost after switching off the crane.
Save	It overwrites the parameters on the main controller. Any changes are saved and will be kept at the next crane restart.

# Installer Manual

## CUST : Devices

### B.4 DEVICES

#### B.4.1 PARAMETERS AND FIRMWARE LOADING

This section allows to download updated firmware onto all devices and save/load the parameters files, as well as download the event log file data.

### Param / Firmware Loading

Name	CPU Number	Node Id	MDS Unit	Connection Status
first:HE154 (UNIT_14)	0	0x0e	14	OFF
first:MC2M_LOGIC_CPU0 (UNIT_12)	0	0x0c	12	OFF
first:MC2M_LOGIC_CPU1 (UNIT_11)	0	0x0b	11	OFF
first:TERA7		0x12		OFF

Device: - Device -

SW Version:

Operations

Save Params  
 Load Params  
 Load SW Application  
 Save Event Log  
 Show Event Log

File Path

Browse

Start Operation

Progress:   0%

System messages:

Other Devices
Back

The listbox shows the devices connected on the CAN-Bus line.

FUNCTIONS	DESCRIPTIONS
<span style="border: 1px solid gray; padding: 2px;">- Device -</span>	It selects the device to operate with. For more information refer to C.2.
SW Version	It shows the current version of the device.
<input checked="" type="radio"/> Save Params <input type="radio"/> Load Params <input type="radio"/> Load SW Application <input type="radio"/> Save Event Log <input type="radio"/> Show Event Log	It loads a parameter file from the selected device on the laptop. It loads a parameter file from the laptop onto the selected device. It loads a new software onto the selected device. N/A N/A
<span style="border: 1px solid gray; padding: 2px 5px;">Browse</span>	It allows to browse and select the path for loading/saving the file.
<span style="border: 1px solid gray; padding: 2px 5px;">Start Operation</span>	Starts the selected operation.
<span style="border: 1px solid gray; padding: 2px 5px;">Other Devices</span>	N/A
<span style="border: 1px solid gray; padding: 2px 5px;">Back</span>	It exits from this section.

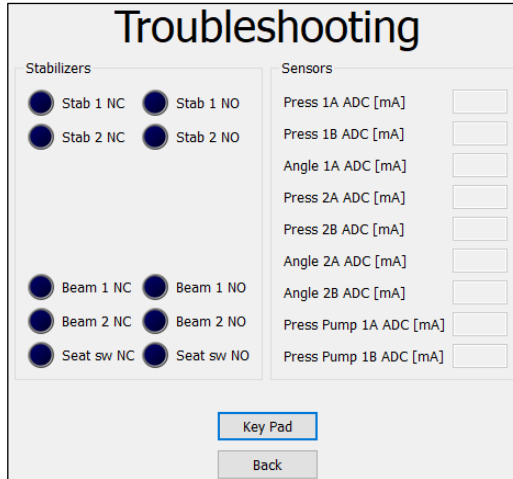


# Installer Manual

## CUST : Troubleshooting

### B.5 TROUBLESHOOTING

This section shows the electric signals of sensors.



INDICATOR	DESCRIPTION
Stab 1 NC     Stab 1 NO Stab 2 NC     Stab 2 NO	Normally Closed (NC) and Normally Open (NO) signals from the redundant proximity sensors for stab. foot deployed.
Beam 1 NC     Beam 1 NO Beam 2 NC     Beam 2 NO	Normally Closed (NC) and Normally Open (NO) signals from the redundant proximity sensors for stab. beam fully extended.
Seat sw NC     Seat sw NO	Normally Closed (NC) and Normally Open (NO) signals from sensor for human presence on top seat.
Press ADC [mA]	The current of a redundant pressure transducer is between 4mA and 20mA
Angle ADC [mA]	The current of a redundant inclination transducer is between 4mA and 20mA
Press Pump ADC [mA]	The current of a redundant pressure transducer of the pump is between 4mA and 20mA
	This section shows the functions of every button of the keypad. 
	It returns to Homepage.

