

# DATASTEAD SOFTWARE

## Multipurpose DirectShow Encoder SDK

### version 1.2.2

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# Overview

## Features

The Datastead Multipurpose Encoder is a DirectShow Sink filter able to compress or encode audio/video streams by invoking in the background a command-line transcoder executable, if this executable supports a named pipe as input.

The filter A LGPL build of [FFmpeg](#) named ffmpegLGPL.exe is included in the filter, allowing to record in most of the encoding formats, as well as :

- H264 software encoding (OpenH264)
- H265/HEVC hardware encoding (NVidia NVENC)

The filter multiplexes the uncompressed DirectShow video and audio streams into an ASF transport stream and writes this transport stream to a named pipe. This named pipe is taken as input by the transcoder, that is invoked as a child process in a non-visible background process from the command line.

There is no binding or C++ linking between the filter and the transcoder, all the settings are passed by the command-line, and the audio/video stream is passed through the named pipe.

To configure the filter, just invoke SetCommandLine and specify the desired command line, along with some reserved keywords for the filter control.

When the graph runs, the transcoder process starts in the background, and stops when the graph is stopped.

Additionally to this default DirectShow behavior, the "PAUSEWHENSTOP" feature allows to pause the process while the graph is stopped, and to resume it when the graph is ran again, allowing to build in real time a single audio/video clip from start/stop sequences separated in time.

It is possible to make the transcoder console visible for debugging or control purpose.

## System requirements

Windows 10, Windows 8.1, Windows 8, Windows 7

32bit or 64bit operating system supported.

## Download

The evaluation package can be downloaded here:

<http://www.datastead.com/products/dsfilters/multipurpose.html>

## License

The license agreement can be found here:

[http://www.datastead.com/index.php?option=com\\_content&id=56](http://www.datastead.com/index.php?option=com_content&id=56)

To buy a license visit our online store here:

<http://www.datastead.com/purchase.html>

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<http://www.datastead.com/contact.html>

## Limitations of the evaluation version

- **if the video pin is connected in RGB24 or RGB32:** the filter overlays a "Datastead" logo over the video frames,

- **if the video pin is connected in YUY2, UYVY or RGB555:** the video frames show a green flash one time and 2 times alternatively, and so on periodically

These limitations are removed in the licensed version.

# FAQ

## Licensing

### **Should I buy one license for each one of my customers?**

No, it's a per-developer, royalty-free license. After purchasing the developer license you can distribute the filter along with the end-user application you have developed on as many PCs as needed, without having to pay anything else.

### **Does the Multipurpose DirectShow encoder include GPL code?**

No, the Multipurpose DirectShow encoder includes only a LGPL build of [ffmpeg.exe](#). There is no GPL code installed by the package.

## Evaluation version

### **What are the limitations of the evaluation version?**

- if the video pin is connected in RGB32 or RGB24, the filter overlays a logo over the video frames
- if the video is connected in another format (YUY2, etc...), the filter flashes alternatively one time then 2 times, this flashing occurs periodically.

## Troubleshooting

### **The frame rate is too slow**

Check the codec's settings options, and choose a faster compression setting, and/or reduce the output video size.

In real time compression, if the time to compress 2 frames becomes longer than the time between 2 frames, frames are dropped.

### **The transcoder does not recognize the pipe input stream**

Verify in the syntax help of the transcoder if you can specify additionally the pipe input format (asf). If this does not help retry after specifying the COMPRESS keyword, however this will increase the CPU load.

### **When I run the graph I get a "The graph could not change state error"**

The origin of the problem is usually a wrong FFmpeg command line parameter.

If you are using FFmpeg add " -report" to the command line, so you will get the FFmpeg log file in the current folder.

### **The output frame rate is not stable**

Specify an [input frame rate](#).

### **When I run the graph it just hangs**

. Usually the problem is wrong transcoder parameter syntax, a missing space, etc.... The filter verifies if the transcoder process starts, but it does not check the syntax itself.

- if you are using FFmpeg, remove the "DONTOVERWRITE" keyword if you have added it.

If specified and the file exists, FFmpeg waits indefinitely for the manual confirmation to overwrite the file. Using DONTOVERWRITE is not recommended for this reason.

- if FFmpeg is connecting to a remote URL (e.g. when pushing the FFmpeg output to a Wowza server), this can take a few seconds, and even wait until the FFmpeg connection timeout if the remote URL does not respond.

## Filter install/Uninstall

The single .exe installer included in the package installs and registers automatically:

- the x86 version of the filter on Windows 32bit,
- both the x86 and x64 versions of the filter on Windows 64bit.

