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ALMEGA2 POSITIONING SYSTEM: QUICK SETUP GUIDE
"ZIEHL Z4, DIRECT TO FLOOR, KP" ISSUE: 1 Date: 12/12/2016

1. PRE-CHECKS (see page 4). Also refer to Almega2 Technical Manual Supplements: **Positioning system**
2. SETTING THE OVERRUN DISTANCE
   In general the default value of 500mm should suffice to cover the max distance the lift could ever overrun. However check this distance to ensure the max shaft position values are set correct, before using in normal operation. They can also be adjusted after the learning run.
   a. Set parameters MENU->POSITIONING SYSTEM PARAMETERS->OVERRUN TOP/BOT, typically-500mm.
3. CLEARING OUT THE FLOOR LEVELS / PREVIOUSLY LEARNED VALUES
   This is recommended for each new installation to clear (at the start of installation) any previously learned floor position values. If this is not carried out the lift may have limited travel because of incorrect information such as the terminal limits. **A common occurrence is the Lift does not go UP on inspection.** This feature can only be selected when on inspection. **Once the lift has been commissioned DO NOT USE THIS FEATURE, IT WILL WIPE ALL FLOOR LEVELS!**
   a. Select option MENU->POSITIONING SYSTEM INFO->CLR ALL FLOOR LEVELS->YES to clear floor levels, terminal limit positions, and correction information. ***Note only when on Inspection***
4. SETTING THE TERMINAL LIMITS
   a. **If parameter "SOFTWARE TERM LIMITS" = <u>NO</u>, Mechanical Terminal Limit Switches are fitted.**
      i. Set Terminal Stopping limit switches above/below, top/bot floor level as required.
   b. **Else if Parameter "SOFTWARE TERM LIMITS" = <u>YES</u>.**
      Note: Software terminal limits are NOT recommended when using an Over-speed Governor Encoder because excessive rope slip could cause the terminal limits to move position and hence the lift could either under-travel, or over-travel onto the Over-travel limits.
      i. Set parameter MENU->POSITIONING SYSTEM PARAMETERS->UP TERM LIMIT DIST as desired (distance above top floor level). Typically set at 25mm.
      ii. Set parameter MENU->POSITIONING SYSTEM PARAMETERS->DN TERM LIMIT DIST as desired (distance below bot floor level). Typically set at 25mm.
      iii. **If Terminal Limits are required before the LEARN RUN (i.e. manual setting)**
         1. Take the lift to the terminal floors and record the Absolute Top / Bottom Position Values, Position Value found by pressing MAIN MENU then LIFT / GROUP VIEWER and reading P=????
         2. Enter the values into system as SET FLOOR LEVELS (8). (POSITIONING SYSTEM PARAMETERS->FLOOR LEVELS).
         3. The terminal limits will now be set e.g. 25mm above and below top/bot floor levels. The lift will stop on these on Inspection Control.
      iv. **Setting terminal limits during Learn Run**
         1. After setting the UP/DN TERM LIMIT DISTANCES (as above) the lift will automatically set the terminal limits when the learning run has been successful.
5. PUT THE LIFT ON PREPARE TO TEST CONTROL (DOORS OFF).
   a. Press MAIN MENU then ENGINEERS SELCTION, or
      i. press MAIN MENU then PARAMETERS then SPECIAL SERVICE2 on the screen.
   b. Move the cursor DOWN to highlight "PREPARE TO TEST CTRL"; Press SELECT
   c. Select the Option DOOR OFF.
   d. Press OK.
6. TAKE LIFT TO BOTTOM ON INSPECTION.
   a. **If Terminal Limits are not configured or not set.**

<ol start="6">
<li type="a">

      i. Lift will be required to run onto Down final limit at the bottom instead of Down Terminal limit, and the limit will have to be bridged to move back up (or handwind). Alternatively the user can physically take the lift to the bottom flr lev before initiating the learning run.

b. If PANEL TEST CONTROL is fitted

      i. Switch to Inspection.

      ii. Take to bottom, and stop on the Down Terminal / Stopping Limit.

      iii. Nudge the lift UPWARDS to release the Down Terminal / Stopping Limit. (This will ensure bottom floor level is not below the limit!)

      iv. Switch Back to Normal.

c. Else if PANEL TEST CONTROL is NOT fitted

      i. On the main terminal rail (lift shaft/car side) remove the wire in terminal **TS** and mark it, then wire in the same terminal as **TS1.**

      ii. Take to bottom (by bridging the Test Down connections TF and TD), and stop on the Down Terminal / Stopping Limit.

      iii. Nudge the lift UPWARDS (by bridging the Test Up connections TF and TU) to release the Down Terminal / Stopping Limit. (This will ensure bottom floor level is not below the limit!)

      iv. Switch Back to Normal by restoring the **TS** wire back into the terminal **TS**.

