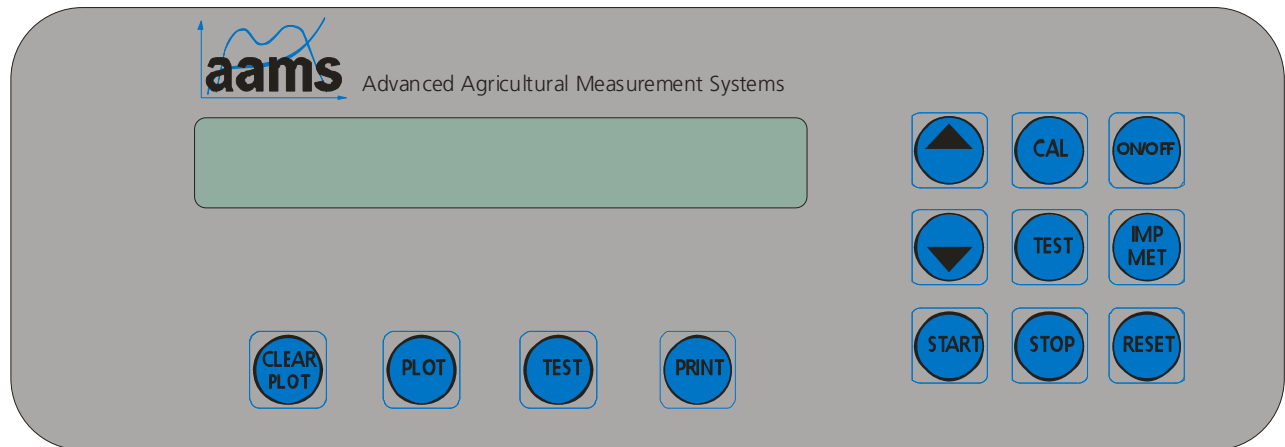


# aams Sprayer Test Computer

## INSTALLATION & OPERATION INSTRUCTIONS



aams Sprayer Test Computer



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# 1.0 Introduction

## 1.1 General Outline

The aams sprayer test computer allows 10 pressure and 10 flow rates to be sampled, displayed and stored. Each pressure and flow rate pair form a plot and 10 plots can be stored in a test. The unit can store data for 10 tests (i.e 100 plots).

The unit can print plot data (pressure and flow) stored in the tests. Printing can be done one test at a time and all at once. Plots can be easily cleared if a mistake is made and once plots have been stored they can be viewed.

The main display of the unit is split displaying the sampled pressure and flow rate.

The aams test computer requires calibration of a flow sensor, which after installation is easily done with the unit's in-built test function.

The aams sprayer supports three languages: English, German and Danish.

### About this Manual

This manual contains the necessary instructions to operate and calibrate the aams test computer.

## 2.0 Installation

### 2.1 Controller Installation

When installing the monitor use the brackets, securing knobs and mounting hardware supplied to mount the controller. Keep the following points in mind when finding the best location for the controller.

- The controller should be installed in the cab, clearly visible to the operator but not subject to intense heat or moisture.
- Mount the unit firmly on the bracket using securing knobs supplied (AH-861). Don't use substitute bolts into the controller.
- When installing the wiring loom, ensure the green 12 way connector is inserted into the back of the unit with the screws in the connector facing upwards.

**DO NOT force the connector. If it does not connect easily check that the connector is being inserted the correct way.**

## 2.2 Power connection

Do not connect power until all other installation is complete.

Connect **power cable** from tractor loom **direct** to 12-volt DC vehicle battery terminals to ensure a clean uninterrupted source of power.

