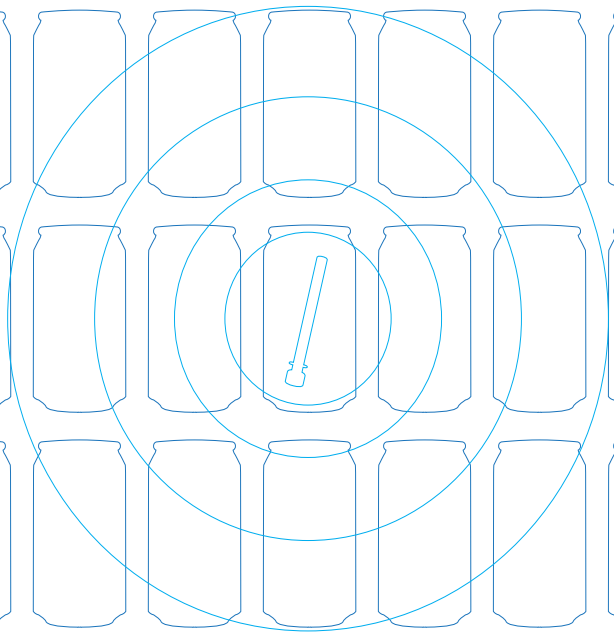
ENPRO INC



FILLER VENT TUBE READER

OPERATIONS MANUAL

v2.072825

SAFTEY AT TIME OF FILL

Foreign Object Detection

The Enpro Filler Vent Tube Reader Touch Screen (FVTR-TS) is a high-speed RFID reader that records each RFID tag present in the filler vent tubes, filler tips, or traceable ball cages in real-time during the filling process. This ensures comprehensive tracking and verification throughout operation.

If a vent tube, filler tip, or ball cage is missing, the FVTR system immediately signals the filler PLC to stop the can gate, allowing the system to run out the cans on the filler and isolate the quarantined cans on the exit conveyors—before they reach the can warmer. This automated process enables operators and quality teams to quickly identify the missing RFID component within the quarantined section, reducing downtime and minimizing the need for product holds or destruction.

IMPROVE PRODUCTIVITY ON YOUR BEVERAGE FILLER

A New Level of Efficiency

By providing real-time detection and immediate filler stops when a vent tube is missing, the FVTR-TS significantly enhances operational safety, prevents foreign objects from contaminating the product, and eliminates unnecessary delays caused by periodic 30- or 60-minute line stops. This system ensures reliability, safety, and improved productivity on your bottling line.

CONTENTS

FORWARD

This service manual is provided to serve as the installation, operation and maintenance guide for the equipment supplied by Enrpo. The contents should be read before attempting any phase of installation, operation and maintenance. The Enpro Vent Tube Detection System (VTDS) requires installation by the customer or prearranged contractor. Unpack carefully and check all items received against the invoice.

The Enrpo Vent Tube Detection System has been tested and passed quality-control inspections in accordance with Enrpo standard procedures. However, the equipment as shipped may have been opened or disassembled for inspection, cleaning, etc., after testing. The customer should confirm that no nuts, bolts, flanges, enclosures or any other component have not become loose during shipment; these should be tightened wherever necessary.

An identification tag has been permanently attached to the equipment. When requesting information, service or spare parts, please be prepared to furnish the part number and serial number located on the identification tag. It is the user's responsibility to check actual operating conditions to ensure the vent tube detection system components, materials of construction, and sealing materials are compatible with the application and are within local safety codes.

Enrpo reserves the right to modify the contents of this service manual without notification.

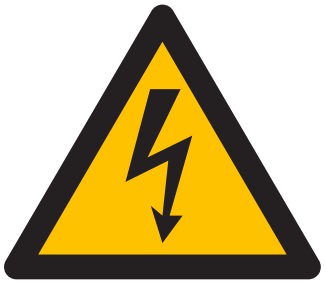
EXTREME WARNING
CRITICAL SYSTEM REQUIREMENTS

CELL PHONE CONNECTION WARNING

DO NOT CONNECT A CELL PHONE TO USB PORT
Doing so may cause:

- **The system to blue screen and crash.**
- **An unsupported system download that may corrupt software.**
- **Windows updates or power malfunctions that will disrupt system stability.**

THIS ACTION IS STRICTLY PROHIBITED.
Connecting a cell phone may require full system restoration, resulting in significant downtime and potential hardware damage.



SYSTEM VOLTAGE STABILITY
CRITICAL POWER REQUIREMENTS

THE SYSTEM MUST RECEIVE 110-130VAC, 5AMP POWER WITH UNINTERRUPTED VOLTAGE.

DANGER: Voltage sag or power interruptions during memory storage may result in:

- **Immediate system crash (blue screen).**
- **Complete system failure requiring reinstallation.**
- **Permanent data corruption.**

Ensure the system is on a stable, uninterrupted power supply to prevent catastrophic failures.

EXTREME WARNING
CRITICAL SYSTEM REQUIREMENTS

AIR PRESSURE RANGE FACILITY RESPONSIBILITY

THE SYSTEM REQUIRES A PLANT AIR SUPPLY OF 80-100 PSI FOR PROPER OPERATION.
Overpressure Risk (>100 PSI):

- **Cylinder failure – may cause mechanical damage.**
- **Antenna malfunction – leading to inaccurate readings or system failure.**
- **Underpressure Risk (<80 PSI):**
- **Low pressure fault – system will not function correctly.**
- **Antenna failure – improper operation and potential downtime.**

Maintaining proper air pressure is the facility's responsibility. Incorrect pressure will result in system failure.

DO NOT POWER UP WITHOUT ANTENNA CABLE CONNECTED

EXTREME WARNING: POWERING UP THE SYSTEM WITHOUT THE ANTENNA CABLE WILL CAUSE PERMANENT DAMAGE TO THE MOST EXPENSIVE COMPONENT OF THE SYSTEM.

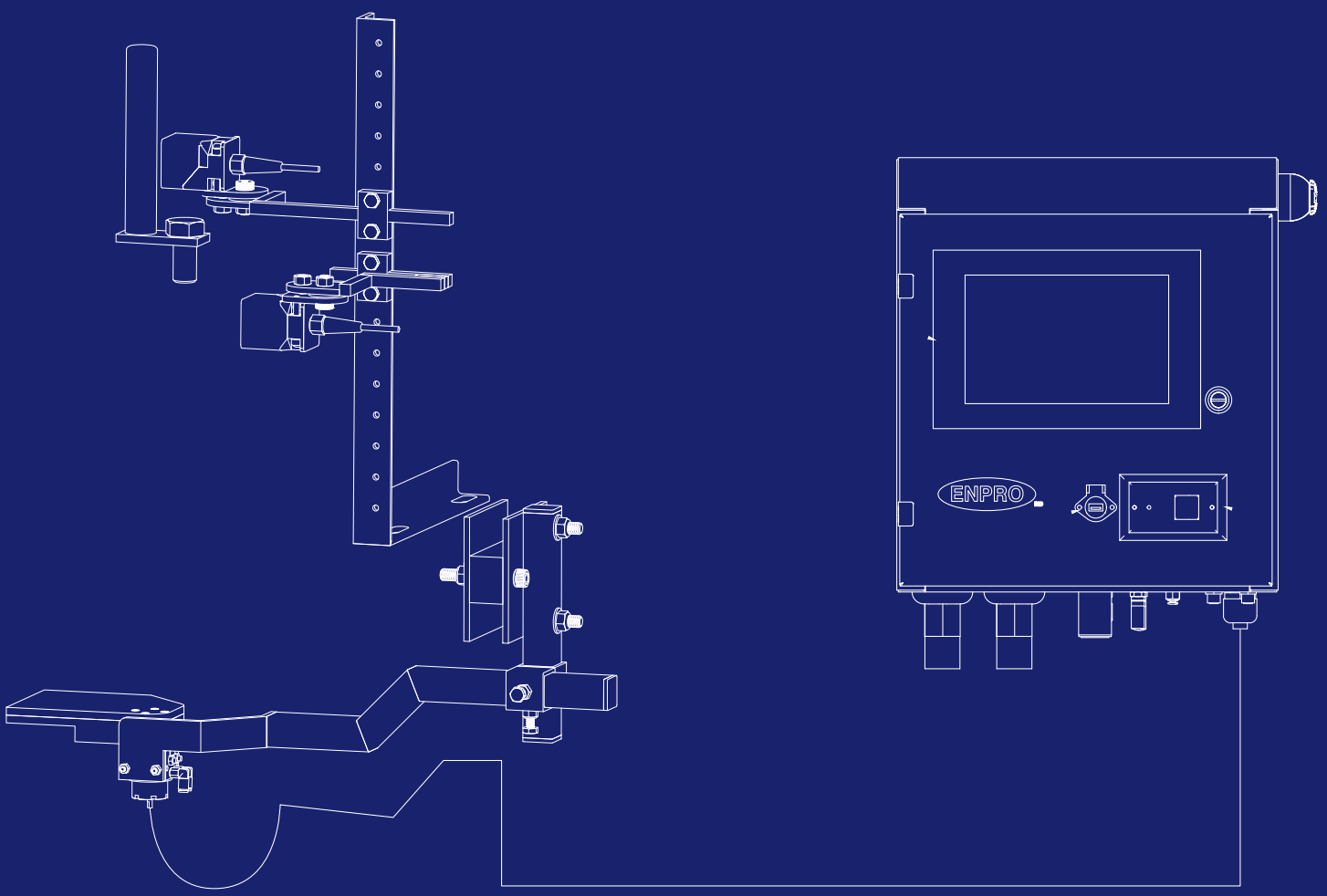
ALWAYS ensure the antenna cable is securely connected before applying power.

FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN SYSTEM DAMAGE, OPERATIONAL FAILURES, OR COSTLY REPAIRS.

IN THE EVENT OF A DAMAGED OR SEVERED ANTENNA CABLE SHUT DOWN THE SYSTEM IMMEDIATELY.

For questions or concerns regarding system requirements, **contact your Enpro Support Team** immediately.

SYSTEM OVERVIEW



MAJOR COMPONENTS OVERVIEW

1. TOUCH SCREEN

2. ANTENNA (Main Sensor)

a. Antenna coax cable (limited to 20 feet)

b. Antenna rotating cylinder (specialty all-stainless construction)

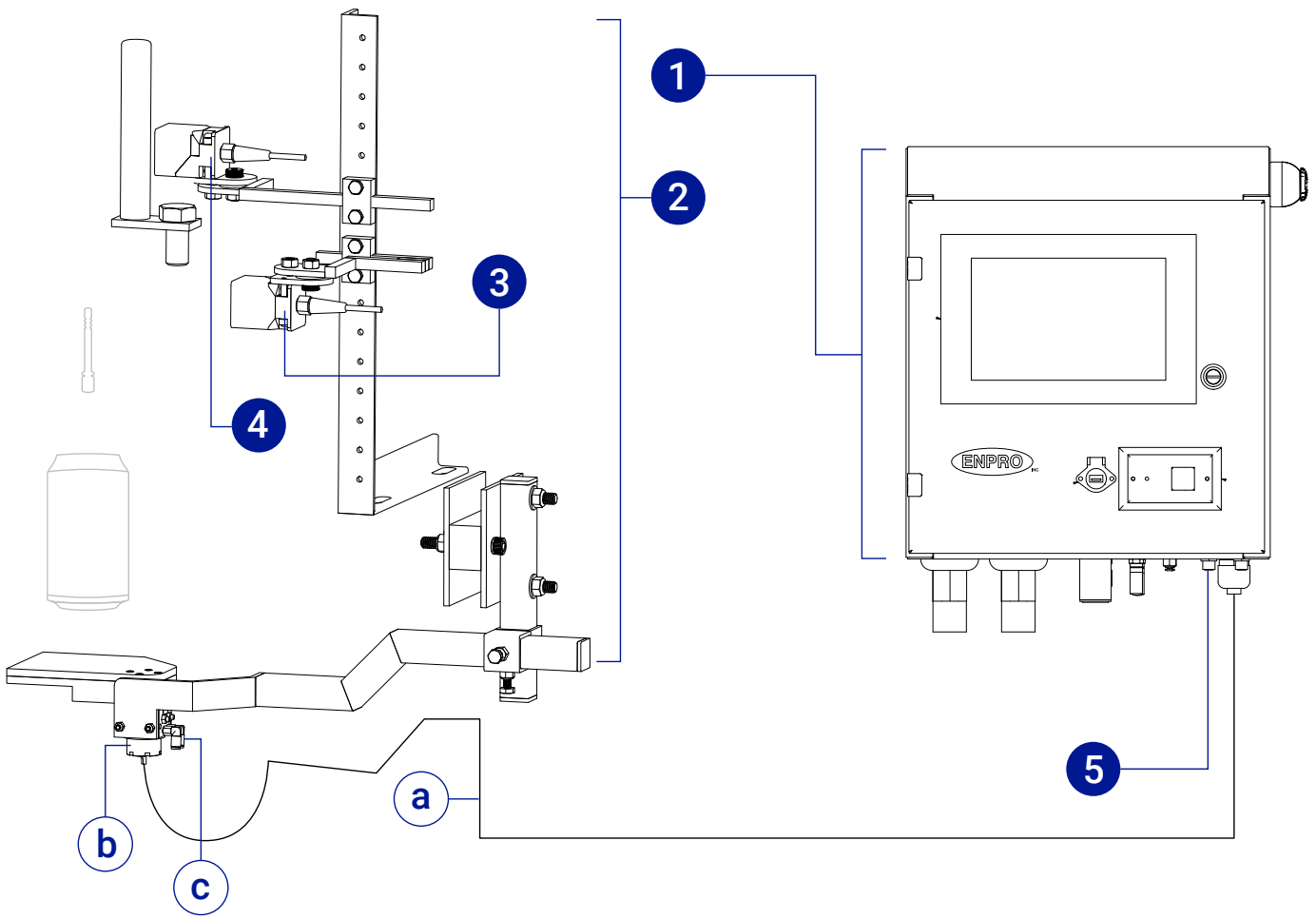
c. Antenna air lines

3. RPM SENSOR

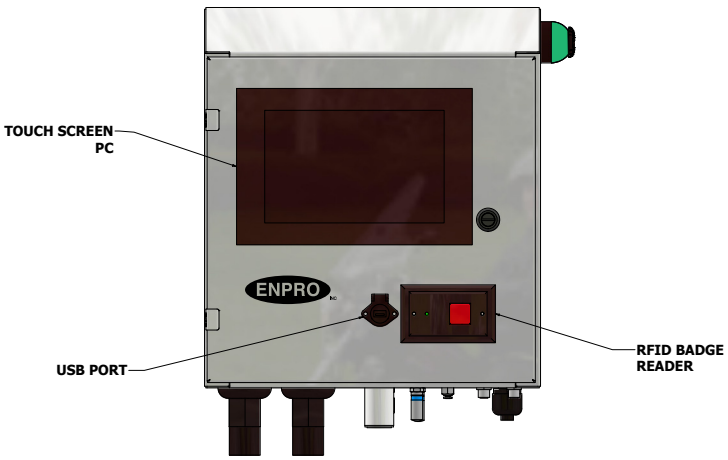
4.HOME FLAG SENSOR

5. SIGNAL WIRES FROM TOUCH SCREEN TO FILLER PLC CONTROL CABINET

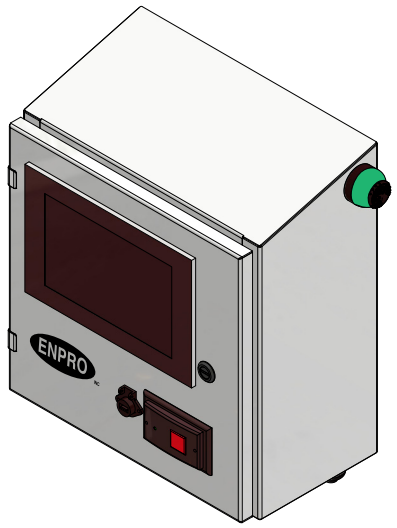
(Customer Supplied Wiring)



