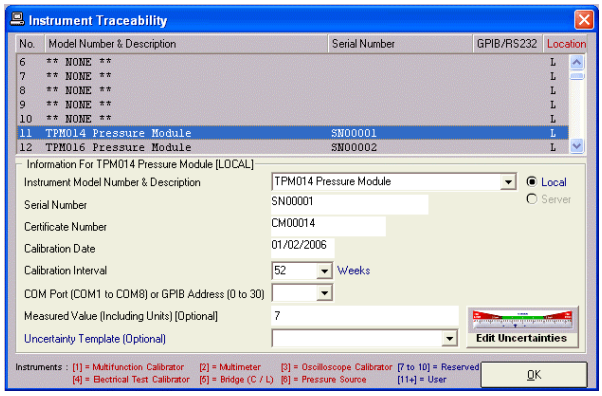
The TPM range of pressure modules for the 3000 Series calibrators can be used directly with the calibrator to readback pressure on the calibrator display.

In addition a calibration procedure using a number of measurement tests can be written – if required, different pressure modules can be used for different ranges. The calibrator is used to measure the output voltage from the pressure module (0 to 5 Volts). This voltage can then be scaled using the formula function in ProCal to any kind of pressure unit.

Traceability and scale factor data for any number of pressure modules can be stored in ProCal.

Enter pressure modules in Traceable list using ProSet



Use the Instrument Traceability function in ProSet to add the pressure modules required to the traceable list. This needs to include the scale factor of the pressure module used, eg.

Instrument model number & description
A text desciption and model number. eg. TPM014 Pressure Module

Serial Number
The pressure module serial number, eg. SN00001

Certificate Number
The pressure module certificate number, eg. CM00014

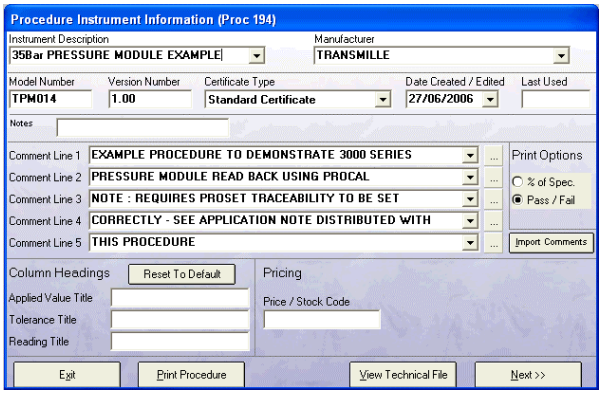
Calibration Date
The pressure module calibration date, eg. 01/02/2006

Calibration interval
The pressure module calibration interval in weeks, eg. 52

Measured Value
This should be the *SCALE FACTOR* WITHOUT units
eg. **TPM014 35Bar** pressure module = **7**
eg. **TPM016 –1 to +1Bar** pressure module = **2.5**

Create / Edit a procedure using ProEdit

STEP 1
Create a procedure using ProEdit (select File -> Create New Procedure)

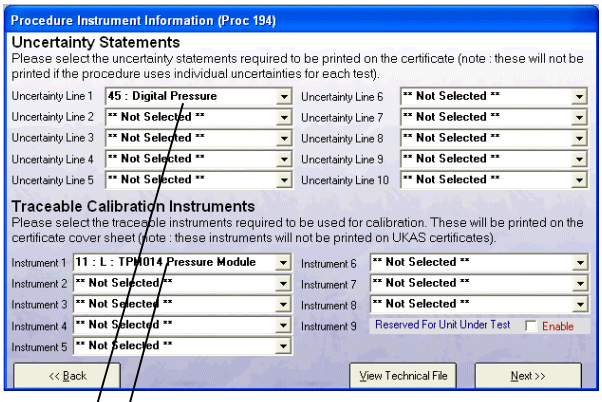


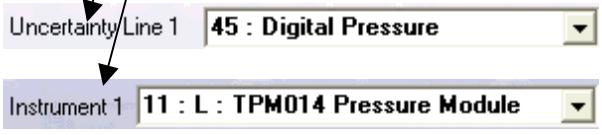
Enter instrument description, model number etc then click **NEXT >**

STEP 2

Set uncertainty line 1 to **DIGITAL PRESSURE**
This will print out the correct uncertainty statement on the certificate.

