TOTALFLOW
Technical Bulletin 134

Communications Module Sulfide Contamination Issue

Totalflow Technical Bulletin

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1. **Purpose**
   To describe possible failure modes and solutions when communication modules are subjected to high concentrations of hydrogen sulfide (H_2S). Modules effected by high concentrations of H_2S are 6400 and XSeries RS-485 (P/N 2015193-002) and RS-232 (P/N 2015192-001) communication modules.

2. **Description**

   Totalflow has been using the same communication module since 1994. These modules were designed to provide years of reliable service while protecting the main Flow Computer electronics board from external surges. As with all Totalflow electronics, these modules include an environmental protective coating designed for the electronic components. The predominant coating has been a white silicone based material to protect the components from human handling and typical environmental conditions. Typical environmental conditions include humidity and airborne chemicals found in Oil and Gas production, distribution and transmission markets.

   Photo of RS-485 Module
   with Silicone Based Coating

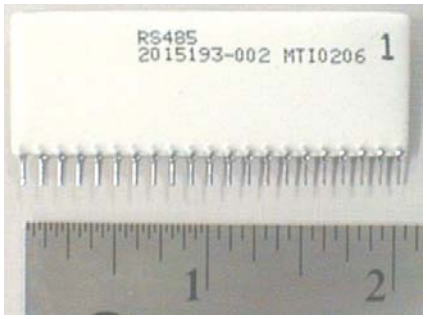

   Photo of RS-485 Module
   with Stycast Based Coating

Even though these modules fully meet our specifications some customers have encountered failures when these modules are subjected to high concentrations of H_2S for an extended period of time. These failures typically occur when exposed for 3-7 years.

Symptoms:
Modules can stop communicating or sporadically transmit data (chirping) during the power-up listen cycle when using Totalflow protocol. The sporadic transmission of data is typically caused when the communication module looses the ground connection on pin #21 of the module. We have found several modules where the ground clad was eroded away when H_2S reacted with the silver substrate located under the silicone coating.

Recommendations:
Totalflow has been providing a more robust coated module for most of 2005. This coating is a Stycast (hard "Black") material that can withstand higher concentrations of H_2S and other chemicals. Stycast is now Totalflow's standard coating and is recommended for any installation where high concentrations of H_2S are present.

3. Conclusion

Totalflow is continually looking for ways to improve product offerings. This new coating process is just one step in providing a better product for severe H_2S environments. For a limited time Totalflow will allow customers to upgrade any communications module either experiencing a problem or is currently installed in high H_2S environments for a flat rate of $25.00 US per module (discounts do not apply). Totalflow will offer this special upgrade from January 1st through December 31st, 2006. To qualify customers must reference technical bulletin 134 when contacting Customer Service and ship a silicone coated module for each stycast coated module replaced.

Please call Order Entry at (800) 442-3097 option 1 for upgrade assistance.