TOPCON

GC-35

Paver and Profiler Control Box

Quick Reference Guide

GC-35 Control Box
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For more information contact Synergy Positioning Systems or
visit the Synergy Positioning Systems website at www.synergypositioning.co.nz
All branches: Phone 0800 867 266 Email: info@synergypositioning.co.nz

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Terms and Conditions

Thank you for buying this Topcon product. This manual has been prepared to assist you with the care and operation of the product and its use is subject to these Terms and Conditions and those more fully set forth in the Operator's Manual.

Usage and Safety

This product is designed for use by professionals. Always use safety precautions when operating this or any Topcon product. See "Safety Warnings" for details.

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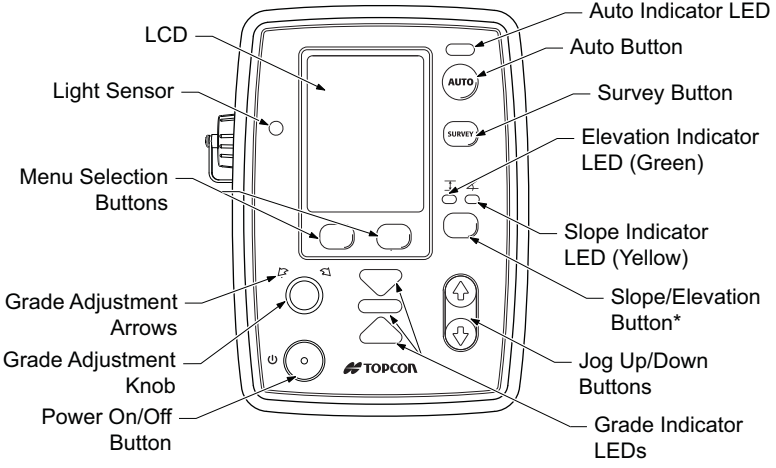
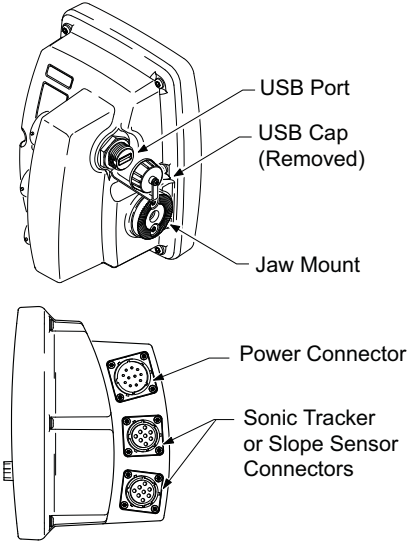
Website

https://www.topconpositioning.com/support/products/gc-35/

GC-35 Setup

Features





*For Profiler (Milling) code, if you are using both a sonic tracker and a yoyo sensor, pressing the Slope/Elevaton button cycles through the sonic tracker (≙), the yoyo sensor (⌶), and the slope sensor (∠).
If you are using only one elevation sensor, either sonic or yoyo, pressing the Slope/Elevation button switches between the elevation sensor (⌶) and the slope sensor (∠).

