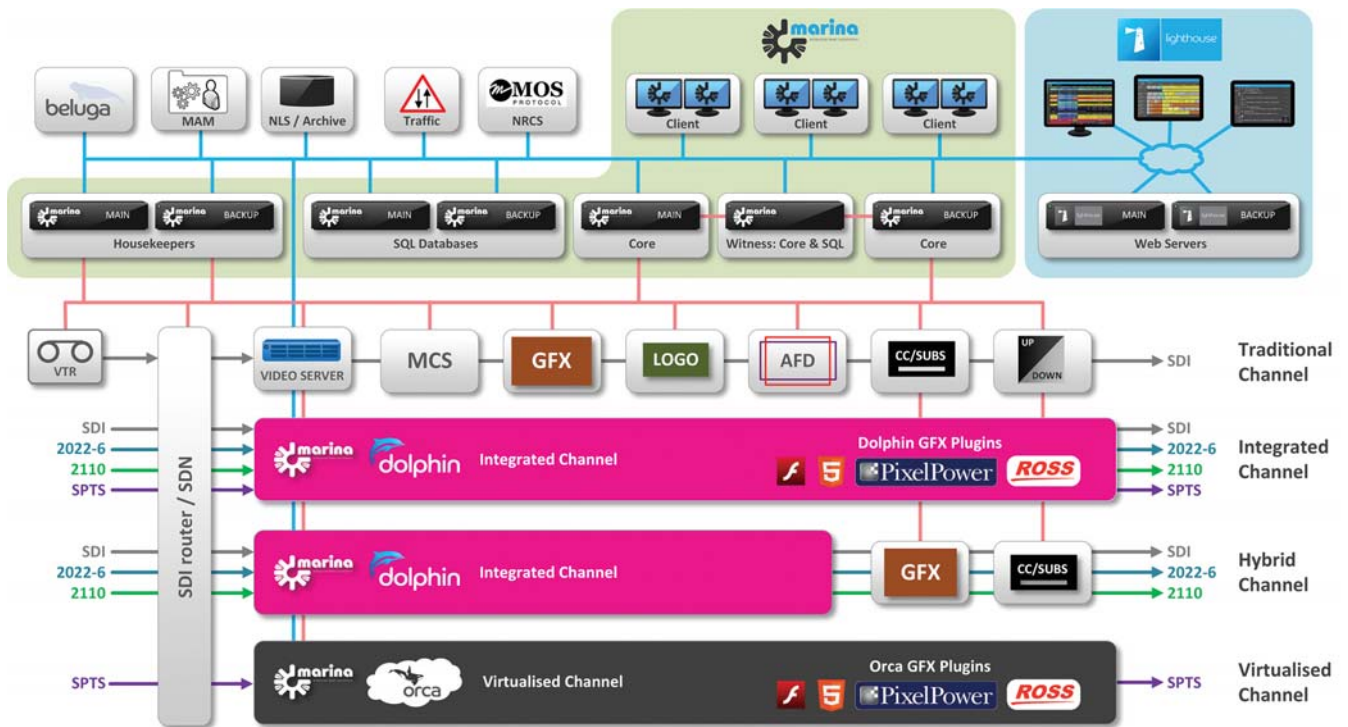




# Software-defined integrated channel in a flexible automation environment

Dolphin is a compact and cost-effective integrated channel device with the flexibility to adapt to your changing broadcast environment. Operating under Pebble Beach Systems' Marina control, it delivers highly automated integrated audio, video and graphics functionality for ingest, channel branding and frame-accurate multi-channel playout. The flexible pipeline design gives you the ability to customise the virtual output chain for each channel, specifying the order in which functions including graphics, effects, aspect ratio conversion are handled within the system.



## Rich Functionality

With SD/HD/4K video server, master control switcher, subtitling, captioning and channel branding functionality, Dolphin is installed at Tier One broadcasters and target installations include regional commercial insertion, fast to market or short-term channels, disaster recovery centres and content ingest. Supporting an extensive range of compression and file formats, it incorporates full up- and down-conversion on ingest and playout, and the ability to mix legacy SD and HD content with new 4K material on the same timeline, to deliver the flexibility your programming demands.

