IMG 132E

1.3 MILLION PIXEL CMOS FIELD PLANETARY CAMERA MANUAL

QHYCCD

DIRECTORY

PRODUCT INTRODUCTION

Welcome to QHYCCD astronomical products.

The IMG 132E is a high sensitivity planetary camera, incorporating a Sony Exmor CMOS sensor. In a short period of time it can capture the details of faint celestial objects. Even at high gain settings, the IMG 132E will not have the horizontal or vertical stripe interferences. Its high frame rate and low noise characteristics will allow the users to easily obtain clearer celestial images. Two resolutions are supported: 1280 × 1024 and 640 × 480, with frame rates up to 25 and 86 fps. [Note 1].

The IMG132E features a 32MByte SDRAM image buffer, so, you can get a smooth image display.

The IMG132E supports EZplanetary imaging software. In addition, for WDM video, a driver is supplied which can be used in the field of HD video chat, webcast video conferencing networks, and industrial applications. The latest software updates for the camera are available at: http://www.qhyccd.com/download.html for download.

Before using the camera, please read this manual carefully in order to quickly master the proper use of this product. Always observe any recommend precautions when using the product.

For technical support, please contact your local QHY dealer, or call us at: 010-82428727 (Chinese), or, log onto www.qhyccd.com / contact.html (English) for guidance and answers.

CAUTION: *Before you attach IMG 132E to your computer for the first time, you must install the software as Page 04! If you reinstall system or uninstall the driver, please do it again!*

CAMERA SPECIFICATION TABLE

CMOS Chip	SONY Exmor CMOS IMX035
CMOS Size	1/3 Inches
Pixel Size	3.63×3.63um
Supported Resolution	1280×1024; 640×480
Image Area	4.6×3.7mm
Quantum Efficiency	61% @ blue; @ 63% green; @ 54% red
Readout Type	Progressive Scan, Rolling Shutter
Frame Rate	1280x1024 @ 25 FPS; 640 × 480 @ 86 FPS
ADC	12 (8 Outputs)
Internal Cache	32MByte
USB Interface	USB2.0 High Speed Interface
Telescope Interface	M42 (M) to 1.25 Inches
IR Cut Filter	Yes, Can be Removed to Replace with Other Filters [Note 2]
Weight (Body Only)	166 g
Size	78×62×28mm
Intercept	12.7mm
Power Supply	USB-Powered

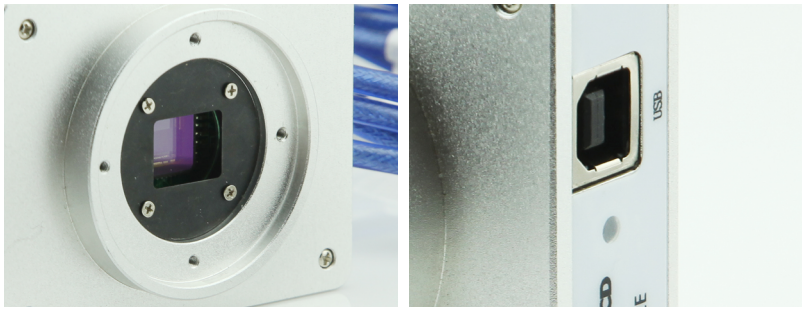
Note 1: Dependant upon computer speed.

Note 2: The filter removal and replacement details are provided in the manual page 07 or contact your product regional agent / QHYCCD technical support.

PACKAGE CONTENTS

Please check that the box contains the following standard / optional items:

1. IMG132E Camera Body×1
2. USB Cable×1
3. M42 (M)×1 (Adapter to Switch to Connect to 1.25-inch Telescope Back)
4. C Mount Adapter Ring×1 (to Connect Lenses, Optional)



Left: Glass Filter Window
Right: USB Sockets and Lights

QUICK INSTALLATION

1. Goto www.qhyccd.com/download.html, download the latest version of IMG132E driver installation program (WINUSB 64/32 version). This version supports Windows XP, Windows Vista and Windows 7, in, both, 64 and 32 bit versions.

2. Run the driver installation program.

3. Using the USB cable, set the USB port of computer and camera connections to desired settings.

4. Connect camera. It should report that it found two new hardware devices: **IMG 132E Base Driver** and **IMG 132E IO Driver**. Select the default option, and click Next until the installation is complete. This should complete the camera installation.

