



Multi-channel CITP-MSEX Video Service

Release Notes & Usage

Iteration 9, Deliverable
Jul 30th, 2014

Overview

Welcome to your new MSeXLord – The CITP-MSEX streaming TV Station.

MSEXLORD is a multi-channel TV station of sorts, transmitting 12 independent video streams to any CITP client such as lighting console or visualiser that wants to listen.

So why would you want such a thing?! Well, maybe you've got bad sightlines, but have cameras backstage or in the stage wings, maybe you have infra-red or FLIR cameras to see cast positioning on stage during blackout, maybe you have stage automation software that displays the status of your chain motors or fly systems, maybe you have multiple feeds from TV control room, or simply want some light entertainment (see what I did there?). We can also stream your favourite lighting visualizer window into the console, or nearly any window visible on your PC. We can also take live streams from some IP cameras and other streamed sources. Heck, you could get an auto-cue feed from the prompters via video capture, and the program stream from the OB van – and broadcast it throughout the entire network for every station, eliminating the clutter of multiple preview monitors around your workstation.

The CITP protocol Multimedia Stream EXtensions streams, or otherwise known as MSEX, is a service which is designed to stream preview quality from media servers to operators at like 160x120 resolution. MSeXLord can produce compressed JPEG video streams at 720x576, keeping the compression quality at the highest possible level.

Channel sources can be from Video Capture, Files, Live IP stream, Screen capture, TimeLord wave form, time code and cue list, or a test pattern or image.



The MSexLord User Interface

Getting Started

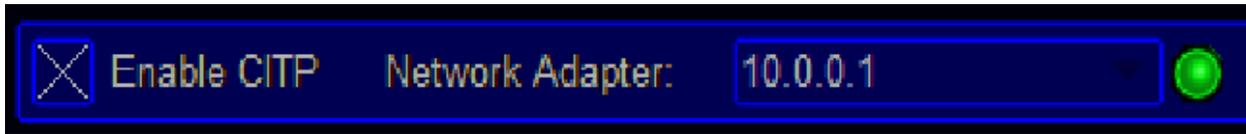
MSexLord will require a PC with a network adapter, configured with an IP address within the range of your other CITP enabled devices. It is important to either disable or configure any firewall software you may have to allow incoming connections on TCP ports 50001 – 50005.

After starting MSexLord, you will be presented with the user interface (show above).

Start by telling MSexLord which network adapter / IP address you wish to use. Note, MA2 and MA3D will not work with 127.0.0.1 presently, though we support it should this become available in the future. X the “Enable CITP” checkbox, and the green LED should light. If it does not light green, this IP address is not available to use (possible other CITP software is blocking it)



IP address selection

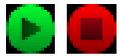


In this example, I am using 10.0.0.1 as the IP address of my PC on the network, and green is good!

If this is the first time you have started MSeXLord, you will see many of these windows (shown below). Each window represents a possible CIP-MSEX stream. This test pattern is shown when the stream is not running. You can move these windows around by dragging the title bar, and minimise unused windows by clicking the clock icon on the right side.



← Clicking this icon will open the Stream Editor, allowing you to change the settings of this stream.



← Clicking the green play icon will force the stream to play, and clicking red stop will stop.



← This indicates an error condition (not running is considered an error condition)



← This flickers on and off to indicate the stream is running (every frame transmission)



This stream is not running



This stream is running



This stream is running, but has no source.

A few notes about CITP-MSEX, and how it works.

Basically, an MSEX client (MA2 for our examples) will request a list of available streams from the server (MSEXLord) every time a CITP Video window is created. MSeXLord sends back a list of its 12 available streams. The user can then configure the CITP Video window by clicking the orange ball, and select the server and stream she wants.



The client (MA2) then asks the server (MSeXLord) to send the selected stream at the requested 10 FPS in this example (frame rate) for 5 seconds. MSeXLord will then begin sending the video at the requested 10 FPS. Every 5 seconds the stream is requested again by the client (MA2), and this is done so that when you close the CITP Video window, the stream is no longer requested and the server stops sending.

