

Understanding the DAQ capabilities of ATI serial interfaces and VISION

Our goal is to help understand the capabilities of our most popular interfaces as it relates to collecting data using VISION. ATI offers a variety of ECU serial interfaces that enable data acquisition, the ability to read and write data directly to the ECU's memory, and real time calibrating of ECUs with supported microprocessors. Main points of improvement with each iteration of serial interface are in bandwidth and throughput of data. Below is a chart of the capabilities of our current offerings. Note that the 2 numbers in the Max items row for the A8 column refer to the USB and Ethernet variants respectively.

	A7	A8	A9
Max Polling Item Rate (32-bit)	25/1ms	15/100us	45/50us
Max Items	660	1200/6000	125,000
Max JTAG Frequency	12MHz	40MHz	40MHz*
Max DAP Frequency	N/A	50MHz	160MHz
Multiphase DAP	N/A	No	Yes
Simultaneous DAQ Rates	4 Static	32 Dynamic	32+ Dynamic
XCP Support	No	Yes	Yes*
Communication Interface	12Mbps USB	12Mbps USB or 100Mbps Ethernet	1Gbps Ethernet
IEEE 1588 Support	No	On Ethernet*	Yes*

*under development


The numbers that are of real importance for this discussion are the **Max polling item rate** and the **Max items**. Max polling Item rate refers to the maximum speed at which the items can be sampled from the ECU (Bandwidth) and the Max items refers to the total number of data items that can be sampled from the ECU with that interface (Throughput).

In VISION, when you're attempting to collect data from an ECU connected with one of the above interfaces you need to create a screen file with data lists and recorders to DAQ and record your data items. The combination of sample rates and number of data items you select will affect the total number of data items you can collect from the ECU. For example, even though an A8 Ethernet variant is capable of up to 6000 data items, choosing a large number of items at faster data rates cuts down on the total amount of items you can collect based on the Max Polling Item Rate.



A8 (Ethernet Variant)			
6000 items max or 150 items/ms			
DAQ list #	Rate	Items	Items/ms
1	1ms	100	100
2	5ms	215	43
3	100ms	700	7
Total		1015	150

Note that this is a limitation of the A8 and not of the VISION software. VISION is capable of DAQing more data items than you can collect with an A7 or A8. This allows you to collect data from other connected devices, such as EDAQ or EMX DAQ equipment, CAN buses, or even a second control module. VISION is currently limited to the resources available to a 32bit Windows program. Another important note about how VISION handles DAQing items has to do with the screen files and screen objects you have open. Data items displayed in a non-minimized screen object across all open screen files are DAQed by VISION and thus count towards the resource usage of VISION and bandwidth/ throughput capabilities of the interface that those items may come from.

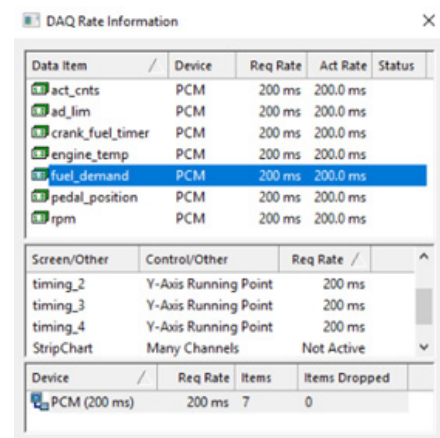
The DAQ Rate Viewer displays information about Data Item configured for data capture within three panes. Open the DAQ Rate Viewer via the “View -> DAQ Rate Info” option or click the “DAQ Rate” toolbar button () typically located at the bottom of the window.

Note: VISION is required to be online to view data in the DAQ Rate Viewer.

Top pane: Displays the captured Data Items and any pertinent information about that item, such as the device, requested rate of capture, actual rate of capture and the status of the Data Item.

Middle pane: Displays selected Data Item location (screen or object), control type, and requested rate.

Bottom pane: Displays sampling rate, requested capture rate, number of Data Items device is handling and number of Data Items dropped of the DAQing devices.



Top Pane Columns

- **Data Item:** Name of monitored Data Item.
- **Device:** Device where Data Item resides.
- **Req Rate:** Rate at which VISION is sampling the Data Item.
- **Act Rate:** Rate at which the Device is sampling the Data Item.
- **Status:** Defines the status of the Data Item or the hardware (for example, offline).

Middle Pane Columns

- **Screen/Other:** VISION Screen or other object where the item resides. For example, 3D Table and its running point.
- **Control/Other:** VISION Screen Object. For example, 3D Table and its running point.
- **Req Rate:** Rate at which the Data Item was originally sampled.

Bottom Pane Columns

- **Device:** Name of the device combined with the requested rate.
- **Req Rate:** Rate VISION has requested from the device.
- **Items:** Number of items requested from this device at the specified requested rate.
- **Items Dropped:** Number of dropped items (not being DAQed) from device. For example, when too many items have been requested at too fast a rate, a device can be overloaded. Fix this issue by changing the items requested number and/or rate.

For additional questions, contact ATI support at support@accuratetechnologies.com.

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