CONTENTS

UNPACKING

The Tegatron CMD-IV system includes the following items:

- CMD-IV Control Unit
- Color Video Microscope
- Main Cable
- Power Cable
- Video Cable
- USB Cable
- Depth Cable (If depth option is installed)
- Video Capture Software
- Hand Remote
- Spares Kit
- Calibration Standard
- Manual

Please inspect all items carefully and report any damaged or missing items to us as soon as possible.

CONNECTIONS

CMD-IV Control Unit

Connect the main cable to the microscope and the control unit. Connect the video cable to the control unit and an NTSC monitor (A video source must be applied to the control unit to function properly). Plug in the depth & USB video cable if used. Plug in the power cable to the control unit and an AC power source. The CMD-IV can operate from an AC power source of 110V or 220VAC (Auto-Sensing). You must turn on the “Master Power” switch before pushing the front panel power switch.

Calibration

The CMD-IV has been Pre-Calibrated at the factory and should not be re-adjusted. If calibration is re-adjusted, any guarantee of accuracy is voided. Calibration procedure is located in the CALIBRATION section of this manual.

Video Input

A video source must be connected to the CMD-IV for it to function properly. Connect the Tegatron microscope main cable to the scope and the CMD-IV control box (The CMD-IV can also be connected to an analog signal via the BNC adapter or an S-Video signal.

Video Output

The CMD-IV can be connected to an analog monitor via the BNC output or to a PC via the Digital Video output (USB-2 connector). There is also an S-Video output.

Other Connections

If you have a custom option installed which requires an external connection, please see the supplement to this user guide for additional information.

CONTROLS & INDICATORS

Power Switch

There are 2 power switches. The Master Power switch is on the top right hand of the CMD-IV control box. This must be turned on first. Then press the power switch located in the lower right corner of the unit.

Motor Switch

The motor switch will move the microscope objectives up & down for fine focus and for measuring depth (if installed).

Lamp Pot

This is used for adjusting the intensity of the light inside the microscope.

Video Snap-Shot Switch

This is used only when you are using the DIGITAL VIDEO OUT via the USB port to a PC (you must install the enclosed software for this function to operate correctly). This switch allows you to take a picture of the image you are measuring and paste it to a form, save it in a file or E-mail to a client. See section on Digital Video Output for more information.

Position Control 1

This rotary control will move the left or top cursor (depending on the setting of the X/Y switch) or it will move both (same axis) cursors together if the track function is enabled.

Position Control 2

This rotary control will move the right or bottom cursor (depending on the setting of the X/Y switch). If track mode is on, it will adjust the spread between the two (same axis) lines.

Lock Switch 1 and Lock Switch 2

Enabling the lock function will cause the related rotary position control to have no effect while lock is on (RED led on). lock functions are remembered independently for the X and Y axes. A Lock override can be set in the menu system to lock a control regardless of the switch setting (which will also be indicated by the light).

Track

Enabling the tracking function (lamp on) will cause the left position control to move both lines of the same axis together (keeping the spacing constant). The right control will adjust the spacing between the lines. When the tracking function is disabled (indicator off), the two controls will move the lines fully independently.

Position

The position set function allows the user to relocate the numeric display. Pressing the POSTION switch will turn on (indicator blinking) the position set function for the numeric dimension display. When the position function is enabled, turn the left (#1) rotary control to move the horizontal position and the right (#2) rotary control to change the vertical position. Press the POSITION switch again when finished to disable the position set function. Note that many other functions are disabled while position set is on.

Display

Pressing the DISPLAY switch will toggle the overlay on and off including the character and line display. This makes it easy to go to a "clean source image" and back to the measurement mode. When the display is off, many switches and the controls are inactive to prevent accidental changes. The indicator is illuminated when the display is on. The Display Switch will cycle through three different states: 1) Overlay completely off, 2) Only lines displayed, the numeric display is off, and 3) Both lines and the numeric display are enabled.

X/Y

The X/Y switch chooses between X or Y axis movement. There is an indicator for each direction. Note that the positions and lock information are remembered independently for each axis.

B/W

Selects whether the lines are displayed as black or white. This switch does not affect the color of the numeric display or menu system.

MENU

Pressing the MENU switch places the unit in the menu mode allowing the user to set his or her preferences. The exact menus are covered in a later chapter in this manual. Note: If the PASSWORD PROTECTION is turned on, you may have to enter a password before using this function. The unit is shipped with PASSWORD ENABLED and a default password of 1 2 3.

Set

Pressing SET will allow the user to calibrate the unit and also set the unit of measure. Operation is through simple menus.