7. INITIATE LEARNING RUN.

    a. Press MAIN MENU then LIFT / GROUP VIEWER on the screen (to show lift viewer).

    b. Is the Door Zone Sensor input on (**Z ●** = ON, **Z ○** = OFF)? If not, DO NOT CONTINUE; get the Door Zone working 1st!

    c. Make sure the lift is not on **any other service that will inhibit the learn run**, check inputs: Fire, Fire Alarm, Serv Ctrl, LW110, LW90, THERM, INSP, Priority Service, Code Blue, ESUP, Auto Srv, Shutdown. Also check brake monitoring switches operate correctly (if fitted).

    d. Press MAIN MENU then POSITINING SYSTEM INFO then select LEAR RUN INITIATION on the screen; press YES to start the learn run; the LIFT / GROUP VIEWER will be invoked.

    e. Read the information on the LCD; press YES to continue.

    f. Wait for the lift to run to the top and back again before the learning has completed.

8. TRY A LIFT FLOOR TO FLOOR RUN (FROM THE CONTROL PANEL)

    a. Before setting floor levels the response of the system needs to be checked so that the lift stops properly, else floor level settings will be inaccurate. Press the **TOP** button whilst in the LIFT / GROUP viewer screen to reset lift position.

    b. Run the lift UP to a floor (preferably a middle floor to avoid terminal / over-travel limits) from the control panel; **do not check the physical floor level within the lift car, this is done later!**

    c. Ensure the lift electrically decelerates to NEAR ZERO SPEED before releasing the brake. If not try adjusting the parameters in the order as below (note all can be fine tuned later):-

      i. SPD_KP   1.0 (Default)   up to 2.5 max   (Speed Reg Base Gain Factor)

    d. Make a note of the position it stops at (i.e. 4000 at floor 2).

    e. Run the lift DN to the same floor. Make a note of the position it stops at (i.e. 4000 at floor 2).

    f. This should correspond to the learned floor level of position 2 ±1mm (e.g. POSITIONING SYSTEM PARAMETERS->FLOOR LEVELS->FLOOR 2 = 4000.

9. PUT THE LIFT ON PREPARE TO TEST CONTROL (DOORS PARK OPEN).

    a. As 5(a/b/c/d), but select "PARK OPEN";   Press ENTER

10. SET FLOOR LEVELS.

Up to this point the actual physical floor levels should NOT have been set. The aim was to setup the positioning system to stop at the learned values rather than the actual floor levels. NOW is the time to set the actual floor levels from within the lift car!

    a. Travel to each floor in turn, making a note of the position error in mm. Travelling to each floor in both directions IS NOT NECESSARY as the system should be the same for both UP and DOWN.

    b. From the menu POSITIONING SYSTEM PARAMETERS->FLOOR LEVELS, select each floor in turn and use the selection wheels to adjust the absolute position in millimetres.

<p align="center">FLOOR LEVEL ADJUSTMENT INFORMATION:</p>

<p align="center">*Fig 1*</p>

0	0	0	0	0	0	0	2 3 4	0	0	0
1	1	1	1	1	1	1	5	1	1	1
2	2	2	2	2	2	2	6	2	2	2

11. LIMITS (SLOWING/STOPPING) AND BUFFER TESTS

A set of dedicated buttons are available to assist in the testing of the slowing limits, stopping limits and lift buffers (i.e. buffer test). To make the buttons appear press and hold the shaft area of the screen for 5 Seconds. Once the buttons appear they need to be held under "constant pressure" to invoke the function. If the buttons are not pressed for a period of 20 minutes they will disappear. Also to clear the buttons, simply press MENU and press LIFT/GROUP VIEWER to re initialise the lift viewer. (see Fig 2).

    a.   TESTING THE SLOWING LIMITS

Press **TOP** button to register a top car call and, then press **SLOW LIMIT TEST** button under constant pressure to inhibit the STEP signal, thus forcing the lift to slowdown via the slowing limit. Press **BOT** to register a bottom car call and repeat the above process.

    b.   TESTING THE TERMINAL LIMITS

Press **TOP** button to register a top car call and then press **STOP VANE TEST** button under constant pressure to inhibit the stopping signals, thus forcing the lift to stop on the terminal limit. Press **BOT** to register a bottom car call and repeat the above process.

    c.   TESTING THE OVERTRAVEL MECHANICAL BUFFERS (BUFFER TEST)

<u>Note this function is to be used only by responsible Lift Test Engineers!</u>

Press **TOP** button to register a top car call and then press **BUFF TEST** button under constant pressure to inhibit the **slowing**, **slowing limits** and **stopping signals**, thus forcing the lift to crash stop onto the lift buffers on HIGH SPEED! Press **CPB** to register a bottom car call and repeat the above process.