**DO NOT** connect power cable to alternative power source such as the starter solenoid as damage may result.

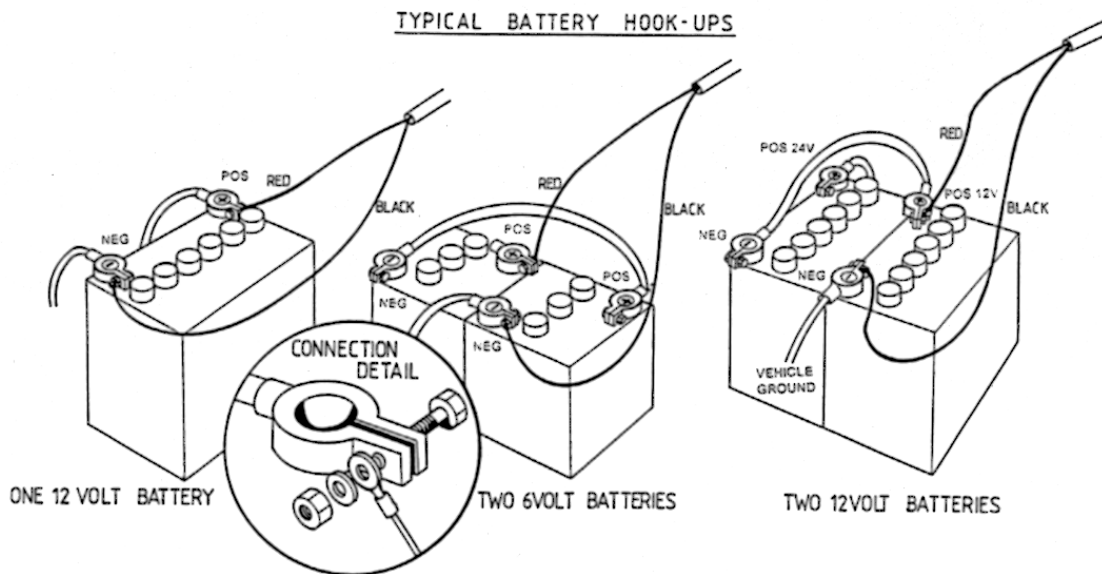
**DO NOT** connect other electrical equipment to the controller **power cable**.

Run the **power cable** away from radio antenna leads and mobile phones or wiring to solenoids or electric clutches.

Use cable ties supplied to secure power cable away from risk of damage.

Connections to battery terminals must be clean and tight.

**! WARNING** - Disconnect power cable when arc welding!



## 2.3 22C5 Port Connections

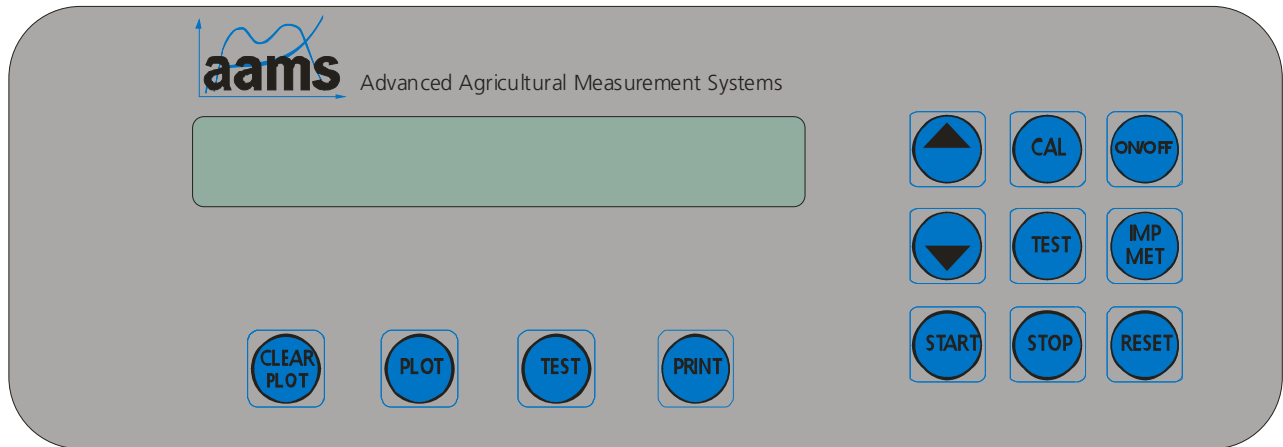
### 12 Way Phoenix Connector

Port Number	Function
1	
2	
3	<b>Pressure</b>
4	<b>Flow</b>
5	
6	
7	
<b>8</b>	<b>12 Volts OUT</b>
<b>9</b>	<b>GND</b>
<b>10</b>	<b>0 Volts Battery IN</b>
<b>11</b>	<b>12 Volts Battery IN</b>
12	

### Female DB9 Connector

Port Number	Function
1	
<b>2</b>	<b>+RS485</b>
<b>3</b>	<b>-RS485</b>
4	
<b>5</b>	<b>GND</b>
6	
7	
8	
<b>9</b>	<b>12 Volts OUT</b>

## 3.0 Operation



### 3.1 Power On/Off Key

To switch the unit **on**, press the “ON/OFF” key.