If the password protection is turned on, you may have to enter a password before using this function.

(Backspace) ←

Pressing the backspace button will allow you to edit the numeric calibration or the password as it is being entered. Backspace deletes the character last entered.

0 thru 9 and . (decimal point)

These keys are used to enter the calibration reference, enter the password and to navigate the menu systems. They are used in a way similar to a calculator. Note also that the 2, 4, 6 and 8 keys are also used as a 4 directional cursor array when changing the custom unit of measure settings.

Enter

Completes the entry of a calibration setting, password or completes a menu operation.

Store

Pressing the STORE key will blink the indicator next to it and display a message on the screen asking you to press a number key. After pressing the STORE key, you must press one of the number keys (0 through 9) to specify which memory, which will turn off the indicator. You can also cancel the storage by pressing STORE a second time (which will also turn off the indicator). Each memory will save most of the settings of the unit, allowing easy access to multiple calibrations. See the section on Memories later in this manual.
If the password protection is turned on, you may have to enter a password before using this function.

Recall

Pressing the RECALL key will blink the indicator next to it and display a message on the screen asking you to press a number key. After pressing the RECALL key, you must press one of the number keys (0 through 9) to specify which memory location you choose, which will turn off the LED. You can also cancel the recall by pressing RECALL a second time (which will also turn off the LED). See the section "MEMORIES" in this manual.

MENUS

Overview

Main Menu

1. Line Options
2. Coordinate Options
3. B/W or Color mode
4. Color Bars
5. Remote Options
6. System Options
7. Password Options

0. Exit

Press number for selection

The CMD-IV is designed for ease of use. Commonly used functions are easily changed with front panel switches while less used functions can be changed only with the menus. This section will describe the various menus and how they work. For the calibration set menus and units of measure, please see the next section.

If you have the "Password Protect-ion" enabled, you may need to enter a password before you can enter the menu. See the section on Password

Protection for more information.

The menus system is divided into a hierarchy, or tree structure. Each branch has several related menus that can be changed. The main or top menu is the first one you see after pressing the MENU button. You then choose one of the categories and press the number key relating to that menu. This will bring up another menu where you press the numeric key of choice and so on. "ENTER" will select the highlighted item. Pressing the 0 (zero) key will exit each menu back up to the previous menu.

Main Menu

Each menu will be described below:

Line Options

1. X1 Line Options — This item selects whether the X1 (left) line is set to solid, serrated or turned off. Each line may be set individually.

2. X2 Line Options — This item selects whether the X2 (right) line is set to solid, serrated or turned off. Each line may be set individually.

3. Y1 Line Options — This item selects whether the Y1 (top) line is set to solid, serrated or turned off. Each line may be set individually.

4. Y2 Line Options — This item selects whether the Y2 (bottom) line is set to solid, serrated or turned off. Each line may be set individually.

5. Lock Overrides — Allows you to enable lock overrides for each line. If these are set to on, the line will remain locked regardless of how the front panel lock switch is set (lock indicators will light).

6. Box/Lines — This will set whether lines or a box will be displayed. The lines are full screen length. Boxes may be set as either an outline (normal box mode) or solid (filled).

7. Line Size — Line size can be set to thin or thick. X and Y axes may be set individually. When the line size is set to thick, measuring resolution will be lower due to video system restrictions and display capabilities. Thin lines may also cause a slight increase in apparent flicker on some monitors due to limitations of the NTSC/PAL video system.

Coordinate Options

1. Display Options — You can choose whether to display the numeric value for X, Y or diagonal measurements. Any combination can be displayed.

2. Character Color — Sets the foreground (character) color of the alpha-numeric digits but does not affect the line color (see the B/W switch to change the line color). Eight color settings are possible. In B&W mode (and most PAL modes), the colors are displayed as shades of gray.

3. Background Color — Sets the background color of the alpha-numeric digits but does does not affect the line color (see the B/W switch to change the line color). eight color settings are possible in addition to no background. No background allows the characters to display directly on the video image without any solid area behind them. In B&W mode (and most PAL modes), the colors are displayed as shades of gray.

4. Display Layout — Chooses whether the X, Y, and diagonal dimensions are displayed in a row or column format.

5. Precision Digits — Allows the user to choose the precision of the measurement display. For readability, the display precision can be reduced to only the amount of information that is really needed for the application. The precision can be set from 2 to 5 digits, with 4 being the factory default.

