(161) 5-30

Tu, Scott

From: Tu, Scott
Sent: Monday, July 19, 2004 4:41 PM
To: 'Sharon Stohrer'
Cc: White, Charles; Cheslak, Edward; Kenzler, Eric; Jereb, Thomas; Zemke, William; Jim Canaday
Subject: RE: QA/QC

sentSWRCB07 1904.zip (1 MB)

Sharon:
Sorry for my late response. I was involved in meetings and field work the entire week last week. As I have explained to you during the lunch break in ERC meeting, the 150 units is the total count we have on temperature data loggers for the entire PG&E watersheds. I have only provided you those that are used for NFFR watershed (about 87 units); others are not used at all for NFFR. Therefore, the QA/QC sheets of the 87 units should provide you the complete record for NFFR (UNFFR and Rock Creek-Cresta). However, monitoring temperature loggers in the lower NFFR, namely Poe, involved different recorders. We have been using Hungrun unit consistently throughout the Poe Re-licensing project. There have been a total of 8 units we used for Poe in 2003. I am in the process putting together QA/QC for Poe and will send the electronic spreadsheets on email within a week (or sooner). Yes, a hard copy and a CD will be sent to you.
With respect to the bug that 'crash' your computer, I am as puzzled as you are. The spreadsheet is generated from PG&E desktop publishing unit. Normally, PG&E has a very rigorous anti-virus program that runs and checks the files once a week or so. I don't believe there is any virus in the program. I speculate this may have been caused, not by virus, but by some compatibility issue between EXCEL 1997 vs. 2003. PG&E has just recently upgrade the EXCEL to 2003. Another possibility is the 'circular reference warning' that was created when our desktop unit 'copied and pasted' values from the various tables into a summary table. This 'warning' does not create any difference in value, but may cause instability when you open up the file. I have corrected this problem and is attaching the spreadsheet in this email. To be on the safe side, I am sending two versions of these spreadsheets (Pre- and post-season) to you, one for EXCEL 2003 and the other is downward compatible to Excel 97. Three files will be sent, all compressed into a zip file (the pre-seaon ECEL 2003 is already in your CD). Please try them out and let me know how they turn out. I need to know where the "BUG" is hiding.

-----Original Message-----
From: Sharon Stohrer [mailto:SSTOHRER@waterrights.swrcb.ca.gov]
Sent: Monday, July 12, 2004 1:36 PM
To: Tu, Scott
Cc: White, Charles; Cheslak, Edward; Kenzler, Eric; Jereb, Thomas; Zemke, William; Jim Canaday
Subject: RE: QA/QC

Scott,
I received the QA/QC package at lunchtime today. Thank you for compiling this information. In looking through the materials, I realize that individual calibration reports have been included for 87 Minilog units. However, you explained that there are 150 units "in service." Are all 150 units being rotated through the UNFFR drainage, or is the 87-unit subset a complete QA/QC record of all those deployed in this watershed? In addition, I would like to know if the Poe dataloggers have been included in this set of records. If so, is there any way to identify the units that have been used specifically for the Poe Reach? Please let me know if there will be additional QA/QC submitted for the Poe.

Although I have attempted to open the Excel files on the CD, I find that something is wrong (either on my computer or on the disk?). The files will not open, and even worse yet, they "crash" my computer with virus messages when I repeatedly try to open them.... I have used my virus scan software on the CD, and it does not appear to detect a virus - I'm puzzled, and appreciate that you have provided hardcopy of the materials. Can I

assume that the set of hardopies is complete to cover everything on the disk? (Have you got suggestions on how best to open the CD?)

Thanks again for your assistance, I look forward to your clarifying response.
Sharon

~~~~~~~~~~~~~~~~~~~~~~~~~~
Sharon Stohrer
State Water Resources Control Board
1001 I Street, 14th Floor
Sacramento, CA 95814
(916) 341-5397

SSTOHRER@waterrights.swrcb.ca.gov
~~~~~~~~~~~~~~~~~~~~~~~~~~

>>> "Tu, Scott" <SST3@pge.com> 07/08/04 04:11PM >>>
Sharon:
The QA/QC package will be sent tomorrow by Overnight Express before 2 pm. It will be shipped to SWRCB office at 1001 I Street. If you want have it delivered at different address, please let me know before 10 am tomorrow, 7/9.
The package includes the following three types of equipment categories:
1. In-stream recording units (VEMCO). We will provide calibration certification datasheet for each VEMCO units that have been in service during 2003. We maintained all temperature loggers for the entire PG&E service territory and we rotated the units randomly, therefore, we are providing the entire suite of records we have. This is a heavy deck since there are 150+ units in service. The calibration included pre-season and post-season record. Summaries of both pre- and post-season calibration will be included.
2. Internal Powerhouses and others. Calibration record used to record water temperature internal powerhouses or pressure transducer units will be included.
3. Telemetered Stations. Calibration and repair (damaged by lightning) records of both telemetered stations (NF56 and NF57) are included. We also duplicated these two telemetered stations with in-situ loggers (in Category 1) as backup. Comparison between these two categories, which is another form of QA/QC, have been documented in the Annual Report (copy from the report is included for your reference).

In the package, you will have a hard copy and a CD which will include the electronic set of datasheets. Let me know if you need any additional information.

