Ultimate Dry Bath Incubator

Instruction Manual

Catalog No. MC-01N-110 / 220
MC-01S-110 / 220

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Version 01C
Revised on : 2012.07.12

Packing list

MC-01N-110 / 220 or
MC-01S-110 / 220

- 1x Ultimate Dry Bath Incubator or
  1x Ultimate plus Dry Bath Incubator
- 1x Transparent Lid
- 1x Power Cord
- 1x Instruction Manual

Signed by:
Date:

Major Science is liable for all missing or damaged parts / accessories within 7 days after customer received this instrument package. Please contact Major Science immediately regarding this issue. If no response within such time period from consignee party, that will be consignee party's whole responsibility.

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Warning

Major Science Ultimate Dry Bath Incubator has been tested and found to comply with safety limits for the CE regulation. Also, Ultimate Dry Bath Incubator is RoHS compliant to deliver confident product which meets the environmental directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended for the user to read the following points carefully before operating this equipment.

1. Read and follow carefully the manual instructions.
2. Do not alter the equipment. Failure to follow these directions could result in personal and/ or laboratory hazards, as well as invalidate equipment warranty.
3. Use a properly grounded electrical outlet with correct voltage and current handing capacity.
4. Disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel.
5. Never use this instrument series without having the safety cover correctly in position.
6. Do not use the unit if there is any sign of damage to the external tank or cover. Replace damaged parts.
7. Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components which may ignite such materials.
8. Refer maintenance and servicing to qualified personnel.
9. Ensure that the system is connected to electrical service according to local and national electrical codes. Failure to properly connection may create fire or shock hazard.
10. Use appropriate materials and operate correctly to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from overheated materials.
11. Always use the block lifter to remove hot blocks, and wear appropriate

protection to avoid burning your hand.

 ATTENTION: Hot surface!

12. The unit shall be operated only by qualified personnel.

Safety Information

Use high level of precaution against any electrical device. Before connecting the electrical supply, check to see if the supply voltage is within the range stated at the rating label, and see to it that the device be seated firmly. Place the unit in a safe and dry location; it must NOT touch the surrounding. Follow the safety precautions for chemicals / dangerous materials. If needed, please contact qualified service representative or service@majorsci.com

Environmental Conditions

Ensure the instrument is installed and operated strictly in the following conditions:

1. Indoor use only
2. ≤95% RH
3. 75 kPa – 106 kPa
4. Altitude must not exceed 2000 meters
5. Ambient to 40°C operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to ±10% of the normal voltage

Avoiding Electrical Shock

Follow the guidelines below to ensure safe operation of the unit.

Ultimate Dry Bath Incubator has been designed to use with shielded wires thus minimizing any potential shock hazard to the user. Major Science recommends against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution accidentally spilled into the instrument, it must be dried out for a period of time, at least 2 hours, and restored to NORMAL CONDITION before each operation.
2. NEVER connect or disconnect wire leads from the power jacks when the power is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
4. ALWAYS make sure that hands, work area, and instruments are clean and

dry before making any connections or operating the equipments.
5. ONLY connect the power cord to a properly grounded AC outlet.

Avoiding Damage to the Instrument

1. Do not attempt to operate the device if it is damaged.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.).
3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Use high level of precautions against the damages on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
5. Prior to apply any cleaning or decontamination method other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the equipment.

Equipment Operation

Follow the guidelines below to ensure safe operation of the unit:
1. Check the displayed temperature figure and external temp. probe to see if it is overheating, and check if it will function in the case of a single fault at least once per day.
2. NEVER access dangerous chemicals or other materials to prevent possible hazard of explosion and damage.
3. Do not apply lids or covers on the tube heated inside Ultimate Dry Bath Incubator to prevent possible hazards of explosion and damages.
4. A temporary conductivity caused by condensation might occur even though this series is rated Pollution Degree 2 in accordance with IEC 664.

Symbols

The symbols used on Ultimate Dry Bath Incubator are explained below.

Indicates an area where a potential shock hazard may exist. Consult the manual to avoid possible personal injury or instrument damage.

ATTENTION: Hot surface!

Indicates disposal instruction.
DO NOT throw this unit into a municipal trash bin when this unit has reached the end of its lifetime. To ensure utmost protection of the global environment and minimize pollution, please recycle this unit.

