HYDRO:EVOLVED

USER MANUAL ADDENDUM

VERSION 1.01

SMARTRISE

Date	Version	Summary of Changes
February 24, 2025	1.01	Reviewed the *Recommended Step-by-Step Procedure for Floor Adjustments-Related Parameters* section.
October 30, 2024	1.0	Initial Release.

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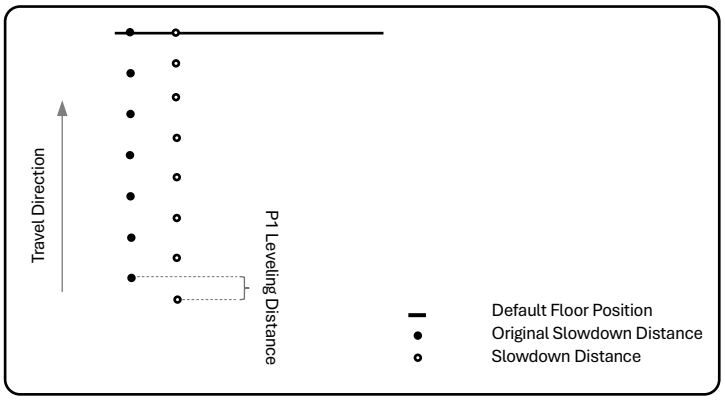
1 08-0024 P1 Leveling Distance 5mm

- **Description:** Adds leveling distance to the existing slowdown distance used in the upward direction, extending the duration the car operates at leveling speed before reaching a floor. The units are measured in 0.2-inch increments.

Slowdown Distance = P1 Leveling Distance + Original Slowdown Distance UP	[units in mm]

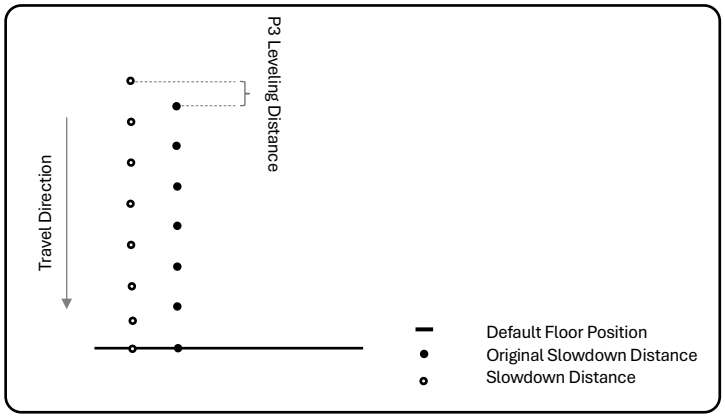


- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameters**
  4. Select **Decimal Format**
  5. Set parameter **08-0024** [see equation above]
  6. Scroll right and press **Save**

2 08-0038 P3 Leveling Distance 5mm

- **Description:** Adds leveling distance to the existing slowdown distance used in the downward direction, extending the duration the car operates at leveling speed before reaching a floor. The units are measured in 0.2-inch increments.

Slowdown Distance = P3 Leveling Distance + Original Slowdown Distance DOWN	[units in mm]



- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameters**
  4. Select **Decimal Format**
  5. Set parameter **08-0038** [see equation above]
  6. Scroll right and press **Save**

3 08-0128 TSRD Offset From NTS

- **Description:** adjusts the TSRD tripping point in reference to the NTS tripping point (the Slowdown point). If the car's speed exceeds speed threshold at either of these points after a debounce time limit, the car will trip a TSRD fault.

  NOTE: This parameter can only be activated when the car is traveling in the upward direction.

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameters**
  4. Select **Decimal Format**
  5. Set parameter **08-0128**
  6. Scroll right and press **Save**

4 08-0139 NTS Debounce

- **Description:** Defines the delay period after the car passes an NTS trip point before the NTS logic is activated. Units are in 25-ms counts.

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameters**
  4. Select **Decimal Format**
  5. Set parameter **08-0139**
  6. Scroll right and press **Save**

5 08-0118 TSRD Debounce Limit

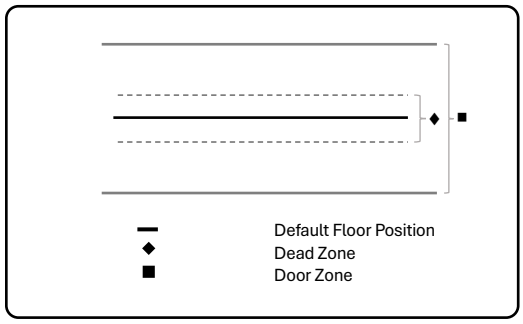
- **Description:** Sets the time the car must be in a TSRD overspeed state before a fault is flagged. Units are in 10-ms counts.

