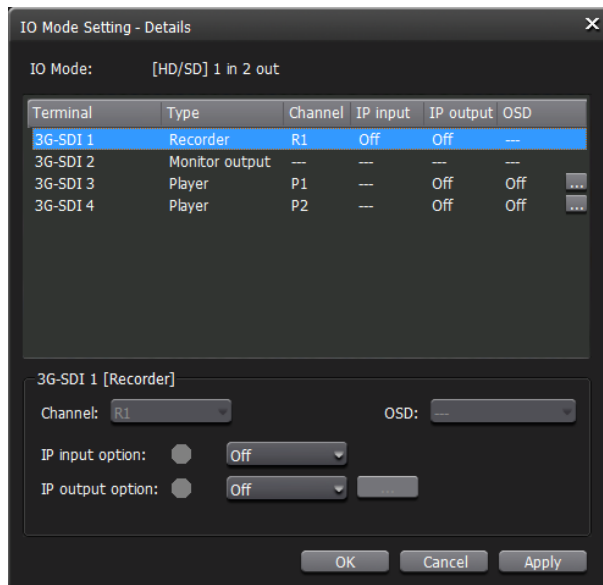# NDI - IP Video Transmission Support (v3.5.0)

T2 4K supports NDI, an IP video transmission method. Specifically, the following features will be added.
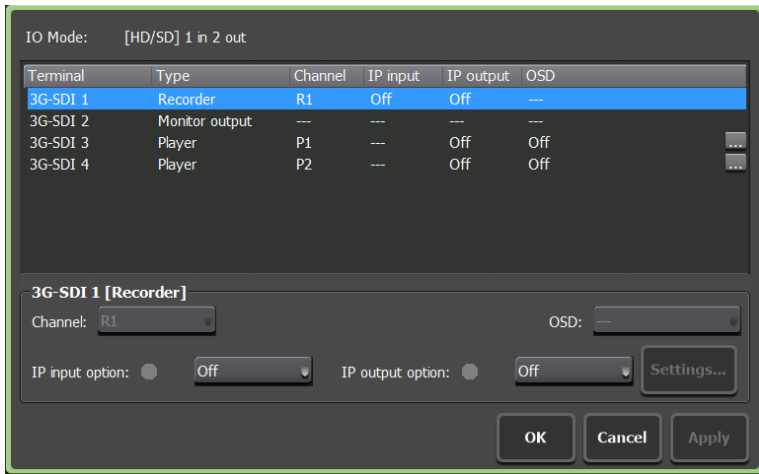
- Record input video and audio from NDI sources.
- NDI output of input and output from each terminal of T2 4K.

This section describes how to set up T2 4K to use the NDI function and other special notes about NDI input/output.

