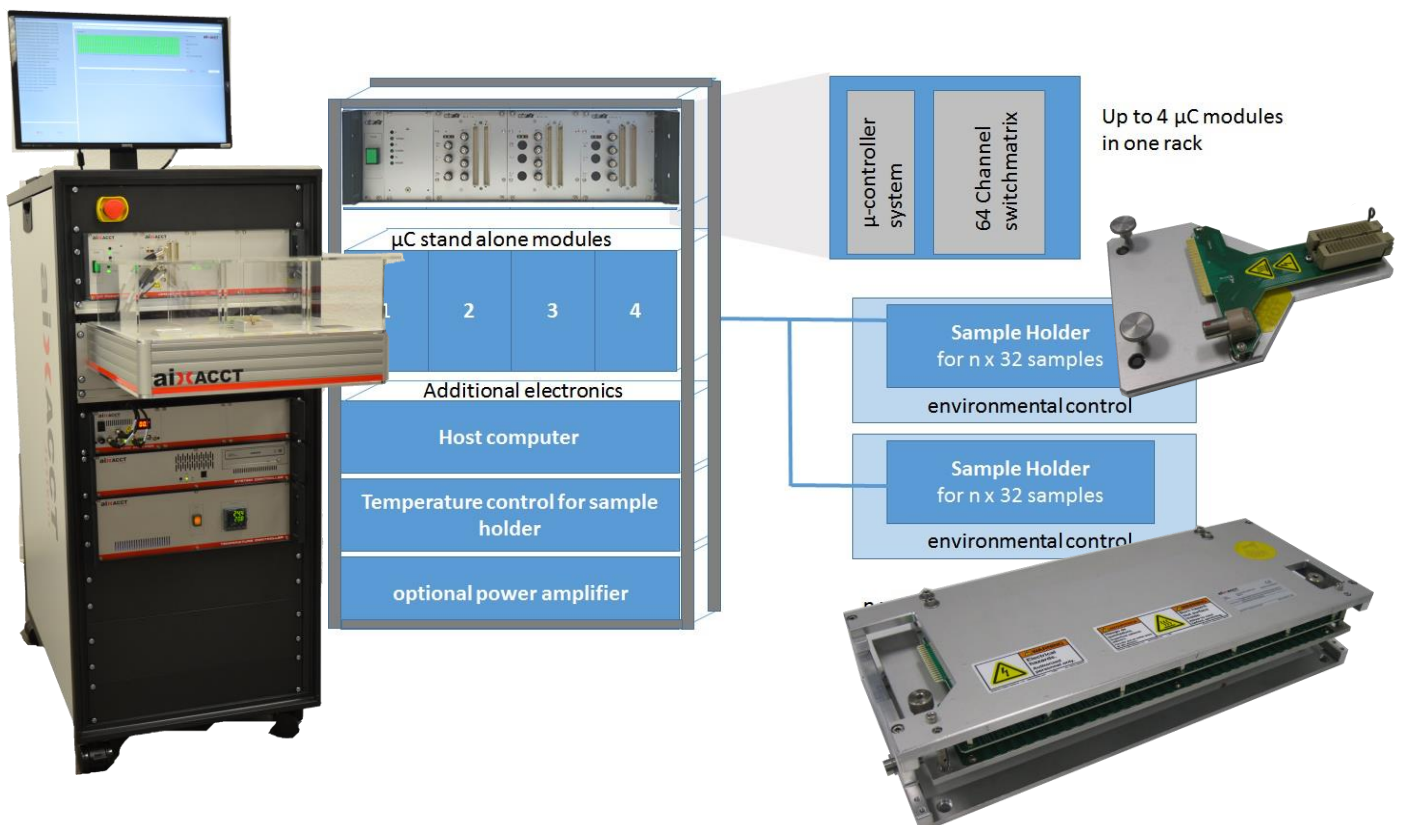


## HTTB - High Throughput Test Bench

The system is designed for fast reliability and accelerated life testing of piezoelectric or dielectric materials. Reliability data including large and small signal material characteristics of materials and devices can be evaluated over temperature with a high flexibility in test patterns which can be tested simultaneously, dependent on the number of modules, on a large number of samples connected and scanned via an integrated switching matrix. For electrical excitation signals a various number of high voltage amplifiers are available to allow time dependent dielectric breakdown (TDDB) studies as well as fatigue cycling stress tests with variable user defined waveforms for evaluation of Weibull distributions, deriving acceleration factors and for lifetime prediction. The current response of the samples is measured by the flexible and precise virtual ground method. Simultaneously external signals can be recorded optionally such as displacement change dependent on external sensors. Multiple modules are controlled by a host PC via Ethernet which allows a large parameter set to be tested with multiple modules simultaneously on a large number of samples, additionally temperature stress can be applied by one or more additional temperature controllers or environmental chambers.

