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

Minutes from the 2021 Technical Committee Meeting

The SDI-12 Support Group's Technical Committee held its annual meeting on Monday, December 6, 2021. This meeting was conducted as a virtual meeting, using Zoom, a web conferencing platform for online meetings. This was the second time the SDI-12 Support Group met online. The reason for using Zoom was in response to the world-wide Covid-19 crisis. Jerry Calhoun, the chairperson of the Technical Committee, chaired the meeting.

The posted agenda for the meeting was:

1. welcome and introductions

2. review of concerns and comments about SDI-12 received over the last year from users and/or manufacturers of SDI-12 devices

3. review of any suggested changes to the SDI-12 Specification that any members of the technical committee are aware of, including any errors or omissions in the SDI-12 Specification

4. discussion about the use of extended commands to receive multiple lines of text from a sensor

5. discussion about the use of extended commands to transfer firmware to an SDI-12 sensor

6. review of website traffic

7. open discussion about SDI-12

8. discuss and list the names of those who 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, December 7)

Welcome and Introductions, Companies and Agencies Represented at the Meeting

The following members of the Technical Committee were present at the meeting:

Philip Bartlett, Forest Technology Systems (USA)
Jerry Calhoun, Chairman of the Technical Committee, Ott Hydromet Corporation (USA, Germany)
Mike Jablonski (Chairman of the SDI-12 Support Group), NR Systems, Inc. (USA)
Joe Thurston, Campbell Scientific (USA)

Other present at the meeting were:

David Schwarz, Stevens Water (USA)
Wally Wang, Smart Sensor Co. Ltd. (China)

Review of Concerns and Comments About SDI-12 Received Over the Last Year from Users and/or Manufacturers of SDI-12 Devices

No issues were received from SDI-12 Users and Manufacturers since the last Support Group meeting in 2020. Jerry Calhoun, however, reported that a few technical questions about SDI-12 were posted to the Technical Committee and that all the questions were answered via email. One question was from a student using an Arduino device with SDI-12. Another question was about SDI-12 cable lengths. A third question was about the 87-millisecond window in the SDI-12 Specification.

Mike also reported that under the auspices of the SDI-12 Support Group he presented an online class, using Microsoft Power Point, for the National Hydrologic Warning Council on June 30, 2021. This Power Point presentation is posted on the Support Groups website, on the archives page.

Review of any Suggested Changes to the SDI-12 Specification that any Members of the Technical Committee Are Aware of, Including Any Errors or Omissions in the SDI-12 Specification

No other participants of the meeting had received comments from the membership expressing any need for any other changes or corrections to the SDI-12 Specification.

Discussion About the Use of Extended Commands to Receive Multiple Lines of Text from a Sensor

Joe Thurston explained how Campbell Scientific uses SDI-12 extended commands to request and get documentation from SDI-12 sensors by returning multiple lines of text in response to a single extended command. The issue, however, is that the SDI-12 Specification supports only a single line of text in response to a command.

All present at the meeting agreed that extended commands, as described in the SDI-12 Specification, are not specified in detail on purpose, leaving the details of extended commands up to the sensor manufacturers.

Jerry Calhoun said that if a data recorder is required to support the return of multiple lines of text from a sensor, then this would require a formal change to the SDI-12 Specification.

David Schwarz said it would be weird if the returned of multiple lines of text were not subject to the timing requirements for all SDI-12 commands and extended commands.

Joe Thurston said that the description of extended commands in the SDI-12 Specification is vague and is not explicit in the stating the timing requirements for extended commands.

After a long discussion on this, all present agreed that the SDI-12 Specification should be updated, as a clarification, and not as a change to the specification, expressing how to use extended commands to get more than one line of text from a sensor.

It was agreed that the return of multiple lines of text should have these requirements:

1. The start bit of the sensor's response to an extended command that returns more than one line of text must be received within fifteen milliseconds, like all SDI-12 commands. Jerry Calhoun pointed out that this is essential for the data recorder's use of retries to ensure that the sensor

is awake and able to receive and respond to commands for all SDI-12 commands, including extended commands.

2. A maximum number of characters for each line of text should be specified.

3. The same timing requirements must be imposed on each line of text returned by the sensors as required for all SDI-12 sensor responses, including the allowed time between characters.

4. There must be a maximum allowed timeout, after the <CR><LF> pair, so the data recorder knows when to stop expecting another line of text. Joe Thurston (Campbell Scientific) said that Campbell Scientific has a timeout between 200 and 300 milliseconds.

Conclusion About Getting Multiple Lines of Text. The committee agreed that guidelines for supporting multiple lines of text should be put into writing and distributed to the Technical Committee for review and further discussion. Upon approval of written details, this will be added to the SDI-12 Specification as guidelines for the use of extended commands between data recorders and sensors. All agreed to work out the details for getting multiple lines of text in writing.