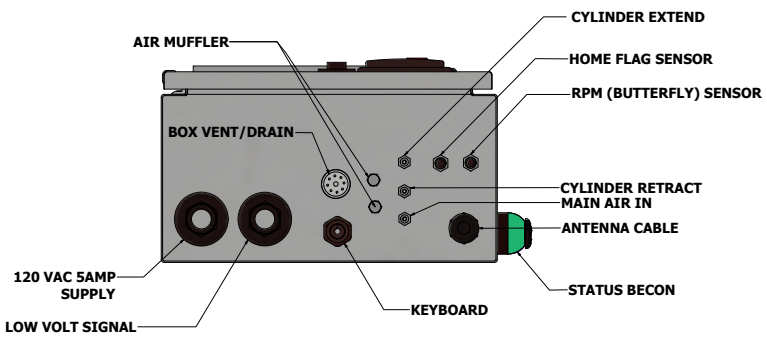
BOX LAYOUT



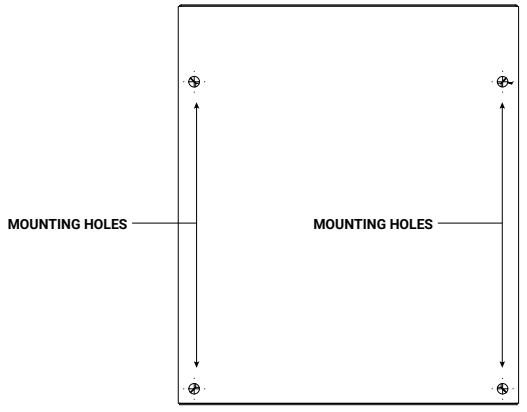
FRONT



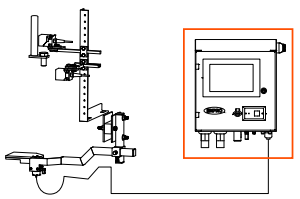
TOP



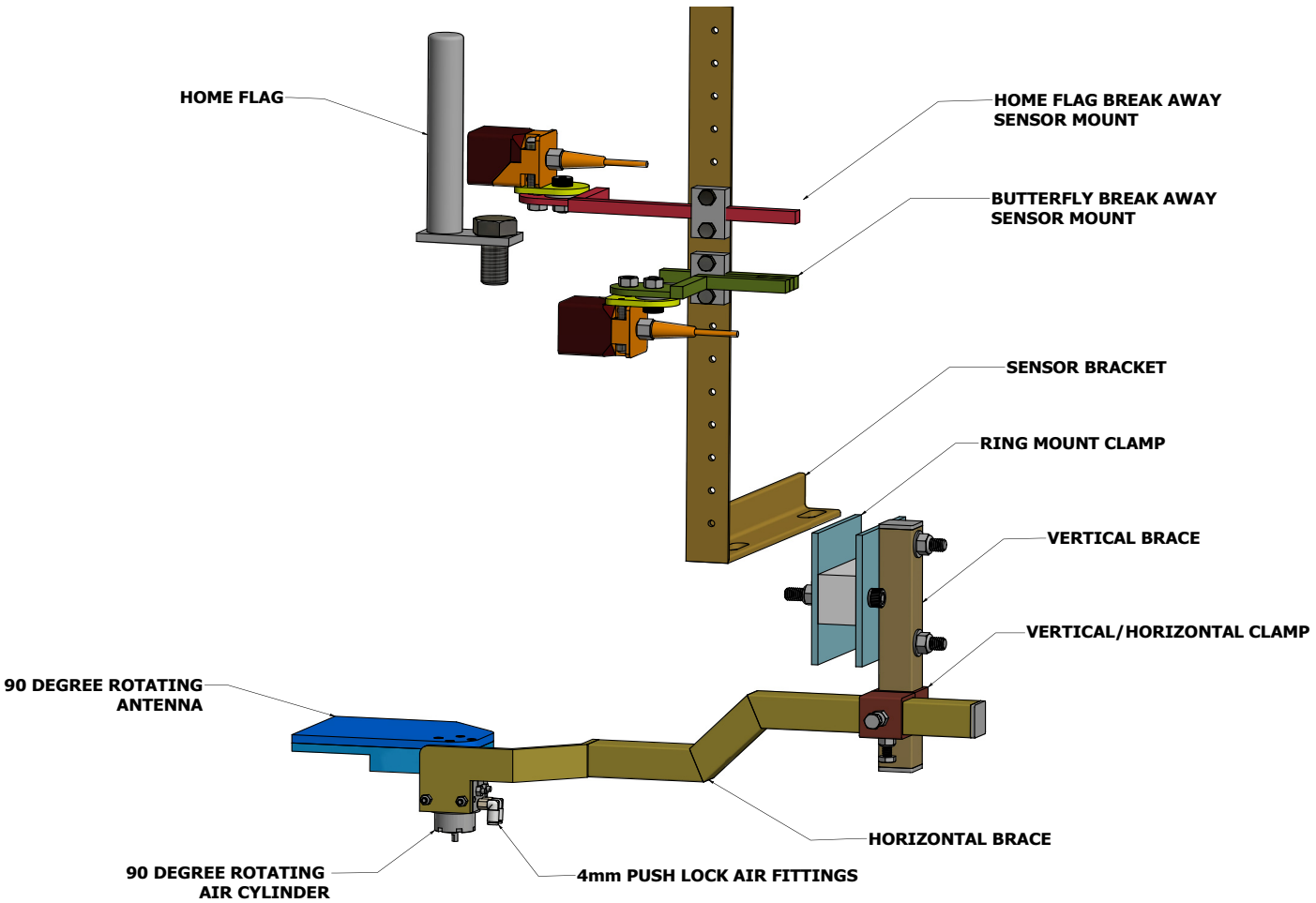
BOTTOM

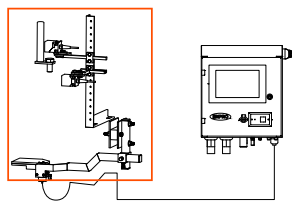


BACK



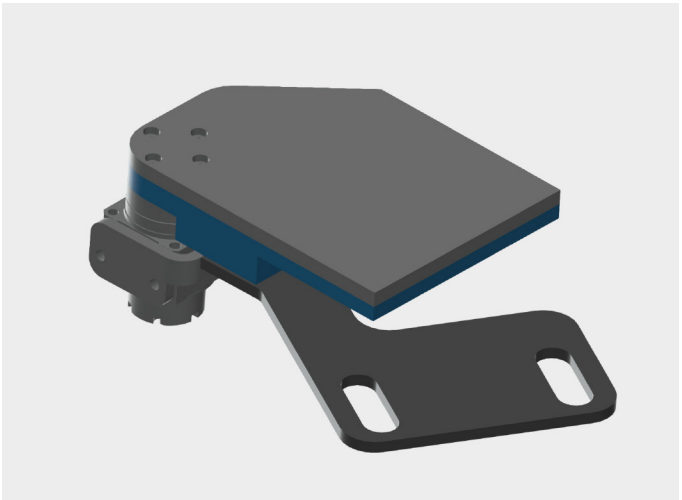
ANTENNA ASSEMBLY



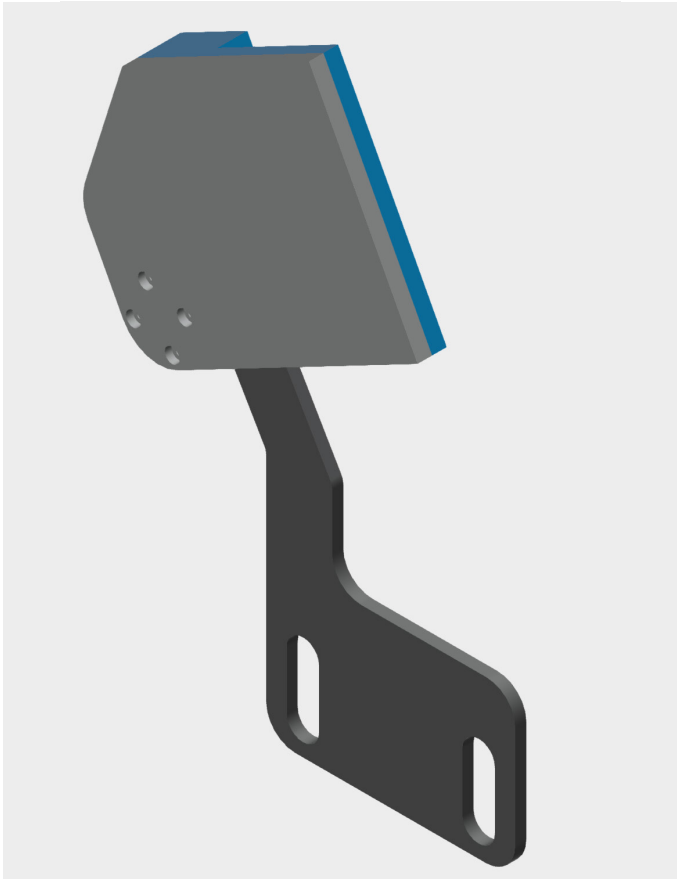


NEW ANTENNA DESIGN OPTIONS

Internal Discharge Rail Mount Antenna

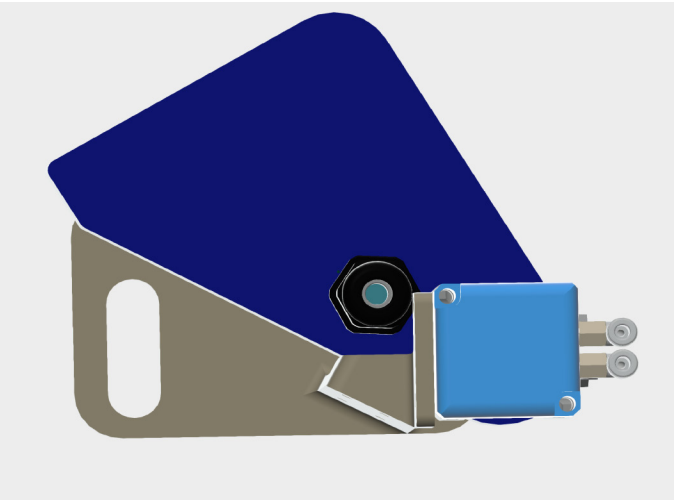


Extended Position

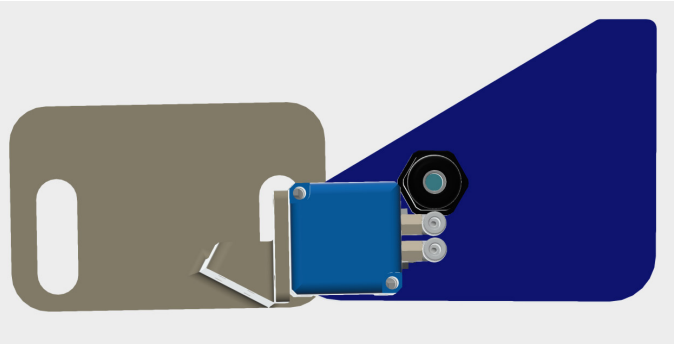


Retracted Position

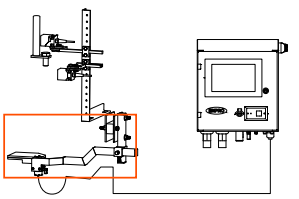
RH9 Discharge Rail Mount Antenna



Extended Position

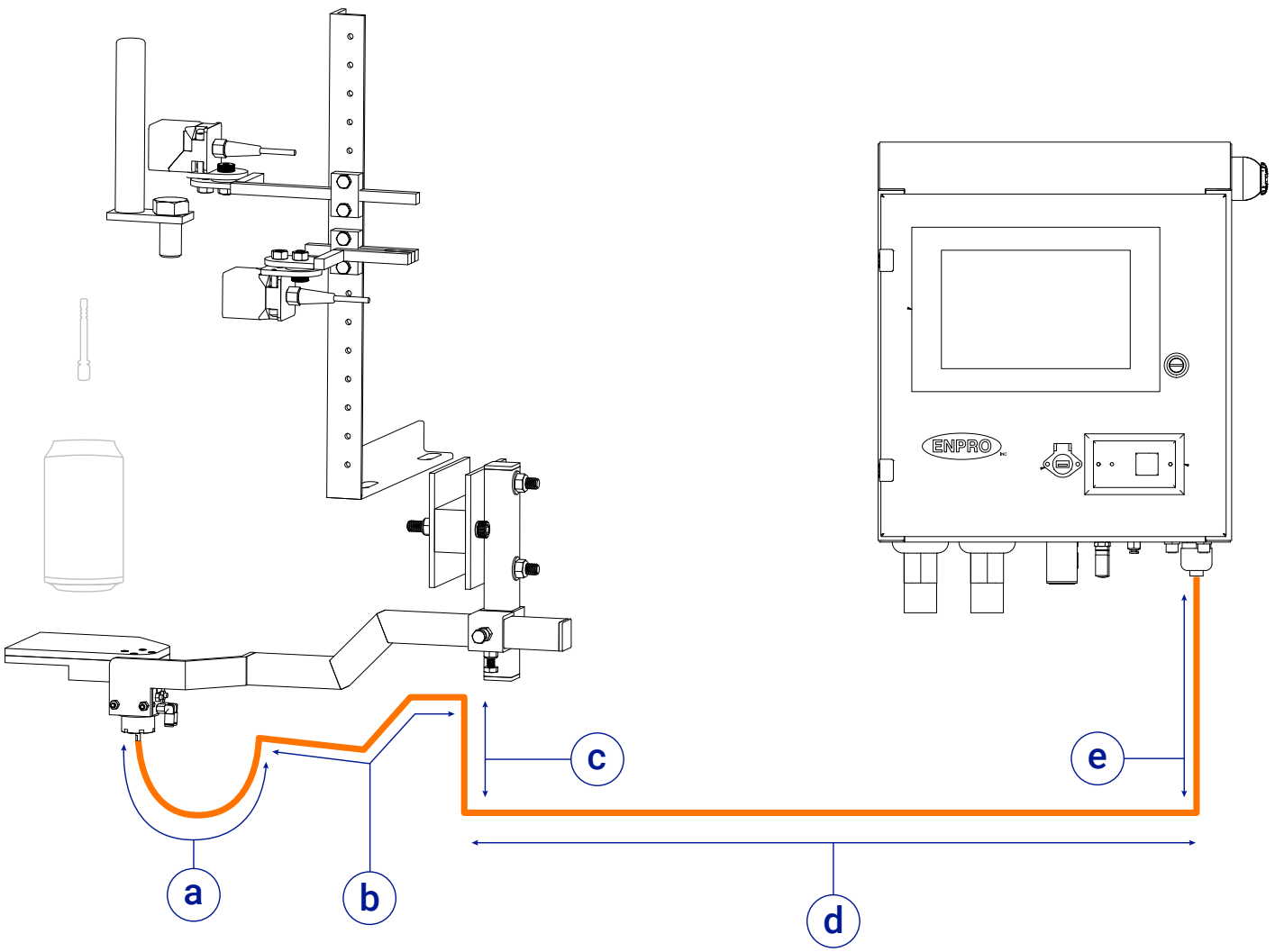


Retracted Position

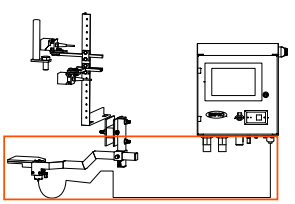


ANTENNA DISTANCE

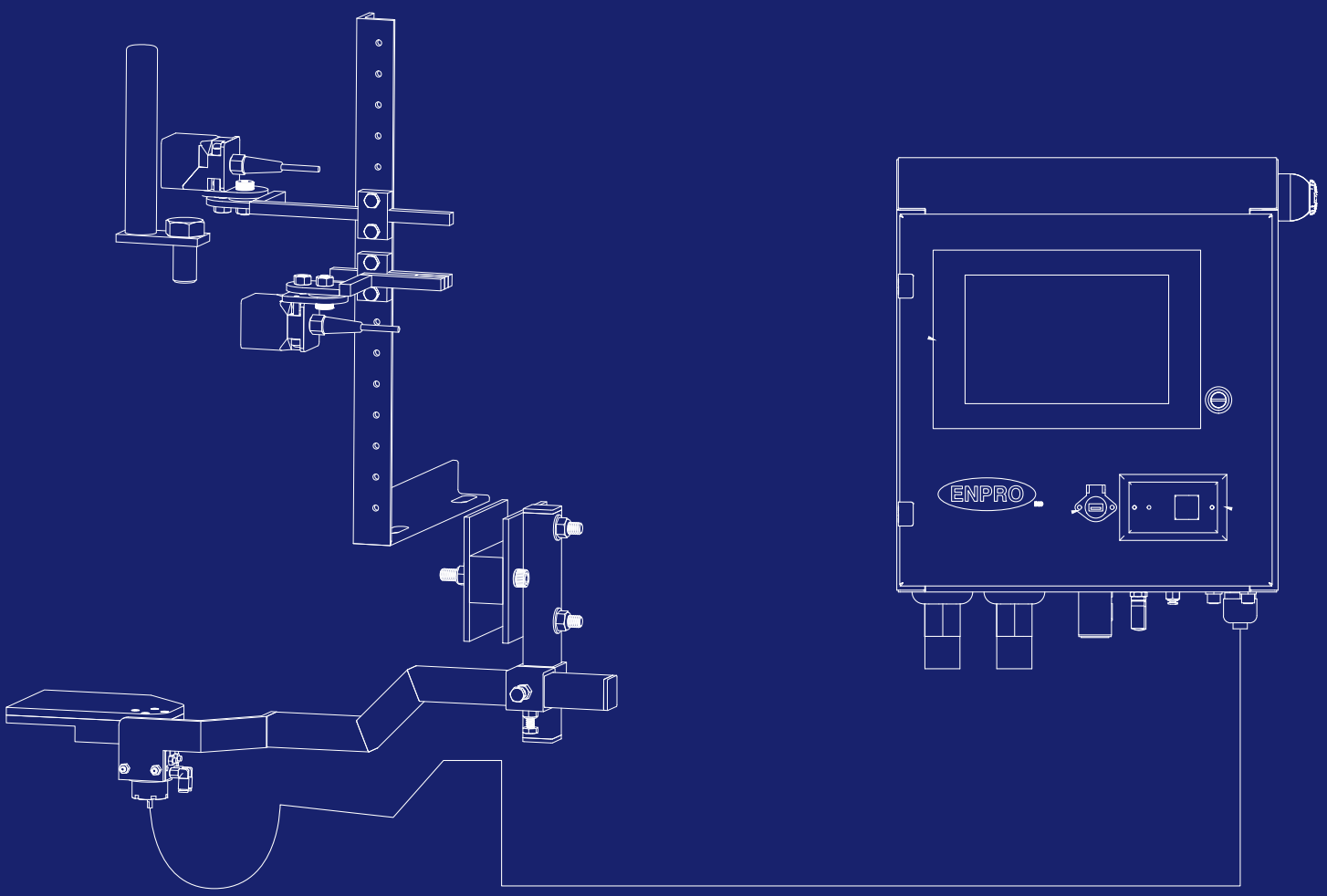
Box should be mounted so the Antenna Coax Cable is no more than 20 feet in length (if layed flat).



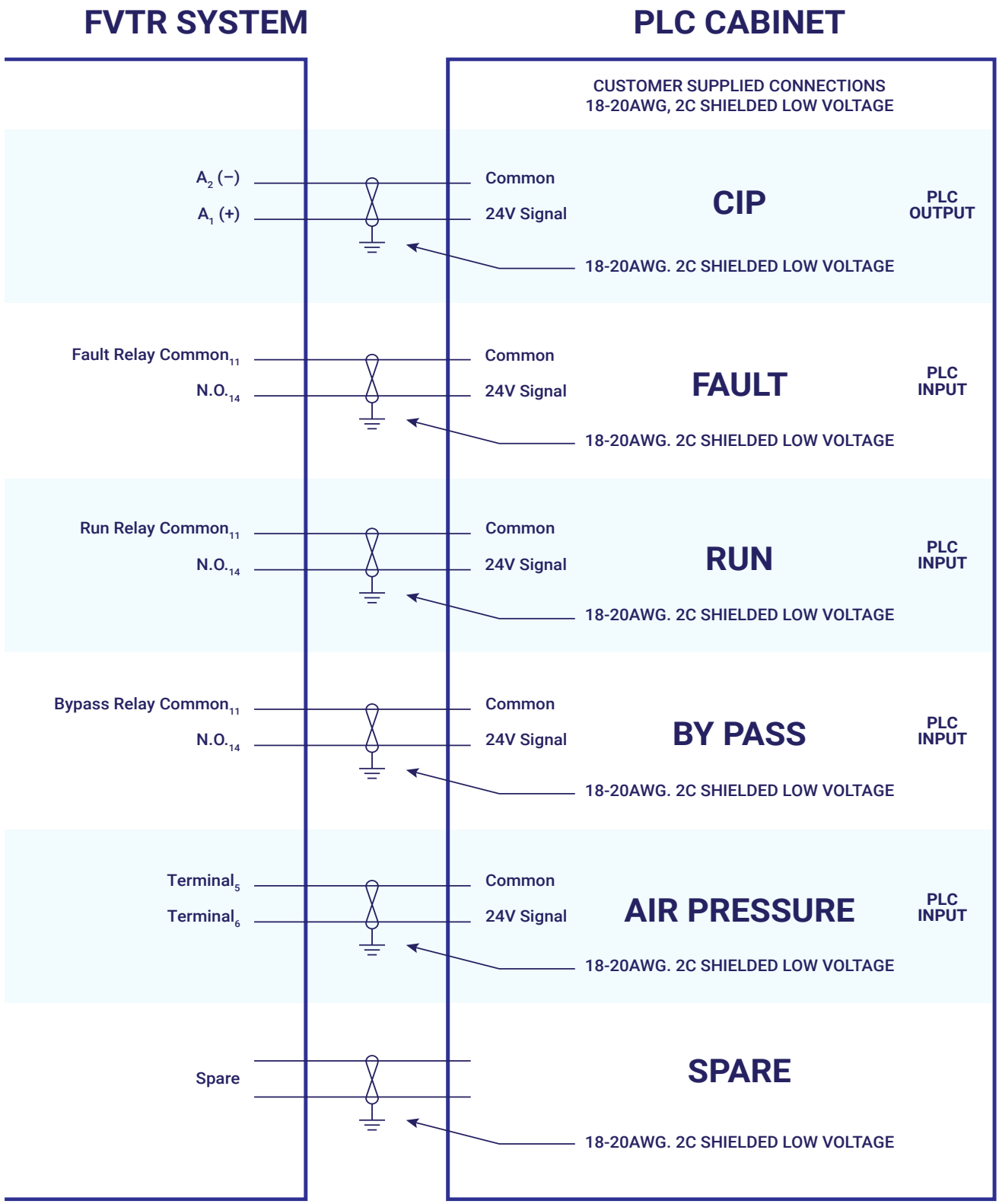
A + B + C + D + E ≤ 20’



SYSTEM SETUP



CONNECTIONS



Run 6, 2 Conductor Shielded Twisted Pair Cables 18 AWG to PLC Cabinet
Air Pressure Switch is preset to close at 3bar

CONTROL SEQUENCING

This summary outlines the control process of the Enpro Filler Vent Tube RFID (FVTR) System with an existing PLC (Programmable Logic Controller) setup in a beverage production line. For a complete controls narrative, please visit www.MissingVentTube.com for a complete integration manual.

SYSTEM CONTROL OVERVIEW

- The FVTR system tracks and records the serial numbers of RFIDs embedded in Vent Tubes, Vent Tips and Ball Cages during the filling process.
- It interfaces with the filler's PLC to coordinate shutdowns and fault recovery, ensuring smooth operations.