Section 1 Introduction

1.1 Overview

Major Science Ultimate Dry Bath Incubator is advanced and comprehensive design for wide varieties of applications. Ultimate Dry Bath Incubators are also space compact instruments with competitive pricing offering, user friendly with great value. More importantly, Ultimate Dry Bath Incubators are RoHS compliant and designed to comply with the CE regulation.

MC-01N

MC-01S

1.2 Product Description

Two models of Ultimate dry bath incubators are available with different temperature performances along with a competitive range of interchangeable blocks. Both models are designed for a variety of applications including ligation, storage, restriction digests, denaturing DNA, BUN, melting agar, coagulation studies, hybridization and Hot Start thermo-cycled reactions. The unit is fully programmable including user set-up options of constant operation, programmable mode and annealing mode. A 2.6" LCD screen shows all the running/setting conditions. The microprocessor controller offers easy temperature selection, rapid heat-up and cool-down with excellent stability. The temperature can be set in increments of 0.1℃ from -10℃ to 100℃. Optional functional control software is available for user-control and real-time data recording through a PC for the user's specified requirements.

Feature:

Microprocessor control with digital performance for precise, accurate control

Wide temperature control range & great temperature controller performance

Rapid heating rate
LCD screen shows all the parameters during run
User temperature calibration
Can be used as a water bath
Function control software available

Section 2 Product Specifications

Controller	Digital Microprocessor Controller
Display	2.6” LCD
Power	400W
Temperature Control Range	-10 - 100°C in the environment of 25°C
Temperature Increment	0.1°C
Temperature Calibration	Yes
Temperature Uniformity	±0.2°C
Temperature Accuracy	±0.2°C
Operation Mode	a. Constant operation: Constant temperature (-10 - 100°C ; Timer: 1- 9999 minutes) b. Program operation : Programmable: 1 - 4 steps and up to 9 cycles ; Timer: 1-9999 minutes for each step c. Annealing program
Data Log	RS 232
Operating Temperature	Ambient to 40°C
Safety Device	Leakage proof for heating chamber
Heating Chamber Material	Water-proof aluminum alloy
Block Material	Aluminum alloy
Chamber Dimension	125 x 90 x 50 mm (L x W x D) for MC-01N 125 x 90 x 30 mm (L x W x D) for MC-01S
Block Type	Standard and customized types are available
Rated Voltages	110V or 220V selectable
Unit Dimension	200 x 295 x 140mm (W x L x H)
Weight	approx. 8.0 kg

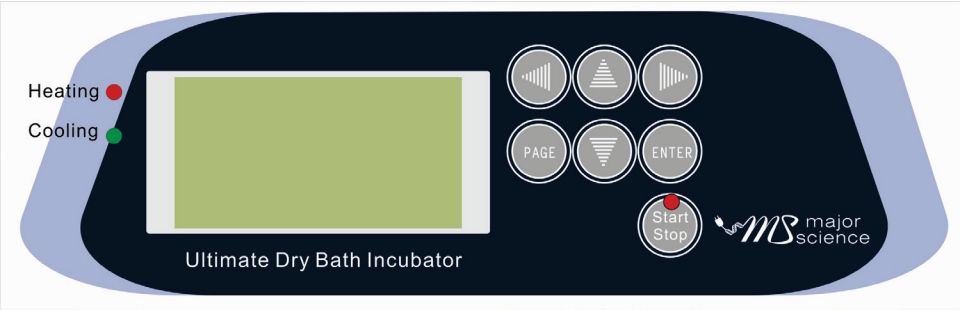
Section 3 Installation Instructions

The Ultimate Dry Bath Incubator is actually a pre-installed instrument. As long as it is placed on a sturdy and level surface in a safe, dry place, and is inserted with one or two heating aluminum block(s) or simply water as a water bath, it is ready for operation.

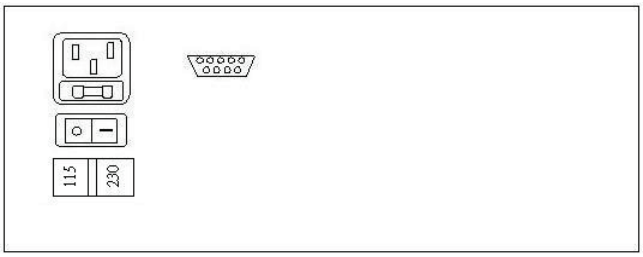
Section 4 Operation Instructions

4.1 Controls and Features

Please refer to below figures on the following page for the location of the different keys.