B/W or Color Mode

The user can select whether the CMD-IV is used with a B/W camera or color camera (unit is set to "Color" to match scope camera). For the unit to display the image properly, it must be set for the proper mode. If the unit is set for B/W when used with a color camera, it will display only B/W characters and color bars will be B/W also. When the unit is used with PAL composite/S-video or B/W video, it automatically is switched into B&W mode. Only RGB and scope in will display color overlay data in PAL mode.

Color Bar Menu

A reference "Color bar generator" is built into the CMD-IV and can be enabled through this menu. When color bars are turned on, the camera or other input video image will not be visible. The color bars are designed to test for the presence of the colors and system troubleshooting. The color bars are not designed to replace a precision test signal generator for calibration purposes.

Remote Options

The remote options are only used when the factory optional remote interface is ordered and installed in the unit. This interface comes with a separate interface operation manual.

Password Options

1. Password Mode There are five (5) different modes of operation for the password system. They are as follows:

    1. Disabled - This will allow all menus and the store function to be accessed without having to enter a password (unit is shipped with password protection "Enabled". The default password is 1, 2, 3).

    2. Enable at Power Off - Once the correct password is entered, all functions will be accessible without having to re-enter the password until the power is turned off to the unit, which will place it back in protected mode, requiring the password to be entered to access the menus and store function.

    3. Enable at Menu Exit - Each time a menu is exited, the password protection will be re-enabled so the next time menu, set or store buttons are pressed, the password will have to be entered again.

    4. Menu Exit + 1 min - Approximately one minute (1.2 minutes for PAL) after exiting a menu, the password requirement will automatically become active, requiring you to enter the password again the next time Menu, Set or Store are pressed. The time is counted from the last time a menu is used. If you used the menu every 45 seconds, the password would never be required. This mode is the factory default.

    5. Menu Exit + 5 min - Approximately five minutes (6 minutes for PAL) after exiting a menu, the password requirement will automatically become active, requiring you to enter the password again the next time Menu, Set or Store are pressed. The time is counted from the last time a menu is used. If you used the menu every 4 minutes, the password would never be required.

2. Protect Now — This immediately reinstates the password requirement and would be the same as turning the unit off and back on. Use Use this when you make changes and need to have the unit password protected before leaving the location.

3. Change Password — Allows you to change the password to any number up to 8 digits. You need to enter the number, press Enter, then enter the number again. The backspace key can be used to correct entry. Passwords do not have to be all 8 digits. Use the number of digits you feel necessary to secure the unit. In fact, if no number is entered in either box, then that becomes the password. Just pressing enter will get you past the password screen but that is not recommended for security. Both entry boxes must match to complete the function. If they do not, a screen will inform you that they don't match and ask you to press the Enter key to try again. There is no cancel function. Turn the unit off to cancel this command. When both input numbers match, a screen will be displayed that indicates the password has been changed and asks you to press the Enter key to continue.

Note: It is recommended that the password be changed from the default password the unit is shipped with since that password is in the manuals.

WARNING: DO NOT FORGET YOUR CHANGED PASSWORD!

CALIBRATION

Scale and Unit Parameters

1 Set Scale Using X Axis
2 Set Scale Using Y Axis
3 Clear Scale
4 Select Unit
5 Define Custom Unit

0 Exit

Press number for selection

Overview

The SET menu is similar in operation to the MAIN MENU, however the SET menu is used to set the calibration for the unit and the unit of measure. See the section about operation (setting the scale) for additional information on using the SET menu. Below, each menu is described in detail. Calibration only needs to be set for one axis to calibrate all directions.

If you have the Password System enabled, you may need to enter a password before you can enter the set menu. See the section on Password Protection for additional information.

Set Scale Using X Axis

This will set the calibration using the horizontal (left to right) axis, or the distance between two vertical (up-down) lines. It will accept any number, up to 4 digits between 0.0001 and 9999 for the calibration.

Note that measuring is much more precise when setting the calibration on the X axis, as opposed to the Y axis. Calibration is also more precise when the distance between the two lines is as wide as possible during calibration.

Set Scale Using Y Axis

This will set the calibration using the vertical (top to bottom) axis, or the distance between 2 horizontal (left-right) lines. Enter any number, up to 4 digits between 0.0001 and 9999 for the calibration.

Note that measuring is much more precise when setting the calibration on the X axis. Y axis calibration is provided for those places where X axis calibration is impractical. Calibration is also more precise when the distance between the two line is as wide as possible during calibration (see the section "Calibration Procedure" for directions on how to calibrate the CMD-IV to the microscope).

NOTE: VERY IMPORTANT !!! The CMD-IV is matched to the scope it was assigned to. Use with any other scope voids all warrantees and all calibration accuracy.

