

# **ProCal** Calibration Software User Guide

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# Introduction to ProCal

# **General Overview**

ProCal is a suite of programs designed to provide the tools to calibrate all types of instrumentation and equipment, with virtually no limitations on the types of measurements recorded. It provides the facilities to configure the basic system, to create and manage test procedures and also perform measurements or allow entry of measurements made independently which are stored within an organised database for producing printed or electronic certificates (i.e. viewable on screen).

This Suite of programs consists of the following:

# ProSet

ProSet provides the facility to configure the system, including the certificate numbering, setting the reference instruments to be used by the system, laboratory Information, user, program and database paths for use on a network etc.

ProSet also provides the ability to customise user preferences, profiles can be set up for the system ,assign users login names and passwords, as well as individual user access permissions and the users level of access.

Note: If the software is installed to be used on a network, ProSet MUST be used to set the COM ports and instruments up, BEFORE ProCal is used. If the software is only being used on a single workstation then ProCal can be used without first setting up ProSet.

## ProEdit

ProEdit is the procedure management program and allows the creation of a list of tests to be performed for a specific instrument. The procedures can also contain specific instructions on how to test an instrument by using picture, text or video prompts. A procedure can provide information for remote control of instruments using either GPIB (General Purpose Instrument Bus) or RS232.

There are complete tools for editing, copying and deleting the procedures; there is also a powerful, yet easy to use Procedure Builder Wizard for the automated writing of procedures for a range of different equipment.

# ProCal

ProCal is the program which ties together all aspects of the system, allowing the user to select a procedure and perform measurements with automated control of equipment where configured. This program is designed to guide the user through the series of tests, and incorporates the facilities to display help and prompts throughout the test sequence. ProCal can also be configured to produce printed certificates and calibration / test labels at the end of a test procedure.

ProCal can also allow integration with ProCal-Track, which incorporates job management from goods-inwards, to paperwork printing and final despatch.

### **ProCert**

Provides the facility to print out certificates, which have been recorded and stored using ProCal. These certificates are easily searchable for by their certificate number, customer name and more.

# **Crystal Reports [Optional]**

The Crystal Reports software is used to edit the templates for reports and certificates. This software is not needed to use the templates provided within the ProCal software.

## Setting up a System

1: Install the programs:

Note that when you install the software, additional files containing procedures, reports, digital pictures, uncertainty templates and an example database containing a few instruments are also installed. Even paths and directories etc are set to the local drive allowing the program to be used directly for either evaluation or training without any further set up besides selecting a calibrator in ProSet.

- 2: Configure the system using the ProCal Wizard (plus advanced options using ProSet)
- 3: Connect up calibrator & reference instruments: Use either the USB interface (or RS232 to USB converters) or the GPIB (IEEE488) interfaces.
- 4: Run ProCal to calibrate an instrument.

# **Installing the programs**

#### INSTALLATION OVERVIEW

The CD provided has both ProCal and ProCal-Track, which have separate installation programs. Please follow the instructions below to install the programs and example files :

This disk contains the full program versions together with many support files, uncertainty templates and tables for ISO17025, procedures, reports/certificates files in Crystal Reports, etc. plus an example instrument database with 5 instruments, which can be used as examples to evaluate the software.

Note to use GPIB control of instruments a NI GPIB(IEEE488) interface will be needed. To control a Transmille calibrator, use the USB Interface (or USB to RS232 converter if a Serial device). To evaluate without a system calibrator or DMM select **DEMO** for instruments in ProSet.

The software will work fully for 60 days after installation. After this time a USB 'dongle' will be required to run ProCal and ProCal-Track (separate licence required). The dongle is supplied by Transmille when the software is purchased.

#### **INSTALL PROCAL FROM THE CD**

Put the Transmille CD in the drive, and allow to auto run

SOLUTIONS IN CALIBRATION	SOLUTIONS IN CALIBRATION
	CAL CALIBRATION SOFTWARE
CALIBRATOR VIRTUAL PANEL / UTILITY SOFTWARE >	ROCAL ADD-ON SOFTWARE
	RCK LRB MRNRGEMENT SOFTWRRE
RODITIONAL SOFTWARE - 2090 / PAT / USB / PRINTERS -	SALES MANAGEMENT SOFTWARE
	PREVIOUS MENU
EXIT	EXIT

Step through the licence information and program group setting, then click **Install** to proceed :



# **PROCAL SETUP WIZARD : INTRODUCTION**

Following the ProCal installation, the computer may need to be restarted.

After the restart (if needed) the ProCal installer will automatically start the ProCal Setup Wizard.

The ProCal Setup Wizard will guide the user through setting up the software for the first time. It is also useful to run if any changes to setting are required at any time after the initial installation.

# **INSTRUMENT DETECTION**

If any Transmille USB instruments or USB to RS232 adapters (FTDI type) are connected to the PC, the Wizard will detect and store the device information, ready for selection whilst configuring the system reference instruments.





The Wizard provides step-by-step assistance in configuring reference instruments, laboratory settings and other important settings in one easy to use program. If at any time information is not correctly entered, the Wizard will assist with help messages to indicate which information is not correct, ensuring the program is correctly set up ready for use on completion of the Wizard 11-step process.

V	ProCal Setup Wizard	Enter Se	<b>1 of 11</b> ttings for System MUL	.TI PRODUCT	CALIBRATOR
÷	<u>Step 1 : Multi Product Calibrator</u> Step 2 : Multimeter	○ NONE ○ DEMONSTRATIO ● CONFIGURE INS	ON MODE (Instrument o TRUMENT	peration will be	simulated for demo purposes)
	Step 3 : Scope Calibrator	Description	1000A Portable Multi Funct	tion Cailbrator 👻	Auto Transmille Model 1000a
	Step 4 : Electrical Calibrator	Serial Number	1234		<
	Step 6 : Frequency Meter	Interface	Auto USB C GPIB	Transmille Mode	1000a Version 12.0.25 Serial 1234
	Step 7 : Laboratory Details	Certificate Number	1234		
	Step 8 : Certificate Format	Calibration Date	01/01/14		
	Step 9 : Cert Numbering	Calibration Interval	52 💌 Weeks		
	Step 10 : Language Step 11 : GPIB Device	X <u>C</u> ancel	i About	← <u>B</u> ack	→ Next

Step 1 - Set up the system multi product calibrator.

#### NONE

If you do not require a multi product calibrator to be configured in your software click NONE

#### **DEMONSTRATION MODE**

If the software is being used without any instruments connected, the DEMONSTRATION MODE setting can be selected to simulate the operation of the software without controlling a calibrator.

### SETTING UP A CALIBRATOR

#### Description and Serial Number

Select the instrument from the list displayed on the right hand side of the screen and click **AUTO SET**, or select the instrument description from the list and enter instrument serial number.

Interface Set Auto USB if the instrument is USB controlled or GPIB (enter address) if the instrument is GPIB controlled.

*Certificate Number* Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

Calibration Interval Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard	Enter Settings for System MULTIMETER
√ →	Step 1 : Multi Product Calibrator <u>Step 2 : Multimeter</u>	<ul> <li>NONE</li> <li>DEMONSTRATION MODE (Instrument operation will be simulated for demo purposes)</li> <li>CONFIGURE INSTRUMENT</li> </ul>
	Step 3 : Scope Calibrator Step 4 : Electrical Calibrator Step 5 : R/C/L Bridge	Description 8081 Multimeter Auto Transmille Model 8081 V Serial Number J1140J12
	Step 6 : Frequency Meter Step 7 : Laboratory Details Step 8 : Certificate Format	Interface  Auto USB  GPIB Certificate Number 12345 Calibration Date 01/02/14
	Step 9 : Cert Numbering Step 10 : Language Step 11 : GPIB Device	Calibration Interval 52 Veeks

Step 2 - Set up the system multimeter.

#### NONE

If you do not require a multimeter to be configured in your software click NONE

#### **DEMONSTRATION MODE**

If the software is being used without any instruments connected, the DEMONSTRATION MODE setting can be selected to simulate the operation of the software without controlling a multimeter.

#### SETTING UP AN INSTRUMENT

#### Description and Serial Number

Select the instrument from the list displayed on the right hand side of the screen and click **AUTO SET**, or select the instrument description from the list and enter instrument serial number.

Interface Set Auto USB if the instrument is USB controlled or GPIB (enter address) if the instrument is GPIB controlled.

Certificate Number Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

Calibration Interval Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard	STEP 3 of 11 Enter Settings for System OSCILLOSCOPE OPTION / CALIBRATOR
✓ ✓	Step 1 : Multi Product Calibrator Step 2 : Multimeter	<ul> <li>NONE</li> <li>DEMONSTRATION MODE (Instrument operation will be simulated for demo purposes)</li> <li>CONFIGURE INSTRUMENT</li> </ul>
$\rightarrow$	Step 3 : Scope Calibrator	Description 3000 Oscilloscope Calibration Module -
	Step 4 : Electrical Calibrator	
	Step 5 : R/C/L Bridge	
	Step 6 : Frequency Meter	
	Step 7 : Laboratory Details	LINKED TO MOLTI PRODUCT CALIBRATOR
	Step 8 : Certificate Format	
	Step 9 : Cert Numbering	
	Step 10 : Language	
	Step 11 : GPIB Device	▲         ▲         ▲         ▲ <u>Cancel</u> <u>About</u> <u>Back</u> <u>N</u> ext

Step 3 - Set up the system oscilloscope option / calibrator.

#### NONE

If you do not require a oscilloscope option / calibrator to be configured in your software click NONE

#### **DEMONSTRATION MODE**

If the software is being used without any instruments connected, the DEMONSTRATION MODE setting can be selected to simulate the operation of the software without controlling a calibrator.

### SETTING UP AN INSTRUMENT

#### Description and Serial Number

Select the instrument description from the list and enter instrument serial number. NOTE : To configure the Oscilloscope option for Transmille calibrators, simply select 3000 Oscilloscope Calibration Module and the traceable information will be linked the calibrator as set in Step 1 automatically.

Interface

Set **Auto USB** if the instrument is USB controlled or **GPIB** (enter address) if the instrument is GPIB controlled.

*Certificate Number* Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

Calibration Interval

Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard	Enter Settings for System ELECTRICAL TEST CALIBRATOR
~	Step 1 : Multi Product Calibrator	C NONE
~	Step 2 : Multimeter	© CONFIGURE INSTRUMENT
~	Step 3 : Scope Calibrator	Description 3200A Electrical Test Calibrator (HI)  Auto Transmille Model 3200A
÷	Step 4 : Electrical Calibrator	Serial Number 1234 <<
	Step 5 : R/C/L Bridge	
	Step 6 : Frequency Meter	Interface   Auto USB
	Step 7 : Laboratory Details	Certificate Number 1234
	Step 8 : Certificate Format	Calibration Date 01/04/14
	Step 9 : Cert Numbering	Calibration Interval 52 💌 Weeks
	Step 10 : Language	
	Step 11 : GPIB Device	▲         ▲         ▲         ▲ <u>Cancel</u> <u>About</u> <u>Back</u> <u>Next</u>

Step 4 - Set up the system electrical test calibrator.

#### NONE

If you do not require a electrical test calibrator to be configured in your software click NONE

#### **DEMONSTRATION MODE**

If the software is being used without any instruments connected, the DEMONSTRATION MODE setting can be selected to simulate the operation of the software without controlling a calibrator.

### SETTING UP AN INSTRUMENT

#### Description and Serial Number

Select the instrument from the list displayed on the right hand side of the screen and click **AUTO SET**, or select the instrument description from the list and enter instrument serial number.

Interface

Set Auto USB if the instrument is USB controlled

*Certificate Number* Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

Calibration Interval Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard	Enter Settings for System R/C/L BRIDGE
~	Step 1 : Multi Product Calibrator	C NONE
~	Step 2 : Multimeter	CONFIGURE INSTRUMENT
~	Step 3 : Scope Calibrator	Description 4263 LCR Meter
~	Step 4 : Electrical Calibrator	Serial Number 1234
÷	<u>Step 5 : R/C/L Bridge</u> Step 6 : Frequency Meter	Interface C Auto USB C GPIB : Address 10 -
	Step 7 : Laboratory Details	Certificate Number 1234
	Step 8 : Certificate Format	Calibration Date 01/01/14
	Step 9 : Cert Numbering	Calibration Interval 52 💌 Weeks
	Step 10 : Language	
	Step 11 : GPIB Device	Cancel     About     Back

Step 5 - Set up the system R/C/L Bridge.

#### NONE

If you do not require an R/C/L Bridge to be configured in your software click NONE

#### SETTING UP AN INSTRUMENT

#### Description and Serial Number

Select the instrument description from the list and enter instrument serial number.

# Interface

Set Auto USB if the instrument is USB controlled

*Certificate Number* Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

*Calibration Interval* Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard	Enter Settings for System FREQUENCY METER
~	Step 1 : Multi Product Calibrator	C NONE
√	Step 2 : Multimeter	CONFIGURE INSTRUMENT
$\checkmark$	Step 3 : Scope Calibrator	Description 8600 Frequency Reference
~	Step 4 : Electrical Calibrator	Serial Number 12345
~	Step 5 : R/C/L Bridge	
$\rightarrow$	Step 6 : Frequency Meter	Interface   Auto USB C GPIB
	Step 7 : Laboratory Details	Certificate Number 12345
	Step 8 : Certificate Format	Calibration Date 01/08/14
	Step 9 : Cert Numbering	Calibration Interval 52 💌 Weeks
	Step 10 : Language	
	Step 11 : GPIB Device	▲         ▲         ▲           Lancel         About         Back         Next

Step 6 - Set up the system frequency meter.

#### NONE

If you do not require a frequency meter to be configured in your software click NONE

### SETTING UP AN INSTRUMENT

#### Description and Serial Number

Select the instrument description from the list and enter instrument serial number.

# Interface

Set Auto USB if the instrument is USB controlled

*Certificate Number* Enter the certificate number of the instrument

Calibration Date Enter the calibration date of the instrument in the format dd/mm/yy

*Calibration Interval* Enter the calibration interval of the instrument in weeks

V	ProCal Setup Wizard		7 of 11 Aboratory det	AILS	
		Laboratory Information			
$\checkmark$	Step 1 : Multi Product Calibrator	Laboratory Number	0324		
$\checkmark$	Step 2 : Multimeter	Certificate Title	Transmille Ltd.		
~	Step 3 : Scope Calibrator	Laboratory Address	Transmille Ltd.		
~	Step 4 : Electrical Calibrator		Unit 4 Select Business Centre		
~	Step 5 : R/C/L Bridge	Kent. TN12 0QW.			
~	Step 6 : Frequency Meter		Tel: 01580 890700	Fax : 01580 890711	
$\rightarrow$	Step 7 : Laboratory Details	Signatories			
	Step 8 : Certificate Format	1) Signatory 1	2) Signa	tory 2 3)	Signatory 3
	Step 9 : Cert Numbering	4) Signatory 4	5) Signa	tory 5	
	Step 10 : Language				
	Step 11 : GPIB Device	<u>C</u> ancel	About	<u>B</u> ack	Next

Step 7 – Set laboratory details and up to five signatories.

V	ProCal Setup Wizard	STEP 8 of 11 SELECT CERTIFICATE FORMAT TO USE AS DEFAULT
✓	Step 1 : Multi Product Calibrator	
✓	Step 2 : Multimeter	BUILT-IN FORMAT (FIXED)
~	Step 3 : Scope Calibrator	
~	Step 4 : Electrical Calibrator	CRYSTAL REPORT TEMPLATE
✓	Step 5 : R/C/L Bridge	Standard Certificate rnt
✓	Step 6 : Frequency Meter	Standard Certificate. pt
$\checkmark$	Step 7 : Laboratory Details	
$\rightarrow$	Step 8 : Certificate Format	
	Step 9 : Cert Numbering	
	Step 10 : Language	
	Step 11 : GPIB Device	Cancel     About     Back

Step 8 - Set the certificate format.

## **BUILT-IN FORMAT (FIXED)**

This is a fixed format, designed to conform to M3003 / ISO17025 guidelines and uses the laboratory address / signatory information as set up in the Wizard (Step 7) and will print a custom company logo (set up via ProCert)

#### CRYSTAL REPORT TEMPLATE

ProCal installs a default certificate layout which can be edited using Crystal Reports editor software\*. The crystal report template uses the laboratory address / signatory information as set up in the Wizard (Step 7)

\*The full version of Crystal Reports is available separately (additional cost).

V	ProCal Setup Wizard	STEP 9 of 11 SET CERTIFICATE NUMBER & FORMAT
~	Step 1 : Multi Product Calibrator	
$\checkmark$	Step 2 : Multimeter	
$\checkmark$	Step 3 : Scope Calibrator	Set STANDARD CERTIFICATE Start Number C2019
$\checkmark$	Step 4 : Electrical Calibrator	
~	Step 5 : R/C/L Bridge	Set ACCREDITED CERTIFICATE Start Number
~	Step 6 : Frequency Meter	
~	Step 7 : Laboratory Details	
$\checkmark$	Step 8 : Certificate Format	
$\rightarrow$	Step 9 : Cert Numbering	
	Step 10 : Language	
	Step 11 : GPIB Device	▲         ▲         ▲         ▲           Cancel         About         Back         Next

Step 9 - Set start numbers for both STANDARD and ACCREDITED calibrations.

ProCal will increase by 1 the numbers set per calibration type, preserving any prefix or suffix alphabetical characters.

Examples:	00011 00012 00013
	C2019
	C2020
	C2021

V	ProCal Setup Wizard	STEP 10 of 11 SELECT LANGUAGE FOR SOFTWARE	
$\checkmark$	Step 1 : Multi Product Calibrator		
$\checkmark$	Step 2 : Multimeter		
$\checkmark$	Step 3 : Scope Calibrator	SELECT LANGUAGE	
$\checkmark$	Step 4 : Electrical Calibrator		
$\checkmark$	Step 5 : R/C/L Bridge	English 🔹	
$\checkmark$	Step 6 : Frequency Meter	·	
$\checkmark$	Step 7 : Laboratory Details		
$\checkmark$	Step 8 : Certificate Format		
$\checkmark$	Step 9 : Cert Numbering		
$\rightarrow$	Step 10 : Language		
	Step 11 : GPIB Device	X         I         ←         → <u>Cancel</u> <u>About</u> <u>Back</u> <u>Next</u>	

Step 10 - Set language from the list of available translations.

Simply select the language from the list displayed.



Step 11 - Set ProCal GPIB support for National Instruments Internal (PC Card) and External (USB) devices.

Simply select YES to activate support.

Note : The latest National Instrument GPIB drivers need to be installed (available from www.ni.com)

# **PROCAL SETUP WIZARD : COMPLETION**

V	ProCal Setup Wizard	<b>SETUP WIZARD COMPLETE</b> PROCAL IS NOW CONFIGURED FOR USE
* * * *	Step 1 : Multi Product Calibrator Step 2 : Multimeter Step 3 : Scope Calibrator Step 4 : Electrical Calibrator	BASIC SETUP IS NOW COMPLETE. TO CONFIGURE ADVANCED SETTINGS PLEASE USE PROSET (OPTIONAL STEP)
$ \stackrel{\checkmark}{\checkmark} \stackrel{\checkmark}{\checkmark} \stackrel{\checkmark}{\checkmark} $	Step 5 : R7C/L Bridge Step 6 : Frequency Meter Step 7 : Laboratory Details Step 8 : Certificate Format Step 9 : Cert Numbering	→ <u>R</u> un ProSet
√ √	Step 10 : Language Step 11 : GPIB Device	XiiCancelAboutBack

Once all Wizard steps are complete, ProCal is ready for use.

The Wizard will allow the user to run ProSet to configure advanced settings if required, but this is optional and is not required to start using the software.

Note : At any time a previous step can be returned to during the Wizard setup process by clicking the **BACK** button. The Wizard can also be re-run at any time to change settings as required.

# **RUNNING THE PROGRAMS**

To start ProCal or ProCal-Track, click the Windows Start button, then click Programs. Next select the Transmille Software menu and choose a program to run.