Configuration

Settings related to NDI for T2 4K are made in the detailed settings of the IO mode. There are columns for IP input and IP output in the list of each terminal setting, which can be enabled (On) or disabled (Off) at the bottom of the list.
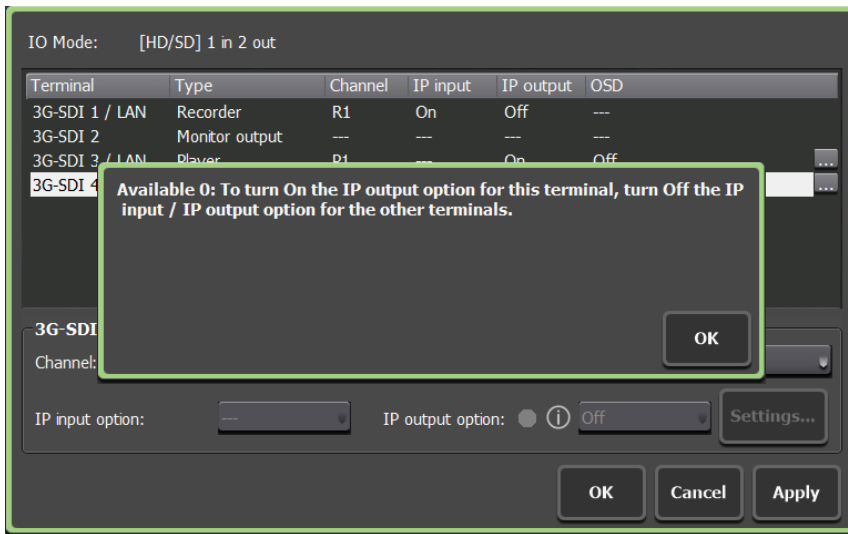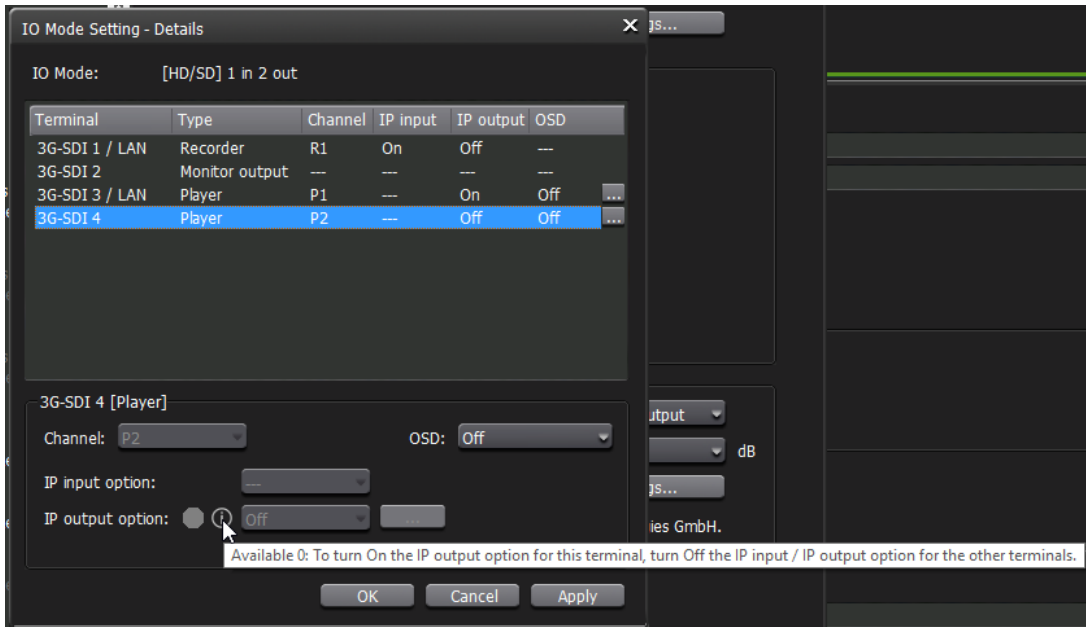
Status signals and information icons are displayed in the lower IP input option and IP output option setting areas. The information icons are displayed only when necessary. The status signal indicates whether the IP input and IP output are functioning properly. At Workstation, hovering over the information icon displays a tooltip for the required operation. On FrontPanel, tapping the information icon displays a dialog with that message.

