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Quality and Compliance

Application Note

Quality and Compliance

Introduction

One of the most important aspects of program creation and delivery is ensuring that the actual program content complies with the myriad of ITU / EBU / SMPTE codes of practice, network requirements and legislative restrictions that differ from one country to the next and from one broadcaster to the next.

If you only have a single customer (network or broadcaster) for you program content it can be a straight forward process to ensure that you meet that customers requirements.

If, however, you are providing content for a number of customers and customers in different countries the task of meeting all of you customers requirements can be onerous.
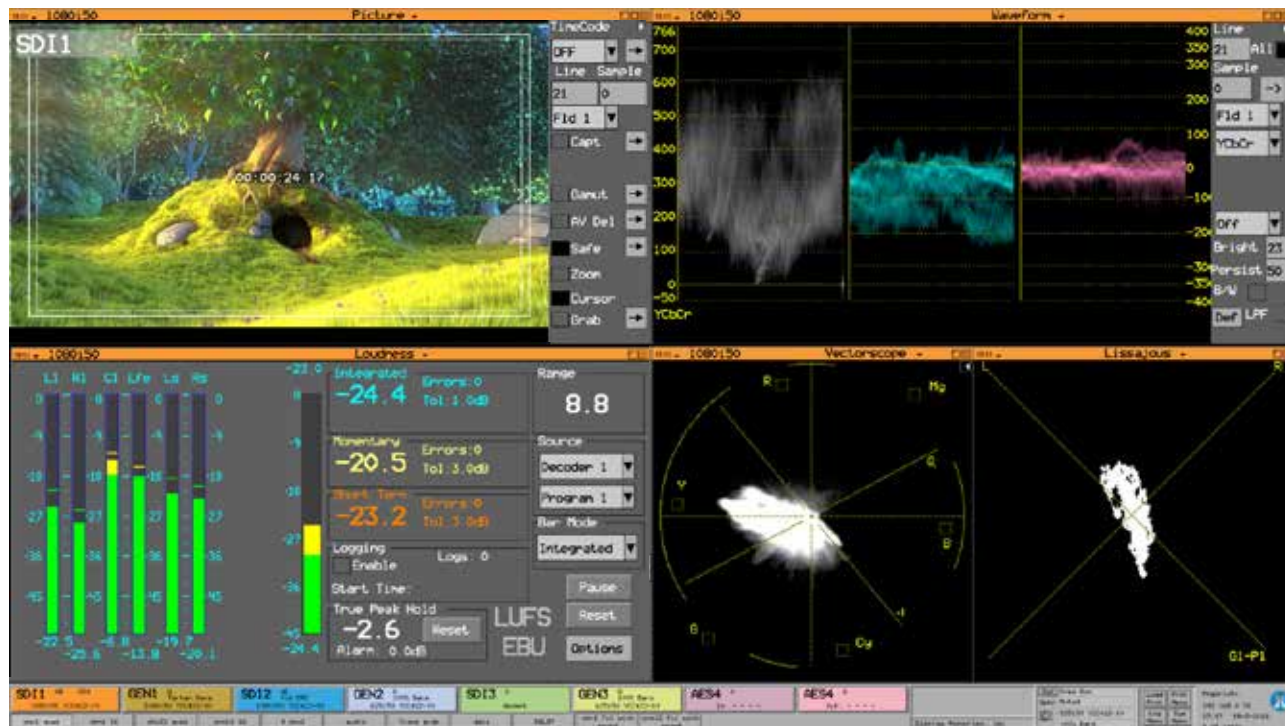
If you are a broadcaster or network trying to ensure the compliance of all of the individual program created by different content providers, the task of compliance checking is a full time job.

Compliance covers a whole range of aspects including the basic video and audio levels, color space gamut, digital audio integrity and surround sound mix as well as program loudness.

The PHABRIX Rx range allow multiple instruments to be displayed on screen at the same time. This makes the Rx ideal for quality control suites as all aspects of the program can be viewed and monitored simultaneously.

