

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

Minutes from the 2020 Technical Committee Meeting

The SDI-12 Support Group's Technical Committee held its annual meeting on Monday, November 9, 2020. This meeting was conducted as a virtual meeting, using Zoom, a web conferencing platform for online meetings. This was the first time the SDI-12 Support Group met online. The reason for using Zoom was in response to the world-wide Covid-19 crisis.

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 removing the word "master" from the SDI-12 Specification on page 35
5. review of website
6. review of website traffic
7. open discussion about SDI-12
8. 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 10)

Welcome and Introductions, Companies and Agencies Represented at the Meeting

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

Alain Goulet, Environment Canada
Gerald Kunkle, U.S. Geological Survey, Hydrologic Instrumentation Facility (USA)
Jerry Calhoun, Chairman of the Technical Committee, Ott Hydromet Corporation (USA)
Mike Jablonski (Chairman of the SDI-12 Support Group), NR Systems, Inc. (USA)

Other present at the meeting were:

Edwardo Ventura, Dualbase Tecnologia (Brasil)
Wally Wang, SmartSensor Co. Ltd. (China)
Zhen Pia, IMKO Micromodultechnik GmbH (Germany)

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

and

Discussion About Removing the Word “Master” from the SDI-12 Specification on Page 35

Two issues were received from SDI-12 Users and Manufacturers since the last Support Group meeting in 2018:

1. Use of the word Master, on page 35, section 7.2 Retries, as an inappropriate metaphor.
2. A request to clarify what a sensor is required to do when it receives a valid command while processing a concurrent command.

Issue 1. In response to the first request, all present agreed to deleting two sentences from the following paragraph on page 35:

“Invalid responses include responses in an incorrect format, parity errors, framing errors, CRC errors, or bus contentions. The data recorder must wait for the response to complete before sending a retry. ~~Because the data recorder is the master of the SDI-12 bus, it is not required to issue a retry. The requirement is for a data recorder to support retries.~~ If one of the above conditions exists, the data recorder will issue retries. Under extraordinary conditions, not as normal operating procedure, the data recorder has the option of not issuing retries.”

All present agreed that the requirement for data recorder retries is clearly explained without the two sentences.

Issue 2. In response to the second request, all agreed that a revision to the SDI-12 Sensor Flow, as worked out during the meeting, clarifies the requirements. A copy of the revised flow chart is appended to these minutes.

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 participants of the meeting expressed any need for any other changes or corrections to the SDI-12 Specification.

Review of Website

Jerry Calhoun pointed out two small issues with www.sdi-12.org:

1. The Archives page should say that an SDI-12 Support Group meeting was not held in 2019.
2. Add text saying that although a meeting was not held in 2019, a written summary about SDI-12 Support Group activities was placed on the website.

Review of Website Traffic

Mike Jablonski presented the following summary of visits to www.sdi-12.org, comparing two years of visitor statistics.

In summary, the following data show that the web site continues to get many visitors, but the numbers are lower as opposed to previous years, possibly due to the Covid-19 crisis. The most popular part of the website is access to the SDI-12 Specification. Visitors from all over the world use the web site.

Mike also reported that two different programs are used to get these descriptive statistics: Google Analytics and Awstats. Mike said he suspects that Google Analytics is better at ignoring visits by web bots than AWStats, as the numbers of visitors reported by Google Analytics is lower than the number of visitors reported by AWStats.

Google Analytics Past Year

Metric	11/1/2019 through 10/31/2020
Users	5,396
New Users	5,354
Sessions	6,935
Number of Sessions per User	1.29
Page Views	13,442
Pages/Session	1.94
Average Session Duration	00:01:30
Bounce Rate	58.59%
New Visitors	13.1%
Returning Visitors	86.9%

Pages

Page	Pageviews
/	6,179
/specification.php	3,471
/announcement.php	916
/membership_list.php	767
/archives.php	618
/membership_form.php	503
/history.html	370
/Index.php	305
/contact.php	240
/specification.php?file_id=1	14

Comparisons

Google Analytics, Comparison

Metric	3/1/2019 through 10/31/2019	3/1/2020 through 10/31/2020	Percent Change
Users	4,950	3,529	-28.1%
New Users	4,940	3,485	-29.5%
Sessions	6,204	4,575	-26.3%
Number of Sessions per User	1.25	1.3	
Page Views	11,753	8,653	-27.1%
Pages/Session	1.89	1.89	
Average Session Duration	00:01:14	00:01:16	
Bounce Rate	62.67%	60.57	
New Visitors	12.3%	13.7%	
Returning Visitors	87.7%	86.3%	

