

SUMMARY INFORMATION PROVIDED BY SELLER
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VIDEO 4G/5G OPTIMIZATION AND SOFTWARE – LOT 72



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Defining **The Standard** for
Video Quality Measurement



V-Factor Technologies, a Wholly-owned Business of Cheetah Technologies, LP

Summary Information Memorandum

January 29, 2018

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The purpose of the Summary Information Memorandum is to assist you in deciding whether to proceed with a bid on certain assets of Cheetah Technologies, LP (the “Company”). The Summary Information Memorandum does not purport to be all-inclusive or to contain all the information that a bidder may desire in fully evaluating certain Company assets.

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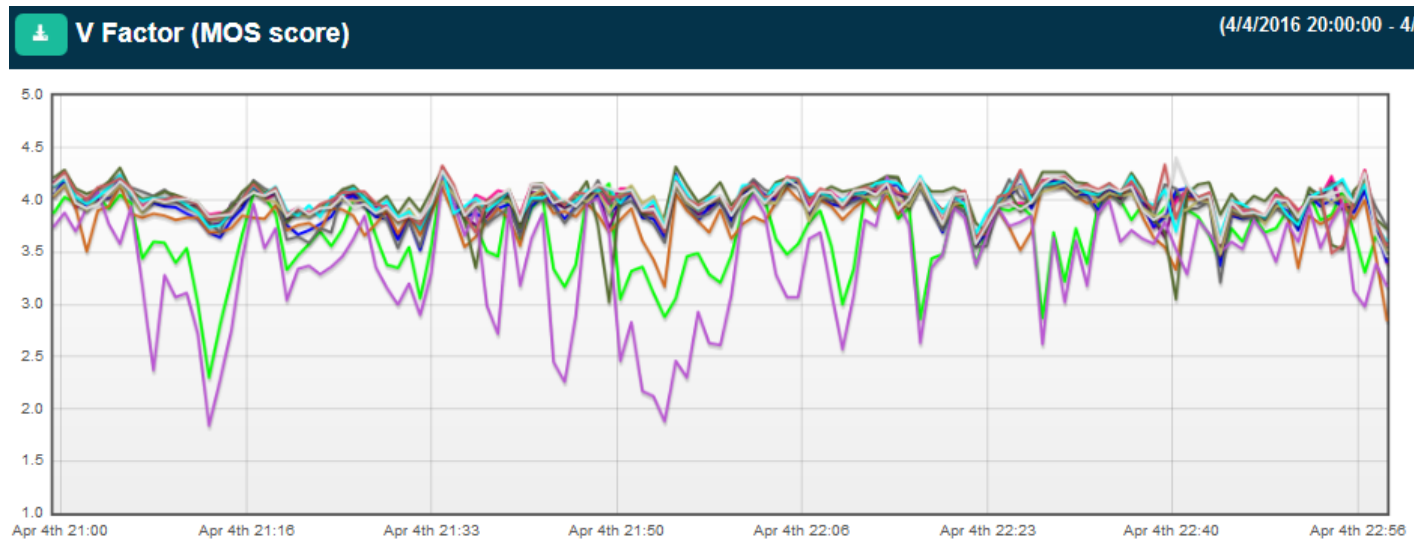
- I. Intellectual Property (Patents)
- II. V-Factor Software Summary
- III. V-Factor Software Solutions

II. V-Factor Software Summary

- 1) Ability to measure quality perception** - V-Factor set the standard for Video Measurement & Analytics by employing a unique patented technology to “watch” the video using a model of the human eye. The only way to have a true measure of quality is to model the human vision system and measure any video, by itself, just like a human does when they are watching video on a TV, tablet, or smartphone. V-Factor’s proprietary/patented algorithms enable MPVDs to do exactly that to large masses of video, dynamically in real-time from the transport down to the pixel level – without reference data.

Real World V-Factor Results

- Non-reference allows an operator to monitor, compare and improve video anywhere
- Major Broadcaster in 14 different cities
- Different signal path, encoding bitrates...same ‘prime time’ content
- Quality trends very closely, with 3 problem stations (brown, green, purple)
- Several stations could be more efficient



Only V-Factor can provide an accurate quality score anywhere in the network and without any reference.

II. V-Factor Software Summary, continued

- 2) **Validated Solution** – V-Factor has successfully proven its technology as the “standard” for perceptual quality measurement. Comcast & Cablevision used the solution nationally and regionally to measure incoming video and their encoded quality to ensure quality and isolate faults.
- 3) **Positioned to be the De Facto Standard** - V-Factor is positioned to be the de facto “Golden Eye” perceptual video quality solution across the entire video ecosystem. As part of a larger solution, V-Factor could be used to guarantee quality from camera to screen, just like Dolby/THX do with audio.
- 4) **Innovative Roadmap for Streaming Video** – V-Factor is uniquely positioned to bring not just quality monitoring, but significant cost savings to Streaming Video applications and Content Delivery Networks (CDN). Using V-Factor’s unique non-reference measurement in a streaming video architecture reduces bandwidth and CDN costs by identifying where bandwidth does not provide higher quality and eliminating unnecessary encoder profiles. Similarly encoding can be optimized for quality, not just bandwidth to ensure that streaming profiles actually provide the required quality the content owner, programmer, or service provider requires.
- 5) **Scalable** - V-Factor’s algorithms provide a scalable and accurate measure of what consumers experience when they watch video.
- 6) **High Barriers to Entry**- There are high barriers to entry due to V-Factor’s human vision based intellectual property, adopted solution, time to develop, costs of development, and subject matter expertise. Years of investment have yielded not only accurate algorithms, but a software platform that was efficient and widely adopted. V-Factor is a software solution that can run on standard operating systems and leverage both CPU and GPU off the shelf technology.
- 6) **Existing Sales** – Prior to closing down operations, V-Factor’s AI video products were used by two of the largest Multichannel Video Programming Distributors (MVPDs) in the United States. Over 3,500 channels of analysis were sold representing a significant portion of the total cable vision market.
- 7) **Intrinsic Value** - Over \$40M and 10 years were invested in taking V-Factor’s technology solution through development, productization, testing, and customer site trials to full commercial deployment.

