FloatMASTER

Professional Installation Manual

For Qualified Installers & Service Technicians

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FloaTek Technologies • Calgary, Alberta, Canada

⚠ Important Information for Installers

Professional Installation Required

This manual is designed for qualified installers, electricians, and service technicians who have experience with:

- ☐ Low-voltage electrical systems and wiring
- ☐ Septic tank, cistern, or water system components
- ☐ WiFi network configuration and troubleshooting
- ☐ IoT device installation and commissioning

Proper installation is critical to system performance and warranty coverage. Improper installation may result in:

- System malfunction or failure to alert
- Voided warranty and manufacturer liability
- Damage to equipment or property
- Customer dissatisfaction and service callbacks

Please read this entire manual carefully before beginning installation. Follow all safety warnings, wiring diagrams, and testing procedures to ensure proper system operation.

Questions? Contact FloaTek Technical Support
support@floatek.ca

1. System Overview

The FloatMASTER system is an IoT water level monitoring solution designed for septic tanks, cisterns, sump pits, and water storage applications. The system consists of two main hardware units communicating via LoRa radio.

System Components

Transmitter Unit (Field Device)

Field-mounted unit with LoRa transmitter, float switch inputs (×2), OLED display, LED indicators, buzzer, and rechargeable battery backup.

- Monitors up to 2 independent float switches
- Transmits status via long-range LoRa radio
- **Local LED and buzzer alarms at the tank location**
- Supports USB-C power or solar charging
- Battery backup for continuous operation

Receiver Unit (Base Station)

Indoor base station with LoRa receiver, WiFi connectivity, MQTT client, OLED display, LED indicators, buzzer, and rechargeable battery backup.

- Receives data from transmitter via LoRa
- Connects to home WiFi for cloud dashboard
- **Local LED and buzzer alarms at the indoor location**
- Auxiliary relay output for external alarms
- MQTT for real-time cloud communication

Primary Alarm System

IMPORTANT: The primary alarm system for FloatMASTER consists of the local LEDs and buzzers on **BOTH** the Transmitter and Receiver units. These provide immediate on-site alerts at the tank location AND indoors, functioning independently of internet connectivity or cloud services. The dashboard and email alerts are secondary notification methods.

Technical Specifications

Parameter	Specification
LoRa Frequency	915 MHz (North America)
Wireless Range	Up to 500m; penetrates walls and standard construction
Float Inputs	2× Normally Open (NO), configurable HIGH/LOW
WiFi	2.4 GHz 802.11 b/g/n only
Battery	Rechargeable Li-Ion (~3 days backup)
Power Input	USB-C 5V or Solar 5V 10W
Display	0.96" OLED 128×64
Aux Relay Output	10A @ 250VAC dry contact
Operating Temp	-20°C to +50°C
Enclosure Rating	IP65 (both Transmitter and Receiver)

2. Pre-Installation Planning

Site Survey Checklist

Complete this checklist before beginning installation:

- ☐ Identify tank/cistern location and access points
- ☐ Confirm float switch mounting locations
- ☐ Verify power availability at transmitter location
- ☐ Identify receiver location with WiFi coverage
- ☐ Confirm transmitter and receiver locations are within range (LoRa penetrates walls; avoid metal enclosures)
- ☐ Confirmed customer has 2.4 GHz WiFi network
- ☐ Obtained WiFi network name (customer may prefer to enter password themselves)
- ☐ Verified neither unit will be inside metal enclosure (walls are OK)

Tools & Materials Needed

- Phillips screwdriver
- Wire strippers/crimpers
- Multimeter
- Drill with appropriate bits
- Cable ties and mounting hardware
- Waterproof wire connectors
- Smartphone or laptop for WiFi configuration
- Customer's WiFi network name (customer may prefer to enter password themselves)

3. Transmitter Installation

Location Selection

Choose a transmitter location that:

- Is protected from direct rain and snow (if possible)
- Is mounted at a readable height above expected snow level
- Has access to power (outlet or solar)
- Is within cable reach of float switches
- Is NOT inside a metal enclosure (walls and buildings are fine)
- Within 500m of receiver location

Good locations: Pump house, under eave, 4×4 post with weatherproof enclosure, inside non-metal shed.

