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OPERATION MANUAL
ISM-DL120
LCD Measuring Microscope



Manual

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I . Description

1.1 Product sketch map

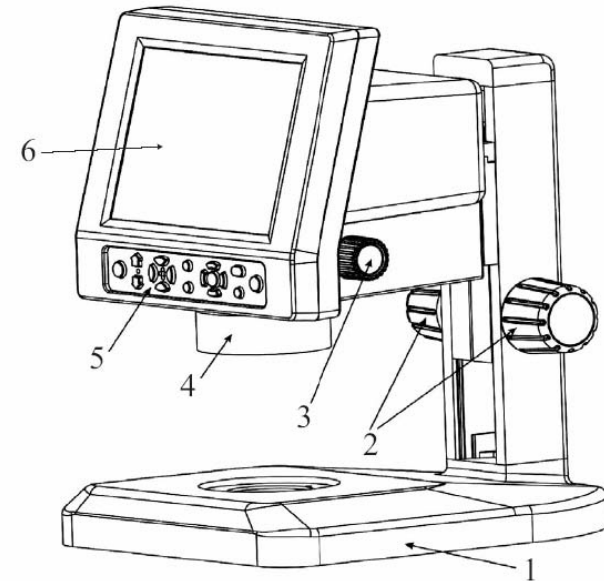


Fig.1-1 ISM-DL120

1. Base 2. Focus adjusting hand wheel 3. Continual zooming
 4. LED Ring lamp 5. Operation button layout
 6. The liquid crystal display screen

1.2 Description

The digital liquid crystal microscope is a one of a kind optical gauging instrument. It includes a wide field of vision, 3.14 megapixel images, high resolution liquid crystal display. It offers comfortable viewing, simple operation, convenient archiving, microscopic imaging and video, as well as many other functions.

Although the range of use is broad, the main applications are as follows:

1. Using rectangular coordinates to determine length. For example basic planar distance, hachure width, keyboard trough width, slit width and so on.

2. The rotation disk determination angle. For example the calibrated dial, the model, the gauge, the drill hole template and the geometric shape complex components of angle measurement.
3. Serves as a microscope, working with superficial quality by the comparison test inspections, the appraisal of metallurgical industry ore specimens. The printing of photography allows for lithograph plates of examination textile fibers and so on.

1.3 Mainframe technical parameters:

1.3 Mainframe technical parameters:	1: 6.5 (0.7×—4.5×)
Total magnification	18.7×—120 × (4.7×—240 × can be obtained with varied accessories)
Digital amplification	1.0×—4.0×
Display screen	8.4 inch TFT LCD (display screen resolution 800×600 pixels)
CMOS sensor	3.0 MEGA pixels
Working distance	88mm
Size of field visual	4.4 x 5.7-27.2 x 35
Zooming mode	Transverse axis continual magnification change
AC adapter	100—240 V / 50—60 Hz the working power of the mainframe: 12VDC 3A
Auxiliary lens	0.5X Ocular, 0.75X auxiliary Lens
Illumination	LED ring light

II . Installation

2.1 Installation

The ISM-DL120 host and its support are disassembled for packaging. Please open carefully the packing box and take out the instrument and accessories (for detail, refer to the packing list). Then, connect the dove-tail groove at the rear base of the machine with that at the upright column prior to the next step operation.



The dove-tail groove on trestle

The dove-tail groove on mainframe

Connect the dove-tail groove together table

2.2 Attention

During installation, it is not allowed to touch the surface of the optical parts and the surface of LCD screen directly with hand. The image quality may be affected if the optical kits are stained with figure print or greasy stain. As to the dirt on the surface of optical kits and LCD screen, please carry out treatment according to maintenance of instrument introduced.

2.3 Preset adjustment



Select the operation distance of the machine by rotating the focusing hand wheels. The tightness of focusing hand wheels may be adjusted through left/right focusing hand wheels by hands in inverse direction. The focusing resistance is rather strong if it is too tight while the machine may easily drop if it is too loose. The users may adjust by themselves according to the practical requirements.


III. Application

3.1 Turning on

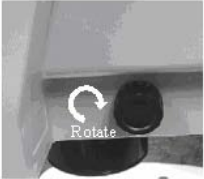
After installation, connect the DC output to the “PWR in” port of the main system, and then connect the AC power adapter in accordance with the requirements. Turn on the master power switch. LED ring lamp will light, mainframe enter the system, the screen show “WELCOME”.

