

Daniel Gas and Liquid Ultrasonic Meters CPU Board Log Memory Technical Bulletin

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1 Background

Some customers have experienced a log memory issue with Daniel Mark III CPU boards where the log memory has grown too large for the meter to operate normally. When the memory size reaches capacity, the meter becomes nonfunctional causing downtime.

2 Purpose

Provide a description of the issue, methods for identifying log memory issues and recommendations for recovering and preventing.

3 Reference Materials

- Daniel MeterLink™ v1.21.002 (or later)
- Gas Mark III firmware v1.78 (or later) (Gas3400_1pt78_Release_Prod_20141201.zip)
- Liquid Ultrasonic firmware v1.78 (or later) (Liquid3800_1pt78_Release_Prod_20141201.zip)

4 Description

The log memory issue is a byproduct of the data compression used in the third party database of the CPU Board. The archive logs are written such that a certain number of sequences are available for each log type. The table below includes the set limits for the number of records available for each log type.

Table 1: Set Limits for Each Log Type

Daily	Hourly	Audit	Alarm	System
365	2400	3000	3000	100

By default, the meter overwrites the oldest log record once the sequence number has exceeded the value in Table 1 for each log type. Overwriting of old log records results in unrecovered bits of data that accumulate over time. It is this accumulation over time that causes the log memory to grow to capacity. Toggling alarms are typically contributing factors with the log memory issue and can quickly cause numerous rollovers, impacting the memory usage. Rollovers of any type of log records can cause the issue.

V1.78 Gas and Liquid Firmware has been released to help prevent the operational issues caused by the log memory reaching capacity. V1.78 (or later) firmware sets a system status message indicating the log memory capacity is too large at a preset limit of 80% and also disables logging capabilities when a predefined limit of 90% memory capacity is reached. Custom memory size limits can also be set by writing database point, LogMemorySizeLimit via MeterLink v1.21 (or later). Once logging is disabled, the meter continues measuring and reporting a measurement but no archive logs will be created, preventing meter downtime due to the log memory issue.

MeterLink v1.21 (or later) used in conjunction with v1.78 (or later) firmware provides a warning upon connection to the meter if the log memory usage limits have been exceeded and provides the ability to clear the log memory. After the memory is cleared and the meter restarts, all archive logs will be erased. Meter configuration, keys, and meter totals are preserved. See the Appendix for details on MeterLink v1.21 and v1.78 (or later) firmware operation.

Identifying meters that may be at risk can be done via an archive log collection where all five log types are selected. The sequence number of each log record can be used to determine if a meter is at risk for the log memory issue. Sequence numbers for a specific log type higher than the values shown in Table 1 indicate log record rollovers. The sequence number is the first column in any log collection that is viewed in MeterLink or Excel.

Figure 1 Example of Log Sequence number

	A	B	C
1	Sequence Number	Date	Time
2	279	12/12/2013	12:00:00 AM
3	280	12/13/2013	12:00:00 AM
4	281	12/14/2013	12:00:00 AM
5	282	12/15/2013	12:00:00 AM
6	283	12/16/2013	12:00:00 AM

Log rollovers can be calculated by dividing the highest sequence number of each log collection by the maximum logs available for a particular log type. (Refer to Table 1.)

$$\text{Log Rollovers} = \frac{\text{Highest sequence number in Log Record}}{\text{Maximum Logs available for log type}}$$

For example, if the sequence number of a System log is 1,000, this indicates the System logs have rolled over ten times:

$$\frac{1000 \text{ (Highest sequence number in Log Record)}}{100 \text{ (Maximum Logs available for log type)}} = 10 \text{ Log Rollovers}$$

Risk Factors for Log Memory Capacity

- High log sequence numbers and log rollover values greater than 1 on three or more log types.
- Toggling alarms repeating at a rate higher than one to two records an hour and persisting at this rate for over one month.
- Frequent System logs repeating at a rate higher than one to two records an hour and persisting for over one month.
- Frequent Audit logs repeating at a rate higher than one to two records an hour and persisting for over 1 month.