-----Original Message-----
From: Sharon Stohrer [mailto:SSTOHRER@waterrights.swrcb.ca.gov]
Sent: Tuesday, July 06, 2004 7:49 PM
To: Tu, Scott
Cc: Jereb, Thomas; Zemke, William; Jim Canaday
Subject: QA/QC

Hi Scott,
I hope that you had a great holiday weekend! Now, back to business....

Please let me know the status of the NFFR water temperature QA/QC materials that you are compiling. As we discussed, I need to have the RC-C temperature program QA/QC information, along with Poe QA/QC and any additional UNFFR verification that you have. You said that you were certain that you could obtain all of the 2003 records on CD or in hard copy. This will be fine, and after review I can let you know if we need any additional records.

I would really appreciate having these records by the end of this week, if possible. If you have compiled this info would it be possible to overnight-mail them to me?

Thank you for your help on this matter. Sharon

Sharon Stohrer
State Water Resources Control Board
1001 I Street, 14th Floor
Sacramento, CA 95814

(916) 341-5397

SSTOHRER@waterrights.swrcb.ca.gov

Poe Project 2003
FERC 2107

Deployment	Type	Pod No.	In-Date	Batteries
Poe - 1A	Seamon Mini	D821	05/29/03	20.3%
Poe - 5	Seamon Mini	D832	05/30/03	22.5%
Mill Creek	Seamon Mini	D824	05/29/03	20.1%
Flea Valley	Seamon Mini	D823	05/29/03	20.2%
Poe - 2A	Seamon Mini	D822	05/29/03	20.2%
Poe - 6	Seamon Mini	D786	05/30/03	19.6%
Poe - 3	Seamon Mini	D785	05/30/03	19.6%
Poe - 7	Seamon Mini	D543	06/05/03	18.0%

		Manufactures Specs	
Recorder	Model	Accuracy	Resolution
Hungrun	Seamon Mini	±0.1°C	±0.025°C

PRE-SEASON CALIBRATION FOR SEAMON-MINI LOGGER

MARCH 2002

NOTE: Manufacturer recommends next calibration within two years

Pre-season Calibration for Seamon-Mini Logger

Seamon mini **No.00D543**

MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.8
3/13/2002	10:01:00	24.95
3/13/2002	10:02:00	24.95
3/13/2002	10:03:00	24.95
3/13/2002	10:04:00	24.95
3/13/2002	10:05:00	24.95
3/13/2002	10:06:00	24.975
3/13/2002	10:07:00	24.975
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	25
3/13/2002	10:10:00	25
3/13/2002	10:11:00	25
3/13/2002	10:12:00	25
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25.025
3/13/2002	10:18:00	25.025
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.05
3/13/2002	10:21:00	25.05
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.7
3/13/2002	10:24:00	24.425
3/13/2002	10:25:00	24.125
3/13/2002	10:26:00	23.85
3/13/2002	10:27:00	23.6
3/13/2002	10:28:00	23.325
3/13/2002	10:29:00	23.05
3/13/2002	10:30:00	22.8
3/13/2002	10:31:00	22.55
3/13/2002	10:32:00	22.25
3/13/2002	10:33:00	22
3/13/2002	10:34:00	21.725
3/13/2002	10:35:00	21.475
3/13/2002	10:36:00	21.35
3/13/2002	10:37:00	21.15
3/13/2002	10:38:00	20.9
3/13/2002	10:39:00	20.625
3/13/2002	10:40:00	20.4
3/13/2002	10:41:00	20.175
3/13/2002	10:42:00	20.125
3/13/2002	10:43:00	20.15
3/13/2002	10:44:00	20.075
3/13/2002	10:45:00	20.05

Cal Bath		Seamon	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.05	-0.01
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.23	-0.02
11:40:00	14.99	15.05	-0.06
11:42:00	14.99	15.05	-0.06
13:35:00	9.99	10.03	-0.04
13:49:00	9.95	10.03	-0.08
14:45:00	4.98	5.08	-0.09
14:48:00	5.00	5.08	-0.08

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D785**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.725
3/13/2002	10:01:00	24.875
3/13/2002	10:02:00	24.95
3/13/2002	10:03:00	24.95
3/13/2002	10:04:00	24.95
3/13/2002	10:05:00	24.95
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.95
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	24.975
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	25
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25.025
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.95
3/13/2002	10:23:00	24.75
3/13/2002	10:24:00	24.5
3/13/2002	10:25:00	24.225
3/13/2002	10:26:00	23.95
3/13/2002	10:27:00	23.65
3/13/2002	10:28:00	23.4
3/13/2002	10:29:00	23.125
3/13/2002	10:30:00	22.85
3/13/2002	10:31:00	22.625
3/13/2002	10:32:00	22.35
3/13/2002	10:33:00	22.075
3/13/2002	10:34:00	21.825
3/13/2002	10:35:00	21.55
3/13/2002	10:36:00	21.4
3/13/2002	10:37:00	21.25
3/13/2002	10:38:00	21
3/13/2002	10:39:00	20.725
3/13/2002	10:40:00	20.475
3/13/2002	10:41:00	20.225
3/13/2002	10:42:00	20.15
3/13/2002	10:43:00	20.175
3/13/2002	10:44:00	20.125
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

	Cal Bath	**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.05	-0.06
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.05	-0.06
13:49:00	9.95	10.00	-0.05
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.08	-0.08

