# MallinCam Micro Extended Control Software

Overview

This is a description of the MallinCam Micro Extended Control (MMEC) software for the MallinCam Micro video camera for Astronomy. This is a Windows based application that provides remote control of the MallinCam Micro from a laptop or PC. A program control cable is connected to the Micro's control port and the other end to the Laptop's USB port using a cable available from MallinCam or an approved vendor. For installation instructions, see the Installation section.

It is recommend you download MallinCam's Micro-EX Camera manual and familiarize yourself with the operation of the Camera before using the MMEC app. You can use the Manual Control buttons of the MMEC app to initially set up the camera as described in the manual, which is available at http://www.MallinCam.net/uploads/2/6/9/1/26913006/micro_ex_user_manual.pdf. See Appendix D in the Micro-Ex User Manual for cable and driver installation for controlling the MallinCam Micro from your computer. Be sure COMM ID is set to 1 and BAUDRATE is set to 9600 on the system settings portion of the Micro's menu.

Main Window

The MMEC main window consists of setup information and Presets

A. Setup information – The COM selector at the bottom of the main window provides the means to set the appropriate Com port for the camera. Just above this is a means of adjusting the speed of Preset Menu commands if needed.

B. Exposure Presets – The majority of the main window contains the extended control portion which allows a specific type of setting (e.g. Moon, Sun, DSO, Custom, etc.) to be selected, which will initiate the sending of a series of preset commands to automatically change the Micro's exposure & enhance settings. After the preset commands are sent to the camera, the exposure/enhance settings can be further adjusted using the Adjustments window by clicking on Adjustment on the menu bar. The Manual Control window can be displayed by clicking on Manual Control on the menu bar.
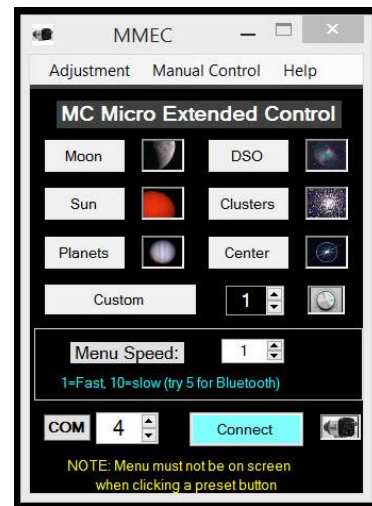
Presets

Presets are great!* Clicking on an Exposure Preset button will set the camera to specific values for that Object type. The Center preset is useful to center a bright star to initially focus your camera. Then Click on the Custom 1 Preset for fine focusing. Custom Presets can be selected/expanded for other specific uses. The Center preset is also useful anytime you slew to a new target to assist centering the target using a fast screen update rate before clicking on a Preset with a slow screen update rate. DSO and Clusters use multi-second exposure settings while the

Moon, Sun and Planets presets use exposure settings less than a second. The Cluster preset also makes a good "preview" for centering Deep Sky Objects before clicking on the DSO preset.

*Yep, this is an asterisk. Presets are great when they are tailored to your equipment setup. That is why you can easily modify every standard Preset object to suit your own needs. You should consider the initial values provided in these Presets as a starting point. Use the Adjustments button to play with the settings while you are viewing an Object like Clusters. Once you know what works well for your equipment, use an editor (e.g. Notepad) to modify that Preset. You may find the standard Preset for the Moon is OK when it is partially full, but is over/under exposed for other phases. You can click the Moon preset and then vary the exposure time by clicking on the Adjustments button until the image looks good. You can also be creative and make several Custom presets for the Moon (Custom 20 is already setup for the full Moon). I recommend using the standard Preset format, which deals with just Exposure and Enhance settings, when first making new Custom presets. Later, you can learn how to use the Manual Preset format to change other settings.

