

helper7

LOADER COMPANION

LOADER SCALE



**User
Guide**



VERSION 2

VEI

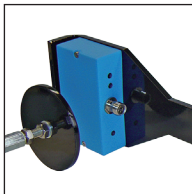
english



User Guide



helper 7 unit with integrated thermal printer.



Contactless proximity switch to display the weight.



Load sensors to read the pressure of the lifting.



ikey pocket memory and ikey reader for data transfer to a personal computer. Optional.



iPot Lite, data management software. Optional.



External Epson impact printer for printing tickets with the company logo. Optional,



21RfLink wireless data transmission device. Optional.



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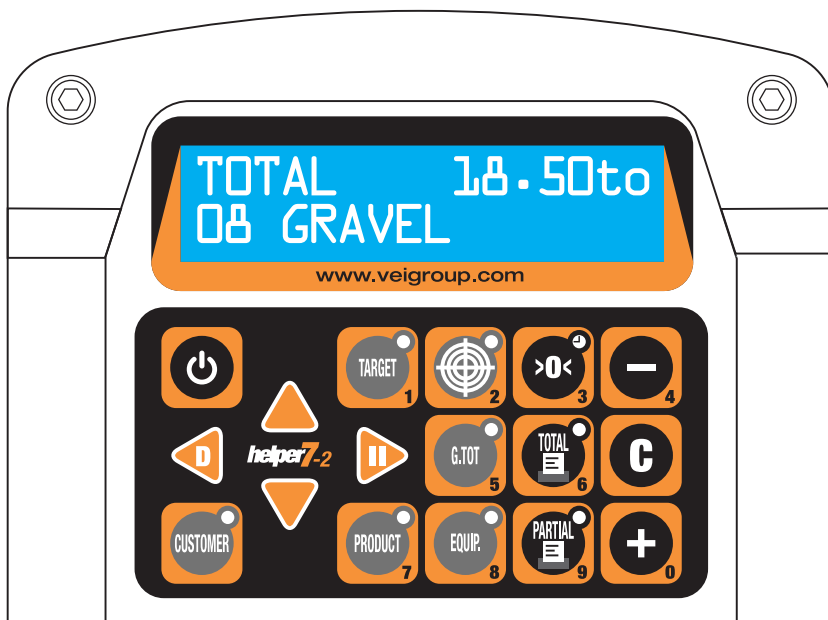


The **helper 7** weighing system, determines the weight lifted by measuring the changes in pressure in the lifting pistons; the greater the weight loaded, the greater the pressure needed to lift the weight.

To determine the weight, **helper 7** is connected to sensors that reads the pressure used to lift the weight and convert it into a weight figure

The display shows:

- a) Single lift net weight
- b) Total net weight
- c) Name of product being loaded
- d) Target net weight to load



TOTAL 18.50to
08 GRAVEL

LCD with two rows of 16 characters (2.95x4.75mm) backlit.



Switches the scale on and off.



Allows to set 0.00 with No-Load. Hold down the key for 3 seconds to perform the function. If hold down during power on, it allows to enter date and time setting.



Allows to enter the Tip off mode when the weighing zone sensor is in front its reference.

Allows to enter the Destinations Listing from where you can choose the destination of the material to load. In the name programming mode, it moves the underscore to the right on a programming line



In weighing mode it allows to put the scale in standby. In the name programming mode, it moves the underscore to the right on a programming line



It allows to scroll through the menu, select a character or name and program a weight by going up on the list or increasing.



It allows to scroll through the menu, select a character or name and program a weight by going down on the list or decreasing



When totalizing is manual it allows the memorization of the partial weight into the total. It is number "0" when programming numbers.



It allows to subtract a partial weight from the total. It is number "4" when programming numbers.



It allows to enter the target weighing mode with a pre-set weight value. It is number "1" when programming numbers.



It allows to cancel (delete) the running Total, Target and Grand Total and to delete a character or the entire name in programming mode



It allows to enter the list of product's grand totals. It is number "5" when programming numbers.





Used to print the running Total or the Grand Totals.
It is number “6” when programming numbers.



Used to print the Partial weight or the Grand Total being displayed. Beside printing it memorizes the partial weight into the total, like the “+” key does, when the totalizing is manual.
It is number “9” when programming numbers.



It allows to enter the list of products.
It is number “7” when programming numbers.



It allows to enter the list of Equipment/Attachments (bucket, forks, clamp etc.) and theirs related weighing calibration factors (gains).
It is number “8” when programming numbers.



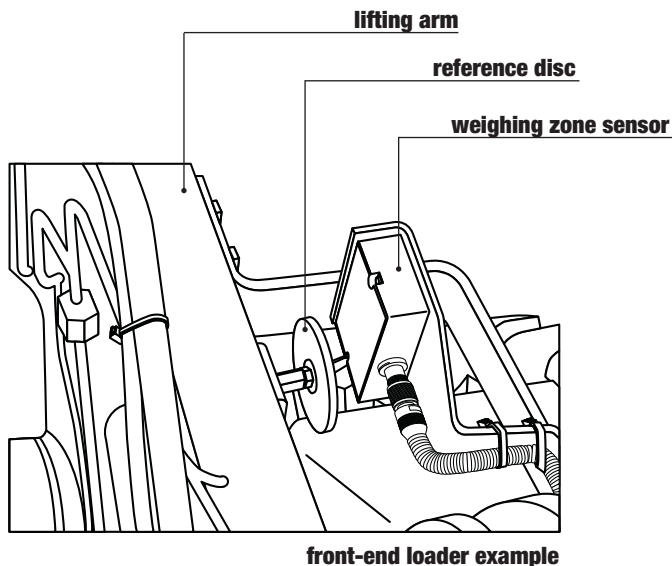
It allows to enter the list of customers.

How to weigh

helper 7 can give best results if the correct weighing procedure is observed.

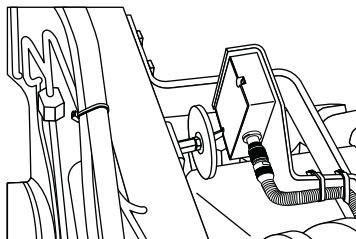
Keep in mind that the weight calculation is made when the arm reference passes in front of the weighing zone sensor during lift; it is then important to avoid abrupt movements and accelerations.

helper 7 has a weight calculation software able to control and correct pressure peaks due to the machine's movement and abrupt accelerations. Nevertheless following few procedures can avoid **helper 7** from giving a repeat message because weighing was not done properly.

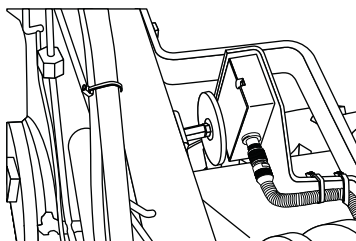


3

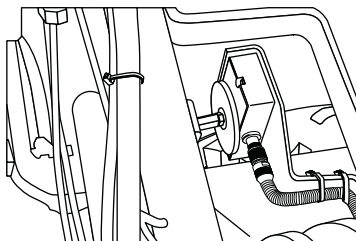
- 1 the lift starts with the reference disc at least 10 cm. (4 inches) under the weighing sensor

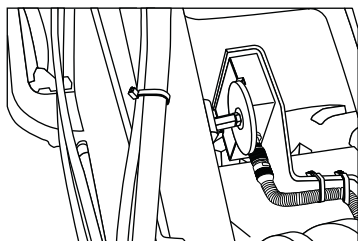


- 2 the reference disc reaches the weighing sensor and then the weighing starts



- 3 the reference disc reaches the end of the weighing sensor and then the weighing ends





- 4** the arm continues its lift toward the unloading position

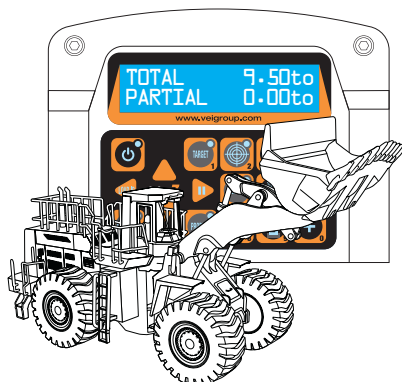
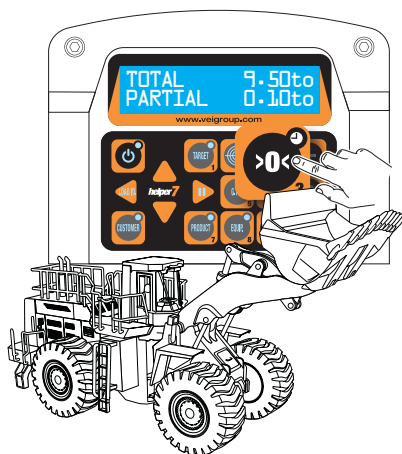
No-load Zero

The No-load Zero is important to maintain the displayed weight with empty bucket at zero. The No-load Zero can vary because:

1. the bucket is dirty
2. the machine hydraulic pressure has changed
3. the previous No-load Zero has been done with the bucket not empty

These are the operations to follow:

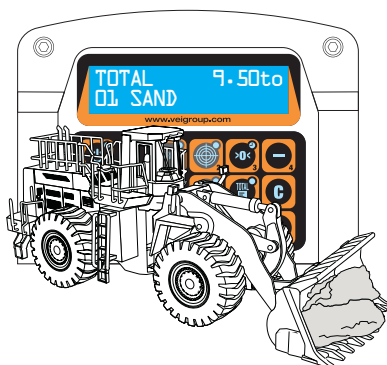
- 1 with the machine standing still fully close the bucket and lift the arm at low speed
- 2 **helper 7** will show 0.10 ton (as an example) on the Partial weight line
- 3 press  for 3 seconds with the arm raised, before the partial weight disappear, to perform the No-load Zero
- 4 the partial weight goes to 0.00, then the No-load Zero has been done and you can release your finger



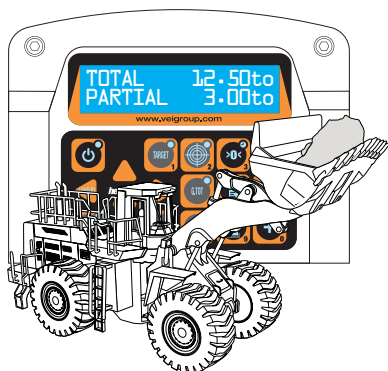
Weighing loaded

The weighing with loaded bucket can be done with the machine travelling forward or backward. Nevertheless we advise to follow this procedure which combine speed of loading and best hydraulic circuit performances.

These are the operations to follow:



- 1 load the material. In this moment **helper 7** displays still the total in progress and the product being loaded
- 2 with the bucket loaded travel backward out of the pile positioning the arm under the weighing sensor.
- 3 when convenient, start lifting the arm while travelling forward toward the unloading position. During this maneuver the weighing take place.



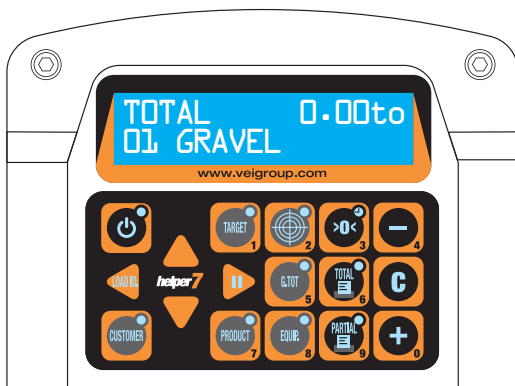
- 4 when you hear a bip sound it means that the weighing has been concluded. On the **Partial** line you will see the new weight just lifted and the **Total** line will be upgraded with it

During the weighing phase **helper 7** can display some errors due to a non suitable weighing condition; in these cases the Partial weight is not displayed and the weighing must be repeated.

W^eighing modes

helper 7 can manage 2 different weighing modes: **Incremental** and **Target**.

Either one can be used for loading trucks; Target mode can be also used to do batching, being each Target relied to a product name as identification.



►► Incremental weighing mode

The load starts from zero (0.00) and loading ends when the known target has been reached



►► Target weighing mode

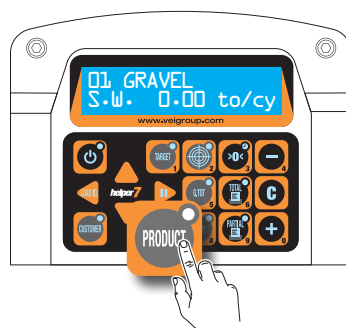
The load starts from the target and loading ends when it reaches zero (0.00)

Incremental mode

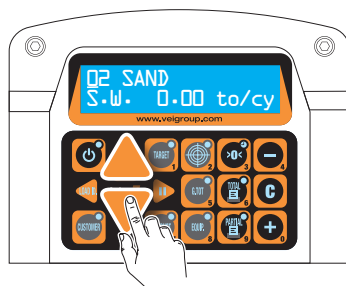
The load starts from zero (0.00) and loading ends when the known target has been reached. If the **helper 7** is in the target mode, press the **Target** key to exit and return to Incremental mode.

- 1 **select the product** to load, if the one already set is not correct, by entering the Products Listing.

There is a maximum of 80 pre-programmed product names.



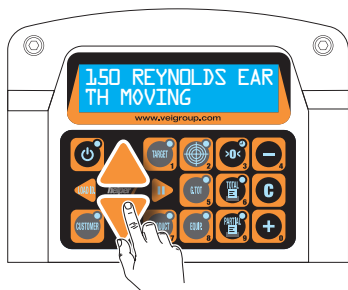
select the product you want to load.



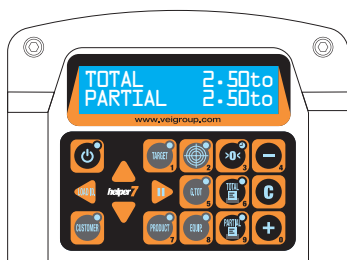
- 2 **select the customer** to load, if the one already set is not correct, by entering the Customers listing.

There is a maximum of 680 pre-programmed customer names.

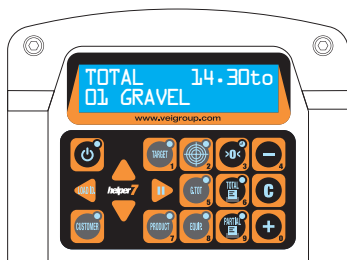




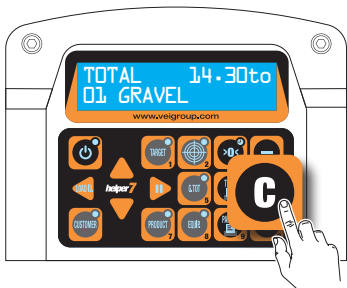
select the customer you want to load.



3 start weighing. Every **Partial** weight is added into the Total and remains on the display for 6 seconds.

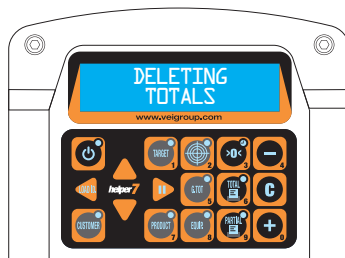


4 continue loading until the **Total** reaches the value you want.

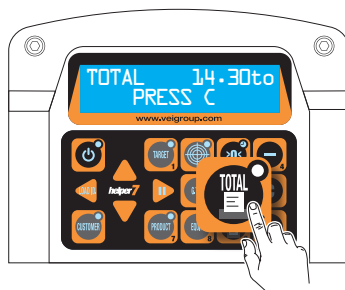


5 delete or **print** the running Total. You're now ready for an other Total.

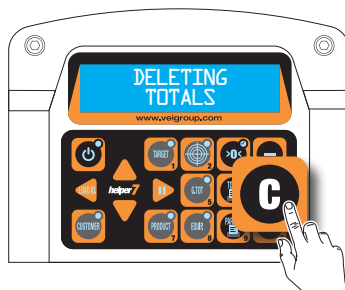
The Totals are deleted



Print the running totals.

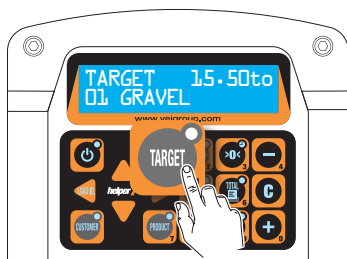


After printing the *helper 7* requires you to delete the totals. Eventually you can print other copies of the ticket before deleting the totals.



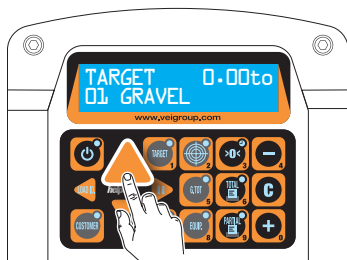
Target mode

The load starts from the target and loading ends when it reaches zero (0.00). Target mode can be also used to do batching, being each Target relied to a product name as identification; being 80 the maximum number of product, 80 is the maximum number of targets which can run simultaneously. For a fast selection, the Targets should be pre-programmed under the Targets list



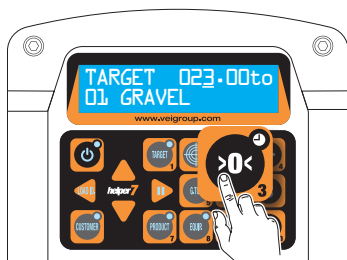
- 1 from Incremental weighing mode enter **target** with the Target key

There is a maximum of 80 targets. The display shows the Target of the product you're set with.



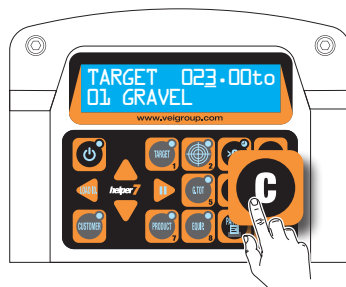
If the Target is not pre-programmed you must enter it as follows:

Enter programming



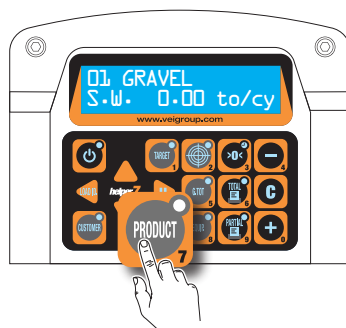
Enter Target weight using the numbers on the keypad. It is mandatory to enter all the digits, even the first one is 0, because your target weight is of 4 digits, for example.

Start back by clearing what you have entered up to the moment. Then enter programming again.

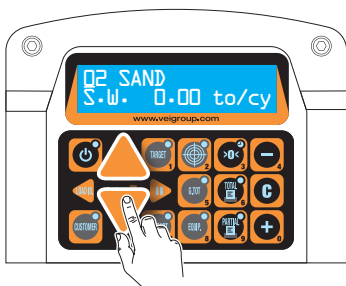


2 **Change Target** by entering the products listing

There is a maximum of 80 pre-programmed product names.

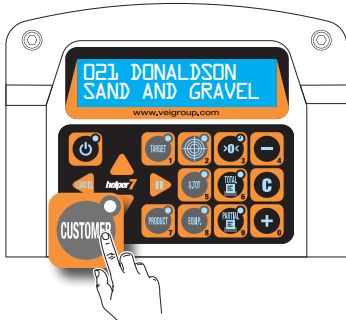


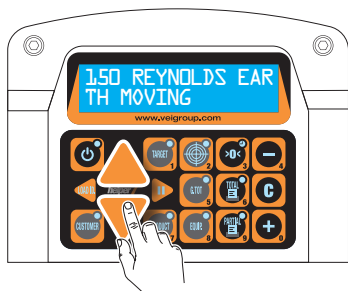
select the product you want to load.



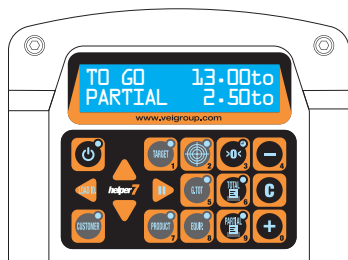
3 **select the customer** to load, if the one already set is not correct, by entering the Customers listing.

There is a maximum of 680 pre-programmed customer names.

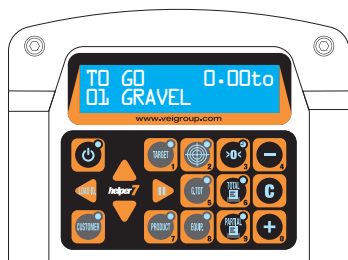




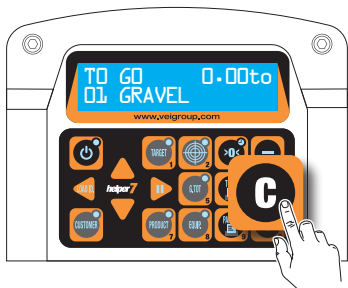
select the **customer** you want to load.



4 start weighing. Every **Partial** weight is added into the Total and remains on the display for 6 seconds.

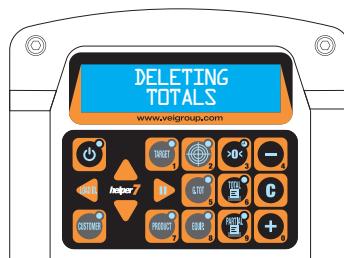


5 continue loading until the **Target** reaches 0.00. When the "TO GO" value reaches 0.05ton or below the alarm comes on to warn that the target weight has been reached. Once the arm is lowered the alarm stops to start again if the arm is raised again.

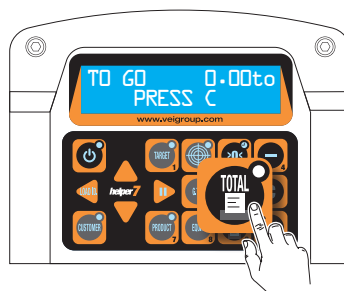


6 **delete** or **print** the running Targets. You're now ready for an other Target.

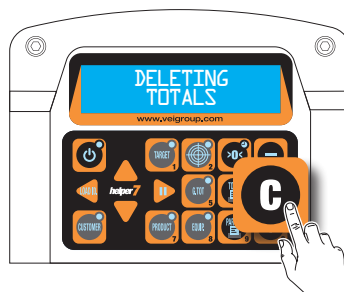
The Targets are deleted



Print the running targets.



After printing the *helper 7* requires you to delete the targets. Eventually you can print other copies of the ticket before deleting the totals.

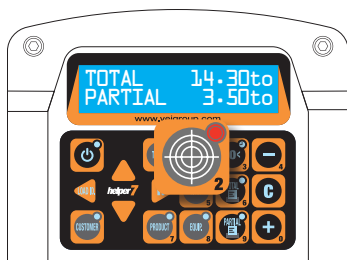


Tip off

Tip off is the feature that allow to reach the wanted load in case the last **Partial** is in excess. When using it, the weight is displayed in continuous mode while unloading into the pile; in this way you can stop the unloading when the **Total** has reached the wanted quantity or the Target weight has reached 0.00.

We recomend to perform the tip off without abrupt maneuvers during the unloading.