# Installer Manual

## CUST : Annexes

### C ANNEXES

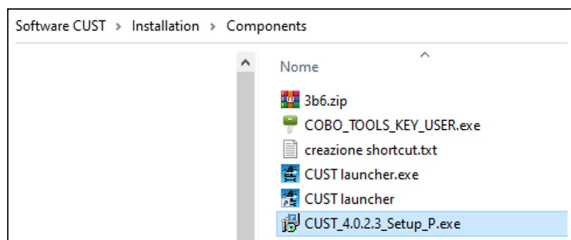
#### C.1 INSTALLATION OF PARTS OF CUST

Instead of installing all software parts at the same time by running the "CUST\_HCE\_INSTALLER.bat" file, you may install single components separately. This annex explains the old installing process that may suggest methods to adjust or re-install some parts already installed.

##### C.1.1 INSTALLATION AND ACTIVATION OF CUST

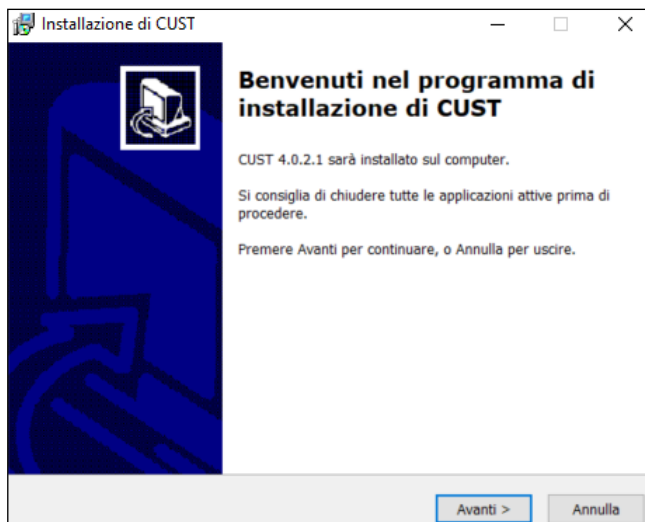
Follow the steps below to install and activate the CUST.

1. Run the CUST setup file.



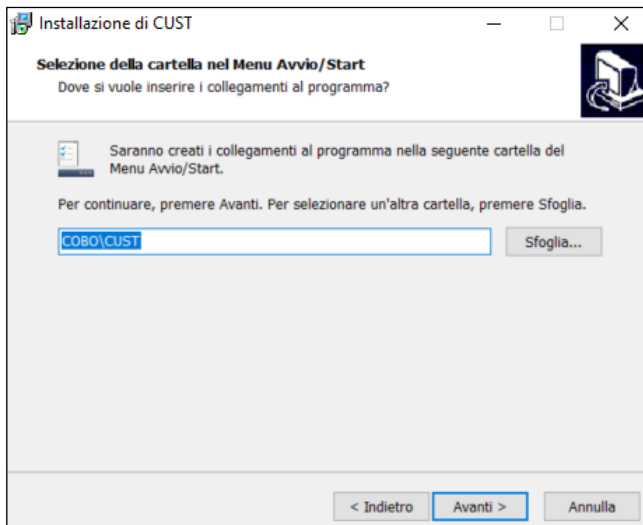
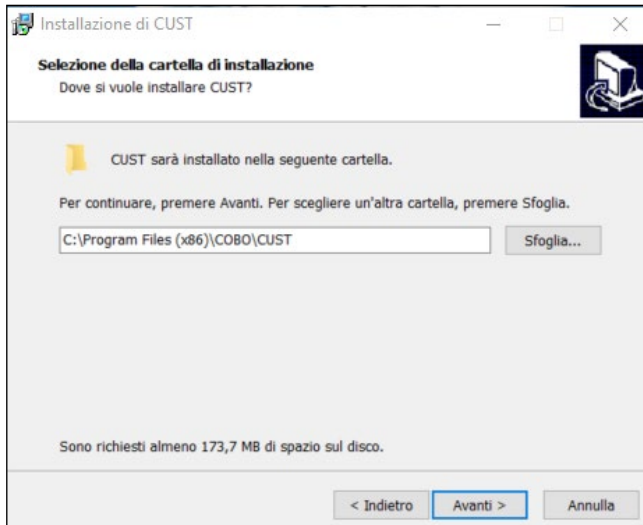
Administrator rights account is needed: please ask to your local IT support.

