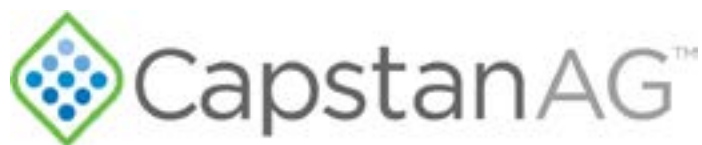


Tattler®

Liquid Application

Rate Control by PinPoint III Lite

Operator Manual



Thank you for your business!

At CapstanAG, our goal is to redefine the way people do their chemical application. Our PWM control systems have been setting the bar for maximum productivity for more than 20 years. Our focus on performance, support, and education have dramatically changed the landscape of agricultural chemical application.

CapstanAG specializes in creating proprietary systems for the agricultural industry, primarily focusing on chemical and fertilizer applications. Our inventive process involves research, engineering, design, and lab and field testing.

Service Contact Information

If a problem occurs with your system that cannot be corrected with the information in this manual, please contact your dealer for service and technical assistance. If further assistance is needed, contact CapstanAG.

System Purchased: _____
Dealer: _____
Contact: _____
Phone: _____
Address: _____
City, State/Province, Zip: _____

Factory Service/Repairs

CapstanAG

4225 S.W. Kirklawn Ave. | Topeka, KS 66609

Hours: 8:00 a.m. to 4:30 p.m. CST

Toll-free number: (855) 628-7722 | Fax: (785) 232-7799

CapstanAG.com | CapstanAG.ca

prodsupport@capstanag.com

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Chapter 1: Safety

Topics:

- [Signal Words](#)
- [Safety Signs](#)
- [Pressurized Fluid Lines](#)
- [Personal Protective Equipment](#)
- [Battery Safety](#)
- [Chemical Safety](#)
- [Emergency Safety](#)

Signal Words



DANGER: Indicates an imminent hazard which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for aircraft components that, for functional purposes, cannot be guarded.



WARNING: Indicates a potential hazard which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



CAUTION: Indicates a potential hazard which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT: This is used to draw attention to specific information that is necessary for the operation, setup, or service of the system.

Note: This is used for additional information that can help understand or operate the system.

Safety Signs



Figure 1: Safety Sign Example

The HCS aligned its provisions with the United Nations' Globally Harmonized System (GHS) Classification and Labeling of Chemicals in 2012. This is a GHS safety label example for a chemical hazard.

These labels and safety messages warn all personnel about hazardous chemicals or potentially unsafe chemical conditions that may exist while working around agricultural application equipment.

CapstanAG add-on application systems for OEM and retrofit agricultural application equipment (booms and toolbars) may contain HCS pictographs and GHS safety labels and safety signal word messages.

Pressurized Fluid Lines

Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when too much heat is present.

Personal Protective Equipment

Wear close-fitting clothing and the correct personal protective equipment (PPE) for the job. Refer to the specific chemical manufacturer documentation or other information for correct PPE.

Battery Safety

Use the procedure in the appropriate agricultural equipment manual for connecting, disconnecting, and jump-starting the machine's battery.

Keep sparks and flames away from the battery. Battery gas can explode and cause serious injury. Do not smoke in the battery charging area.

Remove jewelry, which might make electrical contact and create sparks.

Chemical Safety

Chemicals used in agricultural applications can be harmful to your health and/or the environment if not used correctly. Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Emergency Safety

Fire extinguishing systems must meet the applicable OSHA requirements, and all users of portable/ fixed fire suppression equipment must know the types, limitations, and proper uses of this equipment; including hazards involved with incipient stage firefighting.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Know the location of fire extinguishers and first aid kits and how to use them.

Examine the fire extinguisher and service the fire extinguisher regularly.

Follow the recommendations on the instructions plate.

Very small fires can be put out (extinguished) with a fire extinguisher. Use an appropriate method to extinguish a fire (water for paper fires, and chemical extinguishers for electrical or chemical fires).

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Chapter 2: Warranty

Topics:

- [Limited Warranty](#)

Limited Warranty

What does the Limited Warranty cover?

The ultimate purchaser/user (“you”), by acceptance of seller Capstan Ag Systems, Inc.’s, (“our,” “we,” or “us”) product, assume all risk and liability of the consequences of any use or misuse by you, your employees, or others.

All replacement components furnished under this warranty, but shipped before the failed component is returned for evaluation, will be invoiced in the usual manner and warranty adjustments will be made after the component claimed to be defective has been returned to and inspected and deemed defective by us at our factory.

Upon determining that a component has failed under warranty, the repaired component or replacement component, furnished under this warranty, will be shipped at our expense, to your location. We will credit you an amount equal to the incoming freight you paid. We shall not be responsible for installation costs. (You shall be responsible for all customs and brokerage fees for all international transactions.)

If the component does not prove to be defective, you shall be liable for all freight, inspection, and handling costs. In no event will any claim for labor or incidental or consequential damages be allowed for removing or replacing a defective product. Warranty will be denied on any component which has been subject to misuse, abuse, accidents, or alterations, or to improper or negligent use, maintenance, storage, transportation, and handling.

Our liability under this warranty, or for any loss or damage to the components whether the claim is based on contract or negligence, shall not, in any case, exceed the purchase price of the components and upon the expiration of the warranty period all such liability shall terminate. The foregoing shall constitute your exclusive remedy and our exclusive liability.

The terms of this warranty do not in any way extend to any product which was not manufactured by us or one of our affiliates.

While necessary maintenance or repairs on your CapstanAG product can be performed by any company, we recommend that you use only authorized CapstanAG dealers. Improper or incorrectly performed maintenance or repair voids this warranty.

The foregoing warranty is exclusive and is in lieu of all other warranties expressed or implied. We shall not be liable for any incidental or consequential damages resulting from any breach of warranty.

Your exclusive remedy for breach of warranty shall be repair or replacement of defective component(s): Provided, if the component(s) are incapable of being repaired or replaced, your exclusive remedy shall be credit issued, but such credit shall not exceed the purchase price of the components.

On any claim of any kind, including negligence, our liability for any loss or damage arising out of, or from the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any products shall in no case exceed the purchase price allocable to the components.

In no event, whether as a result of breach of contract or warranty or alleged negligence, shall we be liable for incidental or consequential damages, including, but not limited to: personal injury, loss of profits or revenue, loss of use of equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, environmental damage, crop losses, or claims of customers of you for such damages.

What is the period of coverage?

We warrant to you that our products are free from defects in material and workmanship in normal use and service for a period of one year from date of purchase.

How do you get service?

Our obligation under this warranty shall be limited to the repairing or replacing at our option, the component which our inspection discloses to be defective, free of charge, return freight paid by us, provided you: (i) Notify us of defect within thirty (30) days of failure; (ii) Return the defective component to us, freight prepaid; (iii) Complete the Owner Registration Form and returned it to us; and (iv) Establish that the product has been properly installed, maintained and operated in accordance with our instructions or instructions contained in our operations or maintenance manuals and within the limits of normal usage.

Any claim for breach of our warranty must be in writing addressed to us and must set forth the alleged defect in sufficient detail to permit its easy identification by us. All breach of warranty claims must be made within thirty (30) days after expiration of the warranty period, which is applicable to the defective product. Any breach of warranty claim not timely made will not be honored by us and will be of no force and effect. Any component that needs to be repaired or evaluated for warranty has to be authorized before return. Contact the factory (785-232-4477) to get a Return Materials Authorization (RMA #). This helps to track the part coming into the factory for repair or replacement.

Before returning any component to the factory, clean the component as well as possible to remove any dirt or chemical residue. Components received at the factory that are not clean will be returned and warranty denied.

After receiving your RMA #, package the part, making sure to include the RMA #, customer's name, your address and phone number and description of problems or failure. If the component(s) are not returned to the shipping address below within the thirty (30) day period, no credit will be issued for the part. Ship to:

Capstan Ag Systems, Inc.

Attn: Warranty/Repair

4225 SW Kirklawn Ave.

Topeka, KS 66609

Phone: (785) 232-4477 | Fax: (785) 232-7799

Hours: 8 am to 4:30 pm CST

Once the package is received by us, we have thirty (30) days to process the warranty claim. If the warranty claim is still open after thirty (30) days, the warranty will be accepted, and credit issued.

How does state law relate to this Limited Warranty?

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.¹

¹ Rev. Date 11/02/2021

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Chapter 3: Introduction

Topics:

- [This Manual](#)
- [System Identification](#)
- [Virtual Terminal Display](#)
- [Tattler System Description](#)

This Manual

This manual includes operation, maintenance, and installation information for the system you purchased.

Make sure that all personnel have read this manual and that they thoroughly understand the safe and correct operation and maintenance procedures. Failure to do so could result in personal injury or equipment damage.

This manual should be considered a permanent part of your system and should remain with the system at all times and when you sell it.

Right and left sides of the system are determined by facing the direction of forward travel of the machine on which the system is installed.

The information, screenshots, and other illustrations were correct at the time of publication. Changes can occur without notice.