Use this comand following these steps:

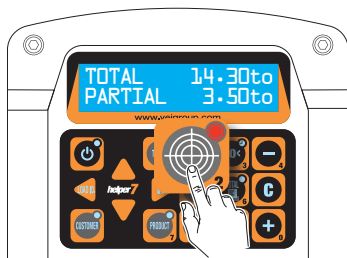


1 perform the **last partial** weighing

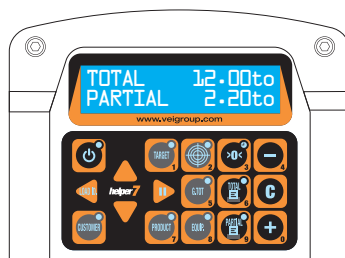
2 **lower the arm** slowly with the bucket still loaded; do not open the bucket

3 **stop the arm** when the reference is in front the weighing zone sensor (blue box). The tip off key led lights on.

4 **press the tip off key** to start tipping off the bucket. Do this on the pile

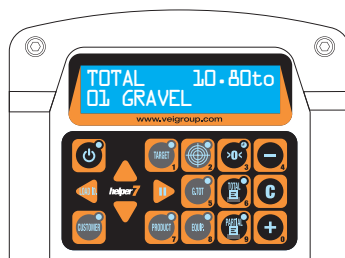


5. **open the bucket slowly** and smoothly tip off the material. The Total and Partial figure start to drop.

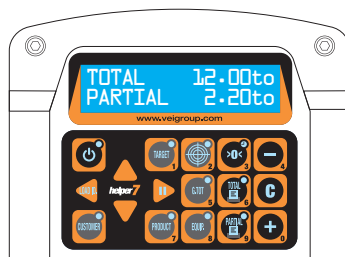


- 6 **tilt the bucket back** when you reach the total you want to

- 7 **lower the arm**, the last Partial is automatically deducted from the Total

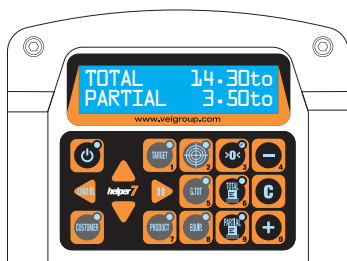


- 8 **lift up** the bucket again. The new Partial and Total weights are then upgraded on the display. You can now proceed and unload the material into the truck or container

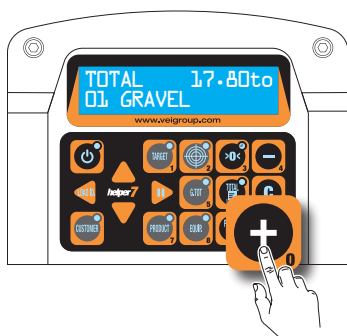


Adding a weight

Adding a weight is the operation of totalizing a weight into a Total. Most of the applications are done with this comand set as “automatic” meaning every time a load is weighed it is automatically memorized into the total. Anyhow the totalizing comand can be manual, too.



1 perform a weighing by lifting the bucket



2 press the + key to memorize the partial weight into the total

Continue loading totalising every weight into the total.

Subtracting a weight

subtracting a weight is the operation of taking the last partial weight off the Total. Depending from the totalizing setting this comand works in two different way.

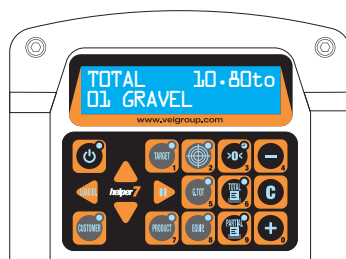
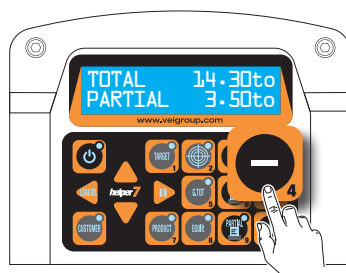
►► Automatic totalizing

When the Partial weight is automatically totalized into the Total weight the subtraction comand can be used as follows:

- before unloading** a Partial weight. For example the Total weight is too big, then you want to subtract the last Partial unload part of it and reweigh.

The key must be pressed once

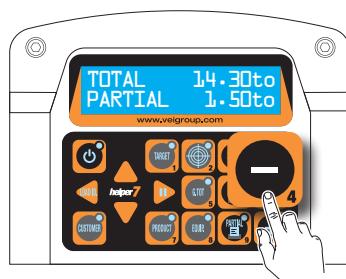
after subtraction the Total is upgraded:
 $14.30 - 3.50 = 10.80$

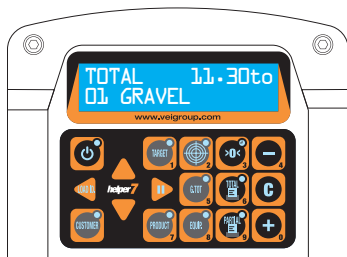


- after unloading**, part of material remains in the bucket and must be dumped on to the pile and subtracted from the Total.

The key must be pressed for 3 seconds 'till the partial is subtracted twice;

in fact the remaining material is weighed and its figure goes into the total (because of automatic totalizing), then it must be deducted because it was not unloaded. after subtraction the Total is upgraded:

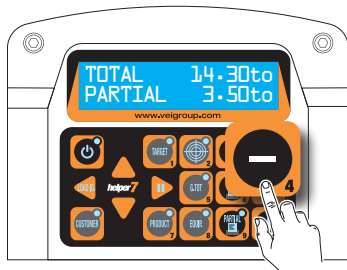




$$14.30 - 1.50 - 1.50 = 11.30$$

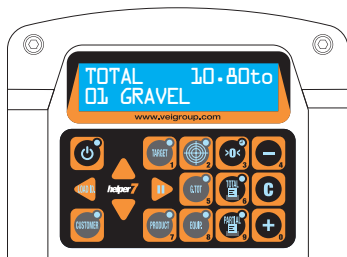
►► Manual totalizing

The subtraction command is used when the Partial weight is manually totalized into the Total weight. It can be used as follows:



- 1 **before unloading** a Partial weight. For example the Total weight is too big, then you want to subtract the last Partial unload part of it and reweigh.

The key must be pressed once



after subtraction the Total is upgraded:
 $14.30 - 3.50 = 10.80$

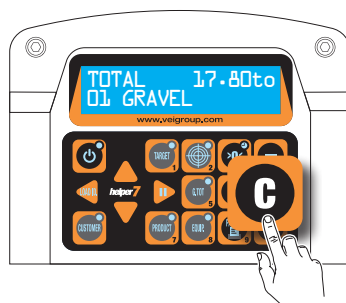
- 2 **after unloading**, some part of material remains in the bucket and must be dumped on to the pile and subtracted from the Total.

The key must be pressed once

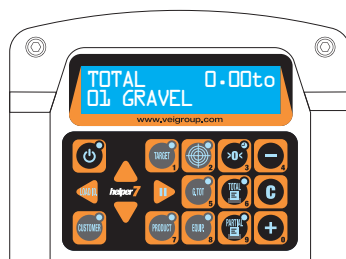
Cclearing a weight

clearing a weight is the operation of deleting a Total weight and get ready for an other one. Depending from the system data setting the Total weight so deleted goes into memory for later retrieval with the **ikkey** pocket size memory.

- 1 when the Total or Target weight is completed use this key to cancel it.

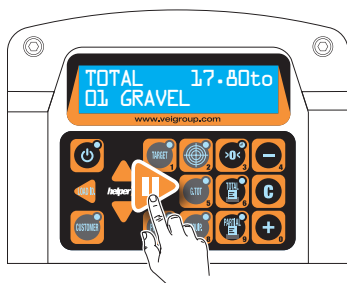


The Total goes back to 0.00 and the Target goes back to its preset weight.



Standby

the standby comand allows to set the *helper7* in a sleep mode. In fact while in standby no weighing take place.



- 1 the standby comand set the system in a **sleep mode** and display the date and time.

Changing unit of mass

depending from the system data setting as far as weight to volume and unit of mass conversions, the unit of mass can be changed while loading.

The options within System Data are as follows:

- data **06** ton (american) to lb and t (european) to lb.
- data **11** volume conversion; Cubic yards or Cubic meters.

Cubic Yards

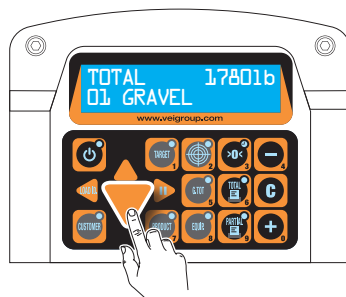
the unit of mass can be changed from ton (american ton) to lb (pounds)

Cubic Meters

the unit of mass can be changed from t (european ton) to lb (pounds)

- 1 press** the comand to change the unit of mass from “to” to “lb” and viceversa or “t” to “lb” and viceversa.

The printout will be done with the unit of mass on the display. The total saved in the Grand Total and memory will be with the unit of mass set in system data 06 which is the standard one you use and not with the temporary one.



Grand totals

helper 7 keeps in memory 80 different grand Totals, one for each product. The totals are memorized on the Grand Total every time they are deleted.

The maximum Grand total weight is:

7.969,990t (metric tons)

7969990lb (pounds)

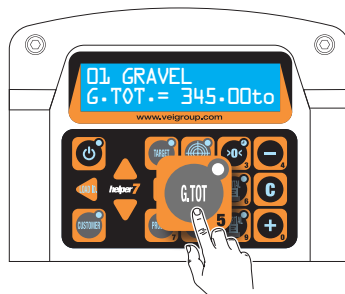
7,969.99 ton (american tons)

When one of the Grand Totals is over 80% of the maximum storing capability, **helper 7** shows the message "GT over 80%" when switched on. You can then print it out and delete it.

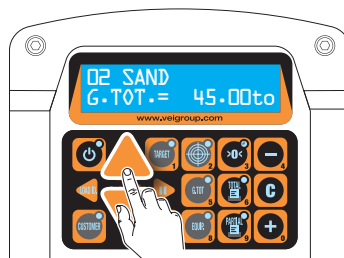
When the Grand Total reaches its maximum value it is automatically printed out and then you're obliged to clear it.

Selection

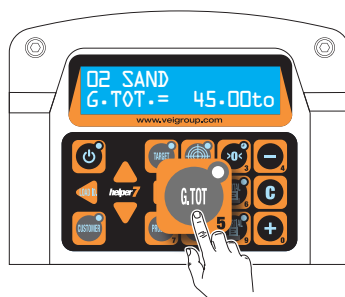
1 enter grand totals



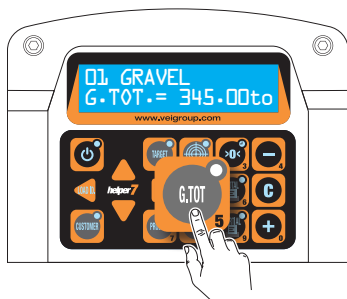
2 scroll the Grand Totals with the navigation arrows



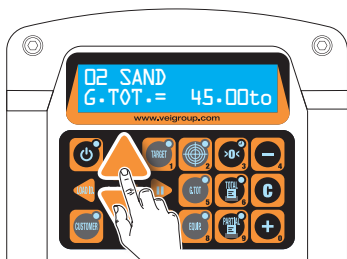
3 exit grand totals.
If no action occurs, exit is automatic after 10 seconds



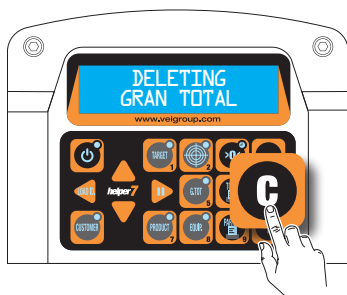
Deleting



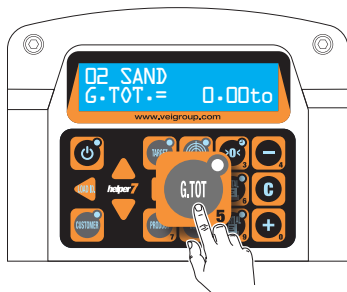
1 enter grand totals



2 scroll the Grand Totals with the navigation arrows



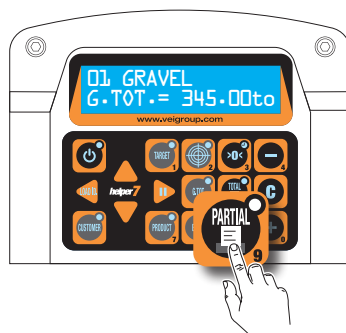
3 delete the selected Grand total



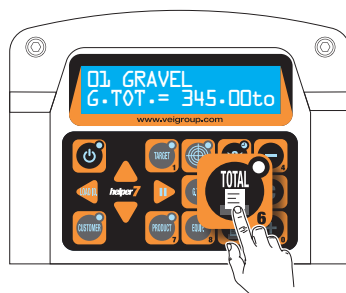
4 exit grand totals.
If no action occurs, exit is automatic after 10 seconds

Printing

- 1 **initialize printing** with the Print keys.
This key prints a single Grand Total.



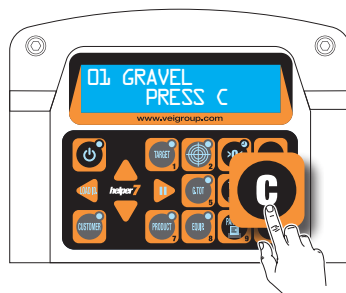
This key prints all the Grand Totals which are not 0.00ton



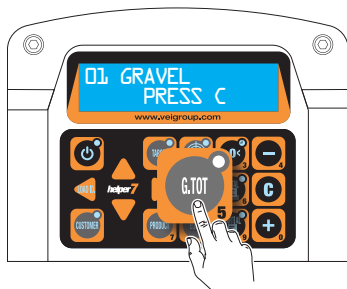
- 2 after printing **helper 7** ask to clear the grand total.

If the request is coming after single grand total printout, then this comand deletes the grand total just printed.

If, instead the request is coming after all grand totals printout, then this comand deletes all the grand totals.



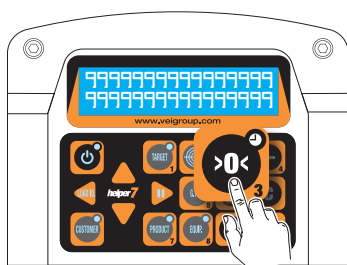
If you don't want to delete the grand totals, exit this function. If no action occurs, exit is automatic after 10 seconds.



3 **exit** grand totals. If no action occurs, exit is automatic after 10 seconds.

Date and time

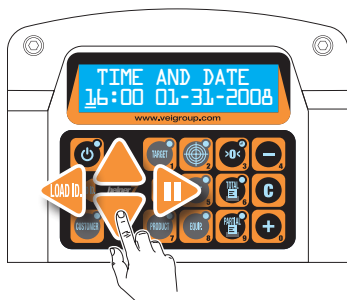
helper 7 holds in memory the date and time even when the power is off. In case of changes or time difference the date and time can be changed as wanted.



- 1 **hold down >0< key** while the **helper 7** scrolls through the numbers during switch on.

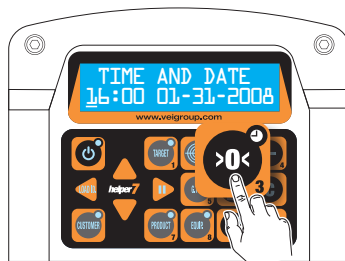


- 2 **release the key** when the **helper 7** displays "Date and Time"



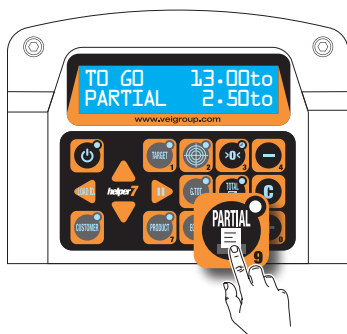
- 3 **program the date and time** using LEFT and RIGHT arrows to move the underscore under the desired parameter to program and UP and DOWN arrows to set the desired value.
First 4 numbers represent the time in hours and minutes format.
Last 6 numbers represent the date.
The date format depends upon system data set up.
In this example it is in the MM/DD/YYYY format

4 **exit** the date and time programming.

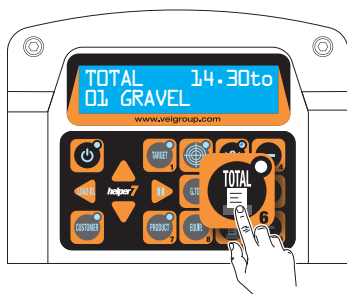


Printing

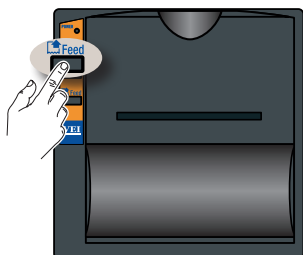
helper 7 can produce different types of printing formats depending from the activity where the print out takes place.



- 1 **press the PRINT PARTIAL key** to print partial weighings, bucket weight, or single grand totals.



- 2 **press the PRINT TOTAL key** to print truck loads, total weighing, or all the grand totals.



- 3 **press the FEED key on the printer** to feed the paper out

Printout formats

the following are the possible printouts from the **helper 7** printer

►► Incremental weighing mode.

Printout of one product total. It can be a typical truck load printout.

```

ROCKWELL QUARRY
1-800-648-8132

03-21-2011    15:33

CODE    TOTAL    C. YARDS
 6      16.65 ton    9.91

TOTAL LOADED
16.65 ton
No. of Weighings = 3

-----
PRODUCT TYPE
CODE 6 SAND
SPECIFIC WEIGHT
1.68 ton/cu. yd.
-----
CUSTOMER NAME
DONALSON SAND & GRAVEL

DESTINATION
PINE ROAD 24

MACHINE CODE
PIT LOADER 3

TICKET No.    2550
  
```

►► Incremental weighing mode.

Printout of more than one product total. It can be a truck loaded with different products

```

ROCKWELL QUARRY
1-800-648-8132

03-21-2011    15:33

CODE    TOTAL    C. YARDS
 1      6.88 ton    4.74
 2      13.76 ton    8.60

TOTAL LOADED
20.64 ton
No. of Weighings = 6

-----
PRODUCT TYPE
CODE 1 GRAVEL
SPECIFIC WEIGHT
1.45 ton/cu. yd.
-----
CODE 2 SAND
SPECIFIC WEIGHT
1.68 ton/cu. yd.
-----
CUSTOMER NAME
DONALSON SAND & GRAVEL

DESTINATION
PINE ROAD 24

MACHINE CODE
PIT LOADER 3

TICKET No.    2581
  
```

```

ROCKWELL QUARRY
1-800-648-8132

03-21-2011 15:33

CODE    TOTAL    C. YARDS
 6      16.65 ton  9.91

TARGET 1 = 17.00 ton

TOTAL LOADED
16.65 ton
No. of Weighins = 3

PRODUCT TYPE
-----
CODE 6 SAND
SPECIFIC WEIGHT
1.68 ton/cu. yd.
-----
CUSTOMER NAME
DONALSON SAND & GRAVEL

DESTINATION
PINE ROAD 24

MACHINE CODE
PIT LOADER 3

TICKET No. 2550
    
```

►► Target weighing mode.

Printout of one target load. It can be a typical truck load printout.

```

ROCKWELL QUARRY
1-800-648-8132

03-21-2011 15:33

CODE    TOTAL    C. YARDS
 1      6.88 ton  4.74
 2     13.76 ton  8.68

TARGET 1 = 7.00 ton
TARGET 2 = 14.00 ton

TOTAL LOADED
20.64 ton
No. of Weighins = 6

PRODUCT TYPE
-----
CODE 1 GRAVEL
SPECIFIC WEIGHT
1.45 ton/cu. yd.
-----
CODE 2 SAND
SPECIFIC WEIGHT
1.68 ton/cu. yd.
-----
CUSTOMER NAME
DONALSON SAND & GRAVEL

DESTINATION
PINE ROAD 24

MACHINE CODE
PIT LOADER 3

TICKET No. 2581
    
```

►► Target weighing mode.

Printout of more than one target load. It can be a truck loaded with different products

►► Grand Total printout.

Printout of all the grand totals having a weight different from zero.

ROCKWELL QUARRY		
1-800-648-8132		
03-21-2011		15:33
CODE	GRAND TOT.	C. YARDS
1	67.17 ton	46.32
2	55.31 ton	34.56
PRODUCT TYPE		
CODE	1 GRAVEL	
	SPECIFIC WEIGHT	
	1.45 ton/cu. yd.	
CODE	2 SAND	
	SPECIFIC WEIGHT	
	1.68 ton/cu. yd.	
TOTAL		
122.48.		

►► Partial weighing printout.

Print out of each bucket weighing with

the  key.

ROCKWELL QUARRY		
1-800-648-8132		
03-21-2011		15:33
CODE	PARTIAL	C. YARDS
1	3.44 ton	2.37
1	3.44 ton	2.37
2	2.78 ton	1.91
3	2.93 ton	2.02
1	3.19 ton	2.20
1	2.53 ton	1.74
1	3.27 ton	2.25

LOADS REPORT	
03-30-2011	17:15
MACHINE CODE	
MAT 972L	
DESTINATION	
STOCK PILE 7	
DONALDSON SAND & GRAVEL	
03-30-2011	09:15
LOAD :	18.73 ton
PRODUCT :	2 SAND
TICKET No.:	2500
DONALDSON SAND & GRAVEL	
03-30-2011	09:30
LOAD :	89.18 ton
PRODUCT :	1 GRAVEL
TICKET No.:	2501
DONALDSON SAND & GRAVEL	
03-30-2011	09:55
LOAD :	13.76 ton
PRODUCT :	2 SAND
TICKET No.:	2503
DONALDSON SAND & GRAVEL	
03-30-2011	10:15
LOAD :	18.18 ton
PRODUCT :	1 GRAVEL
TICKET No.:	0
DONALDSON SAND & GRAVEL	
03-30-2011	10:27
LOAD :	18.02 ton
PRODUCT :	1 GRAVEL
TICKET No.:	2504
DONALDSON SAND & GRAVEL	
03-30-2011	10:48
LOAD :	21.01 ton
PRODUCT :	2 SAND
TICKET No.:	2505
DESTINATION	
PINE RIVER 25	
BLOOMFIELD CONSTRUCTION	
03-30-2011	09:42
LOAD :	17.57 ton
PRODUCT :	2 SAND
TICKET No.:	2502
DESTINATION	
WICHITA LANDFILL	
RAMCO WASTE RECYCLING	
03-30-2011	11:20
LOAD :	24.00 ton
PRODUCT :	1 GRAVEL
TICKET No.:	2506
TOTALS BY CUSTOMER	
DONALDSON SAND & GRAVEL	
LOAD :	78.68 ton
PRODUCT :	1 GRAVEL
LOAD :	69.03 ton
PRODUCT :	2 SAND
BLOOMFIELD CONSTRUCTION	
LOAD :	17.57 ton
PRODUCT :	2 SAND
RAMCO WASTE RECYCLING	
LOAD :	24.00 ton
PRODUCT :	1 GRAVEL

►► Load Report printout.

