

Servicevision Bis S.L.

Leveling Head LH300

User's manual v1.02



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1 TECHNICAL INFORMATION

1.1 BASIC INFORMATION

The Leveling Head 300 has been redesigned to be mounted on any crane or support offering the possibility to change the head position within the range of almost 300 degrees in seconds.

The unique design with two rotation points (*one motorized and another one manual*) ensures the possibility to reach from the highest reaching points of the cranes to the lowest ones without needing to detach the remote head.

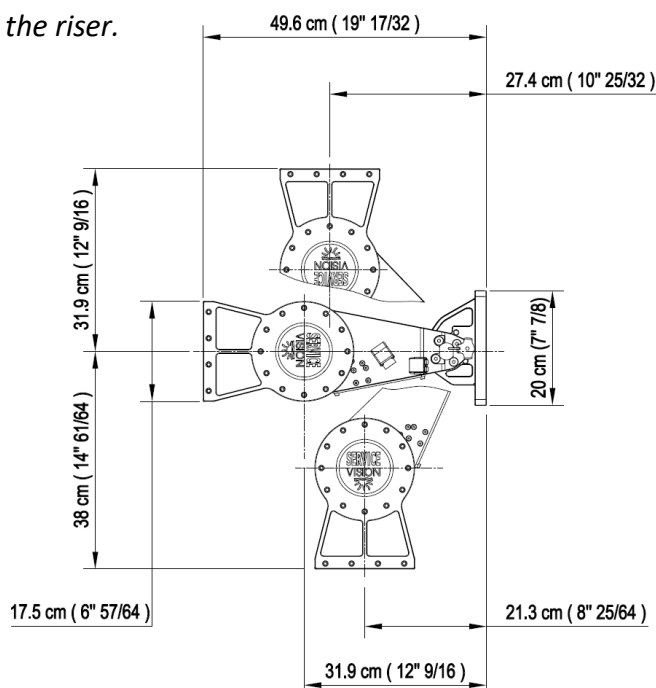
One of the main strengths is the possibility of programming counterweight points on the dynamic counterweight system depending on the position of the leveling head, ensuring a perfect balance on the crane even if the leveling head is in the nose position. This feature is only available if a Scorpio crane with a dynamic counterweight system is being used in combination with the LH300.

Full integration with the Scorpio systems allows us to combine the arc compensation feature with the movement of the leveling head: it is possible to change the leveling head position keeping the camera sensor on the same compensation plane.

The Scorpio Leveling Head LH 300 offers two different programmable limits: physical limits to ensure that the leveling head will stop respecting the arm, and position limits to ensure that the leveling head will stop at certain degrees of inclination.

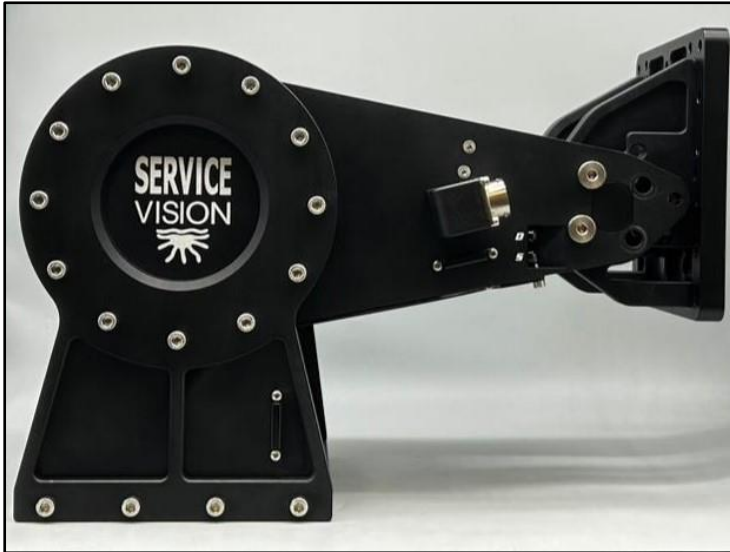
1.2 TECHNICAL INFORMATION

Power requirements:	110VAC-220VAC
Weight:	16kg. (36lbs.)
Payload capacity:	70kg. / 50kg. with the riser.
Range of movement:	300°
Max speed:	42°/sec.



2 PARTS AND COMPONENTS DESCRIPTION

The Leveling Head LH 300 comes with different accessories to use with the Scorpio Cranes or any other support:



02.01 LH 300 and rear view.



The mounting plate has a pattern that allows the Leveling Head LH 300 to fit in any Scorpio crane (from the Scorpio 10' to the Scorpio 78'). Depending on the crane, the screws to be used will be threaded on the yellow marks or pass through the orange holes in *fig.02.01b*.



02.02 Manual turning point.

It has a manual pivot axis to incline the Leveling Head LH300 where it can fit better the needs of the production. There are 4 different positions: $+35^\circ$, 0° , -20° , and -55° respect the mounting plate attached to the crane.

To change the position, remove the side screws that block the manual pivot point and the safety pin (*fig.02.02*). Move the Leveling Head LH 300 to the desired new position and use the locking pin to hold this position while mounting the side screws.



02.03 Detail of the switches.

Two switches will let the system know in which position the LH300 is in order to find the proper level.

