



SightLine

APPLICATIONS

EAN-GStreamer Decoder

PN: EAN-GStreamer-Decoder

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Alerts

The following notifications are used throughout the document to help identify important safety and setup information to the user:

 **CAUTION:** Alerts to a potential hazard that may result in personal injury, or an unsafe practice that causes damage to the equipment if not avoided.

 **IMPORTANT:** Identifies crucial information that is important to setup and configuration procedures.

 *Used to emphasize points or reminds the user of something. Supplementary information that aids in the use or understanding of the equipment or subject that is not critical to system use.*



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1 Overview

GStreamer is an open source tool that can be used to display video from many sources. This document describes how to:

- configure GStreamer to decode and display the video stream.
- define settings to stream H.264 video data to a host system.
- define settings to stream H.265 video data to a host system.

1.1 Associated Documents

[EAN-Startup Guide 1500-OEM](#): Describes steps for connecting, configuring, and testing the 1500-OEM video processing board on the 1500-AB accessory board.

[EAN-Startup Guide 3000-OEM](#): Describes steps for connecting, configuring, and testing the 3000-OEM video processing board on the 3000-IO interface board.

[EAN-Startup Guide 4000-OEM](#): Describes steps for connecting, configuring, and testing the 4000-OEM video processing board.

[EAN-Network Configuration](#): Describes how to assign a static IP address to the board, set telemetry destinations and ports, and provide configuration information for the 1500-OEM, the 3000-OEM, and the 4000-OEM video processing boards.

[EAN-Encoding](#): Outlines options for encoding on the 1500-OEM, 3000-OEM, and 4000-OEM.

[Interface Command and Control \(IDD\)](#): Describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a PDF download on the [Software Download](#) page.

[Panel Plus User Guide](#): A complete overview of settings and dialog windows located in the Help menu of the Panel Plus application.

[EAN-Ground-Control-Stations](#): Describes configuration on common GCS software, which may use GStreamer.

1.2 SightLine Software Requirements

i IMPORTANT: The Panel Plus software version should match the firmware version running on the board. Firmware and Panel Plus software versions are available on the [Software Download](#) page.

1.3 Third Party Software

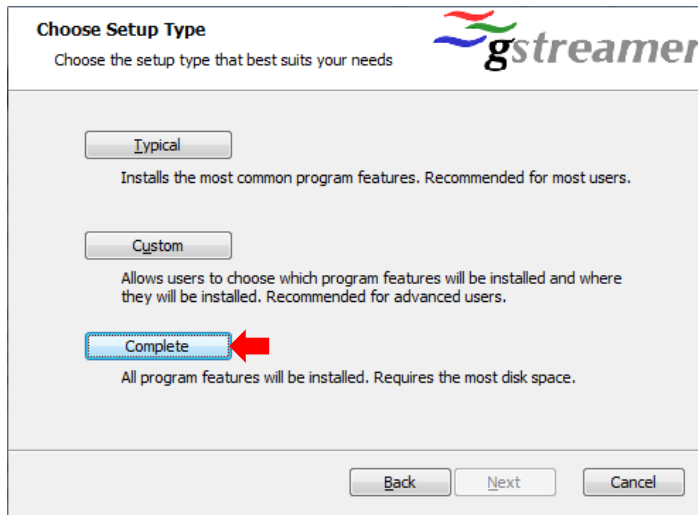
[GStreamer Software](#): SightLine encoding and outbound streams are supported by both 32-bit and 64-bit versions of this software.

i IMPORTANT: There is a known issue with the rtspsrc plugin in version 1.16.0 from GStreamer that makes it incompatible with the SightLine RTSP stream.