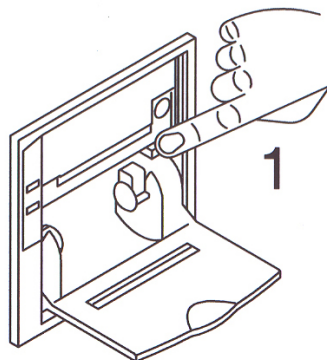
Printout of the Load Report.

It starts with each load done since last memory delete and it continues with the product totals by customer

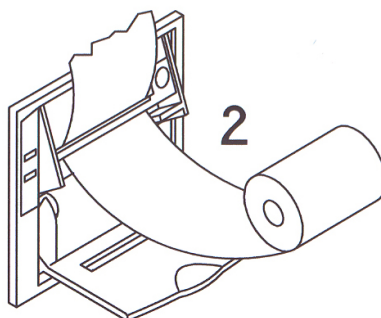
Paper roll replacement

the following shows how to replace the paper roll into the printer.

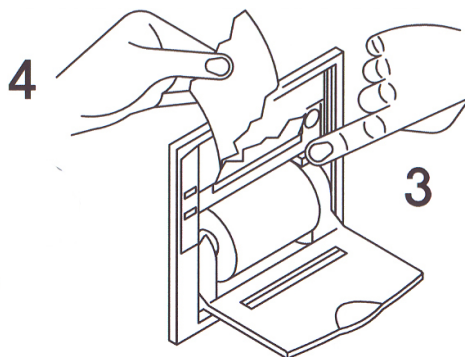
- 1 **push the button PUSH** located on the right side, opposite of VEI logo.



- 2 **lift the printing head** to make the paper insertion easy through the head.



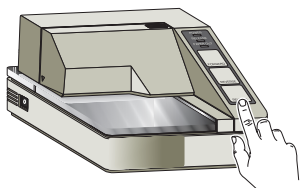
- 3 **insert the paper** and close the printing head pushing it down.



4

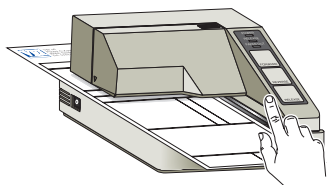
Printing

helper 7 can drive an Epson TM-295 slip printer connected to its RS232 port. It is used to have a different printout layout than the integrated printer. In fact the TM-295 prints on multiple copies and the slip of paper can be prepared with company's logo and fields where the weighing data will be printed on. Beware that on the TM-295 **helper 7** prints the truck's load or totals, only. Instead the Grand Totals and Load Report printouts are done on the integrated printer.



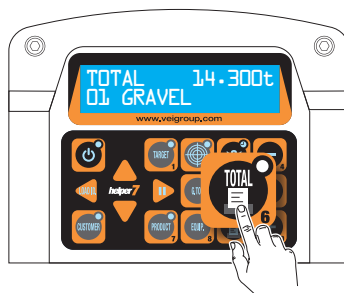
1 press the **RELEASE** key on the printer

2 feed the paper 'till the "paper out" led switch off.



3 press the **FORWARD** key to lock the paper in place.

4 press the **PRINT TOTAL** key to print truck loads



Printout format

the TM-295 paper slip must be pre-formatted as follows in order to have the weighing data printed on the right field's space.

pre-printed Company name and logo		50 (1.96")
Date 30 (1.18") 8 (0.21") Time 30 (1.18") 8 (0.21")		5 (0.19")
Customer loaded		15 (0.59")
65 (2.55") 14 (0.55")		21 (0.82")
Load ID		15 (0.59")
65 (2.55") 8 (0.21")		5 (0.19")
Weight		15 (0.59")
40 (1.57") 14 (0.55")		17 (0.67")
Material		24 (0.94")
40 (1.57") 14 (0.55")		17 (0.67")
Ticket no. 30 (1.18") 8 (0.21")		21 (0.82")
No. of weighings 30 (1.18") 8 (0.21")		
5 (0.19")		
Signature		
pre-printed Company data		

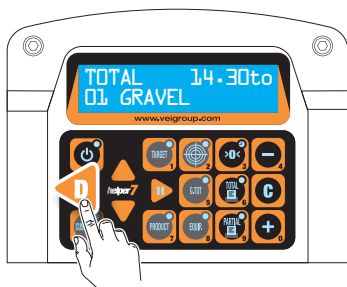
Paper specifications

the following table shows the paper specifications to take into consideration when ordering your slips of paper.

Specification	Description
Paper types	Normal, pressure-sensitive, carbon copy
Total thickness	Single-ply: 0,09 to 0,25mm (0.0035 to 0.0098") Copy paper: 0,09 to 0,35mm (0.0035 to 0.0138")
Number of copies	Original + 1 or 2 copies at 5 to 40°C
Ribbon cassette	Epson, ERC-27

Selection

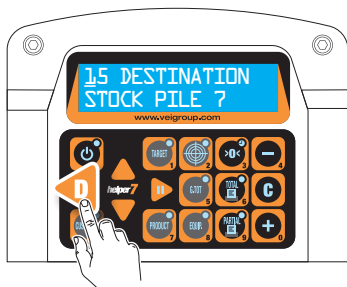
helper 7 keeps in memory 19 different destination's name. Everytime a load takes place the destination can be selected so to appear in the printout and in the wireless transmission.



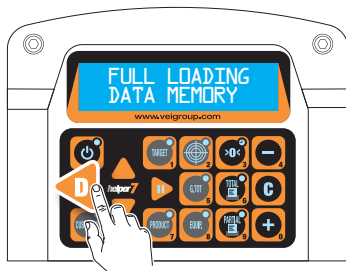
1 Enter Destinations listing



2 select the destination where the load is going to, leaving the underscore under the destination code (03 in this example).



3 exit selection, the destination will be part of your load data. Until the load weight is deleted you have time to change it again.



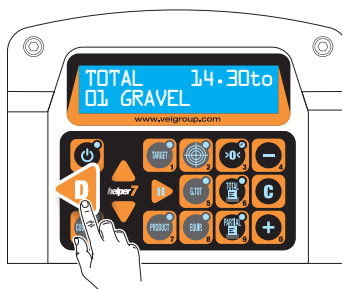
This message can appear when attempting the exit after having selected a new destination, only. It is time to save the loading data into the ikey pocket memory. **Exit** by holding down the key for 3 seconds.

Programming

the destinations can be manually entered with the keypad or imported with the ikey pocket memory during the product import procedure. Regarding the import procedure please see the Products chapter.

Be aware that the Destination programming is locked when system data d26 is disabled.

- 1 **enter Destination Listing** while in the Incremental or Target weighing mode.



- 2 **select the destination** you want to change or make a new entry.

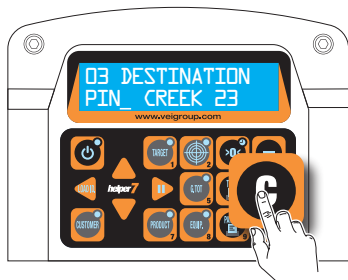


- 3 **move the underscore** on the first character of the second line; one key stroke is enough to position the underscore.





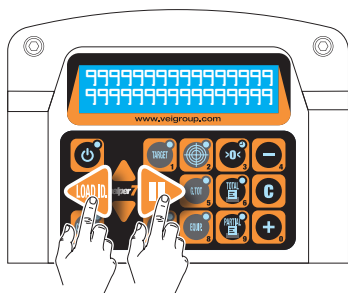
- 4** use the arrows to enter the character and to move on the following character position. You can't use the Left key to move to the previous character because it makes you to exit Destinations. Use the RIGHT arrow to go back to previous characters.



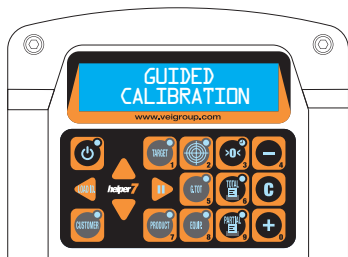
- 5** **Delete** a character with the Clear key; hold it down for 3 seconds to delete the entire destination.

Company name

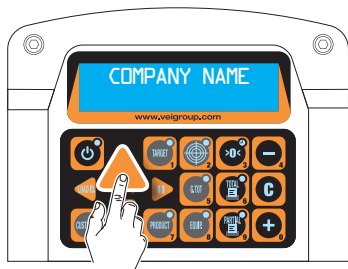
company name programming is used when the **helper 7** has the printer integrated into it. Like this the company name appears as the header of the ticket printout. Company name programming is found in the Menu



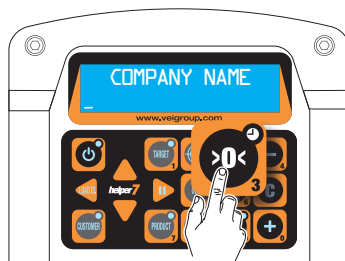
- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.



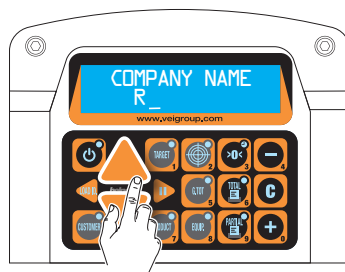
- 2 **release the keys** when the **helper 7** displays the message on the side



- 3 **scroll the menu** 'till you see the message on the side.

4 **confirm**

5 **program** the name you like using **UP** and **DOWN** arrows to program or change the character. There are 48 characters available and the printer divides them into 2 lines of 24 characters each. Because of this make sure to program the name taking into account that the 25th character is the first character of the second line; if you want to center the name then you must create spaces at the beginning and at the end of each line of 24 characters. Keep in mind that on the display you don't see each individual line but all the 48 characters together.



Example:

the name to program is

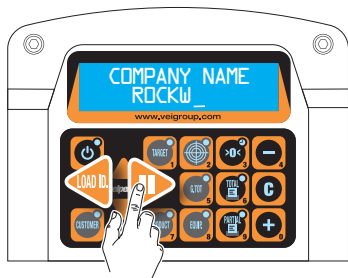
ROCKWELL QUARRY 1-800-671-7655.

The full name is 30 characters including spaces. The full name is broken into 2 lines:

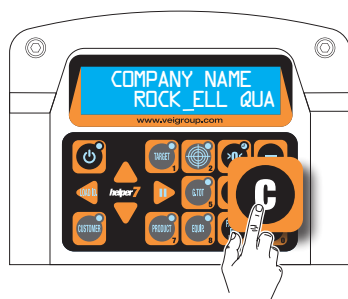
1st line is ROCKWELL QUARRY (15 characters). There are still 9 characters available which you will program as spaces, 5 at the beginning and 4 at the end of the name; in this way the name will be centered.

2nd line is 1-800-671-7655 (14 characters). There are still 10 characters available which you will program as spaces, 5 at the

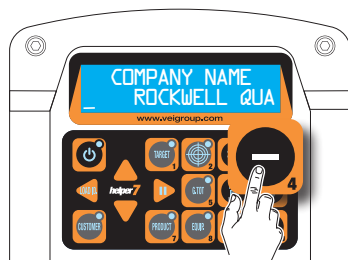
beginning and 5 at the end of the phone number; in this way the phone number will be centered.



use **LEFT** and **RIGHT** arrows to move the underscore on the character you want.

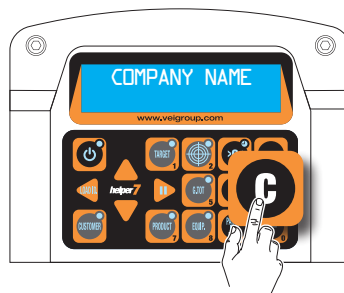


Use the **Cancel** comand to delete a character. Hold it down for 3 seconds to delete the complete name.



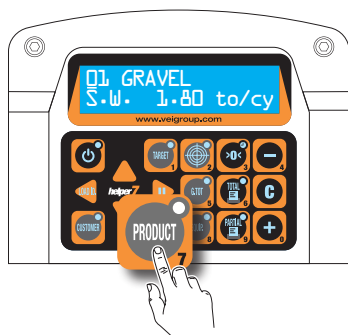
6 exit company name programming

- 7 **exit menu** if you want to go to the weighing mode

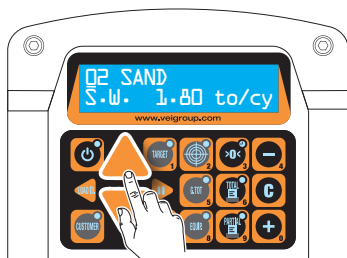


Selection

helper 7 keeps in memory 80 different product's name. Everytime a weighing takes place the product can be selected so to appear in the printout. Furthermore each product has a target connected to it; in this way blending operations can be accomplished.



1 Enter Products listing



2 select the product you want to load.

There are 2 selection methods:

Scrolling the product's code.

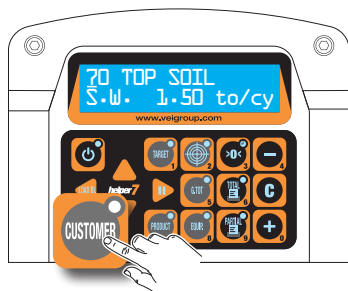
With the underscore under the code use the UP and DOWN keys to search for the name you want.



Entering the products's code.

With the underscore under the code, enter the product's code using the numbers on the keypad. In this example 7 and 0.

If you make a mistake before entering the 2nd number, use C to go back.



3 exit Products listing.

If no action occurs, exit is automatic after 10 seconds

Programming

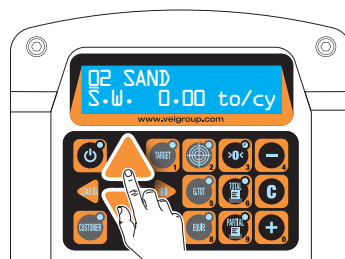
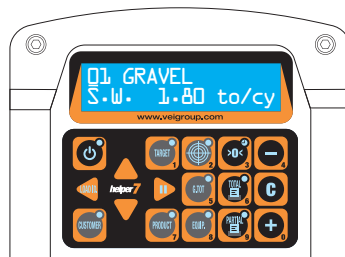
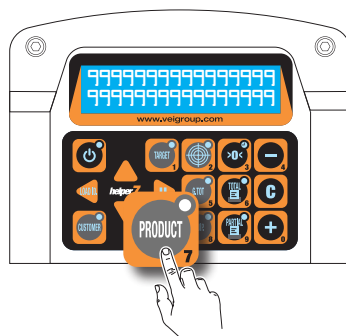
the product name must be programmed in advance in order to be selected in the Incremental or Target weighing mode. There are two ways to program the products:

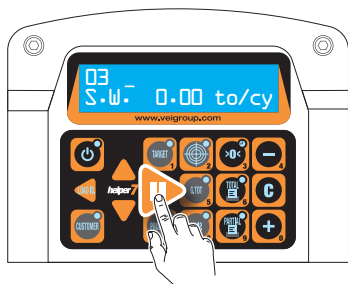
Manual Programming

Automatic Programming with the *key* pocket memory

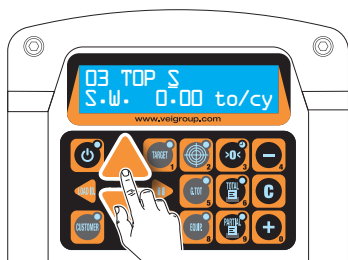
► Manual Programming

- 1** hold down **PRODUCT** key while the *helper 7* scrolls through the numbers during switch on.
- 2** release the key when the *helper 7* displays the Products listing
- 3** scroll the products list 01 through 80 with the underscore under the product number in order to select the product line to program, change or delete.

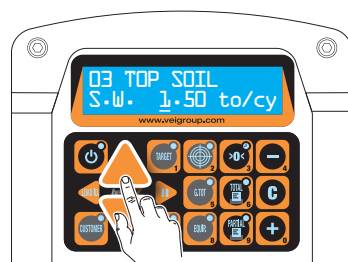




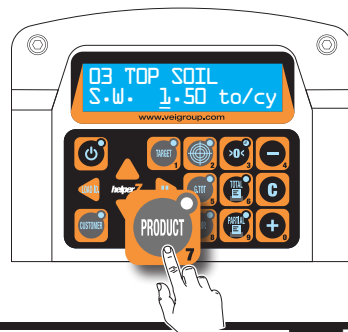
- 4 move the underscore under the first character to program, change or delete. The example shows a new product to enter.



- 5 enter the characters of the name



- 6 move the underscore under the **Specific Weight (S.W.)** value if you want to program it; in this way you will have the weight to volume conversion in the printout.



- 7 exit product programming

►► Automatic Programming

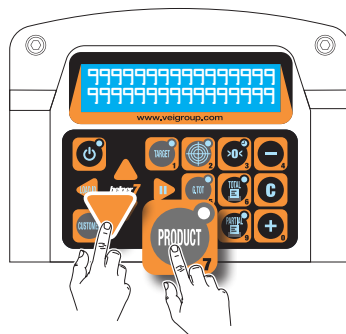
Automatic programming is possible with the ikey pocket memory; the products data must be entered in the ipot lite PC software and then saved into the ikey pocket memory. The following data can be programmed into the **helper 7** from the ikey:

Product **names**

Product **specific weights**

Product **Targets**

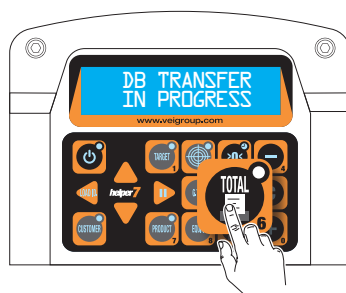
- 1** hold down **PRODUCT** and **DOWN** keys while the **helper 7** scrolls through the numbers during switch on.



- 2** release the keys when the **helper 7** displays the message shown on the side.

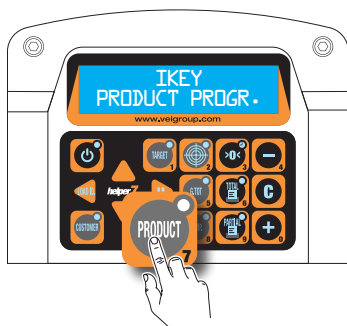


- 3** confirm programming after plugging the ikey into the **helper 7**





The products name are then programmed into the **helper 7**



4 **Exit** automatic programming

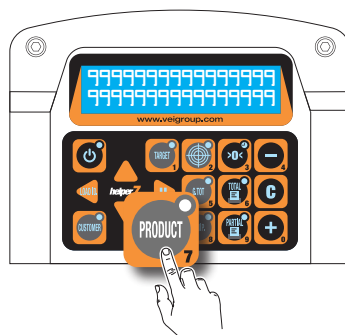
Deleting

the products name can be deleted one by one or all at once.

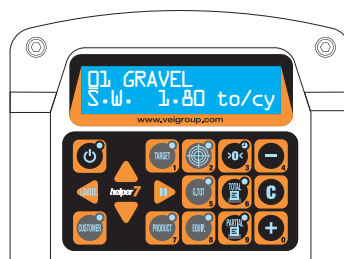
▶▶ Deleting one product

Enter Product programming

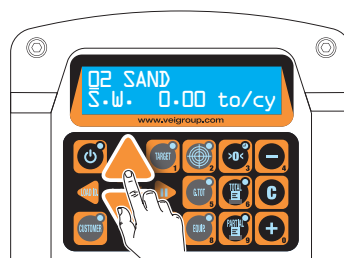
- 1 hold down PRODUCT** key while the **helper 7** scrolls through the numbers during switch on.

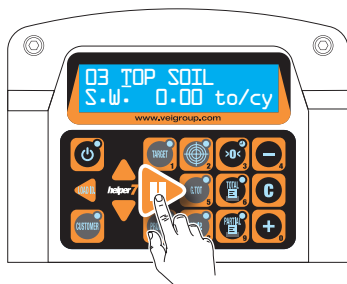


- 2 release the key** when the **helper 7** displays the Products listing

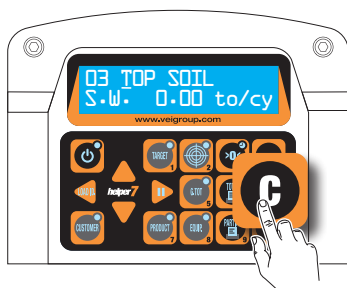


- 3 scroll the product list 01 through 80 with the underscore under the product number** in order to select the product line to program, change or delete.

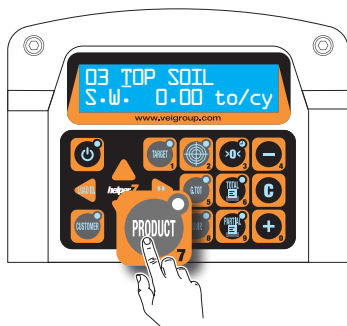




- 4** move the underscore under the first character to program, change or delete;



- 5** delete the whole name with the Cancel key held down for 3 seconds; delete the character you want to change with the Cancel key pressed once.

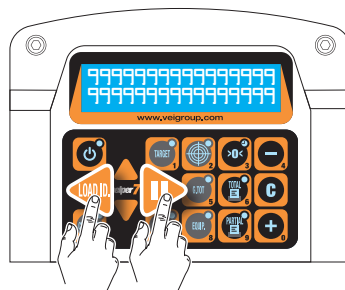


- 6** exit product programming

▶▶ Deleting all products at once

Enter Products List Delete located in the Menu

- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

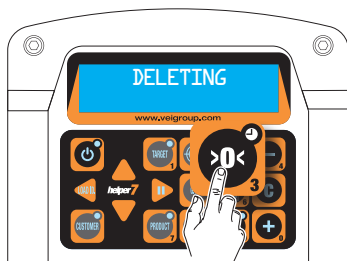


- 2 **release the keys** when the **helper 7** displays the message on the side

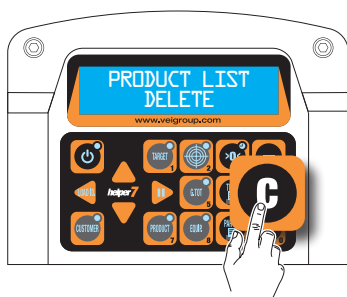


- 3 **scroll the menu** 'till you see the message on the side.





- 4 **delete** the product listing. The delete message will appear on the display.



- 5 **exit** products list delete

Selection

helper 7 keeps in memory 680 different customer's name. Everytime a weighing takes place the customer can be selected so to appear in the printout, in the memory or sent wireless.



1 Enter Customers listing



2 select the customer you want to load.

There are 3 selection methods:

Scrolling the customer's code.

With the underscore under the code use the UP and DOWN keys to search for the name you want.



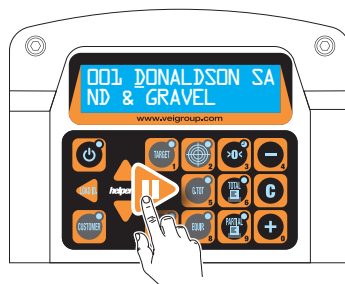
Entering the customer's code.

