SDI-12 Support Group
165 East 500 South
River Heights, Utah 84321
435-752-4200

Minutes from the 2017 Technical Committee Meeting

The SDI-12 Support Group's Technical Committee held its annual meeting on Monday, November 6, 2017. This meeting was held in conjunction with the American Water Resources Association's (AWRA) annual conference, which was held at the Red Lion Hotel on the River-Jantzen Beach, in Portland, Oregon.

The posted agenda for the meeting was:

1. welcome and introductions

2. discussion about the acceptance of SDI-12 version 1.4: metadata commands, high volume ASCII command, and the high volume binary command, by the SDI-12 community

3. comparison of the timing throughput using the version 1.4 binary commands, compared to the version 1.3 ASCII data transfer commands, in cases in where both the ASCII and high volume binary commands could both be used to transfer a small number of parameters from a sensor to a data recorder

4. discussion on the programming effort to implement the version 1.4 commands, metadata and high volume, based on the experience of all present that have added support to version 1.4 for their company's products

5. review of website

6. review of website traffic

7. discuss and list the names of those that wish to serve on the SDI-12 Support Group's Technical Committee for the next year, including the addition of any new volunteers, for presentation at the General Meeting of the Support Group (on Tuesday, November 7)

Jerry Calhoun, chairman of the technical committee, chaired the meeting.

Welcome and Introductions and Companies and Agencies on the Technical Committee Represented at the Meeting

Campbell Scientific, Joe Thurston
Environment Canada, Alain Goulet
NR Systems, Inc., Mike Jablonski (Chairman of the SDI-12 Support Group)
Sutron Corporation, Jerry Calhoun (Chairman of the Technical Committee)

Alain was welcomed to the meeting as this was his first attendance an SDI-12 Support Group meeting.

SDI-12 Version 1.4 Acceptance

All present commented on their experience with Version 1.4, which was released in 2016.

Mike Jablonski reported that he has added full support for all of the Version 1.4 commands to his product, the SDI-12 Verifier, in a software upgrade released in July, 2017.

Mike said, however, that he had not received a single question about the SDI-12 Version 1.4 commands since Version 1.4 was released in 2016. The software upgrade was shipped with new orders for SDI-12 Verifiers, but that only a handful of companies expressed interest in the software upgrade. Those that did, he said, were interested in the metadata commands, not the high volume commands.

Mike further said that after programming the data recorder and sensor sides for the high volume commands, he thinks that the design and documentation for the high volume commands is quite good, adding that he likes the efficiency of the commands.

Joe Thurston said that Campbell Scientific had released one product, a sensor that supports the metadata commands adding that Campbell Scientific is supportive of the metadata commands. He also said the marketing department at Campbell Scientific likes the metadata commands very much.

Jerry Calhoun said that Sutron is planning to add support for the SDI-12 Version 1.4 commands to their products, but has not yet seen a demand for the commands from the user community.

Alain Goulet said that Environment Canada, at present, is using the basic SDI-12 commands only.

High Volume Command Timing Throughput

Mike Jablonski presented a written analysis that he had prepared, comparing the high volume commands to the standard ASCII commands.

A short discussion followed. An analysis shows that using the high volume binary commands is faster than using the ASCII command, for a small number of parameters, as follows:

1) Single Precision Floating Point: if (the total number of characters in the data values > 4) then a binary data transmission will be faster

2) Double Precision Floating Point: if (the number of characters in the data values > 8) then a binary data transmission will be faster

Jerry Calhoun also pointed out that a binary to ASCII conversion is not needed when a sensor transmits binary numbers to a data recorder, in response to the High Volume Binary commands.

See the November 4, 2017 throughput analysis for more detail. That document is appended to these minutes.

Review of Website and Website Traffic

All present thought that the SDI-12 Support Group's website is adequate, as it. No changes to it were proposed.

Mike Jablonski reported that prior download counts, that a server side program generates, as reported in past meetings, were inflated by web robots hitting the download links. Mike said he only recently became aware of this, and subsequently modified the program to detect and ignore robot hits. He noted that after he made his change, the number of download counted by the program declined.

This revised software showed that the SDI-12 Specification was downloaded 783 times since August 8, the date when he modified the program to ignore the robots.

