3RIVE 3D®
APPLICATION SYSTEM

SafeGuard™ Blockage Monitor

Operation Manual

MICRO-TRAK®
INNOVATIVE FROM THE GROUND UP

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SafeGuard™ Blockage Monitor

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Contents

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Console

This is the main unit of the SafeGuard™ system. The console continually scans for a blocked indication. It consists of a display, power button, and volume buttons.

Console

Sensor

The sensor assembly is a liquid flow chamber surrounded by a blockage detection shroud. The bottom openings of the sensor assembly accommodate a variety of plugs (male) and caps (female). The sensors may be mated with other sensors in a manifold or used individually. The chamber contains a detection cartridge which rises with flow. Sensors models are marked with an imprint in the clear ring at the top of the sensor body; standard sensors are marked “P2” and sensors designed for use with fumigants are marked “T1”.

Sensor

Fittings

Micro-Trak offers a wide variety of O-ring seal fittings to connect SafeGuard™ sensors to your plumbing system. The use of non-Micro-Trak fittings with SafeGuard is strongly discouraged and voids the warranty in the event of damage caused by leakage.

Implement Switch & Module

SafeGuard can accept an optional Implement Switch and corresponding Module. This option silences the audible alarm on the SafeGuard when the implement is not in use. The Module provides the interface between an implement switch and SafeGuard wiring and can be placed at any point in the chained sensor connections.

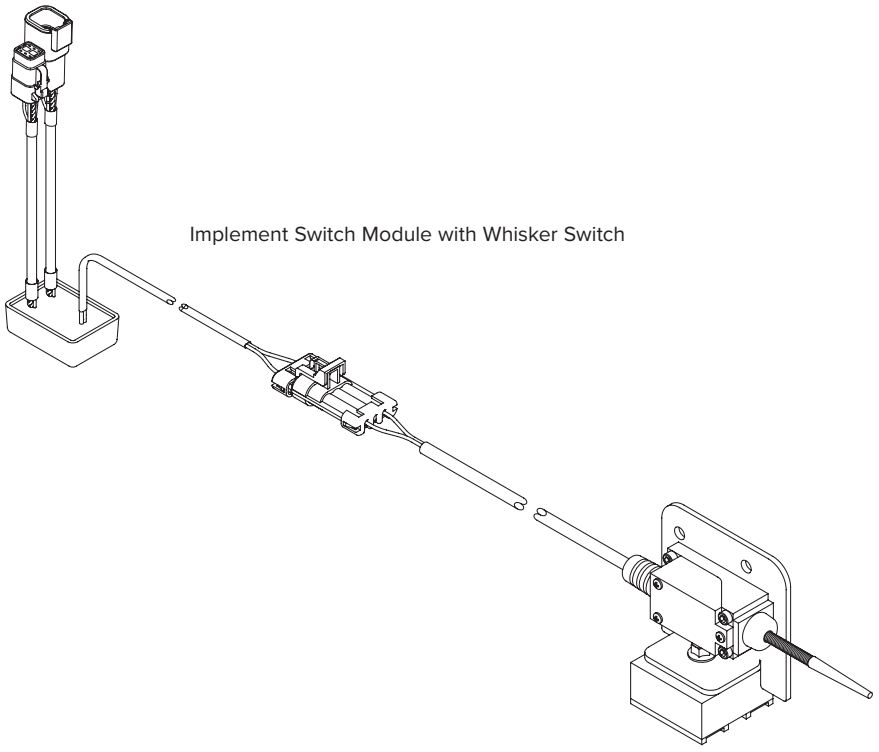
Implement Switch

Implement Switch Module

A three-pin Metri-Pack connector joins the implement switch. The switch is connected between pins A & C. When the switch is closed the audibel alarm is on. When the switch is open, the audible alarm is muted and HOLD is displayed. The display still shows blockage and error indications when HOLD is displayed.

The implement switch module can be installed at any position on the data line. If is the last item on the data line, a termination cap should be installed on the open connector.

