Accutrac 360-t, Tunnel

Startup Procedure

2044 Wadsworth Rd
Norton Ohio 44203

Rev. 07-17-19

Contents

1. Prior to Powering Up the 360-t Controller:

Turn off all circuit breakers and motor disconnects in the Accutrac360-t control panel. Verify that the Bridge End Stops have been installed.

1.1. Check all Proximity Sensors

Verify the Bridge Entrance, Exit & Home proximity sensors have been adjusted from shipping position to **the 3/16" to 1/4" away from the target flags** (face of the proximity sensor will **protrude 3/4" to 13/16" above its mounting plate).** This applies to both D.S. and P.S. Trolley's Extend and Retract proximity sensors also.

Verify all external power to the controller & the 25Hp pump station motor starters or VFD's are powered off. Verify all 360-t controller internal breakers & disconnects are Off.

1.2. Spray Arm Breakaway Setting

Verify Tension has been set properly, according to the procedure located in the Installation Manual and the Operating & Troubleshooting Manual. **Note: the elastomer Breakaway Spring takes a set, and must be readjusted 24-48 hours after initial setting. Measured with a steady 3 second pull at the detent in the lower cover, breakaway force toward the rear (away from nozzles) should be 42 lbs. Breakaway force toward the left (facing spray nozzles) should be 29 lbs.**

1.3. Check for Correct wiring and Voltages

Verify correct wiring for 4-wire 208V Wye versus 230V Delta**. Note: Delta system requires a separate 120V feed and removal of jumper wire to L1A (refer to schematics).**

Verify the 360-t Input (Buffer) relays have coils that match the incoming voltages from the tunnel controller, entrance eye, conveyor pulse, conveyor running, etc. ***(Note that a jumper bar is in place for the "A2" or "common" side of the relay coils (24VDC- is standard, other voltages are optional and must be requested. Refer to schematics)***

2. Power Up & Input Tests:

Power up the 360-t Control Panel, confirm correct voltage at the Line Inputs Then turn CB1 on to power up the PLC & DC power supply, & CB4 for external 24VDC

2.1. Test all Inputs

On the touch screen, go to the **"Menu"** Button, then **"Input View"**: Test all the inputs: E-stops, photo-eyes, proximity switches, and external inputs from the tunnel controller for an on/off transition. Start the conveyor and verify a steady and accurate pulse input exists.

Verify there is a 24VDC(+) jumper to Input 1001, and jumper 24VDC(+) to 1021 if there is No Top Spray Arm.

Note: Inputs 0-31 on the touch screen correspond to inputs 1000-1031 on input list. Input 0 is Input 1000, 1 is 1001, and 2 is 1002 etc. Input 1028, 1029 & 1030 are optional.

Refer to Appendix A for Input/Output List

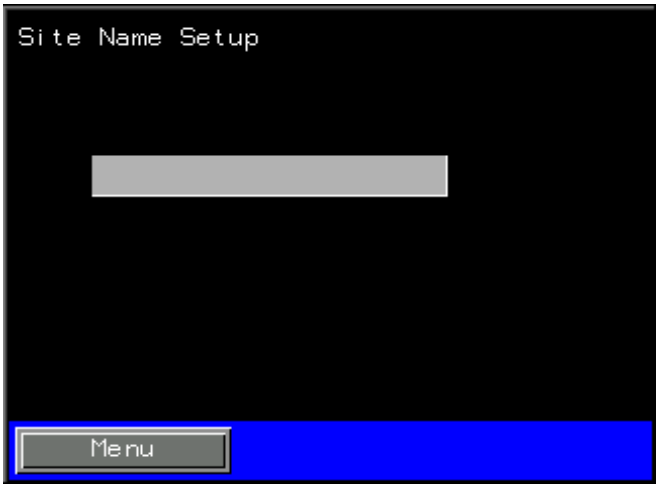
3. Programming:

On the Touch Screen, under **“Menu”** →
Select **“Setup”**→

Setup Menu

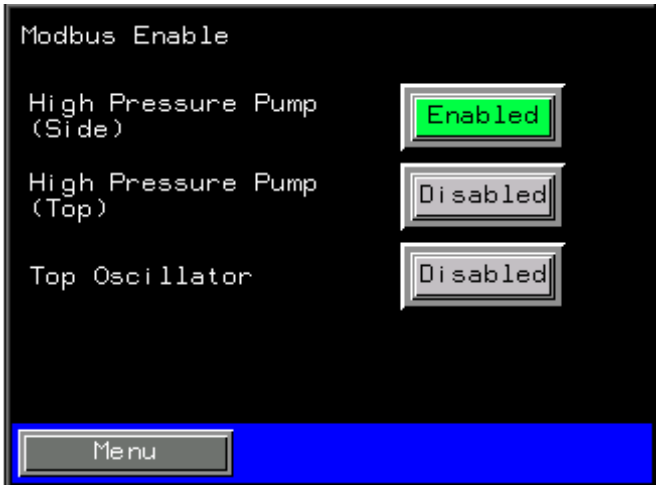
3.1. Entering Site Name:

Select "**Location**": Enter the Site Name. (Number of characters is limited)



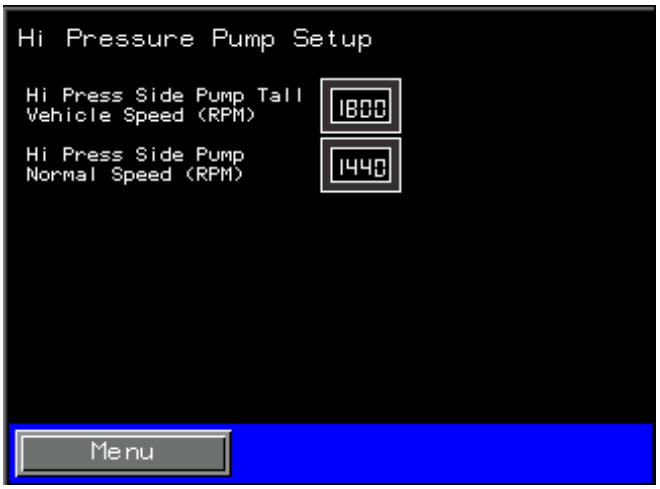
3.2. Enable optional Variable Frequency Drives (Modbus Communication)

Select **"Modbus Enable"** → "**HP Pump Side**": Select "**Enabled**" if using a VFD (Variable Frequency Drive) on the 25Hp Side pump. (Disable if using a motor starter) Same goes for the Top HP pump (with a VFD) and Top Oscillator if you have the Top Washer option.



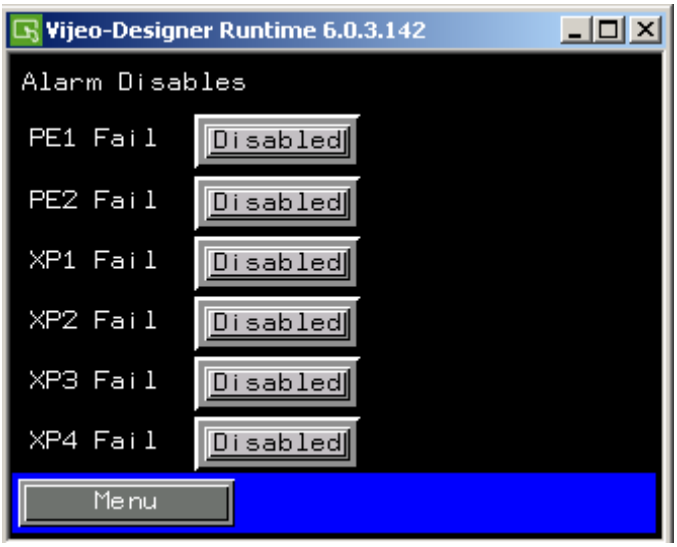
3.3. Set HP Pump Speeds:

Select **"HP Side"**: Set **"Tall Vehicle Pump speed"** to **"1800 RPM"** and **"Normal Pump Speed"** to **"1440 RPM"** (Not required if HP pump has a motor starter rather than a VFD).