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D786**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.8
3/13/2002	10:01:00	24.925
3/13/2002	10:02:00	24.95
3/13/2002	10:03:00	24.95
3/13/2002	10:04:00	24.95
3/13/2002	10:05:00	24.95
3/13/2002	10:06:00	24.975
3/13/2002	10:07:00	24.975
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	24.975
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	25
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25.025
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.05
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.7
3/13/2002	10:24:00	24.4
3/13/2002	10:25:00	24.125
3/13/2002	10:26:00	23.825
3/13/2002	10:27:00	23.6
3/13/2002	10:28:00	23.325
3/13/2002	10:29:00	23.05
3/13/2002	10:30:00	22.8
3/13/2002	10:31:00	22.525
3/13/2002	10:32:00	22.25
3/13/2002	10:33:00	21.975
3/13/2002	10:34:00	21.725
3/13/2002	10:35:00	21.475
3/13/2002	10:36:00	21.35
3/13/2002	10:37:00	21.175
3/13/2002	10:38:00	20.9
3/13/2002	10:39:00	20.625
3/13/2002	10:40:00	20.4
3/13/2002	10:41:00	20.15
3/13/2002	10:42:00	20.125
3/13/2002	10:43:00	20.15
3/13/2002	10:44:00	20.1
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.03	-0.04
13:49:00	9.95	10.03	-0.08
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.05	-0.05

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D821**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.7
3/13/2002	10:01:00	24.825
3/13/2002	10:02:00	24.95
3/13/2002	10:03:00	24.975
3/13/2002	10:04:00	25
3/13/2002	10:05:00	25
3/13/2002	10:06:00	25
3/13/2002	10:07:00	25.025
3/13/2002	10:08:00	25.025
3/13/2002	10:09:00	25.05
3/13/2002	10:10:00	25.05
3/13/2002	10:11:00	25.05
3/13/2002	10:12:00	25.05
3/13/2002	10:13:00	25.075
3/13/2002	10:14:00	25.075
3/13/2002	10:15:00	25.075
3/13/2002	10:16:00	25.075
3/13/2002	10:17:00	25.075
3/13/2002	10:18:00	25.075
3/13/2002	10:19:00	25.1
3/13/2002	10:20:00	25.1
3/13/2002	10:21:00	25.1
3/13/2002	10:22:00	25.025
3/13/2002	10:23:00	24.85
3/13/2002	10:24:00	24.6
3/13/2002	10:25:00	24.35
3/13/2002	10:26:00	24.05
3/13/2002	10:27:00	23.825
3/13/2002	10:28:00	23.6
3/13/2002	10:29:00	23.25
3/13/2002	10:30:00	23.025
3/13/2002	10:31:00	22.75
3/13/2002	10:32:00	22.475
3/13/2002	10:33:00	22.2
3/13/2002	10:34:00	21.9
3/13/2002	10:35:00	21.675
3/13/2002	10:36:00	21.475
3/13/2002	10:37:00	21.375
3/13/2002	10:38:00	21.15
3/13/2002	10:39:00	20.85
3/13/2002	10:40:00	20.65
3/13/2002	10:41:00	20.375
3/13/2002	10:42:00	20.225
3/13/2002	10:43:00	20.2
3/13/2002	10:44:00	20.2
3/13/2002	10:45:00	20.125
3/13/2002	10:46:00	20.1

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.08	-0.05
10:20:00	25.04	25.10	-0.06
10:52:00	20.10	20.13	-0.02
11:02:00	20.21	20.23	-0.02
11:40:00	14.99	15.05	-0.06
11:42:00	14.99	15.05	-0.06
13:35:00	9.99	10.03	-0.04
13:49:00	9.95	10.00	-0.05
14:45:00	4.98	5.00	-0.02
14:48:00	5.00	5.00	0.00

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D822**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.8
3/13/2002	10:01:00	24.925
3/13/2002	10:02:00	24.95
3/13/2002	10:03:00	24.95
3/13/2002	10:04:00	24.95
3/13/2002	10:05:00	24.95
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.95
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	24.975
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	25
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25.025
3/13/2002	10:16:00	25.025
3/13/2002	10:17:00	25.025
3/13/2002	10:18:00	25.025
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.65
3/13/2002	10:24:00	24.425
3/13/2002	10:25:00	24.1
3/13/2002	10:26:00	23.825
3/13/2002	10:27:00	23.55
3/13/2002	10:28:00	23.275
3/13/2002	10:29:00	23.025
3/13/2002	10:30:00	22.775
3/13/2002	10:31:00	22.5
3/13/2002	10:32:00	22.225
3/13/2002	10:33:00	21.95
3/13/2002	10:34:00	21.675
3/13/2002	10:35:00	21.425
3/13/2002	10:36:00	21.35
3/13/2002	10:37:00	21.1
3/13/2002	10:38:00	20.875
3/13/2002	10:39:00	20.6
3/13/2002	10:40:00	20.325
3/13/2002	10:41:00	20.125
3/13/2002	10:42:00	20.125
3/13/2002	10:43:00	20.15
3/13/2002	10:44:00	20.075
3/13/2002	10:45:00	20.025
3/13/2002	10:46:00	20.05

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.03	0.00
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.03	-0.04
13:49:00	9.95	10.03	-0.08
14:45:00	4.98	5.08	-0.09
14:48:00	5.00	5.08	-0.08