The Implement Switch has a magnetic base which allows it to be positioned on the implement as needed.
The coiled spring actuator will active when moved in any direction.
+12VDC on pin A = Audible alarm ON



Implement Switch Module with Whisker Switch

When the console is turned on it searches for sensors and implement switch modules installed on the data line. During the power up sequence the console displays the number of sensors found, for example: S 16 indicates 16 sensors were detected during power up. If the number of detected sensors has changed since the last power-up sequence, the console will pause, display the new sensor count, and beep to alert the operator. **Operator must acknowledge the new sensor count by pressing either volume button to continue the power-up sequence.**

> ⚠ **Important!!** ⚠
>
> After every start-up, confirm that the displayed number of detected sensors matches the actual number of sensors used on the implement. If it does not match, refer to Troubleshooting section of this manual on p. 8.

- Devices are numbered sequentially based on their position on the data line starting with # 1 being closest to the console end of the cable.
- Sensors and implement switch modules are numbered separately so the first implement switch module on the data line is always module # 1.

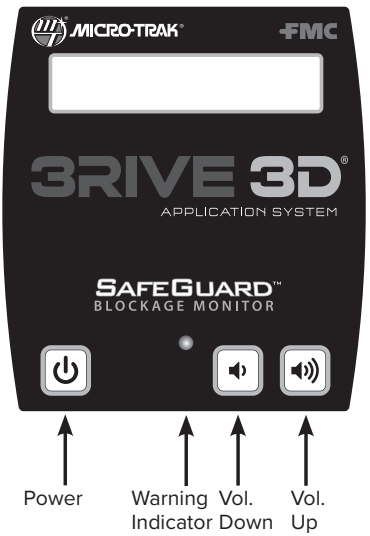
The console continually monitors the sensors for a blocked indication. When a blockage is detected the console immediately alerts you by flashing the red warning LED, sounding an audible alarm, and displaying the number of the sensor that is blocked. This alert will remain until the blockage is cleared. With the implement switch activated the display should show that all runs are blocked, and HOLD is displayed (audible alarm muted). This serves as confirmation that the system is working properly.

Power – Turns the system on or off.

Warning Indicator – This flashes to indicate a blockage. The audible alarm will be beeping unless the volume setting is at minimum.

Volume decrease – Pressing this decreases alarm volume. The lowest setting silences the alarm. The alarm will remain muted until the volume setting is increased. Cycling power does not turn the alarm back on!

Volume increase – Pressing this button increases alarm volume.



Power Up Sequence

SafeGuard™ displays a sequence of information screens during the power-up routine.

- **Elapsed Time** - Total cumulative time the console has been turned on.

- **Software part number** - The part number of the SafeGuard™ software.

- **Software Revision** - Revision designator for the SafeGuard™ software.

- **Number of sensors detected** - The system counts the blockage sensors it sees on the data line on power up. If the number of detected sensors changes during operation, an ERROR is generated. This example shows **16** sensors detected.

  If the number of detected sensors has changed since last power-up, the current count of sensors will be displayed, the audible alarm will sound, and the warning indicator led will flash.
  Operator must acknowledge the new sensor count by pressing either volume button to continue the power-up sequence.

- **Implement Switch Module Status** - The system indicates if an implement switch module is detected. The total number of modules detected will be displayed. This example shows 1 implement switch module detected.

System Status – Not Applying Liquid
Typically the SafeGuard is turned on before liquid application begins, so the sensors detect blockage (no flow) after initial start-up. The system will display ALL BLOCKED, or ALL BLOCKED HOLD if an implement switch is being used and is open. If the HOLD indicator is lit the audible alarm is silenced.

System Status – Normal Operation
While applying, the display shows ALL GOOD.

System Status – Blockage Detected
When a blockage is detected the display shows the number of the sensor which is reading blocked. If there are multiple sensors blocked, the display will scroll through all blocked sensor numbers, i.e. # 7... # 12... # 28. Sensors are numbered starting at the first sensor on the data line.

The warning LED flashes red and the alarm sounds once every three seconds. The audible alarm is muted if an implement switch is holding the system in standby mode (HOLD), or if the volume is set to the minimum setting.

