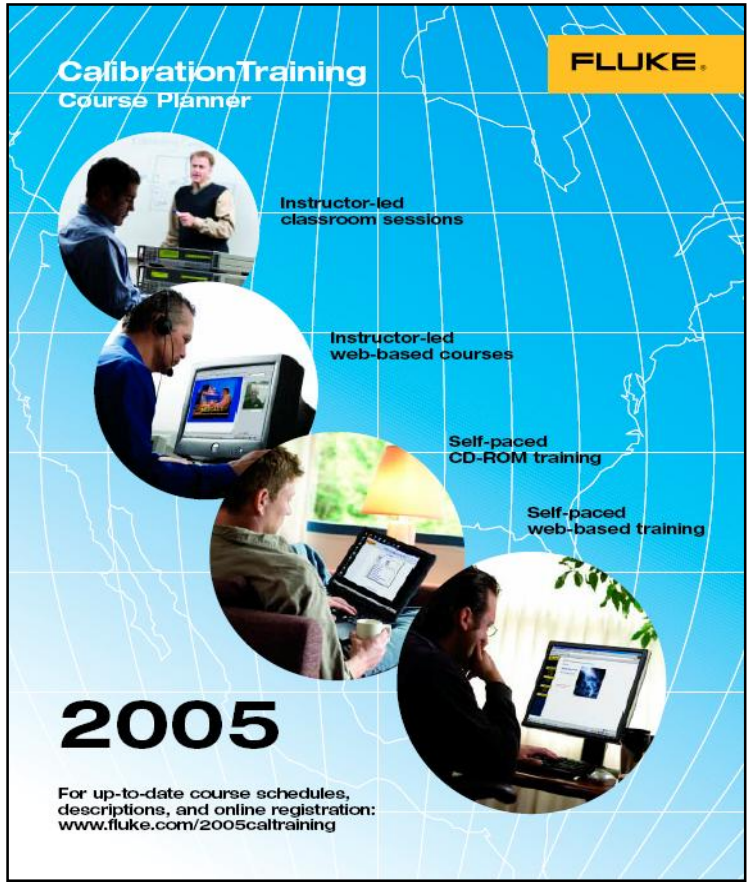
Met/Cal Users Group Meeting

Morning Agenda

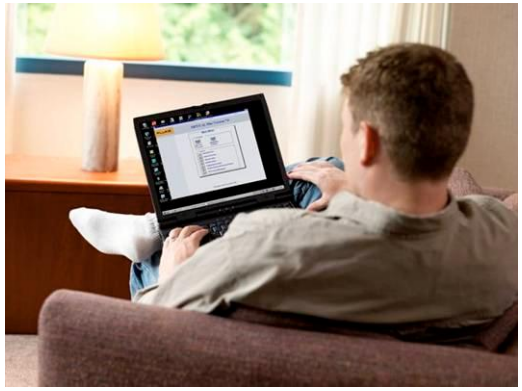
- New Products, Promotions, etc…
- MET/CAL Version 7.2
  - What is new?
  - How do I use the new features?
  - Use of Flexible Standards
- Utility Programs
- Next Generation of MET/CAL

Training

http://training.fluke.com



Training



- **Classroom Training:**
  - Starting in Electrical Calibration
  - Metrology for Technicians
  - Cal Lab Management
  - Preparation for Accreditation
  - MET/CAL Database and Reports
  - MET/CAL Basic Procedure Writing
  - MET/CAL Advanced Procedure Writing
  - Product Specific Training
  - On-Site Training is available for most of the above classes

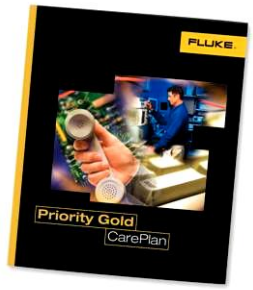
Training

- **Web-Based Training:**
  - MET/CAL Database & Reports
  - MET/CAL Procedure Development

- **Self-Paced Web-Based Training:**
  - Introduction to Measurement and Calibration
  - Precision Electrical Measurement
  - Measurement Uncertainty
  - AC/DC Calibration and Metrology
  - Metrology for Laboratory Personnel (CCT Exam Preparation)

Questions…

Priority Gold Care Plan



- Features…
  - Available on instruments up to 7 years old
  - Includes one, three or 5 annual calibrations
  - Free repairs complete with calibration
  - 3 day in-house turnaround for calibration
  - Priority turnaround for repairs
  - Discounts on upgrades-10%
  - Discounts on training-20%
  - Free two-day return freight on calibrations and repairs

Questions…

Gold Procedures…

Fluke 724/725	**Updated**
Fluke 2680 Family	
Keithley 2000/2015/2016	
Yokogawa DL 1700 Series	
Tektronix 3000 Series	
Agilent/HP 3458A	
Agilent/HP 34410/34411	**To be posted soon**
Agilent/HP 34970	
Agilent/HP 8590	
Biddle Instruments Megadek	
Escort 170 Series	
Tektronix 600 Series	
Tektronix 700 Series	

Gold Procedures…

Tegam ESI DB877
Tegam ESI DB62-11K/ 1M/ 11M
Fluke 433/434
Fluke 45 — **Completely Revised**
Fluke 789
Wavetek HD130B
Wavetek HD160
Wavetek 2015/ 2020/ 2030
Fluke Scopemeters — **Revised**
Tektronix 500 Series
Agilent/HP E2378/2377/2373
Beckman HD 130B / HD 160
Wavetek RMS 225
…….more

Gold Procedures…

RF procedures now available

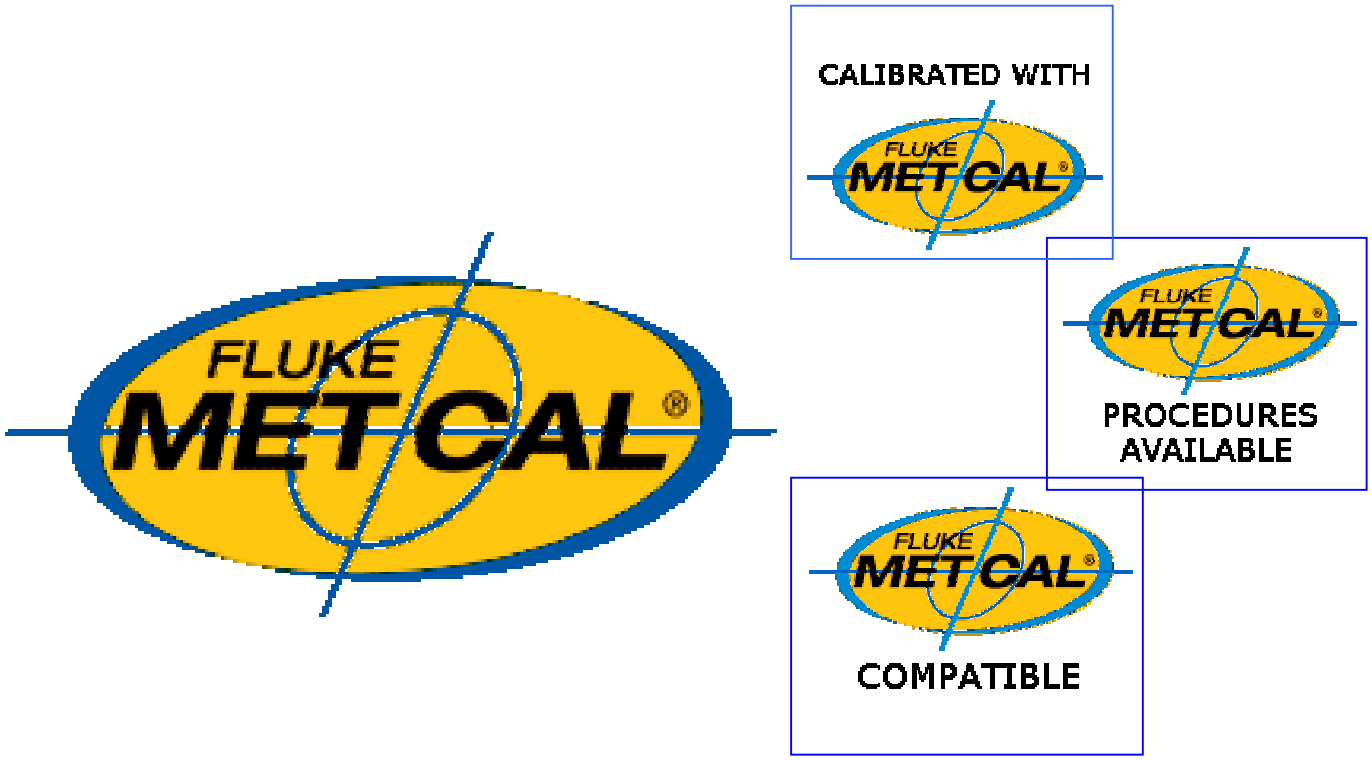
Spectrum Analyzers:

Anritsu MS2661C (new)
Anritsu MS2711D (new)

HP 8563A (new)
HP 8566B (converted for use with flexible standards)
HP 8590L (converted for use with flexible standards)
HP 8594E (converted for use with flexible standards)
HP 8595E (new)