### installing the package automatically from the command line

The command line to run the installer is:

`Datastead_MultipurposeEncoder.exe /silent`

or

`Datastead_MultipurposeEncoder.exe /verysilent`

### uninstalling the package automatically from the command line

The command line to run the uninstaller is:

`"C:\Program Files\Datastead\MultipurposeEncoder\unins000.exe"`

### installing the package manually

Double-click on the .exe installer, and accept each confirmation dialog.

### uninstalling the package manually

Control panel → Add/Remove program → uninstall the Datastead Multipurpose DirectShow Encoder

# Filter configuration

## Adding the filter to the graph

1. create the filter instance
2. add the filter to the graph
3. query the filter's [IDatasteadMultipurposeDirectShowEncoder](#) interface
4. invoke SetCommandLine on this interface.
5. render the pins
6. run the graph.

E.g.:

```
... create filter graph...
... add video and/or audio capture devices ...
IBaseFilter *DatasteadMPE = NULL;
HRESULT hr = CoCreateInstance(CLSID_DatasteadMultipurposeDirectShowEncoder, NULL,
CLSCTX_INPROC_SERVER, (void**) &DatasteadMPE);
if (SUCCEEDED (hr)) {
    hr = pGraph->AddFilter(DatasteadMPE, "Datastead Multipurpose Encoder");
    if (SUCCEEDED (hr)) {
        IDatasteadMultipurposeDirectShowEncoder *MPEConfig;
        hr = Filter.QueryInterface (IID_IDatasteadMultipurposeDirectShowEncoder,
(void**) &MPEConfig);
        if (SUCCEEDED (hr)) {
            hr = MPEConfig.SetCommandLine (...transcoder's ".exe" command line...);
            if (SUCCEEDED (hr)) {
                ... from render the video and audio output pins, and run the graph
            }
            MPEConfig->Release();
        }
    }
    DatasteadMPE->Release();
}
```



## Command line syntax

The command-line is based on the FFmpeg configuration syntax, the documentation can be found [here](#). At the left part of the command line (input part), "**ffmpegLGPL.exe -i %PIPE%**" is required. This tells FFmpeg to take the Multipurpose encoder output as input.

So the encoding settings that configure the video compression + audio compression + multiplexing, are located **after** "**%PIPE%**".

### 1. example for H264->MP4 recording using the OpenH264 software encoder

```
MPEConfig.SetCommandLine ("ffmpegLGPL.exe -i %PIPE% -c:v h264 -threads 8 -profile:v baseline -allow_skip_frames 1 -loopfilter 0 -b:v 1M -an -f mp4 myoutputfile.mp4");
```

**"-c:v h264"** means *"use the H264 software encoder as video codec"*, followed by the specific OpenH264 codec settings (b:v 1M = video bitrate 1Mbps/s)

**"-an"** means *"no audio"*

### 2. example for H264+AAC->MP4 recording using the NVidia hardware encoder

```
MPEConfig.SetCommandLine ("ffmpegLGPL.exe -i %PIPE% -c:v h264_nvenc -preset fast -rc 1 -cbr 1 -b:v 200M -c:a aac -ab 128k -ac 2 -ar 44100 -f mp4 myoutputfile.mp4");
```

**"-c:v h264\_nvenc"** means *"compress video using Nvidia H264 hardware software encoder"*, followed by the specific OpenH264 codec settings (cbr = constant bitrate, b:v 200M means video bitrate 200Mbps)

**"-c:a aac"** means *"compress audio using the AAC encoder"*, followed by the audio encoding settings (ab 128K = audio bitrate 128kbps, ac 2 = 2 audio channels, ar 44100 = sample rate 44100hz)

**ffmpegLGPL.exe** is the name of the LGPL build of [FFmpeg](#) included in the package and located in the installation folder of the filter.

**%PIPE%** is mandatory for the transcoder to take the filter's output as input. It must be written exactly as is. It corresponds to the pipe generated by the filter and used as input by the transcoder. At runtime, %PIPE% is replaced by the real name of the pipe, generated automatically by the filter.

### 3. example of H265(HEVC)+AAC->MP4 recording using the NVidia hardware encoder

```
MPEConfig.SetCommandLine ("ffmpegLGPL.exe -i %PIPE% -c:v hevc_nvenc -preset fast -rc 1 -cbr 1 -b:v 200M -c:a aac -ab 128k -ac 2 -ar 44100 -f mp4 myoutputfile.mp4");
```

## FFmpeg input parameters

FFmpeg takes as input the output of the Multipurpose Encoder filter.

It may be necessary to specify a FFmpeg input parameter, in this case it must be placed **before** "%PIPE%".

E.g. ,depending on the capture device, it may be necessary to specify the input frame rate:

```
MPEConfig.SetCommandLine ("ffmpegLGPL.exe -framerate 30 -i %PIPE% ...
```

# Using the built-in RTSP server

## Configuring the RTSP server

The filter includes a built-in RTSP server.