Here is an important note about using Presets…

IMPORTANT: The Micro's Menu must not be displayed on the screen when clicking a Preset button. Presets send a sequence of commands to the camera just like you were pressing buttons on the back of the camera, but assumes the menu is not on the screen when it begins sending the commands. IF the menu is on the screen, before clicking a Preset button you should use the Manual Control buttons to move to the Exit selection and Exit the On Screen Menu.

Exposure Adjustments

Clicking on Adjustment in the menu bar of the main window displays a window with controls for adjusting the Exposure and Enhance settings. Click an exposure button on the left or an Enhance button on the right and then use the left/right buttons to adjust that setting. Multiple settings can be selected and adjusted before saving. Observe the display screen as you make adjustments to immediately see the effects of your changes. You can also turn on/off crosshairs if you have set them up as described later in this manual. When finished, click SAVE to set the changes in the camera (this will cause the camera to reset using the new saved settings). If you do not want to keep the setting changes you just made, click on Cancel and the camera will revert to the settings prior to your adjustments.
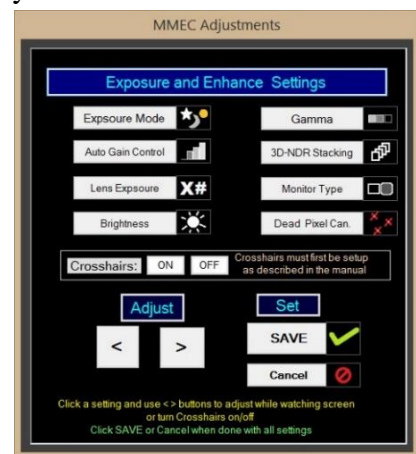
Manual buttons

The manual button window simulates pressing the up/down/left/right/enter buttons on the back of the Micro.
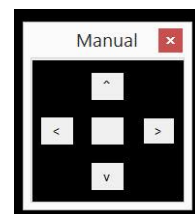
Typical Operation

1. Select COM #
2. Click Connect
3. Click Center - this will send a series of commands to the Micro to set its Exposure settings to aid centering and coarse focusing on a star at the beginning of your session (AGC is set to high and Lens is set to x16). You can click on Center, slew to a bright star and initially adjust your focus. Then place a Bahtinov focus mask on the end of your telescope, click on Custom 1 (fine focus), finish focusing and remove the mask.
4. Click Center, slew to an object, center it on screen and then click the object's Preset type - The Center Preset is useful anytime you slew to a new object to enable you to use your mount controls to easily place the object in the center of the image (this Preset uses a fast update rate). Then click on the object's Preset. This will send a series of commands to the Micro to set its Exposure & Enhance settings for the type of object selected (e.g. DSO, Moon, etc.). The amount of time between clicking an object Preset button and the seeing the first image of the object will vary. Bright objects such as the Moon and Sun will appear quickly (Exposure will be set to WDR for the Moon and HLI for the Sun). The first image of a DSO will appear after about 17 seconds (the DSO preset turns AGC off and sets Lens to X1024).
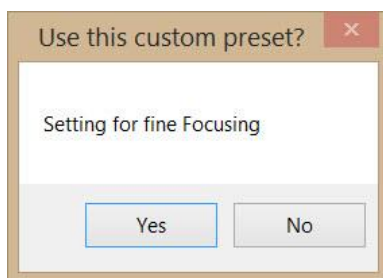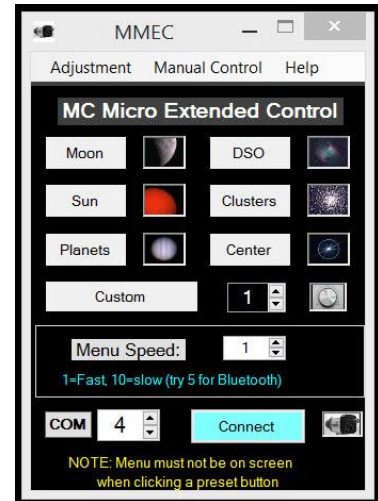
Whenever you click on a Custom preset, a Yes/No prompt will provide a short description of that preset before using it.

