Seek Scan Network & API

Quick Start Guide

Seek Scan software provides a network interface for thermal scan alerts. UDP packets can be broadcasted from the Seek Scan software, TCP packets can be queried or pushed, and RTSP streaming video capabilities allow a user to deliver Seek Scan information throughout a network. All data is encoded in plain-text JSON format.

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Install the latest version of Seek Scan

Please download and install the latest version of Seek Scan software from the Seek Scan webpage near the bottom: https://www.thermal.com/seekscan.html.

Exposing the Networking Settings Menu

To access the API capabilities, make the camera system database accessible on the network, and enable UDP broadcast messaging, place the *Network.lic* file into the *C:/ProgramData/Seek Thermal/Seek Scan* folder on the PC running Seek Scan software.
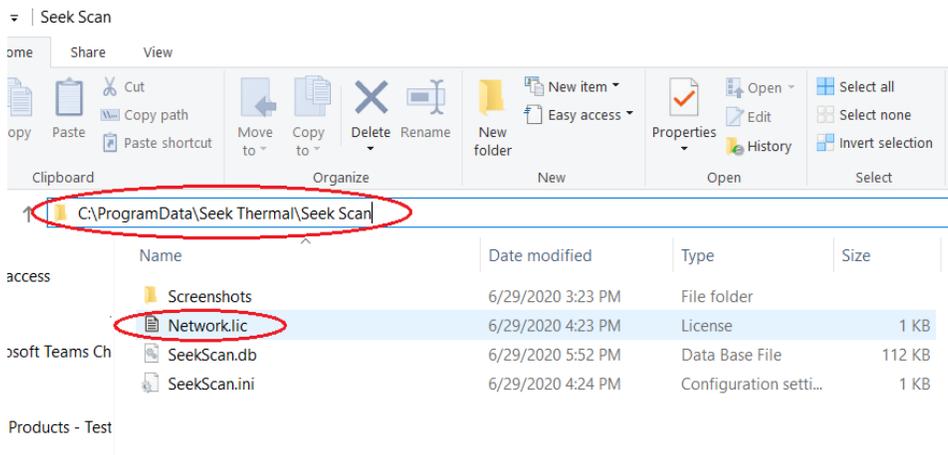
Note: The 'ProgramData' folder may be hidden on your PC. To view a hidden folder, click on the Show Hidden checkbox in the **View** tab of the Windows File Manager window of the PC running the Seek Scan software.
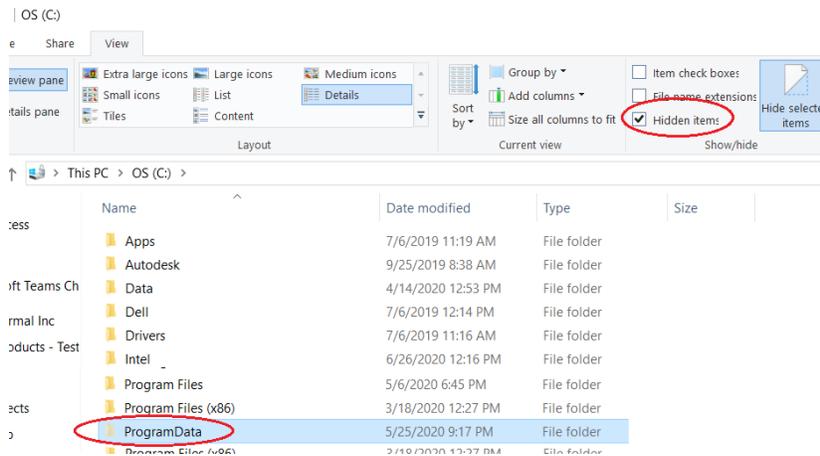
Note: The *Network.lic* file can be obtained by sending the serial number(s) of the camera(s) connected to the Windows PC(s) running the Seek Scan software at the following link: https://www.thermal.com/seekscan-api-request.html

Note: The Network Settings Menu tab will only appear after the Network.lic file is in the *C:/ProgramData/Seek Thermal/Seek Scan/* folder and the thermal camera (black and white camera) is streaming in the software.