To use it, 3 elements per DirectShow graph must be configured:

- the RTSP port of the RTSP server (**RTSPPORT** keyword),
- a session name per DirectShow graph (**RTSPSESSION** keyword),
- a reserved port per DirectShow graph (**RTSPUDP** keyword)

The ports can be in the 554..65535 range, however it is recommended to use ports above 10000 to avoid risking to interact with reserved operating system ports.

The RTSP port and session name will be used to connect to the URL. E.g. if RTSPPORT=12800 and RTSPSESSION=camera1, the clients will connect to the server with the following URL:

```
rtsp://ipaddress:12800/camera1
```

The reserved port is used internally to pass the FFmpeg stream to the RTSP server through the 127.0.0.1 loopback IP address.

Note that if you are using several DirectShow graphs within the same applications, each couple RTSPSESSION and RTSPUDP must be unique per DirectShow graph, it must not be reused in another DirectShow graph at the same time, as this couple represents a given DirectShow source.

E.g. of a typical RTSP server command line:

```
MPEConfig.SetCommandLine (RTSPPORT=12800 UDPPORT=12801 RTSPSESSION=camera1  
SHOWCONSOLE ffmpegLGPL.exe -re -fflags nobuffer -flags low_delay -r 30 -vsync 1 -i  
%PIPE% -vcodec mpeg4 -b:v 1000k -minrate 1000k -acodec aac -ab 128k -ac 2 -f mpegts  
udp://127.0.0.1:12801?pkt_size=188&buffer_size=2048
```

Note that the UDP port is passed to FFmpeg at the end of the line. The value passed to FFmpeg must correspond to the value passed to UDPPORT.

## Example of 2 graphs streaming on the same RTSP server

```
MPEConfig1.SetCommandLine (RTSPPORT=12800 UDPPORT=12801 RTSPSESSION=camera1
SHOWCONSOLE ffmpegLGPL.exe -re -fflags nobuffer -flags low_delay -r 30 -vsync 1 -i
%PIPE% -c:v h264 -threads 8 -profile:v baseline -allow_skip_frames 1 -loopfilter 0
-b:v 1M -c:a aac -ab 128k -ac 2 -f mpegts udp://127.0.0.1:12801?
pkt_size=188&buffer_size=2048
```

```
MPEConfig2.SetCommandLine (RTSPPORT=12800 UDPPORT=12802 RTSPSESSION=camera2
SHOWCONSOLE ffmpegLGPL.exe -re -fflags nobuffer -flags low_delay -r 30 -vsync 1 -i
%PIPE% -c:v h264 -threads 8 -profile:v baseline -allow_skip_frames 1 -loopfilter 0
-b:v 1M -c:a aac -ab 128k -ac 2 -f mpegts udp://127.0.0.1:12802?
pkt_size=188&buffer_size=2048
```

In this case the clients can connect to these 2 cameras with:

```
rtsp://ipadress:12800/camera1
rtsp://ipadress:12800/camera2
```

## Example of 2 graphs streaming on 2 different RTSP servers

```
MPEConfig1.SetCommandLine (RTSPPORT=12800 UDPPORT=12801 RTSPSESSION=camera1
SHOWCONSOLE ffmpegLGPL.exe -re -fflags nobuffer -flags low_delay -r 30 -vsync 1 -i
%PIPE% -c:v h264 -threads 8 -profile:v baseline -allow_skip_frames 1 -loopfilter 0
-b:v 1M -c:a aac -ab 128k -ac 2 -f mpegts udp://127.0.0.1:12801?
pkt_size=188&buffer_size=2048
```

```
MPEConfig2.SetCommandLine (RTSPPORT=12850 UDPPORT=12802 RTSPSESSION=camera1
SHOWCONSOLE ffmpegLGPL.exe -re -fflags nobuffer -flags low_delay -r 30 -vsync 1 -i
%PIPE% -c:v h264 -threads 8 -profile:v baseline -allow_skip_frames 1 -loopfilter 0
-b:v 1M -c:a aac -ab 128k -ac 2 -f mpegts udp://127.0.0.1:12802?
pkt_size=188&buffer_size=2048
```

In this case the clients can connect to these 2 cameras with:

```
rtsp://ipadress:12800/camera1
rtsp://ipadress:12850/camera1
```

# Filter GUID and interface

## Filter CLSID

```
CLSID_DatasteadMultipurposeDirectShowEncoder:  
    TGUID = '{39E3007B-6185-47FC-9839-C4B8621AC065}';
```