The power of the adaptor: 100-240V AC 50Hz/60Hz
The mainframe working power: 12V DC 3A

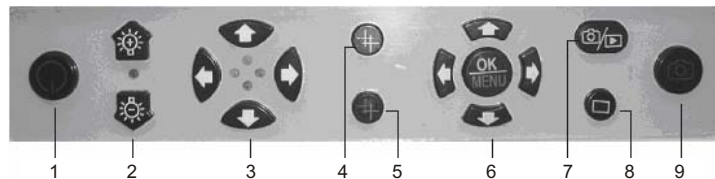
The light source adopts LED ring lamp, divided into the LED circular indicator with adjustable brightness and the multiple function LED circular indicator controllable at four zones. The lower light source is optional on requirements to facilitate observation of different objects. The lower light source is supplied by the PWR out at the rear of the machine by connecting the PWR out of the machine and the input port at the upright column with a connection line.



Rotate the knob for continuous variable power to adjust the optical variable magnification for the microscope image on the screen. (187×—120×)





3.2 Operation buttons and function



1. Power on/off
2. Increases or decrease the brightness of lamp
3. Light switch respectively to control the four-region on or off
4. Self-definition linear converting
5. Linear color converting
6. Menu / confirm
7. Real time view / playback
8. Screen data display
9. Take pictures or take video

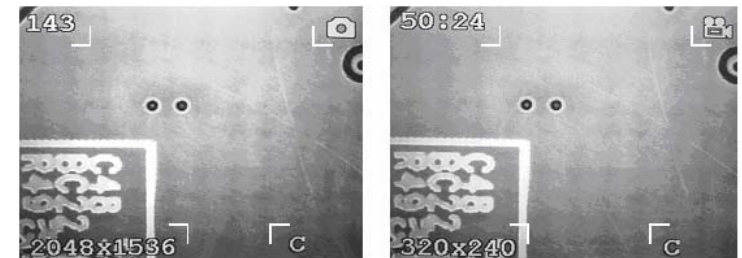
3.3 Data show on the LCD screen

Shown on the upper left corner is the quantity of photos to be taken available at present or the video recording time (with 143 indicating 143 photos available to be taken at the present setup mode; 50:24 indicating the time for video recording at the present setup mode as 50min 24sec).




Shown on the upper right corner  is the mode of photo taken  or the mode of video recording.

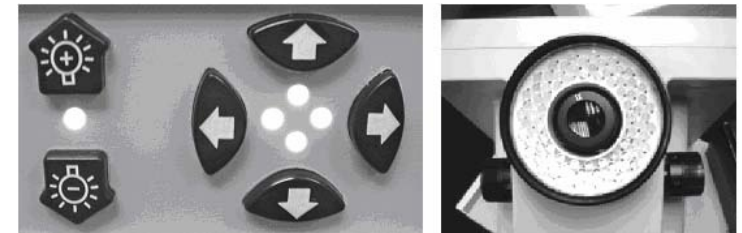
Shown on the lower left corner is the pixels of photos taken (2048×1536 indicating the pixels of photos taken at the present setup mode as 2048×1536; 320×240 indicating the pixels for video recording at the present setup mode as 320×240).

“C” shown on the lower right corner means that SD card is inserted in the machine



3.4 The illumination control of the mainframe

The brightness of LED lamp may be increased or decreased with the help of  and .  is respectively used to turn on/off for the corresponding four corners of LED indicator.