FAULT RELAY ACTIVATION & SHUTDOWN SEQUENCE

1. **Can Gate Closure & Run-Out Delay**
   - On fault detection, the can gate closes.
   - A delay allows cans to exit the filler to prevent jams and issues with open valves.
2. **Conveyor and Seamer Protection**
   - Cans are allowed to pass through the seamer to the exit conveyor.
   - The first three conveyors are then stopped to isolate any affected cans. This creates a buffer zone or isolation zone (230–500 cans depending on filler size). Depending on site setup this would include 2-3 conveyors prior to the warmer. We keep the seamer discharge conveyor running to prevent backup and jams.
3. **Manual Restart Protocol**
   - Fault resolution requires manual restart via the Enpro HMI (Human-Machine Interface) with badged administrator access.
   - The restart is a soft start using a VFD ramp-up to avoid abrupt movements.

SIGNAL DESCRIPTIONS & HMI INDICATORS

- **Initialize Relay**
  - System starts RFID lookup and recording (not active monitoring).
  - Yellow status bar on HMI.
- **Run Relay**
  - Indicates active monitoring, system in normal operation.
  - Green status bar on HMI.
- **Bypass Output Relay**
  - Manually triggered to bypass monitoring temporarily and retract the antenna.
  - Blue and purple flashing status on HMI.

CONTROL SEQUENCING

SIGNAL DESCRIPTIONS & HMI INDICATORS continued

- **CIP Signal Input**
  - Halts monitoring when receiving Clean-in-Place or jog signals.
  - Blue status bar on HMI for safety during maintenance or cleaning.
  - Antenna should retract
- **Air Pressure Switch**
  - Triggers fault if pressure < 3 bar (switch closes when pressurized).
  - Visual alert on HMI for low pressure (though not shown directly by FVTR). PLC HMI

RECOMMENDED CONFIGURATIONS

1. **Delay Timer:**
   Ensure cans clear out of seamer after fault detection.
2. **Conveyor Buffer:**
   Maintain space to accommodate three filler revolutions.
3. **CIP Logic:**
   Only trigger CIP relay during CIP or jog mode.
4. **Air Pressure Alerting:**
   Set HMI alerts for <3 bar air pressure.

TESTING & VERIFICATION

- Recommended tests before full deployment:
- Simulate fault for gate closure and conveyor stop sequence.
- Validate manual restart via HMI.
- Check signal relays and corresponding HMI status bars.
- Simulate CIP mode to ensure monitoring halts properly.

CONCLUSION

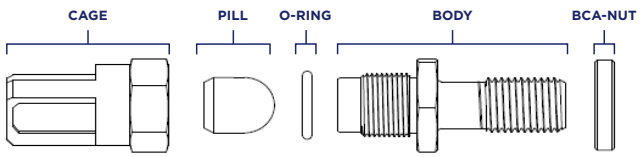
This integration summary offers the brief overview guidance required for controls teams to correctly implement the Enpro FVTR System into the filler line PLC. Following these steps ensures equipment protection and operational continuity. For further help, Enpro support is available.

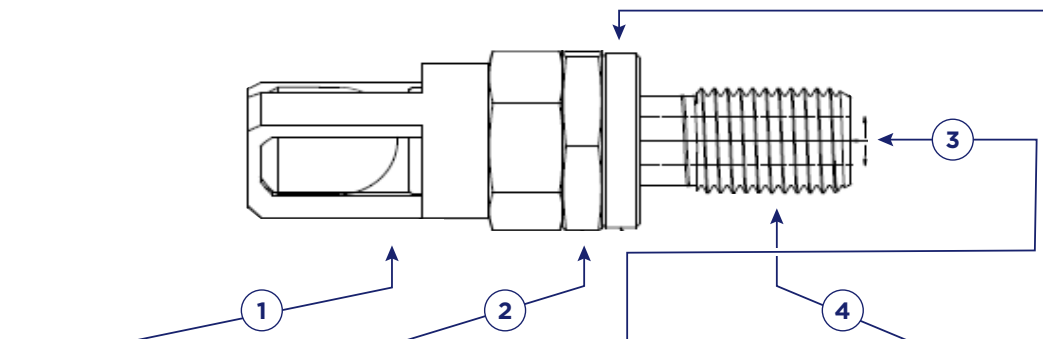
BALL CAGE INSTALLATION

Follow standard BevCorp Instructions including proper torque and max shim.

BALL CAGE ASSEMBLY

ITEM	DESCRIPTION
CAGE	FVTR-P-CAGE-(SEE NOTE #1)
PILL	FVTR-P-PILL-V06.24
O-RING	FVTR-SP-BCA-O-RING
BODY	FVTR-P-BODY-(SEE NOTE #2,#3,#4)
BCA-NUT	FVTR-P-BCA-NUT





CAGE LENGTH		
NOTE #1	PART DESC.	LENGTH
A	STANDARD	1.086"
B	SHORT	1.024"

BODY LENGTH	
NOTE #2	LENGTH
01	0.125"
02	0.250"
03	0.375"
04	0.500"

PORT (ORIFICE) SIZE	
NOTE #3	PORT SIZE
A	0.125"
B	0.156"
C	0.171"
D	0.187"
E	0.203"
F	0.140"

STEM LENGTH		
NOTE #4	PART DESCRIPTION	LENGTH
STANDARD CAGE		
A	STANDARD	0.816"
B	SHORT	0.616"
SHORT CAGE		
C	STANDARD	0.816"
D	SHORT	0.616"

BCA-NUT	
NOTE #5	0.125"
A	YES
B	NO

FVTR-P-BCA

ASSEMBLY PART NUMBER

1 CAGE LENGTH | 2 2 BODY LENGTH | 3 PORT/ORIFICE | 4 STEM LENGTH | 5 BCA-NUT

071725b

START – UP COMMISSIONING

DNC Fill levels shim with RFID Ball Cage or RFID Vent Tube

FVTR SYSTEM START-UP & COMMISSIONING GUIDE

WARNING: PROPER SETUP IS CRITICAL TO ENSURE SYSTEM ACCURACY AND RELIABILITY.
FOLLOW ALL STEPS CAREFULLY.

Step 1: Antenna Placement & RSSI Reading

Objective: Proper antenna positioning for accurate RFID detection.

1. • Ensure RFID Vent Tubes or RFID Ball Cages are installed.
2. • Confirm DNC and Fill Levels are set before commissioning.
3. • Antenna Positioning:
   - Center the antenna under the centerline of the valve.
   - Locate the "sweet spot"—approximately 1" in from the leading edge of the antenna.
4. • DO NOT SKIP SHIMMING. Incorrect placement will result in inaccurate RSSI readings over time.

Step 2: Positioning the IFM Prox Sensor & Home Flag Sensor

Objective: Proper sensor alignment for valve tracking.

1. Mount the IFM Prox Sensor for the Butterfly Sensor.
2. Mount the Home Flag Sensor in Valve Position #1 (Preferred).
3. The Home Flag Sensor light should be engaged when the Butterfly Sensor is engaged on Valve #1.
4. If simultaneous engagement is not possible, place the Home Flag Sensor at Valve Position #2 or Last Valve (Preferred alternatives).
5. Offset Adjustment: If engagement timing isn't perfect, the system allows for an offset correction in later steps.

Step 3: Register an Admin Badge

Objective: Ensure system access and security.

1. Follow the Badge Registration instructions in the Admin Badge Registration Section of the manual.
2. This admin badge is required for system configuration changes and commissioning procedures.

Step 4: Set the Number of Expected Valves

Objective: Store the correct valve count in system memory.

1. Enter the total number of valves in the system.
2. **CRITICAL:**
   If the system loses power before completing a successful Learn Sequence, the valve count will be lost.
3. After successful Learn Sequence is completed, the number of valves will be permanently stored in EPROM memory.

START – UP COMMISSIONING

Step 5: Learn Tags Sequence

Objective: Train the system to recognize all RFID tags.

1. Navigate to the Learn Button on the top tab menu.
2. Swipe the Admin Badge to acknowledge the new Learn Sequence.
3. Start rotating the filler below 800 CPM (Cans Per Minute).
4. The system will automatically read and store RFID tag locations.
5. A green status bar on the Enpro System confirms completion.

Step 6: Validate RFID Detection Accuracy

Objective: Confirm correct RFID tag locations and fault detection.

1. Test Fault Detection:
    - Remove one RFID Vent Tube or RFID Ball Cage, OR
    - Use an RFID Blocking Device (e.g., Tin Foil) to simulate a missing RFID.
2. Rotate the filler.
3. The system should fault out and display the valve number of the missing RFID.
4. Verify Accuracy:
    - If the displayed valve number does not match the actual missing RFID location:
    - Navigate to Admin Screen > Valve Offset.
    - Adjust the Valve Offset by +1 or -1 until the system accurately identifies the missing RFID location.

Step 7: Register Additional Admin Badges

Objective: Ensure proper access for all required personnel.

1. • Register at least one Admin Badge per shift for seamless operations.
2. • Recommendation: Keep a Master Admin Badge in a secure location on-site at all times.

COMMISSIONING COMPLETE!

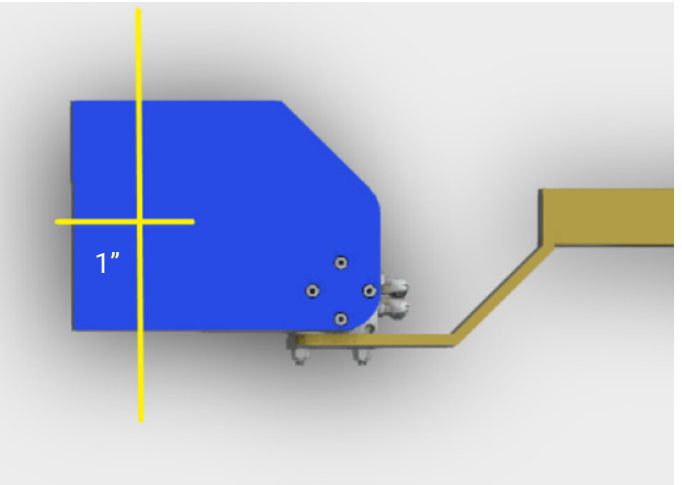
Your FVTR System is now fully operational. Conduct routine system checks to ensure ongoing accuracy and performance.

Contact Enpro for support.

ANTENNA SET-UP: ALIGNMENT

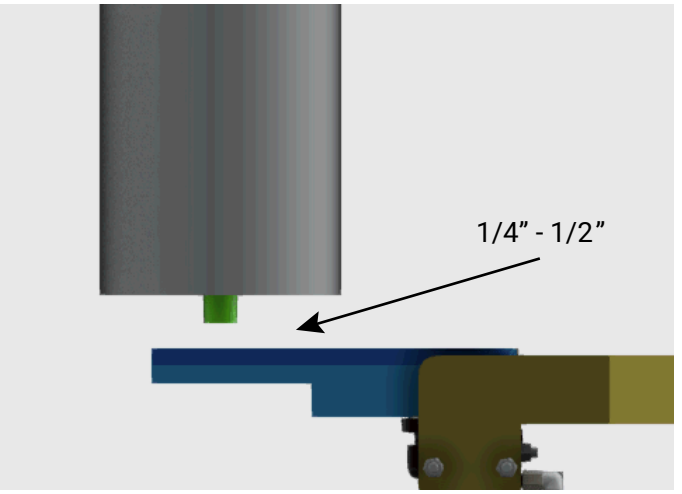
Step 1

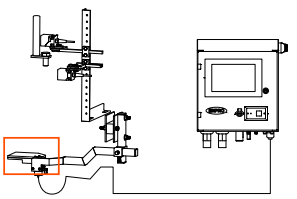
Center antenna 1 inch (from front and from the center) of the vent tube.



Step 2

Position antenna within ¼” to ½” range of the bottom of the filler valve



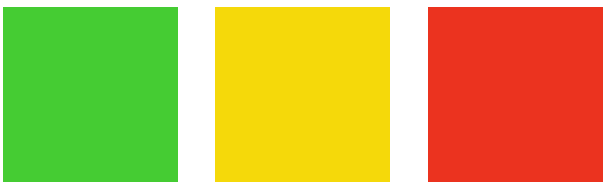


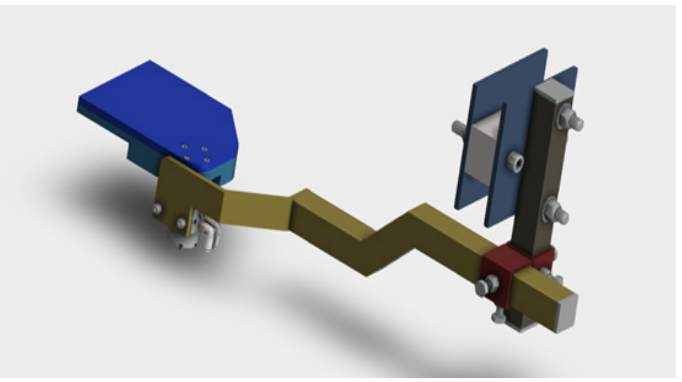
ANTENNA SET-UP: POSITION AND OPERATION

On-screen status bar colors indicate antenna position:

Antenna Extended

The antenna is extended if any of these color bars are on the screen.

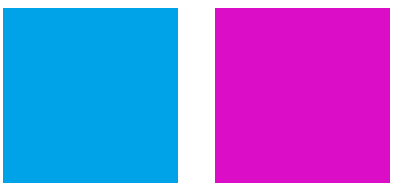


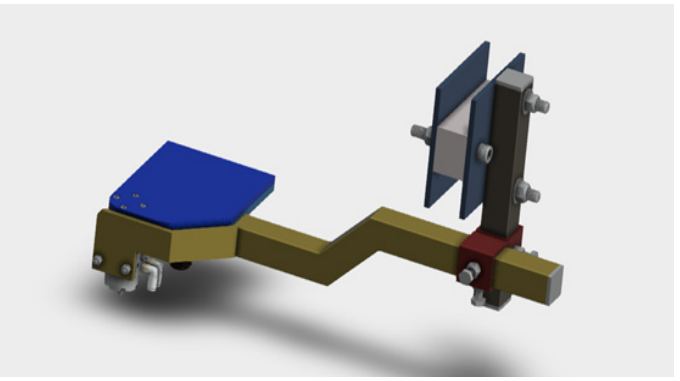


Antenna in the **extended** position.

Antenna Retracted

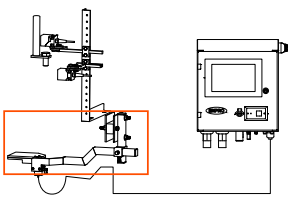
The antenna is retracted if system includes retractable antenna option and it is in CIP mode or manual bypass.





Antenna in the **retracted** position.

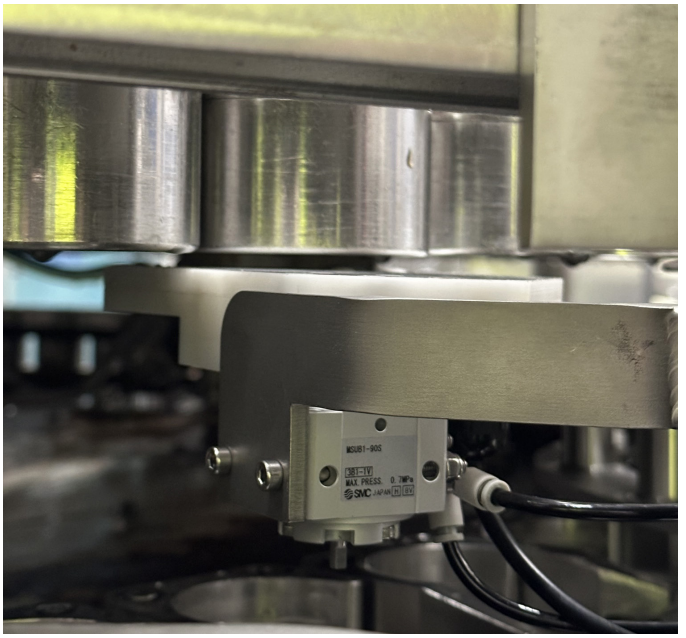
Note: If the antenna is not operating or rotating correctly, please check air pressure and if the rotating cylinder has been changed in the last 12 months.



ANTENNA SET-UP: POSITIONING AND PLACEMENT

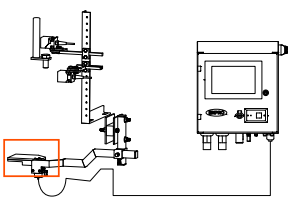
Step 1

FVTR Antenna in extended position. This is a normal operation and show proper antenna placement within 1/4” to 1/2” of the bottom of the bell.



Step 2

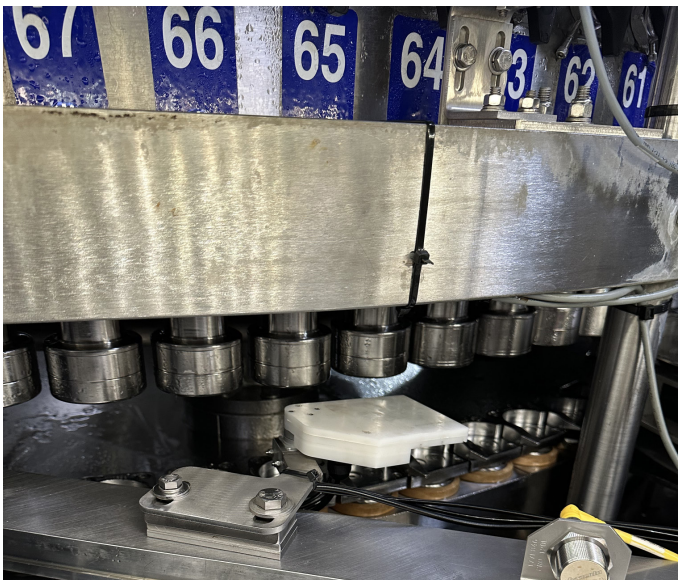
FVTR Antenna in normal operation showing proper placement



ANTENNA SET-UP: POSITIONING AND PLACEMENT

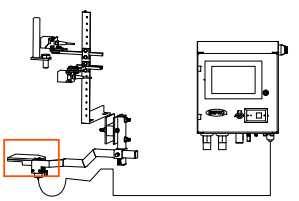
Step 3

FVTR Antenna in Retracted Position. This is a discharge Rail Mounted Antenna Design. This would be during Bypass Mode or CIP Mode, not under normal operation



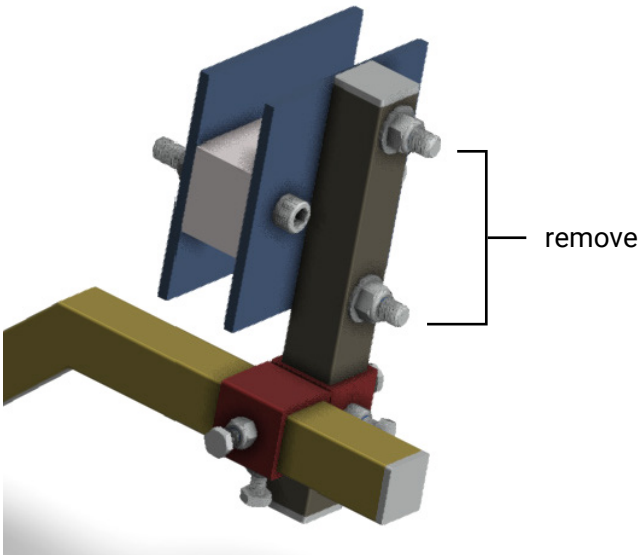
Step 4

FVTR Antenna in the extended position. This is a ring mounted antenna showing normal operation and proper antenna position

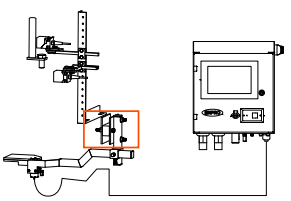


REMOVING THE QUICK RELEASE ANTENNA

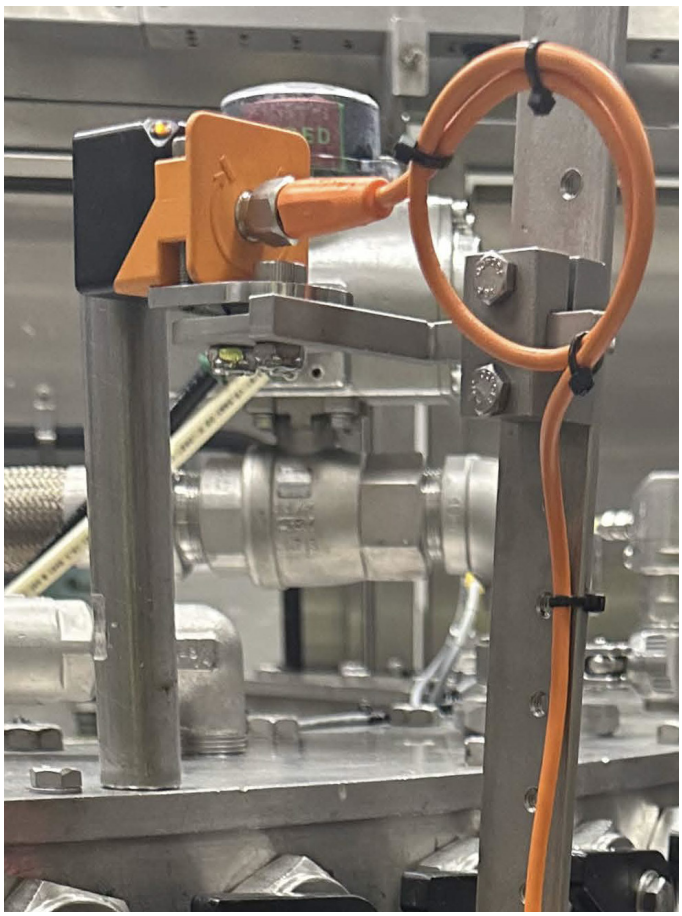
Step 1
Remove the 2 Nylock Flanged nuts.