5. **Click Adjustment to further fine tune setting if needed –** this will display the Adjustments window allowing fine tuning of the Exposure or Enhance settings for the target object.

6. **Click on an Exposure/Enhance setting -** this will select that item, which will be shown on the On Screen Display menu.

7. **Click Left/Right arrows to adjust the setting while watching screen image -** this will adjust the selected Exposure/Enhance setting. Watch the display screen to observe the effects of your adjustments. You can continue to repeat steps 6 & 7 as much as needed.
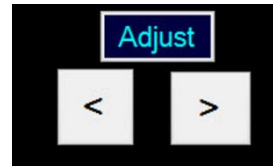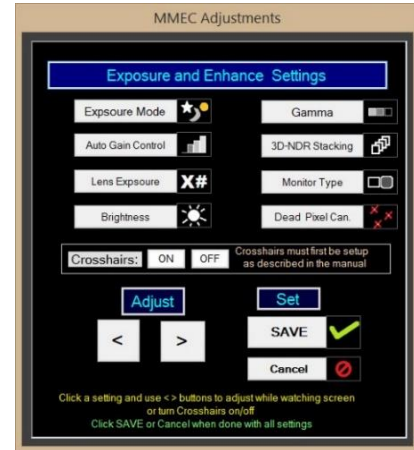
You can also turn on/off crosshairs if you have set them up as described later in this manual.

8. **Click Save to set camera -** the adjustments you made will be saved in the Camera and the OSD menu will be removed from the screen. (If you want to discard your adjustments, click on Cancel instead).

When you are ready to slew to a new object, click on the Center preset, slew to the object, use your mount controls to center the object, and then click on the appropriate object Preset button to better view the object. Then click on Adjustments to fine tune the Exposure or Enhance settings if needed.

Other actions:

Use the Manual Control simulated buttons to manually navigate the Menu on screen and change other settings. Be sure to exit the on screen Menu when done (the Menu should not be on screen when clicking a Preset).

Adjust speed of Preset Menu commands if needed (1=Fast, 10=slow). If a Preset does not complete properly and the menu stays on screen, use the Manual Control buttons to Exit the on screen menu then select a slower Preset Menu Speed. Try setting to 5 if using Bluetooth communications.

Click Crosshair On/Off and then click Save to turn crosshairs on or off (if you have them set up).

Standard Preset Customization

You can customize any of the standard presets to better match your equipment by making changes to the appropriate preset text file. The following standard preset text files can be found in C:\MicroSettings:

      setMoon.txt
      setSun.txt
      setPlanets.txt
      setDSO.txt
      setCluster.txt
      setFocus.txt
      setCustom1.txt
      setCustom2.txt
      setCustom11.txt
      setCustom12.txt
      setCustom13.txt
      setCustom20.txt

The valid values for each of the standard preset parameters are shown below. These values can also be found in the ValidValues.txt file.

    Exposure: Normal, BLC, WDR, HLI

    SenseUp: Off (this setting should not be on for Astronomy use)

    AGC: Off, Low, Medium, High

    Lens: x1024, x512, x256, x128, x64, x32, x16, x8, x4, x2, Auto, 60, 100, 120, 250, 500, 1000, 2000, 4000, 10000, 100000

    Brightness: 0-99

    Gamma: 0.3, 0.45, 0.6, 1.0

    3D-DNR: 0-5

    Monitor: CRT, LCD

    DPC: Off, Auto

If no value is specified for a setting (or OK is used), the current setting will remain unchanged. A comment describing the preset can be added at the end of the first line in the file after a dash.

Standard Presets can be modified to tailor them to your equipment. You can find the settings used in each of the supplied Presets and Custom files later in this manual.

For example, the content of the setDSO text file is shown below.

