Transland Electric Gate Setup & Usage Instructions with Satloc®G4, Rev. B

PN 95652

Transland Quality with Satloc Technology

The Transland electric gate application is an optional product. To purchase the unlock, contact your Satloc dealer for the TLEG unlock code.

The Transland electric gate box must be installed before setting up the G4 with the gate box.

	Description
Hardware	• Transland Electric Gate Box
Software	• On the G4, the required IntelliTrac software is 3.24.228.1865 or later

Contents

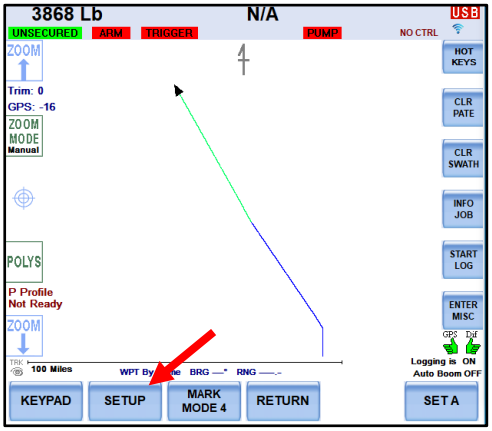
Section One: Set Latched Position Initially on a New Gate

1. Start with gate in latched position and system is “UNARM.”

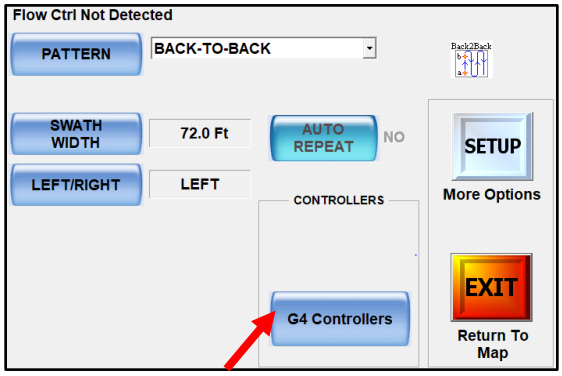
Set the Latched Position

WARNING **Ensure the gate is physically latched shut.**

2. From the Map screen, select “**Setup**.”

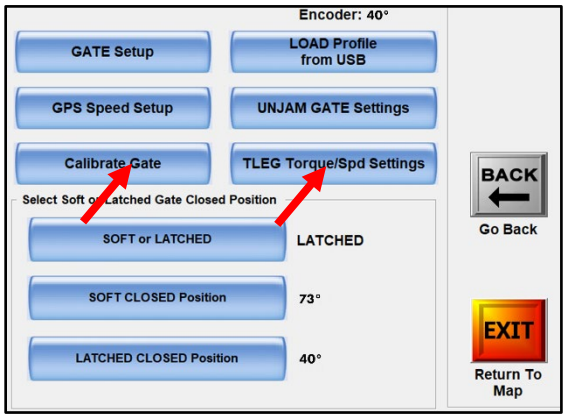


3. Select “**G4 Controllers**.”



4. Select “**Setup**” two times.

5. Select “**Soft or Latched**” until side states “latched.”



6. Ensure the gate door is physically latched shut.

Keep hands clear of gear during operation.

7. Remove gear cover and small gear. Warning: Keep hands clear of gear during operation

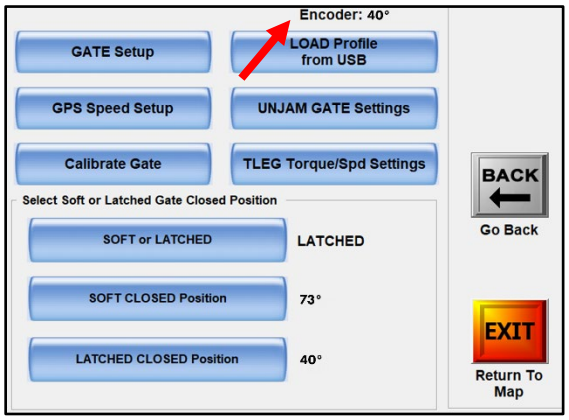
8. Loosen jettison so it can rotate freely on shaft.

9. Go to calibration page to be able to rotate motor shaft freely and read encoder.

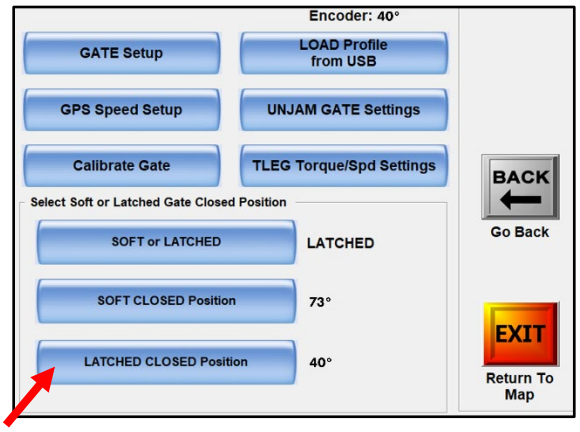
10. Rotate actuator shaft either clockwise or counter clockwise, until reaching 40° position, shown on calibration page encoder value.

11. Install small gear at nearest tooth for final at 40° + or - 2°. Ensure gate is latched when installing gear. Re-install gear cover.