There are two LEDs to inform about the state of the Leveling Head LH 300. These LEDs are labeled as *S* (for the servo board inside), and *D* (for the driver boards). When the equipment receives power both LEDs light in RED. Once communication between the servo board and the CCU is engaged the LED lights in green meaning everything is engaged. If the brake of the Leveling Head LH 300 is activated the *D* LED will be light in RED.



02.04 Data connector.

The main connector of the Leveling Head LH 300 is a 12pin *SORIEAU* connector that provides power, communication with the CCU, and the encoder signal from the tilt of the crane where it's mounted.

On the other side of the Leveling Head LH 300 there is a *LEMO* connector to provide the data of the inclination to the *SCORPIO AUGMENTED REALITY* system (AR).

The motorized axis has an electronic brake that cannot be released. Only when power is applied and the system has control of its position this brake disengages to allow the motor to perform.

In the [chapter MAINTENANCES](#) there is information on the required modification of the electronic box to make it compatible with the Leveling Head LH 300.

The Leveling Head LH 300 can be used without any other accessory in any Scorpio Crane bigger than the regular Scorpio 23' using a 12pin Leveling Head cable (ref. 7148 for a Scorpio 23' for example). It is recommended to ensure that the electronic box of the Scorpio Crane has already been modified to make it compatible with the Leveling Head LH 300.

It is not possible to change the position of the motorized axis of the Leveling Head LH 300 without power. The brake of the motor keeps the position of the axis to prevent unwanted movements in case of a power drop.

With the Leveling Head LH300 there are supplied different accessories to use the LH300 in different configurations. Next there is a list of the different accessories provided with the Leveling Head LH300.

2.1 LEVELING HEAD LH 300 ACCESSORIES

SCORPIO LH300 SWITCH BOX



02.05 LH not found

The Scorpio LH300 Switch Box is used in case the Leveling Head LH300 is used with the light cranes of Service Vision (*Scorpio 10', Scorpio 17' or Scorpio 23'L*).

This box has three connectors: *SORIEAU* 8pin (to connect into the electronic box of the light cranes), *SORIEAU* 12pin (to connect into the Leveling Head LH 300), and a male IEC connector to provide an AC input (110VAC-240VAC) to the Leveling Head LH 300.

When using the LH300 with the Switch Box it is necessary to get a 2m (6ft.) LH300 cable from LH300 Switch box 8 pin *SORIEAU* connector to the Electronic Box 8pin *SORIEAU* connector and a 12pin Leveling Head cable to connect the Switch box to the Leveling Head LH 300.

SCORPIO LH300 ADAPTER BOX



02.06 Adapter box

The Scorpio LH300 Adapter Box can be used with any electronic box from Service Vision's cranes that have a CCU2000 (*touchscreen display*). The purpose of this box is to allow the crane's electronic box to communicate with the Scorpio head control or with a dedicated Hand command for the Leveling Head LH 300 using the control interface connector of the Electronic Box.

It has a cable with a 6 pin XLR female to be connected into the Control Interface connector of the Electronic Box. On the other side of the Adapter box, it has three panel connectors: a four-pin male



02.07 Adapter box connectors

XLR connector (*labeled as 12V/3A DC IN*), a six-pin male XLR connector (*labeled as CONTROL INTERFACE*), and a seven-pin female XLR connector (*labeled as LH-300 HAND COMMAND*).

There is a switch on one side of the box labeled as *ADAPTER YES-NO* to select if the communication on the Control Interface connector of the electronic box links into the LH-300 Hand Command connector or if it remains in the Control Interface connector of the Adapter Box.

SCORPIO LH300 POWER BOX

The Scorpio LH300 Power Box can be used to power the Leveling Head LH300 when used in other cranes or supports.



02.08 Scorpio LH300 Power box.

It has four connectors, three LEDs and a switch on one side of the box.

The IEC connector is used to provide AC power (110VAC/220VAC) into the LH300. Once the switch is ON it will light the AC POWER LED as well as the 12VDC and 24VDC LEDs. This means that all the AC/DC converters are working.

The LH300 connector connects different length cables to the LH300 depending on the distance from the power box to the LH300. The Hand command connector links the hand command into the system using a hand command cable and the display command connector

offers the option to connect a touchscreen panel to perform additional functions that cannot be performed only with the hand command (*such as memories, resolution adjustments for the tilt resolution when used on a telescopic crane, limits...*).



02.09 Top view of the LH300 power box

There are two more connectors on the top side of the box and an SD card slot with an SD card inside. These connectors are used when the LH300 is mounted in a telescopic crane different than the Scorpio cranes. It is possible to attach the tilt encoder or the arm encoder to the Power box and link the movement of the LH300 to the tilt movement of the arm or the telescopic movement of the arm.

The SD card is used to record movements or to update the software of the CCU board inside the Power Box.

All connectors must be connected before toggling the switch to the ON position.

