SDI-12 Support Group
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Minutes from the 2015 Technical Committee Meeting

The SDI-12 Support Group's Technical Committee held its annual meeting on Monday, November 16, 2015. This meeting was held in conjunction with the American Water Resources Association's (AWRA) annual conference, which was held at the Grand Hyatt Hotel in Denver, Colorado.

The posted agenda for the meeting was:

1) Welcome and Introductions

2) Preliminary discussion with the USGS/Hydrologic Instrumentation Facility (HIF) about the possibility of a new standard.

This standard would have the following minimum requirements:

- Higher bandwidth communication for collecting large amounts of data from sensors like Acoustic Doppler Current Profilers (ADCPs) and water quality sondes.
- Plug-and-play sensor capability to allow two compatible devices to automatically recognize each other and communicate. For example, when a sensor is plugged into a data logger, the logger would be able to recognize the sensor and configure itself as needed to log data from the sensor
- This new interface would include most existing SDI-12 features, including the standard command set and a low-power sleep mode.

3) Discussion on a proposed clarification to the SDI-12 Specification

Add text to the sensor flow chart to explicitly state that a sensor must set the data line to marking for 8.33 milliseconds before sending the response, to be in agreement with section 5.0, Timing, which says "After receiving the break and the command, the addressed sensor sets the data line to marking for 8.33 milliseconds and then sends the response."

4) Open discussion about the SDI-12 specification

5) Reinstatement of the Technical Committee for the upcoming year

This meeting was chaired by Jerry Calhoun, chairman of the technical committee.

Companies on the Technical Committee Represented at the Meeting

> Campbell Scientific, Joe Thurston
> Design Analysis Associates, Mike Nelson
> OTT, Dennis Clark
> NR Systems, Inc., Mike Jablonski (Chairman of the SDI-12 Support Group)
> Stevens Water, Fred Holloway
> Sutron Corporation, Jerry Calhoun (Chairman of the Technical Committee)
> USGS, Hydrologic Instrumentation Facility, Gerald Kunkle

Higher Bandwidth

Jerry Calhoun invited Gerald Kunkle to comment on the request for a higher bandwidth. Gerald responded by saying many sensors currently used by the USGS are outputting more data than supported by SDI-12. This includes ADCPs, water quality sensors, and nitrate sensors. He also said that USGS personnel would like less complexity in setting up sensor systems and that plug and play connectivity would be most helpful. He added that USGS/HIF could help drive support for a new standard.

A general discussion followed about bandwidth, with Gerald informing the group that the fastest acquisition rate for taking high volume stream data is every 15 minutes, which allows ample time for a sensor to transmit high volume data to a data recorder between each interval.

As to plug and play, Jerry said the user must be involved in the setup of a system to select the data of interest, which precludes a fully plug and play system. Mike Nelson suggested making changes to SDI-12 as a way to ease into the development of a new standard, by adding support for a higher volume of data acquisition. All present had numerous comments on this, such as the need for a CRC so that the data recorder only stores data known to be error free, comments about RS-485, cable lengths, etc.

The group made two conclusions:

1) There is value and a need to provide a means for a data logger to be able to query a sensor about the data it returns to a data recorder to help users set up systems, as an alternative to a complete plug and play system.

2) There is a need to get high volumes of data from sensors.

It was decided, by consensus, to use the meeting to come up with proposed solutions to both issues by upgrading the SDI-12 Specification rather than creating a new standard.

Sensor Measurements and Parameters

A long discussion followed about a command set to query a sensor about the measurements that are taken by the sensor, to be able to get metadata such as the units of the measurement for each parameter, calibration data, serial numbers, etc.

The Committee concluded to propose the addition of three sets of SDI-12 commands to the membership of the SDI-12 Support Group to meet the setup and high volume needs:

1) Commands to get the number of seconds that a sensor will take to complete its measurements and the number of parameters the sensor will return to the data recorder, without actually initiating a measurement.

2) Commands to query the sensor to get details about each and every parameter to be returned by the sensor.

3) Commands to get high volume data in ASCII; commands to get high volume data in binary.

High Volume Data

Another long discussion followed about commands to get high volume data from sensors. The conclusion was to propose new SDI-12 commands to get high volume data in two formats: 1) ASCII; and 2) binary.

Conclusions

Because many ideas were offered, abandoned, or modified during these two discussions, these minutes omit the intermediate discussions that led to the conclusions. All conclusions were approved by consensus at the meeting.

The details are documented in a separate document, "Proposed Additions to the SDI-12 Specification," which will be presented to the SDI-12 Support Group's membership after review by each member of the Technical Committee.

 If approved under the bylaws of the SDI-12 Support Group by the members of the Support Group, the proposed additions to the standard will be added to the SDI-12 Specification.