12. CAN/CANopen INFORMATION

    a.   The Positioning system is designed for use with Position Devices incorporating CAN or the industry standard CANopen communication protocol. Therefore information can be transferred from the device and viewed by selecting option MENU->POSITIONING SYSTEM INFO-> CAN/CANOPEN INFO. In particular the error information can be viewed as below:

        i.   Schmersal USP: = USP wire Errors / Warnings / CANopen information.

        ii.   Hengstler AC58:   = Contains Alarm / Warnings / CANopen information.

        iii.   CEDES   = APS Status / Errors /Warnings / CAN Information

13. FURTHER INFORMATION FOR USE WITH AN OVERSPEED GOVERNOR ENCODER (If fitted)

    a.   **Resetting the Absolute Position:**

It may be necessary to reset the absolute position of the lift for the following reasons:

        i.   Excessive Correction: See below

        ii.   Clear Correction Levels: With the lift physically at the bot flr level, select to clear.

Select option MENU->POSITIONING SYSTEM INFO-> RSET ENCODER POSITION ->YES to reset the absolute position of the encoder to the position of the bottom floor level.

    b.   **Correction Point Moved:** It is vital that correction points do not move once set after a learn run. <u>IT IS STRONGLY RECOMMENDED THAT CORRECTION SENSOR / POINTS ARE FIXED SO THAT THEY DO NOT MOVE.</u> If they do move they will affect floor levels to the amount moved (i.e. 30mm UP if moved 30mm UP etc). Rectify by (v) "Corr Fault Info" (as below)

    c.   **Correction Point Missing:** If a correction point is not found the event "CORRECT POINT MISSING" is generated in the event logger, and the position error will NOT be corrected! This can be caused by (i)-(v) as "Corr Fault Info" (as below).

    d.   **Correction Point exceeded:** If the level of correction is exceeded, the event "POS DEV CORR EXCEEDED" is generated in the event logger, and the position error will NOT be corrected! The level in the software is typically set to 50mm. This can be caused by (iv) or (v) as "Corr Fault Info" (as below).

    e.   **Correction Fault Info:** When the lift has arrived at its destination it looks for a correction point before stopping. If missing / exceeded the lift will still operate as normal but floor levels will slowly drift over time (due to rope slip) until the appropriate action [as below] is taken.

        i.   Corr Point missing   [re fit corr point]

        ii.   Corr Sensor Failed   [new sensor]

        iii.   Floor Level adjusted > half corr vane length (i.e. >150mm for a 300mm vane) [move corr point central then new learn run].

        iv.   Excessive OSG Rope Slip i.e. the OSG trips and the rope slips [move rope back, or reset abs posn, or new learn run]

        v.   Corr Sensor Moved   [Move back, or new learn run]

    f.   **Correction information:** Select option MENU->POSITIONING SYSTEM INFO-> CORRECTION INFO to view the current correction information. From this menu correction levels can be viewed for each floor. A test would be to run the lift to each floor and the current level should be similar for each floor. If one is vastly different to all the rest then typically the correction point for that floor has moved.

    g.   **Position Device Power Output:** Typically the position encoder will be powered through a relay output from the micro processor. This is to reset the encoder under communications failure by re-cycling the power. If a communications lost condition is detected this output will de-energise every 10 seconds for 2 seconds to re-cycle the power.

14. PRE-CHECK INFORMATION:

A. Door Zone Sensor / Door Zone Actuators Fitted At Each Floor Level.
   a. Ensure **Door Zone Actuators (DZA's)** are fitted at each flr lev and operate the **Door Zone Sensor (DZS)** fitted on the lift car. Also the **DZA's** are clear of any obstructions of the lift car and **DZS**.
   b. Also ensure the signal from the **Door Zone Sensor** can be seen in the lift controller. This can be achieved by pressing MAIN MENU then LIFT / GROUP VIEWER which will display the screen as Fig 2 below:
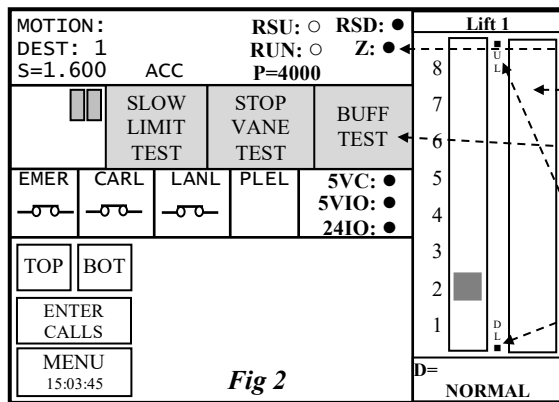

Fig 2

- - - - DZ sensor / Input must be ON!

