



# Flo-Pro<sup>™</sup>

## Dual Batch Controller

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### System Manual

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# System Manual

The Flo-Pro is a two channel controller designed to accurately meter and dispense liquids. It is intended to be part of a complete batching system consisting of the Flo-Pro console, two flowmeters, two control valves, and a connection for an optional remote run/hold switch.

### Flo-Pro™ Kit Components:

PN 19836 - Console  
PN 19834 - Branch Harness  
PN 19835 - Power Cable w/10A fuse  
PN 13181 - Console Mount Kit  
PN 12910 - 10-pack 14" Cable Ties  
PN 19830 - System Manual

Please read the manual carefully and follow the instructions as they apply to your application.

If you do encounter a problem that cannot be corrected by reviewing this manual, consult your dealer or distributor, or contact a Micro-Trak® technician for assistance.

U.S. or Canada: Toll-free (800) 328-9613 or (507) 257-3600

Fax: 507-257-3001

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## Micro-Trak Systems, Inc. Limited Warranty

Micro-Trak Systems, Inc. (herein "Seller") warrants to the original purchaser (herein "Buyer") that, if any product or part of the product (herein "Parts") proves to be defective in material or workmanship, upon inspection and examination by Seller, within three (3) years from the original date-of-purchase, and is returned to Seller with dated proof-of-purchase, transportation prepaid, within sixty (60) days after such defect is discovered, Seller will, at their option and sole discretion, either repair or replace said part, except that the warranty for expendable Parts, including but not limited to, light bulbs and batteries shall be thirty (30) days from the original date-of-purchase; and except that the warranty for Parts manufactured by someone other than the Seller, including but not limited to, shut-off valves, control (servo) valves, flowmeters, pressure sensors, pumps, compressors, tanks and tank accessories, DGPS receivers and related repeater and base stations shall be one (1) year from the original date-of-purchase; and except that the warranty for Parts manufactured by someone other than the Seller, including but not limited to, memory cards and drives, mapping software, terminals, PC's, laptops, tablets and other computer devices shall be thirty (30) days from the original date-of-purchase. Any damage or failure to said part resulting from abuse, misuse, neglect, accidental or improper installation or maintenance, unauthorized modification, use with other parts and/or products, or attributable to acts of God, as determined solely by the Seller, will invalidate the warranty. Said part will not be considered defective if it substantially fulfills the performance specification. Buyer shall be responsible for all maintenance services, if any, all in strict accordance with the procedures outlined in the manual. The warranty does not include labor, installation, replacement parts or repairs, delivery of replacement parts or repairs or time and travel. Said warranty is non-transferable.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. THE SELLER'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE OR OTHERWISE, SHALL NOT EXCEED THE RETURN OF THE AMOUNT OF THE PURCHASE PRICE PAID, AND UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES. SELLER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME FOR IT ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH SAID PART. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS UNDER THIS AGREEMENT MAY BE BROUGHT MORE THAN ONE (1) YEAR AFTER THE CAUSE OF ACTION HAS OCCURRED.

Buyer accepts these warranty terms and limitations unless the part is returned to Seller, via proper distribution channels and approved return authorization, with dated proof-of-purchase, transportation prepaid, within sixty (60) days from the date-of-purchase for refund of the purchase price.

Doc: MTS Warranty Statement\_010119a Rev 2\_01012019

### **MAIL and UPS:**

Micro-Trak® Systems, Inc.  
ATTN: Service Department  
111 LeRay Avenue  
Eagle Lake, MN 56024-9650

At Micro-Trak® Systems, we believe a product that delivers quality and performance at a reasonable cost is what is needed to help today's operator and the operator of the future compete in the world market.

