

HIDRA CRONO controller



SPS2

Shaft Positioning System

User guide

DC81201Q01



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About the Shaft Positioning System 2 (SPS2)

The SPS is an electronic device that allows the Hidra Crono controller to permanently monitor the elevator position thru the reading of an absolute encoder. Additionally is coordinated with the controller to select the proper speed according the travel distance required

During the public service travels the SPS2 is able to propose up to four different speeds to the controller depending of the travel distance. This speed proposed is always the faster available capable to reach this speed accelerating and decelerating without interruptions.

Here are the reasons why the use of the SPS2 is convenient or mandatory

- Convenient when it is required to spend less time installing and adjusting floor levels with magnets
- Mandatory when it is required some normative as EN81-72.
- Mandatory when the rescue is required to a desired floor different than top or bottom floor
- Mandatory on high speed lifts
- Mandatory when the lift has short distances between floors

In some mentioned cases it is possible that the lift only travels at nominal speed, but in other cases it could travel up to a four different speeds named

Smax	This will be the nominal speed of the lift (the faster of the four)
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Smed	This will be an intermediate speed (slower than Smax)
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Smin	This will be the minimum speed (slower than Smed)
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Screep	This will be the creep or approaching speed (The slower speed)
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This speeds must be adjusted according of the lift characteristics. For instance

Example of a high speed lift (2.5m/s)

Smax	2.5m/s to attend calls at four or more floors distance
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Smed	1.6m/s to attend calls between two and four floors
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Smin	1m/s to attend calls at one floor distance
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Screep	0.05m/s This speed is the approaching speed
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In other cases, when the lift has several short floors the speed configurations could be for example

Example of a short floors lift

Smax	1m/s to attend calls to more than 2.8m
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Smed	0.8m/s to attend calls between 1.8m and 2.8m
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Smin	0.3m/s to attend calls between 0.5m and 1.8m
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Screep	0.05m/s to attend very short floors between 10 and 50 cm (This speed is the approaching speed)
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Minimum requirements:

The Hidra Crono controller must have 8.0, or higher, firmware version

Parameter setting and adjustment:

To install the SPS in a Hidra Crono controller is necessary to follow a three step learning procedure. This procedure is as follows.

- Review pre-requisites: We review that the required elements for the SPS to learn the installation details are correct.
- Learning: the controller starts the learning process of the installation.
- Final Adjustment: Once the learning process of the installation has ended, adjust the stop levels.

Step 1 – Review pre-requisites

Due that the SPS will be installed just before assembly mode is switched off, it is known that the lift will be almost completely installed. This means that, in order to learn the installation details, it is required that:

1. All safety series are connected (Wedges, limit switch, doors, STOP Pit ...).
2. The encoder is connected to the SPS and the SPS to the controller.
3. Be able to move the lift, both upward and downward, from the car top box, under inspection mode
4. Also, in each of the floors there has to be a ZD magnet centred at floor level.
NOTE: Once the learning process is finished, the system allows to change the levels only +3cm/-3cm from the middle of the ZD magnet, because of this, the ZD magnet must be as centered as possible.
5. CVS and CVI reference signals are at a distance enough to decelerate the lift and stop at top and bottom floor. **This distance depends of the inverter or valve block adjustments** but in most of the cases the distances listed below are enough.

Nominal speed (m/s)	Distance of CVI/CVS (mm)
0.3	390
0.5	625
0.6	770
0.7	915
0.8	1080
0.9	1250
1	1450
1.1	1640
1.2	1840
1.6	2815
1.8	3400
2	4030
2.2	4700
2.5	5690
2.6	6140

2.8	6910
3	7900
3.2	8740
3.5	10160
4	12900

NOTA: This table is a guidance and in most cases is correct, but if the inverter or central are adjusted for a slower deceleration or sharper it is necessary to increase or decrease the slowing distance.