Mike also presented data, generated by software provided by the Internet Service Provider (ISP) hosting the Support Group's web site produced. He also demonstrated the use of that software by visiting the web-pages the shows the statistics.

The web-page use data, as presented by Mike, are summarized as follows:

Average daily visitors over the last 365 days: 27.4
Average unique daily visitors over the last 365 days: 24.4
Average Daily Time per Visitor over the last 365 days: 5.6 minutes
Average Daily Number of Actions: 60.9
Number of visits to the main page in the last 90 days: 2,074
Number of visits to specification download page in the last 90 days: 1,695
Number of visits to Announcements in the last 90 days: 483
Number of visits to Archives in the last 90 days: 406
Number of visits to History in the last 90 days: 230
Number of visits to Contact in the last 90 days: 128

Other

Joe Thurston reported that the bookmarks, in the Portable Document Version (PDF) of the current SDI-12 Specification, are incomplete and not working properly. Joe showed the problem on his IPad notebook computer. It was agreed to correct this problem as soon as possible.

Technical Committee Membership

All present said they would like to serve for another one-year term on the Support Group's Technical Committee.

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Minutes from the 2017 General Meeting of the SDI-12 Support Group

The SDI-12 Support Group's annual meeting on Monday, November 7, 2017. This meeting was held in conjunction with the American Water Resources Association's (AWRA) annual conference, which was held at the Red Lion Hotel on the River-Jantzen Beach, in Portland, Oregon.

The posted agenda for the meeting was:

1. welcome and introductions
2. review of the Technical Committee meeting, held on November 6
3. financial report and discussion on the collections of membership dues
4. selection of Chairman and Board Members for the upcoming year
5. formally select and renew members of the Technical Committee for the upcoming year

Attendance

Environment Canada, Alain Goulet
Jerry Calhoun, Sutron Corporation, Chairman of the Technical Committee
Mike Jablonski, NR Systems, Inc. Chairman of the SDI-12 Support Group

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 11/6.

Financial Report

Mike Jablonski reported that, at present, the Support Group has $ 4,258.57 in cash.

Expenses for the past two years (11-15-2015 to 11-4-2017), since the last meeting, were:

$ 3,105.95
For:

$ 1,002.98	Sutron Corporation, for Jerry Calhoun's travel expenses to Denver in 2015
$ 1,742.02	NR Systems, for Mike Jablonski's travel expenses to Denver in 2015, and to reimburse NR Systems for the 2015 AWRA conference fee ($595.00)
$ 354.95	NR Systems, to reimburse for the online ballot expenses incurred in 2016.
$ 6.00	Banking Fee

Income for the past two years was $ 3,868.00 in membership dues, for net income of $762.95.

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 two years with the appropriate state and federal agencies. This includes the IRS 990-EZ "Return of Organization Exempt from Income Tax" forms, filed in May, 2016, and 2017.

Mike further reported that his payment of the dues, by the membership, continues to be a problem. Numerous companies did not respond to a written request for dues that went at the beginning of 2016 and 2017. Mike also expressed difficulty in getting dues payments via credit cards, because the Support Group is not setup to accept payments via credit cards. He reported further difficulties in receiving dues payments from other countries, using electronic funds transfers (ETF), because the bank used by the SDI-12 Support Group does not have an international SWIFT code. Mike added, however, that the bank informed him that are in the process of acquiring a SWIFT code.

Alain Goulet suggested that the Support Group use PayPal to accept the payment of membership dues. A brief discussion about this followed, with a consensus that the Group acquire and use a PayPal account, making it easier for current and future members of the Support Group to remit dues payments. The conclusion was to solicit for dues, at the beginning of the year, with the ability to accept membership dues via PayPal.

Selection of Chairman and Board Members for the 2017-2018

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.

Mike pointed out that the Group should have a third member on the Board of Directors for registration of the non-profit corporation in the state of Utah. Alain Goulet volunteered to join the Board, but if and only if, doing so would not violate any policies of Environment Canada. Alain said he would see if joining the Board would be permissible. If so, he will join the Board of Directors for the SDI-12 Support Group.