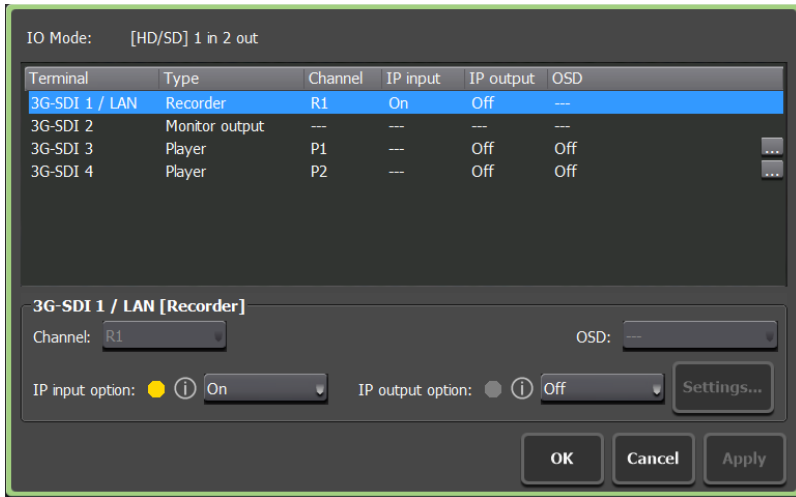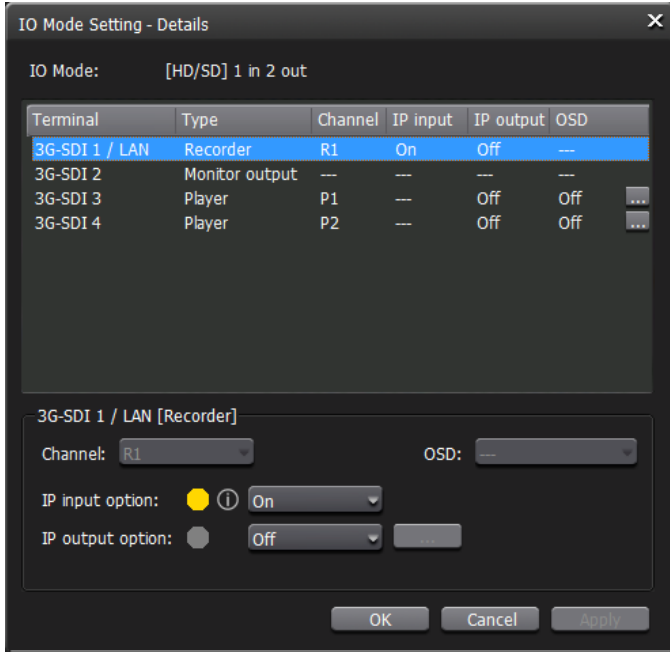| IP input option	Status signal	Information icon	Status
On	Green	Not displayed	IP input in progress
	Yellow	Displayed	There is a problem with the IP input or recording channel settings, or the NDI source is not outputting video.
Off	Gray	Not displayed	IP input not available

IP output option	Status signal	Information icon	Status
On	Green	Not displayed	IP output in progress
Off	Gray	Not displayed	IP output stopped

The number of IP inputs and IP outputs that can be turned On is pre-determined, and if this number is exceeded, the settings of terminals whose IP input or IP output settings are Off cannot be changed. In this case, an information icon appears in the lower setting area when the appropriate terminal is selected. On Workstation, hovering over this icon (or tapping it on FrontPanel) will display the operation instructions that need to be performed to change the settings for this terminal. Specifically, the setting of a terminal whose IP input or IP output setting is set to On can be changed to Off in advance to change the setting of another terminal to On.
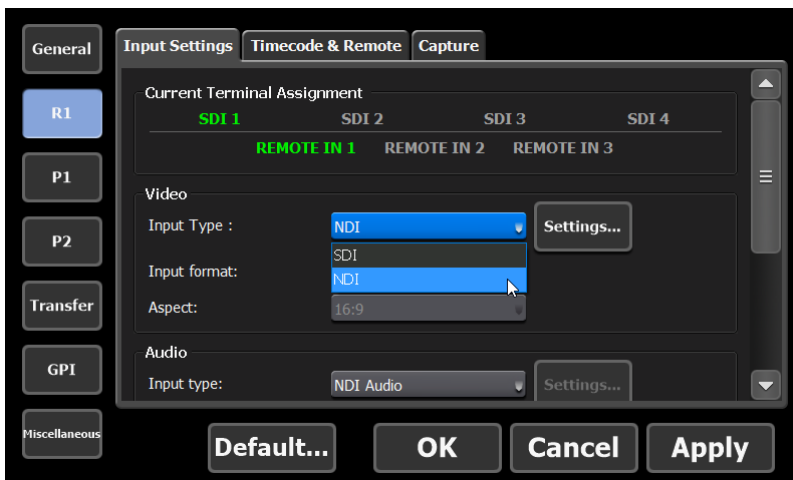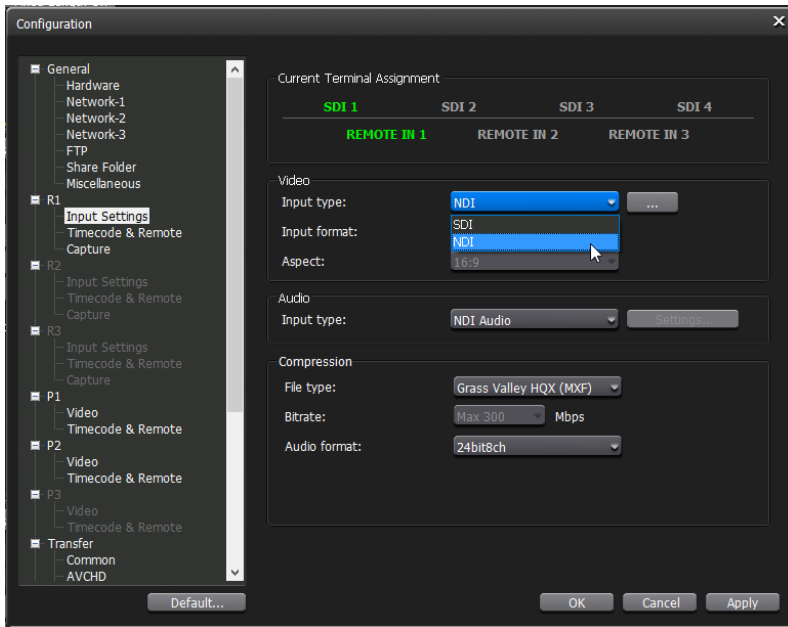
NDI input configuration