Network Configuration

Networking is disabled by default; to enable networking communication, select the *Allow Network Access* checkbox in the 'Network Settings Menu' tab on the Seek Scan Settings window.

To enable network discovery and broadcast messaging of scan events select the *Message Broadcasting (recommended)* checkbox.

PCs running the Seek Scan software that have multiple NIC adapters should use the **Network Adapter** drop down box to select the desired Adapter and configure. When a network adapter is selected, the IP Address and subnet mask are shown for routing purposes.
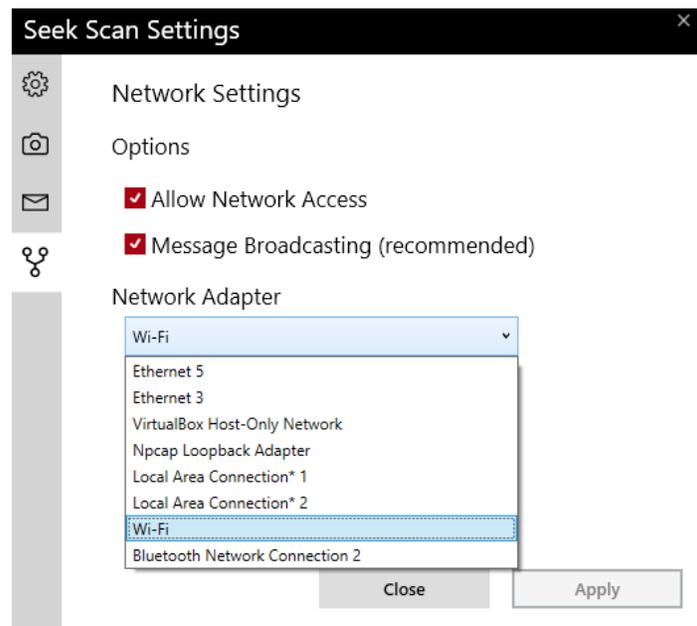
Note: UDP broadcasting is performed only on the subnet as defined by the network subnet mask in the Windows PC control panel.

Note: Apply changes to the Save Images and Allow Network Access checkboxes you may need to close the Settings window and restart the Seek Scan software.

Store and Access Images

The Seek Scan software now allows customers to save and access daylight camera, thermal camera, and Seek Scan software screenshots. The Save Images checkbox is located near the bottom of the Station Settings Menu. This checkbox needs to be selected for images to save to the encrypted database for access later. Use the TCP command set to access the images on the database.
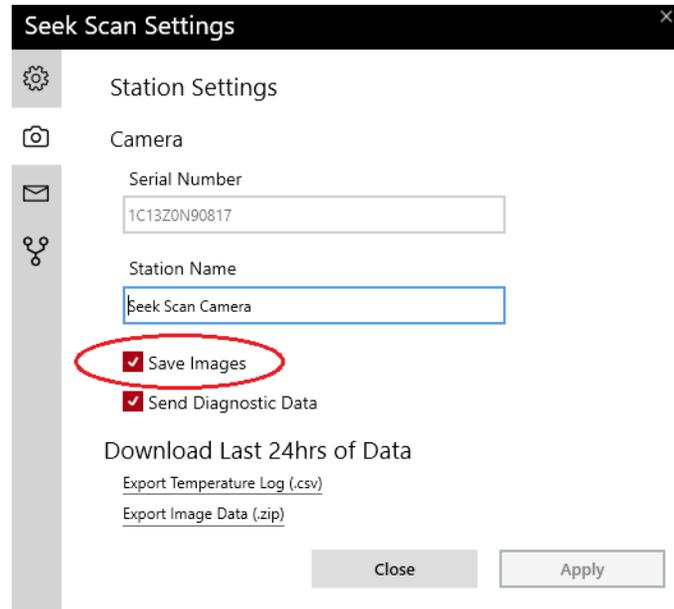
Note: Save Images is not selected by default. The Save Images Checkbox is required to save images to the encrypted Seek Scan database.

