

TechNote      TN-111405-01  
Date:            November 14, 2005  
Applies To:    Greenleaf ViewComm System (VCS) Async Products (All Versions)  
Subject:        **Fine Point about Breakout Box Real-Time Signals View**

## How the Breakout Box View Works...

ViewComm Async models see and update modem and line status signals such as RTS, CTS, DSR, DTR, and others on the Breakout Box view in real time—whenever there is a **transition** on one or more of the signals. Please read the above sentence again. The key is **transition**.

The reason that signals cannot be seen in “absolute” real-time is that UART hardware does not request a (hardware) processor interrupt unless there is a transition. If you think about it, there is not a reason for an interrupt when signals are quiescent over time.

But if **any** UART interrupt occurs: (1) Transmitter Holding Register going empty, (2) Receiver Buffer (FIFO) Register Full, (3) Line Status Transition, or (4) Modem Status Transition—then, unlike the standard serial driver, the Greenleaf ViewComm serial driver will grab all of the items listed below:

- a. Transmit Character (if any)
- b. Received Character (if any)
- c. Current State of each Line Status Bit (Parity, Overrun, Framing Errors, Break)
- d. Current State of each Modem Status bit (Carrier, Ring, DTR, DSR, RTS, CTS)
- e. 64-bit high resolution timestamp that applies to the above four items.

Note that when an interrupt occurs and **ONLY** when an interrupt occurs, will this information be fetched from the UART hardware and presented to the various ViewComm Async views. Affected are:

1. Breakout Box (signal transition = interrupt = signal display change)
2. Event View (If no interrupt occurs, there is no event of any kind except for a few that are not derived from hardware but are inserted as a result of input stream parsing; e.g. start of packet, end of packet.
3. Event Pane if enabled in Frame View (see above).
4. Upon review, the Signals View will mirror the Breakout Box; that is if at a particular point in time a signal transition occurred it will be inserted into the event buffer at the same time as it occurs in the (mostly) real time Breakout Box view.

## If You Measure the Line Voltage...

If you believe a certain signal is in a particular state despite the fact that Breakout box and the other views listed above do not indicate such—because you measure the voltage on a line, know that measuring is a static thing and does not necessarily mean there **was a transition**. **If there was no transition, there will be no change in line or modem status indications UNLESS a character is sent or received.**

We have had reports to the effect that just this has occurred: Although a meter or oscilloscope or external hardware (non-latching) breakout box shows a signal to be in a particular state while the Breakout Box View shows the opposite state, the Breakout Box (and other views) are not updated until a character IS sent or received—or of course when a signal transition does occur.