With the underscore under the code, enter the customer's code using the numbers on the keypad. In this example 0,0 and 3.

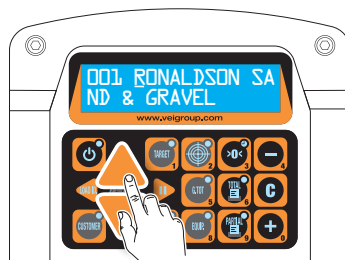
If you make a mistake before entering the 3rd number, use Cancel to go back.

Searching for the customer's name first character.

Move the underscore to the right



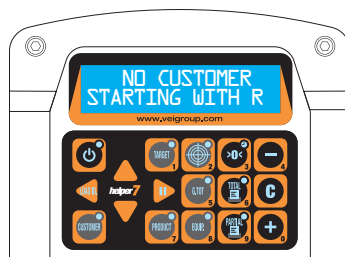
Enter the customer's name first character, "R" in our example



The first customer starting with "R" is found.



Alternatively this message appears when there is not a customer starting with the character just searched for.





- 3 **exit** customers listing.
If no action occurs, exit is automatic after 10 seconds

Programming

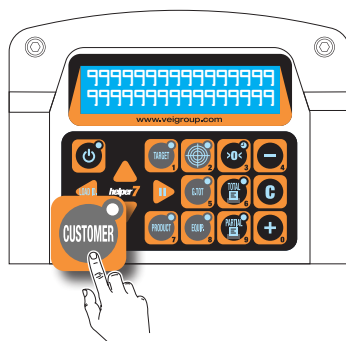
the customer name must be programed in advance in order to be selected in the Incremental or Target weighing mode. There are two ways to program the customers:

Manual Programming

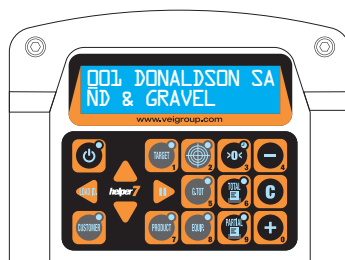
Automatic Programming with the *ikkey* pocket memory

► Manual Programming

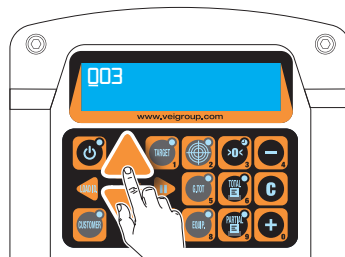
1 hold down **CUSTOMER** key while the *helper 7* scrolls through the numbers during switch on.

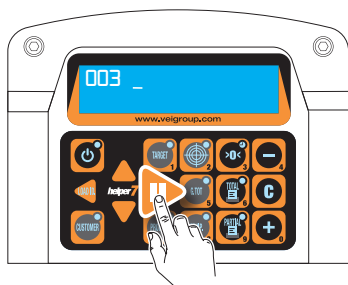


2 release the key when the *helper 7* displays the Customers listing

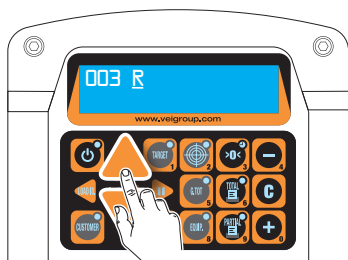


3 scroll the customers list 01 through 680 with the underscore under the customer number in order to select the customer line to program, change or delete.





- 4** move the underscore under the first character to program, change or delete. The example shows a new customer to enter.



- 5** enter the characters of the name



- 6** move the underscore under the next character and continue the name programming using the navigation arrows

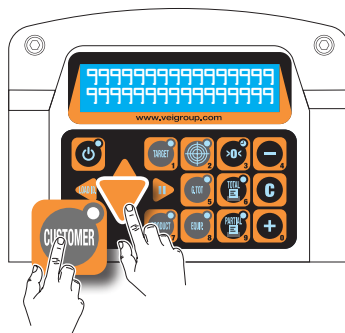


- 7** exit customer programming

►► Automatic Programming

Automatic programming is possible with the ikey pocket memory; the customers name must be entered in the ipot lite PC software and then saved into the ikey pocket memory.

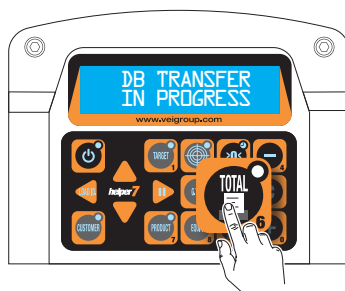
- 1** hold down **CUSTOMER** and **DOWN** keys while the **helper 7** scrolls through the numbers during switch on.



- 2** release the keys when the **helper 7** displays the message shown on the side.



- 3** confirm programming after plugging the ikey into the **helper 7**





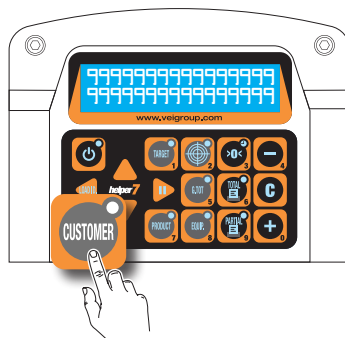
The customers name are then programmed into the **helper 7**



4 **Exit** automatic programming

►► Deleting one customer

1 hold down **CUSTOMER** key while the *helper 7* scrolls through the numbers during switch on.





- 4 **move the underscore under the first name's character** or any of them .



- 5 **delete the whole name** with the Cancel key held down for 3 seconds; delete the character you want to change with the Cancel key pressed once.

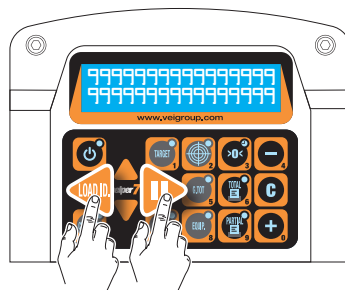


- 6 **exit customer programming**

▶▶ Deleting all customers at once

Enter Customers List Delete located in the menu.

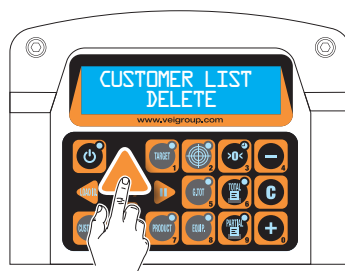
- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

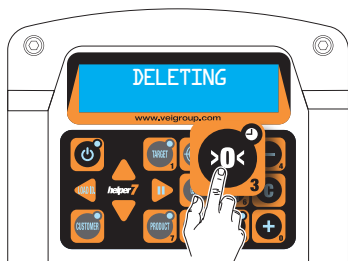


- 2 **release the keys** when the **helper 7** displays the message on the side



- 3 **scroll the menu** 'till you see the message on the side.





- 4 **delete** the customer listing. The delete message will appear on the display.



- 5 **exit** customers list delete

Loading data

helper 7 can transfer the weighing data from its internal memory to the **ikey** which is a pocket size memory. In this way relevant weighing data can be transferred to a remote PC for later analysis, using **ipot lite** software.

To use the **ikey** Loading Data saving feature, the **helper 7** system data 10 must be set as YES.

Beware that the system data should be set YES even you don't use the ikey but the RF or Track-weight data transfer. In this way if a transmission error occurs it is saved into the internal memory and sent on the following data transmissiion retry. If the transmission problem remains, the data in memory can be saved into the ikey.

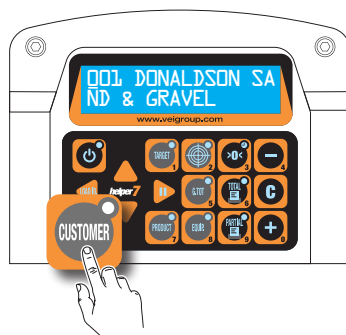
Loading data can be SAVED, DELETED and PRINTED.

Loading data saving

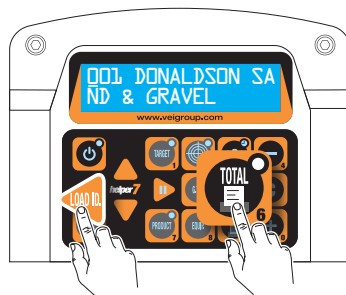
Loading data are saved into the **ikey** in order to be imported on the **ipot lite**, PC based **ikey** reading software.

1 plug in the **ikey** into the **helper 7** front port

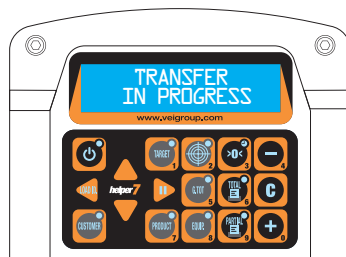
2 enter Customers listing



3 initiate the loading data saving.
Hold down LOAD ID first, then TOTAL

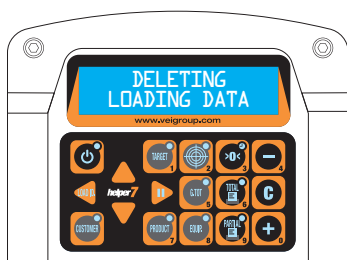


4 transfer is in progress





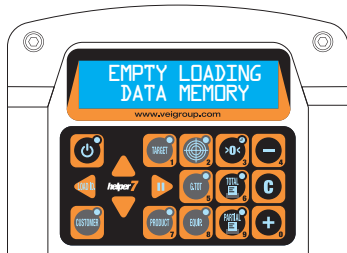
5 transfer is completed



6 loading data delete takes place automatically. **helper 7** internal memory is now empty.



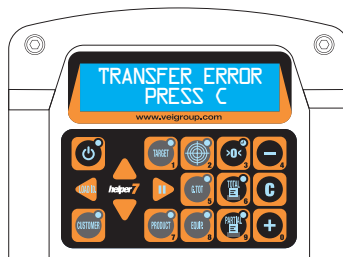
7 Exit Loading data saving
If no action occurs, exit is automatic after 10 seconds



The following errors can appear when using the **ikey**.

When attempting to save data into the **ikey** and **helper 7** memory is empty.

During data transfer this error can appear because the **helper 7** internal memory is corrupted or the **ikey** is broken. Press C and try again. If the same error appears change the **ikey**.



L oading data deleting

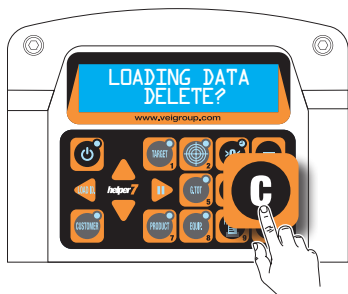
the **helper 7** loading data can be deleted from the internal memory following this simple procedure.

1 enter Customers listing

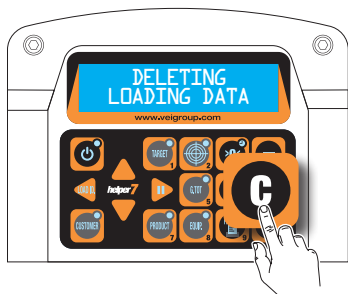


2 hold down the Cancel key for 2 seconds and do not release it. **helper 7** prompts if you really want to delete the loading data.

If you don't want to proceed release the Cancel key



3 keep holding down the Cancel key for an other 2 seconds 'till the deleting confirmation message appears on the display. Then you can release the cancel key.



- 4 exit** Customers listing
If no action occurs, exit is automatic after 10 seconds

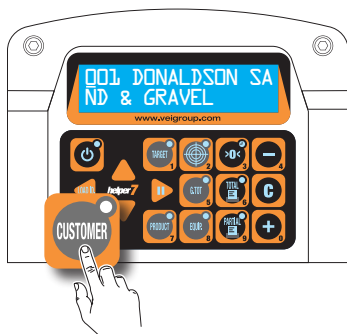


L

oading data printing

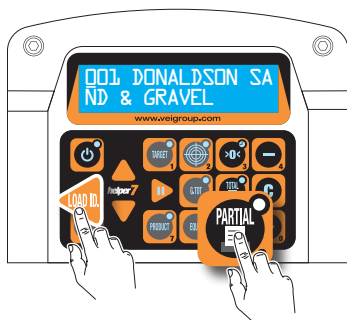
the **helper 7** loading data can be printed following this simple procedure.

1 enter Customers listing



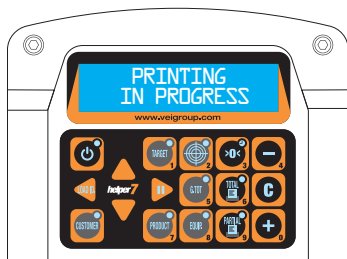
2 initiate the loading data printing.

Hold down LOAD ID first, then PARTIAL



3 printing is in progress.

The printout has each single truck load in sequence and a resume of each product's total delivered per customer



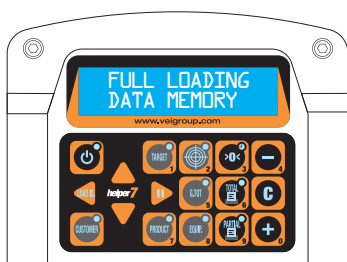
- 4 Exit** Loading data saving
If no action occurs, exit is automatic after 10 seconds



Loading data full memory

the **helper 7** loading data memory has a capacity of 996 records.

We advise to save data into the ikey at the end of every working day. This will allow to be on the safe side and use data for what they are intended to be.



Anyhow if the memory is left to be filled, when data reaches the record #950 and until it get full with 996 records, the **helper 7** will display the message “Full loading data memory” for 3 seconds every time you clear a total with the “C” key, advising then the data saving into the ikey.

Once the number of records in memory reaches 996, the same message remains on the display. You have the following choices:

- 1 **enter Customers listing** and save the loading data into the ikey, see Loading data saving.
- 2 **enter Customers listing** and delete the loading data, see Loading data deleting.
- 3 **Press C for 3 seconds** the message is deleted, the total is deleted without being saved into memroy. You can continue loading the following truck but be aware that from now on data will not be saved into memory and the same message will be prompt every time you try to delete a total.

Wireless communication

helper 7 can transfer the weighing data wireless to a remote location through its serial port (RS232).

The software protocols available are:

RF TOTAL

RF PARTIAL

MODULAR

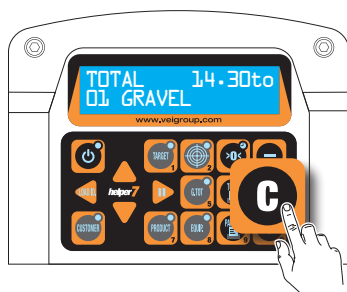
See system data 14 to set the one you want to work with.

►► RF TOTAL protocol description

This protocol sends the Total or truck weight everytime it is deleted from the **helper 7**.

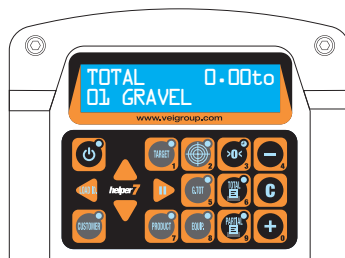
The RF Total protocol comprehends the following weighing data:

- Machine code
- Customer code
- Destination
- Printout ticket number
- Date and Time end of loading
- Product code
- Weight
- Number of weighings (buckets)

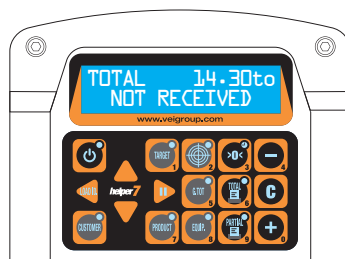


- 1 **Delete** the total to initiate the Truck total wireless transmission

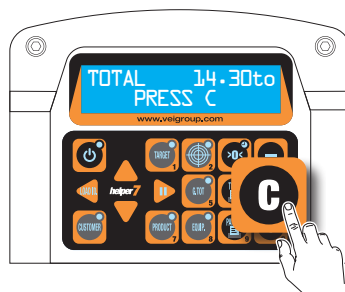
If the Transmission goes well the Total is deleted and the **helper 7** is ready for an other truck load.



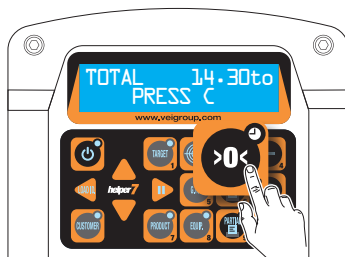
If the transmission does not go well, the **helper 7** displays the message for a few seconds.

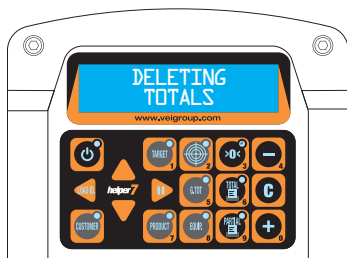


The transmission must be tried again

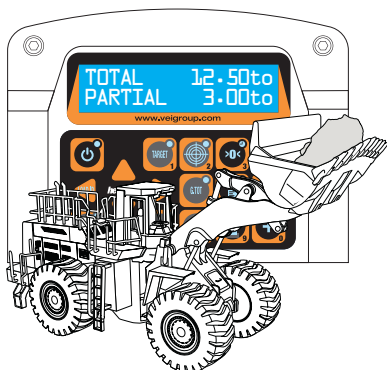


If the transmission persist having problems, you must interrupt it and delete the total. The truck load will be saved in memory and available to be recorded in the ikey pocket memory





total delete confirmation



►► RF PARTIAL protocol description

This protocol sends each partial weight or bucket weight everytime it is displayed.

The RF Partial protocol comprehends the following weighing data:

- Machine code
- Customer code
- Destination
- Date and Time
- Product code
- Weight

►► MODULAR protocol description

This protocol has full compatibility with Modular Mining protocol; therefore the **Helper 7** can be connected with Modular Mining dispatch systems in which VEI interface is already developed.

The protocol comprehends 2 weighing data:

VEI DIPPER which is the bucket weight

VEI-TONS which is the total

1. VEI-DIPPER

This data is the bucket load weight loaded into the truck or somewhere else. It is sent automatically every a partial is displayed

VEI-DIPPER' "weight"

example: VEI-DIPPER 000025

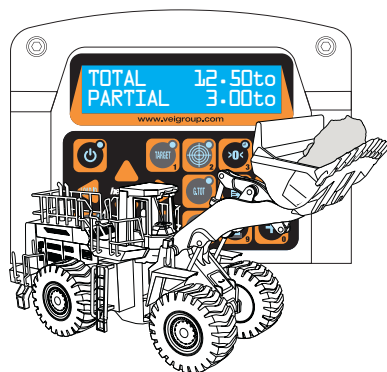
in this case the bucket load weight is 2.50ton

Between VEI-DIPPER and weight there is a space.

The message ends with two characters:

0x0D (CR)

0x0A (LF)



2. VEI-TONS

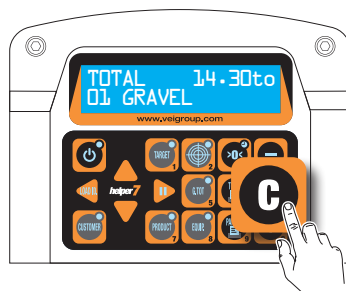
This message is the total load weight. It is sent when the total is deleted.

VEI-TONS' "weight"

example: VEI-TONS 000210

in this case the load weight is 21.00ton

Between VEI-TONS and weight there is a space.



The message ends with two characters:

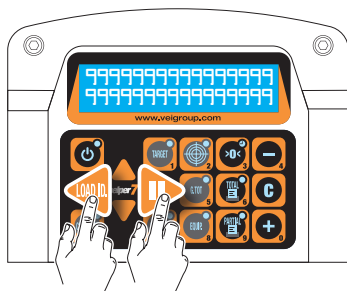
0x0D (CR)

0x0A (LF)

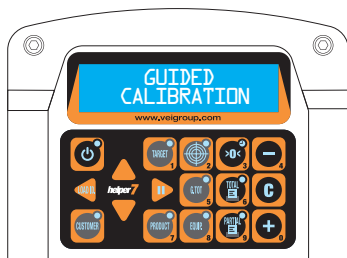
Within this protocol there are no controls and errors on data message reception ok or not ok by the host device.

Calibration with a correct weight

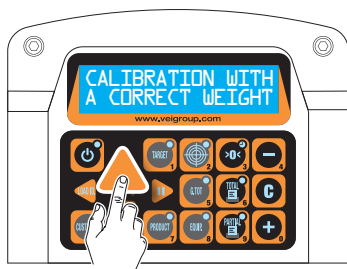
this calibration assumes that known weights are loaded into the machine. In fact the known weight value can be a predicted one because the weight results will be afterwards adjusted checking trucks' loads on a weighbridge. Calibration with a correct weight is found in the Menu. This calibration automatically set the calibration factors called Gain; they can be seen under "Attachments" feature.



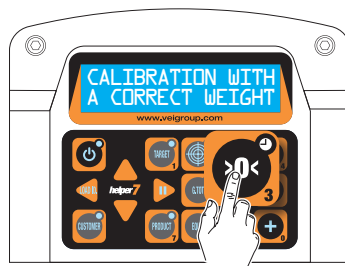
- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.



- 2 **release the keys** when the **helper 7** displays the message on the side

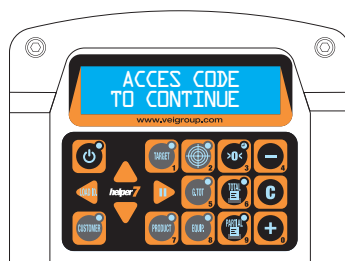


- 3 **scroll the menu** 'till you see the message on the side

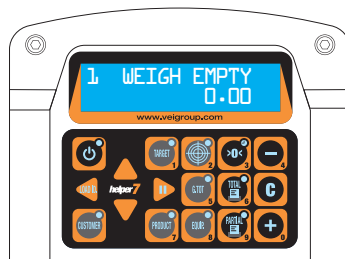
4 **confirm**5 **enter the access code** to continue, "99"

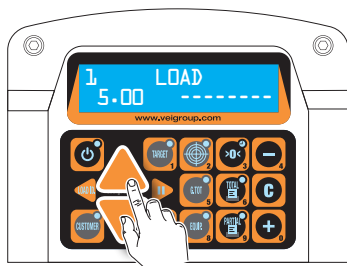
You can skip each step with  key. It works on a loop.

The Equipment number is the one you are using in the weighing mode, 1 in this case. To change it press  key to set the number you desire to do the calibration with.

6 **weigh empty** to automatically perform the zero. Before weighing empty make sure in the machine there is the attachment for which you're doing the calibration, in this example, 1. To change the attachment number from 1 thru 4 use the **EQUIP** key. (see attachments)

the dashes are replaced by 0.00 confirming the zero has been performed

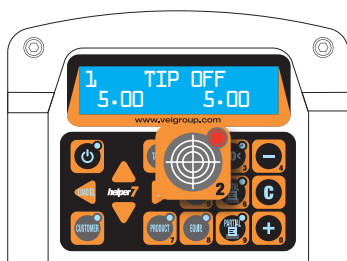




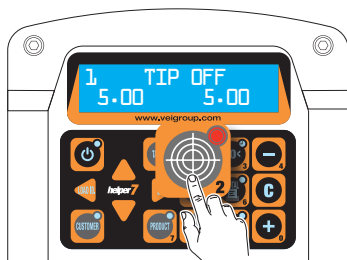
- 7 load the material and program its weight** value with the UP and DOWN arrows. Within 10 seconds even the load weight value is not entered, the procedure shifts to the following step where it is still possible to enter the load weight value.



