

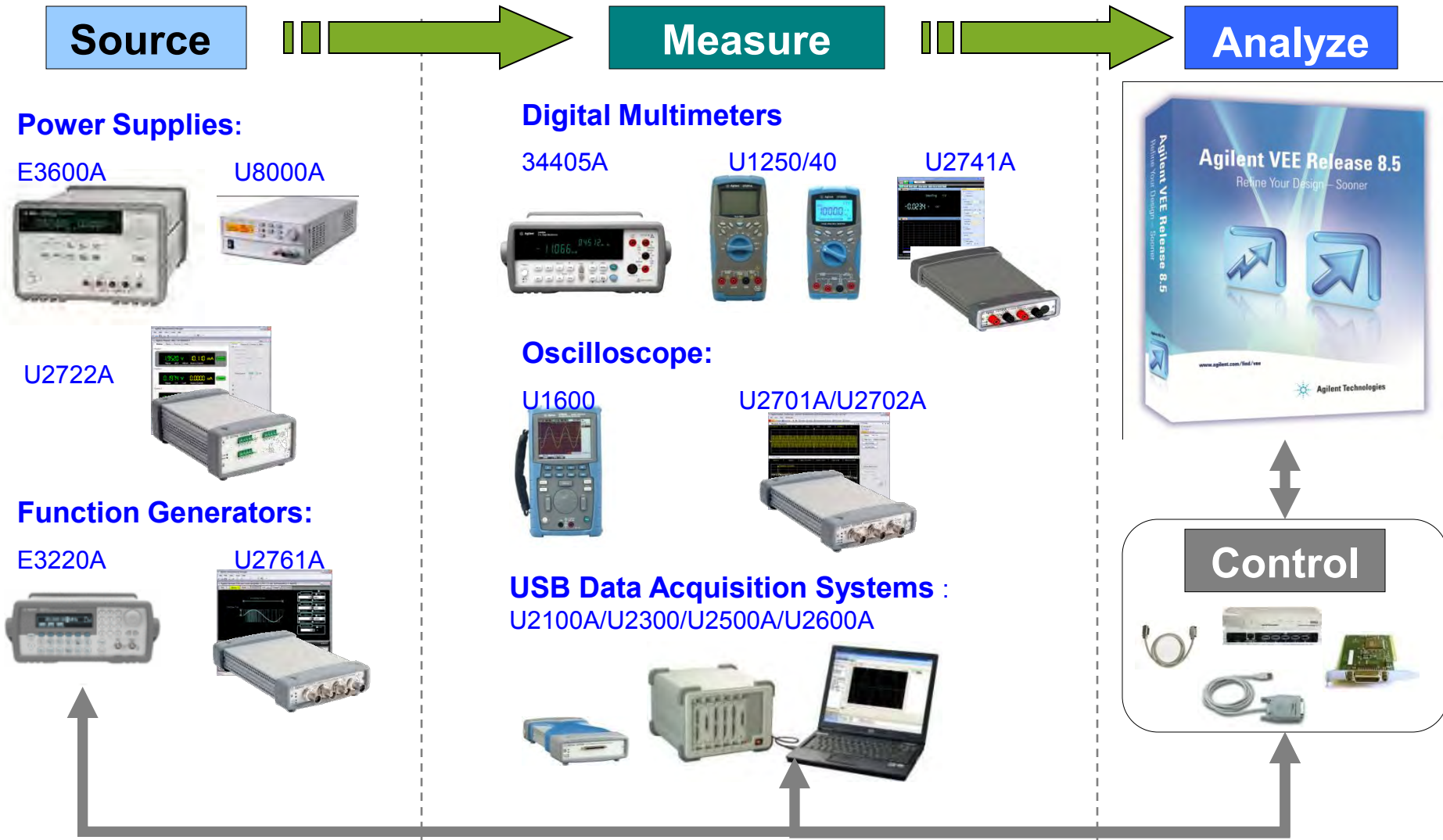
Einfach & Flexibel USB-Messtechnikprodukte von Agilent Technologies



Topics

- **USB Modular Instruments Overview**
- **USB Modular Instruments Features**
- **Examples**

Typical Test Environment



Snapshot: USB Modular Instruments & USB Modular DAQ

“Just what I need: simplicity and flexibility that’s so versatile I can easily arrange and rearrange the configuration to fit my changing measurement needs.”