Step 2
Slide the antenna assembly off of the 2 bolts.



BUTTERFLY (RPM) SENSOR AND HOME (START) SENSOR

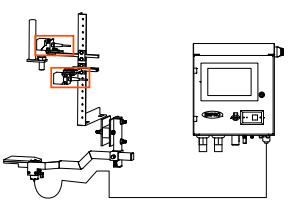


Butterfly (RPM) sensor

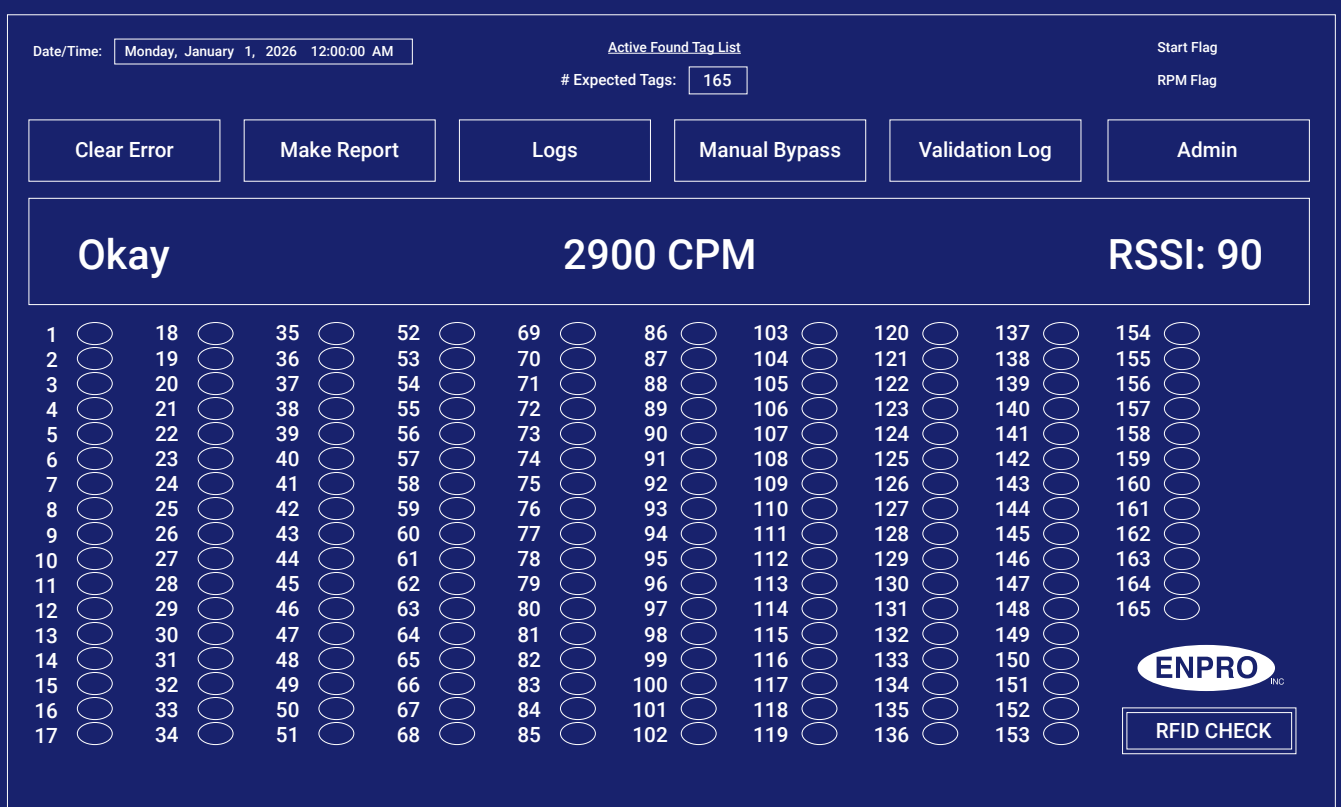
Home (Start) sensor.

Note: The image above shows proper cable routing; with service loop/drip loop and ample slack to allow the sensor to rotate freely.

This cable routing procedure should be used for both the Butterfly (RPM) sensor and the Home (Start) sensor.



TOUCH SCREEN

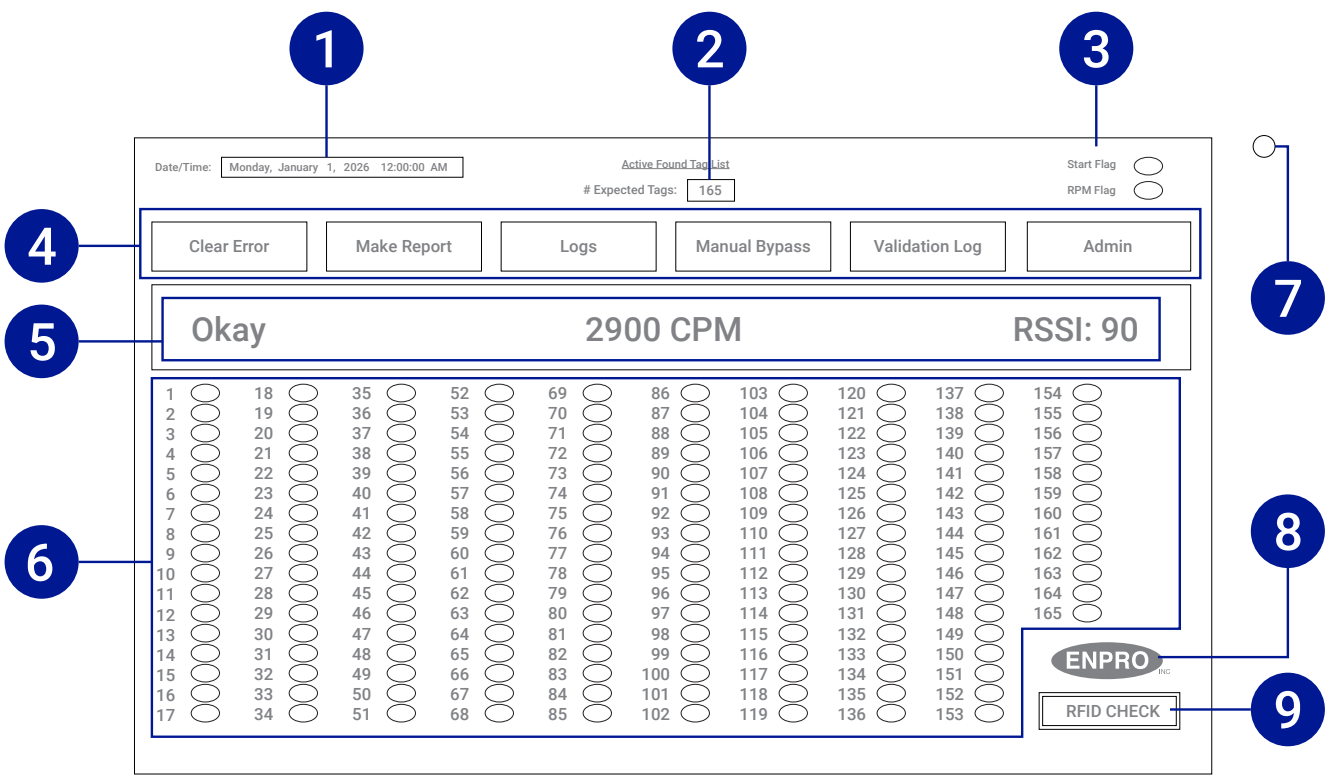


TOUCH SCREEN OVERVIEW

1. CURRENT DATE/TIME
2. EXPECTED ACTIVE TAGS
3. START FLAG / RPM FLAG
4.PRIMARY INTERFACE BUTTONS
5. STATUS AND MESSAGE AREA - COLOR INDICATOR

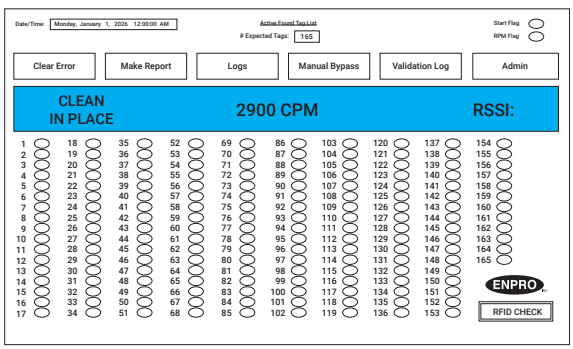
- System Status
- Filler Status/Cans Per Minute
- RSSI number

6. CAN INVENTORY
7. POWER LIGHT
8. ENPRO LOGO: FIRMWARE/SOFTWARE
9. RFID CHECK BUTTON



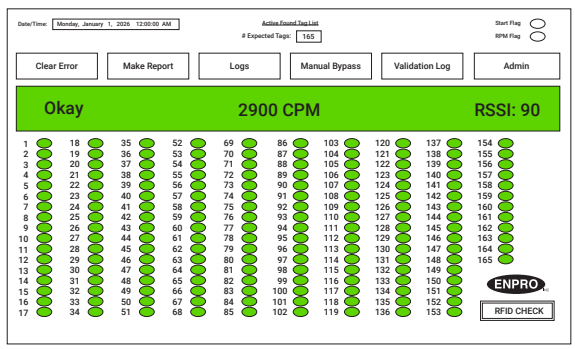
ON-SCREEN (AND BEACON) COLOR INDICATORS

The status bar colors on the screen give the current, real-time status of the FVTR-TS system.
The following are the color codes:



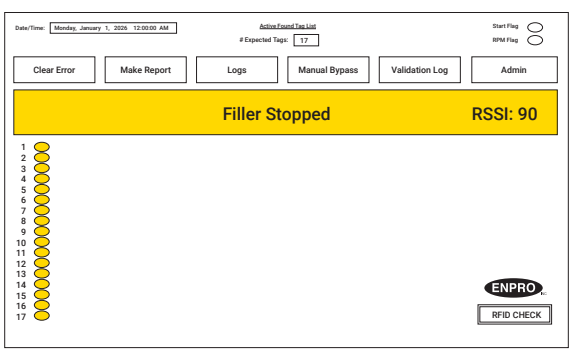
BLUE

Clean-In-Place
(Filler Operational, Detection Disabled)



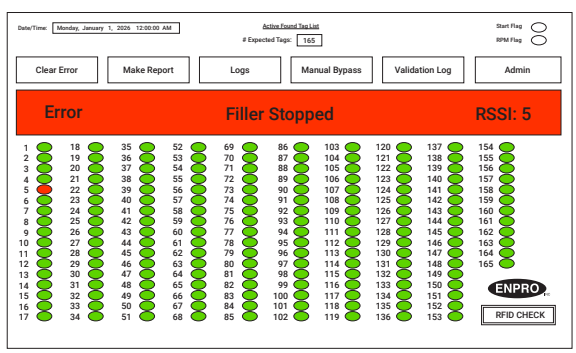
GREEN

All Clear, Ready, OK, All Vent Tubes Seen
(Filler Operational, Detection Enabled)



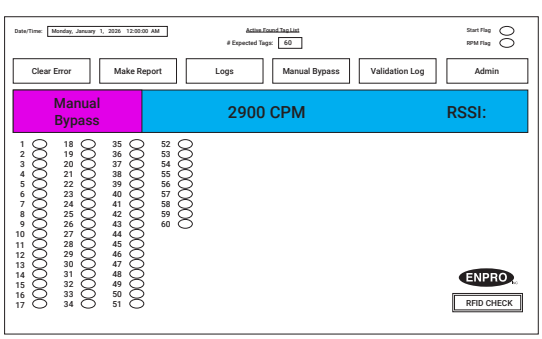
YELLOW

Initializing (reading required number of tags,
Filler Operational, Detection Enabled)



RED

Vent Tube Missing or System Error
(Filler Disabled, Detection Disabled)



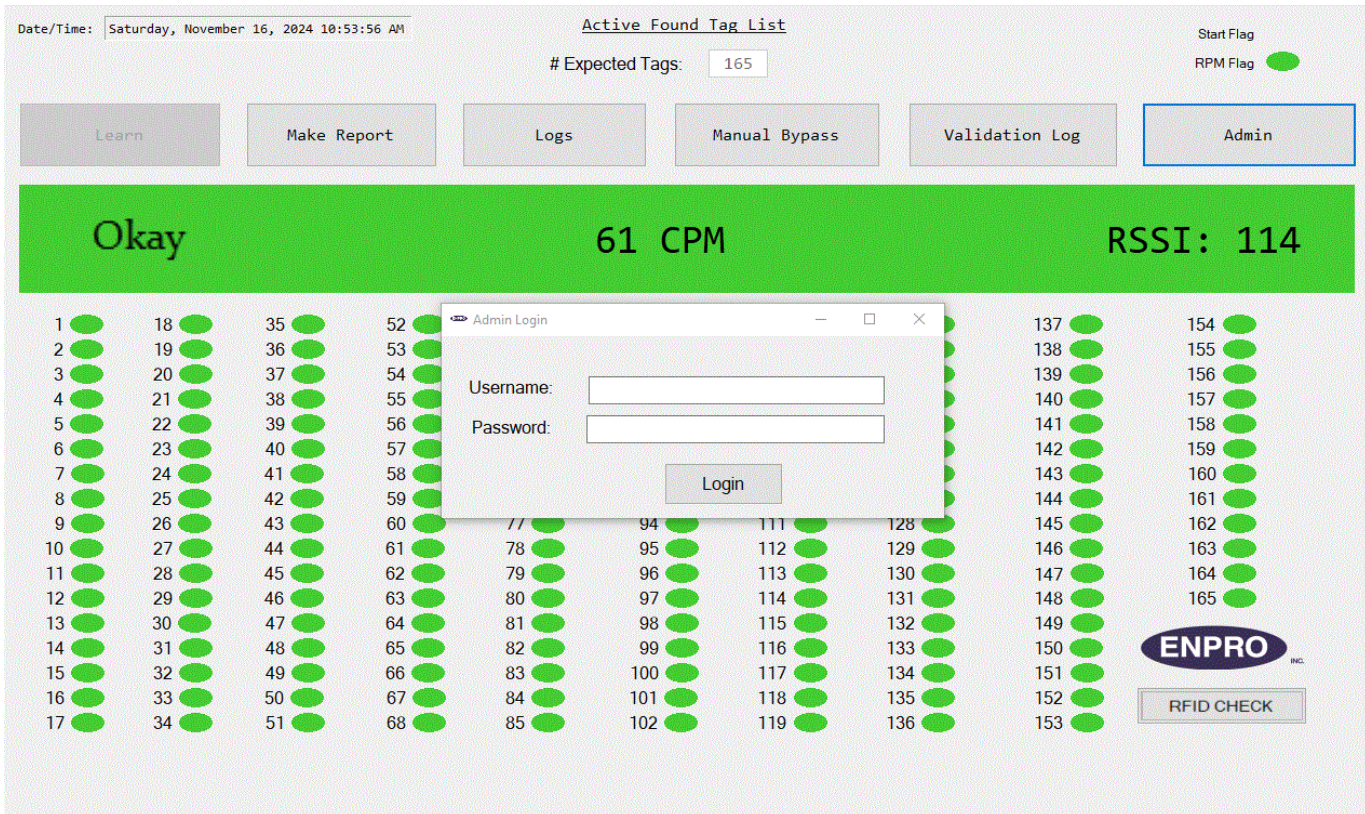
PURPLE

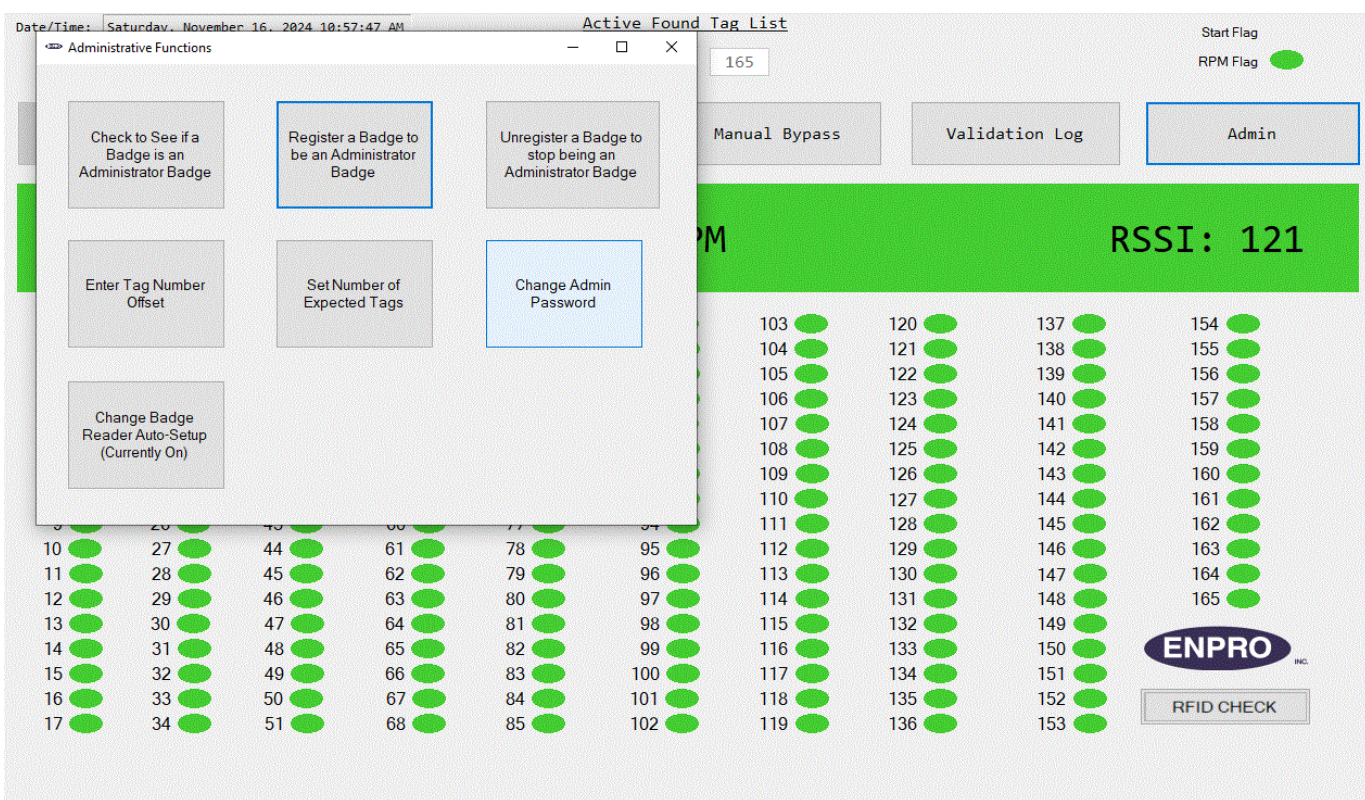
Manual Byass
(System in bypass mode)