12. With gate latched and small gear re-installed, read the encoder value and record it.
    Note: *The range for the min value is 38°-42°.*



13. Select "**Latched Closed Position**" and enter the encoder value.



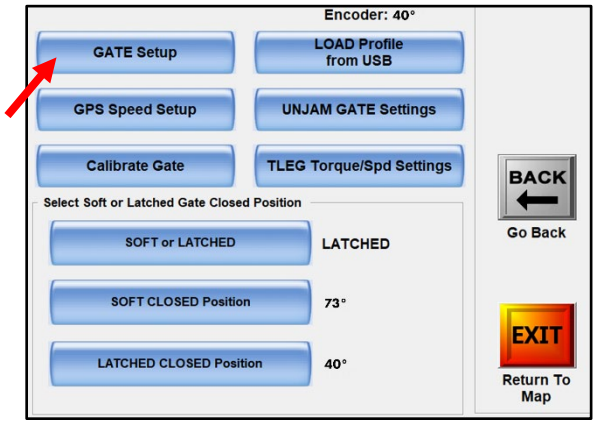
14. Select "**Accept**."

15. Reposition jettison arm and tighten it.

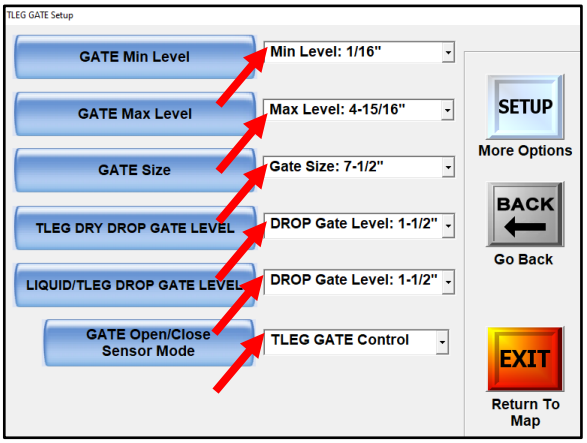
Section Two: Calibration and Setup of Tranlsand Electric Gate with Satloc G4

Gate Setup

1. On the G4, select "**Gate Setup**."



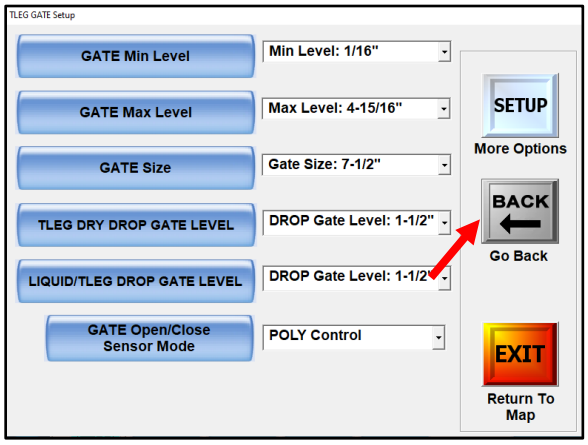
2. From the dropdown menus, select the Min Level, Max Level, Gate Size, Dry Drop Gate Level, Liquid Drop Gate Level. Also, ensure that the "TLEG Gate Control" is selected.



NOTE: *The Dry and Liquid Drop Gate Levels are the amounts the gate will open when the pilot hits the clean-out switch. Set to user preference.*

The G4 must be turned on to use the clean-out switch.

3. Select "**Back**."

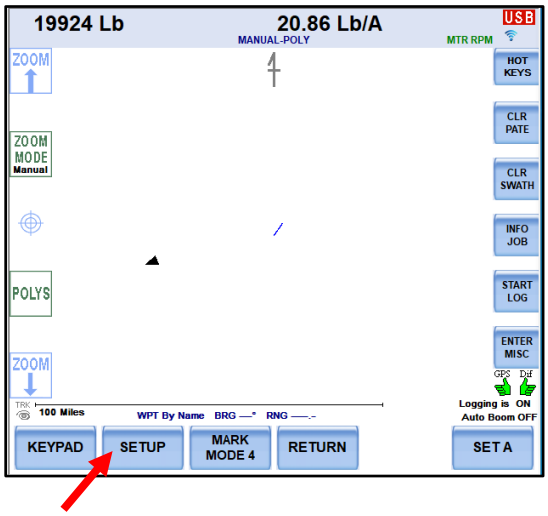


Calibration

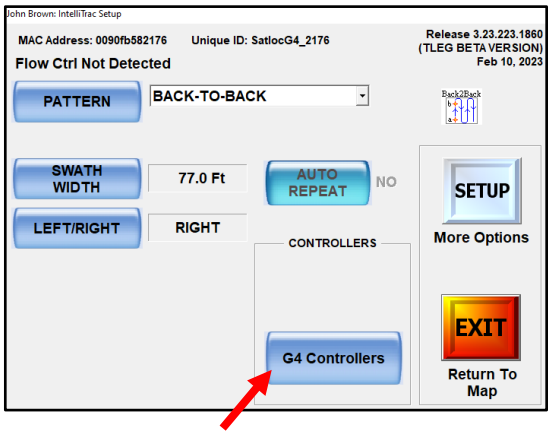
Note: *This calibration method takes two people.* Someone is measuring the gate while the other person is in the cockpit.

1. For the calibration and setup of the Transland electric gate, begin with the gate in the latched/locked position. Ensure gate is unarmed.

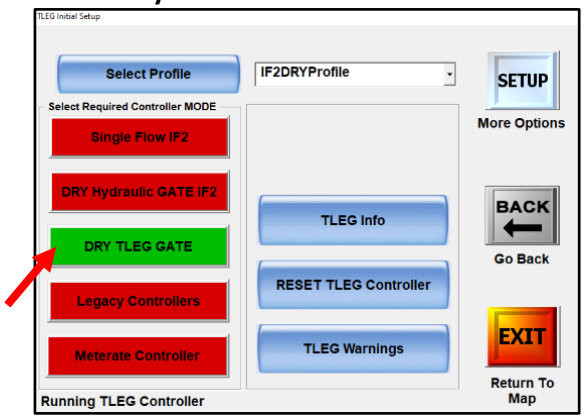
2. From the Maps screen, select "**Setup**."



