

## Component Automatic Test System



# COMPONENT AUTOMATIC TEST SYSTEM MODEL 8800

In recent years, as components become more complicated and multi-channel along with other complex problems, the cost of tests has skyrocketed for manufacturers. Chroma 8800 component automatic test system (ATS) is developed to effectively help manufacturers reduce the test cost and product risk. This system is able to complete all measurements and tests in one single test program. This powerful feature save time and reduce human operation errors that decrease the enterprise risk due to improper tests. The employment of open architecture software provides users a flexible, powerful and cost-effective automated test system that is deemed the best solution for component tests.

Chroma 8800 component automatic test system integrates different test instruments in the system based on test requirements. The open architecture software offers corresponding solutions by various test programs and products that give customers highly flexible test combinations. In addition, user expandable test items are provided for editing if new requirements arise.

This automatic test system uses a unique test command optimization technology to prevent the repetitive control commands from sending to the system hardware devices. This technology improves the system test speed dramatically. Users create new test items based on their requirements using the test item editor. The users can expand the test items as needed.

The system's integrated statistical and management functions generate various test statistical reports and performing system administration. Statistical reports are very important in factories for research and design (R/D) evaluation, quality assurance (QA) verification and production tests. Chroma 8800's Window 2000/XP environments provide test engineers with a dedicated components automatic test system in a familiar Windows environment and allows accesses to resources provided by Windows.

Chroma 8800 component automatic test system can combine different testers and hardware according to the test requirements. For instance, Chroma 13001 performs multi-channel scan test for inductance, capacitance and resistance along with turn ration (if applicable) measurements when combining with the LCR Meters like Chroma 3302/3252/11022/11025. The 8800 can do IR test as well as leakage inductance measurement that is designed specially for short-circuit when combining with Chroma 11200 CLC/IR Meter. Chroma 13001 Component Test Scanner supports up to 320 channels per unit when 8 optional A1130007 40-channel scan modules are installed. Up to 8 slaves of Chroma 13001 can be expanded externally for an 8800 component ATS and up to 2880 channels (1 master plus 8 slaves) can be tested to fulfill the requirements for multi-channel tests.

## MODEL 8800

### Key Features

- Open architecture software
  - Expandable hardware support
  - Support instruments equipped with GPIB/RS232 or RS485 interface
  - User editable test library (test Items)
  - User editable test programs
  - Statistical report
  - User privilege control
  - Test item/ Program Release control
  - Activity log
  - Support Barcode reader
- Test command editor helps to improve test speed
- Comprehensive hardware modules provide highly accurate, repetitive measurements
- High test throughput by system test items
- High test throughput generated by system test items
- Cost effective
- Hardware expandable upon request
- Windows® 2000/ XP based software

\* Test items can be customized or created via the test item editor based on the requirements of various UUTs.

