Librestream Onsight
Mobile Collaboration
with BGAN
Delivering high quality video and
audio from the field over BGAN
Version 1.0
1. **Purpose**

The purpose of this document is to introduce the applications, features and benefits of Librestream’s Onsight mobile collaboration system and describe how to optimally configure Onsight for the BGAN network.

2. **Solution Overview**

Video has rapidly gained momentum as a mission-critical tool for the enterprise. Enterprise video communication has grown into a multi-billion dollar industry, primarily in traditional video conferencing. However, millions of “physical world” workers in locations such as oil rigs, mining sites, nursing wards, construction sites, military and emergency response locations have been unable to participate in this revolution - until now.

Librestream extends the power of video collaboration to these hard to reach environments through its Onsight system over BGAN networks.

2.1 **Introduction to Onsight**

Librestream’s patented Onsight™ Mobile Collaboration System allows workers to view, diagnose, consult, and resolve issues in real time with other people in remote locations. Onsight offers a complete mobile collaboration system that includes the wireless Onsight mobile collaboration device (OD), and a companion software application, the Onsight Expert mobile collaboration application (OE).

Onsight connects colleagues, suppliers, customers, and other team members in an instant and allows them to collaborate with video, 2-way audio and 2-way telestration to bring the problem or situation to the expert as opposed to the other way around.

Key attributes of the Onsight system include the following:

- Best in class SIP devices with strong optics including macro (close-up) capability
• Integrated two-way voice and electronic on-screen drawing ("telestration")
• Onsight Expert software with tools that facilitate remote device control and troubleshooting
• Full recording capabilities, including store & forward video options
• Wireless security and end-to-end encryption
• Bandwidth control and management
• Variable illumination for optimal lighting
• Remote management with a centralized, administration tool
• Integration with WebEx and video conferencing systems
• Full support, maintenance, hosting and training services available

2.2 Products and Services

<table>
<thead>
<tr>
<th>Products/Services</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onsight wireless mobile devices</td>
<td>Librestream offers three Onsight device models including the Onsight 1000, Onsight 2000R and Onsight 2000Ex. The Onsight 2000R is a ruggedized device with an IP64 enclosure rating and ability to withstand 4 foot drops to concrete or steel. The Onsight 2000Ex is ruggedized and also certified for Class 1, Div 2 / Zone 2 environments. All the Onsight models are 802.11 b/g wireless handheld devices that share video and engage in 2-way audio and telestration with remote subject matter experts. Device operators can interact visually through the touch panel screen on the back of the device. The Onsight devices include a built-in microphone, speaker and headset jack to provide full voice communication. Onsight devices also have built-in illumination, zoom and focus to ensure clear visuals. The macro capability provides amazing detail for collaboration close-ups. The Onsight devices were specifically designed for field workers who may be wearing gloves and operating within challenging and varied network environments. As SIP-based endpoints, Onsight devices can easily be added to existing video infrastructure such as Tandberg or Cisco.</td>
</tr>
<tr>
<td>Onsight Expert desktop collaboration software</td>
<td>Onsight Expert is a desktop software application that provides full collaboration with Onsight mobile devices. Onsight Expert operators can see video from the field and interact through voice and onscreen telestration. Onsight Expert can remotely control all the Onsight device functions such as zoom and illumination, share images or pre-recorded videos, optimize media settings for the specific bandwidth environment and record Onsight sessions for future use. They can also bring in additional experts running Onsight Expert, via WebEx, or by connecting with videoconference endpoints.</td>
</tr>
<tr>
<td>Onsight Management Suite server software</td>
<td>Onsight Management Suite is server software that provides a secure, web-based centralized administration system. Using Onsight Management Suite, administrators can centrally update, configure, manage and view statistics on the Onsight device and Onsight Expert endpoints.</td>
</tr>
</tbody>
</table>
This product is an essential component of Onsight, as it provides a scalable way to remotely manage all the endpoints.

The Onsight Accessory Kits include soft or hard carrying cases, spare battery, spare stylus, SD card and various headset options including Class I, Div 2 / Zone 2 rated headsets.

For the Onsight 2000 series, there is also an optional I/O sled to provide additional inputs/outputs including S-video, a secondary audio line input, and Ethernet connectivity. Additional accessories such as an external battery charger, camera harness, etc can also be provided separately.

Librestream offers a range of services for the Onsight system including technical support, user / administrator training on premise or online, and a hosted SIP service.