Rohde & Schwarz FSH3

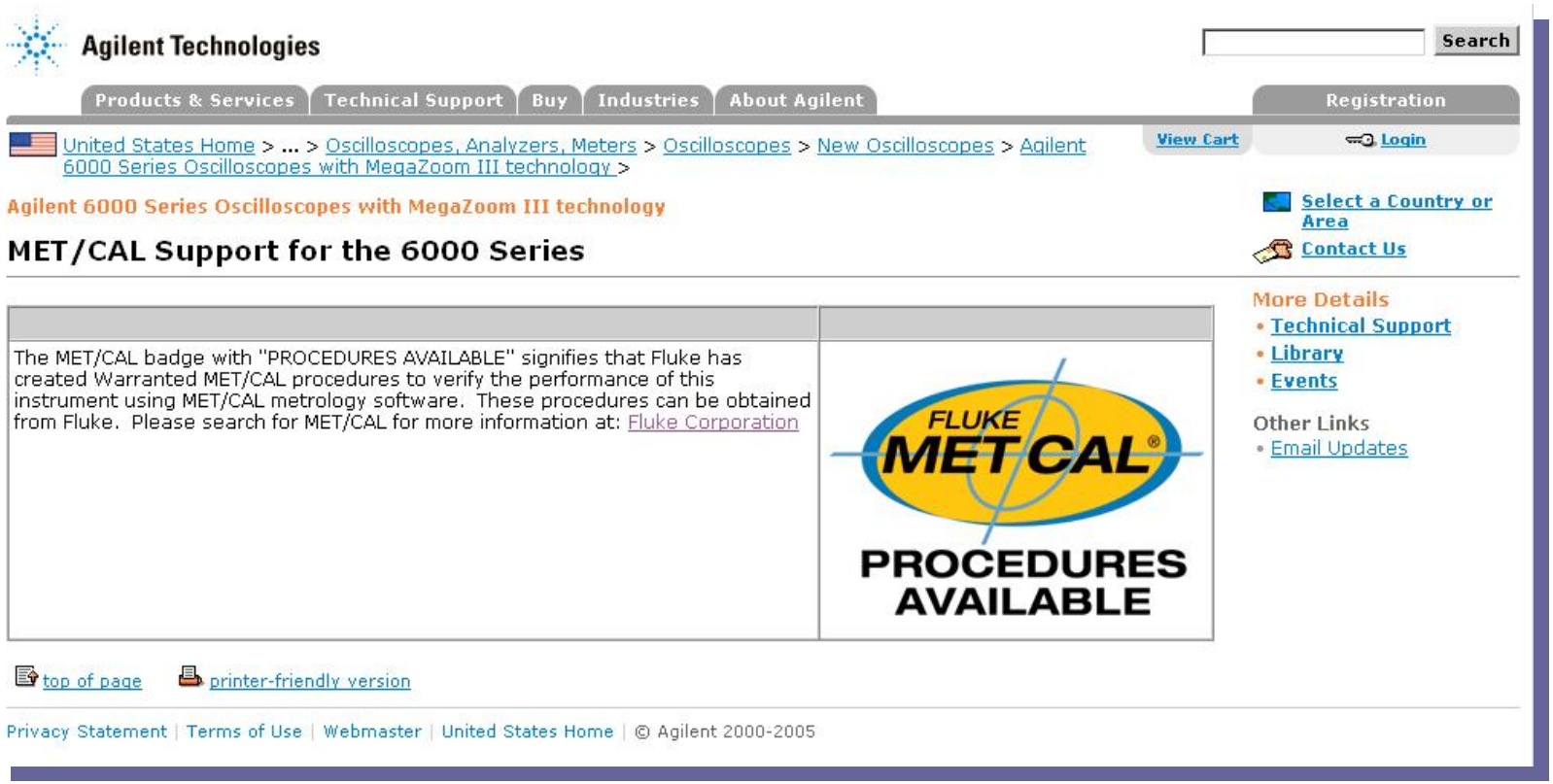
Met/Cal Badge . . .



MET/CAL Badge @ Agilent

Fluke completed Model 6000 procedures for Agilent.

More to come! Agilent 80000/8000 series in the works



Questions…

Pete

The Objective

- How to supply an unlimited number of MET/CAL procedures to our user base?
  - While maintaining a level of quality
  - Minimizing development resources
  - Maintaining reasonable value

MET/CAL Procedures -VOC

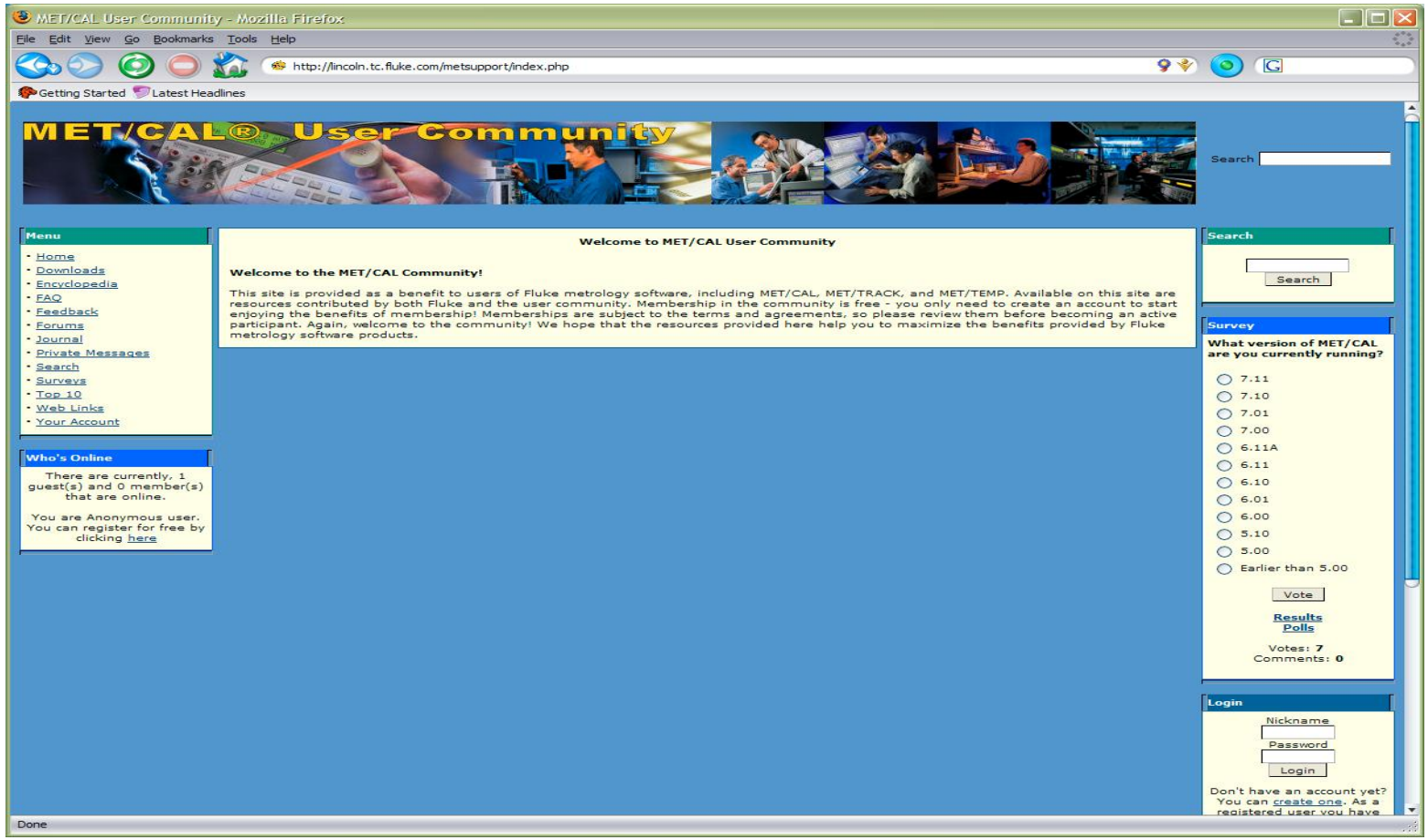
Voice Of Customer

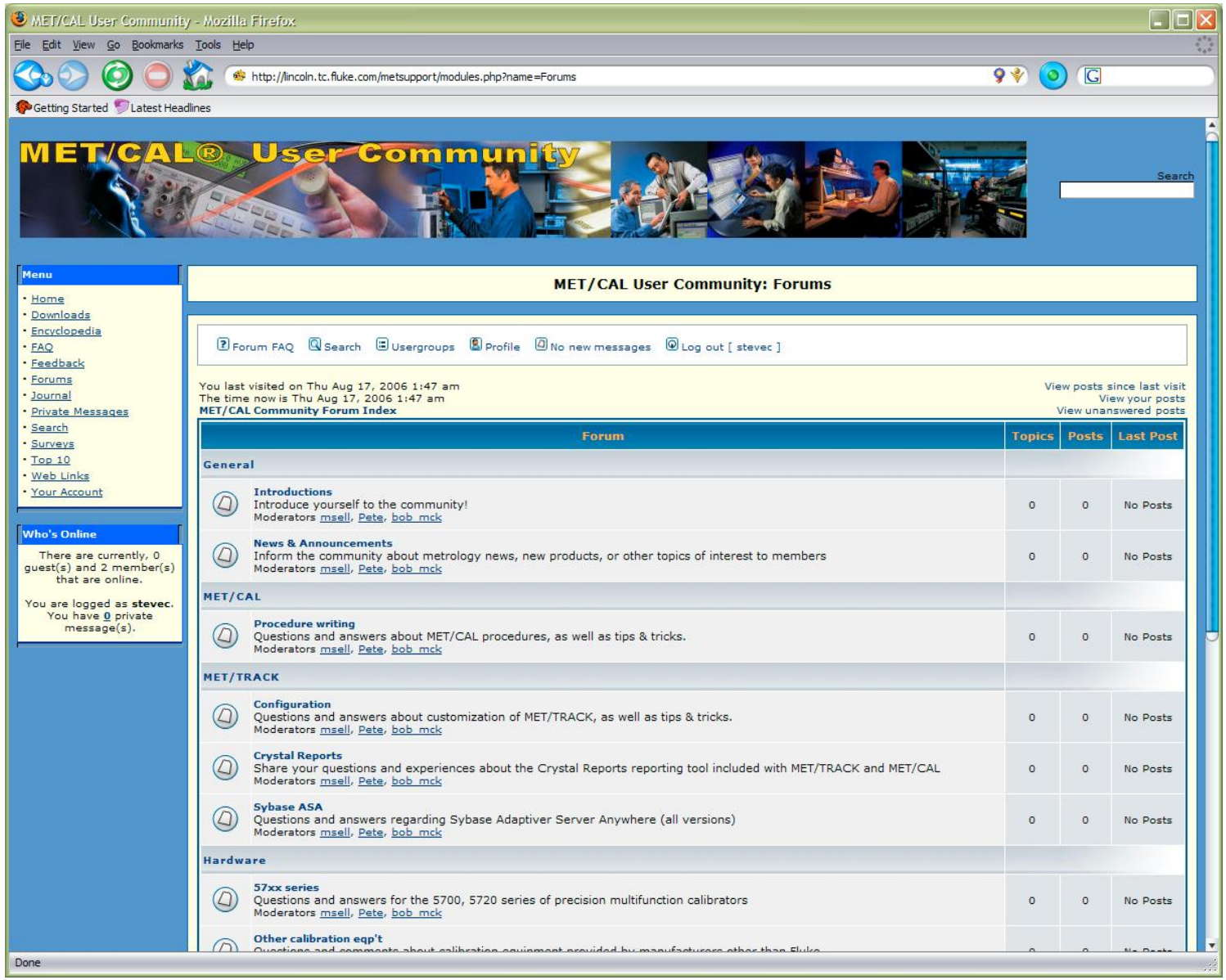
- Never enough procedures to meet User demands
- Access to an untested or part written procedure is better than no available procedure
- Procedures are difficult to share with others
- User confidence is high that procedures available from MET GOLD will function
- MET/CAL users will accept procedures from other sources if quality was known or could be determined
- MET/CAL users are more willing to share procedures with others if rewarded or compensated
- MET/CAL users cannot share procedure with others as these are proprietary to the company they work for
- MET/CAL users are willing to edit/modify procedures that are close to meeting needs

