ADVENTURE PRODUCTS

ELECTRONIC SAFETY ENTRANCE

OPERATIONS, INSPECTIONS, AND MAINTENANCE MANUAL

Manual 1.9 REV. R1 FIRST PUBLICATION

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1.0 OVERVIEW

Built to supplement existing safety efforts, the Sky Trail® Electronic Safety Entrance device works in conjunction with the well-known aerial attraction to further aid Operators and help them successfully complete the on-boarding routine for each participant. The Electronic Safety Entrance was developed to minimize the risks and Operator oversights associated with the distractions that can occur when operating a Sky Trail® attraction. One of the most critical risks that can occur is the failure to connect the slingline to the harness. This is a critical step that can be overlooked or performed improperly. The Safety Entrance's sole function is to gravity test the connection between the slingline and the harness. All Pre-Flight Checks must still be completed as the Safety Entrance is not designed to detect a loose fitting harness, unlocked carabiner or other equipment defects. Refer to the Sky Trail® Manual to learn about the Pre-Flight Checks that are required for each participant.

The Electronic Safety Entrance works by quarantining one slingline between a first and second gate (see Electronic Safety Entrance Diagram). Once between the two locked gates, the slingline must put a force on a movable segment of track called the 'test corner'. This moveable segment is found in the raised corner of the Electronic Safety Entrance. After a person is attached to the slingline, they must sit in their harness and lift their feet off the ground to apply force to the 'test corner'. To ensure a person's hands are not being used to pull on the slingline, there are two ropes that must be pulled. The 'test corner' and both ropes must receive a downward force at the same time to activate the green light and open the second gate leading to the Sky Trail®. A series of one-way gates are used to deter people from entering the Sky Trail® through the exit side of the Safety Entrance.

There are numerous distractions that can cause even the most careful Operator to overlook the slingline connections of the guests or the Operator themselves. The following is a list of some of the most common distractions and oversights that an Operator can experience:

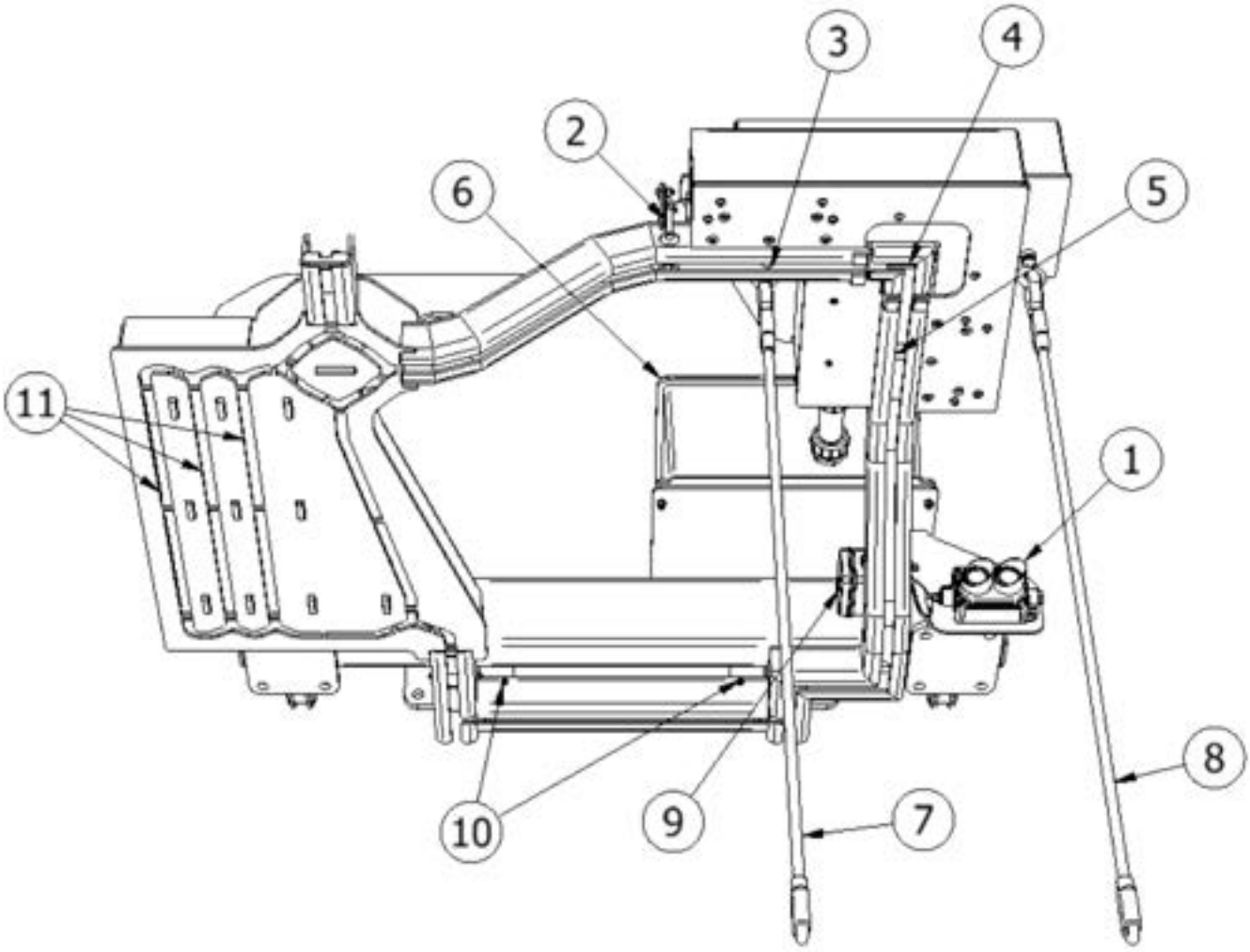
1. Distractions
- Children causing distractions
- Distracting conversations
- Multiple people in the entrance area at the same time
- Multitasking

