

This was obtained with my bike (2016 FXS with 2 removable battery packs).

The logs have been extracted from the bike using Zero Application on my Android smartphone (App version 1.6.50).

You can extract logs for the Main Bike Board (MBB) or the batteries (with my bike I get a log file for each of my two batteries. The files are named BMS0 and BMS1).

<https://zero-motorcycle-community.github.io/browser-parse/> : tools to examine the logs

Looking at the logs you can find some interesting information about the battery (or batteries in the case of my 2016 FXS which has two 3.3 kWh and 26 Ah batteries).

Here is the information found on a "Discharge level" line (for example line 09403):

AH is the battery discharge in Ah. My batteries have a capacity of 26 Ah. As a result, the value of AH (12 Ah) is consistent with the SOC (52%).

L is the lowest cell voltage: 3648 mV

H is the higher cell voltage: 3654 mV

B is the unbalance, B = H - L = 6 mV

PT is probably the Pack Temperature: 19°C

BT is another temperature. Which one?...

PV is the pack voltage: 102215 mV

M is the state of the bike (Charge = charging; Bike On = riding))

Since there are 28 cells in series, the average voltage of a cell is 102215 / 28 = 3650.5 mV

This is in perfect agreement with the values of L and H.

Note 1: you also see in the logs when the system readjusts its way of calculating the SOC by switching from an interpretation of the voltage (Voltage SOC Mode) to an interpretation of the battery discharge (Coulomb counting, mistranslated into Coulomb counting).

Note 2: I also give (below) an extract of my test of near total discharge of the battery.

The minimum voltage of the lowest cell was 3089 mV and the unbalance 154 mV.

After a 56% partial load, the unbalance returned to 3 mV.