The Technical Committee was reinstated for another year, replacing Steve McCoy with Fred Holloway, as Steve no longer works for Stevens Water Monitoring Systems.

The technical committee members are:

 Jerry Calhoun, Sutron Corporation (Chairman)
 Alain Goulet, Environment Canada
 Albrecht Dorr, Ott Messtechnik
 Fred Holloway, Stevens Water Monitoring Systems, Inc.
 Mike Jablonski, NR Systems, Inc.
 Gerald Kunkle, U.S. Geological Survey
 Joe Thurston, Campbell Scientific, Inc.

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November 4, 2017

To: SDI-12 Support Group, Technical Committee
From: Mike Jablonski

Re: comparison of the timing throughput using the version 1.4 binary commands, compared to the version 1.3 ASCII data transfer commands, in cases in where both the ASCII and high volume binary commands could both be used to transfer a small number of parameters from a sensor to a data recorder

Here is a list off parameters measured by the Hydrolab Quanta Multi-Probe Meter:

Parameter	Range	Resolution
1) Temperature	-5 … 50 degrees Centigrade	0.01 degrees C
2) Conductivity	0 … 100 mS/cm	4 digits
3) Depth	0 … 100 m	0.1 m
4) pH	0 .. 14	0.01 units
5) Oxygen Reduction Potential (ORP)	-999 … 999 mV	1 mV
6) Dissolved Oxygen	0 … 50 mg/L	0.01 mg/L
7) Turbidity	0 … 1000 NTU	0.1 NTU

Example of this data returned in response a D command, after a CC command:

0+50.00+100+100.0+14.00+999+50.00+1000.0<CRC><CR><LF>

n = 46 characters
time to transmit, at 8.33 milliseconds per character = **383.18** milliseconds

Same Data in a Binary Data Packet, using IEEE Single Precision:

	Number of Bytes
Address	1
Packet Size	2
Data Type, IEEE Single Precision	1
Binary Data Payload	28 (7 data values, 4 bytes each)
CRC	2
Total Bytes	34

n = 34 bytes
time to transmit, at 8.33 milliseconds per byte = **283.22** milliseconds, for a saving of **99.96** milliseconds

When Transmitting Close to the Maximum Number of ASCII Characters

The maximum number of data value characters that can be transmitted in response to a D command, after an CC command, is: 75. For example, this makes room for 8 data values, having 9 characters each:

0+123456.7+123456.7+123456.7+123456.7+123456.7+123456.7+123456.7+123456.7<CRC><CR><LF>

Counting the address, the <CRC>, and the <CR><LF> pair, the length of the response, in this example, is 78 characters, taking **649.74** milliseconds to transmit.

The same data could be transferred, in a single precision binary data packet, in **316.54** milliseconds:

	Number of Bytes
Address	1
Packet Size	2
Data Type, IEEE Single Precision	1
Binary Data Payload	32 (8 data values with 4 bytes each)
CRC	2
Total Bytes and Transmission Time	38 * 8.33 milliseconds = **316.54** milliseconds

General Comparison of ASCII to Binary Data Transmission

The overhead for the response to a D command: address,<CRC>,<CR><LF> = 6 characters = 49.98 milliseconds

The overhead for the response to a DB command, to get a binary data packet: address, packet size, data type, <CRC> = 6 bytes = 49.98 millisecond, the same as when using ASCII.

Because the overhead is the same for ASCII and binary, the transmission time for an ASCII character is a function of the number of characters in the data values part of the response; the transmission time for a real number is a function of the number of data values:

1) Single Precision: if (the total number of characters in the data values > 4) then a binary data transmission will be faster)

2) Double Precision: if (the number of characters in the data values > 8) then a binary data transmission will be faster)

Total Number of Chars in a Data Value	Time to Transmit ASCII Chars (milliseconds)	Time to Transmit a Single Precision Number (milliseconds)	Time to Transmit a Double Precision Number (milliseconds)
1	8.33	33.32	66.64
2	16.66	33.32	66.64
3	24.99	33.32	66.64
4	33.32	33.32	66.64
5	41.65	33.32	66.64
6	49.98	33.32	66.64
7	58.31	33.32	66.64
8	66.64	33.32	66.64
9	74.79	33.32	66.64