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D823**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.75
3/13/2002	10:01:00	24.875
3/13/2002	10:02:00	24.925
3/13/2002	10:03:00	24.925
3/13/2002	10:04:00	24.925
3/13/2002	10:05:00	24.925
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.95
3/13/2002	10:08:00	24.95
3/13/2002	10:09:00	24.95
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	24.975
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25
3/13/2002	10:19:00	25
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.7
3/13/2002	10:24:00	24.4
3/13/2002	10:25:00	24.1
3/13/2002	10:26:00	23.825
3/13/2002	10:27:00	23.6
3/13/2002	10:28:00	23.3
3/13/2002	10:29:00	23.025
3/13/2002	10:30:00	22.825
3/13/2002	10:31:00	22.525
3/13/2002	10:32:00	22.275
3/13/2002	10:33:00	21.95
3/13/2002	10:34:00	21.75
3/13/2002	10:35:00	21.425
3/13/2002	10:36:00	21.375
3/13/2002	10:37:00	21.15
3/13/2002	10:38:00	20.875
3/13/2002	10:39:00	20.625
3/13/2002	10:40:00	20.375
3/13/2002	10:41:00	20.175
3/13/2002	10:42:00	20.15
3/13/2002	10:43:00	20.15
3/13/2002	10:44:00	20.075
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.05	-0.06
13:49:00	9.95	10.00	-0.05
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.05	-0.05

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D823**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.75
3/13/2002	10:01:00	24.875
3/13/2002	10:02:00	24.925
3/13/2002	10:03:00	24.925
3/13/2002	10:04:00	24.925
3/13/2002	10:05:00	24.925
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.95
3/13/2002	10:08:00	24.95
3/13/2002	10:09:00	24.95
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	24.975
3/13/2002	10:13:00	25
3/13/2002	10:14:00	25
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25
3/13/2002	10:19:00	25
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.7
3/13/2002	10:24:00	24.4
3/13/2002	10:25:00	24.1
3/13/2002	10:26:00	23.825
3/13/2002	10:27:00	23.6
3/13/2002	10:28:00	23.3
3/13/2002	10:29:00	23.025
3/13/2002	10:30:00	22.825
3/13/2002	10:31:00	22.525
3/13/2002	10:32:00	22.275
3/13/2002	10:33:00	21.95
3/13/2002	10:34:00	21.75
3/13/2002	10:35:00	21.425
3/13/2002	10:36:00	21.375
3/13/2002	10:37:00	21.15
3/13/2002	10:38:00	20.875
3/13/2002	10:39:00	20.625
3/13/2002	10:40:00	20.375
3/13/2002	10:41:00	20.175
3/13/2002	10:42:00	20.15
3/13/2002	10:43:00	20.15
3/13/2002	10:44:00	20.075
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.05	-0.06
13:49:00	9.95	10.00	-0.05
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.05	-0.05

Pre-season Calibration for Seamon-Mini Logger

Seamon mini **No.00D824**

MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.75
3/13/2002	10:01:00	24.925
3/13/2002	10:02:00	24.925
3/13/2002	10:03:00	24.925
3/13/2002	10:04:00	24.95
3/13/2002	10:05:00	24.95
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.95
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	24.975
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	24.975
3/13/2002	10:13:00	24.975
3/13/2002	10:14:00	24.975
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.875
3/13/2002	10:23:00	24.7
3/13/2002	10:24:00	24.4
3/13/2002	10:25:00	24.1
3/13/2002	10:26:00	23.85
3/13/2002	10:27:00	23.6
3/13/2002	10:28:00	23.3
3/13/2002	10:29:00	23.075
3/13/2002	10:30:00	22.775
3/13/2002	10:31:00	22.525
3/13/2002	10:32:00	22.25
3/13/2002	10:33:00	22
3/13/2002	10:34:00	21.725
3/13/2002	10:35:00	21.475
3/13/2002	10:36:00	21.35
3/13/2002	10:37:00	21.2
3/13/2002	10:38:00	20.9
3/13/2002	10:39:00	20.65
3/13/2002	10:40:00	20.4
3/13/2002	10:41:00	20.175
3/13/2002	10:42:00	20.125
3/13/2002	10:43:00	20.175
3/13/2002	10:44:00	20.1
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

Cal Bath		Seamon	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.05	-0.06
13:49:00	9.95	10.03	-0.08
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.05	-0.05

Pre-season Calibration for Seamon-Mini Logger

Seamon	mini	**No.00D832**
MM/DD/YY	hh:mm:ss	Temperature
3/13/2002	10:00:00	24.675
3/13/2002	10:01:00	24.825
3/13/2002	10:02:00	24.9
3/13/2002	10:03:00	24.9
3/13/2002	10:04:00	24.925
3/13/2002	10:05:00	24.925
3/13/2002	10:06:00	24.95
3/13/2002	10:07:00	24.975
3/13/2002	10:08:00	24.975
3/13/2002	10:09:00	24.975
3/13/2002	10:10:00	24.975
3/13/2002	10:11:00	24.975
3/13/2002	10:12:00	24.975
3/13/2002	10:13:00	24.975
3/13/2002	10:14:00	24.975
3/13/2002	10:15:00	25
3/13/2002	10:16:00	25
3/13/2002	10:17:00	25
3/13/2002	10:18:00	25.025
3/13/2002	10:19:00	25.025
3/13/2002	10:20:00	25.025
3/13/2002	10:21:00	25.025
3/13/2002	10:22:00	24.9
3/13/2002	10:23:00	24.775
3/13/2002	10:24:00	24.475
3/13/2002	10:25:00	24.25
3/13/2002	10:26:00	23.95
3/13/2002	10:27:00	23.675
3/13/2002	10:28:00	23.4
3/13/2002	10:29:00	23.15
3/13/2002	10:30:00	22.9
3/13/2002	10:31:00	22.675
3/13/2002	10:32:00	22.45
3/13/2002	10:33:00	22.05
3/13/2002	10:34:00	21.85
3/13/2002	10:35:00	21.55
3/13/2002	10:36:00	21.4
3/13/2002	10:37:00	21.25
3/13/2002	10:38:00	20.975
3/13/2002	10:39:00	20.7
3/13/2002	10:40:00	20.55
3/13/2002	10:41:00	20.225
3/13/2002	10:42:00	20.175
3/13/2002	10:43:00	20.175
3/13/2002	10:44:00	20.1
3/13/2002	10:45:00	20.05
3/13/2002	10:46:00	20.05