No more...



cluttered desktops

**With fully featured,
paperback-sized**



modular instruments

**Have a mobile set of
instruments...**



**with or without a
test cart**

Agilent USB Modular DAQ Products

Modular Data Acquisition (18 models)



★ Dual Play



★ Dual Play



★ Dual Play



**U2300A Series –
Multifunction DAQ
(7 Models)**

**U2781A – Modular
Chassis
(1 Model)**

**U2500A –
Simultaneous
Sampling DAQ
(3 Models)**

**U2100A & U2600A –
Isolated Digital IO
(6 Models)**

**U2800A –
Signal Conditioner
(1 model)**

- U2352A**
16SE/8DI,
16-bit, 250kS/s
- U2355A**
64SE/32DI,
16-bit, 250kS/s
- U2351A**
16SE/8DI,
16-bit, 250kS/s
with 2 AO
- U2356A**
64SE/32DI,
16-bit, 500kS/s
- U2354A**
16SE/8DI,
16-bit,
500kS/s
- U2331A**
64SE/32DI,
12-bit, 3MS/s
- U2353A**
16SE/8DI,
16-bit, 500kS/s
with 2 AO

- U2781A**
6 slots chassis

- U2541A**
4 chn,
16-bit, 250kS/s
- U2542A**
4 chn,
16-bit, 500kS/s
- U2531A**
4 chn,
14-bit, 2MS/s

- U2121A**
16 Inputs, 16 Outputs
- U2122A**
32 Inputs
- U2123A**
32 Outputs
- U2651A**
32 Inputs, 32 Outputs
- 2652A**
64 Inputs
- U2653A**
64 Outputs

- U2802A**
31 chn
Thermocouple
Signal
Conditioner

★ USB interface ★ Easy & Quick Setup Software Convenience

USB Modular Instruments Products

U2700A series Agilent USB Modular Instruments and chassis (7 models)