2. Assumptions
- Viewing a slingline that is placed through the chest loop and assuming the carabiners have been connected
- Assuming someone else has connected the carabiners
- Assuming the carabiners locked but not checking

3. Physical error
- Carabiner closes but is not through either the slingline or harness loop
- Unclosed carabiner is not given a proper squeeze test to verify it is locked

4. Recklessness
- Knowingly entering the course unconnected
- Focusing more on speed than safety
- Not completing or rushing through the necessary checks

OVERVIEW *CONTINUED*



1. Stoplight
2. Thru-beam sensor
3. First gate
4. Test corner
5. Second gate
6. Electrical box
7. Left rope
8. Right rope
9. Reset button
10. One-way gates
11. Staging area

2.0 OWNERSHIP

The purpose of this manual is to provide RCI product Owners with the information they need to own and operate a Sky Trail® Electronic Safety Entrance safely and efficiently. This manual is to be used in conjunction with the Sky Trail® Manual.

2.1 PERSONNEL

The Electronic Safety Entrance does not replace a certified Operator that has been properly trained to perform the duties at the Sky Trail® entrance as outlined in the Sky Trail® Manual. Only certified Operators are permitted to operate the Electronic Safety Entrance. Refer to the Sky Trail® Manual for the requirements to become a certified Operator.

2.2 ELECTRONIC SAFETY ENTRANCE DETAILS

There are key components that must be located on the Electronic Safety Entrance in order to be considered compliant with manufacturer requirements. Do not remove any of these components before consulting with RCI. These components include the following:

2.2.1 DATA PLATE

Each attraction has a unique identification number and has a predetermined maximum number of participants who can be on the Sky Trail® at one time. This number does not include Operators. Individual Sky Trails® are assigned a data plate, which must be posted on the entrance to the attraction.

The data plate includes:

- Manufacturer information
- Attraction serial number
- Maximum number of participants
- Participant weight limit
- Unaccompanied minimum height
- Maximum height
- Participant speed

2.2.2 ATTRACTION STICKERS

All stickers must be in place on the Safety Entrance according to manufacturer specifications. Specific sticker locations can be found on the attraction plan set provided by RCI. Refer to the Sky Trail® Manual for the complete list of required attraction stickers. Stickers may include but are not limited to:

Warning stickers

Inspection certification sticker

*Note: Replacement stickers can be ordered from RCI by contacting the Client Success Department. If any of the stickers listed above are not present, they must be replaced and installed in the designated locations on the attraction.

2.3 INSPECTION REQUIREMENTS

A series of attraction inspections are required as part of owning and operating a Sky Trail®. The Electronic Safety Entrance must be inspected as part of the daily pre-use inspection as well as the annual inspection. Detailed information about the required inspections can be found in the Sky Trail® Manual. Refer to section 4.0 for information on how to inspect the Electronic Safety Entrance.

3.0 OPERATIONS

3.1 OPENING THE MECHANICAL SAFETY ENTRANCE

Each operational day, certified Operators are responsible for completing all daily opening duties for the attraction. Refer to the Sky Trail® Manual for the complete list of attraction opening duties. Before opening the Electronic Safety Entrance to the public, the following steps must be completed by a certified Operator: If the power to the Safety Entrance was turned off, power to the Safety Entrance must be turned back on.

- Perform a daily pre-use inspection of the Safety Entrance as described in section 4.0.
- Perform a pre-use function test as described in section 3.5.
- Remove the necessary Sky Trail® entrance barriers.
- Set up queue lines if necessary.
- Set up the safety equipment as described in section 3.4.

3.2 CLOSING THE ELECTRONIC SAFETY ENTRANCE

At the close of business the Operators are responsible for closing the attraction. The attraction should be closed and securely locked to prevent any access. To close a Sky Trail® with the Electronic Safety Entrance, the following steps must be completed:

- Ensure everyone is safely off the Sky Trail®.
- Remove all slinglines from the staging area of the Safety Entrance and store according to the Sky Trail® Manual guidelines.
- Secure and lock all entrance gates.
- Return all fences and barriers to their designated locations.

Note: It is acceptable to leave the Safety Entrance in the on position overnight and/or when the course is not in operation.

3.3 DAILY PRE-USE INSPECTION

A daily pre-use inspection of the Sky Trail® attraction and all safety equipment must be completed prior to each operational day by a certified Operator before participants are allowed on the attraction. The daily pre-use inspection must be documented each time and records must be kept on file at the site location. Refer to the Sky Trail® Manual for the full list of inspection requirements for the attraction.