## IDatasteadMultipurposeDirectShowEncoder interface

The filter exposes the following interface:

```
DECLARE_INTERFACE_(IDatasteadMultipurposeDirectShowEncoder, IUnknown)  
{  
    virtual HRESULT STDMETHODCALLTYPE SetCommandLine(/*in*/ LPWSTR CommandLine) PURE;  
    virtual HRESULT STDMETHODCALLTYPE GetCommandLine(/*out*/ LPWSTR *CommandLine) PURE;  
    virtual HRESULT STDMETHODCALLTYPE Stop_PauseWhenStop() PURE;  
    virtual HRESULT STDMETHODCALLTYPE GetCurrentLog(  
        /*in*/ bool OnlyIfUpdated,  
        /*in*/ PCHAR pBuffer,  
        /*in*/ int MaxBufferSize,  
        /*out*/ int *CurrentLogSize,  
        /*out*/ int *CurrentLogFlag) PURE;  
  
    virtual HRESULT STDMETHODCALLTYPE IsCurrentLogUpdated() PURE;  
    virtual int STDMETHODCALLTYPE GetExitCode() PURE;  
    virtual unsigned int STDMETHODCALLTYPE GetInputsTotalDurationMs() PURE;  
    virtual unsigned int STDMETHODCALLTYPE GetProgress_FrameCount() PURE;  
    virtual unsigned int STDMETHODCALLTYPE GetProgress_TimeMs() PURE;  
    virtual unsigned int STDMETHODCALLTYPE GetProgress_DuplicatedCount() PURE;  
    virtual unsigned int STDMETHODCALLTYPE GetProgress_DroppedCount() PURE;  
    virtual double STDMETHODCALLTYPE GetProgress_Fps() PURE;  
    virtual double STDMETHODCALLTYPE GetProgress_Quality() PURE;  
    virtual double STDMETHODCALLTYPE GetProgress_SizeWrittenKb() PURE;  
    virtual double STDMETHODCALLTYPE GetProgress_BitRateKbps() PURE;  
    virtual HRESULT STDMETHODCALLTYPE GetConnectedVideoPinInfo(  
        /*out*/ int *VideoWidth,  
        /*out*/ int *VideoHeight,  
        /*out*/ int *VideoAvgTimePerFrame) PURE;  
  
    virtual HRESULT STDMETHODCALLTYPE GetConnectedAudioPinInfo(  
        /*out*/ int *AudioChannels,  
        /*out*/ int *AudioSampleRate,  
        /*out*/ int *AudioBitsPerSample) PURE;  
  
    virtual HRESULT STDMETHODCALLTYPE SetMediaEventSinkNotifyID (LONG_PTR Value) PURE;  
    virtual BOOL STDMETHODCALLTYPE Is64BitWindows() PURE;  
    virtual BOOL STDMETHODCALLTYPE Is64BitApplication() PURE;  
};
```

## SetCommandLine

Sets the FFmpeg command line, with eventual extra keywords destined to the filter. The syntax is described [here](#).

## GetCommandLine

Retrieves the current command line. Pass LPWSTR pointer to the function. The function allocates memory and copy the string. If the function succeeds, the LPWSTR pointer must be freed by invoking CoTaskMemFree.

E.g.:

```
LPWSTR pCommandLine;
if (SUCCEEDED (MPEConfig.GetCommandLine (&pCommandLine))) {
    ... do what you need with the pCommandLine string returned
    CoTaskMemFree (pCommandLine);
}
```

## Stop\_PauseWhenStop

See the PAUSEWHENSTOP keyword in the [reserved keywords](#) chapter.

## GetCurrentLog

Copies the current FFmpeg log string in a buffer. If the string contains several lines, they are separated by CR/LF characters: char(13)/char(10).

Note that this function does not work if SHOWCONSOLE has been specified.

You must allocate the buffer and pass its pointer to the function.

To determine the required maximum buffer size and allocate the buffer, invoke GetCurrentLog with all parameters to 0 / NULL excepted CurrentLogSize that will return the size required to allocate the buffer, e.g.:

```
int MaxBufferSize;
CHAR *pBuffer = NULL;
...
if (pBuffer == NULL) {
    if SUCCEEDED (MPEConfig.GetCurrentLog (false, NULL, 0, &MaxBufferSize, NULL)) {
        pBuffer = new CHAR[MaxBufferSize];
    }
}
```

Then to read the current log:

```
int BufferSizeRead = 0;
if SUCCEEDED (MPEConfig.GetCurrentLog (true, pBuffer, BufferSize, &BufferSizeRead, NULL)) {
    ... do anything with the string in the buffer...
}
```

Notes:

**OnlyIfUpdated** parameter:

- . if false, the buffer returns its content, even if this content has already been returned by the function
- if true and the buffer content has changed, the function fills the buffer and returns S\_OK, otherwise it returns E\_NOT\_SET

**the buffer is "string safe"**: GetCurrentLog writes a NULL character at the end of the text read.

## IsCurrentLogUpdated

return S\_OK if the buffer content has changed or E\_NOT\_SET. It is useless to invoke it to determine if GetBufferLog must be invoked just after, in this case invoke directly with the OnlyIfUpdated parameter = true, e.g. GetBufferLog (true, ...) so it will return directly E\_NOT\_SET if no new log is available.