OFF

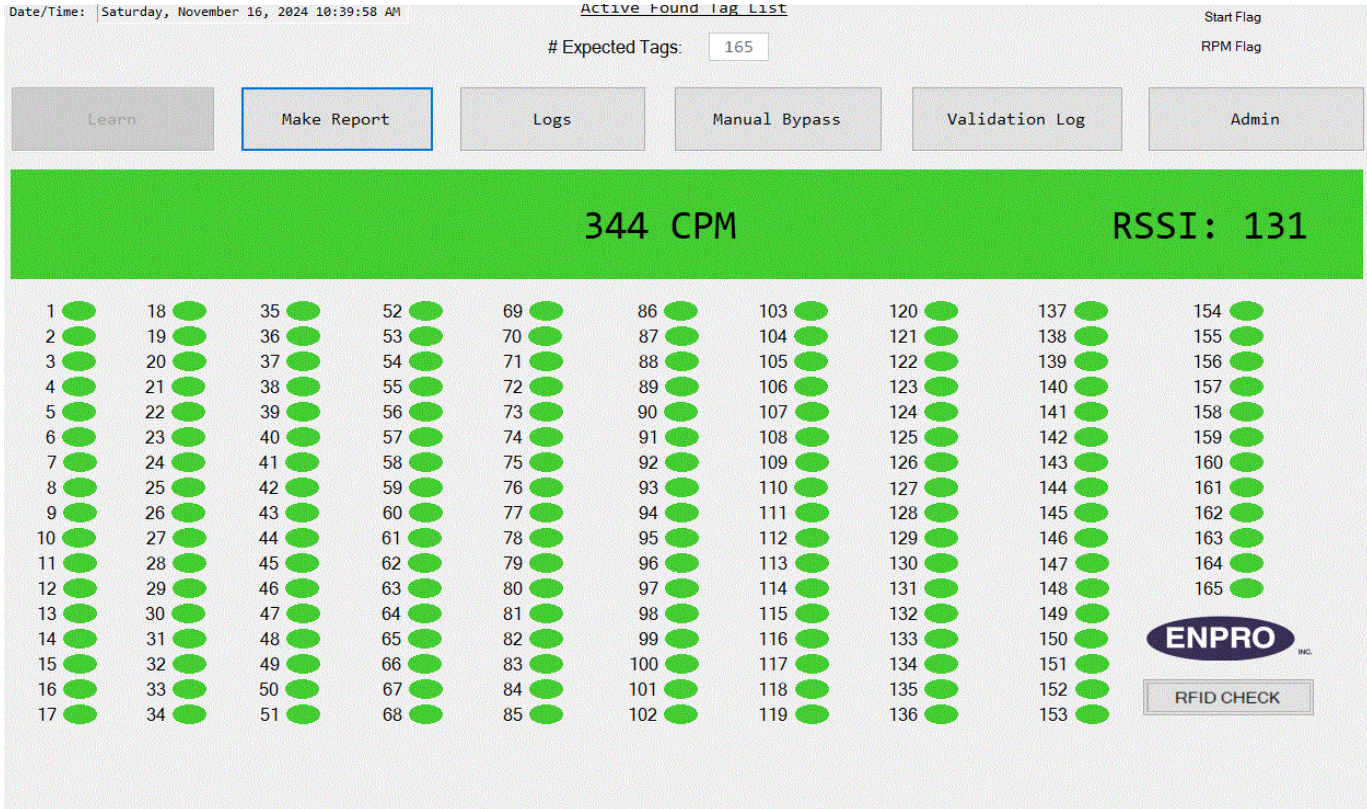
No Screen Power
(Detection Disabled)

ADMIN SCREEN





RUN SCREEN


Date/Time: Saturday, November 16, 2024 10:39:58 AM
Active Found Tag List
Expected Tags: 165
Start Flag
RPM Flag
Learn
Make Report
Logs
Manual Bypass
Validation Log
Admin
344 CPM
RSSI: 131
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51
52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85
86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102
103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136
137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153
154 155 156 157 158 159 160 161 162 163 164 165
ENPRO
RFID CHECK

RUNNING PROCESSES

VENT TUBE LOSS - SYSTEM ERROR (RED STATUS BAR)

To address a **Vent Tube Loss** in the system, follow these steps:

Step 1

In the event of a lost, broken, or malfunctioning vent tube or pill, the status bar will turn RED and indicate the Filler Vent Tube Reader is in “Error” mode. This is determined by two consecutive miss-reads of traceable vent tubes or pills.

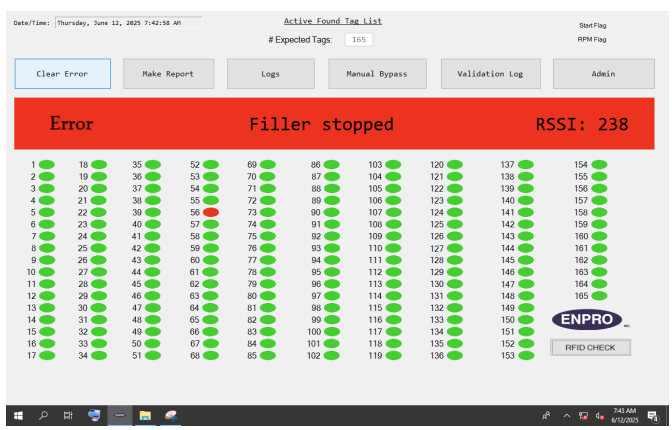
When an “Error” occurs, the filler will receive a fault signal and stop.

Step 2

Determine why “Error” occurred. Check the screen to identify which traceableVent Tube or Pill is missing or malfunctioned.

Step 3

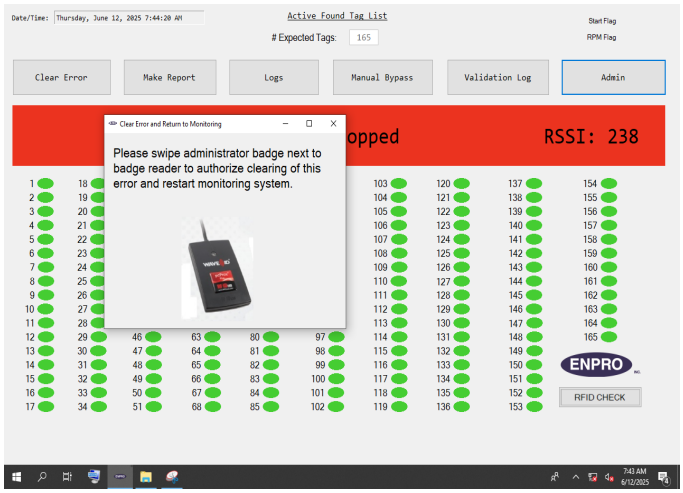
After resolving the error by replacing the missing or faulty vent tube or pill; click the CLEAR ERROR icon on the screen.



VENT TUBE LOSS - SYSTEM ERROR (RED STATUS BAR)

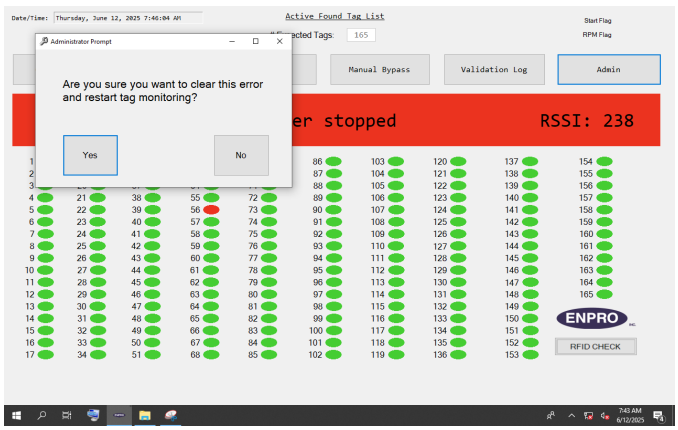
Step 4

To clear “Error” you will be prompted to scan your Authorized ADMIN ID badge. Follow promts on the Touch Screen to clear the Error.



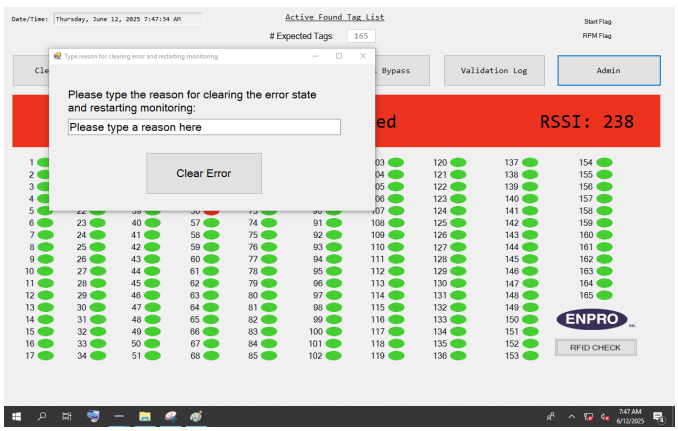
Step 5

Swipe badge on ID badge reader.



Step 6

Follow prompts on the Touch Screen to clear “Error” condition.

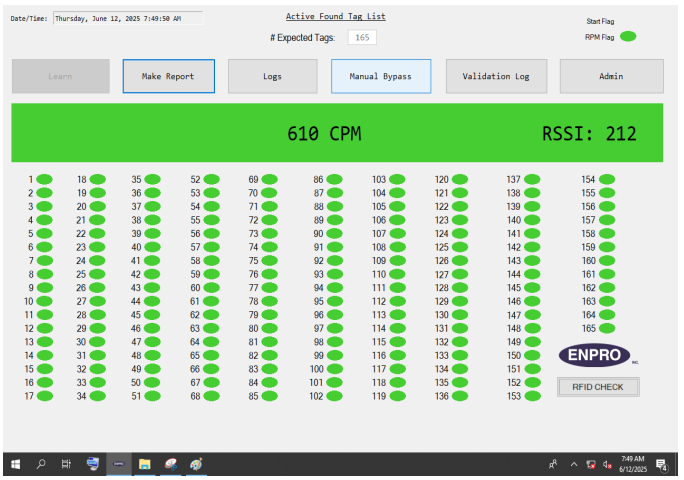


MANUAL BYPASS

To initiate a **Manual Bypass of the System**, follow these steps:

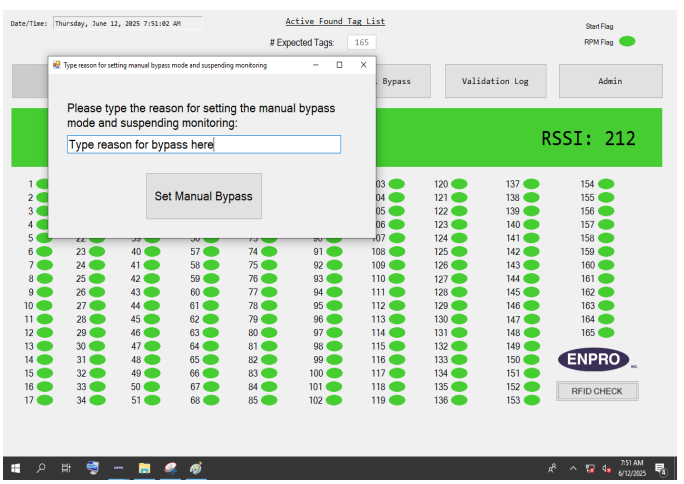
Step 1

Select the MANUAL BYPASS button on the screen.



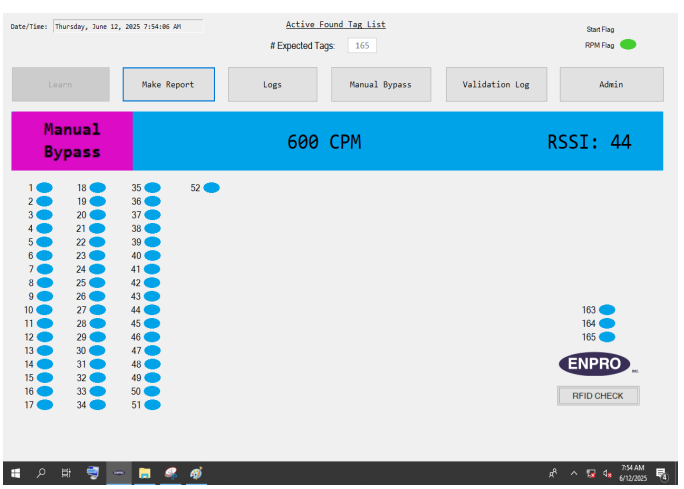
Step 2

Scan your Authorized ADMIN ID badge,
type the reason for placing the system into bypass.
Select Set Manual Bypass.



Step 3

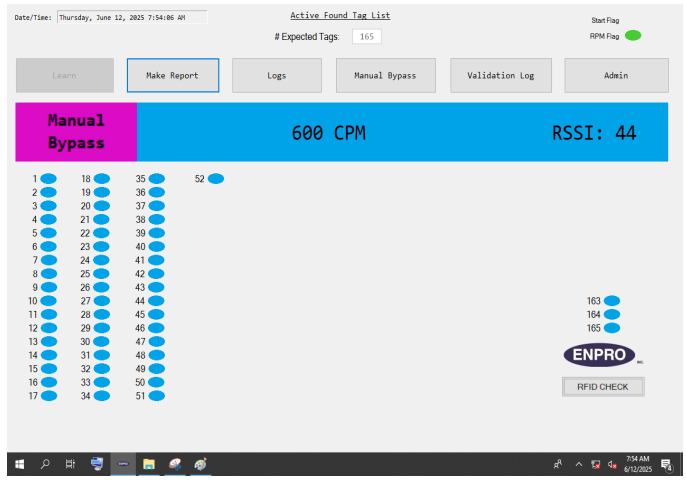
The status bar will be present with a purple indicator and the FVTR-TS will REMAIN in Manual Bypass mode.

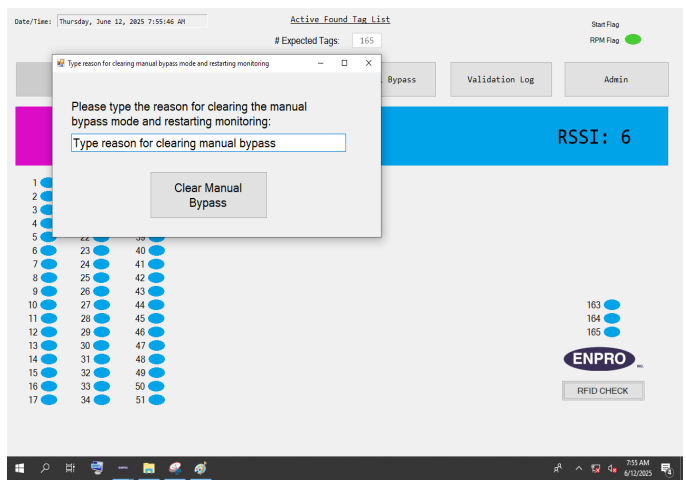


MANUAL BY-PASS

Step 4

To return to normal operation, select the CLEAR MANUAL BYPASS button again and follow the promts on the screen.





START UP / INITIALIZE (YELLOW STATUS BAR)

To **Start Up / Initialize the System**, follow these steps:

Step 1

Make sure ONLY and all Enpro/Dorcia Traceable Vent Tubes or Traceable Pills are securely installed (and flat/color side down) .

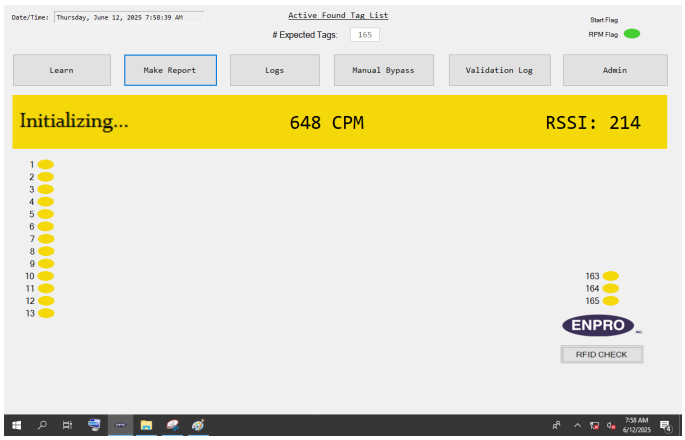
NOTE: If new traceable vent tube or pill is added see "Adding a New Vent Tube or Pill" Instructions

Step 2

Check that the FVTR is NOT in Clean-In-Place mode and all CIP caps are removed.
(BLUE status bar is NOT present).

Step 3

On the touch screen, enter the number of expected tags in the given field.



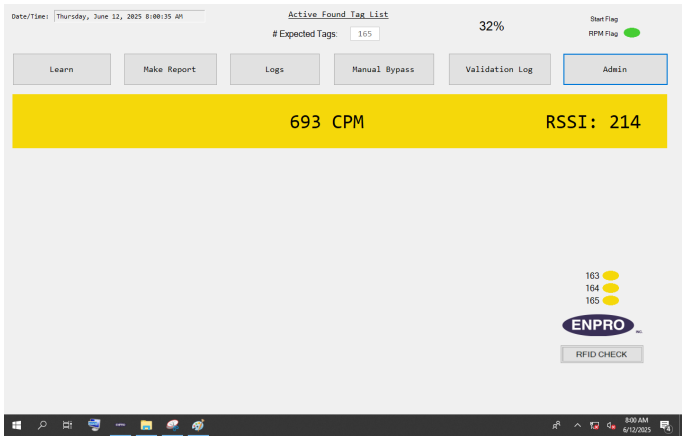
Step 4

Click "LEARN." System will require you to badge in (follow prompts on computer).

START UP / INITIALIZE (YELLOW STATUS BAR)

Step 5

YELLOW status bar is present and filler can begin running, signaling that FVTR-TS is in initialization mode.



Step 6

Allow the filler to rotate several revolutions to complete initializing “learning” sequence (Status bar and beacon will turn from YELLOW to GREEN).

NOTE: Step 4 above, “LEARN,” needs to be done every time the vent tubes or pills are removed or replaced.

Step 7

Once initialization is finished, the GREEN status bar should be present indicating FVTR-TS system is OK.

Note: At this point you should see an average RSSI reading of at least 70 on the screen.

Once the ALL CLEAR, GREEN status bar is illuminated, the system is running properly.

