

**Video Clarity**  
Tools for Video Analysis

PHASE

**Company**

- > A Silicon Valley based group of video experts
- > Started in 2003, first product shipped in 2004
- > Systems and offering diversified in 2006
- > Expanded tools, including Sarnoff JND in 2007
- > Created new products for operators in 2008-10
- > Customers are industry leaders

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**Customers**  
(partial list)

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**Products**

- > ClearView Video Analysis for Product R&D, QA and Television Lab Use
  - > ClearView Shuttle
    - > DVI only or Broadcast
  - > ClearView Extreme
    - > DVI or Dual Broadcast
  - > ClearView QA
- > RTM for TV Network Testing and Manufacturing QA
  - > ClearView Video Analysis also combines with RTM for a full suite of capabilities

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**ClearView – Video Quality Analysis**

|  |   |
|--|---|
| <p><b>ClearView Shuttle</b><br/>Standard 3 Gigabit IO subsystem with high storage capacity along with portability.</p> | <p><b>ClearView Extreme</b><br/>Dual 3 G or DVI for up to 1080P 120Hz, high storage capacity, rack mountable.</p> |
| <p><b>ClearView QA</b><br/>Small 1 RU form factor, records, aligns and compares using PSNR for pass/fail testing.</p>  |   |

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**ClearView Video Analysis Block Diagram**

- ✓ Full uncompressed HD video server
- ✓ Digital or analog AV recording, control
- ✓ Input from file or RTM log
- ✓ Graphical or scripted command set
- ✓ Multiple viewing modes (video with audio)
- ✓ Perceptual scoring (JND or DMOS)

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### ClearView Video Analysis Input/Output

- File Input
  - AVI, JPEG, MPEG, QuickTime, TIF, RAW, BMP, DPX and many more
- Record and play SDI, HDSDI, HDMI, Component, Composite, S-Video or output from DVI
  - Shuttle models provide either DVI or single 3G HDSDI Broadcast interface with HDMI and analog video
  - Extreme DVI provides
    - DVI for up to 1080P 120Hz RGB output
    - Optional single 3G HDSDI Broadcast IO interface
  - Extreme Broadcast provides
    - Dual 3G HDSDI with HDMI and analog video input and output

### ClearView Video Analysis Viewing Modes

The image shows four different viewing modes for video analysis:
 

- Side by Side:** Two video frames are shown side-by-side, labeled 'Source' and 'New'.
- Seamless Split:** Two video frames are shown side-by-side with a vertical split line, labeled 'Source' and 'New'.
- Split Mirror:** Two video frames are shown side-by-side with a vertical split line and a mirror effect, labeled 'Source' and 'New'.
- A-B Threshold:** A video frame is shown with a color threshold overlay, labeled 'Source' and 'New'.

### ClearView Video Analysis – Encoder Testing

- Serve A/V sequence to the encoder
- Capture A/V sequence from the decoder
- Automatic temporal and spatial alignment
- Calculate objective or perceptual score
- Generates pass/fail against threshold
- Multiple subjective viewing modes
- Graphical or scripted control

The diagram illustrates the encoder testing process:
 

- A source video is fed into a **Compression** stage.
- The compressed data is sent to a **Cloud**.
- The data is then sent to a **Decompression** stage.
- The final output is compared against a threshold to determine pass/fail status.

### ClearView Video Analysis – Subjective Testing

- Play 2 A/V sequences in multiple viewing modes
  - with a variable horizontal or vertical split
- Full control over which field is displayed, playback speed, in/out points
- Remove color components
- View color components pixel-for-pixel
- Comparison mode output to full resolution display

The image shows four different viewing modes for subjective testing:
 

- Side by Side:** Two video frames are shown side-by-side, labeled 'Source' and 'New'.
- Seamless Split:** Two video frames are shown side-by-side with a vertical split line, labeled 'Source' and 'New'.
- Split Mirror:** Two video frames are shown side-by-side with a vertical split line and a mirror effect, labeled 'Source' and 'New'.
- A-B Threshold:** A video frame is shown with a color threshold overlay, labeled 'Source' and 'New'.

### ClearView Video Analysis – STB Testing

- Input reference "Gold" file
- Capture processed A/V sequence
- Automatic alignment
- Reports differences between reference & processed A/V sequences
- Generates pass/fail against threshold
- Graphical or scripted control

The diagram illustrates the STB testing process:
 

- A **Reference File** and a **Processed Stream** are fed into an **STB**.
- The STB outputs a **Pass/Fail** result.


### RTM

- Real-Time Monitor
  - Monitors & compares test feed to reference input continuously
  - Checks for no motion on reference input
  - Logs failures and saves sequences when errors are detected
  - Automatic re-alignment as errors are detected
  - New 1 RU form factor

The image shows the RTM hardware device, a 1 RU form factor unit.

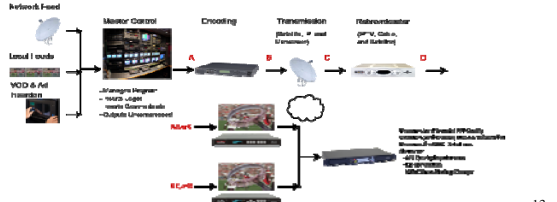
- RTM + ClearView package in 3 RU with 2 TB of storage

## RTM - Block Diagram




Tasks for Video Analysis

- ✓ Input uncompressed digital video, audio
- ✓ Automatic alignment
- ✓ Checks for no audio/video on reference
- ✓ Alerts on degraded audio/video
- ✓ Alerts on lip sync problems
- ✓ Records reference and test feeds for further analysis
- ✓ Graphical, scripted or SNMP control

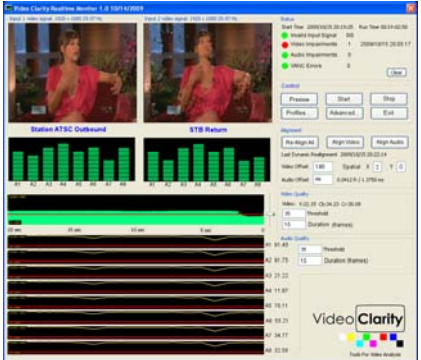


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## RTM Graphical Interface



Tasks for Video Analysis



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## Video Clarity Summary



Tasks for Video Analysis

- High-quality, reliable video quality analysis and monitoring systems
- Product line is configurable for simple to complex testing requirements
- New products and features will continue to be added for industry leading customers



Thank You





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## Video Clarity Summary



Tasks for Video Analysis



**PHASE**

**PHASE Engenharia Ind. e Com. Ltda.**  
 Av. Olegário Maciel 231, Lojas 101 a 105 - Barra da Tijuca, CEP 22 621 200  
 Rio de Janeiro, RJ, Brasil - Tel +55.21.2493.0125, Fax +55.21.2493.2595  
 e-Mail: phase@phase.com.br - Web: www.phase.com.br

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