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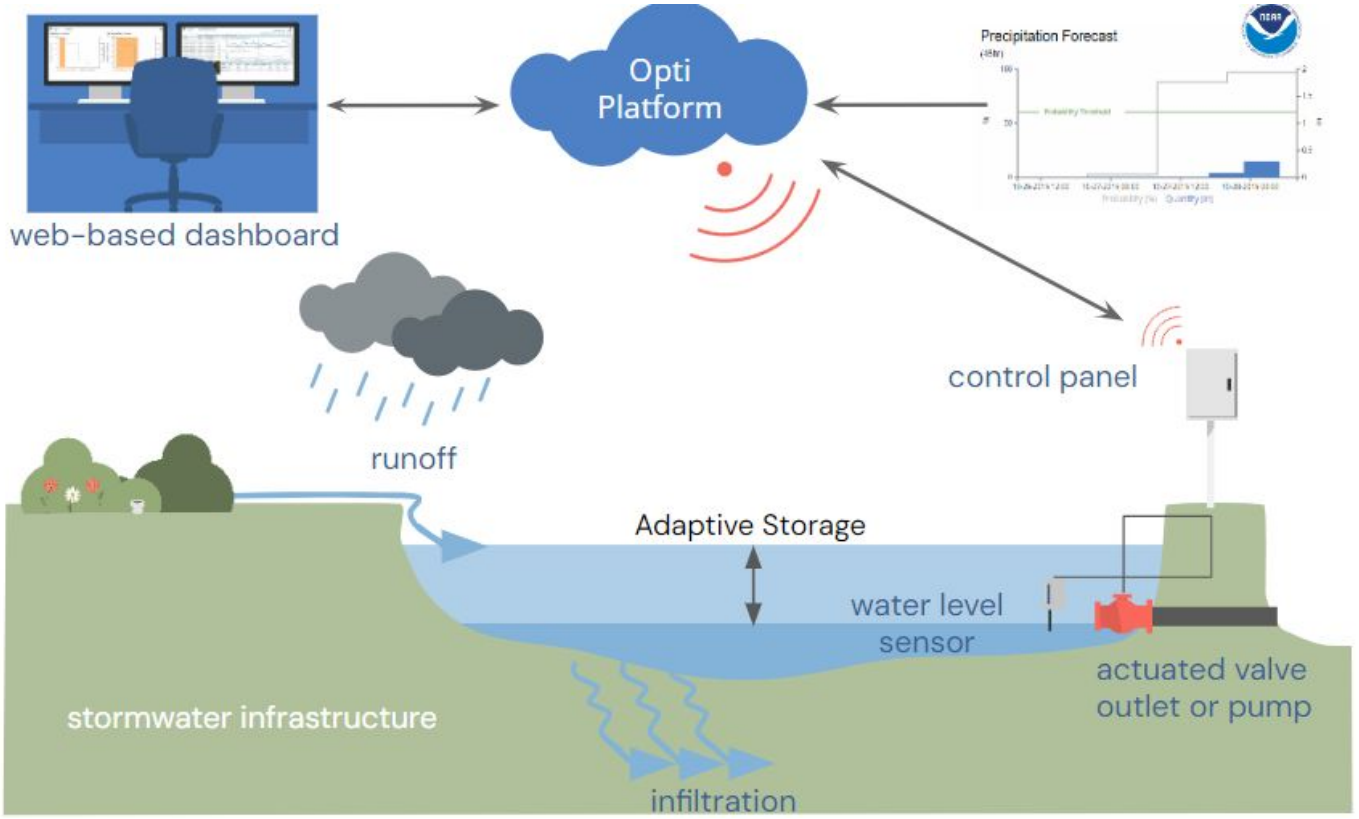
CMAC O&M Inspection Process

Last Revised January 2025

Continuous Monitoring and Adaptive Control (CMAC):

Cloud Software

Field Equipment



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Resources:

- Opti Operations and Maintenance (O&M) Manual
- Inspection and Maintenance Log
- Inspectors Tool Kit