Front panel



Back panel

1. 

Key – Select Next or Last Page

2. 

Key – Activate and stop operation of the unit

3. 
Key – Move cursor to the left

4. 
Key – Move cursor upwards
– Increase values

5. 
Key – Move cursor to the right

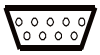
6.  Key – Move cursor downwards
   – Decrease values

7. 

Key – Enable the alteration of a selected value

8. Heating – Red LED light ON indicate Heating

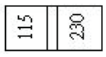
9. Cooling – Green LED light ON indicate Cooling

10.  RS232 Port – Connect computer to record data

11. 

Power Switch – The Main Power Switch. Press " I " to switch on the unit. Press " O " to switch off the unit

12.  AC Socket – For AC Inlet and fuse holder

13. 

Rated Voltage selection switch – For select suitable rated voltage.

4.2 Turn On the Instrument

1. Place Programmable Ultimate Dry Bath Incubator on a sturdy, level surface in a safe, dry place away from laboratory traffic.

2. Ensure that the AC power switch is OFF, then plug the three-pronged power cord into a grounded three-prong AC outlet of the appropriate voltage (115V or 220V as indicated on the rating sticker near the AC cord on the back of the unit).

3. Select a suitable module block or pour appropriate water volume into the Programmable Ultimate Dry Bath Incubator.

4. Switch the main power ON.

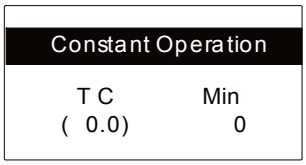
4.3 Normal Constant Operation

1. Switch the main power ON.

2. Run temperature calibration procedure when using the instrument first time (see temperature calibration session for more instruction).

3. Use  key and  key to select "**Constant Operation**" icon, then press  key to enter next screen.

4. Use  key and  key to move cursor to the parameter.



5. Press  key to enable the alternation of the selected parameter, use  key and  key to adjust the setting value, then press  key to store the updated value.

6. Press  to start heating or cooling.

7. Press  again to stop the unit.

4.4 Programmable Mode

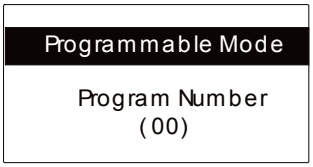
1. Switch the main power ON.

2. Run temperature calibration procedure when using the instrument first time

(see temperature calibration session for more instruction)

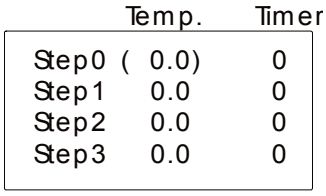
3. Use key and key to select “**Programmable Mode**” icon, then press ENTER key to enter next screen.

4. Press ENTER key and then use key and key to set program number (It can maximum save 10 file from 00 ~ 09). Press ENTER key again to store the program number.



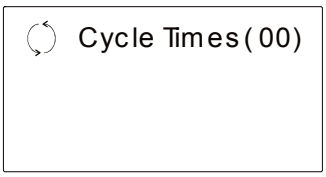
5. Press PAGE key or key to next screen.

6. Use key, key, key and key to move cursor to the parameter.



7. Press ENTER key to enable the alternation of the selected parameter, use key and key to adjust the setting value, then press ENTER key to store the updated value.

8. Press key to next page.



9. Press ENTER key and then use ▲ key and ▼ key to increase or decrease value for cycle times (up to 9 cycles), then press ENTER key to store the updated value.

10. Press Start Stop key to start the program.

11. Press Start Stop key again to stop the unit.

4.5 Annealing Program

1. Switch the main power ON.

2. Run temperature calibration procedure when using the instrument first time (see temperature calibration session for more instruction).

3. Use ▲ key and ▼ key to select "**Annealing Program**" icon, then press ENTER key to enter next screen.

4. Use ◀ key, ▲ key, ▼ key and ▶ key to move cursor to the parameter.

a. Initial Temp.：Start reaction Temp.
b. Descending Temp.：To decrease Temp. on each step
c. Holding Time：Holding time for each step
d. Final Temp.：Temp. for end step

Initial Temp.	95.0
Descending Temp.	5.0
Holding Time	5
Final Temp.	4.0

5. Press 

key to enable the alternation of the selected parameter, use  key and  key to adjust the setting value, then press 

key to store the updated value.