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|-------|------------|----------|--|
| 09399 | 05/28/2021 | 23:17:38 | System Turned On |
| 09400 | 05/28/2021 | 23:17:38 | DEBUG: Entered Standby State |
| 09401 | 05/28/2021 | 23:17:39 | DEBUG: Entered Charging State |
| 09402 | 05/28/2021 | 23:17:39 | DEBUG: CAN Link Is Up |
| 09403 | 05/28/2021 | 23:17:40 | Discharge level 012 AH, SOC: 52%, I:0-1A, L:3648, I:3647, H:3654, B:006, PT:019C, BT:018C, PV:102215, M:Charge |
| 09404 | 05/28/2021 | 23:17:44 | DEBUG: CAN Receiving Syncs |
| 09405 | 05/28/2021 | 23:17:45 | Contactora drive turned on Pack V: 102213mV, Switched V: 89639mV, Duty Cycle: 39% |
| 09406 | 05/28/2021 | 23:17:45 | Contactora was Closed Pack V: 102213mV, Switched V: 89639mV, Prechg Pct: 88%, Dischg Cur: 4294966769mA |
| 09407 | 05/28/2021 | 23:17:46 | DEBUG: CAN Link Is Down |
| 09408 | 05/28/2021 | 23:17:46 | DEBUG: CAN Link Is Up |
| 09409 | 05/28/2021 | 23:27:40 | Discharge level 012 AH, SOC: 54%, I:0-3A, L:3682, I:3676, H:3688, B:006, PT:020C, BT:024C, PV:103157, M:Charge |
| 09410 | 05/28/2021 | 23:37:40 | Discharge level 011 AH, SOC: 55%, I:0-3A, L:3694, I:3688, H:3698, B:004, PT:020C, BT:026C, PV:103471, M:Charge |
| 09411 | 05/28/2021 | 23:47:40 | Discharge level 011 AH, SOC: 57%, I:0-3A, L:3705, I:3699, H:3709, B:004, PT:020C, BT:030C, PV:103792, M:Charge |
| 09412 | 05/28/2021 | 23:57:40 | Discharge level 010 AH, SOC: 59%, I:0-3A, L:3716, I:3710, H:3720, B:004, PT:020C, BT:031C, PV:104100, M:Charge |
| 09413 | 05/29/2021 | 00:07:40 | Discharge level 010 AH, SOC: 60%, I:0-3A, L:3729, I:3723, H:3731, B:002, PT:021C, BT:029C, PV:104442, M:Charge |
| 09414 | 05/29/2021 | 00:17:40 | Discharge level 010 AH, SOC: 62%, I:0-2A, L:3742, I:3738, H:3745, B:003, PT:021C, BT:029C, PV:104814, M:Charge |
| 09415 | 05/29/2021 | 00:27:40 | Discharge level 009 AH, SOC: 63%, I:0-3A, L:3755, I:3749, H:3759, B:004, PT:022C, BT:028C, PV:105217, M:Charge |
| 09416 | 05/29/2021 | 00:37:40 | Discharge level 009 AH, SOC: 65%, I:0-2A, L:3772, I:3768, H:3775, B:003, PT:022C, BT:028C, PV:105668, M:Charge |
| 09417 | 05/29/2021 | 00:47:40 | Discharge level 008 AH, SOC: 67%, I:0-3A, L:3788, I:3782, H:3792, B:004, PT:022C, BT:029C, PV:106132, M:Charge |
| 09418 | 05/29/2021 | 00:57:40 | Discharge level 008 AH, SOC: 68%, I:0-2A, L:3805, I:3801, H:3809, B:004, PT:023C, BT:031C, PV:106609, M:Charge |
| 09419 | 05/29/2021 | 01:07:40 | Discharge level 007 AH, SOC: 70%, I:0-2A, L:3824, I:3820, H:3829, B:005, PT:023C, BT:034C, PV:107147, M:Charge |
| 09420 | 05/29/2021 | 01:17:40 | Discharge level 007 AH, SOC: 71%, I:0-2A, L:3844, I:3840, H:3850, B:006, PT:023C, BT:035C, PV:107722, M:Charge |
| 09421 | 05/29/2021 | 01:27:40 | Discharge level 007 AH, SOC: 73%, I:0-2A, L:3866, I:3862, H:3872, B:006, PT:023C, BT:036C, PV:108345, M:Charge |
| 09422 | 05/29/2021 | 01:37:40 | Discharge level 006 AH, SOC: 75%, I:0-3A, L:3890, I:3885, H:3892, B:002, PT:024C, BT:035C, PV:108957, M:Charge |
| 09423 | 05/29/2021 | 01:47:40 | Discharge level 006 AH, SOC: 76%, I:0-3A, L:3911, I:3906, H:3914, B:003, PT:024C, BT:031C, PV:109570, M:Charge |
| 09424 | 05/29/2021 | 01:57:40 | Discharge level 005 AH, SOC: 78%, I:0-3A, L:3931, I:3926, H:3934, B:003, PT:024C, BT:035C, PV:110121, M:Charge |
| 09425 | 05/29/2021 | 02:07:40 | Discharge level 005 AH, SOC: 79%, I:0-3A, L:3949, I:3944, H:3953, B:004, PT:024C, BT:035C, PV:110655, M:Charge |
| 09426 | 05/29/2021 | 02:17:40 | Discharge level 005 AH, SOC: 81%, I:0-3A, L:3970, I:3965, H:3973, B:003, PT:024C, BT:035C, PV:111204, M:Charge |
| 09427 | 05/29/2021 | 02:27:40 | Discharge level 004 AH, SOC: 82%, I:0-3A, L:3987, I:3982, H:3991, B:004, PT:024C, BT:035C, PV:111709, M:Charge |
| 09428 | 05/29/2021 | 02:29:21 | DEBUG: Switching to voltage SOC mode. SOC: 82%, VSOC: 87%, Ihall: -1713mA, Iext: 0mA |