This manual contains important information on how to safely and correctly install, operate, and maintain CapstanAG products. These instructions will help keep personnel safe, reduce downtime, and increase the reliability and life of the equipment, its components, and related systems.

Review the safety information in the manual(s) from the Original Equipment Manufacturer (OEM).

Follow the instructions (in this manual) and in the OEM manual(s) for each step, to make sure that work conditions in and around the OEM equipment are safe.

It is important for all individuals working with chemicals to understand the potential risks, necessary safety precautions, and proper response in the event of accidental contact.

Review the OEM manual(s) for chemical safety information.

Read, understand, and review the procedures in this manual and OEM manual(s). Use the Safety Data Sheets (SDS) and the required Personal Protective Equipment (PPE) for hazardous chemicals.

Please keep this manual and all enclosed documentation in an accessible location known to all operators, installation, and maintenance personnel.

If you do not understand the CapstanAG equipment after reading this manual, please obtain the proper training before working with equipment, to make sure that your own safety, as well as your coworkers' safety, is maintained.

Do not attempt to operate any equipment or system until you completely understand why, when, and how it operates. If you are uncertain after studying this manual, please contact CapstanAG.

System Identification

Write the system name, serial number, and other information down in the Service Contact Information on the inside cover of this manual. Your dealer will use these numbers when you order parts. File a copy of the identification numbers in a secure place off the machine.

If you are not the original owner of this machine, it is in your interest to contact your local CapstanAG dealer to inform them of this unit's serial number. Providing this information will help CapstanAG notify you of any issues or product improvements.

Virtual Terminal Display

This system can be used with most touch-screen Virtual Terminal (VT) displays. The VT display interacts with the GPS and electronic control devices centralizing the ability to communicate, record, store, and show data.

Note: Each VT display is different, and the system screens may be different from what is shown in this manual.

How to Find the Software Version Information

The system must be installed and connected to the virtual terminal in the cab before you can find the CapstanAG icon on the display.

1. Select the CapstanAG icon on your virtual terminal (VT) display.

Note: Each VT display is different, and the system screens may be different from what is shown in this manual. Each VT display is different, and the system screens may be different from what is shown in this

2. Navigate: 

3. The software version is displayed in the middle of the screen.
4. Make sure to write down the current information in the Service Contact Information on the inside cover of this manual.

Tattler System Description

The Tattler System is run through the CapstanAG PinPoint III Lite rate controller. Tattler is an individual row flow monitoring system with a multitude of additional features with a wide range of application rates, up to 8 GPM per row.

Tattler will alert the user if any single or multiple rows are:

- Flowing higher/lower than the others
- Not flowing
- Lodged open

The system will also monitor the Tattler Sensor Modules and Sensor Caps to ensure they are always connected and operable.

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Chapter 4: Installation

Topics:

- [Prepare for Installation and Setup](#)
- [Plumbing Considerations](#)
- [System Considerations](#)
- [PinPoint III Lite Hub Identification](#)
- [Install the PinPoint III Lite Hub](#)
- [Tattler Sensor Module Identification](#)
- [Valve Body and SuperCheck Assembly](#)
- [Tattler Jumper Assembly](#)
- [Tattler Row Flow Monitor Assembly](#)
- [Tattler System Architecture](#)
- [Tattler Valve Body Assembly Installation](#)
- [Tattler Sensor Module Installation](#)
- [Battery Harness Installation](#)
- [Circuit Breaker Installation](#)

Prepare for Installation and Setup



CAUTION: Before installation, operation, or service to the system, read and understand the machine's operator manual and the system operator manual. Chemical residue may be present on/in the OEM equipment. Use the correct personal protective equipment.

IMPORTANT: Before installation, make sure that all parts are included in the shipping boxes, using the list of parts included in the order.

IMPORTANT: Do not attach the harnesses with cable ties until the dry test of the system is complete.

Check the general system layout at the back of this manual.

Although the installation is usually straightforward, the following are common installation oversights:

- Always follow the orifice manufacturer guidelines.
- When routing sensor harnesses and other wiring, allow for fold joints to operate without damaging harnesses.
- Use the correct orifice sizes for your desired rates.

Plumbing Considerations

- The Tattler system is capable of monitoring a very wide range of flow, so it is important to ensure existing plumbing is adequate to supply flow rates desired. It is required to have at least 3/4" supply hose upstream of the Tattler plumbing. Larger toolbars may require more substantial plumbing.
- 1/2" Push Connect tubing and fittings are used to plumb Tattler flow sense assembly to supercheck assembly.
- It is required to have a metering orifice downstream of each Tattler Valve Assembly. This can be accomplished by adding either the CapstanAG Supercheck Assembly with orifice plate or an orifice at the knife tube.
- It is required to install a check valve downstream of the Tattler flow monitoring assembly to inhibit the drain of liquid out of distribution tubes when not applying. A 3/8" hose and hose clamp is recommended to connect and plumb downstream of supercheck hose barb.

System Considerations

- Tattler Sense Module (TSM) layout
- Orifice Plates
- Number of rows

PinPoint III Lite Hub Identification



Figure 2: PinPoint III Lite Hub Identification (P/N: 123000-130)

Item	Name	Description
1	PPIII Hub Status Lights	Green—PWR: Power—On when there is key-switch power to the hub
		Red—HUB: Blinks when the main hub processor is running
		Yellow—COM: Blinks when the hub is communicating over CAN or Ethernet
2	Digital Inputs	Inputs for ball valve position
3	Digital Outputs	Additional digital outputs
4	VCM 1–4	The VCM ports
5	Boom 1–12 Out	Section outputs
6	Input/Output A	ISO, Serial GPS Input, Servo Control, Analog Input, Master Switch Input
7	Input/Output B	Pressure Sensor, Flowmeter, 5V Power
8	Ethernet	The Ethernet port is used to connect the hub to the CapMod
9	Power Lug	Connect the power wire to this lug
10	Ground Lug	Connect the ground wire to this lug

Table 1: PinPoint III Lite Hub Connections

Refer to [Figure 4](#)

Install the PinPoint III Lite Hub



1. Locate an accessible location near the front, center of the implement.
2. Install the hub onto the implement with the supplied mounting bracket (if needed) and hardware.
3. 5/16" holes may need to be drilled to install on toolbar chassis.

Note: The hub requires a 6-3/4" x 6-3/4" hole pattern. At least two mounting bolts are required.

Tattler Sensor Module (TSM) Identification



Figure 3: Tattler Sense Module (P/N: 123400-109)

Item	Description
1	System Connector
2	Sensor Harness Connector for Sensors 1-6
3	Sensor Harness Connector for Sensors 7-12
4	Tattler Status Lights (see Table 9 on Page 47 for Status Light Explanations)

Table 2: Tattler Sense Module Component Identification

Refer to [Figure 3](#).

Valve Body and Supercheck Assembly

Assemble the valve bodies and superchecks as shown in the diagram below.

Note: Configure hose routing and orientation of the mounting brackets to your machine's needs.



Figure 4: Valve Body & Super Check Assembly

Item	Description	Part Number
1	Hose Clamp	716008-343
2	Valve Body Mounting Bracket	123400-117
3	Valve Body	123400-101
4	Sensor Cap Assembly	123400-102
5	Flange Nut, 5/16", Stainless Steel	713501-450
6	U-bolt	710100-521
7	Push to Connect Hose	716008-114
8	Supercheck Mounting Bracket	123400-120
9	Tattler Supercheck Assembly	10 PSI: 123400-108 with 3/8" Hose Barb: 716008-344
		5 PSI: 123400-128 with Combo-Jet: 132013-069 & 11/16" Lock Nut: 713501-532
10	Hose Barb	716008-344

Table 3: Tattler Components

Refer to [Figure 4](#)

