AJA BRIDGE NDI 3G – Release Notes v1.8

Firmware/Software Update for BRIDGE NDI 3G

Introduction

BRIDGE NDI 3G is a 1RU turnkey gateway offering high density conversion to and from 3G-SDI to NDI and NDI to 3G-SDI for both HD and 4K/UltraHD. Designed to drop into any existing NDI or SDI workflow as a plug and play appliance, it is easy to deploy and administer.

BRIDGE NDI 3G brings immense conversion power and flexibility, full remote controllability for AV use, security and surveillance, broadcast, eSports, entertainment venues and a wide range of other facilities needing high quality, efficient NDI encode and decode. BRIDGE NDI 3G can be a set and forget appliance, or used more dynamically as project needs dictate.

BRIDGE NDI 3G v1.8 is a maintenance release. It is highly recommended that you update firmware.

Be sure to consult the Installation and Operation Guide (user manual) for detailed information about features and configuration guidelines. The most current documentation, along with editable sample graphics projects (in Adobe Photoshop format) can always be found on the BRIDGE NDI 3G Support Page.

Documentation

For initial System Setup see the **BRIDGE NDI 3G Quick Start Guide** that shipped in the box with BRIDGE NDI 3G :

- **Do not discard!** The Quick Start Guide is **unique** to each BRIDGE NDI 3G system since it contains the **unique admin password** necessary to gain access to the system for the first time, or following a Factory Reset.

The BRIDGE NDI 3G Manual is available via the AJA website:

- https://www.aja.com/products/bridge-ndi-3g#support
    - Under the Manuals heading, the BRIDGE NDI 3G manual can be selected for viewing and/or download.

The BRIDGE NDI 3G Tech Specs are available via the AJA website:

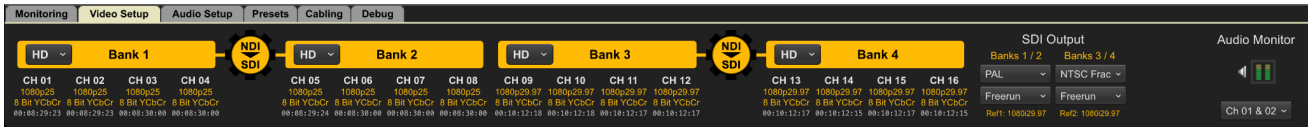
- https://www.aja.com/products/bridge-ndi-3g#techspecs

The BRIDGE NDI 3G REST API documentation is self generating:

- To access the REST API from a remote system, type the IP address of BRIDGE NDI 3G slash "api" into your browser navigation bar: "<ipaddress>/api". This will launch the swagger UI for documentation and interaction.Within BRIDGE NDI 3G itself:
- On the System Settings Screen, use the Resources>Product button to go directly to the BRIDGE NDI product page.
- On the System Settings Screen, use the Resources>Support button to go directly to the BRIDGE NDI support page.
- On the System Settings Screen, use the Resources>About Box for useful Keyboard Shortcuts.

Improvements

- SDI output Fractional/Integer settings have been replaced with NTSC Int, NTSC Frac, and PAL. This is only used when decoding NDI to SDI and is accessed via Control Bar > Video Setup Tab.



  - **NTSC Int**: Natively passes NTSC integer rates (24Hz, 30Hz, 60Hz) and converts NTSC Fractional rates (23.98Hz, 29.97Hz, 59.94Hz) to their respective Integer counterparts on the SDI output. This mode does not pass PAL signals to SDI output.
  - **NTSC Frac**: Natively passes NTSC Fractional rates (23.98Hz, 29.97Hz, 59.94Hz) and converts NTSC Integer rates (24Hz, 30Hz, 60Hz) to their respective Fractional counterparts on the SDI output. This mode does not pass PAL signals to SDI output.
  - **PAL**: Only passes PAL rates of 25Hz and 50Hz. This mode does not pass NTSC signals to SDI output. ***NOTE: when upgrading from version 1.7 or earlier, the SDI outputs will default to NTSC Frac. If your SDI outputs should be PAL or NTSC Integer, the SDI outputs must be set accordingly. ***