LoRa Placement Tips

Unlike WiFi, LoRa radio generally does not require line-of-sight and can typically penetrate walls and standard construction materials. However, thick concrete, multiple walls, or metal structures may reduce signal strength.

- **Transmitter:** Install near your tank, protected from direct weather
- **Receiver:** Place indoors where you have good WiFi signal (mechanical room, utility room, basement)
- **Avoid:** Do not place either unit inside metal enclosures or metal sheds (significantly degrades signal)
- **Range:** Up to 500 meters between Transmitter and Receiver under typical conditions

Float Switch Installation

Pre-Wired Float Switches: Both float switches come pre-wired to the Transmitter unit. No terminal connections are required during installation.

Float Positioning Guidelines

- **HIGH Level Alarm:** Mount float 2-4 inches below maximum safe level
- **LOW Level Alarm:** Mount float 2-4 inches above pump intake or minimum level
- **Tether Length:** Typically 2-4 inches to allow proper float travel
- Ensure float has full range of motion without obstructions

Understanding Float Switch Operation

FloatMASTER uses Normally Open (N.O.) float switches. Here's how they work:

- **Float Down (normal):** Switch is OPEN - no electrical connection
- **Float Up (triggered):** Switch CLOSES - completes the circuit, triggering alarm
- The float contains a steel ball that rolls to close the switch contacts when the float rises

Note: If replacing a float switch in the future, use a 2-wire Normally Open (N.O.) float switch. Connect the two wires to the corresponding terminals on the Transmitter.

Power Connection

- **USB-C Power:** Connect 5V USB-C adapter (included)
- **Solar + Battery:** Connect 5V 10W solar panel for extended off-grid operation (see below)
- **Battery Only:** Approximately 3 days backup operation depending on temperature and battery condition (charge level)

⚠ **IMPORTANT:** Ensure all USB connections are secure and protected. Route cables where they cannot be pulled out or damaged by snow accumulation, foot traffic, landscaping equipment, or animals. Use cable clips or conduit to secure cables along their entire length.

☼ Solar Panel Setup

For remote installations without access to AC power, the Transmitter can be powered by a solar panel. This provides indefinite operation without the need for battery replacement or recharging.

Solar Panel Requirements

- **Output Voltage:** 5V DC (regulated)
- **Power Rating:** 10W recommended
- **Connector:** USB output (connects to Transmitter USB-C port)
- **Type:** Weatherproof/outdoor rated panel with built-in charge controller

Installation Guidelines

1. **Panel Orientation:** Face panel south (in Northern Hemisphere) at a 30-45° angle
2. **Avoid Shading:** Ensure no trees, buildings, or structures shade the panel during peak sun hours
3. **Secure Mounting:** Mount panel securely to withstand wind; consider seasonal snow load
4. **Cable Routing:** Route USB cable to avoid damage; use outdoor-rated cable or conduit
5. **Connection:** Connect solar panel USB output to Transmitter USB-C input

How It Works

The Transmitter's built-in battery acts as a buffer:

- **Sunny conditions:** Solar panel charges battery and powers the device
- **Cloudy/Night:** Battery provides power until sun returns
- **Dashboard Monitoring:** Battery level and charging status visible on dashboard

💡 **TIP:** A 10W panel provides sufficient power for year-round operation in most climates, including Canadian winters with shorter daylight hours.

4. Receiver Installation

Location Requirements

LoRa communication works reliably through walls, so indoor installation is ideal:

- Indoor location with good WiFi signal strength
- Within range of transmitter (walls and standard construction are fine)
- Near power outlet
- Location where buzzer alarm can be heard
- NOT inside metal enclosure or behind metal wall

Good locations: Mechanical room, utility room, basement, garage.

