METROLOGY.NET

# Building a Machine Readable Standardized SoA Database

Metrology Information Infostructure

CALLAB SOLUTIONS
Fusing Software With Metrology


SPARK KALİBRASYON HİZMETLERİ
CALIBRATION SERVICES

# Metrology Data Exchange Standards

## The 21st Century is here
## But Metrology isn't measuring up!

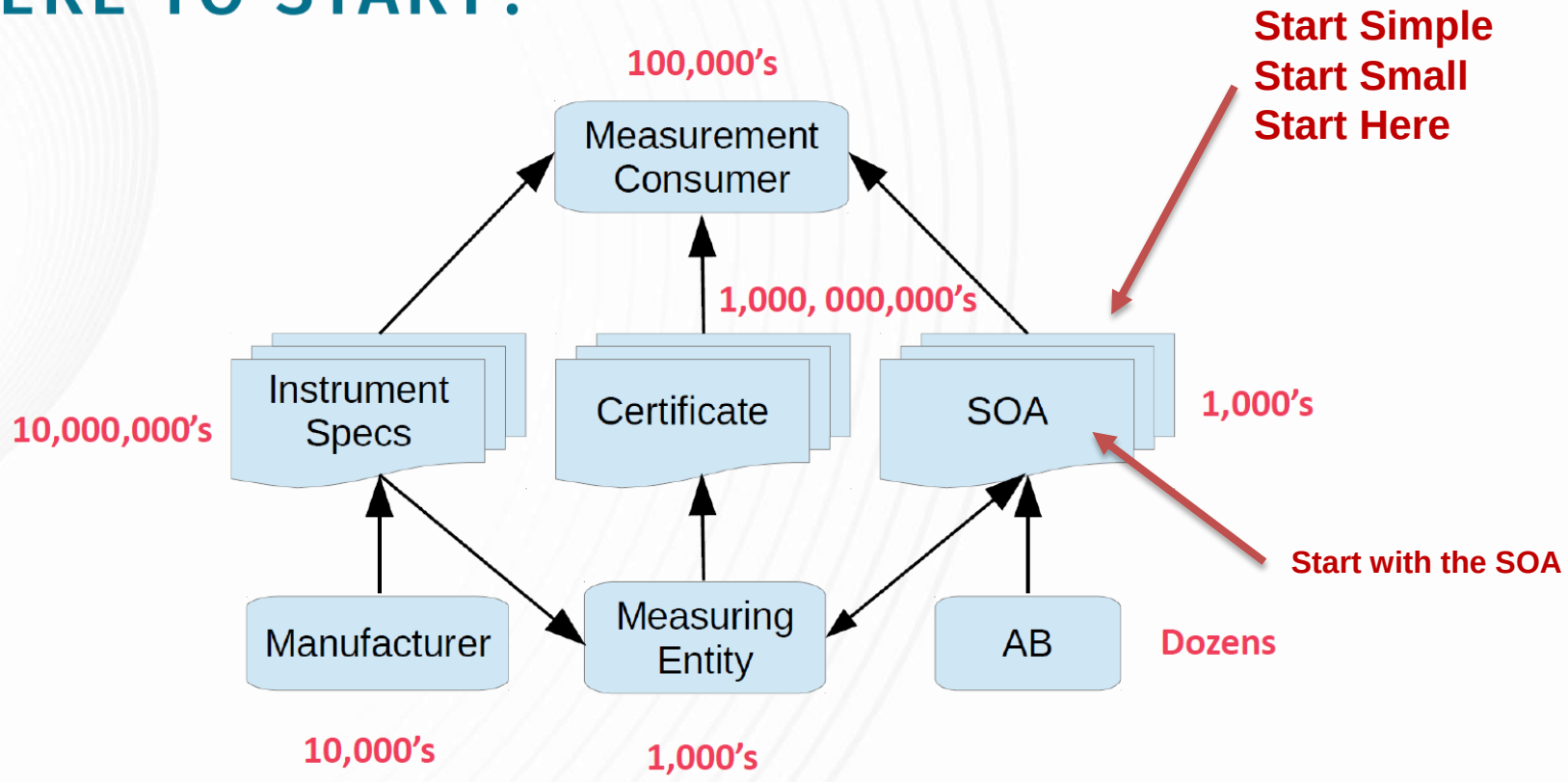
**While the business world is running on data standards the best metrology has is PDFs.**