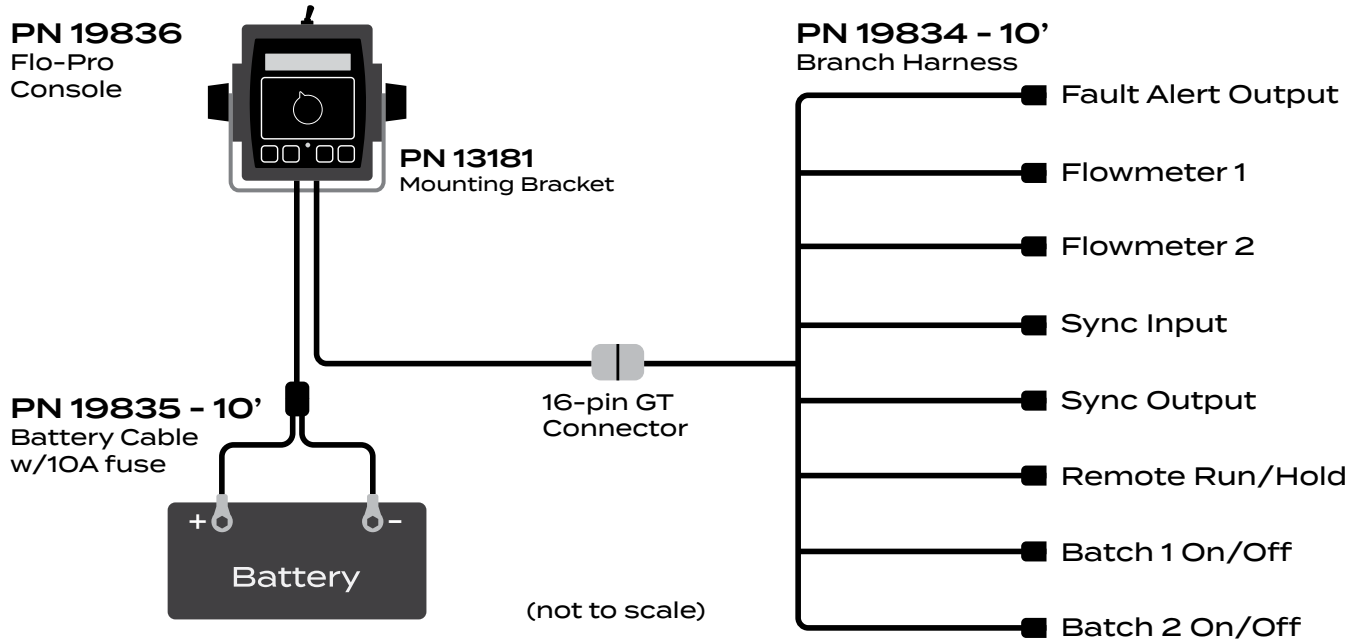
It is our goal to provide operators with a line of electronic equipment that will help build and maintain an efficient and profitable operation that can be passed on to future generations.

We thank you for your purchase and hope that we can be of service to you in the future.