- 8 lift slow the load** keeping low revs throughout the weighing zone which is defined by the blue box located near the lifting arm.

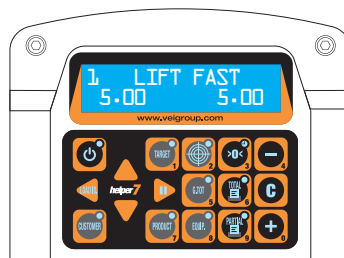
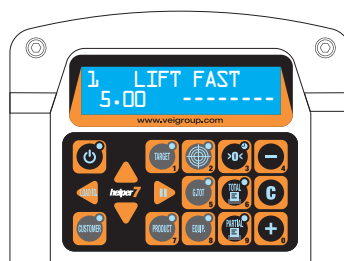


- 9 lower and stop the arm** in front of the weighing zone. The Tip off key led will start blinking, meaning you are in front of the weighing zone

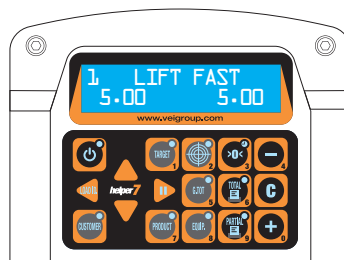


- 10 confirm the tip off calibration**

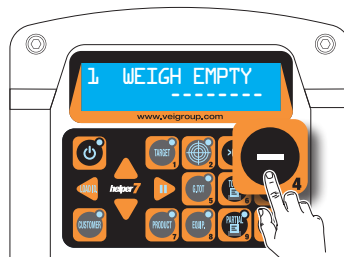
11 lower the arm

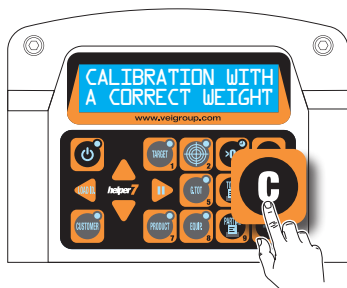
12 lift the arm back up at **full revs** throughout the weighing zone which is defined by the blue box located near the lifting arm.

The Calibration with a correct Weight is completed.



13 exit calibration





14 **exit menu** if you want to go to the weighing mode

Now the calibration must be tried out by loading some material and checking that the results displayed by the **helper 7** between low revs and high revs lifts is within 1 or 2 increments or 1%-2% of machine lifting capacity (an increment is the smallest change in weight, 10,20,50 or 100). If not you must adjust the “Lift fast” calibration by modifying Sensor 2 gain in the “Attachments” section. See Gains Description, S2 Gain in the Attachments chapter.

Attachments

when the machine changes its attachment the **helper 7** has the possibility to select the related attachment's name in order to keep its accuracy. In fact each attachment needs its own calibration.

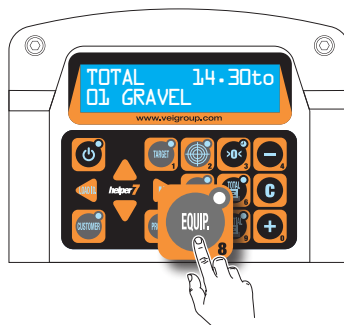
Helper 7 can accept up to 4 different calibrations.

Instead of attachments, this feature can be used to have one **helper 7** calibrated for different machines used as a backup.

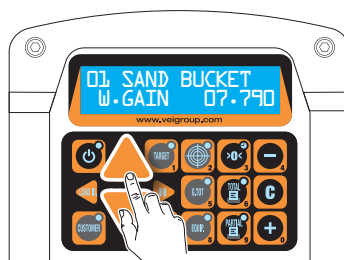
Each attachment has its own "gains setting" which identifies the calibration factors. When doing the calibration with a correct weight, the **helper 7** calculates automatically these gains and make them available under the attachment for which the calibration was done.

Selection

1 Enter Attachment listing

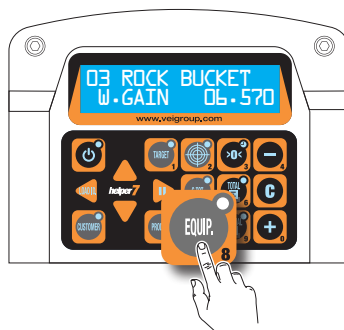


2 select the attachment or machine you want to use.



3 exit attachments listing.

If no action occurs, exit is automatic after 10 seconds



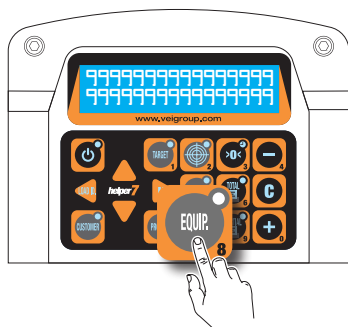
Programming

the attachment listing can be entered in programming mode to modify, create or delete an Attachments and its related gains.

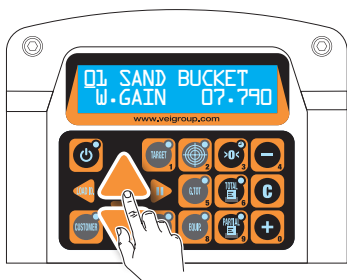
These gains can be manually modified in case of:

fine tuning

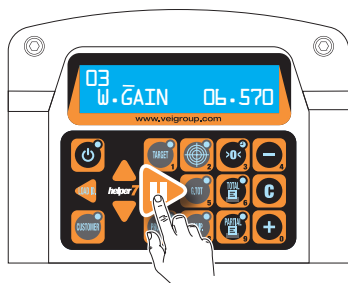
unit re-programming



- 1 **hold down EQUIP key** while the *helper 7* scrolls through the numbers during switch on.



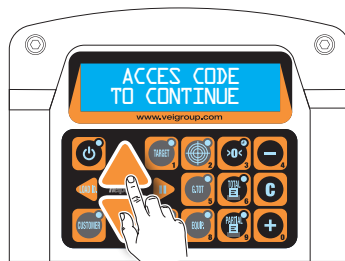
- 2 **release the key** when the *helper 7* displays the attachments listing



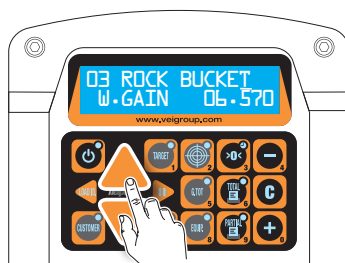
- 3 **move the underscore under the first character** of the attachment's name to program, change or delete. The example shows a new attachment to enter.

4 enter the characters of the name.

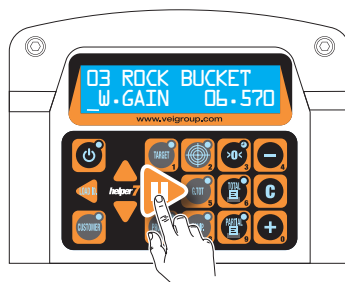
You must first enter the “access code”, 99.



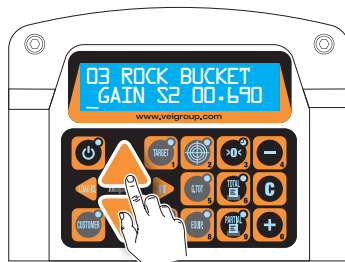
continue programming the name.
At this point you can exit or continue programming the gains.

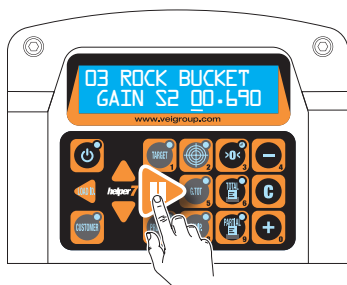


5 move the underscore to the second line, under the gain name to continue programming

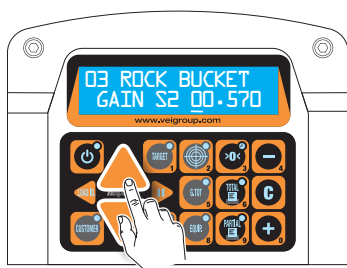


6 scroll the gains

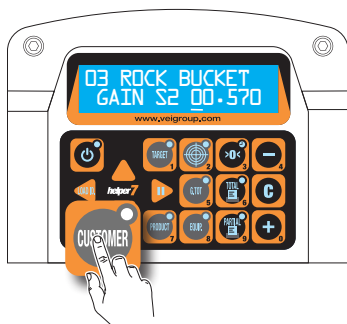




- 7 **move the underscore** as far as it can go to the right of the second line. It will be positioned under the gain's value.



- 6 **enter the gain value** as shown or using the numeric keys



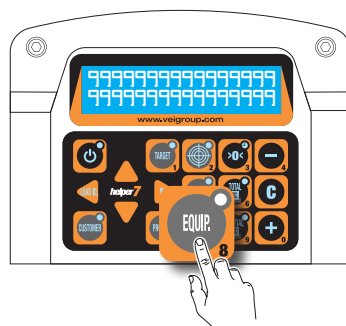
- 8 **exit** attachments programming.

Deleting

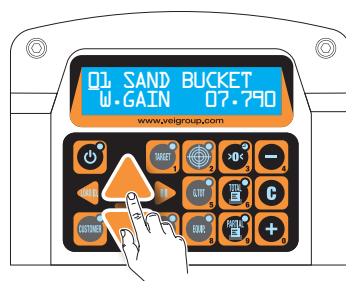
the attachments listing can be deleted one attachment after the other. An attachment cannot be selected and then considered deleted if it is without name. Therefore it is necessary to delete an attachment's name in order to make it disappear from the listing selection.

If all the attachments have come to have their names deleted, **helper 7** will be working with attachment 01, anyhow.

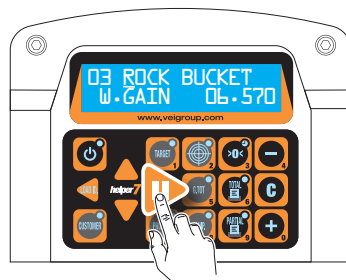
- 1 **hold down EQUIP key** while the **helper 7** scrolls through the numbers during switch on.

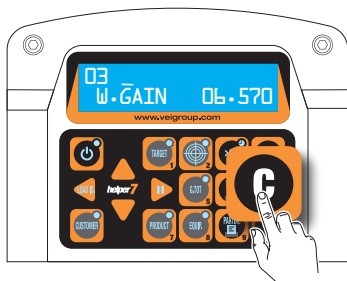


- 2 **release the key** when the **helper 7** displays the attachments listing

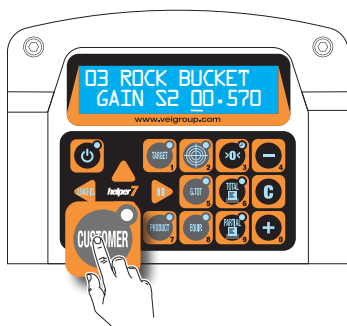


- 3 **move the underscore under the first character** of the attachment's name to delete.





- 5 delete the whole name** with the Cancel key holded down for 3 seconds; delete the character you want to change with the Cancel key pressed once.



- 6 exit** attachments programming

Gains description

the attachments gains are set by the **helper 7** itself during the “calibration with a correct weight”.

Anyhow there are some circumstances where they have to be manually modified to achieve **helper 7** best performances.

This can be the case of a speed adjustment between low and high lifting speed which implies the “S2 gain” adjustment as explained hereafter.

►► **Weight gain (W.Gain)**

The weight gain factor defines the overall weight calibration. Changing this value it changes the weight result; increasing the gain decreases the weight and viceversa.

►► **S2 gain**

This gain factor defines the calibration of the lifting speed. Changing this value it changes the weighing result at different lifting speeds.

It can happened that after the “calibration with a correct weight” the speed compensation is not optimal, then you need to modify the S2 gain accordingly. Decrease this value when the weighing result is bigger with the machine at full speed than the result with the machine at low speed and viceversa. The adjustment of this value is by trial of 0.100 steps of gain’s modification.

» TP gain

this gain factor defines the calibration of the tip off feature. Tip off means unloading the material and seeing the weight value decreasing in real time. Changing this value it changes the weighing result when tipping off the material.

Increasing the gain decreases the weight and viceversa.

With the **helper 7** already calibrated the weight unloaded can be checked towards the previous and successive weights of the unload.

Example:

helper 7 1st result = 3.50ton

tip off = 0.50

helper 7 2nd result = 2.70ton

unloaded correct weight = 0.80ton

(3.50-2.70)

therefore there is an error of 0,30ton less.

The following formula can be applied to find a new gain:

$(\text{tip off weight} \times \text{TP.gain}) / \text{correct weight} =$

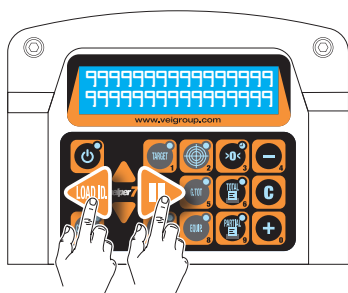
New gain

Guided calibration

this section allows to perform an easy step by step calibration. With this calibration the W.Gain factor is automatically modified together with the TP. Gain as well.

The bigger the weight values the better the calibration; use the sum of 3 truck loads to achieve best fine tuning.

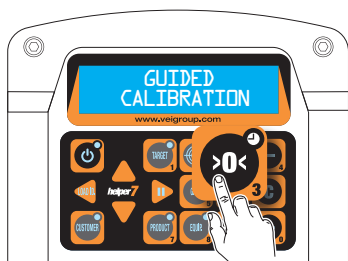
Guided Calibration is found in the menu



- 1 **hold down LEFT and RIGHT** arrows while the *helper 7* scrolls through the numbers during switch on.



- 2 **release the keys** when the *helper 7* displays the message on the side



- 3 **confirm**

4 enter helper 7 weight

you must enter the weight or the sum of weights given by the **helper 7** within 10 seconds. If no action is taken the calibration ends without result.

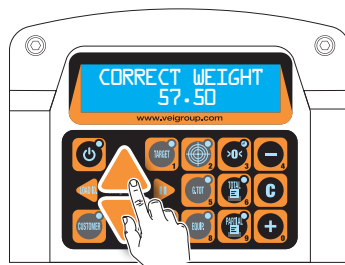
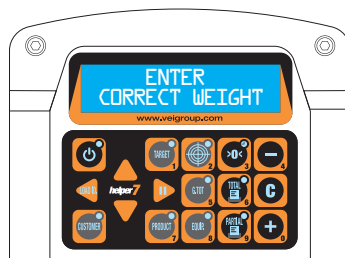
After 10 seconds you entered the weight the procedure goes to the next step



5 enter the correct weight

you must enter the weight or the sum of weights given by the reference weighing system within 10 seconds. If no action is taken the calibration ends without result.

After 10 seconds you entered the weight the procedure goes to the next step



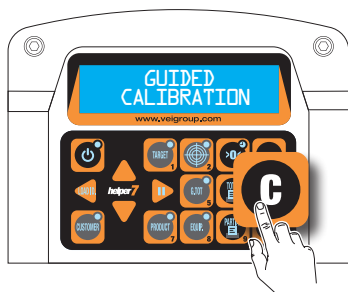


- 6 done**
the calibration has been done and the new Weight gain (W.GAIN) is shown on the display. The Tip off Gain (TP.GAIN) is modified accordingly, too, but not display. You must go on "attachment" to see it.

After 10 seconds the procedure goes to the next step



- 7 press +** key to confirm the calibration change and exit guided calibration

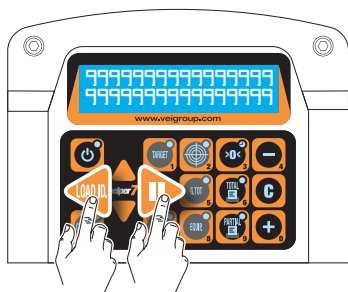


- 8 exit menu** if you want to go to the weighing mode

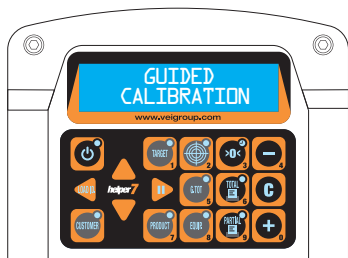
System data setup

this section allows to set the **helper 7** working conditions and operating features as well.

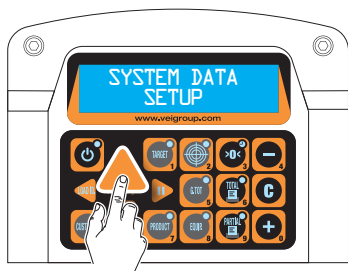
System data setup is found in the Menu.



- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

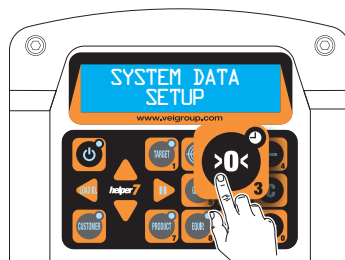


- 2 **release the keys** when the **helper 7** displays the message on the side

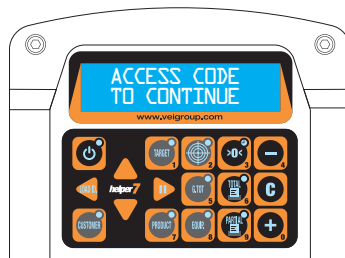


- 3 **scroll the menu** 'till you see the message on the side

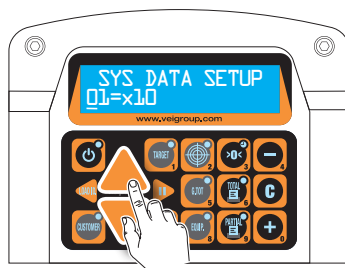
4 **confirm**



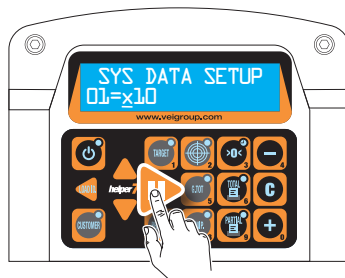
5 **enter the access code** to continue, "99"



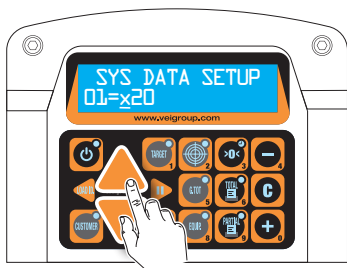
5 **scroll** through the data with UP and DOWN keys when the underscore is under the data number



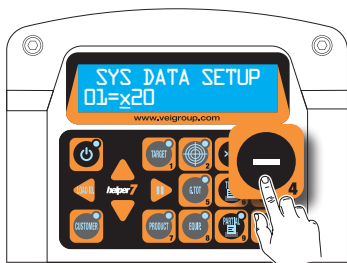
6 **change the data value** moving the underscore under it



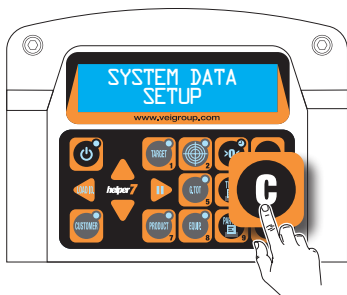
and **scrolling** through the values with the UP and DOWN keys.



7 exit system data setup



8 exit menu if you want to go to the weighing mode



System data table

these are the **helper 7** system data. On the VALUE field is the default values (factory settings or after a “data memory reset”).

The RANGE field contains the values available for each data. (see table on next page)

No.	SYSTEM DATA	VALUE	RANGE
01	Increment	x50	10, 20, 50, 100, 200, 500
02	Printer	Yes	Yes, No
03	No. of load sensors	2	1, 2, 3
04	Maximum weighing time	9,9secs.	0,2÷9,9 secs.
05	Maximum weight drift	0.20ton	0.01÷5.00ton
06	Unit of mass printout	t	No using cubic meters: t, t(lb) using cubic yards: ton, lb, ton (lb), lb (ton)
07	Auto-adding	Yes	Yes, No
08	Closed bucket switch	No	Yes, No
09	Open bucket switch	No	Yes, No
10	ikey	No	Yes, No
11	Volume printout	Cubic meters	cubic meters, cubic yards
12	Buzzer	Yes	Yes, No
13	Language	English	English, other
14	Serial port (RS232)	No	No, slip printer, RF-total, RF-partial, modular
15	Maximum capacity	150.00ton 150,000t	0.10÷150.00ton 0,100÷150,000t
16	Make >0< after C	No	No, 1, 2, 3
17	Tip off	Yes	Yes, No
18	No-Load negative range (percentage of d15)	0	-5%÷0% (0%=No)
19	No-Load positive range (percentage of d15)	0	0%÷5% (0%=No)
20	Warm up liftings	No	Yes, No
21	Date format	DD-MM-YYYY	DD-MM-YYYY MM-DD-YYYY
22	Minimum Capacity	0e	0e, 10e, 20e
23	Weighing zone status	from 1 to 2	from 1 to 2, from 2 to 1
24	Install kit type	from 7 kit	from 7 kit, from P5 kit
25	Auto-print with C	No	Yes, No
26	Destination data upgrade	Yes	Yes, No
27	Power ON	Man	Man, Aut
28	Auto-power OFF	No	Yes, No

System data description

hereafter is described the meaning of each system data.

01 INCREMENT

It is the smallest increment in the weight.

02 PRINTER

It defines if the integrated printer is included.

03 No. of load sensors

It defines the number of load sensors installed on the machine. The "3" option means that during weighing two sensors, main and return pressure, are read, while in the Tip off mode only the main pressure sensor (sensor 1) is read. This is the case when in Tip off mode opening the bucket the weight drops drastically, meaning the return pressure is giving some troubles to the Tip off mode.

04 Maximum weighing time

It is the maximum time allowed during weighing. This time is automatically set when doing the "calibration with correct weights" during the LIFT SLOW phase. It can be changed afterwards if needed.

05 Maximum weight drift

It defines the pressure peak value allowed during weighing. Bigger is the value bigger will be the pressure peak allowed during weighing and then less protection during bouncing. We advise to set this data with a value 3 times data 01 (increment).

06 Unit of mass

It is the unit of mass appearing on the display and on the print out.

t= metric ton

ton= american ton

lb= pound

Depending from the “volume printout” (d11) setting, this data can assume the following values:

d11= cubic meters

t

t (lb) live weight conversion available. Weights stored in t

d11= cubic yards

ton

lb

ton (lb) live weight conversion available. Weights stored in ton.

lb (ton) live weight conversion available. Weights stored in lb.