**Chassis
(1 models)**



**6 slot
chassis
(U2781A)**

**Oscilloscope
(2 models)**



★ Dual Play

**Power supply
(1 model)**



★ Dual Play

**Digital Multi
meter
(1 model)**



★ Dual Play

**Switch
(1 model)**



★ Dual Play

**Function
Generator
(1 model)**



★ Dual Play

**2chn 100MHz
8-bit, 500MSa/s
(U2701A)**

**2chn 200MHz
8-bit, 500MSa/s
(U2702A)**

**3chn 20V/120mA
1uA/100pA res
(U2722A)**



**Parametric Test
Fixture
(U2941A)**

**5.5 digits
100Sa/s
(U2741A)**

**32chn
switch matrix
(U2751A)**

**20Mhz FG with
14-bit 50MS/s
64k AWG
(U2761A)**

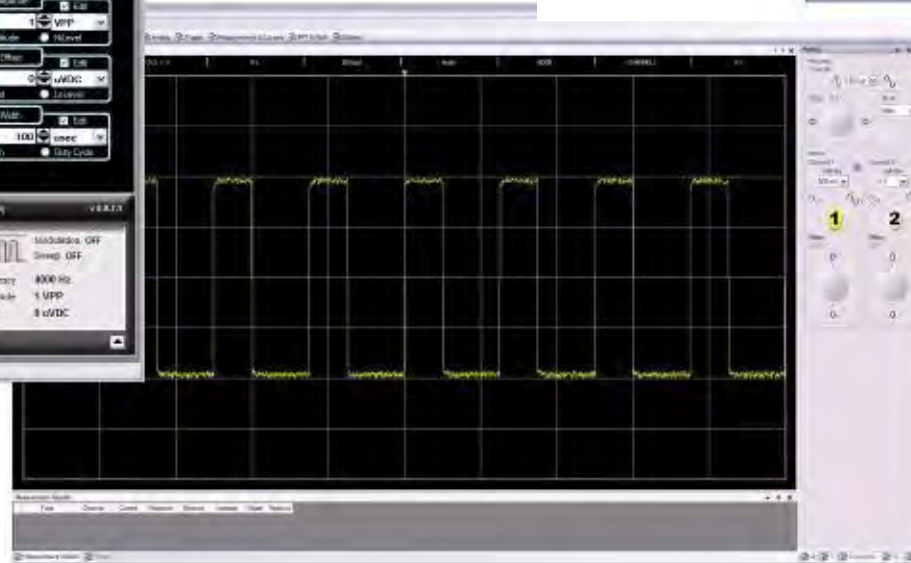
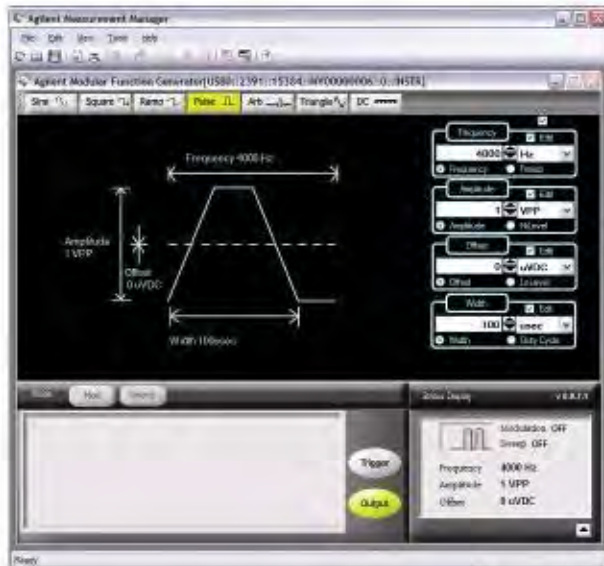
★ Convenient [Work in comfort] ★ Portable [Carry your instruments with you] ★ Simple Setup [Improve Efficiency]
★ Affordable [Low start up cost]

Overview: Soft Front Panel

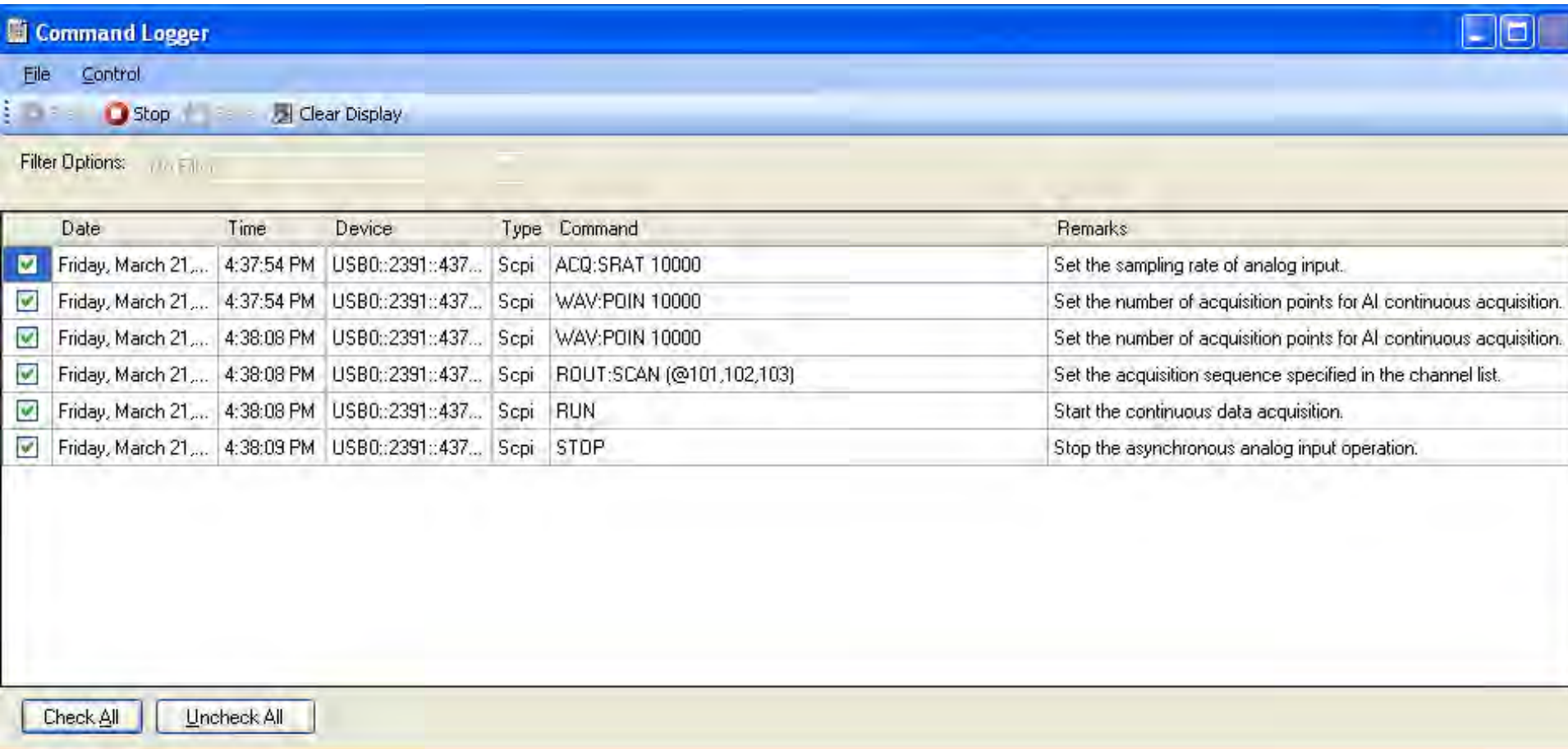
**Say No More to Small Instrument Screens!
Size now depends on your LCD Display or your
laptop/PC!**