## GetExitCode

returns the exit code, 0 on success or another value if the encoding failed for any reason (usually a wrong command line syntax or a non-writeable output file).

## GetInputsTotalDurationMs

(\*)

when the input file has a fixed size, it returns the duration reported by FFmpeg in milliseconds. If several input files are used (e.g. when concatenating clips, the value returned is the total duration of final clip (the sum of the durations of the concatenated clips).

## GetProgress\_FrameCount

returns the current frame count (\*)

## GetProgress\_TimeMs

returns the current stream time in milliseconds (\*)

## GetProgress\_DuplicatedCount

returns the number of duplicated frames, if any (\*)

## GetProgress\_DroppedCount

returns the number of dropped frames, if any (\*)

## GetProgress\_Fps

returns the average number of frames per second (\*)

## GetProgress\_Quality

returns the average quality (the meaning depends on the codec) (\*)

## GetProgress\_SizeWrittenKb

return the size written to disk in KiloBytes (\*)

## GetProgress\_BitRateKbps

returns the average bit rate in KiloBytes per second (\*)

(\*) these functions are currently supported only with FFmpeg, and only if SHOWCONSOLE has not been specified.

## GetConnectedVideoPinInfo

returns the video size of the input pin, and average time per frame of the video input stream (expressed in 100 nanoseconds units, 1 second = 10000000, e.g. at 25 fps the average time per frame returns 400000)

## **GetConnectedAudioPinInfo**

return the number of audio channels, the sample rate and the number of bits per sample of the audio input pin

## **SetMediaEventSinkNotifyID**

This is useful only:

- when processing the event notifications sent by the filter to the graph (when implementing `IMediaEventSink`),
- **and** when using more than one instance of the Multipurpose Encoder in the same graph

## **Is64BitWindows**

This helper function lets you know if your app is running on a Windows 64bit PC, or on a Windows 32bit PC.

## **Is64BitApplication**

This helper function lets you know if the application compiled in 32bit or 64bit.



## Reserved command-line keywords

The following keywords can be specified before the command line. They are interpreted by the filter and removed from the final command line passed to FFmpeg. E.g.:

```
MPEConfig.SetCommandLine ("SHOWCONSOLE NOLOG ffmpegLGPL.exe -i %PIPE% myclip.webm");
```

### PAUSEWHENSTOP

If specified, when the graph is stopped, the FFmpeg recording is paused (instead of being stopped as well). When the graph is ran again, the FFmpeg recording is resumed. So this lets record a single, continuous clip without gap, although the graph has been stopped and restarted, whatever the interval of time between the stops and starts.

Note that when this feature is enabled, and you want to FINALLY stop the FFmpeg recording, invoke **MPEConfig.Stop\_PauseWhenStop()**.

If Stop\_PauseWhenStop is never invoked, the recorded clip will be closed when exiting the application.

Notes:

- while the graph is stopped, the video and audio pins must not be disconnected / reconnected.

### SHOWCONSOLE

makes the console visible. Mainly for debugging purpose. In this mode the FFmpeg information (e.g. current time, frame count) is not available through the the filter interface (see the interface below)

### NOLOG

Can be specified to save CPU. if specified, the filter does not analyze the FFmpeg progress information (e.g. current time, frame count), so the filter does not report them.

### LOWLATENCY

Specify it if the filter is used for a live streaming in real time (e.g. to send the stream to a Wowza server).

### NOABORTONERROR

If there is an error (e.g. if the syntax is not correct and/or if FFmpeg exits by itself with an error code), the filter sends an EC\_ERRORABORT notification to the graph, that stops the graph. If NOABORTONERROR is specified, the filter sends instead an "neutral" EC\_MPE\_TERMINATED\_ERROR notification to the graph that can be handled, but the graph does not stop.

### DONTOVERWRITE

by default, if the command line contains "FFmpeg", the filter passes the "-y" option to FFmpeg to overwrite a previous clip, if any.

Set this option to prevent overwriting an existing file, however it is **NOT RECOMMENDED** to use it, because if SHOWCONSOLE is disabled and FFmpeg waits for the overwrite confirmation, the graph will just hang.

## TOPDOWN

If specified, the image is flipped vertically without extra CPU load. Can be required by some encoders if the image appears inverted.

## COMPRESS

If specified, the video stream passed through the pipe, compressed in MPEG-4. If the command line transcoder does not accept the pipe uncompressed, enabling this option could fix the problem. Note that enabling this option will significantly increase the CPU load.

