

## **Plus 1 Paver Control – Pump Selection (High Current Pumps only)**

The adjustment of the pump parameters in the PLUS1 controller is to handle the different resistance levels in the two High Current pumps; a Sauer H1 and a Rexroth. This is only done for the High Current pumps; the low current (Sauer Series 42) pump logic requires no changes. The Maximum PWM, Minimum PWM and Threshold Percentage values for High Current outputs all have to be adjusted to accommodate the valves on the Rexroth pump which have approximately thirty-three percent more resistance than the valves on the H1 pump. The default PLUS1 controller values are for a Sauer H1 pump. The following routine handles the selection of parameters:

1. Turn OFF power to the control system (Key in Stop/Off position)
2. Connect at least one Steering Wheel or Dual Joystick control box
3. Turn all RUN / STOP switches on the control box(or boxes) to STOP
4. Open the control panel and install the Y-adapter that allows connecting the Optimize and Calibrate plugs at the same time
5. Connect the High Current plug to the High Current connection
6. Connect the Optimize plug to the Y-adapter (ensure that the wires In and Out match)
7. Connect the Calibrate plug to the Y-adapter (ensure that the wires In and Out match)
8. Turn ON the power to the control system (Key in ON position)
9. Wait for the Status Light on the control panel to go out (indicates waiting for commands / running OK)
10. Move the Left Joystick on either Dual Joystick box (if more than one is installed) or the Speed/Direction Joystick on either Steering Box (if more than one is installed) to one of the following positions to choose which parameters to load:
  - a. All the way Forward – loads the Sauer H1 parameters
  - b. All the way Reverse – loads the Rexroth parameters
11. If both Left Joysticks (Dual Joystick boxes) or both Speed/Direction Joysticks (Steering boxes) are moved then NO parameters will be changed; user can only move one Left Joystick or Speed/Direction Joystick
12. Toggle the RUN / STOP switch on the box with the positioned Left Joystick (or Speed/Direction Joystick) to RUN
13. If Parameter Change is successful, the Status Light will flash very rapidly
14. Toggle the RUN / STOP switch used in step 12 to STOP (the Status Light will stop flashing)
15. Turn OFF the power to the control system (Key in OFF position)
16. Disconnect the Optimize and Calibrate plugs from the Y-adapter

After a Parameter Change routine is completed, all Optimize and Calibrate values are reset to default values. Optimize and Calibrate routines will have to be processed again if they were already done before the Parameter Change.

# Optimize Mode – Plus 1 Paver Control

## **To optimize the Dual Joystick Steering Control Box:**

1. Turn the machine off. Open the dash board panel and locate the Optimize/Calibrate connector and plug it into the Optimize receptacle.
2. Place all joysticks in the center position and move the Run/Stop switch(s) into the Stop position.
3. Turn the power key to the on position (power to the Plus One controller). Outputs are disabled. The status light will blink a slow continuous blink to indicate Optimize Mode.
4. Wait 5 seconds for the Plus One to capture the joysticks in center position.
5. Push joysticks full forward for 5 seconds.
6. Push joysticks full reverse for 5 seconds.
7. If a second control box is present optimize it in the same manner.
8. The status light will stop blinking. Unplug the Optimize/Calibrate connector from the Optimize receptacle and turn off the power key.

## **To Optimize the Steering Wheel with Forward/Neutral/Reverse Joystick Control Box:**

1. Turn the machine off. Open the dash board panel and locate the Optimize/Calibrate connector and plug it into the Optimize receptacle.
2. Place all steering wheels and joysticks in the center position and move the Run/Stop switch(s) into the Stop position. **Be sure that the steering wheels are centered!**
3. Turn the power key to the on position (power to the Plus One controller). Outputs are disabled. The status light will blink slowly with no pauses to indicate Optimize Mode.
4. Wait 5 seconds for the Plus One to capture the steering wheel center position.
5. Turn the steering wheel full right and push the FNR joystick full forward for 5 seconds.
6. Turn the steering wheel full left and the FNR joystick full reverse for 5 seconds.
7. If a second control box is present optimize it in the same manner.
8. The status light will stop blinking. Unplug the Optimize/Calibrate connector from the Optimize receptacle and turn off the power key.

# Plus 1 Paver Control Calibration – Joystick Boxes

Calibration (also called straight line tracking) involves 4 steps: Threshold, low, mid and high speed setting. There are separate procedure for calibrating machines with Dual Joystick steering control and Steering wheel with FNR Joystick steering control. On machines with two steering control boxes the calibration will only need to be done with one box. **THIS PROCEDURE WILL SET THE MAXIMUM SPEED OF THE MACHINE.**

## To Calibrate the Dual Joystick Steering Control Box:

Turn the machine off. Open the dash board panel and locate the Optimize/Calibrate connector and plug it into the Calibrate receptacle.