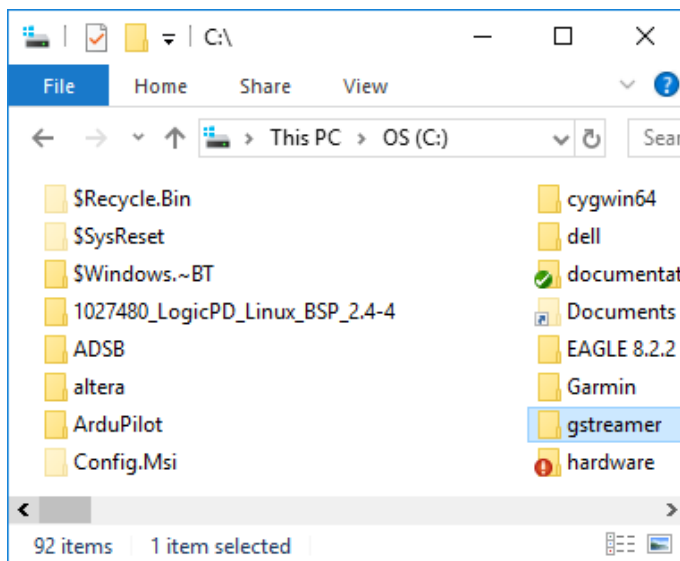
2 Installing GStreamer

1. Download the GStreamer application. Choose the correct version for your PC (e.g., *gstreamer-1.0-mingw-x86-1.16.2.msi*).
2. Launch the installer. Choose the complete installation to ensure that all the tools are installed to receive a stream from the SightLine OEM.



3. Confirm that the GStreamer application is installed in *C:\gstreamer* using Windows Explorer.

 *Configuration tip: Update the system path to add the location of the GStreamer executables (e.g., *c:\gstreamer\1.0\x86\bin*).*



4. Validate the GStreamer installation. Open a command window and navigate to the GStreamer bin directory (e.g., *C:\gstreamer\1.0\x86\bin*). See [Troubleshooting](#) for GStreamer testing examples.



3 Configuration

The GStreamer decoder can display video being streamed from any SightLine video processing board. This section describes how to use the GStreamer decoder from a command prompt to display the SightLine video stream.

3.1 1500-OEM and 3000-OEM Configuration

See [EAN-Encoding](#) for more information on the MPEG2TS-H.264 encoding option for streaming video.

3.2 4000-OEM Configuration


In addition to MPEG2TS-H.264, the 4000-OEM supports MPEG2TS-H.265 encoding, also known as High Efficiency Video Coding (HEVC). It provides better compression at the same quality level, however the resources to compress and decompress are significantly greater than H.264. See [EAN-Encoding](#) for more information on the MPEG2TS-H.264 and MPEG2TS-H.265 encoding options for streaming video.

3.3 Unicast and Multicast

SightLine video processing boards can be configured to stream video to a single destination IP address, Unicast. Typically, this is a system with only one receiver such as a Ground Control Station (GCS).

SightLine video processing boards can also be configured to send out a Multicast stream. The Multicast feature will replace the IP address with a multicast IP address (244.10.10.10 or similar). This will allow one or more clients to subscribe to and display the network video stream on multiple workstations or devices.

The Multicast address used in this section is for example purposes only. Any valid Multicast IP address can be defined.

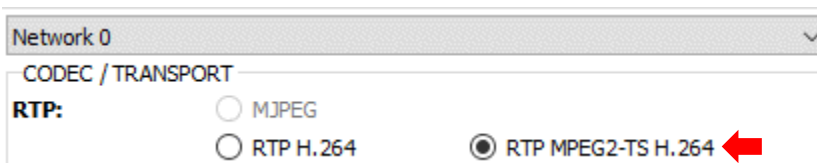
 *There are other issues regarding the transmission of Multicast packets that are specific to each network. Please consult your network administrator regarding this and other networking issues.*

3.4 Panel Plus Streaming Configuration Example

This example uses the 3000-OEM board. See the [EAN-Startup Guide 3000-OEM](#) for connection instructions. The streaming port is set to 5600, which is commonly used by some Ground Control Station (GCS) software. See [EAN-Ground-Control-Stations](#) for additional information.

1. Connect to the board using Panel Plus.
2. In the *Compression* tab, under the *CODEC / TRANSPORT* section select *RTP MPEG-TS H.264*.