Clear Scale

You will initially be provided with three (3) categories as follows:

1. Metric Units A selection of commonly used Metric units are available in this menu. Press the number corresponding to the unit to be displayed.

2. English Units A selection of commonly used English units are available in this menu. Press the number corresponding to the unit to be displayed.

3. User Defined This will display all the user defined units. Units must have been previously defined (see menu item 5, "Define User Unit" below).

The unit of measure is the same for both axis.

Define User Unit

Up to eight (8) different user defined units can be entered. Each can be one or two characters long. Once defined here, they will be available in the Select Unit menu described above. To set a unit, press the appropriate number for the location where you want to save the unit. Next, press the up and down keys (#2 and #8) to change the character. Use the left and right keys (#4 and #6) to select between the left and right characters. Press the "ENTER" key when complete.

MEMORIES

Overview

The CMD-IV incorporates ten (10) user accessible memories which save most system settings. This allows you to save calibration settings for different zoom factors. The CMD-IV will retain the information in memory after power is removed for up to several years.

Memory Store

NOTE: The first four (4) memory locations are loaded with the calibration settings for each objective on the Tegatron microscope and should **NOT** be re-configured. Any changes made to these memory locations will cause the calibration measurements to be off and voids all warrantees of calibration accuracy.

At any time during normal operation, you can save the current calibration and cursor positions into one of the last 6 (of 10) memory locations. To save a setting into memory, press the save button (the red LED next to it should illuminate). Next, press a number (0 or numbers 5 through 9) which corresponds to the memory location you want to save to. To cancel a save, before pressing the number, press the save button a second time or press the enter button.

If you have the Password System enabled, you may need to enter a password before you can enter the store function (unit shipped with password Protection on). See the section on Password Protection for additional information.

Note: It may take up to 5 seconds after the save button is pressed for the setting to be stored into the non-volatile (long term) memory. This is due to the multi-tasking nature of the unit's operating system. Do not turn off or remove power until at least five seconds after pressing the number key of the save operation.

Memory Recall
At any time, you can recall one of the ten memories. To recall one of the settings, press the "RECALL" key and then press one of the number keys that corresponds to the desired memory location.

Password Protection

Overview
The CMD-IV incorporates a password protection system to disallow entry to the menus as well as the set and store functions. This is to help protect against accidental or intentional corruption of settings in a production or unsupervised environment.

To be secure, the password should be changed before the unit is deployed. Use main menu item 7 to set a new password and change the mode. Write down and secure your new password where you will be able to find it.
NOTE: If your password is lost, you may have to send the unit back to Tegatron to have the password reset.

The factory default password is: 123
The default mode is: Menu Exit + 1 minute.
Note: Performing a factory defaults reset will not change the password or password mode.

OPERATION

Overview
This section will describe the basic use of the CMD-IV. The unit should be properly connected and operating. Make sure that the cursors and dimensions are displayed before continuing.

Calibration
The CMD-IV is shipped "Pre-calibrated" for use with its matching microscope (Matching microscope S/N is located in the top left hand corner of the CMD-IV under the logo plate).

NOTE: Do not change calibration settings in memory locations 1, 2, 3, or 4. Doing so will cause microscope to be out of calibration and void warrantee.

To enter other calibration settings, place an object with a known dimension (the reference object) in the field of view, at the same distance from the optics (lens) as the object you wish to measure. It is best to set the reference dimension using the X axis as this provides better accuracy. X axis measurements prove better resolution as well. Once the reference object is fully visible in the monitor, move the cursors to a known dimension on the object. Using a reference dimension that is one half the screen width or more will result in best measurement accuracy.

Setting the Scale
Press the "SET" button to bring up the SCALE and UNIT PARAMETERS menu.
Press 1 to set the scale the X axis or press 2 to set the scale using the Y axis.
Enter the dimension of the reference object that is between the cursors.

The value entered must be in the range of 0.0001 to 9999.
You can use the "Backspace" (←) key to delete an incorrectly entered digit.
Press the "Enter" key when done.

When the reference dimension is entered as above, you can remove the reference object and measure any item at that distance from the optics in either the X or Y directions.

Adding a unit of measure
You may also wish to add a unit of measure to your dimension display. The following procedure is used to add a unit of measure to the dimension display:

Press the "SET" button to bring up the "SCALE and UNIT PARAMETERS" menu. Press 4 to access the SELECT UNIT menu. Press 1 to use a metric unit, 2 to use a US unit or 3 to use a custom unit. If you need to set a custom unit first, press 4 and follow the procedure in the section describing custom units. Next, press number 1 through 8 to choose the appropriate unit of measure. Press 0 twice to exit (once to return to the Scale and Unit Parameters Menu and the second time to exit the menus).