6. Press 

key to start the program.

7. Press 

key again to stop the unit.

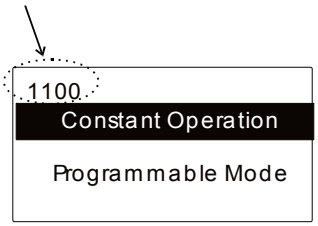
4.6 Temperature Calibration

Programmable Ultimate Dry Bath Incubator with the optional block has been calibrated as a set. But, the different kinds of block, whose ⇆T are not the same result different influences. For optimum accuracy temperature control or while changing with different kinds of block, Ultimate Dry Bath Incubator should be calibrated in accordance with the procedure outlined below.

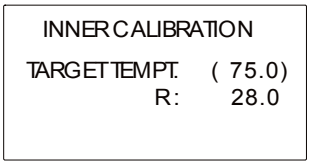
1. Insert a 300mm calibrated laboratory Thermometer into the Thermometer holding port on the block.

2. Please switch the main power OFF/ON and press 

key simultaneously until the display 1100 appeared, which is located on the up left area of display shown as below. And then release them immediately.



3. The Inner Calibration Screen is displayed.

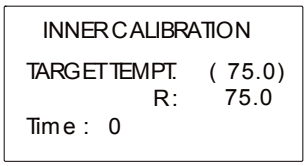


(Note: “R” is Real Temperature)

4. Press ENTER key to enable the alternation of the selected parameter, use key and key to adjust the setting TARGET TEMP value (The Target Temp value is the accurate final temperature value setting). And then press ENTER key to store the updated value.

5. Press Start Stop key to start heating or cooling.

6. Until “R” (Real Temperature) reaches TARGET TEMP. The timer will be starting to count up.



7. Until “**Time**” display 30 (min.), you can set **“ S :”** value to the same as thermometer. And then press ENTER key.

8. Please wait for few more minutes that microprocessor will auto adjust

temperature until LED display value is the same as thermometer.

Section 5 Data Log Software Instructions

5.1 Installation Instruction

1. Insert the CD into CD ROM and press the Setup.exe in the Installer Folder for installation.

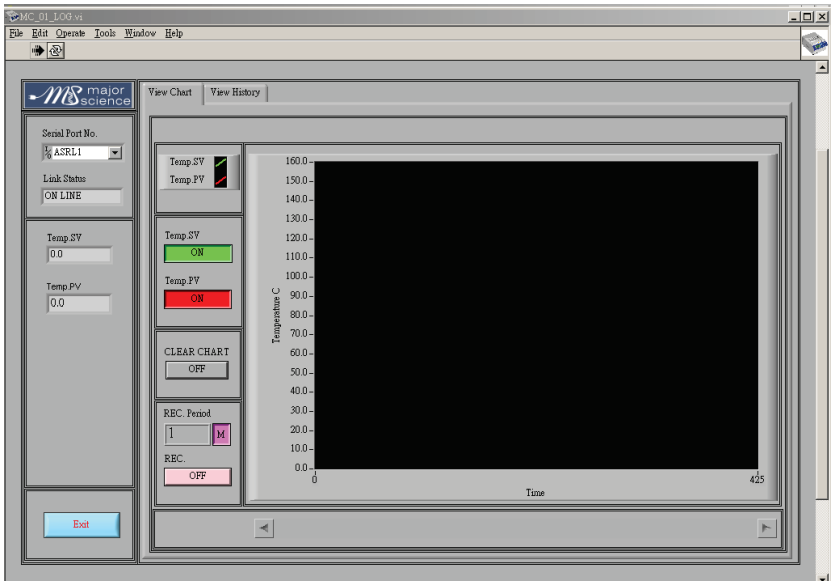
2. Follow up the instructions shown on the computer display screen to complete the installation.

5.2 Operation Instruction

1. Start MC-01-LOG software program and then the below screen will be shown. There are two main sections, View Chart, and View History in this software.

