

Introducing a new line of UT-ONE thermometer readouts

Batemika Measurement Solution is introducing a new line of UT-ONE thermometer readouts. Following a stunning success of our 3-channel benchtop unit, we have taken advantage of the excellent performance of our core measurement circuitry to create a system style of thermometer readouts with more channels and no built-in display.

UT-ONE S12A basically combines a high-accuracy thermometer readout with a multiplexer. The combination is fully evaluated and conforms to its accuracy specification.

The new thermometer readout UT-ONE S12A has 12 main channels for measurement of platinum resistance thermometers, thermistors and thermocouples. It has two internal digital thermometers, which are used for internal temperature compensation and for the automatic cold-

junction compensation for thermocouples. UT-ONE S12A has a USB communication interface, which is also used to power the device.

UT-ONE S12A was designed in accordance with the new paradigm in measurement technology, namely the virtual instrumentation. UT-ONE S12A is a precise general-purpose acquisition platform, which connects to a computer via a USB communication interface. The second part of the system is the acquisition software, which runs on a computer in a higher-level programming language, such as LabVIEW. This allows the end user to simply implement a wide variety of complex test & measurement procedures, using the same acquisition hardware. At Batemika we provide NI LabVIEW drivers and sample applications for UT-ONE thermometer readouts free of charge. On request, we also supply qualified customers with source code for LabVIEW sample applications, which is a great starting point for creating advanced derivative applications.



UT-ONE S12A Thermometer Readout (system style)

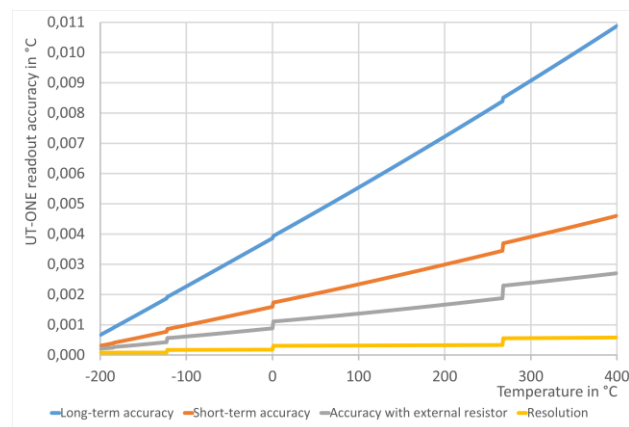
UT-ONE system style thermometer readouts are a complementary product to our existing UT-ONE benchtop style thermometer readouts. Benchtop style thermometer readouts feature a built-in colour display with touchscreen interface, battery powered operation, internal data logging and other advanced features. System-style thermometer readouts omit these features, as they are designed to be used exclusively in a combination with a computer, which implements these features in software. The measurement capabilities and the remote communication interface are the same for benchtop and system style thermometer readouts, so the acquisition software is compatible with any device from the UT-ONE family.



UT-ONE B03A Thermometer Readout (benchtop style)

The accuracy specification of the UT-ONE S12A is the same as for the UT-ONE B03A benchtop model, except for the temperature coefficient of the thermistor ranges, which is directly related to the number of channels and was increased from ± 0.5 ppm/ $^{\circ}\text{C}$ to ± 2 ppm/ $^{\circ}\text{C}$.

Basic accuracy can be significantly improved by implementing the external reference resistor, which effectively eliminates the internal long-term and short-term drift. This makes UT-ONE extremely flexible and applicable even in procedures requiring best accuracy, such as high-end calibrations by comparison.



UT-ONE specification for Pt-100 probes**

UT-ONE S12A Specification Summary

Type	Range	Accuracy
Platinum resistance thermometers	-200 °C to 960 °C (0 to 800 Ω) *	± 0.006 °C **
Thermistors	-100 °C to 200 °C (0 to 40 k Ω) *	± 0.001 °C **
Thermocouples	-200 °C to 1800 °C (± 100 mV) *	± 0.1 °C **
Internal CJC digital thermometer	5 °C to 45 °C	± 0.4 °C

* Readout only, actual range may be limited by probe specification

** Readout only, typical value. Visit our website www.batemika.com to get detailed specification.

UT-ONE S12A is a general-purpose acquisition platform, which can be used for a large variety of applications requiring high-accuracy temperature measurements with multiple channels. The most common application include large-volume calibrations by comparison, advanced testing procedures and validation of climatic chambers.

Validation of climatic chambers requires the accurate measurement of temperature in a specified number of locations inside the climatic chamber (most commonly eight probes in the corners and two probes in the center). This requires a minimum of 10 thermometer probes. The remaining two channels can be used to connect two redundant probes, the external reference resistor, a psychrometer, etc.