AWStats Comparison

Metric	3/1/2019 through 10/31/2019	3/1/2020 through 10/31/2020	Percent Change
Visitors	5,970	4,512	-30.5%
Actions	12,123	9,351	-22.9%
Average Actions	2.0	2.1	
Average Time Per Visit	4 minutes 58 seconds	5 minutes 44 seconds	
Bounce Rate	30%	26%	

Locations Around the World

Locations, 11/1/2019 through 10/31/2019

Country	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
United States	1,635	1,619	2,028	66.12%	1.76	71.16
China	499	494	562	76.87%	1.70	68.05
Japan	251	247	292	61.64%	2.06	85.68
Germany	249	244	331	43.50%	2.15	125.55
Canada	221	221	294	53.40%	1.90	68.10
Australia	210	209	276	48.91%	2.08	98.40
United Kingdom	188	184	268	48.51%	2.29	149.93
France	158	158	187	57.22%	2.03	97.82
South Korea	142	140	167	67.07%	1.96	67.44
Spain	135	133	187	45.99%	2.17	175.49
Brazil	88	85	121	53.72%	1.88	64.48
Italy	86	85	113	39.82%	2.40	108.90
Netherlands	83	81	102	49.02%	1.84	88.73
India	82	82	101	61.39%	2.24	76.67
Russia	62	62	78	57.69%	1.99	113.00
New Zealand	59	59	73	43.84%	2.00	87.71
Poland	52	51	58	37.93%	2.29	194.05
Switzerland	51	52	61	40.98%	2.31	99.31
Austria	50	49	63	44.44%	2.44	92.84
Finland	46	44	64	60.94%	1.75	76.66
Mexico	45	45	67	59.70%	1.97	88.18
Turkey	44	44	81	40.74%	1.98	29.05
South Africa	42	42	76	68.42%	1.50	30.50
Belgium	41	40	45	48.89%	2.02	101.80
Chile	39	39	57	57.89%	1.79	71.56
Vietnam	38	38	41	63.41%	1.98	127.27
United Arab Emirates	37	36	37	86.49%	1.32	19.32
Czechia	37	37	72	45.83%	2.26	90.82
Portugal	36	36	46	54.35%	2.22	126.96
Sweden	35	35	36	69.44%	1.50	95.86
Colombia	33	33	55	41.82%	3.02	257.42
Israel	30	30	49	71.43%	1.49	46.78
Norway	29	29	32	40.63%	2.16	49.06
Egypt	28	28	45	66.67%	1.73	70.44

Country	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
Singapore	26	26	35	51.43%	2.09	70.23
Argentina	25	24	40	60.00%	1.65	92.25
Indonesia	22	21	28	50.00%	1.86	41.50
Peru	22	22	25	68.00%	1.64	110.80
Thailand	22	22	30	56.67%	1.97	41.83
Denmark	21	21	31	35.48%	2.13	109.90
Hungary	21	21	46	41.30%	2.02	58.28
Taiwan	21	21	26	46.15%	3.19	69.50
Greece	20	20	22	45.45%	2.00	188.09
Ireland	19	19	19	68.42%	1.63	57.21
Hong Kong	18	17	28	46.43%	2.32	226.64
Slovakia	18	18	78	35.90%	2.45	82.18
(not set)	18	18	18	72.22%	1.50	85.28
Iran	17	16	20	65.00%	2.00	134.10
Malaysia	16	16	22	72.73%	1.55	92.23
Romania	16	16	16	31.25%	2.25	281.88
Serbia	15	15	19	42.11%	2.32	285.58
Ukraine	13	13	16	37.50%	2.00	102.81
Philippines	12	12	18	77.78%	1.44	3.28
Bulgaria	11	11	12	33.33%	2.08	108.58
Pakistan	10	10	18	83.33%	1.39	20.89
Croatia	9	9	12	16.67%	2.92	263.17
Saudi Arabia	9	9	11	63.64%	1.64	36.27
Slovenia	9	9	9	33.33%	2.00	40.56
Bangladesh	7	7	8	75.00%	1.88	109.63
Belarus	7	7	8	62.50%	1.63	306.25
Costa Rica	7	7	8	50.00%	2.00	262.13
Ecuador	7	7	8	75.00%	1.25	7.25
Latvia	7	7	7	85.71%	1.43	56.43
Bosnia & Herzegovina	6	6	6	33.33%	2.83	186.83
Georgia	6	6	7	57.14%	2.14	195.29
Lebanon	6	6	8	75.00%	1.25	15.50
Lithuania	6	6	9	22.22%	2.00	40.00
Estonia	5	5	8	75.00%	1.50	211.25
Jordan	5	5	5	80.00%	1.20	2.80
Morocco	5	5	5	60.00%	2.00	199.80
Moldova	5	5	6	33.33%	2.00	53.00
Iceland	4	4	4	50.00%	1.75	39.00
Panama	4	4	4	50.00%	1.50	12.25