Proposed Clarification to the SDI12 Specification

Mike Jablonski described an inconsistency in the SDI-12 Specification and proposed   to clarify the inconsistency. He also said that the abbreviation for milliseconds was incorrect on the flow charts in Appendix B-1 and Appendix B-2 in SDI-12 Specification and proposed to correct this mistake.

It was also noted that that a CRC error was not explicitly listed as a reason for a retry in the section about retries on page 26 of the specification.

After a short discussion, the committee agreed (by consensus) to make the following clarifications to the SDI-12 Specification.

1) Page 26, Section 5.2, Retries. Add "CRC error" to the first sentence of the last paragraph as one of five invalid response conditions, from a sensor, that require a data recorder retry.

2) Appendix B-2, SDI-12 Sensor Flow Chart. Add "set data line to marking for 8.33 ms" to the box between "valid command?" and "more processing?" This will clarify the supporting text on page 24, Section 5.0, which says, "After receiving the break and the command, the addressed sensor sets the data line to marking for 8.33 milliseconds and then sends the response."

3) Appendices B-1 and B-2, SDI-12 Data Recorder Flow Chart/SDI-12 Sensor Flow Chart. Change all instances of "msec" to the correct abbreviation of "ms."

Reinstatement of the Technical Committee for the upcoming year

All present indicated that they would like their company to retain a seat on the Technical Committee for another year.

Open discussion about the SDI-12 Specification

There was no further discussion about SDI-12. The meeting adjourned at approximately 4:00 P.M.

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Minutes from the 2015 General Meeting of the SDI-12 Support Group

The SDI-12 Support Group held its annual meeting on Tuesday, November 17, 2015. This meeting was held in conjunction with the American Water Resources Association's (AWRA) annual conference, which was held at the Grand Hyatt Hotel, in Denver.

The posted agenda for the meeting was:

1) Welcome and Introductions

2) Review of the technical committee meeting

3) Review of visitor statistics on www.sdi-12.org

4) Financial Report

5) Selection of Chairman and Board Members for the upcoming year

Attendance

Mike Jablonski, NR Systems, Inc. Chairman of the SDI-12 Support Group
Jerry Calhoun, Sutron Corporation, Chairman of the Technical Committee
 Fred Holloway, Stevens Water

Under the bylaws of the SDI-12 Support Group, attendance of three people constitutes a quorum.   The bylaws say, "Whatever number of SDI-12 Support Group members attend the annual meeting will constitute a quorum."

Review of the Technical Committee Meeting

No report was needed as all present attended the Technical Committee meeting on November 16.

Review of Visitor Statistics on www.sdi-12.org

Mike reported that the number of visits to the SDI-12 Support Group's web page indicates a continued and strong interest in SDI-12. The key figure is that the number of times the SDI-12 Specification, dated January 26, 2013, was downloaded/viewed from the web site, which was 11,264 times since January 1.

Financial Report

Mike Jablonski reported that, at present, the Support Group has $ 3,496.52 in cash.

Expenses for the past year (11-1-2014 to 11-14-2015) were $ 1,806.96, which included $1,111.96, paid to NR Systems, Inc., for Mike Jablonski to travel to Virginia in 2014 for the annual meetings of the Support Group, and $ 695.00 to register for the 2014 AWRA conference. There were no travel expenses for Jerry Calhoun in 2014 because the meetings were held in Virginia, close to Jerry's office.

Income for the year was $ 2,700.00 in membership dues, for net income of $893.04.

Upcoming expenses will be reimbursement to NR Systems, Inc., and to Sutron Corporation to pay the travel expenses to the 2015 meetings in Denver. Mike reported that the Group has sufficient funds for these upcoming expenses.

Mike reported that the SDI-12 Support Group remains as a non-profit corporation in good standing with the State of Utah and the Internal Revenue Service. All of the required tax forms and other paperwork were filed, on time, over the past year with the appropriate state and federal agencies. This includes the IRS 990-EZ "Return of Organization Exempt from Income Tax" forms, filed in May, 2015.

Selection of Chairman and Board Members for the 2015-2016

Mike Jablonski agreed to serve another one year term as the chairman of the SDI-12 Support Group.

Jerry Calhoun agreed to remain on the Board of Directors for another year.

The Technical Committee was reinstated for another year. The technical committee members are:

Jerry Calhoun, Sutron Corporation (Chairman)
Paul Campbell, Environment Canada
Albrecht Dorr, Ott Messtechnik
Steven McCoy, Stevens Water Monitoring Systems, Inc.
Mike Jablonski, NR Systems, Inc.
Gerald Kunkle, U.S. Geological Survey
Mike Nelson, Waterlog/Xylem
Joe Thurston, Campbell Scientific, Inc.

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