Valve Body and Supercheck Assembly Cont'd

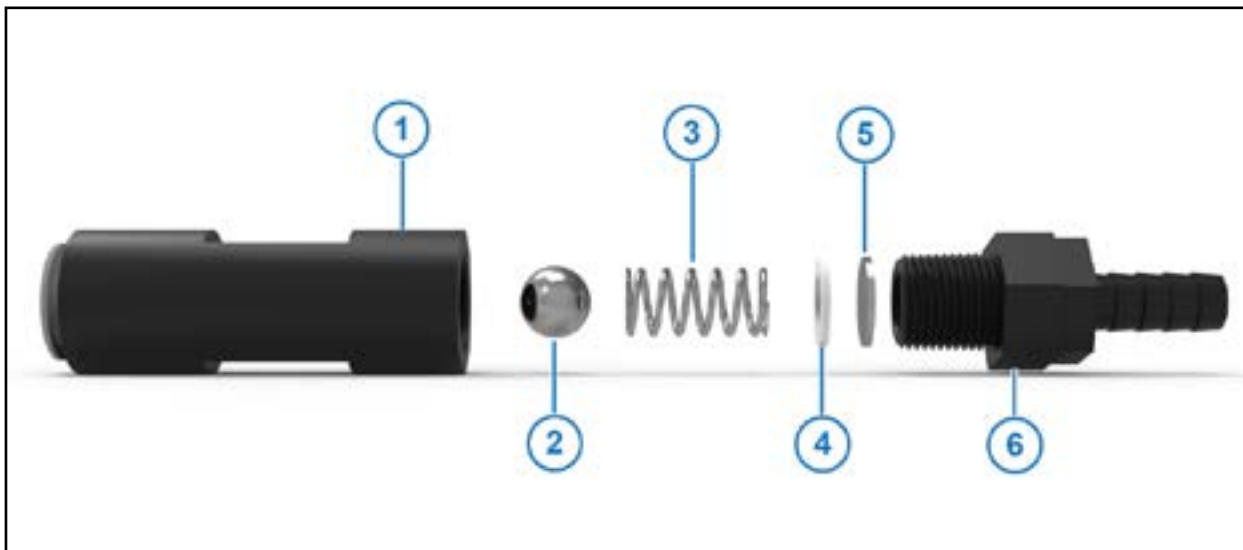


Figure 5: Tattler Supercheck Assembly

Item	Description	Part Number
	Tattler Supercheck Assembly	10 PSI: 123400-108
		5 PSI: 123400-128
1	Tattler Supercheck Body	10 PSI: 123400-129
		5 PSI: 123400-119
2	1/2" SS Ball Bearing	123400-118
3	SuperCheck Spring	123400-121
4	Nylon Washer	713600-016
5	Orifice Disc	Not Included
6	11/16" x 3/8" Hose Barb	716008-344

Table 4: Tattler Super Check Assembly Identification

Refer to [Figure 5](#).

Tattler Jumper Assembly

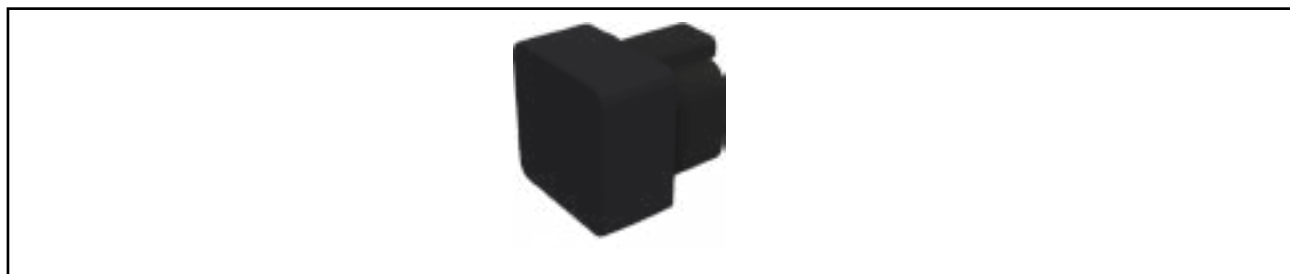


Figure 6: Tattler Jumper Assembly (P/N: 123400-106)

Tattler Row Shutoff Monitor Assembly

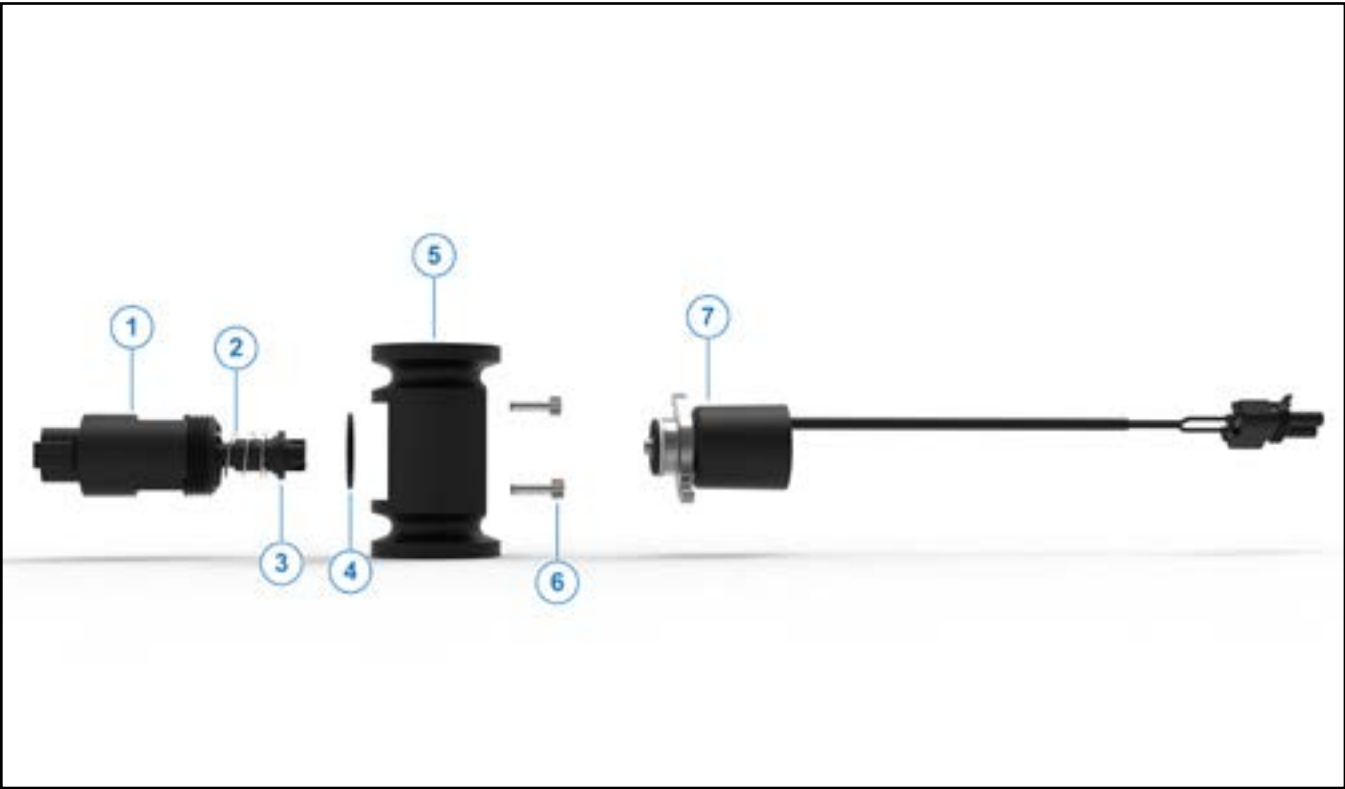


Figure 7: Tattler Row Flow Monitor RSO Assembly (P/N: 123400-132)

Item	Description	Part Number
1	Sensor Cap Assembly	123400-102
2	Tattler Plunger Spring	123400-116
3	Tattler Plunger, 6-Slot	123400-104
4	Tattler Body O-Ring	123400-004
5	Tattler Valve Body, RSO, Sub-Assembly	123400-131
6	Screw, 10-32 x.0625, Socket Head, SS	713501-455
7	Coil Assy, 12W, with Clamp	116500-401
	Tattler RSO Plug (Not Pictured)	123400-133
	Valve Clamp Plate	116500-405
	O-Ring, Orifice Insert	116500-221

Table 5: Tattler Row Shut Off Monitor Assembly Identification

Refer to [Figure 7](#).

Tattler System Architecture

Each Tattler Sensor Module (TSM) and Leap Start VCM (LS VCM) is equipped to handle up to twelve rows and are typically mounted on the toolbar in such a way that it will maximize the number of drops per TSM/LS VCM therefore reducing the total number of TSMs required across the entire system. **If not utilizing Tattler RSO, omit LS VCMs.**

Each TSM has two sensor banks: Sensors 1-6 and Sensors 7-12. These should each be installed on the toolbar with Sensors 1-6 to the left hand side of the toolbar (as seen from the rear), with 7-12 to the right. Likewise with each LS VCM.

If needed, sensor drops can be skipped to accommodate a fold joint. However, if a sensor module drop is skipped, a Jumper Cap ([P/N: 123400-106, Figure 6](#)) **must** be installed at that location to bus power and ground to the next Sensor Cap. Sensor drops omitted at the end of the sensor harness can simply be dust capped. The left-most sensor attached to each TSM is considered the first sensor on that respective module while the right-most is considered the last. Valve drops from the Leap start VCM can also be skipped, but can simply be dust plugged.