IMG 132E is easy to install and use, And, the camera is very suitable for use by all users, including beginners.

SHOOTING IMAGE WITH EZPLANETARY

EZPlanetary is QHYCCD's own independently developed software package for taking professional images using QHY camera models. Its friendly interface and easy to use commands, allows anyone to get professional quality image results, quickly and easily.

1. SOFTWARE DOWNLOAD AND USE

1.1Software download

Load EZPlanetary software from the supplied CD-ROM or download the latest version from www.qhyccd.com/download.Html, double-click to open the installation interface.

1.2 Select the camera model from the Camera menu bar

Click IMG132E and select the desired acquisition resolution. The lower the resolution, the faster the acquisition frame rate.

After starting the software, it will preview the image in the right column, displaying a real-time picture of the acquisition. The preview bar will only display a black/white screen. While observing it, adjust the lens focal length, aperture stop, and

1. Video Capture
2. Color Balance
3. Focus Aid
4. Histogram
5. Display LUT

EZPlanetary GAIN and EXPosure sliders to get clear, natural images.

2. EZPLANETARY TOOLBAR

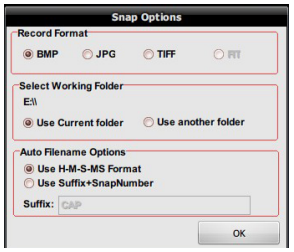
2.1 Video Capture

GAIN: Allows user adjustment of the camera's gain through an ADC programmable gain amplifier. Setting range from 0-8000. The higher the sensitivity value, the more obvious noise will be.

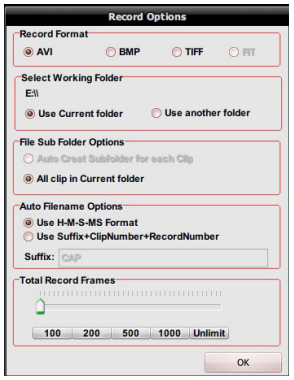
EXP: Is the single frame exposure time setting. Clicking the scroll bar to the upper right of the x1 ms will allow you to switch the exposure multiplier range into X10 ms or X100 ms. Exposure time can be increased by 10X or 100X.With a frame rate prompted EZPlanetary, according to the selected resolution, if the single frame exposure time is too long, causing the frame rate dropped to produce a coherent image, slide bar will turn red highlights.

Snap / REC : image format, storage location, file naming conventions and shooting frames and other parameters.
Sets are located in the File menu under the Snap Options / Video Record Options.

Shooting uncompressed video: open the video capture



Snap Options



Video Record Options

settings window and select the desired format (AVI video, BMP, or TIFF image sequence). The FIT image is only available in the RAW (Mono) mode. If you choose the RAW format, AVI files will be saved as monochrome AVI; its data file is only one-third the size of the color AVI. Thus, this mode can be used when tight on disk space, or, when the machine speed is not very fast. Later, through post processing software one can achieve the color images. Set the file location, file name, shooting frames and other information. Click REC to start recording video, click again when recording is completed.

2.2 Color Balance

Under normal circumstances, the color balance is correct for a daylight shooting environment, and, screen colors are not adjusted to restore the color of the object. Astronomy objects are different and therefore need to be adjusted.The color balance of the three RGB channels is separately adjusted for image color correction. The color balance adjustment range of is 0-191, each color channel individually adjustable, and one can increase the intensity of each color channel.

Manually Adjust the White Balance: Manual adjustment of the white balance is the most accurate and most versatile method to achieve good color correction. Put a blank sheet of paper in front of the CCD before adjusting for the current lighting conditions. The location of this white paper should just fill the screen of the CCD image. The bar on the bottom left of the Histogram column allows you to observe the Color Balance. Under normal circumstances, the RGB channels appear on the histogram in three locations and do not overlap each other. Using the RGB sliders to adjust the Color Balance, a proper RGB histogram of the three channels will slightly

overlap with the next one . When red just overlaps green and green just overlaps blue, that is the accurate white balance position.

Global White Balance: Automatic white balance adjustment can be made by clicking on the Color Balance Global WB button, the software will automatically adjust the white balance.

Spot White Balance: A single-point white balance. In some cases, Global WB can not provide a good white balance correction, such as a screen shot where the red channel accounts for most of the image. Using the Global the WB, the software will automatically adjust red resulting in gray instead of white. To avoid this from happening, you can use a single-point white balance.