ADDING A NEW TRACEABLE VENT TUBE OR PILL

To **Add a New Traceable Vent Tube or Pill**, follow these steps:

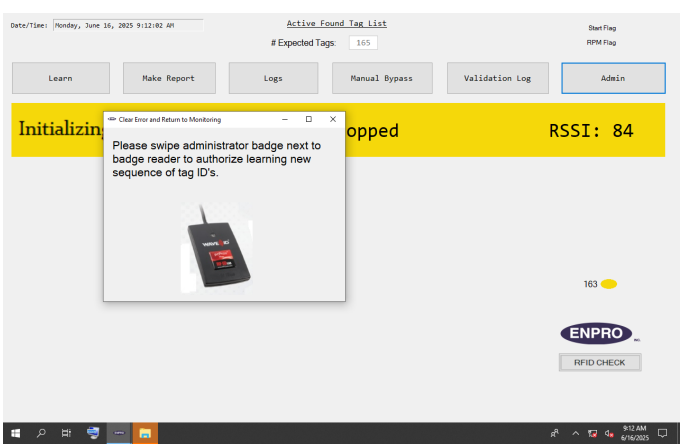
Step 1
First bring the filler to a complete stop, and install new traceable vent tube or pill (flat/color side down).

Step 2
On Filler Vent Tube Reader Touch Screen, the system must now re-learn the new vent tube or pill sequence. With the new vent tube or pill installed, flat/color side facing down.

Step 3
Click the “LEARN” button after new traceable vent tube is replaced

Step 4
Make sure Filler Vent Tube Reader is NOT in Clean in Place mode (no blue status bar present on screen) and all CIP caps are removed.

Step 5
When filler is running the yellow status bar is present, signaling that the Filler Vent Tube Reader is in initialization mode.



Step 6
Allow the filler to rotate several revolutions below 800 rpm to complete initialization sequence. Every time the filler stops the yellow status bar will be present to signal reinitialization.

Step 7
Once initialization is finished GREEN status bar should be present indicating the Filler Vent Tube Reader system is OK.

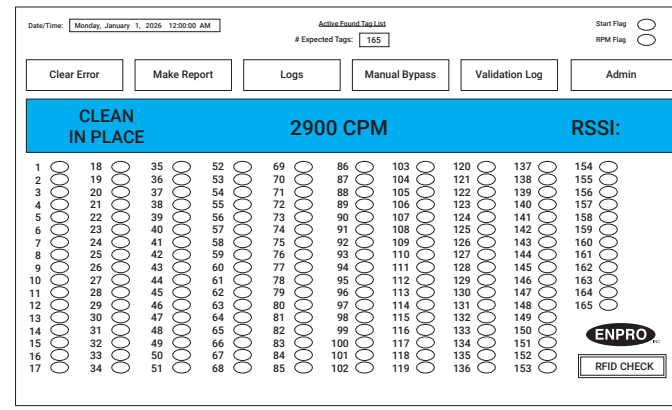
INSTALLING CIP CAPS

NOTE: The Stystem nust be in Clean-In-Place Mode (blue COLOR BAR) before installing CIP Caps.

Once CIP Caps are removed, make sure that system is not in CIP mode before Initializing.

Operating Results:

RSSI reading of at least 70 should be read on the Touch Screen or adjust antenna position.



VALVE COOL DOWN PROCEDURE – POST HOT CIP CYCLE

The purpose of this procedure is to ensure proper system function and longevity of RFID chips by cooling down the filler valves after a hot CIP (Clean-In-Place) cycle before resuming normal operations.

To initiate a **Valve Cool Down Procedure after a Hot CIP Cycle**, follow these steps:

Step 1

Confirm Completion of Hot CIP Cycle:
- Ensure the CIP cycle has fully completed before initiating the cool-down process.

Step 2

Select Cooling Water Source:
- Preferred Option: Use chilled water for optimal and faster cooling.
- Alternative Option: Use plant water if chilled water is unavailable.

Step 3

Initiate Cool Down Process:
- Run chilled water or plant water through the filler for 15-20 minutes, or until the valves are completely cool to the touch.
- Ensure water flows through all valve components evenly for uniform cooling.

Step 4

Monitor Valve Temperature:
- Use a temperature sensor or manual touch check to verify cooling progress.
- Do not proceed with production until all valves have returned to ambient temperature.

Step 5

Check System Readiness:
- Inspect valves and surrounding components for condensation buildup and ensure no thermal expansion stress remains.

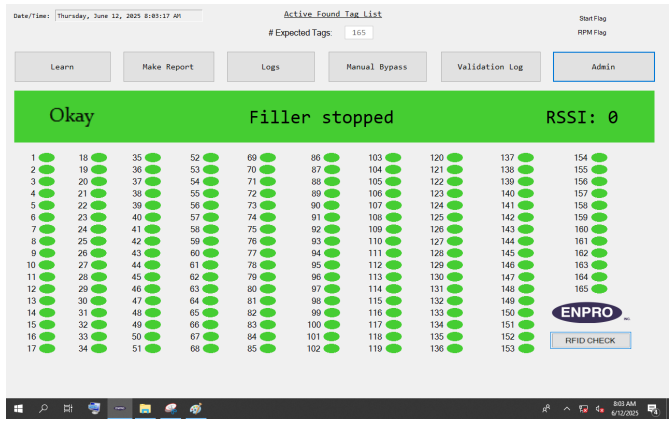
Step 6

Resume Normal Operations:
- Once valves are fully cooled, transition the system back to standard operation and begin production.

WARNING: Skipping this cool-down step may lead to RFID malfunctions, electronic chip stress, and inconsistent performance due to residual heat from the hot CIP cycle. Always ensure a proper cool-down period before resuming production.

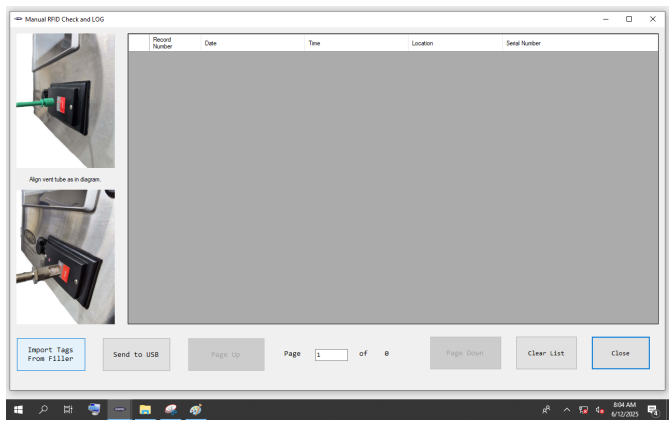
RFID CHECK

To initiate an **RFID Check**, follow these steps:



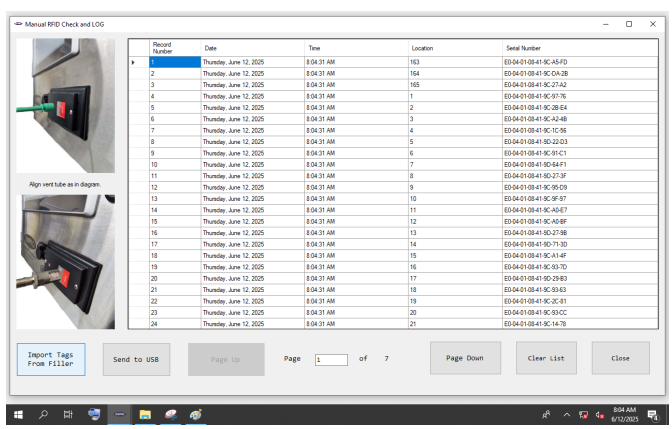
Step 1

Click “RFID Check” Button in lower right hand corner of the main screen, this will open the Manual RFID Check screen.



Step 2

Click “import tags from filler” in lower left hand corner of this screen, this will import all the RFID data from any tags that are in the filler and currently being sensed by the FVTR System. This list will then show each record number, valve location, last time stamp and serial number.



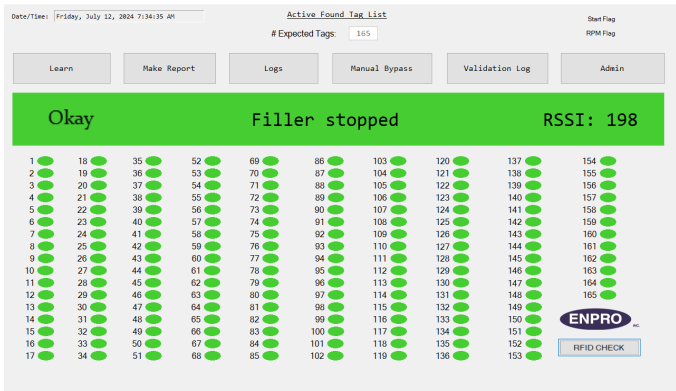
Step 3

Page down to the final page and from here you can then manually scan any additional tags from inventory via the badge scanner. Place each additional tag in front of the scanner as shown and these will show up in the list as “Manual Scan” for location. This will help the site have an accurate inventory of all tags.

SET TAG NUMBER OFFSET

To **Set the Tage Number Offset**, follow these steps:

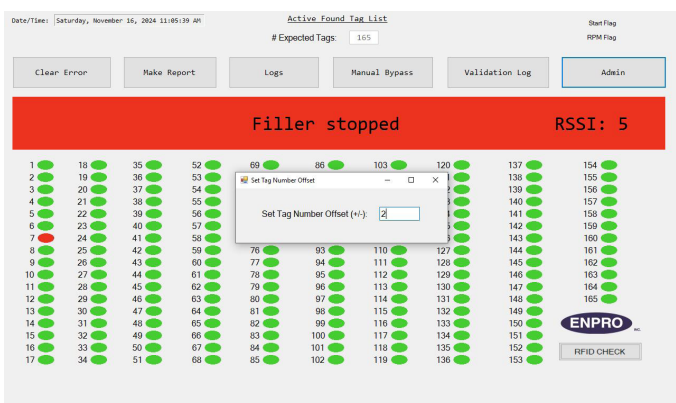
Step 1
Enter admin screen by pressing the admin button.



Step 2
Scan badge and select set off set button.

Step 3
Adjust the offset either by “–1” or “1”

You will see the red indicator on screen move positions. Keep adjusting this number until the red indication is in the proper known position.



ADMINISTRATION

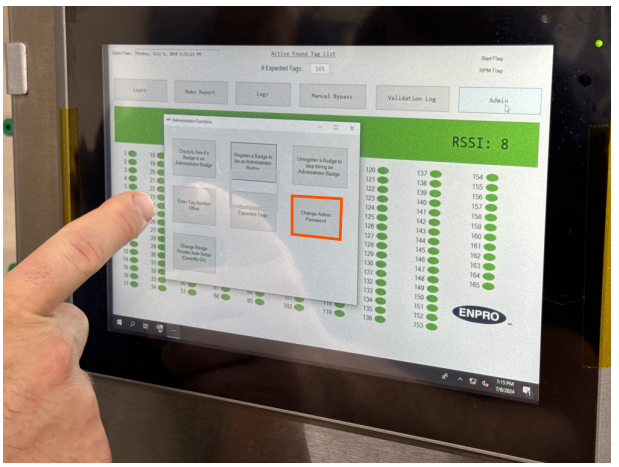
CHANGE AN ADMINISTRATOR PASSWORD

To **Change an Administrator Password**, follow these steps:

The Administrator password can be changed from the admin screen.

The system default is:
Username = **admin**
Password = **EnproInc**

Note: If changed and forgotten, Contact Enpro service.

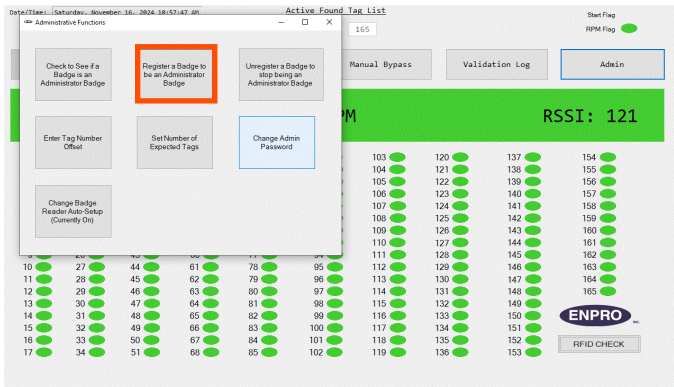


ADDING A SUPERVISOR OR ADMINISTRATOR BADGE

To **Add a Supervisor or Administrator Badge**, follow these steps:

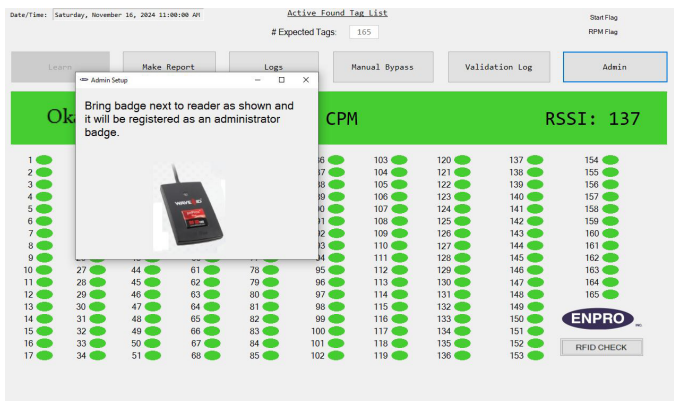
Step 1

Enter the Admin screen by pressing the Admin button and scanning badge.



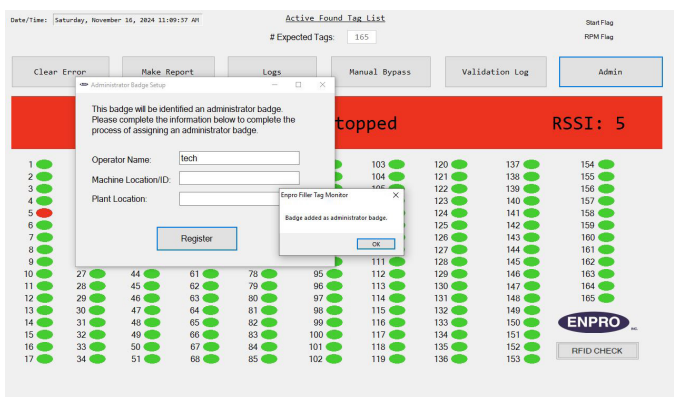
Step 2

Click Register New Badge button, swipe new badge to be added.



Step 3

Enter employee name.
Machine ID and plant should automatically populate after the first badge is completed.



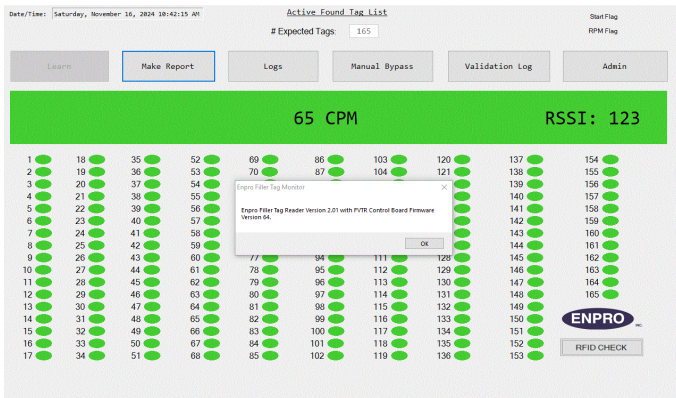
SOFTWARE AND FIRMWARE CHECK

To initiate **software or firmware updates**, follow these steps:

Step 1

Click the Enpro logo on the lower right hand corner. This will display a screen that shows the current firmware and software versions.

Note: this information to share with the Enpro service team.

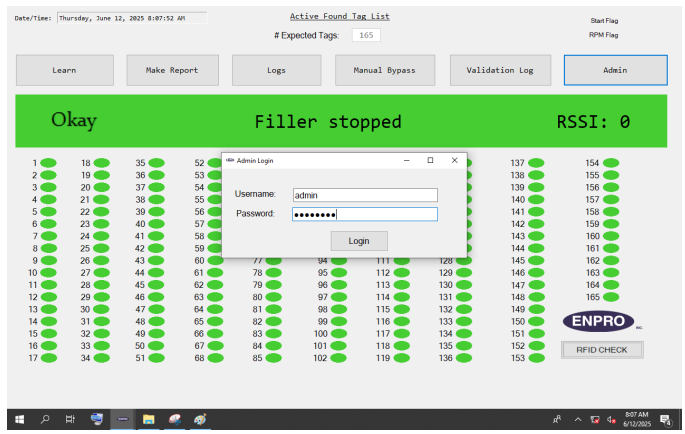


SETUP OF EXPECTED NUMBER OF TAGS

To **set an expected number of tags**, follow these steps:

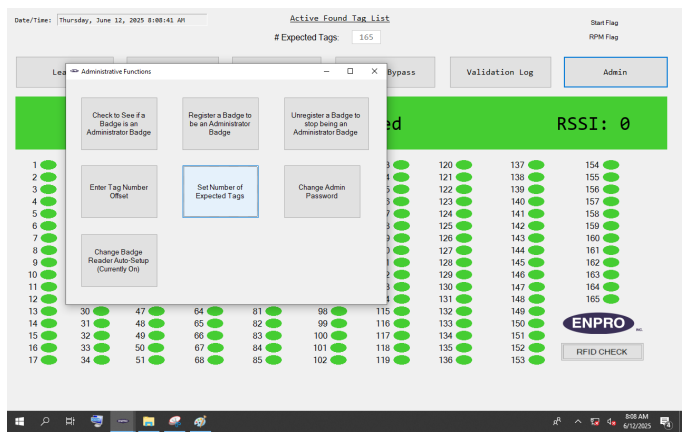
Step 1

Enter admin screen by pressing Admin button.
Scan badge.



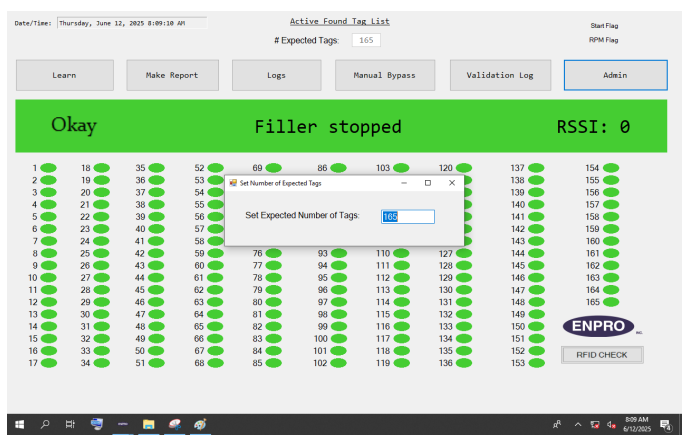
Step 2

Click set number of expected tags button



Step 3

Enter total number of valves on the machine.



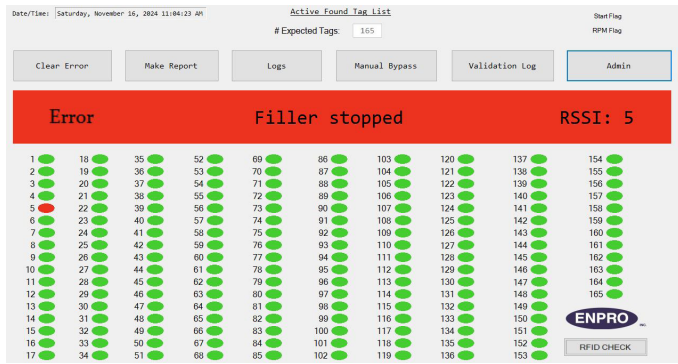
ERRORS & TROUBLESHOOTING

CLEAR ERROR

To **Clear an Error**, follow these steps:

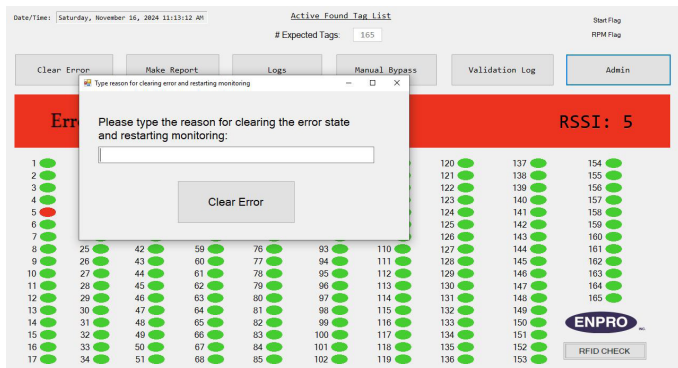
Step 1

Click Clear Error button.
Scan badge.



