

MODEL 1870D Series

KEY FEATURES

- Test and packing speeds
 - From 600ppm to 1,200ppm (1870D)
 - From 80ppm to 250ppm (1870D-12)
- Standard functions
 - Inductance/quality factor test
 - Winding resistance test
 - Polarity test
- Optional functions
 - Layer short test
 - Insulation resistance test
 - Bias current test
- Circular vibrating plate design feeds inductors steadily and rapidly
- Index disc design eliminates dropped inductors
- Four-wire measurement test socket design
- Stable and long lifespan of specific test piece
- Heat-seal module
- Automatic discharge mechanism when feeding errors occur
- Each test station has an independent NG (No Good) product collection box
- Test without packaging function provided, good products gathered in bulk collection box
- Exclusive data collection software designed for monitoring product quality in real time
- Reserved stations for number spraying and automatic optical inspection

INDUCTOR TEST AND PACKING MACHINE MODEL 1870D SERIES

The Chroma 1870D Series (1870D/1870D-12) are specifically designed automated test equipment for chip inductors. It comprises various test functions that are required for verifying chip inductors. In addition, an automated tape packaging machine at the end of production line is equipped to fulfill demand for automated manufacturing.

The standard test functions of Chroma 1870D series are inductance (Ls)/quality factor (Q), winding resistance(RDC) measurements and polarity tests, along with optional layer short (IWT), insulation resistance (IR) and bias current tests that cover all test items for measuring chip inductor quality and standard specifications.

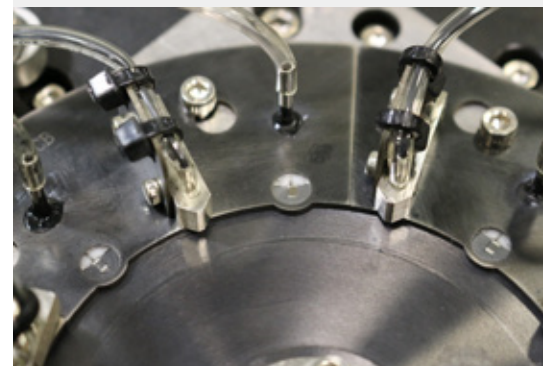
As miniature inductors are widely used in the electronic products today, mass production of chip inductors is necessary. The production capacity of Chroma 1870D/1870D-12 is up to 1,200 ppm, which can satisfy the quantity demanded. Besides testing, the 1870D/1870D-12 is also equipped with an automated packaging machine to tape and pack the inductors mechanically in order to meet the desired style of SMD production lines.

The Chroma 1870D/1870D-12 uses a circular vibrating plate that carries thin products at high speed for feeding. The circular vibrating plate uses a guide rail design, fiber detection and blow hole to determine the feed direction. This is fast and space saving when compared to traditional linear reciprocating mechanical feeders.

When moving inductors for testing, the traditional reciprocating or turret-type mechanical structure uses a nozzle to attract the inductor for movement, and the product often drops due to inertial effects or inaccurate positioning making it unable to test. The Chroma 1870D/1870D-12 uses an index disc design for testing, so that the equipment is within a closed architecture that can eliminate dropped inductors during high-speed movement. It is faster and more stable when compared to the traditional mechanical structure.

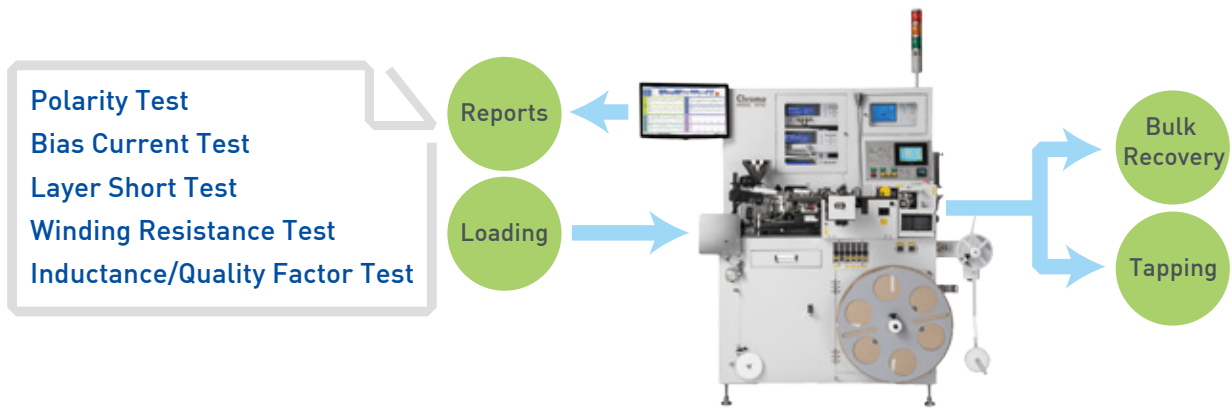
Chroma ATE Inc. not only specializes in electronic testing technology but are also masters in fixture design for automated test equipment. The test socket used by the Chroma 1870D/1870D-12 test station is a four-wire measurement design that is more accurate and stable than common automatic test equipment. The chip design applied to the connection of the test socket and inductor is easier to contact and has longer product life compared to a probe in use. The chip design is also more stable and easier to maintain than a probe.