## Seamless Integration

Dolphin integrates seamlessly as a standalone device into a multichannel system which might also incorporate best-of-breed video server, graphics or captioning devices for prime channels. It can also act as a component of a hybrid channel, blending Dolphin's functionality with discrete technology such as graphics devices. This means that you can choose the optimum technology for the budgetary and technical needs of each channel. Crucially, your operators will be presented with the same user interface whatever the underlying channel

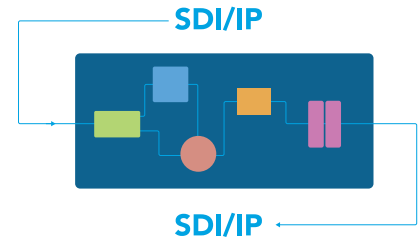
technology across the entire system, and a single system-wide database avoids creating operational silos and simplifies channel control.

## Exceptional Quality

In today's highly commercial, multi-channel broadcast environment, audience engagement is driven by error-free playout and informative, relevant channel branding. Dolphin delivers exceptional SD, HD and 4K quality at an affordable price, safeguarding your on air production values, even for low revenue channels.

## KEY FEATURES

- Leverages full power of flexible Marina automation playlist
  - Can handle dynamic changes to schedules
  - Full validation of media and playout elements
- Simple to use channel design and editing tools with drag and drop
- Flexible configurations for custom I/O requirements
- Comprehensive graphics functionality (2D or optional 3D)
- Complex audio management
- Uses optional GPU for advanced graphics
- Flexible IP inputs and outputs; supports MPEG2-TS, SMPTE 2022-6, 2110
- Offers 4.4TB of usable storage, can be optionally expanded to 7.8TB



## KEY BENEFITS

- Proven solution with multi-channel deployments
- Meets the exact requirements of each service thanks to its highly configurable architecture
- Flexible channel design enables the virtual output chain for each channel in the system to be customised
- Offers a quick and straightforward pathway for the launch of new channels
- Delivers operational efficiencies with the ability for a single operator to control multiple channels
- Modular architecture enables the system to grow as businesses evolve
- Simulcast output capability provides the simultaneous output of a single media timeline in HD and SD formats, eliminating the need for downstream cross-conversion
- Offers a cost-effective route to HD encoding and playout
- Multi format mixed timeline playout including text, logos, stills, RSS tickers, multi-lingual subtitles and 2D effects
- Multi-channel audio support with management of audio track tagging for language selection per event
- Automatic caching of video and graphics content from nearline storage according to multiple playlist priorities, or direct attachment to near line storage



## INPUTS AND OUTPUTS

### Compressed IP Inputs & Outputs

Dolphin can output multiple compliant DVB IP outputs with MPEG2, H264 and H265 compressed video and multiple MPEG1 Layer 2, AAC, DolbyE and DolbyD compressed audio outputs. Full resolution H264/ MPEG2 IP outputs utilise software encoders or optional hardware H265 encode available via NVIDIA GPU's.

### Uncompressed IP Inputs & Outputs

- Dolphin supports multiple streams of ST 2022-6 and ST 2110 with ST 2022-7 hitless redundancy.
- Genlock available via tri-level or ST 2059 (PTP).

Uncompressed IP	Inputs (1080i60)	Outputs (1080i60)	Interface (Speed)
SMPTE 2022-6 Dual Port	4	4	2x SFP+ (10GB)
SMPTE 2110 Dual Port	16	16	2x SFP28 (25GB)
SMPTE 2110 Quad Port	32	32	4x SFP28 (25GB)