💼 Transmille ProCal Calibration Software 🔹 🕨	ProCal - Automatically Check For Web Updates
	🔁 ProCal - Multi Discipline Calibration Software
	📩 ProCal User Manual
	🔁 ProCal-Tweak - Service Configuration Utility
	C ProCert - Certificate Printing Utility
	🗾 ProEdit - Procedure Management Software
	5 ProSet - ProCal Setup Utility
	🜃 ProWiz - ProCal Setup Wizard
	mi ProMigrate - Database Migration Utility
	🔀 Uninstall

From here select the program required. Note there can be more than one program open at a time – for example ProCal *and* ProEdit.

# BOOK IN AN INSTRUMENT WITH PROCAL TRACK.

Step 1 Start ProCal Track.

Step 2 Select Utilities → Goods Inwards - Book in Instrument(s)

ProCal-Track [User=S.A. Hawkins : Level=AD]						
File	Utilities	Calibration Reminders	Reports	User Repor		
	Good	s Inwards - Book in Instr	ument(s)	Ctrl+G		
	Proce	ss Paperwork				
	Despa	atch Instruments		Ctrl+D		

Type '1234' in the serial number box at the top of the screen then press enter. (This instrument is pre-installed in the database and known to ProCal).

Step 3 Click the BOOK IN button - ProCal Track can print either a Job Label or Job Sheet to identify the instrument.

Express Book-In By User S.A. Hawkins - EXISTING Instrument ID00002				
Enter / Scan Serial or ID Number >> 1234	Instrument Photo			
Certificate Address   Customer Address   Despatch Address   Add / Edit Address	22002			
Company Beta Calibrations				
Contact Mr. B. Burrows Tel No. 0123 456789 Fax No. 0123 456780	Cane .			
Address 2 Calibration House The Drive	2. 2			
Anytown Any County , AB12 3CD.				
Instrument Details				
	0000			
Manufacturer Fluke 💽 🛄				
Description Digital Multimeter (5 digit)  CANCEL BOOK IN	Instruments Booked In (This Session)			
Customer Ref N/A	Job No. Customer Manufacturer Model No.			
Serial Number 1234				
Job Information				
Service Type A : Calibration Only  Cert Type B : Accredited Calibration				
Job No. R100814 Order No. Auto				
Cal. Interval 52 💌 Weeks Turn-Around 4 💌 Days				
Comments				
🔁 🗆 Fast Turn Around				
Mains Safety 🔲 Under Warranty 🔲 Damaged 🔲 Quote Regid 🔲				
Recall Last Customer 🦵 Recall Last Inst Details 🦵 Recall Last Job info 🦵	Exit			

Existing Address Information Detected					
The following address information is set for this instrument :					
Certificate : Beta Calibrations Customer : Despatch : Beta Calibrations					
Are these correct?					
Click YES to book in or NO to change an address.					
Yes No					

Click YES to confirm the address settings are correct (this added step allows the user to double check the address settings before committing to book in the instrument)

# CALIBRATE AN INSTRUMENT

# STEP 1 Start ProCal

**STEP 2** Select File  $\rightarrow$  Instrument Calibration Priority Lists  $\rightarrow$  List all Instruments (Active Jobs)

🎢 ProCal - Evaluation [User Name=S.A.	Hawkins : User Level=ADMINISTRATOR]
File Edit Control Help User Login About	
Calibrate An Instrument	
Instrument Calibration Priority Lists	List All Instruments (Active Jobs)
Search For a Procedure (Calibrate Instrument)	List Instruments Awaiting Calibration
Repair An Instrument	List Instruments Awaiting Repair
Add After Adjustment Results	List Instruments For a Specific Customer

STEP 3 Click on the Fluke 187 (serial number 1234) booked in previously and click Next >>

Instrument Calibration	n Priority List			×
Date of Receipt [Return]	Customer Name	Status Model Number	Serial Number	Job Number
18/08/2014 [4]	Beta Calibrations	E Example	1234	R100814
Cancel			Refresh List	Calibrate Instrument
ck 'Calibrate Instrument				Ī

**Step 4** The calibration information screen is now displayed, Drop down the 'Tested By' box and select name or type in manually then click Next >>

nstrument In	formation	Environmental Information
iystem ID	ID 00002	Room Temperature 20 💽 °C
Customer Ref.	N/A	Mains Voltage 240 🚽 Volts
Manufacturer	Fluke	Humidity 50 - %RH Mains Frequency 50 - Hz
Aodel Number	187	Calibration Information
Cal. Interval 52 💌 Weeks		Date of Receipt 18/08/2014 Date of Calibration 18/08/2014
Certificate Ty	pe	Job Number R100814
Standard Ce	rtificate 🗾 💽	Tested By S.A. Hawkins
Customer Info Customer Name Beta Calibra Customer Addre	tions	✓ <u>Add Contact</u>
Calibration	House	The Drive
Calibration		A

**STEP 5** The list of procedures matching the model number will be displayed. Select procedure then click **Next >>**.

P	lease c	onfirm the procedure fo	or instrumen	t 'ID00002'			
	No.	Manufacturer	Model	Description		Version	
	61	Fluke	187	Digital Multi	imeter	1.10	
			Pro	cedure Type :	Standard Certi	ficate	•
		<u>C</u> ancel	ical File	<u>S</u> earch	<< <u>B</u> ack		<u>N</u> ext>>

**STEP 6** The next window lists reference instruments and uncertainty information. (Note : In DEMO mode, Traceability Information will indicate **None Selected**) Click **Yes** to proceed.

Confirm Procedure S	ettings - Fluke 187 procedure [PROC61]	
	Y INFORMATION	
This procedure	uses the following traceable instruments :	
	None Selected	
	Y STATEMENTS	
D.C. Voltage	: 0 to 1000V: 0.002% ± 1digit	^
A.C. Voltage	: 0 to 1000V: 0.01% ± 1digit	
A.C. Current	: 0 to 10%: 0.008% ± 1digit : 0 to 10%: 0.02% ± 2digit	=
Resistance	: 0 to 10MOhms 0.005% ± 1digit: 10Mohms to 1Go	hm 0.4
Capacitance	: 10pF to 10000uF 0.1% $\pm$ 1.5pF $\pm$ 1 digit	
Frequency	: 0.1ppM ± 1digit	<b>~</b>
Is the information	listed above correct ?	
<u>N</u> o		Yes

**STEP 7** The next window asks if As Found or After Adjustment Readings - click As Found Readings, then click Next >>.

Calibration Options		
Select one of the available options below, then click 'Next >>' to proceed As Found Readings C After Adjustment Readings	d or '<< Back'.	
<u>C</u> ancel	<< <u>B</u> ack	<u>N</u> ext>>

**STEP 8** : Prompt for first test is displayed - Click Next >.



**STEP 9** Tests 2, 3, 4 and 5 are YES / NO type tests – select **YES** for each of these tests.

0.	Test Title	Test Value	Reading	% Spec	
	General Operati	ion Tests			^
	Diode Test Bar Graph Backlight  DC Voltage	Blan	k Line		æ
D	50mV D.C. Range 500mV D.C. Rang 3000mV D.C. Ran	e ge nge			*
D	50mV D.C. Range 500mV D.C. Rang 3000mV D.C. Rang YES	e ge nge		NO	

**STEP 10** Test 8 displays a picture prompt, demonstrating the graphical capabilities of ProCal in aiding the user.

Click **Next >>** to continue.



Tests 8 and above are **METER** type tests with keyboard entry of the value – Type in the reading from the meter display and click **Next >>** to go to the next test.

Selec Enter	ct 50mV D.C. Range rvalue displayed on meter (with	out units).			LOTFASSED
No.	Test Title	Test Value	Reading	% Spec	
1	General Operation Te	sts			~
2	Continuity Bleeper		Pass	100 m	
3	Diode Test		Pass	777	
4	Bar Graph		Pass	1000	
5	Backlight	3 <u></u>	Pass	1 <u>1111-14</u>	
6		Blan	k Line		
7	DC Voltage	000000000000000000000000000000000000000		- 75	
8	50mV D.C. Range	49.000mV	48.996mV	6	
9 10	500mV D.C. Range 3000mV D.C. Range				×
E	AllManual Ir	nput > 48.996	< M	anual Input	FAIL
- ñi	0₩) 69uV	1 49.0	100mV I	69uV	(HIGH)
100	المأبيل المالية المالية			<sub>100</sub>         <sub>150</sub>	
æl I	82ppm				

**STEP 11** To finish at any time select Control  $\rightarrow$  Finish Calibration.



**STEP 12** When the last test is reached, the test Review Screen is displayed - Click Next >> (if a message stating some tests are not completed appears, simply click YES to proceed)

Re	viev	v Calibration Results - Te	sts Incomplete	- Procedure P	ROC61			
	Ca Test	alibration Res s Incomplete : 57 Tes	<b>ults (As</b> ts Marginal Pass : 0	Found)	iiled : O			Uncertainty Control
	No.	Test Title	Test Value	Reading	As F % Spec	ound Uncert.		Paner
	1 2 3 4 5 6	General Operation Tes Continuity Bleeper Diode Test Bar Graph Backlight	ts    Blank	Pass Pass Pass Pass Line	  			Export Uncertainties to PROC61
	7 8 9 10 11 12 13	DC Voltage 50mV D.C. Range 500mV D.C. Range 3000mV D.C. Range 5V D.C. Range 50V D.C. Range 500V D.C. Range	49.000mV 490.00mV 2900.0mV 4.9000V 49.000V 49.000V	48.998mV 489.99mV 2900.1mV 4.8999V 49.000V 490.00V	3 6 8 5 0			Import Uncertainties from PROC61
	14 0 R	1000V D.C. Range Click on any test to repeat. ecover Results		0	Current View	w All Tests Back	✓ ✓ <u>N</u> ext >>	Set Procedure as Verified PROC61

t	Comments' and select the required file. T he button marked ''	o edit the contents of	the 'drop down'	lists click	t on
Calibra	ated to manufacturers specificati	on at the measure	d points	•	
Specif	ication Reference: Part No 1584	337 Rev 1 6/02		•	
				•	
				•	
				•	

STEP 13 Enter / select certificate comments - Click Next >>

**STEP 14** Services, Parts Used & Engineers Report, Job Comments & Quote - click **Next >>** to step through each tab and proceed to the status screen.

Services Screen Parts Used Screen Engineers Report Screen

distantial -	Additional to the second secon	CONCERNAL.
The any regularized between been. To not be revealed of the 'depretant' tobulat, or the behaviored	The any report of Honoles Sets. To all he present of he bay that had all perfect, how and	The second secon
Note: (reclam) (reclam) from (reclam)         Set (reclam)         Set (reclam)         Set (reclam)           Set (reclam)         Set (reclam)         Set (reclam)         Set (reclam)         Set (reclam)           Set (reclam)         Set (recla	Internet         Finite United Statements (ad Lanuers). Scatel         Finite United Statements (ad Lanuers). Scated Stated Statements (ad Lanuers). Scated Statements (ad Lanuers	Terrent Restored Commission Landowers ( Dere )
	Junited Street	tage.ur
11246 344 14	- East Bar	A CONTRACT OF A
<ul> <li>Construction</li> <li>Development of the sector of the logic line o</li></ul>	Al Married Ke.	
Termine ( Monthead Conference on Conference	Tantine ( Park Lead Taginas Rapol ) spicences. New. ) Tantine ( er	
Frank Society Ed. (The Theor Fragment	Inter Link base	
-		-

Job Comments Screen Quote Screen

Note : If no services are selected, ProCal may display a message :

Simply click **Yes** to confirm no chargeable services are required for this particular instrument

(?)	There are no charge	able services	selected for this
4	- is this correct?		

**STEP 15** Set instrument status - if unfinished, calibration complete will be disabled. Use 'Other' and manually select **M Cal. done - awaiting paperwork** then click **Next >>** 



**STEP 16** Click Finish to assign certificate number and save the calibration.

Note : To assign a manual certificate number, click Enter Number Manually



STEP 17 To print the certificate, click OK or click Cancel to print later using ProCert.

Number of Copies	Paint Options	SIMA
« <b>1</b>	Program Calibration Carificate(s)	Restr
· 2		
r 3		
C More	T Part Certificate of Conformation	
	IT Per Label(i) IT Per Ed Due?	Gencel
	All-accelSetters	

Note : This option to print can be enabled / disabled using ProSet -> Program Options

# **DESPATCH AN INSTRUMENT WITH PROCAL TRACK**

**STEP 1** Start ProCal-Track : Select Utilities  $\rightarrow$  Process Paperwork.

<i>1</i> 5 p	roCal-T	rack [User Name=S	i.A. Haw	kins : Use
File	Utilities	Calibration Reminders	Reports	User Repor
	Good	s Inwards - Book in Instr	ument(s)	Ctrl+G
	Proce	ss Paperwork		
	Despa	atch Instruments		Ctrl+D

A list is displayed of instruments ready for paperwork processing.

Click on the Fluke 187 calibrated previously and select the required paperwork items, then click Print Paperwork.

System (D	Manufacturer	Model Number	Serial Number	Deccliption	Customer Namer
fb00802	F10ke	167	1234	Digital Hul-	Beta Calibrati.
I naturents lated	ave set to 'M : Cal. Done	- Awaling Paper	wadi.'		1 Job Completion Fr
il instruments loted ielect instrument(s) r Close to return to	ate set to 'M ( Cal Done from the list above, then main menu	- Awaling Paper dick Pint Paper	wak! waili to proceed		(R) Job Completion Fo (R) Service Log (R) Latest Certificate

**STEP 2** Select Utilities  $\rightarrow$  Despatch Instruments

🖉 ProCal-Track [User Name=S.A. Hawkins : Use				
File	Utilities	Calibration Reminders	Reports	User Repor
	Goods Inwards - Book in Instrument(s)			Ctrl+G
	Proce	ss Paperwork		
	Desp	atch Instruments		Ctrl+D

A list is displayed of instruments ready to despatch - Click on the instrument to produce a despatch note.

Instrument	Dispatch Confirmation				
細	J. To dispatch an instrument entropy (multiple selections are valid), the selection of t	r a system ID or choose from hen olick @ispatch Instrumer	the completed /	l joba kat	
	Errier a System ID		Delvery Note Grindvickus (Drve Per Instrument) Cright Instrument Delvery Note Crigo Delvery Note		
ine 🗌	Customer Name	Customer Rel.	ModelNo.	Senal No.	Job No.
1-0	Sets Calibrations	N/A	187	-1734	8100014
	Close Addres	n Labek: 0 💌 🛛	Dispatch Note:	- T - []	Qispatch Instrument
Um Cerpann				18/08	/2014 12:29:34

🗃 Details For Inst	trument ID00002			
Account Number : Contact Name : Department Head :	A0002  Mr. B. Burrows	O Add Contact		
Company Name :	Beta Calibrations			-
Address :	2 Calibration House			
	The Drive			
	Anytown			
	AnyCounty, AB12 3CD.			
Telephone :	0123 456789	Site :	West Building	
Fax:	0123 456780	Dept. :	Engineering	
email :	email@beta.com	Location :	Room 15	
Comments				
				▼
	_			<b>•</b> •••
<u>C</u> ancel	Dispatched Via :	•	]	<u>D</u> ispatch

STEP 3 Confirm despatch information then click Despatch

# **STEP 4** Confirm Accessories

Accessories Despatch Screen			
ACCESSORIES DETECTED			
Accessories For Instrument : ID00002			
Manufacturer : Fluke Model No. : 187 Description : Digital Multimeter (5 digit) Serial No. : 1234			
Customer : Beta Calibrations Job Mumber : R100814			
R100814-1 Case / Cover			
<u>C</u> ancel	<u>0</u> K		

The software will confirm accessories are returned (if accessories set at time of booking in)

Tip : If the system is running with a barcode scanner connected, a label can be printed with a unique number for each accessory booked in - this label can then be scanned to confirm accessory return prior to the despatch paperwork being printed.

#### CALIBRATION EXAMPLE COMPLETED

This completes the cycle of calibration and the instrument status is returned to 'A - With Customer' – the calibration date & certificate number are updated automatically.

For more information please see the documentation installed with each program.

Please visit www.transmille.com for application notes and additional user documentation

# Setting up the system using ProSet

ProSet allows the user to configure the ProCal software suite to their specifications.

# The ProSet File Menu

<i>S</i> P	roSet [User Name=S.A	. Hawkins
File	User Login Help	
S	ystem Settings	Ctrl+S
Vi Ed	ew Instrument Traceability dit Instrument Traceability	
Vi	ew Uncertainty Templates	
Ec	dit Uncertainty Templates	
0	ertificate Information	Ctrl+I
Pt	rogram Options	Ctrl+O
U:	ser Access Permissions	Ctrl+U
C	heck Traceable Instruments	F1
	onfigure Label Printer	
Se	etup Network Licencing	
Pt	int Setup Information	
E:	xit	

#### Quick overview of the menu options:

# In System Settings

1: To begin with set the starting number to use for certificates. Note there are 5 certificate/report types; each with its own counter which will be incremented each time a certificate of that type is saved. If required, characters can be added before the certificate number, e.g. ABC1234. This allows for a different numbering system to be used for example for accredited certificate's verses standard certificates.

- 2: For Network systems it is necessary to set the paths for results, procedures etc.
- 3: If an IEEE488 card is installed click the type installed.
- 4: Select the relevant Language

# In Instrument Traceability

Enter the information about the calibrator & references to be used. This information will be passed on to the certificate automatically when that reference is used in a calibration. The instruments on the traceability list will need to be calibrated periodically to ensure the integrity of the results produced by ProCal.
Note: The traceable instruments are those that are kept in the laboratory and are used to calibrate all instruments that require calibration. These instruments will also need to be calibrated on an annual basis to ensure they output or receive the correct data.

Note the first 10 locations are for the system reference instruments, which ProCal will use as default. Use the 'add' button in the menu bar to add more reference instruments as required. On a networked system, reference standards can be placed on the server, which will make it available to all workstations.

Note: That for evaluation purposes a demo mode can be selected for the three main instruments e.g. calibrator, scope calibrator and DMM. This mode allows a procedure to be run without a calibrator connected.

#### **Certificate Information**

This section should contain the name and address of the laboratory, contact details and names of signatories for the laboratory etc.

#### **Program Options**

Allows the user to set the defaults modes & operations of ProCal. For example if a certificate is to be printed at the end of a calibration. Also for options like the menu function in ProCal to recall a certificate. The Program settings can via File->Program Options to tailor ProCal to the users specifications.

💻 Program Options		×
ProCal Default Startup Screen     No Default Screen On Startup		Show Last Cal. Inst. Information
Show 'Calibrate An Instrument By L.     Show 'Calibrate An Instrument By S     Show 'Calibrate An Instrument By B	The Instrument Information from the last calibration will be reloaded on the next calibration run.	
<ul> <li>Show Calibrate An Instrument By Jo</li> <li>Show 'Calibrate An Instrument By Jo</li> <li>Show 'Instrument Calibration Priority</li> <li>Show 'Search for a Procedure (Calil Note : The screen selected above will be sh</li> </ul>	Show Warning Messages ✓ Show <u>W</u> arning Messages Warning messages include uncertainty / traceability problems.	
the end of each calibration run. Print Defaults (End of Calibration Run) ✓ Show Certificate Printing Dialog ✓ Print Calibration Certificate(s) ✓ Print Certificate of Conformance(s)	Cest Fail Message Options No Test Fail Message Test Fail Message (Ignore Disabled) Test Fail Message (Ignore Enabled) The test fail message box has 3 buttons : Abort, Retry & Ignore.	Auto Select Calibration Option      No Auto Selected Option      Select 'As Found'      Select 'After Adjustment'      The 'Calibration Option' screen will be     shown with the above auto selected.
☑ Print Label(s) Default Number of Copies : 1	Certificate Recall Allow a certificate to be recalled for vie <u>Enable Certificate Recall Function</u>	wing / editing.
Status Code Monitoring Check status is OK before beginning calibration	Report Settings Enable Default Crystal Report Crystal Reports® UKAS Certificate.rpl	ort Name : t
Cancel		<u>D</u> K

## ProCal Default Start-up Screen

This allows the user to be presented with a default screen to minimise the menu selections required. For example if the job number were always used to begin a calibration, this screen would be selected as the default start-up screen. This helps to guide the operator through the program by automatically presenting the correct screen, which prompts the user to enter the required information – the job number in this example.