Step 2

Type the reason for clearing the error.
Click the Clear Error button.

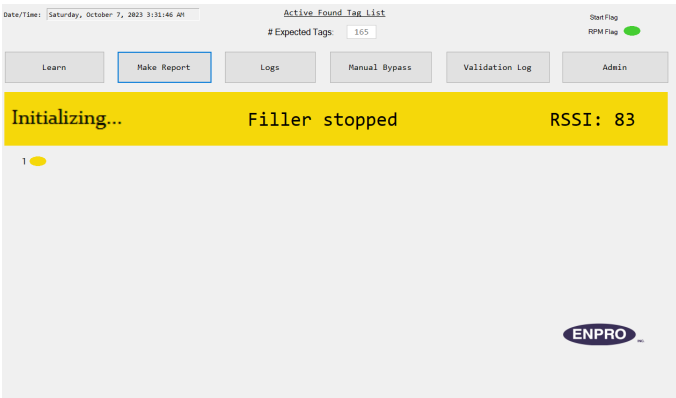


FILLER STOPPED

To reinitialize the system after a **Filler has Stopped**, follow these steps:

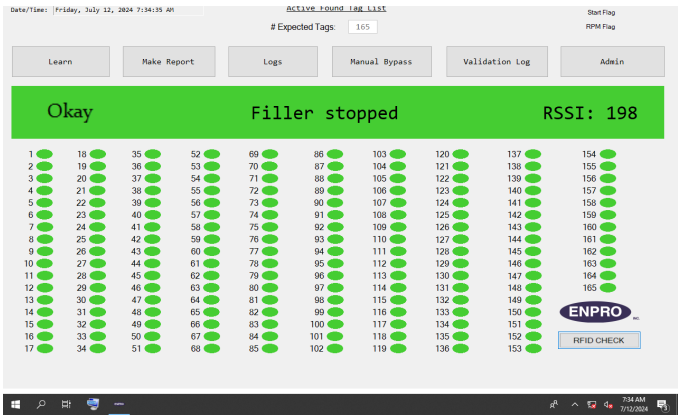
Step 1

Restart the filler from the Filler HMI.
This screen a notification that the system is waiting for the filler to begin operations.
No action needed on the Enpro System.



Step 2

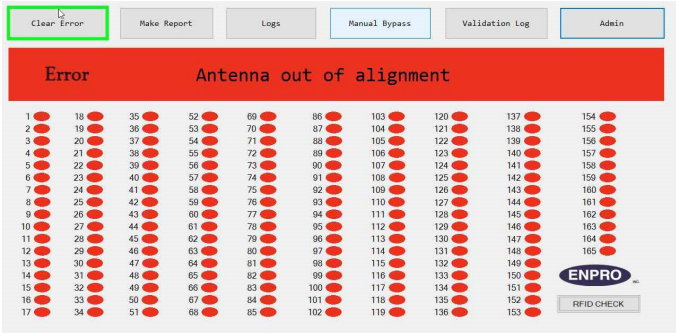
The system has completed a full initialize cycle and the filler has stopped.
Nothing is wrong with the Enpro system, it is waiting for the filler to resume operations.
No action needed on the Enpro System.



ANTENNA ALIGNMENT ERROR

To address an **Antenna Alignment Error**, follow these steps:

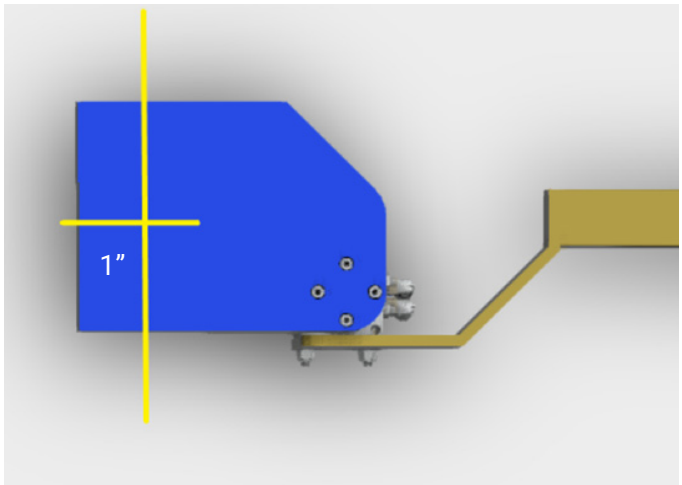
If the antenna is out of allignment you will receive a red screen error.

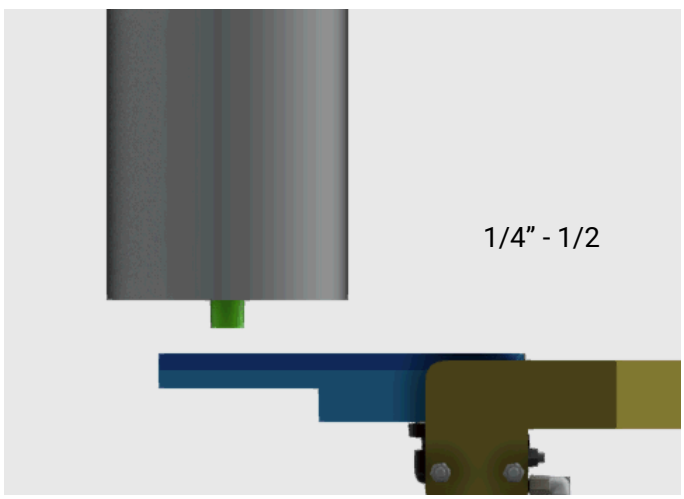


Step 1

Ensure that the antenna is properly aligned. Check rotating cylinder and ensure this has been replaced in the last 12 months with an Enpro Approved custom all-stainless cylinder.

Check Air Pressure and pneumatic tubing and connections.

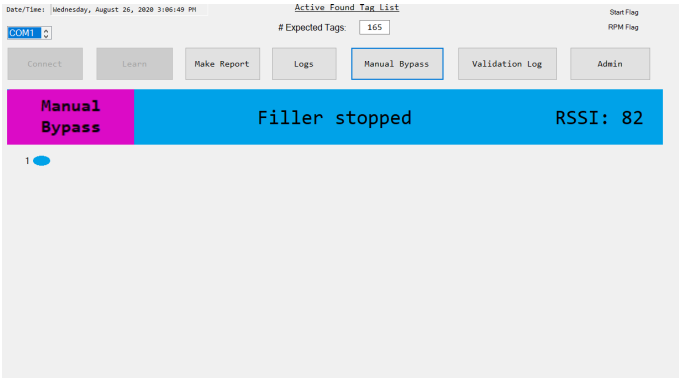




ANTENNA NOT ROTATING

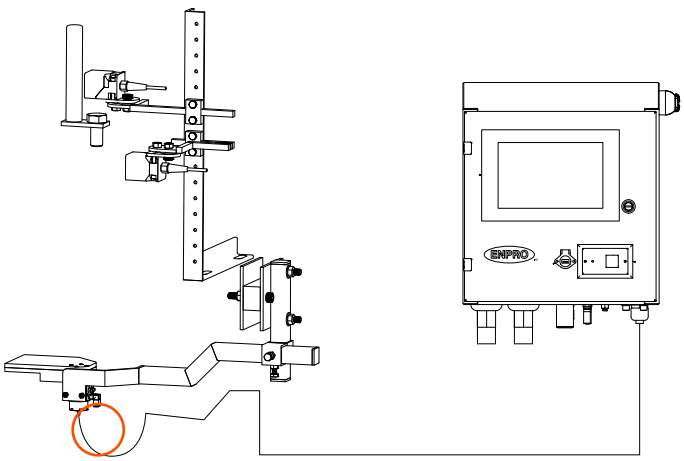
Step 1

Use manual bypass and monitor antenna for proper movement



Step 2

Check air pressure and pneumatic supply lines and connections



Step 3

If air pressure is properly applied at 80-100 PSI and no other visible damage to the pneumatic supply lines, the rotating cylinder may need to be replaced.

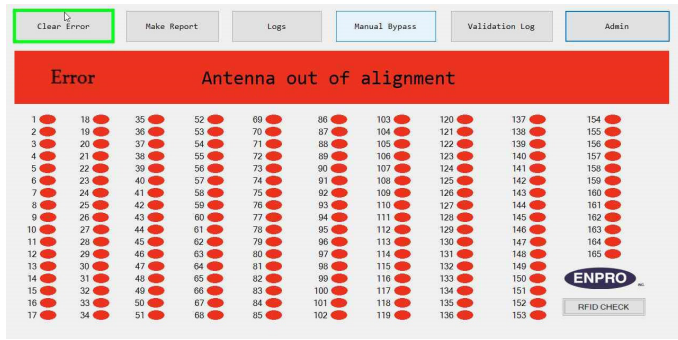
Contact Enpro Service for assistance and/or a quote for parts.

CLEAR ANTENNA OUT OF ALIGNMENT ERROR

Step 1

Check the antenna to make sure the antenna is in proper alignment, rotating freely and has the proper air pressure and all cable and pneumatic lines are in good working order and proper pressure and condition.

Then click Clear Error.

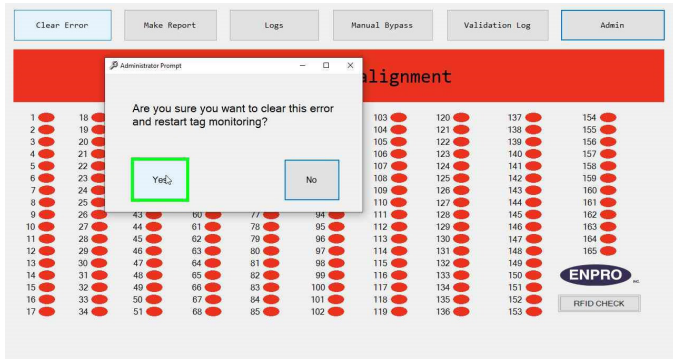


Step 2

Follow the prompts on screen, type the reason for the error (pneumatic line was damaged, etc.) and click clear error button.

Step 3

Confirm you want to clear the error and this will then allow the filler to be restart.

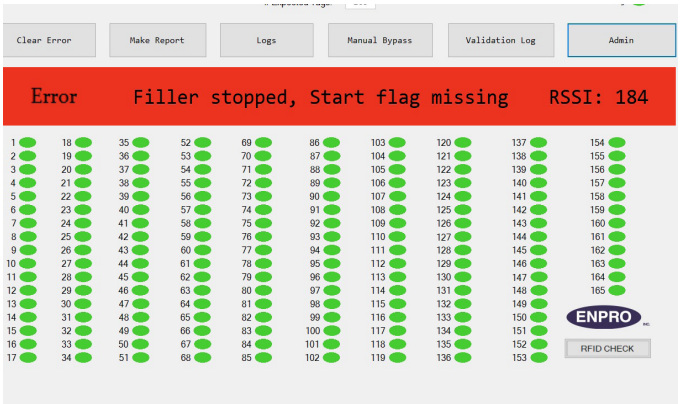


HOME (START) FLAG MISSING

To address a **Start (Home) Flag Missing Error**, follow these steps:

Step 1

Check home flag sensor for proper alignment. Often the sensor has been moved, rotated out-of-position, or damaged.

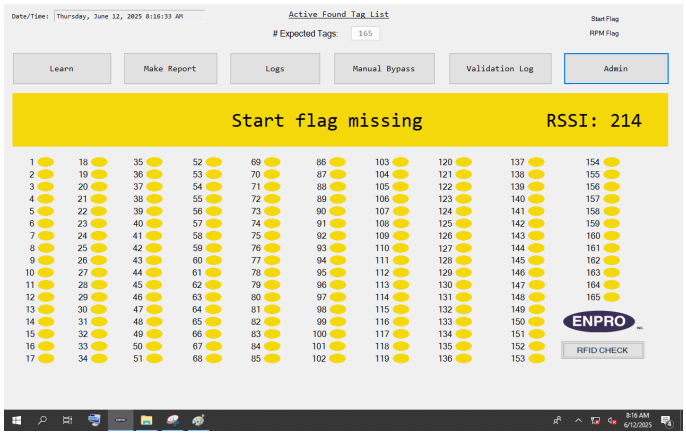


HOME (START) SENSOR ERROR

To address a **Home (start) Sensor Error**, follow these steps:

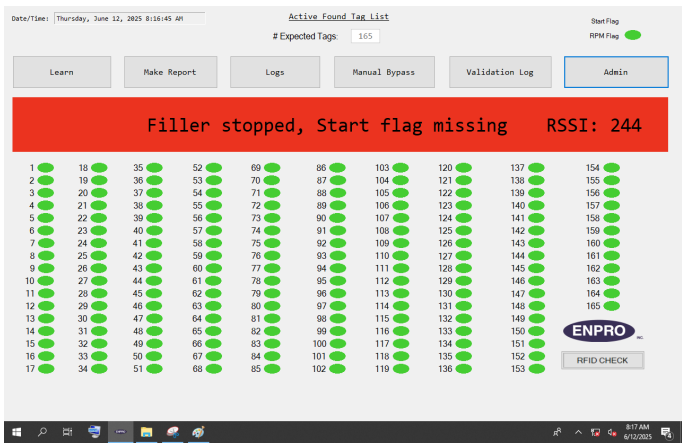
Step 1

Make sure the sensor has not been damaged during a crash.



Step 2

Replace sensor if damaged.



Step 3

If sensor is not damaged, try rotating it back into position to ensure alingnment.

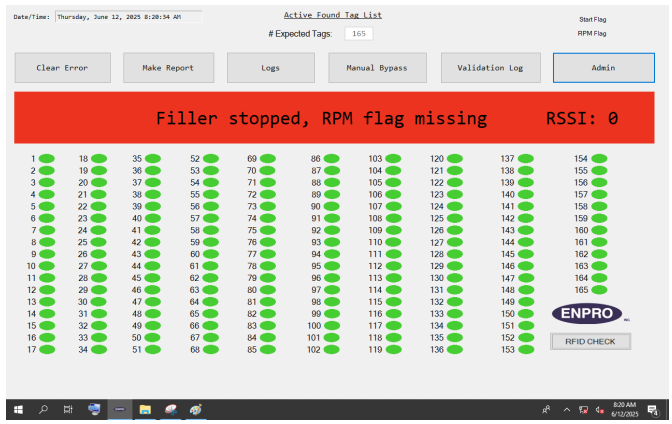
Proper sensor alingnment.

RPM (BUTTERFLY) FLAG MISSING

To address a **RPM (Butterfly) Flag Missing Error**, follow these steps:

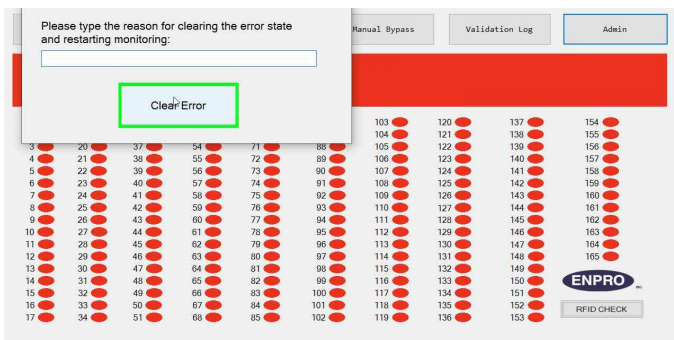
Step 1

Check the RPM Sensor to make sure the sensor is in proper alignment and proper 10mm gap between sensor face and butterfly hex head, detent is locked in place and all cable lines are in good working order. If sensor or cable is damaged, replace with known good spares.



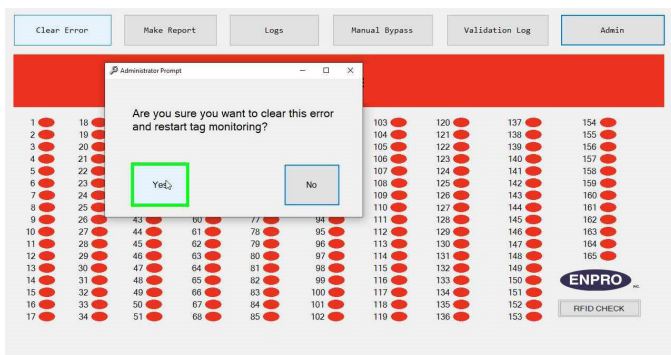
Step 2

Then click **Clear Error**. Follow the prompts on screen, type the reason for the error (sensor replaced, sensor was damaged, etc.) and click clear error button.



Step 3

Confirm you want to clear the error and this will then allow the filler to restart.



RPM (BUTTERFLY) SENSOR ERROR

To address a **RPM (Butterfly) Sensor Missing Error**, follow these steps:

Step 1
Make sure the sensor has not been damaged during a crash.

Step 2
Replace sensor if damaged.

Step 3
If sensor is not damaged, try rotating it back into position to ensure alingnment.

Proper sensor alingnment.

PROCEDURE FOR INSTALLING A NEW SENSOR BRACKET

Step 1
Rotate filler to bring home flag close to home flag sensor.

Step 2
With antenna extended in reading position (center the valve manually with hand wheel)

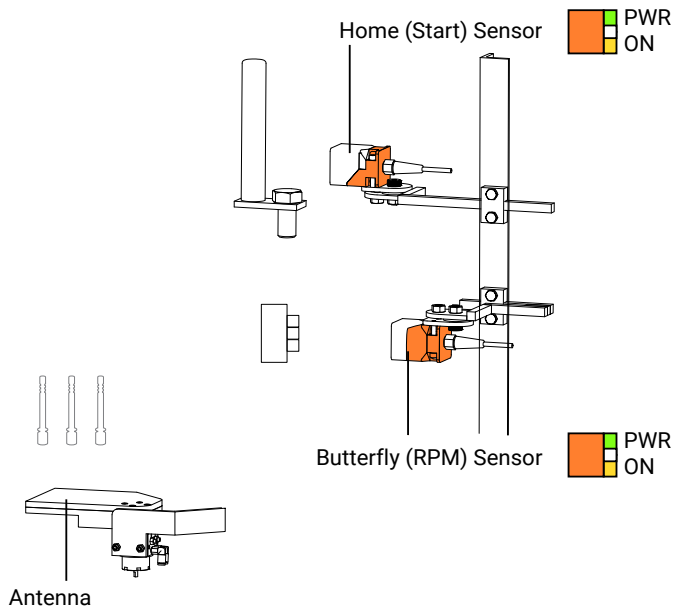
Step 3
Remove old sensor bracket and put sensors on new bracket

Step 4
Mount new bracket so sensors are inline with home flag and bolt on butterfly valve

Step 5
Set gap of sensor to about 10 mm for both

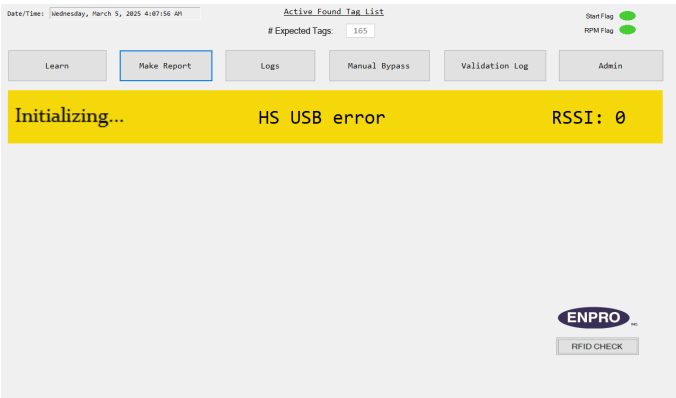
Step 6
Verify ONLY the home flag triggers the sensor be careful of the guage on the bowl that it does not trip the top sensor

Step 7
Re-learn the system and validate the location by removing a ball cage and noting the valve location. If the indication is off by 1 valve, then adjust the offset in the admin settings.