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09429 05/29/2021 02:29:21 DEBUG: Adjusted SOC from 82% to 87%
09430 05/29/2021 02:29:29 DEBUG: Switching to coulomb counting SOC mode. SOC: 88%, VSOC: 87%, I: -2900mA
09431 05/29/2021 02:37:40 Discharge level 003 AH, SOC: 89%, I:0-3A, L:4006, l:4001, H:4009, B:003, PT:025C, BT:034C, PV:112228, M:Charge
09432 05/29/2021 02:46:51 SOC adjusted for voltage old: 2749043uAH (soc:90%), new: 2340000uAH (soc:91%), low cell: 4025 mV
09433 05/29/2021 02:46:51 Charged To Full 002 AH, SOC: 91%, L:4024, H:4027, B:003, PT:025C, BT:034C, PV:112734
09434 05/29/2021 02:46:56 SOC adjusted for voltage old: 2336539uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4025 mV
09435 05/29/2021 02:47:40 SOC adjusted for voltage old: 2313237uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4026 mV
09436 05/29/2021 02:47:40 Discharge level 002 AH, SOC: 91%, I:0-3A, L:4026, l:4021, H:4029, B:003, PT:025C, BT:034C, PV:112786, M:Charge
09437 05/29/2021 02:47:51 SOC adjusted for voltage old: 2332435uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4026 mV
09438 05/29/2021 02:48:11 SOC adjusted for voltage old: 2325732uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4026 mV
09439 05/29/2021 02:48:51 SOC adjusted for voltage old: 2326717uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4029 mV
09440 05/29/2021 02:49:11 SOC adjusted for voltage old: 2325947uAH (soc:92%), new: 2340000uAH (soc:91%), low cell: 4029 mV
09441 05/29/2021 02:49:31 SOC adjusted for voltage old: 2325504uAH (soc:92%), new: 2080000uAH (soc:92%), low cell: 4030 mV
09442 05/29/2021 02:50:11 SOC adjusted for voltage old: 2052628uAH (soc:93%), new: 2080000uAH (soc:92%), low cell: 4030 mV
09443 05/29/2021 02:51:21 SOC adjusted for voltage old: 2045714uAH (soc:93%), new: 2080000uAH (soc:92%), low cell: 4033 mV
09444 05/29/2021 02:51:51 SOC adjusted for voltage old: 2062266uAH (soc:93%), new: 2080000uAH (soc:92%), low cell: 4035 mV
09445 05/29/2021 03:01:49 DEBUG: Switching to voltage SOC mode. SOC: 94%, VSOC: 95%, Ihall: -2372mA, Iext: 0mA
09446 05/29/2021 03:01:49 DEBUG: Adjusted SOC from 94% to 95%
09447 05/29/2021 03:01:49 DEBUG: Switching to coulomb counting SOC mode. SOC: 95%, VSOC: 95%, I: -3000mA
09448 05/29/2021 03:02:29 DEBUG: Switching to voltage SOC mode. SOC: 96%, VSOC: 95%, Ihall: -2372mA, Iext: 0mA
09449 05/29/2021 03:02:29 DEBUG: Switching to coulomb counting SOC mode. SOC: 96%, VSOC: 95%, I: -3000mA
09450 05/29/2021 03:44:29 DEBUG: Switching to voltage SOC mode. SOC: 100%, VSOC: 100%, Ihall: -1713mA, Iext: 0mA
09451 05/29/2021 03:44:39 DEBUG: Switching to coulomb counting SOC mode. SOC: 100%, VSOC: 100%, I: -2800mA
09452 05/29/2021 04:01:20 DEBUG: CAN Link Is Down
09453 05/29/2021 04:01:24 Contactor was Opened Pack V: 116548mV, Switched V: 115712mV, Prechg Pct: 99%, Dischg Cur: 658mA
09454 05/29/2021 04:01:24 DEBUG: CAN Link Is Up
09455 05/29/2021 04:01:25 DEBUG: CAN NOT Receiving Syncs
09456 05/29/2021 04:01:30 DEBUG: CAN Link Is Down
09457 05/29/2021 04:01:54 Voltage Across Contactor: 41877mV (Okay)
09458 05/29/2021 04:01:54 SOC adjusted for voltage old: 0uAH (soc:100%), new: 0uAH (soc:100%), low cell: 4164 mV
09459 05/29/2021 06:10:07 Chassis Isolation Fault 99074 ohms to cell 2
09460 05/29/2021 08:53:32 Chassis Isolation Fault 98513 ohms to cell 2
09461 05/29/2021 12:22:30 Chassis Isolation Fault 99143 ohms to cell 2
09462 05/29/2021 13:25:18 CAN0 STUFF error, count=1
09463 05/29/2021 13:25:18 System Turned Off
09464 05/29/2021 13:25:18 DEBUG: Switching to voltage SOC mode. SOC: 100%, VSOC: 100%, Ihall: -527mA, Iext: 0mA
09465 05/29/2021 13:25:19 DEBUG: Entered Idle State
09466 05/29/2021 13:25:24 Current Sensor Zeroed old: 2574mV, new: 2575mV, corrfact: 181
09467 05/29/2021 13:25:26 Discharge level 000 AH, SOC:100%, I:000A, L:4136, l:4136, H:4138, B:002, PT:022C, BT:029C, PV:115862, M:Idle
09468 05/29/2021 13:31:58 DEBUG: Resetting CAN0 due to error passive mode
09469 05/29/2021 13:31:58 System Turned On
09470 05/29/2021 13:31:58 DEBUG: Entered Charging State
09471 05/29/2021 13:31:58 SOC adjusted for voltage old: 0uAH (soc:100%), new: 0uAH (soc:100%), low cell: 4137 mV
09472 05/29/2021 13:31:58 DEBUG: Entered Running State
09473 05/29/2021 13:31:58 DEBUG: CAN Link Is Up
09474 05/29/2021 13:31:59 Discharge level 000 AH, SOC:100%, I:0-1A, L:4135, l:4134, H:4137, B:002, PT:022C, BT:027C, PV:115823, M:Bike On
09475 05/29/2021 13:32:04 DEBUG: CAN Receiving Syncs
09476 05/29/2021 13:32:05 Contactor drive turned on Pack V: 115811mV, Switched V: 101533mV, Duty Cycle: 34%
09477 05/29/2021 13:32:05 Contactor was Closed Pack V: 115811mV, Switched V: 101533mV, Prechg Pct: 88%, Dischg Cur: 0mA
09478 05/29/2021 13:32:59 Discharge level 000 AH, SOC:100%, I:000A, L:4133, l:4133, H:4136, B:003, PT:022C, BT:028C, PV:115773, M:Bike On
09479 05/29/2021 13:33:59 Discharge level 000 AH, SOC:100%, I:011A, L:4093, l:4125, H:4099, B:006, PT:022C, BT:029C, PV:114656, M:Bike On
09480 05/29/2021 13:34:59 Discharge level 000 AH, SOC:100%, I:0-9A, L:4134, l:4111, H:4136, B:002, PT:022C, BT:030C, PV:115772, M:Bike On
09481 05/29/2021 13:35:59 Discharge level 000 AH, SOC: 99%, I:008A, L:4075, l:4097, H:4080, B:005, PT:022C, BT:030C, PV:114155, M:Bike On
09482 05/29/2021 13:36:59 Discharge level 000 AH, SOC: 99%, I:000A, L:4101, l:4101, H:4104, B:003, PT:022C, BT:030C, PV:114867, M:Bike On
09483 05/29/2021 13:37:59 Discharge level 000 AH, SOC: 99%, I:000A, L:4106, l:4106, H:4107, B:001, PT:023C, BT:031C, PV:114990, M:Bike On
09484 05/29/2021 13:38:59 Discharge level 000 AH, SOC: 99%, I:014A, L:4049, l:4086, H:4057, B:008, PT:023C, BT:031C, PV:113449, M:Bike On
09485 05/29/2021 13:39:59 Discharge level 000 AH, SOC: 98%, I:008A, L:4057, l:4080, H:4062, B:005, PT:023C, BT:031C, PV:113644, M:Bike On
09486 05/29/2021 13:41:00 Discharge level 000 AH, SOC: 98%, I:008A, L:4046, l:4069, H:4052, B:006, PT:023C, BT:031C, PV:113349, M:Bike On
09487 05/29/2021 13:42:00 Discharge level 000 AH, SOC: 97%, I:009A, L:4050, l:4074, H:4056, B:006, PT:023C, BT:032C, PV:113458, M:Bike On

