DMT
Security Radar Solutions

Capture Image Function

OFF | Turn ON | Hide

Aim Point

Distance	True Brng	Aspect Ang
400	125	35

Camera Type Option

☐ Fixed ⦿ DLTV ○ IR

☑ Day/Night

	Hour	Min	
Day start	6	30	AM
Night start	8	15	PM

Camera FOV Selection

IR (fixed): Model: PT-612 ▾ | 12 x 10

DLTV: Cross range extent (m) 200

Screenshot Interval (sec) 5

Assigned camera number 1

Save Directory:

C:\DMTLLC\ScreenShots\CaptureImage

DMT REMOTE CLIENT CAPTURE IMAGE FUNCTION

Automatically capture images of objects entering user defined areas.

Abstract

The DMT Remote Client allows the user to monitor up to 24 radars and any number of cameras. One of the functions available with the DRC is the Capture Image Function.. Users can draw areas on their map, and when an intruder enters that area the nearest camera will be directed to that area and snapshots will be recorded as long as that intruder is in the area.   Users can the use DMT's Image Viewer to search, replay, and analyze the intruders.

Last Updated July 2013

Bill Hickman
support@dmtradar.com

Description

The *Capture Image* function allows the user to setup and start an automatic procedure to detect objects entering a geographic area of interest and record still images using a FLIR-PT series video camera. The mechanism used to signal the presence of an object in the area of interest is the standard Zone 2 region object which can be constructed and activated using standard drawing tools available in the *DMTRemClient* program.[1]

When activated, the *Capture Image* function monitors all radar tracks reported by the DMT Radar, performing no special actions until a Zone 2 entry is detected. At this point the function logic takes control of the designated video camera, moves it to point at the center of the Zone 2 area, and begins making screenshots of the camera video at a user defined rate. This action continues until the object leaves the Zone 2 area, at which time screenshots are stopped and the camera is "released" to resume normal duties.

The user may choose the camera type (DLTV or IR) as *Fixed* (remains unchanged over time) or *DayNight* (changes to DLTV during daylight hours and to IR during the night). Also, the user may select the desired width in meters of the saved image at the target object's range for DLTV screenshots by specifying this value, which automatically sets the zoom level for this camera. (This feature is not available for the IR camera which has a fixed field of view (FOV) value).

The setup for this procedure requires the user to design/implement a Zone 2 object in the Client display, and to specify various geometric parameters from the video camera to the center of the zone. Once these setup actions are completed, the *DMTRemClient* program will save these setup values and restore them automatically at the next program startup. The user will not need to further change or adjust these values unless the basic setup has changed.

The screenshots are intended for later viewing and analysis using the *DMT Image Viewer*[2] program, which shows these images overlaid with a calibrated grid to estimate vertical and horizontal dimensions of the viewed object.

Geometry

The basic geometry anticipated by this function is shown in Figure 1. Here the camera is situated near the river bank, and a Zone 2 region has been constructed at the desired surveillance

---

[1] This new feature is added to the latest client program DMTRemClient v2.10.
[2] The *DMT Image Viewer* is a separate analysis program that displays these screenshots with a calibrated grid overlay. See document *DMT Image Viewer.pdf* for a description of this tool.

area within the river. The scenario here is to monitor the area marked with the Zone 2 object, and to photograph all ships passing through this zone.
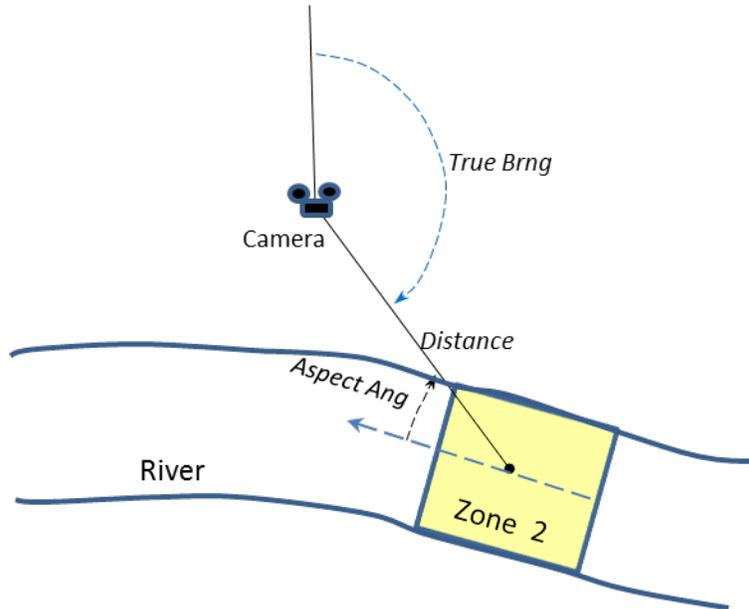

