Voyager II

Operator's Manual Addendum

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The Voyager imaging system is controlled by US export laws. There are special versions of this system that must be approved for international distribution and travel. Please contact FLIR Systems if you have any questions.

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This manual addendum describes the new features recently added that distinguish the Voyager II from the original Voyager thermal camera. These features include the set of NMEA Interface Functions as well as an improved IP interface that allows monitoring and control of the Voyager II from remote locations. The configuration and use of these features is described in this manual. For information regarding installation of the Voyager II, please refer to the Voyager Installation Guide and the Voyager II Installation Guide Addendum.

NMEA Interface Functions

The NMEA interface allows the Voyager II to communicate with radar, GPS or other devices using the National Marine Electronics Association (NMEA) 0183 Protocol. NMEA 0183 (or NMEA for short) is a combined electrical and data specification for communication between marine electronic devices. Additional information regarding the protocol can be found on the NMEA web site: http://www.nmea.org/pub/0183/

The NMEA protocol allows the camera to automatically point toward vessels and other objects that show up on the display and to track their movement. The Voyager connects to the other equipment via a serial cable. The Voyager has three NMEA modes of operation:

- **Radar Cursor Tracking** – This function is implemented using the NMEA Radar System Data (RSD) sentence format
- **Slew to Waypoint** – Uses the NMEA Bearing and Distance to Waypoint, Great Circle (BWC) sentence format
- **Radar Tracking** – Uses the NMEA Tracked Target Message (TTM) sentence format

These functions are configured with the NMEA Interface Setup Menu. The menus and configuration choices are described below.

NMEA Interface Setup Menu

The NMEA menu is accessed from the Voyager II setup menu. To access the main setup menu, push the Setup button on the Joystick Control Unit (JCU).

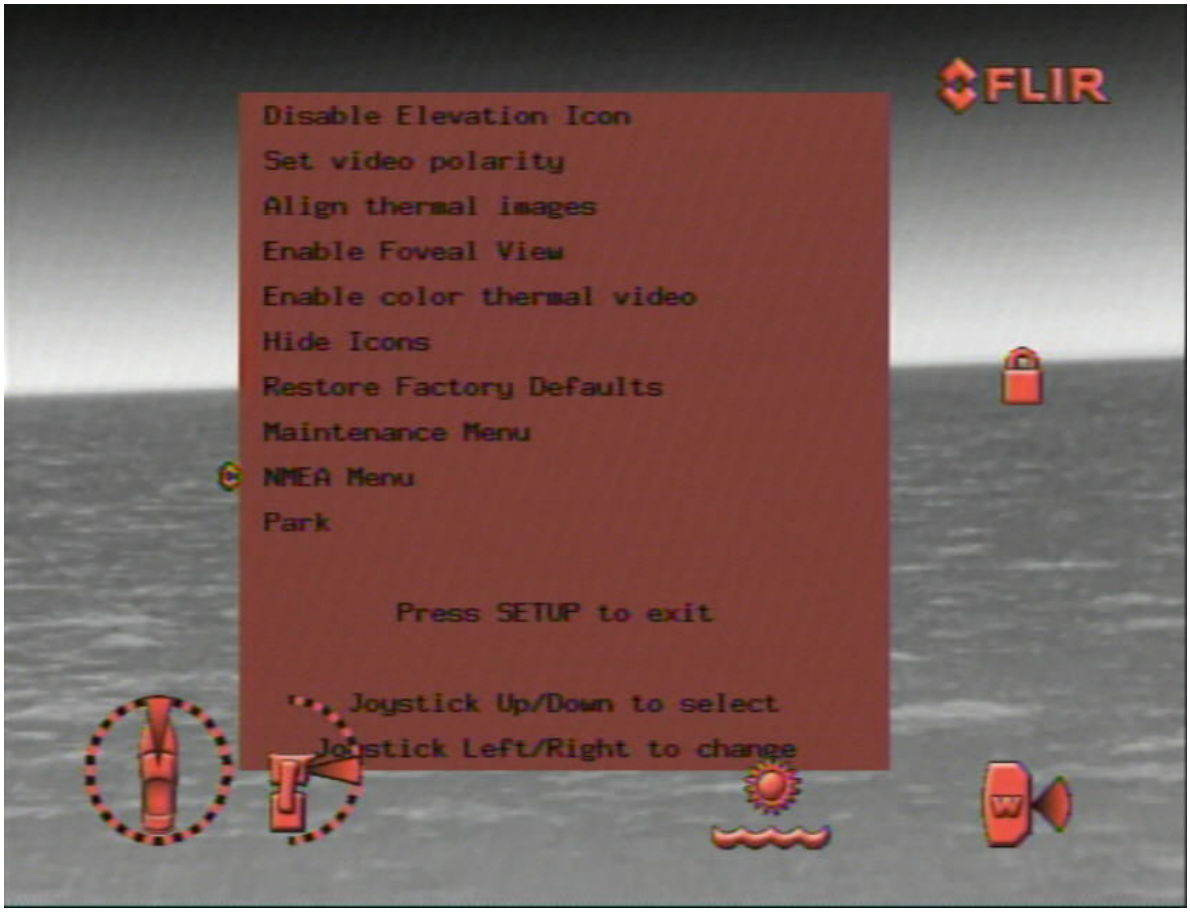


Figure 1: NMEA Menu access

The NMEA menu has the following options:

Figure 2: NMEA Menu

By default, the three possible NMEA modes of operation are disabled. The NMEA menu allows the Voyager II user to enable one NMEA mode at a time. The NMEA menu includes the following choices:

- **Enable Radar Cursor Tracking** – **Enable** turns to **Disable** in the menu when selected
- **Enable Slew to Waypoint** – **Enable** turns to **Disable** in the menu when selected
- **Enable Radar Tracking** – **Enable** turns to **Disable** in the menu when selected
- **Dwell Time**: Time spent on each tracked target. The default time is 10 seconds, with a possible range of 10 to 60 seconds
- **Mount Height**: Height of the camera above the water, necessary for proper triangulation

Radar Cursor Tracking

With this function selected you can control the camera by using the cursor on your radar display screen to select a target. The camera will track whatever target is selected by the cursor. Moving the cursor to a different target will move the camera to the new target. Voyager II will continue to follow the cursor until this function is disabled from the main menu. This function is implemented with NMEA RSD messages.