Display presets can be recalled to focus on any aspects of the program using any instruments

The loudness display allows the program loudness to be monitored and logged for compliance

The vectorscope allows the color saturation and cast of the program to be viewed

The lissajous display allows the phase relationship between the audio channels to be monitored

Picture construction and content

The Picture monitor allows the program to be viewed as a thumbnail or at native size. It can display program timecode, safe area and closed caption information.

Program ancillary timecode can be displayed on the picture in different positions and sizes as required. Up to 4 different safe areas can be displayed at the same time to ensure that the action and open captions stay within 4:3, 14:9 and 16:9 constraints.

608, 708, WST, OP42 or OP47 closed caption present in the program and can be displayed to ensure correct content and accuracy.


The Rx range can also indicate Gamut issues

Video levels

The Waveform monitor allows the quality and levels of the video image content to be checked. Typically the waveform is used to check that the luminance of the image is not saturated or clipped.

The vertical scale can be in percent, mV, decimal or hexadecimal selectable using the Setup menu.

The RGB parade mode and the RGB overlay mode can be used to check the image balance to ensure that cameras are matched.

The maximum luminance level or colour saturation of any of the primary colours is indicated on the graticule and cursors can be used to measure the actual levels.
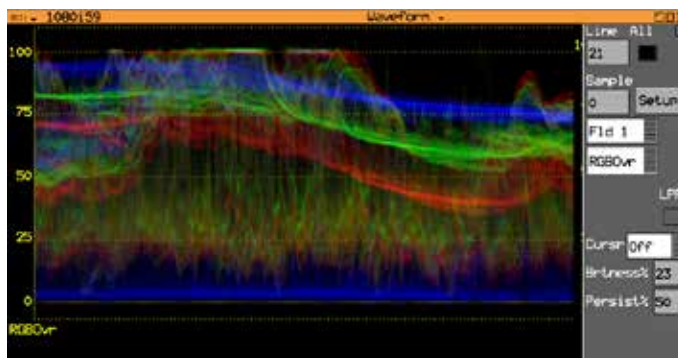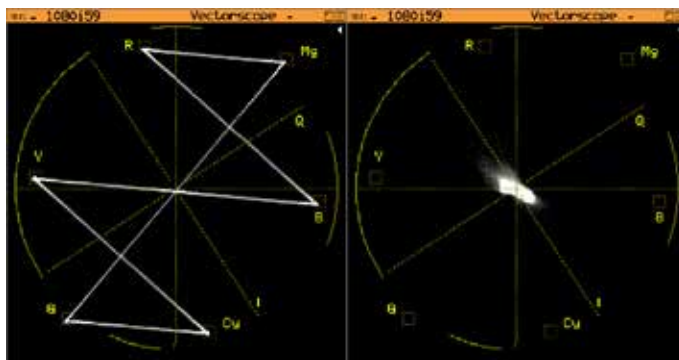

Individual video line selection can be made which can be useful to view the levels on specific lines

Color Saturation and cast

The vectorscope allows the colour saturation and cast of the program to be viewed. In setup the vectorscope is used to check that 100% or 75% color bars are correct. The maximum colour saturation of any of the primary colours is indicated on the graticule.

In general use, the centre point on the vectorscope indicates that there is no colour cast in the image. The cast is effectively the colour of light that appears on white or grey objects that appears as an offset.

The position of the vector mass on the display indicates the main colour of the image. Zoom allows the centre point to be viewed to see any colour cast.

Individual video line selection can be made which can be useful to view the color of the image on specific lines

Video Data Integrity and Status

The Video Status menu displays details about the integrity of the SDI data.

Any detected errors are shown in red text giving an immediate indication and can be logged.

Continuous CRC and EDH error detection is performed on the SDI data stream.

Active Picture CRC (cyclic redundancy check) data.

EDH (error detection handling) data displayed for 625i and 525i video.

Audio channel levels and assignment

The Audio Meters display up 16 embedded audio channels made up from audio pairs from the SDI input, Dolby E metadata or Dolby Decoder module (option).