The Chroma 1870D/1870D-12 has exclusive software for monitoring test status during production in real time, and saving the collected test data for each inductor. Real-time monitoring functions can benefit the production unit by reducing the production risk during manufacturing and cut down unnecessary working hours. The data collection function is favorable to R&D and QA units for product analysis and quality control.



Chroma

APPLICATIONS



Batch verification for RD and QA

As R&D and QA units are required to inspect the features of all products for basic electrical characteristics and quality related tests, the test data from polarity test, layer short test (or bias current test), winding resistance test and inductance/quality factor test station data are collected and analyzed for quality appraisal or for producing samples for trial production. The Chroma 1870D/1870D-12 test and packing machine provides flexible selections to suit the test stations required for different units.

Fully functional electrical characteristics tests for production line

All electrical characteristics are adapted into the production line based on the R&D unit to comprise polarity test, layer short test (or bias current test), winding resistance test and inductance/quality factor test.

Nominal value for production line fast testing

For production line, only test nominal value is required for fast production. The test items applied are winding resistance test and inductance/quality factor test.

System reserved space for marking and optical inspection of marks

Certain chip inductors require marking on the top to identify the polarity and inductor type. The Chroma 1870D/1870D-12 can integrate the marking and optical inspection systems owned by customer into the system.

DEVICE FEATURES

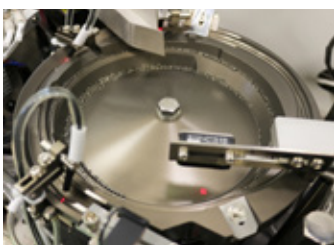
Circular vibrating plate for feeding

The parts feeder is the first post that can affect the overall equipment production efficiency. The circular vibrating plate feeder is fast and stable. As there used to be orientation problems when testing inductors, a linear design was applied for feeding with additional detection and turnover mechanism in the path. The space required for feeding was increased relatively with speed limited. The circular vibrating plate changes the linear feeding path to spiral, and is able to overturn the DUT correctly with a fiber detector and simple blowing machine. It can fix the feed direction without complex turnover mechanism, and only occupies a small space. This new way of feeding is fast, stable and in the same direction.

Auto discharge when encountering a feed error

When transferring the DUT from the circular vibrating plate to the index disc, it passes a linear guide rail to enter the index disc through a side guide rail. The side guide rail is a funnel-shaped part that connects the linear guide rail and index disc with the wider side connecting the linear guide rail and narrow side connecting the index disc, so that it can send the inductors accurately to index disc under high-speed operation.

It is inevitable for inductors to have abnormal situations on the surface, such as a thick electrode, solder icicles, or cracks. These abnormalities often cause the mechanical dimension change to exceed the standard. As the funnel shape is designed for side guide, inductors with abnormal surface may stick here. For general equipment, a top cover is usually designed and equipped for the operator to troubleshoot manually. However, the Chroma 1870D/1870D-12 has a feed error auto discharge function using a feeding fiber detector built in at the side guide rail to automatically discharge the inductor back to a test box when it is stuck.



Circular vibrating plate for feeding



Feeding fiber detector



Index Disc feeding



Auto discharge for feeding error

Movement of index disc

When moving inductors for testing, the traditional reciprocating or turret-type mechanical structure uses nozzle to attract the inductor for movement, and the product often drops or is offset due to inertial force or centrifugal force generated when transferring linearly or circularly.