Discussion about the use of extended commands to transfer firmware to an SDI-12 sensor

Joe Thurston, Campbell Scientific, led the discussion on his topic. He told the Group that Campbell Scientific is using the SDI-12 bus to load firmware, using a higher baud rate than 1200 baud, into their SDI-12 products.

After a brief discussion on this, Joe Thurston said he simply wanted to share what Campbell Scientific is doing, but Campbell Scientific considers this to be outside of the scope of SDI-12.

Philip Bartlett said his company is doing something similar, but they consider this to be outside the scope of SDI-12, as until the device has firmware in it, it is not an SDI-12 sensor.

After a brief discussion about this, it was agreed that loading firmware into an SDI-12 device is beyond the scope of SDI-12 and that the Support Group should take no action on this subject, agreeing that it is acceptable for producers of SDI-12 products to use the SDI-12 bus to load firmware into SDI-12 sensors.

Review of Website Traffic

Mike Jablonski presented the following summary of visits to www.sdi-12.org, comparing two years of visitor statistics, using three different tolls to quantify web site use:

1. Google Analytics
2. AWSTAT
3. Stats2

All three of these tools are used by www.sdi-12.org.

Google Analytics shows an increase of over 30% in the number of users and sessions over the past year. AWSTAT and Stats2 agree, for the most part, with Google Analytics, showing the website remains popular, receiving numerous visitors each day.

Here are the data as presented by Mike at the meeting:

Google Analytics Past Two Years

Metric	11/1/2019 through 10/31/2020	11/1/2020 through 10/31/2021	Percent Change
Users	5,396	7,232	34%
New Users	5,354	7,243	35%
Sessions	6,935	9,197	32%
Number of Sessions per User	1.29	1.27	
Page Views	13,442	17,541	30%
Pages/Session	1.94	1.91	
Average Session Duration	00:01:30	00:01:09	
Bounce Rate	58.59%	64.75%	
New Visitors	86.9%	88.4%	
Returning Visitors	13.1%	11.6%	

Google Analytics Page Views

Page	Pageviews 11/1/2019 through 10/31/2020	11/1/2020 through 10/31/2021	Percent Change
/	6,179	8,008	29%
/specification.php	3,471	2,553	-26%
/announcement.php	916	875	-5%
/membership_list.php	767	672	-12%
/archives.php	618	975	57%
/membership_form.php	503	487	-35%
/history.html	370	441	19%
/Index.php	305	415	36%
/contact.php	240	341	42%
/specification.php?file_id=1	14	?	

AWSTAT Past Two Years

Metric	11/1/2019 through 10/31/2020	11/1/2020 through 10/31/2021	Percent Change
Unique Visitors	15,696	21,233	35%
Number of Visits	21,924	29,885	36%
Pages	42,453	53,382	25%
Hits	104,086	166,291	60%

Stats2 Past Two Years

Metric	11/1/2019 through 10/31/2020	11/1/2020 through 10/31/2021	Percent Change
Visitors	6,601	8,372	26%
Actions	13,891	17,281	24%
Average Time per Visit	5:40	5:10	
Bounce Rate	25%	31%	

Besides the analytical data from the website tools, Mike reported that a PHP program that he wrote several years ago still counts the downloads of documents from the website:

- PHP program to count downloads of the SDI-12 Specification **= 9,420** (11-10-2020 to 12-3-2021), average = 25 per day (approximately)

- The minutes from the 2020 annual meetings were downloaded 1,892 times.

- The class on SDI-12 presented to the Hydrologic Warning Council, a power point presentation posted on 11/8, was downloaded forty-six times.

Open discussion about SDI-12

Jerry Calhoun said that he received comments by one firm that said they found the Standard Hydrometeorological Exchange Format (SHEF) codes to be inadequate for documenting their sensors using the SDI-12 version 1.4 metadata commands. He said the sensor in question measures groundwater and that attributes like the "angle of the sensor" have no corresponding SHEF codes. Jerry asked if others have received similar comments about the use of SHEF codes. All replied, saying no. It was agreed to take no action on this, at present, but to keep SHEF codes in mind as others may express problems with using SHEF codes as time goes by.

Mike Jablonski reported that he had received comments from Jürgen Wickenhäuser, in Germany. Mr. Wickenhäuser has created an open-source project called Open-SDI12-Blue, a means of using Bluetooth to transmit data from SDI-12 Sensors. Specifically, he requested "Consider extending the Signal Levels to <= 3.3V (as suggested in my article) and Supply to >=3.6."

Jerry Calhoun, with agreement from others, said that this would not be feasible, because it would be a significant change to the SDI-12 Specification of 3.5 to 5.5 volts, with a 12-volt power supply. Jerry said while this may work for many SDI-12 sensors, it would have backwards compatibly issues resulting in a high probability that many sensors would not work with the lower voltages.

Jerry Calhoun said he would respond, in writing, to Mr. Wickenhäuser about this.

Technical Committee

Jerry Calhoun asked all the current members of the Technical Committee if they wished to remain on the Technical Committee. All said yes.