3.4 SAFETY EQUIPMENT SETUP

With the Electronic Safety Entrance it is recommended that the carabiners from the slinglines be pre-loaded onto the harness attachment loops and not stored on the slinglines. Pre-loading the carabiners onto the harnesses will help to ease the loading and unloading process that is explained in section 3.6. The daily pre-use inspection of the attraction and safety equipment must be completed prior to opening the attraction. To set up the safety equipment for the operational day, use the following steps.

Step 1
All locking carabiners should be loaded onto the harness attachment loops. Install two carabiners on each harness. Install one on the upper attachment loop and one on the lower attachment loop.

Step 2

- Load the participant slinglines into the staging area to the left of the entrance. Be sure to follow the loading instructions in the Sky Trail® Manual and ensure the white split puck is correctly in the overhead track.
- Loading the participant slinglines in the staging area prior to opening will make the loading process easier and quicker and will prevent participants from having to carry any equipment to the Sky Trail® entrance.

3.5 PRE-USE FUNCTION CHECK

A successful pre-use function test of the Electronic Safety Entrance must be completed prior to allowing any participants on the attraction. The pre-use function test should be completed by certified Operators as part of the daily pre-use inspection. Follow these steps in order to perform the pre-use function test of the Electronic Safety Entrance.

Step 1

- Turn the power to the Safety Entrance [On]. The key switch is located on the electrical box which is on top of the entrance. Turn the switch to the right to turn on. A green light on the electrical box should illuminate.
- Note: It is acceptable to leave the safety entrance in the on position overnight and/or when the course is not in operation.
- When the system first turns on, the stoplight should be illuminated GREEN.

Step 2

- Wait at least one minute then pass a trolley through the first gate. (See the Safety Entrance diagram location #3 for first gate location).
- The first gate should rotate and let one trolley pass through. Push the trolley back and forth to ensure that the first gate locks in both directions.
- The stoplight should turn RED after passing the trolley through the first gate.

Step 3

Move the trolley to the 'test corner'. (Location #4 on the Safety Entrance diagram)

Step 4

Attach the slingline to the harness using the loading steps in section 3.6.1.

Step 5

Ensure the trolley is still in the 'test corner' of the Safety Entrance.

Step 6

Carefully sit in the harness which will cause the 'test corner' to lower. It is required that all Operators must lift both of their feet completely off the ground and let go of the slingline during the pre-use function test.

Step 7

To stand up, pull down on the two ropes simultaneously. Operators should not transfer any weight to their feet prior to pulling on the ropes.

PRE-USE FUNCTION CHECK *CONTINUED*

Step 8
- The stoplight and Operator light (found above the first gate and visible from the Operators position) should turn GREEN. The second gate (location #5 on the Safety Entrance diagram) should now be open allowing the Operator to pass through.
- Note: The second gate will remain open for 45 seconds. If the trolley is not passed through the second gate within 45 seconds, the light will turn red and steps 5 through 7 will need to be repeated.

Step 9
- Pass the trolley through the second gate. Check that the second gate locks in both directions after passing the trolley through.
- Note: The stoplight will remain green after passing through the second gate. The Operator light should turn off. The Operator light should only illuminate when the second gate is open.

The pre-use function test is complete. If any of these actions did not produce the results described in this function test, repeat the procedure. If a reset is needed or the red light flashes, refer to section 5.1.1 for the reset procedure.

3.6 LOADING AND UNLOADING

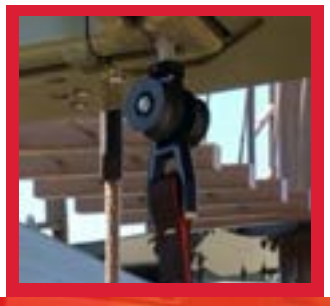
The loading and unloading station is located at the entrance of the Sky Trail®. Only a certified Operator is allowed to load a participant onto the Sky Trail®. Harnessing Assistants are not permitted to load and unload participants. Participants are never allowed to load or unload themselves. The Operator must complete a Pre-Flight Check prior to allowing any participant on the attraction. Refer to the specific section in the Sky Trail® Manual to learn about the required Pre-Flight Checks.

The Safety Entrance is a function test of the connection between the slingline, harness, and overhead track. Failure to properly follow the harnessing, slingline adjustment, loading, and Pre-Flight Checks could result in serious injury or death. Do not allow anyone not properly harnessed and connected to congregate in the entrance area.

3.6.1 LOADING PARTICIPANTS

After all inspections and harnessing procedures have been completed as described in the Sky Trail® Manual, a participant may be loaded onto the Sky Trail®. Certified Operators should follow these steps in order to correctly load a participant using the Electronic Safety Entrance.

*Note: with the use of the Electronic Safety Entrance, SRS Adjustment Guide Stickers are not necessary. If the site's flooring is unlevel, RCI may recommend using the SRS Adjustment Guide Stickers. Contact the RCI Client Success Department to confirm.



Step 1
- The Operator should move the slingline to the "test corner".
- Have the participant come stand next to the slingline, with the slingline in front of them.

LOADING PARTICIPANTS *CONTINUED*

Step 2

- The carabiners should be pre-loaded onto the harness during the daily equipment set up as described in section 3.4. If not, attach one locking carabiner to each attachment loop on the waist of the harness.
- Insert the slingline through the chest loop of the harness.