Country	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
Paraguay	4	4	5	40.00%	1.80	141.20
Armenia	3	3	3	33.33%	2.00	426.00
Cyprus	3	3	3	33.33%	1.67	7.00
Kazakhstan	3	2	4	75.00%	1.75	4.50
Sri Lanka	3	3	10	90.00%	1.10	0.00
Luxembourg	3	3	3	66.67%	5.33	303.67
Tunisia	3	3	3	66.67%	1.33	5.67
Kosovo	3	3	3	0.00%	3.00	909.67
Macao	2	2	2	50.00%	3.50	75.00
Nepal	2	2	3	33.33%	4.33	610.00
Uganda	2	2	2	0.00%	3.00	61.50
Barbados	1	1	2	50.00%	1.50	12.00
Burkina Faso	1	1	1	100.00%	1.00	0.00
Benin	1	1	1	100.00%	1.00	0.00
Bolivia	1	1	2	50.00%	2.50	30.00
Botswana	1	1	1	100.00%	1.00	0.00
Cameroon	1	1	1	100.00%	1.00	0.00
Algeria	1	1	1	100.00%	1.00	0.00
Guatemala	1	1	1	0.00%	4.00	343.00
Iraq	1	1	1	100.00%	1.00	0.00
Jersey	1	1	1	100.00%	1.00	0.00
Kenya	1	1	1	0.00%	3.00	707.00
Cayman Islands	1	1	1	100.00%	1.00	0.00
Montenegro	1	1	1	0.00%	11.00	414.00
New Caledonia	1	1	1	0.00%	2.00	236.00
Niger	1	1	1	100.00%	1.00	0.00
Nigeria	1	1	1	100.00%	1.00	0.00
Oman	1	1	1	100.00%	1.00	0.00
Puerto Rico	1	0	2	50.00%	1.50	205.00
Réunion	1	1	2	50.00%	1.50	124.00
Syria	1	1	1	100.00%	1.00	0.00
Uruguay	1	1	1	100.00%	1.00	0.00
Uzbekistan	1	1	1	100.00%	1.00	0.00
Venezuela	1	1	2	100.00%	1.00	0.00
British Virgin Islands	1	1	1	0.00%	2.00	13.00

SDI-12 Specification Download Counter (by a PHP program written by Mike Jablonski)

Date	Download Count	Downloads/Clicks	Comments
8/08/2017	0		reset to zero
11/5/2017	783	783	Portland, 2017
10/26/2018	9,229	8,446	Baltimore, 2018
11/6/2019	21,577	12,348	Newsletter 1/2020
11/6/2020	31,255	9,678	

Sessions, from Google Analytics, from 10/26/2018 through 11/6/2019 = 6,418

Sessions, from Google Analytics, from 11/7/2019 through 11/6/2020 = 6,976

Conclusion: the download counts are inflated by robots, because the download counts exceed the number of sessions.

Open Discussion about SDI-12

Mike asked Gerald Kunkle, USGS, for an update about the five year plan the USGS has for upgrading their entire hydrologic data acquisition system, as Gerald reported at the 2018 SDI-12 Support Group meetings. Gerald said that no action has yet been taken by the USGS on the SDI-12 portion of that plan, but the intent remains to retain all the SDI-12 command set and most features of SDI-12, when the USGS moves forward with their long-range plan. At present, he said, upgrading the database server side of their system is the most urgent.