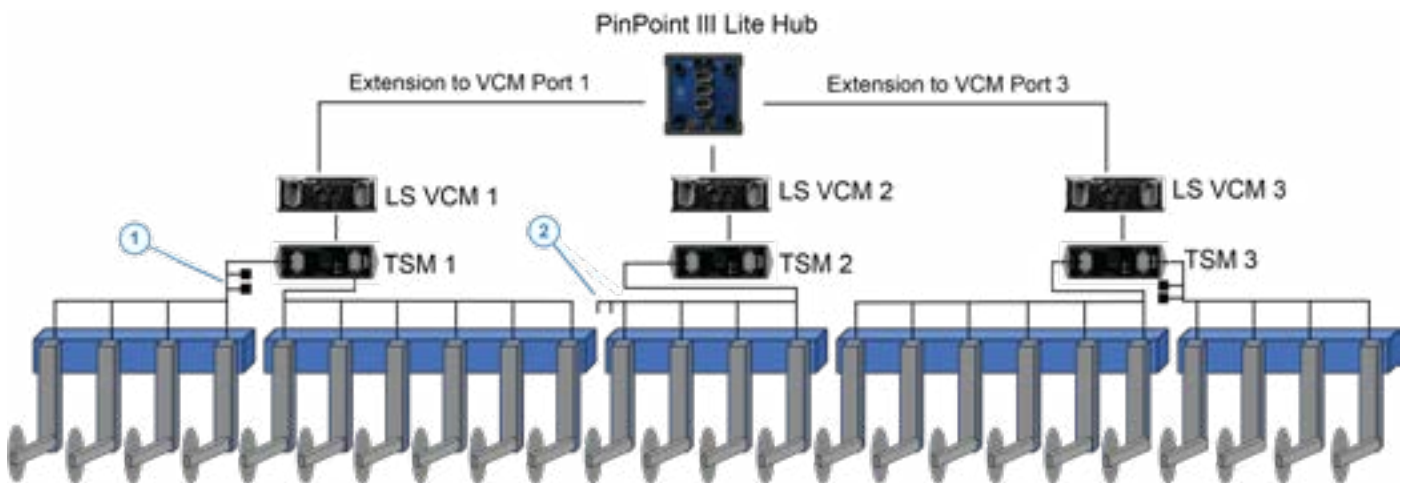


Figure 8: Tattler Sense Module, Leap Start VCM (LS VCM), and Jumper Cap Installation Example

Above (**Figure 8**) shows one way that a Tattler RSO system could lay out on a toolbar. On the left side of the toolbar, when facing in the direction of travel, only four of the six drops are populated on the harness that is plugged into the "Sensors 1-6" port of TSM 1 ([Figure 3, Item 2](#)). To accommodate the fold joint, the two drops closest to the TSM are left empty. These drops must have Jumper Caps ([Figure 6](#)) installed to pass power and ground to the sensors that follow ([Figure 8, Item 1](#)).

The Leap Start VCM is installed in the same location as the TSM. A short CAN extension should be plugged into the LS VCM and routed to each TSM. A longer CAN extension is plugged into the other CAN port of the LS VCM and routed to the PinPoint III Hub.

TSM 2 will only need to read four rows. For the harness that is plugged into the eight pin "Sensors 1-6" port the two drops that are furthest from the TSM will be unused. In this case, they only need dust caps because they do not need to pass power and ground along to any other sensors ([Figure 8, Item 2](#)). A dust plug will be installed in the unused eight pin "Sensors 7-12" port ([Figure 3, Item 3](#)).

Tattler Valve Body Assembly Installation



Figure 9: Tattler Valve Body Installation

1. After assembling the Tattler Valve bodies as shown in [Figure 4](#) on Page 23, mount an assembly at each knife location using the provided 10" hose clamp ([Figure 9](#), Item 1).
2. Install either a 90-degree elbow or tee fitting ([Figure 9](#), Items 2) with hose barbs on the topside of the Tattler Valve Body.

Note: Tattler Valve Body accepts inlet plumbing fittings of 3/4" NPT or 1" flange. Hose barb of choice needs to match inlet hose size.

3. If required, plumb the Push to Connect (PTC) fitting onto the row plumbing.
4. Insert the PTC fitting or 1/2" PTC tubing into the bottom of the Tattler Valve Body ([Figure 9](#), Item 3). PTC Nozzle Lug Adapter (P/N: 123400-126) shown here.
5. If not already completed, with the Tattler Sensor Cap ([Figure 9](#), Item 4) unplugged, insert the correct O-ring and thread it into the Tattler Valve Assembly.

Tattler Sensor Module Installation



Figure 10: TSM Installation

1. Ensure that each Sense Module ([Figure 10](#), Item 1) is placed appropriately for its harnessing to reach all sensor caps for each section.
2. Route each CAN Extension harness ([Figure 10](#), Item 2) along the toolbar back to the PinPoint III Lite Hub and insert each plug into its respective VCM Port. Ensure adequate slack is provided when needed to avoid stretching of the harness at fold joints.

Note: TSMs are plugged into the hub in order from left to right as they sit on the boom.

3. Route each Sensor harness ([Figure 10](#), Item 3) along the toolbar frame ([Figure 10](#), Item 4) to each sensor cap ([Figure 10](#), Item 5) in the corresponding section.
4. Install Dust Caps/Plugs or Jumper Caps (if skipping a drop) on any unused connectors.

Leap Start VCM Identification



Figure 11: Leap Start VCM (123300-001)

Item	Description
1	VCM Status Lights
2	Valve Harness Connector for Valves 1-6
3	Valve Harness Connector for Valves 7-12
4	CAN/Power Connections

Table 6: Leap Start VCM Identification

Tattler Row Shut Off (RSO) Valve Body Assembly Installation

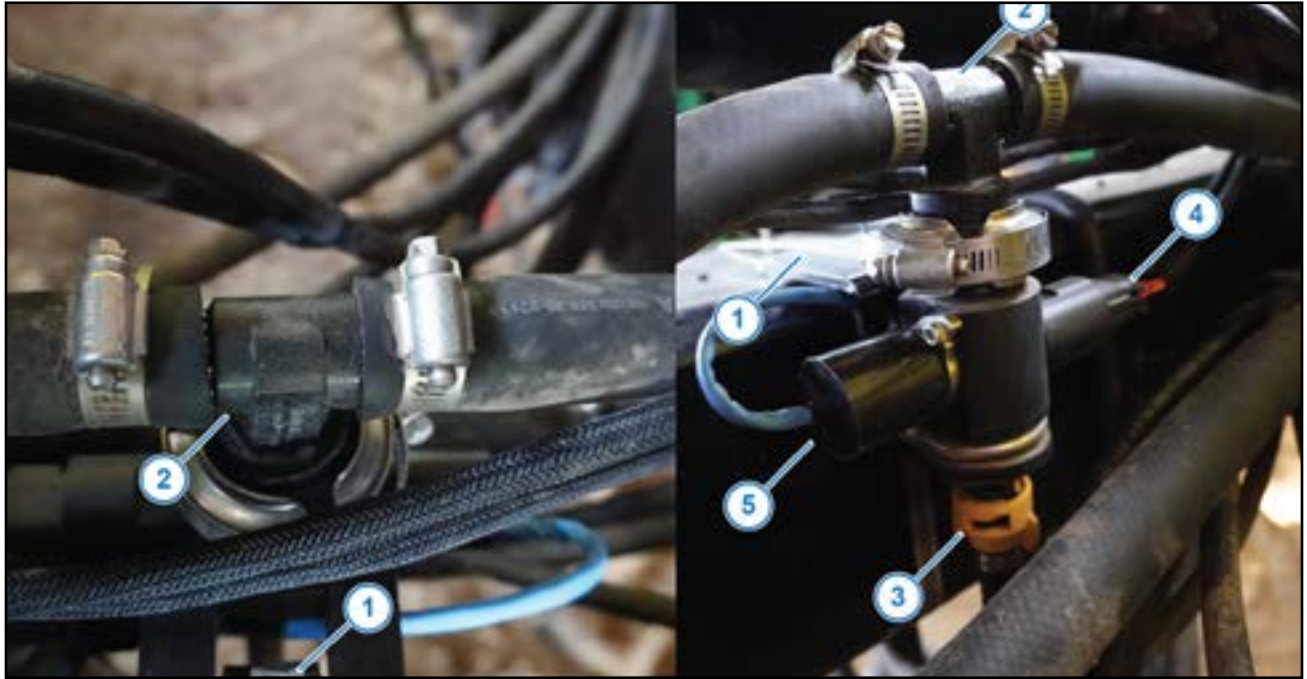


Figure 12: Tattler RSO Valve Body Installation

1. After assembling the Tattler Valve bodies as shown in [Figure 7](#) on Page 25, mount an assembly at each knife location using the provided 10" hose clamp ([Figure 12](#), Item 1).
2. Install 1" flange fitting, a 3/4" NPT x 90-degree elbow or tee fitting ([Figure 12](#), Items 2) with hose barbs on the topside of the Tattler Valve Body.

Note: Plumbing fittings are 3/4" NPT with 3/4" hose barbs.

3. If required, plumb the Push to Connect (PTC) fitting onto the row plumbing.
4. Insert the PTC fitting or 1/2" PTC tube into the bottom of the Tattler Valve Body ([Figure 12](#), Item 3).
5. If not already completed, with the Tattler Sensor Cap ([Figure 12](#), Item 4) unplugged, insert the correct O-ring and thread it into the Tattler Valve Assembly.
6. Install valve assembly on side opposite of the Tattler Sensor Cap ([Figure 12](#), Item 5). Secure with 5/32" allen key.