3.4. Enable Alarms:

Select **"Alarms"**: Enable "**PE-1 & PE-2 Fail"**. Additionally, if using Tall Vehicle nozzle without Top Washer, only enable **XP-3 Fail**. If it's equipped with a Top Washer enable **XP-1** through **XP-4 Fail**.

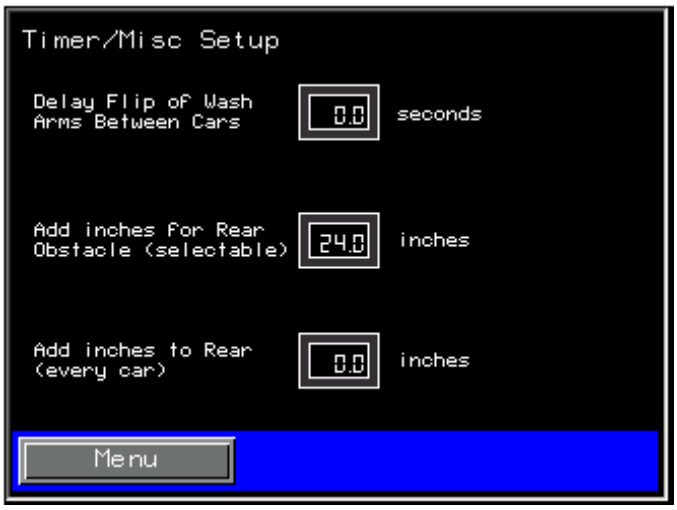


3.5. Set Timers & Miscellaneous Features:

"Tmrs/Misc"→ "Delay Flip": Holds the Spray Arms on the rear license plate area before rotating to the front of next vehicle. 1.5 seconds is a typical amount of delay at the rear.

"Tmrs/Misc"→ "Add inches for Rear Obstacle (Optional)": When selected, via a tunnel controller output, the rear obstacle avoidance feature (Input #1030) will add a settable number of inches to the distance the spray arms track the rear of the vehicle. This allows the 360-t to safely wash ladder racks, bike racks, trailer hitches, etc. without causing an impact.

"Tmrs/Misc"→ "Add inches to Rear <Every Car>: Default is set to 0.0 inches.



3.6. Third Nozzle Control:

"3rd Nozz Control"→ 3rd Nozz Control: Enable if the 3rd Nozzle Option is being used. If unsure, look at the 360-t spray arms. With the 3rd Nozzle Option, the spray arms have been plumbed such that no water feeds the top nozzle. In this case, the ½" hose feeds a manifold to the bottom two nozzles and the 3/8" hose feeds a manifold to the 3rd nozzle from the bottom. If all 4 nozzles have hoses & plumbing to them, then you have the standard 4-nozzle configuration.

3.7. HVI Mode:

Enable the HVI mode if the Accutrac 360-t is **not used to track & wash every car.** This function increases tracking accuracy when a vehicle that **does not** get tracked & washed by the 360-t is followed closely by a vehicle that **does**.

3.8. Passenger Side Sizing (WAGO PLC Only, Optional):

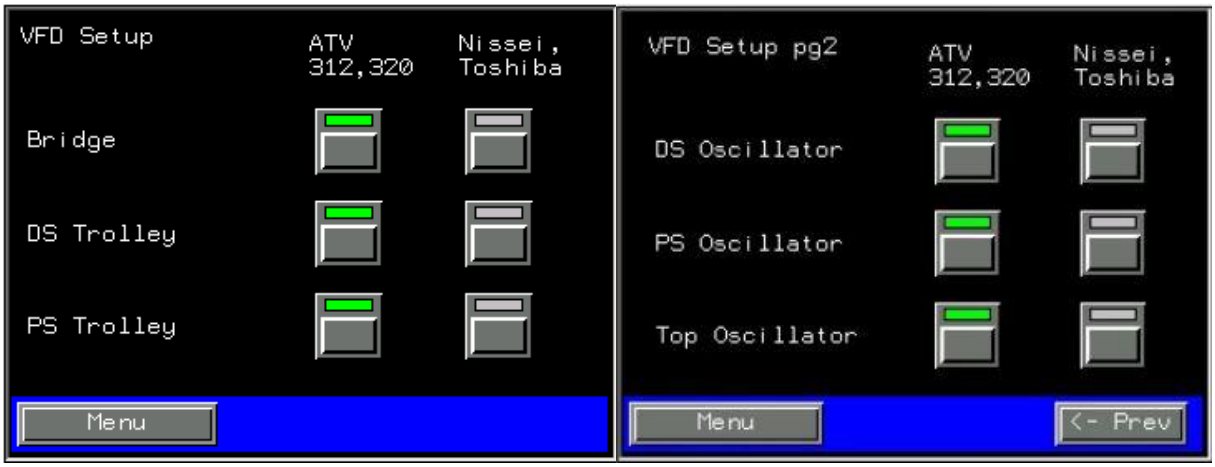
Coming Soon!