2. Click **Next >** (Avanti >) at every step.



# Installer Manual

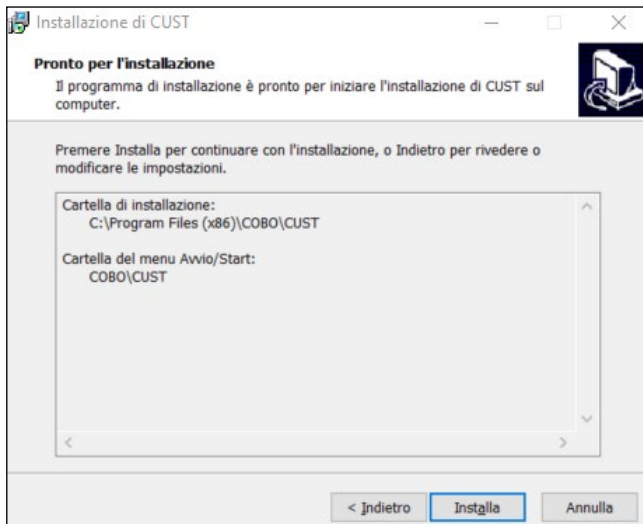
## CUST : Annexes



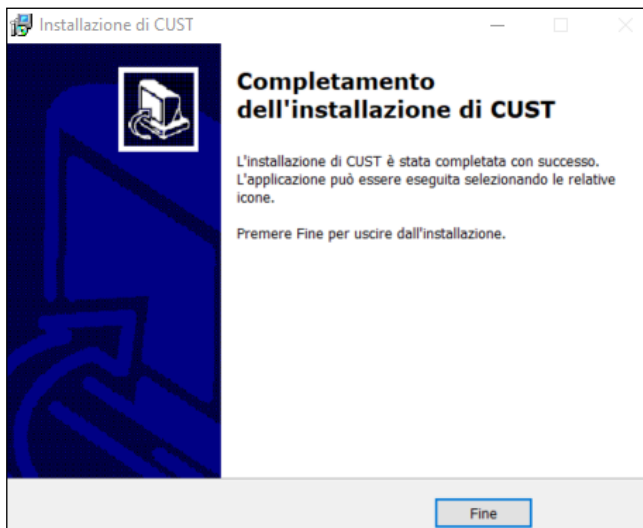
# Installer Manual

## CUST : Annexes

3. Click **Install** (Installa).



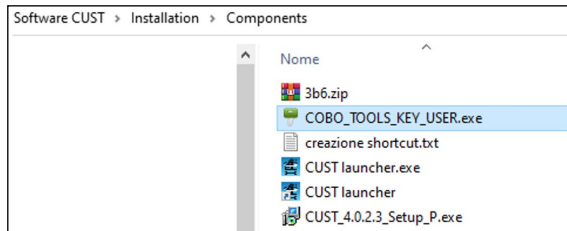
4. Click **Finish** (Fine). The installation is completed.



