SDI-12 Support Group
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Minutes from the 2008 Technical Committee Meeting

The SDI-12 Support Group's Technical Committee held its annual meeting on Monday, November 17, 2008. This meeting was held in conjunction with the American Water Resources Association 's (AWRA) yearly conference, which was held at the Sheraton New Orleans Hotel, in New Orleans, Louisiana.. The posted agenda for the meeting was:

Welcome and introductions
Review of all comments received in the past year
Discussion about extending the cable length beyond 200 feet
Open discussion on SDI-12
Selection of technical committee members for the upcoming year

Companies on the Technical Committee Present at the Meeting

Sutron Corporation, Jerry Calhoun, Chairman of the Technical Committee
NR Systems, Inc., Mike Jablonski, Chairman of the SDI-12 Support Group
OTT Messtechnik, Christel Valentine (Hach Environmental, Hydrolab and OTT Products)

Jerry Calhoun called the meeting to session at 9:00 A.M. Introductions were made to Christel Valentine, as this were her first attendance at an SDI-12 Support Group meeting.

Ms. Valentine informed the group that she was representing both Hach Environmental and OTT Messtechnik at the meeting. Mike Jablonski said that because Ott Messtechnik has a representative on the technical committee, Albrecht Dorr, that Ms. Valentine would, therefore, have a vote on anything that may come up for a vote during the meeting. Under the bylaws of the SDI-12 Support Group, Mike said, she was acting as Ott Messtechnik's member of the technical committee, by sitting in for Albrecht.

Mike also pointed out that a quorum was present and the business of the SDI-12 Support Group could be conducted with only three members of the technical committee present.

Review of Comments Received During the Year

A review of all comments received about SDI-12 during the past year followed. Jerry reported that no formal/written proposals to change the SDI-12 specification were received from the Membership of the SDI-12 Support Group. Verbal and email comments , however, were received about three issues:

1) the use of floating point numbers;
2) the possibility of using SDI-12 over Ethernet connections, adding object oriented programming features to SDI-12, and adding a setup/query command to the SDI-12 command set;
3) the requirements for a service request.

Floating Point. Jerry reported that the floating point issue was a moot point that needed no further discussion. One SDI-12 manufacturer has posted a question about the formatting of numbers in response to the D commands. Jerry had answered the question, via email, and the

issue was resolved to the satisfaction of the person that posted the questions. The details on the floating point question were not discussed at this meeting.

Ethernet, Object Oriented Programming Features, Setup/Query Command. Mike reported that Paul-Emile Bergeron (Environment Canada) had called him prior to the Technical Committee meeting. He asked Mike to bring up the possibility of using SDI-12 with Ethernet connections, using objected oriented programming features in SDI-12, and revisiting an issue which had been proposed, and voted down, by the Membership some years ago, which was the addition of a setup/query command.

Paul-Emile is on the technical committee. He further requested, that although not present at the meeting, that he be allowed to participate at the meeting via telephone.

A discussion on these issues followed. All present agreed that the use of an Ethernet connection for SDI-12 communications was beyond the scope of the SDI-12 specification and could not be implemented in a way that would preserve the simple electronics, backward compatibility, and low power requirements of SDI-12.

Mike pointed out that a proposal for a setup/query command had been proposed and voted down, by the full membership of the Group, several years ago. Mike also said that the no written proposal had been submitted to clarify the request for a setup/query command and the use of object oriented programming features.

All present agreed to call Paul-Emile to inform him about the conclusions, and to ask him to provide a written proposal to clarify his request for a setup/query command and the use of object oriented programming features.

Because the meeting room had no facilities for a conference call, Mike called Paul-Emile using a cell phone.

Mike shared the conclusions with Paul-Emile during the telephone call. He also asked Paul-Emile to submit a brief written proposal about his request for object oriented features and a setup/query command.

Requirements for the Service Request. Paul-Emile Bergeron (Environment Canada) had also requested (prior to the meeting) that the Technical Committee discuss the fact that some SDI-12 sensors will report a measurement time (ttt) that is considerably longer than the actual time it ends up taking to complete the measurement.

A brief discussion on this followed. A consensus was made to change the specification, as follows (the new text for the specification is red), to address this issue:

Page 12, Section 4.4.5 Start Measurement Command (aM!)