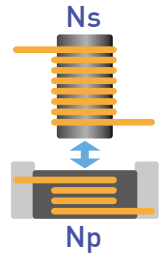


Closed index disc

- ✓ Closed space design for index disc without dropping any inductors
- ✓ Fixed space easy for contact
- ✓ Stable high-speed transfer

Polarity test and direction reverse

The electronic products of today tend to compact designs; therefore, the internal integrated circuit board is distributed with dense components where the adjacent magnetic elements may affect each other due to short distances between components, and incorrect magnetic direction can easily cause quality issues. The Chroma 1870D/ 1870D-12 has a polarity testing function that uses electromagnetic induction principle to test the polarity and turns 180° for inductors with different polarity.



Polarity test diagram

Four-wire measurement design of test socket

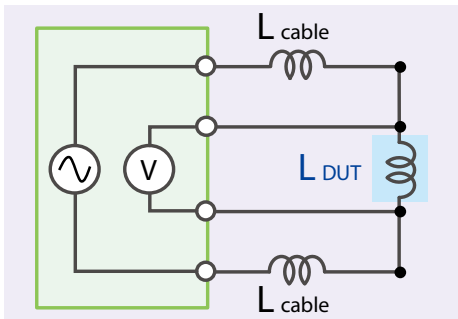
When the basic electrical specification range of an inductor is small, it is easy to be affected by wiring and fixtures. The common test socket is a two-wire design that can be easily influenced by wiring when measuring smaller basic electrical specifications and causes unstable or incorrect measurement. The four-wire design is less affected by wiring as it uses separate circuits for output signal transmission and measurement signal capture.

Stable and long lifespan for specific test piece

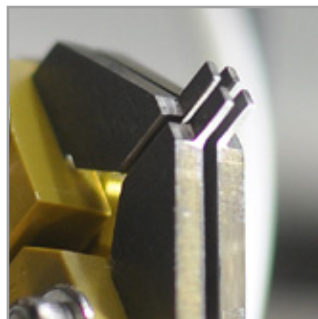
A probe is usually used for contact between the test fixture and inductor; however, the spring inside the probe may fail, easily causing testing errors. The Chroma 1870D/1870D-12 test fixture uses a test piece to directly connect the test wire without using a spring. The contact area of the test piece and inductor is larger than a probe with better connection. The lifespan of test pieces is also longer and easy to maintain.

Independent NG (No Good) product collection box for each station

The test stations equipped with the Chroma 1870D/1870D-12 have different testing purposes. To facilitate analysis, the NG products are collected separately by station to reduce the rework sorting time and improve production quality by defect status.



Four-wire measurement circuit



Proprietary four-wire test piece



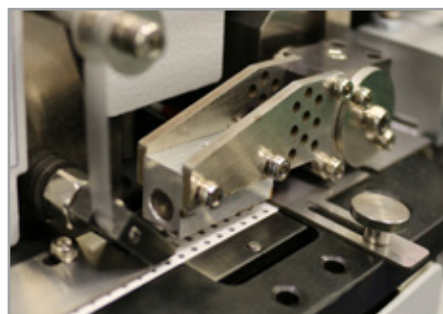
Collection box of each station

Heat-seal module

Heat-seal temperatures can be adjusted for different tape types. When a tape is used as sealant, it heat seals the up and down edge. The heat-seal module is composed of 2 iron plates that are used to fix the platform for heat-seal by pressing them down. The Chroma 1870D/1870D-12 heat-seal module is a flexible platform that can overcome the up/down edge uneven heat-seal problem resulting from the iron plates not being installed on the same level.

User friendly operating interface

The beveled and ergonomically placed panel has a user interface selection for Chinese, English and Japanese languages. It has a production count function for production line use. The failure light panel can identify the problem location easily with error messages shown on the user interface to facilitate troubleshooting.



Heat-seal module



User interface – failure position light panel and count screen

SOFTWARE INTERFACE – TESTING, MONITORING AND DATA COLLECTION

The A187000 is an optional data collection software program for the Chroma 1870D/1870D-12 that is specifically designed for factory use. Other than basic information collection, it provides real-time X-bar and R-chart control, and test parameters setup functions that fulfill requirements for R&D, Production, and QA units.