Note: Attaching Images to Emails does **not** store the images to the Seek Scan database. If Save Images is unchecked in the Station Settings Menu and Include Image is checked in Email Settings Menu, then images will be emailed, but not stored to the database.

UDP Event Broadcasting

Message	Port	Frequency	Description
HELLO	16812	3 Hz	Every 3 seconds, a HELLO command packet containing identity information is broadcasted on the network. By listening to this event, a list of Seek Scan camera systems may be collected. The camera serial number and IP Address are included in the broadcast message.

Message Fields

Message – Contains the text "HELLO", which is the event identifier

CameraID – The serial number of the Seek Scan Camera

IPAddress – The IP Address of the Seek Scan host computer

> *Example*
> *{*
> 　　*"Message" : "HELLO",*
> 　　*"CameraID" : "1713Z1LRQQ65",*
> 　　*"IPAddress" : "192.168.2.210"*

}

Message	Port	Frequency	Description
SCAN	16811	Per Scan	When a scan is taken, the PASS/FAIL result of the scan is broadcasted.

Note: RESCAN SCAN event messages are not available over UDP or TCP Broadcasts.

Message Fields

Message – Contains the text "SCAN", which is the event identifier

CameraID – The serial number of the Seek Scan Camera

IPAddress – The IP Address of the Seek Scan host computer

Disposition – The Pass/Fail result of the scan, where 1 is Pass and 0 is Fail

RecordID – A unique identifying number for the scan

TimeStamp – The date and time at which the scan was taken

```
Example
{
        "Message" : "SCAN",
        "CameraID" : "1713Z1LRQQ65",
        "IPAddress" : "192.168.2.210",
        "Disposition" : 1,
        "RecordID" : 3746,
        "TimeStamp" : "2020-06-19T14:40:39"
}
```

Verify UDP Messaging on your Network

Seek Thermal has provided a visual basic project and example application on how to listen for and verify the UDP message for scans across your network.

Run the UdpDataWatch Application

1) Place the Seek Scan Network Example folder onto a PC on the network where message alerts are desired to be received.
2) Navigate to the Seek Scan Network Example/UdpDataWatch/bin/Release folder and run the *UdpDataWatch* application.
3) The application is not signed; please click the More info link in the 'Windows protected your PC' pop-up, then click the **Run Anyway** button.
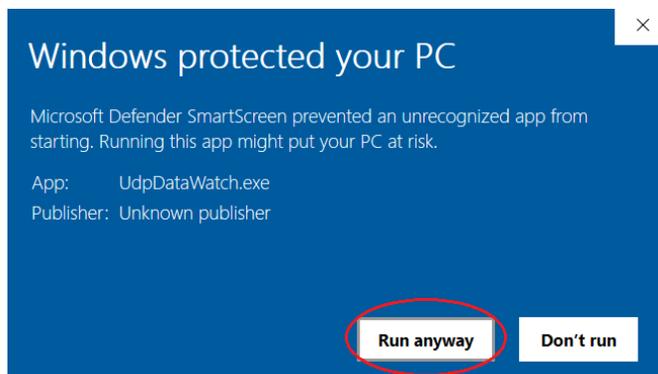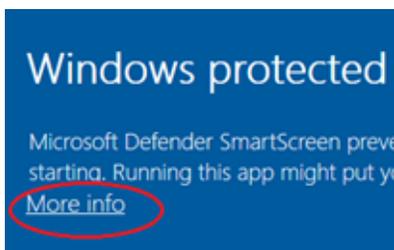
4) Seek Scan systems with a valid *Network.lic* file will start to appear in the UdpDataWatch application automatically if they are on the correct network and subnet.
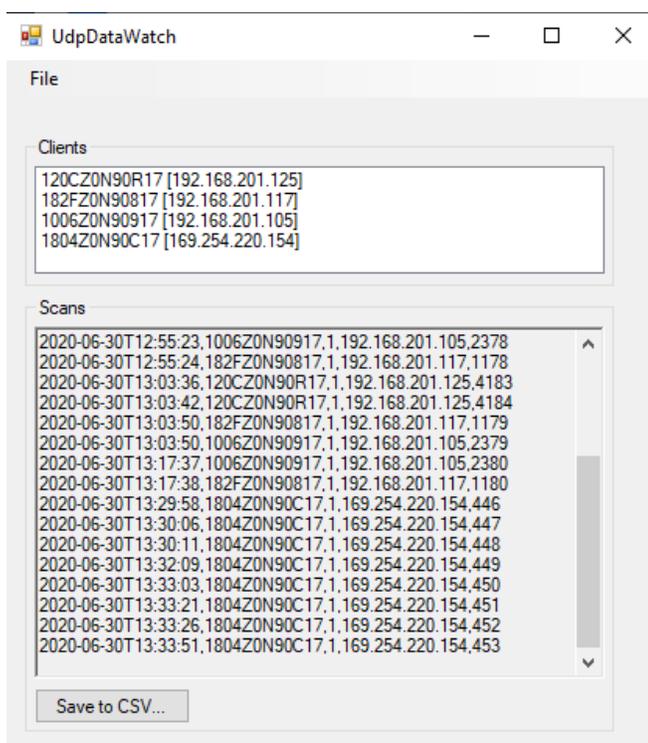
TCP Data Access