Whenever the unit is switched **on** the display will run through a start up routine displaying the version of software and the program the unit is running.

e.g.

AAMS SPRAYER

TEST COMPUTER

VERSION 0.0.1

The version number indicates which generation of functions and features are programmed into your unit.

If an upgraded program is installed, a new version number e.g. “VERSION 0.0.2” will be displayed.

After momentarily displaying the current program and version number, the controller will then display the following.

TEST 1.1 0.0BAR

## 3.2 Imperial / Metric Key

Press the "IMP MET" key to change any readout on the display between metric and imperial.

e.g.

TEST 1.1 0.0BAR

TEST 1.1 0.0PSI

**NOTE:** "IMP MET" key is not active during calibration. All calibration factors must be entered in metric values.

## 3.3 Cal Key

Pressing and holding the "CAL" key for 3 seconds will allow you to enter the calibration menu. The calibration menu has two levels. The first level contains the flow sensor calibration factor and the second level contains language, sound and printer header settings. The calibration section of this manual gives further instructions to change these settings.

## 3.5 Test Key

The "TEST" key (underneath "CAL" key) provides a means of testing that the flow and pressure sensors are working correctly. The test function is used in the calibration of the flow sensor.

Press the "TEST" key and the "PRESS" will appear.

e.g.

PRESS TST 0BAR

Pressing the "TEST" key again will display "FLOW TST".

e.g.

FLOW TST 0

The "FLOW TST" display should increment together with a regular beep that becomes faster as the flow rate increases until the beep becomes an almost constant tone.

**NOTE:**

To reset the flow count press the "RESET" key.

## 3.6 Print Key

The print facility will print out all plots stored under test numbers. Test numbers can be printed one at a time or all together. The unit prints in the EPSON 480 dpi emulation setting. If you're not using the Farmscan 2040 Printer Kit then you must set your printer to EPSON 480dpi emulation.



Press the "PRINT" key and the unit will display the test to be printed.

e.g.

PRINT TRIP 1 ?

To print another trip e.g. test 2, use the up or down arrow keys to select the required test then press "PRINT" again.

To print all the test information, press "PRINT" then use the up or down arrow keys to display to "PRINT ALL TRIPS".

e.g.

PRINT ALL TRIPS?

When the correct option is displayed press "PRINT" key again and the display will say "PRINTING..." and the printer will begin to operate.

#### NOTE:

Each test takes **approx. 16 secs** to finish printing. "PRINTING ALL TRIPS" will take **approx 3 mins**.

### 3.7 Reset Key

Used to reset all test and plot data. Pressing the "RESET" key once will display the following message.

RESET ALL TESTS?

Pressing the "RESET" key again will reset all test and plot data.

### 3.8 Start Key

The "START" key is used to start the measurement of flow and pressure for a selected test number. Press the "START" key while in the test menu, that is when the following screen is displayed.

e.g.

TEST 1.1 0.0L/m

When pressing the "START" key the current test and plot number will be displayed.

e.g.

TEST.PLOT 1.1

Then the following split screen will be displayed showing the pressure on the left and the flow rate on the right.

e.g.

0.0BAR 0.0L/m
---------------

### Starting a Test

1. Select the test number you want to start from by pressing the up and down arrows keys. Press the "START" key.
2. The test and plot number to be filled with data will be briefly displayed (e.g. "TEST.PLOT 3.1").
3. Once the pressure and flow measurement s are ready to be taken press the "PLOT" key.
4. The next test and plot number to be filled with data will be displayed (e.g "TEST.PLOT 3.2").
5. Press the "STOP" key to stop testing or continue until data for 10 plots has been entered.