Note for special Buttons
Press and Hold the shaft Area for 5 seconds to make the test buttons appear. 3 Test Buttons appear in the area dedicated for extra door operators.

If the software terminal limit parameter is set, the terminal limits will appear in the lift viewer as shown.
Filled RED = no position value assigned
Filled GREEN = limit is ok
Not Filled = limit is broken (on the limit)

B. Motor Wiring / Speed
   a. Ensure motor windings are wired correctly i.e. typically the high speed windings (with the lowest electrical resistance, and wired in STAR). Ensure the motor runs at the correct speed (Closed Loop) on <u>Inspection</u>. E.g. on the Almega2 LCD display "S = 0.30" is the actual measured speed, or measure using a Tachometer.

C. Almega2 Parameters (e.g. Contract Speed = 1.6m/s)
   a. TRAVEL TIMES   (Press MENU->PARAMETERS->TRAVEL TIMES)
      i.   STOP TIME   = 3000   Milliseconds
      ii. BRAKE LIFT TIME   = 200   Milliseconds
      iii. BRAKE RELEASE TIME   = 3000   Milliseconds
   b. TRAVEL SPEEDS   (Press MENU->PARAMETERS->TRAVEL SPEEDS)
      i.   DRIVE CONTRACT SPEED / HIGH SPEED / MEDIUM SPEED1   = 1.6 m/s
      ii. DRIVE LEVEL SPEED   = 0.060   m/s
      iii. DRIVE TEST SPEED   = 0.300   m/s
      iv. PROFILE FINISH SPEED   = 0.002 to 0.005 for Geared, 0.010 for Gearless.
      v.   LEARN RUN SPEED   = 0.200   m/s
   c. TRAVEL CONTROLS   (Press MENU->PARAMETERS->TRAVEL CONTROLS)
      i.   STOP ON RUN RELEASE   = YES
   d. CANOPEN DRIVE SETUP (Press MENU->CANOPEN DRIVE SETUP)
      i.   CANOPEN DRIVE MODE   = VELOCITY
      ii. QUICK STOP DECEL   = 2000
   e. POSITIONING SYSTEM SETUP (Press MENU->POSITIONING SYSTEM PARAMETERS)
      i.   SPEED PROFILE CONTROL   = YES
      ii. OVRSPEED GOV DIAMETER (if fitted) = Diameter of OSG (i.e. 300mm for Atwell VG OSG)

D. Drive Parameters
   a. MOTOR NAME PLATE   Enter correct details from the motor name plate
   b. ENCODER & BC   Enter Correct details relating to the motor encoder and check details relating to the Brake Controller /Brake Resistors.
   c. INSTALLATION
      i.   n*   <= MOTOR NAME PLATE->Nominal Motor Speed (*Linked to Almega 2*)
   d. CONTROL SYSTEM
      i.   CONFIG   = 35: LESTER   (Drive Configuration)
      ii.   f IO1   = 01:RF   (Drive Enable)
      iii. f XBR1   = BR1   (If set for Brake Monitoring)
      iv.   f XBR2   = BR2   (If set for Brake Monitoring)
      v.   f O5   = V < V_G1   (Drive Level Speed Feedback output)
      vi.   V_G1   = 0.3m/s   (Drive Level Speed Feedback speed)
   e. MONITORING
      i.   BR   = 2*NC   (2 normally closed (if Brake Monitoring))
   f. TRAVELLING
      i.   V_1   0= .1m/s   (Communications Lost Speed)
      ii.   V_3   = Contract Speed   (*Linked to Almega 2*)
   g. DECELERATING
      i.   A_NEG   = 2.0m/s²   (Quick Decel Rate (*Linked to Almega 2*))
      ii.   R_NEG1/2   = 80%   (Rounding top/bottom)

       h.   CONTROLLER

i.	SPD_KP	= 1.0	(Speed Reg Base Gain Factor)
ii.	SPD_TI	= 100ms	(Speed Reg reset time)
iii.	R_NEG1/2	= 80%	(Rounding top/bottom)

E.   Slowing Limits

      a.   Ensure slowing limits are set as the <u>backup slowing distances (BSD)</u> as below. (Also see shaft wiring drawing). <u>Setting the distance too great may generate events "SLOWED: UP/DN SLOW LIMIT" and result in inaccurate floor levels at the terminal floors!</u>

      b.