Two ports are designated to provide historic data access via TCP network communication. Port 16810 implements request and response messages in plain text. Port 16820 is a mirror of the functionality provides on port 16810 with an additional SSL encryption layer on the port.

Note: It is recommended to use Port 16810 if testing TCP requests via Putty. Putty and other similar tools are not reliable when connecting to Port 16820 due to the additional SSL layer.

Note: PuTTY is a free and open-source terminal emulator, serial console, and network file transfer application. It supports several network protocols, including SCP, SSH, Telnet, rlogin, and raw socket connection. It can also connect to a serial port. Putty can be downloaded here: https://www.putty.org/

Testing with Putty

The HTTP connection is closed after the response data is sent back to the requestor. For testing in Putty, make sure you check the "Never" radio button under "Close window on exit". You can copy the config settings shown below
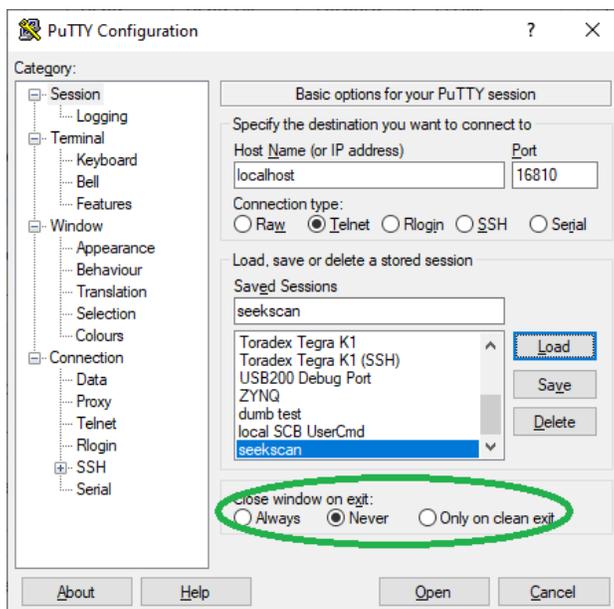
Note: You will only have 10 seconds to type the command; then the connection will timeout and close. It is recommended typing the command out in notepad or wordpad since they can be lengthy, and then copy and paste the call in.

Note: In HTTP, the commands always end with two carriage return newlines (pushing enter twice).

TCP Scan Event Push Notifications

Similar to the UDP Event Broadcasting, the same message and push notification style event notification can be sent over TCP Event. This will make the event notification push on a direct connection instead of broadcasting over an entire subnet. Please use port 16814 for TCP live scan event notifications.