For NDI input, the IP input option for the recording channel must be set to Enable in the IO Mode detailed Settings. the notation in the terminal row of the IO mode detailed settings changes to 3G-SDI with LAN.
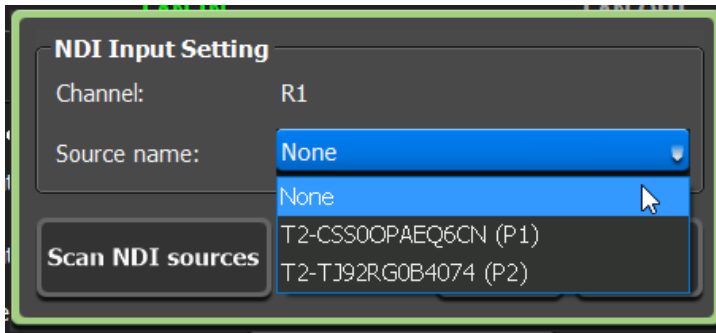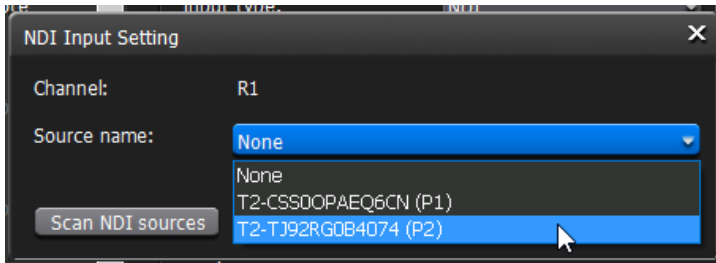
And then the video input type must be changed to NDI in the settings for that channel.

Note that when IP input is enabled in the detailed IO mode setting, the video input type can be selected. When the IP input setting is disabled, the video input type is fixed to SDI and cannot be selected.
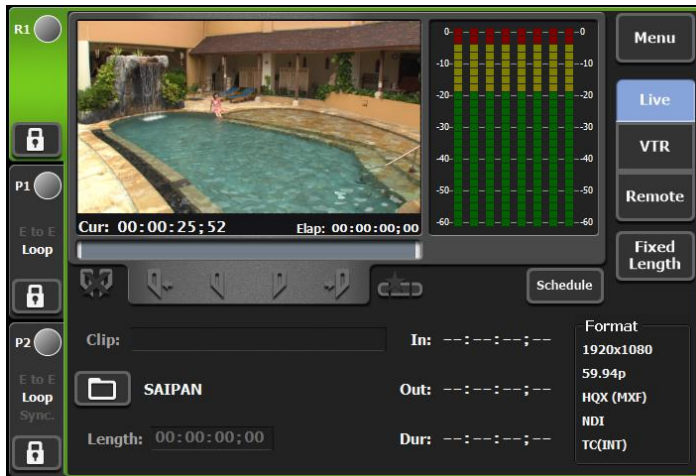
When NDI is selected as the input type, the advanced settings button to the right of it becomes active. The dialog that appears with this button allows the selection of the NDI source to be used for the actual input.