When the camera is in the Radar Cursor Tracking mode, this icon is continuously displayed:

Note: Please keep in mind that Voyager will not "chase" the cursor at will; instead, Voyager will point to a position indicated by the cursor at a point in time *and then ignore all other RSD messages (produced as you move the cursor around to another position) until the dwell time expires.*

Slew to Waypoint

When this option is selected, the camera will slew to a pre-selected waypoint, using NMEA BWC messages, when that waypoint gets within approximately a 3 mile (5km) range. For example, while in route the operator could designate a buoy, an island or any other desired landmark as a navigation waypoint and Voyager will automatically turn to it when in range. Voyager will remain on the target for the specified dwell time. If an additional BWC message is received during this time, Voyager will point to the newer BWC heading for an additional dwell time period.

When the camera is in the Slew to Waypoint mode, this icon is permanently displayed:

When the camera is within range of the waypoint, the icon will flash to signify that this mode is active and is responsible for pointing the camera at the waypoint's coordinates.

Radar Tracking

When Radar Tracking is selected, the camera will slew and track the selected target(s) using NMEA Target Tracking Message (TTM) data provided by the radar unit.

The user can select up to 100 targets to be tracked by Voyager II (refer to the radar or GPS documentation on how to designate a target). Once a target or targets are selected, the Voyager II will point toward each target sequentially, and track the target using position data that is sent from the radar unit. The camera points at each target for a pre-set amount of time (10 seconds by default) before moving on to the next target. The time spent on each target (known as Dwell Time) can be changed by selecting Dwell Time and using the joystick to toggle through the available presets. The default value is 10 seconds. The Dwell Time includes the transition time from one target to the next.

Please note that the TTM targets are the result of the radar signal reflecting off a target, and as such it is possible to momentarily loose that target. To ensure "coasting through" the momentary loss of target, the TTM function maintains the last known position of the target in its queue for 60 seconds after receiving the last valid message. After the 60 seconds has lapsed, that target is removed from the queue.

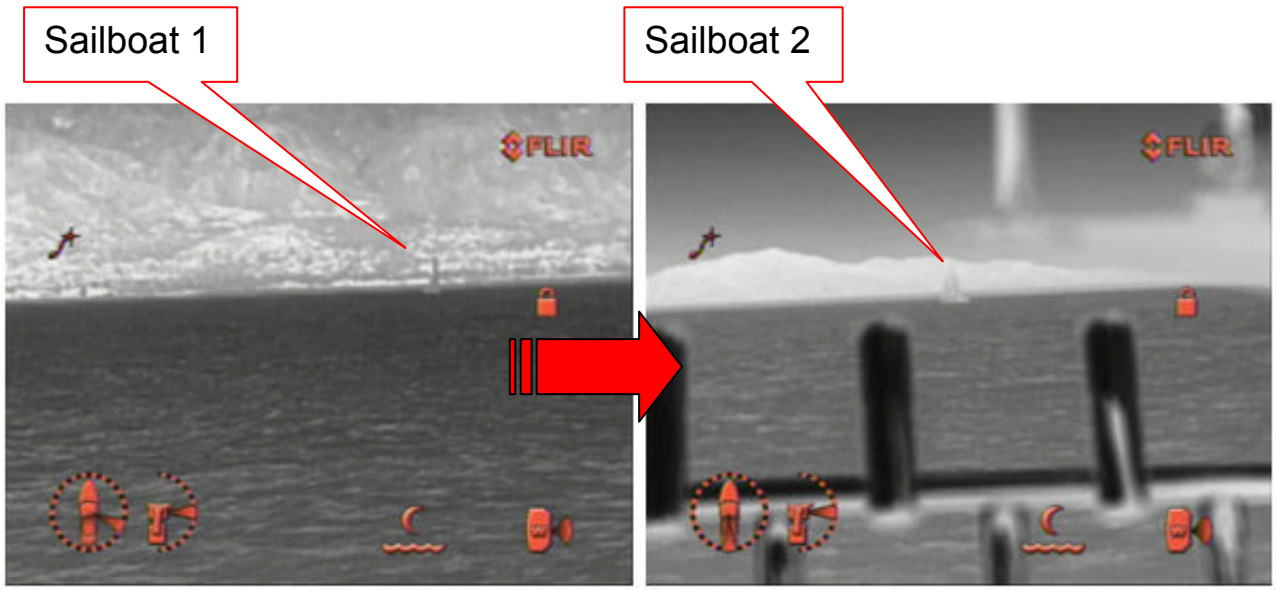


Figure 3: Voyager II tracking two targets

Once Voyager begins to sequentially track the selected target(s), the user can, if desired, override the automatic scan by using the joystick to point the camera at a different location. Once the user releases the joystick, the camera will return to tracking its targets 10 seconds after the last JCU input (buttons or joystick).

When the camera is in the Radar Tracking mode, this icon is permanently displayed:

Note: Voyager's ability to accurately track a target depends on the quality of the data sent from the radar unit. The radar's ability to effectively track a target is influenced by several factors, such as the radar update rate, relative angular rate of the target, angular rate of the boat heading and velocity of target being tracked.

Note: The accurate mounting height of the camera will ensure the unit's pointing accuracy for close-in targets.