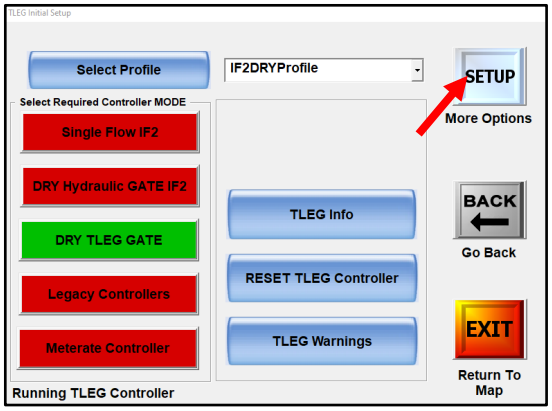
3. Select "**G4 Controllers**."



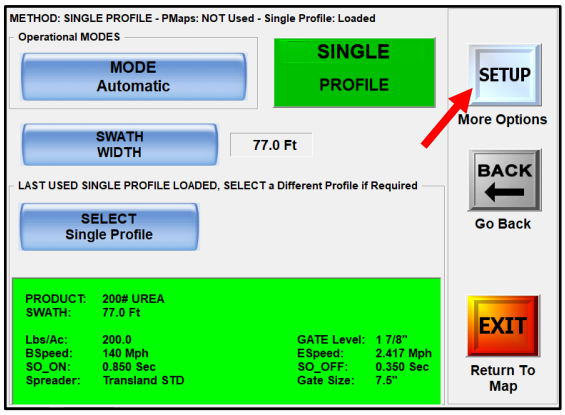
4. Select "**Dry TLEG Gate**."



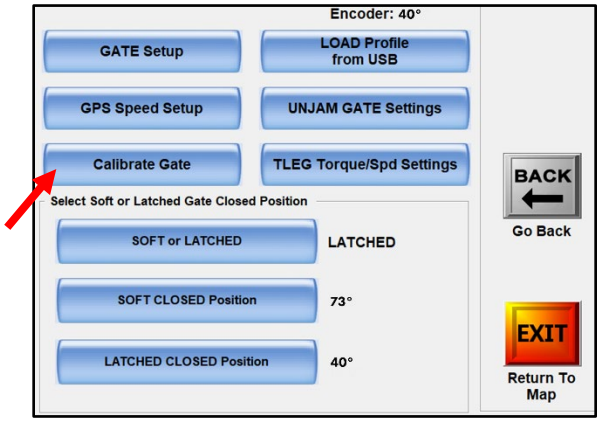
5. Select “**Setup**.”



6. Select “**Setup**.”



7. Select “**Calibrate Gate**.”



The preferred calibration method is with the system unarmed. The door may be moved by hand to achieve the calibration measurements.

8. On the TLEG panel, ensure the gate system is “UNARM” for the gate to move freely.

TLEG Panel
Located in Cockpit

9. Move Gate to each calibration point. Ensure that all slack is pulled out of the linkages and gear lash. All encoder values should be in ascending order.

10. Click “accept” to set each point.

Level #		Level
Gate Level	1	1/16"
Gate Level	2	1/4"
Gate Level	3	1/2"
Gate Level	4	3/4"
Gate Level	5	1"
Gate Level	6	1 1/4"
Gate Level	7	1 1/2"
Gate Level	8	1 3/4"
Gate Level	9	2"
Gate Level	10	2 1/4"
Gate Level	11	2 1/2"
Gate Level	12	2 3/4"
Gate Level	13	3"
Gate Level	14	3 1/2"
Gate Level	15	4"

TL 5” Electric Gate Box

Level #		Level
Gate Level	1	1/16"
Gate Level	2	1/4"
Gate Level	3	1/2"
Gate Level	4	3/4"
Gate Level	5	1"
Gate Level	6	1 1/4"
Gate Level	7	1 1/2"
Gate Level	8	1 3/4"
Gate Level	9	2"
Gate Level	10	2 1/4"
Gate Level	11	2 1/2"
Gate Level	12	2 3/4"
Gate Level	13	3"
Gate Level	14	3 1/2"
Gate Level	15	4"
Gate Level	16	4 1/2"
Gate Level	17	5"

TL 7.5” Electric Gate Box

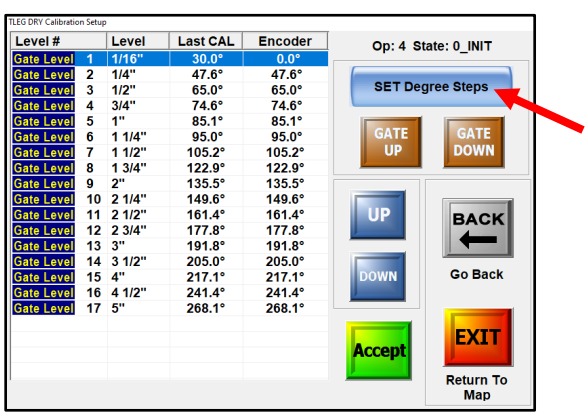
NOTE: *The calibrate page makes actuator free with system unarmed.*

Pull 30 amp fuse on TLEG panel to make the gate free to operate for maintenance.

Second Option for Gate Calibration

Note: *This calibration method takes two people.*

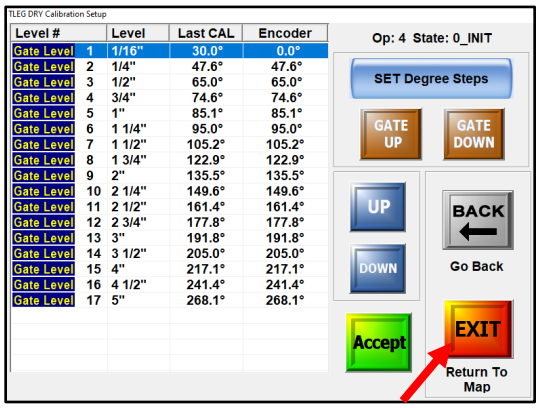
For Gate Level 1, bump the gate around until you get the 1/16” – tapping “**Gate Up**” or “**Gate Down**” (someone is measuring the gate while the other person is in the cockpit). Once it is set, click “**Accept.**”



Tap “**Down**” to go to Gate Level 2.