- Opti Support
  - support@optirtc.com
  - 844-678-4782 ext. 702
  - M-F, 9-5 EST

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Safety Information:

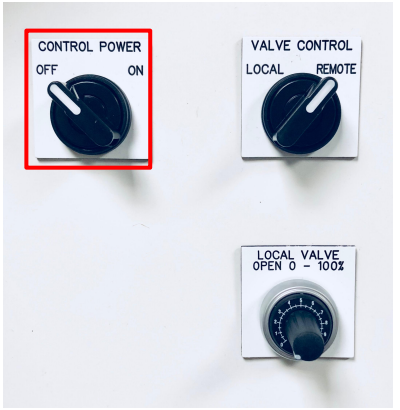
- Power must be turned off before servicing, modifying, or maintaining any equipment. Please refer to the de-energizing procedure in the Opti O&M Manual.

- Only Qualified Personnel (according to OSHA 1910.332) should conduct electrical work on-site, and all work should conform to national and local electric codes (e.g. NFPA 70).

- Proper confined space entry procedures should be followed at all times when entering confined space outlet structures.

De-Energizing:

1. Unlock the control panel enclosure and access the swing panel.
2. Turn the Control Power switch to the off position.
3. Open the swing panel. Locate the panel circuit breakers, labeled CB1 and CB2, and turn them down to the off position.



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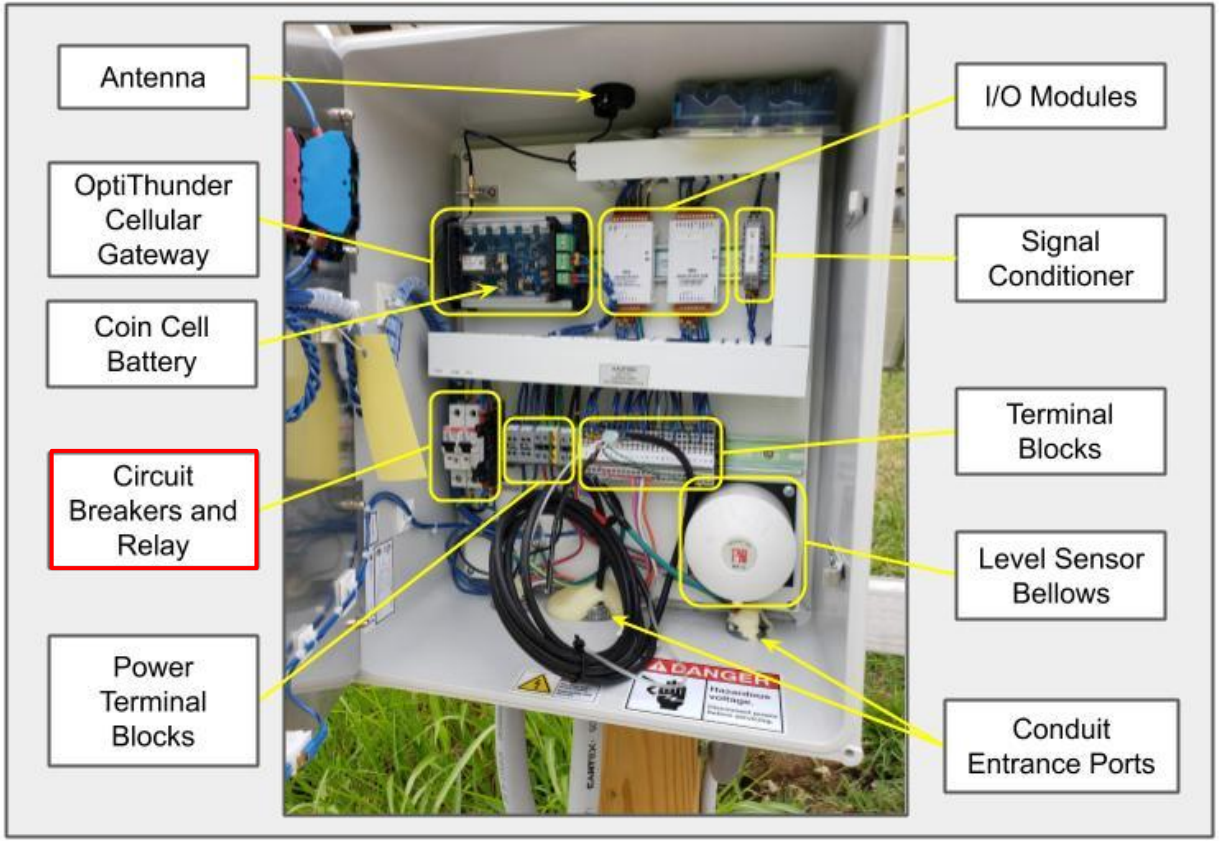
Control Panel:

- Inspect panel for water intrusion or pest infestation
- Inspect conduit for damage or loose connections
- Replace Thunder coin cell battery



**note level sensor bellows location*

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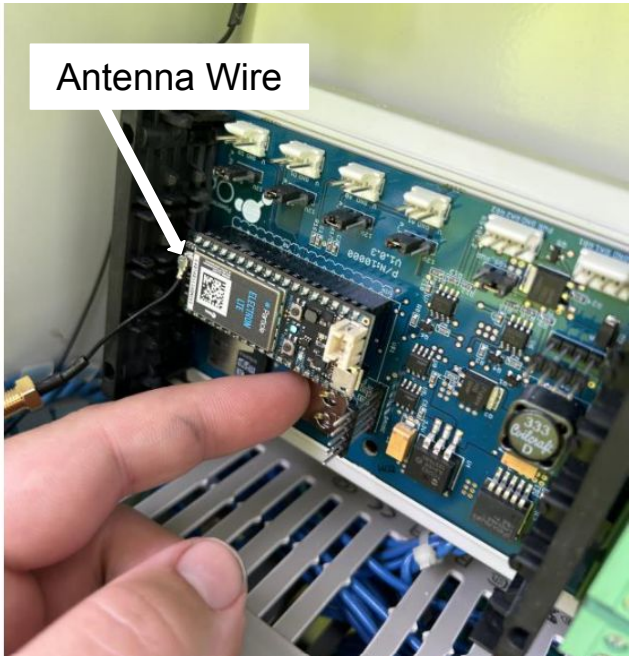
Control Panel:

- Coin cell should have ~3.2 V when new
- Remove plastic cover
- Remove and replace battery
  - **plus side out**
- Re-install plastic cover being careful not to pinch antenna wire



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Water Level Sensor:

- Sensor to be cleaned, visually inspected and calibrated during inspection

- Sensor typically housed within PVC stilling well
- Reads water level via pressure
  - Bellows help adjust for atmospheric pressure
  - Typically housed within control panel or junction box

- Remove debris, sediment from stilling well

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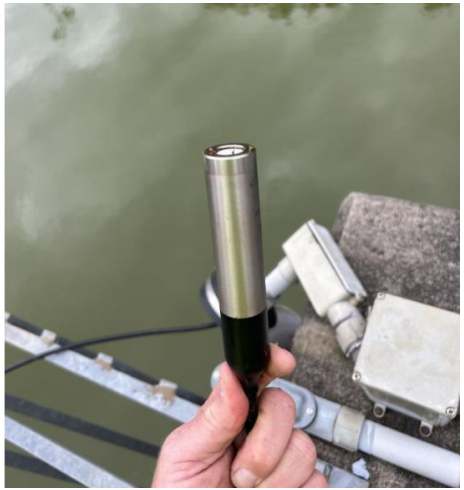
Sensor Inspection:

- Remove sensor from stilling well
- Clean with water and soft cotton towel and only
- Inspect sensor and cable for any signs of damage or wear
- Perform “bucket test” for dry pond
- **Gently** lower in stilling well until resting at bottom
    - *Do not embed in silt / clay*