Place all joysticks in the center position and move the Run/Stop switch into the Run position. If two control boxes are present place the other Run/Stop switch to the stop position.

Turn machine on and the status light will blink rapidly with no pauses to indicate Calibration Mode.

## Setting the threshold:

1. Start the engine and run at ½ throttle
2. Move left joystick forward until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.
3. Move left joystick reverse until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral
4. Move right joystick forward until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.
5. Move right joystick reverse until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.

## Setting the straight line tracking:

1. Move joysticks forward until machine begins to move forward slowly, adjust Right Joystick forward or reverse as necessary to make sure machine is traveling straight. Toggle Run/Stop switch from Run to stop and back to run
2. Move Left Joystick to approximately 1/2 joystick position, adjust Right Joystick forward or reverse as necessary to make sure machine is traveling straight. Toggle Run/Stop switch from Run to stop and back to run.
3. Move Left Joystick to full forward, adjust the Right Joystick forward or reverse as necessary to make sure machine is traveling straight. When the machine has achieved full speed, reduce joystick position until the machine slows to the desired maximum speed and then toggle Run/Stop switch from Run to stop and back to run. **NOTE:** This setting determines the machines maximum speed. Any joystick movement beyond this point will have no effect on the machines forward speed.
4. Repeat for reverse.
5. Bring both joysticks to neutral.
6. Keeping power to the Plus One, unplug the Optimize/Calibrate connector from the Calibrate receptacle (this will write the calibration values to memory).
7. Turn off and restart machine. Run machine to verify acceptable operation. Machine will now operate in typical dual joystick mode with speed and direction of each track controlled by the respective joystick.

# Plus 1 Paver Control

## Calibration – Steering Wheel Boxes

**To Calibrate the Steering Wheel with Forward/Neutral/Reverse Joystick Control Box:**  
Turn the machine off. Open the dash board panel and locate the Optimize/Calibrate connector and plug it into the Calibrate receptacle.

Place all steering wheels and joysticks in the center position and move the Run/Stop switch into the Run position. If two control boxes are present place the other Run/Stop switch to the stop position. Turn machine on and the status light will blink rapidly with no pauses to indicate Calibration Mode.

### **Setting the threshold:**

1. Start the engine and run at ½ throttle
2. Turn the steering wheel full left; Move FNR joystick forward until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.
3. With steering wheel still at full left; Move FNR joystick reverse until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral
4. Turn the steering wheel full right. Move FNR joystick forward until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.
5. With steering wheel still at full right; Move FNR joystick reverse until machine begins to move slightly, back off on handle until machine stops, then toggle run/stop switch from run to stop and back to run. Return joystick to neutral.

### **Setting the straight line tracking:**

1. Move FNR joysticks forward until machine begins to move forward slowly, adjust the steering wheel as necessary to make sure machine is traveling straight. Toggle Run/Stop switch from Run to stop and back to run
2. Move FNR Joystick to approximately 1/2 joystick position, adjust the steering wheel as necessary to make sure machine is traveling straight. Toggle Run/Stop switch from Run to stop and back to run.
3. Move FNR Joystick to full forward. When the machine has achieved full speed, reduce joystick position until the machine slows to the desired maximum speed. Adjust the steering wheel as necessary to make sure machine is traveling straight. Toggle Run/Stop switch from Run to stop and back to run. **NOTE:** This setting determines the machines maximum speed. Any joystick movement beyond this point will have no effect on the machines forward speed.
4. Repeat for reverse.
5. Bring the FNR joystick to neutral and center the steering wheel.
6. Keeping power to the Plus One, unplug the Optimize/Calibrate connector from the Calibrate receptacle (this will write the calibration values to memory).
7. Turn off and restart machine. Run machine to verify acceptable operation.

# Plus 1 Paver Control – Calibration Reset Procedure

(Controller must have software SA2793v121 or greater for this feature to work)

Once the calibration procedure is complete and the calibration needs to be done again the memory needs to be reset in the controller before attempting to calibrate the machine again.

1. Turn OFF power to the control system (Key in Stop/Off position)
2. Connect at least one Steering Wheel or Dual Joystick control box
3. Turn all RUN / STOP switches on the control box(or boxes) to STOP
4. Open the control panel and install the Y-adapter that allows connecting the Optimize and Calibrate plugs at the same time
5. Connect the Optimize plug to the Y-adapter (ensure that the wires In and Out match)
6. Connect the Calibrate plug to the Y-adapter (ensure that the wires In and Out match)
7. Turn ON the power to the control system (Key in ON position)
8. If the reset is successful, the Status Light will flash very rapidly and then stop.
9. Turn OFF the power to the control system (Key in OFF position)
10. Disconnect the Optimize and Calibrate plugs from the Y-adapter

The controller will be set to factory defaults. Optimization and calibration will need to be performed on the machine.