

## Calm® Diagnostic 1.3.1, User's Instructions, 2003-11-10

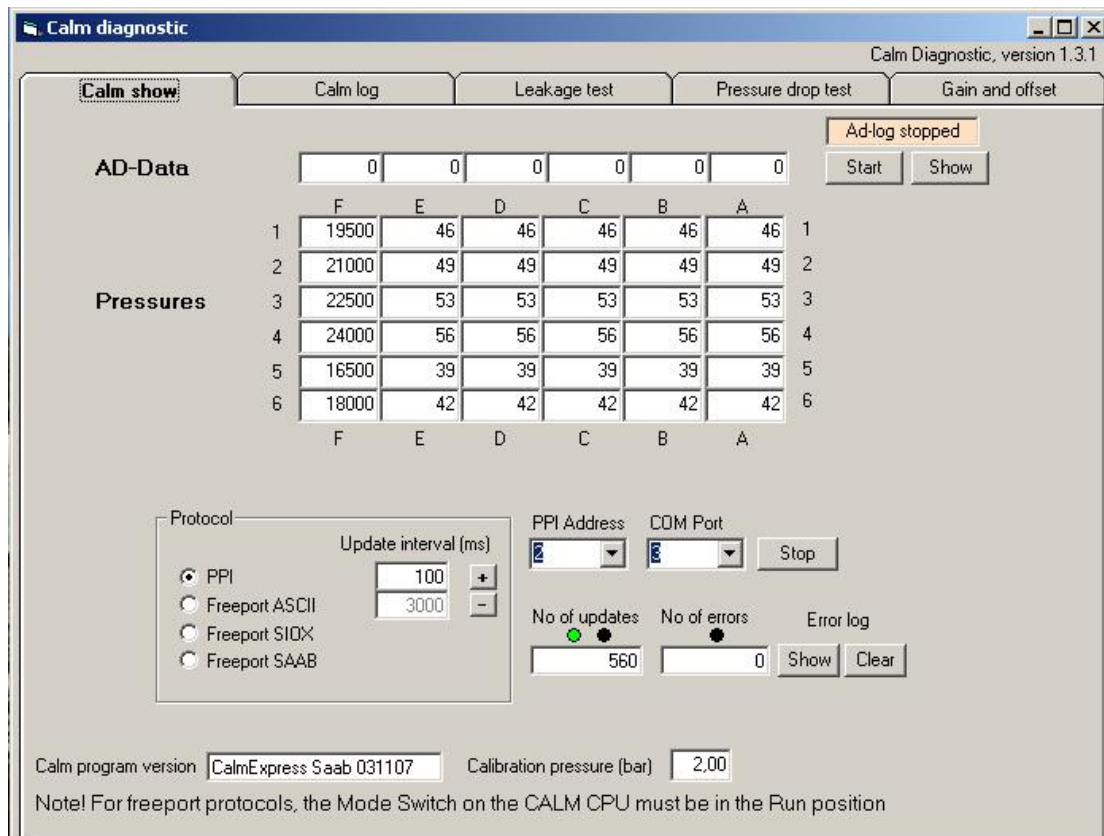
The Calm diagnostic program is a collection of tools, useful when fault finding in a Calm system.

### Calm Show

The Calm Show tab shows the current readings for all 36 channels.

Select protocol and com-port. For PPI protocol, the correct PPI address must also be entered. The address used is normally given by the document inside your Calm cabinet.

Note! For all Freeport protocols, the mode switch on the Calm CPU must be set in the **Run** position. When the mode switch is set in the **Term** position, the only way to communicate with the plc is through the PPI protocol. This protocol will also function in the **Stop** position.



### Pressures

The data area shows the measured pressures for all the positions. The pressure is given in the unit cm H2O.

### AD-Data

When the PPI protocol is selected, the AD-data fields show the current readings for all the AD channels (a+ a-, b+ b-, c+ c- for the connected EM235 modules). During

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start-up, first all blocks are ventilated, and all the readings should go down to the offset value (500 – 1500). When the reference pressure is applied all blocks should go up to the maximum value. Depending on the sensor type, sensor supply voltage and the range setting on the AD converter this figure will vary.

Normal setting is: AD-range 0-100 mV. A 100 mV signal corresponds to a reading of approximate 32000 from the AD-converter.

The start/stop button, will open/close the serial interface. This is convenient when you are working with Micro/Win at the same time as with CalmDiagnostic.

When you set the protocol switch in PPI, the program will fetch additional data, (Program version, gains, offsets, ...). When a Freeport protocol is used, only pressures are fetched from the plc.