## RTSPPORT

See the [Using the built-in RTSP server](#) chapter.

## UDPPORT

See the [Using the built-in RTSP server](#) chapter.

## RTSPSESSION

See the [Using the built-in RTSP server](#) chapter.

# Graph event notification through IMediaEventEx

## IMediaEventEx events

(see <https://msdn.microsoft.com/en-us/library/windows/desktop/dd377538%28v=vs.85%29.aspx>)

```
#define EC_MPE_TERMINATED_SUCCESS EC_USER + 0x5501
#define EC_MPE_TERMINATED_ERROR EC_USER + 0x5502
#define EC_MPE_LOGBUFFER_UPDATED EC_USER + 0x5503
```

### EC\_MPE\_TERMINATED\_ERROR vs EC\_ERRORABORT

By default, if an error occurs after the graph is ran, the filter notifies the graph with an EC\_ERRORABORT event that stops the graph.

You can prevent the filter to stop the graph by specifying the NOABORTONERROR keyword at the beginning of the command line. In this case, if an error occurs the filter sends a EC\_MPE\_TERMINATED\_ERROR notification message that you can handle but that does not stop the graph.

### EC\_MPE\_TERMINATED\_SUCCESS

If the FFmpeg processing ends successfully before the graph is stopped (e.g. if a maximal encoding duration has been specified to the command line), the filter sends a EC\_MPE\_TERMINATED\_SUCCESS event to the graph.

### EC\_MPE\_LOGBUFFER\_UPDATED

Each time the log buffer has been updated, the filter sends a EC\_MPE\_LOGBUFFER\_UPDATED event to the graph.

When this event is received you can successfully invoke [GetCurrentLog](#) to retrieve the log content, or read one of the GetProgress... functions to retrieve the corresponding value.

## Retrieving the sender instance when several instances of the Multipurpose Encoder are used in the same graph

For all the events described above, Param1 and Param2 return the following values:

### Param1:

returns the exit code of FFmpeg

### Param2:

- by default Param2 returns the pointer to the instance of the filter (the same IBaseFilter pointer that has been returned when you invoked

CoCreateInstance(CLSID\_DatasteadMultipurposeDirectShowEncoder...)

- when configuring the filter, if you have invoked SetMediaEventSinkNotifyID (Value) with a value of your

choice, Param2 returns this value (instead of the IBaseFilter pointer)

In the case where several Multipurpose Encoders are used within the same graph, any of these 2 mechanisms lets you easily retrieve what instance of the Multipurpose Encoder sent the event notification.

## Quick start from GraphEdit.exe

- run GraphEdit -> Graph -> Insert Filters -> DirectShow Filters
- locate the "Datastead Multipurpose Encoder" filter, double-click on it to insert it,
- insert the video source filter (e.g. a Webcam) and/or the audio source filter (e.g. a microphone)
- connect video output pin (if any) to the Multipurpose video input pin
- connect audio output pin (if any) to the Multipurpose audio input pin
- right-click on the "Datastead Multipurpose Encoder" filter, and enter the command line, eventually preceded by reserved Multipurpose keywords.

Examples of a very minimalistic command line that can be tested "out the box":

- with console, for debugging purpose:

```
SHOWCONSOLE ffmpegLGPL.exe -i %PIPE% myclip.webm
```

- or not visible, like a normal DirectShow sink filter:

```
ffmpegLGPL.exe -i %PIPE% myclip.webm
```

## How to debug

First verify if the solution is not in the the [Support](#) section of the FAQ. If not:

1. add "SHOWCONSOLE" at the beginning of the command line, to see if the FFmpeg process starts and if any red error report appears.

2. add " -report" or " -report -loglevel debug" to the command line, this will generate the FFmpeg log file in the current folder.

Verify/fix the FFmpeg syntax, then try again.

PS: don't forget to remove the report and loglevel statements because they slow-down the filter.