HS USB ERROR

To address a **HS USB Error**, folow these steps:

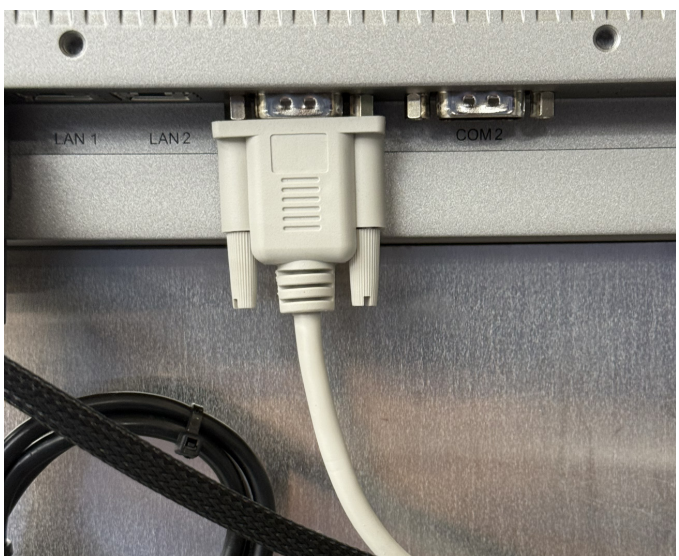


Step 1

Check the connection on the RS485 connection with power off.

Connection 1:
D-sub connection to the PC

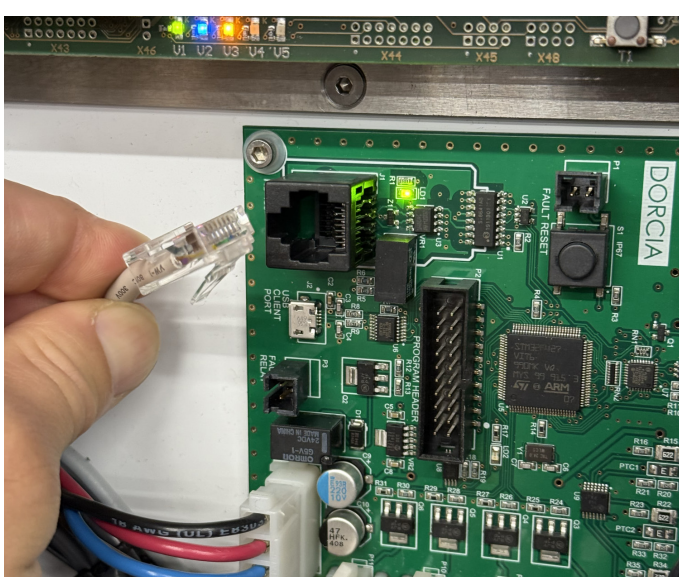
Connection 2:
Ethernet connection to the center PCB board



Connection 1

Step 2

Please inspect the end of the ethernet plug for corrosion or a short between pins.

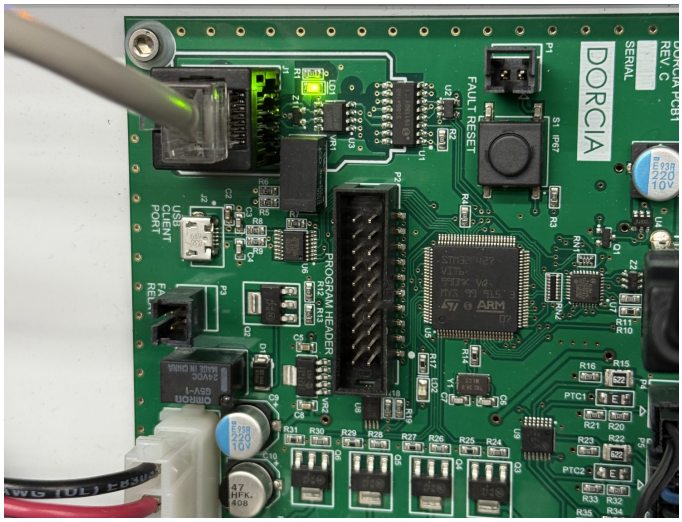


Connection 2

HS USB ERROR

Step 3

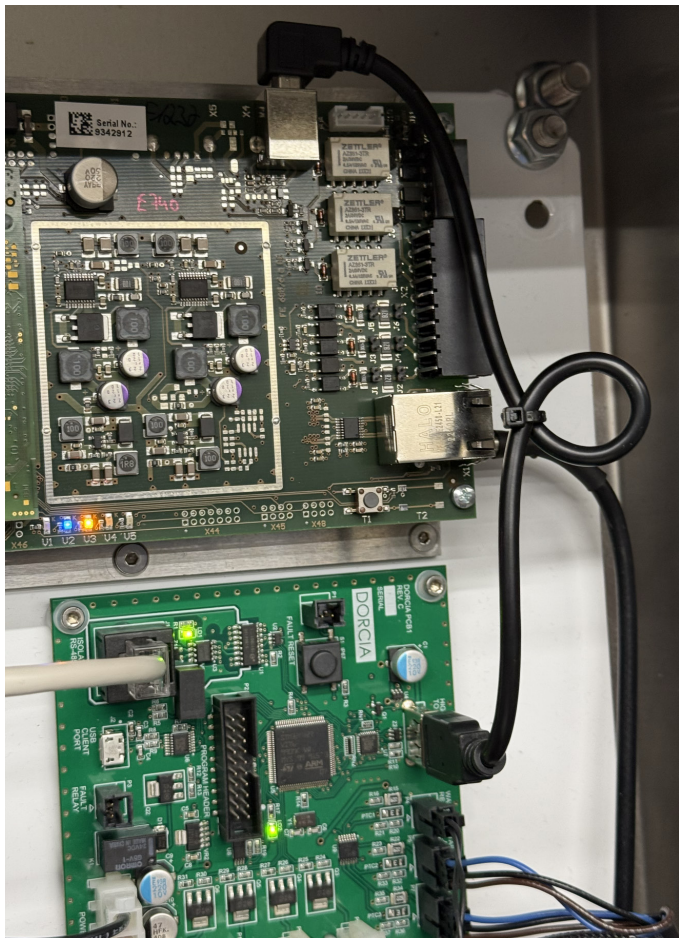
After inspection, plug ethernet cable back in



Step 4

Check the black USB cable going from the top of the board to the middle of the board to make sure it is fully seated

Reset power and determine if this has cleared the alarm.



LOW AIR PRESSURE ERROR

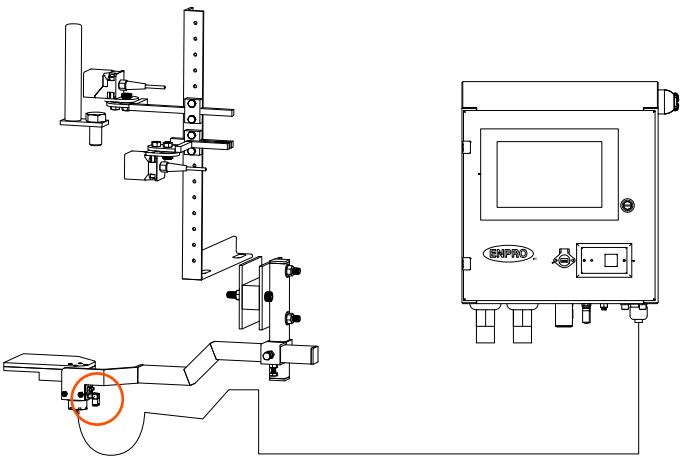
To address an **Low Air Pressure Error**, folow these steps:

Step 1

Check air supply to the system is between **80-100 PSI**.

Step 2

Check air supply tubing lines and connections.

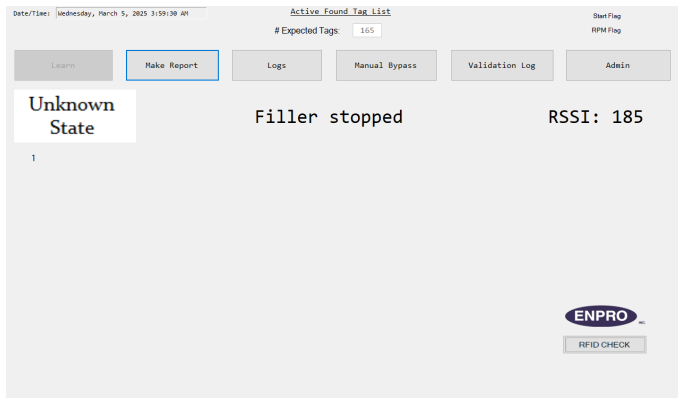


UNKNOWN STATE ERROR

To address an **Unknown State Error**, folow these steps:

Step 1
Ensure all cables are connected.

Step 2
Check RS485 Cable from Com 1 to Ethernet connection on Dorcia Board or CIOS Setting for Com 1 (485).



TEMPERATURE ISSUES

Thermal Shock
Our vent tubes contain an integrated RFID chip, which is an electronic component and therefore sensitive to thermal shock—especially when transitioning between high temperatures such as 190°F and low temperatures like 38°F. To protect the integrity and functionality of the RFID chip, it's important that your team aims to minimize this thermal stress.

We recommend allowing the vent tubes to gradually approach the operating zone for electronic components—ideally by stabilizing them at an intermediate temperature before lowering to the target 38°F. A gentler transition will help avoid damage or reduced performance caused by abrupt temperature changes.

Other temperature related troubleshooting
Your machine may monitoring bowl temperatures and the temperature at the valve is different. Please note the vent tube sits inside the valve and to keep that valve-to-bowl temperature differential in mind when adjusting the cool-down of the system.

AGE OF SYSTEM COMPONENTS

VENT TUBES AND BALL CAGES

Vent tubes and ball cages older than 12 months can affect performance, especially if they've undergone repeated thermal cycling.

Contact Enpro for new Vent Tubes and Ball Cages.

ROTATING CYLINDER

Rotating Cylinders older than 12 months can affect performance.

Contact Enpro for new Rotating Cylinders.

ADDITIONAL SUPPORT & PRODUCTS

FACILITY BADGE TYPE CHANGE

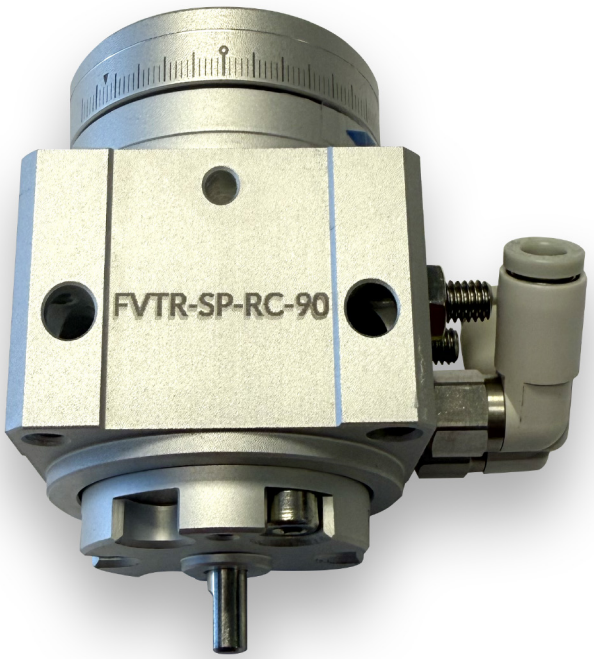
If new badges are started for the facility and these do not work with the system, we can reprogram the badge reader to read these new badge types

Contact Enpro for more information.

ROTATING CYLINDER (FROM ENPRO APPROVED SOURCE ONLY)

Empasis that our cylinder is not available on traditional websites. This is a custom all-stainless assembly and must be purchased through Enpro-approved sources only.

Contact Enpro for more information.



FVTDS 90 degree rotating cylinder

PREVENTATIVE MAINTENANCE (PM) SCHEDULE

Annual Maintenance Overview

To ensure optimal operation and reliability of the FVTR system, a full preventative maintenance routine should be conducted once per year, aligned with the Filler Manufacturer's recommendations and Enpro's service standards.

Key PM Activities

Elastomer Replacement: Replace all elastomeric components including:

- Vent tubes
- O-rings
- Pills (if applicable)

These replacements should follow the Filler OEM's PM schedule, typically recommended annually.

Mechanical and Sensor Checkpoints:

- Replace the rotating cylinder of the antenna assembly.
- Verify operational integrity of sensors (especially the RPM/Home flag sensor).

System Recalibration & Testing:

- Recalibrate the antenna system and validate read accuracy.
- Run diagnostic routines on RFID tracking and response logic.

Inspection for Wear:

- Inspect filler tips and ball cages for wear or deformation.
- Replace components even if slightly degraded to avoid future downtime.

RECOMMENDED SPARE PARTS INVENTORY

Maintaining on-site inventory ensures minimal downtime in case of unexpected failures or urgent maintenance needs. Below are the recommended quantities and types:

Annual PM Parts List (Replace Every Year)

- Full set of Vent Tubes
- Full set of Ball Cages
- Full set of Filler Tips
- One Rotating Cylinder (part of antenna assembly)

Critical Spare Parts to Keep on Hand

- Spare Antenna Assembly (for immediate replacement if primary unit fails)
- Spare RPM/Home Flag Sensor
- 10 Additional RFID Vent Tubes or Ball Cages (to cover emergency replacements or fall-out from CIP cycle heat stress issues)

ENPRO SERVICE INVOLVEMENT

Enpro strongly recommends scheduling an Annual Service Visit by the Enpro Technical Service Team to:

- Perform all PM tasks listed above.
- Update firmware or software as needed.
- Conduct operator training or refresher sessions.

Additionally, Enpro can assist with pill & o-ring replacements for ball cage assemblies, providing a swap-out service.

Summary

A disciplined PM and spares strategy reduces risk of line interruptions and ensures the FVTR system continues to meet quality and throughput targets. Following both the Filler Manufacturer's guidelines for elastomer components and Enpro's enhancements will maintain the system's efficiency and reliability year-round.

COMMON PARTS DIRECTORY

PART NUMBER	DESCRIPTION
FVTR-P-100-RH-1	Custom Antenna Assembly, 100 Valve Filler, Right Hand, Standard, Discharge Rail Mount
FVTR-P-120-RH-1	Custom Antenna Assembly, 120 Valve Filler, Right Hand, Standard, Discharge Rail Mount
FVTR-P-130-RH-STD-1	Custom Antenna Assembly, 130 Valve Filler, Right Hand, Standard, Discharge Rail Mount
FVTR-P-165-RH-2	Custom Antenna Assembly, 165 Valve Filler, Right Hand, Standard, Ring Mount
FVTR-P-72-LH-1	Custom Antenna Assembly, 72 Valve Filler, Left Hand, Standard, Discharge Rail Mount
FVTR-P-72-LH-STD-1	Custom Antenna Assembly, 72 Valve Filler, Left Hand, Standard, Discharge Rail Mount
FVTR-P-72-RH-4	Custom Antenna Assembly, 72 Valve Filler, Right Hand, Extended, Discharge Rail Mount
FVTR-P-BC-529-1	Traceable Ball Cage Assembly, V06.24 Pill, Standard Cage, BevCorp 529 Retaining Nut, Standard Orifice, Standard Stem
FVTR-P-BCA-2-1-1-529-1	Traceable Ball Cage Assembly, V06.24 Pill, Standard Cage, BevCorp 529 Retaining Nut, Standard Orifice, Standard Stem
FVTR-P-BCA-2-1-1-529-1-2	Traceable Ball Cage Assembly, V06.24 Pill, Standard Cage, BevCorp 529 Retaining Nut, Standard Orifice, -0.130” Short Stem
FVTR-P-PBCA-529-2	Traceable Ball Cage Assembly, V06.24 Pill, Standard Cage, BevCorp 529 Retaining Nut, 0.125” Orifice, Standard Stem
FVTR-P-PILL-V06.24	Traceable Pill V06.24
FVTR-REMOTEALARMBOX	FVTR System Remote Alarm Enclosure
FVTR-S-ANNSER	FVTR System Annual Service
FVTR-S-ENG	FVTR System Engineering & Design
FVTR-S-INST	FVTR System Installation & Commissioning
FVTR-SP-RC	FVTR Spare Part, Rotating Cylinder, 90°, Custom with Stainless Steel Hardware
FVTR-S-PROG	FVTR System PLC Programming
FVTR-SP-SA	FVTR Spare Part, Standard Right Hand Antenna Assembly with tuned cable

COMMON PARTS DIRECTORY CONTINUED

FVTR-SP-BCA-ORING	FVTR Spare Part, Ball Cage Assembly Replacement O-Ring
FVTR-S-REPAIR	FVTR System Repair, Onsite
FVTR-TS-120-TVT-4-US-1	Filler Vent Tube Reader System, Touch Screen, 120 Valve Filler, V06.2024, Standard Certification, without Tower Light and Integrated Alarm
FVTR-TS-72-TBC-4-US-2	Filler Vent Tube Reader System, Touch Screen, 72 Valve Filler, V06.2024, Standard Certification, with Tower Light and Integrated Alarm
TVT-A-360-HK-YEL-150	Traceable Vent Tube, 0.360” Head Length, Hytrel/Crastin, Yellow Standard Fork Gap
TVT-A-385-HK-GRN-150	Traceable Vent Tube, 0.385” Head Length, Hytrel/Crastin, Green Standard Fork Gap
TVT-A-385-HK-YEL-150	Traceable Vent Tube, 0.385” Head Length, Hytrel/Crastin, Yellow Standard Fork Gap
TVT-A-390-HK-NAT-150	Traceable Vent Tube, 0.390” Head Length, Hytrel/Crastin, Natural Standard Fork Gap
TVTR-NMSB-210-HK-GRN-150	Traceable Vent Tube, 0.210” Head Length, Hytrel/Crastin, Green Standard Fork Gap
TVTX-A-255-HK-GRN-150	Traceable Vent Tube, 0.255” Head Length, Hytrel/Crastin, Green, Standard Fork Gap
TVTX-A-260-HK-BLU-148-CS	Traceable Vent Tube, 0.260” Head Length, Hytrel/Crastin, Blue, Standard Fork Gap, Counter Sink
TVTX-A-270-HK-RED-148-CS	Traceable Vent Tube, 0.270” Head Length, Hytrel/Crastin, Blue, Standard Fork Gap, Counter Sink
TVTX-A-285-HK-GRN-150-CS	Traceable Vent Tube, 0.285” Head Length, Hytrel/Crastin, Blue, Standard Fork Gap, Counter Sink
TVTX-A-381-HK-NAT-150	Traceable Vent Tube, 0.381” Head Length, Hytrel/Crastin, Natural, Standard Fork Gap
TVTX-A-385-HK-ORG-150	Traceable Vent Tube, 0.385” Head Length, Hytrel/Crastin, Orange, Standard Fork Gap
TVTX-A-390-HK-NAT-150	Traceable Vent Tube, 0.390” Head Length, Hytrel/Crastin, Natural, Standard Fork Gap
TVTX-A-411-HK-GRN-150	Traceable Vent Tube, 0.411” Head Length, Hytrel/Crastin, Green, Standard Fork Gap
TVTX-A-445-HK-YEL-150	Traceable Vent Tube, 0.445” Head Length, Hytrel/Crastin, Yellow, Standard Fork Gap
VT-NMNRF-415-HK-RED-154	Vent Tube, Non Traceable, 0.415” Head Length, Hytrel/Crastin, Red, 0.154” Fork Gap

ENPRO SUPPORT

After reviewing this information, if you have any questions or concerns please Contact Enpro.

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Enpro, Inc.
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E-mail: Grant_Cook@enproinc.com

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Aurora, IL 60505
E-mail: inquiries@americhemsystems.com

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