## Calm Log

The **Calm log** tab is used to log measured channels for a chosen interval and for a desired time. The log is written to an Excel document. The function **Give stop date/time** is optional. If not given, the log continues until stopped manually. When **Auto scroll** is checked, the cursor is automatically placed on the next log line. If you want to scroll through already logged history, uncheck **Auto scroll** to be able to move the cursor freely.

Note! If Excel is not installed a Warning is shown if the log is started.

The screenshot shows a software window titled "Please wait for COM port activity". Inside, there are three tabs: "Pressure drop test", "Calm log" (which is selected), and "Leakage test". The "Calm log" tab contains the following fields and controls:

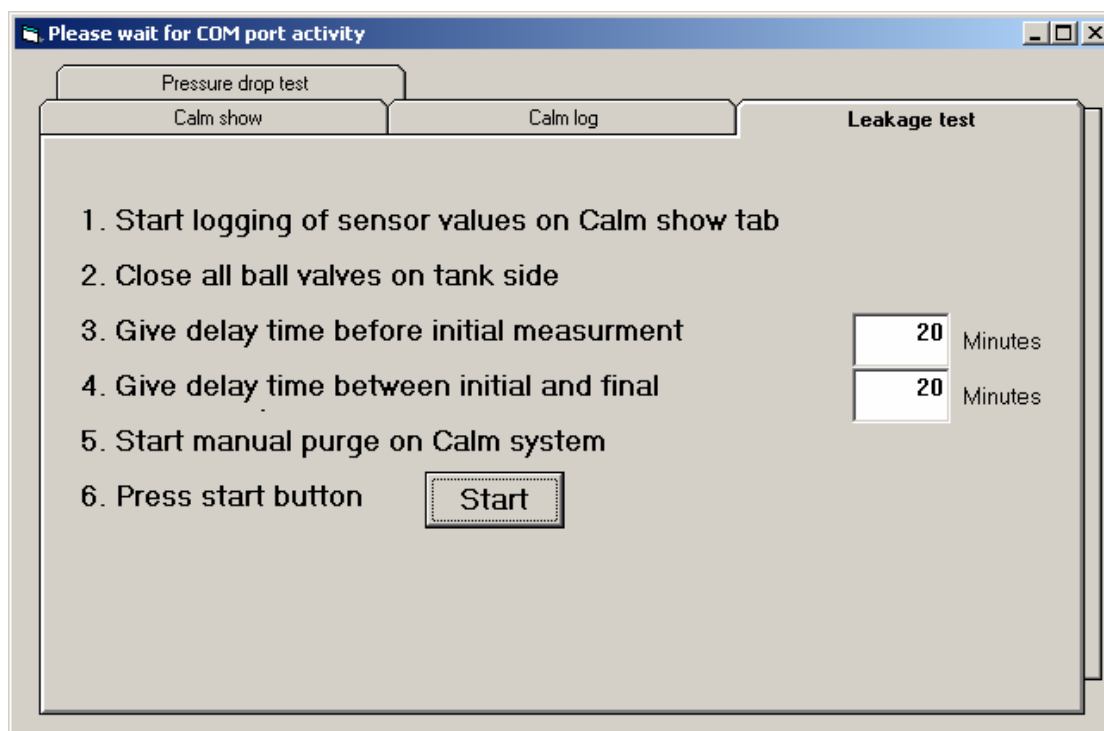
- Order number: K111
- Reference pressure: 2039
- Log intervall in seconds: 60
- Give stop date/time
- Date: 2002-03-25
- Time: 17:30
- Auto scroll
- Start log button
- Stop log button

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### Leakage test

Leakage may have a very negative effect on the readings. Especially in tanks where high levels are to be measured. To detect a leakage, close the pipe at the tank, and let the pressure build up. In the planned new version of Calm, there will be a function called **Man purge**, to force air into the pipes. In this case maximum pressure will be reached within 20 to 40 minutes. In the current Calm system, during normal operation, a longer period of time (several hours) is needed to build up pressure sufficiently. The pressure build up can be monitored on the **Calm Show** tab. In a 2 bar system, a maximum pressure of 1900 cm H<sub>2</sub>O or greater is desirable, and in a 4 bar system a pressure of 3800 cm H<sub>2</sub>O or higher is considered to be an acceptable value. Lower maximum values indicates a leak, which may have effect on the gauged values. In the current Calm systems, instruction 5 below can be ignored.

Note! If Excel is not installed a Warning is shown if the log is started.