Auxiliary Relay Output

Every FloatMASTER receiver includes a built-in auxiliary relay output. This dry-contact relay allows you to connect external devices that activate when an alarm condition occurs.

What is a Dry-Contact Relay?

A dry-contact relay acts like a remote-controlled switch. When an alarm triggers, the relay closes the circuit between its two terminals, allowing current to flow to your connected device. The relay itself provides no power - it simply completes or breaks a circuit.

Common Applications

- **External Sirens/Strobe Lights:** Connect a louder siren or visual strobe for locations where the built-in buzzer may not be heard
- **Auto-Dialers:** Connect to phone dialers that call preset numbers when triggered
- **Home Automation:** Integrate with smart home systems (Home Assistant, SmartThings, etc.) to trigger automations, send notifications, or control other devices
- **Secondary Alarm Panels:** Connect to existing security or monitoring systems
- **Indicator Lights:** Power a warning light in another location

Relay Specifications

- **Rating:** 10A @ 250VAC (resistive load)
- **Contact Type:** Normally Open (NO) - closes when alarm active
- **Connection:** Two-wire screw terminals on receiver unit

Dashboard Control

The auxiliary relay can be configured via the dashboard:

- **Enable/Disable:** Turn the relay function on or off
- **Trigger Mode:** Configure which float conditions activate the relay (Either Float, Both Floats, Float 1 Only, or Float 2 Only)

⚠ **IMPORTANT:** Use appropriate wire gauge for connected load. For high-current devices, consider using the relay to trigger a secondary, higher-capacity relay or contactor.

5. WiFi Configuration

The FloatMASTER Receiver connects to your home WiFi network to enable remote dashboard access and email alerts. This section covers the complete WiFi setup process.

Before You Begin

Gather the following information:

- **WiFi Network Name (SSID):** The exact name of the customer's 2.4 GHz network
- **WiFi Password:** Case-sensitive! Customer may prefer to enter this themselves
- **Router Location:** Ensure receiver is within reasonable range of the WiFi router

⚠ **CRITICAL:** FloatMASTER **ONLY supports 2.4 GHz WiFi networks**. 5 GHz networks will NOT work. Many modern routers broadcast both frequencies - look for network names ending in "_2.4G" or without "_5G" suffix.

Step 1: Enter Setup Mode

6. Power on the receiver unit and wait for it to fully boot (about 10 seconds)
7. Press and hold the button for 5-10 seconds
8. The OLED display will show "WiFi Setup Mode" or "AP Mode"
9. The blue LED will begin blinking, indicating the access point is active
10. The device creates a WiFi network named: **FloatMASTER-XXXXXX** (where XXXXXX is the Device ID)

Step 2: Connect to FloatMASTER Access Point

11. On your smartphone or laptop, open WiFi settings
12. Look for and select the network: **FloatMASTER-XXXXXX**
13. No password is required - connect directly
14. Wait for connection to establish (may show "No Internet" - this is normal)

💡 **TIP:** If your phone keeps switching back to your home WiFi, temporarily "Forget" your home network or disable auto-connect, then reconnect to FloatMASTER.

Step 3: Access Configuration Page

15. Open any web browser (Chrome, Safari, Firefox, Edge)
16. In the address bar, type: **192.168.4.1** and press Enter
17. The FloatMASTER WiFi Configuration page will appear
18. If the page doesn't load, ensure you're still connected to the FloatMASTER network

💡 **TIP:** On some phones, a captive portal page may open automatically - use the manual 192.168.4.1 address for the best experience.