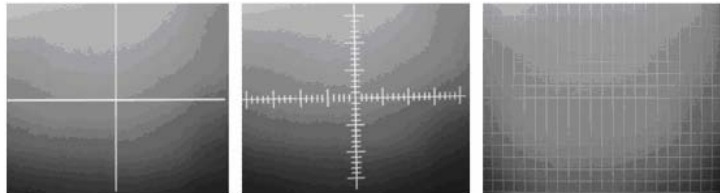


If the light throw back from the object is too sharp, user can install a ground glass on the LED ring lamp. It can improve the image quality. (This ground glass need to order)



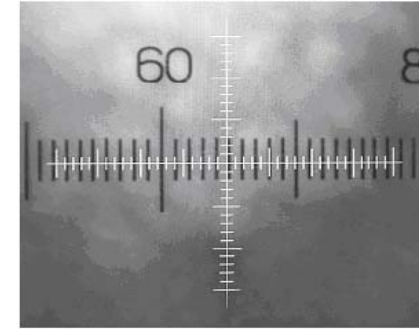
3.5 Self-definition graphics

- ⊕ may be used to select self-definition graphics, including the cross line, coordinates lattice, carrying out simple locating and measurement.
- ⊕ May be used to select among colors of the self definition graphics, facilitating the clear indication under different color materials.



3.6 How to measure


On the micro-ruler is calibrated with precise graduations of three kinds, i.e. 0.1mm, 0.01mm and 0.05mm respectively. Prior to the measurement of the object, select firstly the coordinate or lattice for the self-definition graph. Then, select a certain graduation of micro-ruler under the digital LCD microscope. After having clear focusing, estimate the separation of the coordinate or lattices by comparing the separation of coordinate or lattices with the distance of the standard graduation. Under the condition not to change the power, observe the object inspected. After having clear focusing, user can estimate the length or size of area for the object.

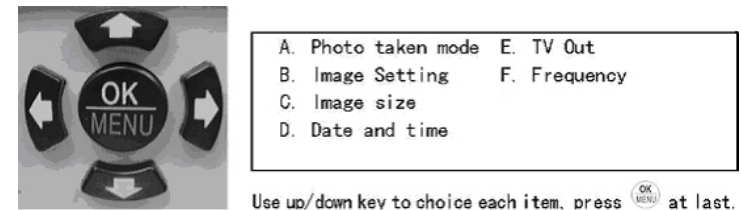


Example:


Select the standard graduation of 0.05mm under a given power and move the micro-ruler after having clear focusing so that the coordinate corresponds with the micro-ruler. The standard ruler of every 12 graduations correspond to 19 graduations of the coordinate ruler, then, each graduation of the coordinate ruler is about 0.03mm (12 0.05/19) . In this case, user can carry out the measurement for the object observed under micro-scope according the distance of coordinate ruler (requiring re-calibration of the separation of coordinate ruler each time for a changed power).

3.7 Selection of function menu

With the help of the  function menu, it is available to carry out the setting for the whole system. It is available to select the following functions through right/left key:




A. Photo taken mode




It is available to select single photo or video shooting. Select single photo at the photo taken mode menu and press the photo taking button, the microscope will take a photo. At the photo taking mode menu and select the video 320×240, press the photo taking button to start AVI video recording. Press the photo taking button once more to stop the AVI video recording.

B. Image Setting




Choice auto or exposure time item, exposure time can be set up between -1.5s ~+1.5s.

C. Image Size




Selection of different pixel may set up the photo size at single photo shooting mode.

D. Date and time



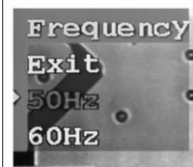
It is available to set up the day, month, year, hour, minute and second. The up/down, right/left and center button may be used to set up the current date and time. Exit from the setting after confirming the date and the time. The time record on/off: after selecting “Time record On” and confirm, the present date and time will be indicated on the lower right corner of the photo. Select “Time record OFF” to turn off the time recording on the photo taken.

E. TV Out




TV Out, choice NTSC or PAL. (User can choice the item by the local video signal)

F. Frequency



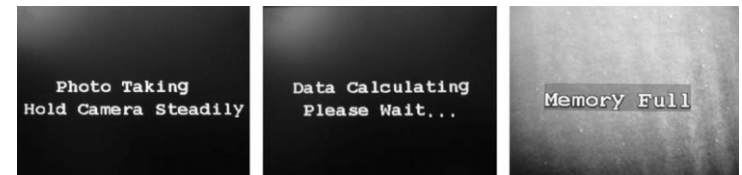
Frequency, choice 50Hz or 60Hz. (User can choice the item by the local power frequency)

3.8 Digital Zoom function menu

Press the Up/down keys  when the system is on the real time view station. It can digital zoom the image from 1.0X to 4.0X. This digital zoom function can help user have a more clear view.