HAND COMMAND



02.11 Bottom view Hand Command

The hand command is used to control the movement of the LH300. On the bottom part of the Hand command there is a potentiometer to adjust the speed of the Rocker (*clockwise the speed is increased, counterclockwise the speed is reduced*) and it has 4 buttons color coded. Below there is a table with the functions of the H.C buttons:

PORTABLE DISPLAY



02.12 Portable display.

In this display the information of the system is shown, position, degrees and the additional functions enabled are shown in this display. It has its own chapter describing the functions that can be performed. It has a connector to connect with the Power box, a knob to adjust the damping of the hand command and a touchscreen to interact with the menu.

REST OF ACCESORIES



02.13 Riser for the LH300

The Leveling Head LH300 is provided with a riser to use bigger but lighter heads further from the spinning point of the LH300. By doing this, the payload is decreased by 20kg (44lbs.) but ensures that the head will be further from the crane when the crane is tilted. It can also be used to reach higher lens positions or to augment the travel distance of movement of the LH300.

To attach it to the LH300, use the three M10x25mm to extend the Mitchell mount.



02.14 Hand Command cable.

A Hand Command cable is provided as well with the Leveling Head LH300 to connect a standard Hand Command of the Scorpio Cranes.

A LH300 Cable of different lengths is provided as well with the equipment to use the LH300 with the power box or the Scorpio Cranes.

Next there is a list of all the accessories provided with the LH300.

Component	Ref.	Qty.	Description
LH300 Scorpio Leveling Head 	7146	1	Remote Leveling Head LH300
Digital Hand Command Scorpio 	7406	1	Hand command to control the LH300
Cable for hand command 20mts 	7129	1	Long cable for hand command
LH300 Switch Box 	7182	1	Box to power the leveling head LH300 with old Scorpio cranes.
LH300 Adapter Box 	7181	1	Box to make the leveling head controllable from an independent hand command when used with any Scorpio Crane.
LH300 POWER BOX 	7179	1	Power box to use the LH300 independently from the Scorpio Cranes.
Portable display 	7692	1	The Portable display allows the user to use the functions of the crane and also displays useful information for the user.

LEVELING HEAD LH300 - PARTS AND COMPONENTS DESCRIPTION

Version 1.02 January 13, 2026

Portable display cables 	7694	1	Long cable for portable display.
LH300 Cable Switch Box- Electronic Box (2m) 	7186	1	Cable from Switch Box to Electronic Box.
LH300 Riser 	xxxx	1 3	Riser to extend Mitchell mount distance DIN 912 screw M10x25mm
LH300 Main cable 	7163 7164 7165 7148 7166 7149 7150 9654	(1) (1) (1) (1) (1) (1) (1) (1)	Cable for LH300 in a <i>Scorpio</i> 10' Cable for LH300 in a <i>Scorpio</i> 17' Cable for LH300 in a <i>Scorpio</i> 23' L Cable for LH300 in a <i>Scorpio</i> 23' Cable for LH300 in a <i>Scorpio</i> 35' Cable for LH300 in a <i>Scorpio</i> 38' Cable for LH300 in a <i>Scorpio</i> 45' Cable for LH300 in a <i>Scorpio</i> 78'

3 SET UP

3.1 MECHANICAL ASSEMBLY

The Leveling head 300 has a plate slightly shorter than the traditional leveling head. The way to mount it varies depending on the model of the crane where it will be mounted.



03.01 LH300 rear plate.

If the LH300 is mounted on the S23'/S35'/S38'/S45' or S78' the mounting screws will be attached from the rear side into the LH plate (M8x35mm) using the external threads.

For the light crane series, the screws will come from the front side (M6x30mm), and the screws will be tightened into the last arm section.

The position where to mount the manual pivot point (*middle, top, middle bottom or fully bottom*) will be determined by the production: If more degrees of movement are required on over slung, mount the plate on the higher part of the attachment plate from the arm.

To modify the manual pivot point position, remove completely both sides screws next to the safety pins. With the screws out, remove the safety pin, move the pivot point to the desired position, introduce the pin again and screw the bolts completely.

With the leveling head already installed and in the desired position just connect the Leveling Head cable and work normally. Depending on the remote head to be attached the riser can be mounted into the LH300 or removed.

In both Scenarios the movement of the LH300 can be controlled by the Arm's Hand Command by pressing and holding the orange button and moving the rocker. It is also possible to move the LH300 to fix positions from the touchscreen of the Electronic Box.

3.2 CONFIGURATIONS

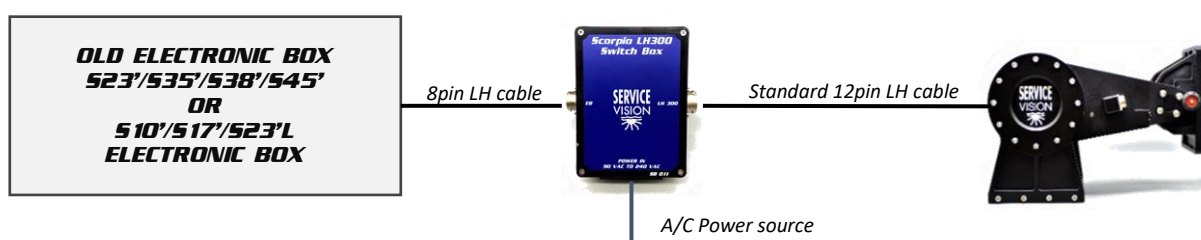
LEVELING HEAD LH300 WITH SCORPIO CRANES

There are different versions of electronic boxes for the Scorpio cranes but with the adapter box and the switch box it is possible to use the Leveling Head LH300 in any of the next possible configurations:

HOW TO POWER THE LH 300



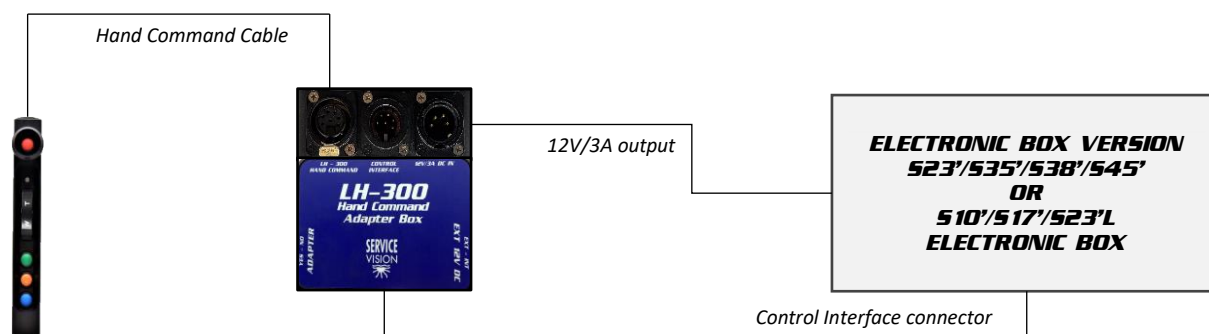
If the leveling head LH300 is used with a standard electronic box it will be powered from the electronic box just using a standard 12-pin LH cable as a regular leveling head.



In case the Scorpio crane's Electronic Box doesn't have a 12-pin output source it is still possible to power the LH300 using the Switch Box connected to an external A/C power source (110V or 220V).

HOW TO CONTROL THE LH 300

In both Scenarios the movement of the LH300 can be controlled by the Arm's Hand Command by pressing and holding the orange button and moving the rocker of the Hand Command or sending instructions from the touchscreen of the Electronic Box.



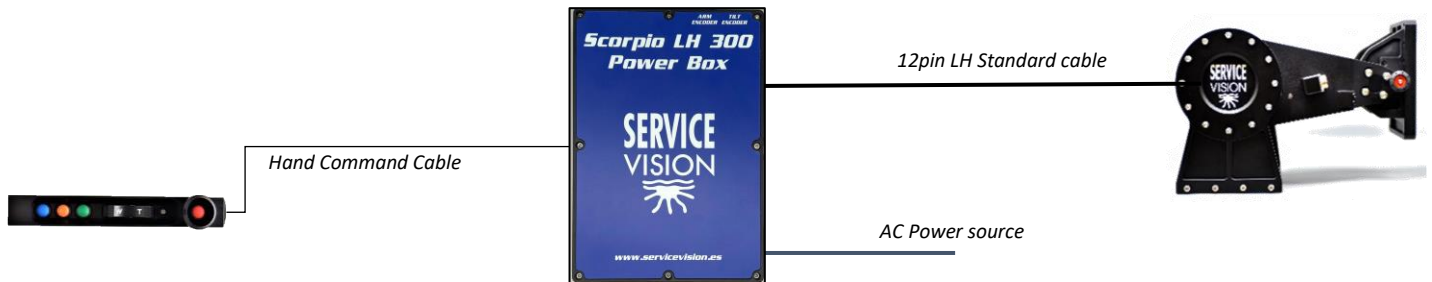
Another option is to control the LH300 with an extra hand command. To do so, the Adapter Box must be connected to the Control Interface of the Electronic Box, and a standard Hand Command cable can be connected into the adapter's box 7-pin XLR connector.

To select the communication line into the Hand command instead of the Control Interface connector from the Adapter Box, verify that the Switch position of the adapter box is in the adapter NO position.

If the electronic box does not have a 12V output from the Control Interface, an external 12V input could be connected to the adapter box (*the 12V/3A output can be used for this purpose*).

LEVELING HEAD LH300 WITHOUT SCORPIO CRANES

To use the leveling LH300 aside from the Scorpio Cranes it is necessary to use it with the Power Box.



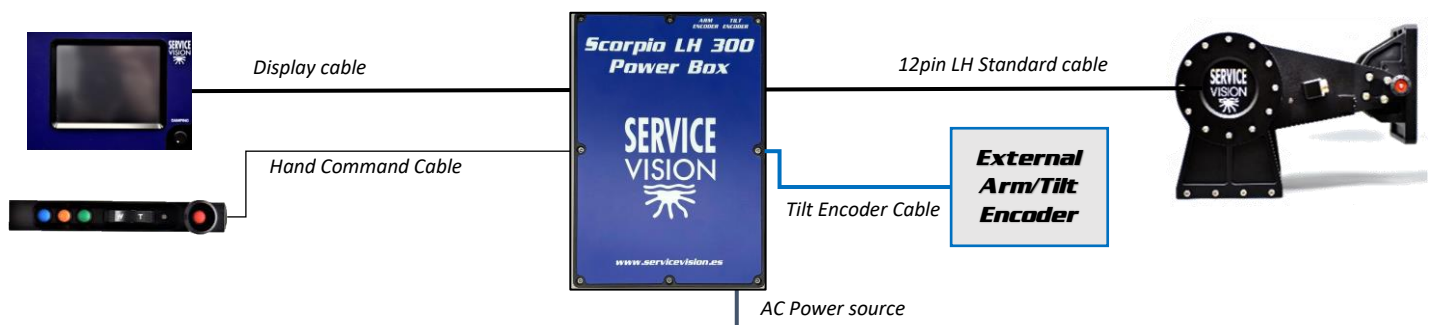
This configuration can be used when the LH300 is mounted in any support (*dollies, rigs...*). The Power Box is connected to an AC power source, a 12pin LH standard cable connects the power box to the LH300 and the hand command can be used to control the movement of the LH300.