Cal Bath		**Seamon**	
Time	Temp	temp	diff
10:15:00	25.02	25.00	0.02
10:20:00	25.04	25.03	0.02
10:52:00	20.10	20.08	0.03
11:02:00	20.21	20.20	0.01
11:40:00	14.99	15.03	-0.04
11:42:00	14.99	15.03	-0.04
13:35:00	9.99	10.03	-0.04
13:49:00	9.95	10.00	-0.05
14:45:00	4.98	5.05	-0.07
14:48:00	5.00	5.05	-0.05

POST-SEASON CALIBRATION FOR SEAMON-MINI LOGGER

MAY 2004

NOTE: Manufacturer recommends next calibration within two years

Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D785

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012*.

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by:

Sig. Karitas

Approved by:

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D785

C0: 6.75275024128271890E+0001
C1: -4.21636598761876687E+0000
C2: 1.76160501527134728E-0001
C3: -6.43836756763927946E-0003
C4: 1.31636857888833008E-0004
C5: -1.25827887538372298E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.013	897	0.006
2	39.0031	39.003	942	0.001
3	38.0020	38.014	987	-0.012
4	36.9991	37.003	1034	-0.004
5	35.9971	35.992	1082	0.005
6	35.0011	35.001	1130	0.000
7	34.0045	34.009	1179	-0.004
8	33.0020	32.995	1230	0.007
9	32.0122	32.000	1281	0.012
10	31.0234	31.021	1332	0.002
11	30.0335	30.038	1384	-0.005
12	29.0438	29.052	1437	-0.008
13	28.0661	28.061	1491	0.005
14	27.0790	27.083	1545	-0.004
15	26.0982	26.099	1600	-0.001
16	25.1241	25.125	1655	-0.001
17	24.1418	24.144	1711	-0.002
18	23.1658	23.171	1767	-0.005
19	22.1913	22.189	1824	0.003
20	21.2173	21.213	1881	0.004
21	20.2426	20.243	1938	-0.000
22	19.2743	19.277	1995	-0.003
23	18.2997	18.298	2053	0.001
24	17.3220	17.322	2111	0.000
25	16.3481	16.346	2169	0.002
26	15.3731	15.372	2227	0.002
27	14.3847	14.379	2286	0.006
28	13.4052	13.401	2344	0.004
29	12.4224	12.420	2402	0.002
30	11.4294	11.435	2460	-0.005
31	10.4340	10.444	2518	-0.010
32	9.4373	9.429	2577	0.009
33	8.4291	8.440	2634	-0.010
34	7.4175	7.424	2692	-0.006
35	6.3987	6.396	2750	0.003
36	5.3586	5.356	2808	0.003
37	4.3197	4.319	2865	0.001
38	3.2704	3.266	2922	0.005
39	2.1996	2.194	2979	0.005
40	1.1191	1.122	3035	-0.003
41	0.0263	0.029	3091	-0.003
42	-1.0902	-1.088	3147	-0.002
43	-2.2307	-2.232	3203	0.001

Calibration result:
Max (m°C): 1.23779883328120E+0001
In pos : 9

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D786

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by:

Sig. Kaeitan

Approved by:

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D786

C0: 6.73548495163248748E+0001
C1: -4.17607378802844161E+0000
C2: 1.72097316555119105E-0001
C3: -6.23458826290978190E-0003
C4: 1.26711857974312529E-0004
C5: -1.21232021971605549E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.015	896	0.003
2	39.0031	39.006	941	-0.003
3	38.0020	37.997	987	0.005
4	36.9991	37.008	1033	-0.009
5	35.9971	35.998	1081	-0.001
6	35.0011	35.008	1129	-0.006
7	34.0045	33.996	1179	0.009
8	33.0020	33.003	1229	-0.001
9	32.0122	32.007	1280	0.005
10	31.0234	31.029	1331	-0.006
11	30.0335	30.028	1384	0.005
12	29.0438	29.042	1437	0.002
13	28.0661	28.070	1490	-0.004
14	27.0790	27.074	1545	0.005
15	26.0982	26.091	1600	0.008
16	25.1241	25.135	1654	-0.011
17	24.1418	24.137	1711	0.005
18	23.1658	23.165	1767	0.001
19	22.1913	22.201	1823	-0.009
20	21.2173	21.226	1880	-0.008
21	20.2426	20.239	1938	0.003
22	19.2743	19.275	1995	-0.000
23	18.2997	18.296	2053	0.003
24	17.3220	17.321	2111	0.001
25	16.3481	16.346	2169	0.002
26	15.3731	15.372	2227	0.001
27	14.3847	14.380	2286	0.004
28	13.4052	13.403	2344	0.002
29	12.4224	12.423	2402	-0.001
30	11.4294	11.438	2460	-0.009
31	10.4340	10.431	2519	0.003
32	9.4373	9.434	2577	0.004
33	8.4291	8.428	2635	0.001
34	7.4175	7.412	2693	0.005
35	6.3987	6.403	2750	-0.004
36	5.3586	5.363	2808	-0.004
37	4.3197	4.326	2865	-0.007
38	3.2704	3.274	2922	-0.003
39	2.1996	2.203	2979	-0.003
40	1.1191	1.112	3036	0.007
41	0.0263	0.019	3092	0.007
42	-1.0902	-1.098	3148	0.008
43	-2.2307	-2.220	3203	-0.010