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameters**
  4. Select **Decimal Format**
  5. Set parameter **08-0118**
  6. Scroll right and press **Save**

6 08-0158 Relevel Zone Size

- **Description:** Sets the size of the releveling zone (also known as dead zone) in increments of 0.02 inches. When the elevator car is beyond this distance from the nearest learned floor position (also known as default floor position), the car will attempt to relevel.

  NOTE: The dead zone is a software-defined area near the floor level where the elevator car stops, and within the dead zone, the car will not enter the releveling process. A zone size too small will cause a yo-yoing effect, a zone too large will hinder the releveling operation and allow the car to stay off level.



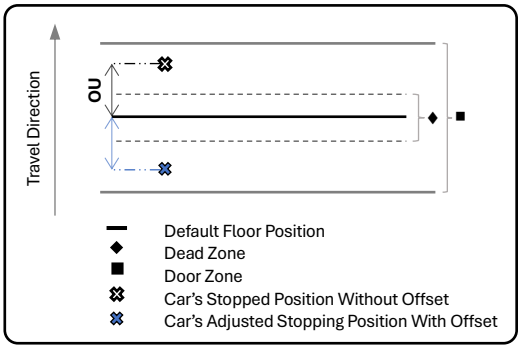
- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Setup**
  3. Go to **Floors**
  4. Select **Relevel Zone Size**
  5. Set the Relevel Zone Size
  6. Scroll right and press **Save**

7 08-0156 Relevel Offset Up 0.5mm

Set this parameter when a command is signaled to the valves to stop the car during a relevel run and the mechanic observes that the car stops beyond the default position while moving upward.

- **Description:** Decreases the releveling destination floor count by the set value when approaching a floor from below.

- **Scenario:** Consider a car traveling in the upward direction. When the car stops, it may relevel. After releveling, the car's position might overshoot above the floor position. If this overshoot occurs frequently, the mechanic will have to activate the Relevel Offset Up 0.5mm [08-0156] parameter by setting the value equal to the distance between the car position and the floor default position.



Offset Up [OU] = Car Position After Stopping – Default Floor Position [units in mm]

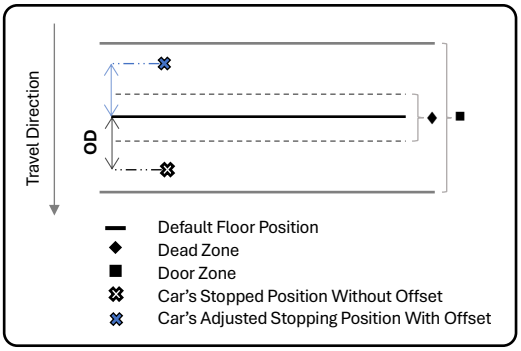
- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Setup**
  3. Go to **Hydro**
  4. Select **Relevel Offset Up**
  5. Enter the offset up value
  6. Scroll right and press **Save**

8 08-0157 Relevel Offset Down 0.5mm

Set this parameter when a command is signaled to the valves to stop the car during a relevel run and the mechanic observes that the car stops beyond the default position while moving downward.

- **Description:** Increases the releveling destination floor count by the set value when approaching a floor from above.

- **Scenario:** Consider a car traveling in the downward direction. When the car stops, it may relevel. After releveling, the car's position might overshoot below the floor position. If this overshoot occurs frequently, the mechanic will have to activate the Relevel Offset Down 0.5mm [08-0157] parameter by setting the value equal to the distance between the car position and the floor default position.



Offset Down [OD] = Default Floor Position - Car Position After Stopping [units in mm]

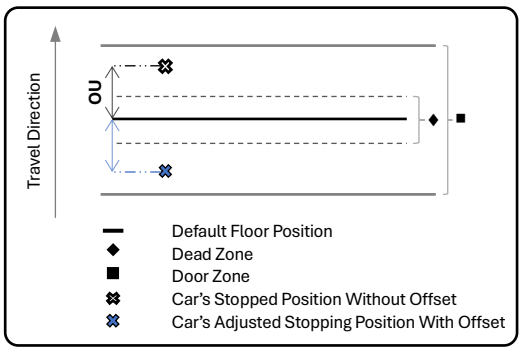
- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Setup**
  3. Go to **Hydro**
  4. Select **Relevel Offset Down**
  5. Enter the offset down value
  6. Scroll right and press **Save**

9 08-0169 Destination Offset Up 0.5mm

Set this parameter when a command is signaled to the valves to stop the car during a normal run and the mechanic observes that the car stops beyond the default position while moving upward.

