



CHIPTRONICS (M) SDN. BHD.

Company No. 195946-U

HD LCD Display Video Microscope Product.

Model: CTN-2KNMHV

Introduction

CTN-2KNMHV is a High Definition LCD display Video Microscope.

It is equipped with a 12 inch HDMI LCD screen. The format of the screen is 1920 x 1080 (16:9).

It has a built in LED ring with brightness control. It is a manual focusing microscope.

It has 9 quantum of magnification, namely x0.7, x1, x1.5, x2, x2.5, x3, x3.5, x4, x4.5.

It also comes with two USB 3.0 port. To fully utilize the functionality of the equipment, one port should be connected to USB Pen Drive while the other port should be connected to a mouse.

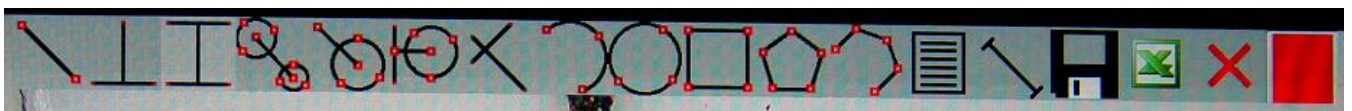
With a x1.0 objective lenses, at x0.7 magnification, the LCD screen can capture an area of up to 22.5mm x 12.5mm.

The minimum working distance with x1.0 objective lenses is about 100mm.



Embedded Tools

The equipment comes with a useful range of measurement tools:



1. Distance between 2 points	9. Circle
2. Distance from a point perpendicular to a line	10. Rectangle
3. Distance between 2 lines	11. Polygon
4. Distance between 2 circle	12. Polyline
5. Distance from a point to a circle	13. Allow user to write text and remarks
6. Distance from a line to a circle	14. Save the picture, and the measurement
7. Angle	15. Converting the data to Excel form.
8. Arc	16. Calibration with Standard Ruler

Magnification

A 1mm length object will be measured at different sizes at different magnification on the 12" HDMI LCD:

Magnification	X0.7	X1.0	X1.5	X2.0	X2.5	X3.0	X3.5	X4.0	X4.5
Measurement on the screen	12mm	17mm	25mm	34mm	40mm	48mm	56mm	64mm	74mm
Actual part to Monitor magnification	12x	17x	25x	34x	40x	48x	56x	64x	74x

Accuracy on measuring distance

Each magnification was calibrated with a VED Artifact (ID 681047-01, S/N 30 589 481). Upon the calibration, we verified the calibration by measuring the straight line, thus obtaining the following results:

Calibration Setting (Unit: mm, 4 bits)			Verification Results		
Magnification	Length	Pixel	Length 1 (mm)	δ (micron)	δ (%)
0d7x	20	1722	20.0116	11.6	0.06%
1d0x	15	1808	14.9917	8.3	0.06%
1d5x	10	1827	9.9891	10.9	0.11%
2d0x	7	1699	7.0000	0	0.00%
2d5x	6	1822	5.9901	9.9	0.17%
3d0x	5	1819	4.9918	8.2	0.16%
3d5x	4	1694	3.9953	4.7	0.12%
4d0x	3	1459	2.9979	2.1	0.07%
4d5x	3	1648	2.9964	3.6	0.12%

In short, the error of measuring straight lines at different magnification is rather convincing, with errors less than 20 micron.

By setting the system to 4 bits, the measurement will produce a data up to 4 decimal places. The high definition LCD helps to resolve the image and enable the sub-micron measurement.

Accuracy on measuring circle

The circle verification shows that the error (δ) was less than 10 micron.