Speed (m/s)	BSD (mm)	Speed (m/s)	BSD (mm)	Speed (m/s)	BSD (mm)
0.2	= 250	1.0	= 900	2.0	= 2150
0.5	= 450	1.25	= 1200	2.5	= 3000
0.75	= 700	1.6	= 1600	3.0	= 3900

F.   Overspeed Governor Encoder (if fitted)

      a.   Ensure Correction Sensor/Points are firmly fixed and cannot move. Also central to floor level.

      b.   Ensure the encoder coupling to the OSG is fitted correctly and all the grub screws are tightened.

15. <u>SOFTWARE SLOWING LIMITS (Using Cedes Dual Positioning System):</u>

A. Almega2 Parameters
- a. POSITIONING SYSTEM   (Press MENU->POSITIONING SYSTEM PARAMETERS)
  - i. SOFTWARE SLOW LIMITS   = YES
  - ii. SLOW LIMIT DECEL RATE   = 1700
  - iii. SLOW LIMIT JERK RATE   = 1700
  - iv. CALC SLOW LIMIT DIST HS   = (READ ONLY)
  - v. SLOW LIMIT RESET DIST   = 750
  - vi. SLOW LIMIT DIST ADJUST   = -50
- b. TRAVEL SPEEDS   (Press MENU->PARAMETERS->TRAVEL SPEEDS)
  - i. SLOW LIMIT COMMS LOST SPEED   = 0.5   m/s

B. RSU and RSD status with software slowing limits.
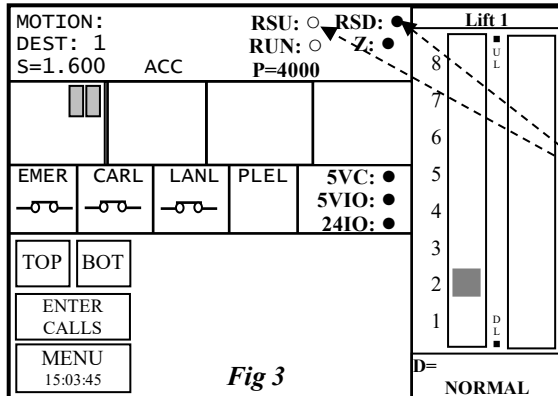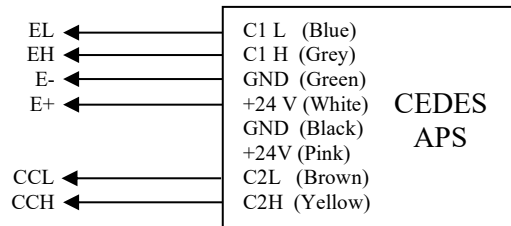- a. Ensure Bottom and Top floors are assigned.

If the SOFTWARE SLOW LIMITS parameter is set, the RSU/RSD will indicate the software slow limit status as below.

Filled RED   = Top/Bottom floor not assigned
Filled ORANGE = Slow limit comms lost
Filled GREEN   = Activated
Not Filled   = Not Activated

Fig 3

C. Wiring
- a. Ensure CEDES channel 1 connected to Position Encoder CAN
- b. Ensure CEDES channel 2 connected to CAR CAN


```
EL ◄───── C1 L  (Blue)
EH ◄───── C1 H  (Grey)
E- ◄───── GND (Green)
E+ ◄───── +24 V (White)      CEDES
          GND (Black)         APS
          +24V (Pink)
CCL ◄──── C2L (Brown)
CCH ◄──── C2H (Yellow)
```

D. Calculated Slowing Limit Distance HS

This can be viewed from the parameter (POSITIONING SYSTEM PARAMETERS->CALC SLOW LIMIT DIST HS). This parameter is updated every 1s for the speed HS. It's also updated when running with the HS value.

E. Non-profile setup
- a. When using non profile control and slow dist calc=Travel Speed PAR, i.e. hydraulic, adjust the backup slowing limit by setting the 'SLOW LIMIT DIST ADJUST' by x value.
  e.g. when it is set to default -50, it puts the backup slowing limits -50mm behind the actual slowing distance.
  (Press MENU->POSITIONING SYSTEM PARAMETERS-> SLOW LIMIT DIST ADJUST)

- b. The debug screen will show the last up/down slow distance.
  (Press MENU->POSITIONING SYSTEM INFO-> DEBUG INFO)