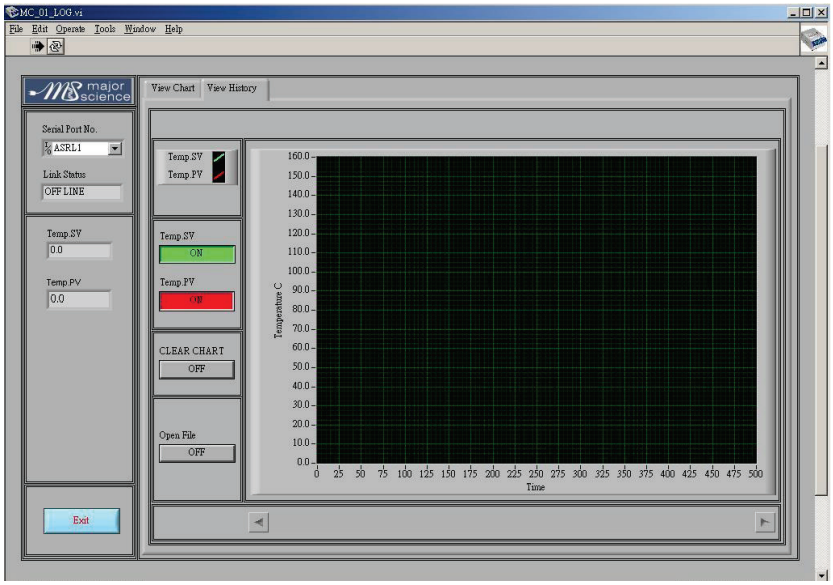
2. View Chart Section: Please see the below figure

Serial Port No.	Communication port selections between computer and Ultimate Dry Bath Incubator
Link Status	Indication whether the Ultimate Dry Bath Incubator is linked with computer or not
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
CLEAR CHART OFF	To clear up the curves in the table
REC. period	To set up how frequent the operation data is recorded. Press (M) or (S) bottom, it can be set either in minute (M) or in second (S).
REC. OFF / REC. ON	Indication of the record status, whether it is recording or not



3. View History: Please see the below figure

Serial Port No.	Communication port selections between computer and Ultimate Dry Bath Incubator
Link Status	Indication whether the Ultimate Dry Bath Incubator is linked with computer or not
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
CLEAR CHART OFF	To clear up the curves in the table
Open File	ON: to view historic record data OFF: No historic record data is shown


MC_01_LOG.vi
File Edit Operate Tools Window Help
major science
View Chart
View History
Serial Port No.
ASRL1
Link Status
OFF LINE
Temp.SV
0.0
Temp.PV
0.0
Exit
Temp.SV
Temp.PV
Temp.SV
ON
Temp.PV
ON
CLEAR CHART
OFF
Open File
OFF
Temperature C
Time

Section 6 Function Control Software Instructions

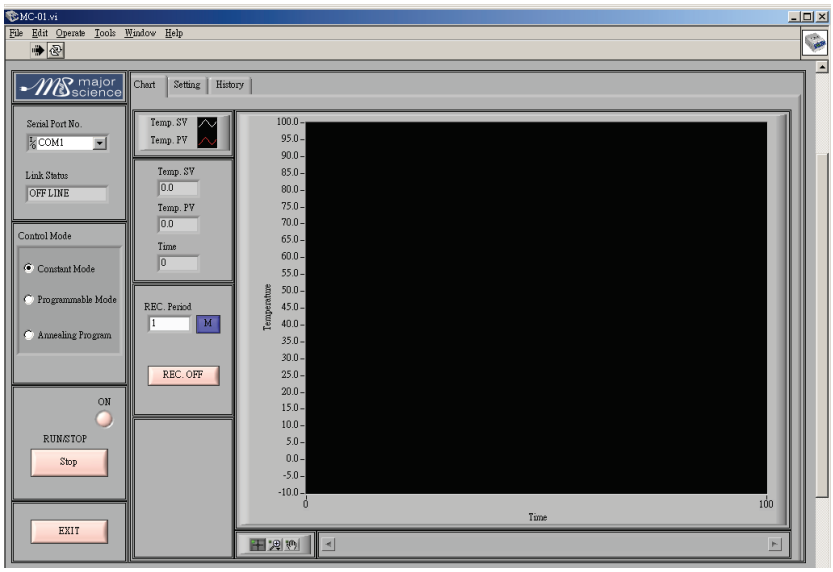
Note: All rights reserved by Major Science co., ltd.