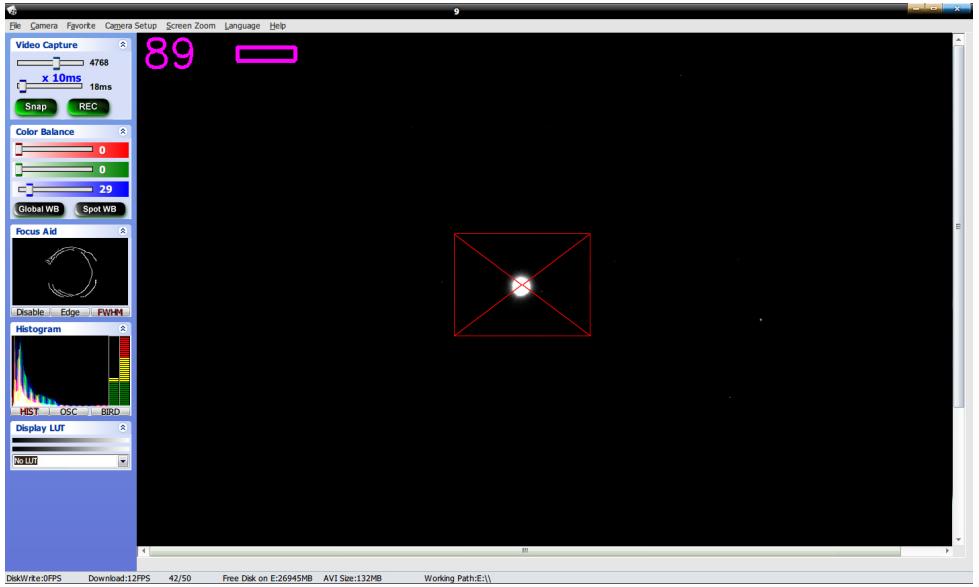
Click Color Balance, Spot WB button for the single-point white balance function. The icon will have the shape of little hands, and the WB button will turn blue. At this point in the real-time display screen, double-click a location which should be gray (or white) on the screen. The software will be able to calculate the white balance according to the point RGB values, and that white balance value is then applied to the whole image map.

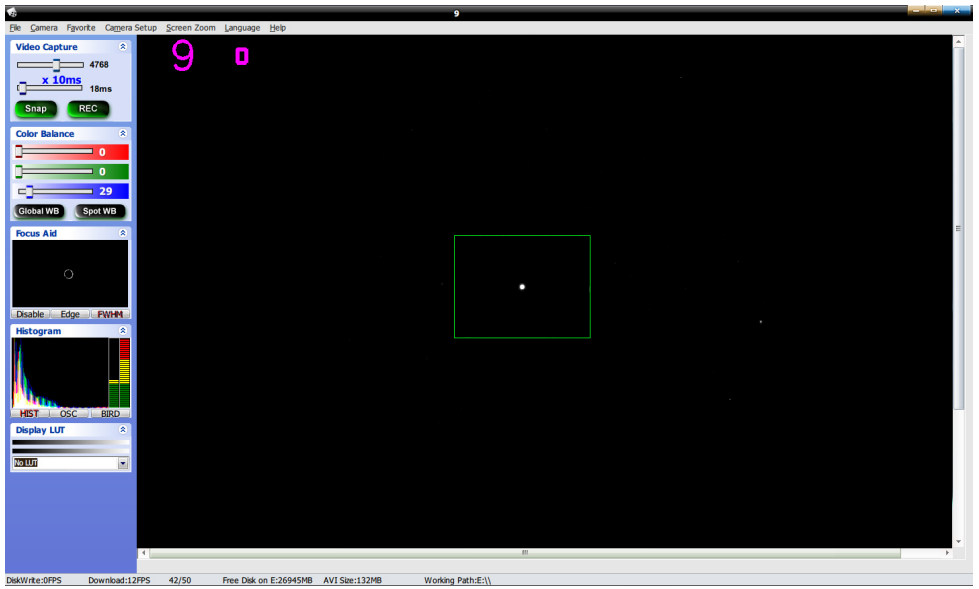
2.3 Focus Aid

The Focus Aid contributes to a more convenient focus through two methods: EZPlanetary's Edge command and FWHM command.