**RIGHT NOW….** **The Technology and Infostructure is available**

- **Businesses already use the technologies**
- **They are proven safe & secure**
- **We just need to use them**

**So let's create a set of Metrology Data Exchange Standards and bring the World of Metrology Together!**

# WHERE TO START?



# Joining the Team?

**This team will define, test, and validate a machine readable XML based standard for storing and communicating with a lab's CMCs (Calibration Measurement Capabilities).**

## We already have!

**A Great Programming Team**

**Created a Solid beta version**

**Created a Search tool**

**Open Sourced the Technology**

## We Need!

**People who are motivated**

**Excited to Define a Standard**

**Have SOA or Metrology Knowledge**

**Can Work with the Group**

# Let’s Stop the Maddness!


**We copy results from our Excel calculations into the Word document we send to the Accreditation body to get back a PDF document.**

**Accreditated Capabilities are 100% disconnected from:**

- **our original uncertainty calculations, and**
- **our daily calibration product.**

**What is needed is a way to tie all this data together!**

# Unusable / Impractical / Broken Seach

**“Dry well” Calibration Search Using Key Words**

**This format is Completely Unusable!**

| | | | |
|---|---|---|---|
| Liquid-In-Glass Thermometers[3] | 32 °F | 0.6 °F | Comparison to digital thermometer in water bath at fixed point (32 °F) |
| | (68 to 662) °F | 0.52 °F | Dry block calibrator |
| Type<br>J,K,T,E,R,S,C,U,N | 32 °F | 0.61 °F | Ice bath/precision thermometer<br>CMART 25 calibrator,<br>Fluke 5502A |
| Type J<br>Type K<br>Type T<br>Type R<br>Type S<br>Type E<br>Type C<br>Type U<br>Type N | (91) °F to (660) °F<br>(91) °F to (660) °F<br>(91) °F to (400) °F<br>(91) °F to (662) °F<br>(91) °F to (662) °F | 0.43 °F<br>0.43 °F<br>0.43 °F<br>0.43 °F<br>0.43 °F | Fluke metrology well<br>CMART 25 calibrator<br>Fluke 5502A |
| Indirect Verification of Rockwell Hardness Testers[3] – | | | |
| Rockwell and Portable Rockwell | HRA:<br>(60.5 to 69) HRA<br>(70 to 79) HRA<br>(80 to 92) HRA<br><br>HRBW:<br>(0 to 59) HRBW | 0.42 HRA<br>0.41 HRA<br>0.29 HRA<br><br>1.5 HRBW<br>0.92 HRBW | Indirect verification per ASTM E18, E110 |