**Micro-Trak® Systems, Inc.**

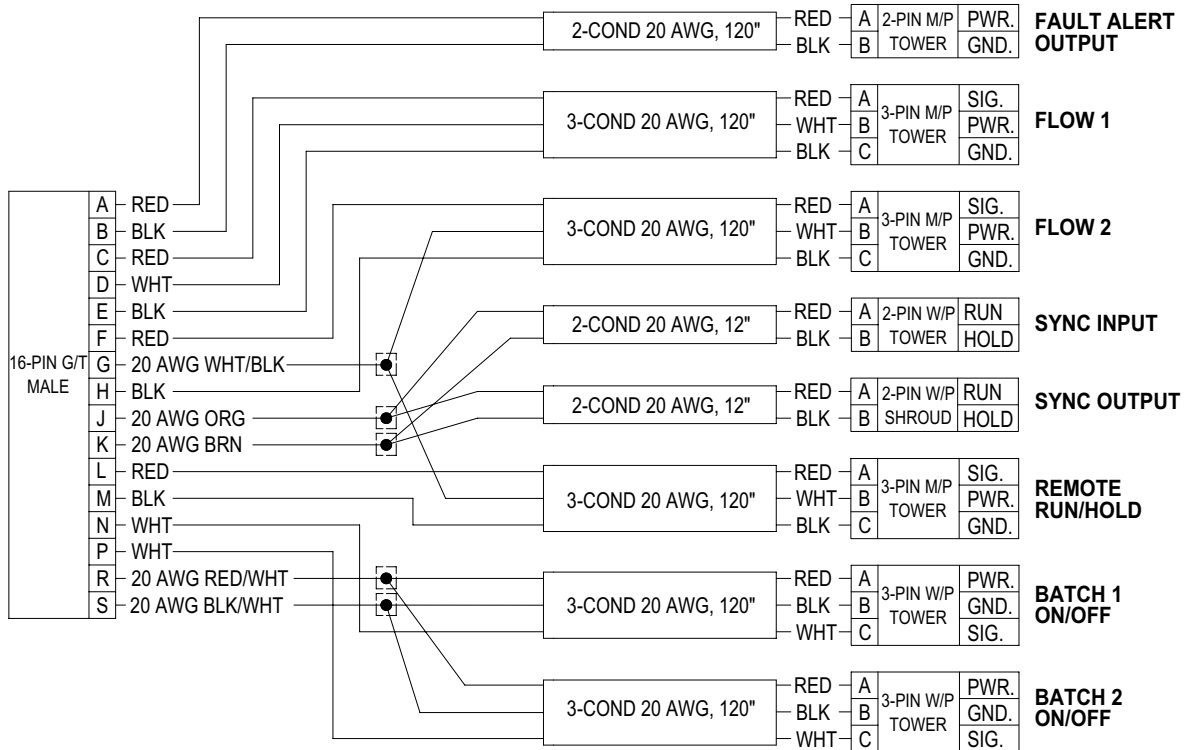
# System Diagram

## Flo-Pro Dual Batch Controller



# Wiring Diagram

## Branch Harness - PN 19834



# Wiring Detail

## Branch Harness 10' - PN 19834



**Fault Alert Output**  
2-pin  
Metri-Pack



**Flow (2)**  
3-pin  
Metri-Pack



**Sync. R/H Output**  
2-pin  
Weather-Pack



**Remote R/H**  
3-pin  
Metri-Pack



**Main Connection**  
16-pin  
GT150/280



**Sync. R/H Input**  
2-pin  
Weather-Pack



**Batch On/Off (2)**  
3-pin  
Metri-Pack

## Power Cable 10' - PN 19835



**Power Connection to harness**  
2-pin  
Weather-Pack

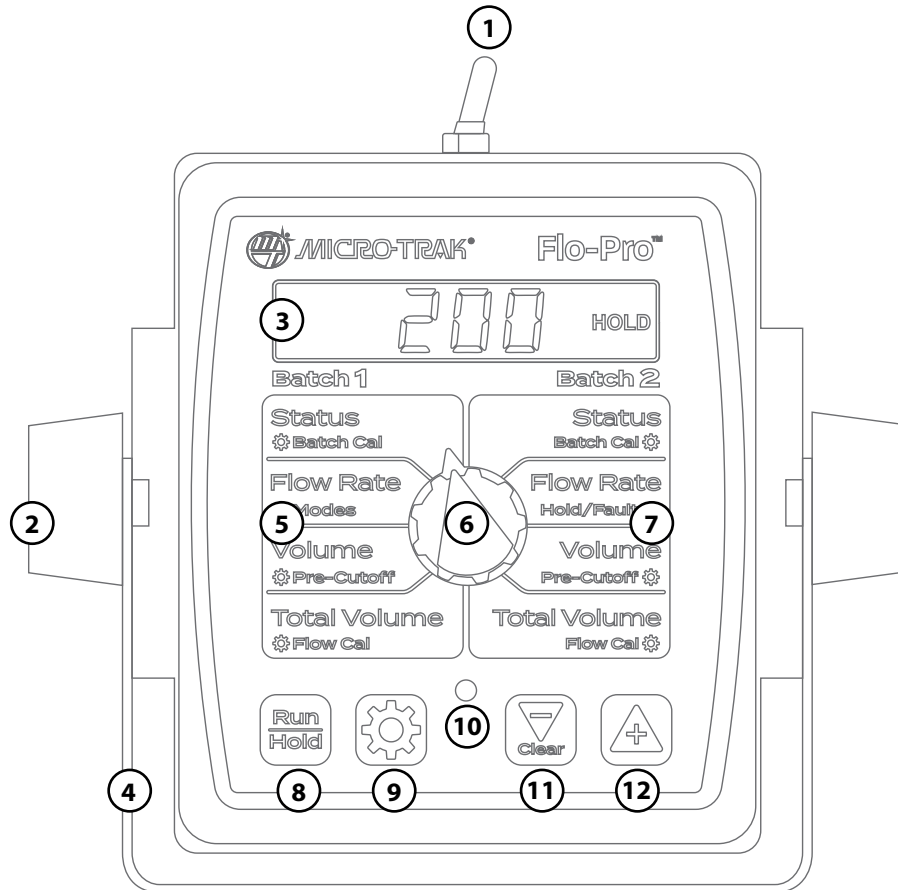


**To Battery**  
5/16" Ring  
Terminal



**To Battery**  
5/16" Ring  
Terminal

# Console Features



1. On/Off Switch.
2. Mounting bracket knob.
3. LCD readout - displays real-time batch information. Can show countdown of current batch, flow rate, or choice of accumulated volume options.
4. Mounting bracket.
5. **Batch 1** function selections. **CALIBRATION** parameters are below functions. (See page 7 for detailed descriptions.)
6. Rotary selector knob.
7. **Batch 2** function selections. **CALIBRATION** parameters are below functions. (See page 7 for detailed descriptions.)
8. **Run/Hold** button - controls start and stop of system. Run/Hold function can also be controlled remotely using pins A & C on Remote Run/Hold connection of branch harness. A remote Run/Hold switch should be a normally open momentary switch.
9. **CALIBRATION (CAL)** button. Press and hold to enter Calibration mode. Console must be in HOLD to enter Calibration.
10. **Indicator LED**. LED lights when in Calibration mode or when selecting Flow Rate display units.
11. **Decrease/Clear** button. Press and hold to decrease number value shown on screen. Holding down this button while in either **Volume** or **Total Volume** position will clear accumulated total value. **Decrease/Clear** is also used to turn batches off. Press and hold for 3 seconds while in Status position and display shows "done". Display will then show **OFF**.
12. **Increase** button. Press and hold to increase number value shown on screen. **Increase** is also used to turn batches on. Press and hold for 3 seconds while in Status position and display shows **OFF**. Display will then show "done".

# Console Functions

## Batch 1

### STATUS:

Countdown volume counter for the batch. When batch is complete, displays "DONE".