### Applications

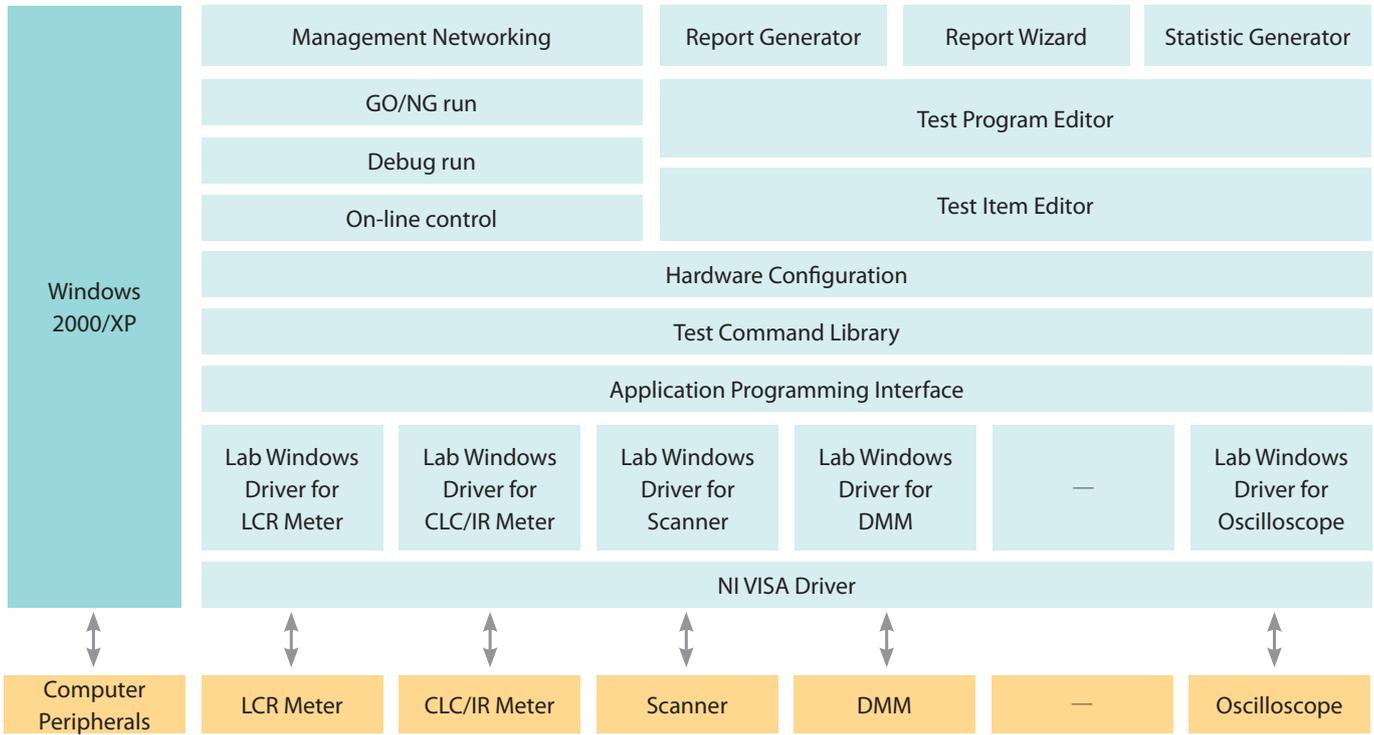
- RJ-45 equipment (including LAN Modules, Ethernet IC, PoE IC) test
- Glass substrate test
- LCD glass substrate test
- Printed circuit glass (including touch panel) test
- PCB test
- EMI filter test
- ICT applications



## NEW MILLENNIUM ATS SOFTWARE PLATFORM

Model 8800 Component Auto Test Systems include the industries' most sophisticated automatic testing software, Chroma ATS software. The Chroma software provides users with an open software architecture suited for a wide range of applications and devices.

The software is a Windows 2000/XP environment which supports necessary computer peripherals.



## MAXIMUM FLEXIBILITY AND EXPENDABILITY

### NI VISA Driver

The National Instrument VISA driver is used by software to allow supports to almost any instrument which uses GPIB/RS-232/RS-485 interface protocols. As a result, users do not need to worry about which interface is provided by individual instrument that are intergraded into system. By using this standard instrument driver, users can incorporate most of the test devices in the market.

## HIGHER COMPATIBILITY

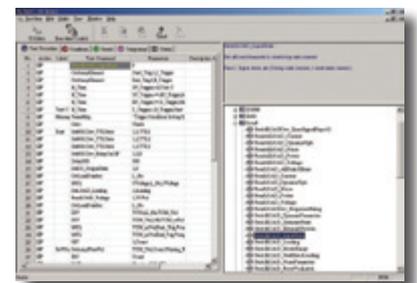
### Application Programming Interface

Under traditional ATS designs, users are prohibited from changing the installed equipment from one brand to the others. This hurdle is caused by the different format of the remote commands. Chroma software provides a unique application programming interface which interprets the different remote commands of various instrument to a standard format. Thus, if the functions of two equipment are identical, even manufactured by two different suppliers, they still can be replaced directly by adding a new application programming interface driver in Chroma ATS software.