Step 3

- Make sure the slingline is hanging straight and vertical. By holding the slingline next to the attachment loops on the waist of the harness, determine what loop of the slingline lines up to the upper attachment loop of the harness. Connect the carabiner on the upper attachment loop of the harness to this loop of the slingline.

Step 4

- Connect the carabiner on the lower attachment loop of the harness to the slingline loop that is directly below the carabiner from step 3.
- There should never be any extra loops of the slingline in between the two that are connected to the harness. Also ensure that each loop only has one carabiner connected and that the carabiners are not intertwined or connected to each other.

Step 5

Perform all Pre-Flight Checks and recite all rules as described in the Sky Trail® Manual.

Step 6

Ensure the trolley is still in the 'test corner' of the Safety Entrance.

Step 7

Instruct the participant to carefully sit in their harness which will cause the test corner to lower. It is required that participants lift both feet fully off the ground and let go of the slingline. It may be necessary to help stabilize the participant to prevent them from swinging or spinning.

Step 8

Instruct the participant to stand up by pulling down on the two ropes simultaneously. Participants should not transfer any weight to their feet prior to pulling on the ropes.

LOADING PARTICIPANTS *CONTINUED*

Step 9
- The stoplight and Operator light should turn GREEN. The second gate (location #5) should now be open allowing the participant to pass through.
- The participant can use the ropes to help them back to a standing position. If the system fails to initiate a green light, repeat steps 6 through 8.

Note: The second gate will remain open for 45 seconds. If the trolley is not passed through the second gate within 45 seconds, the light will turn red and steps 6 through 8 will need to be repeated.

Step 10
Pass the trolley through the second gate and into the Sky Trail® overhead track. The Operator should instruct the participant to go up using the right side of the overhead track.

Ensure that all steps of the connection process are completed on one participant before moving onto the next participant. It is important to follow all safety precautions to avoid distractions and missing steps in the connection process. To avoid distractions, participants should be:
- Attended to one at a time.
- Organized in a single file line at all the points of connection in the entrance area.

Note: All Operators must follow the same steps listed above before going on the attraction themselves.

3.6.2 UNLOADING PARTICIPANTS

When a participant is ready to exit the Sky Trail®, they should come down the stairs using the exit side of the overhead track (opposite side of the overhead track as the one they entered on). The site should inform all participants which side of the track to enter/exit on. This will prevent a “traffic jam” on the incline. Use the following steps to unload a participant when they have reached the bottom of the incline.

Step 1
The Operator will instruct the participant to come completely off the steps and stand on the ground. Do not disconnect anyone while they are still standing on the incline steps.

Step 2
Pull the participant’s slingline through the one-way gates, so the slingline cannot be put back onto the course.

Step 3
Disconnect both carabiners from the slingline. Leave both carabiners on the harness.

Step 4
Carefully remove the slingline without carabiners from the chest loop of the participants harness. Have the participant look up and away to protect their face.

Step 5
Instruct the participant to exit the Sky Trail® entrance area and inform them to return to the harnessing area and wait until an Operator can remove their harness.

Step 6
Return the slingline to the staging area of the Safety Entrance.

3.7 LOSS OF POWER PROCEDURE

The Electronic Safety Entrance system is a safety system that requires electricity to function. In the event of lost power, RCI recommends not to operate the Sky Trail®. However, the system can be bypassed in the event of an emergency by lifting the flipper gates at the rear of the entrance allowing the slider assembly to pass through and onto the Sky Trail® overhead track. Power is not required to exit the Safety Entrance system.

*Note: All procedures in the Sky Trail® Operator Manual must be followed. Refer to the Sky Trail® Manual to learn about required Emergency Action Plans, evacuations, and other emergency procedures.

4.0 INSPECTION

4.1 PRE-USE FUNCTION TEST

A successful pre-use function test of the Electronic Safety Entrance must be completed prior to allowing any participants on the attraction. The pre-use function test should be completed by certified Operators as part of the daily pre-use inspection. Follow the steps in section 3.5 in order to complete the pre-use function test.

4.2 ENTRANCE DATA PLATES AND STICKER

Inspect the Safety Entrance and ensure that all necessary information plates and stickers are present and legible. These plates and stickers include:

- Data plates
- Warning stickers
- Inspection certification stickers

4.3 FLIPPER GATES

Flipper gates are installed in the overhead track at the entrance and exit points to prevent participants from entering the Sky Trail® through the exit side of the Safety Entrance. These flipper gates must:

- Be functional and allow participants to pass through the correct flow of traffic. Must also prevent participants from entering through the exit track.
- Have no loose or missing pieces.

4.4 ROTOR GATES

- Be functional and allow participants to pass through the correct flow of traffic. Must also prevent participants from entering through the exit track. Once in the system, the gate should lock until the safety check has been performed.
- Should not grind while passing the trolley through.

4.5 HANDLINES

Both handlines should be inspected prior to opening the Electronic Safety Entrance. Both handlines must:

- Be free of any cuts, tears, or sharp spots. Handlines can be covered with Rescue Tape® if there are any rough or sharp spots.
- While pulling, the handline should move easily without binding or grinding and when released, should return to the reset position.