- **Description:** Decreases the destination floor count by the set value when approaching a floor from below.

- **Scenario:** Consider a car during a normal run and traveling in the upward direction. When the car comes to a stop, its position might overshoot above the floor position. If this overshoot occurs frequently, the mechanic will have to activate the Destination Offset Up 0.5mm [08-0169] parameter by setting the value equal to the distance between the car position and the floor default position.



Offset Up [OU] = Car Position After Stopping – Default Floor Position [units in mm]

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Setup**
  3. Go to **Hydro**
  4. Select **Dest. Offset Up**

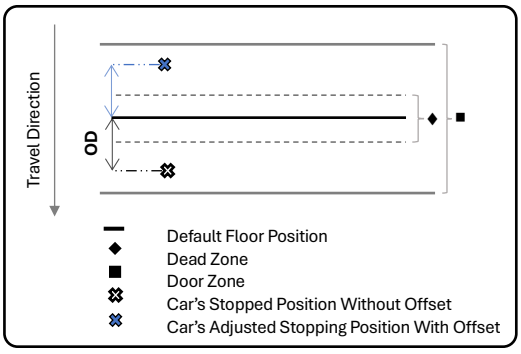
5. Enter the offset up value
6. Scroll right and press **Save**

10 08-0170 Destination Offset Down 0.5mm

Set this parameter when a command is signaled to the valves to stop the car during a relevel run and the mechanic observes that the car stops beyond the default position while moving downward.

- **Description:** Increases the destination floor count by the set value when approaching a floor from above.

- **Scenario:** Consider a car during a normal run and traveling in the downward direction. When the car comes to a stop, its position might overshoot below the floor position. If this overshoot occurs frequently, the mechanic will have to activate the Destination Offset Down 0.5mm [08-0170] parameter by setting the value equal to the distance between the car position and the floor default position.



Offset Down [OD] = Default Floor Position - Car Position After Stopping [units in mm]

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Setup**
  3. Go to **Hydro**
  4. Select **Dest. Offset Down**
  5. Enter the offset down value
  6. Scroll right and press **Save**

11 32-0007 Valve Disable Bitmap

- **Description:** Enables the selective disabling of specific valves on one or more valve boards during certain phases of a run.
  NOTE: This parameter is available on software versions 65d0 to latest.

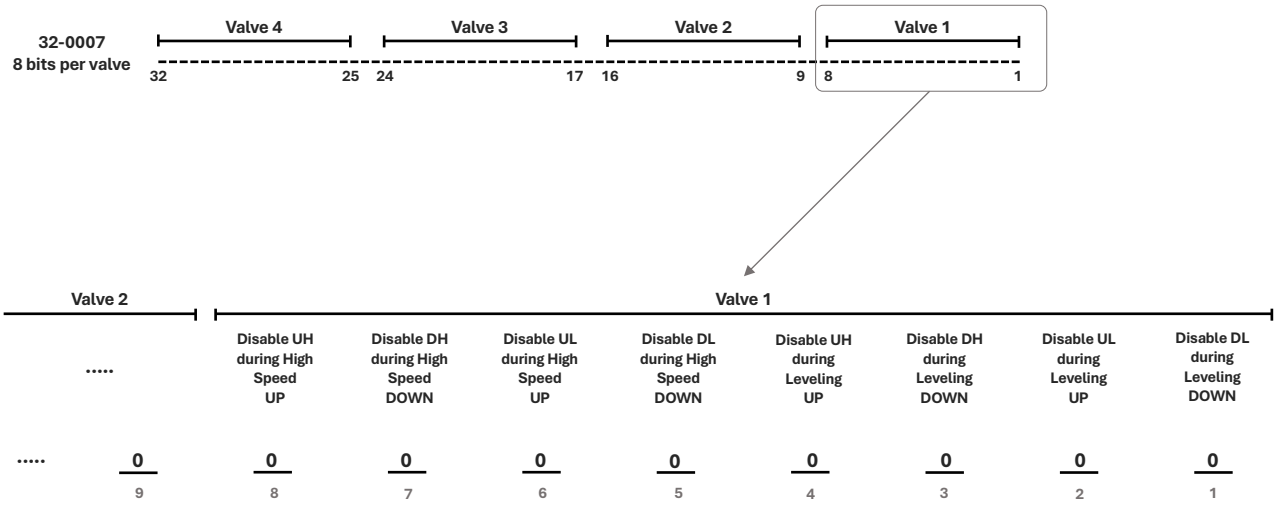
- **Scenario I:** This is useful in cases where, for example, the leveling valve should remain OFF during the high-speed phase of a run and only pick during the leveling phase.