# Better Search

Demo http://beagledev.azurewebsites.net/

Select Electrical

Select Voltage

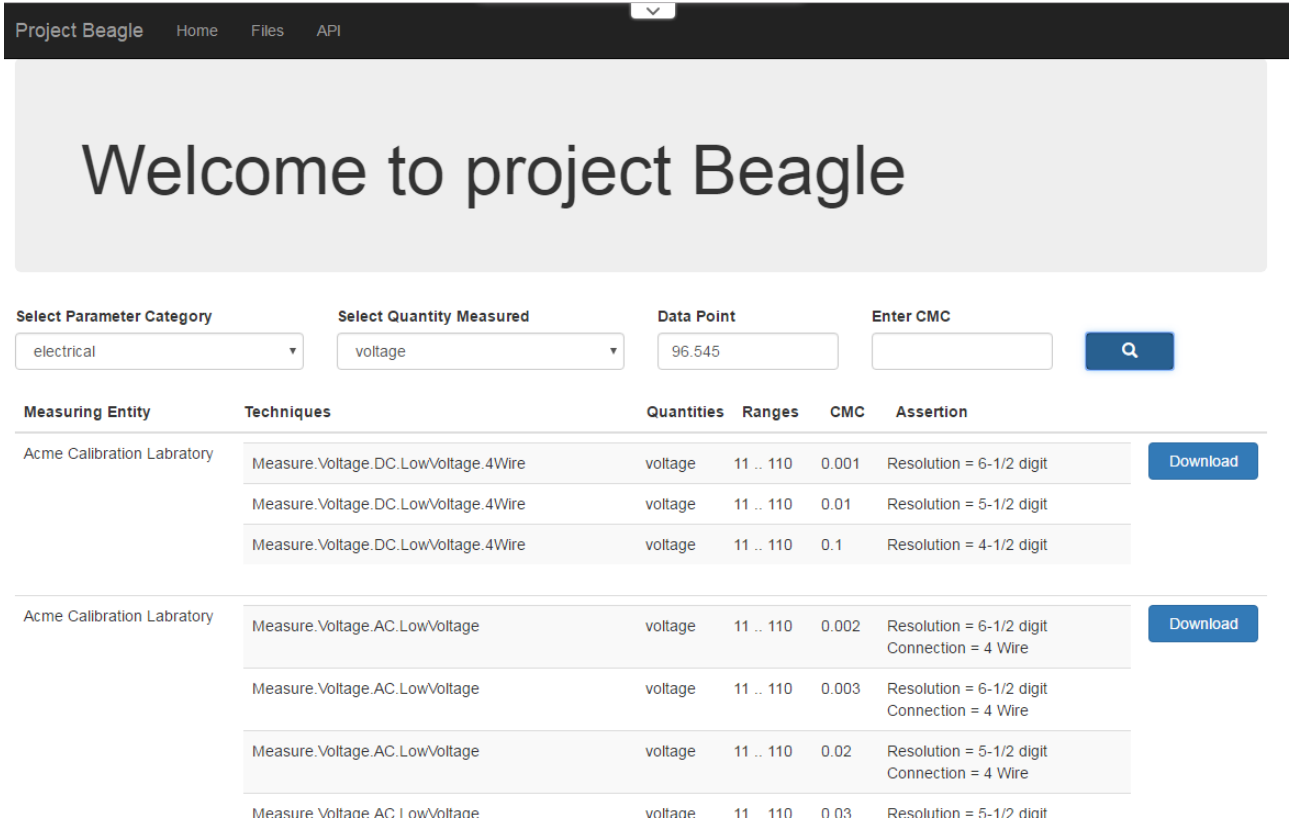
Enter Voltage “95.545”

**Press Search**

Enter CNC Limit “.001”

**Press Search**

* The Search tools work!