Step 4: Enter WiFi Credentials

19. In the "Network Name" or "SSID" field, enter the customer's WiFi network name exactly as it appears
20. In the "Password" field, enter the WiFi password (**case-sensitive!**)
21. Double-check both entries for accuracy - typos are the most common issue
22. Click **Save** or **Connect**

Step 5: Verify Connection

23. The device will restart automatically (takes about 15-20 seconds)
24. Watch for the **Green LED** to illuminate solid - this indicates successful WiFi connection
25. The OLED display will show the connection status and IP address
26. Reconnect your phone/laptop to your normal WiFi network

☑ **SUCCESS:** Green LED solid = WiFi connected. The receiver is now online and communicating with the FloatMASTER cloud.

Troubleshooting WiFi Connection

- **192.168.4.1 not loading:** Disable mobile data on your phone. Ensure you're connected to FloatMASTER-XXXXXX, not your home network. Try a different browser.
- **"No Internet" warning:** This is normal - the FloatMASTER access point provides configuration only, not internet. Proceed with setup.
- **Won't connect to home network:** Verify you're using a 2.4 GHz network. Check password carefully (case-sensitive). Move receiver closer to router temporarily.
- **Red LED after restart:** Connection failed. Re-enter setup mode (hold button 5-10 sec) and try again with correct credentials.
- **Connection drops frequently:** Check WiFi signal strength at receiver location. Consider a WiFi range extender if signal is weak.
- **Need to change WiFi network later:** Hold button for 10-15 seconds to reset and re-enter setup mode.

Identifying 2.4 GHz vs 5 GHz Networks

If the customer is unsure which network is 2.4 GHz:

- Look for network names with "2.4", "2.4G", or "2G" in the name
- Avoid networks with "5G", "5GHz", or "_5" in the name
- Check the router label - it often lists both network names
- Log into the router admin page to view/rename networks
- If networks share the same name ("band steering"), the router may need reconfiguration to separate them

6. System Testing & Verification

LoRa Communication Test

27. Power on both transmitter and receiver
28. Verify receiver OLED shows signal strength (RSSI)
29. Confirm data updates every 10-30 seconds
30. If no signal: check for metal enclosures, try repositioning units

Float Switch Test

31. Manually raise Float 1 to trigger alarm
32. Verify: Red LED illuminates within 5 seconds
33. Verify: Buzzer sounds (if not muted)
34. Verify: Dashboard shows alarm status
35. Release float and verify alarm clears
36. Repeat for Float 2

Dashboard Registration

37. Navigate to: https://app.floatek.ca/register
38. Enter Device ID (shown on OLED)
39. Enter customer name, email, and location
40. Create 4-digit security PIN
41. Click Register Device
42. Bookmark dashboard link for customer

Configure Float Modes

Mode	Alarms When	Typical Use
HIGH	Float rises (water level UP)	Septic tanks, sump pits
LOW	Float drops (water level DOWN)	Cisterns, supply tanks

7. Final Commissioning Checklist

Hardware Verification

- ☐ Transmitter securely mounted and weatherproofed
- ☐ Float switches properly installed and free-moving
- ☐ All wiring connections secure and waterproofed
- ☐ Receiver mounted in appropriate indoor location
- ☐ Power supplies connected and working
- ☐ Auxiliary relay configured via dashboard (if using external devices)

Communication & Connectivity

- ☐ LoRa communication confirmed (receiver shows RSSI; works through walls)
- ☐ WiFi connected (green LED on receiver)
- ☐ Dashboard accessible and showing live data
- ☐ Device registered with customer email

Functional Testing

- ☐ Float 1 alarm test passed (LED, buzzer, dashboard)
- ☐ Float 2 alarm test passed (LED, buzzer, dashboard)
- ☐ Alarms clear when floats return to normal
- ☐ Float modes configured correctly (HIGH/LOW)
- ☐ Email alert received (test or actual)

Customer Handoff

- ☐ Dashboard link bookmarked on customer device
- ☐ Customer shown how to access dashboard
- ☐ LED indicators explained
- ☐ Mute button operation demonstrated
- ☐ Customer Setup Guide provided
- ☐ Support contact information provided
- ☐ Installation record completed