     Exposure: Normal - DSO Preset
     Senseup: Off
     AGC: Off
     Lens: x1024
     Brightness: OK
     Gamma: 0.3
     3D-DNR: 0
     Monitor: OK
     DPC: Auto

If you wish to use a shorter exposure time, just change the x1024 to x512 (or whatever value you wish the DSO preset to use). If a setting should not be modified when clicking on a preset, use OK or leave the parameter blank. The Object Presets do not modify the Brightness setting (the Brightness setting takes longer to change). Note: SenseUp is always set to Off since it is not recommended for Astronomy use.

You can use this standard preset format for Custom presets as well. The setCustom2.txt file illustrates how you can use a custom preset for a specific purpose.

Exposure: Normal - Set Brightness to 40
Senseup: OK
AGC: OK
Lens: OK
Brightness: 40
Gamma: OK
3D-DNR: OK
Monitor: OK
DPC: OK

If you select 2 next to Custom, and click on Custom, you will see a "Use this Custom preset? - Set Brightness to 40" prompt. Clicking on Yes will change the Brightness to its normal setting of 40. You can add several setCustomN.txt files and select them in this manner. Just copy an existing standard preset, change the settings values, modify the description on the first line and save it as setCustomN.txt (e.g. setCustom7.txt).

Selecting Custom 11, 12 or 13 will set the Exposure and Enhance values according to the examples in the Micro-EX User Manual for the Moon, Bright Star/DSO and DSO with stacking. (You will have to manually adjust the sharpness to 20, WDR level = 10 and ATW=auto if needed).

Selecting Custom 20 illustrates how you can make slight variations of an Object Preset. The standard Moon preset is for a partial Moon. The Custom 20 preset is for a full Moon.

Manual Custom Presets

Manual custom presets can be used to adjust settings on menu selections other than Exposure and Enhance. Manual custom presets use a different format and are more involved, and are less "bullet-proof" than the standard preset format. The following manual custom preset text files can be found in C:\MicroSettings:

> setCustom3.txt
> setCustom4.txt
> setCustom5.txt
> setCustom6.txt

The valid values for actions in a manual custom preset file are shown below. These values can also be found in the ValidManualValues.txt file.

> Manual
> Enter
> Up
> Down
> Left
> Right

The first line of a manual custom preset should always begin with "Manual" followed by a dash and a short description of what it accomplishes. All other lines are action or comment lines. A number can be added after an action to indicate how many times to repeat that action (e.g. Left 3). A comment line beginning with a dash can be used to identify a group of actions.

IMPORTANT: Once your action commands have navigated the menu to the setting you wish to change, your custom preset needs to first get the selected item to a default setting, and then change it to the setting you wish. To get the item to a known default setting, first use Left M where M=Maximum number of values for that setting. Then use Right N where N=number of action "button presses" to get to the desired value for the setting.

For example, Gamma has four settings. To select the third setting (0.6), use Left 4 followed by Right 2 (the third setting is two over from the first setting). If you wish to select the default setting (0.3), just use Left 4 (no Right action is needed). If you wish to select the highest setting (1.0) you can just use Right 4 (no Left action is needed).

Always end your manual custom preset with appropriate actions to move to Exit and select Save. The on-screen display Menu should not visible when done.

The setCustom3.txt is an example of changing the mirror setting to Horizontal and contains the following lines:

Manual - Change mirror setting to Horizontal
- Display Menu
Enter
- Move to Effect
Right 3
- Set mirror to horizontal
Down
Left 4
Right
- Return to Menu
Up
Enter
- Exit and Save
Right 5
Down 2
Enter

The setCustom4.txt file changes the mirror setting to vertical and the setCustom5.txt file changes the mirror setting to rotate (this flips it both horizontally and vertically). The setCustom6.txt file changes mirror back to Off, its standard setting. The only difference between these 4 files is the section that sets the mirror setting. The Custom 6 file uses the following:

- Set mirror to off
Down
Left 4

As previously noted, you can add several setCustomN.txt files. A custom preset should be named setCustomN.txt, where N=1, 2, 3, etc. (e.g. setCustom3.txt). Custom presets can either be in the standard preset format (easier) or this manual preset format (involved). Standard presets can only modify Exposure or Enhance settings. But Manual presets can modify any item on any menu selection.