### 3. Main Applications

Onsight is deployed in a variety of applications in vertical markets like oil & gas, mining, manufacturing, health care, military and public safety. Traditional video conferencing doesn’t reach oil rigs, factory floors, remote nursing stations, refineries, or damaged equipment in the field, but Librestream’s Onsight Mobile Collaboration System over a BGAN network does.

Key application examples for Mobile Collaboration today include:

- **Maintenance, repair and overhaul**: Librestream now makes it possible for a repair technician to instantly connect to and collaborate with a remote expert. These applications cross a variety of industry segments and can deliver a very strong ROI.

- **Capital project management**: Construction of a new mine or oil platform, requires input from various specialists. Onsight provides these specialists with a way to see progress inspect quality and monitor safety remotely.

- **Mobile Telemedicine**: Librestream’s Onsight Mobile Collaboration System enables remote workers or citizens to get access to offsite healthcare professionals for remote video consultations to extend the access and quality of health care.

- **Situation Monitoring/assessment**: For military operations or emergency responders, being able to show remote experts the situation through video can be essential to quick, effective decision making. The Onsight mobile collaboration capability makes this possible.

The Onsight system replaces the outdated market alternatives that include the traditional methods for collaboration including travel, conference calls, and e-mailing of digital photos.

### 3.1 Return on Investment and Payback

The Librestream Mobile Collaboration solution provides both tangible cost savings and intangible benefits such as faster and more efficient problem solving, quality improvements, and even environmental impacts. These benefits can include:

- **Travel cost avoidance** (flights, car rentals, hotels, meals, entertainment) – Travel savings are one tangible/hard benefit gained through the use of Onsight. While it is often the simplest to identify, it typically delivers just one small part of the overall ROI.
• **Productivity gain due to travel reduction** (trip to/from airport; flight; flight delays; layover; jetlag). How often could someone in your company deal with a remote issue in a matter of minutes using Onsight rather than travelling there? The productivity gain is often overlooked.

• **Decreased downtime** (connection to experts in real time.) Manufacturers and Energy clients identify a decrease in downtime as one of the most important cost savings related to Onsight. By visually connecting plants or field workers with remote subject matter experts, they can shrink downtime at least by hours, often by days and sometimes even by weeks.

• **Improved visibility and communications on on-going projects**, military comms on the move, new equipment installs, etc. Day-to-day video communication reduces risk of problems down the road. If project managers could see remote projects every day as if they were there what problems could be caught early or avoided all together?

• **Increased leverage of internal experts**, wherever they may be located around the world. Are your experts being leveraged across multiple important situations every day where they can provide key information and help make fast decisions or are they sitting in planes, trains and automobiles?

• **Better training tool** with video/voice/telestration for real-time feedback. Archiving capabilities allow other users to takes advantage of prior recorded sessions. Experts sitting at their laptops can push out informative video recordings to Onsight Device operators in the field and coach them through what they are seeing on its VGA display. Knowledge imparted through video at the time and point of need.

• **Reduction of CO2 (carbon footprint)**. Mobile video collaboration is a “green” technology. It's also a technology that can add to the quality of life of your employees who have to travel constantly to get their jobs done. Now they can avoid leaving Sunday on business or being away from home for the majority of their week by using Onsight.

According to the Aberdeen Group, best in class companies, those that consider video collaboration a strategic tool to develop competitive advantages, calculated an average annual ROI of 94%, including a decrease of 42% in travel time after implementing the solution.
4. Onsight – BGAN Network

4.1 Network Diagram

The Onsight mobile collaboration system can be set up to make calls between the Onsight Device and Onsight Expert PC using direct IP calls or via Session Initiation Protocol (SIP). In its simplest form, the Onsight device and Onsight Expert endpoints can call each other directly within the same LAN through direct IP addresses.

When the Onsight endpoints are not located within the same LAN, firewall traversal will be required to establish an Onsight session. This firewall traversal can be accomplished using a SIP Server, which acts as a proxy and directs SIP messaging and data traffic between the endpoints. Below is a network diagram that shows how Onsight is configured when firewall traversal is required using a BGAN terminal.

Open Ports:
- SIP udp/tcp: 5060
- SIP-TLS tcp: 5061
- UDP ports: 58024 - 58523
5. Onsight Configuration

There are two primary components to the Onsight solution – the Onsight Device (camera) and the Onsight Expert desktop collaboration software. The following configuration information will take you through the basic, initial set-up of both Onsight components.

5.1 Onsight Device (Camera)

5.1.1 Logging in

Turn on the camera by pressing the Power button located on the back on the lower bottom-left corner. It will take approximately a minute for the device to power on and then you will see the following screen below.

Use the default Username of “admin”.