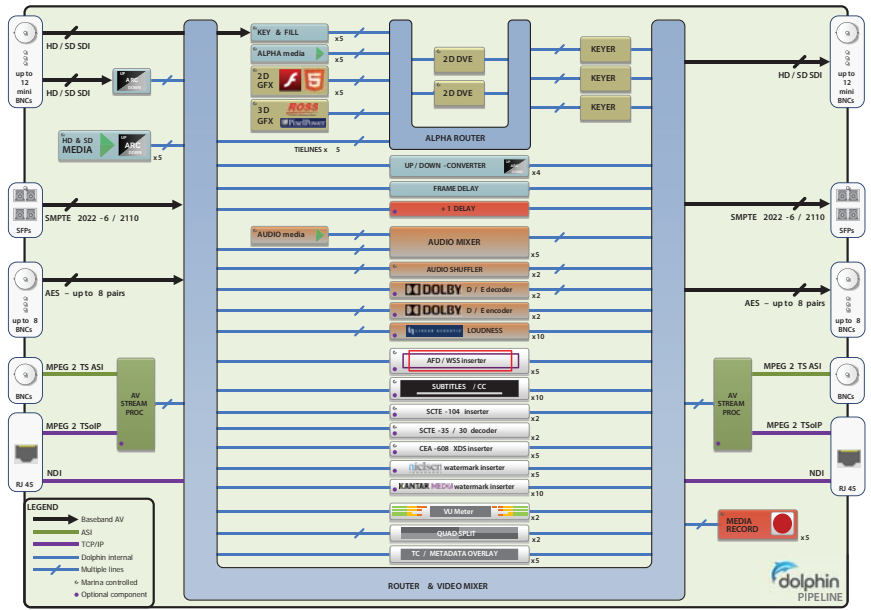
### SDI Inputs & Outputs

Dolphin's configurable I/O SDI card offers 4, 8 or 12 inputs/outputs which can be configured to suit the requirements of your installation, allocated to inputs and outputs as required, and used for external key and fill.

# DOLPHIN SOFTWARE-DEFINED PIPELINE

Dolphin replicates, in software, a playout chain that would traditionally comprise multiple discrete hardware devices. This software pipeline can be configured to deliver the required video and audio workflows, making it easy to specify the order in which processes such as graphics overlay, DVE and Aspect Ratio Conversion are handled within the playout chain.

Dolphin's channel editing and design tools are offered within Lighthouse, Pebble's powerful remote management and monitoring tool for the Marina automation environment. Lighthouse offers a series of interfaces which deliver configuration and deployment functionality for Dolphin integrated channels, including:



## Channel Designer

Offers offline editing of Dolphin pipelines, and enables the end user to create and edit templates for different types of software-defined channels using

drag and drop graphical tools. The Channel Designer is aware of what components are available on your system and will prevent you making invalid selections.

# Video



## VIDEO PLAYER

The Video Player is able to decode and play back video from any of the supported SD or HD codecs. Each pipeline can support up to 5 video players depending on the complexity of the codec and therefore the amount of CPU resource required. Video player features include:

- Seamless back to back HD and SD video clips playback
- Plays clips of single frame duration
- Plays clips whilst the file is importing

The table below lists the wide range of supported file wrappers and codecs for playback.

SD	DVCPRO25, DVCPRO50 & DVCAM DV IMX 30, 40, 40 MPEG2 I Frame & Long GOP	AVI, MOV, MXFOPatom, MXFOP1a, GXF, LXF AVI, MOV, GXF, LXF AVI, MXFOP1a AVI, MOV, MXFOP1a, GXF, MPG
HD	XDCAM HD, XDCAM EX, XDCAM 422 DVCPRO HD AVC-Intra DNxHD H264/AVC MPEG2 I Frame & Long GOP XAVC MXF OP1a AS-11/DPP ProRes	MXFOP1a AVI, MOV, MXFOP1a, MXFOPatom, GXF, LXF MXFOP1a, LXF MOV, MXFOP1a, MXFOPatom MP4.MOV AVI, MOV, MXFOP1a, GXF, MPG MXF MOV MXFOP1b MXF AVI, MOV, MXF
UHD	ProRes XAVC	AVI, MOV, MXF AVI, MOV, MXF

### Note:

- Representative files should be supplied to Pebble Beach Systems for testing
- Supports MOV QuickTime self-contained or reference files
- Up to 32 audio channels/tracks of stored audio per ID
- Up to 16 audio output channels depending on wrapper & codec
- Audio sample size can be 16 and 24 bit PCM @ 48KHz depending on codec



## VIDEO RECORDER

The Dolphin pipeline can be configured with Video Recorders which are controlled by Marina ingest operations. These include VTR dubbing, scheduled recording or crash record. The Video Recorder can also be controlled by Marina secondary record events and used for clean recording of live programs. The following features are supported:

- Encoding profiles allow Marina users to easily change format and codec
- Clips can be exported as they are being recorded
- Inbuilt low resolution proxy browse transcoding
- Key frame generation

The table below lists the wide range of supported file wrappers and codecs for encoding.