**Agilent Measurement Manager
software (AMM)**

– a familiar, instrument-like interface



Command Logger – A Great Tool for Programmers



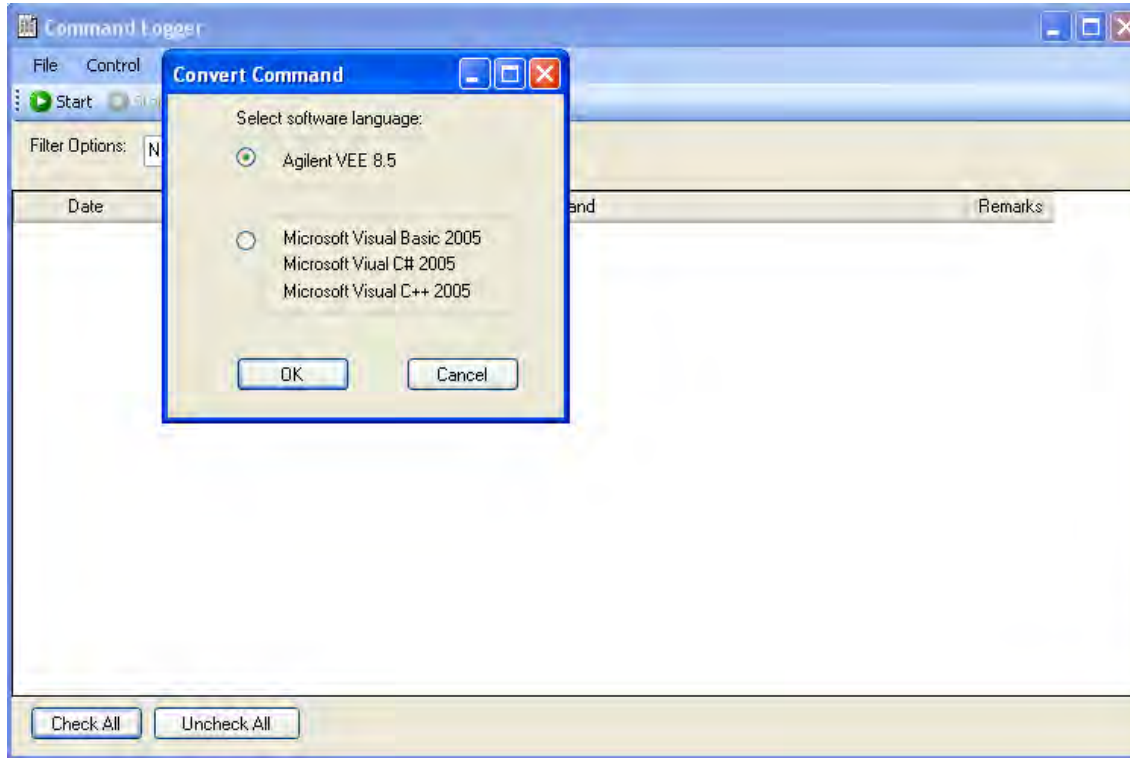
The screenshot shows the Command Logger application window. The title bar reads "Command Logger". The menu bar includes "File" and "Control". The toolbar contains "Stop" and "Clear Display" buttons. Below the toolbar is a "Filter Options" section. The main area is a table with the following columns: Date, Time, Device, Type, Command, and Remarks. The table contains six rows of log entries, each with a checked checkbox in the first column. At the bottom of the window are "Check All" and "Uncheck All" buttons.