### 3.9 Stop Key

The "STOP" key is used to stop data being stored into plots and complete the current test. The current test will automatically stop after data for 10 plots has been stored.

When the "STOP" key is pressed "TEST COMPLETED" will be displayed and the test number you started with will be displayed. Press the "TEST" key (next to "PLOT") to view the data stored for each plot. See below

e.g.

TEST COMPLETED
----------------

Then

e.g.

TEST 3.1 0.0L/m
-----------------

### 3.10 Plot Key

The "PLOT" key is used to store data into a plot number after the "START" key has been pressed.

When the "PLOT" key is pressed the plot number which has just been filled with data is displayed.

e.g. TEST.PLOT 3.1

When the "PLOT" key is pressed again the plot number will increment.

e.g. TEST.PLOT 3.2

Press the "STOP" key to stop storing data under the current test number.

### 3.11 Clear Plot Key

This key is used to clear data stored in a plot number. The "CLEAR PLOT" key clears the data stored in the last plot number.

Pressing the "CLEAR PLOT" key displays "CLEAR PLOT #.#?", pressing "CLEAR PLOT" again clears the data stored in that plot number. To abort clearing the plot press any other key.

For example, "TEST.PLOT 3.7" is displayed when the "PLOT" key is pressed, and you would like to clear the data recorded in plot number 7 in test number 3. Then "CLEAR PLOT" is pressed.

e.g. CLEAR PLOT 3.7?

"CLEAR PLOT" is pressed again to confirm, then the test and plot number cleared is displayed.

e.g. TEST.PLOT 3.7

If the "PLOT" key is pressed to store data into the plot number just cleared the same plot number will be displayed.

e.g. TEST.PLOT 3.7

## 3.12 Test Key

The "TEST" key (next to the "PLOT" key) is used to view the plot data stored under the test numbers.

When the "TEST" key is pressed the display changes from the stored pressure value to the stored flow value. When the "TEST" key is pressed again the data for the next plot number under the same test number is displayed.

e.g.

TEST 3.1 25BAR

The "TEST" key is pressed again.

e.g.

TEST 3.1 82L/m

Once the stored flow value for the 10<sup>th</sup> plot in the test has been displayed the unit will display the total amount of liquid used in that test.

e.g.

USAGE 50.8L

## 4.0 Calibration

### 4.1 General Outline

The aams sprayer test computer unit contains two levels of calibration menus:

1. Level 1 calibration menu – Easily accessible and used to change settings that may vary frequently.
2. Level 2 calibration menu – Changes the display language. Default language is English.

All calibration factors in level 1 must be entered before operation.

All calibration factors must be entered in **metric** units only. To adjust the factor displayed, use the up or down arrow keys to change the displayed value.

Holding the up or down arrow keys will cause the numbers to change faster.

To save the flow sensor calibration figure into memory, press the "CAL" key after the required figure is set.

To exit from the calibration menu, press any other operation key (e.g. "PLOT") to return the unit to normal operation.

### 4.2 Memory Backup

An inbuilt memory backup system will hold all calibrations and accumulated totals in memory whenever the power is switched off.

Memory will last for at least 3 months after disconnection from the 12 Volt DC power source.

### 4.3 Calibration Warning

A calibration checking system incorporated into the system will warn you if any calibration factors are lost from memory or change value without your knowledge.

If for any reason a calibration factor does change value, a continuous series of beeps will sound and the display will indicate which calibration factor has altered.

e.g.

CHECK CALS!

In this case the operator must press the "CAL" key to check and re-enter the correct factor. Save this factor by pressing "CAL" key again. Press any other key (e.g. "PLOT") to return to the normal display.

## 4.4 Level 1 Calibration Menu

Press and hold the "CAL" key for 3 seconds at any time during operation to go into the first level of the calibration menu.

### 4.4.1 Flow Sensor Calibration

The flow sensor calibration factor relates to the number of pulses per litre (PPL) generated by the flow sensor. The PPL factor of every flow sensor is unique and will vary slightly depending on liquid viscosity.