In this configuration the Leveling Head LH300 will not search for level and will not correct any movement of the support. The functions that can be performed are described in the next chapter.



This configuration can be used with the LH300 mounted in any support (*dollies, rigs...*) as the previous one. The difference is that more functions are available thanks to the portable display.

The main difference is that in this configuration the Leveling Head will search for the initial level. The functions of the portable display are described in the next chapter.



On the previous configuration it is possible to add an encoder signal by connecting an encoder to the power box. This allows the system to correct the level as the support changes. This configuration is ideal for cranes to maintain the same level as the inclination of the crane is changing.

In the next chapter it is described how to adjust the correction according to the encoder signals.

4 LH 300 FUNCTIONS

4.1 LH300 USED WITH THE LH300 POWER BOX

With the Leveling Head LH300 it is possible to attach a second Hand Command to control the movements of the Leveling head independently. This second Hand Command has to be connected to the control interface connector of the electronic box using a *LH300 Command cable*.

The functions of the buttons are the next one:



Hand command.

<i>Functions of the H.C. buttons:</i>	Short pulse
GREEN BUTTON	<i>Go to Over slung level position</i>
ORANGE BUTTON	<i>Go to Nose mount position</i>
BLUE BUTTON	<i>Go to Underslung position</i>
RED BUTTON	<i>Activate/Deactivate the electronic brake</i>
ROCKER MOVEMENT	<i>Move the Leveling head to the desired position. *The speed is adjusted with the rear speed knob.</i>

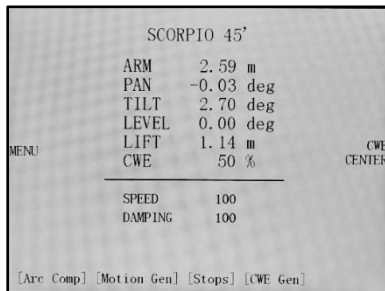
If the extra hand command is not connected, it is still possible to move the leveling head using the regular hand command. To do so, hold the **ORANGE** button on the main hand command and use the rocker to move the leveling head. The speed selected on the knob determinates the speed of the leveling head.

4.2 LH300 USED WITH POWER BOX AND PORTABLE DISPLAY

4.3 LH300 USED WITH POWER BOX AND EXTERNAL ENCODERS

4.4 DIFFERENCES WITH THE REGULAR LEVELING HEAD ON SCORPIO CRANES

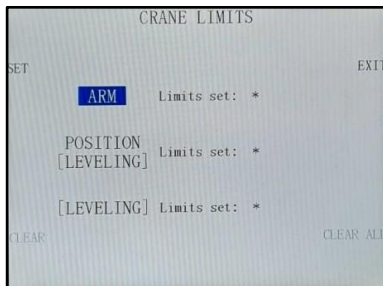
On the main screen it appears one more axis: *LEVEL*.



Main screen

The *LEVEL*'s degrees display the actual degrees of inclination of the *LH300* respect the horizontal level. This means that should be displaying zero if the *LH300* is in the underslung position (*regardless of the degrees of inclination of the arm*).

LIMITS



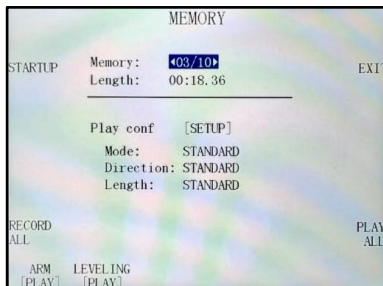
Limits screen

The limits screen has incorporated two kinds of limits: *POSITION[LEVELING]* Limits and *[LEVELING]* Limits.

The position limits are limits related to the degrees of inclination of the leveling (*regardless the position of the arm, the leveling head will stop at certain degrees and will hold this inclination degrees if the inclination of the arm changes*).

The leveling limits are physical limits on ensure that the leveling head will not pass beyond certain points respect the arm.

MEMORIES

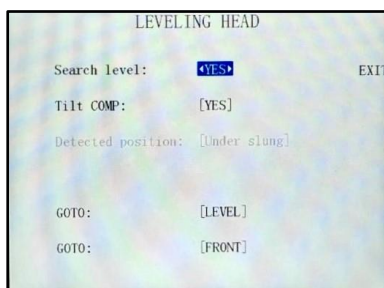


Memories screen.

On the memories menu a new axis has appeared: *LEVELING*.