Chassis/Battery Harness Installation

In most cases, power will be supplied from the tractor's fused IBBC Connector at the rear of the tractor. Otherwise, a power harness can be routed from the PPIII Lite Hub to the hitch, with the other half being routed to the tractor battery.

1. Route the battery harness connectors to the Gateway hub.
2. Connect the positive (+) red cable to the power (+) lug on the Gateway hub using the 1/4" hardware.
3. Connect the negative (-) black cable to the ground (-) lug on the Gateway hub using the 1/4" hardware.
4. Tighten the nuts on the power cables.
5. Install the rubber boots onto the terminals.

IMPORTANT: Make sure that there is enough slack in the harness to avoid stretching when tractor and implement are turning.

Circuit Breaker Installation

1. Disconnect the battery power cables.
2. Cut a short length of wire from the battery harness positive (+) red cable. The length of the wire must reach from the circuit breaker mounting location to the battery positive (+) terminal.
3. Strip the insulation from each cut end of the wire.
4. Crimp the provided ring terminals to the end of each cable.

IMPORTANT: If the machine is so equipped, the system must be wired to the main power disconnect.

5. Connect the positive (+) harness cable ([Figure 13](#), Item 1) to the stud labeled **AUX** on the circuit breaker ([Figure 13](#), Item 2).

Using the short length of cable from Step 2 ([Figure 13](#), Item 3), connect one end to the stud labeled BAT on the circuit breaker. Connect the other end of the cable to the positive (+) battery terminal.

6. Connect the negative (-) black cable on the battery harness ([Figure 13](#), Item 4) to the battery ground terminal.

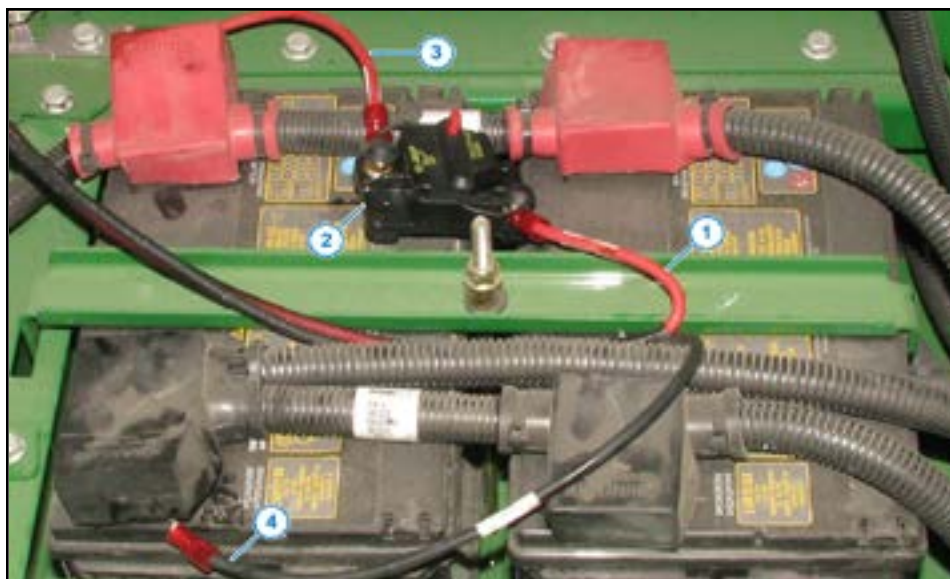


Figure 13: Circuit Breaker Installation Example

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Chapter 5: Initial System Setup

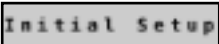
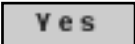
Topics:

- [Factory Reset Procedure](#)
- [Enable Tattler Mode](#)
- [Initial Setup Procedure](#)
- [Tattler Menu Screen](#)
- [Save/Calibrate Tattler Sensor](#)
- [Adjust Nozzle Spacing & Task Control Sections](#)
- [Set Up Sections and Auxilliary Booms](#)
- [System Dry Tests](#)
- [System Wet Tests](#)

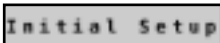
The first time your system is set up, these processes must be completed:

1. Tattler Setup Procedure
2. Initial Setup of the Boom Settings
3. Initial Setup of the System Settings
4. Initial VT System Setup Procedure
5. System Dry Tests
6. System Wet Tests

Factory Reset Procedure

Navigate:  >  >  >  > 

Enable Tattler Mode

1. Navigate:  >  > 
2. Page Down to **Option 22: Flow Mode** and select **Tattler**.
3. If toolbar is set up to handle **Half Rate** or **Rate and a Half** modes of operation, change **Option 24: Rate Mode** to the appropriate setting. Otherwise, leave disabled. See [Page 41](#) for setting descriptions.
4. Page Up to **Option 2: Fluid Control Mode** and select **No Pulse Mode**.

NOTE: If NOT operating with Tattler Row Shut Off, leave this setting at Conventional.

5. Tap the Home button to return to the Home Screen.



Initial System Setup Procedure

1. Tap the Tattler button  to open the Tattler Setup page.

Note: The following page provides descriptions for all information contained in the Tattler Settings Menu. Continue setup on [Page 36](#).

Tattler Menu Screen



Figure 14: Tattler Settings Menu

Item	Name	Description
1	Save Settings Button	Used to save location of all Tattler Sensor Module (TSM) and sensor caps connected.
2	Calibrate Button	Calibrates sensors attached to each TSM.
3	Alarm Threshold	Threshold to compare nozzles against one another for fault detection. Recommended: 20
4	Drops Expected	Number of drops expected on indicated TSM.
5	Drops Seen	Number of drops detected on indicated TSM.
6	Tattler Drop Indicators	Used to indicate where drops are located on each TSM. These will change color depending on their status.
7	Serial Number	Serial number of the indicated TSM.
8	Drops	Total number of Tattler sensors on the system.
9	Status Color Legend	Gray - No Tattler Sensor attached at indicated location Green - Tattler sensor reporting all conditions normal Yellow - Warning condition reported at indicated location Red - Error condition reported at indicated location

Table 7: Tattler Settings Menu Descriptions

Refer to [Figure 14](#).

Save/Calibrate Tattler Sensors

Upon initial system startup with Tattler Mode enabled and the Tattler Settings menu up, complete the following:

1. Tap the Save Settings Button ([Figure 14](#), Item 1). This will trigger the system to display where all Tattler sensors are located.

IMPORTANT: Ensure the total number of Drops ([Figure 14](#), Item 8) is the correct number of sensors on the system.

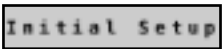
2. Tap the Calibrate button to get baseline calibration information for each Sensor Cap attached to each TSM.
3. Enter a value for the Alarm Threshold ([Figure 14](#), Item 3). This value is a percentage. The function of this feature is to adjust the sensitivity of high or low flow faults. It compares each sensor's reading to the average of all flowing rows. If single or multiple rows are outside the percentage entered, a fault will appear.
4. Drops expected and Drops seen values ([Figure 14](#), Items 4 & 5) should match during normal operation.
5. Tap the Exit Button.

Adjust Nozzle Spacing & Task Control Sections

1. Navigate:  >  > 
2. Page down to **Option 9: Nozzle Spacing** and enter a spacing specific to the toolbar.
3. Ensure the **Total Number of Nozzles** on Item 10 of the configuration menu matches the number listed on the Tattler Settings Menu Page.
4. For **Maximum TC Sections** on Item 12 of the configuration menu, enter the total number of sections controlled by ball valves on the toolbar. If running with Tattler RSO, this number will already be populated.

5. Tap  to return to the main screen.

Set Up Sections & Auxilliary Booms

1. Navigate:  >  >  > 
2. Tap 

Set Up Sections and Auxilliary Booms Cont'd

Soft Boom Setup					
Soft Boom	Start	End	Soft Boom	Start	End
1	1	4	11	0	0
2	5	10	12	0	0
3	11	15	13	0	0
4	16	21	14	0	0
5	22	25	15	0	0
6	0	0	16	0	0
7	0	0	17	0	0
8	0	0	18	0	0
9	0	0	19	0	0
10	0	0	20	0	0






Figure 15: Example Soft Boom Setup

- Soft Booms are configured by entering the **end** nozzle number in each respective section. Sections are divided by how they are controlled with ball valves.
- After each section has been configured, tap the green checkmark  at the top right hand corner of the page to save the configuration. Additionally, this will give the system the ability to have sectional overlap control from the Task Controller.

Set Up Sections and Auxilliary Booms Cont'd



Figure 16: Nozzle Setup Menu

In some instances, the automatically assigned Aux Booms will not be correct for the toolbar being configured. To ensure correct toolbar sectional shutoff:

1. Tap the single right arrow key  to cycle through each nozzle one at a time. The current nozzle selected is indicated by the yellow arrow at the top of the screen.
2. When cycling through the nozzles, compare the Aux Boom Number to the Soft Boom Number of each.
3. If they differ, tap the number next to Aux Boom to enter the correct Aux Boom assignment by matching the Aux Boom number to the Soft Boom number.