	Date	Time	Device	Type	Command	Remarks
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:37:54 PM	USB0::2391::437...	Scpi	ACQ:SRAT 10000	Set the sampling rate of analog input.
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:37:54 PM	USB0::2391::437...	Scpi	WAV:POIN 10000	Set the number of acquisition points for AI continuous acquisition.
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:38:08 PM	USB0::2391::437...	Scpi	WAV:POIN 10000	Set the number of acquisition points for AI continuous acquisition.
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:38:08 PM	USB0::2391::437...	Scpi	ROUT:SCAN (@101,102,103)	Set the acquisition sequence specified in the channel list.
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:38:08 PM	USB0::2391::437...	Scpi	RUN	Start the continuous data acquisition.
<input checked="" type="checkbox"/>	Friday, March 21, 2014	4:38:09 PM	USB0::2391::437...	Scpi	STDP	Stop the asynchronous analog input operation.

- Start Command Logger before starting device configuration

- Log the commands when configuring the device via AMM.

Code Converter – A Great Tool for Programmers



Convert saved command logger file into other languages.

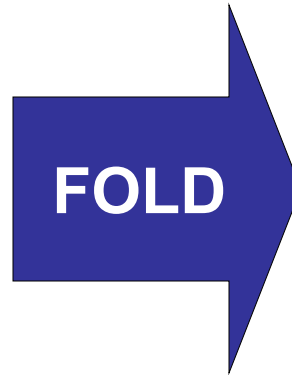
2 converters available:

- Agilent VEE Code Converter.
- Microsoft C#/VC++/VB Code Converter.

Form Factor

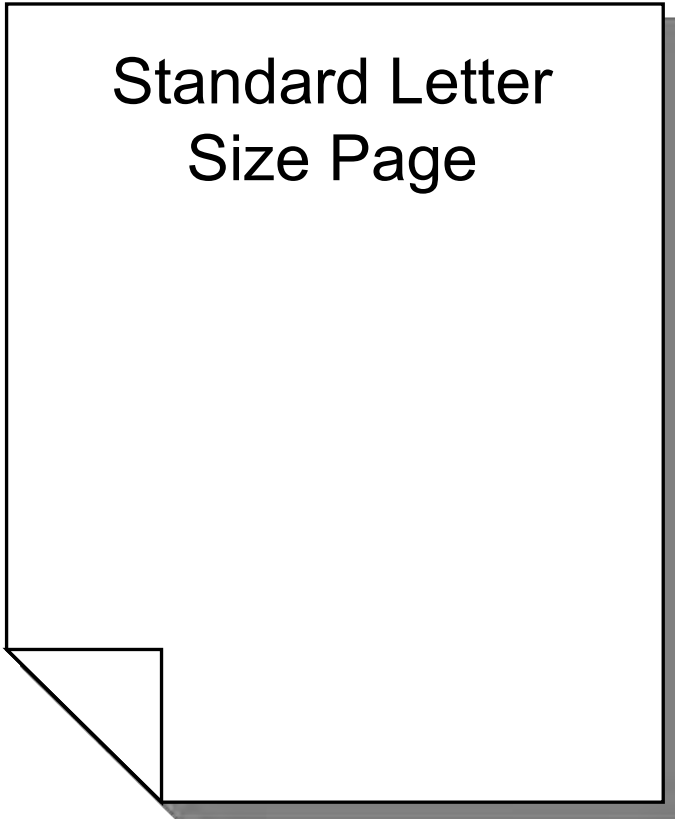
**Less than Half the size of
the standard Letter Page**