The same principle as on the remote heads applicates in this menu: It is possible to record the leveling head axis independently from the arm axis. The process of recording and playing back memories is the same: select the axes to be recorded, start up, move the axis to the initial position and press start. Once the movement finishes, press stop.

LEVELING



Leveling screen.

When the *LH300* is connected, the leveling screen offers more options:

The Search level *YES* or *NO* determinates if the leveling head will find the level when the crane starts. If *NO* is selected, it will remain in the position that it had when it started.

The *Tilt COMP* determinates if the leveling head maintains the desired level degrees when the arm changes its position on the tilt axis.

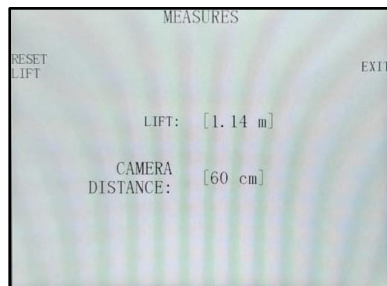
There are two *GOTO* functions: to *LEVEL* and to *FRONT*. When the corresponding button is pressed, the *LH300* will move to the desired position. If the leveling head is closer to over slung, it will

go to over slung (*if the leveling head is closer to underslung position, it will go to underslung when the LEVEL button is pressed*).

The Detected position informs the user of the detected position of the level (*over or underslung*).

LIFT / MEASURES

The lift screen has been changed to display two measurements: The lift and the camera distance.



Measures screen.

The *Lift* indicates the height of the lens. To adjust it, keep the arm at a fix height and introduce the height into the parameter. The system it will calculate the height change of the lens and it will display in the main screen.

The camera distance is to indicate to the system the distance between the camera sensor and the end of the arm (*where the leveling head is attached to the arm*). This distance has to be introduced in order to make proper calculations for the different functions of the crane (*such as arc comp*).

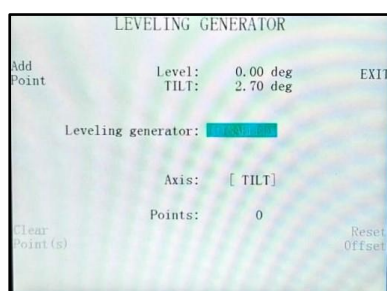
ARC COMPENSATION

Visually, on the arc compensation menu it doesn't appear any change. The difference with the regular leveling heads is that, as the *LH300* changes its position, the arm will retract and extend to keep the camera sensor always on the same plane.

To ensure that the camera position is on the same plane it is important to introduce the camera distance on the *Measures* screen (*if this distance is not properly set, the correction of the position will not be precise*).

LEVELING GENERATOR

The leveling generator works with the same principle than the motion generator but the axis to be moved will be the *LH300* instead of the telescopic arm.

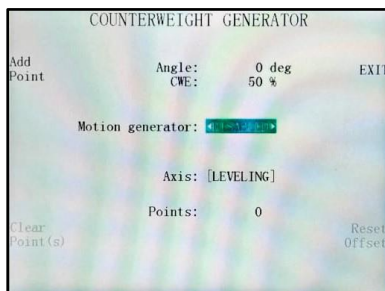


Leveling generator screen.

The points to be recorded could depend on three different axes: The extension of the arm, the degrees of pan, or the degrees of tilt.

Move the position of the desired axis to one position and adjust the *LH300s* position to the corresponding position and add that point. Move the axis to the next position and readjust the position of the *LH300*. Once all the positions have been marked, activate the generator and the leveling head will move automatically to the corresponding points.

COUNTERWEIGHT GENERATOR



Counterweight generator

The counterweight generator now can readjust the position of the counterweights motor respect the *LH300s* position.

On the counterweight generator screen, select the axis as *Leveling* instead of *Arm*. Move the leveling head to the desired position and readjust the dynamic counterweights as required to keep the arm balanced and add the respective point. Repeat the process for different positions of the leveling head.

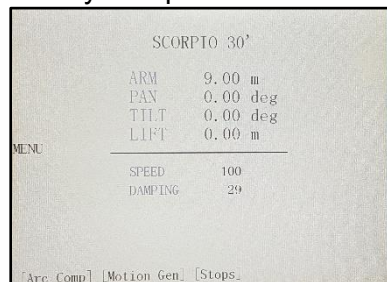
To ensure there will be enough range on the CW, balance the arm with the CW at 80% if the leveling head is over or underslung and at 20% if the leveling head is in nose position. By doing it like this the range of the dynamic counterweight system is increased.

5 MAINTENANCES

5.1 MODIFICATION ON THE ELECTRONIC BOXES

DIFFERENT ELECTRONIC VERSIONS

There are different versions of electronic boxes worldwide and, depending on the manufacturing date, there will be cranes at different update status. There are two common requirements without which the update cannot be done at the clients' locations, and the electronic box must be sent to the factory for update:



White Screen display.



Blue Screen display.

- The electronic box **must have been previously updated to a white screen display**. If the electronic box has a blue display with green buttons around it, it is necessary to send the electronic box and the hand commands to the factory for update.



Analog & Digital Hand command

- The **hand command must be digital**. This is easily recognizable because it has an LED and 4 buttons of different colors. If the hand command is not digital, it is necessary to send the electronic box and the hand commands to the factory to update them.



