

About the S-PolKa Web Cameras

General

Four Netcam XL cameras have been set up at S-PolKa, pointed in the four cardinal directions. For manufacturer technical details and support, see <http://www.stardottech.com>

The S-PolKa images from the cameras can be found on the internal network from the home page: <http://control1> The images are not generally available off-site, although some images will be loaded to the field catalog in real time.

The cameras have a wide field of view (FOV), and have been set to the maximum, somewhere near 90 degrees. Due to this wide FOV, there should be common cloud elements visible in adjacent cameras, somewhere starting about half-way up the side of an image, and above that. The cameras also have an automatically adjusting iris, a function that needs to be turned on in the configuration.

Image quality is good, although not as great as you might expect from an inexpensive point-and-shoot. Image resolution is set to 1024x768 pixels, the manufacturer suggested optimal value for color images.

Each camera runs its own web server, and the linux operating system. For those who understand what they are doing, it is possible to telnet into the camera, and change configuration files directly, or run certain commands in a cron job. This is generally not something that should be done by the user, but the option can be helpful in setting up a camera at the start of an experiment.

Pointing and Alignment

There are no convenient adjustments for aligning the cameras. Adjustment is through gross repositioning of the camera mount, and tipping (or even bending!) of the white mounting bracket within the enclosure. Alignment requires constant re-checking of camera imagery – take a laptop outside when you do this. There tends to be quite a bit of play at the point where the camera is attached to the white angle bracket. This is a function of the two small phillips screws in the camera body tending to work loose.

So pointing is very fussy.

The north and west-pointing cameras have been aligned using the S-Pol antenna by pointing the antenna in the north or west direction, walking about 250-feet away from the radar, and finding the best visual alignment with the radar bore sight. An orange mark was painted on the ground indicating the best subjective north and west alignments with the center of the radar. This could not be done for the south and east orientations due to the ocean.

For the east pointing camera, the position of the rising sun has been noted on the days surrounding the equinox. This provides a pretty good alignment for the east camera.

An attempt was made to level the cameras and adjust the four camera horizons to be approximately equal across all cameras. The design of the mounting bracket for the north and south cameras prevents a full upward tilt of the camera (enclosure hits the sea container). The north and south cameras were therefore used as a reference, and the east and west cameras were tilted to match these.

Wide Angle and Focus

The focus is very sensitive. Set the wide-angle adjustment prior to setting the focus. Both adjustments have locking set-screws, although several of them seem to not rotate (maybe the wide-angle adjustment doesn't have a set screw?). One gotcha: the motor for the auto iris adjustment is attached to the lens, but sometimes gets rotated around the barrel. This partially unscrews the lens and completely changes its focal point. Make sure the motor for the auto iris is hanging at the 6 o'clock position before trying to adjust the wide angle or the focus. Crank the wide angle as wide as it will go. The telephoto end of the adjustment is marked with a "T" – just go full opposite to this.

About the Clocks

This is another non-optimal situation. NetCam documentation states that clocks are only synchronized upon reboot or power-up. This is without regard to the synchronization setting, either "Auto" (with a Network Time Protocol server) or "Manual". Without a clock reset, the clock in any particular camera can be seen to drift by as much as 7 seconds per day. This is a seriously large drift.

Making matters worse, there is a quirk in the msntp routine used in the mini-linux kernels that will not allow the routine to function properly unless a domain name server is declared (under the config network tag). For DYNAMO, declare two DNS addresses: 27.114.138.4 and 27.114.140.62

To ensure that the time server is consulted regularly, go into the camera configuration, find the advanced tab, and then follow the tabs to "Manual Configuration" (note: this step has been done for DYNAMO and should not need to be redone). Edit the crontab. Change the line that references the rc.ntpdate command:

```
0 12 * * * admin /etc/rc.ntpdate
```

change it so it looks like this instead ..

```
0 * * * * admin /etc/rc.ntpdate
```

Daily Data Collection Period and Image Interval

At the equator, days are all 12 hours long. Adding some time for twilight, and since we are collecting all data with UTC/GMT timestamps, we should log camera images from 00 through 14 UTC. While the cameras themselves have good low-light sensitivity, the floodlights used at S-PolKa prevent the cameras from recording any usable information at night.