Set Instruments to the pressure module(s) to be used in this procedure – in this example the pressure module in **position 11** in the Traceable instrument list has been selected :



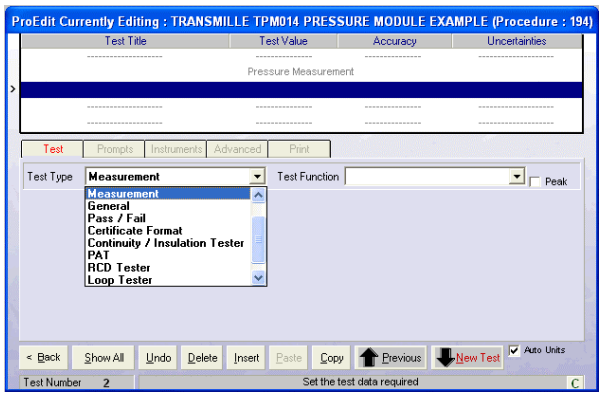


Note : This uncertainty statement can be changed using the Edit uncertainty Statements function within ProEdit

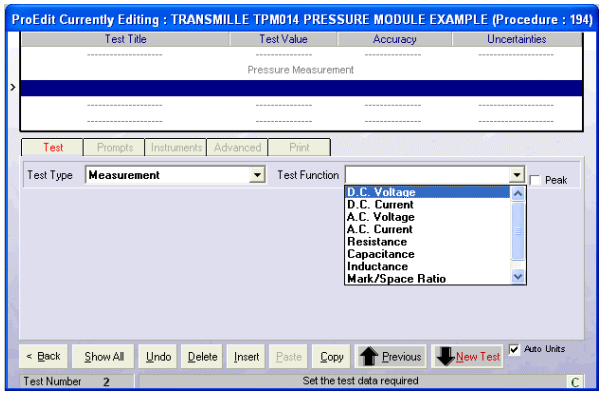
Click **NEXT >** to proceed to the test editing screen

STEP 3

Select test type as **MEASUREMENT**



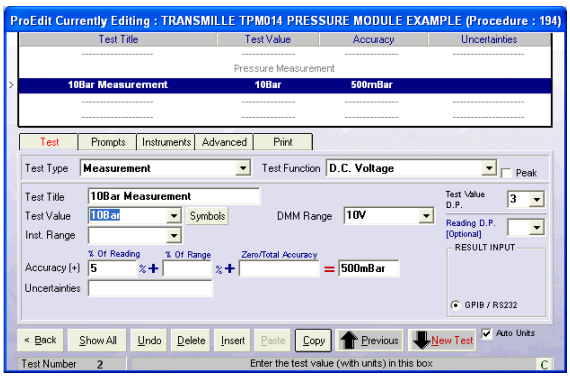
Select test function as **DC VOLTAGE** – this is selected as the signal from the transducer is a 5V DC voltage signal – this test will be configured to convert this to Bar using a scale (conversion) factor.



STEP 4

Set the test details as follows :

Test Title : **10Bar Measurement**
Test Value : **10Bar**
Accuracy : **5%**
DMM Range : **10V**
Test Value D.P. : **3**