Edge: After selecting the Edge button with the mouse, double-click to select the Preview column normally used to focus a region. Edge will show the portion of the focus box in much greater detail than is shown on the main Preview screen and thus be more accurate. The smaller value, the more accurate the target focued.

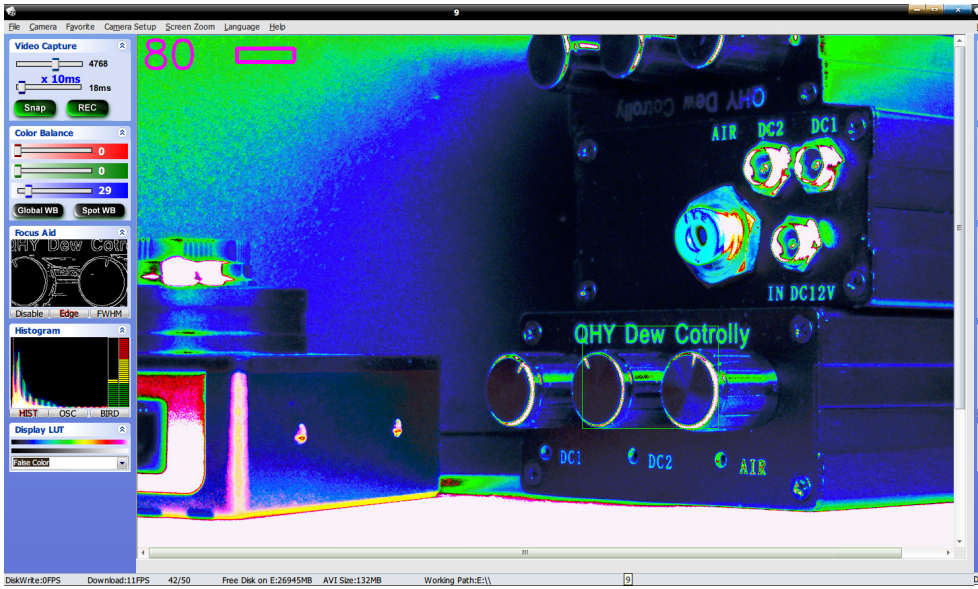
FWHM: Click on the button and with the mouse double-click to select preview column normally used to focus. The top left of the preview bar displays the FWHM value. The smaller value, the more accurate the target focued. This function is available for camera focus only in pure background with stars, but not for sun or daily scene.





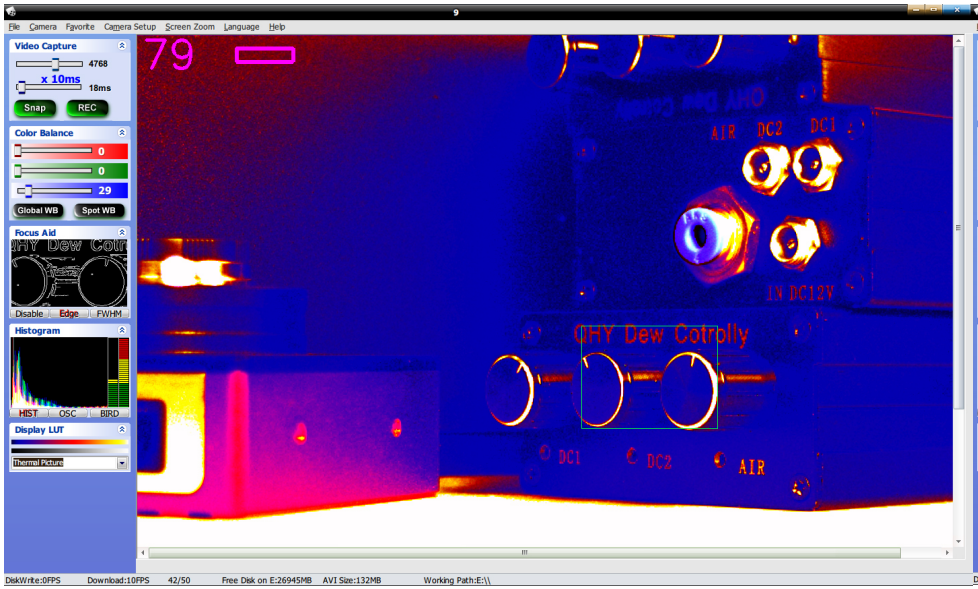
Double-click to select the location of the main interface of the preview bar needs to focus, observe the value of Focus Aid, preview the images and the main interface of the box top left of the preview bar, you can easily determine the focus is accurate.