If the handline does not move easily, follow the instructions in section 5.2.1.2 for lubricating the handline bolt.

4.6 BOLTS AND NUTS

Most structural steel connections on a Sky Trail® use A325 bolts. All bolts must have at least one full thread exposed beyond the accompanying nut. Only with RCI Engineering approval and signature, may this standard be altered. Bolts are to be tight and the Anco® nut locking pin, if present, is to be engaged in at least one complete thread of the bolt.

4.6.1 LOOSE BOLTS

When 1/3 or less of the bolts in a single connection are found to be loose, repair can be completed by simply tightening. When more than 1/3 of the bolts in a single connection are found to be loose, repair can only be completed by replacing all of the bolts in the connection with new bolts and nuts. Replace each bolt individually before moving on to the next bolt. Do not remove all bolts at once. If this occurs, contact the RCI Client Success Department immediately. RCI may request that proof of repair be submitted.

4.7 STEEL SPLICES

Steel splice plates are found where sections of the Sky Trail® come together. Steel splice plates must be inspected for the following:

- Steel splices must be flush and tight. There must be no gaps between steel plates.
- All bolts and nuts are present and secure. The Anco® nut locking pin must be present and engaged in at least one complete thread of the bolt.
- No rust or corrosion, or any damage to the paint.

4.8 WELDS

Almost all welds on the Sky Trail® are fused perpendicular intersecting plates of steel. Inspect all welds for the following:

- Verify that all welds look similar to one another.
- Any broken, cracked, or flaking rust welds are causes to immediately close the Sky Trail® until an RCI Engineer has had an opportunity to review and provide a repair procedure. RCI may require that a NDT inspection be performed. After the repair procedure has been provided to the location, RCI will require proof to be documented and submitted before granting permission to open the Sky Trail®. Once the repair procedure has been completed and approved the Sky Trail® can be reopened.
- All welds should be coated in the approved course paint. Welds should always be the first priority when repairing paint over the Sky Trail's® service life.

*Note: Contact the RCI Client Success Department for any questions or concerns about welds on the Safety Entrance.

4.9 OVERHEAD TRACK

The overhead track must always allow the trolley to pass through uninhibited.

- Make sure the track aligns properly at all connections. Except at intersections, no track section should be wider than 7/8". At intersections, a 1-1/4" dowel must not be allowed into the intersection.
- The track should be free of debris. Sticks, bird and insect nests, and dirt are some things to look for in outdoor attractions.
- The continuous overhead tracking system must never have an exit point unless specifically designed and approved by the RCI Engineering Department.

5.0 MAINTENANCE

5.1 TROUBLESHOOTING

Troubleshooting of the Electronic Safety Entrance may need to occur for a variety of reasons. If the Safety Entrance is not functioning properly, use the reset procedure below before contacting RCI. If issues still exist, contact the RCI Client Success Department for assistance.

5.1.1 RESET PROCEDURE AND FAULT CODES

5.1.1.1 RESET PROCEDURE

A reset procedure may need to be performed if sensors are triggered at the wrong time during the slingline connection and testing process. For example, if a gate is rotated by hand and a slingline was not passed through the gate, the system will become out of sync with the location of the slingline. Follow these steps to reset the safety entrance:

Step 1

Check if a slingline is between the first and second gate.

Step 2

- If a slingline is not present:
  -press the reset button (see Safety Entrance Diagram for reset button location). The first gate will open after pressing reset. Reset is complete.
- If a slingline is present:
  -press the reset button then rotate the first gate by hand. This will illuminate a solid red light meaning there is a slingline in the test area. Continue by connecting a harnessed participant to the slingline and follow connection test procedures. Reset is complete.

If the unit does not reset after following steps 1-2, count the number of flashing sequences as described in section 5.1.1.3 and contact the RCI Client Success Department if necessary.

5.1.1.2 FAULT CODES

The fault code logic is designed to identify mechanical or electrical faults and prevent users from entering the Sky Trail® if faults are detected. When the system receives inputs that do not follow the order and timing of standard operation, a fault code will be triggered. It is therefore important to follow the proper loading procedures. If a fault code is triggered, try performing a reset procedure. If the fault persists, contact the RCI Client Success Department.

Fault codes are displayed on the red stoplight using flashing sequences. The red light will flash a number of times, pause for a moment, then flash again. The number of flashes corresponds with the triggered fault. Qualified personnel may refer to the Wiring Diagram for the fault code chart and repair instructions.

To avoid accidentally triggering a fault code, refrain from doing the following:

- Do not trigger the entrance thru-beam for more than three minutes continuously. Do not allow trolleys to rest in the thru-beam location for long periods of time.
- Do not perform a connection test when the light is green and the first gate is still open. The first gate should rotate and the stoplight should turn red before performing a connection test.
- Do not pull on the 'test corner' while passing a slingline through the first gate.
- Do not pull on the hand ropes while passing a slingline through the first gate.
- Do not manually override gate mechanisms. If the emergency lever on the second gate is used a reset will be required. Do not allow participants on the Sky Trail® by using the emergency lever.