3.9 Take photo and photo management

Select single photo at the photo taken mode menu and press the photo taking button, the system will save a photo. At the photo taking mode menu and select the video 320X240, press the photo taking button to start AVI video recording. Press the photo taking button once again to stop the AVI video recording. When the SD/MMC card memory is full, the system will show “Memory is full”.



As to the photo or video, it is available to change over to real time mode or playback mode for the shooting information with the help of . At the mode of playback, it is available to delete single photo or to delete all the information. With the microscope placed at the mode of playback, it is available to use USB connection line to transfer the data to the computer.

At the playback station, with the help of the function menu, it is available to carry out the setting as following:



A. Delete the photos

B. Protect the photos

C. To rotate the photo by different angle



D. When the system is on the photo playback station. After digital zoom the image from 1.0X to 4.0X, press the screen data display button, It will show "PAN" on top left corner, then user can move the photo by up, down, left, right key , also can use to choice out or move.

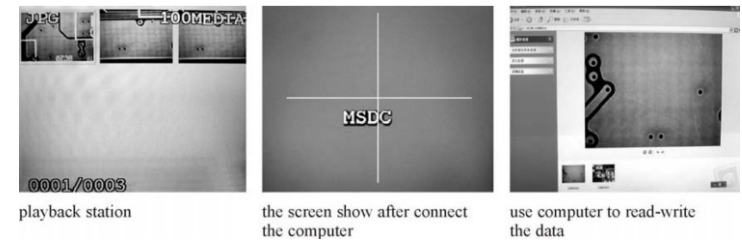
3.10 Rear input / output ports



- ①. it is available to connect through AV Out port of the microscope image to the Monitor in real-time.
- ②. Power Out is a power supply port to connect the bed light source.
- ③. Power In is a connecting port for the main system power supply. (12VDC 3A)
- ④. SD/MMC port is an interface to insert SD memory card.
(Warning: Before pull out the SD card, please turn off the system)
- ⑤. USB port is used for the data communications.

3.11 USB data communicate

when the system is on the playback station, use USB connection line to transfer the data to the computer.



playback station

the screen show after connect the computer

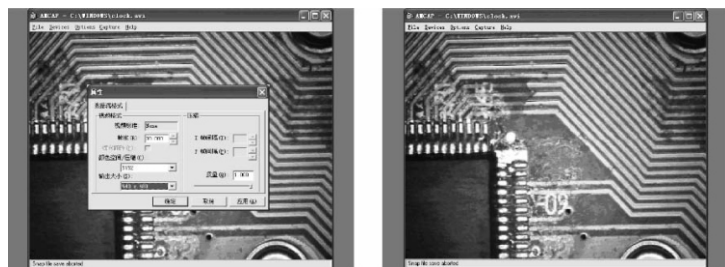
use computer to read-write the data

When the system is on the real time view station, use USB connect the computer. It can view the real time image in the computer by software.



The Screen show after connect the computer

Open the software "Impression 4"



Choice the camera item, select the format of the image to view the image

Use the computer to view the image

For model ISM-DL120 machine, a software disk is provided and the function is available after installation of the two programs from the disk (Install Photo Impression, Install Driver).



3.12 Image view

A clearer image may be observed from TV set via AV output since there is limit of pixels on the LCD screen (800X600). Similarly, the pixels of photo taken with the microscope may reach 2048X1536, and the image will clearer under photo playback mode or when observing photo from the computer after transmission.

IV. Maintenance

For the sake of good microscope protection, it is required to avoid dust, water and humidity intruding into the instrument, otherwise, the photo route and the electronic circuit of microscope might be damaged. Moreover, the apparent grease spot, finger print on the surface of optical kit, dust, dirt stains will effect the imaging quality.

When the microscope is not in use, the microscope should be covered with a clean sheath timely to prevent dust from entering in.

The product is suitable for application and storage indoor, with the environmental humidity for operation and storage being 30% – 80%. The environmental temperature for operation and storage being 0°C – 40°C.

Optical section

The lens should be stored in a dry environment, and it is available to place it in a container with drier agent.

If the surface of lens is attached with dust, please use an air blower ball to clear it off.