### FLOW RATE:

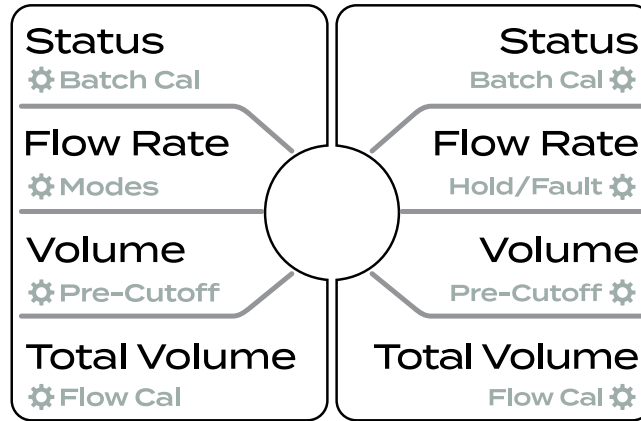
Displays current flow rate. Can be set to show either Volume/Minute or Volume/Hour. See inset below.

### VOLUME:

Displays accumulated batch flow measurement. To clear counter, press "Clear" button and hold for 3 seconds.

### TOTAL VOLUME:

Displays total accumulated flow measurement. To clear counter, press "Clear" button and hold for 3 seconds. Total Volume includes all flow, including when in "HOLD". There are **3** independent counters for each channel - shown by number at lower right of display. Use ▲ button to choose counter.



### Setting Flow Rate Display:

1. Turn off console (if already on).
2. Press and hold BOTH **Run/Hold** and **CAL** buttons.
3. Turn on console and release buttons.
4. After reboot, select Volume/Minute or Volume/Hour by pressing either **Decrease/Clear** or **Increase**.

$$\text{Volume Per Minute} = \text{VPM}$$

$$\text{Volume Per Hour} = \text{VPH}$$

5. Press and hold **CAL** to exit.

## Batch 2

### STATUS:

Countdown volume counter for the batch. When batch is complete, displays "DONE".

### FLOW RATE:

Displays current flow rate. Can be set to show either Volume/Minute or Volume/Hour. See inset below.

### VOLUME:

Displays accumulated batch flow measurement. To clear counter, press "Clear" button and hold for 3 seconds.

### TOTAL VOLUME:

Displays total accumulated flow measurement. To clear counter, press "Clear" button and hold for 3 seconds. Total Volume includes all flow, including when in "HOLD". There are **3** independent counters for each channel - shown by number at lower right of display. Use ▲ button to choose counter.

## Left Calibration Positions

### BATCH 1 CAL:

Enter the desired Batch 1 size. Use the **Decrease/Clear** or **Increase** buttons to adjust value.

Batch  
Cal

### MODES:

Choose 1A, 1B, 2A, 2B, or 3. See page 10 for operational description of Modes.

Modes

### PRE-CUTOFF:

Sets a unit value for the valve to begin closing prior to batch completion. This adjusts the system to compensate for slow-reacting valves. (Value of 0=off.)

Pre-  
Cutoff

### BATCH 1 FLOW CAL:

Enter the calibration value for your flowmeter (edges/unit) for Batch 1.

Flow  
Cal

## Right Calibration Positions

Batch  
Cal

### BATCH 2 CAL:

Enter the desired Batch 2 size. Use the **Decrease/Clear** or **Increase** buttons to adjust value.