Saving the current configuration

Once you set a calibration, you may want to store it in memory for use later, so you don't have to keep re-calibrating for the same zoom or magnification factor. You can save the data in one of ten memories by doing the following:

Memory Store

Set the cursors and scale for your application. Press the STORE key (the indicator should blink and a screen will ask you to enter a number). Press a number (0 through 9) to select one of the ten memory locations (indicator should go out after pressing the number). Within 5 seconds the state of the machine will be saved to that memory number which will be retained after power off.

Note: If power is turned off immediately after pressing the memory location, the data may not be saved or may be corrupted. It takes up to 5 seconds to write the data to memory.

Note: If you have the Password Protection enabled, you may have to enter a password to use the Memory Store function.

Memory Recall

To recall from memory, press the RECALL key (which will cause the indicator next to it to blink and a screen will display indicating you should press a numeric key). Next, press a number key (0 thru 9) relating to the memory you wish to recall from. There are ten memories 0 through 9. The indicator should stop blinking after pressing the numeric key.

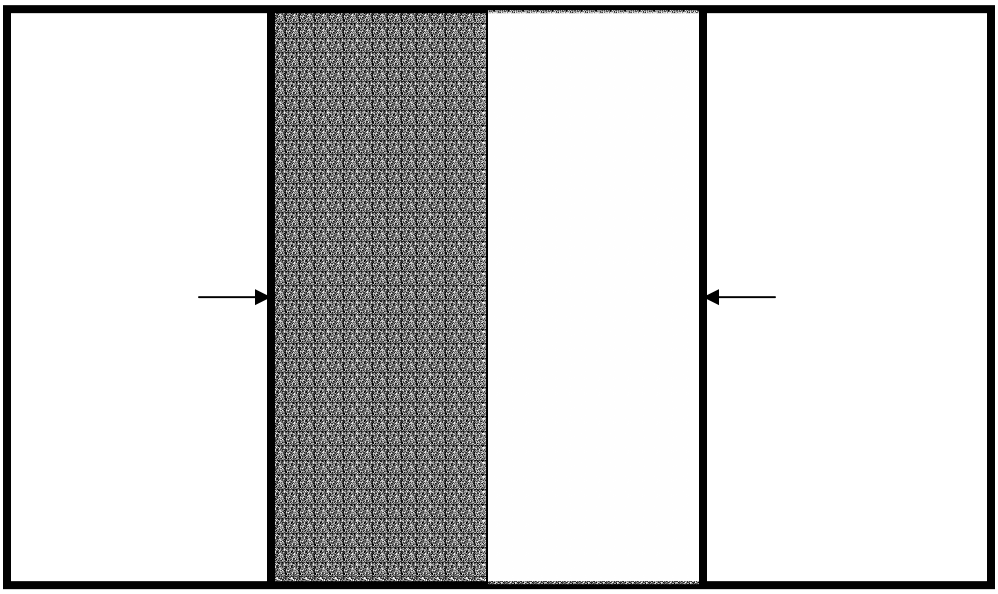
TEGATRON CMD CURSOR CALIBRATION

CALIBRATION

The following is the calibration procedure for the CMD-IV unit:

NOTE: The CMD-IV has been pre-calibrated at the factory and the settings have been stored in memory locations 1, 2, 3 and 4 and should not be changed. Any changes will void the calibration warrantee.

The Tegatron CMD is calibrated for length & width with the 5x, 10x, 20x and 40x objective lenses. The distance between marks on the calibration standard is 10 lines per millimeters. Adjust the cursors as illustrated for each magnification.