DISCLAIMER: Care should always be taken when creating manual custom preset files. Test each step of your manual custom preset using button presses and watch the screen before trying using it with the MMEC application. If you create the wrong sequence in your manual custom preset file, you may wind up changing the wrong settings.

Remember...To Err is Human, to really foul up requires a computer!

Actually you cannot really harm anything. If things did not go the way you planned and the On-Screen Display menu is still on the screen, use the Manual control virtual buttons to move to Exit and exit the menu by selecting EXIT (not SAVE/EXIT) so it reverts to your previous good settings (otherwise you may have to manually adjust some settings back to their normal values).

Using Crosshairs

You can turn crosshairs on and off from the Adjustments window if you have previously set them up. The privacy function of the Micro allows you to create masks on the screen of various colors. By using the light gray color and adjusting four of the masks to create small vertical or horizontal bars, you can create a nice crosshair to assist centering your objects. It takes time to first set this up, but when done you simply turn them on and off. The crosshair on/off buttons on the Adjustments window assume masks 3-6 are used for crosshairs. The steps below set up masks 3-6 to create crosshairs. You can use the manual control portion of the main MMEC window to virtually press the buttons using a mouse, or you can press the actual buttons on the back of the camera.

1. Begin by pressing the middle button to display the menu and then use the right arrow to move over to Privacy. Press the middle button to select Privacy.
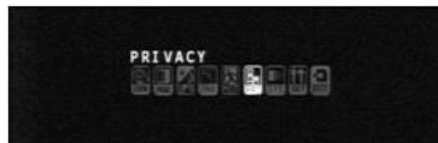
2. Now press the right arrow until Mask 3 is displayed. Press the down arrow to select Mode and then the right arrow to turn it on. Press the down arrow to select Color then press the right arrow until color 7 is shown. (You may see various shapes displayed as you adjust each mask's values).
3. Press the down arrow until Top is highlighted and then use the right/left arrow to set X to the value shown in the table below for Mask 3. Then use the up/down/left/right arrows to select and set the X values shown for Left, Right, Bottom and Move. Sometimes a setting stops changing and you have to set another one first. You may have to readjust values until you get all the values set as shown (the settings interact with one another).
4. With one of the X values highlighted, press the middle button to toggle to the Y values. Then use the up/down/left/right arrows to select and set the Y values shown in the table below for Top, Left, Right, Bottom and Move.
5. When finished with Mask 3, use the up arrow to highlight Mask and then press the right arrow to switch to Mask 4. Repeat steps 2-4 to set the values for Mask 4 as shown in the table below. Do not delay too long between setting each Mask or the camera will timeout and not save your work.
6. Repeat the above for Masks 5 and 6.
7. At this point you should see the complete crosshair as a screen overlay.
8. Press the down arrow to highlight Return and then the middle button.
9. Press the right arrow until Exit is highlighted and then the middle button.

10. Use the down arrow to highlight Save/Exit and then press the middle button.

11. You should now see your completed crosshair on the screen.

The table below contains the values to use for Masks 3-6 to create your crosshair.

Mask Select	3	4	5	6
Mode	ON	ON	ON	ON
Color	7	7	7	7
Top X	143	97	147	143
Left X	143	97	147	143
Right X	145	140	190	145
Bottom X	145	140	190	145
Move X	144	118	168	144
Top Y	33	67	67	70
Left Y	65	68	68	102
Right Y	33	67	67	70
Bottom Y	65	68	68	102
Move Y	49	67	67	86

Installation

Be sure to first download your own copy of the application from RemoteVideoAstronomy.com.