Hold  
Fault

### HOLD/FAULT:

Sets the function for the Run/Hold connection on the harness.  
**HOLD** = Standard Run/Hold (Start/Stop)  
**OPEN** = Normally open Fault input  
**CLOSED** = Normally closed Fault input

Pre-  
Cutoff

### PRE-CUTOFF:

Sets a unit value for the valve to begin closing prior to batch completion. This adjusts the system to compensate for slow-reacting valves. (Value of 0=off.)

Flow  
Cal

### BATCH 2 FLOW CAL:

Enter the calibration value for your flowmeter (edges/unit) for Batch 2.



# System Information

## Units

The Flo-Pro is designed to work in a wide variety of liquid delivery systems. It is not pre-programmed for any specific “unit” (gallons, liters etc.). Entering the appropriate Flow Cal value for your application establishes the unit for metering flow and processing volume information. Default Flow Cal number is 145.

The Flo-Pro uses “edges/unit” to calculate liquid volume flow (pulses X 2).

### Flow Cal Values

#### Micro-Trak flowmeters:

**Gallons** - use Micro-Trak liquid cal number found on the flowmeter tag.

**Liters** - divide Micro-Trak liquid cal number by 3.785.

#### Flow devices in pulses per unit:

**Gallons** - multiply calibration number from product documentation by 2.

**Liters** - multiply calibration number from product documentation by 2, then divide by 3.785.

**Note:** Modes 1A and 1B use 1 flowmeter connected to FLOW 1 connection of branch harness.

## Setup

The console is loaded with default CAL values from the factory. It is necessary to enter Calibration mode prior to operation to setup the system for your application.

1. Press and hold CAL button to enter Calibration mode - red LED will remain on.
2. Adjust each of the Calibration settings as needed.
3. Press CAL button to exit and save any changes.

## Restoring Defaults

To restore factory default settings, turn on console while pressing both **CAL** and **Decrease/Clear** buttons - hold until LOAD then STORE is displayed . Unit software will load factory settings, including Batch values. Check all settings before operation.

## Fine Tuning

1. Set up a calibrated container to capture flow.
2. Enter **CAL** (press and hold **CAL** button) and set the Batch value to the size of container.
3. Exit **CAL** by holding the **CAL** button for 1 second.
4. Select the respective Batch Volume Counter for the intended flowmeter.
5. Hold the **Decrease/Clear** button until the counter reads 0.
6. Depress the **Run/Hold** button to start the batch.
7. After batch is complete, enter **CAL** and turn the rotary switch to the respective **Flow Cal** position.
8. Briefly press the **CAL** key and the display will show the Batch Volume counter (**CAL** icon will flash on and off).
9. If this count does not match the volume in the calibrated container, adjust it to match using the **Increase** or **Decrease/Clear** keys.
10. Empty calibrated container and run batch again to verify.

# Run/Hold & Fault Options

## REMOTE RUN/HOLD

The Run/Hold connection on the branch harness is normally connected to a momentary, normally open, switch as remote Start-Stop control.

## SYNCHRONIZED RUN/HOLD (SYNC)

To synchronize Run/Hold with additional Flo-Pro consoles, connect the **Sync** output on one console to the **Sync** input of the next - up to 4 consoles can be synchronized for a total of 8 batches. All consoles must be set to same Operating Mode.

### Operation Notes:

1. When consoles are synchronized together, whichever console puts the entire group in Hold becomes the **Master** and only it can cause the group to start to Run again. ("Hold" can be caused by either the Run/Hold button, or the Remote Run/Hold input). The **Master** console shows Hold message on-screen without flashing, all other console Hold messages will flash.
2. When a synchronized group is in Run mode, any console can become the **Master** by either the Remote Run/Hold or the Run/Hold button.

## FAULT INPUT

The Run/Hold wiring harness connection can also be connected to a pressure or flow switch for use as a fault input. The fault input polarity is set in the **Hold/Fault** position in **CAL** settings. Use either **Increase** or **Decrease/Clear** button to select.

Choose OPEN for normally open switch and CLOSE for normally closed switch.

When a fault condition is tripped from the switch, **FAULT<sub>1</sub>** is shown on screen and any running Batch is turned off.

Press **Run/Hold** button on console to clear fault message, and resume normal operation in **HOLD**.

To resume or restart batch, press **Run/Hold** again.

### Important Notes:

1. If the system is running and the flowmeter stops sending flow signal, a **FAULT<sub>2</sub>** message will show on screen.
2. On batch start-up, there is a 10 second delay in reading flow signals to allow plumbing system to stabilize. After this period, a 2 second gap in flow signal will cause a **FAULT<sub>2</sub>** message.