Time interval between images is currently set at one of the following: 30, 15, 10 or 6 seconds; the PIs prefer 6 second intervals, and we have been evaluating the impact of this frequency on our ftp server (so far, the 6-second interval is working). Before changing the frequency of image collection, consult the PIs, particularly by Paquita Zuidema, who was instrumental in requesting the cameras for DYNAMO. Note that it is unlikely that we could support an interval shorter than 6 seconds, since the ftp server would likely experience problems with the number of requests from 4 cameras.

Screenshots of the camera configuration pages are appended, here, without much explanation. Also included are images from each camera (I'll try to add an arrow showing where N/E/W/S are).

Call me, or send email if you have questions.
Bob Rilling

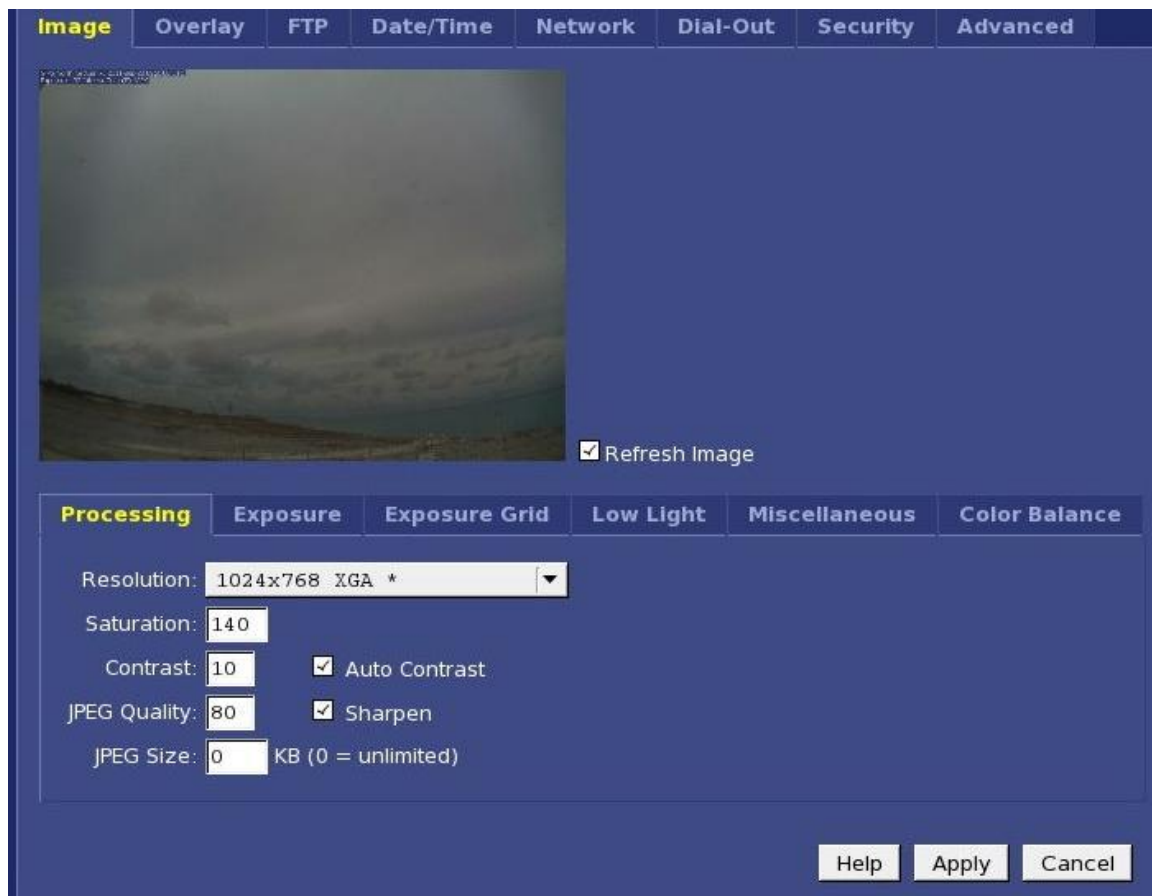



Image Overlay FTP Date/Time Network Dial-Out Security Advanced



Refresh Image

Processing Exposure Exposure Grid Low Light Miscellaneous Color Balance


Manual Exposure:

Auto Brightness:

Sync: Off 60Hz 50Hz

Help Apply Cancel

Image Overlay FTP Date/Time Network Dial-Out Security Advanced



Refresh Image


Processing Exposure Exposure Grid Low Light Miscellaneous Color Balance

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View Grid Set All Clear All Invert

Help Apply Cancel

Image Overlay FTP Date/Time Network Dial-Out Security Advanced



Refresh Image

Processing Exposure Exposure Grid **Low Light** Miscellaneous Color Balance


Allow Extended Exposures
Exposure Limit: (0-32767) 1/1

Automatic Gain Control (AGC)
AGC Limit:

Low Light

Help Apply Cancel

Image Overlay FTP Date/Time Network Dial-Out Security Advanced



Refresh Image

Processing Exposure Exposure Grid Low Light **Miscellaneous** Color Balance