## OFF-THE-SHELF TEST COMMANDS

### Test Command Library

For some special controls, it is not very easy for most of the users to figure out how to make relevant instrument work properly. Chroma ATS software collects most useful test commands for users in order to provide user-friendly editing environment. On the other hand, Chroma ATS software also provides some low level test commands, such as GPIB read/write, RS-232 read/write and RS-485 read/write. This enables users full access to all the equipment on Chroma Component Auto Test System model 8800 directly. Meanwhile, the test command library stops the repetitive test conditions from sending to hardware devices to dramatically improve the test speed.



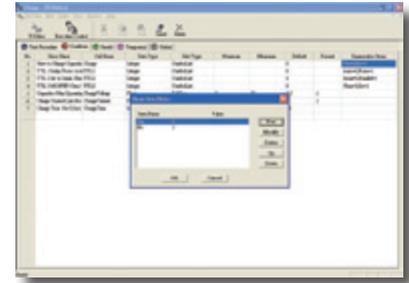
Add test command to the test procedure from test command library

## FLEXIBLE AND EASY TO USE

### Test Item Editor

Utilizing the test command library, Chroma ATS software provides an efficient editing environment for user to create new test items to meet new test requirements. In this test item editor, Chroma ATS software employs a powerful programming language which is similar to the C language, but much easier to learn and operate.

The test item editor allows users to define test procedures, test condition variables, test result variables and temporary variables. Furthermore, it also provides global variables for advanced control test requirement. For instance, it may be used for an auto alignment system which needs to pass the aligned value of the previous UUT as the next UUT's default value. In this way, it is very helpful to improve the align speed.

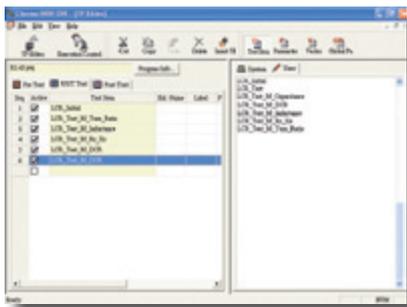


Enumerative items allow programmers define limited selections for low level users

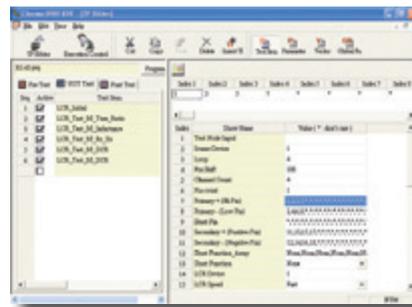
## SEQUENTIAL AND BATCH TESTING

### The Program Editor

The test program editor provides a useful means to integrate several pre-defined test items for one batch test. It also introduces pre-test and post-test functions which allow users to send the test commands that are not necessary to use all the time to the equipment on system but only when the execution just begin, or vice versa, at the end of the test. This feature optimizes the test program and reduces test time. Meanwhile, its run-time control allows users to determine the process and the direction of the test program according to the individual test result of test items.



Test program can be created by stacking test items in test library



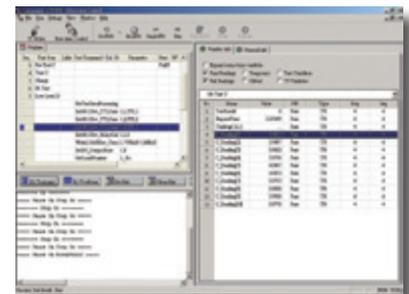
Just fill the test conditions!  
The test procedure was defined in the test item library

## VERSATILE AND POWERFUL EXECUTION MODE

Chroma ATS software platform provides three execution modes. DEDUG RUN is used to verify the user-defined test items and test programs. For production line testing, GO/ NG RUN allows one key operation to perform Pass/ Fail test. And the On-LINE-CONTROL mode extends Chroma Component Auto Test System model 8800 to control and monitor the hardware devices simultaneously. Thus, it is capable of simulating the manual test scenarios just like on the bench.