Length 6.8 in / 175mm
Width 4.1 in / 105mm



**Same thickness as a
Paperback Novel**

Height 1 or 2 in / 25mm or 50mm



Connecting U2700 Series Modular Instruments

Single unit :



- USB connectivity
- Each instrument has its own software-based control panel
- Multiple instruments can be connected via USB hub to a single notebook PC USB port

System via card cage :



- Single USB cable to connect multi-instruments
- Single AC connection to power all instruments
- Card cage support up to six instruments or three SMUs
- Each instrument will have its own software-based control panel

Research Lab -- Small Engine/Dynamometer Testing

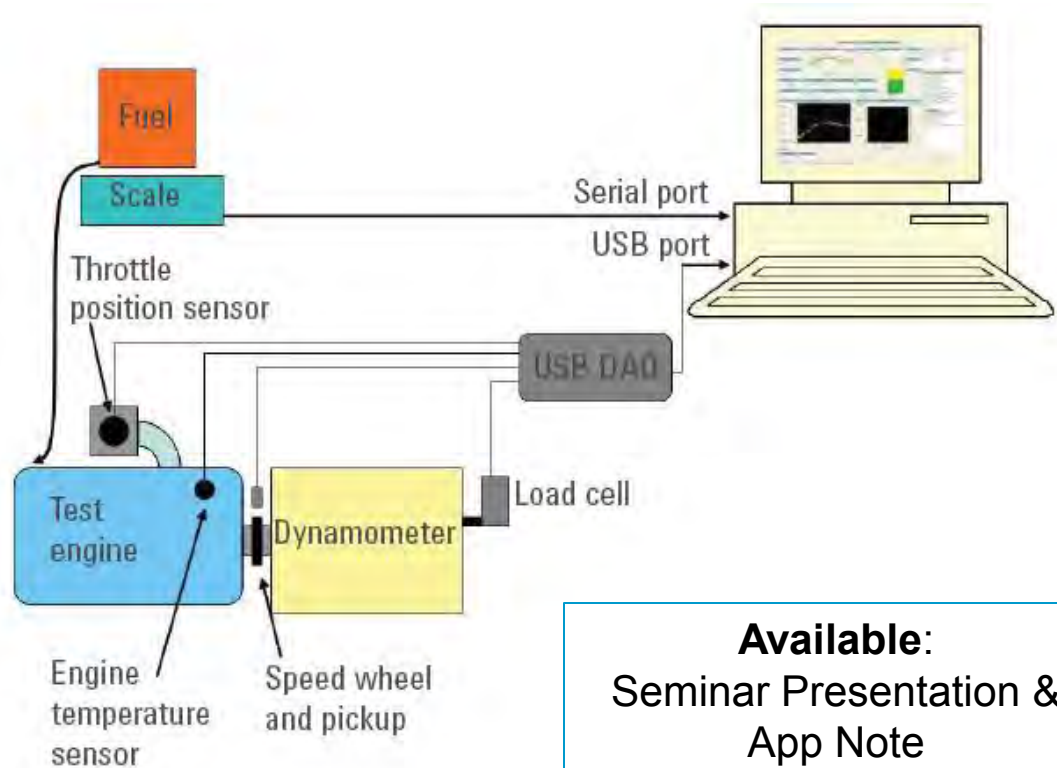
Task of DAQ:

Speed, torque, and throttle position signals are measured using the analog input ports of the U2355A



Application:

Performing Dynamometer Testing on Combustion Engines with USB DAQ and Agilent VEE Pro