First Time Setup

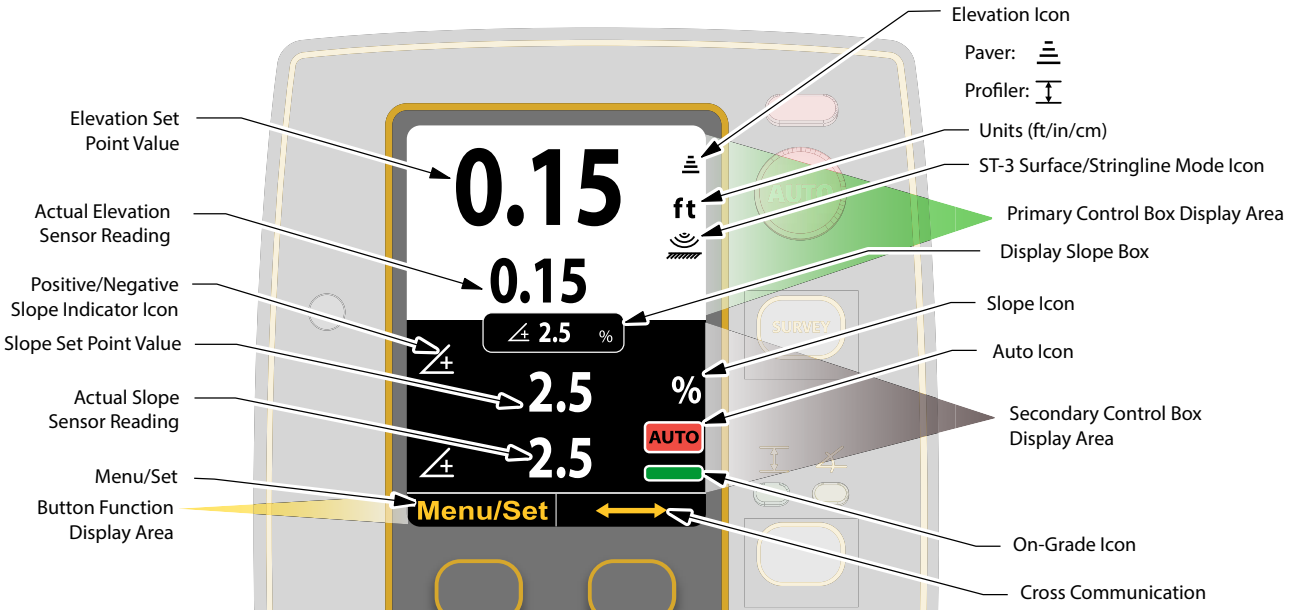
1. Mount the Control Box onto the bracket.
2. Connect the Sensor Cables and the Power Cable to the Control Box.
3. Power on the Control Box. See "Powering the Control Box On/Off" on page 2.
4. Set the Valve Offsets from the Performance Menu. See "Setting Valve Offsets (Raise and Lower) for Paver" on page 7. or See "Setting Valve Offsets (Raise and Lower) for Profiler" on page 10.

Powering the Control Box On/Off

Control Screen

The Control Screen displays when you power on the control box. It is your interface with the components of your Topcon System. The Control Screen changes depending on how you have configured your Control Box and your Topcon System.

The illustration below shows an example of a Control Box set up to display information from a secondary Control Box set up for Slope Control.



Performance Menu

Follow these steps to access the Performance Menu, select Performance Menu items, and make changes.

1. From the **Control Screen**, press the **Menu/Set** button.
2. Rotate the Grade Adjustment Knob to scroll through the menu selections displayed on the screen, and press the **Enter** button  to select a menu item.

3. Press ↵ to highlight the value in blue, and then use the **Grade Adjustment Knob** to change the value.

4. Press ✓ to store the value (Figure 3), or press ✗ to cancel and revert back to the original value..

If power is interrupted to the Control Box within two seconds after making an adjustment, the Control Box does not have time to store the new setting and reverts to previous (or original) settings.

Table 1. Performance Menu Settings

Number	Menu Item	Range	Default
1	Elev.Gains (Raise and Lower)	1 – 200	25
2	Slope Gain (Raise and Lower)	1 – 100	25
3	Valve Offsets	1 – 999	135
4	Elevation Deadband	1 – 30 mm	3 mm
5	Slope Deadband	0.025% – 0.75%	0.075%
6	Averaging	1 – 100	50
7	Machine Type	Paver or Profiler	-
8	Display	Set point, + Sensor, Both sides	+Sensor
9	Units	in, ft, cm	in
10	System Info	N/A	Displays the Topcon logo, copyright date, and current firmware version. Interface to Update Control Box and ST-3 Firmware.
11	Sonic Tracker 3	Surface, Stringline, Use at power up	Surface
12	Slope Res.	0.1%, 0.5%	0.1%
13	Slope Cal. Block	Off, On	On
14	Language	English, Deutsch, Nederlands, Espanol, Francais	English
15	Box Position	Left or Right	Left

Default settings are preset values that run most machines, except for Valve Offsets which must be set by the Operator at first time setup. See “Setting Valve Offsets (Raise and Lower) for Paver” on page 7.

Paving Applications

Setting Valve Offsets (Raise and Lower) for Paver

Set the Valve Offsets first, before setting any other Performance Menu items.

The offset value on one side of the paver may differ from the offset value on the other side of the paver. You must verify the offset values before swapping boxes.

Never attempt to use Valve Offsets to compensate for a slower raise or lower speed of your hydraulic valves, as it causes undershooting or overshooting in Slope Mode and can adversely affect the quality of the mat.