While Voyager can track a large number of targets, it is important to understand that in practical terms the number of targets is linked to the Dwell Time. Since Voyager looks at each target for 10 seconds

before moving on to the next target, it could be possible to set up a long string of targets so that it could take too long to cycle through all of them for the information to be of any use to the operator.

> **Note**: In the rare case you might enable all three features, please keep in mind that there is a set priority in the order in which Voyager responds to the different NMEA messages. They are, in order of priority:
>
> 1. **Radar Cursor Tracking (RSD)**
> 2. **Slew to Waypoint (BWC)**
> 3. **Radar Tracking (TTM)**
>
> If the unit is "listening" to BWC or TTM messages and looking at a particular target, and it receives a RSD message, Voyager will wait until the end of the dwell time and then move on to the RSD message, ignoring all other input.

Dwell Time

Dwell Time is the time spent on each tracked target. The default value is 10 seconds but you can change it by toggling through the different time options.

Mount Height

Mount Height refers to the physical height to the camera above the waterline. This is important because this distance is used for target triangulation and incorrect values will affect the camera's tracking performance. **The height is entered in meters**.

User Interface Additions

Joystick Mode

The joystick can be used in "aircraft" or "gaming" modes.

- **Aircraft mode**: moving the joystick forward causes the camera to look down
- **Gaming mode**: moving the camera forward causes the camera to look up

Focus Buttons

For best results it is suggested that you use the manual focus first when trying to look at an image, and then move to the auto focus mode. This will speed up the focus process. Please be aware that sea conditions may affect Voyager's auto focus ability to lock on a target.

Park Position (standby)

When **Park** is selected, the stabilization mode is disabled and the camera returns to its power-up position, looking forward and down (90^0) The **Park** function is accessible from the setup menu. While in **Park** position the Park icon displays on the video screen. Touching the joystick or any of the buttons on the Joystick Control Unit will return the camera to its previous state (before going into Park).

Display Minimal Icons

When the **Minimal Icon** mode is selected, the azimuth icon and the stabilization icon are displayed permanently on screen. Home, Scene, Zoom, Wide FOV and Narrow FOV icons will display on screen for 3 seconds only before disappearing. Elevation is still an optional icon, selectable from the Setup Menu.

Webcam

It is possible to use Voyager II as a Webcam, allowing you to keep an eye on your vessel from anywhere in the world using an internet connection.

NOTE: The Webcam function is turned off by default. To enable this function please refer to the instructions below

Connecting Voyager II to the Web

In order to be able to connect to your Voyager II camera to the Internet you have several options. You can connect the camera to a LAN network or a wireless router using a Cat-5 cable between the bulkhead box and the PC or wireless router.

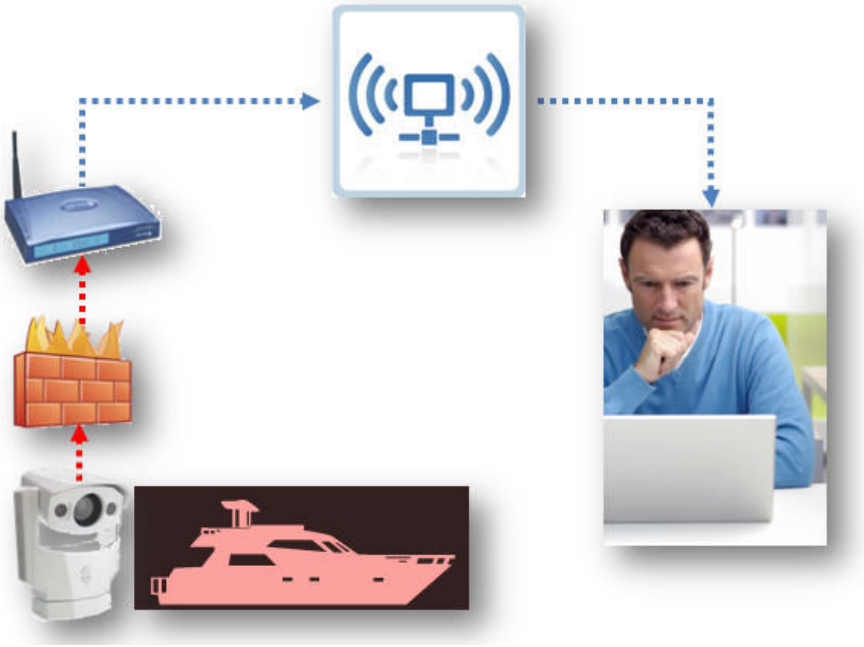


Figure 4: Voyager working as a Webcam

To access the Voyager II from a remote location using your computer or laptop and an internet connection you need to have an internet connection on your vessel.

SECURITY WARNING: in order to protect against unauthorized access to your camera from other Internet users, you must take steps to protect your connection. FLIR recommends that you set up a firewall on your router.

SUPPORTED BROWSWERS: the following browsers/versions are currently supported:

- Microsoft Internet Explorer 7
- Safari 3.1.2
- Firefox 3.0.4

Installing the VLC Video Player

Before you can start using your Voyager II camera through a remote connection you must download the VLC Video Player, which is the supported video player. If you are using Internet Explorer™ 6/7 you will be prompted to install the VLC Player the first time you log on to the remote site and the Voyager camera will download the software to your computer. If you use the Firefox™ or Safari™ browsers, you must download and install the necessary player yourself before you can use Voyager as a Webcam.