6.1 Installation Instruction

1. Insert the CD into CD ROM and press the Setup.exe in the Installer Folder for installation.
2. Follow up the instructions shown on the computer display screen to complete the installation.

6.2 Operation Instruction

1. Start MC-01 software program and then the below screen will be shown. There are three main sections, Chart, Setting and History in this software.

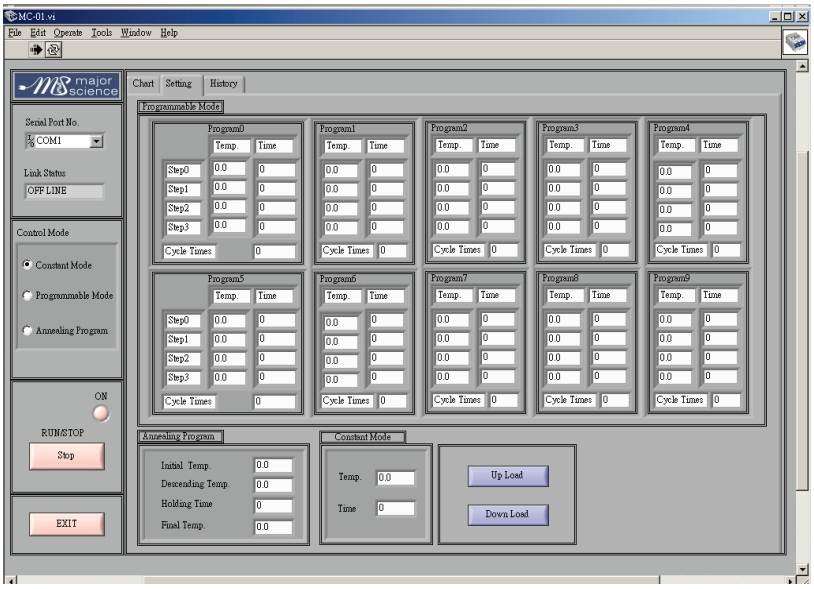


2. Chart Section: Please see the above figure

Serial Port No.	Communication port selections between computer and Ultimate Dry Bath Incubator
Link Status	Indication whether the Ultimate Dry Bath Incubator is linked with

	computer or not
Control Mode	Before start the software and instrument, there are three control modes, Constant Mode, Programmable Mode and Annealing Program, for selecting
RUN / STOP	To start or stop the software and instrument
ON	A Light Indication to see if Ultimate Dry Bath Incubator is in the ON status
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Time	Operation time
REC. period	To set up how frequent the operation data is recorded. Press (M) or (S) bottom, it can be set either in minute (M) or in second (S).
REC. OFF / REC. ON	Indication of the record status, whether it is recording or not
	Enlarge the record table
	Move the record table

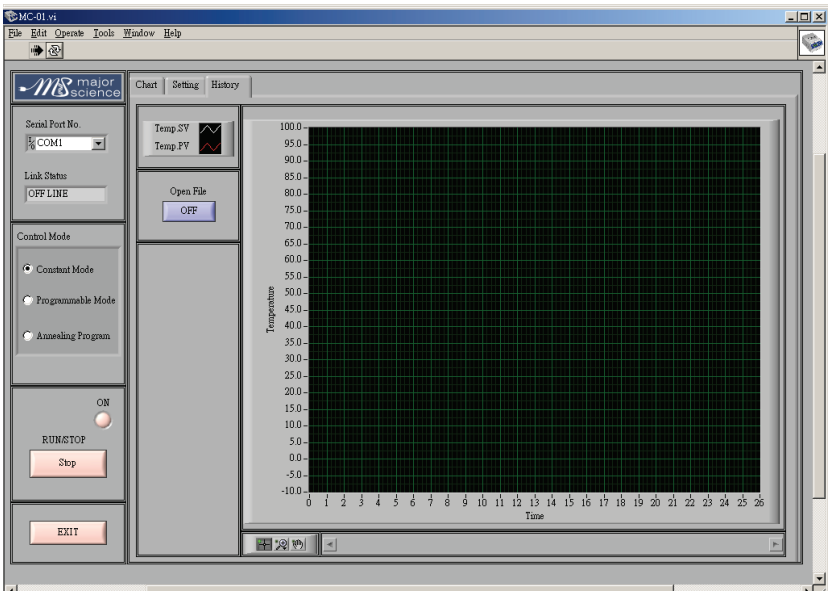
3. Setting Section: Please see the below figure