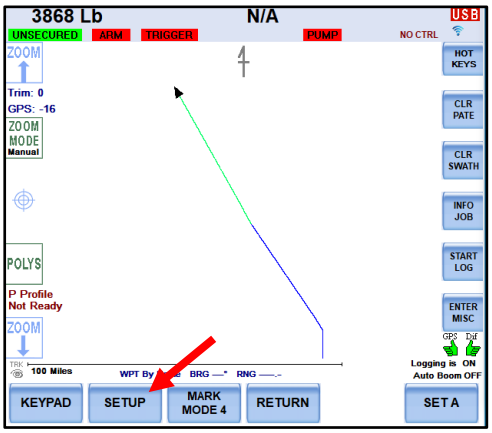
Bump the gate to ¼" – tapping "**Gate Up**" or "**Gate Down**" (someone is measuring the gate while the other person is in the cockpit). Once it is set, click "**Accept**".

When all gate levels are complete, select "**Exit**."

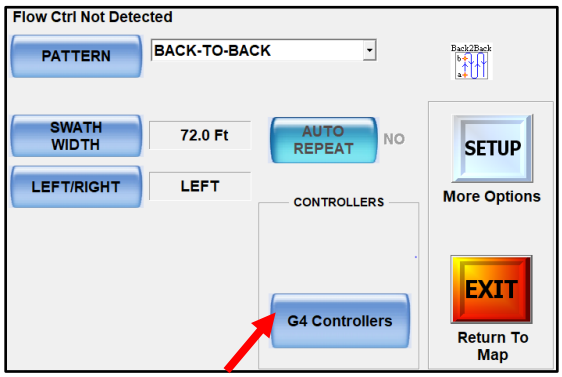


Set the Soft Closed Position

1. From the Map screen, select "**Setup**."



2. Select "**G4 Controllers**."

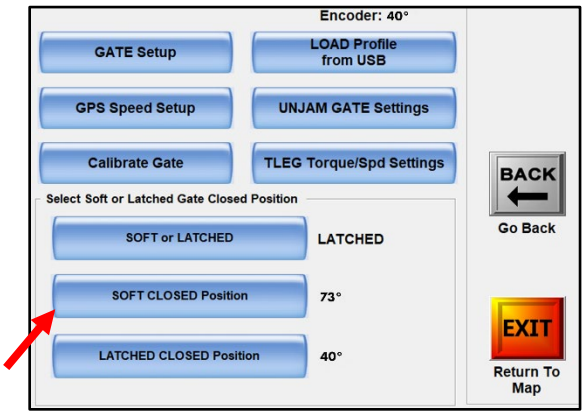


3. Select “**Setup**” two times.

4. Get the gate door to less than 1/16 of an inch opening or desired soft latched opening. But, the minimum opening is the width of paper.

5. Record encoder value.

6. Select “**Soft Closed Position**” and enter the encoder value. For the electric gate, the soft closed position needs an opening between the rubber gate seal and the gate box that allows for a piece of paper to slide through the entire width of the gate.

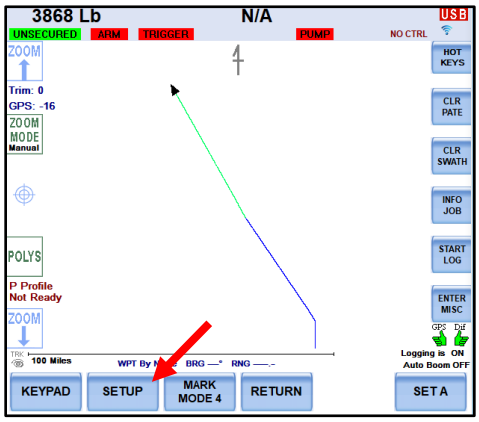


7. Select “**Accept**.”

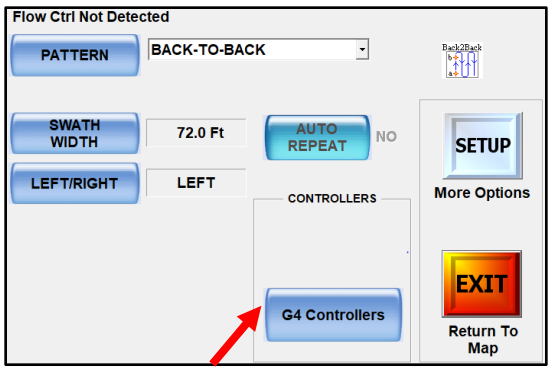
8. Select “**Exit**.”