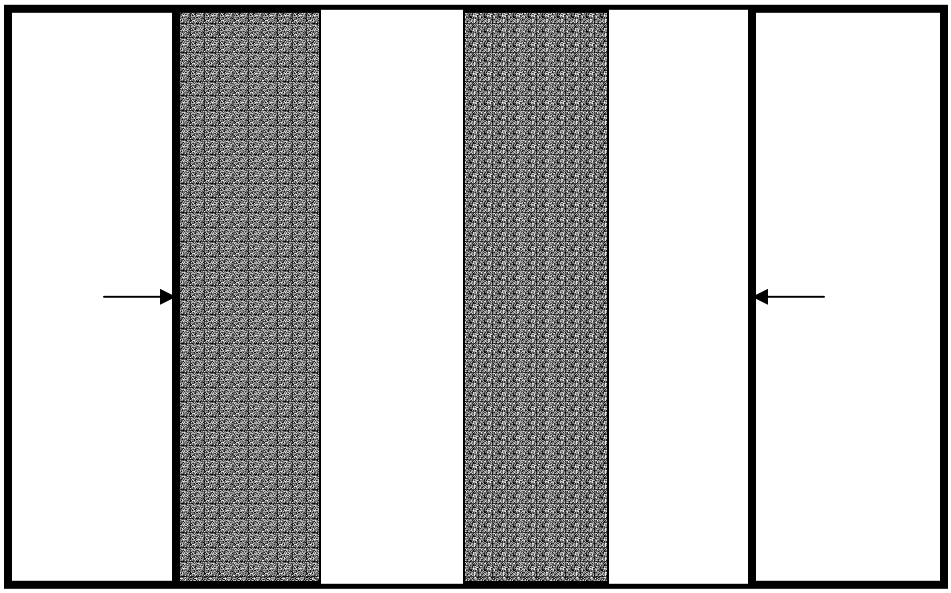


40X OBJECTIVE

(1 dark bar & 1 white bar. Enter value of 100. Save in memory location #4)

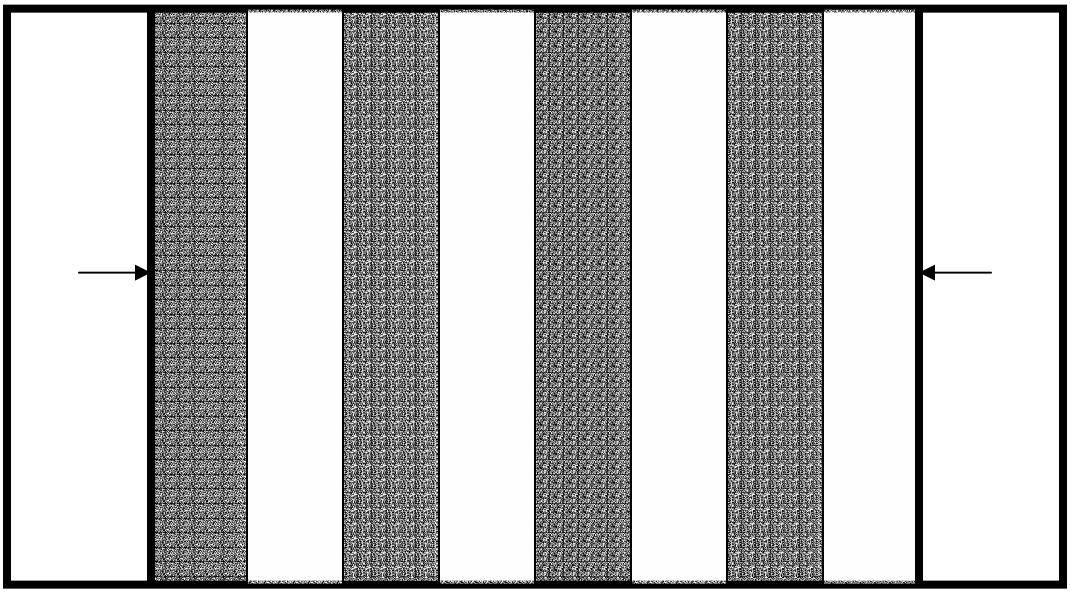
To calibrate the 40X scale, turn the turret on the microscope to where you are viewing the Ronchi Ruling (supplied with new scopes or you can purchase one through Tegatron) through the 40X objective. Using the X axis, move the cursors to the outside edges of 1 dark bar & 1 white bar (as illustrated). Once you have the cursors where you

want them, press the "SET" button. Choose option #1. Enter the value 100 then press "ENTER". Now press "STORE" (red LED should light) and the number 4 (red LED should go out).
Use the same procedure for the other 3 objectives using the images below.



