



# Serial Metadata / Captions

## Audio/Video & Synchronized Live Data

A decorative background consisting of a grid of squares in various shades of green, with a diagonal line cutting across it from the top-left to the bottom-right. The squares are arranged in a pattern that tapers to the right.

**White Paper**



There are many applications where you want to include real time textual data synchronized with your live or stored video. Text can be inserted into the standard VBrick MPEG or WM stream via the VBrick's serial RS-232/422 port.

The most obvious use case is the insertion of live Closed Captions: you type (or speak via commercial speech-to-text products) in real time and the text is displayed along with the live video. But there are many, perhaps less obvious cases:

- Many Global Positioning System receivers sport a conventional RS-232 port that periodically outputs longitude/latitude coordinates. Simply connecting the GPS device to a VBrick provides all viewers with real-time location information. A custom player can receive the GPS data and display a graphical map showing current location. When coupled with BGAN satellite service or cellular data service, you can send live video along with real time position information.
- Recorded video that contains inserted text can be searched by the entered word or phrase. You can add searchable "markers" to your video very easily.
- Remote monitoring equipment can report their status in real time along with the audio/video. For example, Intelligent Transportation Systems can include real time traffic information (vehicle counts, spacing, speeds, etc.) with the video. Because the data is embedded in the video, the video and data can be recorded for later analysis with the confidence that the temporal relationship between the video and the data is maintained.
- The embedded data can be used as a synchronized data track and can be used to control external events. For example, the data might represent control codes for projectors, room lighting controllers, or robotic displays. Thus, when you play a particular video file, external events can be triggered in perfect sync with your video.

## How It Works

Simply connect your data source to the VBrick serial port and set the serial port to match your data rate<sup>1</sup>. Set the serial port destination to be your encoder. Finally, set the Idle Time Out to your desired setting.

The VBrick will accept your serial ASCII textual data and insert it into the video stream. Each insertion will be triggered by one of two possible events:

- The presented text length is equal to the maximum input size (245 characters for WM type, 250 characters for MPEG-4 type, 58 characters for MPEG-2 type), OR
- The time between receipt of characters exceeds the Idle Time Out setting

For example, if you send "HELLO" – wait – "WORLD" and the wait time is greater than the Idle Time Out setting, then the VBrick will insert "HELLO" and then insert "WORLD". If you send "HELLO WORLD" – wait, then the VBrick will insert "HELLO WORLD". If you send continuous characters that ultimately exceed the maximum input size, then those characters will be inserted, and the subsequent characters will be inserted again when there are enough to fill the input size.

For the VBrick WM video type, the inserted characters are of the "TEXT" type. To the extent you view with the conventional Windows Media Player, the inserted characters are represented as "Closed Captions". These characters may be displayed as such, or they can be captured and used by other applications via custom application or conventional Javascript.

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<sup>1</sup> Note: The serial data insertion is not designed for continuous non-stop data at rates above approximately 9600 baud. Serial interface rates up to 115,200 baud may be used for non-continuous data such as keyboard entry, periodic GPS-type data, and other applications where there are sufficient pauses in the transmission.



For the VBrick MPEG video type, the inserted characters are "METADATA" and are contained within the MPEG "user data field". This data can be easily retrieved by a custom player or by using JavaScript in conjunction with a special VBrick ActiveX component.

VBrick appliances (decoders, set top box, IP Receivers) do not have the ability to output or present the data via serial port. The data can only be received by software when playing the live or stored video. Custom players exist that can display the video while presenting the data to a Windows computer serial port.



### About VBrick Systems, Inc.

VBrick is the leader in Enterprise IP Video solutions, with over 6,000 corporate, education and government customers and 60,000 installations worldwide. VBrick solutions work over standard IP networks and the Internet to deliver rich media communications that connect people everywhere – from employees and customers, to partners and shareholders. Our comprehensive product suite and end-to-end solutions are used in a wide range of live and on-demand applications including meeting and event broadcasts, distance learning, digital signage, TV distribution, video surveillance, and Web-based marketing campaigns. Headquartered in Wallingford, CT, VBrick's products and services are available through industry-leading value-added resellers.

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