Setup Every Speed

1. From the Map screen, select “**Setup**.”

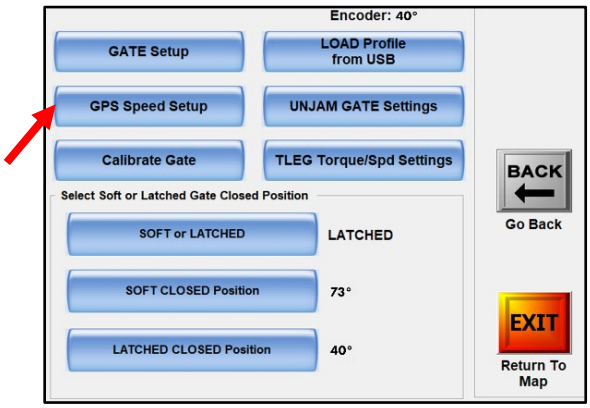


2. Select “**G4 Controllers**.”

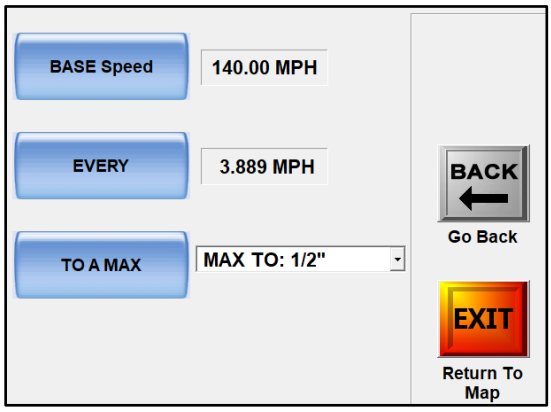


3. Select "**Setup**" two times.

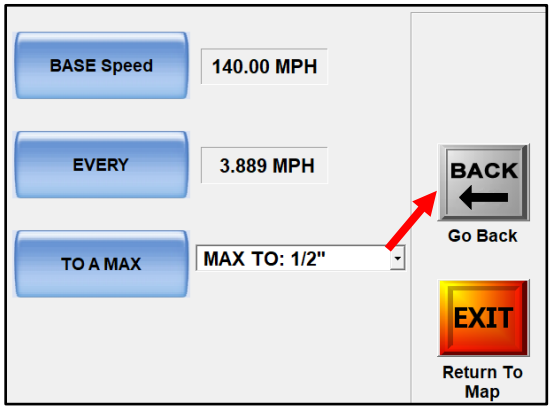
4. Select "**GPS Speed Setup.**"



5. Based upon application, enter Base Speed. 'Every Speed' is automatically calculated. The 'To A Max' is the maximum amount the gate will move plus or minus from the set point based on the change in speed.



6. Select "**Back**."



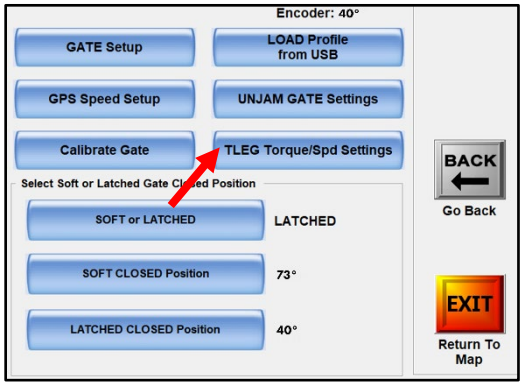
Electric Gate Control Features

The terms and definitions below will help explain some of the control features of the Transland Electric Gate. If you have questions during the next steps of the initial Transland Electric Gate setup, please refer to these terms and definitions.

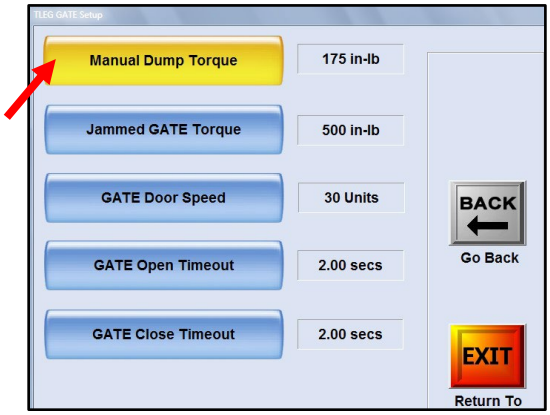
Term	Customer Benefit & Explanation
Manual Dump Torque **&** **Manual Override Holdoff**	*Customer Benefit:* Gain direct control over emergency material release with customizable torque settings, ensuring operations are both safe and precise. Both Manual Dump Torque & Manual Override Holdoff features offer direct control over emergency material release, emphasizing safety and precision. They are designed to work in tandem: 1. The torque setting (Manual Dump Torque) establishes the force needed for activation. 2. The holdoff time (Manual Override Holdoff) ensures this force is applied intentionally and not by unintentional contact. *Manual Dump Torque Explanation:* This is the threshold torque value that releases the electric actuator. The "Manual Dump Torque" is the result of the applied force to the jettison (emergency) handle inside the cockpit. This interacts with the electric motor and applies torque to the input shaft of the electric actuator. The range is 50 – 250 in-lb. *Manual Override Holdoff Explanation:* When you apply the force through the jettison handle, this is a time period called the "Manual Override Holdoff." This prevents unintended jettison by requiring the manual dump torque to be applied consistently for this hold off time. The range is 50 to 2500 milliseconds.

Gate Timeout – Open	*Customer Benefit:* The "Gate Timeout - Open" mode, although not available as of February 2024, introduces a significant conceptual benefit for the operation of aerial application systems. This mode sets a predefined time limit for the gate to open to its target position. If the gate cannot reach the desired openness within this time frame, the system stops trying to open the gate further. This functionality is crucial for preventing material loss, equipment strain, and potential safety hazards that can arise from a gate being stuck or failing to open as expected. *Explanation:* The time at which the gate will stop trying to open if the target value has not been reached. The gate timeout - open mode is not available as of February 2024.
Gate Timeout – Close	*Customer Benefit:* Avoid material loss with intelligent gate timeout features, preventing gate closure beyond 1.0 to 2.5 seconds if the target position isn't achieved. *Explanation:* The time at which the gate will stop trying to close if the target value has not been reached. The range is 1.0 to 2.5 seconds.
Jam Mode	*Customer Benefit:* Ensures continuous operation. *Explanation:* There are two jam modes: 1) automatic and 2) manual.
Jam Remain Open Time & Jam Open to Level	*Customer Benefit:* Facilitates quick resolution of jams and continuous operation. *Explanation:* For auto mode: When the gate jams, it will open to a pre-determined level and for a pre-determined time. The range is 0.0 to 2.0 seconds. For manual mode: An alert will pop up on the screen when the gate jams. The user can touch an onscreen button, and the gate will open to the predetermined level.
No Jam Deadband before Soft-Position	*Customer Benefit:* This feature offers precise control from the selected opening to the gate latched level, minimizing the risk of jams and aiding in smooth operation. *Explanation:* This is a small safety zone before the gate reaches the "Gate Soft Position." It's set to a precise tolerance (e.g., 1/32 inch) to prevent the gate from thinking it is jammed as it moves towards the soft position into the latched position. When latching the gate, the No Jam Deadband is a zone where a jam will not be detected so that the actuator can apply full torque to latch the gate. The width of this zone is adjustable in the settings. A more detailed explanation is available in Section 6: Explanation of Transland Electric Gate Box Openings, Gate Positions, & No Jam Deadband
Jammed Gate Torque	*Customer Benefit:* Helps to safeguard against equipment damage and loss of materials. *Explanation:* A precautionary measure that automatically releases the gate if closure torque exceeds the preset range of 200 to 530 in-lb.

