

The UBA4

A Professional Battery Analyzer For Less Than You Thought



The Ultimate Battery Analyzer is a professional battery analyzer that uses the versatility and power of your PC. It will test all your NiCd, NiMH, lead acid and lithium ion battery packs from a single cell to 20V and 10mAh to 100Ah.

The UBA connects to the serial port of your PC and will Analyze, Recondition, Charge and Cycle your batteries. Its two independent channels, each with their own programmable load and charger, are under full PC control.

Never again will you forget or lose the results of a battery test.

All test results including the battery voltage and current (and optional temperature) are stored in a data file for future reference, analysis or comparison. This enables viewing and printing any previous test results along with the charge and discharge graph.

Operation is simple and automatic, but *you* are in control.

Connect your battery to the UBA and tell it the type of battery being tested. The software selects the optimum discharge and charge current, depth of discharge, and charge method. Of course, you can override any of these settings. The UBA will then analyze your battery and record to disk all the test results.

Battery test results available in real time.

As part of its advanced test procedures the UBA provides battery test status information in real time. At the conclusion of the test, a host of performance data including battery capacity, energy, and midpoint voltage are displayed and a hard copy generated.

Tests under actual field conditions.

The UBA tests the battery with the actual current used under field conditions. This increases the accuracy and reduces the cycle time compared to fixed current units.

Standard battery input connectors.

With its industry standard banana jacks, the UBA will connect to batteries directly or it can use any of the many battery cups already available.

Programmable parameters and upgradable software protect the UBA from obsolescence.

Analyzers that allow changing the battery parameters are the most flexible and do not become obsolete when new battery types are introduced. Battery voltage, current, and chemistry can be quickly changed with the UBA.

Cost Effective.

The UBA has no display and no keyboard. It doesn't need any. Everything is controlled by your PC. This elegant solution saves you money and explains the low cost compared to other professional units.

Expandable.

By linking UBAs together you can test many batteries simultaneously or increase its current capabilities.

Vencon Technologies has achieved international recognition for its battery testing products. A partial list of our satisfied customers include:

- British Columbia Hydro
- Energizer Power Systems
- Government of Canada
- Israel Defense Force
- NASA
- Royal Canadian Mounted Police
- Sharp Electronics
- Sony Electronics
- Siemens Medical
- Texas Instruments
- United States Government
- United States Navy
- University of California
- Intel

Support.

On our web site you can find the latest software along with applications notes.

Specifications

The UBA4 comes with two battery input channels under full independent software control. UBAs can be combined for more channels or higher currents, or customized for lower currents.

Batteries that can be tested:

Chemistry	NiCd, NiMH, Lead Acid, Gel Cell, Li-ion and all primary cells.
Voltage	High range: 0 to 24V, Low: 0 to 6.5V (accuracy $\pm 0.1\%$ full scale) <ul style="list-style-type: none">○ NiCd, NiMH: 1 to 16 cells in series○ Lead Acid, Gel Cell: 1 to 9 cells in series○ Li-ion cells: 1 to 4 cells in series
Capacity	20mAh to 100Ah

Internal Load (one per channel)

Type	Programmable constant current. (pulse discharge available as upgrade)
Current	10mA to 2500mA in 10mA increments.
Load terminated by any of the following conditions:	Cut off voltage Maximum time or maximum capacity
Power limit	18W
Accuracy:	$\pm 0.5\%$ full scale
Resolution	0.1mAh

Internal Charger (one per channel)

Type:	Programmable constant current, voltage and duty cycle.
Current:	10mA to 2.0A in 20mA increments.
Constant Current charge terminated by any of the following conditions:	Peak (delta V) Maximum time. Maximum charged capacity Temperature (limit or dT/dt - with optional temperature probes)
Constant Voltage charge terminated by any of the following conditions:	Minimum current. Maximum time. Maximum charged capacity

Miscellaneous

Battery input:	Banana connectors (two pairs of plugs included).
Accessory ports:	Two (extra analog and digital lines for accessories).
Power:	DC: 12V to 26V, 4.5A max. (120/230VAC universal power supply available).
Approvals:	CE and FCC
Size, Weight:	130mm x 170mm x 65mm (WxLxH), 550g
Warranty:	Two year parts and labour.
Software:	Win9X/NT4/2000 UBA Console software included.

Notes:

- You can link any charging or load actions together to create a custom algorithm.
- You can combine channels to increase the charge or load current and power limits.

Accessories:

- Temperature probes (for battery temperature monitoring and charge termination).
- High current discharge module (controls up to 50 Amperes discharge current)
- Third electrode low current amplifier (current less than 10pA or even less than 100fA)
- Technical Reference Manual (includes schematics and the UBA4 serial communication protocol).

Available in Australia from:

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Web: www.master-instruments.com.au sales@master-instruments.com.au

The UBA4



The UBA4 comes with Windows 95/98/NT software (including the award winning graphical battery analysis routines), a serial cable, a set of battery connectors, a comprehensive manual, a power supply (if ordering a combo) and an unprecedented two year warranty. You'll find the UBA4's specifications on the last page. If you don't order a UBA Combo you can specify the maximum charge rate be limited to 500mA or 1A per channel (default is 1.5A per channel). You would request this to prevent overloading of your power supply if it can't supply the 3.2A required for the default 1.5A/channel UBA4.