1. Download the MallinCam Micro Extended Control application zip file from the Downloads tab at RemoteVideoAstronomy.com.
2. Unzip the file and click on setup.exe in the extracted folder.
3. Click on the Install button when the Application Installation Security Warning window is displayed.
4. The MallinCam Micro Extended Control application will automatically run when the installation is complete.

   The first time you click on the Connect button, an End User License Agreement window will be displayed. After you close the Agreement window it will not be displayed again.

Upgrading or Reinstalling

NOTE: If you are upgrading from a prior version of the MallinCam Micro Extended Control application, your existing presets will remain unchanged. If you get a message that it is already installed from a different location, go to the control panel and uninstall "Micro Extended Control" and then install the new version. Your existing presets will remain intact.

This version has some modifications to the Object Presets from the previous version. If you wish to use the new Preset values, delete the folder C:\MicroSettings and it will recreate a new one containing the new Preset values.

You may want to make a copy of C:\MicroSettings before you begin altering any of the presets in case you want to return to any of the original values.

Troubleshooting

Sometimes clicking on Connect does not connect

Cause: The USB cable is loose, you selected the wrong Com port, or another program is using the selected com port

Solution: Check to make sure your cable connections are snug. Go to the Windows Device Manager and click on Ports to make sure you are using the correct Com port that appears when you plug in the USB cable. You may need to start the MMEC application first before starting other programs that use serial communication.

Clicking Connect works, but none of the buttons bring up the menu

Cause: The video cable or camera power is loose, you selected the wrong active Com port, or the video display software does not have the video capture device selected properly.

Solution: Check to make sure your cable connections are snug. Go to the Windows Device Manager and click on Ports to make sure you are using the correct Com port that appears when you plug in the USB cable. Check your video display software to make sure its video device is set to your capture device, and its video input is set to video composite.

Sometimes the menu is still on the screen after using a preset

Cause: The preset commands are being sent too fast for your communication connection.

Solution: Use the Manual control virtual buttons to move to Exit and exit the menu by selecting EXIT (not SAVE/EXIT) so it reverts to your previous good settings. If this continues to occur, select a slower Preset Menu Speed by changing it to a higher number (1=Fast, 10=slow). If you are using Bluetooth communications, try setting the Preset Menu Speed to 5 or higher.

Sometimes the Adjustment screen does not work properly

Cause: SenseUp has accidently been turned on, which affects the menu command sequence.

Solution: Click Cancel on the Adjustment screen. If the menu is still on the screen, use the manual control buttons to exit the menu. Now click on a Preset button (e.g. Moon) to return to working settings.

My manual custom preset does not always work the same

Cause: Some other setting has been changed that causes the menu navigation to be different from when you first tested your manual custom preset.

Solution: Open up your custom preset (e.g. with Notepad) and use the manual buttons to single step through each of your preset actions to see where it does not navigate properly. Change a menu setting manually as needed, or add steps to your manual custom preset to make sure that settings match what you were expecting.

Other issues

See also Appendix D in the Micro-Ex User Manual for cable and driver installation for controlling the MallinCam Micro from your computer. Also see its Appendix F for additional troubleshooting tips.

Preset and Custom Settings

Below are the settings used in each of the object Preset files in C:\MicroSettings.