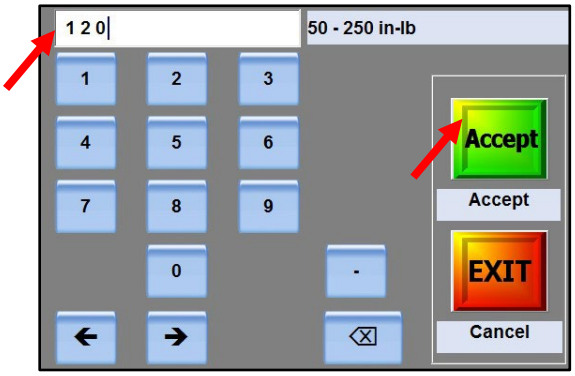
7. Select “**TLEG Torque/Spd Settings**.”



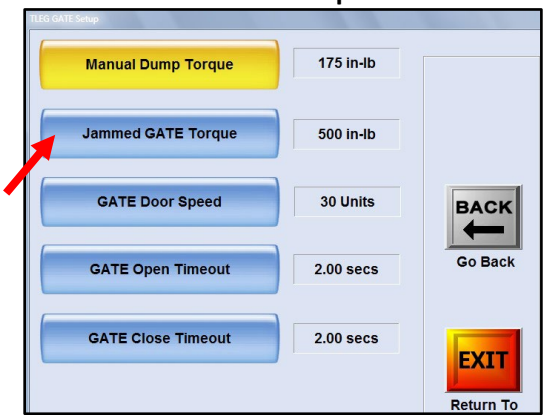
8. Select "**Manual Dump Torque**.”



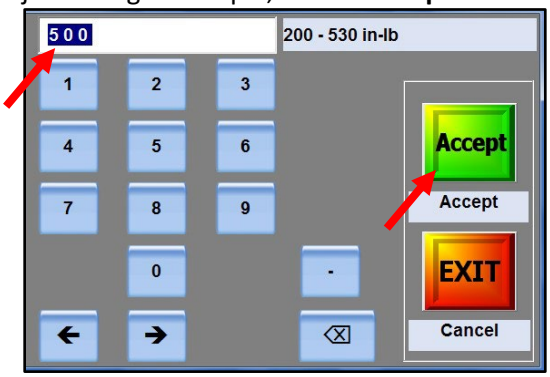
9. Set Manual Dump Torque. This interacts with the electric motor and applies torque to the input shaft of the electric actuator. The range is 50 – 250 in-lb. Typically, users set it at 120; however, a user should consider their preference and adjust accordingly. After setting the manual dump torque, select "**Accept**.”



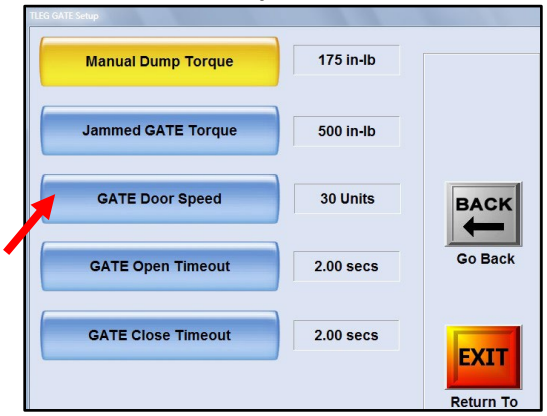
10. Select “**Jammed Gate Torque**.”



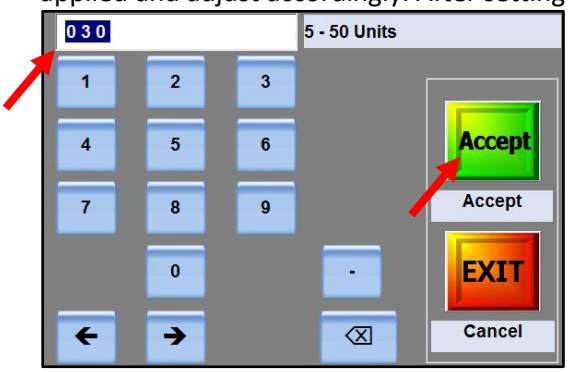
11. Set Jammed Gate Torque. This is a precautionary measure that automatically releases the gate if closure torque exceeds the preset range of 200 to 530 in-lb. Typically, users set it at 500; however, a user should consider what is being applied and adjust accordingly. After setting the jammed gate torque, select "**Accept**.”