Frame Skip:

LED: ▼

Auto Iris Backlight

Help Apply Cancel

Image Overlay FTP Date/Time Network Dial-Out Security **Advanced**



Refresh Image

Processing Exposure Exposure Grid Low Light Miscellaneous **Color Balance**

Balance: Auto Manual
 Type: Average ▾

Skew (auto): R 256 G 256 B 256

Initial (manual): R 256 G 256 B 256

(256 means "no change")

Help Apply Cancel

Image **Overlay** FTP Date/Time Network Dial-Out Security Advanced

TIME/DATE/TEXT STAMP

Text: S-Pol North NetCam XL %Y-%b-%d %H:%M:%S UTC
 Exposure: \$e Internal Temp(F): \${IF}

Scale: 1x ▾

MARKUP CHARACTER QUICK REFERENCE

%y Year [00-99]	\$e	Exposure
%Y Year [2000-2199]	\$E	Exposure (1/x)
%m Month [01-12]	\${IF}	Internal Temperature (F)
%b Month [Jan-Dec]	\${IC}	Internal Temperature (C)
%d Day of Month [01-31]	\${F}	Weather Station Temperature (F)
%a Weekday [Sun-Sat]	\${C}	Weather Station Temperature (C)
%H Hour [00-23]	\${HUM}	Weather Station Relative Humidity
%I Hour [01-12]	\${HGIN}	Weather Station Pressure (inches)
%M Minute [00-59]	\${HGMM}	Weather Station Pressure (mm)
%S Second [00-59]	\${MB}	Weather Station Pressure (millibars)
%p AM/PM	\251	Copyright Sign (or copy/paste ©)
%P am/pm	\260	Degrees Symbol (or copy/paste °)
%% Percent Symbol %		

Help Apply Cancel

Image Overlay **FTP** Date/Time Network Dial-Out Security Advanced

FTP UPLOAD

Hostname:

Username:

Password:

Path/File:

Rotating Archive (last 10 images)

Passive Mode Timeout: seconds

Delete Before Rename IIS 4.0

Secondary Path/File:

Current IP Link Path/File:

SCHEDULE

Delay seconds between uploads

Upload between and (Military Format - HH:MM)

Sun Mon Tue Wed Thu Fri Sat

Image Overlay FTP **Date/Time** Network Dial-Out Security Advanced

AUTOMATIC

Time Server:

MANUAL

Date:

Time:

TIME ZONE

Time Zone:

PST8PDT Pacific Standard/Daylight Time
MST7MDT Mountain Standard/Daylight Time
MST7 Mountain Standard Time (Arizona)
CST6CDT Central Standard/Daylight Time
EST5EDT Eastern Standard/Daylight Time

Image Overlay FTP Date/Time **Network** Dial-Out Security Advanced

ETHERNET

IP Assignment: DHCP Manual

IP Address:

Subnet Mask:

MAC Address:

NETWORK

Hostname:

Gateway:

NAME SERVERS

DNS 1:

DNS 2:

DNS 3:

WEB SERVER

Port: (Default=80)

VIDEO STREAMING

Base Port: (Default=8001, Use 0 to disable)

Help Apply Cancel

Image Overlay FTP Date/Time Network **Dial-Out** Security Advanced

INTERNET DIAL-OUT CONNECTION

Connection: ▼

Baud Rate: ▼

Initialization String:

Phone Number:

Timeout:

Username:

Password:

Default Connection

Always Up

Send CR After Login

Shell Login

Help Apply Cancel

Image Overlay FTP Date/Time Network Dial-Out **Security** Advanced

USERS

admin
viewer

Remove

Name:

Password:

Verify Password:

Add/Modify

Help

Miscellaneous Manual Config PTZ DDNS Trigger Weather **Basic**

MISCELLANEOUS

Click below to reboot the device. Note that you will temporarily lose your connection to the device during the reboot process.