Each time this dialog is opened, the NDI sources that exist on the same network at that time are listed as candidates. If the number of NDI sources increases or decreases during the course of opening the dialog, the list is updated by pressing the Scan NDI sources button. Note that NDI sources that were selected when the dialog was opened will not disappear from the list even if they do not exist.

If the video input type of a recording channel is changed to NDI, a preview of the recording channel is displayed and the channel is ready for recording. At this time, even if the video profiles do not match, the preview will still be displayed and recording will be possible. The input type of the recording channel format notation will also be NDI.
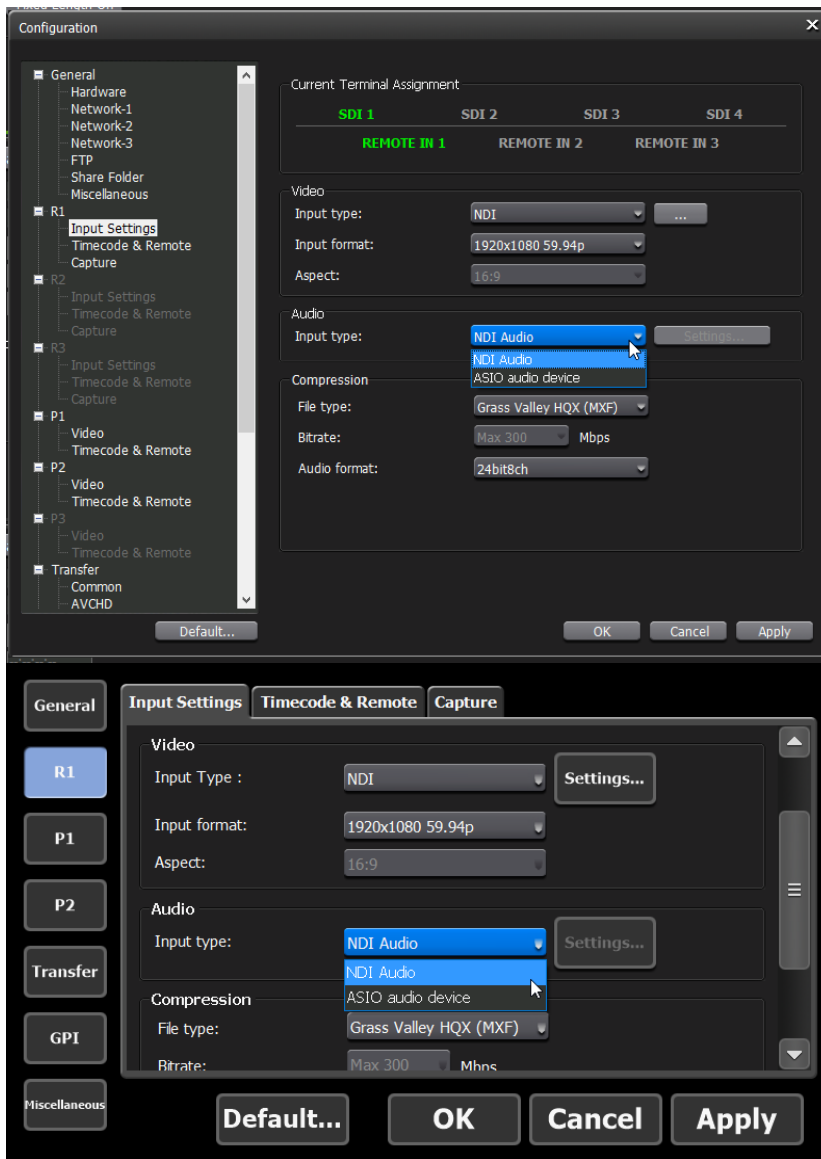
Other recording-related functions are the same as for SDI input.