Using your stylus, tap inside the Password box. This will display the screen keypad. If you need to move the keypad, you can do this by using the stylus and grabbing the keypad from its top bar then dragging it to a better location on the screen.

The Password is also admin. Once entered, click Login.
5.1.2 Network Set Up

Once logged in, you will need to configure the camera for network access. This would typically be a function of someone from your IT Department. They will know what information to enter for the camera to get on a network. Below are steps on accessing the network settings in the camera.

First, you must bring up the Main Menu of the camera. This is done by pressing the Display button 3-times. The Display button is located on the back left-side of the Onsight camera immediately above the button with RED dot. Pressing the Display button 3-times will display the screen below. Once the Main Menu is displayed, using the stylus tap on Configuration.

MAIN MENU

Once in the Configuration Menu, expand the Network section as seen on the screen below, and then tap on Wireless.
Once in the Wireless page, click the **Advanced** button located in the lower center of the page. This will display the **Wireless Adapter (R1) Window** as seen below.

![Wireless Adapter (R1) Window](image)

Search for the appropriate network to connect to, then double-tap the selected network, as shown above. This will open the **Wireless Network Properties** window as below.

![Wireless Network Properties](image)

Here you can enter the appropriate selection and entry for Encryption, Authentication and Network key. Once these parameters have been selected and entered, using the stylus tap the **OK** button. This will exit the **Wireless Network Properties** window, and return to the **CF8385PN1** window.
If the correct settings were selected and entered, you should see the words ‘connected to xxx’ beside the **Status** line as in the example below. Click **OK** at the top-right to exit, and then click **Accept** in the Wireless page.

Your Onsight camera is now ready to connect through the wireless network. You can either place a call from the Onsight camera to the Onsight Expert PC or vice versa.

### 5.1.3 Setting up a New Contact

If you want to call the Onsight Expert PC, you will need to enter a new contact in your Onsight camera directory. To do so, press the **Call** button. Select the New button, as shown in the screen below.
You will then enter the **Name** and **Address** (either direct IP address or SIP address) of the Onsight Expert PC, on the screen shown below.

### 5.1.4 Making a Call

After the new contact is entered, select it and press **Dial** to make the call.

You will immediately have a two-way audio connection between Onsight Expert and the Onsight camera. To start the video stream from Onsight Expert, press the **Green Button** on the top of the Onsight camera.
5.1.5 SIP Settings

In most, if not all cases, the Onsight camera will be located on another network other than where the Onsight Expert is located. This is a normal occurrence. However when faced with this scenario there are two items that you must addressed. They are: 1) the restrictions on NAT IP Addresses when attempting to route over the Internet, and 2) specific range of virtual ports that must be opened (usually at the company firewall) to allow audio and video streaming coming from outside the corporate network.

The first item is addressed by configuring the camera with the appropriate SIP settings. Your IT Administrator will need to get you this information. To enable SIP go to:

**Configuration -> Call Control -> SIP**, tap on the **Enable SIP Registration** box. Click **Apply**.

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**General**
- Display
- Video
- Audio
- Call Control
  - General
  - SIP
  - SIP Settings
  - Bandwidth
- Network
- Security
- Time
- Information
- Maintenance

**SIP**
- Enable SIP Registration
- Always use my SIP settings
- Use UDP instead of TCP for SIP messaging

**Accept | Cancel | Apply**

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Now, from the left column tap on **SIP Settings**. A sample window is shown below.

<table>
<thead>
<tr>
<th>General</th>
<th>SIP Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td></td>
</tr>
<tr>
<td>Video</td>
<td></td>
</tr>
<tr>
<td>Audio</td>
<td></td>
</tr>
<tr>
<td>Call Control</td>
<td>Authentication Type:</td>
</tr>
<tr>
<td></td>
<td>Digest</td>
</tr>
<tr>
<td></td>
<td>TCP</td>
</tr>
<tr>
<td></td>
<td>TLS</td>
</tr>
</tbody>
</table>

From the example above, the **Authentication Transport** can be either **TCP** or **TLS**. Consult with your IT Administrator on this. When you enter the appropriate SIP settings tap **Apply**. It will automatically attempt to register those settings with the appropriate SIP Server. If the SIP settings are correct, as in the example above you will see (Registered) along the **SIP Server Address** parameter. If for some reason the SIP settings are incorrect you will see (Register Failed) in the same location. If you continue getting (Register Failed) consult with your IT Administrator.

To address the second item, specific ports need to be opened on the appropriate company firewall to successfully receive real-time audio and video streams from outside the corporate network. These specific ports are also mentioned and configured under the **Port Forwarding** section of the **BGAN Thrane & Thrane Explorer 700** system. Check with your IT Administrator on whether these specific ports need to be opened elsewhere like on the company firewall.