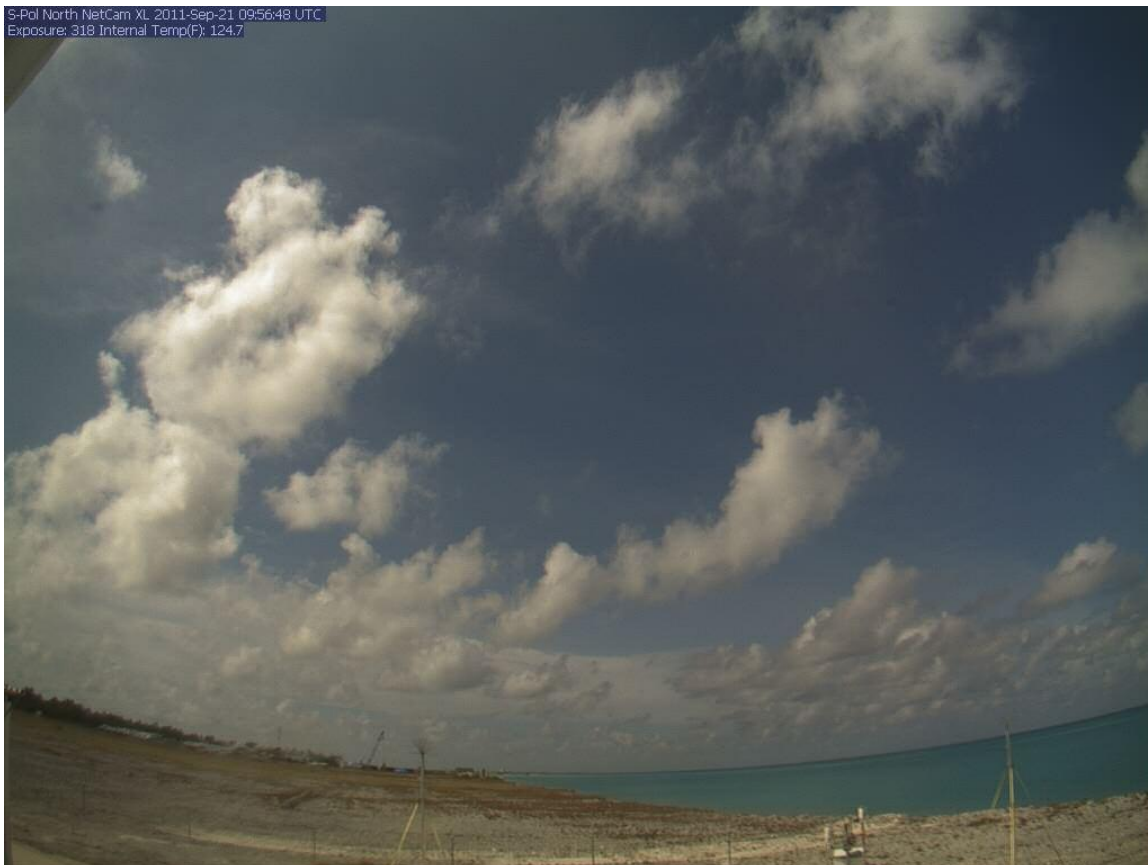
Reboot device

UPGRADE FIRMWARE

Browse... Upgrade

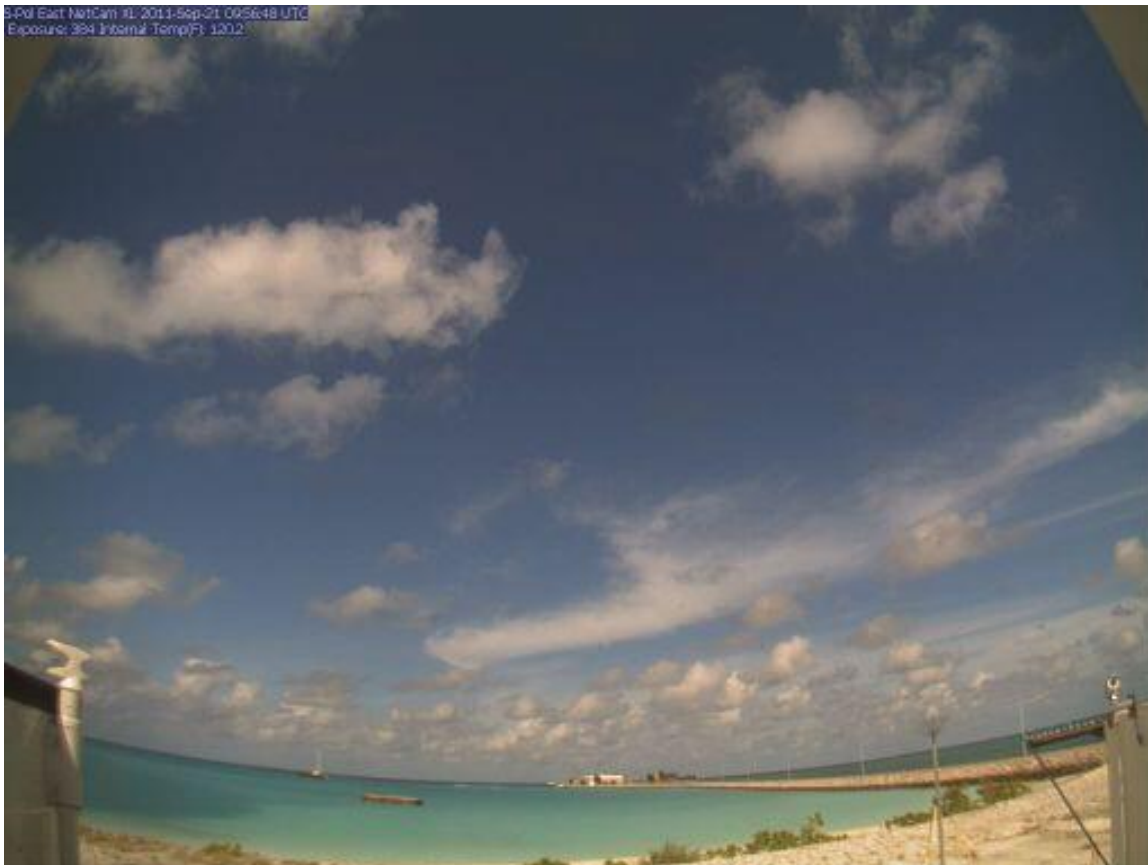
S-Pol North NetCam XL 2011-Sep-21 09:56:48 UTC