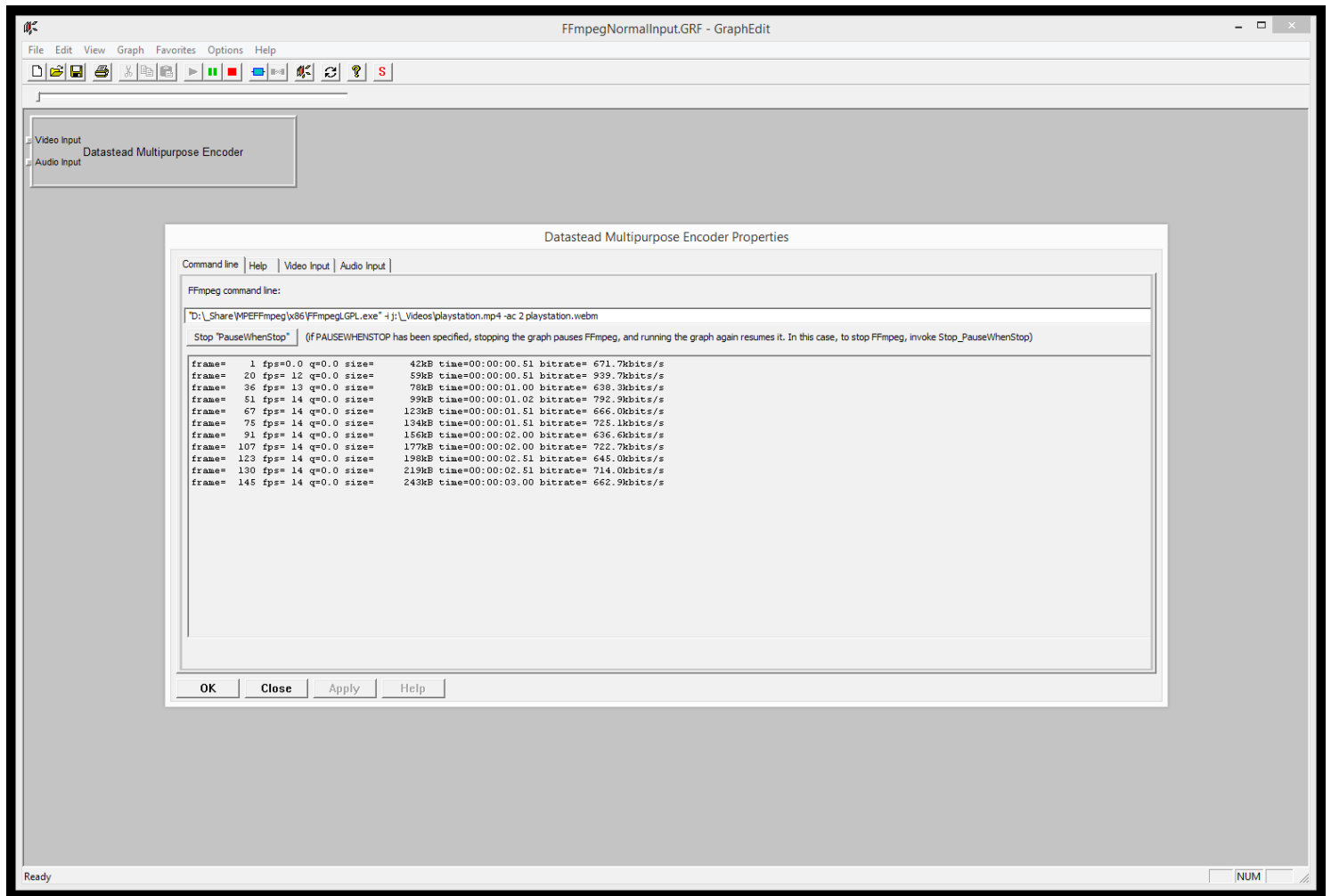
# Using the filter for a normal processing, without DirectShow input.

To avoid having to implement specific code for editing or transcoding that do not use the pipe as input, you can use the filter for a normal batch transcoding as follows:

- add the filter to the graph (alone without connecting any pin)
- configure command line with a normal command line (without "%PIPE%")
- run the graph

The progress log and completion notification events work the same way.

E.g.:



# Screenshots

## graphedit:

The screenshot displays the GraphEdit interface for a project named 'C920.GRF'. The main graph area shows a flow from left to right. On the left, there are two input nodes: 'Video Camera Terminal Logitech HD Pro Webcam C920' (orange) and 'Volume principal Microphone (HD Pro Webcam C920)' (blue). The video camera node has a 'Capture' port and a 'Fixe' port. The microphone node has a 'Capture' port. Both inputs feed into an 'XForm In MJPEG Decompressor' node. The output of this node is 'XForm Out', which then feeds into the 'Video Input' and 'Audio Input' ports of the 'Datastead Multipurpose Encoder' node.

The 'Datastead Multipurpose Encoder Properties' dialog box is open, showing the 'Command line' tab. The 'FFmpeg command line' field contains the following text:

```
ffmpeg_GPL.exe -r 30 -i %PIPE% -vcodec mpeg4 -biv 1600k -strict experimental -acodec aac -ac 2 -ab 128k -f mp4 DatasteadMultiPurposeDemo.mp4
```