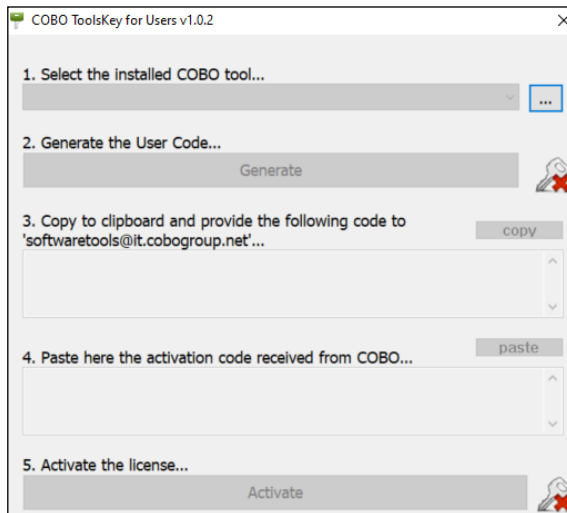
# Installer Manual

## CUST : Annexes

5. Run the software “COBO\_TOOLS\_KEY\_USER.exe”.



6. Click the 3-dot button  on the top right corner.



7. Continue the procedure resuming from point 15 of paragraph A.3.

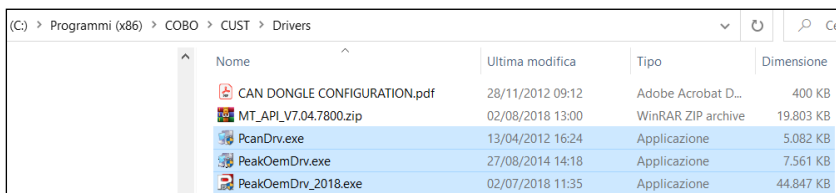
# Installer Manual

## CUST : Annexes

### C.1.2 UPDATING THE DRIVERS

The CUST software runs properly with specific driver versions for the Peak (PCAN) USB dongle.

1. Open the folder CUST on your local "C:" Disk, and the subfolder "Drivers".
2. Install all 3 driver files: please continue even if drivers are already installed: if message informing that more recent drivers are installed appears, then you can skip.



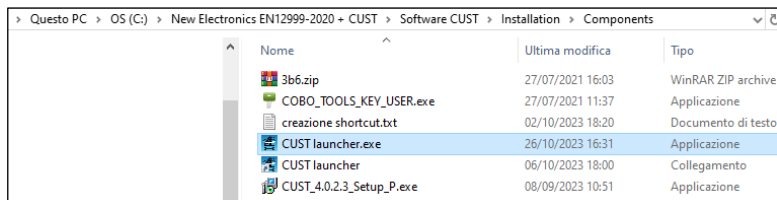
Nome	Ultima modifica	Tipo	Dimensione
CAN DONGLE CONFIGURATION.pdf	28/11/2012 09:12	Adobe Acrobat D...	400 KB
MT_API_V7.04.7800.zip	02/08/2018 13:00	WinRAR ZIP archive	19,803 KB
PcanDrv.exe	13/04/2012 16:24	Applicazione	5,082 KB
PeakOemDrv.exe	27/08/2014 14:18	Applicazione	7,561 KB
PeakOemDrv_2018.exe	02/07/2018 11:35	Applicazione	44,847 KB

3. Check that the USB Peak dongle is correctly enabled.
4. Continue resuming from A.4.

### C.1.3 INSTALLATION OF CUST LAUNCHER

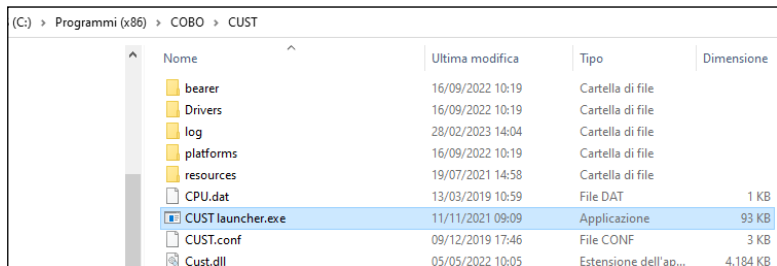
Follow this procedure:

1. Copy the "CUST launcher.exe" file located in the following package folder: "C:\New Electronics EN12999-2020 + CUST\Software CUST\Installation\Components".