SD	DVCPRO25, DVCPRO50, DVCAM DV IMX 30, 40, 40 MPEG2 I Frame & Long GOP	MOV, MXFOP1a, MXFOPAtom MOV MXFOP1a MOV, MXFOP1a
HD	XDCAM HD, XDCAM EX, XDCAM 422 DVCPRO HD AVC-Intra DNxHD H264/AVC MPEG2 I Frame & Long GOP XAVC ProRes	MXFOP1a MOV, MXFOP1a, MXFOPAtom MXFOP1a, MXFOPAtom MXFOP1a, MXFOPAtom MP4, MOV MXFOP1a, MOV MXF MOV AVI, MOV, MXF
UHD	ProRes XAVC (Hardware Required)	AVI, MOV, MXF AVI, MOV, MXF



## VIDEO CONFORMER



The Dolphin Video Conformer is a configurable module that provides Aspect Ratio and Up/Down conversion. Operations can be applied to both live and clip based video. The video conformer will up or down convert video if the resolution of the input video does not match that configured for its output. For example, the Aspect Ratio Converter included with the Video Player ensures that the output video resolution will always match that of the channel. Additional conformers can be positioned anywhere in the pipeline – for example to generate down-converted video for a simulcast output.

The conformer is capable of up-converting captions from CEA-608 to CEA-708 when up-converting video.

The Video Conformer is configurable for each received AFD code and will aspect ratio convert video depending upon the AFD code present on its input video. The AFD code inserted into the Conformer output video will change with aspect ratio conversion. If the video into the conformer does not have an AFD value Dolphin will apply a default AFD and ARC. Dolphin complies with SMPTE-2016.



## AFD INSERTER

The AFD (Active Format Descriptor) inserter will overwrite the AFD data on incoming video with a value from the Marina automation playlist, otherwise AFD will pass through unchanged. When

positioned upstream of the Conformer the AFD values in the playlist are able to change the aspect ratio of the output video.

+1 DELAY

## DELAY SERVICE

If there is a requirement to delay a channel, perhaps for a +1 hour catch up service or to delay for time zone variations, the optional +hr delay can be configured into pipelines hosted on a standalone server dedicated to delay services or included within the channel pipeline. It is also possible to uniquely brand a delay service with a continuous graphic or one that is controlled from the master playlist.

There are two modes of time delay available within Dolphin, one is designed for baseband delay and the second mode is for compressed MPEG2 transport streams (TS). The benefit of using the TS delay is there is only a single encode->decode->encode required for a typical baseband and compressed time delay.



## MASTER CONTROL

Each Dolphin pipeline has an internal video/audio router. The pipeline editor connects together logical devices and routes video to external inputs and outputs. The router also includes master control functionality with several transition types

including V-fade, cut-fade, fade-cut and mix.

A second Alpha Router connects video and key sources to the keyers. Router tielines are available for passing video from the main router to the alpha router.

# Graphics

KEYER

## KEYER

The pipeline can be configured with up to 3 Keyers to enable outputs to multiple platforms, each with unique branding. For example, both an SD simulcast and a streaming web service could be output from the pipeline, each with different graphics. Each Keyer has 10 input layers

which can be fed video and key from any of the Alpha Router sources. Sources include the Dolphin graphics players, 2D DVE's, optional 3D graphics, external graphics devices and the Tieline video sources from the main router.

2D FLASH  
GFX

## 2D GRAPHICS PLAYER

Each Dolphin pipeline supports up to 1- graphics players that are controlled by Marina secondary playlist events, or manually from the Marina Smart Panel. Static graphic formats include TGA, GIF, JPEG, PNG, SVG and SWF. Animated graphics are supported through sequential TGA and GIF or SWF (Flash) files, and graphics can be sized and positioned from within the Marina playlist.

receive dynamic textual data from the Marina playlist. The data can be included in the traffic schedule, manually entered by the Marina operator or created automatically by Marina's Auto Promo feature. Data for text crawls can be supplied from XML or RSS feeds.

Graphics are created using Adobe Animate CC and can be designed to

Adobe graphics can also control Dolphin DVE's. This provides a powerful method for coordinating graphics and DVE effects from a single secondary event.



## GRAPHICS PLUGIN

Multiple options exist for graphics plugins. Requires the optional GPU for graphics rendering. For more details contact your local representative.

KEY & FILL

## KEY AND FILL

External graphics devices under the control of the Marina playlist can input their key and fill video directly into the pipeline. In this way Dolphin can cater for

a wide range of graphics requirements, and accommodate legacy graphics products and workflows.

2D DVE

## 2D DVE

Dolphin Digital Video Effects are used to resize and position video on the screen. Five 2D box DVEs are available for squeeze back and picture in picture. These can be

controlled by playlist secondary events or from an Adobe graphic.