1. Run the paver until the hydraulic oil is at normal operatin temperature before setting the valve offsets.
2. Select **Valve Offsets ▸ raise:**.
3. Turn the **Grade Adjustment Knob** counter clockwise, decreasing the **Valve Offset - raise** value until the hydraulic cylinder no longer moves. Then slowly rotate the **Grade Adjustment Knob** clockwise until the hydraulic cylinder just begins to move up.
4. Repeat step 3 for **Valve Offsets ▸ lower:**.

Getting Started Paving Using Elevation Control

1. Setup the paver screed as you would to start paving manually.
2. Power up the Control Box and select Elevation Control by pressing the **Slope/Elevation** button until the green LED above the elevation symbol lights up.
3. Position the Sonic Tracker over the grade reference.
4. Press **Survey** to set to On-grade.
5. Press and hold the **Menu/Set** button, then turn the **Grade Adjustment Knob** to set the display's Elevation Setpoint value to the desired paving thickness.
6. Switch to Auto, by pressing the **Auto** button and begin paving.
7. After paving several feet/meters, check the mat thickness.
8. Use the **Grade Adjustment Knob** as needed to make changes to the mat thickness.

Getting Started Paving Using Slope Control

1. Setup the paver screed as you would to start paving manually.
2. Make sure the slope sensor is mounted onto the transverse beam of the paver.
3. To pave using slope control you must first calibrate the slope sensor to the screed.
4. Find a smooth area where the screed can rest evenly across its entire surface. Using a laser, a Smart Level, or a slope board, that itself has been calibrated, check the slope and direction of fall of the ground.

Slope Cal. Block must be set to **Off** in the **Performance Menu** to calibrate the slope sensor. Slope Cal. Block will reset to On after five minutes.

5. Place the screed on the ground and null it out.
6. Power up the Control Box and select Slope Control by pressing the **Slope/Elevation** button until the yellow LED above the slope symbol lights up.
7. Press **Survey**.
    a. If the On-grade bar lights up, and the screen displays a slope value that is identical to the laser or Smart Level, press the **Auto** button to put the Control Box into Automatic control, and begin paving.
    b. If the slope displayed in the box does not match the surface, then you must calibrate the slope sensor.
8. Press and hold the **Menu/Set** button, then turn the **Grade Adjustment Knob** to change the display's slope percentage to match the slope of the surface.
9. Press the **Auto** button to switch to Auto, and begin paving.

Once the slope sensor is calibrated and you are ready to begin paving, you may find the existing surface does not have the same slope as the finish design. In order to produce a smooth transition, begin paving at the existing slope and slowly turn the Grade Adjustment Knob to change the cross slope to the correct percentage.

10. Use the **Grade Adjustment Knob** as needed to make changes to the slope value.

Profiler (Milling) Applications

Setting Valve Offsets (Raise and Lower) for Profiler

Set the Valve Offsets first, before setting any other Performance Menu items.

The offset value on one side of the profiler may differ from the offset value on the other side of the profiler. You must verify the offset values before swapping boxes.

Never attempt to use Valve Offsets to compensate for a slower raise or lower speed of your hydraulic valves, as it causes undershooting or overshooting in Slope Mode and can adversely affect the quality of the job.

1. Run the profiler until the hydraulic oil is at normal operating temperature before setting the valve offsets.
2. Select **Valve Offsets** ▸ **raise:**.
3. Turn the **Grade Adjustment Knob** counter clockwise, decreasing the **Valve Offset - raise** value until the hydraulic cylinder no longer moves. Then slowly rotate the **Grade Adjustment Knob** clockwise until the hydraulic cylinder just begins to move up.
4. Repeat step 3 for **Valve Offsets** ▸ **lower:**.

Getting Started Milling Using Elevation Control

1. Setup the profiler as you would to start milling manually.
2. Power up the Control Box and select Elevation Control by pressing the **Slope/Elevation** button until the green LED above the elevation symbol lights up.

If you are using both a sonic tracker and a yoyo sensor, pressing the **Slope/Elevaton** button cycles through the sonic tracker , the yoyo sensor , and the slope sensor .
If you are using only one elevation sensor, either sonic or yoyo, pressing the **Slope/Elevation** button switches between the elevation sensor and the slope sensor .

