Put a bench in your bag

Make essential measurements with your laptop PC and Agilent's compact USB modular instruments

Agilent Technologies

PUT A BENCH IN YOUR BAG

The next time you're called out to solve tough problems in electronic products or processes, leave the bulky transit cases behind. With Agilent's USB modular instrument (MI) family, you can easily carry powerful test gear in your bag along with your laptop PC.

Our line of paperback-sized MIs includes two oscilloscopes, a DMM, and a function generator with arbitrary waveform capability:

- **Scopes:** The 100 MHz and 200 MHz models feature two channels, eight-bit sampling, and 500 MSa/s per channel. (see page 3)
- **DMM:** This 5½-digit multimeter offers 100 Sa/s and maximum input levels of 300 Vdc and 2 A. (see page 3)
- **Function generator:** This one-channel source provides six standard waveforms, including 20 MHz sine and square, plus 64 KB arb generation (≤ 200 kHz). (see page 4)

All provide USB 2.0 connectivity and plug-and-play simplicity. The front panel is your PC screen: With the companion software (below) loaded on your laptop PC—and a few recommended accessories in your bag—you'll be ready for measurements at a customer site, an outsourced manufacturing operation, and beyond.

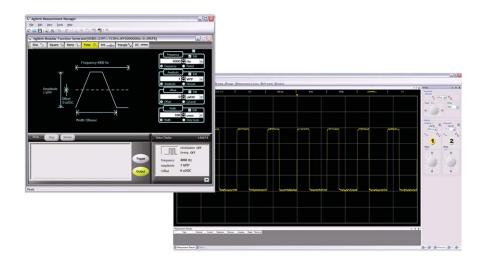## A FRIENDLY INTERFACE

Agilent Measurement Manager

Through individual windows, the Agilent Measurement Manager (AMM) software provides a friendly soft front-panel interface for each of the modular instruments. It helps you perform quick configuration and measurement acquisition as well as flexible analysis of measured data. For more information, see **www.agilent.com/find/AMM**.

Hardware requirements
- 1.6 GHz Pentium IV processor or better
- Windows XP (Pro or Home; SP1 or later) or Windows 2000 Pro (SP4 or later)
- At least 1 GB disk space
- At least 512 MB RAM
- Super VGA (800x600), ≥256 colors

Software requirements
- Agilent IO Libraries Suite 14.2 or later
- Agilent T&M Toolkit runtime version
- Microsoft .NET Framework versions 1.0 and 2.0

WAVEFORM MEASUREMENT AND ANALYSIS

U2701A/U2702A USB modular two-channel oscilloscopes

The USB scopes are available with bandwidths of either 100 MHz (U2701A) or 200 MHz (U2702A). Both provide 500 MSa/s sampling per channel and 16 Mpts of memory to help you gain better insight into signal details. Advanced analysis capabilities built into the AMM scope software include waveform math and FFT with windowing.

- Normal, averaging and peak-detect acquisition modes
- Advanced triggering including edge, pulse width and line-selectable video
- Manual, auto and tracking cursors with T, V and frequency measurements
- 1,024-point FFT with Hanning, Hamming, Blackman-Harris and rectangular windowing

For complete specifications, please download the U2701A/U2702A data sheet from **www.agilent.com/find/usbscope**.

Accessories

Each scope includes an AC/DC adapter, a USB Standard-A to Mini-B interface cable and a passive probe (N2862A with U2701A; N2863A with U2702). The table presents optional Agilent accessories you may want to carry with you.

Item	Model number
BNC cable	U2921A-100
USB secure cable, 2 m	U2921A-101
1:1 20 MHz passive probe	10070C
10:1 150 MHz passive probe, 1.2 m (for U2701A)	N2862A
10:1 300 MHz passive probe, 1.2 m (for U2702A)	N2863A

FUNDAMENTAL MEASUREMENTS WITH 5½ DIGITS

U2741A USB modular digital multimeter

The USB DMM provides a broad range of essential features and 10 measurement functions: DC voltage and DC current; true-RMS AC voltage and AC current; two- and four-wire resistance; frequency; diode test; continuity; and temperature.

- Make fast measurements with up to 100 readings/second
- Measure up to 300 Vdc with 5½ digits resolution
- Utilize wide measurement ranges: 100 mVdc to 300 Vdc and 10 mA to 2 A

For complete specifications, please download the U2741A data sheet from **www.agilent.com/find/U2741A**.

Accessories

The DMM includes an AC/DC adapter, a USB Standard-A to Mini-B interface cable and test leads. The table summarizes additional Agilent accessories that may be useful in the field.

Item	Model number
USB secure cable, 2 m	U2921A-101
Test lead set	34138A

www.agilent.com/find/usbmodular

BASIC SIGNALS AND ARBITRARY WAVEFORMS

U2761A USB modular one-channel function generator

The USB function generator relies on direct digital synthesis (DDS) to create stable, accurate output of low-distortion sine waves. It also gives you square waves with fast rise and fall times up to 20 MHz and linear ramps up to 200 kHz. For simulation of real-world signals, arbitrary waveforms can be created with 14-bit resolution up to 200 kHz.