If the surface of lens is attached with finger print, dirt, greasy stain or other trace not available to use an air blower ball to clean, please use absorbent cotton or lens paper dipped with a little alcohol or ether mixture (proportion 1:4) to wipe off them lightly.

Notice: Under no any circumstances should the lens surface be dry cleaned, otherwise the surface of lens may be damaged. Moreover, it is not allowed to wipe the lens with water or other liquid solutions.

LCD screen

It is required to pay attention that no heavy pressure on the surface of color LCD screen is allowable during operation and storage.

In case the LCD screen surface is dirty, it is only available to use clean and soft cloth to wipe lightly, and it is forbidden to use organic solution agent to wash and clean.

It is forbidden for the consumers to disassemble the microscope by themselves, least there is danger of damage or electric shock.

V. Installation and Operation Manual of Image Tester

A. Installation method and steps of the micrometer:

★ Plug ② support rod of micrometer into ① movable platform clamp spring first, with the LCD screen facing upward, and noting that the support rod of micrometer should be plugged to location. Then, use M3 inner hexangular spanner to tight uniformly the fastening screw for the rod of micrometer to the extent of not shedding off and rotating the micrometer.



★ Install another micrometer in the same way and steps to the movable platform clamp spring. Tighten the fastening screw to clamp the support rod of micrometer to the extent of not shedding off and not rotating. Put it into the black/white workbench or single sided frosted glass workbench (note that the smooth surface should be facing upward). The final installation structure is as shown in the diagram.



B. The connection and application of bed light source:

★ The connection of bed light source: Connect one end of the connection line with the both ends having spring and normal DC specification to the DC socket marked with "DC OUT", with another terminal inserting into the DC socket of the frame.



★ Adjust the black knob for the brightness of bed light source, attaining the sharp image outline. The arrowhead direction is the rotating direction for increasing brightness. The reverse direction is for brightness attenuating and turning off the bed light source power.



C. Operating instructions for the measurement application of image tester:

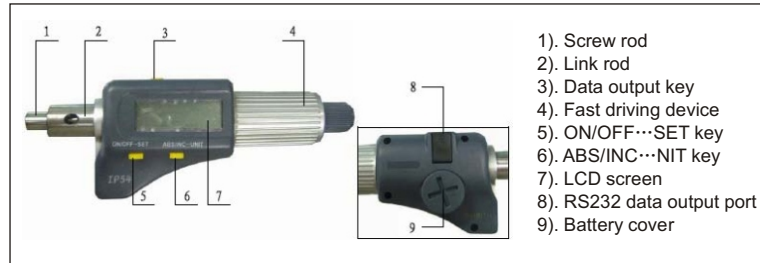
★ The measurement of length:

1. Place the system levelly on a desktop. Firstly, install and fasten the micrometer and the movable platform, wipe clean the workbench surface, connect properly the DC connection line of bed light source, and connect the main system power supply.
2. Press lightly the main system power switch, start the instrument and rotate the rapid driving device of micrometer so that the screw rod of the micrometer stretches out about half of length (12.5mm). Place the substance to be measured lightly on the center of workbench surface, with the bed light source available to shine thoroughly for the best.
3. Adjust the focal length, magnification and the brightness of the upper light source and the bed light source, making the substance to be measured having a very sharp image.
4. Self define the linear graphic, rotate the rotary disc of the rotation movable platform, so that one side of the substance tested runs parallel with the cross line. Rotate again the rapid driving device of micrometer to align closely one side of the substance tested with the cross line. Reset the micrometer. Rotate the rapid driving device to align closely the position to be measured with cross line of one side of the aligned substance. The value of the micrometer is the value of the substance value measured.

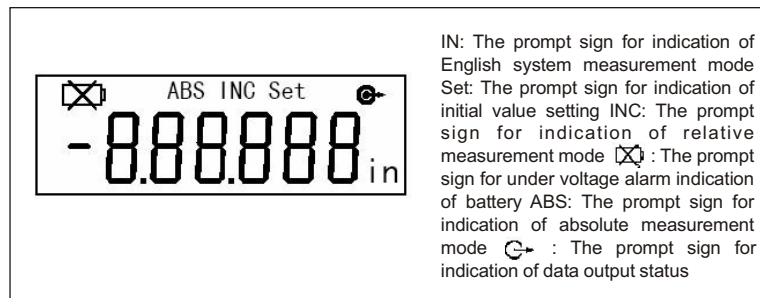
Remarks: The detail application of the micrometer is referred to the operation manual of the electronic micrometer.