QHYCCD



False Color Mode

Black/OverExposure Mode



Thermal Picture Mode

Negative Mode

2.4 Histogram

HIST: When selected, it will display a standard histogram of the photo. Both, the dark and the bright parts of the image, along with white balance can be analyzed with great accuracy.

OSC: Waveform

BIRD: Full map preview.

2.5 Display LUT

There are four kinds of default processing of predefined data processing in real time image processing mode: False Color, Thermal Picture, Black/OverExposure and Negative, the users can select any of them as needed. This additionally allows three kinds of customer defined custom modes. Photoshop and other graphic image software editors along with their corresponding reference articles are set to install in the LUTMAP folder.

Black/Over Exposure: Use this mode on the overexposed areas shown in red, underexposed areas are blue features, you can adjust the GAIN/offset value for the regulation to obtain a normal exposure picture.

2.6 Other Menu Bar Options:

TimeStamp Show: When this feature is selected, the timestamp will be displayed on the screen.

Favorite-Show the OSD: Select the function on the screen will display the OSD box.

Favorite - High Priority Disk Write: This is part of the small memory of the graphics to make improvements. You can reduce the display frame rate, slower graphics to ensure that the file's writing speed.

Favorite-Quality the Filter Setting: Slider set to retain image quality, low-quality images can be filtered and removed the atmospheric jitter impact on image quality, suitable for astrophotography.

The Camera Setup-Color/Mono: Different cameras have different Bayer Pattern. We can choose a different Bayer Pattern, to get the right color. RAW (Mono), do not use the Bayer Pattern, image monochrome.

The Camera Setup-other setting-Offset: The adjustment range is 1-100. Slight backlight compensation on the image, to increase the overall brightness of the image, to avoid the darkest pixel value less than 0.

Screen the Zoom: Adjust the screen aspect ratio. Note that this setting is only to change the display ratio do not to change the size of footage.

Language: Select the display language.

Help: Display help on the information.

CREATING VIDEO WHTH WDM

1. SOFTWARE DOWNLOAD AND USE

1.1. Software to Download and Use

You may load WDM from the CD Rom or download it from: www.qhyccd.com/download.Html you may download WDM.

Installing the software is easy. Extract the compressed package. Run the WDM Driver Installer.exe to install the driver file. After installation has finished, you should see a webcam application directory. Inside of it, double-click the IMG132E_WDM.exe file to run the program.

1.2. Select the Camera to Obtain Images

Double click the icon which will appear in the Windows system tray double-click the icon to display the software interface. After you connect the camera, click the VIDEO button, the camera begin to work in the preview window. The console will display the video screen.

1.3. High-definition Network Video

The IMG132E has two possible resolution settings: 1280 × 1024 and 640 × 480. Select the video function in a third-party software to start using the IMG 132E as high-definition video camera. In this case, the software and network must operate at the same setting in order to use this feature.

2. TOOLBAR

GAIN: You can adjust the gain of the camera.

Exposure: You can adjust the camera's exposure time. Click on the scroll bar to the upper right x1 ms, can be switched to x10 ms,

It provides a very simple and friendly WDM interface

x100 ms, exposure time range.

White Balance: Three scroll bars adjust the proportion of red, green and blue colors, respectively, in order to achieve the manual white balance control on the image.

Offset: You can adjust image backlight compensation slightly to avoid the darkest pixel value being less than 0.

Full Size Video: Highest resolution of the video screen is displayed in a new window.

Time: In the preview window, you can have the time superimposed on the current video image. The timestamp shows time in milliseconds.

Overlay: A video image may be superimposed on a static image. Static image is saved on the software directory with the filename, overlay.bmp. You can edit according to your needs with any image editing software for special effects, such as borders or character message superimposed effect.

The Select LUT model: With this drop-down box, you can choose some special image processing effects, such as, pseudo-color, thermal sensor, film and color correction.The software is capable of having video data in real-time image processing, output to the preview window, a large video screen window, or WDM streaming video.