MET/CAL Procedures – a strategy

- Simplify the consolidation of files that constitute a procedure
- Develop a MET/CAL user community repository for procedures
  - Users will upload, download and rate procedures
- Mandate & Automate the process of peer quality rating
- Compensate those that contribute
- Example site

Example site



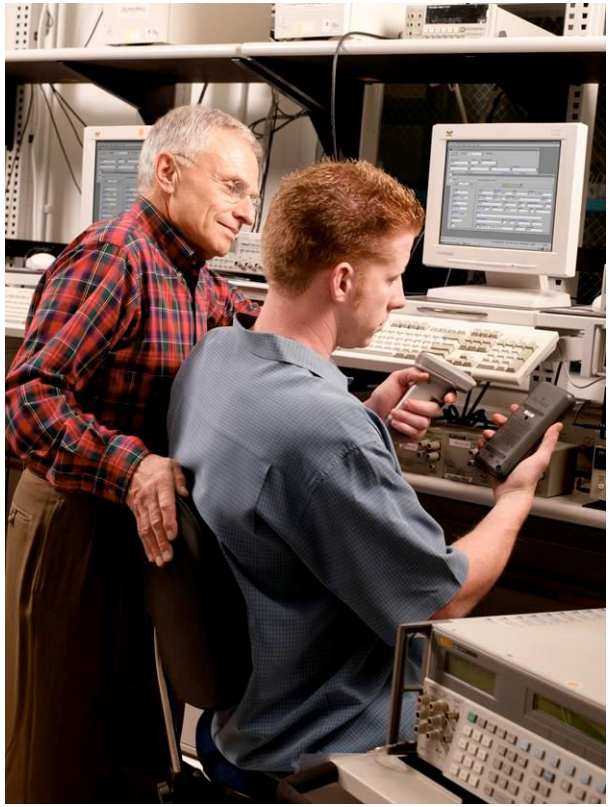

MET/CAL User Community - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://lincoln.tc.fluke.com/metsupport/modules.php?name=Forums
Getting Started Latest Headlines
MET/CAL® User Community
Search
Menu
Home
Downloads
Encyclopedia
FAQ
Feedback
Forums
Journal
Private Messages
Search
Surveys
Top 10
Web Links
Your Account
Who's Online
There are currently, 0 guest(s) and 2 member(s) that are online.
You are logged as stevec. You have 0 private message(s).
MET/CAL User Community: Forums
Forum FAQ Search Usergroups Profile No new messages Log out [stevec]
You last visited on Thu Aug 17, 2006 1:47 am
The time now is Thu Aug 17, 2006 1:47 am
MET/CAL Community Forum Index
View posts since last visit
View your posts
View unanswered posts
Forum
Topics
Posts
Last Post
General
Introductions
Introduce yourself to the community!
Moderators msell, Pete, bob_mck
0 0 No Posts
News & Announcements
Inform the community about metrology news, new products, or other topics of interest to members
Moderators msell, Pete, bob_mck
0 0 No Posts
MET/CAL
Procedure writing
Questions and answers about MET/CAL procedures, as well as tips & tricks.
Moderators msell, Pete, bob_mck
0 0 No Posts
MET/TRACK
Configuration
Questions and answers about customization of MET/TRACK, as well as tips & tricks.
Moderators msell, Pete, bob_mck
0 0 No Posts
Crystal Reports
Share your questions and experiences about the Crystal Reports reporting tool included with MET/TRACK and MET/CAL
Moderators msell, Pete, bob_mck
0 0 No Posts
Sybase ASA
Questions and answers regarding Sybase Adaptiver Server Anywhere (all versions)
Moderators msell, Pete, bob_mck
0 0 No Posts
Hardware
57xx series
Questions and answers for the 5700, 5720 series of precision multifunction calibrators
Moderators msell, Pete, bob_mck
0 0 No Posts
Other calibration eqp't
Done

We Need Your Input ….

- Procedure Development Community
  - See Peter Dack (peter.dack@fluke.com)

Questions…

What's new in 7.2…



What's new in 7.2…

- Anticipated release Sept '06
- Coincides with the release of new hardware
- New FSC's
- New features to enhance RF calibration
- New Flexible Standards
- Procedure portability tool (Pack/Unpack)

Version 7.2 – Flexible Standards

- Problem: Need multiple procedures for a UUT using different standards
- Solution: Single procedures capable of supporting different standards -- Flexible Standards

Version 7.2 – Flexible Standards

- Easy to implement:
  - Procedure based
  - 7.2 supplied with “starter set” of accuracy & control files
  - Easy for customer to add additional FS supported instruments by editing supplied initialization file
  - Procedures coming using FS feature

Version 7.2 – Pack/Unpack

- New tool to package procedures and reinstall in a MET/CAL *Plus* system.

- Works from the MET/CAL procedure editor.
  - Unpack will be downloadable freeware
    - Useful for customers who do not have V7.20 or later and who have access to Gold procedures

Version 7.2 – Pack/Unpack

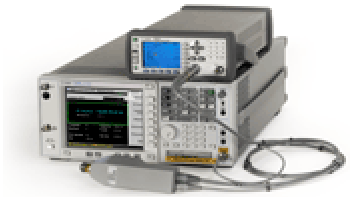
- Combines the procedure, sub procedures and auxiliary files needed to run a calibration.
  - Enhanced procedure portability and distribution
  - Migrate Gold Warranted procedures
  - Reduces user error (missing files)

Version 7.1 – New FSCs

- 53131/M53131 Agilent/HP 53131A Timer/Counter
- 53132/M53132 Agilent/HP 53132A Timer/Counter
- 53181/M53181 Agilent/HP 53181A Counter

Version 7.2 – New FSCs

- 8845/6
- 9640
- 5320
- N5531S
- PSA
- 5350/5351/5352



Version 7.2 – New FSCs

- 9640 - Fluke 9640A Reference Source
  - Instrument control
    - Sine
    - Modulation
    - Sweep
  - Learn Mode
    - Automatically generate procedure statement based on front panel setup

Version 7.2 – New FSCs

- 9640 - Fluke 9640A Reference Source

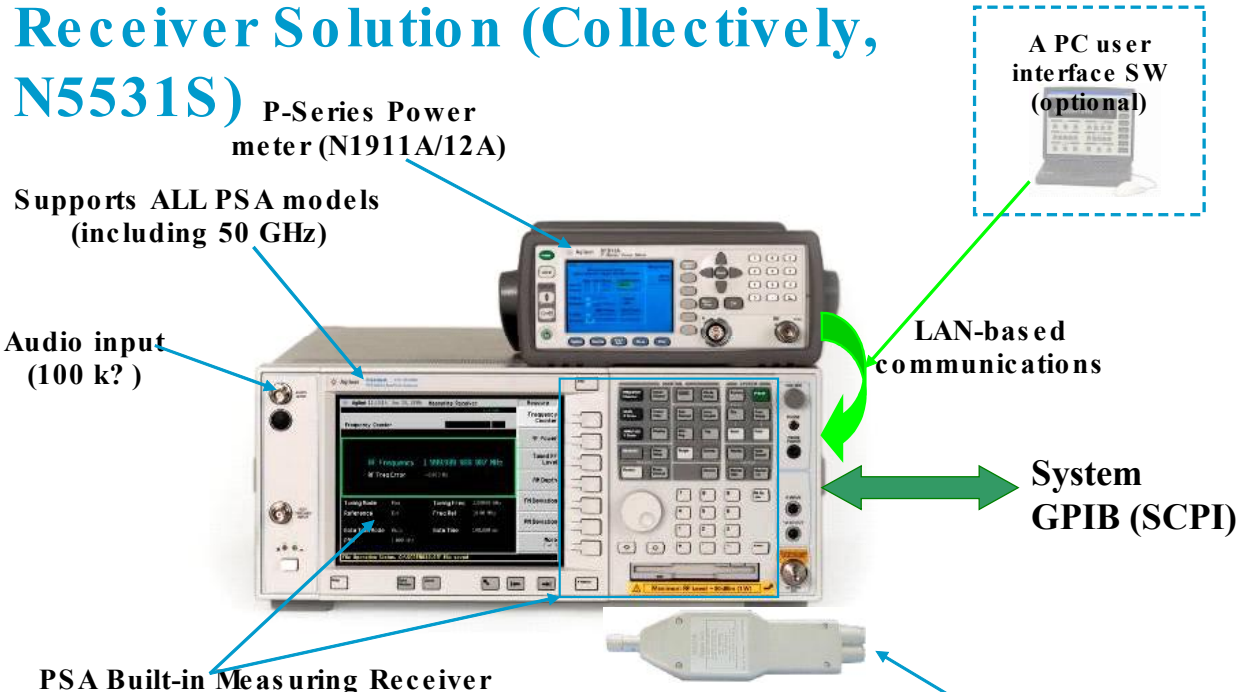
  – FSC supports slewing

  – FSC uses Name/Value Syntax

9640 +Level = -130 dBm; Freq = 100 MHz; OutpImp = 50 ohm

Version 7.2 – New FSCs

PSA/opt 233-Based Measuring Receiver Solution (Collectively, N5531S)