You can download a copy of the player here:

http://download.videolan.org/pub/videolan/vlc/0.8.6f/

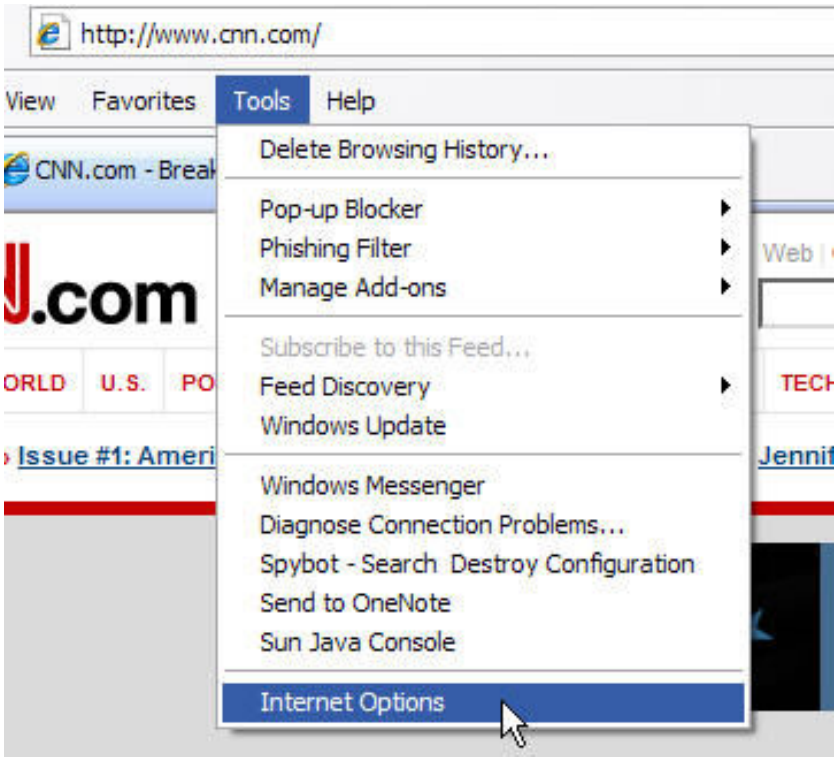
If you have problems finding or downloading the player, you can also get a copy from FLIR Technical Support.

Please note that currently the Voyager GUI only supports the VLC Player v. o.8.6.f

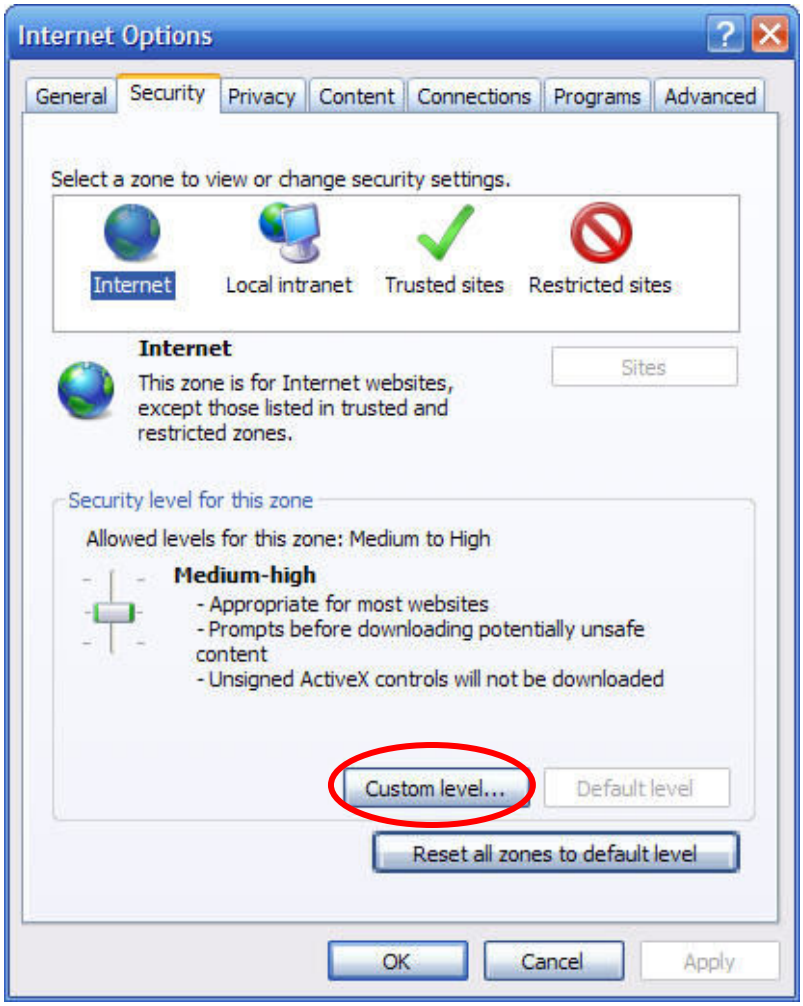
Internet Explorer users: you can download the VLC Player directly from the Voyager (the software is already installed in the camera). In order to be able to download the VLC Player you must change your Security settings in Internet Explorer. This is

necessary only in order to download the software. Once you download the player you can reset your security settings. To change the security settings to allow the download of the player, follow these steps:

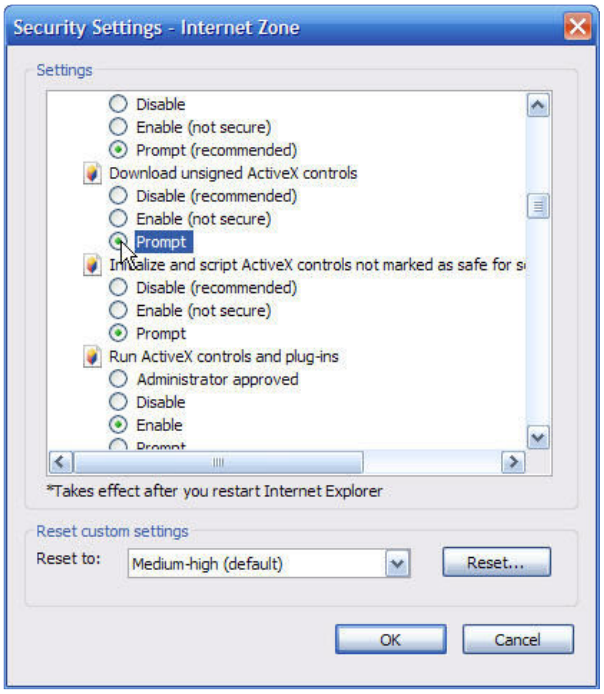
1 In Internet Explorer, click on Tools and select Internet Options:



2 In Internet Options, select Security Tab, then Custom Level:

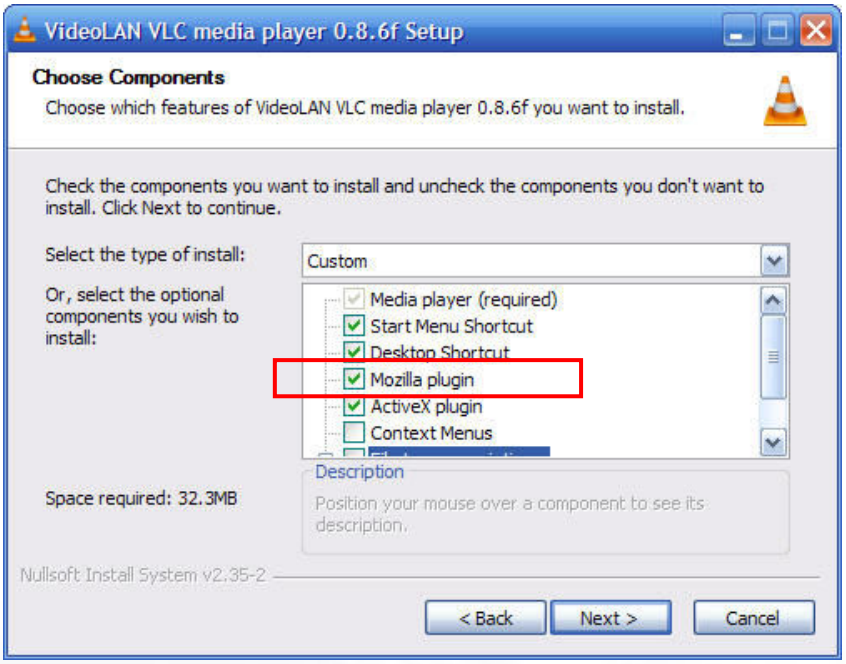


3 Scroll down through the options until you find "Download Unsigned Active-X Controls", then change the setting from **Disable** to **Prompt**:



Click **Ok** when done and exit all dialogue windows. You can now download and install the VLC Player.

Download and save the executable file to your computer, then click on the file to install the application. Please note that when asked to choose components you must make sure you select also the Mozilla plugin:



Accessing the Voyager II from a Remote Location

To access your Voyager camera from a remote location (WAN), enter the camera's IP address in your browser address bar:

http://[IP from Service Provider]:8080/operation.html

Note: When accessing the Voyager from a LAN, use the camera's default IP Address: http://192.168.250.116:8080/operation.html

The GUI for Voyager displays on your screen. It may take a moment for the video to start streaming.

The GUI used to view the images from the Voyager is web based and platform-independent. FLIR recommends that you use Internet Explorer™ 7.0 or Safari 3.1.for best results. The GUI allows you to control the camera's pan and tilt motion, change between wide and narrow fields of view, change the imaging mode from red/white-hot to gray/white-hot (see figure 7) and set different levels of contrast.

If you wish to get Full Screen view, double-click on the image. To exit Full Screen mode double-click on the image again.

Please note that no icons are displayed on the MPEG video stream. For azimuth control use the graphic on the left of the screen, which indicates in which direction the Voyager is pointing relative to the bow of the vessel.