VI. Operation Manual of Electronic Micrometer

1. Sketch diagram of structure:



2. LCD screen:



3. The function and operation of the key:

There are two kinds of key operation:

- (1) Short press (time < 2 seconds)
- (2) Long press (time ≥ 2 seconds)

3.1 ON/OFF...SET: The switch key, delay setting key

The key operation < 2 seconds: Power supply ON/OFF of digital display meter

The key operation ≥ 2 seconds: Setting initial value of digital display meter of absolute measurement: Display "Set".

After reinstalling a battery, the initial value setting will be carried out automatically.

The default initial value of the digital display meter is 0.

3.2 ABS/INC...UNIT: Absolute/relative measurement mode convert key, the delay metric system/English system to measurement mode convert key. The key operation < 2 seconds: Absolute and relative measurement mode convert: Relative measurement mode with "INC" indication, absolute measurement mode with "ABS" indication. The key operation ≥ 2 seconds: Metric/English system convert: The English system measurement mode with "in" indication, otherwise it is the metric system measurement mode.

3.3 The data output key:

The key operation < 2 seconds: It will deliver output once, and it will display on the LCD screen once as "↻".

Continuous key operation ≥ 2 seconds: It will deliver output display data continuously, and the LCD screen displays continuously "↻".

The output data will be ended if you press this key again.

4. Power supply:

- Digital display meter adopts one SR44 battery. Please replace the battery when the digit displayed on LCD screen is unclear or when displaying "⊗".
- The digital display meter will cut off the power automatically if the digital display meter is not used for 5 minutes and it will resume to the original value prior to the auto cutting off if rotating the screw rod or pressing "ON/OFF...SET" key. Please press "ON/OFF...SET" key to turn off the power supply for energy saving if it is not to be used.
- Insert a coin to the slot on the battery cover and rotate clockwise to lose and open the battery cover. Take out the used battery.
- Change for a new battery with the positive polarity heading up. Screw tightly the battery cover anti-clockwise.

5. The data output:

- The data output is of the standard RS232 C format, and can be connected to the serial PC port via cable.

6. Precautions:

- Do not fall off or collide the digital display meter and do not apply too great a force.
- Do not dismantle the digital display meter.
- Do not press the key with a sharp object. To press a key, please move along the moving direction of the key, otherwise, it will affect the sensitivity of key.
- Please do not use or store the digital display meter at a location with direct sunlight, or an environment too cold or too hot.
- Please do not use the digital display meter in an environment with too high voltage or strong magnetic field.
- The dry soft cloth or cotton may be used to wipe the stains on the surface of digital display meter. Do not use organic solvent such as acetone or benzene to clean the meter.
- Use soft cloth to wipe the measurement face before measurement.
- Please take out the battery if the meter is not to be used for a long time.

7. Characteristics:

Measurement of force: 5-10 N measuring range: 0-25 (the present product supplied)
 resolutions: 1μm
 Power consumption: ≤ 35 μA operation temperature: 0-40°C
 storage temperature: -20 - 60°C

8. Trouble shooting:

Symptoms	Possible causes	Remedies
The LCD screen displays "E 1".	The computer data overflow.	Move the screw rod in reverse direction to resume the normal displayed value; Or press ON/OFF...SET key to set up again the initial value of measurement.
The LCD screen displays "E 3".	1. Interference exists in the peripheral environment. Perhaps the sensor is stained with foreign object to result in a mistaken sensor. 2. The sensor breaks down.	1. Reinstall the Battery. 2. Send back to the factory for repair.
The measurement value is not accurate.	1. Measurement face may be dirty. 2. The setting value may be not accurate.	1. Wipe the measurement face. 2. Check the setting value, and set up again.
The LCD screen does not display.	1.The battery installation is incorrect. 2. The battery may be short of capacity.	1. Reinstall the battery. 2. Replace the battery.
The displayed digit is not stable, not clear; The displayed digit is not changing or is confused.	1. Battery voltage is possibility less than 1.45V. 2.The battery installation may be incorrect.	1. Replace the battery. 2. Reinstall the battery.