## **User Access Permissions**

Administrators can modify the list of users by selecting the menu item Utilities->Advanced->User Access Permissions. A list of users and their user levels is shown:

- User Access Permissions			
User Name Us Bert : E Mike : C Ernie : J	ser Level ENGINEER : DPERATOR : ADMINISTRATOR :	Password Mm123	
User Name User Level Pass <del>w</del> ord (Optional)	Bert ENGINEER	•	<u>A</u> dd a User <u>D</u> elete a User <u>C</u> lose

#### Add a User

Click "Add a User". The new user is now selected, Enter the user name, choose the user level from the drop-down list and choose a password if required.

#### Edit a User's Permissions

Select a user in the list and select the new user level from the User Level drop-down list.

#### Delete a User Button

Select a user in the list and click "Delete a User".

#### **Close Button**

Click "Close" when user update is finished. If the list is empty ProCal-Track will operate with an unnamed user with the level of Administrator and no password.

#### System Settings in detail

The system setting screen from File>System settings

Data Paths Programs Certificates : Procedures : Digital Photo's : Stock Data :	NSERVER\F \\SERVER\F C:\ProCal\In:	PUBLIC\PROCAL\CERTIFICATES PUBLIC\PROCAL\PROCEDURES strument Photos		
Miscellaneous Information System Number Marginal Pass Limit GPIB Card Information	1 90	Auto Numbering Information Last Used Certificate Numbers : Standard Certificate Number UKAS Certificate Number C of C Certificate Number	CM19689 16530 CC00001	
<ul> <li>Brain Boxes®</li> <li>National Instruments®</li> <li>None</li> </ul>		Test Report Certificate Number	TR0935 M100B3377	
Language Setting Language Eng	lish	To change the langulist then restart the	uage, select from t program.	ihe

## **Drive & Directory Information**

- Data Paths		
Programs :	C:\ProCal\Programs	
Certificates :	C:\ProCal\Certificates	
Procedures :	C:ProCal\Procedures	
Digital Photo's :	\\SnapServer\Share1\InstPhotos	
Stock Data :	C:\ProCal\Certificates	

This section can be used to set the location of data, although on installation of the ProCal software the directories and paths will automatically be set to the local drive which is usually the C: drive.

#### **Drive & Directory Information continued**

To enable use of the software with networked computers, the certificates and procedures paths should be used to link a workstation with a main storage server.

To enable ProCal to share the Certificates database it is necessary to set the Certificates, procedures and also the digital photo paths.

When initially installed on a single computer, these paths are set to point to the local ProCal installation as default i.e. C:\ProCal\xxx

Using ProCal on a Windows network means that one of the computer will need to be used as the default location to store data (known as the server). This means that all the data is stored on this computer and shared by every other computer (known as a workstation) on the network. To allow each workstation to use the server for data storage, the paths to the server need to be set.

Note: The location of the stored data (the server) should be backed up to a separate location on a daily basis as a precaution.

## Sharing the 'C' drive on the Server

To set the path across the network, the server computer must have its 'C' drive shared for access across the network.

Windows can achieve sharing the 'C' Drive:

1. On your desktop, double click on My Computer.



2. Right click on your 'C' Drive and choose SHARING (note: this will only be available if your computer is set up on a network).



3) Select Security and Sharing, set Shared Name as 'C:' <u>Do not enter a password</u>. Click OK to set.

Local Disk (C:) Properties 🛛 🕐 🔀					
General Tools Hardware Sharing Quota					
Local sharing and security					
To share this folder with other users of this computer only, drag it to the <u>Shared Documents</u> folder.					
To make this folder and its subfolders private so that only you have access, select the following check box.					
Make this folder private					
Network sharing and security To share this folder with both network users and other users of this computer, select the first check box below and type a share name.					
Share this folder on the network					
Share name: C					
Allow network users to change my files					
Learn more about sharing and security.					
Windows Firewall is configured to allow this folder to be shared with other computers on the network. <u>View your Windows Firewall settings</u>					
OK Cancel Apply					

Now the server 'C' drive is shared, this can be accessed across the network by the workstations.

## Setting up a Workstation

All that is now required is to set up each workstation to 'point' at the server. To do this, the name of the computer must be known - contact your IT administrator if you do not know this computer name.

This path will include the name of the computer on the network you will be using as the server. In this example the name of the computer being used as the server is LabServer.

Note: this name does not need to indicate it is a server; it is simply the name of the computer you are going to use for the main data storage.

For the certificates database, the path would be:

## \\LABSERVER\C\PROCAL\CERTIFICATES

For the procedures, the path would be:

## \\LABSERVER\C\PROCAL\PROCEDURES

For the digital photo's database, the path would be:

#### \\LABSERVER\C\PROCAL\CERTIFICATE

#### System Number

This is optional and will be recorded whenever this computer is used to perform a calibration.

#### **Marginal Pass Limit**

The marginal pass limit is 90% as default. This means that whenever a reading is made which is 90% or more of its specification (accuracy) then a certificate will display a marginal pass (where configured to show a Pass / Fail column). This value can be changed to any percentage required.

#### **GPIB Card Information**



This section allows a GPIB card to be configured for use by the ProCal software. This option should be set to 'None' unless your computer has a compatible GPIB card installed in the computer.

Note: To use either the Brain Boxes<sup>®</sup> or National Instruments<sup>®</sup> GPIB cards, the relevant drivers MUST be installed on the computer. The latest National Instruments<sup>®</sup> drivers are available to download from <u>www.ni.com</u>

## Auto Certificate Numbering Information

-Auto Numbering Information	
Last Used Certificate Numbers :	
Standard Certificate Number	CM19906
UKAS Certificate Number	16739
C of C Certificate Number	CC00001
Electrical Safety Test Number	ES120002
Test Report Certificate Number	TR0942
Last Used System ID :	T00101147

The auto numbering system allows the user to set a start point from which the computer will automatically 'count on' from, e.g.

If the sequence XYZ0010 were to be entered as the starting number, then the computer would use this sequence and count up accordingly to XYZ0011, XYZ0012, and XYZ0013 etc.

The different counters are available because a procedure can be set as a specific type of test, i.e. Standard Certificate, Accredited Certificate, etc. and each of these may want to have a different prefix.

Note: The reason for these different types is to provide an easy way for users to select procedures. ProCal allows a user to search for a specific type of procedure, and then to find a specific model number. This way the user is not presented with a large number of procedures to choose from.

Standard certificate: Categorises a traceable or commercial certificate.

Accredited Certificate: For accredited laboratories.

C of C Certificate: A Certificate of Conformance, or CertCon.

Electrical Safety Test: For procedures which are concerned only with testing electrical safety (e.g. Portable Appliance Test results).

Test Report Certificate: A test report, typically for new instrument testing on product lines or in ATE (automatic test equipment) systems where sub assembly testing is performed.

In addition to the certificate numbering system, the System ID counter can also be customised. This unique reference is given to every instrument and is used by the computer to link together all related information.

Note: It is recommended that this System ID counter is left as per the default and is not changed unless you are an experienced user.

## Language Setting

– Language Setting —			
Language	English	-	To change the language, select from the list then restart the program.

The ProCal suite of programs support multiple languages – if these are available on your system they will be listed in the drop down box. Simply select the language from this list. For the new language settings to be implemented, the program must be restarted.

Note: To apply the language change, any ProCal Suite program must be closed and restarted after selection.

## Traceability Information of Reference standards used.

In order for ProCal to control instruments and / or record information about instruments used for a calibration these instruments need to be added to the systems traceability list. The traceable instruments and reference standards are those instruments that are consistently used to calibrate all of the instruments that pass through the system.

This list can be found in ProSet by clicking File->View Instrument Traceability. The is comprised of a list of traceable instruments, with the first 10 instruments <u>reserved for specific types of instrument</u>:

🔊 Ins	trument Traceability [VIEW ONLY]			
No.	Model Number & Description	Serial Number	GPIB/RS232	Location
1	** NONE **	107842C6	COM4	L 🔨
2	** NONE **	2823A14830	18	L 🚍
3	** NONE **			L
4	** NONE ** ROOS Automatic Precision Bridge	925		L T
6	** NONE **	023		L
7	** NONE **			L 🔽
- Infor	mation For ** NONE ** [LOCAL]			
Instru	ument Model Number & Description	** NONE **	- •	Local
Seria	l Number	107842C6	0	Server
Certif	icate Number	15125		
Calib	ration Date	03/12/08		
Calib	ration Interval	52 🚽 Weeks		
СОМ	Port (COM1 to COM8) or GPIB Address (0 to 30)	COM4 🚽		
Meas	sured Value (Including Units) [Optional]		ante este este este este este este este e	
Unce	ertainty Template (Optional)	<b>v</b>	Edit Uncerta	inties
Instrum	ents : [1] = Multifunction Calibrator [2] = Multimeter	[3] = Oscilloscope Calibrator [7 to 10] = Rese	rved or	
	[4] = Electrical Test Calibrator [5] = Bridge (C / L	) [8] = Pressure Source [11+] = User		·

Instrument	Туре	ProEdit Test Type
1	Multi-Product Calibrator	Meter
2	Multimeter	Measurement
3	Oscilloscope Calibrator	Oscilloscope
4	Electrical Test Equipment Calibrator	Insulation Tester
		PAT
		RCD Tester
		LOOP Tester
5	Reserved for Future Use	N/A
6	Reserved for Future Use	N/A
7	Reserved for Future Use	N/A
8	Reserved for Future Use	N/A
9	Reserved for Future Use	N/A
10	Reserved for Future Use	N/A
11+	User defined instrument – no restriction	N/A

As the list indicates, the system instruments are used by ProCal to determine which instrument to use for a specific type of test.

Each instrument requires full traceability information to be entered, including interface address and measured value if relevant:

Instrument Model Number & Description	EA008 Electrometer	✓ O Local
Serial Number	TL907	Server
Certificate Number	14834	
Calibration Date	20/10/08	
Calibration Interval	52 💌 Weeks	
COM Port (COM1 to COM8) or GPIB Address (0 to 30)	СОМЗ 🖵	
Measured Value (Including Units) [Optional]		
Uncertainty Template (Optional)		Edit Uncertainties

## Instrument Model Number and Description

This is selectable from a drop down list for the first 10 system instruments. This list is linked to the available software drivers enabling communication to / from the specific instrument selected.

#### **Serial Number**

The Serial Number of an instrument should be entered here. If an instrument doesn't have a serial number then one can be entered manually.

#### **Certificate Number**

Enter the latest calibration certificate number for this instrument here.

#### **Calibration Date**

Enter the latest date of calibration here, in the format DD/MM/YYYY.

#### **Calibration Interval**

Enter the calibration interval in weeks here – this enables the system to calculate the recalibration date based on the calibration date and the calibration interval and warn the user that this instrument is out of its calibration period (or nearing that period – the length of warning before the next calibration is due can be set by the user e.g. 3 weeks).

## COM Port (COM1 to COM8 or GPIB Address 0 to 30)

Enter the relevant address for the instrument here. This field can be left blank if it is not required.

## Measured Value (Including Unit) [Optional]

This field is not valid for the first 10 instruments as the reference instruments use these places. It allows the measured value for a standard to be stored centrally to allow for easily updateable values, which may change from calibration to calibration.

# Note: The measured value will be used by ProCal as the nominal test value for tests where this standard is selected as the reference in the procedure.

## **Uncertainty Template**

Each traceable instrument can have a specific uncertainty template associated with it as default. This allows the system to be set up so that when a specific traceable instrument is used within a calibration and the uncertainty is calculated at test time, the uncertainty template selected here will automatically be incorporated into this calculation. For more information on uncertainty templates, see the section further on.

## Local / Server Storage

The local / server option allows an instrument's information to be stored on the designated server computer. This allows several workstations to share the same instrument information, and avoids the need to enter duplicate information on several workstations.



## Setting up instrument Uncertainties

Each traceable instrument can have a table of uncertainties assigned to it, which can be accessed by clicking the Edit Uncertainties button

Luit oncertainties							
Jncer	taint	ies For Model xxx 3458A Multimeter					
	No.	Range (must end with valid units, eq V. A. *C)	Imported U	ncertaintv	Stability of R	eference	
			% Reading	Zero	% Reading	Zero	
	1	DCV : 0 to 100mV	0.0002	0.44uV	0.0005	1uV	
	2	DCV : 100mV to 1V	0.0002	0.44uV	0.0004	1uV	
	3	DCV : 1V to 10V	0.0003		0.0004	2uV	1
	4	DCV : 10V to 100V	0.0003		0.0006	30uV	1
	5	DCV : 100V to 1000V	0.0003		0.0006	100u¥	1
	6	DCI: 0 to 100nA	0.00235	20nA	0.003	.04nA	1
	7	DCI: 100nA to 1uA	0.00235	20nA	0.002	.04nA	1
	8	DCI : 1uA to 10uA	0.00235	20nA	0.002	.4nA	1
	9	DCI : 10uA to 100uA	0.00235	20nA	0.002	0.8nA	1
	10	DCI : 100uA to 1mA	0.000384		0.002	5nA	1
	11	DCI: 1mA to 10mA	0.000437		0.002	50nA	1
	12	DCI: 10mA to 100mA	0.000497		0.0035	500nA	1
	13	DCI: 100mA to 1A	0.000909		0.011	10uA	
	14	ACV : 0 to 10mV (1Hz to 40Hz)	0.04	25uV	0.03	3uV	1
	15	ACV : 0 to 10mV (40Hz to 1kHz)	0.015	17uV	0.02	1.1uV	
	16	ACV : 0 to 10mV (1kHz to 20kHz)	0.015	17uV	0.03	1.1uV	1
	17	ACV : 0 to 10mV (20kHz to 50kHz)	0.05	30uV	0.1	1.1uV	$1 \square$
	18	ACV · O to 10mV (50kHz to 100kHz)	0.08	40uV	0.5	1 1uV	
		<u>D</u> elete Rar	nge	<u>A</u> dd Range	•	Exit	

Each range can be assigned the following information:

#### Calibration of Reference

#### : % of Reading : Zero

Enter the imported uncertainties from the calibration certificate for this instrument:

#### Stability of Reference

: % of Reading : Zero

Enter the accuracy of this instrument from the manufacturers specifications.

ProCal comes installed with all Transmille calibrator uncertainty tables complete, incorporating the imported uncertainties for calibrations as performed by Transmille.

Note: If your Transmille calibrator is not calibrated by Transmille, these imported uncertainties will need to be updated to reflect the uncertainties from the laboratory that calibrated the instrument.

## Adding / Editing Range information

The Uncertainties table can be edited by adding a new range or editing an existing range.

Note: The uncertainty table for system instruments 1 to 10 should not be changed as these are used by ProCal to automatically determine the correct line to use with a specific test value / frequency.

Simply click on the Add Range button to add a new range, an empty box will appear below the last range – then enter new details. To edit a range simply select that row and the new details. To delete a range again highlight the relevant ranges and click the 'Delete Button'

15	ACV : 0 to 10mV (40Hz to 1kHz)	1	0.0	5	17uV	0.0	2 1.1uV	·
16	ACV : 0 to 10mV (1kHz to 20kH)	z)	0.0	5	17uV	0.0	3 1.1uV	r I
17	ACV : 0 to 10mV (20kHz to 50kH	lz)	0.0	5	30uV	0.1	l 1.1uV	· ] _
18	ACV · 0 to 10mV (50kHz to 100)	(Hz)	0.0	8	40uV	<u> </u>	5 <u>11</u> uV	
		<u>D</u> elete Ran	ge	A	dd Range	, [	Exit	

How does ProCal select the correct range / function from the uncertainties table? ProCal uses a built in look up table to determine the correct range / function / frequency range for a specific test. This is preset for the following instruments:

## All Transmille 2000 Series calibrators Transmille 2100 Electrical Test Equipment Calibrator HP / Agilent 3458A

For all other instruments, the specific line required for use, to calculate the uncertainties <u>must be</u> <u>manually selected</u>. This is covered in further detail in the section on ProEdit.

## **Uncertainty Templates**

For the comprehensive calculation of uncertainties, ProCal allows additional sources of uncertainty to be incorporated into uncertainty templates which can store such sources as connection / lead errors, noise etc.

Each uncertainty template can be uniquely named and record one or more source of uncertainty. As required by M3003, this includes the probability devisor to enable correct statistical calculation of the final uncertainty.

Uncertainty Templates[VIEW (	DNLY]				
Uncertainty Templates 100mH Inducatnce Standard	Source of Uncertainty	Limit Value	Probability Distribution	Divisor	Ci
100nF Capacitance Standard	Imported Uncertainty	>Calculated At Run Time<	Normal	2.0	1.00
100uH Inductance Standard	Stability of Reference	>Calculated At Run Time<	Rectangular	√3	1.00
10nE Capacitance Standard	Resolution	>Calculated At Run Time<	Rectangular	√3	1.00
1A to 20A DCI Measure	Noise / Flicker	>Calculated At Run Time<	Rectangular	√3	1.00
1H Inductance Standard	Leads	0.001mH	Rectangular	12 -	1.00
1mH Inductance Standard		, 	. to o ta ga . a		i I
1nF Capacitance Standard		, 			
3200 DCV INS 1000V	1			-	
3200 DCV INS 100V	) 				
3200 DCV INS 250V	l 	 			
3200 DCV INS 500V				- *	
3200 DCV INS 50V				- *	<u> </u>
ACI Measure					
ACI Source		<u> </u>		- *	
ACV Output				- *	
ACV Source					
BMC - 1 - Clamp Coil Calibrati				- *	
BMC - ACI - 1 - 25uA to 100u				_ "	
BMC - ACI - 2 - 101uA to 1m/		<u> </u>			
BMC - ACI - 3 - 1.0 IMA to 10				[_ ¬	
	-			, _	
Add Template	View Uncertainty Evaluation View Pr	ocedure Manual	)	<u>E</u> xit	

The left hand list displays the available uncertainty templates, which can be edited. To create a new template, the user should click on the 'Add Template' button. To edit the method sheet, use a word document with the file name as template. Click on 'View method sheet'

To edit an existing uncertainty template first select the required template by clicking on the list. Then click on the box in the table to edit the contents, new uncertainty contributions can be added in the same way to an existing uncertainty template. Once all the new data has been entered, just close the Uncertainty Templates window or move onto the next template and it will save the data.

Note the top 4 lines are always present and are greyed out. The value of these will be dynamically calculated at run time. Data is taken from the 'uncertainty' table in ProSet, which

contains both the 'imported uncertainty' and 'stability' for the reference used by ProCal in that test. Note that ProCal will determine the reference used either automatically or by the reference selected manually in the procedure by ProEdit. If an uncertainty table does not exist for the reference selected then a warning message is displayed.

Resolution is taken from the 'number of digits' field in the procedure.

Noise/Flicker is entered in the drop down box on the measurement screen. This is treated as a rectangular contribution with degrees of freedom = infinity in the uncertainty calculation.

Note: All uncertainty contributions are assumed to have degrees of freedom = infinity. Should a calculation contain dominant terms or terms with low degrees of freedom then they should be calculated outside of the auto calculator inside ProCal and be entered either in the procedure as a Pre calculated term or calculated at run time term and be entered in the box at the bottom of the measurement screen.

## Laboratory Information

The address, signatories and environmental information for the laboratory are set up using this screen. These settings are stored with each calibration performed, so changing this information will only affect calibrations performed AFTER the changes. If a certificate or report is printed before any changes are made then the document will need to be reprinted.