6. The parameter 02.01.08 must be adjusted to "SPS" and the parameter 02.01.09 must be "SPS2".
7. The inverter or the block valve must be set to the nominal speed of the lift. (if it is adjusted to a slower speed, the SPS2 will learn this speed and after, when the speed will be increased, the SPS2 will detect over speed error)
8. The parameter 02.01.02 parameter must be set to number of stops minus 1 (in a 6 stop installation it must be set to 5).
9. The parameter 02.13.01 must be set as follows:
A – Number of floors below the reference signals CVI (the number of plants are actually the ZD magnets within the CVI area).
B – Number of plants between the CVS and CVI reference signals.
C - Number of floors there above the CVS reference signal.
Example: In an installation of 6 stops , it may well be A-1, B-4, C-1 but depending on the rated speed or distances between floors, there could be that there is more than one floor in reference signals, being able to A-2, B-2, C-2 or other configurations.
Always keep in mind that the sum of A + B + C to be the number of floors.

NOTE: If a reference signal (CVS/CVI) matches a ZD magnet, it must be displaced by increasing the distance from the extreme floor until it no longer matches the magnet.

Only when all these points are met you can follow with the next step

Step 2 – learning:

1. Under inspection place the car above the CVI reference signal.
2. Set assembly mode to NO (parameter 02.01.06 to 0).
3. Adjust the SPS2 to the factory settings (parameter 03.13.90).
NOTE: In order to set SPS2 to factory settings it is required that the safety circuit is broken. If is not, open the circuit for example pressing one STOP, removing series fuse or removing A70 connector on the control panel
4. Save controller data (parameter 03.55.01)
5. Turn power off and on again .
6. Check that the parameter 01.13.04 is showing "YES". If is not, check the SPS2 encoder wiring
7. Move the car under inspection in both directions for a couple of travels so that the SPS2 sets the encoder direction. After each travel wait 5 seconds before perform the following
8. Check that the cabin is above the CVI, take it out of inspection mode, leave the car roof top and close the doors to allow you to move. (So far it must not move)
9. Go to parameter 03.13.10 and start the learning process. The car will now perform the following process:

- a. Travel to lower floor.
- b. Stop for 5 seconds.
- c. Travel to upper floor at inspection speed.
- d. Stop for 5 seconds at upper floor.
- e. Travel to lower floor at inspection speed.
- f. Travel to upper floor at Smed speed.
- g. Stop for 5 seconds
- h. Travel to lower floor at Smax (Nominal speed).

Note: If this travel is, by any reason, interrupted for (opening of series, power failure, etc.) you must perform the process, from the beginning, again. (Take the car above the CVI signal and generate the learning order again)

Note2: If the lift travels to the final limit switch during the last travel, the distance from bottom floor to CVI is not enough. Try to increase this distance or make the inverter/valve block decelerate faster. After that repeat again the learning process

10. Once the process is finished the car rest at bottom floor and the parameter 01.13.02 shows "YES". This means that the learning was correct. In this case, save parametrization on 03.55.01 and save the SPS2 parameters on 03.13.40. Once this is done turn off and on again and check if the lift enters on public service.

If the parameter 03.13.40 shows "NO" probably an error was detected during the learning process. This error can be due to several reasons. The most frequent ones being:

- a. The number of ZD magnets is different of the number of floors
- b. The distribution of ZD magnets is different of the adjusted in the parameter 02.13.01 (for example, it is programmed A--2B--2C--1 but during the learning the SPS2 has read A--1B--3C--1)
- c. The CVI or CVS has not been read
- d. The CVI or CVS match with one ZD magnet

In this case it is necessary to fix the errors and start again the learning process

Step 3 – Final adjustments:

Once the SPS has learned the installation and lift entered in public service must do some final adjustments of operation

- 1. Adjustment of the speed slowing distance at Smax (Nominal speed):** Make some travels from top to bottom floors and back. On each travel check if the lift is able to decelerate and stop at floor without over pass the final limit switch.
Once this check is done, adjust the point of the speed change as you wish increasing the distance if you want more creep speed or decreasing the distance if you want less creep speed. The parameters that allow you to change this speed change point are 02.13.40.10 (for the upwards speed change) and 02.13.40.11 (for the downwards speed change)
- 2. Adjustment of the speed slowing distance at Smed .** Depending on the lift configuration it is possible that this speed is never used. For example, when there are no short floors and it is

not a high speed lift, all the floors probably may be attended at nominal speed (Smax), Because of this, in this case Smed and Smin will not be used. But, if is not the case the Smed may be adjusted as follows.