**IMPORTANT NOTE**

Port range **58024-58523** is the default media port range for the **Ingate Siparator**. These ports are used by the **video/audio/data** streams when a call is established. This port range is configurable and "may" vary in your situation. Check with your SIP Server Administrator or IT Administrator for your appropriate port range.
5.2 Onsight Expert

5.2.1 Onsight Expert Log In
After you have installed and launched the Onsight Expert application, the following Splash screen will appear.

You will then get a login prompt as seen below. The User Name and Password are both admin.

5.2.2 Setting up a New Contact
Once logged in, the Main Screen for Onsight Expert will appear as below.
To create a contact, click **Edit** and select **New** as seen below.

A New Contact window will appear as seen below. Enter the appropriate info for **Name** and **Address**. The Name can be any name associated with a given Onsight camera or Onsight Expert user. The Address refers to an IP Address or SIP Address. Once the Name and Address have been entered, click **OK**.

You will then see the contact shown under the Contact tab from Onsight Expert, as below.
5.2.3 Making a Call from Onsight Expert

To make a call from Onsight Expert, **double-click** the Contact entry you wish to call. When the Call begins, you will see the calling and ringing message below.

When the call is accepted by the camera user, the **Call Accepted** message box will appear. Click **OK**.

Once the call is accepted, the following window will appear.

You will immediately have a two-way audio connection between Onsight Expert and the Onsight camera. To start the video stream from Onsight Expert, press the **Play icon** on the bottom left side of the screen.
5.2.4 Setting up Custom Media Configurations

Media configurations determine the specifics of a video stream. Media configurations contain the resolution, bit rate, and settings for optimizing the video stream. The Onsight system comes with three preconfigured media configurations – Low, Medium, and High. These default configurations can be used for testing purposes or actual use. You will want to create your own media configurations so that you can operate effectively and efficiently within the boundaries of your network.

To create a media configuration, click **File** and select **Media Configurations**.

The Media Configurations window will appear as below. Click **Add**.
Enter the Name for this new configuration, and then click the **Video** tab on the top-left, as below.

In the Video tab, you select the appropriate settings for each parameter shown below. As a rule of thumb, set the **GOP** between 5 and 10. Choosing “**Hard Limit**” keeps the video stream within the chosen **Target Video Bit Rate** setting. Choosing “**Soft Limit**” provides a little more flexibility and allows the video stream to very briefly exceed the chosen **Target Video Bit Rate** setting.
Once all the settings have been chosen, click **OK**.

You will now see the newly created media configuration listed with the preconfigured media configurations, as seen below. Click **Close**.

The following table provides suggested Media Configurations for you to use as a starting point to test at the different BGAN Streaming plan levels.

<table>
<thead>
<tr>
<th>Satellite Bitrate</th>
<th>Video Resolution</th>
<th>Video Bitrate Hard Limit</th>
<th>Frame Rate</th>
<th>GOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>384</td>
<td>320x240</td>
<td>267</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>256</td>
<td>320x240</td>
<td>136</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>128</td>
<td>160x112</td>
<td>70</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>64</td>
<td>160x112</td>
<td>37</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note:** Disable Subject Audio and use the GSM Audio Codec.
5.2.5 SIP Settings

As with the Onsight camera, SIP settings need to be configured with Onsight Expert. Follow the prompts below to configure the SIP settings. Click on the File menu and select My Profile.

![Onsight Expert Window]

Now, enter the fields below under the Identification tab. See example to the right. You may or may not choose to have Administrator privileges for this account.

![New User Window]

User Name: johndoe
Password: **********
First Name: John
Last Name: Doe
Administrator
URI: johndoe@eip.acompany.com
Next, click on the SIP Server tab. Enter all the info here. Example on the right. Once all the information has been entered, click OK.

Completely exit Onsight Expert. You will need to close the Onsight program running in the SysTray. To do this, right-click on the Onsight icon in the SysTray and select Exit.

Now log on again, and use the username and password you just created under your profile. If all the info, you will see Registered on the bottom of the screen as seen below.
5.3 Setting up BGAN with Onsight

Refer to the technical document or user guide for the specific BGAN terminal you are using. Configure all wireless network settings such as IP Address, Subnet Mask, etc. on the BGAN terminal.

Note: The user can choose to use a streaming connection of 128, 256 or 384 X Stream Connections. The higher the bit rate the better the quality. For some applications 128 kbps Streaming may be enough.