- Video profiles, recording containers and codecs
- Recording destination, that is internal or external
- Playback of a recording clip
- Exporting a recording clip
- Marker operation of a recording clip
- Create sub-clip
- EtoE
- ASIO audio
- Remote control（GPI, RS-422, AMP, VDCP)
- R1 VTR mode (RS-422)

Audio source configuration

As with SDI input, ASIO can be used as the audio source for recording. When SDI input is used, the audio input source could be selected from SDI-Embedded and ASIO audio device, but when NDI is selected as the video input type, the audio input source can be selected from NDI Audio and ASIO audio device.
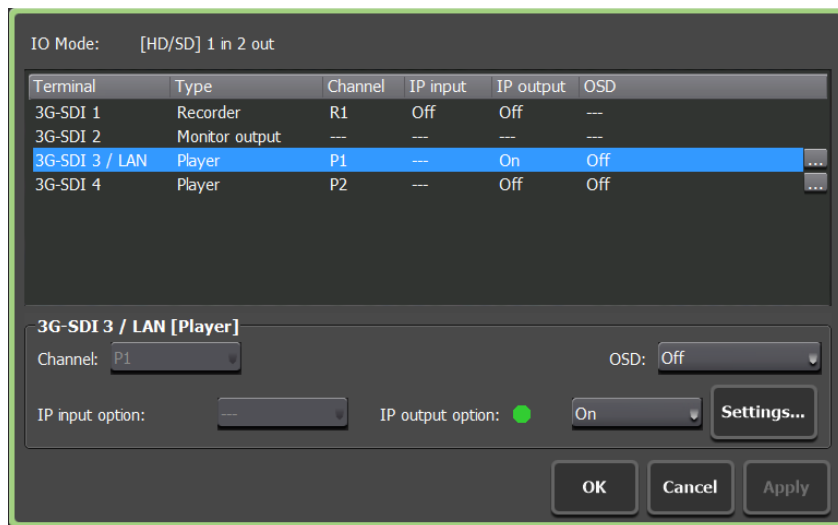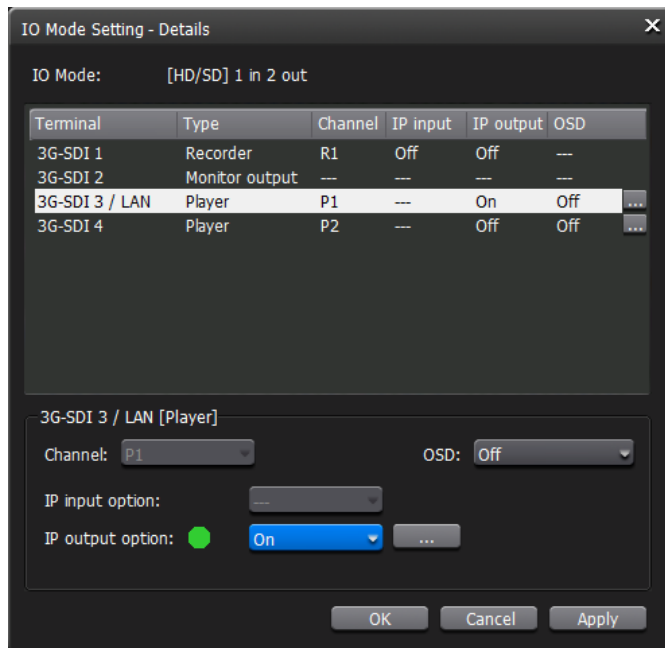
Schedule Recording

NDI input can also be used during schedule recording. In the recording format settings dialog of the schedule, you can select NDI as the input type for the bidet as well as the recording channel settings; if you select NDI, the Advanced button to the right becomes active and you can select the NDI source.
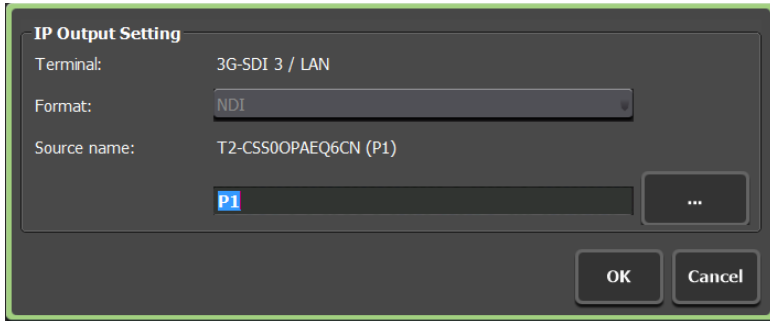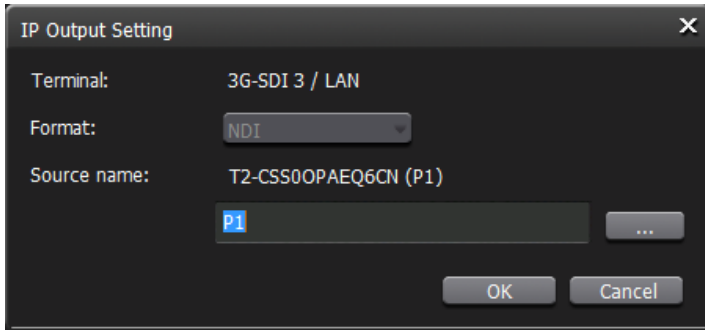