IMPORTANT: For **Tattler RSO**, if the toolbar is set up to run **Half Rate** or **Rate and a Half** modes it may be desired to group the end two nozzles within the same Aux Boom to avoid the end nozzles from "flickering" due to automatic section control detecting an overlap and turning the outer nozzles off.

4. After each has been verified to be correct, tap the Home button .

System Dry Tests

After installing system and completing the initial system setup on the virtual terminal display, a dry test can be conducted to ensure digital sensor locations match with actual rows the applicator.

With the product pump and applicator section valves OFF, remove the sensor on the last physical row of the applicator. This should be the furthest right row when facing in the direction of travel. Ensure that the o-ring, plunger, and spring are not misplaced.

On the VT, the last bar, far right, should be lower than the rest, and a disconnected error should show, with that row's number indicated.

Go to the first row on the applicator, leftmost when facing in the direction of travel, with the sensor cap that was removed from the last row. Disconnect the connector from the row 1 sensor. Connect the sensor from the last row and manually actuate the plunger.

Note: If desired, the plunger can be held down with a piece of tape while going to the tractor cab to verify correct operation.

The leftmost bar on the VT should increase and decrease. Reconnect the sensor on the first row. Repeat this procedure as needed to ensure matching digital and physical row locations.

Once location verification is complete, and the system is returned to ready state, the sensors should be recalibrated using the “calibrate” button on the VT in the Tattler Setup Menu.

Chapter 6: Operation

Topics:

- [Main System Screen](#)
- [Soft Key Descriptions](#)
- [Operate the System](#)
- [Rate Modes](#)

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Main System Screen

The main system screen is the main user interface for the control of the system.

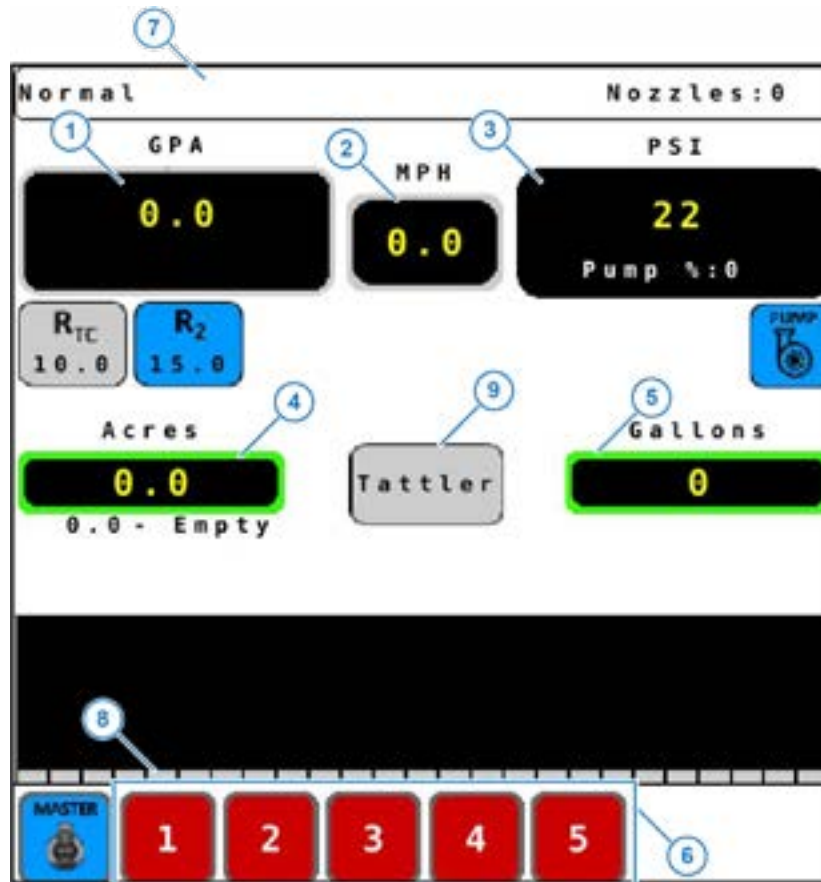


Figure 17: Main System Screen

Table 8: Main System Screen Identification

Refer to [Figure 17](#).

Item	Name	Description	Action
1	Rate	Actual application rate is displayed	Select for additional rate information
2	Speed	Actual speed is displayed	Select to change to test speed
3	Pressure	Actual pressure is displayed	Select for additional pressure information
4	Area	Counter for area covered	Select to see additional area counters
5	Volume	Counter for volume of fluid sprayed	Select to see additional volume counters
6	Section Switches	On-screen Switches	Turns sections on/off with selection
7	Message Area	Displays system status, fault codes, and number of nozzles currently on	Shows any system fault messages in this area. For more information refer to Troubleshooting Charts .

Item	Name	Description	Action
8	Row Flow Status Indicators	Each bar relates how a row is flowing compared to the overall group of rows	Rises and falls with each sensor's respective flow. Sections will change color depending on condition: Green - Normal Condition; Red - Fault Condition
9	Tattler Menu	Opens Tattler Settings	Select to open Tattler Settings Menu screen

Soft Key Descriptions

Icon	Description
 	Select this softkey icon to open the Settings screen. The background of the icon is green when you are on the Settings screen.
 	Select this softkey icon to navigate to the main Home screen The background of the icon is green when you are on the Home screen.
 	Select this softkey icon to navigate to the Diagnostics screen. The background of the icon is green when you are on the Diagnostics screen.

Operate the System

- Set up the VT display to operate.
Refer to the VT manual for more information.
- Once the VT display is set up and the CapstanAG system is shown on the display, Select a Target Rate, turn on the pump, and turn sections on
- Start operation.

Half Rate / Rate and a Half

The PinPoint III rate controller is able to adjust its transmitted Task Control (TC) implement width. In some applications, it is desired to be able to have the ability to apply product at half or rate and a half rates.

- Half Rate mode reduces the overall TC implement width by a quarter knife spacing on each end of the toolbar.
- Rate and a half mode increases the overall TC implement width by a quarter knife spacing on each end of the toolbar



To enable/change rate modes, navigate:  > **Initial Setup** > **Configuration** and page down to Rate Mode on the third page of the Configuration Menu.

Chapter 7: Maintenance

Topics:

- [Service the System](#)
- [Inspect the System](#)
- [Clean the System](#)
- [Storage of the System](#)
- [Recommended Guidelines for Maintenance/Service](#)
- [Baseline Evaluation Process](#)
- [Strainers and Screens](#)

Service the System



CAUTION: Before operation or service to the system, read and understand the machine's operator manual and the system operator manual. Chemical residue may be present on/in the OEM equipment. Use the correct personal protective equipment.

Before servicing the system or plumbing components, release the pressure and empty any product from the system and liquid delivery lines.

Jump Start, Weld On, or Charge the Machine

If jump starting the machine, make sure that you trip the circuit breaker to prevent damage.

If charging the machine's batteries or welding on the machine, trip the circuit breaker.

Inspect the System

- Inspect the hoses for cuts, nicks, or abrasions before each use. Immediately replace any damaged hoses.
- Make sure that the strainers are clean.
- Make sure that all hoses and wiring are secure.
- Check for loose hoses, mounting hardware, and other components. Tighten if necessary.
- Check for damaged or missing decals. Replace if necessary.

Clean the System

- Thoroughly clean the system after each use.
- Avoid high-pressure spray when cleaning the system components.

Storage of the System

Thoroughly clean the implement and the system before any long-term storage.

Winterize for Storage

Thoroughly clean the system before winter storage. Flush the system with clean water.

Winterize the system with RV antifreeze for winter storage. Proper winterizing of the machine with a CapstanAG system installed on it is essential. Make sure that the lines are completely full of antifreeze at 100% strength and that the nozzle valves are purged until 100% antifreeze is seen at all nozzle valves.

Recommended Guidelines for Maintenance/Service

When servicing a system, it is recommended to do these:

- Do the baseline service checks and verify the original setup values in this manual.
- Identify individual performance problems. Evaluate possible causes and corrections for performance issues.
- Troubleshoot individual components and replace, if needed.

IMPORTANT: The primary service tool will be a voltmeter that can measure voltage and resistance (ohms).

Baseline Evaluation Process

1. Make sure that the voltage readings are correct.
2. Visually check of all wire connections, harnesses, and connectors. Make sure that there are no loose, broken, or damaged parts.
3. Make sure that the correct orifice plate is used for the application.
4. Compare the current settings with those recorded in the manual during setup.
5. Make sure that the liquid product plumbing and the strainer(s) are clean.
6. Perform a like component swap test to see if the failure follows the component.
7. Repair or replace any damaged components.
8. Perform the system tests.
9. Review the system testing information in this manual.

Strainers and Screens

IMPORTANT: Clean the strainers on a regular basis.