Make some travels between floors in which the nominal speed cannot be reached. Adjust the speed change point as you wish increasing distance if you want more creep speed or decreasing distance if you want less. The parameters that allows you to change this speed change point are 02.13.41.10 (for the upwards speed change) and 02.13.41.11 (for the downwards speed change)

3. **Adjustment of the speed change distance at Smin.** As in the case of the Smed, depending of the lift configuration it is possible that this speed will be never used. In case of high speed lifts this speed may be the floor to floor speed and in case of short floors lift, this speed may be used to attend the shorter floors. If this is the case, the Smin adjust can be done as follows.

Set the speed at which these calls will be served in parameter 02.13.42.01 make some travels between these floors.

Adjust the speed change point as you wish increasing distance if you want more creep speed or decreasing distance if you want less. The parameters that allows you to change this speed change point are 02.13.42.10 (for the upwards speed change) and 02.13.42.11 (for the downwards speed change)

4. **Advanced door opening point:** If this lift has advanced doors, in the parameter 02.13.20.01 you can set the point at wich the lift start to open doors. If the lift do not have advance door opening, you do not need to change this setting.

NOTE: The advanced door opening requires a CSG/DSG circuit in the control panel

NOTE2: If this distance is set too big and at the time of doors opening the controller is not reading the ZD magnet, it will cancel the advanced door opening and will be opened on stop

5. **Floor level adjustment:** With the menu 02.13.10 the level of each floor can be adjusted directly in mm. Make travels inside car and make the adjust adding or subtracting the error at the level of each floor

For example. The level of floor 1 is 15mm high

- a. Go to parameter 02.13.10.02 (floor 1 level) y check its value (for example 3520)
- b. Modify this parameter to 3505

Make a new travel to this floor and check if the level now is correct.

NOTE: It is not possible to change the level of one floor if the lift is moving

NOTE2: The level can only be modified +30mm/-30mm from the centre of the ZD magnet. If the system does not allow to set the correct level, modify the position of the ZD magnet of this floor and repeat the learning process.

NOTE3: At bottom floor may be necessary to set a negative level. If this is the case add 1000000 at the desired level. For example, if the level must be -13mm set the parameter to 1000013

6. Once all the final adjustments are made, save the SPS2 configuration with the parameter 03.13.40

IMPORTANT WARNING:

1. Once the learning process is finished, the system allows to change the levels only +3cm/-3cm from the middle of the ZD magnet of each floor, because of this, the ZD magnet must be as centered as possible prior to start the learning process
2. Any modification on the position of CVI or CVS signal will require a new learning process and its final adjustment
3. Any change in parameters of SPS2 (menu 02.13) requires that you save in the SPS2 (03.13.40 parameter). If these were not saved before a power failure, they will be set back to the value set the last time it was saved
4. The 02.13.90 parameter is intended to modify advanced parameters of the SPS2. There are advanced parameters and is not advisable modify then if is not by express request by Carlos Silva s.a. technicians
5. When lift goes to floor 0 to correct. It is possible that the controller make the speed slowing at the CVI signal. If CVI is not set at enough distance the final limit switch may be reached. Increase the distance and repeat the learning process or change the inverter/valve block deceleration profile.



www.carlos-silva.com



C a r l o s S i l v a

Soluciones y Sistemas Electrónicos para Control de Ascensores

Salvador Albert i Riera 3, 08339 Vilassar de Dalt, Barcelona, ESPAÑA

GPS: (41° 30' 51" N. / 2° 22' 12" E.)

Tel. +34 937541980 Fax +34 937541983

www.carlos-silva.com

e-mail: info@carlos-silva.com

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