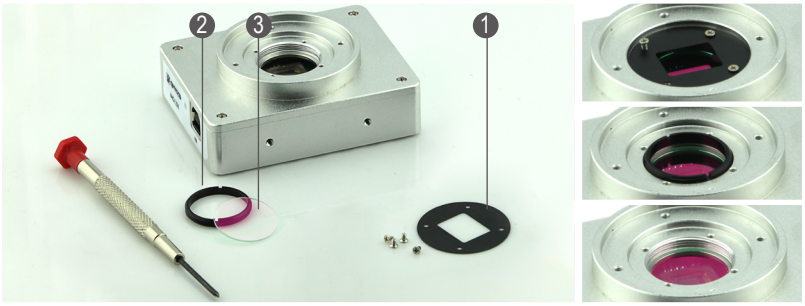
CMOS SURFACE CLEANING

If the CMOS surface gets dust and dirt, this will lead to degraded imaging results.To avoid poor results, cleaning may become necessary.

1. For smaller dust and stains, it is first recommended to try to use software flat-field processing. This will improve image quality without needing to open your camera.

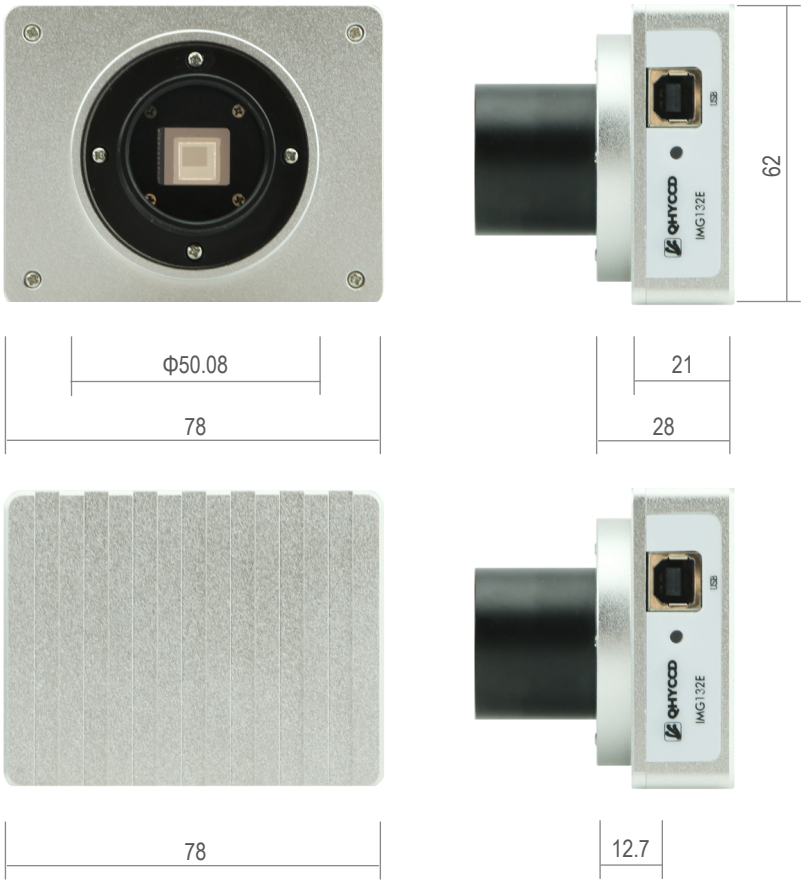
2. for the larger dust and dirt which a flat field can not eliminate, you can follow the steps below to remove the infrared filter and clean the detector's optical surface.

> Remove the four screws holding the shade film in place;
> Counterclockwise rotation of the filter ring will allow the filter to be removed;
> Carefully remove the infrared filter, paying attention not to touch or scratch the surface;
> Cleaning the surface of the CMOS and reverse the steps to reassemble the camera.



• Using a clean rubber bulb, gently blow dust off to clean the surface.
• For dust which can not be blown off, use lens paper or a commercially available SLR Camera Cleaning Kit to clean the surface of the CMOS.
• Lens paper: Take a single sheet of lens paper and fold it once or twice (do not fold too much, and lens paper is easy to produce sharp edges can scratch the CMOS glass surface). Wet the paper with some distilled water, and, gently drag the lens paper over the CMOS to maintain an appropriate pressure to wipe off dust and stains.

DIMENSIONS AND FRONT FLANGE



All units are in millimeters.

IMG 132E Distance to sensor: 12.7mm