The peak level indicators and audio level meters show the level of all of the program audio channels. Audio phase meters show the phase relationship between each stereo pair. Instantaneous numeric values of audio level are also provided. Meter scale selection and meter ballistics can be set to studio normal practice.
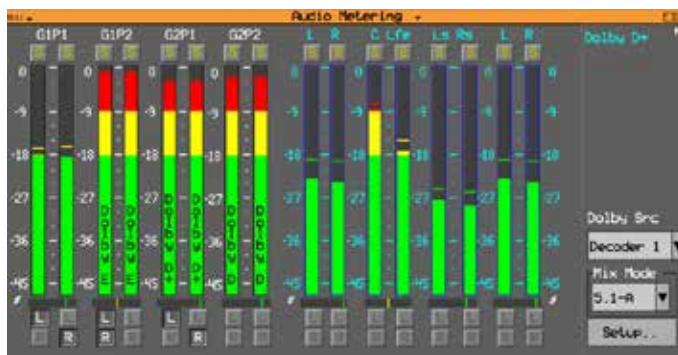

Audio channel phase relationship

The Lissajous display shows the relationship between the stereo audio channels.

If the display is mostly in the vertical centre then the audio channels are in phase (mono).

If the display is mostly to the right then the audio channels are out of phase in favour of the right

If the display is mostly to the left then the audio channels are out of phase in favour of the left.
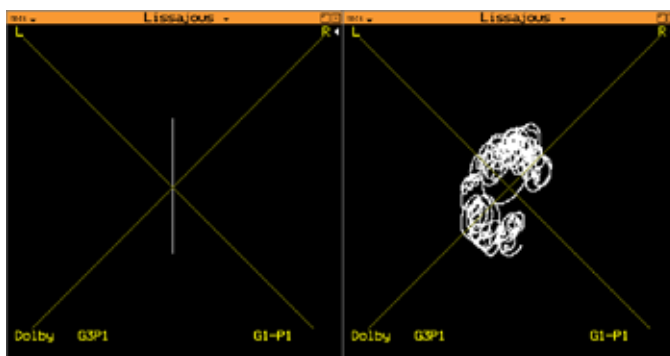

Program loudness measurement

The Loudness display allows the programme loudness to be measured and logged for a stereo audio pair or a 5.1 group of channels.

Peak level indicators and audio level meters show the level of all of the program audio channels. The loudness meter level shows the overall program loudness as Short Term, Momentary or Integrated.

The Loudness monitoring can be setup for ITU/EBU and LU/LUFS/LKFS. The Time duration between automatic saves of loudness log files can be setup to produce manageable data at regular intervals.

The current loudness log can also be saved manually at any time to allow specific programme or commercials to be captured.

A manual save of current loudness log can be made as a CSV file in Rx Loudness folder. The CSV files created by the loudness logging are saved in the Rx Loudness folder for access at any time and can be opened in any spreadsheet processor and plotted graphically.
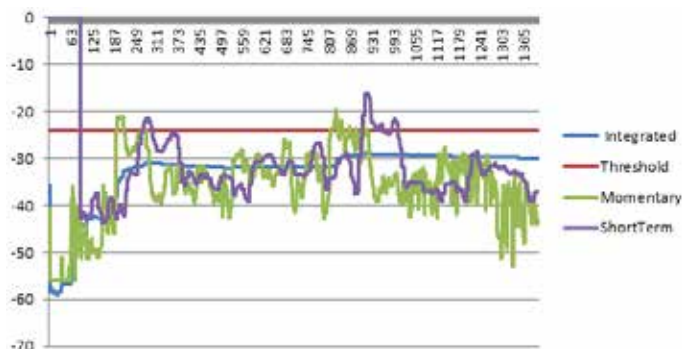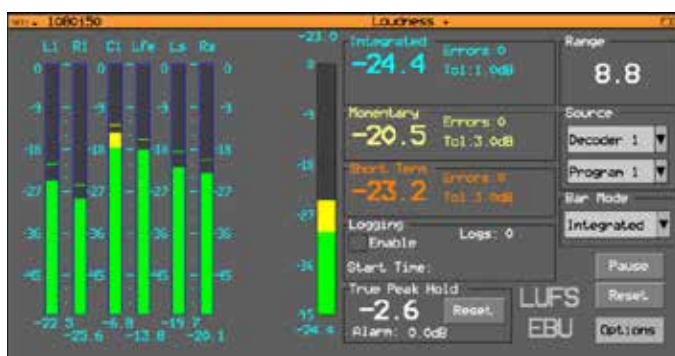
Audio Quality

The Rx range of products provides broadcast audio quality analogue output to allow the quality of the selected audio pair to be heard. The Rx2000 provides broadcast quality speakers to allow the audio pair to be checked in the bay.