Certificate Settings						X
Laboratory Information Laboratory Number Certificate Title	1234 Laboratory Name [Certificate Title]					
Laboratory Address	Laboratory Name Address Line 1 Address Line 2 Address Line 3					
Signatories 1) <sup>A.B.</sup> Smith 4)	2) C.I	D. Jones	3)			
Uncertainties Temperature Relative Humidity	± 1 ± 20	°C %	Mains Voltage Mains Frequen	± 12 cy ± 1	V Hz	
Cancel						<u>o</u> k

Note: It is useful to put the laboratory telephone and fax numbers and Email address in the address line 4 location, address length permitting (e.g. TEL: xxxxx xxxxxx • FAX: xxxxx xxxxxx • Email x@x.COM).

## Configuring the Label Printer



To set-up the system label printer select File -> Configure Label Printer or click the *L* toolbar button.

Note: For the DYMO printer, all settings are configured by the DYMO printer installation. Simply select DYMO 300 Series to use this printer.

## The Calibration Program ProCal

## **ProCal Overview**

ProCal is the piece of software which is used to perform calibrations on instruments, it controls this sequence from the starting a calibration to the results of the calibration combining the before and after adjustment results to the results database in 'Access'. These results can then be viewed, or printed into multiple templates as required to meet the customer's requirements.

There are many settings in ProSet – 'program options' are used to control the default operation of ProCal to suit individual requirements, including the printing of certificates & labels after calibration.

ProCal controls the measurement process by loading a 'calibration procedure' that can be created in ProEdit. This procedure is made up of individual measurement tests; the data held in each test is used by ProCal to control the reference instruments, take the measurements, calculate uncertainties etc.

There are four main points for performing a calibration with ProCal.

Starting the calibration, entering data on the instrument to be calibrated, selecting the procedure etc.

Running the procedure, taking the measurements and recording the results.

Conducting necessary adjustments if needed, retaking the measurements and recording the new results

Finishing the calibration, saving the results, entering comments etc.

ProCal is very flexible in the way it can be operated to meet the requirements of different users, the options to the user on starting/finishing a calibration are different for the stand alone calibration system to the networked calibration station integrated with job control (ProCal Track) software.

In all cases running the measurement procedure is always the same.

## **Starting ProCal:**

ProCal can be started either from the Start Menu->Transmille Software->ProCal or from the desktop shortcut, ProCal will ask for a user login (if users have been assigned in ProSet)

User Logi	in		
	User Name User Level Password	J.A. Bailey	🔽 Mask
<u>_</u> a	ancel		<u>о</u> к

ProCal will then check the reference standards data (as set in ProSet) for any standards requiring calibration and will display a list of any instruments found. This menu can be set to appear on the start-up of ProCal to inform the user of any outstanding calibrations. This list is for information only, and may be closed.

Incor No.	nplete trace			The Following Traceability Problems Have Been Detected					
No.		able instrument entries exist :							
	Location	Description	Serial Number	Recal Due	Action				
		· · ·			·				
1									
The									
Ine	following tra	ceable instruments require (or are nearing	g) recalibration -	2 weeks notice	given :				
No.	following tra	ceable instruments require (or are nearing Description	g) recalibration - Serial Number	2 weeks notice Recal Due	<b>given :</b> Action				
No.	following tra Location : Local	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg	g) recalibration - Serial Number : 825	2 weeks notice Recal Due : 14/04/2009	given : Action : Recal				
No. 05 106	following tra Location : Local : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa	<ul> <li>g) recalibration -</li> <li>Serial Number</li> <li>825</li> <li>TL1006</li> </ul>	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009	given : Action : Recal				
No. 05 106 114	following tra Location : Local : Server : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor	g) recalibration - Serial Number : 825 : TL1006 : TL174	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009	given : Action : Recal : Recal : Recal				
No. 05 106 114 12	following tra Location : Local : Server : Server : Server	Ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR	g) recalibration -           Serial Number           : 825           : TL1006           : TL174           : TN180	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009	given : Action : Recal : Recal : Recal : Recal				
No. 05 106 114 12 135	following tra Location : Local : Server : Server : Server : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR : Granite Surface Table	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/09/2009	given : Action : Recal : Recal : Recal : Recal				
No. 05 106 114 12 135 146	following tra Location : Local : Server : Server : Server : Server : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR : Granite Surface Table : Pressure Transducer 350mBar	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004 : TL915 (020	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/09/2009 : 08/06/2009	given : Action : Recal : Recal : Recal : Recal : Recal				
No. 05 106 114 12 135 146 147	following tra Location : Local : Server : Server : Server : Server : Server : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR : Granite Surface Table : Pressure Transducer 350mBar : Pressure Transducer 350mBar : Pressure Ror = 0, 18 to 10	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004 : TL915 (020 : TL917	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/09/2009 : 08/06/2009 : 08/06/2009 : 08/06/2009	given : Action : Recal : Recal : Recal : Recal : Recal : Recal : Recal				
No. 05 106 114 12 135 146 147 150 151	tollowing tra Location : Local : Server : Server : Server : Server : Server : Server : Server : Server	Ceable instruments require (or are nearing         Description         : B905 Automatic Precision Bridg         : Tinsley 100R Resistance Standa         : 50A Standard Resistor         : Standard Resistor         : Standard Resistor         : Granite Surface Table         : Pressure Transducer 350mBar         : Pressure Transducer 35Bar         : AC Resistance Box - 0.1R to 10         : AC Resistance Box - 100KB to 100KB	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TL174 : TL174 : TL174 : TL915 (020 : TL917 : TL917 : TL917 : TL937	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/06/2009 : 08/06/2009 : 14/09/2009 : 14/09/2009	given : Action : Recal : Recal : Recal : Recal : Recal : Recal : Recal : Recal : Recal				
No. 05 106 114 12 135 146 147 150 151 159	tollowing tra Location : Local : Server : Server : Server : Server : Server : Server : Server : Server : Server	ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor : Standard Resistor 100mR : Granite Surface Table : Pressure Transducer 350mBar : Pressure Transducer 35Bar : AC Resistance Box - 0.1R to 10 : AC Resistance Box 100kR to 10MF	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004 : TL915 (020 : TL917 : TL917 : TL937 : TN224	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/06/2009 : 08/06/2009 : 14/09/2009 : 14/09/2009 : 22/09/2009	given : Action : Recal : Recal				
No. 05 106 114 12 135 146 147 150 151 159	Collowing tra Location : Local : Server : Server : Server : Server : Server : Server : Server : Server : Server	Ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR : Granite Surface Table : Pressure Transducer 350mBar : Pressure Transducer 35Bar : AC Resistance Box - 0.1R to 10 : AC Resistance Box 100kR to 10M : Standard Capacitor (3T) 10nF	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004 : TL915 (020 : TL917 : TL917 : TL917 : TL937 : TN224	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/06/2009 : 08/06/2009 : 14/09/2009 : 14/09/2009 : 22/09/2009	given : Action : Recal : Recal				
No. 05 106 114 12 135 146 147 150 151 159	following tra Location : Local : Server : Server : Server : Server : Server : Server : Server : Server : Server : Server	Ceable instruments require (or are nearing Description : B905 Automatic Precision Bridg : Tinsley 100R Resistance Standa : 50A Standard Resistor : Standard Resistor 100mR : Granite Surface Table : Pressure Transducer 350mBar : Pressure Transducer 35Bar : AC Resistance Box - 0.1R to 10 : AC Resistance Box - 0.1R to 10M : Standard Capacitor (3T) 10nF	g) recalibration - Serial Number : 825 : TL1006 : TL174 : TN180 : TN2004 : TL915 (020 : TL917 : TL917 : TL917 : TL937 : TN224	2 weeks notice Recal Due : 14/04/2009 : 09/06/2009 : 09/06/2009 : 18/09/2009 : 08/06/2009 : 08/06/2009 : 14/09/2009 : 14/09/2009 : 22/09/2009	given : Action : Recal : Recal				

If a procedure, which uses an instrument in this list, is selected to be used in ProCal, an error message will be displayed and the calibration will not be able to continue until the instrument has been calibrated.

ProCal will then display a message box as it initialises instruments connected to the PC's interfaces. The user will be prompted to either try again or cancel any instrument not responding.

# ProCal Menus: The File Menu

🎢 ProCal [User Name=S.A. Hawkins : U	sei	Level=ADMINISTRATOR
File Edit Control Help User Login About		
Calibrate An Instrument	►	By System ID
Instrument Calibration Priority Lists	۲	By Serial Number By Certificate Number
Search For a Procedure (Calibrate Instrument)	►	By Job Number
Repair An Instrument	۲	
Add After Adjustment Results	۲	
Recall a Certificate	۲	
Resume a Calibration (Calibration Incomplete)		
Print Test Summary Print Job Information		
Save & Exit Calibration		
Check Instrument Traceability		
Exit		

## A new calibration may be started by selecting from the file menu either:

## Calibrate an instrument: - use to start a new calibration.

ProCal will search the database for the instrument from either the ID number, serial no, last certificate number or job number (if booked in by ProCal Track). This allows instrument information to be recalled from the database. When a new instrument, unknown to the database is entered ProCal will display a message box and ask if you wish to create this as a new instrument, ProCal will then add the instrument details to the data base as you enter them, saving them in the database so they only need to be entered once. In the future ProCal will recognise this instrument.

This powerful feature allows ProCal to learn the instruments as they come through the system, avoiding having to create instruments in the database first.

#### Instrument Calibration Priority List: - select from a list of instruments in order of priority.

Displays a list of instruments to be calibrated ordered by the number of days left to calibrate (only available if the instruments have been booked in with ProCal track). This helps organize the workload and keeps the procession of instruments being calibrated/repaired in order.

## Search for a Procedure: - Select procedure before entering instrument details

Allows the calibration procedure to be selected first before entering instrument details. This may be useful for an ad-hock calibration or for checking to see if a calibration procedure exists.

#### An unfinished calibration can be completed by selecting:

#### Add after adjustment results

Entering the certificate number for the before readings starts after adjustment calibration.

#### Recall a certificate

Enter the certificate number to recall either the before or after adjustment results. Using this allows mistakes on certificates to be corrected, e.g. comments, instruments details, even measurements can be remade. This is a very powerful function of ProCal and can save a great deal of time, avoiding having to completely re-run a calibration. To avoid misuse of this function it must first be enabled in ProSet – ProCal 'options'.

#### Resume a calibration

Displays a list of calibrations marked incomplete as set at the end of calibration. This allows an incomplete calibration to be saved, then continued later. Click on the instrument in the list to resume calibration.

#### Recover a calibration

Should for any reason a calibration be halted unexpectedly (due to power failure for example) and the results have not been copied to the database, ProCal keeps a recovery file, which can be reloaded. To reload this file the system ID number must be entered.

#### Other options from the file menu:

#### **Print Test Summary**

Prints a results summary type sheet showing only basic instrument details and readings taken against % of spec. Very useful to show faulty ranges etc when passed on to a different engineer or department for repair, or to show the user the problem ranges.

#### **Print Job Sheet**

Prints job sheet, which contains the instruments, details, the customer details etc.

#### Save and Exit

Goes straight to the certificate save screen. The certificate number can be noted down onto the Job Label if one has been printed through ProCal-Track.

#### Check Instrument Traceability

Checks the reference instrument database for incomplete traceability information or instruments, which are past their calibration date.

## ProCal Menus: Edit Menu

ProCal [User=S.A. Hawkins						
File	Edit Control Help			User Log		
	Job Information Instrument Information					

The edit Menu allows access to the job information and Instrument information screens below:

## Job Information Screen

Virtual Job Sheet [Sy	ystem ID:T1A8	371J6]		
Job No. : 21863 Instrument : Transmil	ille 2901A	Certific Custor	ate Add. : ner Add. :	
Job Info Inst Details	Cert Address   Ret	urned By	Despatch Address	s Accessories Service Details History
Job Number : 21	1863	Link	Service Details S	Sub Contract Details Do Not Recall 🔽
Date Received : 05	5/10/2006	PDF Order	Service Tupe :	G : New Instrument Test
Order Number : 00	0003077	View	Cert Tupe :	A : Shandard Calibratian
Invoice Number :		Docs	Cert. Type . Ouete Status :	
Despatch Date : 24	4/04/2007	Add		
Calibration Date : 05	5/10/2006	Scan	Quote No. :	
Calibration Due : 04	4/10/2007	Link	Service By:	
Certificate No. : CN	M13262	Cert	×	Warranty Mains Safety Fast T/R
Status : A : With custo	omer	-	Turn-around : 1	1 💌 Days 🛛 Cal. Interval : 52 💌 Weeks
Use:		-	Customer	<u> </u>
Booked E. Turner	•		Inst. Log	~
<u>C</u> lose <u>P</u> ri	int Menu			<u>Advanced Edit</u>

From this screen all aspects of a specific job can be viewed and edited. From this menu every aspect of the instruments information can be accessed.

#### Advanced Edit

Advanced Edit allows the user to change more intricate details about the instrument, such as the signatory for the certificate, or the traceable instruments used during its calibration.

All the details of an instrument can be changed in this menu, so care should be taken that important data is not lost, this function can be set to Administrator Access only. The list of enterable data is long; this list contains the information for every part of the instruments procession through Booking In, Calibration and its Despatch details.

## Instrument Information Screen

Room Temperatura	The second se	
Hoom remperature	20 <u>→</u> °C	
Mains Voltage	230 Volts	
Humidity	50 🚽 %RH	
Mains Frequency	50 <u>→</u> Hz	
- Calibration Information	21/10/2008	
Date of Calibration	25/08/2009	
Job Number		
Tested By	<u> </u>	
•	Add Contact	
	Mains Voltage Humidity Mains Frequency Calibration Information Date of Receipt Date of Calibration Job Number Tested By	

This menu enables the user to enter important information such as the System ID, Certificate Type and customer details.

Without a certificate type selected ProCal will be unable to select the correct procedure for the instrument. (More information can be found in the appendix).

## **Control Menu**

The control menu allows several functions to take place,

There are two 'control' menus, a short menu for procedures, which use manual control to step on to the next test, and a longer menu for procedures, which use auto step.

l [User=S.A. Hawkins : Level=ADMINISTR					
Control Help User Login About					
✓ AUTOSTEP[N]					
Ignore Fail					
<ul> <li>Show Auto Safety Prompts</li> </ul>	Ctrl+S				
Show Auto Connection Prompts					
Set Current Test to Non-Printing Ctrl+P					
Edit Tests					
<ul> <li>Run Calibration Tests</li> </ul>					
Reset Procedure Uncertainties					
Finish Calibration (Review Results)					
Abort Current Test					
Abort Calibration Run					

## Auto Step (Y) (only in menu when autostep set)

When Auto Step is selected, this function allows ProCal to automatically move onto the next test. For this process to take place, the auto step function must have been selected for the procedure, auto step can also be turned on through Control->AUTOSTEP. If the procedure is for a close loop calibration then this will be checked to allow it to run automatically.

Note: If the user only wishes to run one test, then auto step should be turned off.

Autostep can be very useful even on manual instruments like decade boxes. Here the Autostep condition can be set to proceed on to the next test if the measurement is within specifications, this will allow the operator to simply switch round the values, with ProCal automatically proceeding to the next test when it has the correct value.

#### Ignore Fail (only in menu when autostep set)

This will allow ProCal to proceed on to the next test even if the test fails. This is required when an instrument is out of specification and it is required to let the ProCal procedure run through taking all the measurements without stopping.

#### Show Auto Safety Prompts

Selecting prompts allows ProCal to automatically display safety warnings before any test where the output from the calibrator is higher than 200 Volts or 2Amps, before the procedure will move on the operator must click the 'OK' button within the message box.

## **Show Auto Connection Prompts**

Checking this will cause the program to automatically display connection diagrams based on the Transmille range of products for AC / DC Voltage, AC / DC Current and Resistance.

## Set Current Test to Non Printing

Selecting this will prevent individual test results being printed on the certificate. May be used where a limited calibration is being performed.

#### Edit Test

The Edit Test function can be accessed via the 'Control' Menu. This function allows the user to modify parts of tests, and to delete tests that have are not needed by highlighting the relevant test/line and then clicking 'Clear

Test

i.	E di	t T	Test Data	$\mathbf{X}$
				_
	No.	Ι	Test Title   Test Value   Print Type	^
	1	Ι	GENERAL TESTS     TITLE	
	2	L	Display   Yes	
	3	L	Controls   Yes	
	4	Ι	240/110V Socket     Yes	
	5	I	Blank Line   BLANK	
	6	I	Earth Bond     TITLE	
	7	Ι	26A   Yes	=
	8	Ι	8A   Yes	
	9	Ι	100mA   Yes	
	10	Ι	Blank Line   BLANK	
	11	Ι	0.1R 0 8A   Yes	
	12	Ι	0.5R 0 8A   Yes	
	13	Ι	1R @ 8A   Yes	
	14	I	Blank Line   BLANK	
	15	Ι	P-N Fuse Continuity     TITLE	_
	16	I	P-N Fuse Test Fail   Yes	
	17	I.	P-N Fuse Test Pass   Yes	
	18	Ì	Pass/Fail Level   Yes	
	19	Ì	Blank Line   BLANK	
	20	Ì	Insulation Voltage   TITLE	
	21	Ì	500V @ 1mA   Yes	~
	<u><u></u></u>	iea)	ar Test(s) ♪ <u>C</u> lose	

## Modify Print Type(s)

If the 'Modify Print Type(s)' button is clicked, a new menu will open with eight options for the user to choose from. The selected option from the list is entered into the text box, to save click OK, to abort the current action click Cancel.

Modify Test Print Types	×
This function will alter the print type of all tests highlighted in blue. Print Types : 	OK Cancel

## **Run Calibration Tests**

This will enable interaction to the external .exe program set in the procedure, allowing for automatic adjustment of the instrument under calibration.

Note: This interaction is still conditional on the instruments error being larger than that set in the procedure.

## Finish Calibration (Review Results)

This option allows a direct step to the end of the procedure. A message box will display how many tests are left.



## **Abort Current Test**

Halts the current test. Takes you to a list of all the test in the procedure, this list allows the user to select which test to complete and in what order, from this menu hitting next will allow the user to enter job comments, input the price and write an engineers report (if needed).

## Abort Calibration Run

Stops calibration and displays the below message:



Select the required option; note there is a further 'are you sure' box after this if 'Discard results' is clicked by mistake.

ProCal	
⚠	This will discard the results - Are you sure ?
	Yes No

## Help Menu

Used to display & view Technical Help File, Calibration Help and the Uncertainty Template. Note if these files are not present they will be greyed out.

🗟 ProCal -			
File Edit Control	Help	User Login	About
	Vie Vie Vie	w Technical H w Calibration w Uncertaint	<b>Help File</b> Help y Template

#### **About**



Displays the start up screen showing the version number program & data paths, the data paths can be changed by the user, but upon installation they are directed to the local drive on the workstation.

## ProCal Tweak

ProCal Tweak is a quick adjustment tool for ProCal. This menu can be accessed by clicking 'About->ProCal Tweak).

#### Settings

From here the user has access to the printer settings, and the choice of the ProEdit welcome screen, and allows the choice of sounds within ProCal.

-	Settings	Uncertainti	es Appearanc	e Advanced			
				_			
	Show	/ ProEdit We	elcome Screen				
	Play : (e.g.	Sounds with HV Ramping	in ProCal J Up)	Γ			
	Defau	ılt Printer	HP LaserJet 1	200 Series PCL	•	2	

#### **Uncertainties**

The Uncertainties tab offers the ability to bypass the uncertainty calculations, although this option should be carefully used

Settings	Uncertainties	Appearance Ac	lvanced	
Unce (Appli Bypa	rtainties Noise / ies only if 1 mea ss Uncertainty C	Flicker Default surement sample s Calculation	et)	x Counts For 2000/3000 Series calibrators only

#### Appearance

From the user can change the appearance of ProCal, a new menu can chosen by clicking 'Change'.



#### Advanced

The Advanced tab provides the options to several settings including enabling uncertainties to be imported and exported, and locking the environmental settings for the laboratory in Procal, e.g. the temperature.