Software features

- ✓ Test parameter setting, save and recall
- ✓ Real-time test monitoring
- ✓ Test data collection
- ✓ Production report query
- ✓ Statistical analysis
- ✓ System level and authority management
- ✓ Support barcode scan



A187000 Data collection software



Test monitoring window

Test parameter settings, save and recall

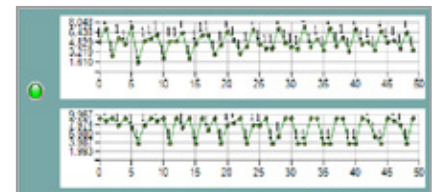
The Chroma 1870D/1870D-12 uses the A187000 software platform to set the parameters and condition limits on all configured instruments instead of operating them individually. Moreover, the test parameters can be saved to a PC and recalled later to test different products.



Parameter setting window

Real-time test monitoring

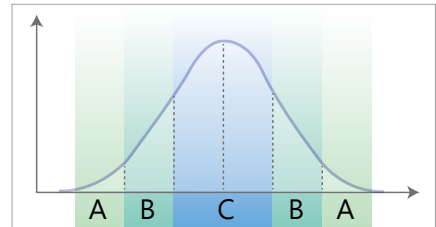
The A187000 data collection software has a real-time monitoring function that includes the number of inputs, the good products count, the defect products count, the production yield and good/no good statistics for each station. X-bar and R-charts real-time monitoring function is added for the production unit to control the product quality as well as to monitor for any abnormalities that have occurred.



X-bar and R-charts

Control chart pattern recognition

- ✓ 1 dot exceeds control limits (out of 3 Sigma)
- ✓ 2 dots out of 3 consecutive dots in zone A or over zone A (applicable for X-bar chart only)
- ✓ 4 dots out of 5 consecutive dots in zone B or over zone 5 (applicable for X-bar chart only)
- ✓ 6 consecutive dots rise and fall
- ✓ 8 consecutive dots not in zone C (applicable for X-bar chart only)
- ✓ 9 consecutive dots are on the same side of center line
- ✓ 14 consecutive dots alternately rise and fall
- ✓ 15 consecutive dots in zone C (applicable for X-bar chart only)



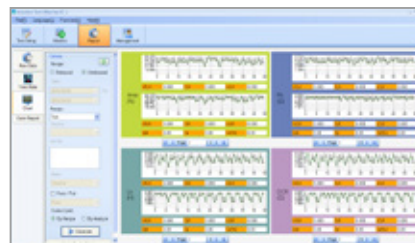
Normal distribution

Production report query and statistical analysis

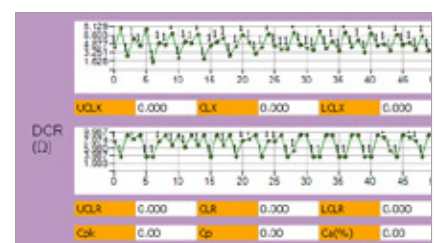
The software is able to query the test data for basic information, production yield, and control charts. It can also analyze the test data from the queried control charts, and automatically calculate, as well as set, the control limits in test conditions.

Station	Input	Good	Defect	Yield
1	100	95	5	95%
2	100	98	2	98%
3	100	99	1	99%
4	100	97	3	97%
5	100	96	4	96%

Basic information query window



Control chart query window



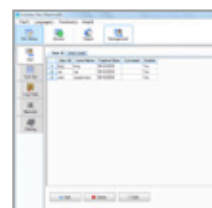
Control limits calculated by tested data

System level and authority management

The system level and authority management is divided into administrator, engineer and operator levels to facilitate equipment control, preventing any production loss caused by human error.