Bucket Test:

- On level ground, pour enough water in a bucket to cover the sensor
- Place sensor in bucket, record water depth and times of test
- Wait at least 10 minutes
- Add water to the bucket, record new water level and times of test
- Wait at least 10 minutes
- Remove sensor from bucket and return to stilling well

Sensor test **(if site is dry - Use "bucket test" for sensor calibration)**	Make sure the bucket is level. Measure the depth of water in the bucket. Place the sensor in a bucket for 10 minutes. Measurement 1 - Depth: Measurement 1 Start - Date / Time: Measurement 1 Finish - Date / Time: **After returning sensor to stilling well:** Survey point (e.g. top of OCS or weir wall): Distance from survey point to sensor location (in):

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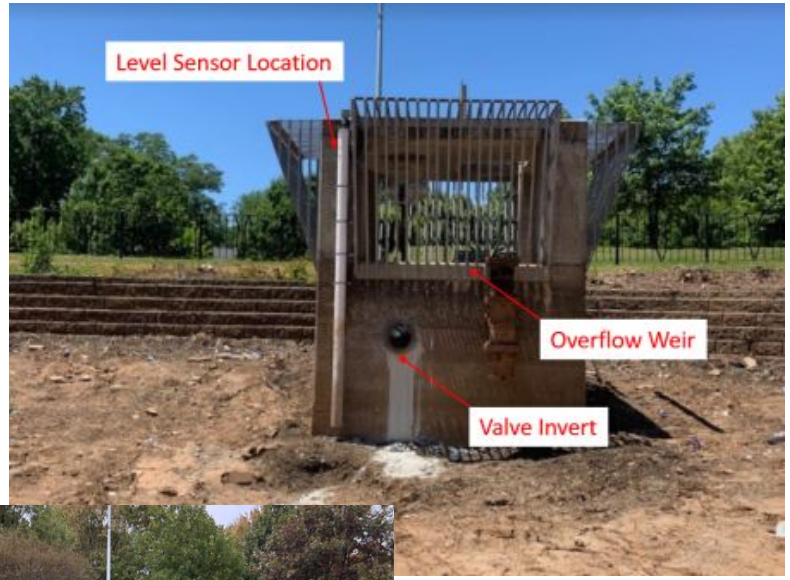
Field Measurements:

- **Measurement must be taken from top of Survey Point**

- A survey point has a known reference elevation such as:
  - Top of outlet control structure
  - Base of overflow weir / weir notch