Calibration result:
Max (m°C): -1.12913251638773E+0001
In pos : 16

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Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D821

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by:

Sig. Karitas

Approved by:

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Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D821

C0: 6.73121978148183371E+0001
C1: -4.16761712013339089E+0000
C2: 1.71475951450266507E-0001
C3: -6.20318588583976203E-0003
C4: 1.25893647630435238E-0004
C5: -1.20379048061755132E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.017	896	0.002
2	39.0031	39.008	941	-0.005
3	38.0020	38.000	987	0.002
4	36.9991	36.992	1034	0.007
5	35.9971	36.004	1081	-0.007
6	35.0011	34.994	1130	0.007
7	34.0045	34.004	1179	0.000
8	33.0020	33.012	1229	-0.010
9	32.0122	32.018	1280	-0.006
10	31.0234	31.022	1332	0.002
11	30.0335	30.041	1384	-0.007
12	29.0438	29.038	1438	0.006
13	28.0661	28.067	1491	-0.001
14	27.0790	27.073	1546	0.006
15	26.0982	26.090	1601	0.008
16	25.1241	25.119	1656	0.005
17	24.1418	24.139	1712	0.002
18	23.1658	23.169	1768	-0.003
19	22.1913	22.188	1825	0.003
20	21.2173	21.215	1882	0.003
21	20.2426	20.247	1939	-0.004
22	19.2743	19.283	1996	-0.009
23	18.2997	18.306	2054	-0.006
24	17.3220	17.331	2112	-0.009
25	16.3481	16.341	2171	0.007
26	15.3731	15.368	2229	0.005
27	14.3847	14.394	2287	-0.010
28	13.4052	13.401	2346	0.004
29	12.4224	12.422	2404	0.000
30	11.4294	11.421	2463	0.008
31	10.4340	10.432	2521	0.002
32	9.4373	9.435	2579	0.002
33	8.4291	8.430	2637	-0.001
34	7.4175	7.415	2695	0.002
35	6.3987	6.407	2752	-0.008
36	5.3586	5.349	2811	0.010
37	4.3197	4.313	2868	0.007
38	3.2704	3.279	2924	-0.009
39	2.1996	2.209	2981	-0.009
40	1.1191	1.119	3038	0.001
41	0.0263	0.026	3094	0.001
42	-1.0902	-1.091	3150	0.001
43	-2.2307	-2.233	3206	0.003

Calibration result:
Max (m°C): -1.00913557146540E+0001
In pos : 8

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Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D822

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by:

Sig. Karitas

Approved by:

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D822

C0: 6.72865747293686827E+0001
C1: -4.18657906205918960E+0000
C2: 1.74731965376596923E-0001
C3: -6.43615580781449836E-0003
C4: 1.33247655620397532E-0004
C5: -1.28799031544587637E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.025	893	-0.006
2	39.0031	38.994	939	0.009
3	38.0020	38.007	984	-0.005
4	36.9991	36.998	1031	0.001
5	35.9971	35.989	1079	0.008
6	35.0011	35.000	1127	0.002
7	34.0045	34.009	1176	-0.004
8	33.0020	32.996	1227	0.006
9	32.0122	32.021	1277	-0.009
10	31.0234	31.024	1329	-0.000
11	30.0335	30.042	1381	-0.009
12	29.0438	29.038	1435	0.006
13	28.0661	28.066	1488	-0.000
14	27.0790	27.089	1542	-0.010
15	26.0982	26.088	1598	0.010
16	25.1241	25.115	1653	0.009
17	24.1418	24.152	1708	-0.010
18	23.1658	23.163	1765	0.003
19	22.1913	22.182	1822	0.009
20	21.2173	21.225	1878	-0.007
21	20.2426	20.239	1936	0.004
22	19.2743	19.275	1993	-0.000
23	18.2997	18.297	2051	0.002
24	17.3220	17.323	2109	-0.001
25	16.3481	16.350	2167	-0.001
26	15.3731	15.377	2225	-0.004
27	14.3847	14.387	2284	-0.002
28	13.4052	13.412	2342	-0.006
29	12.4224	12.417	2401	0.006
30	11.4294	11.434	2459	-0.005
31	10.4340	10.429	2518	0.005
32	9.4373	9.434	2576	0.003
33	8.4291	8.431	2634	-0.002
34	7.4175	7.418	2692	-0.001
35	6.3987	6.394	2750	0.005
36	5.3586	5.356	2808	0.002
37	4.3197	4.322	2865	-0.003
38	3.2704	3.272	2922	-0.001
39	2.1996	2.203	2979	-0.003
40	1.1191	1.114	3036	0.005
41	0.0263	0.021	3092	0.005
42	-1.0902	-1.075	3147	-0.015
43	-2.2307	-2.238	3204	0.008

Calibration result:
Max (m°C): -1.52184147129220E+0001
In pos : 42

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D823

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012*.