Message	Port	Frequency	Description
SCAN	16814	Per Scan	When a scan is taken, the PASS/FAIL result of the scan is broadcasted.

Note: RESCAN SCAN event messages are <u>not</u> available over UDP or TCP Broadcasts.

Message Fields

Message – Contains the text "SCAN", which is the event identifier

CameraID – The serial number of the Seek Scan Camera

IPAddress – The IP Address of the Seek Scan host computer

Disposition – The Pass/Fail result of the scan, where 1 is Pass and 0 is Fail
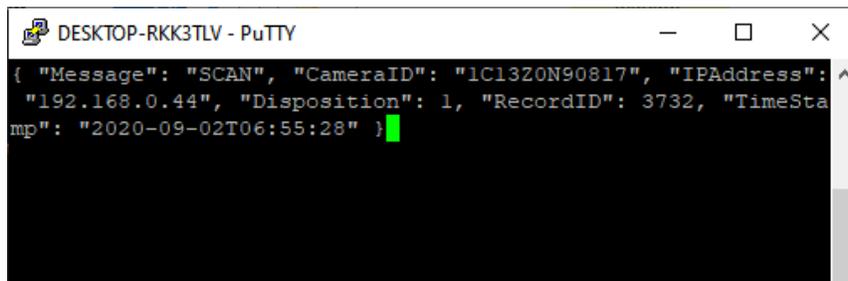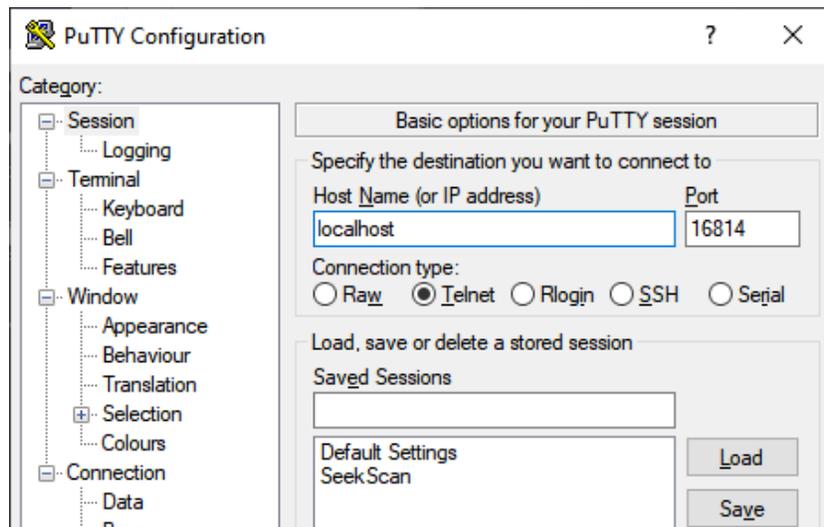
RecordID – A unique identifying number for the scan

TimeStamp – The date and time at which the scan was taken

> *Example*
> *{*
>> *"Message" : "SCAN",*
>> *"CameraID" : "1713Z1LRQQ65",*
>> *"IPAddress" : "192.168.2.210",*
>> *"Disposition" : 1,*
>> *"RecordID" : 3746,*
>> *"TimeStamp" : "2020-06-19T14:40:39"*

Testing TCP Broadcast with Putty

Data Query

The data query messaging format uses standard HTTP GET requests, where HTTP header fields are optional. The http responses are JSON strings or jpeg images with the corresponding mime type denoted in the http response header. Standardized HTTP web request may be used to query the Seek Scan system using JavaScript or other languages and tools that have http web request support. Alternatively, a raw socket may also be used to access the data. As a complete HTTP header is optional for accessing the data, only the required portion of the communication request is documented.

Note: Requests are expected within 10 seconds of the communication socket being opened. The socket connection is closed when either the timeout occurs, or the complete response has been sent.

Note: For the fastest performance when communicating with a remote machine, connect to that machine via IP address, not host name.