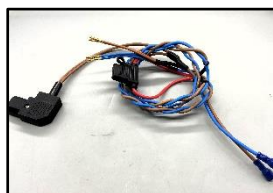
Digital Hand Command connector

- It could be that the **digital** version of the **hand command** is not the latest. This is easily identifiable by counting the pins of the connector. If there is **one pin cut on the hand command**, then both (*Electronic Box & Hand command*) have the latest digital board (*Adapter 005*). No modifications must be made regarding the digital boards.

- In case the hand command has all the pins, it is necessary to modify the electronic box and the hand commands to the latest PCB versions because the version of the electronic box's PCBs is not the latest (*Adapter 003*). It is possible to send it to the factory for update or see how to [UPDATE the ADAPTER in this event](#).

DIFFERENT MODIFICATIONS FOR THE LH300

If the electronic box has already the latest versions, it will only be necessary to make two simple modifications to the Electronic Box. To do so, Servicevision will send the next material:



Patch cord from the 90VAC Output of the coil to the driver & LH connector.

Pin extractor to replace the LH connector.

New 12pin panel connector.



Patch cord with connector from the adapter board to two different outputs (hand command connector & control interface connector).

Besides the material sent by service vision it will be necessary to have a soldering machine, heat shrink, drilling machine and a drill bit big enough to adapt the hole of the 8pin connector into the 12pin connector (25mm at least).

These cords and tools are used to provide AC power to the 12-pin panel connector for the LH and to provide 12V DC output to power a second hand command to control the LH300. The process is the same for both kinds of electronic boxes (23'/30'/30'+7'/35' and 38'/45'/78') but the connection point for the cords is slightly different.

EB 38'/45'/78'

To modify the electronic box, it is necessary to detach the pins of the Leveling head connector using the pin extractor and then unscrew the connector from the panel.

Adapt the size of the hole to the 12pin connector using the drill bit for the connector housing and the screws of it.

Connect the pins in the order displayed next and add the brown and blue cables from the cord provided by servicevision:

A VCC +28V (Red 1.5mm)

B GROUND (Black 1.5mm)

C TILT ENC B1+ OUT (Red 0.25mm)

D TILT ENC B1 - OUT (Black 0.25mm)

E 485 - (Grey 0.25mm)

F 485 + (Blue 0.25mm)

G TILT ENC A1- OUT (White 0.25mm)

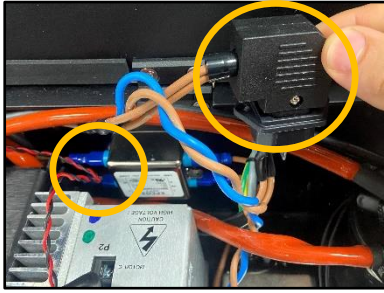
H TILT ENC A1+ OUT (Green 0.25mm)

J 90VAC (Brown 1.5mm) FROM THE CORD

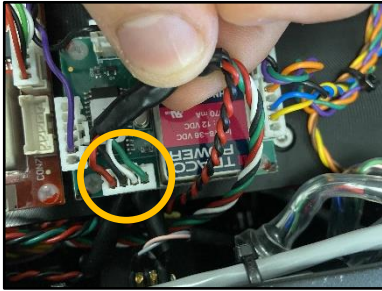
K 90VAC (Brown 1.5mm) FROM THE CORD

L 90VAC (Blue 1.5mm) FROM THE CORD

M 90VAC (Blue 1.5mm) FROM THE CORD



This connector is finished, and the other ends of the cord are connected in the driver connector (*replacing the actual IEC connector*) and into the filter after the main coil (*see picture attached*).



Next it is necessary to ensure the Control Interface connector has 12V output. To do this, servicevision sent the second cable cord. This cord provides 12Vout for both hand controls from the adapter board located inside the electronic box.

The JST pins must be connected to the adapter board as shown in the picture attached. The other ends of the cord have thermal fuses to be connected to the hand command connector and the control interface

connector as displayed next:

HAND COMMAND CONNECTOR:

- 1 VCC +5V (Red) FROM THE CORD
- 2 GND (Black) FROM THE CORD
- 3 485 N (White)
- 4 485 P (Green)
- 5
- 6
- 7

CONTROL INTERFACE CONNECTOR:

- 1 VCC +5V (Red) FROM THE CORD
- 2 GND (Black) FROM THE CORD
- 3
- 4
- 5 485 N (Grey)
- 6 485 P (Pink)

Remember to use heat shrink on the connectors to ensure there is no cross connections and protect the soldering.

Once this modification is finished, the Electronic Box is ready to be used with the LH300.

EB 23'/30'/30'+7' & 35'



To modify the Electronic Box the AC cords are slightly different because they are connected into a different point of the electronic box. It will also be sent a spacer to be mounted on the rear side of the 12pin connector.

The first thing to do is remove the pins of the 8pin LH connector using the pin extractor provided by servicevision and detach the connector.