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by: Sig. Karitas

Approved by:

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RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D823

C0: 6.74656954796619707E+0001
C1: -4.22055670437473273E+0000
C2: 1.77651271881100509E-0001
C3: -6.56510689879395012E-0003
C4: 1.35925595867884909E-0004
C5: -1.31015012372701296E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.012	895	0.007
2	39.0031	39.002	940	0.001
3	38.0020	38.013	985	-0.011
4	36.9991	37.003	1032	-0.003
5	35.9971	35.992	1080	0.006
6	35.0011	35.001	1128	0.000
7	34.0045	34.008	1177	-0.004
8	33.0020	32.995	1228	0.007
9	32.0122	32.018	1278	-0.006
10	31.0234	31.020	1330	0.004
11	30.0335	30.037	1382	-0.003
12	29.0438	29.050	1435	-0.006
13	28.0661	28.058	1489	0.008
14	27.0790	27.080	1543	-0.001
15	26.0982	26.095	1598	0.004
16	25.1241	25.120	1653	0.004
17	24.1418	24.138	1709	0.004
18	23.1658	23.165	1765	0.001
19	22.1913	22.199	1821	-0.008
20	21.2173	21.222	1878	-0.005
21	20.2426	20.235	1936	0.008
22	19.2743	19.268	1993	0.006
23	18.2997	18.305	2050	-0.006
24	17.3220	17.328	2108	-0.006
25	16.3481	16.353	2166	-0.004
26	15.3731	15.377	2224	-0.004
27	14.3847	14.384	2283	0.001
28	13.4052	13.406	2341	-0.001
29	12.4224	12.425	2399	-0.003
30	11.4294	11.423	2458	0.007
31	10.4340	10.431	2516	0.003
32	9.4373	9.434	2574	0.004
33	8.4291	8.427	2632	0.002
34	7.4175	7.411	2690	0.007
35	6.3987	6.401	2747	-0.002
36	5.3586	5.361	2805	-0.002
37	4.3197	4.323	2862	-0.004
38	3.2704	3.270	2919	0.001
39	2.1996	2.198	2976	0.002
40	1.1191	1.125	3032	-0.006
41	0.0263	0.030	3088	-0.003
42	-1.0902	-1.090	3144	-0.001
43	-2.2307	-2.236	3200	0.005

Calibration result:
Max (m°C): -1.13341234154228E+0001
In pos : 3

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Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D543

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by: Sig. Karitas

Approved by:

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D543

C0: 6.75547274721111347E+0001
C1: -4.21763243319168018E+0000
C2: 1.77461406111356616E-0001
C3: -6.56200677238992399E-0003
C4: 1.36007733473701400E-0004
C5: -1.31132827502543044E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.024	899	-0.005
2	39.0031	38.994	945	0.009
3	38.0020	38.008	990	-0.006
4	36.9991	36.999	1037	-0.000
5	35.9971	35.991	1085	0.006
6	35.0011	35.002	1133	-0.001
7	34.0045	34.012	1182	-0.007
8	33.0020	33.000	1233	0.002
9	32.0122	32.006	1284	0.006
10	31.0234	31.028	1335	-0.005
11	30.0335	30.028	1388	0.005
12	29.0438	29.043	1441	0.001
13	28.0661	28.071	1494	-0.005
14	27.0790	27.076	1549	0.003
15	26.0982	26.110	1603	-0.012
16	25.1241	25.119	1659	0.005
17	24.1418	24.138	1715	0.004
18	23.1658	23.165	1771	0.000
19	22.1913	22.201	1827	-0.009
20	21.2173	21.225	1884	-0.008
21	20.2426	20.238	1942	0.005
22	19.2743	19.272	1999	0.002
23	18.2997	18.294	2057	0.006
24	17.3220	17.317	2115	0.005
25	16.3481	16.342	2173	0.006
26	15.3731	15.367	2231	0.006
27	14.3847	14.392	2289	-0.007
28	13.4052	13.414	2347	-0.009
29	12.4224	12.417	2406	0.005
30	11.4294	11.432	2464	-0.003
31	10.4340	10.424	2523	0.010
32	9.4373	9.444	2580	-0.007
33	8.4291	8.438	2638	-0.009
34	7.4175	7.422	2696	-0.005
35	6.3987	6.395	2754	0.004
36	5.3586	5.355	2812	0.004
37	4.3197	4.317	2869	0.002
38	3.2704	3.264	2926	0.007
39	2.1996	2.210	2982	-0.011
40	1.1191	1.118	3039	0.001
41	0.0263	0.023	3095	0.004
42	-1.0902	-1.097	3151	0.007
43	-2.2307	-2.223	3206	-0.007

Calibration result:
Max (m°C): -1.15450900708050E+0001
In pos : 15

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RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D824

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by:

Sig. Karitas

Approved by:

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RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D824