8. Maintenance & Troubleshooting

Routine Maintenance Schedule

Frequency	Task
Monthly	Check dashboard for battery levels and connection status
Quarterly	Inspect float switches for debris, verify free movement
Every 6 Months	Full alarm test - manually trigger each float
Annually	Inspect all wiring connections, check enclosure seals
Every 2-3 Years	Replace batteries (if runtime significantly reduced)

Common Issues & Solutions

No LoRa Communication:

- Check transmitter power and battery level
- Ensure neither unit is inside a metal enclosure (walls and standard construction are fine)
- Reduce distance or reposition if using thick concrete or multiple walls

WiFi Not Connecting:

- Confirm 2.4 GHz network (not 5 GHz)
- Verify password is correct (case-sensitive)
- Check WiFi signal strength at receiver location

False Alarms:

- Check float switch for debris or obstruction
- Verify float mode setting matches application
- Check wiring connections for intermittent contact

No Email Alerts:

- Check spam/junk folder
- Verify email address in registration
- Confirm device is connected to WiFi (green LED)

9. LED Indicator Reference

LED	State	Meaning
Green	Solid	WiFi connected, system normal
Green	Blinking	Connecting to WiFi...
Red	Solid	ALARM - Float triggered
Red	Blinking	Low battery warning
Blue	Blinking	WiFi setup mode active
Yellow/Orange	Solid	Alarm muted

10. Technical Support

FloaTek Technical Support

Email: support@floatek.ca
Website: www.floatek.ca
Hours: Monday-Friday, 9am-5pm MST

When contacting support, have ready:

- Device ID (6-character code)
- Description of the issue
- LED indicator status
- Installation date

11. Warranty & Disclaimers

1-Year Limited Warranty

FloatMASTER products are covered by a 1-year limited warranty protecting against manufacturing defects in materials and workmanship under normal use.

What's Covered

- Manufacturing defects in materials and workmanship
- Component failures under normal operation
- Firmware issues

What's NOT Covered

This warranty does NOT cover damage from:

- Misuse, neglect, or abuse
- Lightning strikes or power surges
- Frost damage or extreme temperature exposure beyond rated specs
- Water ingress due to improper sealing or installation
- Unauthorized modifications or repairs
- Improper installation not following this manual
- Normal wear and tear

Warranty Claims

To make a warranty claim:

43. Contact support@floatek.ca with your Device ID
44. Describe the issue in detail
45. Provide photos if applicable
46. We'll provide return instructions if needed

Liability Disclaimer

IMPORTANT: Please read carefully.

FloatMASTER water level monitoring systems contain mechanical and electrical components that, like all such devices, can fail. Component failure could result in property damage, flooding, or tank overflow.

FloaTek Technologies assumes no liability for:

- Damages arising from system failures
- Property damage from flooding or water-related incidents
- Consequential damages of any kind
- Damages exceeding the purchase price of the product

This system is designed as a secondary monitoring aid, not a primary safety device. *Regular maintenance and testing of your primary water management systems (pumps, floats, alarms) remains essential.*

Software & Remote Monitoring Disclaimer

IMPORTANT NOTICE REGARDING CLOUD SERVICES:

- FloaTek Technologies does not guarantee continuous availability of remote monitoring services
- Cloud services may experience downtime for maintenance or technical issues
- **Remote monitoring services may be discontinued or changed at any time**
- **Services may transition to a paid subscription model in the future**
- Internet connectivity issues are beyond our control

Your primary alarm system consists of the local LEDs and buzzers on BOTH the Transmitter and Receiver units. These local alarms function independently of internet connectivity and cloud services. Do not rely solely on remote notifications or dashboard access.

Regular testing of all alarm functions is required.

Installation Liability

Improper installation may void the warranty and can result in system failure. FloaTek Technologies is not liable for damages resulting from installations that do not follow the procedures outlined in this manual.

By installing or using this product, you acknowledge that you have read, understood, and agree to these warranty terms, limitations, and disclaimers.

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