Mike asked Gerald Kunkle, USGS, approximately how many stream gaging stations are in the U.S. Gerald said about 10,000, with 8,000 to 9,000 of them transmitting telemetry data. The stations which use telemetry, he said, all use SDI-12 sensors. He added that each stream gaging station has a unique ID number, and all data from all stations are available to the public.

Zhen Pia expressed concern that SDI-12 is hard to develop and program for newcomers to SDI-12. Gerald agreed, saying that when he teaches a class about SDI-12 instrumentation, he starts by simply focusing on the M and D commands as a starting point.

Zhen Pia said some SDI-12 users, in his experience, using the ? character as a wild card address. Jerry Calhoun responded by saying they could likely get away with that, if and only if, one sensor is on the SDI-12 bus. Otherwise, there would be bus contentions as all sensors would respond to the command at once.

Zhen added that source code examples would be helpful. Jerry Calhoun responded by saying examples would depend on the specific hardware and micro-controller used along with other software in place to manage SDI-12 timing and asynchronous requests.

A short discussion of maximum cable lengths for SDI-12 followed. Jerry Calhoun said that many variables determine the maximum cable length, as this subject has been discussed at numerous SDI-12 Support Group meetings over the years.

Technical Committee

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

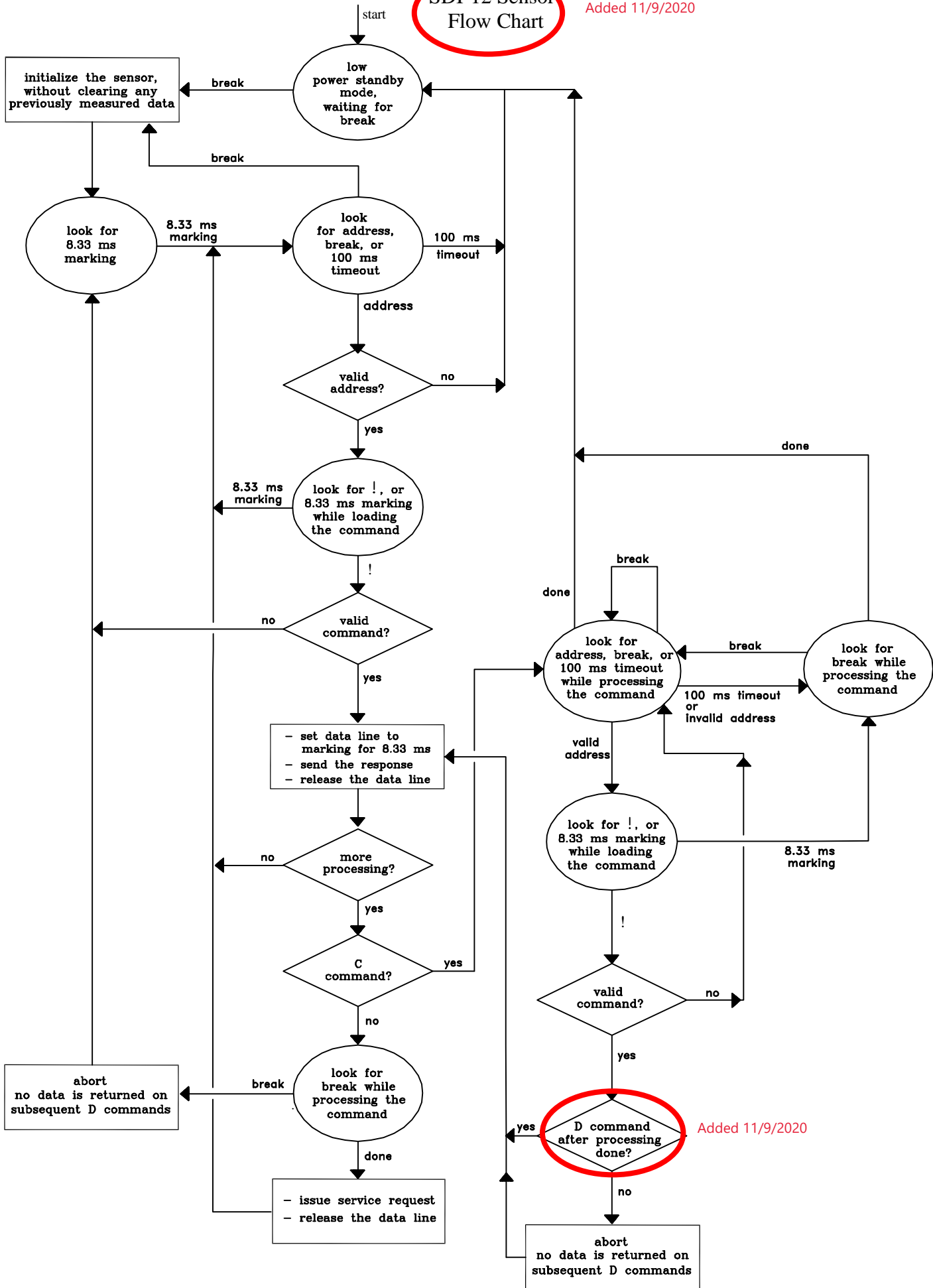
Mike Jablonski pointed out that under the bylaws of the SDI-12 Support Group, the Technical Committee can have up to nine members, and at present, there are seven people on the Technical Committee. He asked Zhen Pia if he would like to join the Technical Committee. Zhen replied that he would have to discuss it with his company before he could answer.