- When water is present measure from survey point to top of water

- When water in not present measure from survey point to bottom of sensor



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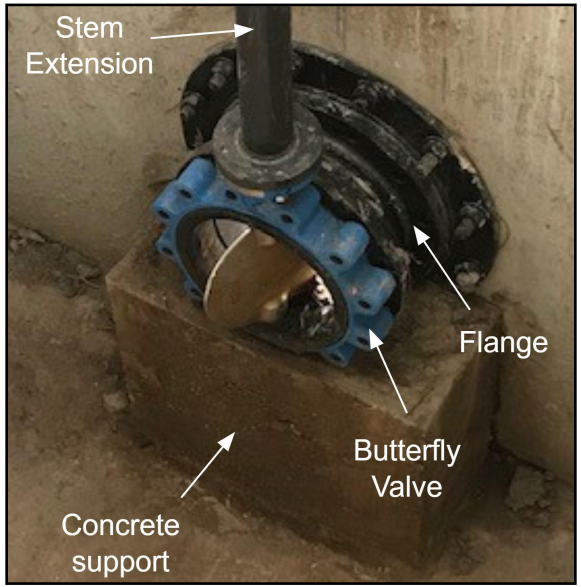
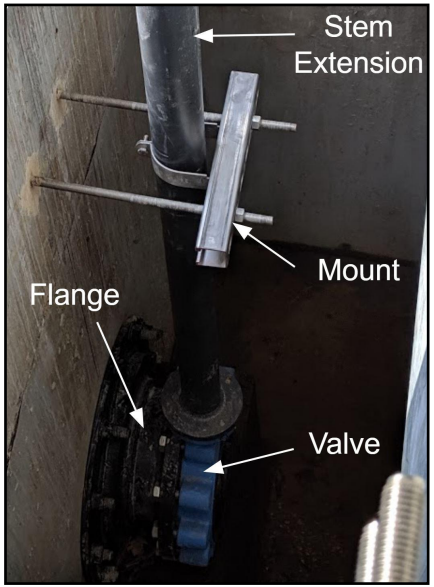
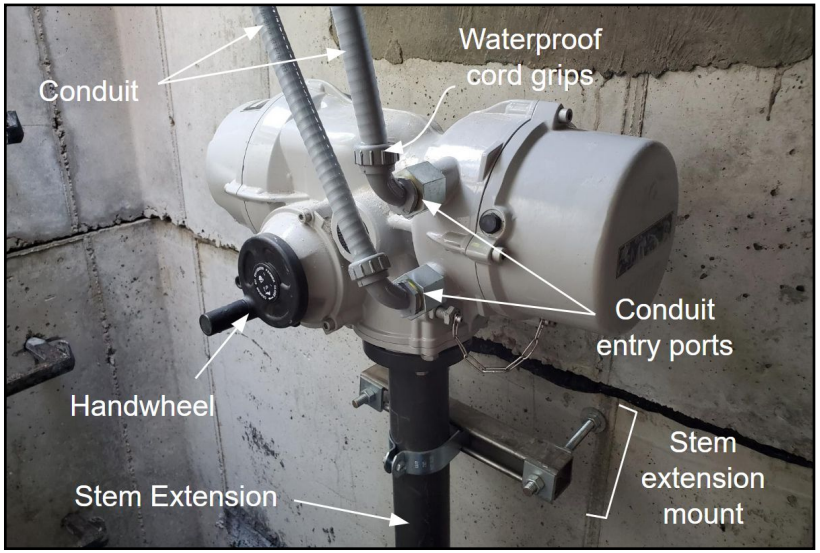
Valve / Actuator:







- Remove trash and debris from trash rack
- Visually inspect valve, stem, flange, mounts and actuator for signs of wear or damage

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Actuator / Valve / Gate Calibration:

- Set Valve Control to **local**
- Set Local Valve to 100%
  - Record set position if less than 100%
- When actuator stops moving:
  - Visually confirm valve is at target position
  - Record valve open position from actuator screen and time
- Set Local Valve to 0%
  - Visually confirm valve closes
  - Record valve position and time
- Return Valve Control to **remote**

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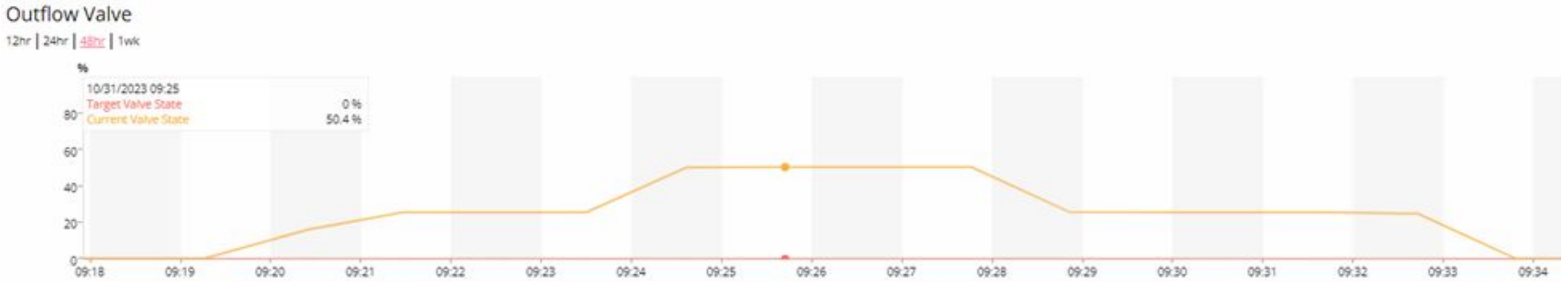
Actuator / Valve / Gate Calibration:



- Opti will remotely test the valve to confirm the valve operates locally and remotely
- Visually confirm valve reaches remotely targeted position

- The above test was from 0% - 25% - 50% - 25% - 0%

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Actuator Settings:

- Use Rotork remote control to access actuator menu
- Find and record from actuator
  - Close Limits set
  - Fail Safe set
  - Torque set
- Exit and return actuator remote to control panel (or other storage location)

Rotork Bluetooth® Setting Tool Pro

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Failsafe Position Check:

- **Only if line powered actuator!**
- De-energize panel as previously described
- Record and report the valve position to Opti Support
  - Valve failsafe position is typically fully open or fully closed - Opti Support can verify intended position
- Re-energize panel

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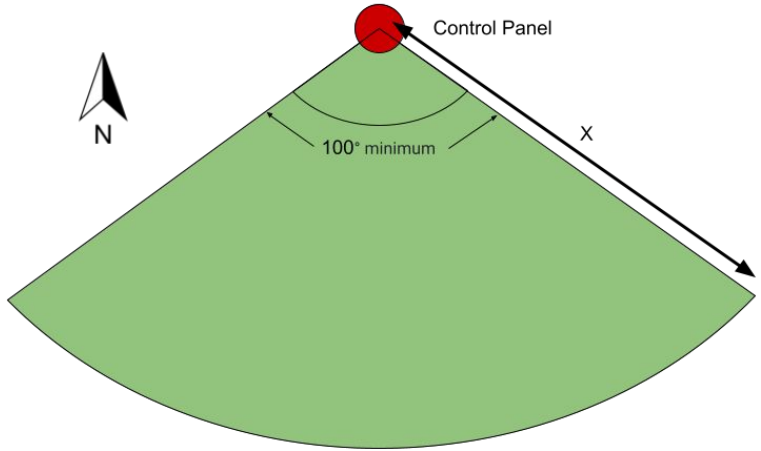
Solar Kit:

- Clean solar panel with cotton cloth and water only - no chemicals!
- Cut back any vegetation directly covering solar panel
- Confirm DIP Switch position on charge controller
    - if set correctly, Opti will receive solar health data
- Use multimeter to measure and record charge of both batteries
    - charge should be equal or near equal

Solar Panel Positioning:

- Panels ideally have at least 100’ of open horizontal space and 75’ vertical space as shown
- Southern exposure is typically best solar panel position
- The panel should be at roughly the same angle as the site’s latitude



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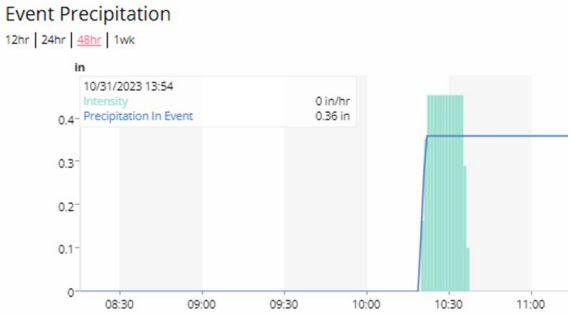
Rain Gauge:

- Remove debris from collector cone
- Inspect rain gauge and wiring for signs of physical damage, including removal of collector cone and inspection of tipping bucket
- Perform pour test with Opti Support or note test time for data review



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Results:

- In the field:
  - All maintenance tasks completed
  - Inspection log completed
  - Site and asset conditions thoroughly documented

- In the office:
  - Submit inspection log, site and asset photos to Opti via email or cloud
  - Thoroughly describe / explain any repairs identified during inspection if needed

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Opti Customer Support

support@optirtc.com
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M-F 9:00am - 5:00pm EST