Nome	Ultima modifica	Tipo
3b6.zip	27/07/2021 16:03	WinRAR ZIP archive
COBO_TOOLS_KEY_USER.exe	27/07/2021 11:37	Applicazione
creazione shortcut.txt	02/10/2023 18:20	Documento di testo
CUST launcher.exe	26/10/2023 16:31	Applicazione
CUST launcher	06/10/2023 18:00	Collegamento
CUST_4.0.2.3_Setup_P.exe	08/09/2023 10:51	Applicazione

2. Paste it on your local "C:\Programs\COBO\CUST" computer folder.

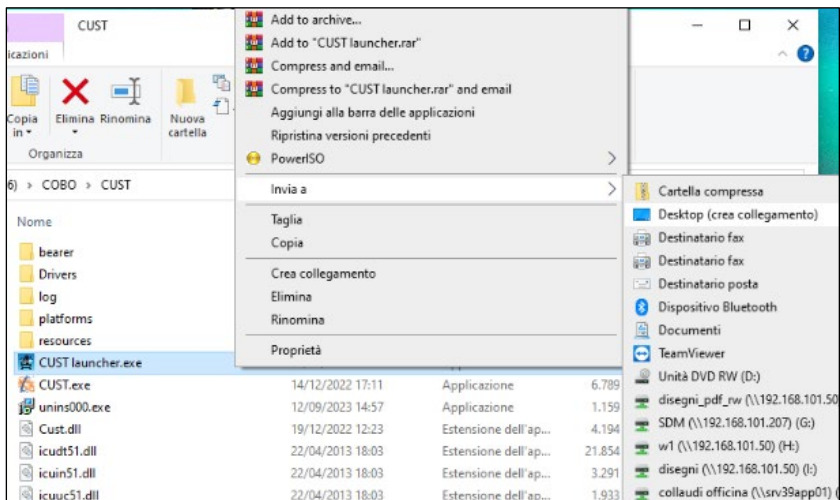


Nome	Ultima modifica	Tipo	Dimensione
beaver	16/09/2022 10:19	Cartella di file	
Drivers	16/09/2022 10:19	Cartella di file	
log	28/02/2023 14:04	Cartella di file	
platforms	16/09/2022 10:19	Cartella di file	
resources	19/07/2021 14:58	Cartella di file	
CPU.dat	13/03/2019 10:59	File DAT	1 KB
CUST launcher.exe	11/11/2021 09:09	Applicazione	93 KB
CUST.conf	09/12/2019 17:46	File CONF	3 KB
Cust.dll	05/05/2022 10:05	Estensione dell'ap...	4,184 KB

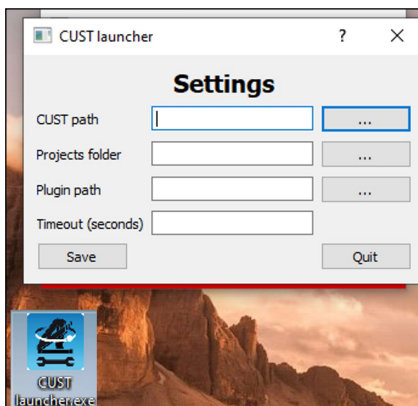
# Installer Manual

## CUST : Annexes

3. Create a shortcut on your desktop.



4. Double-click "CUST launcher.exe" icon on desktop.



5. Only the first time it is needed to link all the files.
6. Please continue resuming from paragraph A.5.

# Installer Manual

## CUST : Annexes

### C.2 LIST OF DEVICES

DEVICE NAME	DESCRIPTION	OPERATIONS PERMITTED	
		Save/Load param. file (extension)	Load sw application file (extension)
HE154(UNIT 14)	HE154 top seat controller to save/load parameter file on already programmed units	Yes (.U14)	No
LOADER_HE154_NEW_UNIT	HE154 top seat controller to program new units	No	Yes (.S19)
LOADER_HE154UPDATE	HE154 top seat controller to reprogram already programmed units	No	Yes (.S19)
MC2M_LOGIC_CPU0 (UNIT_12)	MC2M base controller CPU0	Yes (.U12)	Yes (.S19)
MC2M_LOGIC_CPU1 (UNIT_11)	MC2M base controller CPU1	Yes (.U11)	Yes (.S19)
TERA7	Top Monitor 7 display	No	Yes (.ZIP)

