Technote 03 – AcquiSuite Data Storage Capacity

The AcquiSuite (A8810 and A8812) uses approximately 11 MB of flash disk for temporary log file storage prior to uploading the log files to a typical external destination. As data from the Modbus meters is collected, it is appended to log files on this flash chip. Then the AcquiSuite uploads and removes those temporary log files on a scheduled basis. If the AcquiSuite encounters an unsuccessful upload attempt, the relevant 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 upload transfer, ensuring comfortable overhead of temporary storage until the typical upload process resumes normal operation.

Because the files are compressed, the actual size of the data on the flash chip will vary depending directly on the data itself. For example, if a device is reporting 25KWh (5 characters), it will use fewer bytes than a log entry that has 9,999,999KWh (10 characters without the commas). In the same way a log entry of an error condition containing essentially empty fields would be much smaller than a normal data-rich log entry.

Consider a somewhat typical installation with an AcquiSuite A8812 monitoring ten different complex Modbus devices, such as a Flex I/O Module (A8332-8F2D), a few ModHoppers (R9120-3), and number of different Modbus meters (such as Veris Industries E51C3 and Continental Control Systems LLC, WattNode MODBUS). With that AcquiSuite misconfigured to have two bad upload targets, it was determined that the system will run for approximately 40 days with a 5 minute log cycle. Changing the number and types 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 11 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 sites. 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.

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The following are some actual test results over a two-week period, with logging set to daily or 5 minutes, and two upload channels mis-configured to prevent successful uploads:

Uncompressed 5 minute log file	Compressed files daily or 5 minutes	Device Type
0.34K	0.05K-0.80K	Obvius, ModHopper, R9120-3T
0.63K	0.05K-0.92K	Obvius, A8332-8F2D, IO Module, 8-Flex, 2-DO
1.89K	0.13K-2.99K	Veris Industries E51C3 Power Meter Full Data Set, Logging
1.75K	0.14K-8.10K	Emon Promon, Energy Meter, 208-0100-1-3
1.59K	0.06K-1.53K	Continental Control Systems LLC, WattNode MODBUS
1.00K	0.05K-2.80K	SquareD, E5600
0.76K	0.08K-7.31K	Obvius, A8812, Internal I/O

With two bad upload targets enabled on the test AcquiSuite, 254 files accumulated for each one of the distinct Modbus devices (not all listed above) over a two week period, creating a total of about 3000 log files over the test period, consuming 6.4M of flash disk (59% used, 41% free), including space used for some larger system log files.

Averaging all above compressed log files yields a rough value of 1.79K to use for estimation. Based on 5-minute logs (288 per 24-hour day), the estimate becomes 515K per day. Divided into 11M total disk space implies 21 days of temporary storage for the example logs. Again, these estimates vary greatly since the meter types and meter data vary greatly, but serve to illustrate the generous headroom provided on the AcquiSuite to recover from disruptions to the regular upload process such as a temporarily unavailable destination server.

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.

To find out the storage capacity of a specific AcquiSuite, use a web browser to view the System / Status page, and review the size of "/mnt/main" for the specific storage capacity.

Beginning with the January 2011 firmware, the AcquiSuite also will remove log files from upload channels which have been disabled, further reducing the burden on temporary storage.