Version 7.2 – Named Variables

- We now support the use of Named Variables
  - **Makes procedure easier to read/write**
  - **Do not need GETV/PUTV etc.**
- Examples:
  - Local Variable
    - `MATH RefLevel = -10`
  - Global Variable
    - `MATH @Channel = 1`

New MATH Functions

- Read/Write to ini file
  - Specify a directory for wif/rif functions
- New file utility functions
- Read from user configured instrument information file
- Load up a contiguous sequence of registers in a loop.
- String replacement function

New MATH Functions

- Prepend/Append spaces to a string
- New numeric test functions
- Return the full instrument name of a configured instrument
- Return the asset number of the UUT

Read/Write to .ini

- New MATH FSC function to read or write to an .ini file
- Function name is ***RIF***
- Function name is ***WIF***

Store your cal factors

New Math functions

New File Related Utility Functions:

(1) EXISTS - determine if specified file exists

(2) FLEN - determine length of specified file

(3) ISDIR - determine if specified file is a directory file

(4) ISORD - determine if specified file is an ordinary file

(5) MTIME - determine modification time of specified file

New Math functions

RINF - read data from user-configured instrument information file

RINFE - read data from user-configured instrument information file and generate an error message when the requested parameter value is not found

The path for these files may be added to the metcal.ini file.

New Math functions

A new MATH FSC utility function, REPL, to perform string replacement.

Example:

```
MATH S[1] = "abc def ghi"
MATH REPL("def", "xyz", S[1])
```

The call to REPL above will change the value of S[1] to:

abc xyz ghi

New Math functions

BASE	**- convert number to base units**
IS_DIM	**- validate dimensioned number string**
IS_UNIT	**- compare specified units to units in dimensioned number**
PSCALE	**- return scale factor based on units prefix**
UNIT	**- return units symbol from dimensioned number string**
UPREFIX	**- return units prefix symbol from dimensioned number string**

New Math functions

Two new functions, PAD and PADB, to append or prepend, respectively, spaces to a string.

For example, to add 13 spaces to the end of a string:

```
MATH   S[3] = PAD("xyz", 13)
```

PAD	append spaces to make string specified length
PADB	prepend spaces to make string specified length

New Math functions

V7.11 includes 3 new MATH FSC numeric test functions:

(1) Function IS_NUM to determine if a string is entirely numeric.

(2) Function IS_NUM_LEAD to determine if a string begins with a number.

(3) Function IS_NUM_SUB to determine if a string contains an embedded number.

New Math functions

A new MATH FSC function named “INSTR" which, when given an alias, returns the name of the corresponding configured instrument.

MATH S[5] = INSTR("5700")

Assuming the workstation has a configured Fluke 5700A with alias "5700", the call above will return the string "Fluke 5700A".

New Math functions – 7.11 sp1

UUT Returns the asset number of the UUT.

Example: MATH S[1] = UUT()

New Math functions – 7.2

CAL

Returns the value of a specified Calibration Table field, for a specified cal record of a specified asset.

The first argument specifies the asset number (string) of the instrument for which the specified Calibration Table value is to be retrieved.

The second argument specifies the record number. Records are numbered from 1 to <NREC>, where record 1 is the oldest record and record <NREC> is the most recent. It is possible to access the records in reverse order by specifying a negative record number:

Example: MATH MEM2 = CAL("Sample-5700", 5, 2342)

New Math functions – 7.2

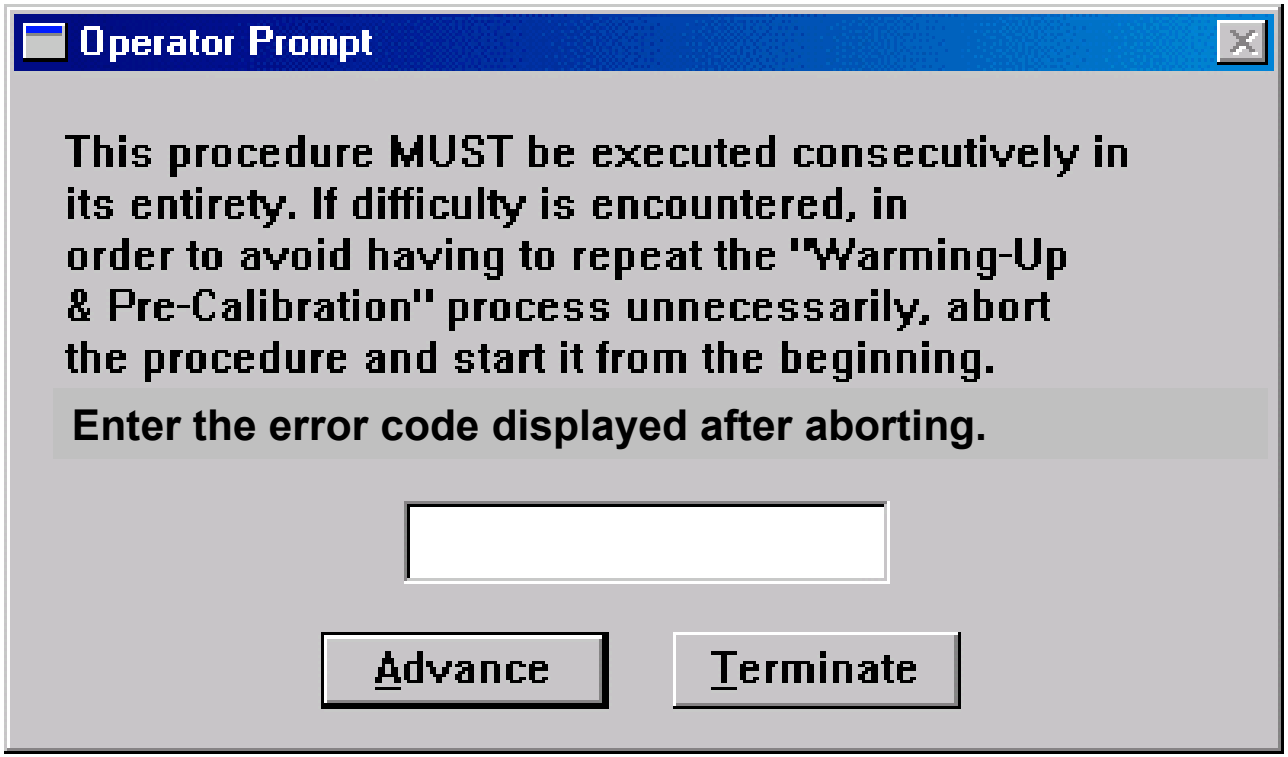
NCAL Returns the number of cal records for a specified asset.

The first argument specifies the asset number (string) of the instrument for which the specified Calibration Table value is to be retrieved.

Example: MATH MEM = NCAL("Sample-5700")

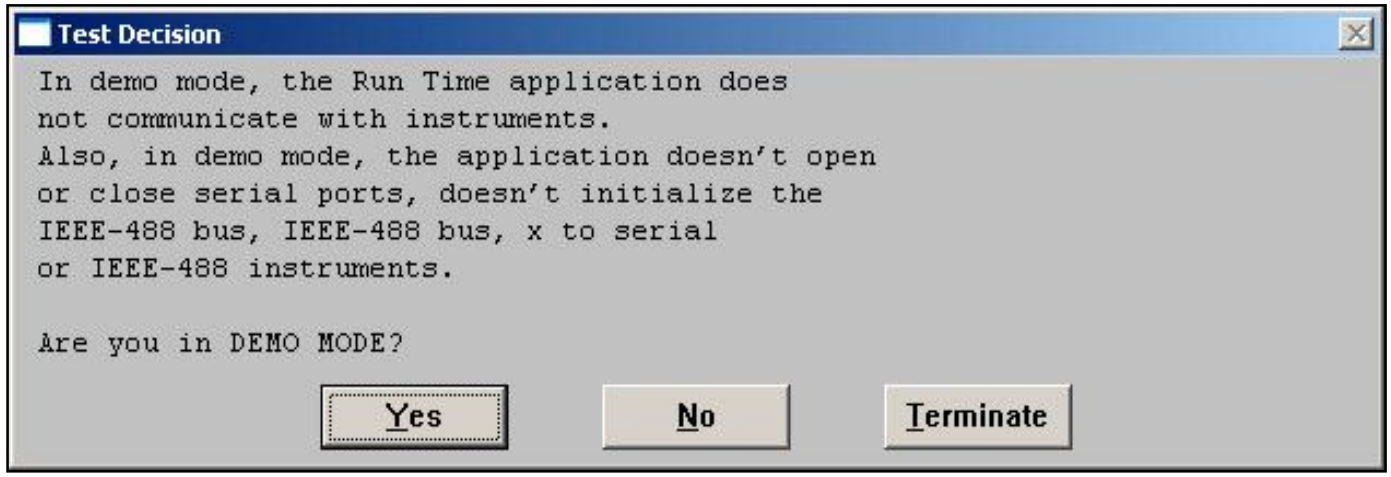
Multiline MEMI Statement

MEMI may now contain up to 32 lines..