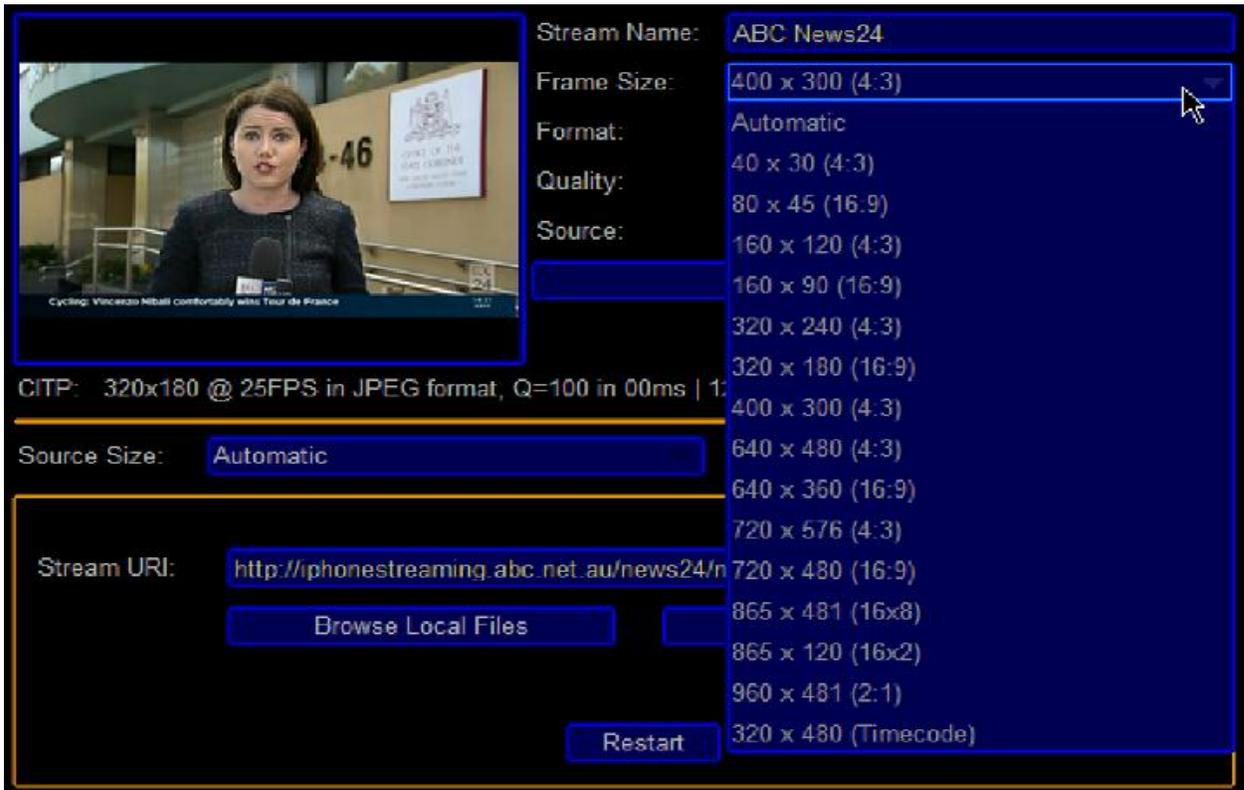
MSeXLord will start and stop streams on request from the client (MA2), or manually using the stop and play buttons – however, the client (MA2) takes priority and will restart a stream you manually stopped, or change the frame rate to the requested rate rather than the rate you set in the Stream Editor.



The Stream Editor.



This is where we can configure the Name, Size, Format, Quality (JPEG), Source and other settings associated with the stream. We can also see some information regarding its performance and bandwidth usage. To configure a stream, click on the  icon in its window.



Which settings you will use is going to depend on your source content, size and quality requirements.

The top half of the window relates directly to the output stream, the bottom to the source.

Stream **Frame Size** will configure the size of the stream output frame, and your sources will be scaled to fit this size (Automatic will use the size requested by the client, which is typically 160x120ish).

Stream **Format** can be RGB8 (highly recommend you don't use!!!) or JPEG compressed frames. RGB8 is limited by size and uses much more network bandwidth than JPEG. Automatic will use JPEG.