With the Dolby Decoder option installed, the Rx range can decode Dolby encoded audio to its base channels so that the quality of the individual audio channels to be checked at point of transmission.
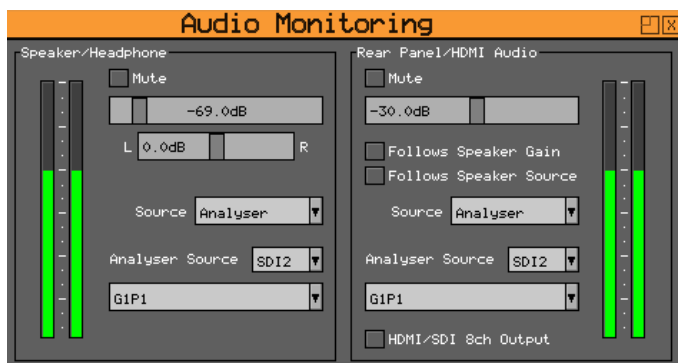
Audio Data Integrity and status

The Audio Status menu shows the type of audio data on each channel. This can be PCM, Dolby E, Dolby D or Dolby D+. The Channel Status for the selected audio channel is displayed in decoded form as well as a hexadecimal dump of the bytes.

The Rx Instrument with an Analyzer Module installed and Dolby Analyzer option can monitor the selected input audio and provide details of its Dolby E , Dolby Digital or Dolby Digital Plus audio encoding.
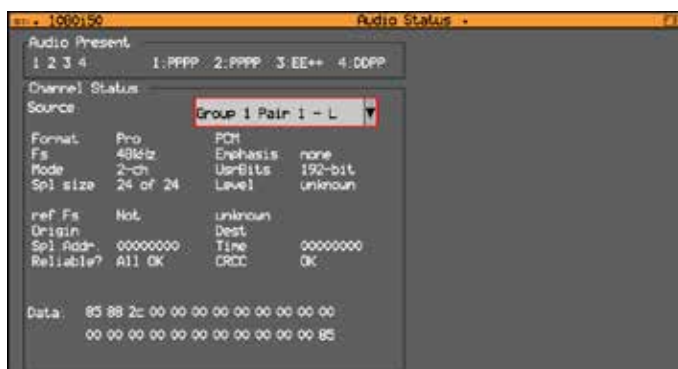
The Dolby Meta data window allows display of the Dolby metadata present in the selected audio stream.

This window also allows the correct timing of the Dolby E packets with the SDI signal to be checked at all stages in a broadcast chain. Checks can be made to see that the Dolby E has been created correctly and transferred transparently through the broadcast chain unaffected by routers/switchers, satellite links, etc.

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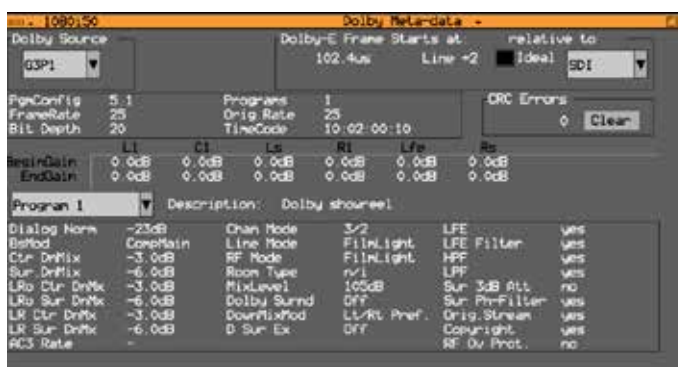
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compliance solutions,
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