### Debug Run

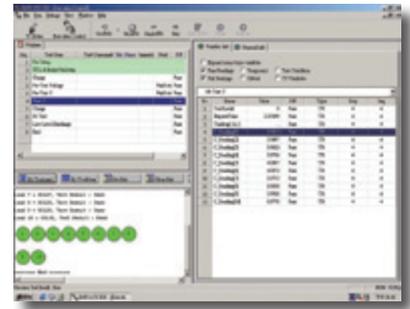
The debug run provides a versatile and immediate tool for users to verify the test items and test programs created before releasing them to operators. All the essential debugging tools are provided here, such as step run, set break point(s), run to break and simultaneous variables display. Users may use this to control the process of execution and at the mean time, monitor the test results and verify them. As a result, there is no risk for users to put an uncheck test item or test program onto production line.



The selected variables will be updated simultaneously when the test item or test program is under going

### GO/ NG Run

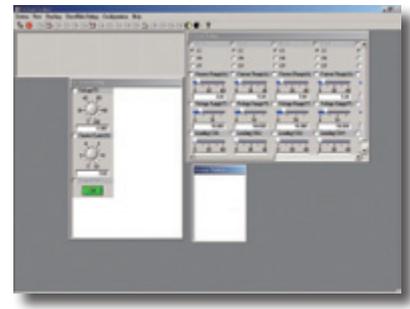
The GO/ NG run provides friendly and easy-to-execute environment for production line and operators. All the test programs need to be released in management function. This minimizes the risk of running a wrong or unchecked test program. The test results will be stored in hard drive of the system controller They can be used to create statistical and test reports and perform the fail rate check, bar code scanner support, and Pass/ Fail indication TTL signal. All these powerful features make it an ideal tool for mass production testing.



Failure rate check function is available in GO/NG execution mode

### On line Control

This execution mode is the implementation of virtual instrumentation. Users may achieve all the instrument on system to control them and get readings from them. The type of reading shown on display can be selected by user and user can define specifications for them. Furthermore, the readings can be displayed as a time graph to show the trends. And, the waveform measured by DSO can be merged onto the same display as well. The waveform can be downloaded as hard copy or digitizing waveform. Under digitizing mode. Users can select measurement parameters just like it provides in DSO.



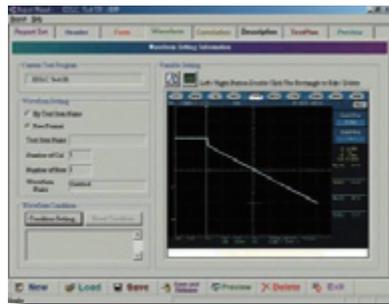
Users allow to create their own soft-panel layout and store it for recall later

## COMPREHENSIVE ANALYZING TOOLS

### Report Generator & Wizard

Documentation and producing a readable report has been one of the weakest parts of a traditional auto test system. Users usually spend a lot of efforts to translate the data stored by the auto test system to be more readable to their customers. This translation process is generally error-prone.

Now, Chroma ATS software's outstanding report generator and wizard provide the total solution for any documentation requirements. From tabular test data, DSO waveform to correlation chart, they allows users to integrate different types of presentation in the same report. Users can edit and store report format for future usages; thus, it saves a lot of precious time in creating test reports. Meanwhile, to make the test report more portable, the output of the report wizard is in a standard Microsoft Word format.



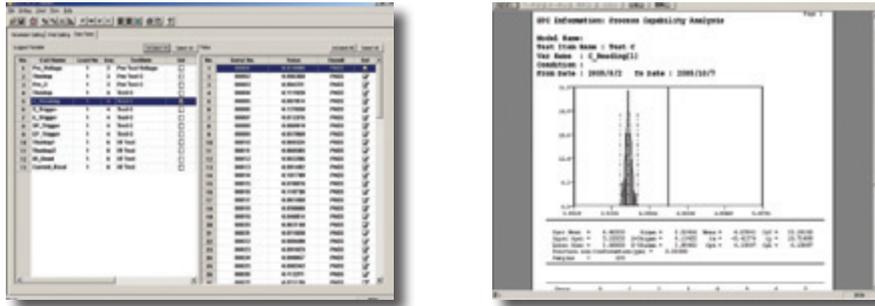
Define parameters and waveform preview Report Wizard