The solution for climatic chamber validation using UT-ONE S12A is extremely compact and is perfectly suited for onsite work. The whole system can be packed in a plastic carrying case weighing less than 8 kg and the only additional requirement is the laptop computer with acquisition software.

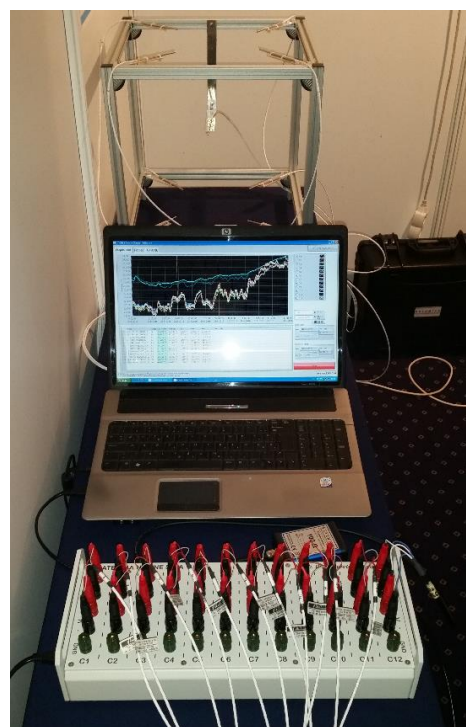
The setting up of the system onsite is very straightforward. The probes can be transported connected to the UT-ONE S12A, so the user has to just remove the device from the case and connect it to the laptop with a USB cable. The acquisition application is then started on the computer and the validation can begin.

The complete uncertainty of the measurement system depends primarily on the selected thermometer probes and the temperature

range, but uncertainties ranging from 25 mK to 50 mK can be achieved routinely.

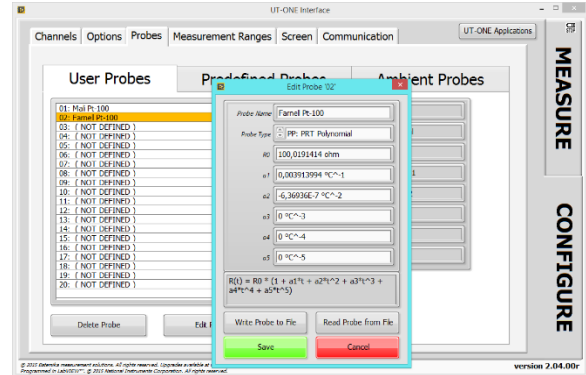


UT-ONE S12A packed in plastic carrying case

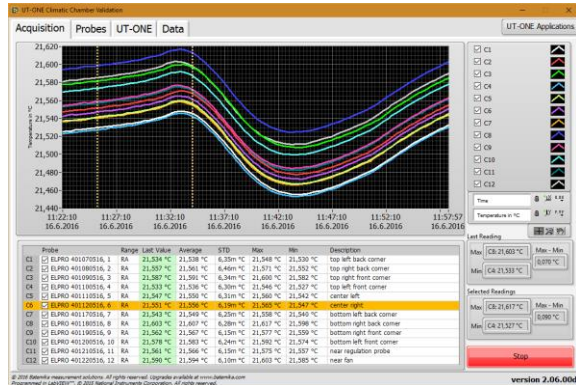


UT-ONE S12A test setup with 12 Elpro Pt-100 probes for climatic chamber validation

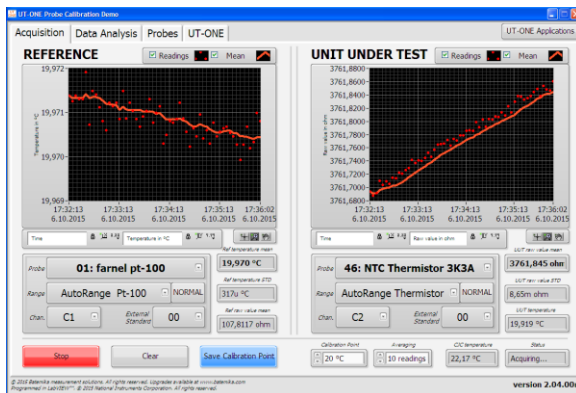
UT-ONE S12A is controlled exclusively with the acquisition software, which communicates with the instrument via USB communication interface. The communication protocol is open and fully documented, so users can easily implement their own software. Furthermore, Batemika provides you with drivers and sample applications in LabVIEW environment, including the source code for selected applications.



Configuration of thermometer probe coefficients



Application for climatic chamber validation



Application for calibration by comparison