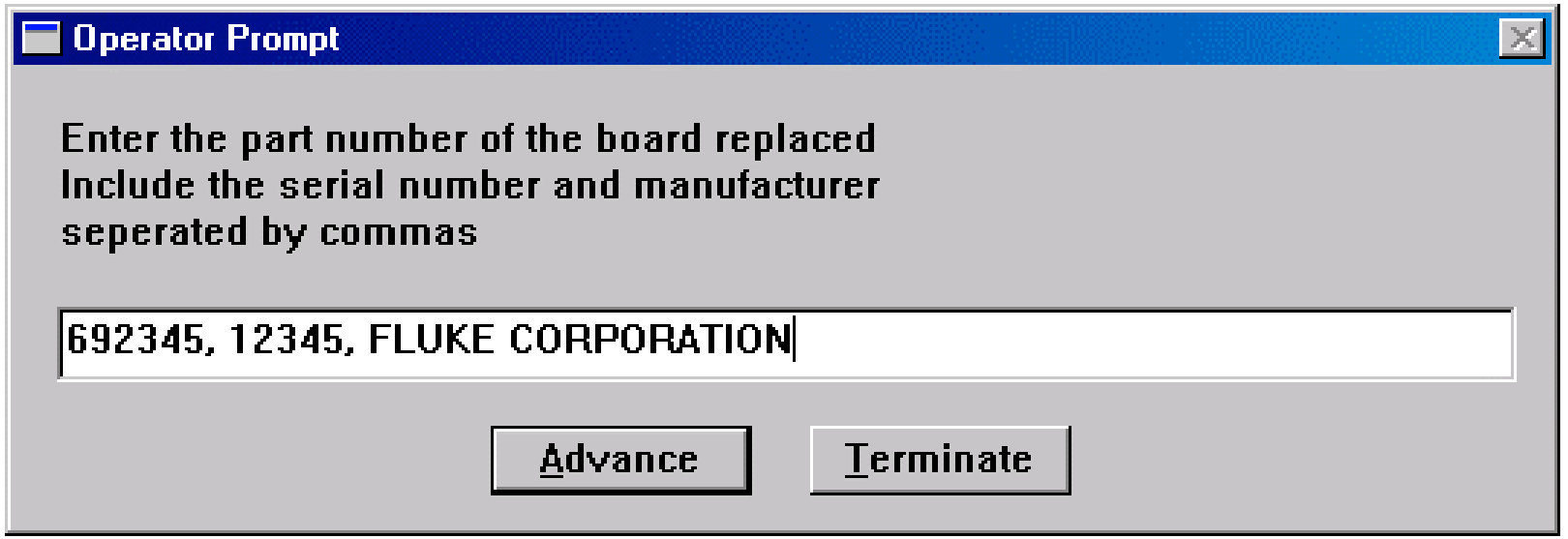
Multiline OPBR Statement

OPBR may now contain up to 32 lines..



Multiline MEM2 Statement

MEM2 may now contain up to 32 lines..



Editor Compile Date Now Adds Time

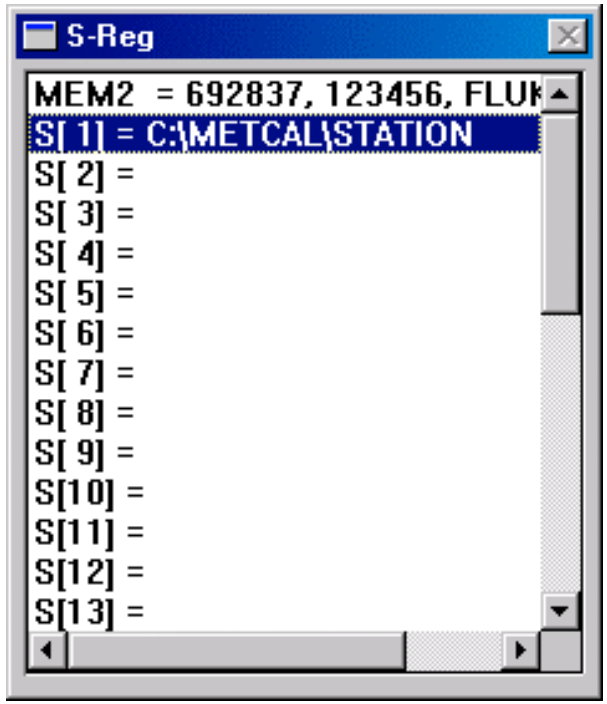
Turned on by ini parameter:

[Startup]
proc_date_format = DD/MONTH/YYYY
ProcHdrDateTime = yes

```
Fluke                                                          MET/CAL Procedure
================================================================================
INSTRUMENT:              Fluke 87 (1 Year) Cal/Ver 5520A
DATE:                    09/May/2005    8:54:32
AUTHOR:                  Fluke Training
REVISION:
ADJUSTMENT THRESHOLD:    70%
NUMBER OF TESTS:         0
NUMBER OF LINES:         12
================================================================================
 STEP     FSC     RANGE NOMINAL          TOLERANCE      MOD1          MOD2   3   4 CON
```

Visible S[x] Registers

Now can view string registers S[1], ..., S[32] in test run



Lose Your Server Connection?

The Run Time application detects a dropped connection and displays a prompt at the end of procedure execution asking whether to reconnect.

(v.7.11sp1)

IEEE-488 I/O Trace – V7.1

- Assists debugging problems [illegible] E-488 I/O by tracing all M [illegible] es written to or [illegible]

Remember – IEEE2 and SCPI FSCs help!!

- Debug data [illegible] <workdir> di [illegible]

- Use command line arguments “-df -trace”

D:\metcal\mcr32.exe -df -trace

Cal Interval Ranges – 7.1

- Many users extend cal intervals for references.
- MET/CAL accuracy files will allow a range of cal intervals to be mapped to a particular specification.
- For example: “Use the 90-day specs for any cal interval from 2 months to 6 months.”

```
Begin Header
      instrument = Fluke 5500A
      interval   = 60 - 120 days
      confidence = 2.58 sigma
End Header
```

Function: Write to variable cache

- Store value in MET/CAL variable cache.

Example 1: **MATH MEM2 = PUT("temperature", 23.2)**

Example 2: **MATH PUT("temperature", "23.2 degC")**

These can now be replaced by Named Variables

Function: Read from variable cache

- Read value in MET/CAL variable cache.

MATH MEM2 = GET("temperature")

These can now be replaced by Named Variables

Function: Read from variable.dat

- Read value in MET/CAL/STATION/ variable.dat.

MATH MEM = GETV("temperature")

These can now be replaced by Named Variables

Function: Write to variable.dat

- Read value in MET/CAL/STATION/ variable.dat.

MATH MEM = PUTV("temperature")

These can now be replaced by Named Variables

Flexible Standards

- What do we mean by “Flexible Standards”?
- Why would you use them?
- How are they implemented?
- Practical example using a Flexible Standard.
- What are their limitations?

What do we mean by “Flexible Standards”?

For our purposes, flexible standards refers to *the ability to interchange any reference instrument with another of the same functional class without necessitating procedure modification*.

What do we mean by “Flexible Standards”?

- Currently defined functional classes are: DMM (Digital Multimeter), FGEN (Function Generator), LFCTR (Low Frequency Counter), HFCTR (High Frequency Counter), UWCTR (Microwave Counter), LFSG (Low Frequency Signal Generator), HFSG (High Frequency Signal Generator), SWPG (Sweep Generator), LVLG (Level Generator), and LO (Local Oscillator)

Why use Flexible Standards?

Some metrology disciplines, e.g., RF, utilize a broad number of ‘generic’ references.

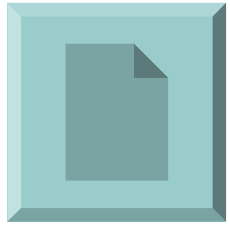
Flexible standards expand the functional usability of procedures while minimizing development and support costs.

How are Flexible Standards implemented in MET/CAL®?