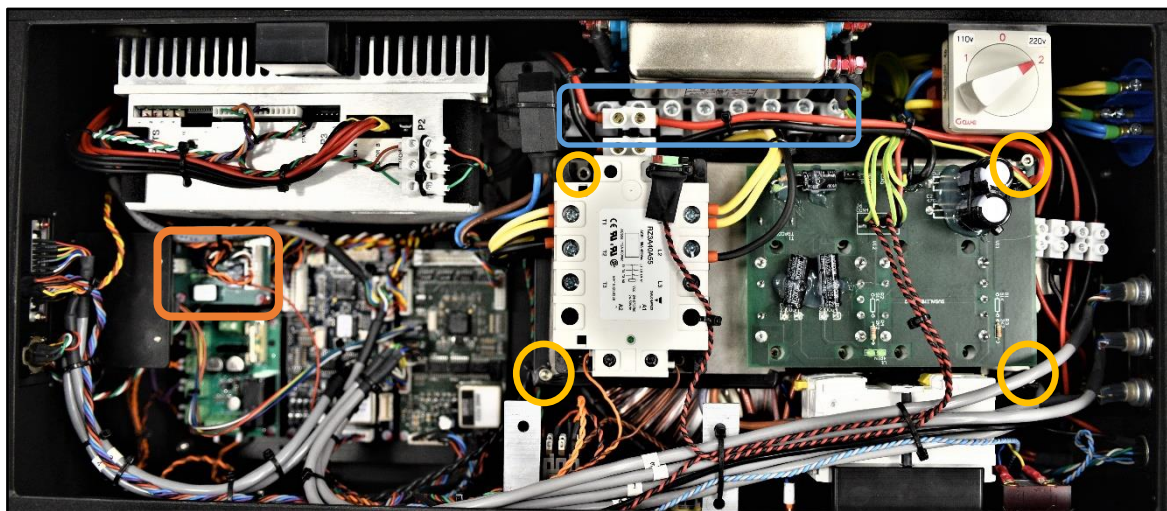


Adapt the size of the hole to the 12pin connector using the drill bit for the connector housing and the screws of it. Notice that it will be necessary to use this spacer to secure it properly as shown in the picture attached.

Connect the pins in the order displayed next and add the brown and blue cables from the cord provided by servicevision:

A VCC +28V (Red 1.5mm)
 B GROUND (Black 1.5mm)
 C TILT ENC B1 - OUT (Green 0.25mm)
 D TILT ENC B1 + OUT (Blue 0.25mm)
 E 485 - (Grey 0.25mm)
 F 485 + (Blue 0.25mm)
 G TILT ENC A1+ OUT (White 0.25mm)
 H TILT ENC A1- OUT (Brown 0.25mm)
 J 90VAC (Brown 1.5mm) FROM THE CORD
 K 90VAC (Brown 1.5mm) FROM THE CORD
 L 90VAC (Blue 1.5mm) FROM THE CORD
 M 90VAC (Blue 1.5mm) FROM THE CORD

The other end of the cord must be connected to one of the primary inputs of the main coil. To accede there, it is necessary to detach the top plate where the contactors are mounted (*by removing the screws marked in yellow*) and solder the brown and blue cables into the strip marked in blue on the picture under here.



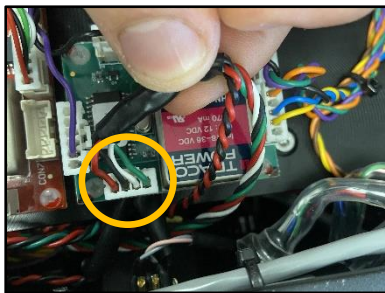
Yellow 4mm ²	ORANGE
Blue 4mm ²	BLUE
Brown 4mm ²	BROWN
Grey 4mm ²	PRUPLE
Black (20VAC) 4mm ²	RED (20VAC)
Black (20VAC) 4mm ²	RED (20VAC)
yellow 4mm ² x2	WHITE (80VAC)
Brown 2.5mm ²	WHITE (80VAC)
Blue 2.5mm ²	Yellow 4mm ² x2

The order of the strips is labelled on the picture next, it is necessary to connect the brown and blue cables from the LH300 connector into the 2 and 3 strips (*the order is not important*).

Once this modification is done it will be necessary to ensure the Control Interface connector has the 12V output for the extra hand command.

To do this, servicevision sent the second cable cord. This cord provides 12Vout for both hand controls from the adapter board located inside the electronic box.

The adapter board is under the limits board marked in orange on the picture above. To accede the board it is necessary to detach the upper board and then there will be access to the connectors.



The JST pins must be connected to the adapter board as shown in the picture attached. The other ends of the cord have thermal fuses to be connected to the hand command connector and the control interface connector as displayed next:

HAND COMMAND CONNECTOR:

- 1 VCC +5V (Red) FROM THE CORD
- 2 GND (Black) FROM THE CORD
- 3 485 N (White)
- 4 485 P (Green)
- 5
- 6
- 7

CONTROL INTERFACE CONNECTOR:

- 1 VCC +5V (Red) FROM THE CORD
- 2 GND (Black) FROM THE CORD
- 3
- 4
- 5 485 N (Grey)
- 6 485 P (Pink)

Remember to use heat shrink on the connectors to ensure there is no cross connections and protect the soldering.

Once this modification is finished, the Electronic Box is ready to be used with the LH300.