07 Auto-adding

It determines if the adding is manual or automatic each partial weight

08 Close bucket switch

It determines if a switch has been installed on the machine to detect when the bucket is fully closed.

09 Open bucket switch

It determines if a switch has been installed on the machine to detect when the bucket is partially or fully open.

10 ikey

It determines if the ikey pocket size memory is available for loading data saving and customers, products name restoring. In case of using the “RF Total” or “TWR Total” transmission, this data must be set “YES”. By doing this if a data is not sent for any reason, it is saved in memroy and will be sent with the following data transmission.

11 Volume printout

It determines the volume conversion type:
cubic meters or cubic yards.
Based on this data setting the d06 unit of mass
data, can be set accordingly.

12 Buzzer

It sets the buzzer presence everytime a partial
weight is displayed, reaching the target weight
when in target weighing mode and when a wrong
weighing with the “repeat” result is performed.

13 Language

It sets the interface language

14 Serial port

It defines the device connected to the serial port
(RS232)

Slip printer:	Epson TM295
RF-Total:	radio-frequency device, totals are transmitted
RF-Partial:	radio-frequency device partials are transmitted
Modular:	protocol compatible with Modular Mining
TRW-Partial:	protocol compatible with Trackweight RF modem, partials are transmitted. Available in North America, only.
TRW-Total:	protocol compatible with Trackweight RF modem, totals are transmitted. Available in North America, only.

15 Maximum capacity

It determines the maximum capacity of the
system; **helper 7** shows the message “weight
over max. capacity” when the lifted load is
heavier than Maximum capacity + 9x d01
(increment)

16 Make >0< after C

There are 3 values for this data, all of them aiming to keep a stable zero by warning the operator to perform zero checking with empty bucket. In the following circumstances the warning message "Empty and weigh then press >0<" will be prompt on the display.

- NO: data is disabled
- 1:
 - *after power on
 - *every time a total is deleted
 - *after 30' from the last >0<.
- 2:
 - *after power on
 - *after 15' from power on >0< if at least 5 lifts have been done, otherwise not
 - *after 30' from last >0<, if 5 totals are not cleared (C key) within this time
 - *after the 5th total clearing if it is done before 30' from last >0<
- 3:
 - *after power on
 - *every 15' during the first hour from power on
 - *every 30' after the first hour from power on

Consider the stringency of the above values as:

- 1= high
- 2= medium
- 3= low

17 Tip off

It enables the Tip off feature, allowing to see the weight decreasing in real time while unloading onto the pile.

18 No-Load negative range

It defines the negative percentage beyond which the No-load Zero is not possible. Usually it is programmed -1% which is a percentage of the Maximum Capacity (15).

19 No-Load positive range

It defines the positive percentage beyond which the No-load Zero is not possible. Usually it is programmed +3% which is a percentage of the Maximum Capacity (15).

20 Warm up liftings

It defines the request of doing 10 lifts when the unit is switched on; only after the lifts, weighing can start.

21 Date format

It sets the date in european format (DD-MM-YYYY) or american format (MM-DD-YYYY)

22 Minimum capacity

It defines the partial weight limit under which it cannot be printed.

The value is a multiple of 03 data (e).

Example:

e (01) = 20

22 = 10e

Set limit = $10 \times 20 = 200$

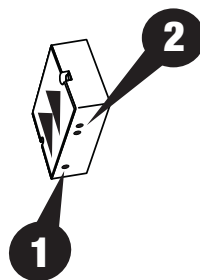
23 Weighing zone status

It enables the working direction of the weighing zone sensor.

From 1 to 2 means the lift is done starting from the side where one led is.

From 2 to 1 means the lift is done starting from the side where two leds are.

The example shows the weighing zone sensor installed with the lift direction from 1 to 2.

**24 Install kit type**

It enables which installation kit is on the machine, **helper 7** or **helper P5**.

25 Auto-print with C

It enables the auto printout with the "C" key when a total is deleted. It prevents the load from being deleted without printing, first.

26 Destination data upgrade

It enables the Destination data field upgrade. When set "No" the data field cannot be upgraded manually or by using the ikey portable memory.

27 Power On

It enables the auto power on when the machine is started. The feature presumes the power supply is taken after the ignition key contact.

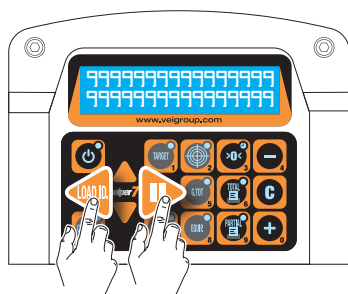
28 Auto-power Off

It enables the auto-power off when the helper 7 is not in use for 30 minutes. Not in use means no key stroke or arm lifts.

Data memory reset

data memory reset brings all the parameters, except Products' name, Grand Totals and Customers' name back to factory setting.

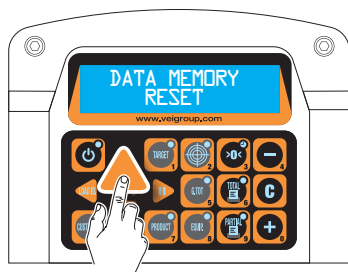
Data memory reset is found in the Menu.



- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

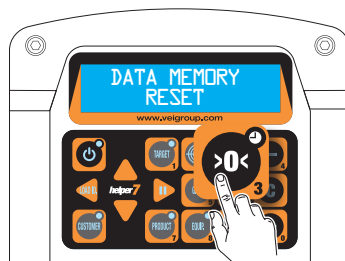


- 2 **release the keys** when the **helper 7** displays the message on the side

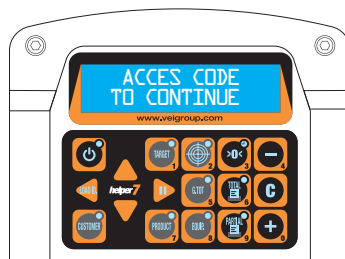


- 3 **scroll the menu** 'till you see the message on the side

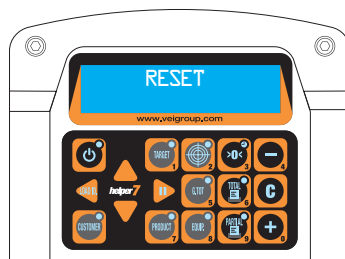
4 **confirm**



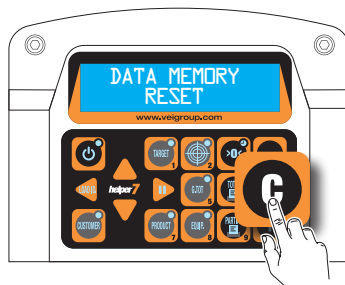
5 **enter the access code** to continue, "99"



6 **reset** takes place

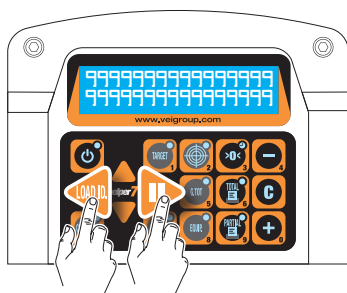


7 **exit menu** if you want to go to the weighing mode

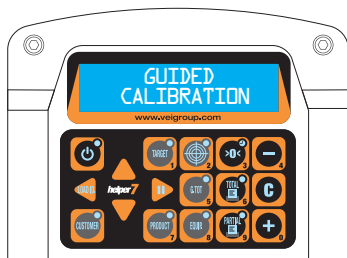


Ticket number

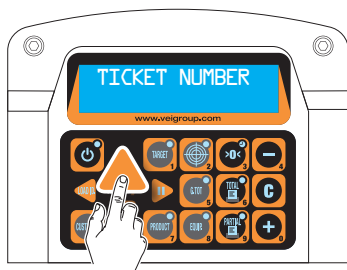
this section allows to change the printout ticket number. The Ticket number starts from 1 and goes to a maximum of 65535. Ticket number is found in the Menu.



- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

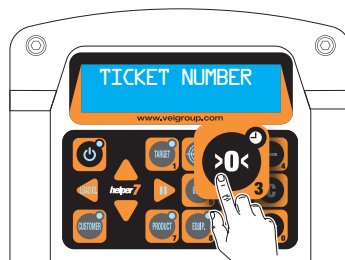


- 2 **release the keys** when the **helper 7** displays the message on the side

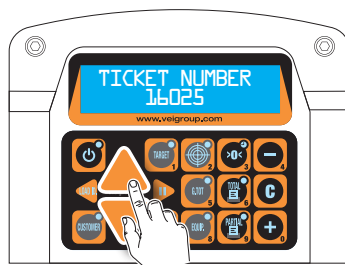


- 3 **scroll the menu** 'till you see the message on the side

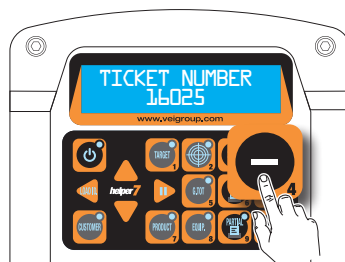
4 **confirm**



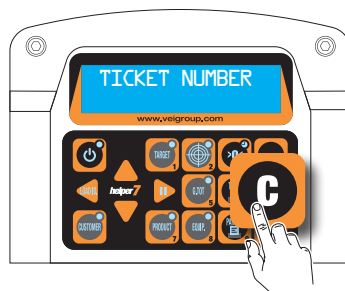
5 **program** the ticket number



6 **exit** ticket number programming

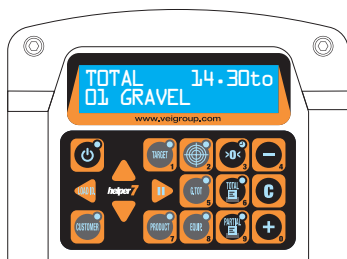


7 **exit menu** if you want to go to the weighing mode

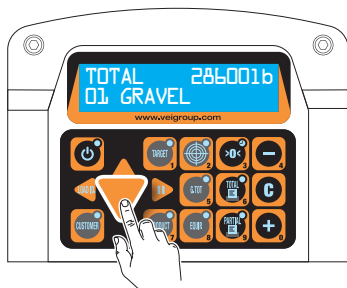


Changing unit of mass

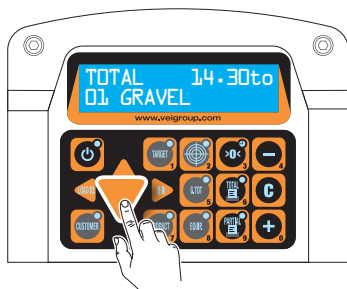
during weighing it can be possible to switch from one unit of mass to another. The possibilities available depends from system data "Unit of Mass" (d06) and "Volume printout" (d11). See system data setup.



1 weight is in "to", american tons



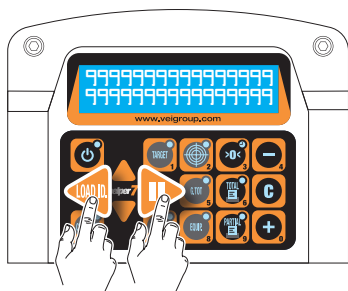
2 **press** the key and the weight is displayed in "lb", pounds.



3 **press** the key again to go back

Machine code

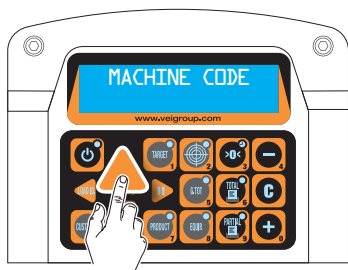
this section allows to introduce the machine code which will appear in the printout and in the wireless transmission, therefore the data received into ipot lite can be sorted by machine to have the production of it, for example, or for others interesting analysis purposes.



- 1 **hold down LEFT and RIGHT** arrows while the *helper 7* scrolls through the numbers during switch on.

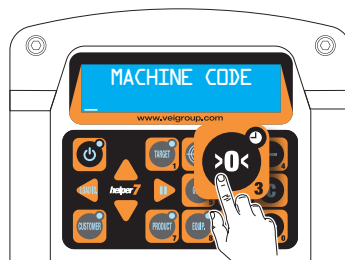
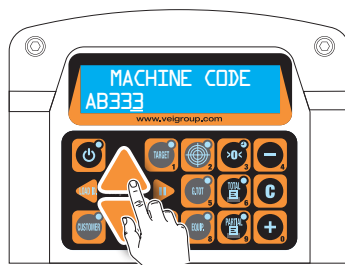
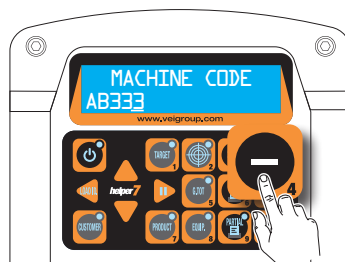
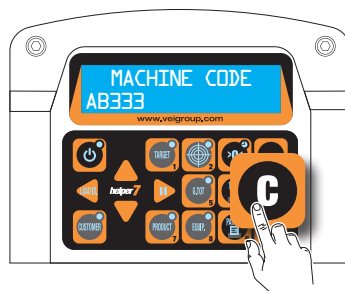


- 2 **release the keys** when the *helper 7* displays the message on the side



- 3 **scroll the menu** 'till you see the message on the side

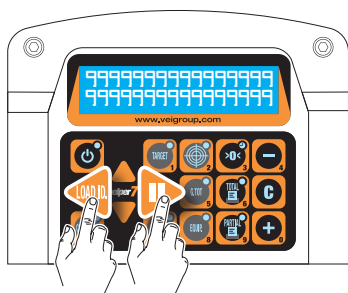
2

4 **confirm**5 **program** the machine code6 **exit** machine code programming7 **exit menu** if you want to go to the weighing mode

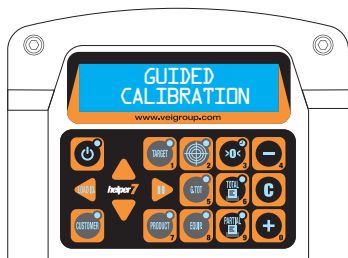
Diagnostic

this section allows diagnosing the **helper 7** system in case of problems to it.

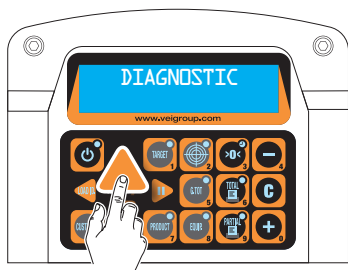
Diagnostic is found in the Menu.



- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

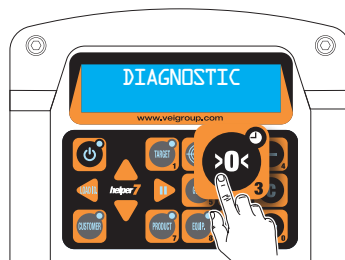


- 2 **release the keys** when the **helper 7** displays the message on the side

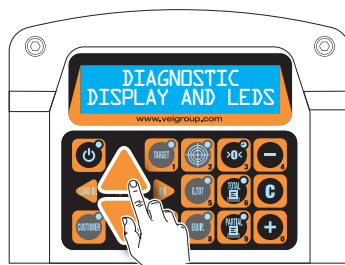


- 3 **scroll the menu** 'till you see the message on the side

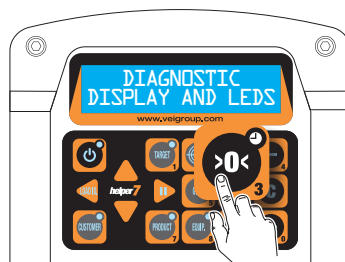
4 **confirm**



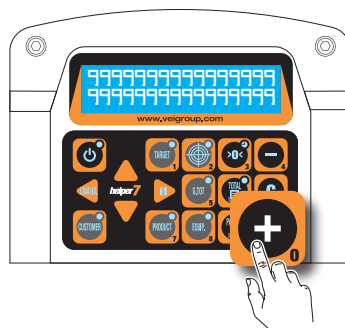
5 **scroll** through the tests to select the one to perform

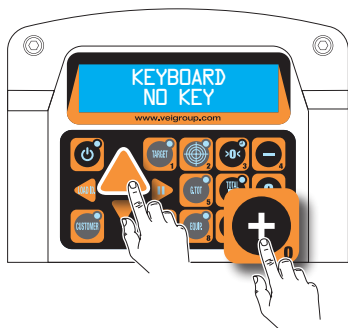


6 **confirm test**

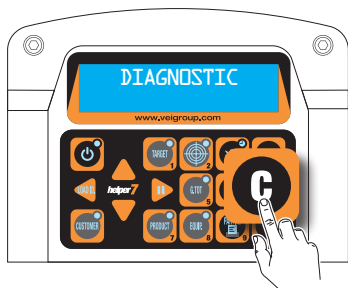


7 **exit** test in progress and **go to the next one.**





exit and **go to the next test** pressing this combination of keys, when in keyboard test.



8 **exit menu** if you want to go to the weighing mode

Diagnostic tests

these are the diagnostic tests available:

►► Display and leds

this test allows to check the functionality of the display single character and the leds of the keyboard



►► Sensor 1

It is the test of the sensor connected to the Sensor 1 plug. Usually this is the sensor applied to the pressure side of a piston. When lifting the arm this signal increases and its value depend upon the machine where it is installed; anyhow it is very unusual to have a value over 10000 bits. Values of -32768 and +32768 shows an underrange or overrange condition and therefore a malfunctioning. With the arm stopped in front the weighing sensor the value should decrease little by little due to the piston's pressure drift. If instead it varies up and down, it identifies a malfunctioning on the Sensor or on the **helper 7**. Connect a VEI load simulator in place of the Sensor and select the CAL position on the simulator: the value should be around 4300/4600 bits; if again the value varies up and down the **helper 7** is out of order.



►► Sensor 2

It is the test of the sensor connected to the Sensor 2 plug. Usually this is the sensor applied to the anular side of a piston. This signal is very low and while lifting the arm it increases quite a little.



Values of -32768 and +32768 shows an underrange or overrange condition and therefore a malfunctioning. The same Sensor 1 concept above applies for troubleshooting .



▶▶ Keyboard

It is the keyboard testing to make sure all the keys are working. Once pressing a key, the display will show the name of it. If pressing a key the display doesn't show its name but "no key" instead, the key is not working and should be replaced.



▶▶ Memory

It is the internal memory test. During this test do not switch the power off. The memory address test has to stop at 4095, if it doesn't the memory is not working properly.



▶▶ ikey

It is the external ikey memory test. During this test plug in the ikey and do not switch the power off. The ikey address test has to stop at 4095, if it doesn't the ikey is not working properly.



▶▶ IN/OUT

It is the inputs test, load sensors excluded.
 B= buzzer (0/1 means off,on)
 1= 1st weighing zone sensor encountered during weighing
 2= 2nd weighing zone sensor encountered during weighing
 3= open bucket switch
 4= close bucket switch

O and C status means Open and Close.

The weighing zone sensor test must be performed with the reference in front of it. If in this position the weighing zone sensor leds are all on but the diagnostic does not show C into position 1 or 2, then the problem has to be found on the weighing zone sensor's cable or on the indicator mother board itself.

►► **Serial port (RS232)**

This test allows to check the Serial port good functionality. Before confirming the JP2 jumper located on the mother board should be closed (moved to the right position) The serial port works well when the Loop Fail=0.



Software specifications

The following tables gives usefull information on the **helper 7** operating system capability and on the serial port protocols available.

►► helper 7 specs

Weights	maximum limit
Partial	150,000t, 150.00ton, 150000lb
Total	7969,990t, 7969.99ton, 7969990lb
Target	655,000t, 655.00ton, 655000lb
Grand Totals	Specifications
maximum number	80, one each product
maximum weight	7969,990t, 7969.99ton, 7969990lb
Targets	Specifications
maximum number	80
Destinations	Specifications
maximum number	19, 16 characters each
Products	Specifications
maximum number	80, 13chr. each
Customers	Specifications
maximum number	680, 28chr. each
Date and Time	Formats
european	DD-MM-YYYY
american	MM-DD-YYYY
Ticket No.	Specifications
programmable	from 1 to 65535
ikkey	Maximum storage
totals	996 records
Features	Specifications
weighing software	DYN
weighing mode	Incremental, Target
Tip off	YES
make >0< after C	YES
Bucket close switch	YES
Bucket open switch	YES
Unit of mass selection	YES
Volume printout	YES

►► serial port specs

Protocol: RF-TOTAL	Description
characters in hexadecimal	TX every time a total is deleted.
start of message	'\$' = 24H
machine code	16 chr.
customer code	3 chr., 001÷680
load ID	16 chr.
ticket number	6 chr., 000000÷065535
day	2 chr.
month	2 chr.
year	4 chr.
hour	2 chr.
minute	2 chr.
product code	2 chr.
product specific weight	4 chr.
weight	6 chr.
number of weighings	4 chr., 0000÷0255
checksum	2 chr.
end of message	'#' = 23H
Protocol: RF-PARTIAL	Description
characters in hexadecimal	TX every partial weight
start of message	'\$' = 24H
machine code	16 chr.
customer code	3 chr., 001÷680
load ID	16 chr.
day	2 chr.
month	2 chr.
year	4 chr.
hour	2 chr.
minute	2 chr.
product code	2 chr.
product specific weight	4 chr.
weight	6 chr.
checksum	2 chr.
end of message	'#' = 23H

Note: date is always in the DD-MM-YYYY format

►► serial port specs

Protocol: Modular	Description
characters in hexadecimal	TX every partial weight and every time a total is deleted
VEI-dipper	11 chr.
space	1 chr. (20H)
weight	6 chr. value without final 0 for "t" and "lb". Ex: 000560 is 5,600t Ex.: 000560 is 5.60ton Ex.: 000560 is 5600lb the receiving software must know which unit of mass is used for converting correctly the weight
end of message	2 chr. 0x0D and 0x0A (Cr - Lf)
VEI-tons	9 chr.
space	1 chr. (20H)
weight	6 chr. value without final 0 for "t" and "lb". Ex: 000560 is 5,600t Ex.: 000560 is 5.60ton Ex.: 000560 is 5600lb the receiving software must know which unit of mass is used for converting correctly the weight
end of message	2 chr. 0x0D and 0x0A (Cr - Lf)

Note: for **RF-TOTAL** and **RF-PARTIAL** protocols the receiving device needs to send back to the **helper 7** a "reception OK" message. This must be done with the character ACK (06H) within 2 seconds. If the reception is not OK the character to send is NAK (15H).

For **MODULAR** protocol there is no need to confirm "reception OK" by the receiving device.

key software specs

The following tables describe which are the data handled by the **helper 7** and **ikey**.

►► Weighing data saving

These data are saved into the **helper 7** memory and available to be saved into the **ikey**.

The maximum number of loads (records) depends from how many load Ids (record 1) are involved in the saving.

For example:

If you change Load id every truck or total, then the maximum number of loads that can be saved is 483.

If, instead, the load id remains always the same, the maximum number of loads that can be saved in memory is 965.