setMoon.txt
Exposure: WDR - Moon Preset
Senseup: Off
AGC: Low
Lens: 1000
Brightness: OK
Gamma: 1.0
3D-DNR: 5
Monitor: LCD
DPC: Off

setDSO.txt
Exposure: Normal - DSO Preset
Senseup: Off
AGC: Off
Lens: x1024
Brightness: OK
Gamma: 0.3
3D-DNR: 0
Monitor: OK
DPC: Auto

setSun.txt
Exposure: HLI - Sun Preset
Senseup: Off
AGC: Off
Lens: 10000
Brightness: OK
Gamma: 1.0
3D-DNR: 0
Monitor: OK
DPC: Off

setCluster.txt
Exposure: Normal - Cluster Preset
Senseup: Off
AGC: High
Lens: x64
Brightness: OK
Gamma: 1.0
3D-DNR: 5
Monitor: OK
DPC: On

setPlanets.txt
Exposure: Normal - Planets Preset
Senseup: Off
AGC: Low
Lens: 100
Brightness: OK
Gamma: 1.0
3D-DNR: 3
Monitor: OK
DPC: Off

setCenter.txt
Exposure: Normal - Center Preset
Senseup: Off
AGC: High
Lens: x16
Brightness: OK
Gamma: 0.45
3D-DNR: 0
Monitor: OK
DPC: Off

Below are the settings used in each of the standard format Custom files in C:\MicroSettings.

setCustom1.txt
Exposure: Normal - Setting for fine Focusing
SenseUp: Off
AGC: Medium
Lens: x2
Brightness: OK
Gamma: 0.6
3D-DNR: 0
Monitor: OK
DPC: Off

setCustom11.txt
Exposure: WDR - Moon example
Senseup: OFF
AGC: Off
Lens: 10000
Brightness: 40
Gamma: 1.0
3D-DNR: 0
Monitor: OK
DPC: Off

setCustom2.txt
Exposure: Normal - Set Brightness to 40
Senseup: OK
AGC: OK
Lens: OK
Brightness: 40
Gamma: OK
3D-DNR: OK
Monitor: OK
DPC: OK

setCustom12.txt
Exposure: Normal - Bright Star/DSO example
Senseup: OFF
AGC: Off
Lens: x128
Brightness: 40
Gamma: 1.0
3D-DNR: 0
Monitor: OK
DPC: Off

setCustom20.txt
Exposure: WDR - Full Moon Preset
Senseup: Off
AGC: Low
Lens: 2000
Brightness: OK
Gamma: 1.0
3D-DNR: 5
Monitor: LCD
DPC: Off

setCustom13.txt
Exposure: Normal - DSO stacking example
Senseup: OFF
AGC: Low
Lens: x512
Brightness: 40
Gamma: 1.0
3D-DNR: 3
Monitor: OK
DPC: Auto

Below are the settings used in each of the manual format Custom files in C:\MicroSettings.

setCustom3.txt
Manual - Change mirror setting to Horizontal
- Display Menu
Enter
- Move to Effect
Right 3
- Set mirror to horizontal
Down
Left 4
Right
- Return to Menu
Up
Enter
- Exit and Save
Right 5
Down 2
Enter

setCustom5.txt
Manual - Change mirror setting to Rotate
- Display Menu
Enter
- Move to Effect
Right 3
- Set mirror to Rotate
Down
Right 4
- Return to Menu
Up
Enter
- Exit and Save
Right 5
Down 2
Enter

setCustom4.txt
Manual - Change mirror setting to Vertical
- Display Menu
Enter
- Move to Effect
Right 3
- Set mirror to vertical
Down
Left 4
Right 2
- Return to Menu
Up
Enter
- Exit and Save
Right 5
Down 2
Enter

setCustom6.txt
Manual - Change mirror setting to Off
- Display Menu
Enter
- Move to Effect
Right 3
- Set mirror to off
Down
Left 4
- Return to Menu
Up
Enter
- Exit and Save
Right 5
Down 2
Enter

Additional Information

You can find other helpful information at RemoteVideoAstronomy.com. If you wish to be notified about updates, or you have any questions or comments, please send an email to RemoteVideoAstronomy@aol.com. If you wish to share your preset files with others, you can simply post the text contents of a preset file in a thread message, or you can email your MallinCam Micro preset files to RemoteVideoAstronomy@aol.com for review and posting.