Troubleshooting

Console won't turn on

Is there power on the console power cable? Pin A is +12 VDC, Pin B is ground.

- **NO** Troubleshoot for possible blown fuse, broken wiring or bad connections on power cable. Verify there's power at cable connection point.
- **YES** Disconnect data cable and try to turn on the console. If it turns on with data cable disconnected troubleshoot damaged cable or sensor assembly. If it does not turn on with data cable disconnected, replace console.

Sensors Not Detected

Several sensors in a row missing - Check connection between last good sensor and first bad sensor. Bypass first bad sensor in string with extension cable or adjacent sensor leads.

Single sensors not detected - Isolate or verify bad sensor by bypassing suspect sensor with extension cable or sensor leads. Cycle power on console to re-scan for sensors.

Implement Switch Not Working

HOLD indication on display won't go out

Using a jumper wire short pin A to pin C on three-pin implement switch module connector. If the HOLD indicator goes away, replace implement switch (not module). If it does not go away, replace implement switch module.

HOLD indication won't turn on

Disconnect implement switch from module. Does HOLD indication turn on?

- **NO** Replace implement Switch Module
- **YES** Verify implement switch operation / replace implement switch.

Sensor not detecting blockage or Showing blockage when not present

Doesn't read BLOCKED

If the cartridge is at the bottom of the sensor assembly and the sensor does not indicate BLOCKED, verify cartridge is in sensor tube with tail on top/ball on bottom. If this is correct, replace sensor.

Doesn't read GOOD

Remove cartridge from sensor chamber. Sensor should read GOOD. If it doesn't read GOOD with cartridge removed, replace sensor.

HOLD

This is not an error. This indicates that the implement switch module has placed the system in “hold”, or standby. The audible alarm is muted but blockages are still displayed.

BLOCKED

This indicates a blockage is detected. The sensor (or sensors) which are blocked are displayed.

OPEN

No sensors detected during power-up. Check connection and cables between console and first sensor.

NET

Displayed when operating and communication with all sensors is lost.