Figure 1 Capture Image setup geometry

Notice that the look aspect for the camera will not generally be perpendicular to the object being viewed. This is due to the fact that the DMT Radar is usually setup to ignore radar returns with little or no Doppler velocity as a clutter reduction technique. As a result, Zone 2 should be located such that the Aspect Angle provides some measurable Doppler signal on the objects in the area of interest while at the same time being as large as possible.

After constructing the desired Zone 2 region, the user must measure the following parameters used for later setup:

     True Brng   -- the true bearing in degrees from the camera to the center of Zone 2
     Distance   -- the distance in meters from the camera to the center of Zone 2
     Aspect Ang   -- the smaller angle between the camera look direction and the general
                    direction of movement for the objects (ships). (0 < aspect ang < 90˚).

Setup

        The controls for the *Capture Image* function are normally hidden (disabled) in the standard DMT Client program, and are made visible (enabled) by a special line entry in the Client program's configuration file.[3] An additional field is also required to enable

---

[3] This configuration file is C:\DMTLLC\ClientSetup\DMTClientConfig*.txt

communications with the FLIR-PT camera directly (Nexus Server link). The following lines must appear in the configuration file to enable the *Capture Image* function:

CAPTUREIMAGE | True | True
NEXUSLINK | <IPaddress> | <Port>   *(IPaddress/port for the Nexus server)*

Begin the setup by opening the *Capture Image* controls and entering the required setup parameters. To open these controls, choose the *Capture Image* menu option in the *Client* menu option in the *DMTRemClient* main display as shown in Figure 2. (*If the Capture Image menu option is missing, then the configuration file is either missing or does not contain the required entries shown above*).
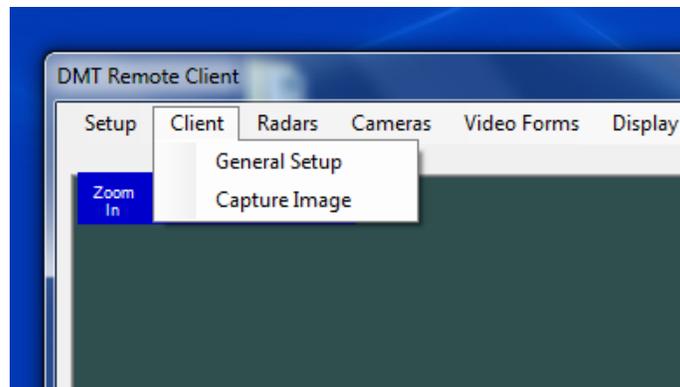

Figure 2. Capture Image menu option.

These controls will now appear in the OFF state in a separate form as shown in Figure 3.
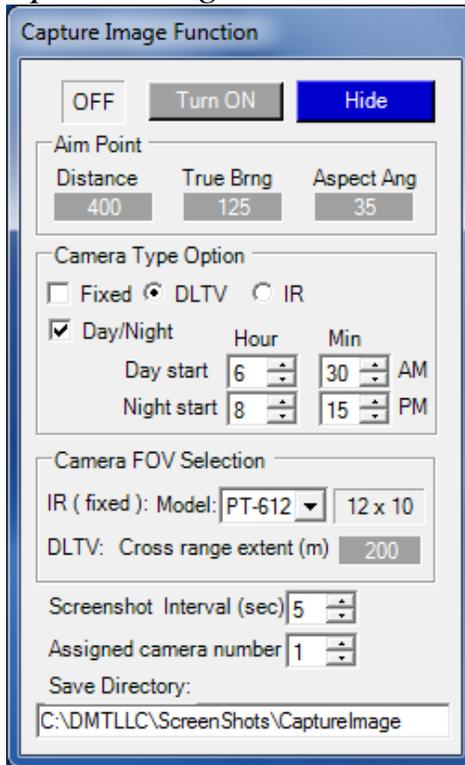
Figure 3. Capture Image controls form.

Enter the *Distance*, *True Brng*, and *Aspect Ang* parameters by clicking on the appropriate value boxes and completing the value entry dialog.