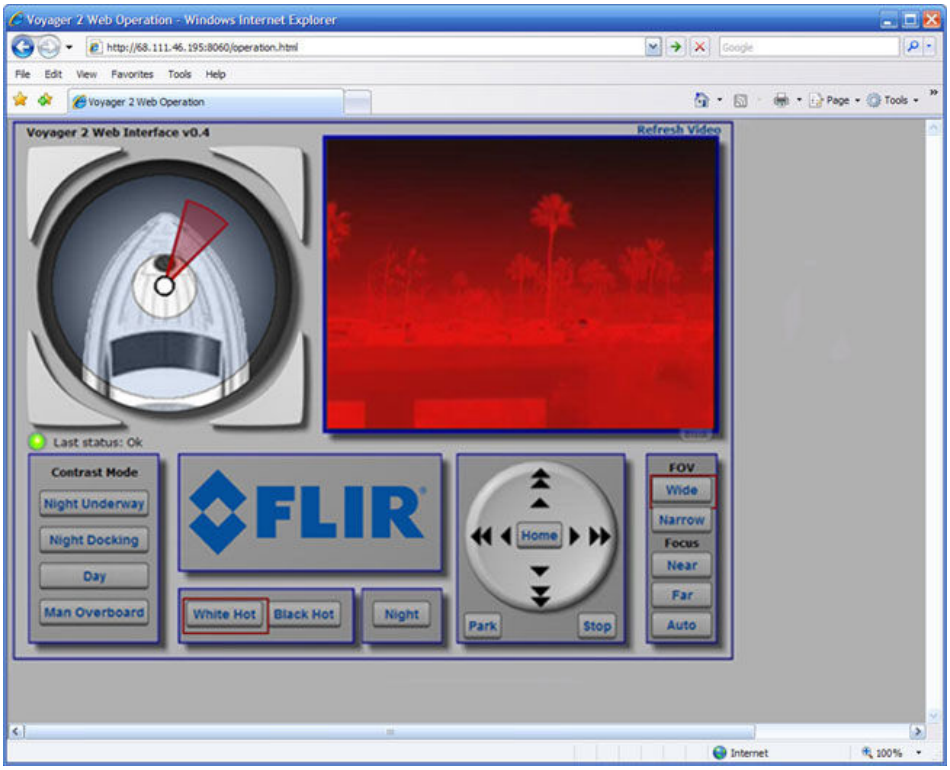


Figure 5: Voyager's GUI displayed on Internet Explorer 7

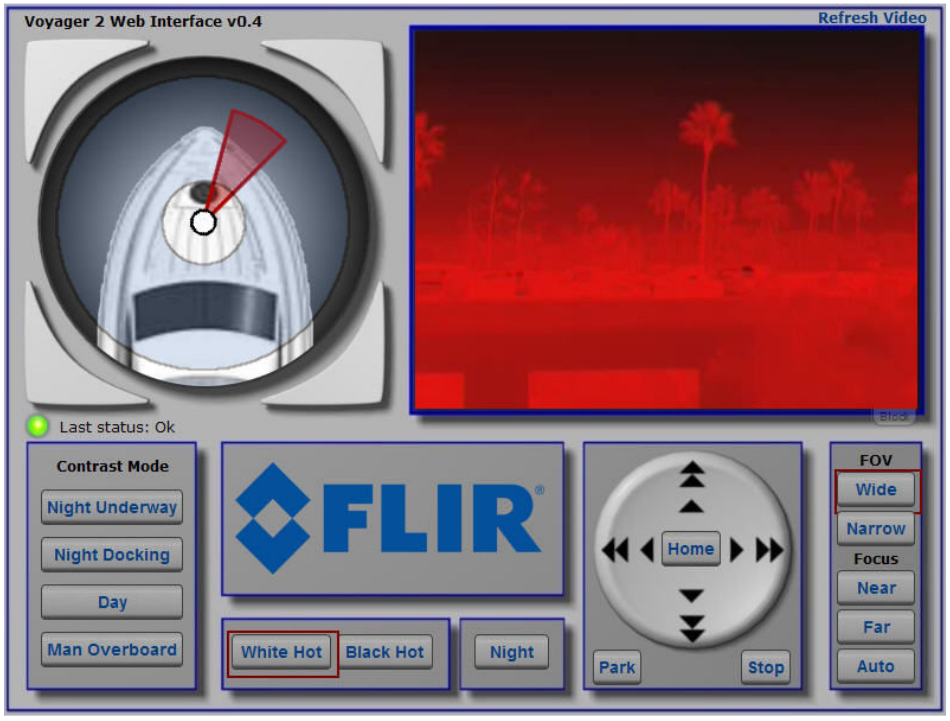


Figure 6: Voyager's Web Interface

Camera Control

To control the camera movement, use the arrow button 

. Please note the following:

- Pressing the single arrow ► and releasing the mouse button in less than one second lets the camera move one step (1/3 or ¼ of FOV).
- Pressing and holding the single arrow ► allows the camera to move at 1/10 FOV /second. Releasing the mouse button stops the movement.
- Pressing the double arrows ►► produces the same results but at two times the speed (steps and speed).
- Double clicking on the azimuth control area around the boat symbol in the upper left portion of the GUI will make the camera turn in that direction.

Note: the Home position cannot be changed through the GUI. When you click on Home, the camera will return to the last saved position. Changes to the Home position must be made on site (on the vessel).

Image Mode Control

Click the Night button to toggle between red (night) and gray (daytime) modes.

Figure 7: Same image with different color modes - White/Hot Night (left) and Day (right) color modes

Image Contrast

Under Contrast Mode you have four preset options: Night Underway, Night Docking, Day, and Man Overboard. It is advisable that you find and select one that produces the best image for your needs for the current environmental conditions.

Black/White Hot

If you select White Hot, hot objects are displayed in white, cold objects in black, with the color gradient between them indicating relative temperatures between hot and cold. Selecting Black Hot reverses the image and hotter objects are now displayed in black.

Field of View (FOV) Control

You can change between Wide and Narrow field of view (see Figure 8). The Focus function only applies to the Narrow field of view.

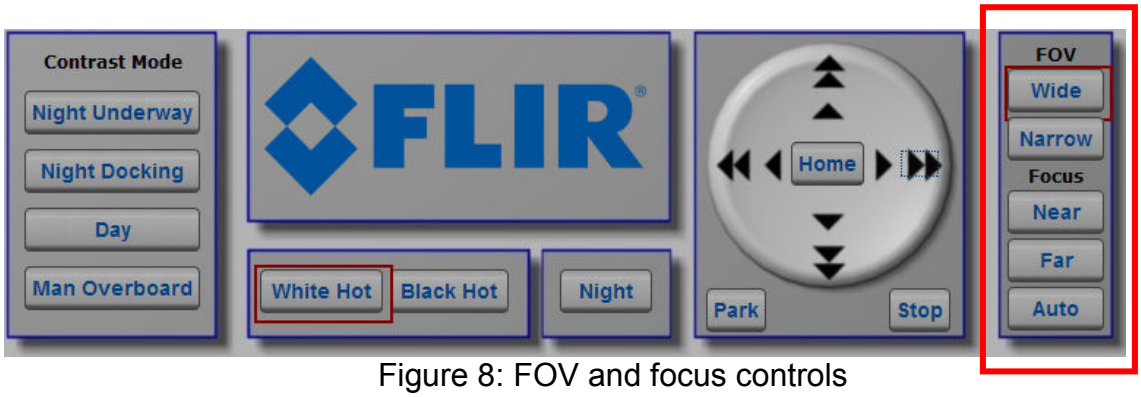


Figure 8: FOV and focus controls

Focus Control

When the Narrow field of view is selected you can use the Near/Far/ buttons to manually focus the camera. Use the Far button to "pull back" on the focus function, and the Near button to focus in. Using the Near/Far buttons instead of just using the Auto focus button will speed up the focusing process.