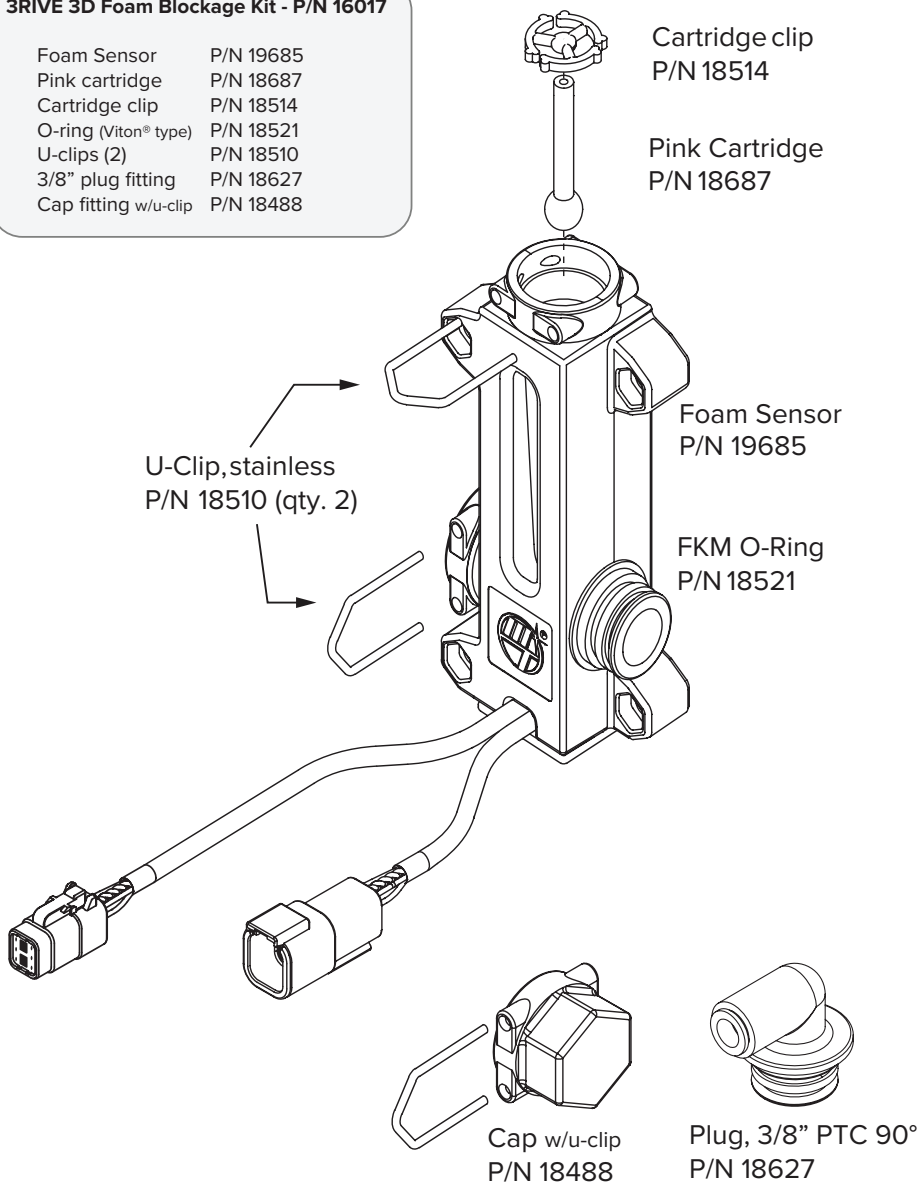
ERROR

Sensor was present at power-up, and is now not talking to console. The sensor number will be displayed. If an H is displayed, the error is originating from an implement switch module. The number of the module will be displayed.

Sensor Parts

3RIVE 3D Foam Blockage Kit - P/N 16017

Foam Sensor	P/N 19685
Pink cartridge	P/N 18687
Cartridge clip	P/N 18514
O-ring (Viton® type)	P/N 18521
U-clips (2)	P/N 18510
3/8” plug fitting	P/N 18627
Cap fitting w/u-clip	P/N 18488



Part #	Description
18687	Pink Cartridge
18514	Cartridge Retainer Clip
19360	3RIVE 3D™ SafeGuard™ Console
13304	Console Mount Bracket
13181	Console Mount Kit
12888	Console Mount Knob
12889	Console Mount Washer
18529 A	Implement Whisker Switch w/cable
18530	Magnet Mount for Implement Whisker Switch
18541	Implement Whisker Switch Kit w/cable and magnetic mount
19625 A	SafeGuard™ Implement Switch Module
19681	6-pin Amphenol Terminator Tower
19682	6-pin Amphenol Terminator Shroud
18982	Power Cable w/5A fuse
19624	6-pin 15’ M/P150 to Amphenol Twisted Pair adapter
19676	6-pin 25’ M/P150 to Amphenol Twisted Pair adapter
19694	6-pin Amphenol 2.5’ Twisted Pair Extension Cable
19616	6-pin Amphenol 5 ’ Twisted Pair Extension Cable
19617	6-pin Amphenol 10’ Twisted Pair Extension Cable
19618	6-pin Amphenol 15’ Twisted Pair Extension Cable
19619	6-pin Amphenol 20’ Twisted Pair Extension Cable
19620	6-pin Amphenol 25’ Twisted Pair Extension Cable
19621	6-pin Amphenol 30’ Twisted Pair Extension Cable
18510	U-clip, stainless steel
18521	O-ring, FKM (viton®) type
18488	Cap, no threads w/stainless steel U-clip
18627	Plug, John Guest®, 3/8” elbow hosebarb w/FKM (viton® type) O-ring

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, batteries, hose and tubing, nuts, bolts, screws and other fasteners 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 and regulators, pumps, motors, 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 BY THE BUYER, 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.

Source Doc: MTS Warranty Statement 080120

We thank you for your purchase and hope that we can be of service to you in the future.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www.micro-trak.com
1305 Stadium Rd. Mankato, MN 56001-5355

P/N 19361 111023