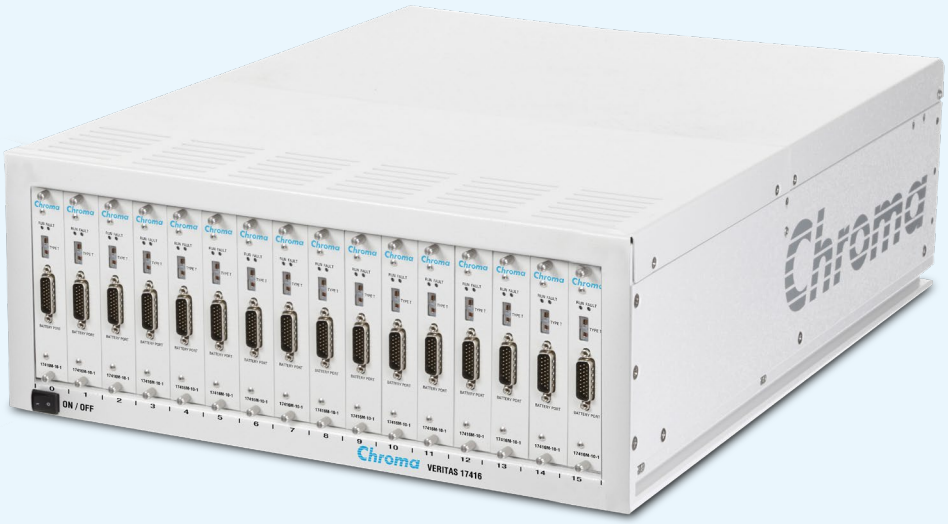

KEY FEATURES

- 50 ppm V/I measurement accuracy
- High accuracy CE measurements
- Built-in EIS (50 mHz to 20 kHz)
- DCIR and ACIR testing
- Charge/discharge, Capacity, and Cycle-life testing
- Supercapacitor testing
- High sampling rate (1 MHz)
- Custom waveform testing
- Temperature monitoring
- BMS communication
- Simple GUI and advanced Python
- Mix and match channels:
  - ± 10 V / ± 1 A
  - 0 to 5 V / ± 6.5 A

Veritas Battery Analyzer

The Veritas Battery Analyzer provides industry-leading accuracy and precision for a range of electric-mobility, electrochemistry, research, and related applications. A single chassis provides up to 16 mix-and-match channels with full potentiostatic and galvanostatic control. Each channel can conveniently measure coulombic efficiency (CE), DCIR, ACIR, EIS and battery temperature; model ESR; communicate with/control a BMS; and perform custom waveform testing. This enables continuous measurements without changing test programs and/or equipment.

High Accuracy Measurements

Industry-leading accuracy and precision can detect early signs of cell degradation that conventional test equipment may miss. Tracking minute coulombic efficiency (CE) losses can help accelerate the prediction and modeling for the overall lifetime of a cell with fewer test cycles, potentially yielding definitive data in weeks vs years.

Advanced Software Package

A simple and intuitive Graphical User Interface (GUI) allows quick setup for running basic charge/discharge test programs. Sample test programs to measure CE, DCIR, ACIR, and EIS are also included. Advanced test programs can be defined through Python scripting. The software provides data acquisition, management, and analysis in convenient standard formats. Custom charge/discharge waveforms can be imported to simulate application-specific use cases.

High Sampling Rate

A measurement sampling rate of 1 MHz captures critical transient cell behavior that is often lost with slower sample periods.

Flexible and Scalable Form Factor

The compact and modular 3U form factor saves valuable lab benchtop space and allows users to select up to 16 channels per chassis. An optional rack-mount kit allows the flexibility to expand to multiple chassis per standard 19" rack.

SPECIFICATIONS

Model	Veritas 1 Resource Card				
Channels	1 channel per card, up to 16 channels per tester				
Electrical	Range	Measurement Resolution	Measurement Accuracy	Source Resolution	Source Accuracy
Voltage	± 10 V	19.7 µV	±(0.005% of reading + 50 µV)	19.7 µV	±(0.01% of setting + 100 µV)
	± 5 V	9.83 µV	±(0.005% of reading + 25 µV)	9.83 µV	±(0.01% of setting + 50 µV)
Current	± 1 A	1.97 µA	±(0.006% of reading + 15 µA)	1.97 µA	±(0.02% of setting + 60 µA)
	± 100 mA	197 nA	±(0.006% of reading + 1 µA)	197 nA	±(0.01% of setting + 3 µA)
	± 10 mA	19.7 nA	±(0.006% of reading + 100 nA)	19.7 nA	±(0.01% of setting + 300 nA)
	± 1 mA	1.97 nA	±(0.006% of reading + 10 nA)	1.97 nA	±(0.01% of setting + 30 nA)
	± 100 µA	197 pA	±(0.006% of reading + 1 nA)	197 pA	±(0.01% of setting + 3 nA)
	± 10 µA	19.7 pA	±(0.006% of reading + 200 pA)	19.7 pA	±(0.01% of setting + 600 pA)
	± 1 µA	1.97 pA	±(0.02% of reading + 100 pA)	1.97 pA	±(0.05% of setting + 200 pA)
ACIR/EIS Measurements	3 selectable voltage null ranges. Forcing maximum current and measuring minimum voltage yields the best ohm resolution.				
	Post Null Voltage Range	Voltage Resolution	1 Amp Range		100 mA Range	
			Z Range	Z Resolution	Z Range	Z Resolution
	± 1 V	31.5 µV	± 1 Ω	± 31.5 µΩ	± 10 Ω	± 315 µΩ
	± 100 mV	3.15 µV	± 100 mΩ	± 3.15 µΩ	± 1 Ω	± 31.5 µΩ
	± 10 mV	315 nV	± 10 mΩ	± 315 nΩ	± 100 mΩ	± 3.15 µΩ
Rise time (V and I)	64 µs typical					