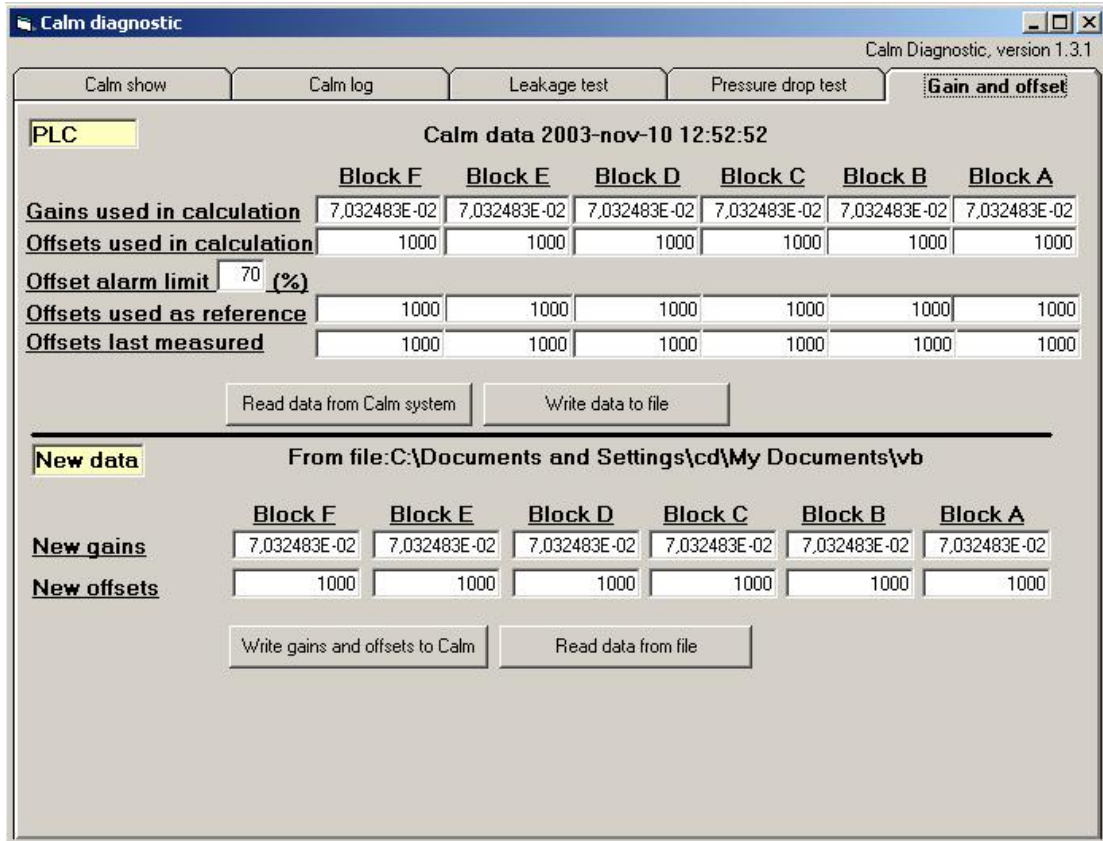
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### **Pressure drop test**

The pressure drop comprises the following components: Pressure drop across the air valve in the Calm cabinet and the pressure drop along the air pipe from the Calm cabinet to the tank. In normal situations the pressure drop is in the range from 10 to 15 cm H<sub>2</sub>O. Due to contamination in the air valve or water/contamination in the pipes, the drop may increase considerably, which in turn has the effect that reading in the Calm unit is shifted higher.

Note! If Excel is not installed a Warning is shown if the log is started.

Gain and offset



Note! To use these functions, the PLC must be in PPI mode. (PPI program or else set the PLC mode switch in the Term or Stop position.)

The values shown are:

**Gains used in calculation**

(Ref pressure in cm H2O)/(AD reading for ref pressure – AD reading offset)

Normal: 4bar ref/4bar sensor = ( 4078)/(25000) = app 0.16  
 2 bar ref/2bar sensor = (2039)/(25000) = app 0.08

**Offsets used in calculation**

These are the offsets currently used

**Offsets used as reference**

Offset reading when the last calibration was done. For program versions 36XA, 36XXA and 36SIOX these fields will be zero.

**Offsets last measured**

These are the offsets that was measured at the last calibration

**Offset alarm limit**

When a new calibration is done, the program test that the new offsets are in the range +/- 70 % from the reference offsets.

To refresh the picture press: **Read data from Calm system**

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To save the constants to a file press: **Write data to file**.

The upper part shows the stored constants in the PLC system while the lower part can be used to enter new constants into the plc.

Use **Read data from file**, to read data from a file.

To write displayed data into the plc, use the command: **Write gains and offsets to plc**