9	Settings Uncertainties	Арре	earance Advanced
	Debug Mode		Turns off serial comms for debugging
	RS232 Display		Show RS232 Com screen for 5 seconds
	Web Procedure Export		Enable web procedure export mode (ProEdit)
	Enable Uncertainty Control Panel		Enable uncertainties to be imported / exported to / from procedures & Procedure Verification
	Disable Auto Archive Mode (ProSet)		Disable Auto Archive in ProSet (Traceable Instrument / Uncertainty Template EDIT)
	Lock Environmental Settings in ProCal		Lock environmental settings in ProCal Instrument information screen

## **Performing a Calibration with ProCal:**

## Starting the Calibration

ProCal offers several ways to start a calibration to work the way you wish to. Use the file Menu to select the preferred way you wish to start the calibration.

The most popular method when running with ProCal Track is by Job number, which can be entered or scanned from the bar code label printed when the instrument was booked via ProCal Track.

If using ProCal by itself simply entering the serial number is often the preferred method.

Note: The default start up	screen can be set in ProSet	File>options. (Page15)
----------------------------	-----------------------------	------------------------

The Calibration Information screen details the instrument, environmental and calibration information.

Instrument Information	Environmental Information
System ID Customer Ref. Manufacturer <b>Transmille</b> Serial Number	Room Temperature     20     °C       Mains Voltage     230     Volts       Humidity     50     %RH       Mains Frequency     50     Hz
Model Number 3200HA Cal. Interval 52 Veeks Certificate Type	Calibration Information         Date of Receipt       21/10/2008         Date of Calibration       25/08/2009         Job Number       5000000000000000000000000000000000000
Accredited Certificate	Tested By
	Add Contact
Customer Address	
Canad	// Back

complete this form with the instruments details and environmental information, the calibration information will be filled in automatically once calibration is complete.

This data will all be completed from the database if the instrument is on the database because it has been booked in by ProCal track or because it was previously known.

### Note: You cannot leave this screen until the serial number and the calibration interval have been filled in.

The environmental information will be remembered from the previous calibration.

#### Note: The variation, e.g. ±1°C printed on certificates is entered in ProSet.

Customer information can be stored in the customer database by entering the details of a customer and clicking 'Add Contact' button, which will add this customer to a drop down list to save re-typing frequently used addresses.

#### **Selecting the Procedure**

ProCal will automatically search for procedures, which match the model number and the type of certificate required, Standard, Accredited etc, and if there are several, it will highlight the one used last time.

P	lease c	onfirm the pr	rocedure for in	nstrument	: 'T009412I8	•				
	No.	Manufacturer	Mo	odel	Description			Version		
	3574	Transmille	32	00H	Electrical	Test	Calibrato	3.3/N		
	Procedu	re Type :	Accredited Cer	tificate	-					
		Cance	⊻iew Technical I	File	<u>S</u> earch		<< <u>B</u> ack		<u>N</u> ext>>	

Use the 'Search' button to manually search for a procedure if required.

#### Note: That ProCal uses the Procedure TYPE selected in the search and will only list that TYPE.

Use the 'Technical Help file' to keep notes on procedures. Then if there are several procedures for one instrument it can be viewed to help select the correct procedure.

## Traceable Reference Instruments & Uncertainty Statements.

The list of Reference instruments used in the selected procedure and also the uncertainty statements will be displayed in the below table.

This procedure uses the following traceable instrumen	ts :
None Selected	
VNCERTAINTY STATEMENTS	
Procedure uses individual, comment line or auto-calcu	lation uncertaintie:
Procedure uses individual, comment line or auto-calcu s the information listed above correct ?	lation uncertaintie

Note: Traceability information, calibration date etc, on the reference instruments used in this calibration is copied from the Instrument Traceability table in ProSet to the certificate file. The calibration will be halted if any reference instrument used is past its calibration date.

#### Address of Device under Calibration

If the procedure has been written to calibrate a UUT (Unit Under Test) using an interface connection either GPIB (IEEE488) or serial COM, then ProCal will ask for the address/COM port of that instrument.

🔋 UUT COM / GPIB :: Cal Run Options 🛛 🛛 🔀
Please select a COM Port / GPIB Address : >>> Select COM1 to COM6 for Serial Communication >>> Select 0 to 30 for GPIB Communication.           COM1
RUN CALIBRATION TESTS
<u>O</u> K

## **Before or After Adjustment**

This screen allows the user to select whether the results to be taken are the before or as found or after adjustment. Normally the user will select first as Found readings, then if required make adjustments and return to the procedure then take another set of 'After Adjustment' readings. ProCal will know the 'As Found' results have been already taken and this option will be greyed out when returning to take the results.

#### Both As Found and After Adjustment Results will be on the same certificate in this case.

If required the user may select directly the 'After-Adjustments' results, for example when the instrument had to be repaired first before any as found readings could be taken. In exceptional circumstances it is possible to also select to make two certificates, one for before and one for after results. As this is not the normal way, ProCal will prompt you with an 'are you sure' message box.

	C As Found Readings	1
	G After <u>A</u> djustment Readings	
	Select Optional Sections (4 available)	-
stomer Comments		

Comments from the 'customer comment box' on the virtual job sheet are also displayed at this time. These may have been entered when the instrument was booked in. This is to bring to notice any special requirements asked for by the customer.

If existing results are found for an instrument, ProCal will ask the user to either attach the current 'As Found' results onto the same certificate as the new 'After Adjustment' results, or to have the 'After Adjustment' results saved onto a new certificate.



## **ProCal Measurement Tests**

ProCal is now running the procedure as created in ProEdit. The procedure will contain many different types of test depending on the requirement for that test.

The measurement screen is very similar however for all types of test. This screen will display the tests in the procedure, of about which 10 can be viewed at one time, use the scroll bar to view all.

Normally a procedure will be started at test one and will run in sequence through to the end. However it is possible to jump to any test simply by clicking on it in the test list. (Note title tests and print formatting tests cannot be run).

#### Clicking the 'hand' symbol in the toolbar at the top stops a test running.

#### The Prompt Screen in ProCal

The prompt screen is displayed before a test if set in the procedure.

The information can be simply a typed message, a bitmap picture or even a video file. The prompt screen is there to inform the operator of the required connections, instrument settings etc.



# **Basic Test Types in ProCal**

## Running a Pass /Fail Test

General Tests Display Check Diode Check 400V D.C. RANGE 400V Range 400V Range 400V Range 400V Range 400V Range 400V Range	General Tests Display Check Diode Check Blank Line	^
Display Check Diode Check 400V D.C. RANGE 400V Range 400V Range 400V Range 400V Range 400V Range 400V Range	Display Check Diode Check Blank Line	
Diode Check 400V D.C. RANGE 400V Range 400V Range 400V Range 400V Range 400V Range 400V Range	Diode Check	
400V D.C. RANGE 400V Range 400V Range 400V Range 400V Range 400V Range 400V Range	Blank Line	
400V D.C. RANGE 400V Range 400V Range 400V Range 400V Range		
400V Range 400V Range 400V Range 400V Range	400V D.C. RANGE	
400V Range 400V Range 400V Range	400V Range	
400V Range 400V Range	400V Kange	
400V Kange	400V Kange	
A LOOT A	400V Kange	-
.U 400V Range	U 400V Kange	
	YES NO	

Simple click on the result, ProCal will automatically advance to the next test.

## Running Meter type test: Using a calibrator

In this test the computer will set the system calibrator to the output set in the procedure. The operator will enter the reading displayed on the meter usually using the keyboard for a digital meter, or by slewing the output of the calibrator to align the pointer of an analogue meter to a scale mark.

Alternatively the reading from the meter under test may be read back using a GPIB (IEEE488) or serial interface. This type of calibration is called 'closed loop'. ProCal can even control the range and setting of the instrument under calibration, if it is entered into the procedure.

Conn Enter	nection Diagram For DC r value displayed on met	yoltage er (without units).			TEST PA (PROBA	SSED
No.	Test Title	Test Value	Reading	% Spec		1
1 2	DC Voltage 100mV Range				^	
3	100mV Range	100.000mV	100.0001mV	80		
4	100mV Range					
5	11 B	Blank	Line			
567	 1V Range 1V Range	Blank	Line			
5 6 7 8	 1V Range 1V Range 1V Range	Blank	Line			
5 6 7 8 9	1V Range 1V Range 1V Range	Blank Blank	Line			
5 6 7 8 9 10	1V Range 1V Range 1V Range 10V Range	Blank Blank	Line		~	
5 6 7 8 9 10 F/ (L	1V Range 1V Range 1V Range 10V Range AIL Ma OW) 150n 1 200         150	Blank Blank nual Input > 100.00012 1 100.00 1 100.01	Line Line 2 < Ma 200mV   1       1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	nual Input 150nV I 100 I I I I	FAIL (HIGH) 150         200	
5 6 7 8 9 10 F/ (L	1V Range 1V Range 1V Range 10V Range AIL Ma OW) 150n 1 200         150       1 ppm	Blank Blank nual Input > 100.00012	Line Line 2 < Ma 200mV   1       50       4 1	inual Input 150nV 1 101 1 1 1	FAIL (HIGH) 150         200   1	

The bar graph display on the screen clearly shows the error related to the instrument under the test specifications in a graphical manner.

The width of the uncertainty band is also graphically shown as arrowheads extending to the left and right of the measurement pointer.

The result of the test is shown in the top right corner of the window. Four possible results will be shown as described below

Pass: -	Instrument passes regardless of measurement uncertainties
Probable Pass:	Instrument could be out of specification allowing for uncertainty
Probable Fail:	Instrument could be in specification allowing for uncertainty
Fail:	Instrument fails regardless of measurement uncertainties
## Uncertainty Calculation

To view the Uncertainty calculation window click on the 'UNCERTS' button whilst on the above menu.

Note: This button will only appear if there are no uncertainty statements selected for the procedure and there is no data in the 'uncertainty box'.

It is necessary to enter numerical value in the 'noise/flicker' drop down box to obtain an accurate calculation of uncertainty.

🗱 M3003 Uncertainties Calculation Using 'DCV Source' Uncertainty Template 🛛 🔀						
DCV Source 3050A Precision Multi-Product Calibrator : Line 1 [DCV : 0mV to 202mV] Calibration = 0.00026% ± 0.5uV Stability = 0.005% ± 4.4V					:o 202mV]	
Source of Uncertainy	Limit Value	Probability Distribution	Div.	c <sub>i</sub>	±Ui	
Imported Uncertainty 🚺	563.6nV	Normal	2.0	1	281.8nV	
Stability of Reference 🚺	9.0uV	Rectangular	√3	1	5.2uV	
Resolution 🕕	100.0nV	Rectangular	√3	1	57.7nV	
Noise / Flicker	500.0nV	Rectangular	√3	1	288.7nV	
Connection / Lead Error	3.0uV	Rectangular	13	1.0	1.7uV	
Combined Standard Uncertainty		Normal			7.6uV	
Expanded Uncertainty		Normal (k=2)			15uV	
View Uncertainty Evaluation View Procedure Manual 2						

The Template for this spread sheet is 'DCV source' created in ProSet.

**1: Imported Uncertainty** is calculated at run time from data in the Uncertainty file created in ProSet for the calibrator in use. The figure is calculated by combining the Zero (Floor) and the % of reading (Gain) using root-sum of squares form the 'Calibration of reference' column.

**2: Stability of Reference** is calculated at run time from data in the Uncertainty file created in ProSet for the calibrator in use. The figure is calculated combining the Zero (Floor) and the % of reading (Gain) using root-sum of squares from the 'Stability of Reference' column. The data used must be entered in ProSet as K=2, 95% confidence level with infinite degrees of freedom.

**3: Resolution** is taken from the number set in the D.P (Decimal points box), in the test data for that test in ProEdit.

**4:** Noise/Flicker or the short term repeatability of a manual instrument, for example a hand held DMM must be observed by the operator and entered in the Noise/flicker drop down box at the bottom of the screen.

5: Connection Lead errors are taken directly from the DCV source template created in ProSet.

These values are then combined at run time using the standard method in GUM, M3003 etc as called for by ISO17025 to produce a dynamically calculated figure for uncertainty for 95% for each test reading. For quality audits this visual approach allows all the calculations to be easily verified.

Note: The automated calculation assumes that there are no dominate terms and all contributions have infinite degrees of freedom.

## Running a Measurement Test: using a DMM to take the reading

This type of test controls & reads from the system DMM (Digital Multi Meter) using the GPIB or serial interface to automatically make a measurement.

Typically it would be used for calibrating a voltage source or measuring the output from a process control calibrator.

The system DMM must first be selected from the available models in the drop down list in line 2 of the Traceable instruments table in ProSet.

If the type of DMM needed is not supported in this list then it may be possible to order a custom driver to support your DMM. Alternatively use a general test to read a DMM using the command window to control the DMM

There are three advantages of using a driver to communicate with the DMM,

1: Avoids writing interface code in the procedure, which can be difficult and generally requires a higher level of understanding of controlling instruments.

2: With a driver all that is required to update the system DMM at a future date is to change the selection in the Traceable instruments table in ProSet.

3: A driver for the same procedure may be used on two or more systems with different models of DMM.

Note: Additional control commands can still be sent to the system DMM using the command window. Also commands to control the unit under test (UUT) can be sent which makes writing a closed loop procedure very simple. See ProEdit – command window.

The measured value is displayed in the same graphical way as the meter test above (Page 47), the only difference is that the reading is being read automatically from the system DMM, as opposed to the meter test above where the reading is being either entered manually using the keyboard or being read back from the UUT over the interface. The reading, Pass & Fail results, and uncertainties are displayed the same.

## Running a General Test

A general test is different from the above oscilloscope, meter and measurement tests etc in three ways: -

1: There is no 'built in' control of any instrumentation. Only using the command window controls the test.

2: There is also no Default reference instrument. This must be selected in the procedure.

3: There are no predefined units, e.g. volts,

Note: Every element of the procedure will need to be selected by the user

These differences allow a general test to be written for almost any calibration, using any reference in the Traceable instruments table, where there is a nominal value and a reading with a pass/fail tolerance.

For example calibrating a pressure gauge using a dead weight tester. Neither instrument is controlled in any way by the software, but a pressure is applied and a reading taken.

<b>Tes</b> Conn Enter	st 3 : 100m nection Diagrar r value display	<b>V Range</b> n For DC Voltag ed on meter (wit	ie hout units).		TEST PASSE
No.	Test Title		Test Value	Reading	% Spec
1	Pressure	Rising	5.00Bar	5.0Bar	10
2	Pressure	Rising	25.00Bar	25.1Bar	18
3	Pressure	Rising	50.00Bar	49.9Bar	26
220					
4	Pressure	Falling	25.00Bar	24.8Bar	36
4	Pressure Pressure	Falling Falling	25.00Bar 5.00Bar	24.8Bar 4.8Bar	36
4 5 FA	Pressure Pressure	Falling Falling Manual	25.00Bar 5.00Bar	24.8Bar 4.8Bar <	36 36 Ianual Input FAIL
FAI (LO	Pressure Pressure	Falling Falling Manual 0.50Bar	25.00Bar 5.00Bar Input > 4.82	24.8Bar 4.8Bar < < N 10Bar	36 36 Ianual Input FAIL 0,50Bar (HIGH)
4 5 (LO ₽	Pressure Pressure	Falling Falling Manual 0.50Bar 50         100	25.00Bar 5.00Bar Input > 4.82 1 5.1 1 1 1 50 1 1 1 1	24.8Bar 4.8Bar < M 10Bar   0         50     1       50     1         1   50	36 36 Ianual Input 0.50Bar 1 1 100 1 1 1 1 150 1 1 1 1 200 1 1 1 1 100 1 1 1 1 150 1 1 1 1 200 1 1 1 1 100 1 1 1 1 1 150 1 1 1 1 1 200 1 1

With this test type the result can be entered the same as any other reading and a certificate can still be produced, the only difference is the user has to manually enter the test results and conduct the test themselves instead of allowing the software to control the test This makes ProCal a universal solution for calibration software throughout the calibration laboratory.

Note: The Test Value box can be typed into, to change the Nominal test value if not correct for tests where the	e
actual value cannot be known until the test is run.	

## Running other test types

The other test types all follow the same format as the tests mentioned in the preceding examples e.g. they will either be a variant of a meter test, where the calibrator is set by the computer and a reading value is to be entered, a measurement type test where the computer will use an instrument to take the reading or a general test.

See the ProEdit section for details of how each test type is used.

## Finishing The Calibration

After all the measurements have been taken and the instrument has passed calibration, the certificate comments should be edited. ProCal will copy comments in the procedure across automatically. Simply type in the relevant comments or use the drop down boxes to add further comments.

Enter any required certific Comments' and select the the button marked ''	cate comments below - to import an exter e required file. To edit the contents of the	nal text file click on 'Import ' drop down' lists click on	
Instrument was allow	ved to stabilise for at least 12 hou	rs before calibratio 💌	
All ranges were null	ed prior to calibration	<u> </u>	
4 Wire ohms connec	tion was used on values up to 10	) kohms 🗾 📃	
		<b>.</b>	

Note: To edit the content of the drop down boxes click the button '...' Notepad will allow you to edit the file & save. The new text will only appear once the current screen has been closed and reopened.

#### Job information

Details of any parts used, prices, and an engineers report on any repair work are now entered.

Note: That the Job comments print on the service log, and that the engineers report can be used on a crystal report to inform the customer of any further details about the instrument.

Job Information						
😥 Enter any required job information below. To edit the contents of the 'drop down' lists click on the button marked ''						
Services       Parts Used       Engineers Report       Job Comments       Quote         Service Description       Qty       Cost (Each)         Calibration       Digital 8.5       1       £ 214.00         Densition       Service       Service       Service	Total Parts Cost £ 0.00 Repair Cost £ 0.00					
Additional Services	Calibration Cost £ 214.00 Repair Time (Hours)					
	Cal. / Test Time					
Engineer Edit <u>P</u> arts List						
<pre></pre>						

From here the costs for repairs and additional services can be added using the green cross button, this will open a new menu which contains a list of options, once the correct option is selected the new costs will be visible in the Services tab.

Setting the Instrument status at the end of calibration

Each instrument in the database has a status, which enables ProCal to keep track of what is happening to it and where it is in the calibration cycle. Before saving the results this status can be set.

<ul> <li>Select an instrument status from the available options below.</li> <li>Instrument Status Selection         <ul> <li>Galibration Complete</li> <li>Adjustment Required</li> <li>Awaiting Customer Response / Information</li> <li>Calibration Incomplete</li> <li>Other</li> </ul> </li> <li>Instrument Priority : Adjust Turn Around Time         <ul> <li>Turn Around Time</li> <li>Date Received :</li> <li>01/09/2014</li> </ul> </li> </ul>
Instrument Status Selection         © Lalibration Complete         © Adjustment Required         © Awaiting Customer Response / Information         © Calibration Incomplete         © Other         Instrument Priority : Adjust Turn Around Time         Turn Around Time         5 • Day(s)         Date Received :         01/09/2014
<ul> <li>Calibration Complete</li> <li>Adjustment Required</li> <li>Awaiting Customer Response / Information</li> <li>Calibration Incomplete</li> <li>Other</li> </ul> Instrument Priority : Adjust Turn Around Time Turn Around Time 5 Day(s) Instrument is due on 10/09/2014
Instrument Priority : Adjust Turn Around Time         Turn Around Time       5 • Day(s)         Date Received :       01/09/2014

Note: Calibration complete cannot be selected, as the instrument requires adjustment.

From here a crystal report can also be generated which can be sent directly to the instruments owner to inform them, of any problems, see Calibration fault report.

If the calibration has not been completed then the 'Calibration Complete' option will be greyed out.

From the turn around time for an instrument can be updated, this means if an instruments needs repairs or adjustments the number of days can be changed to help keep track of instruments on the priority list.

