

s1 disdrometer is broken

When Leila swapped the s9 DSM for s1, I discovered the disdrometer messages were broken. The quick summary is that the eeprom got erased, leading to these questions. The details follow.

- Can we take up this problem with Ott Hydromet?
- Any clues as to what could be causing the Parsivel2 to lose its memory?
- Is voltage or current supply borderline for reliable operation?

It looks like the first data file at setup for s1 is s1_20200325_120000.dat. Disdrometer was working as of 2020-03-25,17:49:13. I'm guessing the site was setup that day, and for whatever reason the disdrometer data messages start there, without the boot messages. Probably the time was not synchronized until then.

```
[isfs@barolo raw_data]$ data_stats -a -i 1, -1 s1_20200325_120000.dat
2020-04-29,09:39:54|NOTICE|parsing: /h/eol/isfs/isfs/projects/SWEX/ISFS/config/swex.xml
Exception: EOFException: s1_20200325_120000.dat: open: EOF
sensor                dsm sampid    nsamps |----- start -----| |----- end -----|
rate                minMaxDT(sec) minMaxLen
s1:/dev/ttyDSM1      1      8      371 2020 03 25 17:49:13.254 03 25 23:59:10.090 0.02
57.007 60.021 4142 4142
s1:/dev/gps_pty0     1     10     44573 2020 03 25 17:48:16.892 03 25 23:59:59.024 2.00
-2.133 1.253 59 147
s1:/var/log/chrony/tracking.log 1     18      2654 2020 03 25 17:48:16.958 03 25 23:59:59.913 0.12
0.000 2578.788 100 100
s1:/dev/ttyDSM2      1     20     22436 2010 02 01 00:00:57.185 03 25 23:59:59.275 0.00-
1946506.446 1.342 42 44
s1:/dev/ttyDSM3      1     22          0 *****
nan nan nan nan nan
s1:/dev/ttyDSM4      1     40     446122 2010 02 01 00:00:57.159 03 25 23:59:59.974 0.00-
1946507.325 0.493 60 60
s1:/dev/ttyPWRMONV   1     60     445799 2010 02 01 00:00:56.308 03 25 23:59:59.422 0.00-
1946506.527 1.172 3 90
s1:/dev/ttyDSM5      1    100     223047 2020 03 25 17:48:17.032 03 25 23:59:59.976 10.00
-2.889 0.428 32 32
s1:/dev/ttyDSM7      1 0x8000      4467 2020 03 25 17:48:20.498 03 25 23:59:57.411 0.20
1.616 5.689 26 60
```

The messages appeared to be fine, including reporting the serial number 450620:

```
2020 03 25 17:49:13.2549 0 1, 8 4142 450620;0000.000;00;20000;024;27025;00000;0;000;...
```

It booted up again 2020-03-26,01:35:11, for reasons unknown. It reported one good message, then started rebooting and reporting "POWERSUPPLY TEST FAILED !!!".

```
2020-04-29,09:13:52|INFO|opening: s1_20200326_013511.dat
2020 03 26 01:35:11.6336 121.6 1, 8 3 \r\n
2020 03 26 01:35:11.6346 0.001042 1, 8 22 BOOTLOADER PARSIVEL\r\n
2020 03 26 01:35:12.9390 1.304 1, 8 3 \r\n
2020 03 26 01:35:12.9400 0.001042 1, 8 21 *** PARSIVEL 2 ***\r\n
2020 03 26 01:35:12.9518 0.01182 1, 8 20 OTT HYDROMET GMBH\r\n
2020 03 26 01:35:12.9631 0.01129 1, 8 22 COPYRIGHT (C) 2019 \r\n
2020 03 26 01:35:12.9755 0.01238 1, 8 18 VERSION: 2.11.6\r\n
2020 03 26 01:35:12.9843 0.008857 1, 8 17 BUILD: 2112151\r\n
2020 03 26 01:35:13.0045 0.02015 1, 8 3 \r\n
2020 03 26 01:35:13.3090 0.3045 1, 9 40 0 0 20000 15
0 0 3 0 0 0
2020 03 26 01:35:13.3090 0 1, 8 4142 450620;0000.000;00;....;\r\n
2020 03 26 01:35:28.0125 14.7 1, 8 4 \x80\r\n
2020 03 26 01:35:29.6423 1.63 1, 8 22 BOOTLOADER PARSIVEL\r\n
2020 03 26 01:35:30.9507 1.308 1, 8 3 \r\n
2020 03 26 01:35:30.9517 0.001042 1, 8 21 *** PARSIVEL 2 ***\r\n
2020 03 26 01:35:30.9635 0.01181 1, 8 20 OTT HYDROMET GMBH\r\n
2020 03 26 01:35:30.9748 0.01131 1, 8 22 COPYRIGHT (C) 2019 \r\n
2020 03 26 01:35:30.9858 0.01094 1, 8 18 VERSION: 2.11.6\r\n
2020 03 26 01:35:30.9961 0.01028 1, 8 17 BUILD: 2112151\r\n
2020 03 26 01:35:31.0044 0.008336 1, 8 3 \r\n
2020 03 26 01:35:35.0523 4.048 1, 8 31 \xf8POWERSUPPLY TEST FAILED !!!\r\n
```