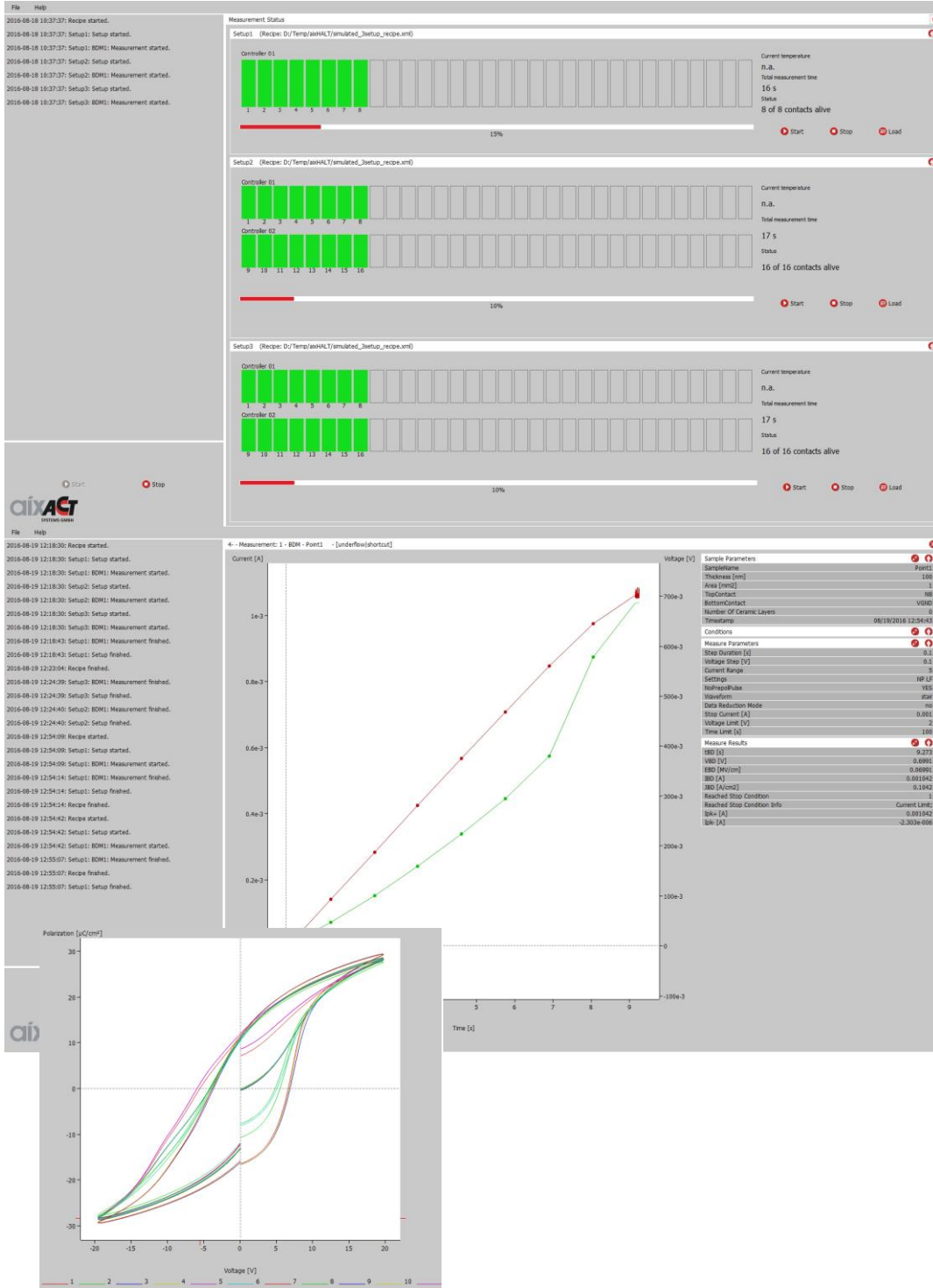
- schematic setup:
- 19" rack system with multiple controllers, host PC, optional power amplifier unit and temperature controller.
- Multiple sample connection is typically done via switching matrix modules
- sample holders with connection via PCB, probecard adapter, or designed specifically customer or application dependent



Software control

The system runs under our new software aixHALT that was specially designed for controlling the complete setup and presents a real time feedback of the measurement progress. The simplified design ensures an intuitive handling suited for production environments.

It can be scaled with the complexity of the hardware configuration and the related measurement tasks. This allows the upscaling of the tool with customers growing demands of simultaneous data acquisition.