Request Format

The data request starts with a "GET" or "POST" string, followed by the command name. If a "GET" request contains fields or parameters, they are appended to the command name after appending a '?' character. "POST" commands may also provide a set of parameter fields. For "POST" commands, the command is proceeded by a double carriage return line feed pair and then followed by the parameter string. Each field is a name value pair written as case insensitive *"name=value".* When more than one field is used, they are concatenated together and separated with an ampersand ('&'). The command is terminated using the standard http specification of carriage return and line feed character twice in a row (i.e. "\r\n\r\n"). The following is an example query request when using raw socket communication.

```
GET /query?Disposition=1&StartDate=2020-06-01&EndDate=2020-06-
31&Index=0&Count=25
```

When an http request library or internet browser is used to access the data, the *"GET"* may be omitted as it is inserted by the browser or http API. A URL may be used to retrieve the data. The following is the URL version of the above example

```
http://localhost:16810/query?Disposition=1&StartDate=2020-06-
01&EndDate=2020-06-31&Index=0&Count=25
```

The following is an example of a POST command

```
POST /settings
```

```
TemperatureThreshold=37.2&EnableAlertSounds=1
```

Alternatively, https may be used to request and receive data over an encrypted secure socket layer. It is important to note that as individual cameras do not have a unique domain name associated with them, the associated SSL certificate cannot be authenticated by an SSL certificate authority. Care must be taken to allow the request to proceed as many http request libraries, including internet browsers, will not allow the request due to security restrictions.

Despite the restriction, the request is safe since it is coming from the Seek Scan system and not an unknown external website. The following is a URL example using HTTPS/SSL on port 16820. Notice the 's' after the "http" in the URL.

https://localhost:16820/query?Disposition=1&StartDate=2020-06-01&EndDate=2020-06-31&Index=0&Count=25

Date/Time format

All data and time fields use a format of *[year]-[month]-[day]T[hour]:[minute]:[second].* All values are integer where January=1 and Hours are represented from 0 to 24. Granularity of the data/time may be variably fine or coarse by omitting portions of the data/time descriptor from right to left. For example, a date of "2020-06" is equivalent to "2020-06-01". The time portion, as separated from the data by a 'T' character, is optional. The following is a formatted string representing July 10, 2020, 3PM.

2020-7-10T15:0:0

Response Format

All responses contain a minimal set of HTTP header information, followed by the response data. Preceding transmission of the response data, the HTTP header is terminated with two carriage return & line feed character sequences totaling 4 bytes. When data transmission is complete, the socket connection is automatically closed, signifying that all data has been sent and received.

Example Response header for JSON Data

HTTP/1.1 200

Content-Type: application/json

Access-Control-Allow-Origin: *

Connection: close

[JSON TEXT DATA]

Example Response header for Image Data


```
HTTP/1.1 200

Content-Type: image/jpeg

Content-Length: 47201

Access-Control-Allow-Origin: *

Connection: close
```


[JPEG IMAGE BINARY DATA]

Message	Port	Frequency	Description
QUERY	16810/16820	Request	A query request provides access to historic scan data. Fields are provided to filter the data set. Pagination is also supported as responses are limited to a maximum result size of 1000 data entries.

Message Request Fields / query filters

ScanID	Unique integer identifier for the scan entry. Used to return a single entry.
Disposition	Integer Pass/Fail condition where 1=PASS, 0=FAIL, and 2=RESCAN.
IncludeRescans	Whether results marked as "Rescan" are included in results data set. 0=Not included, 1=Included.
MinSkinTemp	Minimum skin temperature.
MaxSkinTemp	Maximum skin temperature.
MinBodyTemp	Minimum body temperature.
MaxBodyTemp	Maximum body temperature.
StartDate	The starting date from which to retrieve scans.
EndDate	The end date from which to retrieve scans.
Index	The starting index, used for pagination, of the request result subset. When index=0, the result is the first set of "Count" records (see below).
Count	The count of records in the requested subset.
Order	The sort order of the results data set. The values are as follows: *ID, Serial, CameraName, SkinTemp, BodyTemp, ThresholdTemp, Disposition, TimeStamp.* When omitted, the default order is by TimeStamp.
OrderDir	The sort order direction of the results data set where 0=ascending and 1=descending order. When omitted, the default direction is ascending.