Software Upgrade

Users will be notified when software upgrades for the Voyager system become available.

Enabling the Webcam function

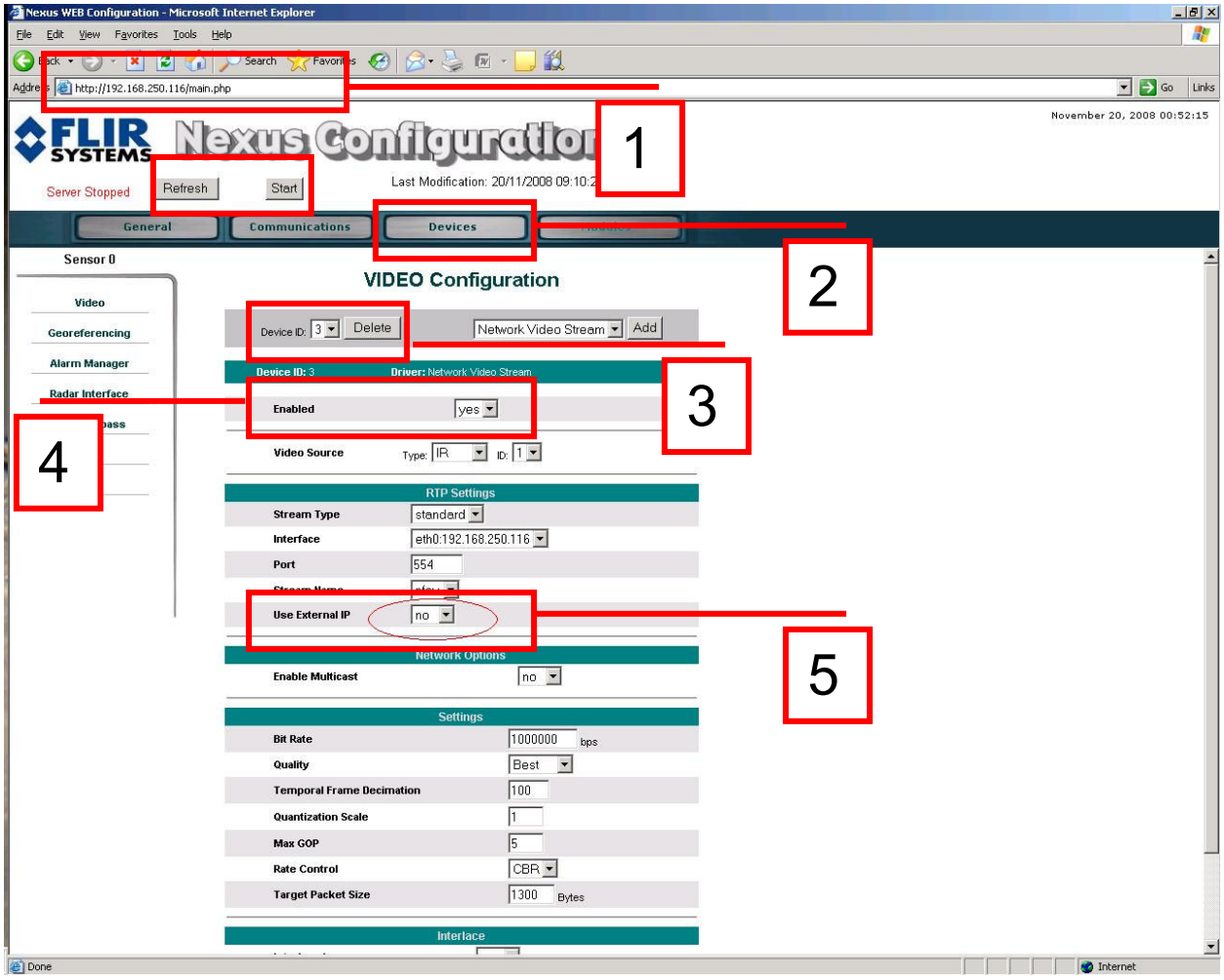
The webcam function on Voyager II is turned off by default. To enable this function follow these steps:

1. Logon to the web configuration server located at http://192.168.250.116/. When asked for username and password enter the following:

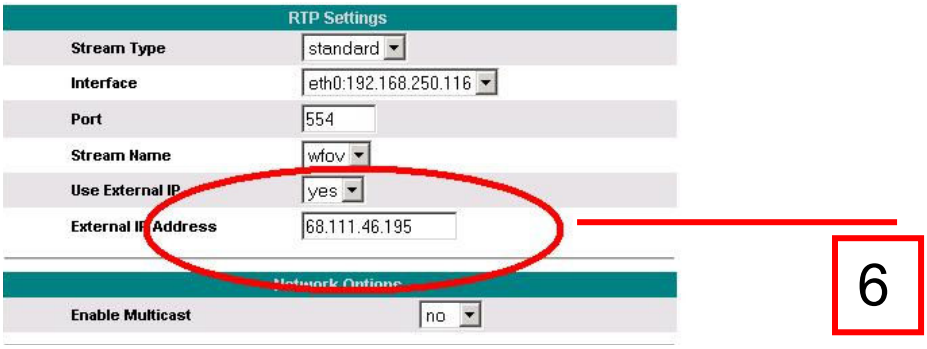
    - **Username**: admin
    - **Password**: indigo

2. Click on the Devices tab to see the Video configuration options.
3. The Device ID defaults to 0, which is the Visible stream. Use the pull-down menu to select device 2.
4. **Enable** is selected by default.