Mike Jablonski pointed out that under the bylaws of the SDI-12 Support Group, the Technical Committee can have up to nine members, and at present, there are seven people on the Technical Committee.

The meeting adjourned after this discussion.

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Minutes from the 2021 General Meeting of the SDI-12 Support Group

The SDI-12 Support Group's annual meeting occurred on Tuesday, December 7, 2021. This meeting was conducted as a virtual meeting, using Zoom, a web conferencing platform for online meetings. This was the second time the SDI-12 Support Group met online. The reason for using Zoom was in response to the world-wide Covid-19 crisis. Michael Jablonski, the chairperson of the SDI-12 Support Group, chaired the meeting.

The posted agenda for the meeting was:

1. welcome and introductions
2. report about the technical committee meeting, as held on December 6, 2021
3. financial report for the past year
4. selection of chairperson and board members for the upcoming year
5. formally select and renew members of the technical committee for the upcoming year

Welcome and Introductions

The following members of the SDI-12 Support Group were present at the meeting:

Philip Bartlett, Forest Technology Systems (USA)
Jerry Calhoun, Chairman of the Technical Committee, Ott Hydromet Corporation (USA, Germany)
Mike Jablonski (Chairman of the SDI-12 Support Group), NR Systems, Inc. (USA)
David Schwarz, Stevens Water (USA)
Wally Wang, Smart Sensor Co. Ltd. (China)

Review of the Technical Committee Meeting

A summary of the 2021 Technical Committee meeting, held the day before on December 6, was waived as all present at this meeting had attended the Technical Committee meeting.

Financial Report for 2018 and 2019

Mike reported that the SDI-12 Support Group is financially sound, having $9,670.25 in cash, $161.91 in liabilities, leaving a balance of $ 9,508.34. The Group received revenues of $ 3,000 over the past year in membership dues. Most paid the dues via PayPal, or via credit card using PayPal, a system that has worked well for the Support Group.

Date	Cache Valley Bank	PayPal	Total	
10/31/2020	$6,840.79	$286.50	$7,127.29	Balance Forward
11/30/2020	$6,840.79	$286.50	$7,127.29	
12/31/2020	$6,840.79	$286.50	$7,127.29	
1/30/2021	$6,840.79	$2,014.50	$8,855.29	(6 members paid)
2/28/2021	$6,840.79	$2,014.50	$8,855.29	(3 members paid)
3/31/2021	$7,740.79	$2,014.50	$9,755.29	
4/30/2021	$7,740.79	$2,014.50	$9,755.29	
5/31/2021	$7,740.79	$2,014.50	$9,755.29	
6/30/2021	$7,740.79	$2,014.50	$9,755.29	
7/31/2021	$7,740.79	$2,014.50	$9,755.29	
8/31/2021	$7,740.79	$2,014.50	$9,755.29	
9/30/2021	$7,740.79	$2,014.50	$9,755.29	
10/31/2021	$7,355.75	($385.04)	$2,014.50	$9,370.25
11/30/2021				
12/6/2021	$7,655.75	$2,014.50	**$9,670.25**	one member paid

total dues received	$3,000.00
PayPal banking fees	$72.00

Liabilities

$27.95 fee for Stats2, website visitor statistics, 13 months @ $2.15/month
$39.99 SSL certificate for sdi-12.org (expires in 3 months)
$39.99 SSL certificate for sdi-12supportgroup.org (expires in 3 months)
$15.99 domain name registration for sdi-12.org for 12 months
$17.99 domain name registration for sdi-12.info (expires at end of Dec)
$10.00 annual report/renewal, state of Utah, Department of Commerce (Dec. 2020)
$10.00 annual report/renewal, state of Utah, Department of Commerce (Dec. 2021)

$161.91 Total Liabilities

Expenses paid were: $ 385.04, paid to NR Systems, Inc., to reimburse Mike Jablonski for hotel expenses for three nights. Mike had presented his class on SDI-12, for the Hydrologic Warning Council, from a hotel room in Seattle, Washington. Mike had to be in Seattle on the date of the class for personal family reasons, requiring a hotel room for high-speed Internet access to present the online class.

Dues Payments

Dues payment by the membership continues to be a problem. Despite sending invoices to the membership, not all members renewed their dues over the past year, including companies that were active in the Support Group over that past year. It was agreed to send invoices out again for the year 2022, asking those members to pay their dues for 2021 as well.

Selection of Chairman and Board Members for 2021-2022

Because Mike Jablonski and Jerry Calhoun had agreed to remain on the Board of Directors, and because they all had the support of all present, their terms were extended for another year. Likewise, although not present at the meeting, Alain Goulet was retained for another term as a board member.

The Technical Committee was also reinstated for another year. Technical Committee members not in attendance at the December 6, 2021, meeting had previously agreed to serve on the committee for another year.

The technical committee members are:

Jerry Calhoun, OTT HydroMet (Chairperson)
Philip Bartlett, Forest Technology Systems (FTS)
Alain Goulet, Environment Canada
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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