Available:
Seminar Presentation &
App Note

Research Lab -- Battery emulation using U2722A SMU

- A 2/5 AAA size rechargeable battery use case

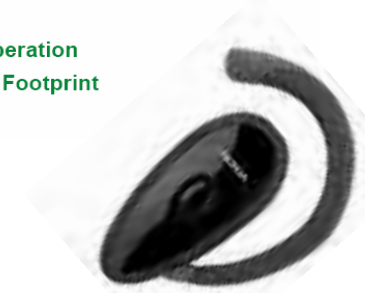
Li-ion Cylindrical Type



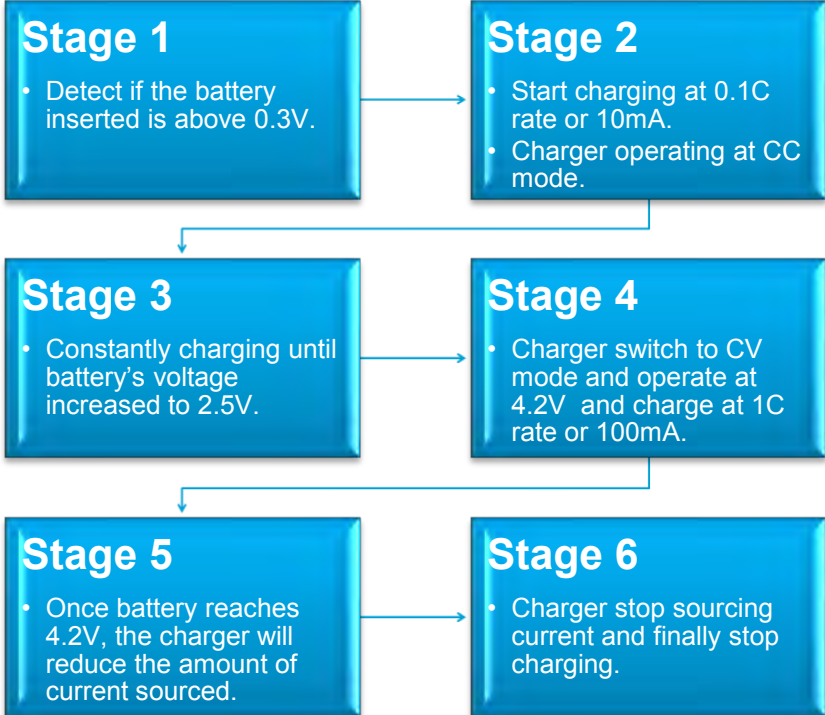
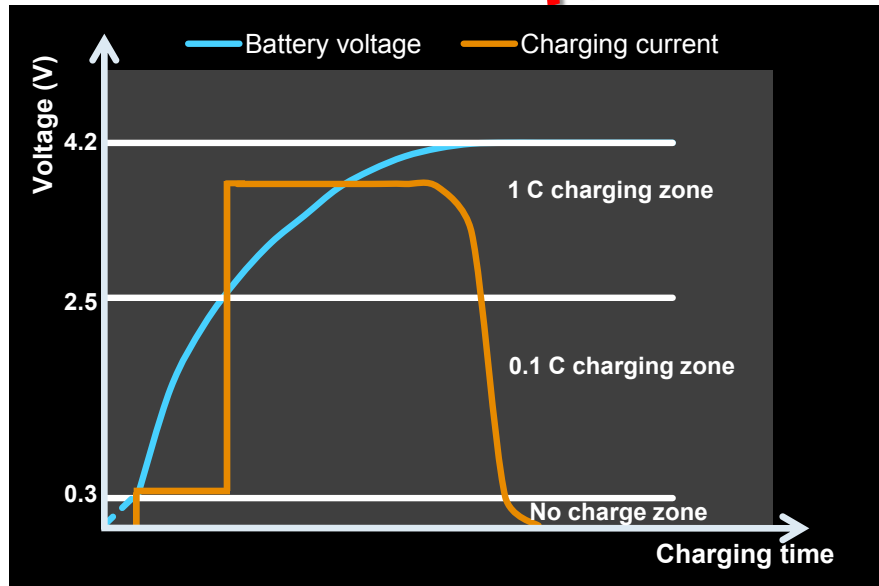
Size	AAAA	2/5AAA	1/2AAA	2/3AAA
Model No.	0840L17	1018L10	1022L14	1029L18
Voltage	3.7V	3.7V	3.7V	3.7V
Capacity	170mAh	105mAh	140mAh	180mAh

Mobile Applications for Bluetooth Headset

- Light Weight
- Design for Safe Operation
- Slender & Smaller Footprint
- Long Cycle Life



Requirements



Research Lab: How U2722A meets the requirements

Stage 1 (simulate short circuit)

- U2722A is set to CV mode at 0.3V or lower with 10mA input protection current.
- The charger will not charging at this region.