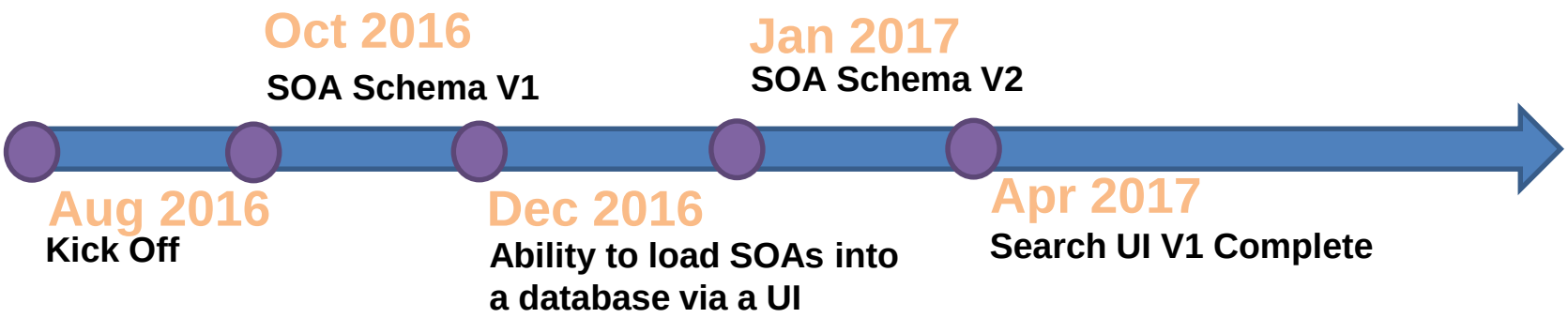


# Open Source Project (GPL-3 License)

https://github.com/CalLabSolutions/Metrology.NET_Public

There is a Measurement Information Infrastructure (MII) Group that has been meeting once a week for the last 9 months.
Our Goals are as follows:

- Build a FREE SoA Editor for calibration labs and accreditation bodies
- Create a standard XML Schema for storing and exchanging SoA data
- Demonstrate the power of search tools
- Demonstrate how to verify uncertainties against SoA on every calibration
- Create a distributed database with tons of SoAs



# Find Specific SoA CMC Calculation

**Comments are Defined and usable in the Schema**

III. Electrical – DC/Low Frequency

| Parameter/Equipment | Range | CMC[2] (±) | Comments |
|---|---|---|---|
| DC Voltage – Generate | (0 to 220) mV<br>(220 to 2.2) V<br>(2.2 to 11) V<br>(11 to 22) V<br>(22 to 220) V<br>(220 to 1000) V | 4.2 µV/V + 0.4 µV<br>2.3 µV/V + 0.7 µV<br>1.1 µV/V + 2.5 µV<br>1.1 µV/V + 4 µV<br>2.2 µV/V + 40 µV<br>3.2 µV/V + 400 µV | Source.Volts.DC (Fluke 5720A) |

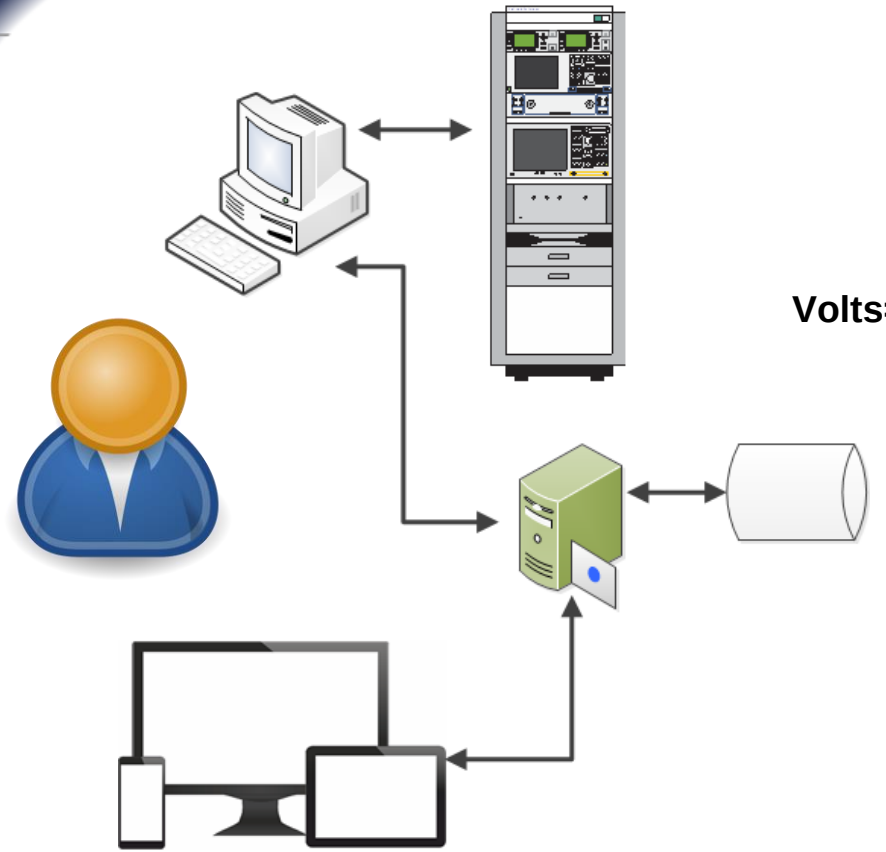
Volts =

-220e-3 to +220e-3
-2.2 to +2.2
-11 to +11
-22 to +22
-220 to +220
-1000 to +1000