5.1.1.3 FAULT CODE CHART

NUMBER OF FLASHES	FAULT REASON	ASSUMED CAUSE
2	Entrance thru-beam signal on for more than three minutes.	• An obstruction was present in the thru-beam for three minutes or more. • Faulty wiring. • Signal wire contacting continuous voltage. • Thru-beam sensor has failed.
3	No slingline in the check area, but safety check was performed.	• First gate was not rotated after pressing reset when the slingline was in the system. • Faulty wiring on first gate sensor. • First gate sensor misaligned. • First gate sensor failure.
4	First slingline sensor off at the time the first gate rotated.	• Sensor misaligned. • Faulty wiring on first slingline sensor. • First slingline sensor failure.
5	Second slingline sensor off at the time the first gate rotated.	• Sensor misaligned. • Faulty wiring on second slingline sensor. • Second slingline sensor failure.

5.1.1.3 FAULT CODE CHART *CONTINUED*

NUMBER OF FLASHES	FAULT REASON	ASSUMED CAUSE
6	Left-hand rope sensor off at the time the first gate rotated.	• Sensor misaligned. • Faulty wiring on left-hand rope sensor. • Left-hand rope sensor failure.
7	Right-hand rope sensor off at the time the first gate rotated.	• Sensor misaligned. • Faulty wiring on right-hand rope sensor. • Right-hand rope sensor failure.
8	First gate moved while a slingline was in the system.	• First gate sensor sent a signal when a slingline was already in the check area. System thinks two or more slinglines entered the check area. • Mechanical failure of first gate. • Faulty first gate actuator circuit. • Faulty wiring on first gate sensor. • First gate sensor failure.
9	Voltage on the second gate actuator when the gate should be locked.	• Second gate actuator relay or PLC output stuck in closed position. • Faulty wiring causing voltage to be present on the second gate actuator circuit when it should be turned off.
10	Second gate moved before the safety check was completed.	• Faulty second gate sensor. • Mechanical failure of second gate. • Faulty wiring of second gate sensor. • Faulty second gate actuator circuit.

5.1.2 NORMAL PLC FUNCTIONS

1. No slingline in system, green light	

I: 3,4,7,8 (first slingline sensor, second slingline sensor, left hand rope sensor, right hand rope sensor)
O: 3 (green light)
Note: O: 0 (first gate solenoid) may be lit if reset button was pressed or through beam sensor was triggered less than 45 seconds ago.

2. Slingline triggering thru beam sensor before first gate.	

I: 0,3,4,7,8 (entrance thru beam sensor, first slingline sensor, second slingline sensor, left hand rope sensor, right hand rope sensor)
O: 0,3 (first gate solenoid, green light)

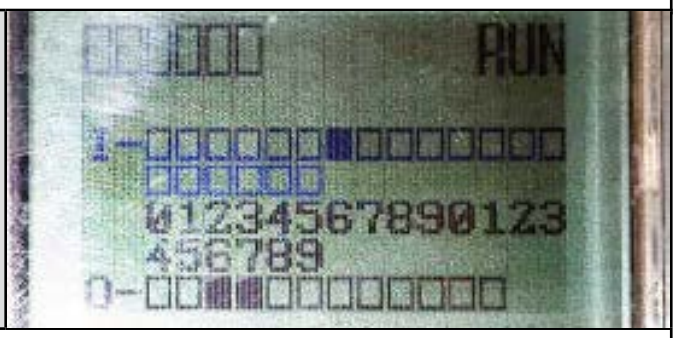
3. Slingline between thru beam sensor and first gate	

I: 3,4,7,8 (first slingline sensor, second slingline sensor, left hand rope sensor, right hand rope sensor)
O: 0,3 (first gate solenoid, green light)

5.1.2 NORMAL PLC FUNCTIONS

4. Inside first gate, before pull test	

I I: 3,4,7,8 (first slingline sensor, second slingline sensor, left hand rope sensor, right hand rope sensor)
O: 1 (red light)

5. Inside first gate, during pull test	

I: 6 (second gate check)
O: 2,3 (second gate solenoid, green light)

6. Inside first gate, after pull test	

I: 3,4,6,7,8 (first slingline sensor, second slingline sensor, left hand rope sensor, right hand rope sensor)
O: 2,3 (second gate solenoid, green light)

5.2 MAINTENANCE

5.2.1 LUBRICATION INSTRUCTIONS

It is important to keep the Electronic Safety Entrance clean and lubricated. This will ensure that the system works correctly and does not jam or cause false readings. RCI recommends checking the functionality of the Electronic Safety Entrance every day before opening the course for normal operation. The lubrication schedule will vary by site as it is largely dependent on operating conditions and how busy the course is. To inspect the system:

Step 1
Perform the Pre-Use Function Check as outlined in section 3.5.

Step 2
Pull a slingline into the test corner and gently pull down on it. While pulling, observe the movement of the test corner. The corner should move easily without binding or grinding. If the test corner does not move easily, follow the instructions in section 5.2.1.1 for lubricating the test corner bolt.

Step 3
Slowly release the slingline and verify that the test corner returns to the reset position. The 'test corner' should realign with the non-moving tracking. If the test corner remains in a lowered position or does not return smoothly, follow the instructions in section 5.2.1.1 for lubricating the test corner bolt.