Circle Verification

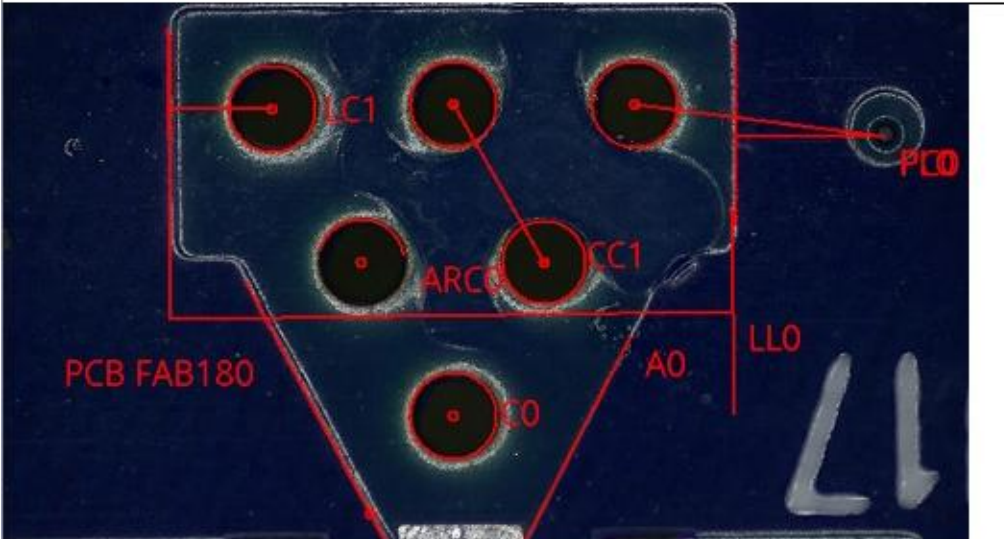
Nominal Size	Measured Size	4.5x δ	4.0x δ	3.5x δ	3.0x δ	2.5x δ	2.0x δ	1.5x δ	1.0x δ	0.7x δ	
0.10	0.0993	0.0980	1.3	0.0987	0.6						
0.25	0.2496	0.2476	2.0	0.2467	2.9	0.2503	0.7	0.2474	2.6		
0.50	0.4997	0.4951	4.6	0.4976	2.1	0.5006	0.9	0.5003	0.3	0.5005	0.5
1.00	0.9998					0.9965	3.3	1.0006	0.6	1.0011	1.1
2.50	2.4999							0.9971	2.9	0.9962	3.8
5.00	4.9998							2.4968	3.2	2.4959	4.1
										0.9956	4.4
										0.9988	1.2
										2.5055	5.5
										2.5087	8.7
										4.9945	5.5
										4.9942	5.8
	δ Max	4.6	2.9	3.3	2.6	1.1	3.2	4.1	5.5	8.7	
	δ Min	1.3	0.6	0.7	0.3	0.3	2.6	3.6	4.4	1.2	
	δ Mean	2.6	1.9	1.6	1.2	0.6	2.9	3.8	5.1	5.2	

Note: All errors (δ) are measured in micron

Data Compilation

The Equipment allows the user to save the data in Excel form:

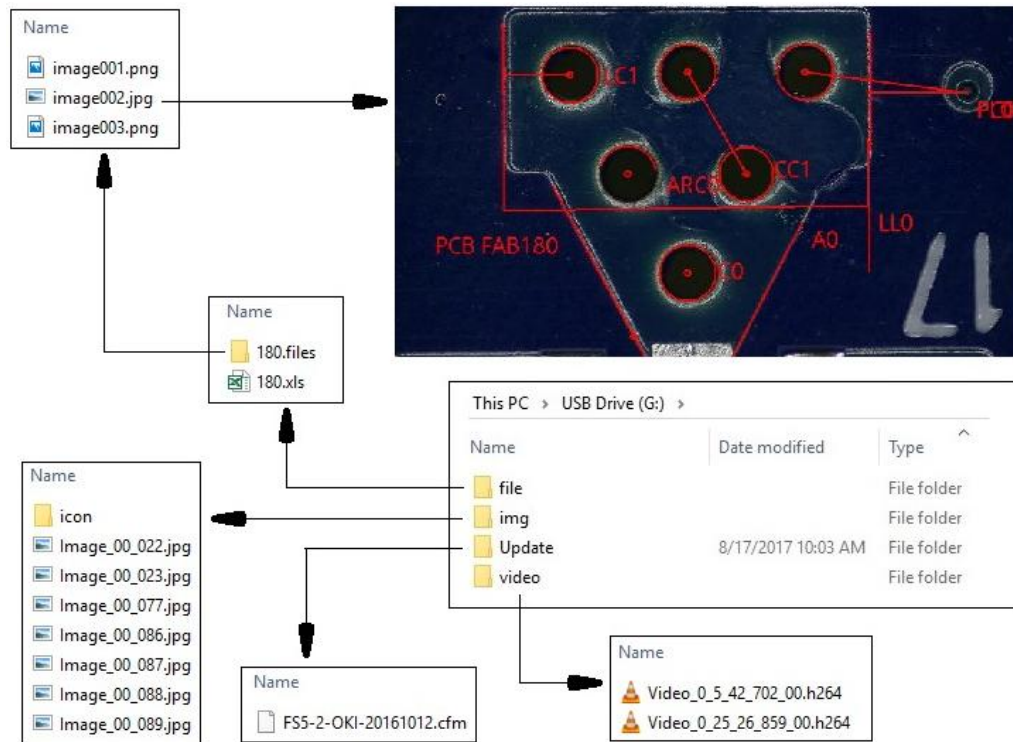
Image Measurement Result



Type	Length	Width	Height	Perimeter	Diameter	Area	Angle	Unit
CC1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	mm
LC1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	mm
PCO	2.1	0.0	0.0	0.0	0.0	0.0	0.0	mm
AO	0.0	0.0	0.0	0.0	0.0	0.0	55.0	degree
ARCO	0.9	0.0	0.0	0.0	-0.6	0.0		mm
LLO	4.6	0.0	0.0	0.0	0.0	0.0	0.0	mm
CO	0.0	0.0	0.0	2.2	0.7	0.4	0.0	mm
PLO	1.2	0.0	0.0	0.0	0.0	0.0	0.0	mm

Files in the USB Folder

The Folder in USB contains Images, Videos, Measurement data and Firmware update.



Main Specifications

A. Microscope:

Magnifications	Default: 9.3x - 114.3x (Zoom) Optional: 18x – 440x
Video Coupler	Built in: 0.35X Optional: 0.5X, 0.75X, 1X, 1.5X and 2X
Objective Lens	Standard: 1X Optional: 0.3X, 0.5X, 0.75X, 1.5X and 2X
FOV	Default: 23mm- 3mm Optional: Max. 46mm
Working Distance	Default: 100mm Optional: Max.198mm
Base Size	260mm(X) x 320mm(Y)
Height of the microscope	480mm
Weight of the microscope	5.5kgs

B. Camera:

Format	2.0M HDMI, true color, no delay.
Maximum Resolution	1920 x 1080
Sensor	1/2.86" Sony sensor
Pixel Size	2.75µm x 2.75µm
Frame Rate	60fps@1920*1080
Signal to Noise Ratio (SNR)	65db

C. LCD Display:

12 inch HD LCD display, 1080P, wide screen, multi angle adjustment.

D. Illumination:

High quality LED illumination, 144 LED bulbs ring lights.

E. Optical Technical Parameters:

Objective Lens	Parameter	CCD Coupler					
		0.35X	0.5X	0.75X	1X	1.5X	2X
0.5X	Magnification	0.1225~0.7875	0.175~1.125	0.2625~1.688	0.35~2.25	0.525~3.375	0.5~4.5
	FOV(mm)	46~7	35~5	23.5~4	17.6~3	11.8~2	8.8-1~3
	WD(mm)	198					
0.75X	Magnification	0.18375~1.18125	0.2625~1.6875	0.39375~2.53125	0.525~3.375	0.7875~5.0625	1.05~6.75
	FOV(mm)	31-4.7	23.5-3.6	15.7-2.4	12-1.8	7.8-1.2	6-0.9
	WD(mm)	131					
1X	Magnification	0.245~1.575	0.35~2.25	0.525~3.375	0.7~4.5	1.05~6.75	1.4~9
	FOV(mm)	23-3	17.6-2.7	12-1.8	9-1.6	6-0.98	4-0.7
	WD(mm)	96					
1.5X	Magnification	0.3675~2.3625	0.525~3.375	0.7875~5.0625	1.05~6.75	1.575~10.125	2.1~13.5
	FOV(mm)	15-2.3	11.8-1.8	7.8-1.2	6-0.99	4-0.61	3-0.4
	WD(mm)	63					
2X	Magnification	0.49-3.15	0.7~4.5	1.05~6.75	1.4~9	2.1~13.5	2.8~18
	FOV(mm)	11.6-1.7	8.8-1.3	6-0.9	4-0.71	3-0.41	2-0.3
	WD(mm)	46					

Conclusion

CTN-2KNMHV HD Video Microscope is a user friendly and handy inspection and measurement equipment. It provides supremely clear picture and easily use measurement tools.

The Pros:

1. It has a very clear HD LCD display, user is able to clearly review the surface condition of any inspected object. Adjusting the brightness of the light can even enable the user to determine the defect easier.
2. It was designed with a useful magnification range from 0.7x to 4.5x.
3. The embedded measurement tools are handy and easy to use. Often can learn how to use the tools in a very short period of time.
4. Easy conversion to obtain different magnification by turning the knob.
5. Measurement is stored in a spreadsheet form which can be analyzed in Excel, making the Data analysis easy, convenient and productive.
6. Upon saving the data and photo, a simple report can be printed out straight away. This feature will help QC and Engineering department on speeding up their reporting.
7. With a 5.5kg weight, it is light enough to be carried around easily even by a timid operator.
8. Calibration is made easy with a scaled glass. User can calibrate the lens at different magnification in just a snap shot.

**Please contact Chiptronics at 604-6598888 or email
to sales@chiptronics.com.my for more information.**