The meeting adjourned after this discussion.

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SDI-12 Sensor Flow Chart

Added 11/9/2020



Added 11/9/2020

SDI-12 Support Group
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Minutes from the 2020 General Meeting of the SDI-12 Support Group

The SDI-12 Support Group's annual meeting occurred on Tuesday, November 10, 2020. This meeting was conducted as a virtual meeting, using Zoom, a web conferencing platform for online meetings. This was the first time the SDI-12 Support Group met online. The reason for using Zoom was in response to the world-wide Covid-19 crisis.

The posted agenda for the meeting was:

1. welcome and introductions
2. report about the Technical Committee meeting held on November 9, 2020
3. financial report and discussion for 2018 and 2019 (two years because a meeting was not held in 2019)
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

Welcome and Introductions

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

Alain Goulet, Environment Canada
Calvin Odell, Meter Group, Inc. (USA)
Eduardo Ventura, Dualbase Tecnologia (Brasil)
Mike Jablonski, (Chairman of the SDI-12 Support Group), NR Systems, Inc. (USA)
Philip Bartlett, Forest Technology Systems (FTS)
Wally Wang, Smart Sensor Co. Ltd. (China)
Zhen Pia, IMKO Micromodultechnik GmbH (Germany)

Review of the Technical Committee Meeting

A summary of the 2020 Technical Committee meeting, held the day before on November 9, was provided by Mike Jablonski.

Financial Report for 2018 and 2019

Although the agenda said the financial report is for 2018 and 2019, Mike Jablonski summarized all financial activity from January 2018 to November 8, 2020.

Mike Jablonski reported that the SDI-12 Support Group has \$ 7,122.29 in cash, and zero bills due to be paid.

The total amount in dues collected from January 1, 2018 to present totals \$ 6,310.00.

Expenses paid were:

\$ 1,186.31 paid on 12/08/2018 to NR Systems, Inc., for Mike Jablonski's travel expenses for the 2018 Support Group meetings in Baltimore, Maryland, which includes a fee of \$ 595.00 paid to the American Water Resources Association, a registration fee for their 2018 annual conference where the SDI-12 meetings held.

\$ 1,137.47 paid on 6/28/2020 to NR Systems, Inc., for reimbursement for domain names and web hosting of www.sdi-12.org, which is now paid in advance until January 2021. This invoice also included a fee of \$ 350.00 for a one-day registration fee to the American Water Resources Association, for their 2019 conference in Salt Lake City, Utah; Mike Jablonski attended that conference for one day only, to meet with the new CEO of AWRA, Dresden Farrand, to discuss continuing the relationship between the Support Group and AWRA.

Dues Payments

Mike proposed sending invoices to the SDI-12 Support Group's membership to get a better response to dues payments. Mike said that some companies request an invoice, after which he prepares an invoice and then they promptly pay the dues. Mike has created invoices only upon request. For 2021 Mike proposed sending invoices unconditionally. All present agreed with that plan.

Selection of Chairman and Board Members for 2021-2022

Because Mike Jablonski, Jerry Calhoun, and Alain Goulet 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.

The Technical Committee was also reinstated for another year. Technical Committee members not present at the November 9, 2020 meeting had previously agreed to serve on the committee for another year.

The technical committee members are:

Jerry Calhoun, OTT HydroMet (Chairman)
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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