#### - Device -

```

first:HE154 (UNIT_14)
first:LOADER_HE154UPDATE
first:LOADER_HE154_NEW_UNIT
first:MC2M_LOGIC_CPU0 (UNIT_12)
first:MC2M_LOGIC_CPU1 (UNIT_11)
first:TERA7
    
```



# Installer Manual

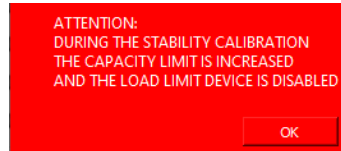
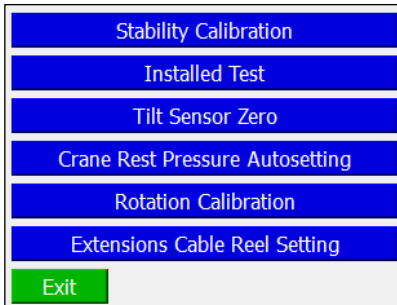
## CUST : Stability calibration

### D STABILITY CALIBRATION

The stability calibration must be performed after the crane has been installed on the trailer: the calibration allows to automatically set the tilting angle limits according to the safety regulations. Please refer to crane manual for the details.

After the CUST plug-in has been automatically selected, it is possible to access the stability calibration with the following steps:

1. Click **Calibration** in the Homepage.
2. Click **Stability Calibration**. A pup-up warns the operator that during calibration the capacity limit will be increased because the moment limiter will be disabled.



3. Click **OK** to proceed.

# Installer Manual

## CUST : Stability calibration

### D.1.1 CALIBRATION SETTINGS

During calibration, the crane speed is limited, the 1st boom and the 2nd boom inclination angles are limited as well, and the crane performance is increased by a safety factor (between 1.25 and 1.40). The page below allows to set the safety parameters.

PARAMETERS	DESCRIPTIONS
Crane Speed @0%	Speed percentage for all crane movements, with engine at 0% rpm.
Crane Speed @93%	Speed percentage for all crane movements, with engine at 93% rpm.
B1 Max Angle	Max. allowed inclination angle for 1st boom.
B2 Max Angle	Max. allowed inclination angle for 2nd boom.
P1 Max factor	Increase factor for the 1st boom cylinder pressure limit. P1 Test = P1 Nom x P1 Max factor.
P2 Max factor	Increase factor for the 2nd boom cylinder pressure limit. P2 Test = P2 Nom x P2 Max factor.

BUTTONS	DESCRIPTIONS
Exit	It exits the calibration without saving.
Save	It applies the parameters to the system.
Next	It goes to the calibration procedure.

# Installer Manual

## CUST : Stability calibration

### D.1.2 STABILITY CALIBRATION MODE

CUST shows the following window.

Please Choose the Procedure

Stability Test

Continue from last Step (0)

Single Point

FL

Exit

BUTTONS	DESCRIPTIONS
<span style="background-color: #92d050; padding: 2px 5px;">Stability Test</span>	It starts the stability calibration from beginning.
<span style="background-color: #92d050; padding: 2px 5px;">Continue from last Step (0)</span>	It restarts the stability calibration resuming from the last step calibrated.
<span style="background-color: #92d050; padding: 2px 5px;">Single Point</span>	It performs the calibration in one point (step) only (*). <div style="border: 1px solid black; background-color: #4a7ebb; color: white; padding: 2px; display: flex; flex-direction: column; gap: 2px; width: 100px;"> <span>FL</span> <span>RL</span> <span>RR</span> <span>FR</span> </div>
<span style="background-color: #92d050; padding: 2px 5px;">Exit</span>	It exits the calibration.