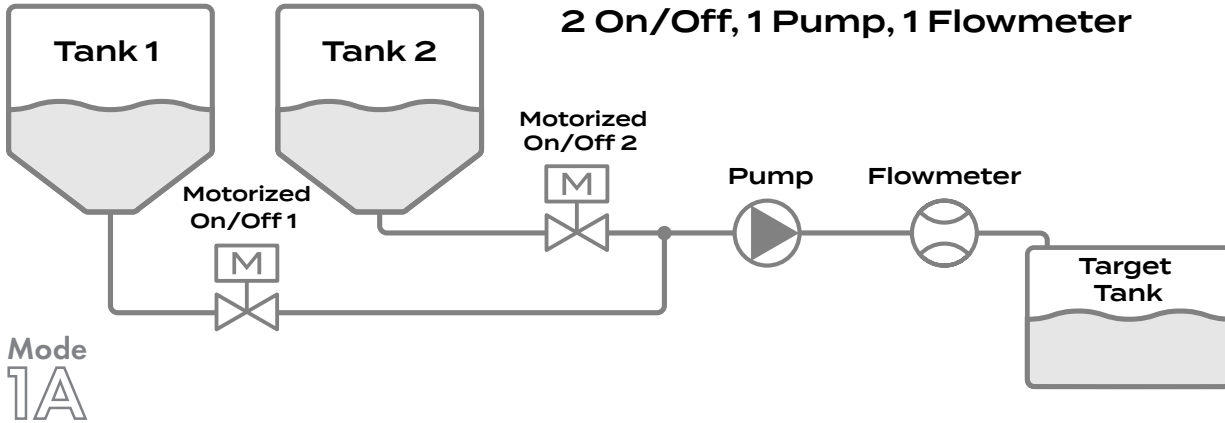
## FAULT OUTPUT

The Fault Output connection on the wiring harness can be connected to an alarm or light (1.5A max. load) to signal a Fault condition (see above.) When a Fault happens, the Fault Output turns on, and stays on until cleared by Run/Hold button or switch. Fault Output for Mode 3 is a short pulse - 1 pulse in Batch 1 and 2 pulses in Batch 2.

# Operation

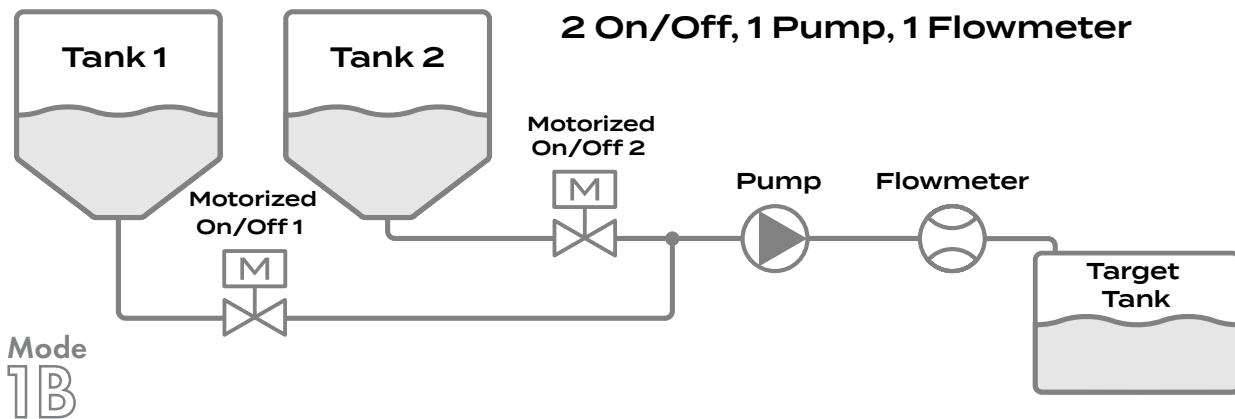
## Mode 1A Operation:

Batches run in sequence through one flowmeter.  
Batch sequence controlled automatically.