Below the command line, there is a checkbox for 'Stop "PauseWhenStop"' with a note: '(if PAUSEWHENSTOP has been specified, stopping the graph pauses FFmpeg, and running the graph again resumes it. In this case, to stop FFmpeg, invoke Stop\_PauseWhenStop)'. A list of frame statistics is displayed:

frame	fps	q	size	time	bitrate
528	30	4.1	3926kB	00:17.87	1799.1kbits/s
558	30	4.8	4154kB	00:18.87	1803.0kbits/s
588	30	4.1	4346kB	00:19.92	1787.4kbits/s
619	30	4.5	4582kB	00:20.90	1795.4kbits/s
648	30	4.2	4770kB	00:21.91	1783.1kbits/s
679	30	4.3	5004kB	00:22.93	1787.2kbits/s
709	30	3.3	5236kB	00:23.95	1791.0kbits/s
740	30	4.3	5430kB	00:24.95	1782.2kbits/s
771	30	5.0	5666kB	00:25.98	1786.4kbits/s
801	30	4.0	5858kB	00:26.97	1777.7kbits/s
831	30	5.1	6080kB	00:27.99	1781.7kbits/s
862	30	4.3	6280kB	00:29.02	1772.6kbits/s
877	30	3.4	6415kB	00:29.53	1779.5kbits/s

The dialog box has 'OK', 'Cancel', 'Apply', and 'Help' buttons at the bottom. The status bar at the bottom of the window shows 'Ready' and 'NUM'.



# graphedit with debug console:

The screenshot displays the GraphEdit interface with a video processing graph and a debug console window.

**Graph Components:**

- Video Camera Terminal:** Logitech HD Pro Webcam C920
- Capturer:** Fixed
- XForm In:** MJPEG Decompressor
- XForm Out:** (Intermediate output)
- Video Input:** (Intermediate output)
- Audio Input:** (Intermediate output)
- Datastead Multipurpose Encoder:** (Final output)

**Debug Console Output:**

```
D:\_Share\MPEFFmpeg\vx86\FFmpegLGPL.exe
IsOBR      : 0
encoder    : Lavf56.19.100
Stream #0:0(fre): Video: mpeg4 ( [010101] / 0x0020), yuv420p, 1920x1080 [SA
R 1:1 DAR 16:9], q=2-31, 1600 kb/s, 30 fps, 15360 tbn, 30 tbc
Metadata:
encoder    : Lavc56.21.102 mpeg4
Stream mapping:
Stream #0:0 -> #0:0 (rawvideo (native) -> mpeg4 (native))
Press [q] to stop, [?] for help
frame= 21 fps= 0.0 q=3.6 size= 250kB time=00:00:00.70 bitrate=3017.2kbits/s
frame= 37 fps= 35 q=3.0 size= 400kB time=00:00:01.23 bitrate=2712.3kbits/s
frame= 53 fps= 33 q=4.3 size= 518kB time=00:00:01.76 bitrate=2400.6kbits/s
frame= 69 fps= 33 q=3.6 size= 619kB time=00:00:02.30 bitrate=2203.7kbits/s
frame= 70 fps= 12 q=3.5 size= 622kB time=00:00:02.33 bitrate=2183.9kbits/s
frame= 97 fps= 15 q=2.9 size= 846kB time=00:00:03.23 bitrate=2143.6kbits/s
frame= 114 fps= 16 q=4.4 size= 948kB time=00:00:03.80 bitrate=2044.3kbits/s
frame= 130 fps= 17 q=3.9 size= 1043kB time=00:00:04.33 bitrate=1972.2kbits/s
frame= 146 fps= 18 q=4.1 size= 1102kB time=00:00:04.86 bitrate=1989.3kbits/s
frame= 162 fps= 19 q=4.7 size= 1274kB time=00:00:05.40 bitrate=1932.7kbits/s
frame= 178 fps= 20 q=4.0 size= 1360kB time=00:00:05.93 bitrate=1880.2kbits/s
frame= 194 fps= 20 q=4.2 size= 1505kB time=00:00:06.46 bitrate=1905.9kbits/s
frame= 210 fps= 21 q=4.8 size= 1595kB time=00:00:07.00 bitrate=1866.8kbits/s
frame= 226 fps= 21 q=4.1 size= 1687kB time=00:00:07.53 bitrate=1834.8kbits/s
frame= 242 fps= 22 q=4.4 size= 1821kB time=00:00:08.06 bitrate=1849.8kbits/s
```

**Datastead Multipurpose Encoder Properties:**

Command line: | Help | Video Input | Audio Input

FFmpeg command line:  
SHOWCONSOLE ffmpeg.LGPL.exe -r 30 -i %PIPE% -an -vcodec mpeg4 -b:v 1600k -f mp4 DatasteadMultiPurposeDemo.mp4

Stop "PauseWhenStop" (If PAUSEWHENSTOP has been specified, stopping the graph pauses FFmpeg, and running the graph again resumes it. In this case, the graph will stop when the console output contains the string "PauseWhenStop".)

Buttons: OK, Cancel, Apply, Help