A sensor should return a ttt value greater than the time it takes to make a measurement, to allow for timing tolerance and for the service request. (See section 4.4.6.) The data recorder may wait for the entire ttt time. Therefore, the tolerance above the measurement time, added to ttt, should be minimal.

Cable Length

Christel Valentine next gave all present a copy of a technical document titled “Analysis of the Maximum Length of the SDI-12 Bus Depending on the Sensor and the Cable” that her company had prepared. She also described a computer program that her company is working on

which will "… be a user friendly program where the user can input the number and assembly of the sensors and the data of the cables to find out if it is possible to realize it the SDI-12 bus."

A long discussion about this cable lengths and certain details about the proposed computer program by Hach Environmental followed. Both Jerry Calhoun and Mike said that they thought the proposed program has merit and that Hach should proceed with its development.

Christel said that she has considerable experience working with SDI-12 sensors and data recorders in the field and that she has worked on many installations where the cable lengths are more than 200 feet long.

A discussion followed about the continual misunderstanding about the 200 feet number in the introduction to the SDI-12 specification. The introduction lays out the requirements that the specification was designed to address as opposed to the maximum that the specification can do. Some have viewed the 200 ft as a maximum and that a user could not setup a system with one sensor that had a 250 ft cable.

A consensus was made to change the specification, as follows (the new text for the specification is red), to address this issue:

Page 2, Section 3.0 SDI-12 Electrical Interface

Figure 1 shows the SDI-12 bus connecting one data recorder with two sensors. The SDI-12 bus is capable of having at least 10 sensors connected to it, each with 200 feet of cable. With fewer sensors, longer cable lengths are possible.

There is also a DC voltage drop type of constraint which is related to cable length and sensor power consumption. This constraint has always been pointed out in the specification. There is another constraint having to do with the amount of capacitance that the SDI-12 transmitter can charge and discharge during the bit transitions. For this reason communication with a sensor 10 feet away could fail if there were other sensors in the system with very long cables adding a lot of capacitance to the SDI-12 data line.

A consensus was made to change the specification, as follows (the new text for the specification is red), to address this issue:

Page 4, Section 3.1.2 Impedance

Figure 2 shows an equivalent circuit. Due to this impedance, the maximum cable length depends on the capacitance of all cables connected to the SDI-12 data line.

Open discussion on SDI-12

A short discussion about SDI-12 in general followed, with no further additions or clarifications being made to the specification. It was noted that the Roy Johnson of the U.S. Geological Survey had told Mike that the USGS is still firmly supporting and encouraging the use of SDI-12.

Selection of technical committee members for the upcoming year

The meeting concluded with an agreement to recommend reinstatement of the existing technical committee for another year. Members of the SDI-12 Support Group's Technical Committee are:

Albrecht Dorr, Ott Messtechnik

Jerry Calhoun, Sutron Corp.

Joe Thurston, Campbell Scientific

Mike Jablonski, NR Systems

Paul-Emile Bergeron, Environment Canada

Roy Johnson, USGS

The meeting adjourned after recommending reinstatement of the technical committee for another year.

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Minutes from the 2008 SDI-12 Support Group

The SDI-12 Support Group held its annual meeting on Tuesday, November 18, 2008. This meeting was held in conjunction with the American Water Resources Association (AWRA) yearly conference, which was held at the Sheraton New Orleans Hotel, in New Orleans, Louisiana. The posted agenda for the meeting was:

Welcome and introductions

Report from the technical committee and open discussion on SDI-12

Financial report

Selection of Board Members for 2008-2009

Present at the meeting were Mike Jablonski (Board Member and President of the Corporation) and Jerry Calhoun (Board Member), Blake Farnsworth (Campbell Scientific), and Pete Nyberg (Stevens Water Monitoring Systems).

Mike Jablonski opened the meeting by stating that a quorum was present under the bylaws of the SDI-12 Support Group. Mike and Jerry welcomed Pete and Blake to the meeting.

Report from the Technical Committee

Jerry gave a short overview of the three clarifications to the specification that the technical committee decided to add to the SDI-12 specification. There are two clarifications about the cable length and one clarification about the number of seconds (ttt) reported by a sensor that it will take before one or more sensor measurements are ready.