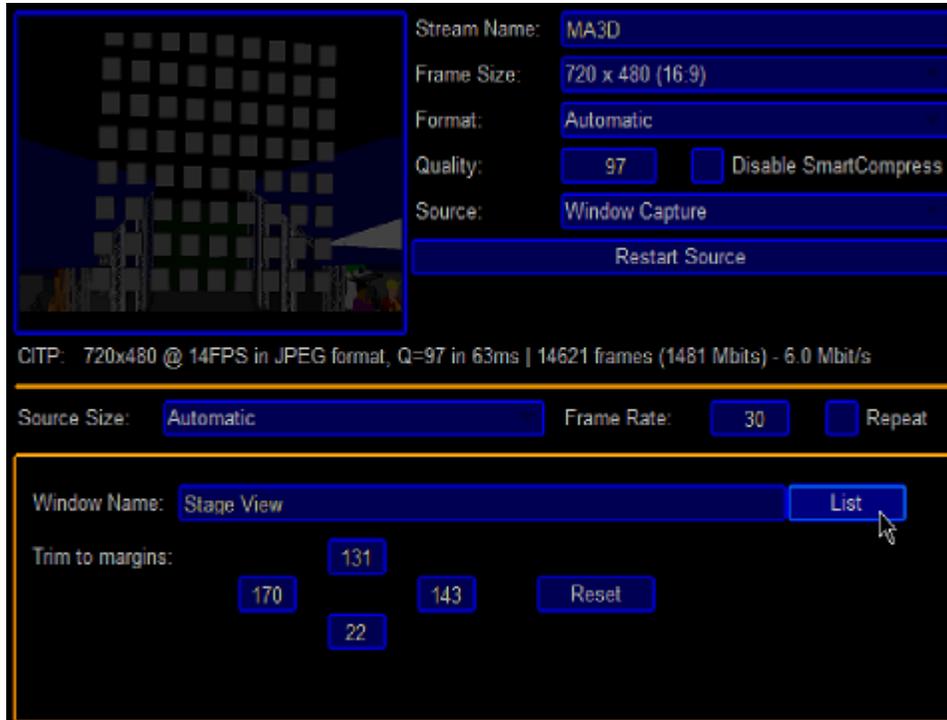
Quality is relevant to JPEG only, and can be between 1 and 100. Recommend 100, and MSexLord will dynamically recompress frames to maximum quality.

Source can be Video Capture, Network / File Stream, Window capture, TimeLord wave form, time code and cuelist, or a test pattern.

Source Size should be typically left on Automatic (especially for Video Capture) which will select the highest source resolution possible. If you are using a File Stream of 1080p resolution, you can optionally use this to scale the source before it's rendered.

Frame Rate is the maximum frame rate you want the source to run at, not the stream. Typically you should set this to 30, if you want to request the stream at 30FPS. If you specify 10FPS and then request 24FPS from the client, you will still only get 10FPS as this is the source frame rate, not the stream. This does have some different effects on different sources. Video/Stream sources will not change source rate dynamically (press restart to make FPS changes take effect) though Window Capture and TimeLord sources will respond instantly.

Repeat should only be used on streams or files, and will restart the source should it reach the end or the connection be lost.



There will be different options for most sources. Shown above are the options for Window Capture. Pressing the list button will display a list of possible windows, and the Trim to margins can be used to remove window borders and title bars.

The line “CITP: 720x480 @ 14FPS in JPEG format, Q=97 in 63ms...” Shows the current output format. Note, the client can override the frame rate, regardless of what is selected in the stream editor.

Interesting to note here that the Frame Rate is set to 30, but the CITP stream is sending at 14FPS. This is because the Window Capture routine is taking 63 milliseconds to complete (normal) and only can run at 14FPS on this machine, this will vary from PC to PC. Also we can see that 14621 frames have been transmitted (totalling 1481 Mbits of data) and is running at 6.0 Mbits/s

Streams Running: 2 | Total FPS: 41 | Total Bandwidth: 4.0 Mbit/s

This display at the top shows the overall output, here 2 streams are running, with 41 frames output per second with a total 4.0 Mbit/s bandwidth.