Next select the Camera Type option as *Fixed* or *DayNight*. The *Fixed* option selects either the DLTV or the IR camera to be used for all screenshots. The *DayNight* option automatically selects the DLTV during daylight hours, and the IR camera during the night. The user must select the start times for day/ night by entering local times in the selection boxes.

The user then needs to select the FLIR PT camera model being used by making the appropriate selection in the *Model* selection box in the *Camera FOV Selection* group. This selection will set the <u>fixed</u> FOV value for the IR camera, which is displayed in the adjacent text box for the selected model. The DLTV camera for all FLIR PT models has a variable FOV from wide angle (58°) to fully zoomed in (1.7°). The user can select the *Cross range extent* in meters of the image at the target object's distance by clicking on the entry box and entering the value. This value is used to automatically set the zoom level for the DLTV.

Next select the interval in seconds for screenshot captures, and the camera number (1 .. 8) that will be used in the selection boxes. Finally, select the main directory for saving files by

clicking on the box, which brings up a directory selection dialog. This directory is the parent directory for the individual "day" directories that are created automatically to store screenshots for a particular day, as described later in this document.

Once these parameters have been entered, they will be remembered (and restored automatically on the next Client program startup) with the Client program *Save Settings* function.

Operation

To start the *Capture Image* function, click on the *Turn ON* button located at the top of the control form. The function logic will then check for proper setup of all required values and resources, which include the following:

- The selected camera is defined in the Camera List form
- The Zone 2 region object has been defined
- Proper values for parameters are entered
  - o Aspect angle: $0 < \text{ang} < 90°$
  - o Distance: $0 < \text{dist}$

If any of the above checks fails, the user will be provided an error message similar to that shown in Figure 4, and the start request will then be ignored.
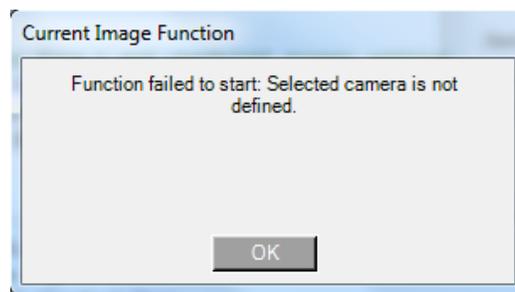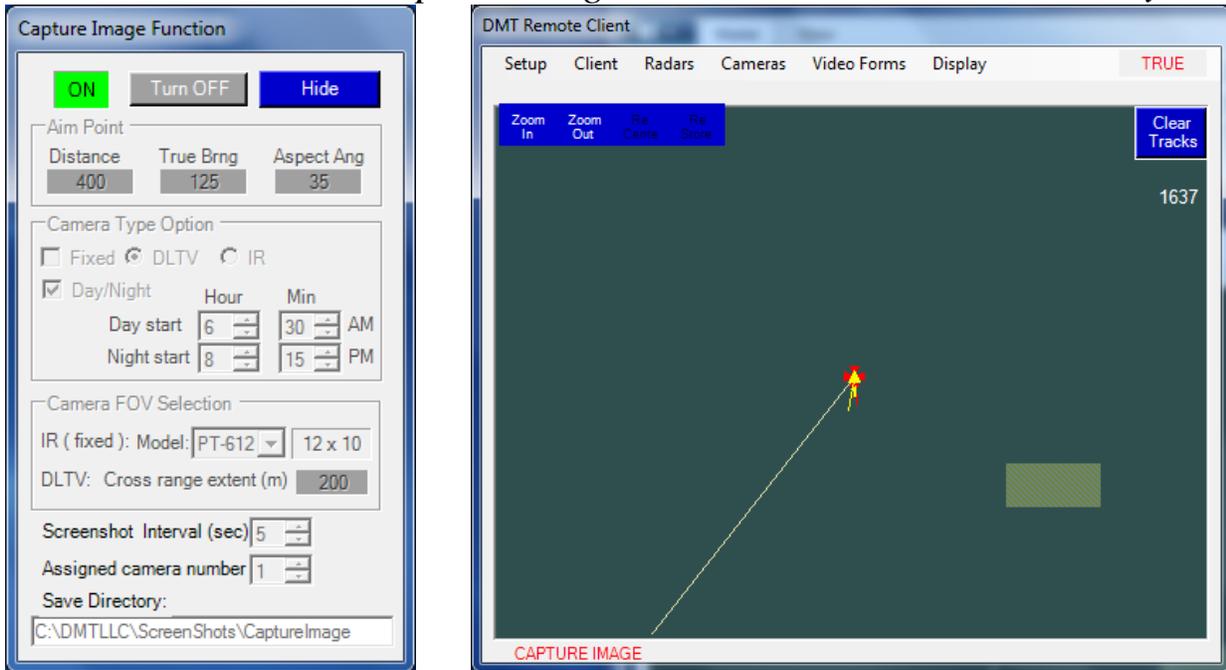