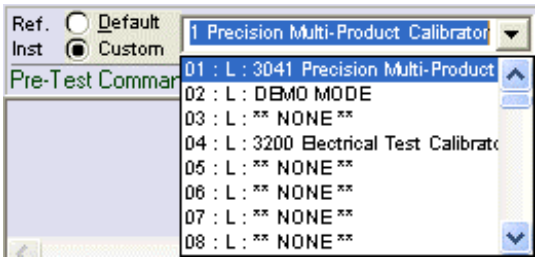


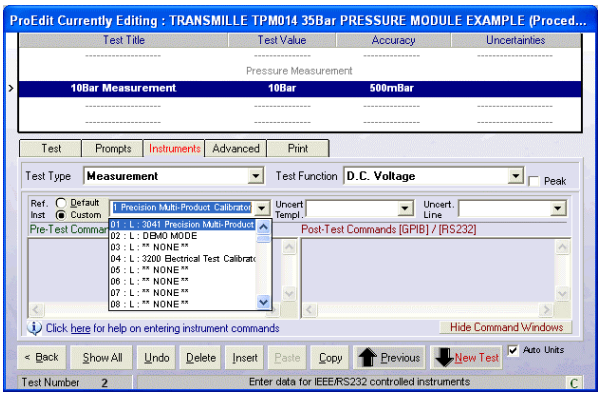
STEP 5

Select the **INSTRUMENTS** tab

Set the Ref. Inst. to
01 : L : 3041 Precision Multi-Product Calibrator

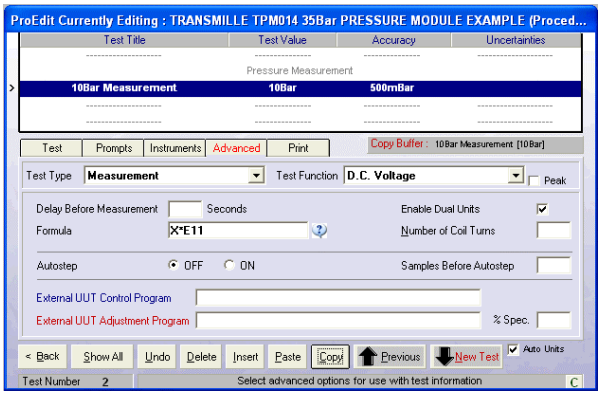
Note : If the first item in the list is not correct, this can be changed on the ProSet Traceable instrument screen.





STEP 6

Select the **ADVANCED** tab



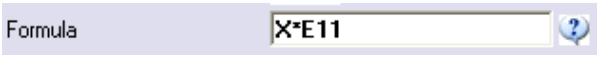
Scale Factor Calculation :

(Transducer Range) / (Output voltage)

For example a 35 Bar transducer with a 5 Volt output the scale factor is 35/5 = 7.

Example Formula : 35Bar Pressure Module :

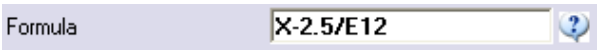
Set the **formula** to **X*E11**



X = Current test
E11 = Traceable instrument 11 scale factor
(as set in ProSet)

Example Formula : -1 to +1 Bar Pressure Module :

Set the **formula** to **X-2.5/E12**



X = Current test
2.5 = 0 Bar output of transducer
E12 = Traceable instrument 12 scale factor
(as set in ProSet)

Note : This transducer has a 2.5V output at 0 Bar, therefore this formula includes the subtraction of this 'zero' output voltage (a transducer with a positive or negative only output requires the formula as per the 35Bar transducer example)

Using the **Exx** command, the scale factor is used from the central instrument traceability list as created using ProSet. When the pressure module is recalibrated the scale factor can be updated in ProSet without having to change any procedures which are using this pressure module.

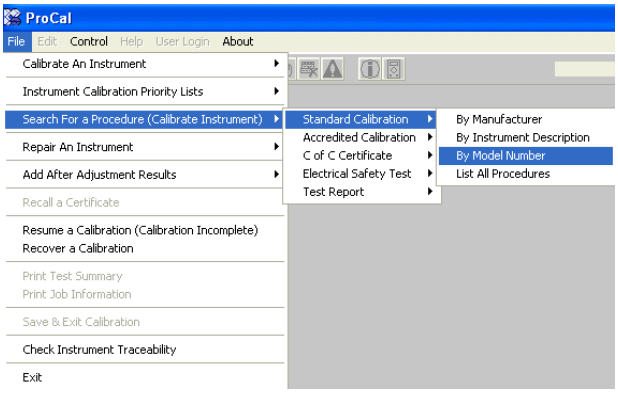
Tick the **'Enable Dual Units'** option

This allows the measurement in voltage to be scaled using the formula and displayed in Bar.