### D.1.3 STABILITY TEST

The complete stability test must be performed for all the 4 steps:

- FL : Front-Left
- RL : Rear-Left
- RR : Rear-Right
- FR : Front-Right

The system displays at every step a calibration page showing the involved parameters (see next page). At every step you shall follow the procedure below to obtain and set the max. allowed tilting angles (see crane manuals for detailed procedure).

1. Attach the Test Load and lift it with extensions fully retracted;
2. Rotate the booms towards the target slewing angle (Target Rot).
3. Extend the booms till instability occurs: if the crane is fully stable extend up to max. outreach.
4. Set the pressure limit (Target P1 = P1/1.2) for the tilt test by clicking Set Max Limit.
5. Retract the boom extensions till P1 = Target P1.
6. Record the max. allowed tilting angle(s) by clicking Set Tilt Limit.
7. Go to next step by clicking Next step.
8. Continue the procedure till the last step.

After the calibration procedure is completed, the system sets the ultimate tilt limits as follows:

- the limit tilting angle on the left side of trailer is the minimum value between FL and FR results.
- the limit tilting angle on the right side of trailer is the minimum value between RL and RR results.

# Installer Manual

## CUST : Stability calibration

Title

**STEP 1 (FL) - FRONT TRAILER LEFT SIDE**

Stab1 DW

Stab2 DW

Stab1 Out

Stab2 Out

P1 =

P1 Nom =

P1 Test =

Target P1 =

P2 =

P2 Nom =

P2 Test =

A1 =

A2 =

Rot =

Target Rot = 76°

Ext =

Tilt Crane =

Tilt Trailer =

Target and sensors values

- PLACE THE CRANE IN FRONT OF THE TRAILER
- ROTATE THE CRANE ON TARGET ANGLE
- PLACE STABILIZERS 100mm FROM GROUND
- IF DURING THE TEST ONE TOUCHES THE GROUND, LIFT IT 100mm
- EXTEND THE BOOM UNTIL THE INSTABILITY OCCURS
- PRESS "SET MAX LIMIT" BUTTON
- RETRACT UNTIL THE TARGET PRESSURE P1 VALUE IS REACHED
- PRESS "SET TILT LIMIT" BUTTON

Procedure

Save and Exit

Set Max Limit

Set Tilt Limit

Next step

DATA	DESCRIPTIONS
<b>Title</b>	Calibration step number (code) and position of calibration point.
<b>Target and sensors values</b>	Sensors values for pressures and angles. P1: current pressure in the 1st boom cylinder. P1 Nom: max. working pressure for the 1st boom cylinder. P1 Test: max. allowable pressure of 1st boom cyl. during test (P1 Nom x P1 Max factor). Target P1: P1 at instability or at max. outreach divided by 1.2. Tilt test pressure. P2: current pressure in the 2nd boom cylinder. P2 Nom: max. working pressure for the 2nd boom cylinder. P2 Test: max. allowable pressure of 1st boom cyl. during test (P2 Nom x P2 Max factor). A1/A2: current inclination angle of 1st/2nd boom, respectively. Rot: current slewing angle Target Rot: slewing angle to be reached before starting the calibration. Tilt Crane/Trailer: current crane and trailer tilting angle.
<b>Procedure</b>	Procedure to be performed for the current calibration step.

The descriptions of the buttons are on the next page.

# Installer Manual

## CUST : Stability calibration

BUTTONS	DESCRIPTIONS
Save and Exit	It saves the calibration step and exits the calibration procedure.
Set Max Limit	It activates (green) when Target Rot is reached. Click this button after the max. limit (instability or max. outreach) is reached, to calculate and display the Target P1 value.
Set Tilt Limit	It activates (green) when Target P1 is reached. Click this button when P1 = Target P1, to record the Max. tilting angle(s).
Next step	It activates (green) after setting the tilt limit. It goes to next calibration step.