Eventually it starts repeating the messages "ERROR: No Valid Serial Number found !!!" and "ERROR: No Valid Hardware info found !!!".

```
2020 03 26 01:38:57.7429 0.001042 1, 8 22 BOOTLOADER PARSIVEL\r\n
2020 03 26 01:38:59.0512 1.308 1, 8 3 \r\n
2020 03 26 01:38:59.0522 0.001042 1, 8 21 *** PARSIVEL 2 ***\r\n
2020 03 26 01:38:59.0641 0.01184 1, 8 20 OTT HYDROMET GMBH\r\n
2020 03 26 01:38:59.0740 0.009899 1, 8 22 COPYRIGHT (C) 2019 \r\n
2020 03 26 01:38:59.0879 0.01393 1, 8 40 VERSION: \xf8POWERSUPPLY TEST FAILED !!!\r\n
2020-04-29,09:13:52|INFO|opening: s1_20200326_120000.dat
2020 03 26 19:49:41.7501 6.544e+04 1, 8 42 ERROR: No Valid Serial Number found !!!\r\n
2020 03 26 19:49:41.7597 0.009589 1, 8 43 ERROR: No Valid Hardware info found !!!\r\n
2020 03 26 19:49:58.6922 16.93 1, 8 22 BOOTLOADER PARSIVEL\r\n
2020 03 26 19:50:00.0337 1.341 1, 8 42 ERROR: No Valid Serial Number found !!!\r\n
2020 03 26 19:50:00.0577 0.02407 1, 8 43 ERROR: No Valid Hardware info found !!!\r\n
```

It keeps reporting the "No Valid Hardware info" messages until 2020-03-27,01:50, then some noise, then nothing until 20:13, when it starts reporting the default messages with the serial number of XXXXXXXX:

```
2020 03 27 01:50:38.3070 0.001042 1, 8 22 BOOTLOADER PARSIVEL\r\n
2020 03 27 01:50:39.0419 0.7349 1, 8 42 \x00\xe0\x00\x00\x00\x00\x00\xff\x00\x00\xfe\x00POWERSUPPLY
TEST FAILED !!!\r\n
2020 03 27 01:50:42.5119 3.47 1, 8 33 \x00\x00\x00POWERSUPPLY TEST FAILED !!!\r\n
2020 03 27 01:50:44.8753 2.363 1, 8 44
\x00\x00\x00\x00\x00\x00\x00\x00\xff\x00\xfe\x00\x00POWERSUPPLY TEST FAILED !!!\r\n
2020 03 27 01:50:47.5648 2.69 1, 8 63 \x00\x00\xff\x02\x00\xfe\x00\xff\x00\x00\x00\x9d
(\x80\x00\xff\x00\xff\x00\xfd\xff\x00\x00\xfe\x00\xff\x00\x00\xff\xff\x00\x00POWERSUPPLY TEST FAILED !!!\r\n
2020 03 27 01:50:51.8081 4.243 1, 8 49
\x00\x00\x00\x00\x00@\x14\x00\x00\x00\xfe\x00\x00\x00\x0e\x00\x00\xff\x00POWERSUPPLY TEST FAILED !!!\r\n
2020-04-29,09:13:56|INFO|opening: s1_20200327_120000.dat
2020 03 27 20:13:06.5367 0 1, 8 71 XXXXXXXX;0000.000;0000.00;00;-9.999;20000;0000.00;025;27028;
00000;0;\r\n
2020 03 27 20:14:06.5447 0 1, 8 71 XXXXXXXX;0000.000;0000.00;00;-9.999;19320;0000.00;025;27018;
00000;0;\r\n
```

There are still some reboot messages later on and more error messages, so it's not like the disdrometer is stabilized again but just missing eeprom. Either way it's in a broken state, and I don't think this is the only one to have had this kind of problem.

For the moment, I have modified the NIDAS config to parse the messages but skip the serial number field. However, that is not a fix since the whole configuration of the data messages has been lost, and we don't know if losing the hardware info and any other eeprom settings makes the data useless.