4. Test Outputs:

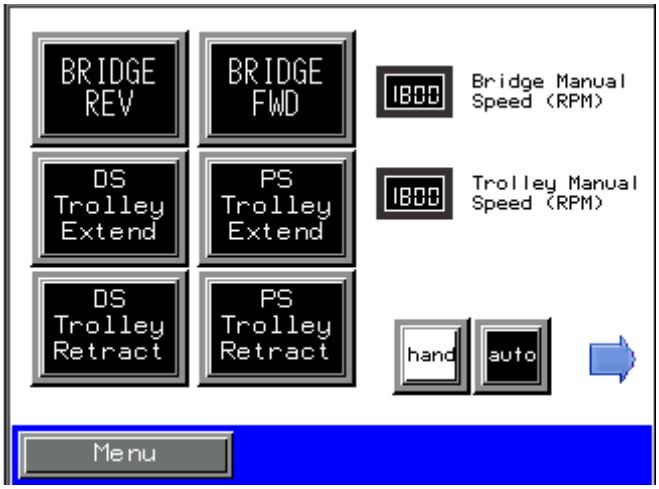
On the Touch Screen, under **“Menu”→ “Setup”** select **“VFD Type”**.

Look inside the control panel and on the HMI select the correct VFD type for each motor.

Note: The Bridge & Trolley VFDs will either be Altivar (ATV) 312, Nissei Corporation (Brother) VF-nC3M or Toshiba S15. The Oscillator VFDs will either be Altivar 312, Altivar 320.



On the Touch Screen, under **“Menu”→ “Manual”** select **“Hand”** This enables manual control mode.



4.1. Bridge Movement

Test the **"Bridge Fwd"** button & **"Bridge Rev"** button movements: **"Fwd"** should move the Bridge toward the wash exit, **"Rev"** should move the Bridge toward the wash entrance. Bridge should move smoothly and stop within an inch or two of the end stops.

4.2. Trolley Movement

Repeat with DS & PS Trolley "**Extend"** & "**Retract"** buttons: **"Extend"** sends the arms to the middle of the Bay. **"Retract"** returns them to the outside.

4.3. Verify Spray Arm Breakaway Tension Settings

Note: the elastomer Breakaway Spring takes a set, and must be readjusted 24-48 hours after initial setting. Measured with a steady 3 second pull at the detent in the lower cover, breakaway force toward the rear (away from nozzles) should be **42 lbs**. Breakaway force toward the left (facing spray nozzles) should be **29 lbs**.

