

Technote 03 – A8811 Data storage capacity

The AcquiSuite uses approximately 8 MB of flash disk for log file storage. As data from the Modbus meters is collected, it is appended to log files on this flash chip. Once a day (at the first call-out period for uploading data) the log files are "rotated". This action renames each log file and compresses the old file using gzip. The net result is a smaller file for storage or modem/Ethernet transfer.

Because the files are compressed, the actual size of the data on the flash chip will vary depending on the data itself. For example, if a device is reporting 25KWh, it will use fewer bytes than a log entry that has 9,999,999KWh.

We have measured a typical installation with 10 A8923 IO modules, and determined the system will run for approximately 240 days with a 15 minute log cycle. Changing the number of meters or the log cycle period will affect your results accordingly.

When the AcquiSuite storage area on the flash starts to run out of space, the following action is taken:

- When the 8 MB log file storage area is 75% full, the AcquiSuite will immediately compress the log files and attempt to upload the data to the BMO website or user specified site. This action will not wait until the next scheduled upload time.
- When the storage area is 95% full, the AcquiSuite will immediately attempt to upload the data, and if unsuccessful, will purge the oldest (rotated) log data file.

The following are actual test results:

A8923-4, 32 points. (remote system, lots of changes, 4 pulses active)
96 records, (1 day @ 15 minutes)
14202 bytes. 148 bytes/log entry.
3028 bytes compressed. (4.8x compression)

A8923-4, 32 points. (remote system, lots of changes, 2 pulses active, 2 analogs active)
96 records (1 day @ 15 minutes)
16270. 170 bytes/log entry.
3410 bytes compressed 4.8x compression

In all examples above, the log interval is set to log once every 15 minutes. This generates 96 log entries per day. The AcquiSuite A8811 has 8 megabytes of storage space in flash memory and is included as the standard configuration in all units shipped in 2005. Previous units shipped have a 2 MB storage area. To find out the storage capacity of a specific AcquiSuite, use a web browser and click on the AcquiSuite System / Status page, and review the size of "/mnt/main" for the specific storage capacity.

Based on our expected calculations with this system configuration, and confirmed by the samples above, the AcquiSuite will store approximately 2400 log file days of data. For example, with one A8923-4 I/O module attached, (2 pulse, 2 analog in use), you should get approximately 2400 days of storage capacity before the system must purge the oldest log files first. With 10 A8923-4 devices attached, you can store about 240 days of data storage.

Another sample shows how the data being logged has an effect on the storage capacity. This system shows an example where the inputs all zero, and do not change. The compressed output file shows the compression is variable based on the amount the data changes in a log file. Because the numbers in the

log file do not change, the gzip compression is able to pack the file into a much smaller space. (this example should not be used in storage time calculations.)

A8923-4, 32 points. (test system, no inputs active)
96 records, (1 day @ 15 minutes)
15916 bytes. 166 bytes/log entry.
320 bytes compressed. (50x compression)

Because the actual compression varies with the type of data being logged, and how much the logged numbers change between log intervals, the numbers shown above are estimates and actual log storage results may vary.

Some examples.

The following are some common case examples that we have sample log data for. Again, these are samples and should be used for estimation purposes only.

Power Measurement ION 6200, option pack 2, with 62 data points (test mode)
96 records, (1 day @ 15 minutes)
30976 bytes. 323 bytes/log entry.
2143 bytes compressed (14x compression)

In this example, the ION 6200 is in “demo” mode, meaning that it simulates some input data on the voltage and current inputs. The resulting numbers are not as random as one would like so the resulting data compresses more tightly than real world data. Unless you have more reasonable sample data, it is recommended that you estimate a compression ration of 5x, and assume 6429 bytes per day for log storage.

The ION6200 has additional option packs one and a base pack with reduced data points. The basic option pack has 12 data points, and the option pack two has 27 data points. The following are some estimates for file sizes, based on estimates. (not real world data).

Option pack one: 1600 bytes per day. (96 log entires)
Option pack two: 3020 bytes per day. (96 log entries)

The ION6300 has 31 points of data, based on similar ratios, you may see 3500 bytes per day. At the time of this writing however, the driver has not been tested with actual hardware by Obvius.

Veris Industries H8036 meter has 26 data points. The following is a sample of data collected from an H8036 power meter.

Veris H8036, 26 data points.
96 records, (1 day @ 15 minutes)
18795 bytes. bytes/log entry.
6187 bytes compressed (3x compression)

On a system with 10 H8036 meters, running 15 minute log interval, the system will consume about 61k bytes per day. On the standard A8811 AcquiSuite with 8M of log storage capacity, this will take about 127 days to reach 95% capacity of the system.