Stage 2 (simulate 0.1C charging)

- U2722A is set to CV mode at 0.3V – 2.5V with 120mA protection current.
- The charger is charging at 10mA or 0.1C rate as shown.

Stage 3 (simulate 1C charging)

- U2722A is set to CV mode at 2.5V – 4.0V with 120mA protection current.
- The charger is charging at 105mA or 1C rate as shown.

Stage 4

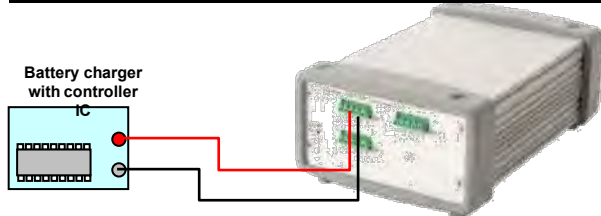
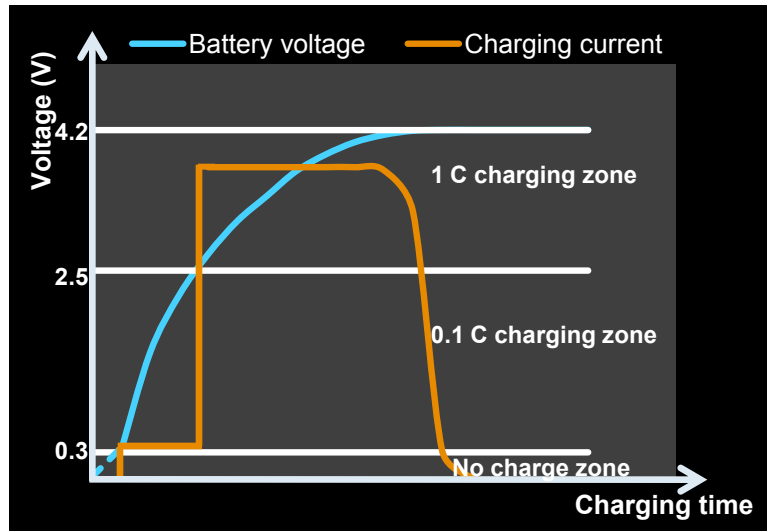
- U2722A is set to CC mode to sink 50mA with 4.3V protection voltage.
- The charger is now sourcing a 50mA current.

Stage 5

- U2722A is set to CC mode to sink 20mA with 4.3V protection voltage.
- The charger is now sourcing a 20mA current.

Stage 6

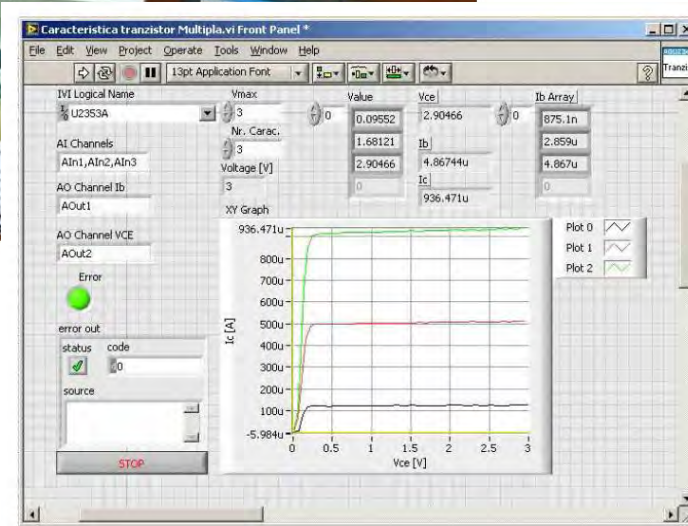
- U2722A is set to CV mode at 4.3V with 10mA input protection.
- The charger finally stop charging.



Available: App Note

CO2 Tester @ University of Transilvania

CO2 Tester – University of Transilvania (in Romania)
in collaboration with Industrial Company (Steiner)



- Monitoring of CO2 levels.
- Solution for University of Transilvania
- Powered by :
 - Agilent's U2300A, USB based data acquisition system
 - Agilent Vee

Questions, comments or suggestions?





Thank

you