5 Recommendations

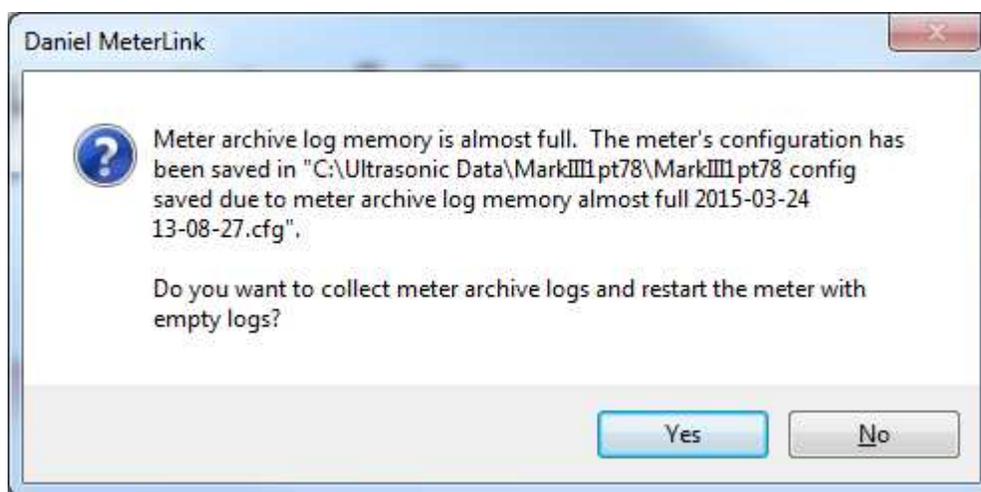
It is recommended that all customers update to v1.78 (or later) firmware and MeterLink v1.21 (or later). Without v1.78 (or later) firmware, the risk factors can be assessed to determine if logging memory is a potential problem. If any of the conditions previously listed are observed in the log record, an immediate update to v1.78 (or later) firmware and MeterLink v1.21 (or later) is recommended and customers are advised to clear the memory. If assistance is required, contact Daniel for support.

If a meter continues to have toggling alarms or frequent system alarm messages, it is recommended that the cause of these reoccurring events be determined as these may be indicating poor meter performance or other issues with meter. Contact Daniel personnel for assistance with investigating the alarms and to discuss solutions to reduce or eliminate them.