Check the mesh size of the strainers and replace the screens if they are too coarse. Use 50-mesh or finer strainer screens. The filter manufacturer is specified only on the strainer housing. Only a color code identifies the strainer mesh size, which is not consistent between filter suppliers. A 50-mesh screen is required to prevent nozzles from plugging. When selecting a strainer, do not rely on the color coding. Check with the strainer manufacturer to be sure and select the correct strainer.

Plugged strainers will cause a reduction in system operating pressure.

When replacing the mesh screen on a Tee-jet Strainers:

1. Install and set the mesh screen in the strainer head.
2. Install the strainer cap.

IMPORTANT: Failure to do this will likely result in a damaged mesh screen and overall strainer failure.

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Chapter 8: Troubleshooting

Topics:

- [System Faults](#)
- [Interchange Components](#)
- [Tattler Sense Module Status Lights](#)
- [Circuit Breaker Test](#)
- [System Load Capacity Test](#)

System Faults

Table 9: System Fault Code Explanations

Fault Code: Message	Fault	Cause(s)	Correction(s)
Fault 509: Drop Missing	Drop Missing	The number of Tattler sensors detected upon startup is less than before	Inspect drop indicated on VT
			Inspect harness to indicated drop
			Inspect sensor cap connections at indicated drop
Fault 510: Out of Bounds	Out of Bounds	The sensed flow at the indicated row is above the sensor maximum	Remove sensor cap and inspect plunger at indicated row
			Replace sensor cap
Fault 511: Magnet Reversed	Magnet Reversed	Magnet in plunger of sensor cap assembly installed incorrectly	Replace plunger in valve body
Fault 512: Low Flow	Row Flow Low	Flow at row is below expected range	Inspect valve body and plunger assembly
Fault 513: High Flow	Row Flow High	Flow at row is above expected range	Inspect valve body and plunger assembly
Fault 514: Sensor Warning	Sensor Warning	Sensor reading out of normal operating range	Inspect Sensor cap and harnessing
Fault 515: Missing Plunger	Missing Plunger	No plunger detected in Tattler Valve Body	Install Plunger in Tattler Valve Body
			Replace Sensor Cap
Fault 516: Message Timeout	Message Timeout	CAN High/CAN Low Connection Issue	Inspect harnessing and connections
Fault 517: New Drop	New Drop	A new Tattler sensor cap sensed where there was not one previously	Inspect harnessing and connections Save Settings in Tattler popup menu to save sensor in correct location
Fault 518: Lodged Plunger	Lodged Plunger	A plunger in the Tattler Valve Body at the indicated row is lodged in the open position	Inspect valve body and plunger assembly

Interchange Components

The system includes a number of usages of the same part in multiple locations:

- Valve Bodies
- Extension Harnesses
- Sense Modules
- Jumper Assemblies
- Superchecks
- Sensor Caps
- Plungers

When troubleshooting failed components, it can be helpful to replace the failed part with a working part at another location. If the problem follows the failed part to the new location, repair or replace the failed part.

If the problem does not follow the failed part, then the problem is likely elsewhere in the system, and other troubleshooting means may be followed.

Note: Use caution when failed parts are interchanged with a part that is operating correctly; in rare cases, the failed component may cause other components to fail at the new location.

Tattler Sense Module Status Lights

Table 10: Tattler Sense Module Status Light Explanations

Item	Description	States
Power Status (Green LED)	Indicates if module has power	On - Module Powered
		Off - Module Not Powered
CAN Status (Red LED)	Indicates status of CAN Communication	Off - No CAN Communications
		Slow Blink - Initializing
		Fast Blink - CAN Communication Active
Status Light (Yellow LED)	Indicates status of TSM application running	Off - Not in Application
		Slow Blink - TSM Application running

Circuit Breaker Test



Figure 18: Circuit Breaker

The circuit breaker has a manual trip button (Figure 18, Item 1) and a manual reset lever (Figure 18, Item 2). A tripped circuit breaker is an indicator of a short or overload condition.

Do not reset the circuit breaker without looking into the cause of the tripped circuit breaker.

Note: The circuit breaker is usually located near the battery or in the battery compartment. The 60A or 80A circuit breaker is equipped with a manual trip. To reset the breaker, rotate the tripped lever back into the reset position.

IMPORTANT: When disconnecting the battery terminals, remove the negative (-) cable first, then remove the positive (+) cable. When connecting cables, connect the positive (+) cable first, then connect the negative (-) cable.

System Load Capacity Test

1. Start the machine engine.
2. Turn on all the toolbar sections.
3. Turn on all electrical loads, including the air conditioning, etc.
4. Observe the voltage readout on the correct settings screen in the display.
5. The reading should be 12 VDC or higher.

If low voltage is observed, inspect:

- Battery terminals, clean as necessary
- Battery condition
- Alternator condition
- Electrical connections

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Chapter 9: Schematics

Topics:

- [TSM Connector Pinouts](#)
- [System Layout](#)

Tattler Sense Module (TSM) Pinout

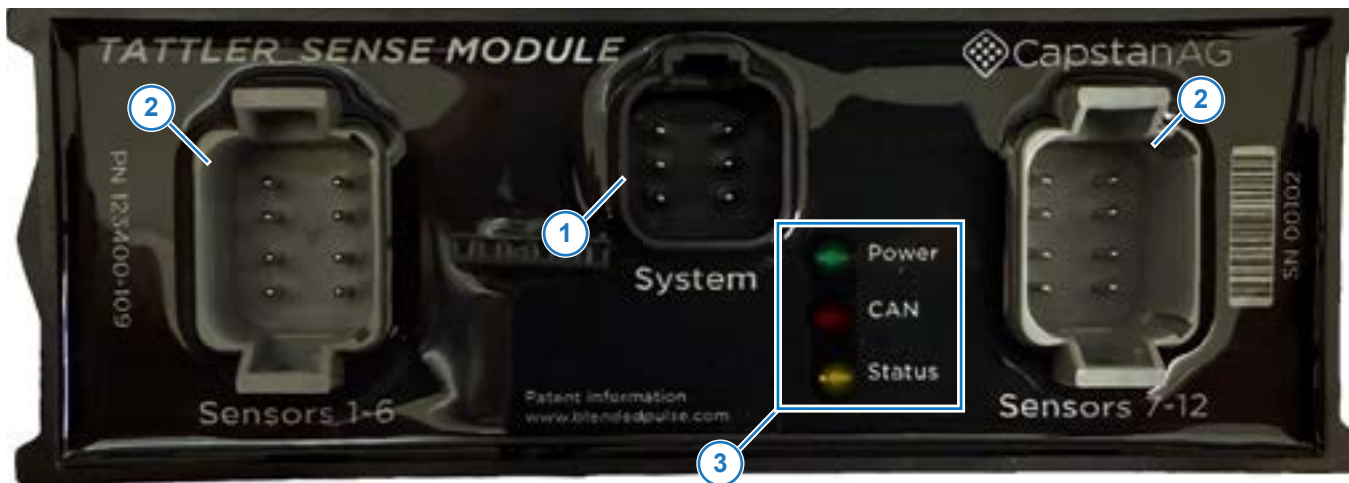


Figure 19: Sense Module

Item	Description
1	System Connector
2	Sensor Harness Connector
3	Tattler Status Lights

Table 11: System Connector Pinout (Figure 17, Item 1)

Pin	Description	Wire Color	Pin	Description	Wire Color
1	Power	Red	4	CAN High	Yellow
2	Ground	Black	5	CAN Low	Green
3	Boom Switch Signal	Blue	6	Key Switched Power	Brown

Table 12: Sensor Connector Pinout (Figure 17, Item 2)

Pin	Description	Wire Color	Pin	Description	Wire Color
1	Power	Red	5	Sensor 3 Signal	Green
2	Ground	Black	6	Sensor 4 Signal	Orange
3	Sensor 1 Signal	Blue	7	Sensor 5 Signal	Pink
4	Sensor 2 Signal	Brown	8	Sensor 6 Signal	Violet

Table 13: Sensor Cap/Jumper Connector Pinout

Pin	Description	Wire Color	Pin	Description	Wire Color
1	Power In	Red or Red & White	4	Unused	-
2	Ground	Black or Black & White	5	Ground	Black or Black & White
3	Sensor Signal	See Table 12	6	Power Out	Red or Red & White