Barcode scanner support

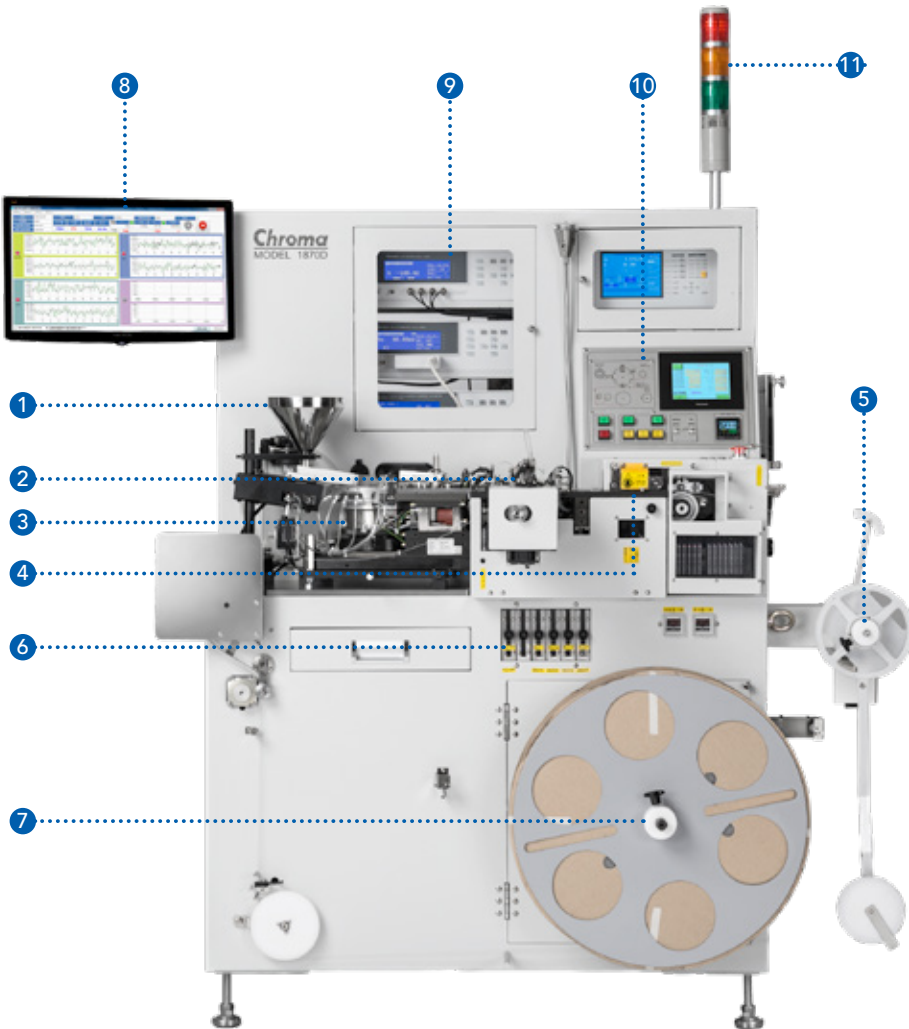
Barcode scanners are supported in order to scan the inductor model and lot number, and save them to a parameter setting file for recall automatically.



User level window

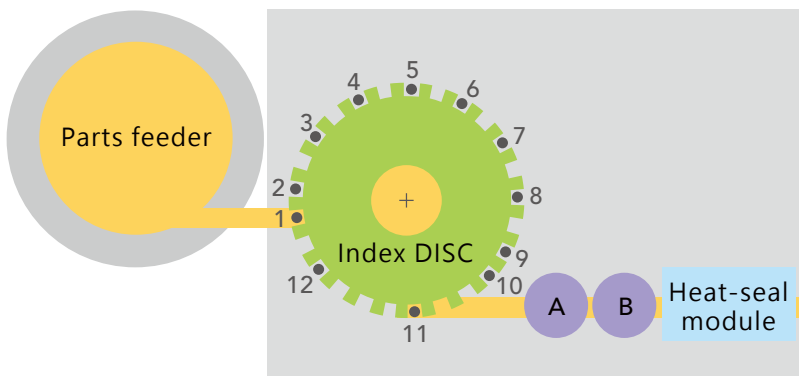


EQUIPMENT STRUCTURE



1. Storage hopper
2. Index disc
3. Parts feeder
4. Heat-seal module
5. Receipts reel motor
6. Parts collection box
7. Tape feed motor
8. Software window
9. Instruments cabinet
10. User interface
11. Signal lights

TEST ZONE AND STATIONS



1870D / 1870D-12 Stations

1. Feeding detect
2. Polarity test (works with 11025)
3. Polarity reverse
- * 4. Layer shorttest (works with 19301A)
Insulation resistance test (works with 11200)
Bias current test (works with 11300)
5. NG inductor discharge for station 4
6. Winding resistance test (works with 16502)
7. NG inductor discharge for station 6
8. Inductor/quality factor test
(works with 11050 Series /3302)
9. NG inductor discharge for station 8
10. Good inductor receipt
11. Move to packing tape
12. Clean remaining inductors
- A. Reserved for number spraying station
- B. Reserved for automatic optical inspection station

