GemOne®

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Sapphire V2SC Scale Installation & Calibration

Procedure Manual

Version 1.3 - December 2025

Content

1 - Safety Precautions

Read the following safety precautions before installation or operation.

Abnormal Conditions
Should the transducer display become hot, start to emit smoke, or a strange odor; immediately turn the power off and contact GemOne. Continued usage is dangerous and may result in fire or electrical shock.

Power Supply
Do not install the transducer with any voltage other than that specified. Avoid situations that can cause damage to the power cable.

2 - Introduction

Purpose

This document is to be used as a guide to install the hydraulic pressure transducer with a Sapphire V2SC. This can be installed onto various types of equipment, whether they are internal combustion or electric equipment.

Scope

This document is to be used by a trained and authorized person(s) with the necessary PPE as a guide for the installation, operation, and management of the transducer. This document provides information on installation and general troubleshooting methods.

3 - Weight Sensor

Components Required

- 1 x Transducer with 3 cables (PWR, GND, SIGNAL)
- 1 × 6 & 3 pin adapter cable

Installation of Transducer

The transducer will need to be installed into the hydraulic line of the equipment. Install this between the control valve and the primary lift cylinder.

This will require a T-piece to be installed and the transducer will screw into the T-piece. The thread size is **¼-18 NPT Male**.
The maximum **pressure** for the transducer is **200 bar.**

Electrical Specifications

There are three wires coming out of the transducer:

1. Black – Battery Negative
2. Red – Power Input (12-30VDC)
3. White – Signal output

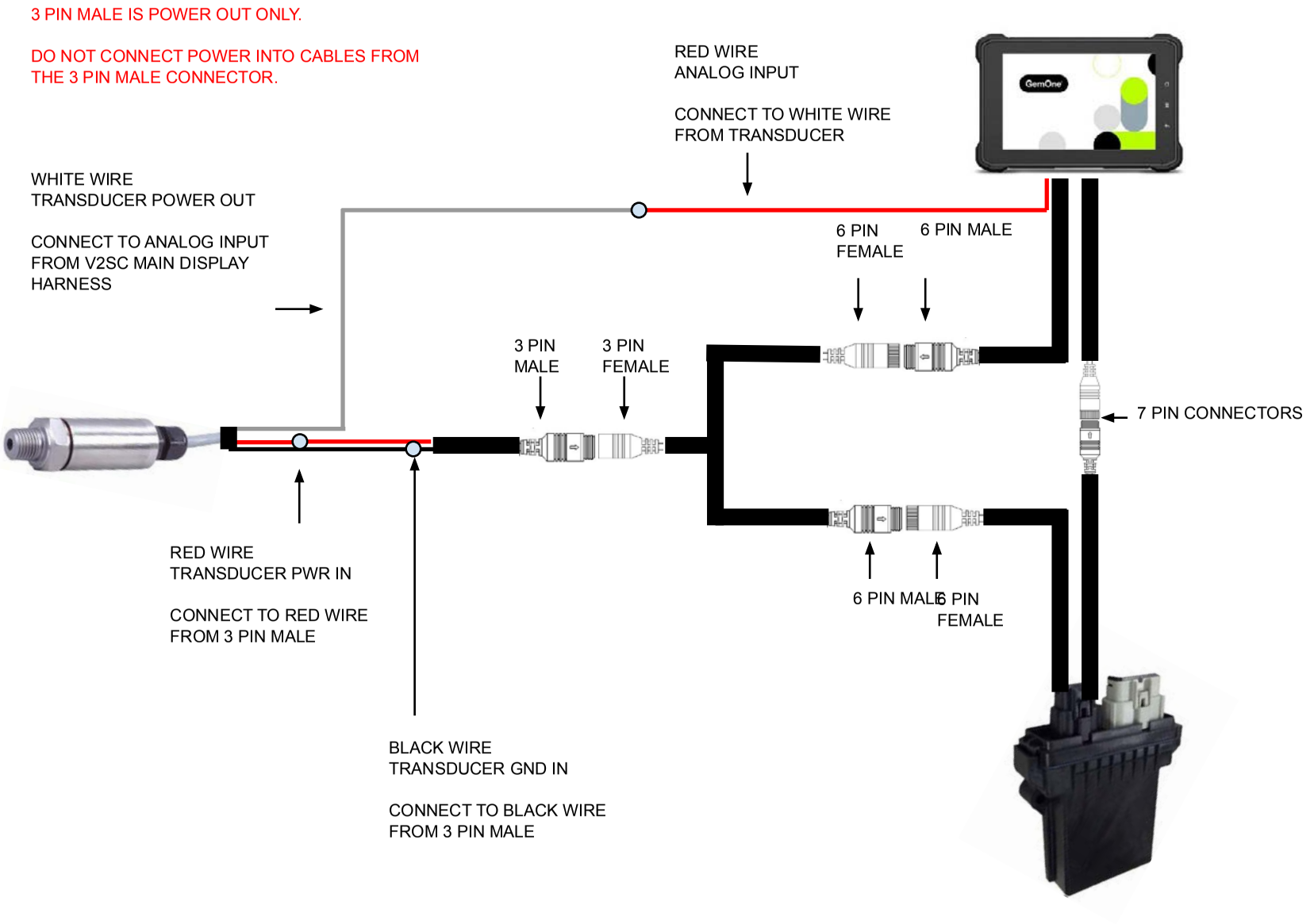
Do not exceed 30VDC for the power input

Electrical Connections

Wire Color	Purpose	Connected To
Black	Ground	Black wire from 3 pin male connector.
Red	Power IN	Red wire from 3 pin male connector.
White	Power OUT	Connect to the red analog input wire found on the main display harness.

Wiring Diagram

The sapphire interface box will supply power to the transducer using the adapter cable.
Connect the adapter cable between the 6 pin connectors from the main display cable and black connector cable from the interface box.
Do not connect power into the 3 pin male cables as this will damage the components.



4 - Calibrating Weight Indicator

Hardware Required

The calibration process will require the following:
- A known weight around half the capacity of the equipment.
- A known weight close to the capacity of the equipment.

These are required to set reference points for the calibration process. A minimum of two known weights are required to calibrate the scale. Additional weights will increase the accuracy of the scale calibration.

Calibration Process

The calibration process only needs to be completed once.
Each piece of equipment will need to be calibrated.
Calibrate the equipment when the hydraulic fluid is at a normal operating temperature under normal conditions.

Overview

The calibration process will require the following:
- A reference point.
- A weight that is around half the capacity of the equipment.
- A weight that is around the full capacity of the equipment.

A reference point must be selected on the equipment. This will be used during the calibration and also during normal operation. The same point must be used each time the weight sensor is used.

Using a wide range of weights to calibrate the scale will yield more accurate results. A minimum of two known weights (half and full capacity) are required but it is recommended to have four (quarter, half, three quarters, and full capacity).

The first point will be without any weight.
This steps the reference point for the known weights.

Lifting the forks above the set point will read a higher weight.
Lowering the forks below the set point will read a lower weight.

Procedure

Follow the steps below to calibrate the weight indicator.

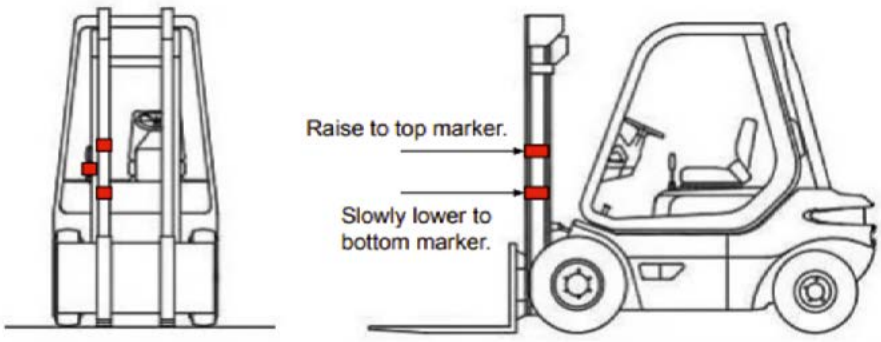
1. Log into the module using an **override code** with **supervisor** mode selected.
2. Go into the settings screen and select **re-calibrate.**

3. Ensure the forks are not tilted forward and they are straight.
4. Pick a measurement point that operators will use to measure weight and mark these with indicators.

The measurement point must be visible to the operator during normal operation of the equipment.

5. Raise up the forks so the sticker on the forks aligns with the top sticker on the cylinder and then slowly lower the forks so the sticker aligns with the bottom sticker on the cylinder.
6. **Wait 10 seconds** before pressing the Set button.

The distance between the top marker and the bottom marker should be 6 inches or 15cm.
Lower the weight at a steady rate. Sudden drops will cause big fluctuations in the weight measured.