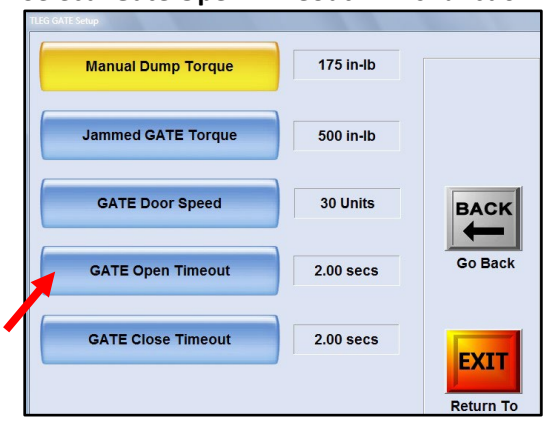
12. Select “**Gate Door Speed**.”



13. Set Gate Door Speed. The default is usually 30. However, a user should consider what is being applied and adjust accordingly. After setting the Gate Door Speed, select "**Accept**."

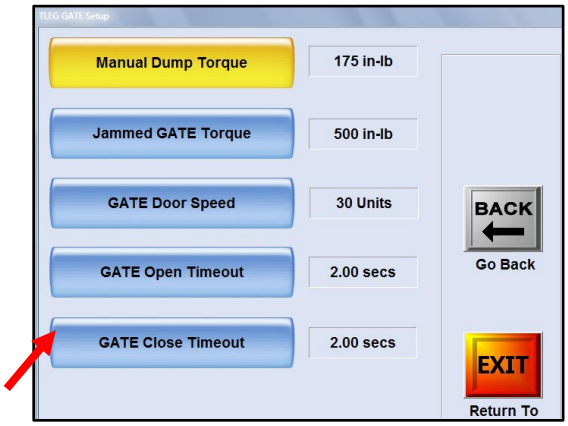


14. Select "**Gate Open Timeout**." This function will be available soon.

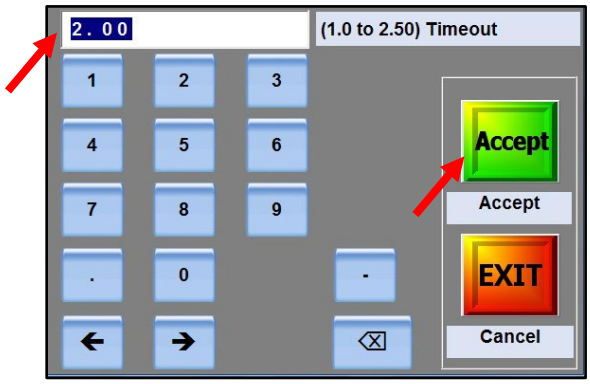


15. Set Gate Open Timeout. This function will be available soon.

16. Select "**Gate Close Timeout**."

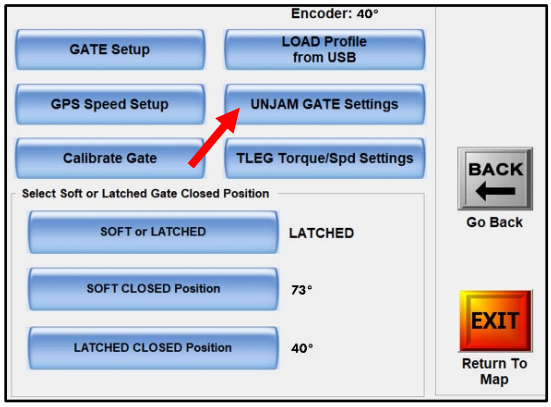


17. Set Gate Close Timeout. This is the time at which the gate will stop trying to close if the target value has not been reached. The range is 1.0 to 2.5 seconds. Set to pilot preference. After setting the Gate Close Timeout, select "**Accept**."



18. Tap "Back."

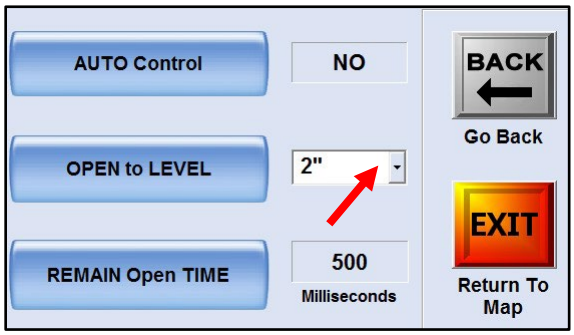
19. Select "**Unjam Gate Settings**."



20. Choose whether you want to use auto control for the unjam gate feature.
<u>For auto mode:</u> When the gate jams, it will open to a pre-determined level and for a pre-determined time. The range is 0.0 to 2.0 seconds.

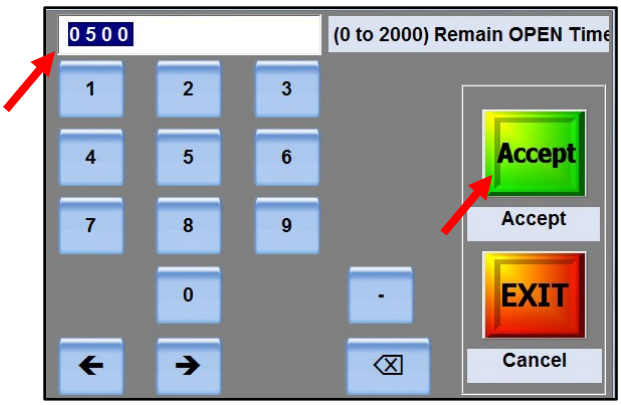
For manual mode: An alert will pop up on the screen when the gate jams. The user can touch an onscreen button, and the gate will open to the predetermined level.

21. In the “Open to Level” dropdown menu, choose your preferred open level.

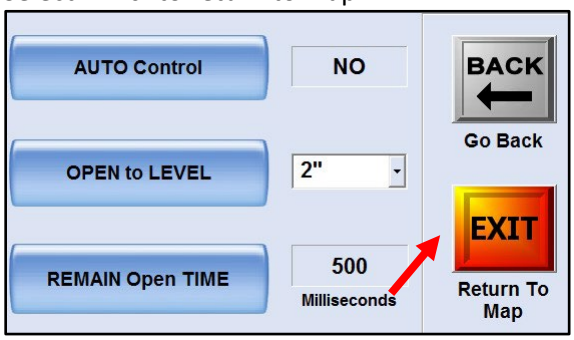


22. Select “**Remain Open Time**.”

23. Set Remain Open Time to pilot preference. The recommended default is 0500 milliseconds. This will be for both auto and manual modes. The range is 0.0 to 2.0 seconds. After setting the Remain Open Time, select "**Accept**.”