- 10 mVpp to 10 Vpp amplitude range
- Pulse, ramp, triangle, noise and DC waveforms
- AM, FM, PM, ASK, FSK, PSK signals
- 64 Kpt arbitrary waveforms are customizable through the waveform editor

For complete specifications, please download the U2761A data sheet from **www.agilent.com/find/U2761A**.

Accessories

The function generator includes an AC/DC adapter and a USB Standard-A to Mini-B interface cable. The table presents two more Agilent accessories that may be useful.

Item	Model number
BNC cable	U2921A-100
USB secure cable, 2 m	U2921A-101

ON-THE-GO NECESSITIES

When you're on the road, a few essential "survival kit" items may reduce weight and eliminate hassles. You should be able to find these at electronics stores (and some music stores) that carry computer accessories and power adapters.

USB hub: Most laptop PCs have just two USB ports, and many people use one for a wireless mouse. To connect more than one USB modular instrument, you'll need a multiport USB 2.0 hub and an extra USB cable to connect the hub to your PC. Also, be sure that the hub is compatible with Windows XP Pro or Home (SP1 or later), or Windows 2000 Pro (SP4 or later).

Multiport AC/DC adapter: Each USB modular instrument is powered by a 12 V, 2 A AC/DC adapter (12 V, 3 A for USB modular source/measure unit). To lighten the load on your shoulder, you may want to carry a Y-splitter or a multiport AC/DC adapter. The key specs for a suitable multiport adapter are 12 V/5 A for two USB MI and 12 V/8 A, for up to four USB MI. The DC connectors must be 9 mm long with a 5.5 mm outside diameter and 2.5 mm inside diameter.

www.agilent.com/find/usbmodular

RELATED PRODUCTS

The scopes, DMM and function generator are part of Agilent's line of USB-based instruments: The USB MI family also includes a source/measure unit and a matrix switch. Our family of 17 USB data acquisition (DAQ) modules includes measurement devices, digital input/output (I/O) units, a thermocouple signal conditioner, and a six-slot chassis that is also compatible with the USB MI modules.

Agilent USB Modular Instruments

For your bench, we offer two more modular instruments that complement the scopes, DMM and function generator. To save space—and simplify connections—up to six modules can be mounted in the USB MI chassis.

U2722A USB modular source/measure unit

As a three-channel power supply, this device delivers 20 V and 120 mA per channel with fast response time and voltage and current programming/readback. The U2722A is also capable of four-quadrant operation, acting as a current source and current sink (load) across its ±20 V output range. Its measurement capabilities provide 0.1% accuracy and 100 pA sensitivity.

U2751A USB modular switch matrix

This is a high-quality, low-cost switching solution for complex testing. It has 32 two-wire cross points in a 4x8 configuration, enabling connection with any combination of rows and columns—including multiple channels at the same time. Other key features are 45-MHz bandwidth (without terminal block), a relay cycle counter, and a command-logger function.

U2700A USB modular instrument chassis

The six-slot chassis offers the convenience of one AC-power connection and a single USB link. Modules are hot-swappable and the auto-detection feature reduces setup time and effort. The chassis also provides simultaneous synchronization between modules and enables SSI/star-trigger bus synchronization with an external trigger source.

For complete specifications, please download the individual product data sheets from **www.agilent.com/find/usbmodular.**

Agilent USB Data Acquisition

The USB DAQ family gives you the choice and flexibility to create solutions that expand and evolve according to your changing measurement needs. All can be used side-by-side with Agilent USB MI modules—standalone or in the six-slot chassis.

U2600A Series USB digital I/O

The series includes three high-performance modules with opto-isolated lines: the U2651A 32-bit DI and 32-bit DO; the U2652A 64-bit DI; and the U2653A 64-bit DO. Input voltage range is 10 to 24 V and output range is 5 to 35 V.

U2300A Series USB modular multifunction DAQ

This series includes seven modules, four basic and three high-density, that offer up to 64 channels with 12- or 16-bit resolution and up to 3 MSa/s on a single channel. They also include 24-bit programmable digital I/O.

U2500A Series USB simultaneous-sampling DAQ

These high-performance modules provide four analog inputs, two analog outputs and 24-bit programmable digital I/O. Analog input performance includes 14- or 16-bit resolution, and per-channel sampling rates of 0.25, 0.5 and 2.0 MSa/s.

To learn more about the complete family of Agilent USB DAQ modules, please visit **www.agilent.com/find/usbdaq.**

PUT A BENCH IN YOUR BAG

Take powerful measurement capabilities on the road—and leave the transit cases behind. Roughly the size of a paperback book, Agilent USB modular instruments make it easy to perform essential measurements—waveforms, voltage, current, resistance, and more—and inject standard or arbitrary waveforms into the systems or devices you're testing. With USB 2.0 connectivity, plug-and-play simplicity and a graphical user interface, you'll be able to carry bench-quality measurements alongside a laptop PC in your bag or briefcase.

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