Step 4
Gently pull down on one of the handlines. While pulling, observe the movement of the handline. The handline should move easily without binding or grinding. If the handline does not move easily, follow the instructions in section 5.2.1.2 for lubricating the handline bolt.

Step 5
Slowly release the handline and verify that it returns to the reset position. If the handline remains in a lowered position or does not return smoothly, follow the instructions in section 5.2.1.2 for lubricating the handline bolt.

Step 6
Repeat steps 4-5 with the other handline.

Step 7
Once the test corner and both handlines have been inspected, the slingline can be moved out of the safety entrance and returned to the slingline staging area.

5.2.1.1 LUBRICATING THE TEST CORNER

If the test corner is binding or sticking, complete the following steps to lubricate it.

1. Remove the top cover and both gate covers and set these aside.

2. Using a can of WD-40 Spray and Stay Gel Lubricant Non-Drip Formula, squirt a small amount of lubricant onto the test corner bolt above the top bushing. Try to get the lubricant all of the way around the bolt.

3. Pull down on the test corner to expose the section of bolt inside of the weldment (Note: It may be easiest to pull down on the test corner using a slingline in the tracking). Squirt a small amount of lubricant onto the exposed part of the test corner bolt below the bottom bushing. Try to get the lubricant all of the way around the bolt.

4. Pull the test corner down and release it several times to help move the lubricant around.

5. If the test corner is still binding, it may be necessary to grease the tabs welded to the test corner

6. To grease the tabs, apply a small amount of multi-purpose lithium grease to a thin, flat blade screwdriver.

7. Smear the grease along the bottom of the tabs located on each side of the test corner.

8. Pull the test corner down and release it several times to help move the lubricant around.

Note: Clean up any excess lubricant to reduce risk of contaminating the slingline webbing and or equipment.

9. Replace the top cover and both gate covers.

5.2.1.2 LUBRICATING THE HANDLINE BOLTS

If one or both of the handlines are binding or sticking, complete the following steps to lubricate them.

1. Remove the top cover and set it aside.

2. Using a can of WD-40 Spray and Stay Gel Lubricant Non-Drip Formula, squirt a small amount of lubricant onto the handline bolt above the bushing. Try to get the lubricant all of the way around the bolt.

3. Pull up on the washer above the top bushing for the handline bolt, compressing the spring, and squirt lubricant all of the way around the bolt.

4. Pull the handline down and release it several times to help move the lubricant around.

Repeat steps 2 through 4 on the other handline, if necessary.

Note: Clean up any excess lubricant to reduce risk of contaminating the slingline webbing and or equipment.

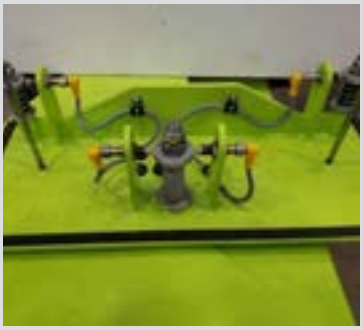
5. Replace the top cover.

5.2.2 TEST CORNER SPRING AND SENSOR CALIBRATION

The Electronic Safety Entrance uses a spring and sensor system on the test corner. This system may require periodic adjustments to keep it within the recommended tolerances. It is recommended to check the calibration of this system at least once a year or when faulty operation is observed. If a spring is cracked, broken or fatigued, it will need replacement. Likewise, if a sensor is damaged or not sending a proper signal, it will need replacement. Use the following steps to replace or recalibrate the test corner assembly. Note that accurate calibration is only possible if lubrication procedures have been followed and the moving components do not bind or jam.

TEST CORNER SPRING AND SENSOR CALIBRATION *CONTINUED*

1. Remove the top cover by removing the two black threaded knobs.



2. Insert a 30 pound test weight into tracking and position it in the test corner.

3. The 30 pound test weight must cause the moveable corner to drop 1/2" and must be fully supported by the spring at the bottom of the 1/2" movement. The weight shall not rest on the steel stops.
If adjustment or spring replacement is required, loosen the top locking nut using a 15/16" socket or wrench. Turn the non-locking nut until proper spring tension is reached. Tighten the locking nut against the non-locking nut after spring tension is correct. If spring replacement is needed, remove both nuts, washers and spring. Reassemble using a new spring and continue with the spring adjustment procedure.

4. Using a straight edge or flat tool, push up on the moveable corner until the bottom of the corner section is flush with the blocks welded to the surrounding tracking. Hold the corner in this position while another person performs step 5.

TEST CORNER SPRING AND SENSOR CALIBRATION *CONTINUED*

5. While holding the moveable test corner in the position described in step 4, loosen the two sensors using two 17mm wrenches.

First, adjust the horizontal position of the sensor head to be approximately 1/8" from the edge of the washers. After setting the approximate horizontal position of the sensor nuts, adjust the vertical position of the sensors. Using the slots found in the sensor brackets, slide the sensors down from the top of the slots until you see the sensor lights turn ON. Tighten the sensor at the very position at which it turns ON. Double check the horizontal sensor position by moving washers from side to side. Ensure that washers cannot collide with sensor heads. Center the washers so they are the same distance from each sensor.