- **Scenario II:** This is also helpful in cases where, for example, the additional valve boards are needed only during an upward travel, when the pump needs to lift heavy weights. During the downward direction, only the main (primary) valve board would be utilized.

  NOTE: The scenarios are endless and very customer/job specific so to keep up with these constraints, the 32-bit parameter (32-0007) "ValvesDisableBitmap" is provided to give the user precise control on when and how each valve board (Primary, Secondary, etc.) behaves during a run.

This 32-bit parameter is divided into 4 sets, where each set controls the behavior of a specific valve board. Each set is made up of 8 bits. By toggling the bit, the mechanic can either enable or disable the valve's functionality during specific phases of operation. When a bit is switched from 0 to 1, this serves to disable a specific action of the valve during a particular phase.

Referring to the figure below, the lowest set (right-most) corresponds to the 1st valve board, the next set represents the 2nd valve board, and the one after is for the 3rd valve board. The last set of 8 bits is for the 4th valve.



Step 1: Replace 0 with 1 to disable the required valve commands for valve 1

Step 1a (only for jobs with more than one valve board): Repeat the above step for valves 2, 3, and 4, if available

Step 2: Convert from Binary to DEC or HEX

Step 3: Save number in Parameter 32-0007

Each set is further split into two subsets of 4 bits – one subset for the high-speed phase and the other for the leveling phase. These subsets are then divided into the high-speed valve and the level Speed valve. Each Valve, whether for High UP, High DN, Level UP, or Level DN, is represented by 2 bits – one for the Up direction and the other for the Down direction.

- **Example I:** Consider the first bit in the control system. Changing the first bit from 0 to 1 at this position will prevent the primary valve board (valve 1) from picking the leveling valve during the leveling phase when a call is placed in the down direction. This scenario is not logical, as it would cause the car to remain stationary during leveling phase. Setting the second bit to 1 will have the same effect.

- **Example II:** Changing the bit values at positions 6, 14, and 22 from 0 to 1, would mean Valve 1, Valve 2, and Valve 3 will not pick/activate the leveling valve when a car call is placed in the up direction during the high-speed phase. In this case, only the high-speed valves will be engaged during the high-speed phase of a run in the up direction, then switching to the leveling valves during the leveling phase. In the down direction, both high-speed and leveling valves will pick during the high-speed phase.

The table below presents some of the most common cases with their corresponding parameter value in both decimal and hexadecimal forms.

Case	Case Description	DEC	HEX
	One – Valve System		
Disable Leveling Valve during High Speed Down	When the car is going down, only the high-speed valve will pick during the high-speed phase, then the leveling valve will pick during the leveling phase. When going up, both high-speed and leveling valves will pick during the high-speed state, then the leveling valve will pick during the leveling phase.	16	x10
Disable Leveling Valve during High Speed Up	When the car is going up, only the high-speed valve will pick during the high-speed phase, then the leveling valve will pick during the leveling	32	x20

	phase. When going down, both high-speed and leveling valves will pick during the high-speed state, then the leveling valve will pick during the leveling phase.		
Disable Leveling Valve during High Speed Down and High Speed Up	When the car is going either up or down, only the high-speed valve will pick during the high-speed phases, then the leveling valve will pick during the leveling phases.	48	x30
Two – Valve System			
Disable Leveling Valves during High Speed Down	When the car is going down, only the high-speed valves will pick during the high-speed phase, then the leveling valves will pick during the leveling phase. When going up, both high-speed and leveling valves will pick during the high-speed state, then the leveling valves will pick during the leveling phase.	4112	x1010
Disable Leveling Valves during High Speed Up	When the car is going up, only the high-speed valves will pick during the high-speed phase, then the leveling valves will pick during the leveling phase. When going down, both high-speed and leveling valves will pick during the high-speed state, then the leveling valves will pick during the leveling phase.	8224	x2020
Disable Leveling Valves during High Speed Down and High Speed Up	When the car is going either up or down, only the high-speed valves will pick during the high-speed phases, then the leveling valves will pick during the leveling phases.	12336	x3030
Disable Secondary Valve's High Speed Valve during High Speed Down	When the car is going up, both the primary and secondary valve boards will pick/activate the high-speed valves during the high-speed phase. When going down, only the primary valve board will pick/activate) the high-speed valve during the high-speed phase. Both boards will pick the leveling valve during both up and down runs.	16384	x4000