Figure 4 Example error message for failed Capture Image function start

Once the Capture Image function is turned ON, the user will see an ON status indication in the control form and on the main display as shown in Figure 5.

5

Green ON light - controls disabled   Red Capture Image label on main display

Figure 5 Capture Image function active indications

Capture Image will then open the *Camera Video 1* window, set the appropriate settings, and automatically connect with the selected video camera, as shown in Figure 6.   The user should verify the correct camera has been selected in the *Name* textbox and that the desired camera type (DLTV or IR) is being viewed.
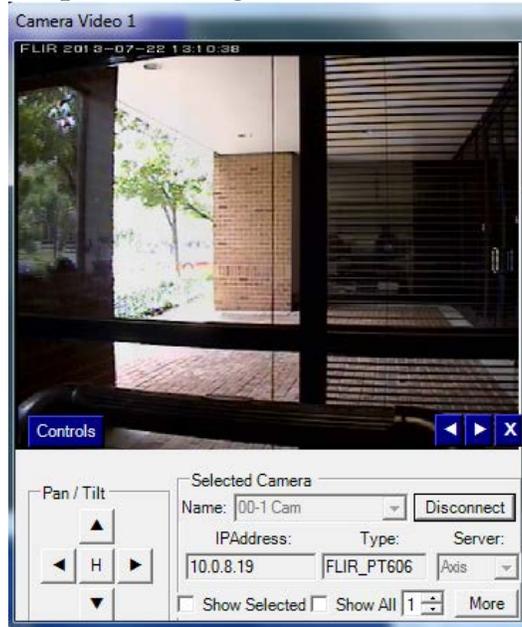
Figure 6 Example camera video window connected to DLTV camera

At this point *Capture Image* begins to monitor all incoming track reports from the DMT Radar, and remains idle until a Zone 2 entry is reported with a track.   When a Zone 2 entry is reported, the function moves the assigned camera to point at the center of Zone 2, and begins making screenshots (still images) of the video being displayed on the *Camera Video 1* window. The images are collected at the interval (in seconds) selected on the control panel. While screenshots are being taken, the label on the main display will turn green as shown in Figure 7.
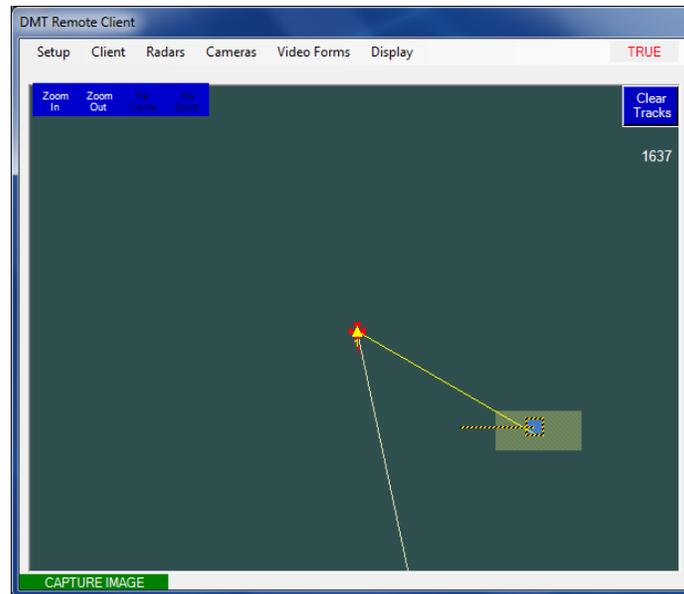
Figure 7 Capture Image function taking screenshots -- Green label

When Zone 2 entries are no longer being reported, the assigned camera is "released" to resume other duties (such a track to alarms) and the screenshots are stopped. The main display label will change back to red to indicate the idle state.

If the *DayNight* camera option is selected, the *DMTRemClient* program will automatically switch the camera type selection to DLTV at the day start time, and to IR at the night start time.