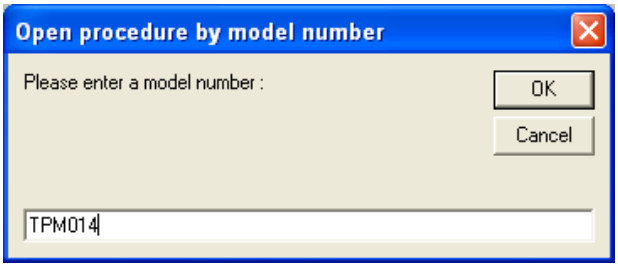
Run the procedure using ProCal

STEP 1
Start a calibration by selecting a procedure :

File > Search For a Procedure > Standard Calibration > By Model Number

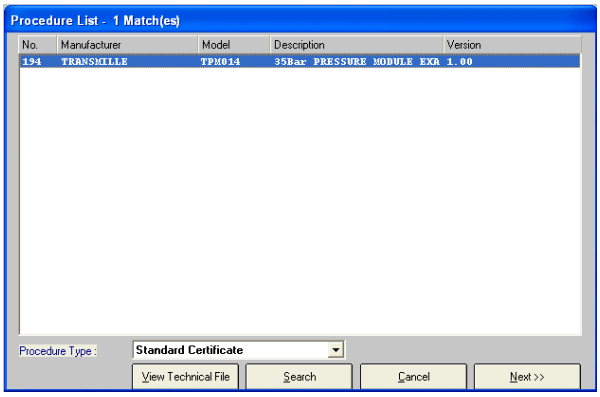


Enter instrument model number :



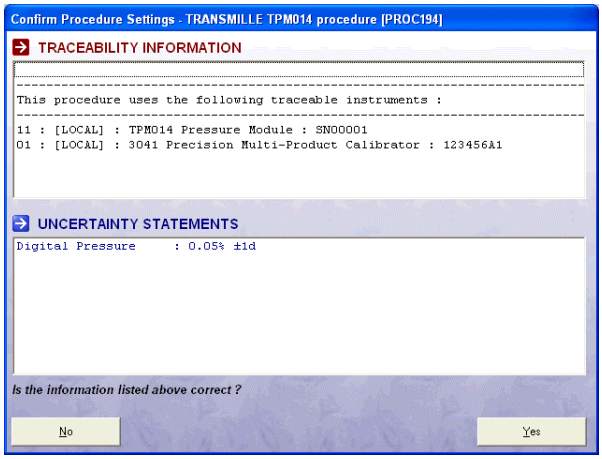
STEP 2

Select the procedure :



Click Next > to proceed

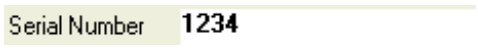
ProCal will confirm the traceable instruments and the uncertainty statements to be used :



Click YES to proceed.

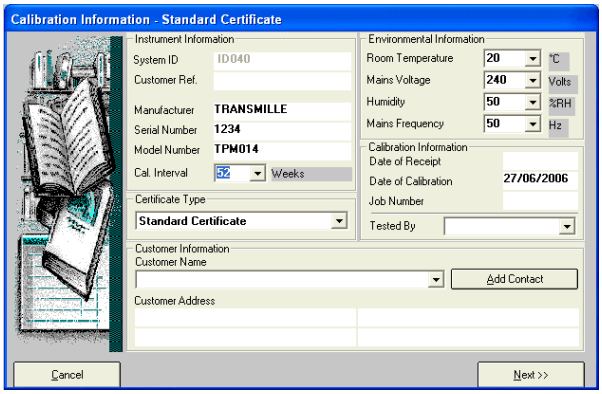
STEP 3

Enter the serial number



Enter the calibration interval in weeks

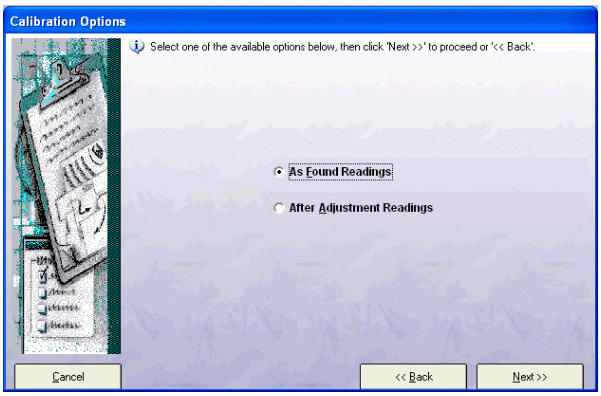
(or enter 'test' information for a test run – serial number and calibration interval must be entered)



Click Next > to proceed

STEP 4

Set 'As Found' results to be taken



Click **Next >** to begin testing

STEP 5

The test will be displayed, measuring back from the pressure module and displaying the value in Bar