	Mode & SDI output conversion		
NDI Input Scan Rate	NTSC Int	NTSC Frac	PAL
23.98Hz	24Hz	Pass	No SDI out
29.97Hz	30Hz	Pass	No SDI out
59.94Hz	60Hz	Pass	No SDI out
24Hz	Pass	23.98Hz	No SDI out
30Hz	Pass	29.97Hz	No SDI out
60Hz	Pass	59.94Hz	No SDI out
25Hz	No SDI out	No SDI out	Pass
50Hz	No SDI out	No SDI out	Pass

- Implemented NDI library v5.5.4. NDI library v5 is now default (new systems & factory reset), rather than v4.

Bug Fixes

- Integer SDI output mode can get into a state where field & line length errors occur causing bouncing video.
- SDI output can have repeated frames resulting in jerky motion with high channel density or complex video.
- Rhythmic repeat / drop frames on SDI output after CH setting change.
- System crash when adjusting any parameter in Canon HX camera. Resolved in NDI library v5.5.4. Canon has also introduced a fix in their signal delivery.
- NDI-SDI video performance impact due to CPU spike when system cyclically searches for networking devices.
- Skip/Repeat Frames improvement with Improved UDP performance in unicast.

Expected Behavior and Known Issues

Performance / Features-by-Design

- BRIDGE NDI 3G is designed to work with rates up to 50/60p for HD and 4K/UltraHD. Maximum performance is up to 16-channels of HD 60p or 4 channels of 4K/UltraHD 60p. Network conditions, video processing load and other parameters may reduce channel count and/or supportable rates in some situations.
- BRIDGE NDI 3G is not intended to do real-time switching. Changing configurations will result in some time for signals to be re-acquired/locked, and if the change is system-wide this will momentarily affect all channels. System-wide changes include:
    - Changing between running BRIDGE NDI 3G under NDI library v5 and NDI library v4 (default is v4).
    - Changing Max Audio Channels on Control Bar > Audio Setup Tab
    - Changing Fraction/Integer Setting on Control Bar > Video Setup Tab (if decoding NDI to SDI)
    - Changing Reference setting for SDI output on Control Bar > Video Setup Tab (if decoding NDI to SDI)
    - Changing an Engine between Encoding (SDI to NDI) and Decoding (NDI to SDI)
    - Changing a Bank Mode between HD / V+K / 4K
- BRIDGE NDI 3G preview via Video Tiles on the I/O Screen in the GUI is for confidence monitoring, and performance may depend on various factors including network health and the remote system being used to access the BRIDGE NDI 3G Interface. BRIDGE NDI 3G prioritizes system resources for SDI / NDI Video I/O over the confidence monitoring presented on the Canvas. A more graceful link degradation for remote monitoring and control is implemented as part of BRIDGE NDI v1.5 onwards, and this can be seen as a reduction in image quality and rate for previews. Note however, that low bandwidth or highly variable network internet/network conditions may still result in a “Disconnected” notification, until the worst of the network interruption has passed. Increasing the bandwidth/quality/reliability of connection will resolve this.
- Using the system locally with the Kiosk Interface (via customer supplied VGA Monitor with USB Keyboard and Mouse) together with the supplied USB sound card, means that it's possible to confidence-monitor both audio and video without any additional tools. Via the remote Web Browser Interface, confidence-monitoring picture is possible via the I/O screen, but for audio monitoring a separate utility such as NewTek NDI Studio Monitor should be used.
- System Settings > Generate (Support Log) button is only available via remote Web Browser Interface (not presented via local Kiosk Interface).
- Control Bar > Presets Tab is for system presets only; there are currently no user presets available.
- BRIDGE NDI 3G supports Unicast only.
- BRIDGE NDI 3G can use either UTC or local Time Zone for system time. Either value can also be used for TOD (Time-of-Day) Timecode.
- The BRIDGE NDI 3G local (Kiosk) interface is dedicated to running the system, and is not intended as a general purpose interface where web browsing takes place.
- BRIDGE NDI 3G is designed for live/real-time workflows, and therefore does not support capturing or playing back media to/from local or remote storage.