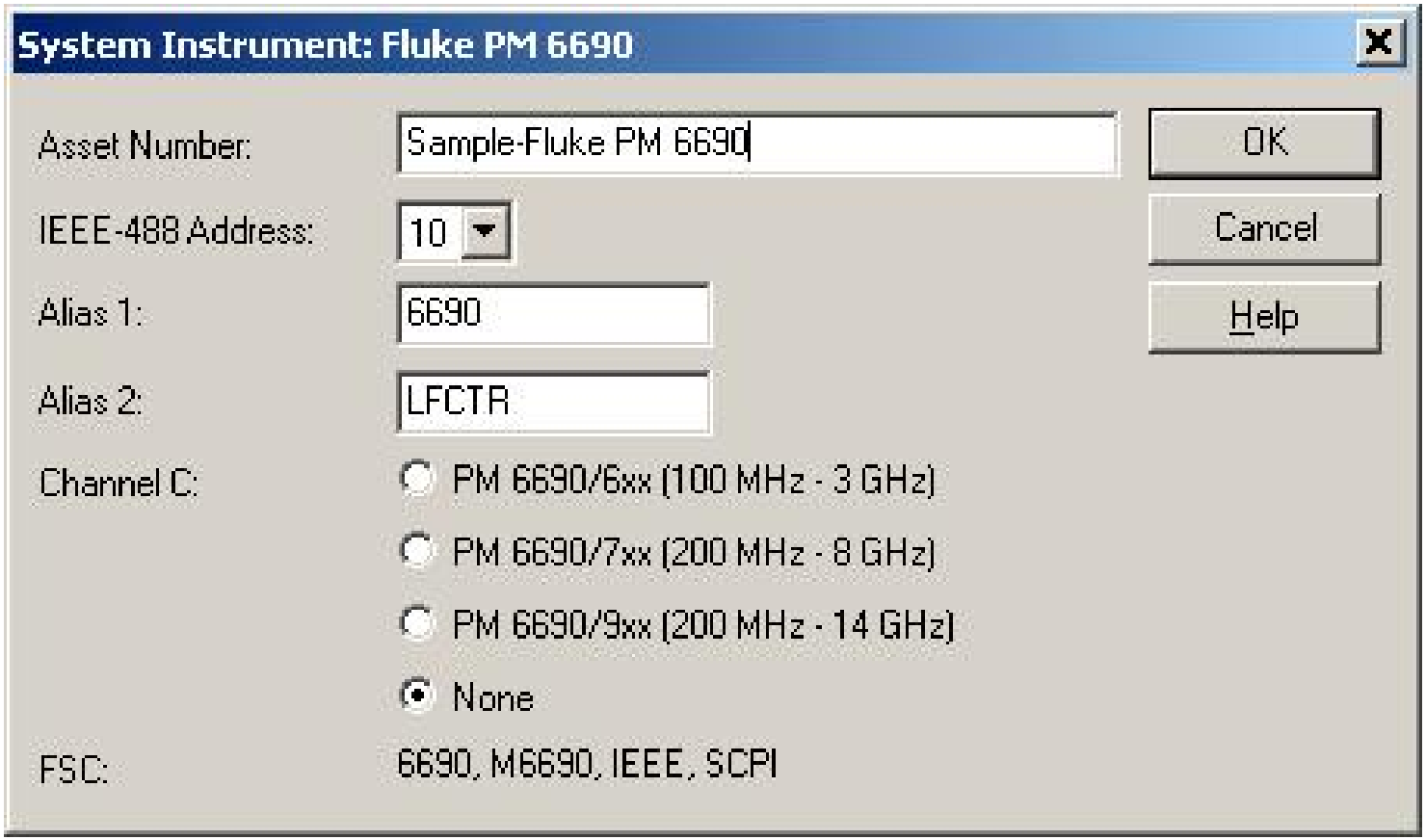
Procedure-based drivers, defined by the class of instruments they control, are called to access the desired functionality of the reference. Specific instrument commands are resident in a text-based initialization file, which may be edited by the end-user at any time to add functionality and/or devices.

How are Flexible Standards implemented in MET/CAL®?

Instrument Initialisation file (example)



Configuring a Flexible Standard



Procedure Syntax Using Flexible Standards

```
# Initialize parameter values.
  1.001  CALL          Sub Initialize /LFCTR
# Reset LF Counter.
  1.002  CALL          Sub Reset IEEE /LFCTR
# Get LFCTR device name and place into S[12].
  1.003  MATH          S[12] = GET("LFCTR_Device_Name")
# Get LFCTR measurement terminal name and place into S[21].
  1.004  MATH          S[21] = GET("LFCTR_Ch1")
```

Subprocedure to Initialize a Flexible Standard

```
# Get and store device name.
  1.001  MATH          MEM2 = INSTR("LFCTR")
  1.002  MATH          PUT("LFCTR_Device_Name", MEM2)

# Get and store programming section name.
  1.003  MATH          MEM2 = RINFE(GET("LFCTR_Device_Name"), "Prog_Sec_Name")
  1.004  MATH          S[31] = MEM2; PUT("LFCTR_Prog_Sec_Name", MEM2)

# Get and store FSC.
  1.005  MATH          MEM2 = RINFE(S[31], "FSC")
  1.006  MATH          PUT("LFCTR_FSC", MEM2)
```

Using a Flexible Standard in a Procedure

```
  1.001  MATH          PUT("LFCTR_Func", "Freq_Ch1")
  1.002  MATH          PUT("LFCTR_Ch1_Attn", "x1")
  1.003  MATH          PUT("LFCTR_Ch1_Cpl", "AC")
  1.004  MATH          PUT("LFCTR_Ch1_Imp", "LoZ")
  1.005  MATH          PUT("LFCTR_Meas_Time", "2 s")
  1.006  CALL          Sub Setup IEEE /LFCTR

# Tolerance in ACC FSC reflects those of the PM 9691 (OCXO) timebase option.
  1.007  ACC           10.0000000MH   0.1P%
  1.008  TARGET        -m
  1.009  CALL          Sub Measure IEEE /LFCTR
  1.010  MATH          MEM = MEM / 1E+6
  1.011  MEMC          10.0000000MH   2.5P%

  2.001  CALL          Sub Reset IEEE /LFCTR
  2.002  END
```

What are the limitations of Flexible Standards?

- IEEE-488 or RS-232 controlled
- I/O must be ASCII text without special constructions
- Limited error checking (IEEE-488.2 and SCPI compliant instruments)
- Technical adequacy of the device used is the user’s responsibility

Questions…

Utility programs

do more with less

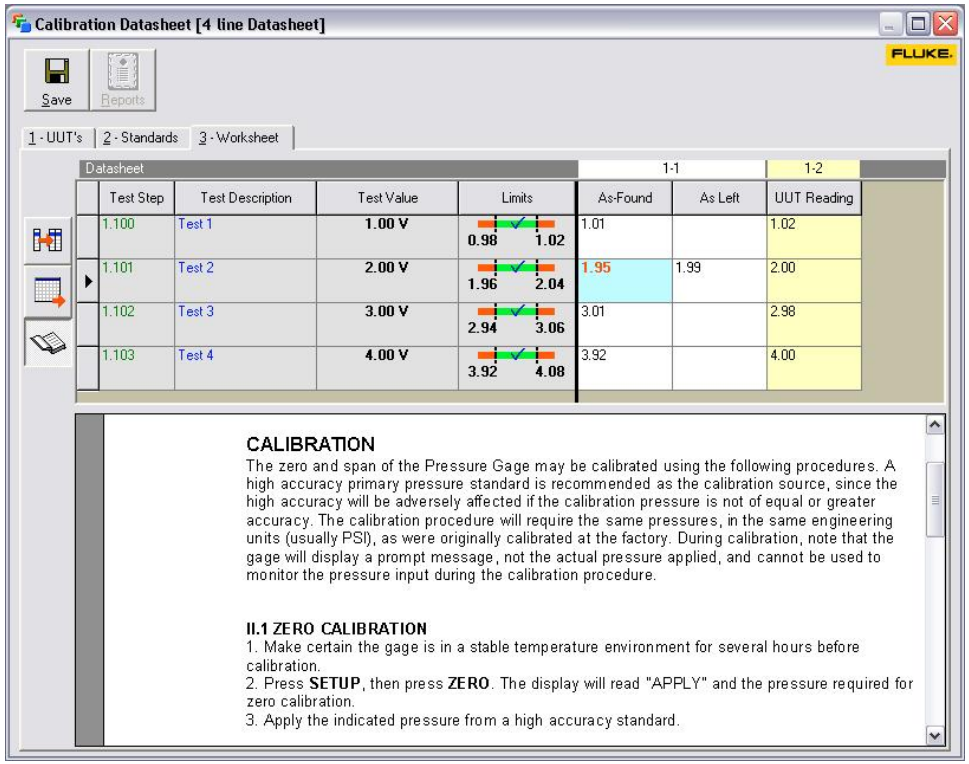
4 New Utility programs . . .

- Quick Sort - *revised*
- Questions – Answers
- Interval Analyzer/Adjustor
- Manual Met/Cal
- External Services Manage

Free for Met/Support Gold

4. Manual Met/Cal

- Replace spreadsheets
- Cal multiple UUT's
- As-found & as-left capture & reporting