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|-------|------------|----------|----------------------|--|-----------------|---|
| 09488 | 05/29/2021 | 13:42:32 | Charged To Full | 000 AH, SOC: 97%, | L:4047, | H:4052, B:005, PT:023C, BT:032C, PV:113366 |
| 09489 | 05/29/2021 | 13:43:00 | Discharge level | 000 AH, SOC: 97%, I:0-1A, | L:4065, 1:4064, | H:4068, B:003, PT:023C, BT:032C, PV:113860, M:Bike On |
| 09490 | 05/29/2021 | 13:44:00 | Discharge level | 001 AH, SOC: 97%, I:004A, | L:4056, 1:4066, | H:4061, B:005, PT:023C, BT:032C, PV:113618, M:Bike On |
| 09491 | 05/29/2021 | 13:45:00 | Discharge level | 001 AH, SOC: 95%, I:-16A, | L:4065, 1:4025, | H:4069, B:004, PT:024C, BT:032C, PV:113887, M:Bike On |
| 09492 | 05/29/2021 | 13:45:15 | Charged To Full | 001 AH, SOC: 95%, | L:4065, | H:4069, B:004, PT:024C, BT:032C, PV:113871 |
| 09493 | 05/29/2021 | 13:45:35 | Charged To Full | 001 AH, SOC: 94%, | L:4056, | H:4058, B:002, PT:024C, BT:032C, PV:113597 |
| 09494 | 05/29/2021 | 13:46:00 | Discharge level | 001 AH, SOC: 94%, I:-21A, | L:4049, 1:3999, | H:4054, B:005, PT:024C, BT:032C, PV:113438, M:Bike On |
| 09495 | 05/29/2021 | 13:46:49 | Charged To Full | 001 AH, SOC: 93%, | L:4039, | H:4042, B:003, PT:024C, BT:032C, PV:113146 |
| 09496 | 05/29/2021 | 13:46:57 | Charged To Full | 002 AH, SOC: 93%, | L:4038, | H:4041, B:003, PT:024C, BT:032C, PV:113125 |
| 09497 | 05/29/2021 | 13:47:00 | Discharge level | 002 AH, SOC: 93%, I:018A, | L:3947, 1:3992, | H:3958, B:011, PT:024C, BT:032C, PV:110614, M:Bike On |
| 09498 | 05/29/2021 | 13:47:09 | Charged To Full | 002 AH, SOC: 93%, | L:4035, | H:4039, B:004, PT:025C, BT:032C, PV:113020 |
| 09499 | 05/29/2021 | 13:47:37 | Charged To Full | 002 AH, SOC: 92%, | L:4031, | H:4035, B:004, PT:025C, BT:032C, PV:112943 |
| 09500 | 05/29/2021 | 13:48:00 | Discharge level | 002 AH, SOC: 92%, I:049A, | L:3847, 1:3967, | H:3867, B:020, PT:025C, BT:033C, PV:107897, M:Bike On |
| 09501 | 05/29/2021 | 13:49:00 | Discharge level | 002 AH, SOC: 90%, I:000A, | L:3945, 1:3946, | H:3952, B:007, PT:025C, BT:033C, PV:110534, M:Bike On |
| 09502 | 05/29/2021 | 13:50:00 | Discharge level | 003 AH, SOC: 89%, I:000A, | L:3932, 1:3933, | H:3939, B:007, PT:026C, BT:033C, PV:110162, M:Bike On |
| 09503 | 05/29/2021 | 13:51:00 | Discharge level | 003 AH, SOC: 87%, I:071A, | L:3750, 1:3918, | H:3773, B:023, PT:027C, BT:033C, PV:105181, M:Bike On |
| 09504 | 05/29/2021 | 13:52:00 | Discharge level | 003 AH, SOC: 86%, I:001A, | L:3927, 1:3929, | H:3933, B:006, PT:027C, BT:033C, PV:110032, M:Bike On |
| 09505 | 05/29/2021 | 13:53:00 | Discharge level | 003 AH, SOC: 86%, I:020A, | L:3881, 1:3929, | H:3891, B:010, PT:027C, BT:033C, PV:108748, M:Bike On |
| 09506 | 05/29/2021 | 13:54:00 | Discharge level | 004 AH, SOC: 85%, I:-13A, | L:3948, 1:3920, | H:3953, B:005, PT:028C, BT:034C, PV:110614, M:Bike On |
| 09507 | 05/29/2021 | 13:55:00 | Discharge level | 004 AH, SOC: 85%, I:015A, | L:3884, 1:3919, | H:3893, B:009, PT:028C, BT:034C, PV:108852, M:Bike On |