3. Position the Sonic Tracker over the grade reference or the side blade when using yoyo sensors.
4. Gradually lower the drum so it is just about the scrape the surface at both sides.
5. Press **Survey** to set to On-grade.
6. Press and hold the **Menu/Set** button, then turn the **Grade Adjustment Knob** to set the display's Elevation Setpoint value to zero cutting depth.
7. Switch to Auto, by pressing the **Auto** button and begin milling. Use the **Grade Adjustment Knob** to gradually cut to the desired depth.
8. After milling several feet/meters, check the cutting depth.

9. Use the **Grade Adjustment Knob** as needed to make changes to the cutting depth.

Once steps 1-6 have been done when using yoyo sensors, the actual cutting depth will always be shown. Only steps 7 to 9 will be required.

Getting Started Milling Using Slope Control

1. Setup the profiler as you would to start milling manually.
2. Make sure the slope sensor is mounted parallel to the cutting drum as close as possible to the drum.
3. To mill using slope control you must first calibrate the slope sensor to the cutting drum.
4. Find a smooth area where the drum can rest evenly across its entire surface. Using a laser, a Smart Level, or a slope board, that itself has been calibrated, check the slope and direction of the fall of the ground.

Slope Cal. Block must be set to **Off** in the **Performance Menu** to calibrate the slope sensor.

5. Place the drum on the ground on the same location as the slope was measured.
6. Power up the Control Box and select Slope Control by pressing the **Slope/Elevation** button until the yellow LED above the slope symbol lights up.
7. Press **Survey**.
    a. If the On-grade bar lights up, and the screen displays a slope value that is identical to the laser or Smart Level, press the **Auto** button to put the Control Box into Automatic control, and begin milling.

b. If the slope displayed in the box does not match the surface, then you must calibrate the slope sensor.

8. Press and hold the **Menu/Set** button, then turn the **Grade Adjustment Knob** to change the display's slope percentage to match the slope of the surface.
9. Press the **Auto** button to switch to Auto, and begin milling.

Once the slope sensor is calibrated and you are ready to begin milling, you may find the existing surface does not have the same slope as the finish design. In order to produce a smooth transition, begin milling at the existing slope and slowly turn the Grade Adjustment Knob to change the cross slope to the correct percentage.

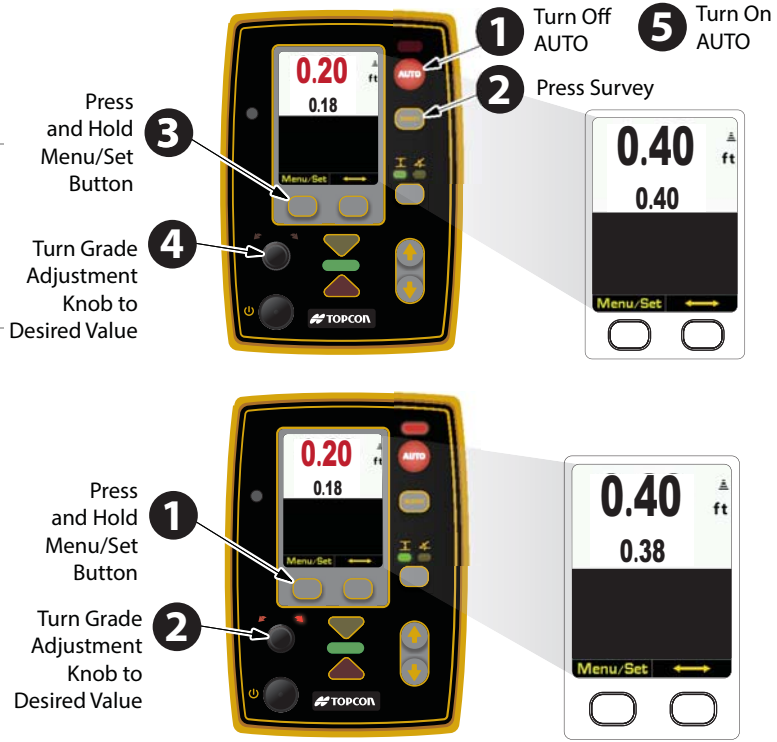
10. Use the **Grade Adjustment Knob** as needed to make changes to the slope value.

General Features

Adjusting the Setpoint Value Before You Start

Adjusting the Setpoint value does not change the existing depth, it only changes the reference number viewed on the display
The Setpoint value changes to Red when you turn the knob.