Make sure the Onsight camera’s Wireless settings are configured for the same wireless network as the BGAN terminal. See Section 5.12-Network Set-up for more information on how to configure the wireless settings on the Onsight camera. After the wireless network is configured on the Onsight camera, choose the appropriate wireless network from the list displayed on the Onsight camera and click the Connect button, as below.
5.4 Setting up BGAN – Thrane & Thrane Explorer 700

Streaming IP service should be initiated from the BGAN terminal and can be configured from either the EXPLORER™'s built-in web server (via a laptop’s web browser) or using the LCD MMI.

1. Open your internet web browser and type the following IP address in the address bar: 192.168.0.1

2. Click on Settings and then LAN

3. Now you should see the web server interface. The screenshot below shows the settings required as configured via the EXPLORER™’s web server interface, ensure you click apply before leave the web page. Please consult your EXPLORER™ manual for more detailed information.

4. NAT Mode Select Router

5. APN Select User Defined, enter the APN, user name and password provided by your SP in order to get a Static IP address. NOTE: If no static IP address is used your IP address will change every time you connect to the BGAN network. On the dashboard screen you can see the IP address of your connection.

6. Automatic Activation select Disable.

7. Primary: Choose the desired Streaming Bit Rate 128, 256 or X Stream

8. Click Apply
9. Now your terminal is configured to start a Streaming connection manually after you register on the network using the web interface (DASHBOARD Page) or LCD MMI (Please Below).
10. Click on Port Forwarding on the left Menu.
11. On Port Forwarding select ENABLE.
12. Check the Active box and enter 58024 – 58523 for the incoming port Range and the IP address you configured in the PNSC ex. 192.168.0.X then for the destination port 58024 – 58523
13. Check the Active box and enter 5060 to 5061 for the Incoming port Range and the IP address you configured in the PNSC ex. 192.168.0.X then for the destination port 5060 to 5061

NOTE: The IP Address 192.168.0.X needs to be manually configured on the Onsight camera to either the wired or wireless interface.
14. Your configuration should look like this:

![Configuration screenshot]

15. Click **APPLY** before leaving the page.

16. Restart your terminal and click OK after properly pointing the terminal. Once the Explorer is registered on the BGAN network you need to go to the **DASHBOARD** and click **Start Streaming**. Please see image below for reference.
5.5 Connecting to Explorer 700 BGAN via LCD MMI

The screenshot below shows the settings required as configured via the EXPLORER™ LCD MMI.

To initiate a connection from the LCD MMI, go to the main view of the LCD.

Press Arrow Down button until CONNECT menu is selected
Press OK

Select the Streaming rate desired and press OK button

Select START and press OK button

Press OK button to confirm Standard connection and wait a minute or two to allow the EXPLORER™ to register the Packet Switched connection with the BGAN system. After registration the LCD main screen will show STREAMING ACTIVE. See LCD below.
5.6 Setting up BGAN – Hughes

Standard service should be initiated from the BGAN terminal and needs to be configured from the Hughes™ HNS9201’s built-in web server (via a PC’s web browser).

1. Open your internet web browser and type the following IP address in the address bar: 192.168.128.100

2. Click on ACA on the menu on the left.

3. Select **ACA settings for TEs with Static IP address** ‘ON’ for the range of the Streaming Data rate you desire. QoS select from 32k up to X-Stream. Enter the APN, user name and password provided by your SP in order to get a Static IP address. NOTE: If no static IP address is used your IP address will change every time you connect to the BGAN network. On the PDP Contexts screen you can see the IP address of your connection.

4. Click Apply
5. Then Click Restart Terminal
Your configuration should look like this

6. The IP address 192.168.128.X with the range of the desired Streaming Data Rate needs to be manually configured on the Onsight camera to either the wired or wireless interface.

7. Now register the terminal by pressing the Audio button until the signal strength lights go off or by clicking the Register with the Network button on the Properties page of the web interface.

8. The terminal will automatically recognize the IP address assigned to the Onsight Camera and start the PDP connection automatically.

Note: You can manually start the connections by going to the PDP Context menu and activating the desired data Rate.
6. Contact Information

6.1 Librestream General Contact
Website: www.librestream.com
Email: support@librestream.com
Phone: North America - 1-800-849-5507
International – +1 (204) 487-0612

6.2 Direct Contacts
Marieke Wijtkamp, VP Marketing & Client Services
Email: marieke.wijtkamp@librestream.com
Phone: +1 (204) 487-0612 ext 259

Lou Silva, Senior Systems Engineer
Email: lou.silva@librestream.com
Phone: +1 (210) 523-7213