# Audio

AUDIO  
MEDIA



AUDIO  
MIXER

## DOLPHIN AUDIO PLAYER

The pipeline can be configured with 5 Dolphin Audio Players that will play pre-recorded audio files under the control of playlist secondary events. In this way

multi-lingual Audio Overs from separate audio files can be supported. The audio level, program duck level, fade in/out time and track mixing are all configurable.

### Audio Support

- Advanced audio shuffling and substitution using SMTPE 377-4 tagged tracks;
  - ISO639-2 Descriptor
  - RFC5646 Descriptor
  - Private sub tag support (RFC5646 only)
- Formats
  - WAV
  - BWF/BWAV
  - AIFF
- Bit Depths (16,24,32)
- Sample rate 48kHz
- Multi-lingual Audio overs upto 8, dynamic ducking for each language
- Dolby D Encoding, Dolby D Decoding, Dolby E Encoding, Dolby E Decoding
- Downmix & Upmix (2.0 -> 5.1) (5.1 -> 2.0)

**AUDIO SHUFFLER**

## AUDIO SHUFFLER

The Audio Shufflers are controlled by Marina automation and are able to change the arrangement of the audio tracks. The track shuffle for each event can be scheduled, or edited manually from the Marina playlist. It can also be automatically controlled from Marina by reading the audio language tags of the source media

and comparing these with the preconfigured channel output mapping. The channel can be configured with primary, secondary and tertiary output mappings to allow audio substitution if first or second choice languages are unavailable.



## LOUDNESS

Optional loudness processing dynamically adjusts the loudness of audio in real-time to ensure that Dolphin output is in compliance with ITU-R.BS1770-4 based international loudness

recommendations including ATSC A/85, EBU R128, ARIB TR-B32, and FreeTV OP59. Loudness is adjusted on both clip and live feed playback based upon preconfigured profiles.

**SUBTITLES / CC**

## SUBTITLE / CC INSERTER

The Dolphin SUBTITLES/CC inserter is an optional plug-in and provides Closed Captions and Subtitle support. Multiple inserters can be configured for each pipeline. Each inserter can insert a separate subtitle/caption file stored on a Dolphin Media Drive, making it possible to output multiple subtitle or closed caption languages from Dolphin.

Supported Subtitle features include:

- Multi-language support with validation
- WST and OP47 subtitle insertion into configurable VBI lines and teletext pages.

- Inserts open subtitles into video
- Line 21, CEA-608 and CEA-708 closed caption insertion
- Supported file formats include EBU .stl, .pac, .chk, .890, .scr, .scc, .xml (tt)
- DVB Bitmap - 2 modes:
  - Insertion into Dolphin internal encoder/multiplexer
  - Insertion into downstream encoder/multiplexer, required for SDI installations

## Regional Insertion

**SCTE-104 INSERTER**

## SCTE MESSAGE INSERTION

The Dolphin pipeline can be configured to insert SCTE104 data into its SDI output and SCTE35 data into its IP transport stream output. The data instructs when downstream devices should switch away and re-join a Dolphin feed, typically to allow the insertion of local programming.

SCTE output data is controlled from the Marina playlist either through explicitly scheduled secondary start and stop events or automatically using a combination of appropriately tagged primary events and rules which determine the type and timing of SCTE messages to be sent.

**SCTE-104 EXTRACTION**

## SCTE MESSAGE EXTRACTION

SCTE messages in the live SDI or IP transport streams fed into Dolphin can be read and used by the Marina to switch the local Dolphin output between the live feed and a regional playlist.

**PACKET 31 INSERTION**

## PACKET 31 INSERTION

The Dolphin pipeline can be configured to insert Packet 31 data into the teletext data PID of an IP transport stream output. The data instructs when downstream devices should switch away and re-join a Dolphin feed, typically to allow the insertion of local programming.

DOLBY® D / E ENCODER

DOLBY® D / E DECODER

## DOLBY ENCODER & DECODER

Dolby Encoders and Decoders are optional logical devices that can be positioned anywhere in the pipeline. For example, it is possible to decode Dolby E or D to discrete PCM audio from either clip or live

sources, add audio voice over, and then encode to Dolby E or D.

## ANCILLARY DATA

Comprehensive support for:

- XDS/V-chip
- ATC timecode

## WATERMARKING

Support for popular watermarking standards including:

- Nielsen
- Kantar Civolution

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