NOTE: This SOA tells me they can't source voltage below 0 Volts.

** This is not machine readable

# Uncertainty Check On Every Test Point



**Run Live Calculations**

Source.Volts.DC (Fluke 5720A)

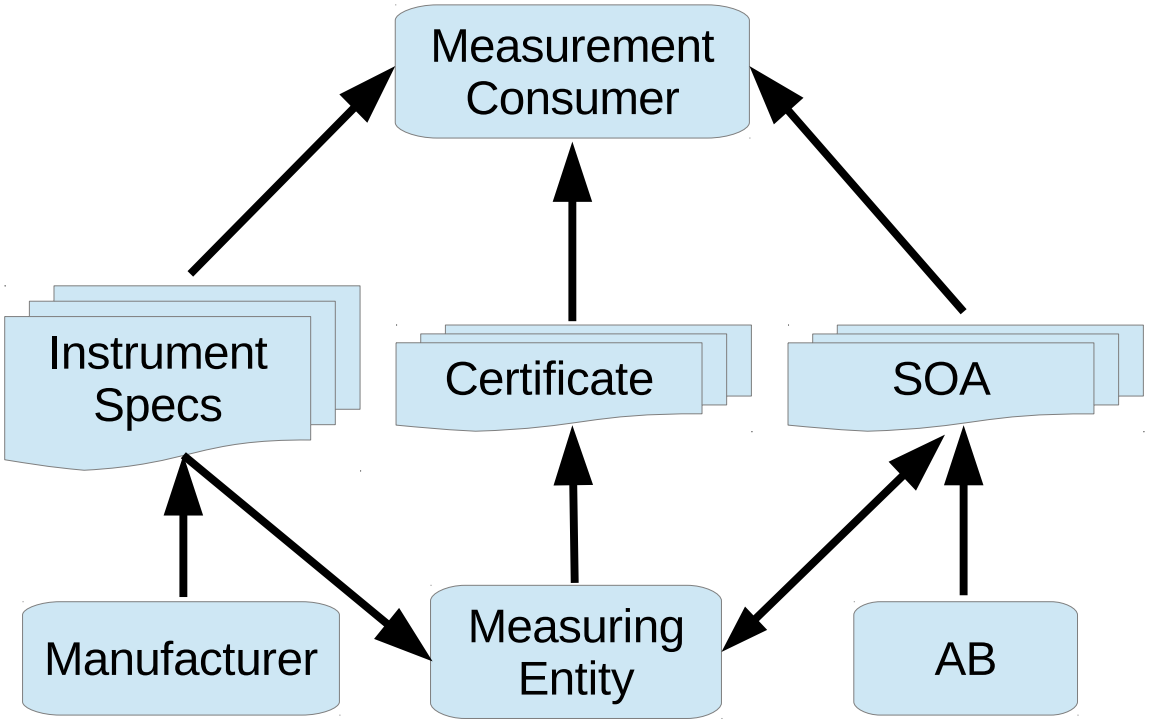
**Volts= 10**

**Check Scope of Accreditation**

Source.Volts.DC (Fluke 5720A)

If test point calculated uncertainty is less than the SoA uncertainty, then use SoA uncertainties and store the test point uncertainties for next accreditation, otherwise use test point calculated uncertainty.
* Mark data point as Verified Accredited.