6. Test the sensor adjustment by moving the test corner up and down. Both sensors should turn on when in the upward position. Both sensors should turn off at relatively the same time when slowly pulling the test corner to the down position. There should be roughly 3/16" of downward movement after the sensors turn off. This ensures a reliable OFF signal when 30 pounds is applied to the test corner.

UP POSITION

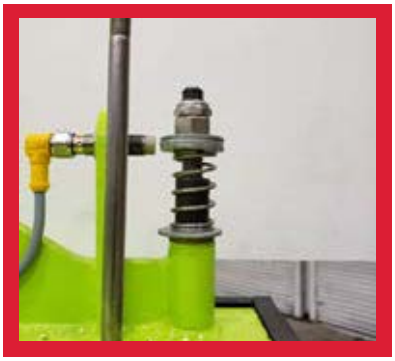
- 3/16" from bottom.
- Sensors edge of range.

MID POSITION

- 3/16" from mid position.
- Sensors OFF.

DOWN POSITION

5.2.3 ROPE PULL SPRING AND SENSOR CALIBRATION



1. The sensors on the rope pull mechanism have no vertical adjustment. They fit into holes in the sensor brackets, so only horizontal positioning is required. Check that sensor heads are approximately 1/8" from the washers. Move washers side to side to ensure washers cannot collide with sensor heads. Loosen sensor nuts using two 17mm wrenches if adjustments or replacement is required.

2. Check that washer height is adjusted appropriately. Washers should be in-line with the sensor head when in the up position. Sensor should turn off in the down position. Check that there is movement after the sensor turns off to ensure a reliable off signal.

5.2.4 SAFETY ENTRANCE WIRING DIAGRAM

SAFETY ENTRANCE WIRING KEY				
WIRE COLOR	**GAUGE**	**FUNCTION**	**PLC I/O**	**FUSE**
Purple	16	Entrance Thru Beam Sensor	I: 0/0	
Orange/White	16	Reset Push Button	I: 0/1	
Brown/White	16	First Gate Sensor	I: 0/2	
Blue/White	16	First Slingline Sensor	I: 0/3	
Red/White	16	Second Slingline Sensor	I: 0/4	
Pink/White	16	Second Gate Sensor	I: 0/5	
Pink	16	Second Gate Check	I: 0/6	

SAFETY ENTRANCE WIRING DIAGRAM *CONTINUED*

SAFETY ENTRANCE WIRING KEY				
WIRE COLOR	**GAUGE**	**FUNCTION**	**PLC I/O**	**FUSE**
Purple/White	16	Left-hand Rope Sensor	I: 0/7	
Black/White	16	Right-hand Rope Sensor	I: 0/8	
Red	14	First Gate Solenoid	O: 0/0	
Orange	16	Red Light	O: 0/1	
Pink	14	Second Gate Solenoid	O: 0/2	
Grey	16	Green Light	O: 0/3	
Yellow	16	Safety Relay	O: 0/4	
Brown	16	24 Volts	VDC	2 & 5 Amp
Blue	14, 16	Negative	COM	
Green	12, 16	Ground	Ground	
Black/White	12, 14	110 VAC		10 Amp
White	12, 14	110 VAC Common		

Note: The I/O PLC boxes start at 0.

5.2.5 PAINT REPAIRS

RCI recommends that any paint damage be repaired within 48 hours of first steel exposure. The two methods for handling paint repairs on a Sky Trail® Safety Entrance are as follows:

5.2.5.1 TEMPORARY SOLUTION

- Use a Scotch pad or 120 grit sandpaper to smooth any rough edges of the blemish.
- Lightly coat with a rust-inhibiting spray primer. The Rust-Oleum color of your choice or a similar product is acceptable for Sky Trails® located in indoor or non-marine environments. Sky Trails® located in marine environments should use ZRC as a rust-inhibiting primer.

*Note: When completely repairing the paint blemish at a later time, any rust-inhibiting spray primer must first be removed with a light sander or wheel before applying the permanent Epoxy primer and paint.

5.2.5.2 PERMANENT SOLUTION (RCI RECOMMENDED)

- Use a Scotch pad or 120 grit sandpaper to smooth any rough edges of the blemish.
- Mix the needed amount of epoxy primer part A and epoxy activator part B. Refer to data sheet included with paint for mixing instructions.
- Apply epoxy primer mixture to bare, cleaned steel with a fine tip brush. This step must happen within 2 hours of activating the epoxy primer. Once applied, the epoxy primer mixture will be dry and paint ready in about one hour at 70 °F (21°C).
- Mix the needed amount of epoxy paint part A and epoxy paint activator part B. Refer to data sheet included with paint for mixing instructions.
- Apply the epoxy paint mixture over the dried epoxy primer mixture.
- Clean and seal all cans of unused primer, activator, and paint for future use.

6.0 REVISIONS

Revision history for this document is outlined in the following table:

Table 1: Revision history

REV	MODIFIED BY	APPROVAL DATE	APPROVED BY
R0	GRACE COLEGROVE	03/11/2022	JORDAN TERPSTRA
R1	KYRA DUTKIEWICZ	01/22/2026	JORDAN TERPSTRA

Summary of R0 Changes:

- Initial Publication

Summary of R1 Changes:

- Page 25, Reference to paint touch up procedure