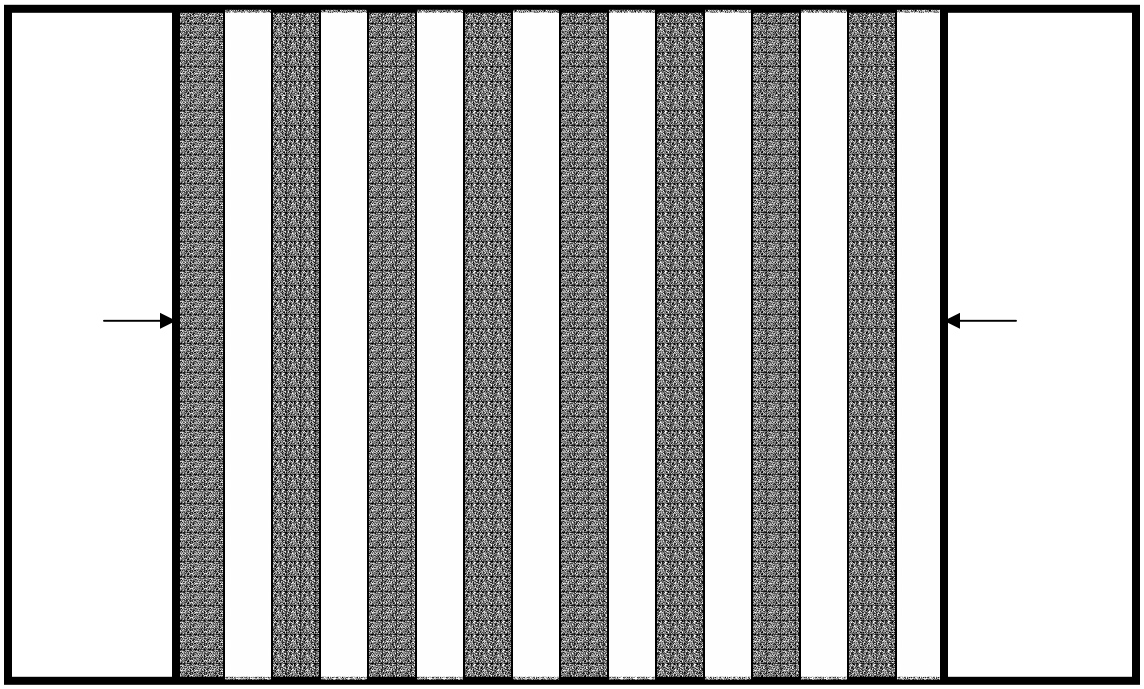
20X OBJECTIVE

(2 dark bars & 2 white bars. Enter value of 200. Save in memory location #3)



10X OBJECTIVE

(4 dark bars & 4 white bars. Enter value of 400. Save in memory location #2)



5X OBJECTIVE

(8 dark bars & 8 white bars. Enter value of 800. Save in memory location #1)

DEPTH

Depth Measurement

If you have the optional Depth gauge installed, use the following procedure to measure the depth of the object you are looking at:

1. Press the "Set" button on the depth gauge to turn the unit on.
2. Using the 40X objective, run the scope down to the bottom of the object you are looking at.
3. Press the "set" button again to rest the counter back to 0.000 (gauge should be in the MM mode).
4. Using the motor switch on the CMD-IV, run the scope up till the top of the object is focused.
5. The gauge should now be showing the depth of the object you are looking at.
6. To turn the gauge off, hold down the on/off - set button for a couple seconds.

There is a 9 pin "D" sub connector on the back of the CMD-IV which is the depth out to run into a PC. If you have the optional PC software, This is where you would get your depth signal.

Digital Video Output

The CMD-IV can be connected to a PC via the USB-2 connector located on the back panel of the CMD-IV. Note: Your PC must have a USB-2 high speed port for this to operate correctly. In order to use this output, you must first install the enclosed software. First, put the cd into your cd drive. The CD should start automatically. Click on INSTALL DRIVER and follow the on screen directions. Once driver is installed, you can then plug in the USB-2 cable from the Digital Video Out (on the back panel of the CMD-IV) to the high speed USB-2 port on your PC. A screen should pop up saying "Found New Hardware". Follow the directions on screen (a screen will pop up saying the software has not passed the Windows Logo Testing. Click "Continue Anyway"). The software should start loading. When done, click "Finish". Continue this procedure till all drivers are installed. You are now ready to use the Digital Video Out.

Note: To simplify operation, do the following:

1. First, see if an icon was put on your desktop that says "amcap.exe". If not, here is how to put the shortcut on your desktop.

2. Go to "C:\Program Files\XL Imaging". Right click on "amcap.exe". Go to "Send to", then click on Desktop "create shortcut". A shortcut to "amcap.exe" should now be on your desktop.

To see your image on the PC screen, hook up the CMD-IV as described earlier and plug in the USB-2 cable. Turn the CMD-IV on. Now double click the icon labeled "amcap.exe. Your image should now be on the screen. An operation manual and additional software is located on the install disc for directions on how to set up the different options available for this program.