- BRIDGE NDI 3G does not support all features found in Access Manager.
- Control Bar>Monitoring tab>Refresh Rate; note that this control is designed to allow the user to find the “sweet spot” for the smoothest representation of moving video in the confidence view, given network conditions and other variables. A value of 100% will most likely not be the optimal setting unless working in a very well behaved network environment.

Video and Audio I/O

- SDI I/O supports 1920x1080, 3840x2160p and 4096x2160. 2K is not supported.
- NDI I/O is designed to receive NDI and NDI HX (v1, v2 and v3) and to transmit NDI (no NDI HX Tx support).
- Note that when receiving from NDI HX sources, that full rate, smooth motion and latency performance are a function of the NDI HX transmitting device (in addition to network health). For example, phones and tablets tend to be less capable of sending properly timed / low latency streams.
- BRIDGE NDI 3G supports P216 for output, but does not support P216 for input.
- BRIDGE NDI 3G is not intended to do frame rate conversion. No 50->60, 60->50, 25->30, 30->25 conversions. If a 25p source is presented for output at 30p for example, the system will flag a warning error and no video will pass. The product can however, rectify and homogenize integer/fractional mismatches; i.e. if you have 7x 30p sources and 1x 29.97p source, and have set the output to be globally integer, the 29.97 input will be converted into 30p on output to match the other progressive outputs.
- BRIDGE NDI 3G can run 25/50 rates on one engine, whilst running 29.97-30/59.94-60 rates on the other e.g. Bank 1+2, vs. Bank 3+4, or vice versa.
- BRIDGE NDI 3G has two independent external reference connectors which can be used instead of free run for SDI Output. One Reference Input is for Engine A (Banks 1 and 2) and the other Reference Input is for Engine B (Banks 3 and 4).
- BRIDGE NDI 3G does not perform SDI up, down or cross-conversion. HD In -> HD Out, 4K In -> 4K Out, No HD <-> 4K.
- For NDI sources presenting non-SDI video rasters smaller than 1920x1080 typically coming from mobile phones, tablets, MS Teams or other web cams, BRIDGE NDI 3G will default to the “Scale” option under Individual Channel/Group Screen > Controls Column > Video > Video Convert, meaning it will scale the image to fit the HD raster using either letterboxing or pillarboxing to pad the rest of the image. Changing “Scale” to “Actual” will present the original raster on black within the HD raster.
- For NDI sources presenting non-SDI video rasters bigger than 1920x1080 but smaller than 4096x2160, BRIDGE NDI 3G will default to the “Scale” option under Individual Channel/Group Screen > Controls Column > Video > Video Convert, meaning it will scale the image to fit the 4K/UltraHD raster using either letterboxing or pillarboxing to pad the rest of the image. Changing “Scale” to “Actual” will present the original raster on black within the HD raster. Note, BRIDGE NDI 3G will require a configuration change such that a Bank can support 4K before this will work as designed.
- BRIDGE NDI 3G does not perform ROI extraction. Scale up and letterbox/pillarbox only.
- BRIDGE NDI 3G does not currently have Closed Captioning support.
- When choosing a reference level for NDI, note that (for example) “20” means 20dBu attenuation.

- Using the system locally with the Kiosk Interface (via customer supplied VGA Monitor with USB Keyboard and Mouse) together with the supplied USB sound card, analog audio has a small click every 3 secs when listening to tone.
- I/O screen>Canvas and Control Bar>Video Setup tab; V+K groups do not always switch back to HD channels properly and sometimes the channel needs to be disabled and then re-enabled, or else the NDI source re-selected, for normal channel behavior to resume.