4. Manual Met/Cal

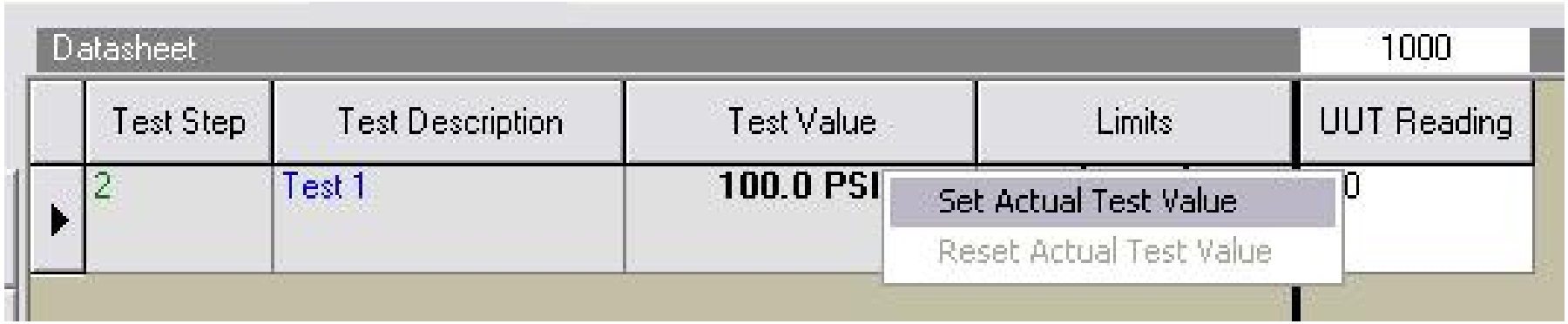
- 2 New features

1. Can set the actual test value if it differs from the nominal
2. Can customize the “Save Cal” screen

Coming to your favorite support site real soon

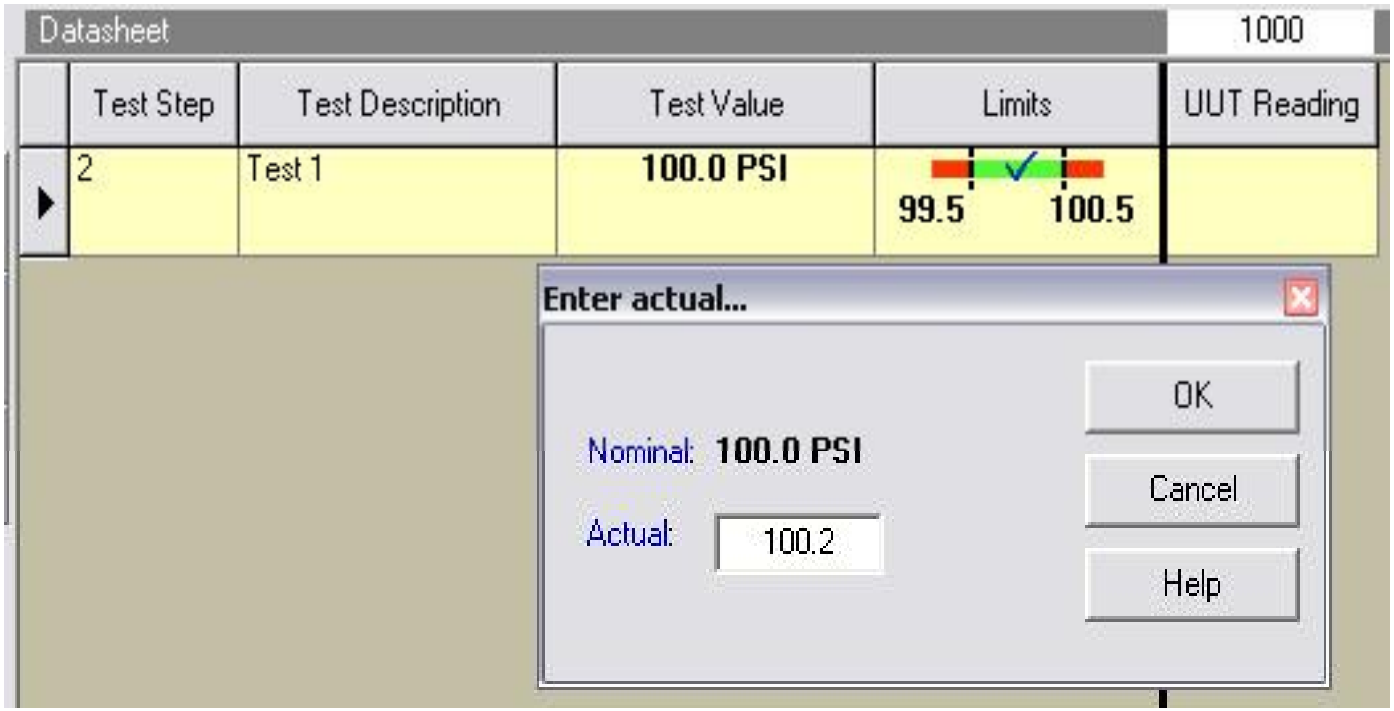
4. Manual Met/Cal

- Right-Click the Test Value cell
- Select “Set Actual Test Value”



4. Manual Met/Cal

- Enter “actual” test value



4. Manual Met/Cal

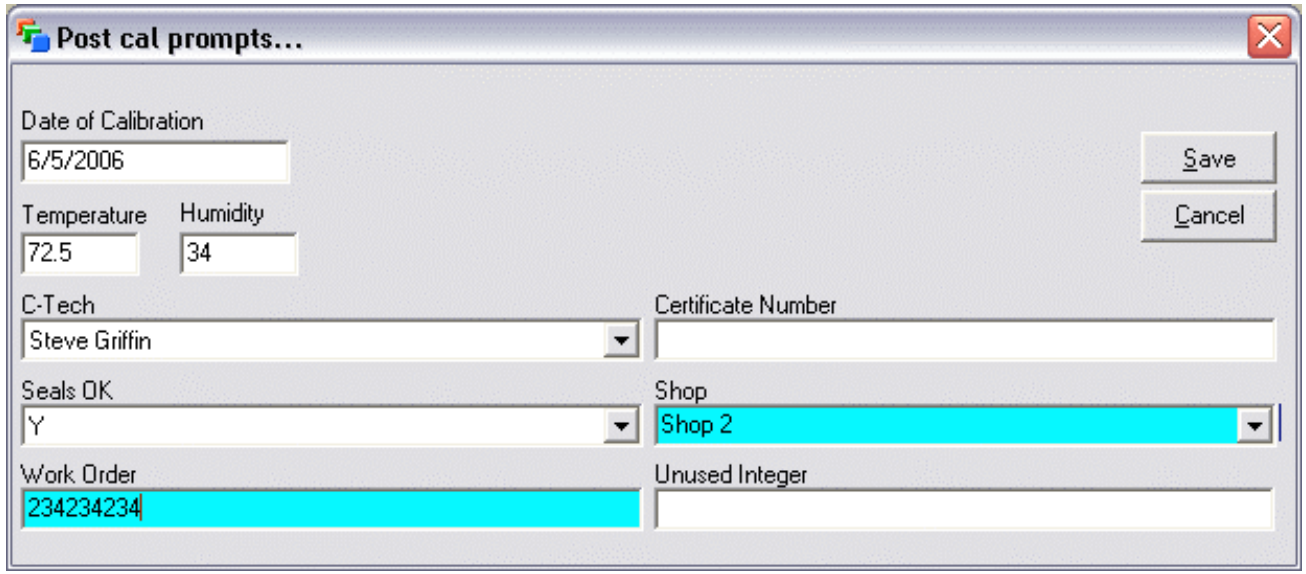
- Actual is displayed
- Test limits are revised
- Pass / fail based on the revised limits

Datasheet 1000

	Test Step	Test Description	Test Value	Limits	UUT Reading
▶	2	Test 1	@100.2 PSI	99.7 ✓ 100.7	

4. Manual Met/Cal

- Customize the Save Cal screen
- Fields follow customizing rules
  - (required, validated, default, etc)



4. Manual Met/Cal

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Questions

?

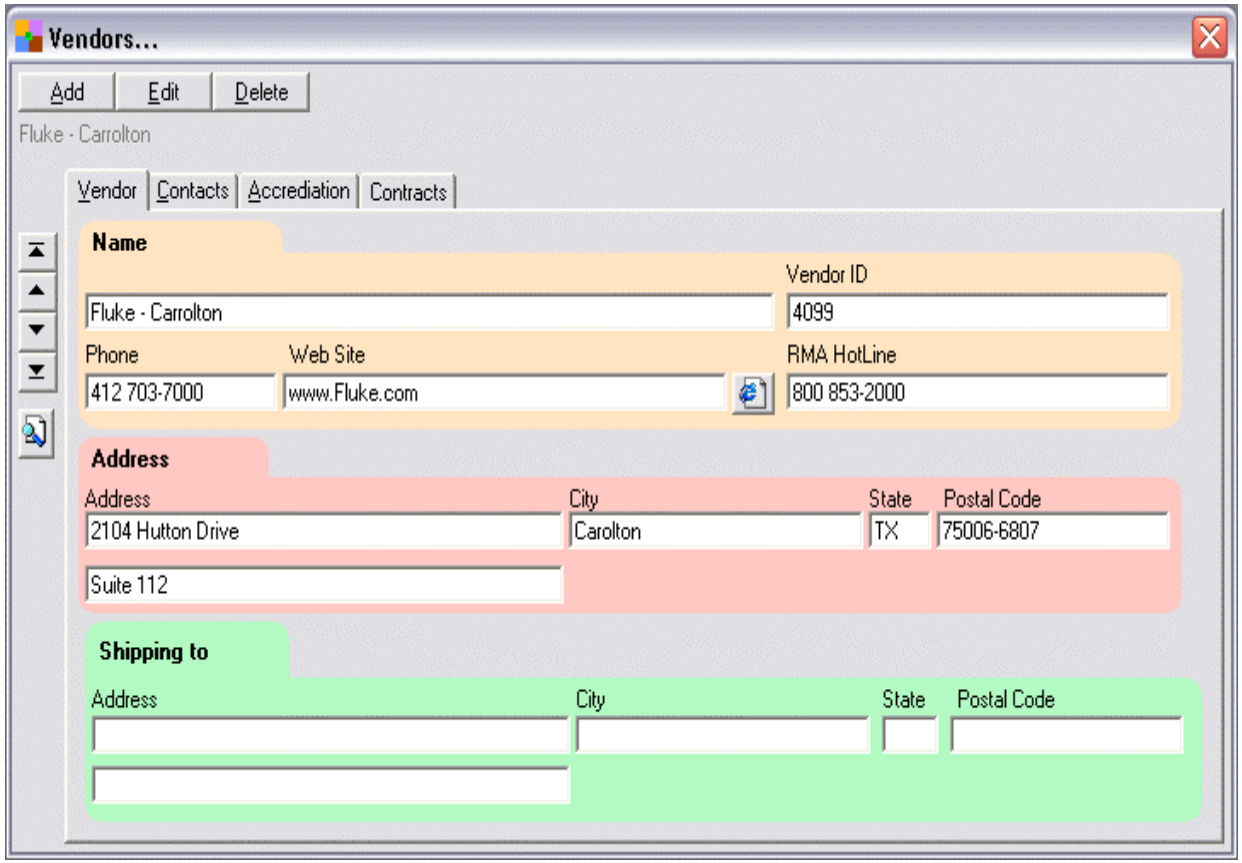
Coming to your favorite support site real soon