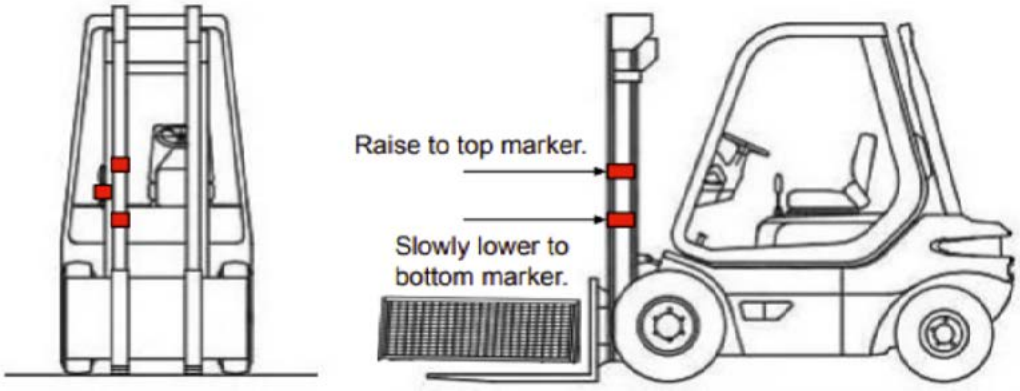
7. Set the **0lb reference point**. Set the weight accordingly using a combination of the available buttons. Press **set** and the first reference point will be set. Set points all appear on the left hand side under **saved calibrations**.

It is important to wait 10 seconds after lowering the weight before pressing Set. This is required so analog input reading stabilises before setting the weight.

8. Lower the forks and pick up a known weight that is half the capacity of the equipment.

The example below will use 1000lb as a known weight.
Pick up the weight so the weight sits as close to the back of the forks as possible.

9. Raise up the forks so the sticker aligns with the top sticker on the cylinder then slowly lower the forks so the sticker aligns with the bottom sticker on the cylinder.



10. **Wait 10 seconds** before pressing the Set button.
11. Enter **1000lb** and hit **set.**

It is important to wait 10 seconds after lowering the weight before pressing Set. This allows for the hydraulic pressure to stabilize.

12. Lower the forks and pick up the last known weight that is close to the capacity of the equipment.
13. Repeat steps 9, 10 & 11 to set the last reference point.
14. Set the overweight alert to the equipment capacity as per section 3.3 below.
15. The module is now calibrated and is ready to test.

The overweight alert must be set in order for the scale to work correctly.

Setting Overweight Alert

The overweight alert must be set in order for the scale to work. The upper limit of the overweight alert is affected by what weight has been used to calibrate the scale.

The settings screen will allow the user to adjust the overweight level.
Any reading over the set threshold, will prompt the user they are overweight while closing a normally open relay.

The normally open relay can be connected to certain areas of the equipment to prevent or activate a certain feature. Please contact GemOne staff for additional information.

Setting Debounce

If the weight is fluctuating excessively when the forks are stable, a debounce can be added to prevent this. A value between 0 to 10% can be added to hold the weight reading for a longer period. A higher percentage will hold the weight for longer periods.

For example, if the analog input is reading 2.0V and a debounce of 5% is set, the scale will hold the weight value for +5% of 2.0V (analog input reading between 1.9V to 2.1V will hold the value). If the analog input reads a value outside of the range, a new weight value will be displayed on the screen.

Test Procedure

Log into the sapphire module using an operator or driver code to access the weight screen. This screen will change values as the forks are raised and lowered.

It is important to wait 10 seconds before reading the weight.
This allows the weight to stabilize.

5 - Using the Scale

The Sapphire V2SC scale can be accessed by logging into the device under a driver. The Weight Icon will load the scale screen.

Using the reference points from earlier, raise the forks 6 inches or 15 cm above the reference point, slowly lower the weight, and wait 10 seconds before taking the reading.

Troubleshooting

Various troubleshooting steps can be taken depending on symptoms observed at the lift.

No weight displayed

Ensure the analog input is sensing a voltage from the transducer.
The analog input reading should increase as the forks are raised and decrease as the forks are lowered.

Weight fluctuating – Air in hydraulic line

It is possible to introduce an air pocket into the hydraulic line after installation of the transducer. In order to fix this, the line must be bled. This can be done by running the mast to the very top and back down several times. This will move the air pocket out of the line and into the return reservoir.

No output from the transducer

Ensure the transducer is receiving the correct voltage input and the transducer is on the same GND as the sapphire. The maximum input voltage is 30V for the transducer.

6 - Support

In case of issues, questions or feedback, feel free to contact our support team.

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