Access

- BRIDGE NDI 3G will arrive with DHCP enabled, meaning once connected to the intended network the system can be located via Mac or Win network browse. Alternatively, the system can be set up locally using the USB and VGA connectivity, and this allows for setting the IP address(es) manually. See Manual for more details.
- User management / password changes currently only support the “admin” user type.
- If the password is changed and subsequently forgotten, the only way to recover access will be to perform a factory reset and then use the factory password provided on the physical quickstart guide shipped in the product box. See the BRIDGE NDI 3G User Manual for more details. If you cannot locate the physical quickstart guide, contact AJA Technical Support.

Other

- In the local Kiosk Interface, System Setting Screen>Resources; if you open either “Product” or “Support”, after you are done, use the Keyboard Shortcut ALT + Left Arrow to return to the BRIDGE NDI 3G Interface.
- OBS Studio may crash on macOS if BRIDGE NDI 3G sends 16-channels of audio via NDI, to avoid this use the system default of 8-channels, or set to 2 channels.
- Microsoft Teams NDI output can intermittently exhibit A/V sync drifts.
- Microsoft Teams can/will cause flickering if NDI Discovery is on. To solve this there are controls on the Source/Destination Screen under NDI Network>Scan Mode:
    - “Off”: The scan and metadata gathering threads will sleep - and in the case of Microsoft Teams this will solve the flickering behavior.
    - “Only Names”: This will only use the NDI scan functionality which provides the NDI source name and IP address. In this mode there is only enough info to populate "In Use", "URL" and "Source Name" columns.
    - “All”: All columns will be populated (if a valid source is present).
- NDI playback from NLEs can intermittently exhibit A/V sync drifts. If this is experienced, it is recommended to enable the NDIFrameSync.
- Currently if changing from 2SI to Quad using the individual Channel/Groups Screens it may be necessary to disable and re-enable the Channel/Group for the intended change to take effect.
- Bridge NDI drop-down menus in Firefox can sometimes be problematic. Use an alternate browser (e.g. Chrome) if necessary.
- When using FoMaKo PTZ NDI HX camera under NDI 5 and set to H.265 there is no compatible NDI to receive. The workaround is to either set the camera to H.264, or else run Bridge NDI under NDI 4 (vs NDI 5).
- When using some models of NDI HX3 cameras, BRIDGE NDI 3G will sometimes show repeated frames via SDI output.

Troubleshooting

- If a Channel/Group becomes badly behaved, first try fully disabling and then re-enabling that Channel/Group using the Individual Channel/Group Screen controls.
- If multiple Channels/Groups become badly behaved, try using the “Refresh App” button located on the System Settings Screen.
- For troubleshooting SDI I/O it is highly recommended to try at least two different SDI cables and two different upstream/downstream SDI devices/monitors, to make sure the problem is not a damaged cable or unreliable source/destination.
- Another SDI I/O verification test would be to take the SDI Output (HD) from one BRIDGE NDI 3G channel and loop this back to another SDI channel (HD) designated as Input on the same BRIDGE NDI 3G system. Check to make sure BRIDGE NDI 3G can properly auto-detect its own SDI Output.
- Verifying NDI sources on the same network as BRIDGE NDI 3G can be done with a tool such as NewTek NDI Studio Monitor. If NDI Studio Monitor can see an NDI source on the network, then BRIDGE NDI 3G on the same network should see it too. Likewise, if NDI Studio monitor cannot find an NDI source on the network, it's unlikely that BRIDGE NDI 3G will be able to, either.
- For troubleshooting network connectivity it is highly recommended to try at least two different Ethernet cables and unplug-replug the Ethernet connections into the Ethernet switch, to make sure the problem is not a damaged cable or a switch not refreshing correctly.
- If you are not receiving any data from BRIDGE NDI 3G on target devices, please verify that the network configuration (both for the BRIDGE NDI 3G unit and for your network devices) allows the unit to send data to your desired destination.
- If running under NDI v5, try running the same workflow under NDI 4 as a comparison, or vice versa. The NDI v5/v4 change button is present on the System Settings Page>NDI Version.