**High Throughput Test Bench**  
for highly accelerated life time testing



**Measurement examples**

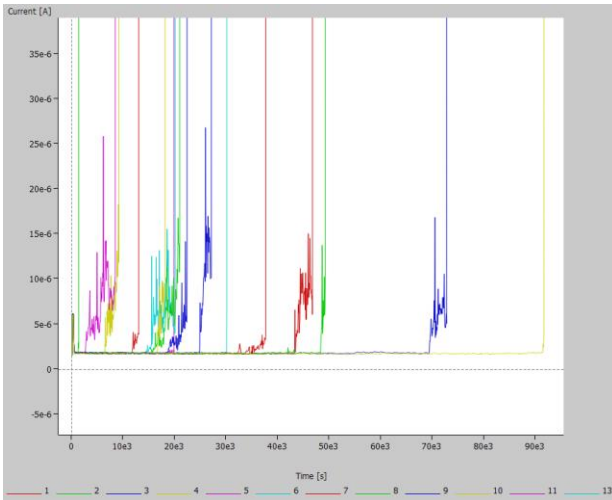


Figure 1 : TDDB measurements on multiple samples

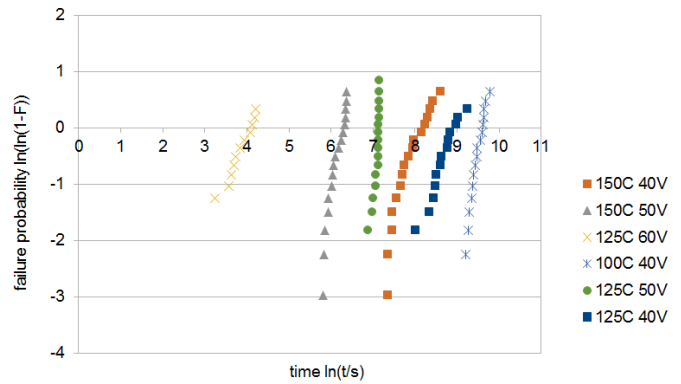


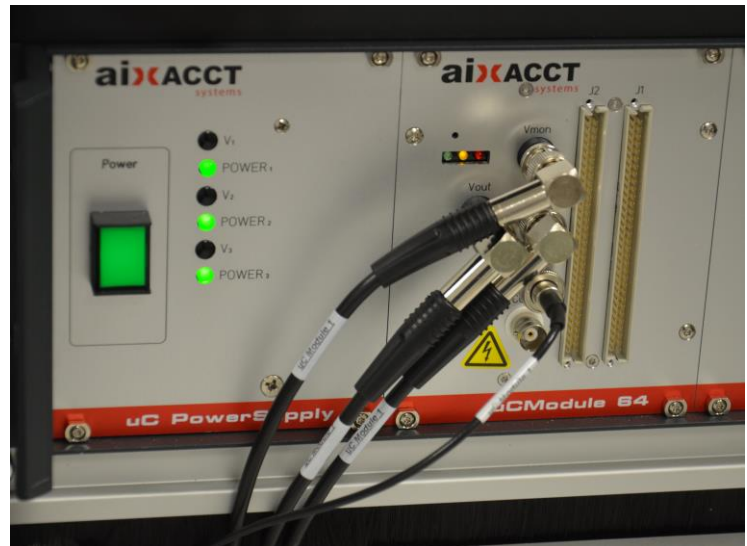
Figure 2: TDDB derived Weibull plots

**Features and Specifications**

- all specifications preliminary and subject to change without notice

Module hardware:

- Microcontroller based test module with Ethernet interface
- Single measurement modes similar to TFAalyzer (DHM, LM, CVM(0V), BDM) controlled by host application
- Hysteresis (DHM) up to 1kHz, CVM 1kHz
- Treatment modes (electrical stress): rect, sine triangle, manual waveforms
- Fatigue signal up to 250kHz, DC bias stress, or arbitrary waveforms
- 2 (opt. 4) analog inputs, 16bit, 800kS/s simultaneous, 256kS channel memory
- 1 analog output 16bit, 1MS/s, 32kS arbitrary waveform buffer
- Test sequence and data for each module is transferred via Ethernet by host application
- Data can be recorded and temporarily stored in each module for each measurement cycle



Driving unit:

- output voltages: +/-12V, 150mApk, 250kHz, 50 Ohm output impedance
- optional module (internal): +/-100V, 50mA, (10nF@10kHz) or +/-200V, 20mA, (10nF@2kHz)
- optional external power amplifier support (output, voltage monitor, enable)
- optional external amplifier module +/-100V, 500mA<sub>rms</sub>, 100kHz (load dependent); 200V and 400V module also available

Measurement Channels:

- Current input ranges: 1A, 100mA, virtual ground 1nA, 10 nA, 1μA, 10μA, 100μA, 1mA, 10 mA, optional 10pA, 100pA
- Voltage monitor input +/-10V or internal output monitor
- 2 optional inputs +/-10V (displacement, external sensors, etc.)


Switching unit

- Add-on switch matrix module, up to 64 channels per module, 1x32, 1x64, 2x32 or 2x64 configuration
- 64-way 2-row DIN 41612 connector
- max. contact rating 200V,1A (400V optional)
- optional current limit per channel ( ~300uA, 100V)
- optional aux connection for external amplifier support
- optional common output switchable for common drive or common sense configuration, or individual top and bottom contacts

Dimensions:

- 19" rackmount controller module 3HE(3U), 14TE(14HP), with switching unit 21TE(21HP)
- up to 3 controller modules with switching unit per frame with power supply

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