| 09508 | 05/29/2021 | 13:56:00 | Discharge level | 004 AH, SOC: 84%, I:000A, | L:3914, 1:3915, | H:3920, B:006, PT:028C, BT:034C, PV:109673, M:Bike On |
| 09509 | 05/29/2021 | 13:57:00 | Discharge level | 004 AH, SOC: 82%, I:015A, | L:3838, 1:3873, | H:3848, B:010, PT:028C, BT:035C, PV:107575, M:Bike On |
| 09510 | 05/29/2021 | 13:58:00 | Discharge level | 004 AH, SOC: 82%, I:001A, | L:3888, 1:3890, | H:3895, B:007, PT:028C, BT:035C, PV:108960, M:Bike On |
| 09511 | 05/29/2021 | 13:59:00 | Discharge level | 005 AH, SOC: 81%, I:032A, | L:3788, 1:3861, | H:3801, B:013, PT:028C, BT:035C, PV:106161, M:Bike On |
| 09512 | 05/29/2021 | 14:00:00 | Discharge level | 005 AH, SOC: 79%, I:013A, | L:3807, 1:3836, | H:3819, B:012, PT:029C, BT:035C, PV:106733, M:Bike On |
| 09513 | 05/29/2021 | 14:01:00 | Discharge level | 005 AH, SOC: 79%, I:059A, | L:3716, 1:3845, | H:3735, B:019, PT:029C, BT:035C, PV:104217, M:Bike On |
| 09514 | 05/29/2021 | 14:02:00 | Discharge level | 006 AH, SOC: 77%, I:023A, | L:3758, 1:3810, | H:3771, B:013, PT:029C, BT:035C, PV:105336, M:Bike On |
| 09515 | 05/29/2021 | 14:03:00 | Discharge level | 006 AH, SOC: 77%, I:007A, | L:3812, 1:3828, | H:3821, B:009, PT:029C, BT:036C, PV:106846, M:Bike On |
| 09516 | 05/29/2021 | 14:04:00 | Discharge level | 006 AH, SOC: 76%, I:002A, | L:3806, 1:3810, | H:3813, B:007, PT:029C, BT:036C, PV:106661, M:Bike On |
| 09517 | 05/29/2021 | 14:05:00 | Discharge level | 006 AH, SOC: 74%, I:023A, | L:3741, 1:3792, | H:3754, B:013, PT:030C, BT:036C, PV:104910, M:Bike On |
| 09518 | 05/29/2021 | 14:06:00 | Discharge level | 006 AH, SOC: 74%, I:000A, | L:3812, 1:3813, | H:3819, B:007, PT:030C, BT:036C, PV:106841, M:Bike On |
| 09519 | 05/29/2021 | 14:07:00 | Discharge level | 006 AH, SOC: 74%, I:012A, | L:3776, 1:3803, | H:3787, B:011, PT:030C, BT:036C, PV:105868, M:Bike On |
| 09520 | 05/29/2021 | 14:08:00 | Discharge level | 007 AH, SOC: 73%, I:023A, | L:3739, 1:3790, | H:3751, B:012, PT:030C, BT:036C, PV:104825, M:Bike On |
| 09521 | 05/29/2021 | 14:09:00 | Discharge level | 007 AH, SOC: 72%, I:021A, | L:3711, 1:3757, | H:3723, B:012, PT:030C, BT:036C, PV:104041, M:Bike On |
| 09522 | 05/29/2021 | 14:10:00 | Discharge level | 007 AH, SOC: 71%, I:000A, | L:3775, 1:3775, | H:3782, B:007, PT:030C, BT:037C, PV:105792, M:Bike On |
| 09523 | 05/29/2021 | 14:11:00 | Discharge level | 007 AH, SOC: 71%, I:0-6A, | L:3795, 1:3784, | H:3801, B:006, PT:030C, BT:037C, PV:106345, M:Bike On |
| 09524 | 05/29/2021 | 14:12:00 | Discharge level | 007 AH, SOC: 71%, I:000A, | L:3786, 1:3787, | H:3793, B:007, PT:030C, BT:037C, PV:106118, M:Bike On |
| 09525 | 05/29/2021 | 14:13:00 | Discharge level | 007 AH, SOC: 71%, I:000A, | L:3788, 1:3789, | H:3796, B:008, PT:030C, BT:037C, PV:106196, M:Bike On |
| 09526 | 05/29/2021 | 14:13:26 | Contactor was Opened | Pack V: 106211mV, Switched V: 105314mV, Prechg Pct: 99%, Dischg Cur: 527mA | | |
| 09527 | 05/29/2021 | 14:13:26 | System Turned Off | | | |