Preview the correlation chart in Report Wizard before converting it to M/S Word file

## STATISTICAL REPORT

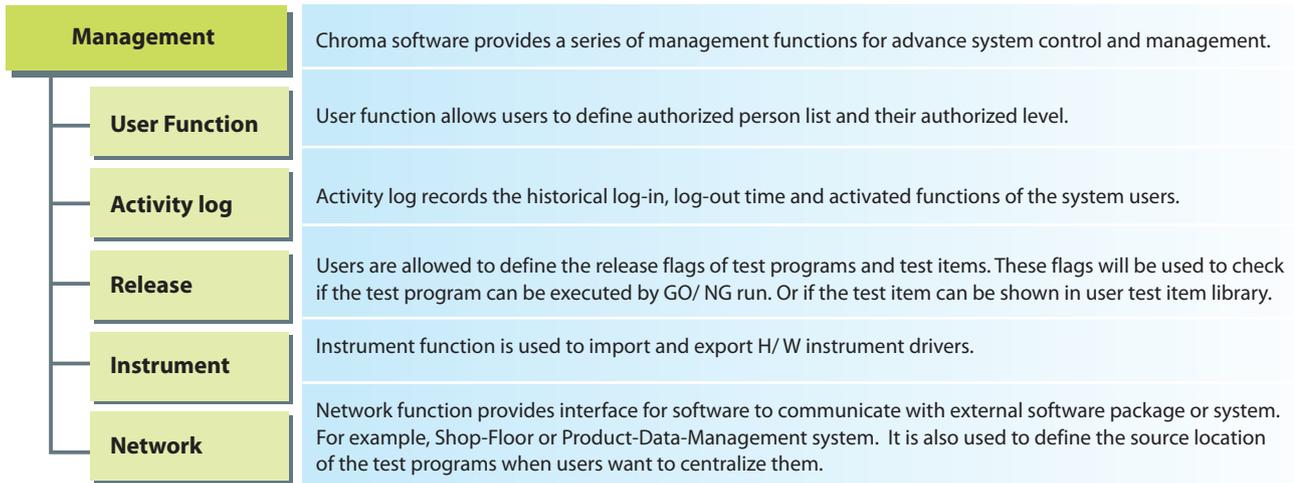
Chroma ATS software provides off-the-shelf statistical report function. All the test conditions defined in the test program and the test readings can be stored and analyzed by statistical report function. The statistical report function provides process capability, Pareto, Xbar-R chart, Xbar-S chart, nP chart, P chart, U chart and C chart. Users can select test program, test date period and include test data from remote computers via network connections. Then choose any one of the control chart to generate statistical report. The report may be printed out or stored in a file. Or users can directly store the raw data as a text file which can be imported by Excel or other spreadsheet software for further analysis.



Example of statistic report - Process Capability

## COMPLETE SYSTEM ADMINISTRATION

### Management Function



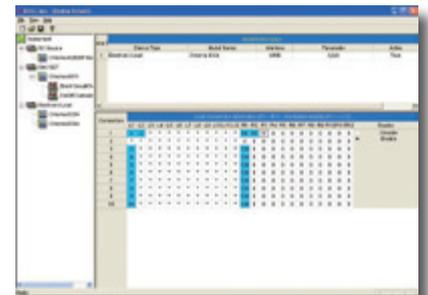
### Hardware Configuration

The hardware configuration function allows users to define the system configuration by selecting devices from the instrument list defined in the Instrument section of Management function.

### Shop-Floor Control System

For mass production lines, it is a big challenge to fully control production lines. Therefore, Shop-Floor control system is widely used to improve fabrication process.

To satisfy customers requirements, Chroma also provides customized Shop-Floor control systems. For details, please contact your local representative of Chroma ATE INC.