- **Configuration:**
  1. Navigate to **Main Menu**
  2. Go to **Debug**
  3. Go to **Edit Parameter**
  4. Select **Decimal Format** or **Hex Format**
  5. Set parameter **32-0007**
  6. Scroll right and press **Save**

12 Recommended Step-by-Step Procedure for Floor Adjustments-Related Parameters

Follow these steps in exact order when programming certain floor adjustments-related parameters:

I. <u>Disable Adaptive Slowdown™ system (U.S. Patent Pending)</u>:

Prior to Learning the Hoistway and Generating the Speeds and Threshold, ensure that the Adaptive Slowdown™ system (U.S. Patent Pending) is set to **OFF**:

1. Navigate to **Main Menu**
2. Go to **Setup**
3. Go to **Hydro**
4. Go to **Adaptive Slowdown**™ system (U.S. Patent Pending)
5. Select **Enable Slowdown**
6. Set to **OFF**
7. Scroll right and press **Save**

II. <u>Learn the Hoistway</u>:

1. Bring the car to the top or bottom floor terminal
2. Check if the DZ input to the CT board is high either by checking the top right corner of the main screen or by viewing the status menus
3. On the MR board, turn on **DIP 5A**
4. The main screen should change from **Normal** to **Hold UP/DN To Start**
5. Depending on the car's position:
   i. If the car is at the top landing, hold the Enable and Down buttons until the car starts moving
   ii. If the car is at the bottom landing, hold the Enable and Up buttons until the car starts moving
6. When the car stops, the screen shows **Learn Complete**
7. On the MR board, turn off **DIP 5A**

III. <u>Generate Speeds and Thresholds</u>:

1. Navigate to **Main Menu**
2. Go to **Setup**
3. Go to **Hydro**
4. Go to **Hydro Speed Setup**
5. Select **Gen Thrshlds & Dist**
6. Select **Yes**

IV. <u>Enable Adaptive Slowdown™ system (U.S. Patent Pending) & Run the Car</u>:

1. Follow steps **1-5** from part **I**
2. Set to **ON**
3. Scroll right and press **Save**
4. Run the car at high speed at least 12 times

NOTE: During these runs, the car may overshoot above or below the default floor position. This overshooting should gradually decrease with each run as the system stabilizes.

V. Adjust Floor Levels:

A. Car is Too High/ Too Low

The car may stop either too low or too high from the floor level.
If the car stops before floor level, increase the distance by the amount the car needs to move up.
If the car stops above floor level, decrease the distance by the amount the car needs to move down.

NOTE: This adjustment should be made in only one direction – either up or down – where the offset is observed. As a result, the offset will be corrected in a single direction.

1. Navigate to **Main Menu | Setup | Floors**
2. From the Floors menu, scroll and select **Too High/Too Low**
3. If the car is stopping too low or too high:
   i. If the car stops too low, go to step 4
   ii. If the car stops too high, go to step 5
4. From the **Adjust Floors** menu, adjust the stopping point so the car stops at the exact floor level. For example, if the car stops 1.5”-2” below the floor level, add that distance to the learned position. Go to step 6
5. From the **Adjust Floors** menu, adjust the stopping point so the car stops at the exact floor level. For example, if the car stops 1.5”-2” above the floor level, remove that distance to the learned position.
6. Scroll right and press **Save**

B. Store Floor Level

The Store Floor Level stores the position of the floor level.

1. Navigate to **Main Menu | Setup | Floors**
2. From the **Floors** menu, scroll and select **Store Floor Level**
3. From the **Store Floors** menu, scroll and select the floor’s position that is being changed
4. Scroll right and press **Save**

C. Relevel Offset Up/Down & Destination Offset Up/Down

Refer to sections **7** [08-0156 Relevel Offset Up 0.5mm] / **8** [08-0157 Relevel Offset Down 0.5mm] & **9** [08-0169 Destination Offset Up 0.5mm] / **10** [08-0170 Destination Offset Down 0.5mm].

VI. Adjust NTS/TSRD:

Refer to sections **3** [08-0128 TSRD Offset From NTS], **4** [08-0139 NTS Debounce], and **5** [08-0118 TSRD Debounce Limit].