# Calibrate Our Project Goals




**We are NOT trying to**
**Convert the industry's software**

**We DON'T need every**
**Accredation Body on board**

**We DON'T need every**
**Calibration Lab either**

**The technology**
**Will Speak for Itself**

**The team is dedicated to**
**Moving the technology forward**

**We are accepting new members**
**Who see the vision**
**Who add value to the team**

# Join the Team Today

**Do you have what it takes to create a Metrology Standard?**


**The Clock is Ticking!**

- **Over 1500 SOAs are Being Migrated**
- **Editor Tool Release - Q3 2017**
- **Search Tools Release - Q4 2017**
- **Demo at NCSLI in August**
- **Education & Training Begins in 2018**

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# Questions

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# SOA / MII Editor

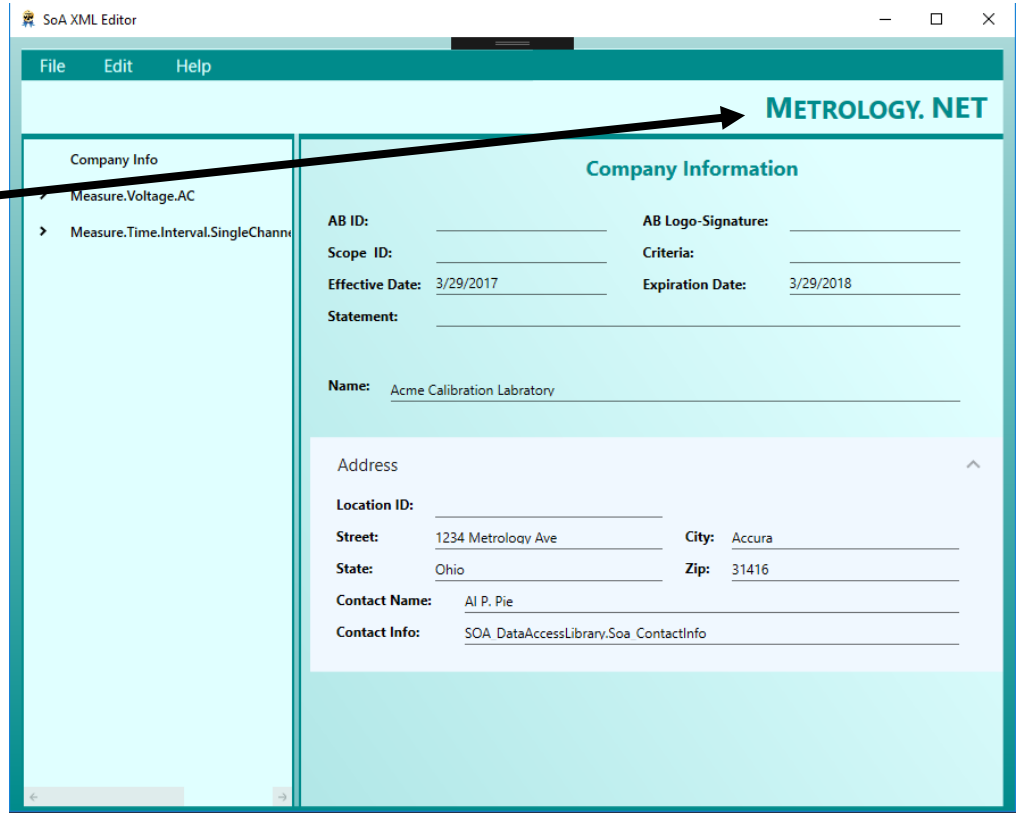
**Editor Features**

- Colors are skinned and changeable
- AB Brand able
- AB Logo & Signature
- Supports Multiple Address

Windows Desktop Applications

Open Source Project

github.com/CalLabSolutions/Metrology.NET_Public



# SOA / MII Editor

**Editor Features**

- Entry for each CMC Line
- Range & Limits
- Live Calculations
  - –Constant Values
  - –Parameter Values

Beta Version Ready for Testing
Q4 - 2018

Sign Up For Beta Release & Testing