Attached to every flow sensor is a tag, which gives the PPL factor for that sensor. Enter this PPL factor into the "PULSES/L" screen.

**Important:** After installing the system, the PPL factor should be checked before operating the unit by measuring into a known container. Disconnect a hose after the flow sensor that can be directed into a bucket. Preferably after a solenoid valve or another valve that can be used easily to stop and start the test. Follow the procedure below to test the flow sensor's PPL calibration factor.

#### Test Procedure:

1. Switch the unit on. Fully prime the flow sensor before starting.
2. Press the "TEST" key on the right hand side of the front panel to display "TEST FLOW" on the screen. Press the "RESET" key to clear accumulated pulses.

eg

TEST FLOW 0

3. Start pump, measure flow coming out using a measuring bucket. Usually 10 – 20 litres is plenty. Shut off flow exactly at the desired point. The test flow counter should stop counting, eg

eg

TEST FLOW 568

4. Take the "TEST FLOW" pulse reading from the unit and divide it by the total litres. For example:  
**1425 pulses ÷ 22.1 L = 64.4 pulses per litre** or a PPL factor of 64.4.
5. Repeat steps 1 –4 at least 3 times to verify the accuracy of the final result.
6. See below to enter the pulses per litre flow calibration factor into the unit.

#### Important:

Perform calibration with the actual product for accurate results.

### To Set Pulses/L Flow Cal Factor

1. Press "CAL" key to display "PULSES/L" factor.

Eg PULSES/L 45.6

2. Use '▲' and '▼' keys to set correct the "PULSES/L" factor.

Eg PULSES/L 64.4

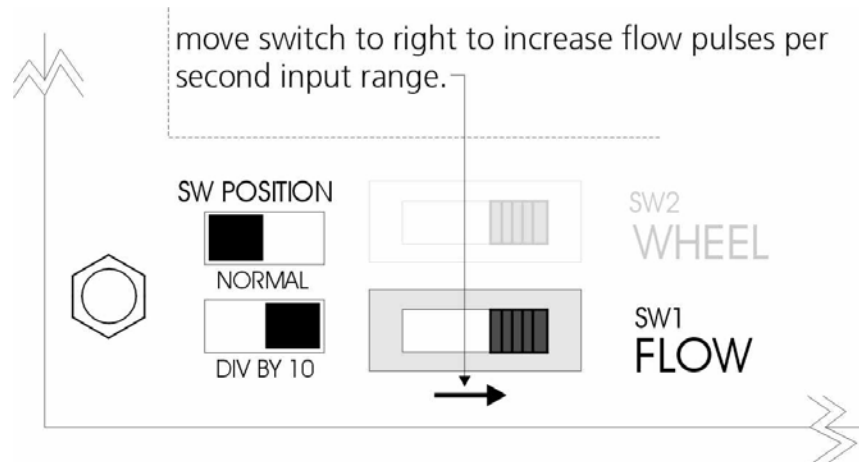
3. Press the "PLOT" or "TEST" key to return to the normal display.

### Note! Jumper Setting for Flow

At any point in the operating flow range of the sprayer, the flow sensor generates more than 200 pulses per second then the flow sensor jumper switch on the back board of the unit must be set. Follow the procedure below to set the jumper switch.

#### Procedure

1. Remove the front panel and lift the front circuit board to see the back board screwed to the back cover.
2. Locate the switches on the bottom left corner of the circuit board joined to the back of the unit.
3. Move the switch labelled "FLOW" (bottom) to the right to the "/10" side.
4. The unit will now accept up to a maximum of 2000 pulses per second from the flow sensor.



### 4.4.2 Pressure Sensor Calibration

The unit has been programmed to take readings from a pressure sensor with an output range of 0 to 10V DC. To calibrate the sensor the maximum pressure the sensor will read at 10 Volts must be entered into the unit.

Eg MAX PRESS 60BAR

For example, if the pressure sensor outputs 10 Volts at 60 bar then 60 bar must be entered into the unit as the "MAX PRESS" setting.