Note: The user has the option to include RESCAN events in their search or not. By default, if the IncludeRescans parameter is missing from the call, rescan events will not be included.

Example
```
http://localhost:16810/query?Disposition=1&StartDate=2020-06-
01&EndDate=2020-06-31&Index=0&Count=25&Order=SkinTemp&IncludeRescans=1
```

Response Fields

The Response is a JSON formatted string containing some top-level information as well as a list of scans.

> **RowCount** – contains the total number of results in the results superset that would be returned without the index and count pagination request fields. This value is intended to be used for pagination implementation purposes. It is important to differentiate between this value and the number of results returned in the current request as the request may return a subset of the data as defined by the index and count fields.

> **Results** – This contains an array of JSON objects, which are the scan entries. The scan entries have a set of fields defined below

ID	Unique integer identifier for the scan.
AppVersion	Version of the Seek Scan software at the time the scan was captured.
Serial	Serial number of the Seek Scan Camera.
CameraName	User defined camera/station name. See the "Station Settings Menu" tab in the Seek Scan Settings window.
FileVisible	Path and filename of the visible image file. This file path can be passed to the *IMAGE* command to retrieve the image.
FileThermal	Path and filename of the thermal image file. This file path can be passed to the *IMAGE* command to retrieve the image.
FileScreenshot	Path and filename of the screenshot image file. This file path can be passed to the *IMAGE* command to retrieve the image.
SkinTemp	Skin temperature.
BodyTemp	Body temperature.
ThresholdTemp	The threshold temperature used to calculate the pass/fail disposition result.
BodyTempOffsetStatic	User defined value to convert skin temperature to body temperature.
BodyTempOffsetAdaptive	The software-calculated adaptive offset from skin temperature to body temperature.
BodyTempOffsetType	The body temperature offset mode for the system: "Static" or "Adaptive".
Disposition	The Pass/Fail condition where 1=PASS, 0=FAIL, and 2=RESCAN.
TimeStamp	The Date & Time at which the scan was captured.

Example

```
{
 "Results": [
  {
    "ID": "77",
    "AppVersion": "1.9.1.0",
    "Serial": "1713Z1LRQQ65",
    "CameraName": "West Entrance",
    "FileVisible": "PASS\/2020.07.02._12.37.08\/2020.07.02.12.37.08_PASS_Visible_Temp_31.07",
    "FileThermal": "PASS\/2020.07.02._12.37.08\/2020.07.02.12.37.08_PASS_Thermal_Temp_31.07",
    "FileScreenshot": "PASS\/2020.07.02._12.37.08\/2020.07.02.12.37.08_PASS_Scrnshot_Temp_31.07",
    "SkinTemp": "31.071812",
    "BodyTemp": "36.099999",
    "ThresholdTemp": "39",
    "BodyTempOffsetStatic": "3.4",
    "BodyTempOffsetAdaptive": "5.028187",
    "BodyTempOffsetType": "Adaptive",
    "Disposition": "1",
    "TimeStamp": "2020-07-02T12:37:08"
  },
  {
    "ID": "78",
    "AppVersion": "1.9.1.0",
    "Serial": "1713Z1LRQQ65",
    "CameraName": "West Entrance",
    "FileVisible": "FAIL\/2020.07.02._12.37.11\/2020.07.02.12.37.11_FAIL_Visible_Temp_39.87",
    "FileThermal": "FAIL\/2020.07.02._12.37.11\/2020.07.02.12.37.11_FAIL_Thermal_Temp_39.87",
    "FileScreenshot":"FAIL\/2020.07.02._12.37.11\/2020.07.02.12.37.11_FAIL_Scrnshot_Temp_39.87",
    "SkinTemp": "39.866287",
    "BodyTemp": "40.497238",
    "ThresholdTemp": "39",
    "BodyTempOffsetStatic": "3.4",
    "BodyTempOffsetAdaptive": "0.630951",
    "BodyTempOffsetType": "Adaptive",
    "Disposition": "0",
    "TimeStamp": "2020-07-02T12:37:11"
  },
  {
    "ID": "79",
    "AppVersion": "1.9.1.0",
    "Serial": "1713Z1LRQQ65",
    "CameraName": "West Entrance",
    "FileVisible": "RESCAN\/2020.07.02._12.37.11\/2020.07.02.12.39.11_RESCAN_Visible_Temp_29.87",
    "FileThermal": "RESCAN\/2020.07.02._12.37.11\/2020.07.02.12.39.11_RESCAN_Thermal_Temp_29.87",
    "FileScreenshot":"RESCAN\/2020.07.02._12.37.11\/2020.07.02.12.39.11_RESCAN_Scrnshot_Temp_29.87",
    "SkinTemp": "29.866287",
    "BodyTemp": "",
    "ThresholdTemp": "39",
    "BodyTempOffsetStatic": "3.4",
    "BodyTempOffsetAdaptive": "5.630951",
    "BodyTempOffsetType": "Adaptive",
    "Disposition": "2",
    "TimeStamp": "2020-07-02T12:39:11"
  }
 ],
 "RowCount": 3
}
```