Parallel setting for E-loads allow users to control multiple load channels as one

## HIGH PERFORMANCE HARDWARE DEVICES



1. **Display**
2. **LCR Meter** : Model 11022 / 11025 / 3302 / 3252 series
3. **Component Test Scanner** : Model 13001 series
4. **CLC/IR Meter** : Model 11200 series
5. **System Controller** : Industrial PC
6. **4U Drawer**
7. **Fans**
8. **Rear Door**
9. **3U board**
10. **Breaker** : 30A
11. **EMI Filter** : 30A
12. **System Power Inlet** : 1Ø 3W/ 30A

\* Other devices supported upon request

## HIGH PERFORMANCE HARDWARE DEVICES

### LCR METER

The Chroma 11022 LCR Meters are the measurement instruments for passive components. They are applicable to the automatic manufacturers for passive components in material inspection. With the features of 21ms high-speed measurement and 0.1% accuracy, 11022 LCR Meter fulfills the requirements for fast production. Its functions of 8-level counting, pass/fail judgment, and 50 sets of internal save and recall settings totally meet the production line requirements for easy operation.

The four impedance output modes can measure the results with the LCR Meters of other brands to get a common measurement standard. The measurement results can also be compared with other brand of LCR Meters. Chroma11022 is the ideal selection for passive components quality assurance and automatic production.



Model	11022
Test Parameter	L, C, R,  Z , Q, D, ESR, X, $\theta$
<b>Test Signals</b>	
Level	10 mV~1V, step 10 mV; $\pm (10\% + 3 \text{ mV})$
Frequency	50Hz, 60Hz, 100Hz, 120Hz, 1kHz, 10kHz, 20kHz, 40kHz, 50kHz, 100kHz; $\pm 0.01\%$
<b>Measurement Display Range</b>	
C (Capacitance)	0.001 pF ~ 1.9999F
L, M, L2 (Inductance)	0.001 $\mu$ H ~ 99.99kH
Z (Impedance), ESR	0.01m $\Omega$ ~99.99M $\Omega$
Q (Quality Factor)	0.0001 ~ 9999
D (Distortion Factor)	
$\theta$ (Phase Angle)	-180.00° ~ +180.00°
<b>Basic Measurement Accuracy (Note1)</b>	$\pm 0.1\%$
<b>Measurement Time (Fast) (Note2)</b>	21ms

Note 1 :  $23 \pm 5^\circ$  C after OPEN and SHORT correction. Slow measurement speed. Refer to Operation Manual for detail measurement accuracy descriptions

Note 2 : Measurement time includes sampling, calculation and judge of primary and secondary test parameter measurement.

### CAPACITOR LEAKAGE CURRENT/ IR METER

The Chroma 11200 Capacitor Leakage Current/IR Meter is Chroma's newest digital leakage current meter. It provides DC 1~650 V, 0.5mA~500mA (150mA for V>100V) DC power source. It is mainly used for electrolytic capacitor leakage current testing, and aluminum-foil withstand voltage testing (EIAJ RC-2364A). And, it also can be used for active voltage checking or leakage current testing of absorber, Zener diode, and Neon lamp among others. Standard RS232 interface, optional GPIB & Handler interface, high speed and stable measurement capabilities enable the Chroma 11200 be used for both component evaluation on the production line and fundamental leakage current testing for bench-top applications.

Model	11200 (650V)
Main Function	Capacitor Leakage Current / IR Meter
Test Parameter	LC, IR
<b>Test Signals Information</b>	
Voltage	1.0 V~100 V, step 0.1 V; 101V~650 V, step 1V; $\pm (0.5\% + 0.2V)$
Charge Current Limit	V $\leq$ 100V: 0.5mA~500mA V > 100V: 0.5mA~150mA, 65W max. step 0.5mA; $\pm (3\% + 0.05\text{mA})$
Measurement Display Range	LC : 0.001 $\mu$ A~20.00mA
Basic Measurement Accuracy (Note)	LC Reading : $\pm (0.3\% + 0.005 \mu\text{A})$
Measurement speed	Fast 77 ms
(Ext. Trigger, Hold Range, Line Frequency 60Hz)	Medium 143 ms
	Slow 420 ms
<b>Function</b>	
Correction	Null zeroing
Test Voltage Monitor	Vm: 0.0 V~660.0V; $\pm (0.2\% \text{ of reading} + 0.1V)$
Charge Timer	0~999 Sec.
Dwell Timer	0.2~999 Sec

**Note :**  $23 \pm 5^\circ$  C after Null correction. Refer to Operation Manual for detail measurement accuracy descriptions.