## 4.5 Level 2 Calibration Menu

In this menu the display language and printer are set up. At present the display language can be set to Danish, English (default) and German. The header on the docket the unit prints can be customised.

### To Change Language Setting

Press and hold the "CAL" key for 3 seconds to display the "PULSES/L" screen as seen in section 4.4.1. Then press and hold the "CAL" key and the following screen will be displayed.

LANGUAGE ENGLISH

Press the up and down arrow keys to select a different display language. The display will be set to this language when pressing any other key such as "PLOT" to exit the level 2 calibration menu.

### To Customise the Printer Header

Once the printer has been selected press "CAL" to display the following screen.

HEADER FARMSCAN

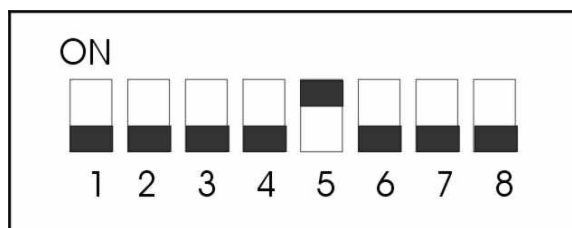
A header with a maximum of 9 characters can be set in this screen.

When entering this screen the cursor will be under the "A" in "AAMS" use the up and down arrow keys to change the letters and press the "CAL" to move the cursor to the right. The "RESET" key clears the header text allowing you to start again.

Press and hold the "CAL" key to return to the language setting screen. Press any other key to exit. Upon exiting the screen the header set will be appear on the top of the docket when test plots are printed.

### Printer Dip Switch Setting

For the unit to print the printer must be set to print in EPSON 480dpi emulation. If the printer has a dip switch set the dip switch as shown below.





## 5.0 Parts List

ITEM	PART No.	DESCRIPTION	QTY
1	A-22AAMS	AAMS SPRAYER TEST COMPUTER	1
2	AH-405	MOUNTING BRACKET	1
3	AH-861	SECURING KNOBS	2
4	P-006	12 WAY PHOENIX CONNECTOR	1
5	AC-103	8M POWER CABLE	1
8	AM-22AAMS	AAMS MANUAL	1
9	AM-200	1 YEAR WARRANTY CARD	1

## 6.0 Troubleshooting Guide

	PROBLEM	POSSIBLE CAUSE / REMEDY
1.	UNIT DOES NOT TURN ON.	<p>a) A fuse has blown. The unit uses internal poly-fuses which cut out if the monitor is drawing too much current and will automatically restore power when the fault has been repaired.</p> <p>b) Disconnect power cable at controller and test voltage is 12-13.8V DC from battery. Reconnect power to the controller and check that there is 12V between pins 10 &amp; 11 on the green plug at the back of the controller.</p> <p>c) Check connections at battery are <b>clean</b> and tight at terminals, try with engine running.</p> <p>d) Check that <b>red</b> wire is to positive and <b>black</b> wire is to negative.</p> <p>e) Check that no other electrical device is connected to the same power cable - the power cable must be completely independent. Do not share power with other devices.</p> <p>f) Connect unit direct to another 12 Volt battery known to be in good condition.</p> <p>g) Unable to locate fault – contact nearest Dealer.</p>
2.	LCD DISPLAY DROPS OUT OR GREY SQUARES APPEAR ON HALF THE READOUT	<p>a) If display rectifies when engine running this indicates battery is in poor condition or connections to battery are poor.</p> <p>b) If problem persists when engine running, then voltage supply is low or low current is a problem due to poor connections at battery or corroded inline fuse holder on loom.</p> <p>c) Clean battery terminals and power cable connections.</p> <p>d) Connect the unit directly to an independent battery to prove if unit is OK.</p>

# 7.0 Appendix

## 7.1 Specifications

### Supply Voltage

nominal supply voltage:	12V DC
maximum supply voltage:	14V DC
minimum output voltage at 12V supply:	11.3V
maximum current:	1A

### Flow Input

Divide by 10 switch or jumper selectable on back board HP-B71

maximum input frequency:	200Hz
maximum input frequency /10:	2000Hz
input voltage (activate):	0-4V
maximum input voltage:	14V