RECORD 1 (load ID)	RECORD 2 (weighing data)
Destination (16 chr.)	Date end of loading
	Time end of loading
	Product code (01÷80)
	Customer code (01÷680)
	Total weights
	Nr. of weighings
	Ticket number

►► Product data restoring

The product data are stored in the **ikey** and then transferred into the **helper 7** memory.

PRODUCT RECORD (max. 80)
Name (13 chr.)
Specific Weight (S.W.)
Target Weight

►► Customer data restoring

The customer data are stored in the **ikey** and then transferred into the **helper 7** memory.

CUSTOMER RECORD (max. 680)
Name (28 chr.)

►► Destinations data restoring

The destination and machine code data are stored in the **ikey** and then transferred into the **helper 7** memory when you perform Product data restoring in to it.

DESTINATION RECORD (max. 19)
Name (16 chr.)
Machine code (16 chr.)

Hardware specifications

The following tables gives usefull information on the **helper 7** and serial port hardware specifications.

Specification	Description
power supply	10 to 36VDC
consumption	25W when printing
fuse	1.85A - Vmax 72Vdc auto-restoring
display	2 lines of 16 chr. each
keyboard	17 mechanical keys
pressure sensors	2
switches	weighing zone bucket open bucket close
buzzer	YES
printer	YES (RS232)
ikey reader	YES (RS232)
serial port	YES (RS232)
power output (external buzzer)	5Vdc 0,5A
ikey	1MB

►► helper 7 specifications

Specification	Description
interface	RS232
baud rate	9600 bps
bits/character	8
stop bits	2
parity	none

►► serial port specifications

►► Epson TM295 specs

These are the hardware specs when the **helper 7** RS232 port system data is set as “Slip printer”.

Specification	Description
interface	RS232
baud rate	1200 bps
bits/character	8
stop bits	1
parity	odd
power supply	+24 Vdc ±10%
Current consumption	operating: 600mA peak: 5,5A standby: 100mA

Underneath the TM295 printer there is access to a row of dip switches, set them as described so to make the printer compatible with the **helper 7**

dip switch	1	2	3	4	5	6	7	8	9	10
status	OFF	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF

Errors and messages

the following error messages can be displayed by the **helper 7** when it gets in certain conditions of work.



This error appears when the signals coming from the pressure sensors is in overrange. In this case the related sensor must be replaced by checking in diagnostic which sensor is having Err 1. On the other hand if the sensors are good, then the **helper 7** mother board could be the cause and it must be replaced.



It is not possible to repeat the comand just done.

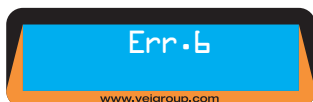


The weight is equal or smaller than the weight when empty. This can happen only during calibration with a known weight if:

- a. the material has not been loaded
- b. the No-load zero has not been done empty



It appears when attempting total printing and they are at 0.00



System data setting is not correct. It appears when system data exit is attempted or after switch on. The reason is that system data "ikey" (d10) cannot be set as "yes" together with system data "serial port" (d14) set as "RF-Partial", "Modular", "TRW-PARtial", TRW-Total".

It appears if the bucket is not closed.



It is not possible to totalize a negative weight



It appears when performing the calibration with known weight and the lift cycle is very slow. Time of lifting bigger than the one permitted. The lift must be faster.



It appears during guided calibration when the calculated gain (calibration factor) is in overrange (more than 65,000). Reattempt calibration or you have a condition of very high pressure with a light weight



This message appears during weighing if the lifting cycle is slower than the allowed one, or the lift is stopped during the message "lift" is displayed.



This message tells to make a weighing empty and then make the No-load zero. It appears automatically everytime a total is deleted and if no weighing takes place in 30 minutes. This feature is set in system data 16, "Make >0< after C



It appears when the lifted load weight is bigger than the Maximum capacity set in system data 15, "Maximum capacity" plus 9 times the increment which is set in system data 01, "increment".



When switching from Incremental to Target weighing mode and viceversa this message appears if there is a running total. You're obliged to clear or print the total.





When attempting to Cancel a Total and the loading data memory is full or almost full, this message appears while pressing the “C” key; you must save on **ikey** or delete the loading data. Furthermore it can appear when attempting to change to a new Destination.



During data transfer into the **ikey** this error can appear because the **helper 7** internal memory gets corrupted or the **ikey** is broken.



This message appears when printing is attempted and the gran totals are all 0.00.



It appears in Target mode when the lifted load weight is bigger than the Maximum capacity set in system data 15, “Maximum capacity” plus 9 times the increment which is set in system data 01, “increment”.



One of the Grand Totals has reached 80% of its maximum storing capacity which is 7.999,990t or 7,999.90ton

This message appears only when turning the system on.

The Grand Totals exceeding 80% of maximum storing capacity must be cleared for the message to disappear.



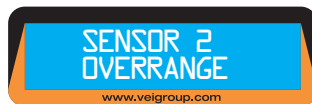
There is a problem in reading the signal of Sensor 1.

Overrange means the A/D converter is not able to convert the signals that is receiving because they exceed the A/D's maximum converting range. You must call for assistance.

There is a problem in reading the signal of Sensor 2.

Overrange means the A/D converter is not able to convert the signals that is receiving because they exceed the A/D's maximum converting range.

You must call for assistance.



The Load has not been completely unloaded.

This message appears when attempting a partial weighing before having completely unloaded the previous one.

You can subtract or unload the bucket totally before taking a new partial weight.

This message appears only if the System Data d09 "bucket open" is set "Yes", and a switch is installed in the machine to control the bucket unloading position.



X number of liftings must be done before allowing any operation. This message appears when turning the system on or periodically if the weighing zone sensor has not been triggered for a certain period of time:

≥15 minutes lift 2 times

≥30 minutes lift 4 times

≥45 minutes lift 6 times

≥60 minutes lift 10 times



Connections

these are the connections of sensors and external printer to the **helper 7**.

►► Power

Code:

R00623

Description:

LOOSE CONNECTOR TYPE AMPHENOL 7PF 90° PG11 SOLDER TYPE CONTACTS

Pin	Connection	Description	Color
1	+ VBAT	+ Power Supply	Red
2	- VBAT	- Power Supply - Weighing zone - Bucket switches	Black Blue Blue
3	POWER	+ Weighing zone + Bucket switches	Brown Brown
4	S1	Weighing zone 1st	Black
5	S2	Weighing zone 2nd	White
6	S3	Bucket open	Black
7	S4	Bucket close	Black

►► Sensor 1

Code:

R00623

Description:

LOOSE CONNECTOR TYPE AMPHENOL 7PF 90° PG11 SOLDER TYPE CONTACTS

Pin	Connection	Description	Color
1	N.C.	Not connected	
2	- S	- Signal	Red
3	+ E	+ Power	Blue + Green
4	- E	- Power	Black + Gray
5	+ S	+ Signal	White
6	SCH	Shielding	Yellow
7	N.C.	Not connected	

Note: some sensors can have 6 wires. Please connect the 2 extra wires, Green and Gray as described.

►► Sensor 2

Code:

R00623

Description:

LOOSE CONNECTOR TYPE
AMPHENOL 7PF 90° PG11
SOLDER TYPE CONTACTS

Note: some sensors can have 6 wires. Please connect the 2 extra wires, Green and Gray as described.

Pin	Connection	Description	Color
1	N.C.	Not connected	
2	- S	- Signal	Red
3	+ E	+ Power	Blue + Green
4	- E	- Power	Black + Gray
5	+ S	+ Signal	White
6	SCH	Shielding	Yellow
7	N.C.	Not connected	

►► RS232

Code:

R00623

Description:

LOOSE CONNECTOR TYPE
AMPHENOL 7PF 90° PG11
SOLDER TYPE CONTACTS

Pin	Connection	Description	Color
1	N.C.	Not connected	
2	- BUZ	- Power external buzzer	
3	+ BUZ	+ Power external buzzer	
4	SGND	Signal ground	
5	RXD	Receive Signal	
6	TXD	Transmit Signal	
7	DTR	Data terminal ready	

►► RS232 Epson TM295

Code:

R00623

Description:

LOOSE CONNECTOR TYPE AMPHENOL 7PF 90°
PG11 SOLDER TYPE CONTACTS

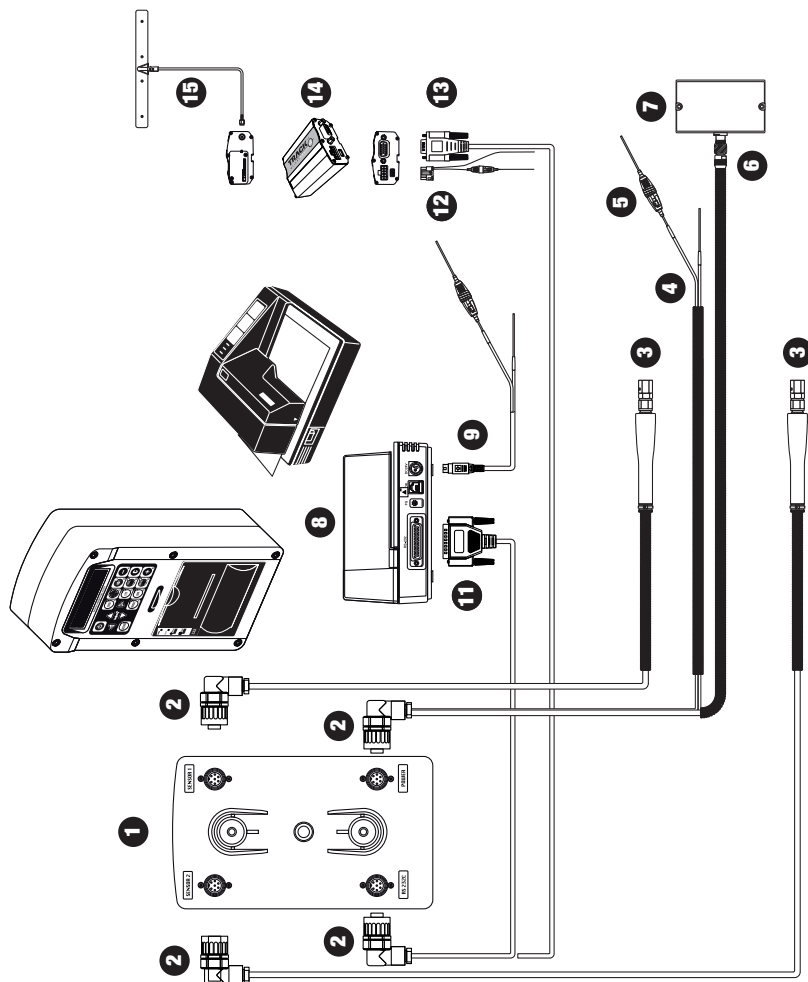
7 Pin	Description	TM295 pin	Description
4	SGND signal ground	7	SGND signal ground
5	RXD receive signal	2	TXD transmit signal
6	TXD transmit signal	3	RXD receive signal

►► Epson TM295 power connection

Pin	Connection	Description	Color
	- VBAT	- Power Supply	White
	+ VBAT	+ Power Supply	Red

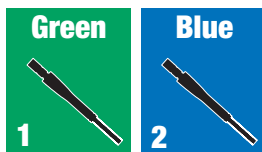
System layout

helper 7 can manage sensors inputs and communication devices. The system layout here shown is what is available at present moment.



System layout description

- 1 **helper 7** on board computer
- 2 connector
- 3 pressure sensor
- 4 power harness
- 5 power fuse
- 6 weighing zone sensor harness
- 7 weighing zone sensor
- 8 Epson TM295 printer
- 9 Epson TM295 printer power harness with in line fuse
- 11 Epson TM295 printer data cable
- 12 Trackweight modem power harness with in line fuse
- 13 Trackweight modem data cable
- 14 Trackweight modem
- 15 Trackweight modem glass mount antenna



Load sensor 1 & 2

are installed along the hydraulic pipeline of the machine. Use the same piston for both sensors, it will be easier when running your cables towards the cabin, this is the only reason why; virtually one piston pressure or the other are the same, then it makes no difference where you place your sensors. The installation must be done the closest possible to the piston avoiding to have valves in between the piston and the sensor.

Avoid those positions where:

- a. the sensor can be hit by rocks and other objects during working movements.
- b. the piston is moving up and down, so is the sensor. If you have no other choice, then do it, carefully making sure the sensors are safe at any movement of the piston or use VEI micropipe (7) to bring the sensors in a protected area.

VEI has a selection of hydraulic fittings to cover all the installations. In case a machine model is not covered, please provide us with all the technical info for the adapter and we will try to include it into our database and manufacturing schedule.

Follow these simple steps to install the sensors
The example shows a flange fitting but it can be any other type of adapter (7)

- 1 Open the machine original flange (5) unscrewing the 4 bolts (6)
- 2 Place the VEI flange adapter (4) in place making sure it has the OR-ring mounted on it. Re-install then the original flange (5) and pipe with longer bolts (6); the longer bolts are not provided in the kit.
- 3 Fit the Sensor (1,2) into the hydraulic port of the flange using the sensor coupling (3). In this example it is a 90°, in other cases it can be a straight coupling.
- 4 Run your cable towards the cabin where the **helper 7** is gonna be installed. Care must be taken to avoid breakages when the machine is turning left and right. Follow the machine's pipeline and you will be safe.
- 5 Find a hole or a cable path under the cabin and pull the cables up. If there is no possibilities to pull the cables up you must drill a hole about 1" 1/2 or 40mm. (hole size in case the connectors are already soldered on the cables. If the cables have no connectors on it then the hole could be 1" or 25mm.). Pay attention that no loader's wires are on the way.

- 1 **Sensor 1 GREEN**
- 2 **Sensor 2 BLUE**
- 3 **Sensor 90° coupling**
- 4 **VEI flange adapter**
- 5 **Machine original flange**
- 6 **Flange fixing Bolt**

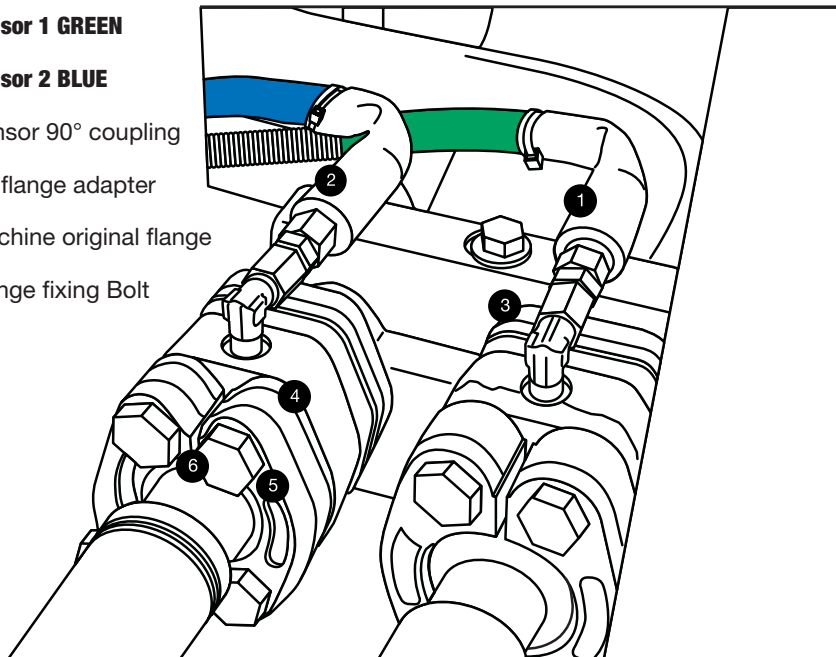
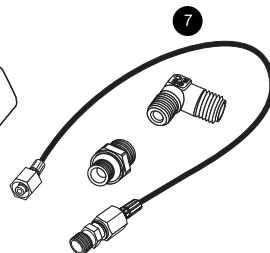
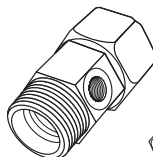
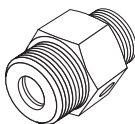
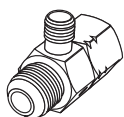
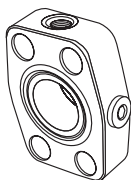


illustration is an example of sensor fitting



Typical hydraulic adapters available

Weighing zone sensor

it is installed in front of the machine's body, close to the lifting arm pin area; together with the weighing zone reference this sensor triggers the **helper 7** weighing. In fact while lifting the machine's arm, the weighing zone reference passes in front the sensor and the bucket weight is then displayed by the **helper 7**. This is why this sensor is so called Weighing zone, in fact weighing is not performed in any other position of the arm's lift, but this one.



- 1 Position the arm as on fig.1; the bucket pin should be just above the lift arm pin. In this position the **helper 7** should start weighing: **LIFT** appears on the screen.

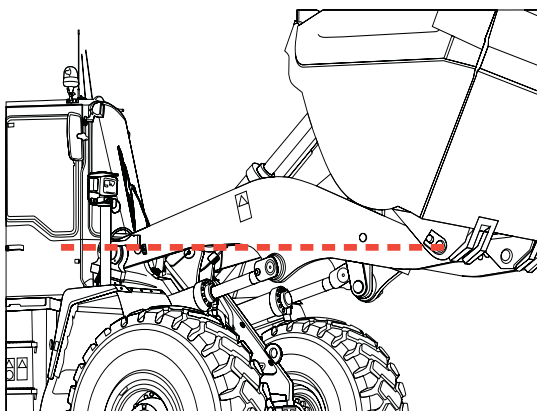


Fig. 1

- 2 Position the weighing zone sensor bracket on the machine's body close to the arm's pin then mark its location where it will be installed. Drill and tap M8A the desired location. Install the sensor bracket with 2 M8A x 16mm screws provided in the kit

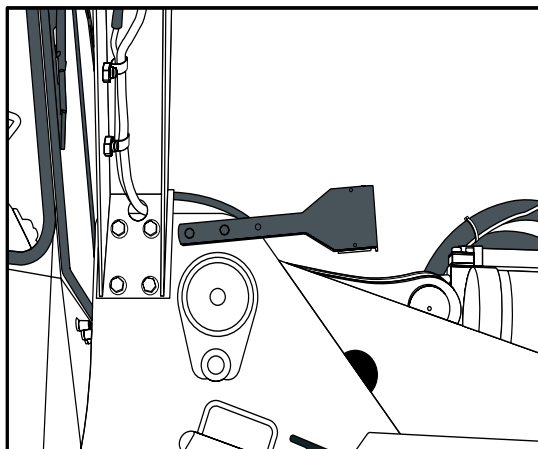


Fig. 2

The weighing zone sensor has a working direction which depends from system data 23 “weighing zone status” setting.
As default the working direction is set as **from 1 to 2**, illustrated in fig.3

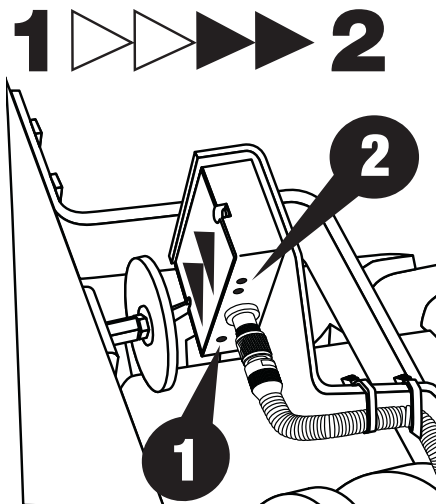


Fig. 3

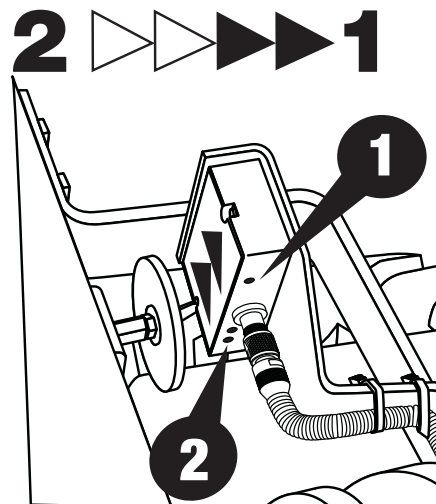


Fig. 4

If instead the working direction is as in fig. 4, the system data 23 must be set **from 2 to 1**

- 3 Once the weighing zone sensor is fixed on, place the magnetized weighing reference (VEI part # R00606) on the arm and try out the position. If you don't have this part you can proceed to step 4.

REMEMBER:

- a. lift the arm up and down and make sure the weighing reference doesn't hit somewhere
- b. the starting weighing point should be when the bucket's pin is just above the arm's pin
- c. make sure no other metal object belonging to the machine is entering the weighing zone sensor sensitive distance, 13mm/1/2"

- 4 Once you are sure about the position, mark the arm and then drill and tap an M8A thread

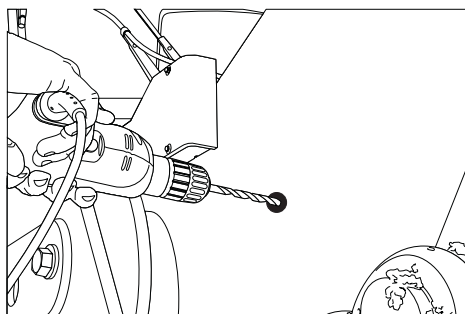


Fig. 5

- 5 Install the M8A x 30mm no head screw reference holder provided. Leave at least 12mm-1/2" screw out.

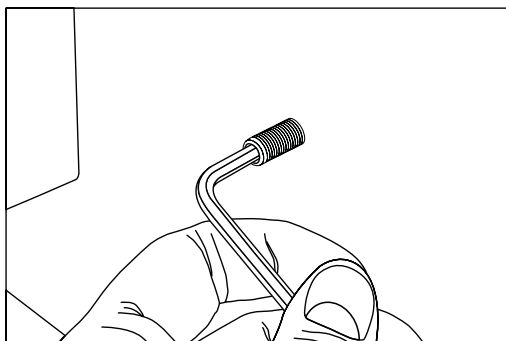


Fig. 6

- 6 The round **weighing reference** can be then installed together with the exagonal spacer. The spacer can be adjusted properly (or cut in case it is too long) in order for the **weighing reference** to be within the sensitive distance from the sensor (13mm - 1/2 " maximum)

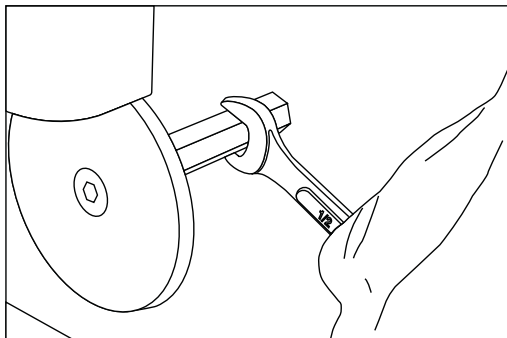


Fig. 7

Cables wiring

run your cables towards the cabin where the **helper 7** is gonna be installed. Care must be taken to avoid breakages when the machine is working. Follow the machine's pipeline and you will be safe.