Unlike the video input type in the recording channel setting, the video input type can always be selected in the recording format setting for scheduled recording. However, if the IP input for the recording channel is not enabled in the IO mode advanced settings when the schedule is started, recording of that schedule will result in an error. At the scheduled time, if the IP input for the recording channel is valid and the NDI source set in the schedule is available, recording will take place according to the registered schedule.
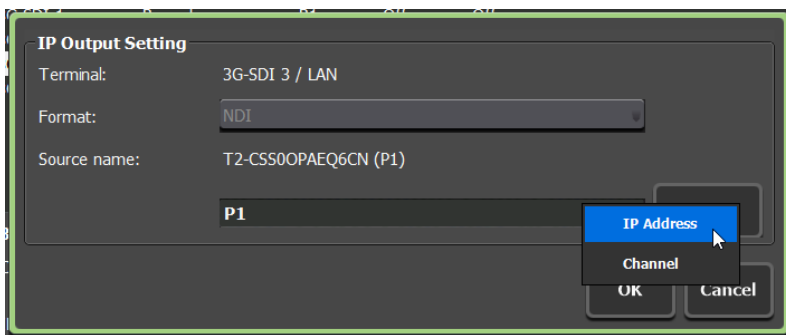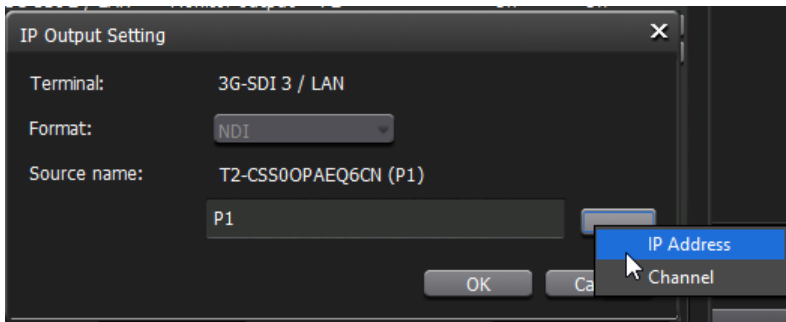
NDI output configuration

NDI output is available by simply enabling IP output in the IO mode detailed settings; an NDI source is created for each terminal with IP output enabled, and the NDI output is the same as the SDI output to that terminal. When IP output is enabled, "/ LAN" is added to the notation in the terminal row of the IO mode detailed settings.