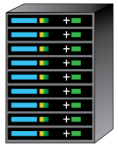
III. V-Factor Software Solutions

Current Solutions



Linear Video

- Fault Isolation
- Source & Encode Quality Assurance “Garbage In? Garbage Out?”



CDN/ABR

- CDN Bandwidth Reduction
- Source & Encode Quality Assurance
- Quality Profiling



Broadcast/
Programmer

- Quality Assurance
- Affiliate comparisons
- MVPD comparisons



Analytics

- Correlation of data to provide root cause, frequency, scale, & severity
- Events are alarmed to contain costs
- Reports available for management & third parties



ROI

- Isolation of who and what is causing video quality issues
- Ability to achieve consistent quality
- Bandwidth reduced

V-Factor Pixel Level Analytics

Event Driven Analytics

Frequency, scale, severity
Purely visual, or underlying QoS/QoE
Business priority

Pixel Domain

Pixel Values
Frequency Domain Analysis
Spatial Domain Analysis

Transform

DCT Values
Spatial Complexity
Temporal Complexity

Slice Layer

Slice Loss Propagation
Frame Coding
Resolution

Macroblock Layer

Type Intracoded 4x4
Average Quantization
Block Damage
Progressive MBAFF

MPEG (QoE)

IP (QoS)

III. V-Factor Software Solutions, cont.

V-Factor is a software based solution, optimized for deployment on Linux based architectures. V-Factor was designed to run cost effectively on off-the-shelf hardware to leverage both Intel and Nvidia hardware to achieve a scaled real-time analytics solution. V-Factor was productized as an appliance that customers could purchase as a complete system, or as a software package to install on their own datacenter platform.



Appliance Solutions

V-Factor SM300: Hybrid GPU & CPU Architecture. 1RU height. 2x10GBE interfaces. Simultaneous analysis of up to 70HD channels.

V-Factor SM200: Hybrid GPU & CPU Architecture. 1RU height. 2xGBE interfaces. Simultaneous analysis of up to 40HD channels.

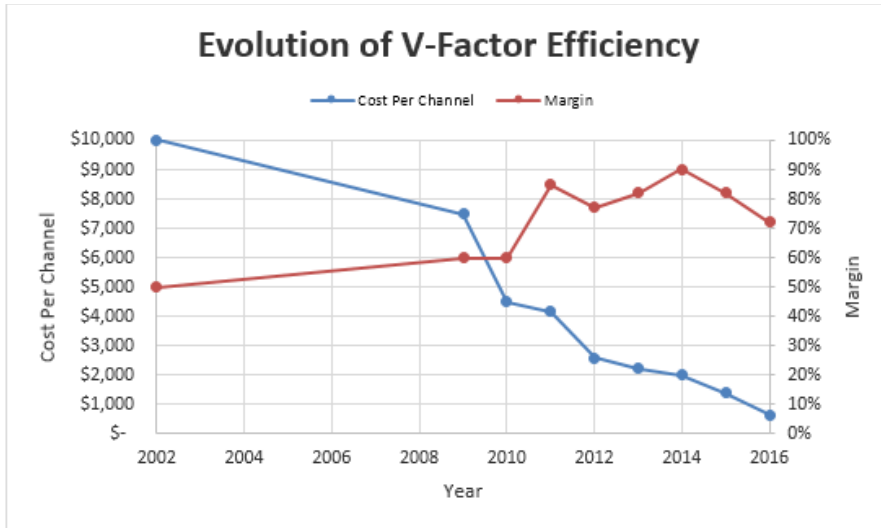
V-Factor SM100: CPU Architecture. 1RU height. 2xGBE interfaces. Simultaneous analysis of up to 10HD channels

V-Factor SM HDMI: CPU Architecture. 1RU height. 1-6xHDMI interfaces. Simultaneous analysis of 1-6 HDMI interfaces from STBs or other consumer devices.

V-Factor Manager: The V-Factor Analytics platform. Manages, collects and analyzes data based on business rules to provide alarms, event generation, scorecards and reports.

Software Solutions

Perpetual or Annual License: V-Factor analysis software and management software was available on a per channel license. The hardware was benchmarked to ensure capacity and compatibility with CPU only or GPU/ CPU architectures.



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Established in 2003, Ocean Tomo, LLC provides industry leading financial products and services related to intellectual property including financial expert testimony, valuation, strategy consulting, investment services, risk management products, innovation management services and transaction brokerage. Ocean Tomo assists clients – corporations, law firms, governments and institutional investors – in realizing Intellectual Capital Equity® value broadly defined.

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- Conducted over 300 valuation engagements and 500 financial damages expert testimony engagements.

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