UBA Combos

The UBA4 does not come with a power supply, but it needs one to operate. You can either use your own power supply or purchase a UBA "Combo" which comes with a power supply. We offer a few combos depending on the type of batteries you want to test. Why do we offer different "combos" and not include a power supply with the UBA? Simple answer - price, performance and reliability. We decided to keep the UBA4 itself as simple and reliable as possible. For this reason we didn't build a power supply inside it and didn't add voltage boosting circuitry. This keeps the UBA4 very powerful, amazingly reliable, deadly accurate, and unbeatable inexpensive. In fact you could purchase a UBA4 and three power supplies and it still would be the least expensive battery tester on the market for its capabilities!

Budget UBA4

The Budget UBA4 comes with a 1A 15V linear power supply (currently only 120V input available) that can simultaneously charge two batteries at up to 15V and 500mA. This is perfect if you are testing small capacity batteries (less than 500mAh) or don't mind waiting a few hours to charge larger sized battery packs (greater than 1Ah). Note, if you use the Channel Combiner the Budget UBA4 can charge a battery at up to 1A.

Maximum number of cells in series that can be charged (at 500mA)	
NiCd/NiMH	8
Lead acid/Gel cells	5
Li-Ion	2

General Purpose UBA4

The General Purpose UBA4 comes with a 19V 3.4A universal (100 to 240V input) power supply that can simultaneously charge two batteries at up to 16V and 1.5A. This is perfect if you have a wide variety of batteries to charge. If you will be exclusively testing batteries less than 8V then the High Current UBA4 is a more appropriate choice as the General Purpose UBA4 will start reducing current from its maximum of 1.5A on batteries of this size. Note, if you use the Channel Combiner the General Purpose UBA4 can charge a battery at up to 3A.

Maximum number of cells in series that can be charged (at 1.5A)	
NiCd/NiMH	10
Lead acid/Gel cells	6 (i.e. 12V battery)
Li-Ion	3

Low Voltage UBA4

The Low Voltage UBA4 comes with a 15V 3.4A universal (100 to 240V input) power supply that can simultaneously charge two batteries at up to 12V and 1.5A. This is perfect if you are testing cellular phone or camcorder batteries. Note, if you use the Channel Combiner with the Low Voltage UBA4 you can charge a battery at up to 3A.

Maximum number of cells in series that can be charged (at 1.5A)	
NiCd/NiMH	7
Lead acid/Gel cells	4
Li-Ion	2

High Voltage UBA4

The High Voltage UBA4 comes with a 24V universal (100 to 240V input) power supply that can simultaneously charge two batteries at up to 21V and 1.0A. This is perfect if you are testing large battery packs (for laptops or industrial machinery). Note, if you use the Channel Combiner with the High Voltage UBA4 can charge a battery at up to 2A.

Maximum number of cells in series that can be charged (at 1.0A)	
NiCd/NiMH	13
Lead acid/Gel cells	8
Li-Ion	4

Custom Voltage UBA4

The Custom UBA4 can charge batteries at up to 44V and 2.0A. It comes with a power supply (240VAC input) than powers the UBA4's internal circuitry only. You have to provide a power supply that can power the charger. For example, if you want to be able to charge a battery up to 40V and 1.5A you would require a 43V 3A power DC supply. Note, if you use the Channel Combiner with the Custom Voltage UBA4 can charge a battery at up to 4A.

Note: the higher voltage capability of the UBA4CU results in reduced accuracy of the charge current and the requirement of a lower voltage power supply when charging smaller battery packs.

	Maximum number of cells in series that can be charged (at 2.0A)	Nominal Battery Pack Voltage
NiCd/NiMH	26	31.2V
Lead acid/Gel cells	17	34V
Li-Ion	9	38V

UBA Accessories and Upgrades

Channel Combiner Adapter



This adapter combines the two battery inputs on your UBA4. This allows combined channel charging and discharging which doubles the charge and discharge current.

Set of Extra Battery Connectors



The UBA4 uses standard banana jacks for connecting to your battery. The UBA4 comes with a set of four banana plugs. More than likely you will require more banana plugs. Although you can pick them up at most well stocked electronics stores, why take the chance? Order an extra set with your UBA4 and save yourself some time. Recommended.

Technical Reference Manual

This document contains the protocol that the UBA4 uses to communicate with its host (your PC) and a set of schematics. You would require this if you want to write software to communicate directly with your UBA.

External Temperature Probes

The temperature probes plug into the back of your UBA4 and allows you to monitor the temperature of your batteries and to specify a temperature or dT/dt to terminate quick charging. You can also have the battery temperature logged to a file for further analysis. You can also use the thermometer probes as a data logger record the temperature of something else besides batteries. The probes work for temperature's between 0 and 100 degrees Celsius. Note, External Temperature Probes includes the connector on the back of your UBA which is installed when your order the Probes with your UBA4. Additional temperature probes can be ordered (see item below).