VCM Connector Pinout

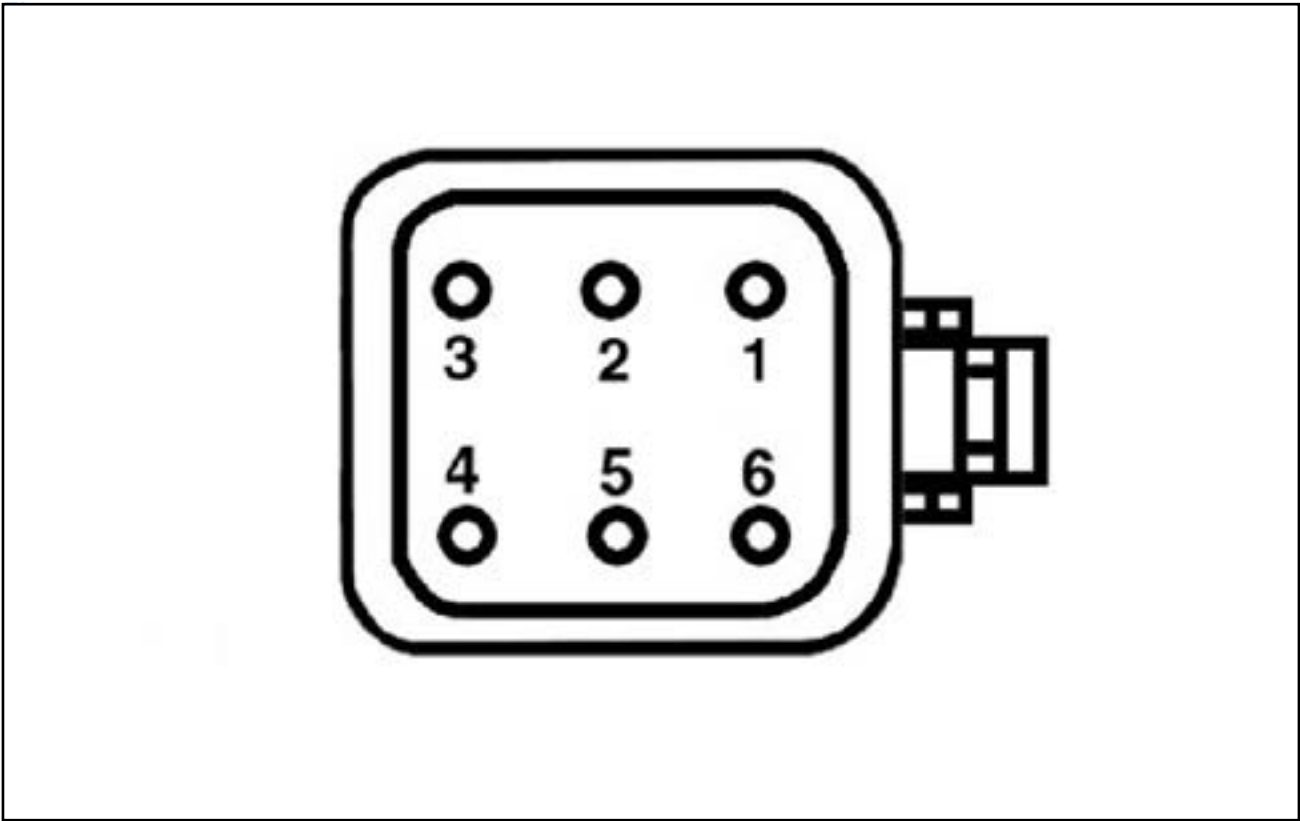


Figure 20: VCM Connector

Table 14: VCM Connector Pinout

Pin	Description	Wire Color	Pin	Description	Wire Color
1	Power	Red	4	CAN High	Yellow
2	Ground	Black	5	CAN Low	Green
3	Boom Switch Signal	Blue	6	Key Switched Power	Brown

Table 15: VCM Connector Pinout (Fence Row Outputs Enabled - VCM Ports 1 & 4)

Pin	Description	Wire Color	Pin	Description	Wire Color
1	Power	Red	4	CAN High	Yellow
2	Ground	Black	5	CAN Low	Green
3	Fence Row Nozzle Signal	Blue	6	Key Switched Power	Brown

Leap Start VCM Identification



Figure 21: Leap Start VCM

Item	Description
1	VCM Status Lights
2	Valve Harness Connector for Valves 1-6
3	Valve Harness Connector for Valves 7-12
4	CAN/Power Connections

Table 16: Leap Start VCM Identification

Pin	Wire Color	Description	
		Left 1-6	Right 7-12
1	Red	Valve 6 Power	Valve 7 Power
2	Black	Valve 5 Power	Valve 8 Power
3	Blue	Valve 4 Power	Valve 9 Power
4	Yellow	Valve 3 Power	Valve 10 Power
5	Green	Valve 2 Power	Valve 11 Power
6	Brown	Valve 1 Power	Valve 12 Power
7	Brown/White	Valve 1 Return	Valve 12 Return
8	Green/White	Valve 2 Return	Valve 11 Return
9	Yellow/White	Valve 3 Return	Valve 10 Return
10	Blue/White	Valve 4 Return	Valve 9 Return
11	Black/White	Valve 5 Return	Valve 8 Return
12	Red/White	Valve 6 Return	Valve 7 Return

Table 17: Leap Start VCM Valve Connection Pinout

System Layout

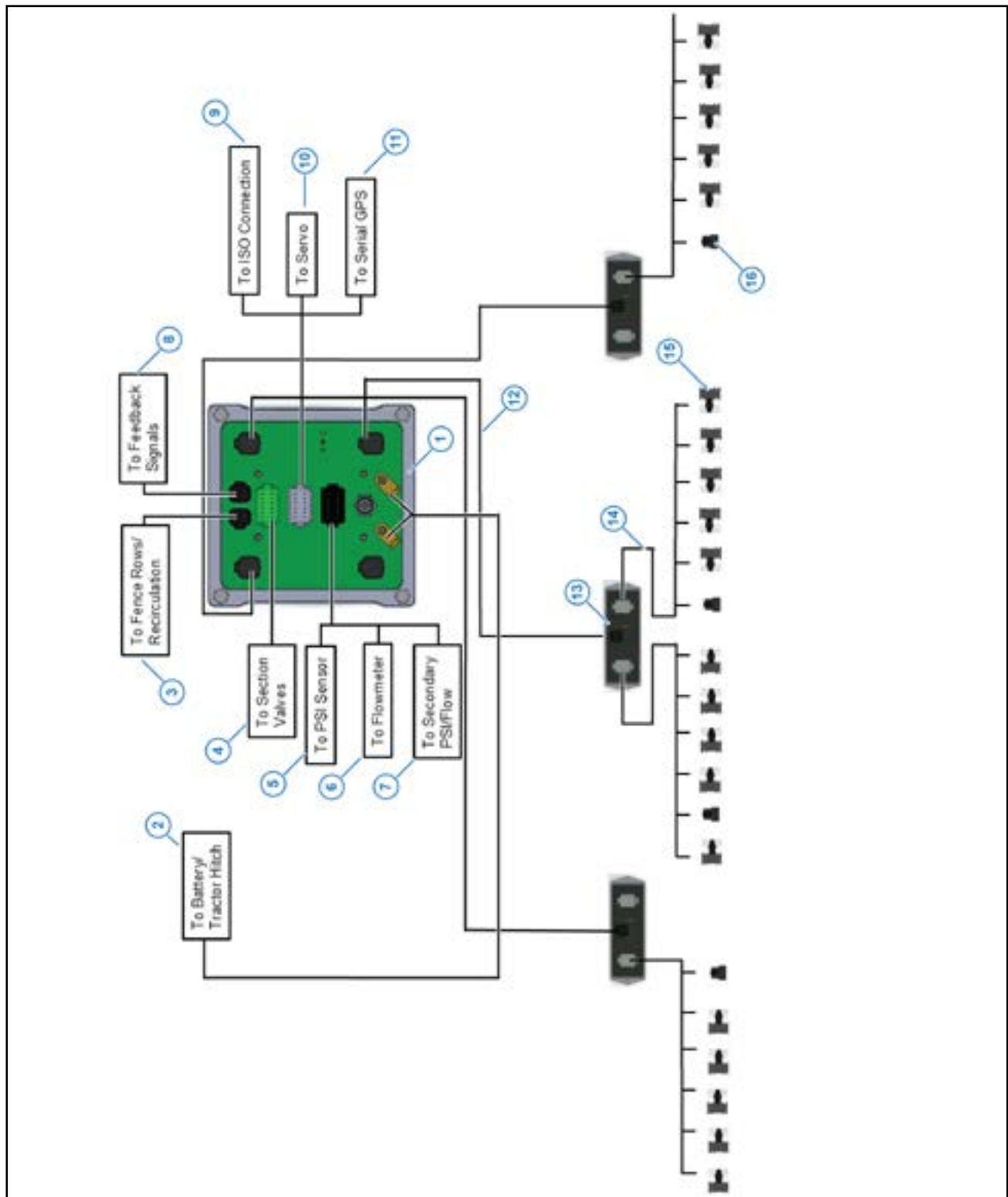


Figure 22: System Layout

Table 18: System Layout Diagram Components

Item	Description
1	PinPoint III Lite Hub
2	Power Harness
3	Harness to connect to Recirculation and/or Fence Rows
4	Harness to connect to Section Valve Signals
5	Harness to Pressure Sensor
6	Harness to Flowmeter
7	Harness to additional PSI/Flow (if equipped)
8	Harness to valve feedback signals
9	Harness to machine ISO connection
10	Harness to Pump Servo
11	Harness to Serial GPS Receiver
12	CAN Extension Harness
13	Tattler Sensor Module
14	Tattler Sensor Harness
15	Tattler Row Flow Monitor
16	Tattler Jumper

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