## Mode 1B Operation:

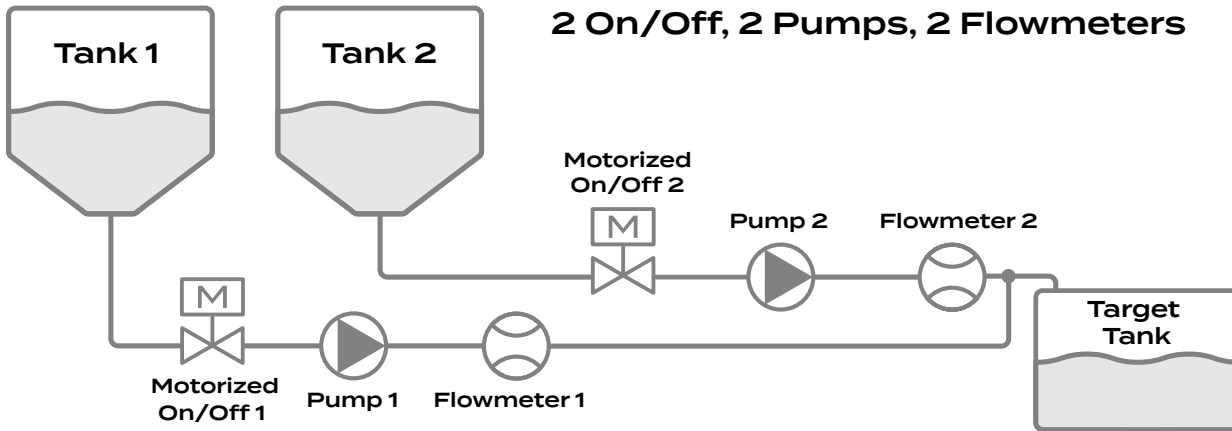
Batches run in sequence through one flowmeter.  
Batch sequence controlled manually.



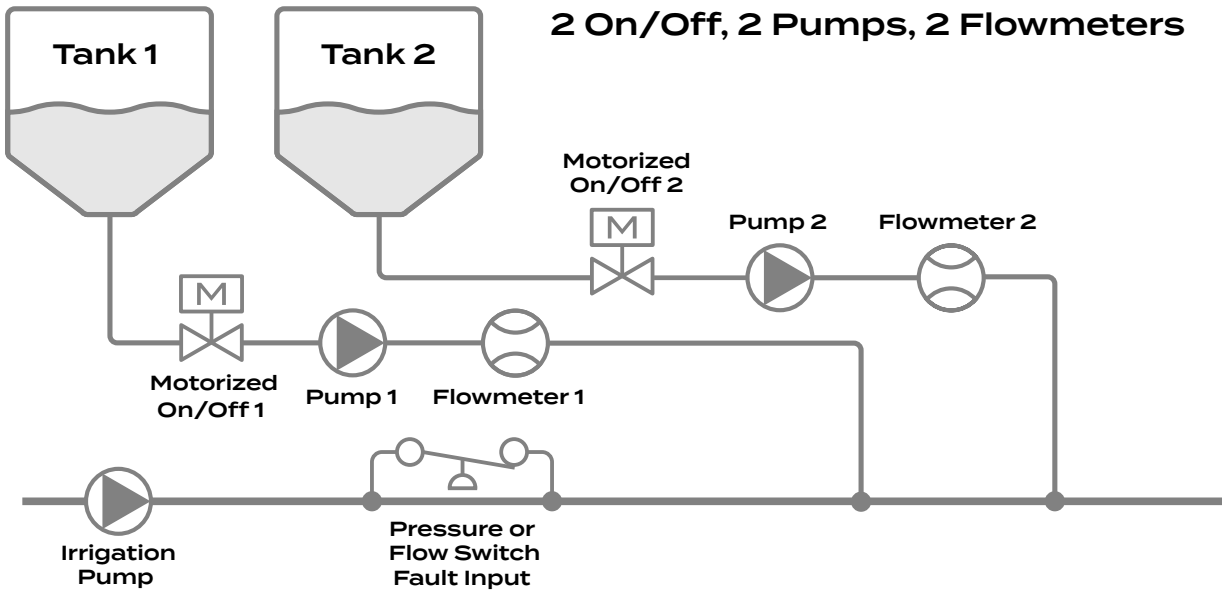
# Operation cont.

## Mode 2A Operation:

Batches run at the same time in separate flowmeters.