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|-------|------------|----------|---|--|--|--|
| 09799 | 05/29/2021 | 18:33:59 | System Turned Off | | | |
| 09800 | 05/29/2021 | 18:34:00 | DEBUG: CAN NOT Receiving Syncs | | | |
| 09801 | 05/29/2021 | 18:34:00 | DEBUG: CAN Link Is Down | | | |
| 09802 | 05/29/2021 | 18:34:00 | DEBUG: Entered Idle State | | | |
| 09803 | 05/29/2021 | 18:34:06 | Current Sensor Zeroed | old: 2572mV, new: 2578mV, corrfact: 178 | | |
| 09804 | 05/29/2021 | 18:34:07 | Discharge level | 019 AH, SOC: 25%, I:000A, L:3535, 1:3535, H:3544, B:009, PT:035C, BT:040C, PV:99108, M:Idle | | |
| 09805 | 05/29/2021 | 18:34:29 | Voltage Across Contactor: 35917mV (Okay) | | | |
| 09806 | 05/29/2021 | 18:34:32 | DEBUG: Resetting CAN0 due to error passive mode | | | |
| 09807 | 05/29/2021 | 18:34:32 | System Turned On | | | |
| 09808 | 05/29/2021 | 18:34:32 | DEBUG: Entered Running State | | | |
| 09809 | 05/29/2021 | 18:34:32 | DEBUG: CAN Link Is Up | | | |
| 09810 | 05/29/2021 | 18:34:33 | Discharge level | 019 AH, SOC: 25%, I:0-1A, L:3535, 1:3535, H:3544, B:009, PT:036C, BT:039C, PV:99106, M:Bike On | | |
| 09811 | 05/29/2021 | 18:34:33 | Discharge cutback | 67% | | |
| 09812 | 05/29/2021 | 18:34:33 | 173A | | | |
| 09813 | 05/29/2021 | 18:34:38 | DEBUG: CAN Receiving Syncs | | | |
| 09814 | 05/29/2021 | 18:34:39 | Contactor drive turned on | Pack V: 99103mV, Switched V: 87552mV, Duty Cycle: 40% | | |

```

09815 05/29/2021 18:34:39 Contactor was Closed      Pack V: 99103mV, Switched V: 87552mV, Prechg Pct: 88%, Dischg Cur: 131mA
09816 05/29/2021 18:35:33 Discharge level      019 AH, SOC: 25%, I:000A, L:3534, l:3534, H:3544, B:010, PT:035C, BT:040C, PV:99101, M:Bike On
09817 05/29/2021 18:35:33 Discharge cutback    67%
09818 05/29/2021 18:35:33 173A
09819 05/29/2021 18:36:33 Discharge level      019 AH, SOC: 25%, I:000A, L:3535, l:3535, H:3544, B:009, PT:035C, BT:040C, PV:99109, M:Bike On
09820 05/29/2021 18:36:33 Discharge cutback    67%
09821 05/29/2021 18:36:33 173A
09822 05/29/2021 18:37:17 Contactor was Opened  Pack V: 99114mV, Switched V: 98304mV, Prechg Pct: 99%, Dischg Cur: 131mA
09823 05/29/2021 18:37:17 System Turned Off