#### Assigning the certificate number

ProCal will get the next number for the type of certificate produced (based on the procedure used) from the counters set in ProSet. The number is obtained at the completion of calibration to avoid having unused numbers if the calibration is aborted mid-test.

The user can type over the automatically generated certificate number to use a custom number. A warning message will be given if a duplicate number is entered.

Check the certificate number below. If not acceptable, change to the required r click 'Einish' to save the calibration.	number and then
Note : If the certificate number already exists a warning will be shown and anot be chosen.	her number may
Certificate Number	
CLICK FINISH TO ASSIGN AUTOMATIC CERTIFICATE NUMBER	Enter Number Manually
DETERMINING NEXT CERTIFICATE NUMBER	

Note: Use the back button to return to any previous screen

Click finish to complete the calibration and save the certificate number.

# **ProEdit: Managing Procedures**

#### **Overview and Introduction**

ProEdit's prime function is to create and edit calibration procedures used by ProCal. A procedure is made from a header, which contains information about model numbers, instrument manufacturers etc, followed by any number of individual tests. The use of in built wizards allows easy and rapid generation of procedures based on generic type instruments.

ProEdit also manages the procedure library. Allowing procedures to be copied, printed and deleted. In addition ProEdit can upload to its library, procedures which can be downloaded from the Transmille website.

#### Note: For this function to work a key code from Transmille must first be purchased.

ProEdit will be installed as part of the ProCal suite but can be run as a stand alone program, enabling procedures to be worked on remotely from the calibration station.

Procedures are stored in Microsoft Access as individual files in .mob format. There is also an index file, which logs the procedures in the library.

## **ProEdit Shortcuts**

To have this menu open on start-up, click Help->Show Welcome Screen' and tick the box in the lower left corner. This menu does not need to be used; the same functions can be accessed via the normal menu.



From this menu the user can 'Create a NEW Procedure' detailed instructions on this function can be found on Page 68. The users can also 'Edit an EXISITNG Procedure' with detailed instructions on Page 65. The user can also 'Search for a Procedure' via this menu. The final

option allows the user to 'Start Procedure Wizard' for which detailed instructions can be found on Page 66.

## **ProEdit Menus**

#### The File Menu

The main file menu allows basic controls for creating, editing and copying procedures etc.

🛋 ProEdit [User Name=S.A. Hawki				
File	Utilities	User Login	Help	
Ci Ec	reate New dit An Exis	/ Procedure ting Procedu	Ctrl+N re Ctrl+E	
Pr Ci	ocedure B onvert Pro	Builder Wizard ocedure(s)	ł	<b>)</b>
Print Procedure(s) Ctrl+P Copy a Procedure Delete Procedure(s)				
R	ecently Ec	lited Procedu	res	۲
E	kit			

## Create a New Procedure

Selecting File ->Create New Procedure will open up a new menu allowing the user to create a procedure without using the wizard, a detailed guide can be found on page 68.

#### Edit an Existing Procedure

Select File->Edit an Existing Procedure if changes or updates need to be made to a procedure, changes can be made to any part of a procedure, a detailed guide can be found on Page 65.

#### Procedure Builder Wizard

Selecting File->Procedure Builder Wizard opens a new menu with a series of images depicting various instruments that have pre-written procedures, a detailed guide can be found on Page 66.

#### **The Utility Menu**

E) P	roEdit [User Name=S.A. Hawkins : User Level=AD					
File	Utilities User Login Help					
E	Edit Uncertainty Statements					
	Export Procedures					
	Import Procedures					
	Edit Custom Lists					
	View / Edit Procedure Costings					
	Advanced					

The Utilities menu allows access to the functions in the above image, 'Import Web Procedures' will only be greyed out if a key code hasn't be acquired from Transmille.

#### **Edit Uncertainty Statements**

🛋 ProEdit [User Name=S.A. Hawkins : User Level=AD					
File	Utilities User Login Help				
	Edit Uncertainty Statements				
	Export Procedures Import Procedures				
	Edit Custom Lists				
	View / Edit Procedure Costings				
	Advanced •				

Selecting Utilities->Edit Uncertainty Statements allows the uncertainty statements, which can be selected in a procedure and printed on the certificate to be created and edited. A default table is loaded when installed, but new lines can be added to suit the requirements of an instrument.

Note: This table is only used if uncertainty statements are selected in procedures. Otherwise individual
uncertainties will print.

Uncertainty Statements		
1 : D.C. Voltage 2 : A.C. Voltage 3 : D.C. Current 4 : A.C. Current 5 : Resistance 6 : Capacitance 7 : Inductance 8 : Amplitude 9 : Time here		
<ul> <li>9 Timebase</li> <li>10 Frequency</li> <li>11 Analogue Pressure</li> <li>12 Time</li> <li>12 To edit statements or the uncertainty statement</li> <li>Note:- The first ten items have fixed titles, if a</li> </ul>	nt name, click on the required statement line from the list. custom line is required lines 11+ should be used.	
Currently Selected :- Line : 1		
D.C. Voltage		
Uncertainties For D.C. Voltage		
0 to 1000V: 0.002% ± 1digit		
Add New Line	Search For Procedures	<u>E</u> xit

Note: A procedure only uses the line number of a statement. If the order of statements in this table is changed, a previously written procedure will transfer the new statement, which may be incorrect. Example: If the statement for AC volts were replaced with RPM any procedure that had AC volts originally selected would now transfer the RPM statement to the certificate when used. On Networked systems it should be remembered that this table is on the local C: drive, (as each system will require its own uncertainties) care should be taken to ensure the order of this table is the same for each workstation. Otherwise a procedure will select the incorrect statements on some stations. To check which procedures use a particular statement use the 'search for procedures' button

#### **Export Procedures**

This function allows the selected procedures to be exported to back up the data, or to be transferred to another system.

#### **Import Procedures**

This function enables procedures that have been exported by the above method to then be reimported onto the system.

Import Procedure(s)	
Select Drive & Folder :	Select File(s) (j) To load all files, leave selection blank
C:\ProCal\Procedures	<u>C</u> ancel <u>O</u> .K.

#### **Edit Custom Lists**

Opens with notepad either the 'Manufacturers list' or 'Instrument description list for editing. These lists are used in the drop down boxes. The data in the drop down boxes will no be updated

#### View Edit procedure costing

Opens a list box showing procedures with the option to edit the price/code field.

#### Advanced

Offers the option to compact and update procedures to the archive for backup. Also allows the user to archive a copy of a procedure before it is edited.

## Writing and Editing procedures with ProEdit

A ProCal procedure is made up of a header and a series of tests. New procedures can be created in three ways: -

## 1: By Using the Wizards

2: By editing an existing procedure

## 3: By writing it line by line

A test can be dynamically edited using ProEdit while at the same time running that test in ProCal. In this way a test can be corrected in ProEdit, saved back to the database by using 'copy test' button, and then run directly by ProCal by using 'restart test'. This provides a very quick method to De-bug a procedure. Note An error will be generated if a test is added or deleted in a procedure by ProEdit when ProCal is running that procedure.

**Procedure Builder Wizard** 

By using ProEdit, the user can create procedures very easily and quickly by using the inbuilt wizard, which can be used to build a basic procedure for a generic instrument type. If an instrument combines several functions such as a Loop and RCD tester, the wizard can actually amend the second instrument tests to an existing procedure, negating the need to create a new procedure.

If extra tests or changes to the specification need to be made then using the edit function within ProEdit can perform this.

From this screen select the instrument you wish to create a procedure for -



Selecting the MultiMeter image will open the menu below.

## Wizard for a Multi meter: -

To create a Procedure for a DMM (Digital Multi Meter) complete this form and click 'Build Procedure'

Manufacturer	Megger		Model Number	Example	Version 1. Number	00
D Meter [	Display 399	19 💌	2 Actual Tes	t Value 3900		×1 💌
B Function	Range Lowest Range	Information Highest Range	Inst % Of Reading	rument Specific % Of Range	ations ± No. Of Counts	Frequency (H
DCV 💿	40mV 💌	1000V -	0.5	1	1	-DC-
ACV 🔶	40m∀ _	1000V 💌	0.5	1	2	1000
DCI 🔶	400uA 👻	10A 🔻	1	2	5	-DC-
ACI 🔶	400uA 💌	10A 🔹	1	2	10	60
онмз 🔶	10R 💌	10MB -	2	5	15	-DC-
CAPS NA	1nF 💌	100nF 💌	1	J.	<b></b>	-DC-
FREQ 🔶	1Hz 💌	10000Hz 🔻	5			-
	Linearity Li Function B	inearity ange 40V	Linearity 10	V 💽		
3 Additio	nal Checks	Continuity Bleepe	er 🔽 Diode T	est 🗹 Bar D	isplay	
					-	

Each separate wizard is used in the same manner to create procedures for different instruments. Choosing a different instrument within the Wizard will open a different form; each one details the individual information that is needed to build the procedure.

## Editing a Procedure

Once a procedure has been created it can be very easily edited. Tests can be deleted, copied, inserted & pasted which enables tests to be quickly duplicated and edited.

Note: A test can be dynamically edited using ProEdit whilst at the same time running that test in ProCal. In this way a test can be corrected in ProEdit, saved back to the database by using 'copy test' button, and then run directly by ProCal by using 'restart test'. This provides a very quick method to De-bug a procedure. Note: An error will be generated if a test is added or deleted in a procedure by ProEdit when ProCal is running that procedure.

Each test in a ProCal procedure is independent, containing all the data required for that procedure and no other.

Select Procedure [E	Select Procedure [Edit Mode]										
Search By	Order By	r Tip : Select criteria to search by clicking on one or more button(s). To view all instruments click start search without selecting a search criteria.									
Procedure Number	۲	Procedure Number	Manufacturer								
<u>V</u> ersion Number	D	1299	Acculab Act Advance								
<u>M</u> anufacturer	D		Agilent Anglicon								
<u>D</u> escription	D	Procedure Version	AUIP Appa AV Power Ltd								
Model Number	О										
Date <u>C</u> reated/Edited	0		Description								
<ul><li>Standard</li><li>Accredited</li></ul>		Model Number	2/10/50 Current Clamp Adaptor								
Select Accredited, Standard or both.		Date Created / Edited	5kV Insulation Adaptor AC Microvolt Meter								
<u>S</u> tart Search											
<u>E</u> xit		ļ.									

A procedure can be searched for by any one of the above methods, the description of the instrument and the manufacturer can be chosen via the scroll bar or by entering the name manually. Procedures can also be found by selecting if it is a Standard or Accredited procedure using the tick boxes, this option will load a seperate list of all accredited or standard procedures.

If the procedure is found a new menu will open allowing the user to select the correct procedure if more than has appeared depending on the search options used.

Select	Procedure [	Edit Mode]			
Pro	cedure Se	earch Results		đ	Match(es) Found.
No.	Instrument D	escription	Model Number	Version Number	
1299	) ¦ Cable An	nalyser	¦ Transmille	¦ GHC6354	210
>> On	lered By Proced	ure Number		ĺ	Print List

Double click the procedure, or select it and click 'Accept', if the wrong procedure is found then click 'Re-Search' to find the correct one.

The Procedure instrument Information menu will be opened, all information can then be edited and updated, the next menu will contain the Uncertainty statements and Traceable instruments that can be changed and updated if required. The final menu contains the tests of which all can be edited, to finish editing a procedure just click 'Done'. Editing a procedure follows the same outline as creating a new procedure.

#### Create new Procedure

After selecting 'create new procedure' the user is first asked if they are sure they wish to create a new procedure, after selecting "Yes" the user will have the below form to fill in with the details of the procedure and the instrument.

#### The Procedure Header Page: -

Procedure Ins	trument Information (Proc 83)	
Instrument Descrip	tion Manufacturer	
Digital Multime	ter 🗾 Fluke	-
Model Number	Version Number     Certificate Type     Date Created / Edited       1.10     Standard Certificate     22/06/2010	Last Used 24/09/2014
Verified	Report Filename	•
Comment Line 1	Calibrated to manufacturers specification at the measured points	<b>.</b>
Comment Line 2	Specification Reference: Part No 731034 January 1984 Rev 1 05-89	<b>▼</b>
Comment Line 3		<b>•</b>
Comment Line 4		<b>.</b>
Comment Line 5		<b>•</b>
Result Type -	Custom Column Headings (Optional)         Price / Stock Code           Applied Value Title         AmpCal001	
🖲 Pass / Fail	Tolerance Title	
Select result display for 'built-in certificate forma	Reading Title	•
Co E <u>x</u> it	Technical Data         Click to View technical data         or add a new document         WEB Credits         0	<b>⊖</b> <u>N</u> ext

#### **Instrument Description**

Use this field to describe instrument functions, this will be printed on the certificate and MUST be completed.

Note: The drop down box can be edited in the utilities menu.

#### Manufacturer

Used to highlight the manufacturer of the instrument, this will be printed on the certificate and MUST be completed.

Note: The drop down box can be edited in the utilities menu.

#### **Model Number**

This field is for the model number of the instrument and is very important, as the model number used in the procedure must match for ProCal to automatically search for it. It is a good idea to have a 'company standard' method to deal with spaces in model numbers and the use of Roman numerals when entering a model number.

Note: That any digital ID images and that the Technical help notepad file are linked to the procedure by model number. Changing model numbers here will require these files to also be renamed and updated.

#### **Version Number**

Used to identify the version of the procedure. Note that when editing a procedure there is an automatic archive option available. The archive option allows the user to save a copy of a procedure before it is edited; this is a valuable function of ProEdit.

#### **Certificate Type**

Used to select the type of calibration and certificate that this procedure will produce. This selection sets both the certificate print style and also to only list procedures in ProCal which match the certificate/report style set for the instrument, as set in ProCal or ProCal-Track.

For example: Only procedures for standard calibration will be listed for an instrument which has been booked in for standard calibration, whereas an instrument which has been booked in for an Accredited calibration will only have the Accredited ISO17025 procedures listed. This stops the accidental selection of the wrong type of certificate format.

Note there are 5 different certificate/reports available:

Standard Certificate Accredited Certificate Certificate of Conformance Electrical Safety Test Test Report None

Each with its own certificate number counter as set in ProSet. Any particular model may have for example both a standard certificate procedure, and an ISO17025 accredited style procedure with different test points, uncertainties comments etc. This allows the laboratory to provide complete flexibility in the choice of services it provides.

A separate counter is used for each type of certificate/report, allowing for the sequential numbering of certificates.

The Test report is of particular interest for hire equipment as it allows a short procedure to be used as a quick check before or after hire, whilst the certificate procedure allows for a full annual calibration.

#### **Date Created**

Used to log the date that a procedure is written.

Note: Use the Technical help file to keep details of the procedure history.

## **Date last Used**

Automatically filled in by ProCal when used, useful when checking on the usage of a procedure.

## Notes (Technical File)

Short text field used for procedure notes, e.g. special version. Use the Technical help file to keep longer notes.

Note: That the Technical note file is a simple text file edited by Windows notepad, and is automatically created by ProCal as model number .txt from a template file. This file can be easily viewed and edited from many screens in ProCal simply by clicking on the 'View Technical File' button. It is very handy for keeping all sorts of notes relating to that instrument.

#### **Report File Name**

If a special style of certificate/report is required for this procedure then a crystal report file name can be entered here and this will always be used for any certificate produced by this procedure.

## **Comment Fields**

Any comments made in these 5 lines will be copied across to the certificate when this procedure is used. These lines can be edited before the certificate is saved. This can save time and also mistakes.

## **Print Options**

Set on standard certificates where a test result will be printed as pass/fail or as a percentage of specifications figure. The majority of quality mangers prefer to see Pass/fail printed.

#### **Column Headings**

Sets the titles printed at the top of each measurement page on the printed certificates.

#### Price / Code

Sets the Price of a calibration using this procedure, this information is then transferred to ProCal track and used for Job costing and invoicing later.

## Procedure uncertainty statements and Traceable reference instruments used.

Procedure Instrument Information (Proc 83)										
<b>Uncertainty Statements</b> Please select the uncertainty statements required to be printed on the certificate (note : these will not be printed if the procedure uses individual uncertainties for each test).										
Uncertainty Line 1	1 : D.C. Voltage	-	Uncertainty Lin	e 6	** Not Selected **	-				
Uncertainty Line 2	2 : A.C. Voltage	•	Uncertainty Lin	e 7	** Not Selected **	•				
Uncertainty Line 3	3 : D.C. Current	•	Uncertainty Lin	e 8	** Not Selected **	•				
Uncertainty Line 4	4 : A.C. Current	•	Uncertainty Lin	e 9	** Not Selected **	•				
Uncertainty Line 5	5 : Resistance	•	Uncertainty Lin	e 10	** Not Selected **	•				
Please select the certificate cover	e traceable instruments require sheet (note : these instruments	d to will	be used for a not be printed	calibri d on U	ation. These will be pi JKAS certificates).	rinted on the				
Instrument 1 TNO	t Selected **	•	Instrument 6	I™ No	ot Selected **	<u> </u>				
Instrument 2	t Selected ** 3050A Precision Multi-Produc	^	Instrument 7	™ No	ot Selected **	<b>_</b>				
Instrument 3 02 : L	.: ** NONE **		Instrument 8	** No	ot Selected **	-				
Instrument 4 03 : L	. : ** NONE **		Instrument 9	Rese	rved For Unit Under Test	🔲 Enable				
Instrument 5 05 : L	. : ** NONE ** - ** NONE **									
07 : L	: ** NONE **	~								
9										
Back						<u>N</u> ext				

Use the drop down boxes for the Uncertainty Statements if using this method of uncertainties for the certificate. Note there are a maximum of 10 lines of statements that can be printed on a certificate using this method.

#### LEAVE ALL STATEMENT LINES SET TO '\*\*NOT SELECTED\*\*' IF YOU WANT TO PRINT INDIVADUAL UNCERTANTIES WITH EACH TEST AS REQUIRED FOR AN ISO 25 / 17025 ACCREDITED CERTIFICATE

Use the drop down boxes for any reference standards used in the procedure. Not that ProCal automatically knows about reference standards used when manually selected in tests, or are the default instrument for that test. Other standards used as ancillary equipment, for example a thermometer to measure the temperature of a resistor will need to be added here.

# Instrument 9 'Reserved For Unit Under Test (UUT)' must be clicked. Enable if the UUT's interface is being used to perform a closed loop calibration. This will cause ProCal to Prompt for the UUT's interface either as a GPIB (IEEE488) address or as serial COM port number before starting calibration.

## Test Control

When editing a procedure or creating a new procedure the buttons below the data screen enable the user to control the process:



#### <Back:

Returns the user to the previous screen-Procedure instrument information screen

## Show All

Displays a list of all the tests in the procedure

Test Li	ist				
No.	Test Title	Test Value	Accuracy	Uncertainty	
1	TITLE LINE : DC Vol	tage			^
2	1V D.C. Range	0.9900V	3.1mV		
3	10V D.C. Range	9.900V	27.8mV		
4	100V D.C. Range	99.00V	277.5mV		
5	1000V D.C. Range	1000.OV	4.3V		
6		BLANK LINE-			
7	TITLE LINE : AC Vol	tage			
8	10V A.C. 0 50Hz	9.900V	156.5mV		
9	100V A.C. 0 50Hz	99.00V	1.6V		
10	750V A.C. 0 50Hz	750.OV	12.1V		
11		BLANK LINE-			
12	TITLE LINE : DC Cur	rent			
13	10mA D.C. Range	9.900mA	82.2uA		
14	40mA D.C. Range	39.00mA	372.5uA		
15	10A D.C. Range	10.000A	83mA		
16		BLANK LINE-			
17	TITLE LINE : AC Cur	rent			
18	10mA A.C. @ 50Hz	9.900mA	181.2uA		
19	40mA A.C. @ 50Hz	39.00mA	762.5uA		*
		<u>P</u> rint Procedu	re <u>C</u> ancel	<u>0</u> .K.	

From this screen it is possible to jump to any test simply by double clicking on it or clicking 'OK' after highlighting the relevant line. A short print out of the procedure can also be generated from here by clicking on 'Print Procedure'.