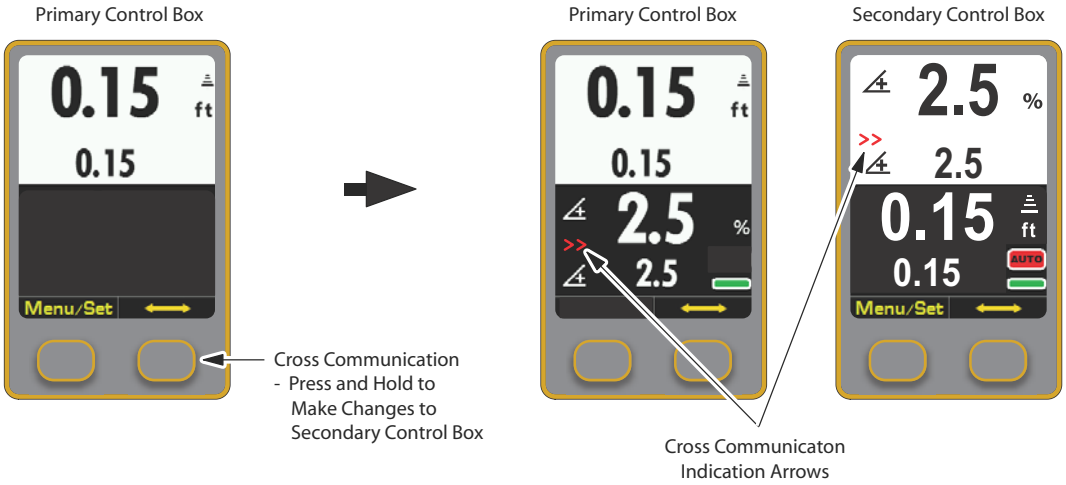
Adjusting the Setpoint Value While in Automatic Control



Cross Communication

Pressing the Cross Communication button allows you to remotely control a secondary Control Box. When the Cross Communication Indication Arrows display on the Control Screen, Cross Communication is active. The bottom half of the Control Screen shows the settings of the secondary box.

1. Press and hold **Cross Communication**.
   Red double arrows display on the screen once cross communication with the secondary Control Box establishes.



2. While holding **Cross Communication**, you can view or make the following changes to the settings in the secondary box:
   - Switch the secondary Control Box into Automatic or Manual mode.
   - Adjust the slope or elevation values using the Grade Adjustment Knob.
   - Survey to On-grade.
   - Switch between Elevation/Slope control.
   - Jog Up/Down.

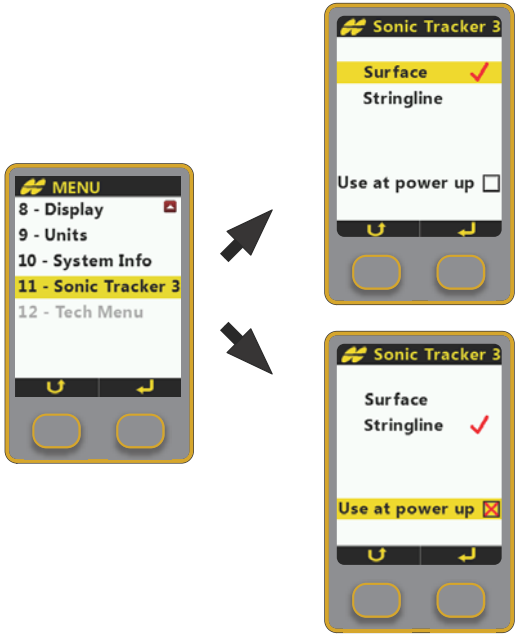
The Menu/Set Button and access to the secondary Control Box's Performance Menu is disabled while in Cross Communication.

3. When finished, release **Cross Communication**.

Setting Surface or Stringline Mode for the ST-3

When using a Sonic Tracker 3 (ST-3), you can select either **Surface** or **Stringline** mode from the **Performance Menu**. Use Surface mode when tracking a surface, or Stringline when tracking a stringline with your ST-3. By checking the **Use at power up** check box, the Control Box remembers your preferred setting at power up. The default setting is Surface.

1. From the Performance Menu select Sonic Tracker 3 and press the press the **Enter** button  .
2. Press either **Surface** or **Stringline**.
3. Check the **Use at power up** check box to lock this setting to **Stringline Mode** when the Control Box powers on and off, if desired, otherwise the Control Box always powers up with the ST-3 set to **Surface Mode**.



If using the ST-3 Sonic Tracker with a Topcon System Five™ Control Box, only **Surface Mode** is available. To use **Stringline Mode**, you must use a GC-35 Control Box.