5. Under **Use External IP**, select **Yes**.

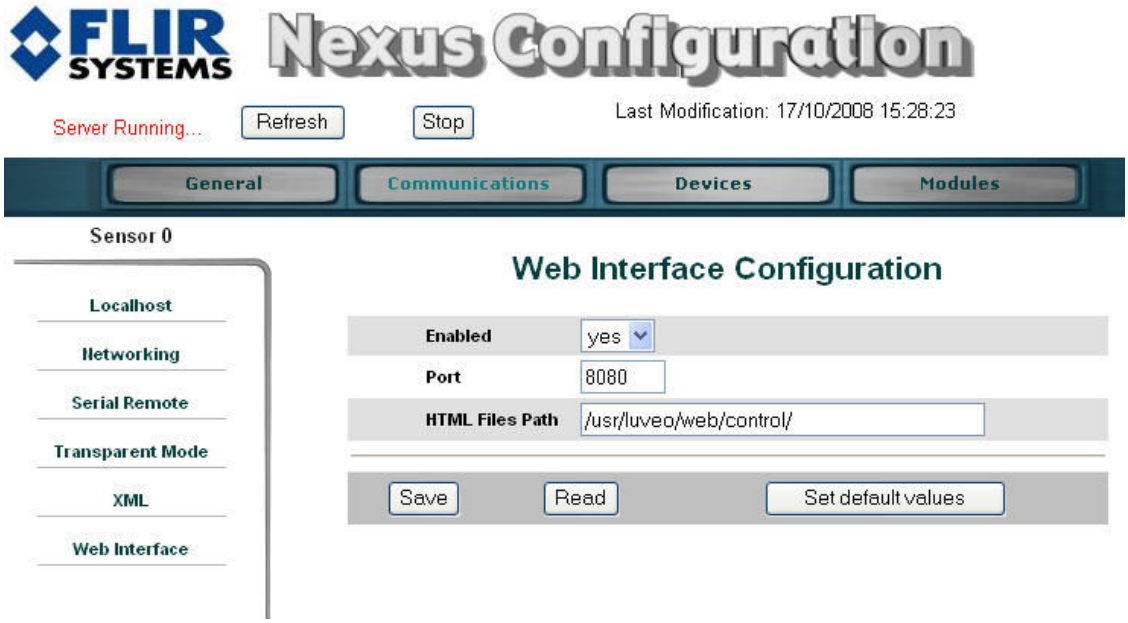


6. When you select **Yes**, a box for the external IP address opens. Type in the IP address shown below:

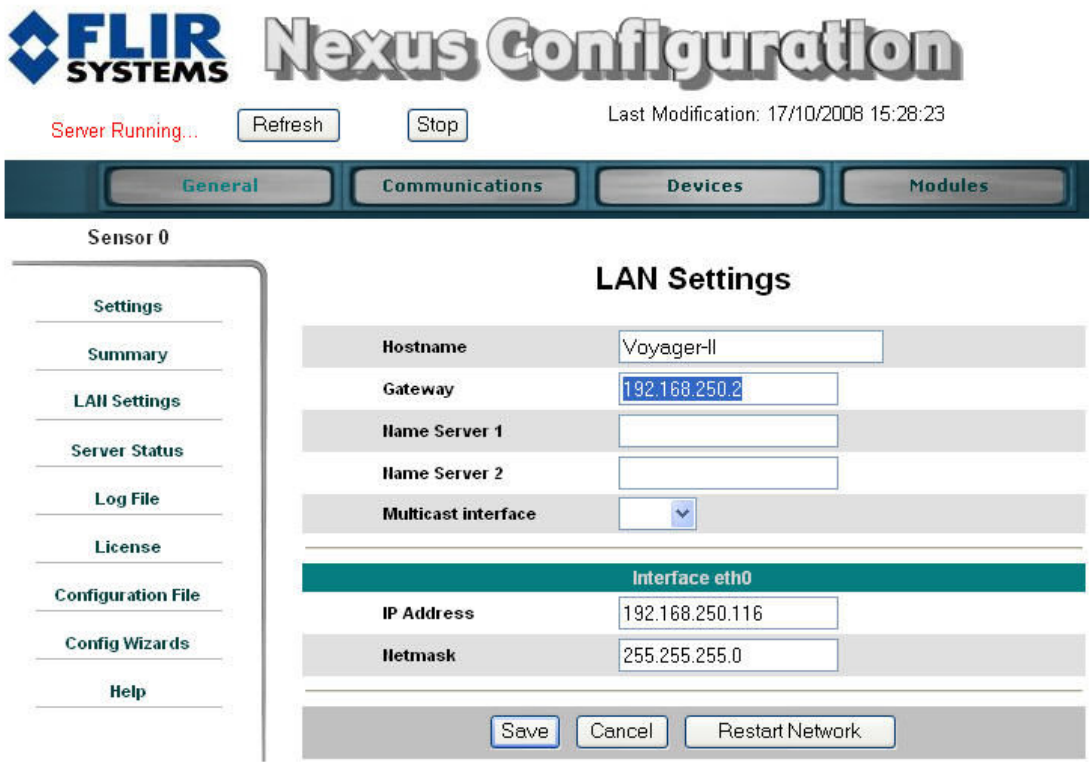


7. Click the **Save** button at the bottom of the page, then repeat these steps for device 3.

8. Next, click on the Communications Tab and enter the port and gateway settings as shown below, then click **Save**:



9. Next, click on the General tab and enter the Gateway as shown below:



10. Click **Save**. When done, reset the camera by turning it off and on **OR** use the Stop/Start button on top of the page. Either method will make the changes effective.

List of Icons

Auto Focus

Auto Focus Off

Azimuth

Elevation

Focus Scale

Home

Locked

Unlocked

NFOV (Narrow Field of View)

WFOV (Wide Field of View)

Slew to Waypoint Mode

Radar Cursor Tracking Mode

Radar Tracking Mode

Park

Night Running

Docking

Day Running

Man Overboard

Stabilization Off

Stabilization On

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