Video Snap-Shot Switch

The Video Snap-Shot switch works with the Digital Video Out only. Operation is as follows:

1. Follow the procedure above to obtain an image on the screen. Adjust the cursors using the CMD-IV to obtain the measurements you are looking for.

2. Once you have the image the way you want it, press the "Video Snap-Shot" button. You now have a captured image that can be archived, E-mailed, saved to a file or loaded onto a form.

Specifications

Calibration Entry Range	0.0001 to 9999
Numeric Display Range	0.00001 to 15668400
Significant Digits	Selectable 2, 3, 4, 5, or 6
Password Size	0 to 8 digits, may also be disabled
Scale Display Layout	Row or Column
Calibration Axes	Can be calibrated on X Y axis
Measurement Axes	Any Combination of X, Y and/or Diagonal
Scale Display Position	Movable within 90% center of screen
B&W Select	Menu setting to support B&W video
Line Attributes	Selectable as off, solid or serrated
Rule Mode	Full line or box display
User Defined Memories	10
User Defined Units of Measure	8 (2 digits each)
Color Bars	Not displayed in B&W, PAL or PAL S-Video
Character Cell Display	16x20 pixel cell, interlaced (HxV)
Non-Volatile Memory type	EEPROM
System Microprocessor	16/32 bit architecture
X axis line width	NTSC - 40.75nS (Narrow), 81.5nS (Wide) PAL - 33.9nS (Narrow), 67.8nS (Wide)
Y axis line width	1 scan line (Narrow), 2 scan lines (Wide)
Line Resolution	NTSC - 1280 x 480 PAL - 1536 x 576
Adjustment Range	98% of normal visible raster area minimum
Sync System	RS170A or CCIR
Color System	NTSC or PAL
Genlock	Precision PLL, square pixel
Bandwidth	Greater than 30 MHZ
Input Levels	
Composite	1.0Vpp composite, 75 ohm
S-Video	1.0Vpp (Y), 0.286Vpp burst (C), 75 ohm
RGB	0.7Vpp non-comp / 1.0Vpp comp, 75 ohm
Sync	0.3-4.0Vpp, 75 ohm

Output Levels

Composite	Same as respective input, +/-5% into 75 Ohm
S-Video	Same as respective input, +/-5% into 75 Ohm
RGB	Same as respective input, +/-5% into 75 Ohm
Sync	Same as input level, up to 2Vpp. +/- 5%, into 75 Ohm
Digital	Digital Video out via USB-2 connector.

Connectors

Composite	BNC Female
S-Video	4 pin mini-DIN Female (std. S-Video connector)
RGB & Sync	9 pin D-sub Female
Microscope	10 pin circular Female
Digital Video	USB-2 Type A connector
AC 110-220V	AC power jack input
12VDC - 5A	DC Power Jack Aux. in/out
Depth	9 pin D-sub connector

Remote port (optional)

Data Format	EIA-232 (RS-232)
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200
Data Bits	7 or 8, selectable
Parity	Off or Even, selectable
Stop Bits	1

Temperature

Operating	0 deg ~ 40 deg C (32 deg - 104 deg F)

Humidity

Operating	10% ~ 90% (non-condensing)

Power

Voltage	110 - 220 VAC (Auto-sensing) 12 VDC in via 12 VDC in/out connector
Consumption	270ma typical

Size	9.00" (W) x 7.63" (D) x 2.88" (H)
Weight	1 lb. 14 oz.
Country of Origin	Manufactured in the U.S.A.

Specifications are subject to change without notice.

Warranty

Tegatron Inc. warrants that each CMD-IV system is free from defects due to faulty materials or improper workmanship for a period of one (1) year. Tegatron further warrants that any part which proves defective in materials or workmanship within one (1) year, will be replaced or repaired at no cost to the user. Labor to replace defective parts will be done without charge, provided the equipment is returned to Tegatron, Inc. prepaid, insured and properly packaged.

CONDITIONS

This warranty is void if the warranted part has been altered or subject to abuse or misuse. Defective parts must be returned to Tegatron, Inc.

SOLE WARRANTY

This Warranty is in lieu of all other warranties expressed or implied including, without limitation, any implied warranty or any implied warranty of fitness for a particular purpose. Tegatron, Inc. shall have the final right to determination as to the existence and cause of any defect and its appropriate adjustment in accordance with the terms of this warranty. In no event shall Tegatron, Inc. be liable for any consequential damages.

Returns

Please ship all repairs to: Tegatron, Inc.
47 E 4th St.
Franklin, Oh 45005
U.S.A.
Ph: 937-746-6439
Fax: 937-746-2759