Exposure: 318 Internal Temp(F): 124.7

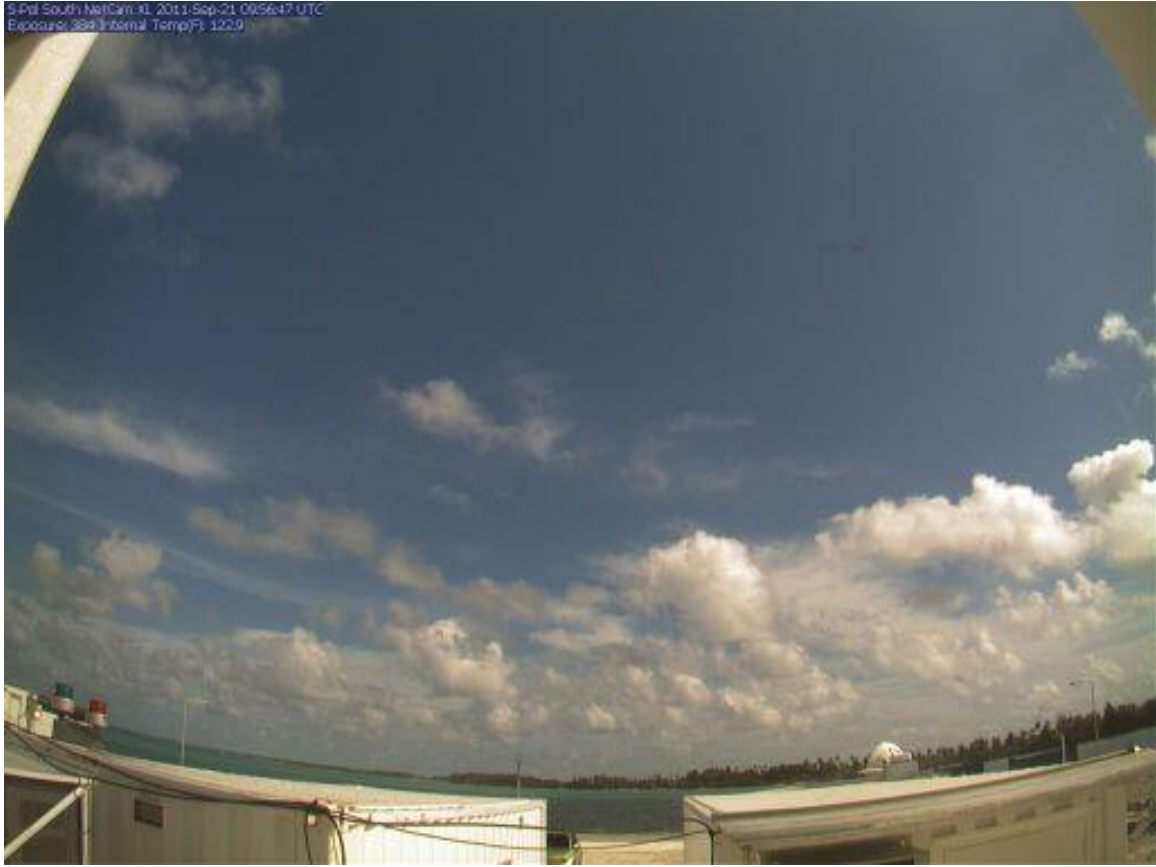


S-Pol East NetCam #1 2011-Sep-21 09:56:48 UTC

Exposure: 394 Internal Temp(F): 130.2



S-Pol South NetCam XL 2011-Sep-21 09:56:47 UTC
Exposure: 384 Internal Temp/F: 122.9



S-Pol West NetCam XL 2011-Sep-21 04:24:51 UTC
Exposure: 351 Internal Temp/F: 113.0