The NDI source name is set in the form of a "**hostname (unique name of the NDI source)**". This is an NDI specification. The host name part cannot be changed, but the unique name of the NDI source can be changed. You can make detailed settings related to IP output by pressing the button to the right of the IP output option selection at the bottom of the IO mode detailed settings. Note that the same NDI source name cannot be set for multiple terminals.
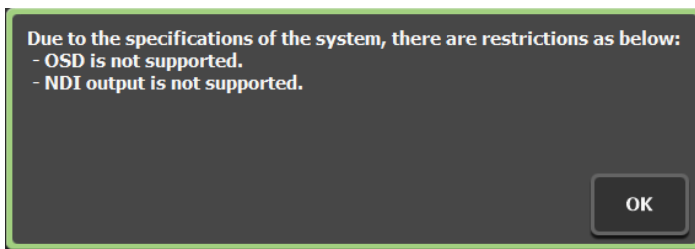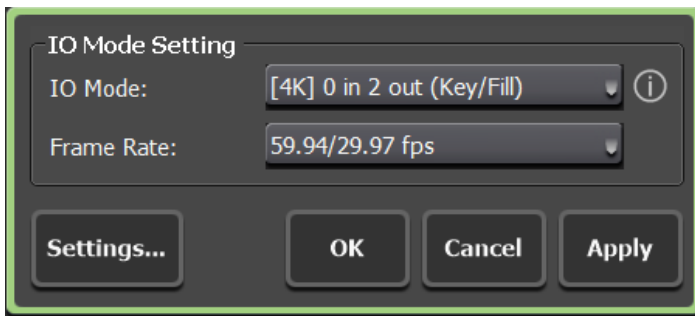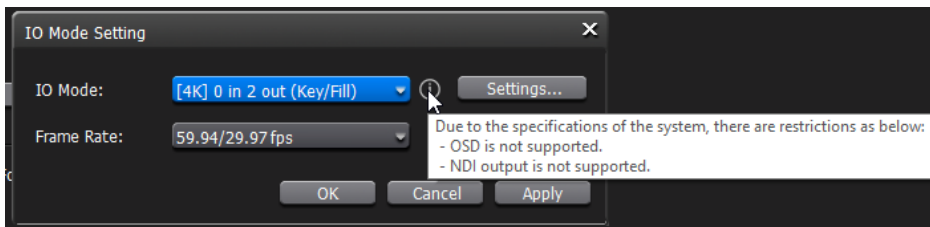
To make it easier for users to enter NDI source names, which are relatively easy to recognize, this dialog provides a menu for input assistance right next to the source name text box. Using this menu, you can easily enter the IP address of the T2 4K you are using or the channel name of the selected terminal.

The NDI output can be set for the monitor output as well as the playback channel. Thus, it is possible to output video with and without OSD from different NDI sources for the same channel output video. It is also possible to output the preview directly to the NDI on the recording channel.

Limitation

NDI output is not available due to performance limitations on [4K] 0 in 2 out (Key/Fill) mode. In this case, hover (Workstation) or tap (FrontPanel) the information icon in the IO Mode Settings dialog to confirm that NDI output is not supported.

NDI input

T2 4K can use any NDI source as input except audio only. At this writing, we have confirmed that the following NDI sources can be recorded with T2 4K.

- T2 4K
- EDIUS
- Test Patterns (NDI Tools)
- NDI for VLC (NDI Tools)
- OBS Studio with obs-ndi plugin
- Grass Valley PTZ 35X HD camera

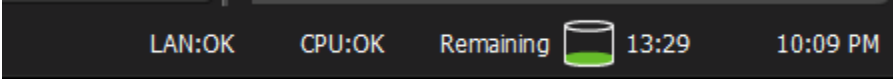The T2 4K can also use its own NDI output as an NDI input.

NDI output

Other points to mention regarding NDI output for T2 4K.

- Even if the NDI output setting is enabled, no output is sent to the NDI if there is no client connected to actually receive that output. Therefore, when no clients are connected, the T2 4K itself does not incur extra CPU load or consume network bandwidth.
- If there are multiple clients using T2 4K's NDI output, the CPU load on T2 4K will increase in proportion to the number of connections. If the CPU indicator on the bottom status display of the workstation is constantly red CPU:HIGH, normal operation of the T2 4K may be interfered with, such as frame drops in playback or recording stoppage. In this case, please adjust by reducing the number of clients using T2 4K's NDI output.
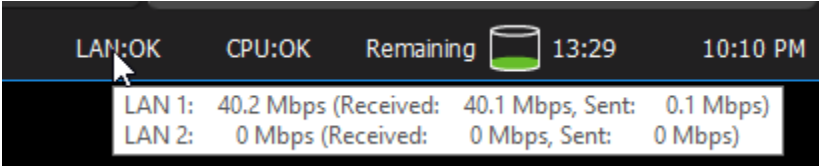
Other useful information

LAN indicator

A LAN indicator has been added to the status column at the bottom of the workstation. This allows you to see how much network bandwidth is being used. This display changes to a red HIGH display when network bandwidth usage exceeds 600 Mbps.

 In addition, hovering the mouse over this display area displays a tooltip showing the amount of data sent and received for each LAN terminal.

When in use, the network design and NDI input/output must be based on these status indications to ensure stable transmission and reception.

Multilingualization

Currently only English or Japanese are available as language resources in the settings.