#### Undo

Undoes all changes since moving to that test.

#### **Delete**

Removes a test from a procedure. All other tests are shifted up one line. Any formula functions, which use a test number, are also adjusted.

## Insert

Inserts a blank test above the current tests in the procedure, all tests below are shifted down one line. Any formula functions, which use a test number, are also adjusted.

## Paste and Copy

Pastes a complete test, which was previously copied using 'copy' over the current test. If the 'Paste' button is greyed out then there is nothing in the buffer to paste, copy a test first.

Note: Paste does not insert a test, it will Paste over any existing data, use 'Insert' first to create a new blank test if required.

#### **Previous**

Click to step back a test. - Note you can also double click on the test in the test window.

#### Next/ Add New Test

Move down a test, if already on the last test, a new test will be automatically created. Note if you create a new test by mistake use delete.

## ProEdit Test Types

ProEdit Cu	rrently Edit	ing : Fluke 7	7 Digital N	ultimete	r (Proce	dure : 83)		
	Test Titl	e	Te	st Value		Accuracy	Unc	ertainties
				BLANK LINI	E			
				End of resul	ts			
	200000000000000000000000000000000000000		30				5263003	
0							202200	
Test	Prompts	Instruments	Advanced	Print		Copy Buffer: B	LANK LINE	
Test Type			•					
Eack	Meter Measurem General Pass / Fai Certificate Continuity PAT	ent Format / Insulation	Tester	Paste	<b>Ра</b> Сору	Prev Ner	Done	✓ Auto Units
Test Numb	er 45		a Allante	Set th	ne test data	a required		

Much of the power of ProCal is the speed and simplicity in which a Procedure can be written; this is due to the ease in which tests can be created.

In ProEdit the first action in creating a new test is simply to decide what type of instrument or test is needed. From this first selection ProEdit can restrict the information displayed and the format to only the data required for that test type.

When an oscilloscope, meter or measurement type test is selected, ProCal will also know what instrument to use, such as a calibrator or DMM (Digital Multi Meter). As ProCal already knows how to communicate with the default instruments via its inbuilt driver there is no need for any 'interface code' to be embedded in a test. All that is required is to set the values required and ProCal will do the rest.

This very powerful feature allows a ProCal procedure to be used on different calibrator's without modification as the driver imbedded within ProCal is handling the interface code. As there is no need for most tests to get bogged down in writing interface code, control code tests can be generated very quickly.

## **Description of Test types**

## Oscilloscope

For calibrating oscilloscopes using the system oscilloscope calibrator, selected in Line 3 of the traceable instruments table in ProSet

Used for Amplitude, time base, rise time and bandwidth tests.

#### Meter

Use for calibrating any kind of meter using the system Multi product calibrator, selected in Line 1 of the traceable instruments table in ProSet

#### Measurement

Use for calibrating any instrument you need to measure the output, using the systems multi meter (DMM), as selected in line 2 of the traceable instruments table in ProSet.

#### General

This test is very powerful as it can be used for almost any type of calibration where there is a test/applied value and a result.

For example it could be used for calibrating a pressure gauge using a dead weight tester, or liquid in a glass thermometer with a liquid bath. It does not need to be electrical measurement and does not have to control any instruments at all. Although electrical tests can be performed using this and instruments can still be controlled from the command window.

P	roEdit Currently Editing : Fluke 77	Digital Multimeter (Proc	edure : 83)	
	Test Title	Test Value BLANK LINE End of results	Accuracy	Uncertainties
>	50Bar	50B ar	50mB ar	0.08B ar
	Test Prompts Instruments A	vdvanced Print	Copy Buffer : 50Bar	(50Bar)
	Test Type General	•		
	Test Title 50Bar	Frequency	Hz	Test Value 2 💌
	Test Value 50Bar Symi Inst. Range T	bols		Reading D.P.
	Accuracy (+)	ie Zero/Total Accuracy C %+ +	ounts = 50mB ar	Keyboard (manual)     Keyboard (deviate)
	Accuracy (-) Enter accuracy (+ units) or le Uncertainties 0.088 ar	ave blank to use Accuracy (+) 	I	
	Image: BackImage: ListImage: ColumnImage: Col	Insert Paste Copy	Prev O	Cone Auto Units
	Test Number 45	Select the number of Readin	ng D.P. (min. = 0, max.	= 8)

Any units can be used in this test, PSI, kgs, millimetres, inches etc. This General test type makes ProCal a completely universal calibration software package.

## Pass / Fail

For tests where there is no numerical result, a simple Pass/Fail result can be chosen, for example a continuity bleeper.

## **Certificate Format**

Used to format the certificate, although ProCal does not run a format test; they are passed through to the certificate. Allows page breaks, titles, and blank lines to be added to a certificate.

## Continuity / Insulation testers

Tests specifically for calibrating insulation and continuity tester using the Transmille 2100. Covers high value resistance to 10 GOhms, Low value resistance and Insulation test voltage measurement.

## PAT

Tests designed to cover the calibration requirements for PAT testers using the Transmille 2100. Tests include earth bond resistance & current, insulation resistance, leakage current, flash voltage measurement etc.

## **RCD Testers**

A specific test that only works with the Transmille 2100 to calibrate both RCD current and time.

## **Loop Testers**

For calibration of loop tester using only the 2100. Allows selection of loop values with read-back from 2100 of loop value after correction for local loop supply.

#### Pressure

Tests for calibration Pressure indicators, sources and switches using the Druck DPI515 calibrator.

## Oscilloscope Test.

Select this test type for calibrating an oscilloscope's amplitude, time base, bandwidth & fast rise. See pass/fail test and general tests and meter tests, which may also be used in an oscilloscope procedure

> This type of test will use the oscilloscope calibrator selected in ProSet>file>instrument traceability: Line/Instrument 3

## Select the Test Tab and test type then enter 'oscilloscope'

The functions that can then be selected are

Test	Prompts	Instruments	Advanced	Print			
Test Type	Oscillosco	pe	•	Test Func	tion		•
,					Amplitud Timebas	e e	
					Rise Tim Bandwid	e th (Levelled Sweej	p)
					Bandwid	th (Fast Rise)	

Select the required option and fill in the test data as required. Most fields are obvious.

Note: To use deviate the calibrator for amplitude and time base so the trace can be aligned with the graticule.

To create an Oscilloscope procedure it is recommended to first use the wizard in ProEdit and then edit the procedure.

#### Further options, setting and controls

Many more functions, controlling the UUT, formula, etc are available in the other tabs; these functions are covered in the section following 'test types' on Page 79.

Meter Test (Use calibrator to calibrate meter)

One of the most used test types for calibrating all types of meter.

- 1: Digital or analogue multi meter measuring volts, current and resistance etc.
- 2: RLC meter
- 3: Frequency meter
- 4: Temperature meter
- 5: Pressure meter
- 6: RPM meter (for 2000 Series calibrators only)
- 7: Torque meter
- 8: Power meter

Test	Prompts	Instruments	Advanced	Print		
Test Type	Meter		-	Test Function		•
r					D.C. Voltage D.C. Current A.C. Voltage A.C. Current Resistance Capacitance Inductance Mark/Space Ratio PRT Torque Pressure RPM Power (Watts) Power (VA) Power (Phase Angle) Power (Power Factor)	< III )

After selecting this test type then select the test function and next select the measurement parameter of the meter.

## Editing a Procedure

P	roEdit Curr	ently Editi	ng : Fluke	77 Digital i	Multimete	r (Proce	dure : 83)	)
	Test Title			Te	est Value		Accuracy	Uncertainties
		320mV D.C. F	lange	2	290.0mV		970uV	
		3.2V D.C. Ra	ange		2.900V		9.7mV	
>		32V D.C. R	ange		29.00V		97mV	
		320V D.C. R	ange		290.0V		970mV	
		1000V D.C. R	ange		1000V		5V	
	Test	Prompts	Instruments	Advanced	Print		Copy Buffer :	50Bar (50Bar)
	Test Type	Meter		•	Test Func	ion D.C.	Voltage	•
	Test Title Test Value Inst. Range	32V D.C. 29.00V 30V	Range S	ymbols				Test Value 2 - D.P. Reading D.P
	Accuracy (+) • % • PP Uncertainties	% Of Readi M 0.3	ng <u>% Of R</u> a % <b>+</b>	ange Ze % <b>+</b>	ro/Total Acc	uracy Cou + 1	<u>int</u> s <b>= 97</b> π	Keyboard (manual)     Keyboard (deviate)     Deviate Calibrator
	Back	ist Unc	do <u>D</u> elete	Insert	Paste	<b>Copy</b>	Prev 20 c	Auto Units

## **Test Title**

This is the Printed title on the certificate, it has no control function and is just text. If performing an AC test the frequency should be in the title.

## **Test Value**

This is the value that the calibrator will be set too. The units must correspond to the function selected, e.g. mV or V for a voltage tests.

## Note: The value in this box will be used in the accuracy calculation as the % of reading

#### Instrument Range:

This box can be left empty if there is no % of range accuracy, otherwise enter the full scale of range.

#### Accuracy Boxes

ProCal will calculate the total instrument error by adding together the contributions by

#### % Of reading

This is used to calculate the error of reading from the value in the Test value box above.

% Of range

This is used to calculate the error of range from the value in the instrument range box above.

#### **Zero/Total accuracy**

This must be entered in the same units as Test value and is used directly

#### **Counts**

Many DMM specifications quote a floor error as a number of digits or counts. The number entered here is used together with the resolution of the last digit taken from the decimal point (D.P. boxes) above. From this ProEdit can work out the error in the units of the test value.

These boxes are added together dynamically and the error can be seen to change as data is entered. The 4 boxes have been provided to allow for the way different specifications are written, if there is no specification for one or more boxes leave blank. It is only necessary for ProCal to have one box with data in.

#### Test Value D.P (Decimal Points)

This is the number of decimal places the applied value will be printed onto the certificate. Usually set to be one more than the reading.

## Reading D.P. (Decimal Points)

This is the number of decimal places used to print the DMM reading to. If left blank it will default to the test value above. This is also used as part of the uncertainty calculation and accuracy calculation above.

#### **Result Input**

Keyboard (Manual); Enter reading from DMM using keyboard.

Keyboard (Deviate):

Nominal test value is displayed, which may be incremented or decremented by using keyboard. Useful for a frequency counter with long display lengths.

Deviate Calibrator:

Use mouse/keyboard to slew calibrator until meter reads correct. Very useful for older analogue meters.

#### **Uncertainties**

When uncertainties have been calculated manually enter the value here, this value will be used by ProCal in the test and passed on to the certificate when this test is run. The auto uncertainty calculations function is disabled when a value is entered in this box.

#### Auto Units

The auto unit's option allows units to be preserved as entered. When clicked ProCal will convert values to the most appropriate scaling (e.g. 0.05V would convert to 50mV).

Additional Information (Resistance, Temperature & Power Test Functions)

The resistance test function also has an additional 4-Wire selection checkbox

Test	Prompts	Instruments	Advanced	Print			
Test Type	Meter		-	Test Function	Resistance	▼ 4	-Wire

The **temperature** test function also requires the thermocouple type to be selected. This is displayed in a drop down list.

Test Prompts Instruments Advar	nced Print	
Test Type Meter	Test Function Temperature	•
Test Title     100°C       Test Value     100°C ▼ Symbols       Inst. Range     ▼	Thermocouple Type	Test Value D.P. Reading D.P. [Optional]
Accuracy (+) 5 % of Range	Zero/Total Accuracy     C TYPE K     TYPE J     TYPE B     TYPE E     TYPE N     TYPE R     TYPE S	RESULT INPUT Keyboard (manual) Keyboard (deviate) Deviate Calibrator

The power test function also requires the voltage and phase angle to be set.

#### Note: The current is automatically calculated based on the Voltage, Phase Angle and Test Value.

Test Prompts Instruments Advanced	Print
Test Type Meter	Test Function <b>Power (Watts)</b>
Test Title 1kW	Frequency (Hz) 60 Test Value D.P.
Test Value 1kW  7.071A Inst. Range  7.071A	Voltage 200V  Phase Angle 45  [Optional]
Accuracy (+) 10 % + 2 % Accuracy (+)	o/Total Accuracy Counts   Counts  Coun
Uncertainties	

## Tab Function's in the test data screen in ProEdit

Each test in a ProCal procedure has five 'tabs' the first tab selects the prime test function, covered in the previous section on Page 74.

The other tab functions perform basically the same for all test types:

## Tabs in the ProEdit test data screen

Test	Prompts	Instruments	Advanced	Print

## Prompt tab

Test Prompts Ins	struments Advanced Print			
Test Type Meter	Test Function Power (Watts)			
Show Help Screen Before Te	est 🔿 Yes 💿 No			
Before Test Prompt File Link to > Image / Video <u>T</u> ext File <u>V</u> iew Folder				
Before Test Prompt Text	Select DC range and connect test leads			
Calibration Test Prompt File	Link to > Image / Video I ext File View Folder			
Calibration Prompt Text	Adjust for correct reading using VR2			

## 1:Show Help Screen Before Test:

Sets ProCal to display a help screen before starting the test. This is to allow the operator to set up the instrument and connection from the on screen information before the test is started. To run the test directly without displaying help click 'No'

## 2:Before Test Prompt File:

The name of either a text (.txt), Graphic (.BMP) or video (.AVI) file which will be displayed before the test starts (as above) or when selected with the 'help' button on the ProCal measurement screen. The '...' button & the 'Edit' button are to help select and edit these files. The files may be created using any program that will produce the required file extension format

#### Note: Windows Media Player is used to play video files.

#### **3:Before Test Prompt Text:**

One line (40 Characters), which can be typed in here and displayed instead of using the file above. Useful for short instructions for that stage of the procedure.

## 4:Calibration Test Prompt file:

Same as 2:(Before Test Prompt File) but only shown when selected from 'cal help' (Calibration Help), button on the ProCal measurement screen. This is to give the operator instructions on how to adjust the instrument. – Note the 'Technical help file' is very useful for this as well. The '...' button & the 'Edit' button are to help select and edit these files.

The files may be created using any program, which will produce the required file extension format.

#### Note: Windows Media Player is used to play video files.

## 5: Calibration Prompt text:

Same as 3:(Before Test Prompt Text) but can only be displayed when the option is selected via the 'Cal help' button.

Test	Prompts	Instruments	Advanced	Print			
Test Type	Meter		•	Test Fun	ction Power (W	atts)	•
Reference	Instrument	O <u>D</u> efault	Custom	01 : L	: 3050A Precis	ion Multi-Produ	ct Calibrator 💌
	y Template			•	Uncertainty Line		-
R				P 0			~
E T				T			
E S				V E			~
T			)	Ť	<		>
🛛 🔃 Click <u>he</u>	<u>ere</u> for help or	n entering instru	ment command	s		Hide C	ommand Windows

## The Instruments Tab

## Ref Inst

## Ref Inst:

The Default option is usually selected which sets ProCal up to automatically use a reference instrument from the ten instruments listed in the Instrument Traceability List. ProCal will for example automatically select the DMM at position two if it is a measurement test, or the calibrator at position one if it is a meter type test.

For a general test it is necessary to select a Custom Reference Instrument, selecting Custom will preset a list of instruments in the drop down list to the right, this list will display all of the instruments in the Instruments Traceability List. (As set in ProSet>File>Instruments.) Select the required instrument.

Note: When a custom standard is selected, the value set in the Traceable instrument table will be used as the
Nominal test value.

## Uncert Temp (Uncertainty Template):

Selects the uncertainty template required to perform the uncertainty calculation for this test, as created in ProSet. This template will be called and used by ProCal at the time of measurement.

## Uncert Line (Uncertainty Line):

If the reference standard used for this measurement has different bands of accuracy as set in the 'uncertainty file' in ProSet then the correct band can be selected here.

## **Post-Test Commands:**

Type in here commands to be sent to instruments using either the GPIB interface or the RS232 serial COM's port.

Click on the '?' to show a list of available commands. Double click on the window to enlarge it.

There are three ways to select the address the instrument is to communicate with.

The address must be at the start of the line and immediately before the command

Communicate with any instrument by directly using its address or COM port

For GPIB start the line with the GPIB address of that instrument: Example: 14 SETACV: Will send 'SETACV' to instrument with GPIB address 14

For RS232 serial start the line with COMxx, where xx is the COM port number. Example: COM2 SETDCI: will send SETDCI to COM port 2

## Set Baud Rate, Parity etc. for serial Commutations.

See example in the command window below.



The COM command is comprised of the following parameters:

COM [Baud Rate, Parity, Data Bits, Stop Bits]

Baud Rate: The following table lists the valid baud rates.

Setting
110
300
600
1200
2400
9600 (Default)
14400
19200

Parity: The following table describes the valid parity values.

Setting	Description
E	Even
Μ	Mark
N	(Default) None
0	Odd
S	Space

Data Bit: The following table lists the valid data bit values.

Setting	
4	
5	
6	
7	
8	(Default)

Stop Bit: The following table lists the valid stop bit values.

Setting	
1	(Default)
1.5	
2	

Notes on use:

## UUT FUNC: DC 1 COM[1200,N, 8, 1] UUT FUNC: AC 10 COM[1200,N, 8, 1]

The COM command MUST be placed at the END of each command line

The default COM settings are 9600,n, 8, 1 - these will be used if no COM command is present

#### To Communicate with an instrument in the Instrument Traceability List

Use '@' followed by the line number in the list. ProCal will then take the GPIB address entered for that instrument in the instrument data set by ProSet.

The advantage of using relative addressing is that should an address of a reference instrument be changed the procedure can remain the same, the only change is to update data in ProSet.

Example: @02 SETACV :will send the command 'SETACV' to the instrument in the 2 position in the traceability list, e.g. the system DMM.

#### To Commutate with the instrument under test (UUT)

If a procedure is set to communicate with the UUT by selecting on the Procedure Instrument information screen when creating/editing a procedure, then when ProCal runs this procedure a message box will prompt the user for an address of the UUT.

To use this address in the command window start the line with UUT, commands will then be sent to the address entered by the operator in the address message box. This allows an instrument to be calibrated using it address as set, avoiding changing it.

Example: UUT DCV 1V: Will send 'DCV 1V' to the address of UUT.

#### Terminators:

All commands will be sent as entered, to add a carriage return or line feed the append

>CR add carriage return

>LF add line feed

>CR>LF add carriage return and line feed.

For GPIB commands the EOI line will be asserted with the last byte sent.

# **Other Commands:**

## **Delays:**

Use to allow a setting delay between two command lines

Example Delay 1.5 : Gives a 1.5 second delay.

## Reading a measurement back from a GPIB instrument

Set addressed instrument to talker and place data into string variable 'READING' until EOI or line feed received. Return instrument back to talker. Timeout of 30 seconds. This command simply reads directly, from the instruments, it usually necessary to first send a range and trigger/take reading commands. Note this command does not use the GPIB 'SRQ'.

Example: UUT FETCHREAD ?RDG : Get reading from the UUT or @02 FETCHREAD ?RDG : Get reading from instrument 2 in the traceability list.

Note these commands are only meaningful in a General or Meter test type.

## Formatting the string variable 'Reading'

The data sent by the instrument to ProCal is stored in the string variable 'reading'. This will contain other characters sent by the GPIB instrument, which will need to be removed before being changed into a numeric value, which can be used by ProCal.

Example TRIM 3, 4 : this will remove the 3 leading and the 4 trailing characters.

It may be useful if unsure of the string sent by the instrument to first check using a simple GPIB program first, for example the GPIB test programs supplied with the NI card.

#### Setting the Nominal or measured test values to the reading taken with FetchRead.

The readings taken and placed in the variable read, once formatted by the 'Trim' command above, can be stored as either the nominal test value or the test value itself used in the ProCal measurement screen.

Example MEAS=READ NOM = READ

With these few simple commands it is possible to set a DMM range, trigger a reading and store it to the nominal test value, and then set and read from another DMM and store it as the test value.