4.4. HP Pump Test

On the second page of the **"Manual"** screen

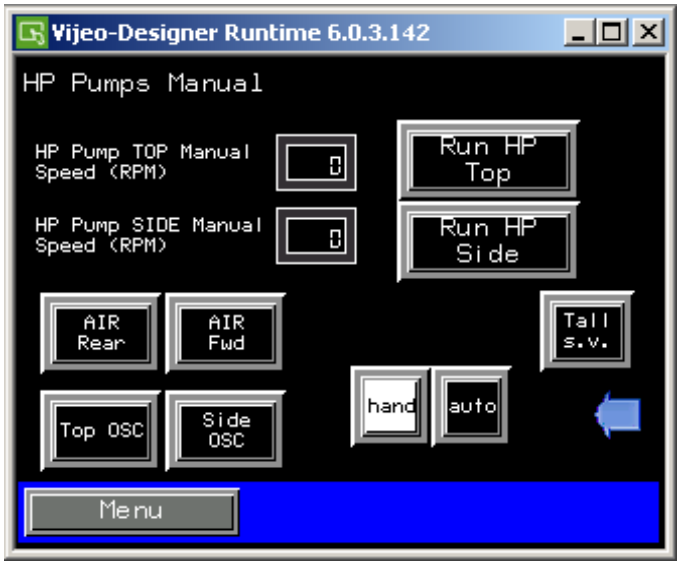
Top HP Pump

Verify there's water in pump stand tank and fill valve Is open

Reduce pressure regulator to lowest psi setting (Typically turn it CCW)

Set the HP Top pump manual speed to 60 rpm to verify correct rotation

Now set Top HP pump rpm to 1600 and set the pressure to 1,100 psi



Note: To change rotation reverse any 2 leads between the VFD and the Motor. Switching leads going into the VFD will not change rotation.

Side HP Pump

Verify there's water in pump stand tank and fill valve Is open

Reduce pressure regulator to lowest psi setting (Typically turn it CCW)

Set the HP Side pump manual speed to 60 rpm to verify correct rotation

Set the Side Pump speed to 1440 rpm, without the T.V. (Tall Vehicle) Nozzles enabled. Adjust pressure to 1,100 psi.

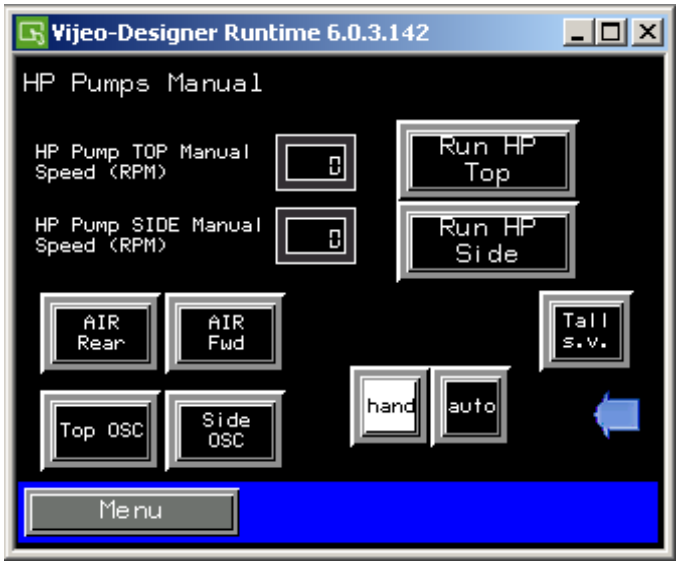
If applicable, change speed to 1800 rpm. Run HP pump again with the TV nozzle enabled and verify it still produces 1,100 psi.

4.5. Spray Arm Oscillator Test

Verify that the **"Top Osc"** & **"Side Osc**" buttons make the Top & Side Spray arms oscillate

4.6. Spray Arm Rotation Test

Verify that the **"Air Fwd."** & **"Air Rear"** buttons rotate the Spray Arms to the front and rear of a car respectively.



5. Tunnel Controller Setup:

5.1. Output Function Timing

Note: All of the following measurements are taken from the leading edge of the entrance leg's foot.

The **Start 360 (Extend and Enable) signal** should be turned on when the front bumper reaches 7 ft before the entrance legs. (Minimum 2 ft before the entrance legs) If your tunnel controller does not have a "look back" feature the turn off point should be when rear bumper is 35ft past the entrance legs. This is to prevent short cycling of the Spray Arm Trolleys between cars. If it does have a "Look back" feature then the turn off point should be when the rear bumper is 9ft past the entrance leg with a "Look back" set at 25ft.

The **Side HP pump signal** should come on when the front bumper is 2ft past the entrance legs and turn off when the rear bumper is 7.5ft past the entrance legs.

The **Top HP pump signal** should be turned on when front bumper is 7.5ft past the entrance leg. It should turn off when the rear bumper is 4ft past the entrance leg.

6. Conveyor Pulse Setup:

6.1. Pulse Initialization Setup

Use the **"Reset"** button to Home the machine, verify that the Spray Arms are retracted and the Bridge has moved to the center of its travel.