5. External Services Manager

- Monitor, control & track external calibrations and repairs
- Includes Vendor list
- Create, update & close work orders
- Print shipping, status, historical reports
- Report history, costs and activity

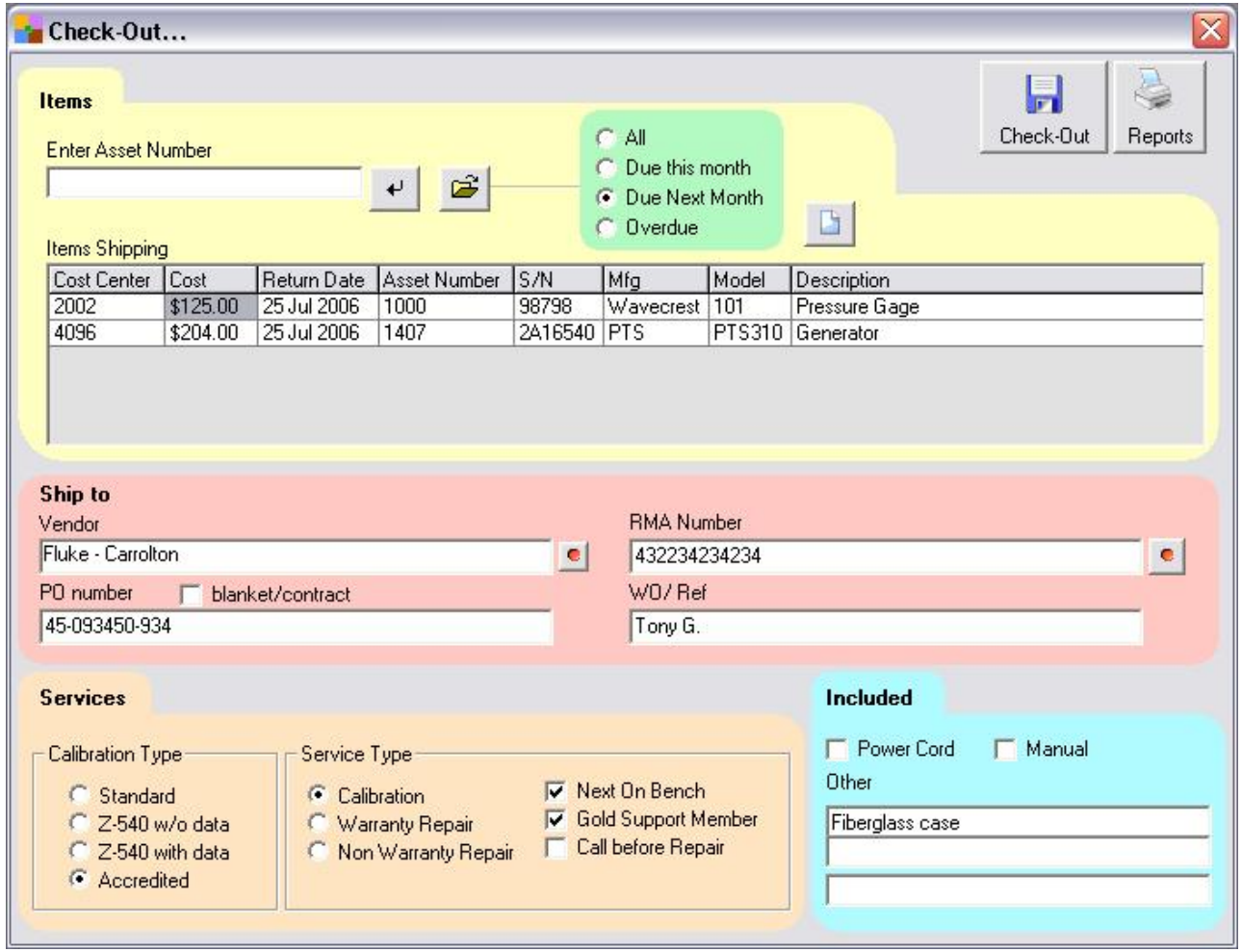
5. External Services Manager

In Development



5. External Services Manager

In Development



5. External Services Manager

- Need it?
- Have suggestions?
- Want to discuss?

5. External Services Manager

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Questions

?

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Available now at…

- http://support.fluke.com
  - Met/support
  - Library
  - Utility programs ***(sort by date)***

- Requires version 7.X
- Requires Met/Support Gold
- No formal support

Could do… Any Interest?

- Maintenance
- Workload scheduling
- Workload leveler
- Tools for scanned or PDF certs
- Document manager
- Real parts manager
- More capable search & replace

Questions…

What is Beyond MET/CAL Plus 7.2????

MET/CAL Generation 2

- Extensive VOC collected to date and still on-going
- Revolutionary new platform for MET/CAL
- Multi-year development effort

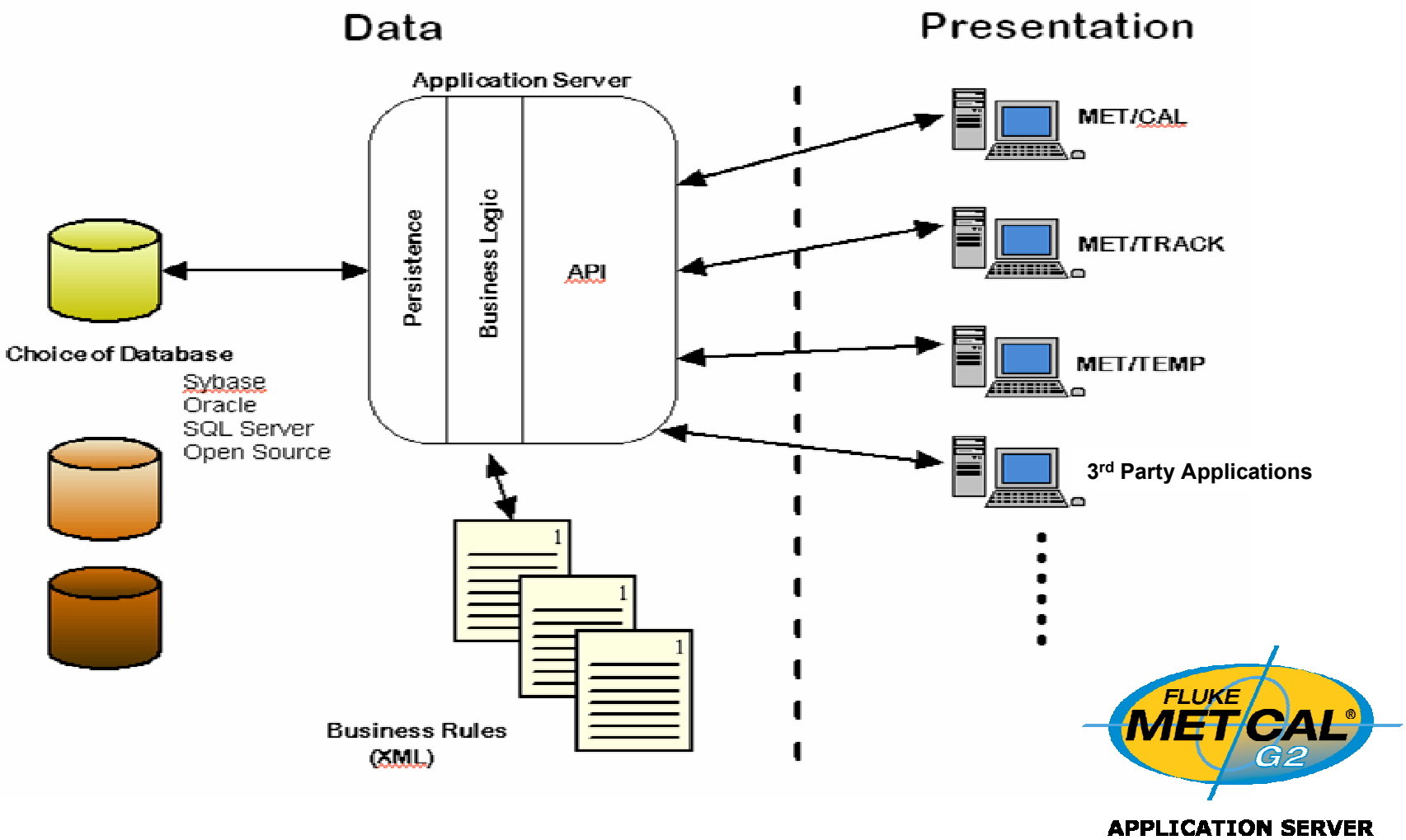
MET/CAL G2 Development Goals

- Make MET/CAL scalable
  - Single user to multi-site enterprise
- Add new workload to automated calibration
- Expand the functionality of MET/TRACK

MET/CAL G2 Development Goals

- Support more regulatory requirements
  – FDA (21CFR Part 11)
- Additional Laboratory Management Capabilities
- Evolve past client/server into… multi-tiered service oriented architecture.

MET/CAL G2 Architecture Overview



MET/CAL G2 Development

- Engineering development will be staged over three phases
  - Phase 1 - MET/CAL 7.2
    - Enhanced for RF calibration
    - Flexible standards
  - Complete 2006

FLUKE MET/CAL® G2

APPLICATION SERVER

MET/CAL G2 Development

- Phase 2 – MET/CAL G2 (Laboratory Management)
  - Commercially-available high performance application server underlying structure
  - MET/TRACK completely browser based
  - New license structure
  - Addition of 3rd party applications

MET/CAL G2 Development

- Phase 3 – Continued evolution
  - Multiple databases supported
  - Big changes in MET/CAL “Run Time”
  - Complete 2008/2009

We Need Your Input ….

- Development of browser-based MET/TRACK GUI
  - See Matt Sell (matt.sell@fluke.com)
- Procedure Development Community
  - See Peter Dack (peter.dack@fluke.com)