Message	Port	Frequency	Description
IMAGE	16810/16820	Request	Retrieve a JPEG image

The image command is used to retrieve a captured image from an individual scan. The image may be a visible, thermal, or screenshot image capture. The image request is made by sending the "image" command keyword and concatenating with the image file path as returned by the *QUERY* request. The paths for the three types of images are contained in the results of the FileVisible, FileThermal, and

FileScreenshot data fields. The format of the image data is JPEG and is returned after the http response header as a binary byte stream.

Example

```
http://localhost:16810/image/PASS/2020.06.24._15.43.31/2020.06.24
._15.43.31_PASS_Visible_Temp_36.59
```

OR

```
GET
image/PASS/2020.06.24._15.43.31/2020.06.24._15.43.31_PASS_Visible
_Temp_36.59
```

Message	Port	Frequency	Description
SETTINGS	16810/16820	Request	Set one or more settings in the seek scan application

The SETTINGS command uses an HTTP POST to configure various settings in the application. The command may contain a single parameter or multiple parameters in a single POST.

Message Fields

TemperatureThreshold – Defines the maximum temperature allowed to produce a PASS disposition result. Append a "C" or "F" to the end of the threshold number to specify units of Celsius or Fahrenheit.

BodyTemperatureOffset -- User defined value to convert skin temperature to body temperature. Append "C" or "F" to the end of the offset number to specify units of Celsius or Fahrenheit.

Units – Options are either "C" or "F" for Celsius or Fahrenheit. This option is for display only.

SaveImages – Option to store images securely on the Seek Scan Windows PC. Values are either 0 or 1 for disable and enable, respectively.

EnableAlertSounds – Option to Enable or Disable Sounds when a scan is taken. Values are either 0 or 1 for disable and enable, respectively.

Example
POST /settings

TemperatureThreshold=37.2&EnableAlertSounds=1

RTSP Streaming Video

The daylight camera video stream and the thermal camera video stream can be accessed over a network using the Unicast RTSP streams. There is a slight delay in the video today, but all the real time data is still happening live in the Seek Scan software and does not affect the system performance. Networks that are slower or that have limited bandwidth may experience more delay.

> *Seek Scan Daylight Video Stream – rtsp://<ip address>:8554/visible*

> *Seek Scan Thermal Video Stream – rtsp://<ip address>:8554/thermal*

Note: Today both streams have some On Screen Displays in them, we hope to have a new feature to add or remove the OSDs from the streams.

Note: To stream on the same PC running the Seek Scan software use 'localhost' instead of the Seek Scan PC's IP Address.