Programmable Mode	From Program0 to Program 9, 10 programs for setting. Under this mode, there are 4 setting steps, from step0 to step 3 for temperature (Temp.) and operation time (Time) settings, and also setting for Cycle Times
Annealing Program	There are setting parameters for Initial Temp., Descending Temp., Holding Time, and Final Temp.
Constant Mode	There are setting parameters for Temp. and Time
Up Load	To up load the parameter in the software to Ultimate Dry Bath Incubator.

Down Load	To down load the setting parameter from Ultimate Dry Bath Incubator to the Function Control Software

4. History Section: Please see the below figure



Open File	ON: to view historic record data OFF: No historic record data is shown

Section 7 Troubleshooting Guide

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, contact our SERVICE DEPARTMENT or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Recommendations
No signal on the screen	1. Check the **FUSE**
	2. Ensure that the AC power switch is ON
	3. Check the three-pronged power cord are properly plugged into a grounded three-prong AC outlet with the appropriate voltage
	4. If main power is switched on, There shall be a “Green” LCD on the up right side. Please check if it is lighting on. If not, press “Screen power switch”

Maintenance

Genius Dry Bath Incubator may be cleaned with a moist cloth containing a mild soap solution. The chamber and blocks are constructed of aluminum alloy and may be cleaned with any of the commercial aluminum cleaners on the market

Section 8 Ordering information

Cat. No.	Description
MC-01N-110/220	Ultimate Dry Bath Incubator; without block
MC-01S-110/220	Ultimate plus Dry Bath Incubator, without block

ACCESSORIES

MC-MP01	For Microplate; Titerplate (Plane Block)
MC-MP02	For 96 wells Deep Microplate; PCR Plate or 0.2 ml PCR Strip Tube
MC-B0.5	For 0.5 ml tube, 30 wells
MC-B1.5	For 1.5 or 2.0 ml tube, 30 wells
MC-B0.5+1.5	Combination: 1.5 or 2.0 ml tube, 15 well and 0.5 ml tube, 15 wells On the same side
MC-B0.2+0.5+1.5	Combination: 0.2 ml tube (or Strip tube for 8 wells), 24 wells; 1.5 or 2.0 ml tube, 10 well; and 0.5 ml tube, 10 wells
MC-B0.2H	(1/2) Half Block for 0.2 tube or PCR Strip tube for 8 wells, 40 wells
MC-B0.5H	(1/2) Half Block for 0.5 ml tube, 15 wells
MC-B1.5H	(1/2) Half Block for 1.5 or 2.0 ml tube, 15 wells
MC-B13	Well size: 13 mm, 30 wells
MC-B17	Well size: 17 mm, 15 wells, For 15 ml Centrifuge tube, 15 wells
MC-B20	Well size: 20 mm, 15 wells
MC-B25	Well size: 25 mm, 6 wells
MC-B29	For 50 ml Centrifuge tube, 6 wells
MC-RS232	RS 232 cable
MC-DLSW	Data Logging software package
MC-PCSW	Function Control software package
MC-DLSW-R	Data Logging software package, including a RS 232
MC-PCSW-R	Function Control software package, including a RS 232
MS-BL95	Block Lifter

Note:

1. Dimension of Standard Aluminum Block is approximately W129 x L90 x H50 mm.
2. Customized Aluminum block is also available.

For more detailed Block information, please contact us at info@majorsci.com or visit our web-site, www.majorsci.com.

Section 9 Warranty

Major Science warrants apparatus of its manufacture against defects in materials and workmanship, under normal service, for ***one year from the shipping date to purchaser***. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect. Major Science's liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to Major Science within one year following the date of delivery of the product to the customer.

Manufacturer
Major Science Co., Ltd.

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No. 37, Wuquan 5th Rd.,
Wugu Dist., New Taipei City 24888
Taiwan

T/ 886-2-2298-1055
F/ 886-2-2299-7871

Contact Information

Address
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Saratoga, CA 95070
U.S.A

T/ 1-408-366-9866
F/ 1-408-446-1107