Additional External Temperature Probes

If you have already purchased a set of External Temperature Probes for your UBA4 you can purchase additional sets of probes. These probes require that your UBA4 has already been equipped with a temperature probe connector (with comes with the External Temperature Probes).

Serial Port Opto-Isolator

Do you want to operate your UBA4 at a different ground potential from your PC? Then you need the Serial Port Opto-Isolator. This isolator optically couples your UBA4 to your PC or to another UBA4. No additional power is required for it. You would require this isolator if the battery being tested is connected to equipment or you want to use two UBA4s to test two batteries that are wired in series. Or if you are combining a few UBA4s for high discharge current testing, you should isolate the UBA4 that's doing the voltage measurements.

Add-In Modules

We have two modules that you can use with your UBA4 to extends it's capabilities.

High Current Discharge Module



This module allows discharging a battery at up to 15 Amperes (or 50A with the Very High Current Discharge Module). It works in conjunction with a load that you supply and a UBA4. It connects and disconnects the load while measuring the load current. For the load, you can use automotive lamps, power resistors or even an active load.

This accessory allows you to test battery under high current load conditions. With it you can really show you the true capabilities of your battery. It can even test single cells.

What's Included

The price includes the module, complete with connectors, software, and manual. You need only supply your own high current load.

Note, you can't use this module at the same time as temperature probes, as they both use the accessory port.

Very High Current Discharge Module

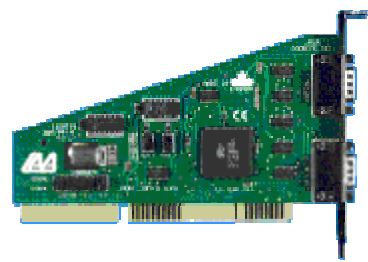
This is similar to the High Current Discharge Module except it can discharge up to 50A!

Extremely Low Current Voltage Sense Module

Do you want to monitor your battery's voltage with a separate set of probes that draw less than 10pA or even less then 100fA of current? This module is designed for electrochemistry research and can turn your UBA4 into an inexpensive galvanostat.

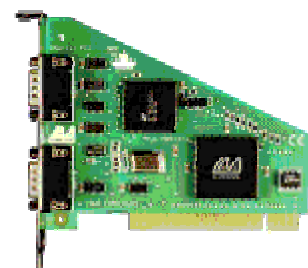
PC Accessories

Dual Serial Port Board - ISA Bus



Run out of serial ports on your PC? No free ports for a UBA4? No problem. This Dual Serial Port Board plugs in to a free ISA slot on your computer and incorporates two high-speed 16550 UART serial ports capable of handling data throughput rates up to 115.2k bps (more than adequate for the UBA4). Each of the card's serial ports is independently configurable as Com 1 through Com 6, and selectable for any of IRQ 2/3/4/5/7/10/11/12/15. Note, if you have a free PCI slot in your PC the Dual Serial Port Board - PCI Bus card (described below) is a much better choice.

Dual Serial Port Board - PCI Bus



This board has all the speed advantages of the Dual Serial Port Board - ISA described above, but resides on the faster PCI bus. This allows it to utilize the shared interrupt structure of the PCI architecture and access some non-standard Com addresses. Dual 9-pin High Speed 16550 UART serial ports - adds two additional COM ports to any PCI-equipped PC. Require only one system IRQ - saves valuable resources for other expansion cards. Both ports share one PCI bus IRQ - even when accessed simultaneously. Automatically selects next available IRQ and COM addresses - just plug in and go!

UBA4 Specifications

The UBA4 has two independent channels, each with its own programmable constant current load and programmable pulsed constant current charger. It is protected against reverse battery and power connection, shorted batteries, and over temperature. Each UBA4 is individually calibrated (traceable to NRCC) and the calibration is guaranteed for one year.

Number of Channels		Two
Battery Voltage:	Automatic Range Selection	0 to 20V (two ranges per channel)
Battery capacity:		10mAh to 40Ah
Load:	Internal programmable constant current load (one for each channel)	0A to 2.5A with 18W power limit per channel.
Accuracy:	Voltage (automatic voltage range selection)	+/-1mV (3V range) +/-2mV (8V range) +/-5mV (20V range)
	Load Current	+/-0.5%
	Time	Better than 0.01% (crystal controlled)
	Capacity	+/-0.5%
Resolution:	Capacity	0.1mAh
Charging method:	Peak & Inflection.	0 to 1.5A per channel.
	Timed	0 to 1.5A per channel.
	Voltage	Up to 1.5A per channel.
		Note: Combining both channels gives up to 3A of current for all charging types.
Battery connectors:	Banana jacks.	Two sets included.
Power:	AC 120V or 230V DC 12V to 22V 3.5A max	
Size:		4.5"W x 6.5"L x 2.5"H
Warranty:		Two year full warranty.
Software:		Win95/98/NT included.
Money back guarantee:		Thirty days