 *Other protocols may also work. RTP is used in this example.*





3. In the *Streaming* section set the *Port* to *5600* and click *Send*.

Streaming

To IP Address Port

Use My IP - Unicast Use Multicast Broadcast

 Start/Stop All Nets

4. In the Multi-Camera tab use the following settings:

Network Index	Video Source	Network Display		Physical Display			Decode @ P+	
		Enable	Resolution	Ana	HDMI	HDSDI		Resolution
0	Cam 2	<input checked="" type="radio"/>	Out=In	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	720p60	<input checked="" type="radio"/>
1	None	<input type="radio"/>	N/A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1080p30	<input type="radio"/>

5. From a command prompt type in the following command:

```
gst-launch-1.0 -v udpsrc port=5600 ! video/mpegts ! tsdemux ! h264parse ! avdec_h264 ! fpsdisplaysink sync=false
```



Figure 1: GStreamer window displaying H.264 video with overlays

3.5 GStreamer Examples

All examples assume GStreamer has been installed and tested. Environment variables and application paths for the GStreamer application and libraries may need to be updated to be properly accessed and executed.

Refer to the GStreamer website to review features, FAQs and installation support for help getting started.

For <UDP PORT> use the UDP port number that defined in the EAN-Encoding steps above. Default UDP port is 15004.

For <MULTICAST-ADDRESS> use the multicast IP address defined in the configuration step above. Default Multicast IP address is 224.10.10.10.



Example 1 MPEG2TS Unicast stream (all platforms):

From a command prompt type in the following command:

```
gst-launch-1.0 -v udpsrc port=<UDP-PORT> ! video/mpegts ! tsdemux !
h264parse ! avdec_h264 ! fpsdisplaysink sync=false
```

Example 2 - MPEG2TS-H.264 Multicast stream (all platforms):

From a command prompt type in the follow command:

```
gst-launch-1.0 -v udpsrc multicast-group=<MULTICAST-ADDRESS> port=<UDP PORT>
! video/mpegts ! tsdemux ! h264parse ! avdec_h264 ! fpsdisplaysink
sync=false
```

Example 3 - MPEG2TS-H.265 Unicast stream (4000-OEM)

From a command prompt type in the following command:

```
gst-launch-1.0 -v udpsrc port=<UDP-PORT> ! video/mpegts ! tsdemux !
h265parse ! avdec_h265 ! fpsdisplaysink sync=false
```

Example 4 - MPEG2TS-H.264 Multicast stream (4000-OEM)

From a command prompt type in the following command:

```
gst-launch-1.0 -v udpsrc multicast-group=<MULTICAST-ADDRESS> port=<UDP PORT>
! video/mpegts ! tsdemux ! h265parse ! avdec_h265 ! fpsdisplaysink
sync=false
```

4 Troubleshooting

4.1 Testing GStreamer

The following tests can be used to verify that GStreameer is functioning properly.

Test

Display a random noise pattern locally.

Command Prompt

```
gst-launch-1.0 -v videotestsrc
pattern=snow ! video/x-
raw,width=1280,height=720 !
autovideosink
```

Display a bouncing ball and clock locally.

```
gst-launch-1.0 -v videotestsrc
pattern=ball ! clockoverlay ! video/x-
raw,width=640,height=480 !
autovideosink
```




4.2 Inspecting GStreamer Plugins

The above strings used to decode the video stream are comprised of plugin elements. Review the options that are available for each of these elements.


Example:

Inspect operation on the *tsdemux* element:

1. Open a command prompt and type the following command:

```
gst-inspect-1.0 tsdemux
```

2. The command window will list out details about the plugin.

 *Manually scroll to review the plugins name, author, corresponding DLL (dynamic link library), and other information related to properties and signals.*

```
...
Plugin Details:
  Name                mpegtsdemux
  Description          MPEG TS demuxer
  Filename             C:\gstreamer\1.0\x86_64\lib\gstreamer-
1.0\libgstmpegtsdemux.dll
  Version             1.16.0
  License              LGPL
  Source module       gst-plugins-bad
  Binary package      GStreamer Bad Plug-ins source release
  Origin URL          Unknown package origin
```

3. If the plugin is missing the following errors may be displayed. See the [GStreamer documentation](#) to correct the issues:
 - No such element
 - Plugin tsdemux not available
 - Error: Pipeline could not be constructed: no element tsdemux

5 Questions and Additional Support

For questions and additional support, please contact [Technical Support](#). Additional support documentation and Engineering Application Notes (EANs) can be found on the [Documentation](#) page of the SightLine Applications website.