```

=====
Log of the 1st battery (BMS0) at the end of my full battery discharge test:

```

09753 03/17/2019 15:22:09 Discharge level      025 AH, SOC: 2%, I:0-1A, L:3207, l:3204, H:3307, B:100, PT:030C, BT:031C, PV:91219, M:Bike On
09754 03/17/2019 15:22:09 Discharge cutback    11%
09755 03/17/2019 15:22:09 29A
09756 03/17/2019 15:23:09 Discharge level      025 AH, SOC: 1%, I:0-1A, L:3161, l:3158, H:3280, B:119, PT:030C, BT:031C, PV:90279, M:Bike On
09757 03/17/2019 15:23:09 Discharge cutback    11%
09758 03/17/2019 15:23:09 29A
09759 03/17/2019 15:24:09 Discharge level      025 AH, SOC: 1%, I:0-9A, L:3183, l:3138, H:3297, B:114, PT:030C, BT:031C, PV:90740, M:Bike On
09760 03/17/2019 15:24:09 Discharge cutback    11%
09761 03/17/2019 15:24:09 29A
09762 03/17/2019 15:25:09 Discharge level      025 AH, SOC: 1%, I:000A, L:3089, l:3091, H:3243, B:154, PT:030C, BT:031C, PV:88912, M:Bike On
09763 03/17/2019 15:25:09 Discharge cutback    11%
09764 03/17/2019 15:25:09 29A
09765 03/17/2019 15:26:09 Discharge level      025 AH, SOC: 1%, I:000A, L:3128, l:3128, H:3258, B:130, PT:030C, BT:031C, PV:89468, M:Bike On
09766 03/17/2019 15:26:09 Discharge cutback    11%
09767 03/17/2019 15:26:09 29A
09768 03/17/2019 15:27:09 Discharge level      025 AH, SOC: 1%, I:001A, L:3126, l:3136, H:3254, B:128, PT:030C, BT:031C, PV:89349, M:Bike On
09769 03/17/2019 15:27:09 Discharge cutback    11%
09770 03/17/2019 15:27:09 29A
09771 03/17/2019 15:28:09 Discharge level      025 AH, SOC: 1%, I:000A, L:3126, l:3128, H:3255, B:129, PT:030C, BT:031C, PV:89334, M:Bike On
09772 03/17/2019 15:28:09 Discharge cutback    11%
09773 03/17/2019 15:28:09 29A
09774 03/17/2019 15:29:09 Discharge level      025 AH, SOC: 1%, I:000A, L:3124, l:3126, H:3252, B:128, PT:030C, BT:031C, PV:89245, M:Bike On
09775 03/17/2019 15:29:09 Discharge cutback    11%
09776 03/17/2019 15:29:09 29A
09777 03/17/2019 15:29:14 Contactor was Opened  Pack V: 89258mV, Switched V: 88379mV, Prechg Pct: 99%, Dischg Cur: 527mA
09778 03/17/2019 15:29:15 System Turned Off
09779 03/17/2019 15:29:15 DEBUG: CAN NOT Receiving Syncs
09780 03/17/2019 15:29:15 DEBUG: CAN Link Is Down
09781 03/17/2019 15:29:16 DEBUG: Entered Idle State
09782 03/17/2019 15:29:21 Current Sensor Zeroed  old: 2575mV, new: 2577mV, corrfact: 179
09783 03/17/2019 15:29:22 Discharge level      025 AH, SOC: 1%, I:000A, L:3129, l:3129, H:3256, B:127, PT:029C, BT:031C, PV:89339, M:Idle
09784 03/17/2019 15:29:44 Voltage Across Contactor: 32991mV (Okay)
09785 03/17/2019 15:42:33 DEBUG: Resetting CAN0 due to error passive mode
09786 03/17/2019 15:42:33 System Turned On
09787 03/17/2019 15:42:33 DEBUG: Entered Running State
09788 03/17/2019 15:42:33 DEBUG: CAN Link Is Up
09789 03/17/2019 15:42:34 Discharge level      025 AH, SOC: 1%, I:0-1A, L:3149, l:3148, H:3265, B:116, PT:029C, BT:030C, PV:89726, M:Bike On
09790 03/17/2019 15:42:34 Discharge cutback    11%
09791 03/17/2019 15:42:34 29A
09792 03/17/2019 15:42:39 DEBUG: CAN Receiving Syncs
09793 03/17/2019 15:42:40 Contactor drive turned on  Pack V: 89693mV, Switched V: 78690mV, Duty Cycle: 45%
09794 03/17/2019 15:42:40 Contactor was Closed  Pack V: 89693mV, Switched V: 78690mV, Prechg Pct: 88%, Dischg Cur: 4294967033mA
09795 03/17/2019 15:42:41 DEBUG: CAN Link Is Down
09796 03/17/2019 15:42:41 DEBUG: CAN Link Is Up

