QUALITY ALERT

Quality Alert #: **QALERT-000058**
Date Issued: **01/15/2014**

Semtech Corporation is reporting an issue associated with the I2C interface for the following devices and all associated variants:

- GN2425A, GN2426A
- GN2010D, GN2010EA, GN2012A
- GN1411A, GN1412A, GN1412B
- GN7152
- GN2017A
- GN2040, GN2042, GN2044
- GX4002

Please note, if there is only one device on the I2C bus, or if SPI is used instead of I2C, this issue will not occur. Semtech Corporation is issuing the attached errata document (PDS-060316) which contains detailed information on how this issue could be presented and its recommended solution.

If you have any questions, do not hesitate to contact me or your designated Field Application Engineer.

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SEMTECH
GENNUM PRODUCTS

Device Errata

Purpose

This document outlines the known issues associated with the following devices and all associated variants:

- GN2425A, GN2426A
- GN2010D, GN2010EA, GN2012A
- GN1411, GN1412
- GN7152
- GN2017A
- GX4002

Description

Please note, if there is only one device on the I^2C bus, or if SPI is used instead of I^2C, this issue will not occur.

If there are multiple devices on the I^2C bus, and the specific conditions below exist, the Semtech devices will begin to write subsequent data to its control registers. Under no other conditions will this event occur:

Conditions

- Multiple devices on an I^2C bus
- I^2C transfer that contains $F0_h$ or $F1_h$ in the payload, which is followed by the slave address of the Semtech device (different slave addresses for different Semtech products)
  - Both $F0_h$ or $F1_h$ and the Semtech slave address must occur in the same transfer for the issue to occur
  - No other data patterns / combinations will cause the issue
- The transfer must be a Master to Slave (i.e. write) type
- The transfer must target a slave other than the specific Semtech device

Example

The following provides an example based on the GN2425A with a slave address of 12_h.

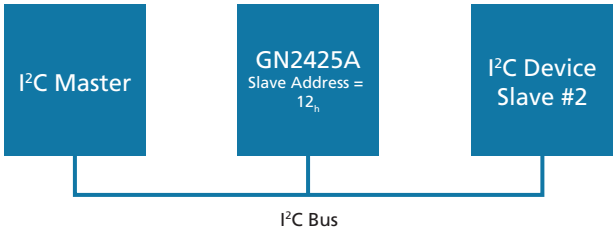

Figure A: Block Diagram

The I^2C Master is communicating with Slave #2. The payload contains $F0_h$ or $F1_h$ which is followed by the slave address of the GN2425A (12_h) either immediately or as any subsequent byte in the transfer. The GN2425A Bus Protocol State Machine (Bus FSM) interprets the 12_h as its address, and writes the subsequent data to its 12_h register and then continues to write the contents of the payload to its own registers.

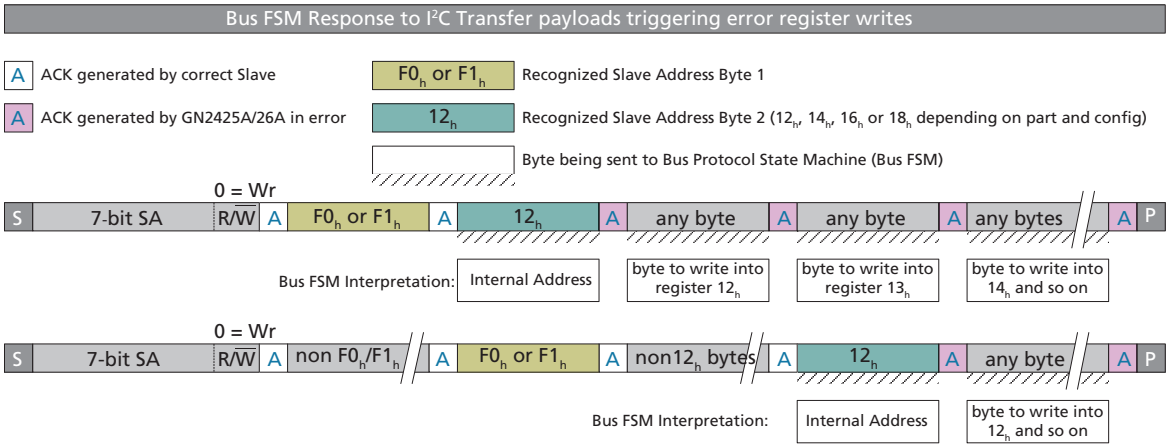

Figure B: Single Transfer Register Corruption

The recommendations in the following section ensure that register corruption will never occur.

Recommended Solution

Whenever $F0_h$ or $F1_h$ followed by the slave address of the Semtech device is contained in the payload:

1. Issue a stop condition immediately after the Semtech slave address. The ACK issued by Semtech device can be ignored.
2. Perform an I^2C read transfer to the Semtech device. This takes the Semtech device out of the problematic mode.
3. Discard payload provided by Semtech device in response to read transfer.

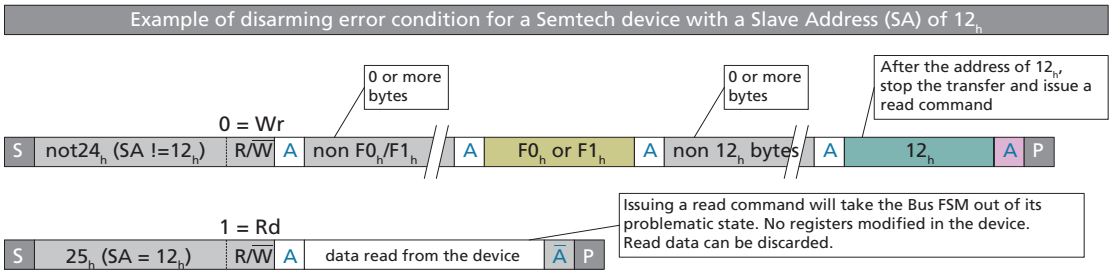

Figure C: Firmware Solution

The stop followed by a read will take the Bus FSM out of the problematic state without corrupting the Semtech device registers in all scenarios.

For new designs, if the Semtech device has a dedicated I^2C bus, there will be no issue and the above firmware recommendations are not required.

Please contact Semtech's Applications Support for more information.

Revision History

Version	ECO	Date	Changes and/or Modification
0	017141	January 2014	New document.

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DOCUMENT IDENTIFICATION
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