Loading and Saving Machine Configuration Files

From the GC-35 Performance Menu you can load and save machine configuration files from a USB drive and/or select files from a list. You can save a maximum of twenty machine configuration files to the GC-35.

Loading Files

1. Insert a USB key with the machine configuration file into the GC-35's USB port.
2. From the **Performance Menu**, select **Machine Type,** and press the **Enter** button  .
3. Select **Load from USB,** and press **Enter**  .
4. Choose the configuration file, and press  .
5. To use the configuration file, select **Use,** and press  .

Saving Files

1. From the **Performance Menu**, select **Machine Type,** and press the **Enter** button  .
2. Select **Enter Name/Save,** and press **Enter**  .
3. Use the adjustment knob to cycle through characters (letters A-Z and numbers from 0-9) to name the configuration file, and press  .
4. To delete a character, use the knob to cycle through the characters until the ← symbol appears. Press  .
5. When you are finished naming the file, press  .

6. To save and use the configuration file, select **Use,** and press  .
7. To save the configuration file to a USB key, insert a USB key into the USB port, select **Copy to USB**, and press  .

Selecting Language Type

1. From the **Performance Menu**, select **Language,** and press the **Enter** button  .
2. Select from **English, Deutsch, Nederlands, Espanol,** or **Francais** to change the user interface language on the Control Box, and press  .

In Slope Control, Slow Tow Point Cylinder Response in One Direction (Raise or Lower)

Solution:

1. From the Performance Menu, decrease the Valve Offset value of the direction (either Raise or Lower) in which the tow point cylinder moves faster.
2. If necessary, adjust both the Slope and Elevation Gains in the Performance Menu to increase overall responsiveness of the valve.

When using Slope Control, do not raise the Valve Offset value of the direction (either Raise or Lower) in which the tow point cylinder moves slower to compensate for the slow response time, as this can cause overshooting or undershooting On-grade.

Sensor Readings on the Control Screen Fluctuating Rapidly, and Grade Lights Flash High and Low and Do Not Stay On-grade

Solution:

1. Check that Trackers are between 14 and 24 inches from reference.
2. If there are gusty winds, lower Tracker closer to reference. Approximately 14 to 16 inches.
3. Move Tracker away from gusty heat source, such as engine fan exhaust.
4. Verify Tracker is not picking up erroneous signals from undesired reference. Example: Debris such as rocks, parts of the machine obstructing the sonics.

5. If using stringline, verify that the line is not bouncing.

Sonic Tracker Picks Up the Ground, but Does Not Pick Up a Stringline

Solution:

1. To verify if the Tracker detects the stringline, set up the Tracker at least 16 inches over the stringline, then pull up on the stringline slowly, and verify that the sensor reading on the Control Box's Control Screen immediately changes.
2. Verify that Tracker is at least 14 inches above the stringline.
3. Smooth, steel wire is not recommended. Use minimum 1/16 inch diameter string for elevated stringline or averaging ski. Use 1/8 inch string for surface stringline.
4. If using an ST-3, make sure the Sonic Tracker 3 is set to **Stringline** in the Control Box's Performance Menu and that the ST-3 is aligned with the stringline.

Tow Point Cylinders Moving too Fast or Too Slow (Strange Valve Response)

Solution:

1. Check that the machine power is on and all switches for automatic control on the machine are in the proper position.
2. Check that all cables are properly and securely connected to the Control Box and the machine.
3. Disconnect cables and inspect them for damage or contamination. Clean all connections with an electrical contact cleaner.
4. Check that Trackers are between 14 and 24 inches from reference.
5. If there are gusty winds, lower Tracker closer to reference. Approximately 14 to 16 inches.
6. Check that the Valve Offsets are set correctly.
7. Check that the Elevation Gain and Slope Gain are set correctly.

General Warnings

This product should never be used:

- Without the operator thoroughly understanding the Operator's Manual and Quick Reference Guide.
- After disabling safety systems or altering the product.
- With unauthorized accessories.
- Without proper safeguards at the job site.
- Contrary to applicable laws, rules, and regulations.

TPS products should never be used in dangerous environments. Use in rain or snow for a limited period is permitted.

Tampering with the unit by the operator or non-factory authorized technicians will void the unit's warranty:

- Do not attempt to open the unit and modify any of its internal components.
- Do not short circuit.

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