## Typical Application



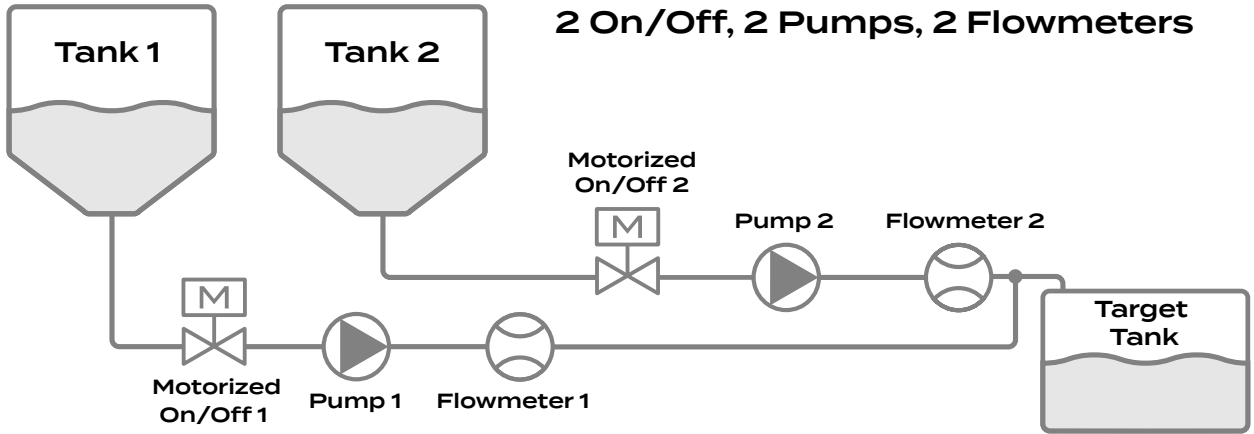
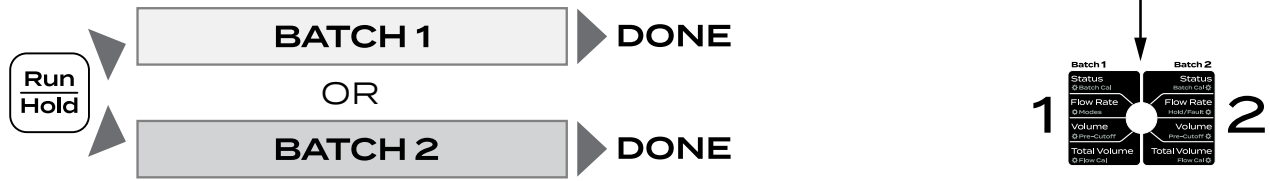
## Chemigation Example - using Fault Input

Mode  
2A

# Operation cont.

## Mode 2B Operation:

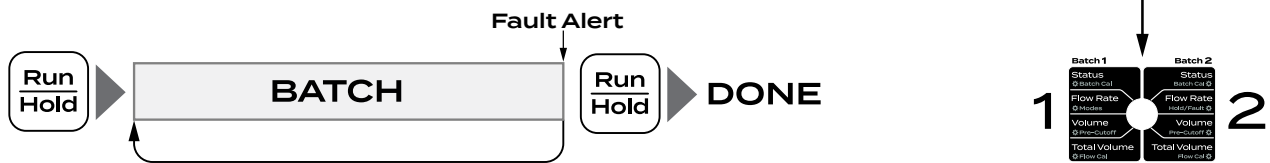
Batches run one at a time in separate flowmeters. Select batch by turning dial to any position on that side.



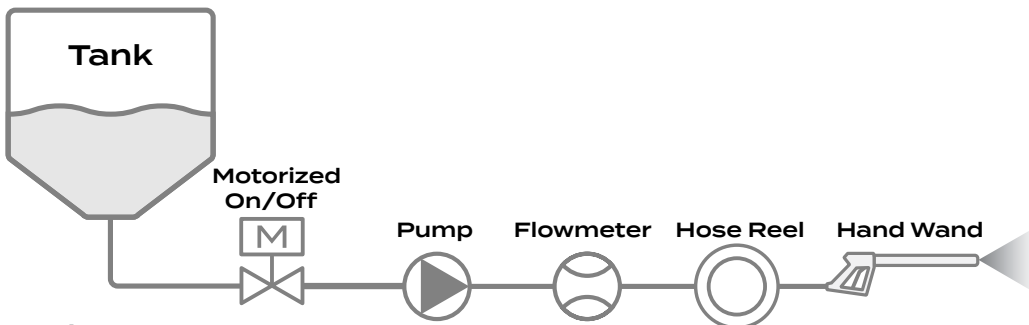
Mode  
**2B**

## Mode 3 Operation:

Batch cycles continuously until Run/Hold is pressed again. Fault Alert Output pulses at end of each cycle. Select batch by turning dial to any position on that side.



1 On/Off, 1 Pump, 1 Flowmeter



Mode  
**3**

# Replacement Parts

The following replacement parts are available from your dealer or distributor. A Dealer Locator can be found online at <https://micro-trak.com/where-to-buy/dealer-locator>.

## PART NUMBER DESCRIPTION

PN 19836	Flo-Pro console
PN 19834	Branch Wiring Harness
PN 19835	Power Cable w/10A fuse
PN 13181	Console Mount Kit
PN 19830	System Manual



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