## Post Test Commands

Type in here the commands to be sent to instruments after the test is finished using either the GPIB interface or the RS232 serial COM's port. This is to reset instruments back to a safe state.

## Example use of command Window

Sending extra commands to the System DMM in a measurement test and setting a calibrator:

Test Prompts	Instruments Advanced Print
Test Type Meter	Test Function Power (Watts)
Reference Instrument	Default     O Custom
Uncertainty Template	Uncertainty Line
P @02 NPLC=100 R @02 LFILTER ON E UUT R1/0100/S0>CR T E	
S C	
😲 Click <u>here</u> for help (	n entering instrument commands Hide Command Windows

The DMM is the HP 3458A; the UUT is a Transmille 2000 series calibrator

- Line 1: Sends the command NPLC=100 to the DMM to set reading rate
- Line 2: Sends the command LFILTER ON to the DMM to set filter

Line 3: Sends the command R1/O100.5/S0 to the calibrator with a carriage return character as a terminator.

Note ProCal gets the COM port to which the calibrator is connected from the message box displayed at the start of the calibration.

Note: This function must be selected in the Procedure by ticking INSTRUMENT 9 in the calibration information screen.

## **Example Reading from the UUT**

Test	Prompts	Instruments	Advanced	Print			
Test Type	Meter		•	Test Fur	nction Power (W	'atts)	•
Reference	Instrument	● <u>D</u> efault	O Custom				
Uncertainty	/ Template			-	Uncertainty Line		•
P UUT CON R > READBJ E UUT FET( T TRIM 3,5 E MEAS=RE	IF:VOLT:DC 10 ACK CHREAD R?>C AD	⊳CR R		P O S T T E	UUT S1>CR		~
Ť				> S T	<		>
Olick here for help on entering instrument commands							nand Windows

Line 1: Send command READ? To the UUT to trigger a reading

Line 2: Get the reading from the UUT

The FETCHREAD command tells ProCal to set the addressed instrument to talk and then read in up to either EOI or Line feed. This data transfer is not using service requests.

- Line 3: Trim off unwanted characters
- Line 4: Set measurement to the value of the reading back from UUT.

#### Note: Click on 'Click here' for a list of commands and examples.

## The Advanced Tab

Test	Prompts Instrume	nts Advanced	Print			
Test Type	Meter	<b>•</b> 1	Test Function	Power (Watts)	)	•
Pre-Tes	t Stabilty	Auto Stability 🔿 N % Difference	No. of Samples		Number of C	Coil Turns
Formula						,
Autostep	OFF	C ON		No. d	of Readings to	Average :
External L External L	JUT Control Program JUT Adjustment Program					% Spec.

## Formula Box

Use this box to enter a formula to process or scale the reading.

*Example 1*: Taking off zero / end resistance from readings

If you needed to take lead resistance value off another measurement, simply create a test which measures this lead resistance (e.g. test 1), then in subsequent tests (e.g. tests 2 and above) use the formula to subtract the lead resistance value (result of test 1) from the measurements e.g. X-T1 (where X is the current test value and T1 is the reading taken in test 1 – the end resistance).

When using a 2000 Series calibrator in two-wire ohms mode, the zero value can be used to measure the resistance of the leads without needing to manually short the leads together.

Create a two wire ohms meter test using the zero ohms output from the calibrator and use the formula X-Z (where X is the meter reading and Z is the calibrator zero ohm value). When the meter reading is subtracted from the calibrator zero ohm value this gives the actual lead resistance. This lead resistance value can then be used in subsequent tests by subtracting this value from the test value e.g. X-T1.

Example 2: Scaling the output from a transducer If you are reading the output of a 20Bar pressure transducer (which gives 10V output for 20Bar pressure) with a DMM using a measurement test and you want the measurement to be in Bar, use a formula to SCALE the reading e.g. X\*2 (where X is the voltage being read back by the DMM and 2 is the scale factor).

Note: This test would also use the DUAL UNITS function which allows a DMM range to be set to VOLTAGE but the test value to be set as BAR.
Example 3: Changing the nominal test value

If you want to perform a test where the nominal value is not known until measured, first create a test, which measures this required value (e.g. mains voltage). Then in each subsequent test which requires this value as its nominal, set the formula N=Tx (where N is the nominal value for this test and is being set to the value taken from that test x).

	Formula Key
$\checkmark$	X : Current Test Txx : Test xx Z : Zero Ohms (from 2000 Series calibrator) N= : Set Nominal to [Txx]
	Ехх : External traceable value (as set in ProSet traceability list)
	Valid Operators : + - / *
	Examples
	X - T34   : Subtract test 34 from current test     X - Z   : Subtract calibrator zero from current test     X * 0.75   : Multiply current test by 0.75     N=T1   : Set nominal to the result of Test 1     N=T1/2   : Set nominal to the result of Test 1 divided by 2     X=X/E15   : Divide reading by value stored in traceability location 15     N=T10/E15   : Set nominal to value of test 10 divided by value stored in traceability location 15
	(OK)

Note the ability to use the value for a reference standard in a formula, this can be useful in many cases for example using a current shunts for measuring high current, where the test type would be a measurement of DC voltage which would require the measurement to be divided by the certified value for the shunt to convert to amps.

For example X/E23 would divide the voltage read by the DMM by the value of the current shunt E23. The value of the standard must be entered in the instrument traceability table by ProSet first. The value of the shunt may of course be used directly in the formula, but by using this method only the value held in ProSet, need be changed when the standard is recalibrated.

Formula	0	
---------	---	--

The formula field does not recognise brackets, the expression is evaluated only from left to right.

### **Dual Units**

Clicking the DUAL UNITS checkbox allows the test value units to be set to a different type than the DMM range units (e.g. 10Bar for test units and 10V for DMM range).

Note: Normally the test value and DMM range must be the same otherwise ProEdit will indicate a test error due to the different units being detected. Dual units permit different units.

This is particularly useful when reading back from transducers where a voltage or current is read back from a DMM but the signal is pressure, torque etc.

See 'example 1' of the formula function for more information

### Number of turns:

This box is for the number of turns of a clamp coil adaptor. The current entered in the test value box for a meter type test is divided by the 'number of turns' before being sent to the calibrator. This then sets the calibrator to output the correct current when using a coil. The numbers of turns when using a Transmille Clamp Coil range from 5 to 10 to 50.

### Auto step:

This selects if the test will automatically step on. If clicked 'yes' a drop down box can set a further condition, such as the length of time before the current test is stopped and the new one begun.

Autostep	O OFF	🖲 ON	<b>X</b> -
			Y ^ 5 10
			20
			40
			50
			60 💌

From this box the action can be conditional on the result of the test. Select 'Y' to allow the test to step on regardless of the result, or select the percent of specification to pass the test by before stepping onto the next test.

Note that selecting auto step changes the control menu in ProCal. Auto step can be over ridden via the 'Control' menu at run time allowing a procedure to be single stepped in the usual way, which is very useful for testing.

### Samples Before Auto step:

This controls the number of samples or readings that are taken before stepping on to the next test. If left blank three readings are taken on a measurement test.

# External UUT control Program

To perform advanced control and calculation functions outside of the scope of ProCal. By entering the file name of this external program in this box ProCal will automatically create and save test information to a file, and then execute an external program. With ProCal in suspension the external program can then open this file and perform whatever task it is written to do. On closing this program it will pass data in a file back and restart ProCal. This feature allows ProCal to be used for any calibration task. The external program can be written in any language, visual basic, C, etc the user is familiar with. As the external program only has to perform control and measurement it can be relatively small, leaving ProCal to do all the major work. This approach can dramatically speed up the development of semi custom applications.

See Appendix for application notes on writing external programs.

### External UUT adjustment Program

As above but this program will be written to make software adjustments to the UUT and will only be called under the following conditions.

- 1: ProCal will be running after adjustment tests
- 2: Run Adjustments tests in the ProCal control menu is selected
- 3: The % of spec error is larger than the figure entered in the '% spec' box.

### The Print Tab

Test Prompts Instruments Advanced	Print
Test Type Meter	Test Function D.C. Voltage
Print Type Always Print Test Always Print Test Print Only If Failed Do Not Print Test Print If Completed DO NOT Print If Completed	

### Always Print Test:

Most used option; the result of the test will always be printed on the certificate.

### **Print Only if Failed:**

Used mainly for ATE (automatic test equipment) stations where only failed results are of interest.

### Do not Print test:

Use for test to confirm operation or pre-tests, which may not form part of the calibration. Also allows for 'lead connections error checks' to be performed, for example before a 20 Amp test perform a 2.1A test to check that the leads are in the correct sockets on the DMM before applying the full current with incorrect connections and blowing up the DMM.

### **Print Only if Completed:**

This print type allows one procedure to cover an instruments model, which have different option combinations, fitted.

When ProCal starts to run a test with this set it will prompt the user if they which to run this section. ProCal takes the title test before as the name of this section of tests. If the user answer yes the tests are run, if no then the block of tests with print only if completed is jumped over.

For example a DMM may come as standard with only DC volts, with options for AC volts, current and resistance. Normally this would require several procedures to be able to cover every combination. By using the print only if completed test, only one procedure is required.

# **Certificate Printing using ProCert**

ProCert is the certificate-printing program and is installed as part of the program suite of ProCal. Using this program certificates can be searched for and reprinted. This program can be used on, as many PC's as required to print certificates locally from a central ProCal database.

### Certificates can also be printed at the end of a calibration or from ProCal track.

### Certificate Types & Styles

For flexibility ProCal offers a choice of two methods used for certificates & report styles

1: In built report styles (including a standard certificate and an accredited ISO17025 certificate) built into the program. These offer ease of use but cannot be edited by the user.

2: Crystal reports custom styles. There are several example reports (including a standard certificate and a accredited ISO17025 certificate), which are installed with ProCal and can be used as templates for the user to edit and create their own custom reports.

Crystal Reports allow the user complete flexibility in the design of the reports. A report is a mixture of data fields, which take information from the database and text. Once created this report can be given a file name and saved. Reports for all sorts of purposes can be written, as can been seen from the installed examples including instrument fault reports, Quotes, Reverse traceability etc.

To edit or create a crystal report the 'Crystal report' program must be installed. Once created a report can be used without installing Crystal reports on other workstations.

When this report is selected the data fields will be filled up and the complete report is displayed on screen, this can be then printed, emailed, faxed etc as per normal.

ProCert will use the type of report stored in the certificate data.

This can be either the built in standard certificate report, or the accredited style certificate or use the file name of certificate reports written by the user in Crystal Reports.

Note: ProCal will save the file name of a crystal report for ProCert to use. This file name will be copied from the procedure, or if not set in the procedure will use the 'Global' name set in ProSet>Program options. If this field is empty then the built in certificate format for that certificate type, standard/accredited/test report etc will be used.

# **ProCert Menus**

# File menu: Search for certificates



Click on the 'Search by' buttons to open up a search box. Enter the details to search by, use '\*' as a wildcard. Use more than one search button if required, then click the search button to start the search.

#### Note: that just clicking on 'search' will show all the certificates.

### Search Results

📓 Certificate List [Multi	Search]				×
System ID	Certificate No. [u] = UKAS	Cal. Date	Model Number	Serial Number	
ID00002 ID00100 ID20394 ID39484 ID85780 ID29389 ID94830 ID29402	STD 3405 STD 3948 A293840 A102090 A193820 A019320 STD 2048 A394209	09/09/2009 01/02/2009 01/01/2009 12/12/2008 05/12/2008 30/11/2008 25/05/2008	8081 TD 495 TL304 TL309 34401A 2080 TL3028 \$239290	S958619 B 1039P 2971903 L394KD LD3940 A 19238 1039410 D39402	
			<u>S</u> earch	<u>P</u> rint	

From this screen select the certificate to print.

### **Print Dialogue Box**



Select the required options for printing, select the printer and click OK to print certificate. Note a PDF printer can be installed on windows to enable a PDF certificate to be produced.

### **Options Menu**

🔊 P	roCert		
File	Options	Help	
Q	Set Lo	go Positions 🔹 🕨 🕨	Certificate Cover Company Logo
Set Logo Positions		jure Label Printer	Certificate UKAS Logo Certificate of Conformance Logo
	Edit C	ertificate of Conformance Text	
	Edit C	ertificate Footer Text	

#### **Set Logo Positions**

This allows the logo print position to be set for the inbuilt reports. Depending on the logo size and printer resolution this will need to be set by trial and error. Note this positions two different logos, the company logo used on the standard certificate and the ACCREDITED/accreditation logo.

📓 Adjust Logo Positi	oning (UKAS Logo) 🛛 🛛 🔀
Adjust positioning for the printed logo :	
X = Across Y = Down	דדיקיות
× Position : 1940	
Y Position : 80	SOLUTIONS IN CALIBRATION
Cancel	<u>K</u>

# Configure Label Printer: Configures Seiko type label printer.

DYMD 300 Series Printer	Print Test Label
Seiko Smart Label Printer® [Label Code : SLP-TMBL]	
Port	
COM1	
С СОМ2	
С СОМЗ	
С СОМ4	
C USB	

# Edit Certificate of Conformance

Clicking Options->Edit Certificate of Conformance Text will open a Notepad file, which can hold customised information for the certificate.

# Appendix

## Data Paths

The below paths are automatically set upon installation of the software

### **Certificates Database**

### C:\PROCAL\CERTIFICATES

Enter the path to the certificates database. Click the "..." button to bring up a file window and navigate to the location of the database. The database file name will be ProResDB.mdb and is shared with the ProCal programs. This is where all certificate data will be stored, the data path should not be changed unless linking paths and files are also updated.

### **Contacts Database**

### C:\PROCAL\CERTIFICATES\CONTACTS.MDB

Enter the file name of the contacts database. Click the "..." button to bring up a file window and navigate to the location of the database.

### **Digital Photos**

### C:\PROCAL\INSTRUMENTPHOTOS

Enter the path containing digital photographs of the instruments. Click the "…" button to bring up a file window and navigate to the location of this directory. The digital photographs directory contains a number of bitmap files with the same name as the instrument they illustrate.

### Sales Database

### C:\PROSALES

Enter the location of the sales database. Click the "..." button to bring up a file window and navigate to the location of the database.

### **Stock Database**

Enter the location of the stock database. Click the "..." button to bring up a file window and navigate to the location of the database.

### PDF Scans

### C:\SCANTEMP

Enter the location where scanned documents will be stored. Click the "..." button to bring up a file window and navigate to the location of the .PDF files

### Advanced Edit

Advanced Edit can be found on all virtual job sheets, to manoeuvre to this menu, click File->View/Edit an Instrument, enter the identifying number such as an instruments serial or job number, when the instrument details appear, double click them, or highlight them and click View/Edit.

Virtual Job Sheet	
Job No. : Instrument :	Certificate Add. : Customer Add. :
Job Info Inst Details Cert Address	Returned By Despatch Address Accessories Service Details History
Job Number :Date Received :Order Number :Invoice Number :Invoice Number :Despatch Date :Calibration Date :Calibration Due :Not AvailableCertificate No :	Link PDF Order   Service Details   Sub Contract Details   Do Not Recall     View Docs   Service Type :   Image: Cert. Type :
Status : Use : Booked in By :	Turn-around : Days Cal. Interval : Weeks  Customer Comments> Inst. Log
<u>C</u> lose <u>P</u> rint Menu	Advanced Edit

Once this menu appears, click on Advanced Edit to change more intricate details about the instrument, such as the signatory for the certificate, or the traceable instruments used during its calibration.

🐐 Edit Calibration Ir	Iformation For Instrument	
Description	Data	
Cal Ref	æ	
Inst_ID		
Cert_No	:	
Cust_Ref	:	
Cal_Date	:	
Rec_Date	( <b>1</b> )	
Proc_no	:	
Cal_By	:	
Version	:	
Temp	:	
Humidity	:	
MVolt		
MFreq	:	
Cal_Int	: •	
Cert_Complete	:	100
Quality		~
Edit Cal Bef		
The data distance	a sea he weather what was to see the shares of shit was to be	of Without a college
The oats displaye	a can be modified. Crick save to save the changes of crick Cancel to abo	Art Without saving.
Cancel	Delete Job Delete	Certificate Save Changes
<u>Tauroo</u>		Service Surve endinges

All the details of an instrument can be changed in this menu, so care should be taken that important data is not lost, this function can be set to Administrator Access only. The list of enterable data is long; this list contains the information for every part of the instruments procession through Booking In, Calibration and its Despatch details.

### **Certificate Number**

If an instrument has been subcontracted out to an external company, then upon its return, the certificate will need to be linked to the instruments details, go into the Advanced Edit of that instrument, highlight 'Cert\_No' by clicking it, and then type the certificate number into the text box below, once the information has been entered click "Save Changes" and then "Yes". For a sub-contracted instrument it is advisable to also scan and link the certificate to the instrument.

🐐 Edit Calibration In	Iformation For Instrument TL756	×
Description	Data	
Cal_Ref	:	
Inst_ID	- 1	
Cert_No	: 2768	
Cust_Ref		
Cal_Date	:	
Rec_Date	3	
Proc_no		
Cal_By	3	
Version	3	
Temp		
Humidity		
MVolt	12 I I I I I I I I I I I I I I I I I I I	
MFreq	3	
Cal_Int	3	
Cert_Complete		
Quality	N	
Edit Cert_No		
2768		
i) Tip : The data displayed	d can be modified. Click Save to save the changes or click Cancel to abort without saving.	
Cancel	Delete Job     Delete Certificate     Save Changes	

#### **Editing Signatories**

To edit the signatory of a certificate, the same method is followed as for entering a Certificate Number, search and open the Job Sheet of the required instrument, open The Advanced Edit menu, and scroll down, highlight the line data that needs to be entered, and type the information into the text box.

ion I	Data	
id 4	<u> </u>	1
id 5		
tory_1	: J, Bailey	
ory_2		_
cory_3	13 C	
ory_4		
cory_5	:	
3		
ass		
)esc_1	:	
L_1 :	:	
lo_1		
ate_1	8	
eriod_1		
)esc_2		
_2 ;		
inatory_1		-
ey		
The data displayed can b	e modified. Click Save to save the changes or click Cancel to abort without saving.	
inatory_1 >y The data displayed can b	be modified. Click Save to save the changes or click Cancel to abort without saving	

### **Editing Traceable Instruments**

The same process can also be applied for editing the traceable instruments that were used during the calibration process. As the image below shows, each traceable instrument has its name, serial number, certificate number, the date that instrument was calibrated, and the calibration period.

🔌 Edit Calibration Info	mation For Instrument	×
Description	Data	
Signatory_3	:	<b>^</b>
Signatory_4	:	
Signatory_5		
Sys_No	: 2	
Marg_Pass	: 90	
Inst Desc 1	: 3010 Precision Multi-Product Calibrator	
Serial_1		
Cert_No_1		
Cal_Date_1	: 03/12/08	
Cal_Period_1	: 52	
Inst_Desc_2	: 3458A Multimeter	
Serial_2		
Cert_NO_2		
Cal_Date_2	: 20/11/08	
Cal_Period_2	: 52	
linst_Desc_3	:	
Edit Inst_Desc_1		
3010 Precision Multi-Product Calibrator		
Tip : The data displayed can be modified. Click Save to save the changes or click Cancel to abort without saving.		
Cancel	Delete Job Delete Certificate Save Change	jes

Note: Once Save is clicked, any changed data will be saved and could affect certificates, reports, and can change information such as despatch addresses, therefore it is wise to operate within Advanced Edit with care.

Note: Only a user with administrator access will have the Advanced Edit function available to them on a Virtual Job Sheet, both the engineer and the operator are unable to access this menu.

# Editing Drop Down Menus/ "..."

Each drop down menu will have a button next to it with three dots "...", once clicked this button will open up a text file in Notepad, once the changes have been made save and close the text file. For the changes to appear in the drop down menu, the screen that is being worked from must be reset.

# Note: The program will not need to be reset, only the current screen or menu will need to be closed and reopened.

# **Contact Us**

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