* Choose one from three alternatives to work with installation testing

SPECIFICATIONS

1870D Application Size Maximum Productivity										Unit : pcs/min
W x D (mm)	3.2 x 2.5		2.5 x 2.0		2.0 x 1.6 / 2.0 x 1.2			1.6 x 0.8		
H (mm)	1.2	1.0	1.2	1.0	1.2	1.0	0.8	1.0	0.8	0.6
Single-sided electrode	600	600	800	800	800	800	1,000	800	800	900
Five-sided electrodes	900	900	1,000	1,000	1,000	1,000	1,000	1,200	1,200	1,200

*The above maximum production efficiency does not include IWT test, IR test, BIAS test.

*The above is only the efficiency of using a single size, if different sizes are required, separate evaluation is required.

*Production efficiency > 1,200 pcs/min. The packaging used must be paper tape, not plastic tape.

1870D-12 Application Size Maximum Productivity						Unit : pcs/min				
W x D (mm)	4.0 x 4.0		6.0 x 6.0		8.0 x 8.0		10.0 x 10.0		12.0 x 12.0	
Single-sided electrode	250		200		150		100		80	

*The above maximum production efficiency does not include IWT test, IR test, BIAS test.

*The above is only the efficiency of using a single size, if different sizes are required, separate evaluation is required.

General Specifications	
Power requirement	Single phase 220V, frequency 50 Hz / 2.0kW
Air pressure system	CDA pressure 5~6 kg/cm ² ; CDA flow: 150~200 L/min
Operating environment	8~38°C ; < 70%RH
Weight	approx. 450 kgs
Dimension (W x H x D)	1192 x 1660 x 1000 mm

* All specifications are subject to change without notice.

ORDERING INFORMATION

1870D : Inductor Test & Packing Machine

1870D-12 : Inductor Test & Packing Machine

11025 : LCR Meter

11050 Series : HF LCR Meter

11200 : Capacitor Leakage Current/IR Meter

11300 : Bias Current Test System

16502 : Milliohm Meter

19301A : Impulse Winding Tester

3302 : Automatic Transformer Test System

Get more product & global distributor information in Chroma ATE APP



iOS



Android

Search Keyword

1870D

HEADQUARTERS
CHROMA ATE INC.
88 Wenmao Rd.,
Guishan Dist.,
Taoyuan City
333001, Taiwan
T +886-3-327-9999
F +886-3-327-8898
www.chromaate.com
info@chromaate.com

U.S.A.
CHROMA SYSTEMS
SOLUTIONS, INC.
19772 Pauling,
Foothill Ranch,
CA 92610
T +1-949-600-6400
F +1-949-600-6401
www.chromausa.com
sales@chromausa.com

EUROPE
CHROMA ATE EUROPE B.V.
Morsestraat 32, 6716 AH
Ede, The Netherlands
T +31-318-648282
F +31-318-648288
www.chromaeu.com
salesnl@chromaeu.com

CHROMA GERMANY GMBH
Südtiroler Str. 9, 86165,
Augsburg, Germany
T +49-821-790967-0
F +49-821-790967-600
www.chromaeu.com
salesde@chromaeu.com

JAPAN
CHROMA JAPAN
CORP.
888 Nippa-cho,
Kouhoku-ku,
Yokohama-shi,
Kanagawa,
223-0057 Japan
T +81-45-542-1118
F +81-45-542-1080
www.chroma.co.jp
info@chroma.co.jp

KOREA
CHROMA ATE
KOREA BRANCH
3F Richtogether
Center, 14,
Pangyoyeok-ro 192,
Bundang-gu,
Seongnam-si,
Gyeonggi-do
13524, Korea
T +82-31-781-1025
F +82-31-8017-6614
www.chromaate.co.kr
info@chromaate.com

CHINA
CHROMA ELECTRONICS
(SHENZHEN) CO., LTD.
8F, No.4, Nanyou Tian
An Industrial Estate,
Shenzhen, China
T +86-755-2664-4598
F +86-755-2641-9620
www.chroma.com.cn
info@chromaate.com

SOUTHEAST ASIA
QUANTEL PTE LTD.
(A company of Chroma Group)
25 Kallang Avenue #05-02
Singapore 339416
T +65-6745-3200
F +65-6745-9764
www.quantel-global.com
sales@quantel-global.com