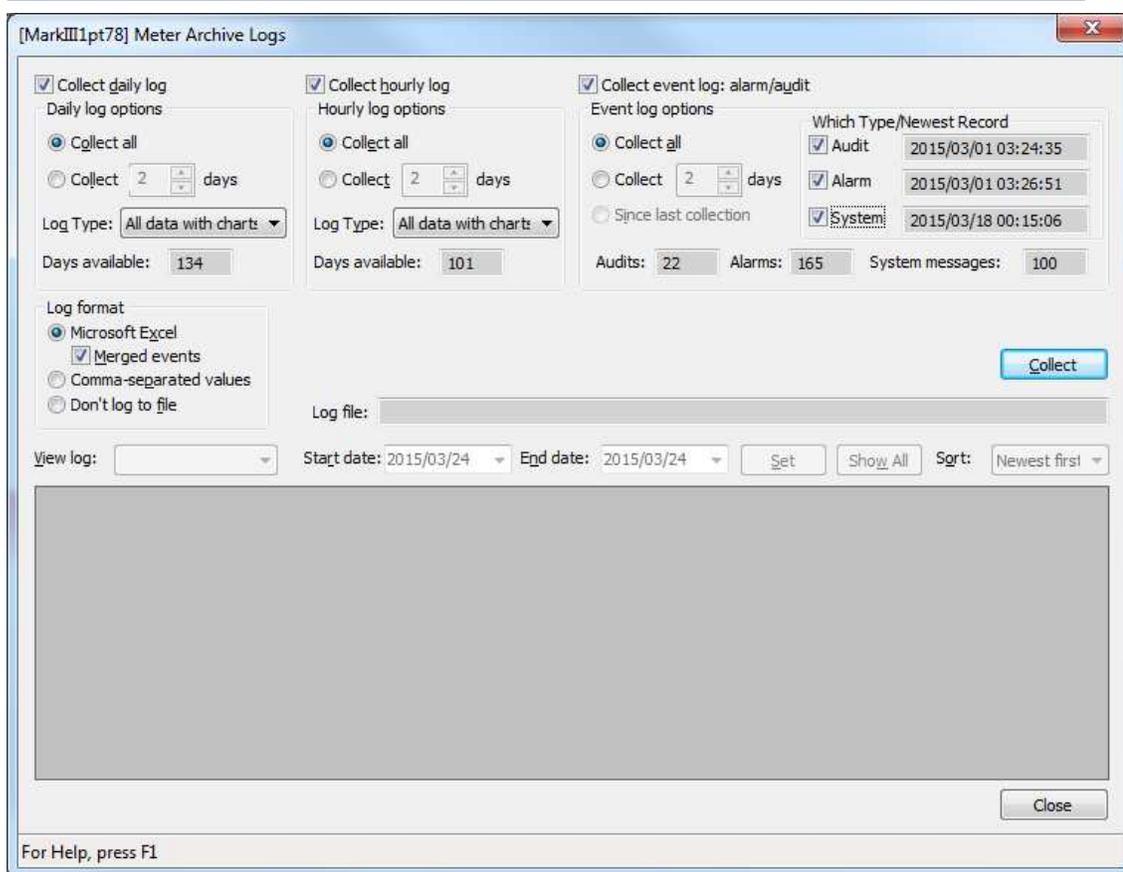
6 Appendix

Instructions for Upgrading to MeterLink v1.21 (or later) and Firmware v1.78 (or later) and additional actions to identify and resolve the log memory issue:

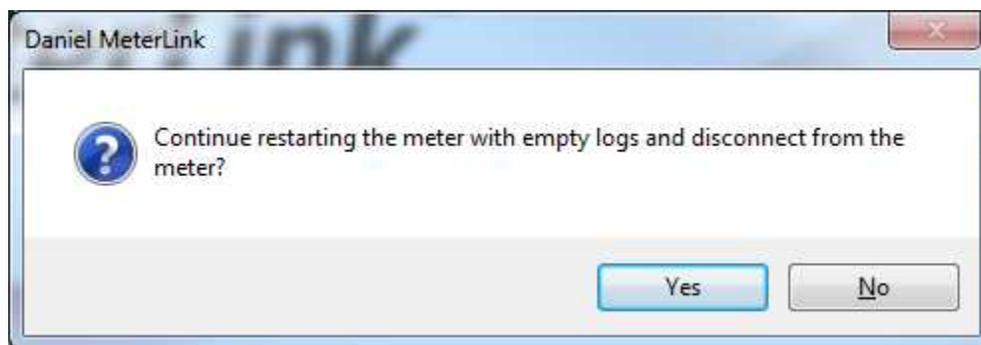
- Connect to meter using MeterLink v1.21 (or later).
- Use Program Download Utility in Meterlink to upgrade firmware to v1.78 (or later)
- After firmware upgrade completes, meter will reboot.
- Connect with Meterlink.
- If the Mark III (v1.78 or later) archive log memory is too full, MeterLink v1.21 (or later) will display the following message upon connecting to the meter:



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- If **No** is selected, no action is taken. The same message will appear each time a meter connection is made until the log memory is cleared.
 - If **Yes** is selected, the Meter Archive Logs dialog is opened so that the user can collect meter archive logs:



- When the Meter Archive Logs dialog is closed, Meterlink prompts the user to verify if they want to restart the meter with empty logs:



- If **No** is selected, no action is taken.
- If **Yes** is selected, MeterLink commands the meter to empty the meter archive logs and disconnects from the meter. The meter warm starts (reboots) and empties the meter archive logs.
- Upon reboot, the meter is ready for continued operation with empty log files.
- The meter configuration, meter totals and keys are preserved.

7 Technical Bulletin Revision History

Revision A

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Approved by: Kerry Groeschel

Date approved: 6/16/2015

Written by: Keith Groeschel

Date written: Mar 23rd, 2015