Find a hole or a cable path under the cabin and pull the cables up. If there is no possibilities to pull the cables up, you must drill a hole paying attention to where no machine's wiring is on the way.

The dimension of the hole you have to make is about 1" 1/2 (40mm)

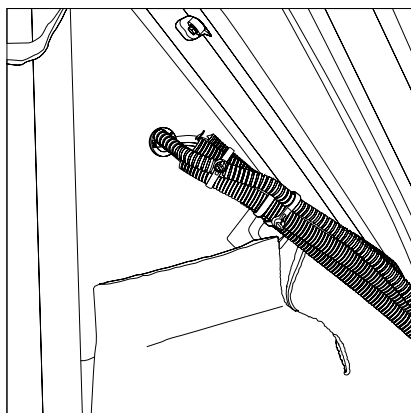


Fig. 8

Red

Power supply

connect the power supply wires to 12 or 24VDC power source. It would be always better if your ground is the machine's ground. The power supply can be taken from the ignition key, the cigaret lighter or the fuse box.

helper 7 mounting

install the **helper 7** on the right side of the cabin, fixing its swivel bracket onto the cabin pole. Position the **helper 7** to clearly see it from the driving seat.

1

Install the bracket onto the cabin pole

The bracket can be fixed by drilling and tapping two M8 threads. Use the M8Ax20mm screws provided in the kit. In some loaders the cabin pole has already few threaded points where you can screw in the bracket sphere; its thread is M10A, metric.

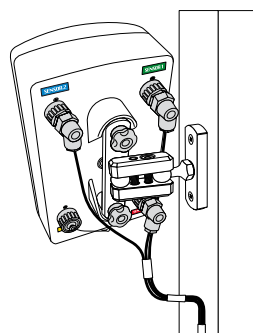


Fig. 9

Alternatively you can use the “U type pole locking bracket”, see fig.10. This “U type bracket” is not provided with the scale kit therefore you must order it separately.

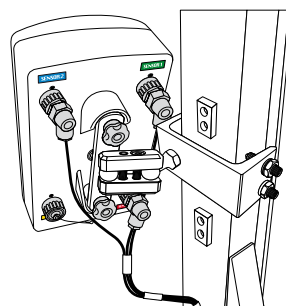


Fig. 10

- 2 Hold the **helper 7** and insert the back sphere into the bracket then tight the fixing plates
- 3 Position the **helper 7** directly towards the visual of the user.

System configuration

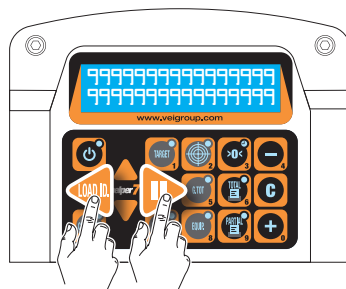
once all the components have been installed you are ready now to proceed with the **helper 7** configuration which include the calibration.

►► System data programming

System data determine the system working conditions and operating features as well.

System data setup is located in the Menu. Follow this procedure to enter system data programming.

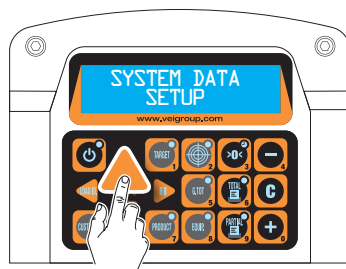
- 1 **hold down LEFT and RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

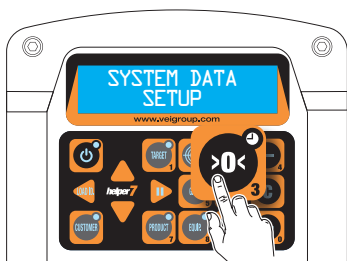


- 2 **release the keys** when the **helper 7** displays the message on the side



- 3 **scroll the menu** 'till you see the message on the side

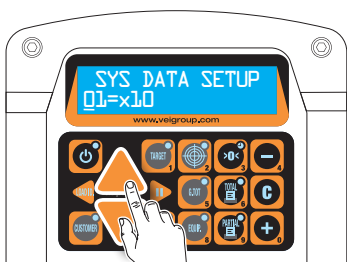




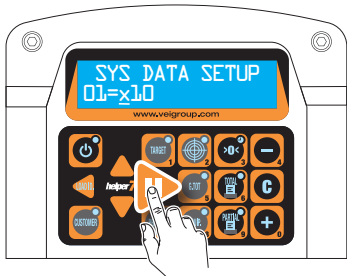
4 **confirm**



5 **enter the access code** to continue, "99"

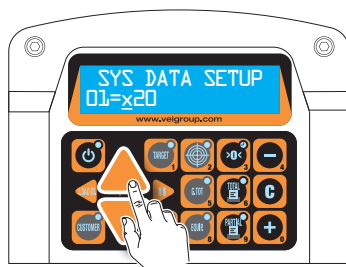


6 **scroll** through the data with UP and DOWN keys when the underscore is under the data number

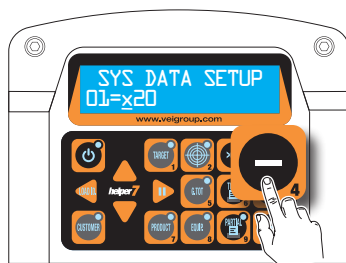


7 **change the data value** moving the underscore under it

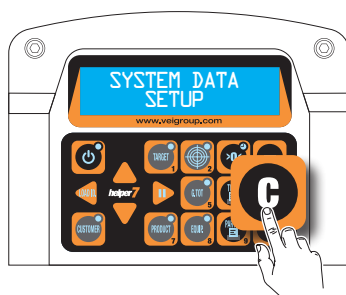
and **scrolling** through the values with the UP and DOWN keys.



8 exit system data setup



9 exit menu if you want to go to the weighing mode



►► **System data description**

The following table shows the system data and the values they can have. After the table the description explains the meaning for each one of them.

No.	SYSTEM DATA	VALUE	RANGE
01	Increment	x50	10, 20, 50, 100, 200, 500
02	Printer	Yes	Yes, No
03	No. of load sensors	2	1, 2, 3
04	Maximum weighing time	9,9secs.	0,2÷9,9 secs.
05	Maximum weight drift	0.20ton	0.01÷5.00ton
06	Unit of mass printout	t	No using cubic meters: t, t(lb) using cubic yards: ton, lb, ton (lb), lb (ton)
07	Auto-adding	Yes	Yes, No
08	Closed bucket switch	No	Yes, No
09	Open bucket switch	No	Yes, No
10	ikey	No	Yes, No
11	Volume printout	Cubic meters	cubic meters, cubic yards
12	Buzzer	Yes	Yes, No
13	Language	English	English, other
14	Serial port (RS232)	No	No, slip printer, RF-total, RF-partial, modular
15	Maximum capacity	150.00ton 150,000t	0.10÷150.00ton 0,100÷150,000t
16	Make >0< after C	No	No, 1, 2, 3
17	Tip off	Yes	Yes, No
18	No-Load negative range (percentage of d15)	0	-5%÷0% (0%=No)
19	No-Load positive range (percentage of d15)	0	0%÷5% (0%=No)
20	Warm up liftings	No	Yes, No
21	Date format	DD-MM-YYYY	DD-MM-YYYY MM-DD-YYYY
22	Minimum Capacity	0e	0e, 10e, 20e
23	Weighing zone status	from 1 to 2	from 1 to 2, from 2 to 1
24	Install kit type	from 7 kit	from 7 kit, from P5 kit
25	Auto-print with C	No	Yes, No
26	Destination data upgrade	Yes	Yes, No
27	Power ON	Man	Man, Aut
28	Auto-power OFF	No	Yes, No

01 INCREMENT

It is the smallest increment in the weight.

02 PRINTER

It defines if the integrated printer is included.

03 No. of load sensors

It defines the number of load sensors installed on the machine. The “3” option means that during weighing two sensors, main and return pressure, are read, while in the Tip off mode only the main pressure sensor (sensor 1) is read. This is the case when in Tip off mode opening the bucket the weight drops drastically, meaning the return pressure is giving some troubles to the Tip off mode.

04 Maximum weighing time

It is the maximum time allowed during weighing. This time is automatically set when doing the “calibration with correct weights” during the LIFT SLOW phase. It can be changed afterwards if needed.

05 Maximum weight drift

It defines the pressure peak value allowed during weighing. Bigger is the value bigger will be the pressure peak allowed during weighing and then less protection during bouncing. We advise to set this data with a value 3 times data 01 (increment).

06 Unit of mass

It is the unit of mass appearing on the display and on the print out.

t= metric ton

ton= american ton

lb= pound

Depending from the “volume printout” (d11) setting, this data can assume the following values:

d11= cubic meters

t

t (lb) live weight conversion available. Weights stored in t

d11= cubic yards

ton

lb

ton (lb) live weight conversion available. Weights stored in ton.

lb (ton) live weight conversion available. Weights stored in lb.

07 Auto-adding

It determines if the adding is manual or automatic each partial weight

08 Close bucket switch

It determines if a switch has been installed on the machine to detect when the bucket is fully closed.

09 Open bucket switch

It determines if a switch has been installed on the machine to detect when the bucket is partially or fully open.

10 ikey

It determines if the ikey pocket size memory is available for loading data saving and customers, products name restoring. In case of using the "RF Total" or "TWR Total" transmission, this data must be set "YES". By doing this if a data is not sent for any reason, it is saved in memroy and will be sent with the following data transmission.

11 Volume printout

It determines the volume conversion type: cubic meters or cubic yards.

Based on this data setting the d06 unit of mass data, can be set accordingly.

12 Buzzer

It sets the buzzer presence everytime a partial

weight is displayed, reaching the target weight when in target weighing mode and when a wrong weighing with the “repeat” result is performed.

13 Language

It sets the interface language

14 Serial port

It defines the device connected to the serial port (RS232)

Slip printer:	Epson TM295
RF-Total:	radio-frequency device, totals are transmitted
RF-Partial:	radio-frequency device partials are transmitted
Modular:	protocol compatible with Modular Mining.
TRW-Partial:	protocol compatible with Trackweight RF modem, partials are transmitted. Available in North America, only.
TRW-Total:	protocol compatible with Trackweight RF modem, totals are transmitted. Available in North America, only.

15 Maximum capacity

It determines the maximum capacity of the system; **helper 7** shows the message “weight over max. capacity” when the lifted load is heavier than Maximum capacity + 9x d01 (increment)

16 Make >0< after C

There are 3 values for this data, all of them aiming to keep a stable zero by warning the operator to perform zero checking with empty bucket. In the following circumstances the warning message “Empty and weigh then press >0<” will be prompt on the display.

- NO: data is disabled
- 1: *after power on
*every time a total is deleted
*after 30' from the last >0<.
- 2: *after power on
*after 15' from power on >0< if at least 5 lifts have been done, otherwise not
*after 30' from last >0<, if 5 totals are not cleared (C key) within this time
*after the 5th total clearing if it is done before 30' from last >0<
- 3: *after power on
*every 15' during the first hour from power on
*every 30' after the first hour from power on

Consider the stringency of the above values as:

- 1= high
2= medium
3= low

17 Tip off

It enables the Tip off feature, allowing to see the weight decreasing in real time while unloading onto the pile.

18 No-Load negative range

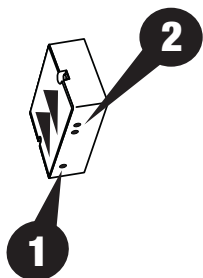
It defines the negative percentage beyond which the No-load Zero is not possible. Usually it is programmed -1% which is a percentage of the Maximum Capacity (15).

19 No-Load positive range

It defines the positive percentage beyond which the No-load Zero is not possible. Usually it is programmed +3% which is a percentage of the Maximum Capacity (15).

20 Warm up liftings

It defines the request of doing 10 lifts when the unit is switched on; only after the lifts, weighing can start.



21 Date format

It sets the date in european format (DD-MM-YYYY)
or american format (MM-DD-YYYY)

22 Minimum capacity

It defines the partial weight limit under which it cannot be printed.

The value is a multiple of 03 data (e).

Example:

e (01) = 20

22 = 10e

Set limit = 10x20=200

23 Weighing zone status

It enables the working direction of the weighing zone sensor.

From 1 to 2 means the lift is done starting from the side where one led is.

From 2 to 1 means the lift is done starting from the side where two leds are.

The example shows the weighing zone sensor installed with the lift direction from 1 to 2.

24 Install kit type

It enables which installation kit is on the machine, **helper 7** or **helper P5**.

25 Auto-print with C

It enables the auto printout with the "C" key when a total is deleted. It prevents the load from being deleted without printing, first

26 Destination data upgrade

It enables the Destination data field upgrade.

When set "No" the data field cannot be upgraded manually or by using the ikey portable memory.

27 Power On

It enables the auto power on when the machine is started. The feature presumes the power supply is taken after the ignition key contact.

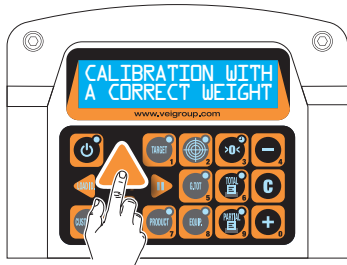
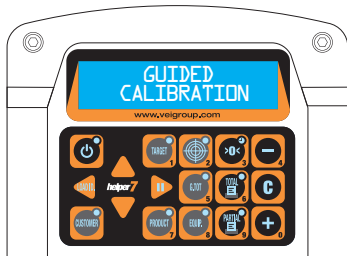
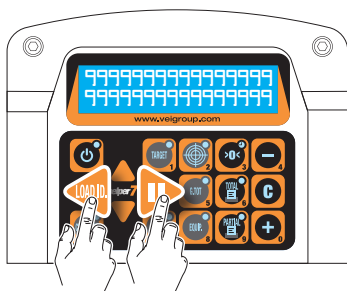
28 Auto-power Off

It enables the auto-power off when the helper 7 is not in use for 30 minutes. Not in use means no key stroke or arm lifts.

►► **Calibration with a correct weight**

The following procedure allows the perform the system calibration and it is therefore important to do it carefully.

This calibration assumes that known weights are loaded into the machine. In fact the known weights value can be a predicted one because the weight results will be afterwards adjusted checking trucks' loads on a weighbridge. Calibration with a correct weight is located in the Menu. This calibration automatically set the calibration factors called Gain; they can be seen under "Attachments" located under the "EQUIP" key

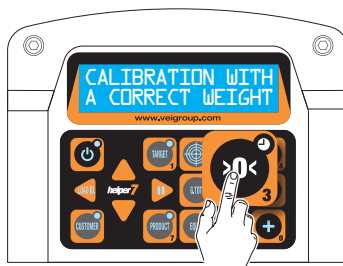


1 hold down **LEFT** and **RIGHT** arrows while the **helper 7** scrolls through the numbers during switch on.

2 release the keys when the **helper 7** displays the message on the side

3 scroll the menu 'till you see the message on the side

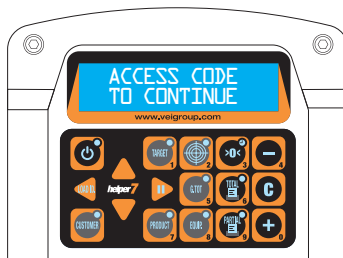
4 confirm



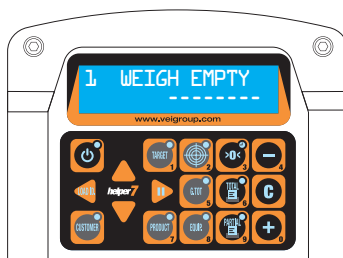
5 enter the access code to continue, "99"

You can skip each step with  key. It works on a loop.

The Equipment number is the one you are using in the weighing mode, 1 in this case. To change it press  key to set the number you desire to do the calibration with.

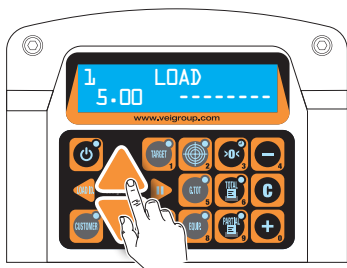


6 weigh empty to automatically perform the zero. Before weighing empty make sure in the machine there is the attachment for which you're doing the calibration, in this example, 1. To change the attachment number from 1 thru 4 use the **EQUIP** key. (see attachments)



the dashes are replaced by 0.00 confirming the zero has been performed





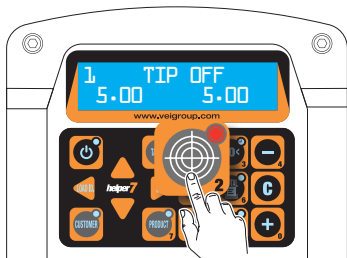
- 7 load the material and program its weight** value with the UP and DOWN arrows. Within 10 seconds even the load weight value is not entered, the procedure shifts to the following step where it is still possible to enter the load weight value.



- 8 lift slow the load** keeping low revs throughout the weighing zone which is defined by the blue box located near the lifting arm.

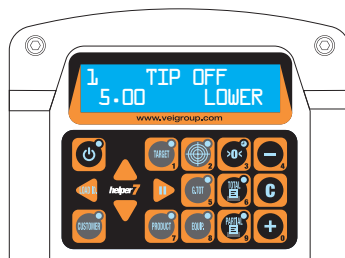
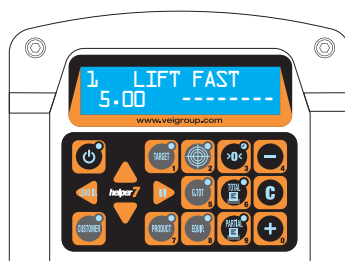


- 9 lower and stop the arm** in front of the weighing zone. The Tip off key led will start blinking, meaning you are in front of the weighing zone

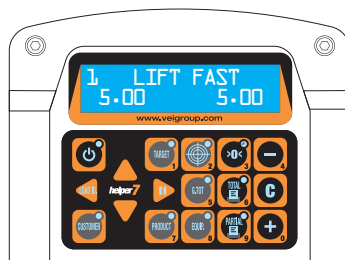


- 10 confirm the tip off calibration**

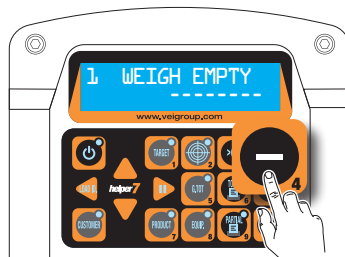
11 lower the arm

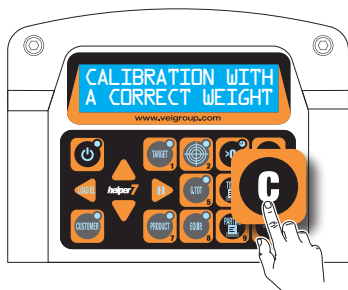
12 lift the arm back up at **full revs** throughout the weighing zone which is defined by the blue box located near the lifting arm.

The Calibration with a correct Weight is completed.



13 exit calibration





14 **exit menu** if you want to go to the weighing mode

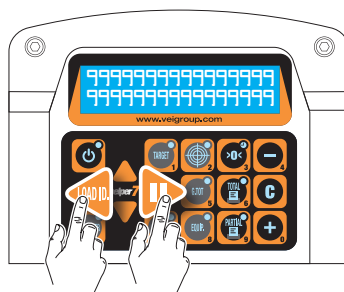
Now the calibration must be tried out by loading some material and checking that the results displayed by the **helper 7** between low revs and high revs lifts is within 1 or 2 increments or 1%-2% of machine lifting capacity (an increment is the smallest change in weight, 10,20,50 or 100). If not you must adjust the “Lift fast” calibration by modifying Sensor 2 gain in the “Attachments” section. See Gains Description, S2 Gain in the Attachments chapter.

►► Calibration fine tuning

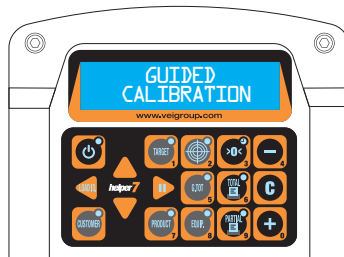
After the calibration has been performed, a trail with few trucks load should be done. Once you have the results in your hand perform the guided calibration procedure described here below.

With this calibration the W.Gain factor is automatically modified together with the TP. Gain (gain of tip off) as well. The bigger the weight values the better the calibration; use the sum of 3 truck loads to achieve best fine tuning.

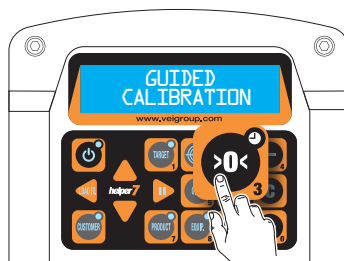
- 1 **hold down LEFT and RIGHT** arrows while the *helper 7* scrolls through the numbers during switch on.



- 2 **release the keys** when the *helper 7* displays the message on the side



- 3 **confirm**

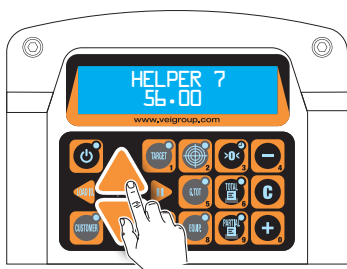


4 enter *helper 7* weight

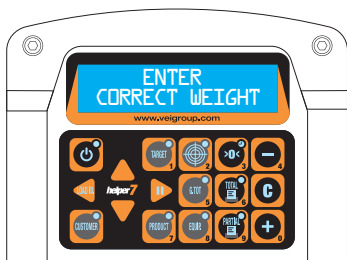


you must enter the weight or the sum of weights given by the *helper 7* within 10 seconds. If no action is taken the calibration ends without result.

After 10 seconds you entered the weight the procedure goes to the next step

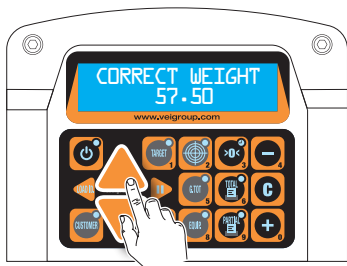


5 enter the correct weight



you must enter the weight or the sum of weights given by the reference weighing system within 10 seconds. If no action is taken the calibration ends without result.

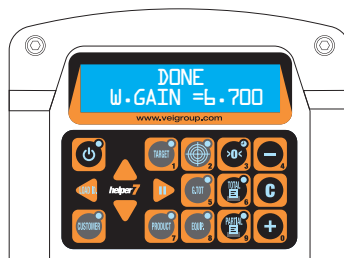
After 10 seconds you entered the weight the procedure goes to the next step



6 **done**

the calibration has been done and the new Weight gain (W.GAIN) is shown on the display. The Tip off Gain (TP.GAIN) is modified accordingly, too, but not display. You must go on “attachment” to see it.

After 10 seconds the procedure goes to the next step

7 **press +** key to confirm the calibration change and exit guided calibration8 **exit menu** if you want to go to the weighing mode