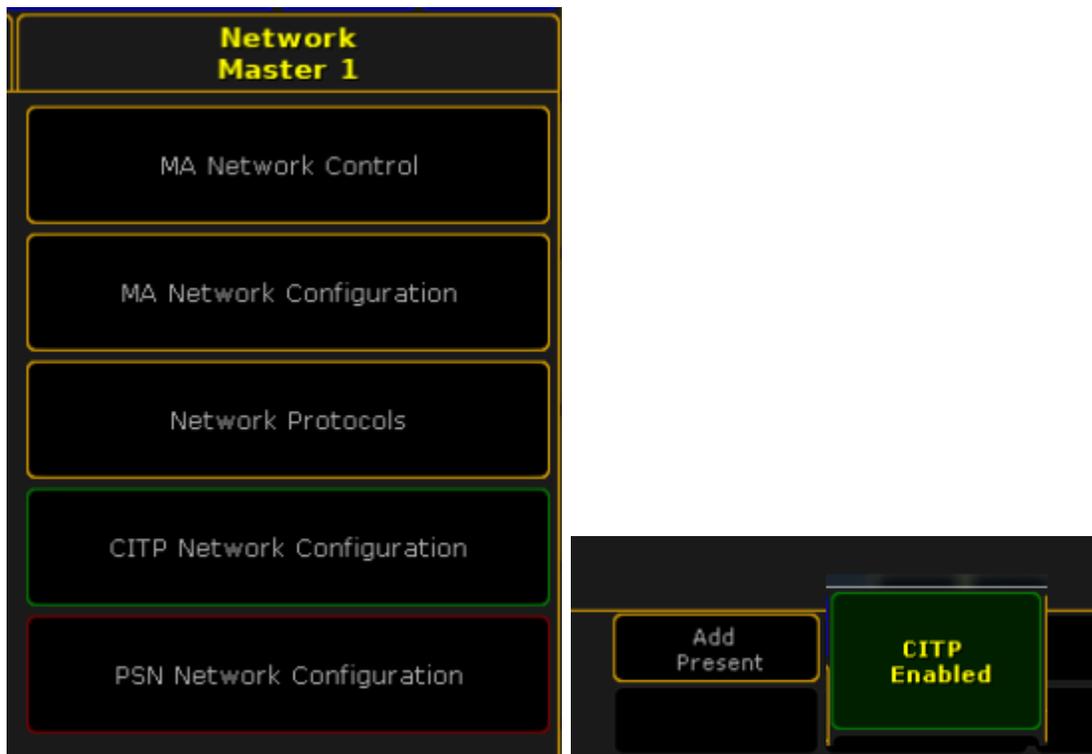
The Limiter is here to ensure you don't exceed the desired bandwidth, and will scale back the quality across all frames to ensure the limit specified is attained. Set attack to 1 or greater to enable quality scaling and decay to 1 or greater to attempt to keep right on the limit.

Note, MA2 has its own limit of 30Mbit/s (which is a little restrictive, though still very usable). It has been observed that exceeding this limit can result in MA2 stopping requests for the streams, and the CITP Video window or ViewPage will need to be changed to something else and then back again.

Some more usage notes:

MSEXLORD is very configurable; therefore it is difficult to cover every different setup, though these tips might help....

- You will need a TimeLord license, you will be asked every 5 minutes if you don't and streaming will switch off.
- Won't work on same PC as MA2 onPC. Will work with Console or other onPC via network (and also tested under a virtual machine on same PC)
- Make sure MA2 CITP is enabled, and you have pressed "add present"



- If you send over 30Mbit/s to MA2, after a while it seems to stop requesting the stream and you must restart the CITP-Viewers (press your current view page button again will do it usually)

-
- Click the “Cog” icon to edit a stream.
 - Use the mouse wheel in number boxes like frame rate and trim margins.
 - Pressing the green play button starts the stream manually, otherwise the stream starts as requested by stream viewers requesting it.
 - Only send as many FPS as you need. 15 is quite acceptable, though you can run upto 30 (depends on the source type and overall CPU)
 - Only make the frame as big as you need.
 - The Limiter will contain the overall output in Mbits/s by reducing JPEG quality first, then frame-size (only frame-size for RGB8)
 - JPEG is the best format, only choose RGB8 if you must, or if you want to generate a lot of bandwidth.
 - Use the restart button in the steams source type to restart the stream or apply a URL you typed in
 - While trying to get a live stream to work, Right-click the mouse to paste a URL from the clipboard into the edit box, it's much faster than typing it!
 - Don't use the repeat function on images! Use an image by loading it as a file stream.
 - To use a video capture device, it's best to leave source frame size on Automatic so the cameras best resolution is chosen.
 - Some times you might be pushing it too hard and crash MsexLord.
 - If you have it working great, to save the setup you must exit MsexLord (this saves it), restart MsexLord and it should load it up.