Save/Restore Operation

Once the *Capture Image* setup is completed, the user should save these settings by clicking on the *Save Settings* menu option within the *Setup* menu option on the *DMTRemClient*'s main display. These settings will then be restored automatically with the next startup of the *DMTRemClient* program.

If the *Capture Image* function was turned ON when the *Save Settings* operation was performed, then this function will be restarted automatically during the next program start. An alert will be presented during startup to advise the user that the function is ON, as shown in Figure 8. Also, the *Camera Video 1* window will open with the selected camera connected and displaying video.
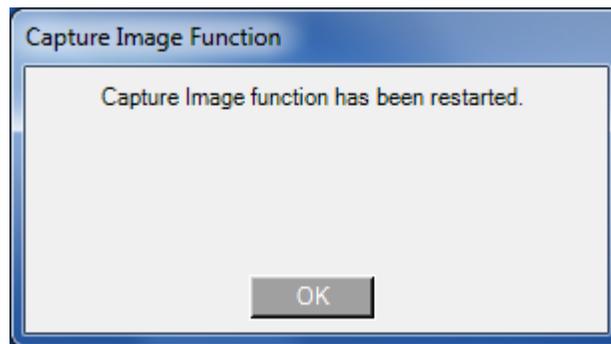

Figure 8 Program startup alert -- Capture Image function restarted

The *Capture Image* setup values are saved with two new text lines in the *DMTRemClient*'s settings file.[4] These entries may be viewed and edited as desired by the user by opening the settings file with any text editor.

The new settings file lines are defined as follows:

---

[4] This save settings file is C:\DMTLLC\ClientSetup\DMTClientSet.txt

CAPTURERESTART | <val>

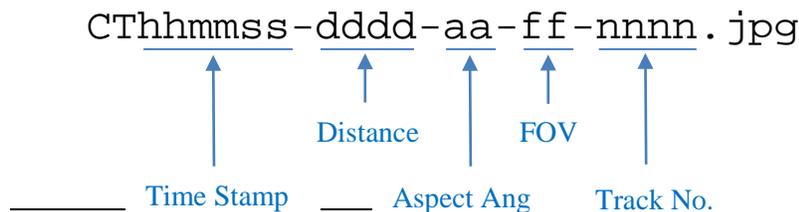   where **<val>** = (True | False) *Flag indicating automatic restart of the Capture Image*
                                          function at program startup.

CAPTURESET | <val1> | <val2> | <val3> | … | <val15>

      where   **<val1>** = (integer) *Aspect angle (degrees)*

                  <val2> = (integer) *Distance (meters)*

                  <val3> = (integer) *Camera type selection 0 - DLTV, 1 - IR*

                  <val4> = (integer) *Screenshot interval (sec)*

                  <val5> = (string) *Save directory path*

                  <val6> = (integer) *Assigned camera number (1 .. 8)*

                  <val7> = (integer) *True bearing (degrees)*

                  <val8> = (integer) *Camera option 0 - Fixed, 1 - DayNight*

                  <val9> = (integer) *Day start hour AM (0 .. 11)*

                  <val10> = (integer) *Day start min (0 .. 59)*

                  <val11> = (integer) *Night start hour PM (0 .. 11)*

                  <val12> = (integer) *Night start min (0 .. 59)*

                  <val13> = (string) *Camera model (PT-304, PT-307, PT-313, PT-612,*
                                          PT-618, PT-625)

                  <val14> = (string) *IR camera FOV (4.6x3.7, 7x5, 13x10, 6.2x5, 12x10,*
                                          18x14,25x20)

                  <val15> = (integer) *Cross range extent (meters) (20 .. 500)*

Video Files

      The screenshots are saved into the directory selected by the user on the *Capture Image* control panel. They are further organized into "day" directories which are created automatically when saving the first screenshot for a given day.[5] The filenames are constructed to save the key information needed for later viewing of calibrated images using the DMT Image Viewer. (The FOV field in the filename saves the actual camera field of value when the screenshot was taken). The general format for filenames begins with the letters "CT" followed by data fields defined as follows:

```
CThhmmss-dddd-aa-ff-nnnn.jpg
```

                                    Distance   FOV

Time Stamp   Aspect Ang   Track No.

---

[5] These directories have the general form mm-dd-yyyy (e.g., 7-22-2013 for the day 22 July 2013)