## COMPONENT TEST SCANNER

Chroma 13001 component test scanner performs switch and scan tests for L, C, R and other measurements combined with LCR Meter (Chroma 3302/3252/11022/11025) including turn ratios, if the model has it, and IR test combined with Chroma 11200 CLC / IR Meter. It also offers short function for leakage inductance measurement. One unit can accommodate plug-in modules up to 8 slots. It can be up to 320 channels for one unit if combined with 8 optional A130007 40 channels modules. It provides master and slave designs and up to 8 slave units for a multiple scanner. Users can control the output test circuit through RS232, GPIB or USB interfaces.



Model	13001 (MASTER & SLAVE)
Mode	SCAN
Interface (Master only)	RS232 , USB , GPIB
<b>General</b>	
Operation Environment	Temperature: 0°C ~ 45°C, Humidity: 15% to 80% R.H@ ≤ 40°C
Power Consumption	150VA Max. (with rated load)
Power Requirements	90 ~ 132Vac or 180 ~ 264Vac, 47 ~ 63Hz
Weight	Approx.20Kg (13001 main frame only, without module)
Size(WxHxD)	About 430mm x 311mm x 570mm

MODULE SPECIFICATION	
Module	A130007
Channel	40
Port	80
Max. voltage without switch	DC 500V
	AC 10V
Max. Current without switch	DC 1000mA
	AC 100mA

## DIGITAL MULTI-METER & STORAGE OSCILLOSCOPE

Chroma 8800 supports Agilent 34401A / 34970A, Keithley 2700 series DMM and most of the Tektronix scopes . Other DMM and DSO are supported upon request.

## ORDERING INFORMATION

- 8800:** Component ATS
- LCR Meter :** Refer to Model 11022 / 11025 / 3302 / 3252 series
- Scanner :** Refer to Model 13001 series
- Scan Module :** Refer to Model A130007 series
- IR Meter :** Refer to Model 11200 series
- A600009 :** GPIB Cable (200 cm)
- A600010 :** GPIB Cable (60 cm)
- A800005 :** PCI Bus GPIB Card (National Instrument)

Developed and Manufactured by :

### CHROMA ATE INC.

**HEADQUARTERS**  
66 Hwaya 1st Rd., Kueishan  
Hwaya Technology Park,  
Taoyuan County 33383,  
Taiwan  
Tel: +886-3-327-9999  
Fax: +886-3-327-8898  
<http://www.chromaate.com>  
E-mail: [info@chromaate.com](mailto:info@chromaate.com)

**CHINA**  
**CHROMA ELECTRONICS**  
**(SHENZHEN) CO., LTD.**  
8F, No.4, Nanyou Tian An  
Industrial Estate, Shenzhen,  
China PC: 518052  
Tel: +86-755-2664-4598  
Fax: +86-755-2641-9620

**JAPAN**  
**CHROMA JAPAN CORP.**  
472 Nippa-cho, Kouhoku-ku,  
Yokohama-shi, Kanagawa,  
223-0057 Japan  
Tel: +81-45-542-1118  
Fax: +81-45-542-1080  
<http://www.chroma.co.jp>  
E-mail: [info@chromaate.com](mailto:info@chromaate.com)

**U.S.A.**  
**CHROMA SYSTEMS**  
**SOLUTIONS, INC.**  
19772 Pauling, Foothill Ranch,  
CA 92610  
Tel: +1-949-600-6400  
Fax: +1-949-600-6401  
<http://www.chromausa.com>  
E-mail: [sales@chromausa.com](mailto:sales@chromausa.com)

**EUROPE**  
**CHROMA ATE EUROPE B.V.**  
Morsestraat 32, 6716 AH Ede,  
The Netherlands  
Tel: +31-318-648282  
Fax: +31-318-648288  
<http://www.chromaeu.com>  
E-mail: [sales@chromaeu.com](mailto:sales@chromaeu.com)

Worldwide Distribution and  
Service Network