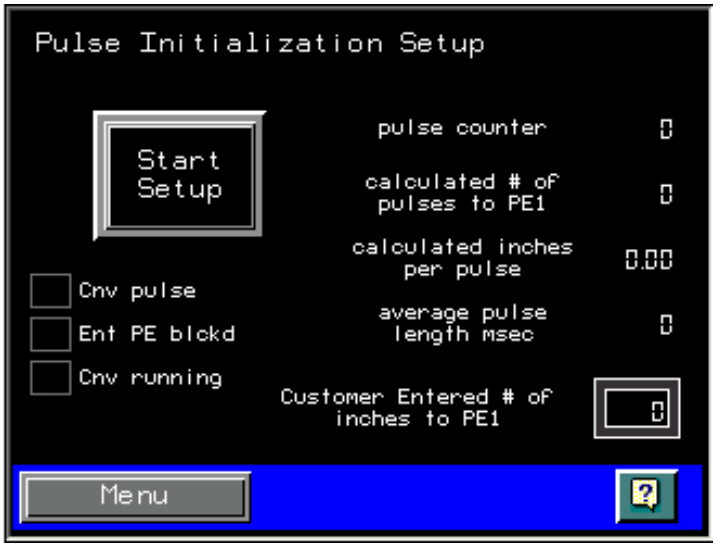
Measure the distance from the tunnel controller entrance eye to the entrance T-Bar photo-eye (PE-1). Or measure from the tunnel controller entrance eye to the leading edge of the entrance leg's foot and add 41 inches.

On the touch screen, under **"Menu" →"Setup" →"Pulse"**: Enter the distance (in inches) to PE-1.

Press "Start Setup"

Leave all tunnel controller outputs "Off" except the conveyor, and then run a dry car.

During this process make sure that no one walks through the gate photo-eye or T-Bar eyes. The 360 Controller will calculate the Pulse Length in inches which is the actual distance the conveyor moves per pulse. Once the car moves past the 360-t the pulse initialization is complete.



6.2. Verify Proper Pulse Initialization

On the Pulse Setup screen record the **"Calculated Inches per Pulse"** value. Using the same vehicle, run the Pulse Setup two more times and insure the values are all consistent. You can also look at the **"Car Length"** screen to verify consistent measurement. If the measurements are not consistent, there is most likely a problem with the pulse signal.

7. Simulated Pulse Setup:

7.1. Enter Speed

On the Touch Screen, under **"Menu"→ "Setup"→ "Simulated Pulse"→** in the **"Customer Entered Conveyor Ft/sec"** box, enter the conveyor speed in ft. /sec. Once you have ran your test cars this is displayed on the left hand side of the main screen view. Whenever you change the conveyor speed always re-enter the new conveyor speed in the simulated pulse screen. In the event your pulse switch fails, the speed on the main screen may not be accurate. Using a stopwatch, time how long it takes one roller on the conveyor to move across on 10ft section of the conveyor track. Take 10/ the time in seconds and plug that into the ft. /sec box on the screen. Now when the conveyor clock pulse signal fails simply click the **"Simulated Pulse"** button and continue washing.

Compare the actual conveyor speed you just measured in the previous step, to the displayed conveyor speed on the "Home" screen. They should be very similar.

8. Check the machine's conveyor tracking speed.

8.1. Checking the tracking speed

To check the tracking motion of the Accutrac 360-t: Enable the **"360 Extend & Enable"** signal from the tunnel controller and run a dry vehicle (Disable all tunnel equipment, including High Pressure pumps). When tracking the front and rear of the vehicle, the Bridge should move at exactly the same speed as the conveyor. When tracking the sides of the vehicle, the Bridge should move rearward at a rate that puts the Bridge at the entrance end of the rails just a second before the Spray Arms rotate and begin tracking the rear. The Machine will automatically adjust the Bridge speed for different conveyor speeds and vehicle lengths.

9. Test

9.1. Wash a test vehicle

Enable the HP pumps, and run a test vehicle. Pay close attention to the timing of the machine and the On/Off points of the HP water. Adjust as necessary.