Model	Veritas 6 Resource Card							
Channels	1 channel per card, up to 16 channels per tester							
Electrical	Range	Measurement Resolution	Measurement Accuracy	Source Resolution	Source Accuracy			
Voltage	0 to 5 V	9.83 µV	±(0.005% of reading + 25 µV)	9.83 µV	±(0.01% of setting + 50 µV)			
Current	± 6.5 A	19.7 µA	±(0.006% of reading + 97.5µA)	19.7 µA	±(0.03% of setting + 500 µA)			
	± 1 A	1.97 µA	±(0.006% of reading + 15 µA)	1.97 µA	±(0.02% of setting + 60 µA)			
	± 100 mA	197 nA	±(0.006% of reading + 1 µA)	197 nA	±(0.01% of setting + 3 µA)			
	± 10 mA	19.7 nA	±(0.006% of reading + 100 nA)	19.7 nA	±(0.01% of setting + 300 nA)			
	± 1 mA	1.97 nA	±(0.006% of reading + 10 nA)	1.97 nA	±(0.01% of setting + 30 nA)			
	± 100 µA	197 pA	±(0.006% of reading + 1 nA)	197 pA	±(0.01% of setting + 3 nA)			
	± 10 µA	19.7 pA	±(0.006% of reading + 200 pA)	19.7 pA	±(0.01% of setting + 600 pA)			
	± 1 µA	1.97 pA	±(0.02% of reading + 100 pA)	1.97 pA	±(0.05% of setting + 200 pA)			
ACIR/EIS Measurements	3 selectable voltage null ranges. Forcing maximum current and measuring minimum voltage yields the best ohm resolution.							
	Post Null Voltage Range	Voltage Resolution	6.5 Amp Range		1 Amp Range		100 mA Range	
			Z Range	Z Resolution	Z Range	Z Resolution	Z Range	Z Resolution
	± 500 mV	983 nV	± 76.9 mΩ	± 152 nΩ	± 500 mΩ	± 983 nΩ	± 5 Ω	± 9.83 µΩ
	± 50 mV	98.3 nV	± 7.69 mΩ	± 15.2 nΩ	± 50 mΩ	± 98.3 nΩ	± 500 mΩ	± 983 nΩ
	± 5 mV	9.83 nV	± 769 µΩ	± 1.52 nΩ	± 5 mΩ	± 9.83 nΩ	± 50 mΩ	±98.3 nΩ
Rise time (V and I)	20 µs typical							

General Electrical Specifications (applies to all Veritas cards)	
Sampling Rate	1 MHz
Charge/Discharge modes	Constant Current / Constant Voltage / Constant Power
Input Impedance	> 1 TΩ. 5 pA max, 200 fA typical
Temperature Sensor Inputs	1 per channel, supports RTDs, thermocouples, and thermistors
Auxiliary Inputs	4 per channel, ± 10 V (Veritas 1) and ± 5 V (Veritas 6) range, ±(0.005% of reading + 25 µV), 10 pA maximum
General I/O pins	4 per channel, programmable from 1.8 V to 5 V, I2C, SMBus, HDQ
Software Specifications	
Operating System	Windows 7 or above
Intuitive GUI	Included
Custom Scripting	Python
Communication	Ethernet TCP/IP
Veritas Chassis Specifications	
Dimension (WxDxH)	190 x 440 x 624 mm (7.5" x 17.3" x 24.6")
Weight	50 lbs
Required Power	90-240 VAC±10%, 50/60 Hz, 1Φ, 1 kW
Specification Temperature	25°C ± 5°C

All specifications are subject to change without notice.

ORDERING INFORMATION

Base chassis (16 empty slots) part number: 17400-16-16
Channel card (10V/1A) part number: 17416M-10-1
Channel card (5V/6.5A) part number: 17416M-5-6
Blank card assembly: 17416-C03-000
Channel output cable part number: A1017416-c
Coin cell fixture: A1017416-f

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