Jerry presented a summary about the computer program being developed by Hach Environmental and OTT Hydrometry, which will advise the user on maximum cable lengths that can be used in an SDI-12 installation, as a function of all the variables (e.g. inputs to the program) that determine the maximum cable lengths that could be used in that specific configuration of sensors.

Financial Report

Mike then gave a financial report for the past year. He reported:

1) a cash balance as of November 16, 2008, of $ 7,915

2) the balance includes a recent deposit of $1,000, having received dues from five companies, at $200 each

3) that $485 was paid on November 17, 2008, to AWRA for the registration fee for attendance at the AWRA conference

4) current liabilities include:

- reimbursement of travel expenses to Sutron Corpration for Jerry Calhoun's travel costs to attend this meeting in New Orleans and last year's meeting in New Mexico (approximately $2,000)

- reimbursement of Mike Jablonski's travel expenses to New Orleans (approximately $ 1,000)

- payment to Amass Data Technologies for two years of web site management and web site hosting for www.sdi-12.org (approximately $1,400)

This leaves an estimated balance of: $ 3,030

Expenditures for the past year was:

$ 100.00	donation to an AWRA scholarship fund in 2007
$ 7.00	corporation filing fees to the state of Utah
$ 1,333.00	travel expenses for Mike Jablonski to attend the meeting last year in New Mexico, which includes $445.00 paid to AWRA for registration for the 2007 conference
$ 1,440.00	Total Expenditures

Income for the past year was:

$1,000 in dues, all received in October/November of 2008

Mike also reported that he expects additional dues to be received soon as the solicitation for dues was mailed in early October.

In response to the financial report, Blake Farnsworth expressed his opinion that dues of $200 per year was insufficient. After a brief discussion, a consensus was reached to raise dues to $300 per year, starting with the 2009/2010 dues.

Mike also requested, and everyone agreed, to make a donation of $100.00 to AWRA's scholarship fund. Blake suggested that this donation be increased in 2010.

Reinstatement of the Technical Committee

Pete Nyberg (Stevens Water Monitoring Systems) asked if he could join the technical committee. This request was agreed upon by all present because the bylaws of the SDI-12 Support Group allow 11 members to serve on the technical committee and only six people are on it at present.

All present also agreed to accept the recommendation to reinstate the existing technical committee (as recommended by the technical committee on the November 17), with the addition of Pete Nyberg.

Open Discussion About SDI-12

Blake asked why SDI-12 is limited to 1200 baud. Jerry answered saying the SDI-12 protocol is actually based on whole seconds, because the time (ttt) that a sensor states it will need before a measurement is ready precludes having a request for a measurement and transfer of that measurement to a data recorder to be done is less one second when ttt is greater than zero seconds. Thus, even a faster baud rate would not reduce this time to less than one second.

Blake then suggested that the SDI-12 Group offer a certification for all SDI-12 products. Mike Jablonski said the by bylaws of the say that "Certification program for compliance testing will not be provided by the Group." Mike also said that a proposal for the Group to provide a logo for SDI-12 compliance for self-certification was voted down by the membership many years ago.

Blake then asked if "SDI-12" is registered as a trademark, so that a company could not use the term "SDI-12" without the permission of the SDI-12 Support Group. Mike responded by saying that SDI-12 is not registered as a trademark and that the SDI-12 specification is not copyrighted and has been placed in the public domain. This, Mike said, would make it difficult, if not impossible, to preclude companies from using the term "SDI-12."

Blake stated his opinion that if a company says that a product uses SDI-12 then that product is obligated to be compliant with the SDI-12 specification. Jerry said that in his experience, the first version of an SDI-12 product from a company new to SDI-12 is almost never compliant with the standard.

Pete suggested that another level of management is needed to certify SDI-12 products for compliance with the standard.

Discussion on this ended without any formal action on certification testing for SDI-12 products. Blake said, however, that Campbell Scientific may be willing to take the lead on this and may submit a proposal to the SDI-12 Support Group on this issue.

Mike expressed a desire to serve for another year as the Chairman of the SDI-12 Support Group. Jerry agreed to remain on the Board of Directors. A consensus was reached for Mike to continue as the chairman of the Group with Jerry as the chairman of the technical committee.

Then the meeting adjourned.