24. Select "**Exit**" to return to map.



Section Three: Electric Gate Troubleshooting

1. If the gate does not move with the arm switch or trigger switch, look on the G4 Electric Gate Info tab for communications.
2. If no communications are shown, check the 2-amp fuse on the red wire from the 12-volt power supply. This circuit turns on communications from the gate to the G4.
3. Check the other fuse on the ground circuit from the Zener diode to the 12-volt post.
4. Check for 12 volts at the actuator two-wire plug.
5. Check plug-in on the communications side for connections.

Section Four: Notes on Usage of Transland Electric Gate with Satloc G4

1. When turning the system on, you must select DRY TLEG GATE from the controller page and select dry mode switch on the lower instrument panel.
2. If you want to do liquid, select SINGLE FLOW IF2/IF3 and turn on the wet mode switch on the lower instrument panel.
3. The gate must be unarmed when shut down.
4. If the gate is left on when shut down, when you reboot, you will have to unarm and rearm for the gate to work.
5. You must select a profile each time you boot up G4.
6. You can check the gate on the ground. It will read ¼" less than the profile selected in the top window and actual window because of 0 speed (GPS-8).
7. While flying, the gate will latch when airspeed goes below 45 mph and unlatch when airspeed goes above 45 mph.

Section Five: Polygon Control in Gate Setup

1. When running polygon control, the gate will only open inside of polygons.
2. The gate will automatically latch when you are one mile away from any polygon inside the job file.
3. The gate will automatically unlatch to the soft position when you are within one mile of any polygon.

Section Six: Explanation of Transland Electric Gate Box Openings, Gate Positions, & No Jam Deadband

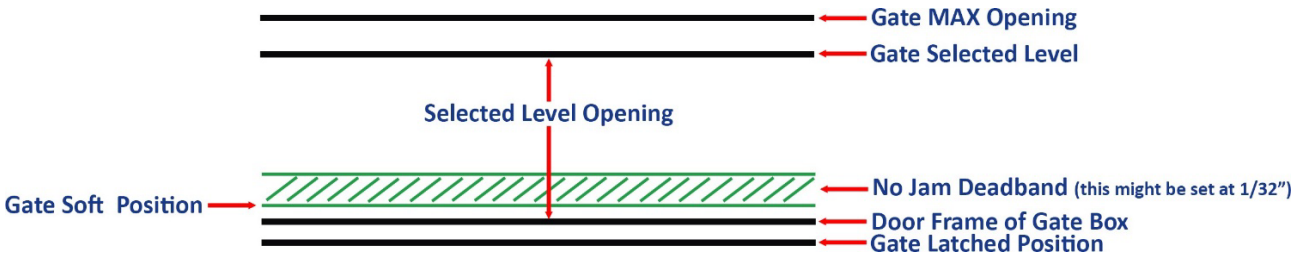


Figure 1: Gate Openings and Gate Positions

Gate Box Openings and Gate Positions

1. **Gate MAX Opening:** This is a user-defined level MAX gate opening.
2. **Gate Selected Level:** This is the desired position that the gate will open to. It's determined according to the rate required.
3. **No Jam Deadband:** This is a small zone before the gate reaches the "Gate Soft Position." It's set to a precise tolerance (e.g., 1/32 inch) to prevent the gate from thinking it is jammed as it moves towards the soft position into the latched position. When latching the gate, the No Jam Deadband is a zone where a jam will not be detected so that the actuator can apply full torque to latch the gate. The width of this zone is adjustable in the settings.
4. **Gate Soft Position:** This position, is an unlatched position that creates an opening of approximately 1/64". This position is used for dry applications where a complete seal isn't necessary, thus preventing unnecessary wear on the seal. In dry application scenarios, the soft-latched position is commonly preferred because it lessens the actuator travel, making the gate box ready for operation sooner than the fully latched position. This arrangement is crucial for optimizing the speed at which the door opens in relation to the velocity of the aircraft.
5. **Gate Latched Position:** This is the fully closed and sealed position of the gate, critical for liquid applications where no leakage can be tolerated. When in this position for liquid applications, the gate acts as a pump sump, maintaining the integrity of liquid containment and application. For electric gate boxes, the latched position is the default gate position when not in the area of operations and dispersing material. This latched position removes the load from the electric actuator that would cause it to overheat.
6. **Door Frame of Gate Box:** The physical boundary of the gate's movement, indicating the fully closed position within the housing or frame of the gate mechanism.

Operational Sequence

1. **From Open at the Selected Level:** The gate closes from the "Gate Opening Level" towards the "Gate Soft Position," which is where the gate is intended to stop for operational use.
2. **Engaging No Jam Deadband:** As the gate approaches the "Gate Soft Position," it passes through the "No Jam Deadband." The "No Jam Deadband" is instrumental in providing a buffer to prevent jamming during transitions between these positions, ensuring smooth and reliable gate operation for both solid and liquid applications, while also protecting the integrity of the gate's sealing mechanism.
3. **Reaching Gate Soft Position:** The gate achieves the "Gate Soft Position" which is suitable for quick operations, especially in applications where a fast response is needed.
4. **Transition to Gate Latched Position:** If a full seal is required for liquid applications, the gate moves beyond the "Gate Soft Position" to the "Gate Latched Position," ensuring complete closure. The "No Jam Deadband" plays a critical role here as well, preventing jamming during this final closure.