Downloading and Applying Software Updates from AJA.com

Although BRIDGE NDI 3G comes from the factory pre-installed with the latest software at the time of manufacture, it may be desirable or necessary to update BRIDGE NDI 3G with the latest software update package that has been posted on the AJA website. The steps required to upgrade AJA BRIDGE NDI 3G software are as follows.

Download the Latest BRIDGE NDI 3G Update

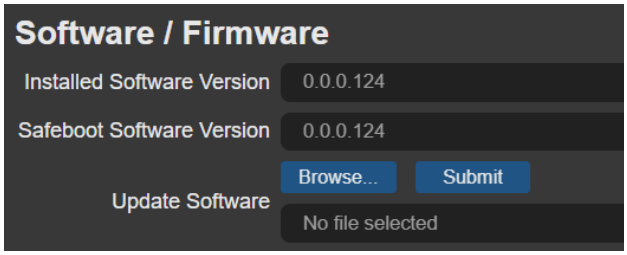
- The update can be obtained with a separate Mac, Windows or Linux-based host-system with a network interface and access to the internet. If you wish to apply the update from the same system you are using to download the update package, it will need to be connected to the same network as BRIDGE NDI 3G.
- Use a web-browser to reach:
    - **https://www.aja.com/products/bridge-ndi-3g#support**

- Under the Software heading, the BRIDGE NDI 3G package can be selected for download.
- Current and previous releases of BRIDGE NDI 3G will be available on AJA's website.
- Download the package you require to the separate host-system, connected to the same network as BRIDGE NDI 3G.

Unpack BRIDGE NDI 3G Update

- The update downloaded from AJA.com is a “ZIP” file, which can be opened with OS tools or third party applications.
- Extract the contents of the ZIP file (unzip). This will present a folder containing the BRIDGE NDI 3G Product Manual, Release Notes, and the appropriate Software update package.

Follow this procedure to update BRIDGE NDI 3G from a remote system



1. In BRIDGE NDI 3G (via Web Browser Interface) go to System Settings Screen > Software Update and click Browse.
2. Navigate to the unzipped Software update (*.ajas), select and click open.
3. Choose Submit.
4. Following reboot or restart, a login will be required.
   Note: Depending on your connection speed to the remote BRIDGE NDI unit, it may take some time before the update begins after choosing “Submit”.

Follow this procedure to update BRIDGE NDI 3G locally using a USB connected storage device

1. Copy the downloaded and unzipped update file to a USB drive.
2. Plug USB drive into the BRIDGE NDI 3G USB port.
3. In BRIDGE NDI 3G (via Kiosk Interface) go to System Settings Screen > Software Update and click Browse.
4. From the left hand OS navigation menu go to Run > Media > sda1.
5. Navigate to the unzipped Software update (*.ajas), select and click open.
6. Choose Submit.
7. Following reboot or restart, a login will be required.

NOTE: While updating software, do not remove power.

Technical Support

To contact AJA Technical Support:

Email: support@aja.com
Phone: +1-530-271-3190
Fax: +1-530-274-9442
Web: https://www.aja.com/support/contact
Shipping: 180 Litton Dr. Grass Valley, CA 95945 USA

Items helpful to Technical Support

- Issue description (as extensive as possible).
- Error messages.
- Details of the devices and software that are being used to receive from or send to BRIDGE NDI 3G's.
- Basic Network verification (e.g. do other devices and software see each other on the network).
- Network configuration.
- Screen shots, screen captures/videos.
- Provide a Support Log to AJA: System Settings > System Details > Support Log > Download
    - Download the support log using a remote system accessing BRIDGE NDI 3G via Browser Application, and this can be emailed to your support representative along with the other information described above.
    - Note there is no facility to download a support log locally via the Kiosk Interface; this must be done via a remotely connected host system.]