C0: 6.72468158392296455E+0001
C1: -4.15082316182525618E+0000
C2: 1.70651669306206105E-0001
C3: -6.21183962726965208E-0003
C4: 1.27306034390437618E-0004
C5: -1.22776132778420381E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.014	897	0.005
2	39.0031	39.008	942	-0.005
3	38.0020	38.001	988	0.001
4	36.9991	36.994	1035	0.005
5	35.9971	36.008	1082	-0.011
6	35.0011	34.999	1131	0.002
7	34.0045	34.010	1180	-0.005
8	33.0020	32.999	1231	0.003
9	32.0122	32.006	1282	0.007
10	31.0234	31.029	1333	-0.005
11	30.0335	30.029	1386	0.004
12	29.0438	29.045	1439	-0.001
13	28.0661	28.056	1493	0.010
14	27.0790	27.080	1547	-0.001
15	26.0982	26.097	1602	0.001
16	25.1241	25.125	1657	-0.001
17	24.1418	24.145	1713	-0.003
18	23.1658	23.174	1769	-0.008
19	22.1913	22.193	1826	-0.002
20	21.2173	21.219	1883	-0.002
21	20.2426	20.251	1940	-0.008
22	19.2743	19.270	1998	0.004
23	18.2997	18.293	2056	0.007
24	17.3220	17.318	2114	0.004
25	16.3481	16.345	2172	0.003
26	15.3731	15.372	2230	0.001
27	14.3847	14.381	2289	0.003
28	13.4052	13.405	2347	-0.000
29	12.4224	12.426	2405	-0.004
30	11.4294	11.426	2464	0.004
31	10.4340	10.437	2522	-0.003
32	9.4373	9.440	2580	-0.003
33	8.4291	8.436	2638	-0.007
34	7.4175	7.421	2696	-0.004
35	6.3987	6.395	2754	0.004
36	5.3586	5.355	2812	0.003
37	4.3197	4.319	2869	0.001
38	3.2704	3.266	2926	0.004
39	2.1996	2.196	2983	0.004
40	1.1191	1.123	3039	-0.004
41	0.0263	0.029	3095	-0.003
42	-1.0902	-1.089	3151	-0.002
43	-2.2307	-2.233	3207	0.002

Calibration result:
Max (m°C): -1.05020710699549E+0001
In pos : 5

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Marine Device Manufacturing

RECALIBRATION CERTIFICATE

TEMPERATURE RECALIBRATION OF SEAMON-MINI, SER. NO. D832

Temperature range: -2°C to +40°C

Absolute accuracy: +/-0.1°C over the full temperature range.

Average measuring resolution: 0.025°C

The recorder was recalibrated in an accurate adjustable temperature bath *Hart 7012.*

Temperature reference measurements are taken by Hart 1504 thermometer, which has an absolute accuracy better than +/-0.003°C.

Measurements are taken when setpoint temperature is stable within 0.001°C.

Recalibration results are on the attached data sheet.

Recalibration date (dmy): 05.02.2004.
Next calibration recommended within two years.

Recalibration performed by: Sig. Karitas

Approved by:

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Star-Oddi
Marine Device Manufacturing

RECALIBRATION CERTIFICATE

Recalibration of Seamon recorder: D832

C0: 6.78696317468543588E+0001
C1: -4.27969496387482420E+0000
C2: 1.83710011469403270E-0001
C3: -6.88353507402351011E-0003
C4: 1.44138778137871776E-0004
C5: -1.39149527432508361E-0006

SetP.	Reference(°C)	Processed(°C)	Binary()	Residual[°C]
1	40.0189	40.010	903	0.009
2	39.0031	39.001	948	0.002
3	38.0020	38.014	993	-0.012
4	36.9991	37.005	1040	-0.006
5	35.9971	35.995	1088	0.002
6	35.0011	35.006	1136	-0.005
7	34.0045	33.995	1186	0.009
8	33.0020	33.003	1236	-0.001
9	32.0122	32.008	1287	0.004
10	31.0234	31.030	1338	-0.007
11	30.0335	30.030	1391	0.004
12	29.0438	29.044	1444	-0.000
13	28.0661	28.072	1497	-0.006
14	27.0790	27.076	1552	0.003
15	26.0982	26.092	1607	0.006
16	25.1241	25.118	1662	0.006
17	24.1418	24.137	1718	0.005
18	23.1658	23.163	1774	0.002
19	22.1913	22.198	1830	-0.006
20	21.2173	21.221	1887	-0.004
21	20.2426	20.250	1944	-0.008
22	19.2743	19.267	2002	0.007
23	18.2997	18.304	2059	-0.004
24	17.3220	17.327	2117	-0.005
25	16.3481	16.351	2175	-0.003
26	15.3731	15.375	2233	-0.002
27	14.3847	14.382	2292	0.003
28	13.4052	13.404	2350	0.002
29	12.4224	12.422	2408	0.000
30	11.4294	11.436	2466	-0.007
31	10.4340	10.428	2525	0.006
32	9.4373	9.430	2583	0.008
33	8.4291	8.423	2641	0.006
34	7.4175	7.424	2698	-0.006
35	6.3987	6.396	2756	0.003
36	5.3586	5.354	2814	0.004
37	4.3197	4.316	2871	0.004
38	3.2704	3.280	2927	-0.009
39	2.1996	2.206	2984	-0.007
40	1.1191	1.112	3041	0.007
41	0.0263	0.034	3096	-0.008
42	-1.0902	-1.088	3152	-0.002
43	-2.2307	-2.238	3208	0.007

Calibration result:
Max (m°C): -1.20814252028397E+0001
In pos : 3

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