```

| | | | | |
|-------|------------|----------|---|--|
| 09797 | 03/17/2019 | 15:43:34 | Discharge level | 025 AH, SOC: 1%, I:000A, L:3142, l:3143, H:3260, B:118, PT:029C, BT:030C, PV:89537, M:Bike On |
| 09798 | 03/17/2019 | 15:43:34 | Discharge cutback | 11% |
| 09799 | 03/17/2019 | 15:43:34 | 29A | |
| 09800 | 03/17/2019 | 15:44:34 | Discharge level | 025 AH, SOC: 1%, I:000A, L:3137, l:3138, H:3257, B:120, PT:029C, BT:031C, PV:89437, M:Bike On |
| 09801 | 03/17/2019 | 15:44:34 | Discharge cutback | 11% |
| 09802 | 03/17/2019 | 15:44:34 | 29A | |
| 09803 | 03/17/2019 | 15:44:52 | Contactora was Opened | Pack V: 89412mV, Switched V: 88615mV, Prechg Pct: 99%, Dischg Cur: 263mA |
| 09804 | 03/17/2019 | 15:44:53 | System Turned Off | |
| 09805 | 03/17/2019 | 15:44:53 | DEBUG: CAN NOT Receiving Syncs | |
| 09806 | 03/17/2019 | 15:44:54 | DEBUG: CAN Link Is Down | |
| 09807 | 03/17/2019 | 15:44:54 | DEBUG: Entered Idle State | |
| 09808 | 03/17/2019 | 15:44:59 | Current Sensor Zeroed | old: 2577mV, new: 2575mV, corrfact: 181 |
| 09809 | 03/17/2019 | 15:45:01 | Discharge level | 025 AH, SOC: 1%, I:000A, L:3138, l:3138, H:3259, B:121, PT:029C, BT:031C, PV:89478, M:Idle |
| 09810 | 03/17/2019 | 15:45:10 | DEBUG: Resetting CAN0 due to error passive mode | |
| 09811 | 03/17/2019 | 15:45:10 | System Turned On | |
| 09812 | 03/17/2019 | 15:45:10 | DEBUG: Entered Running State | |
| 09813 | 03/17/2019 | 15:45:10 | DEBUG: CAN Link Is Up | |
| 09814 | 03/17/2019 | 15:45:11 | DEBUG: Entered Charging State | |
| 09815 | 03/17/2019 | 15:45:12 | Discharge level | 025 AH, SOC: 1%, I:000A, L:3140, l:3140, H:3259, B:119, PT:029C, BT:031C, PV:89494, M:Charge |
| 09816 | 03/17/2019 | 15:45:16 | DEBUG: CAN Receiving Syncs | |
| 09817 | 03/17/2019 | 15:45:17 | Contactora drive turned on | Pack V: 89495mV, Switched V: 79478mV, Duty Cycle: 45% |
| 09818 | 03/17/2019 | 15:45:17 | Contactora was Closed | Pack V: 89495mV, Switched V: 79478mV, Prechg Pct: 89%, Dischg Cur: 0mA |
| 09819 | 03/17/2019 | 15:45:18 | DEBUG: CAN Link Is Down | |
| 09820 | 03/17/2019 | 15:45:18 | DEBUG: CAN Link Is Up | |
| 09821 | 03/17/2019 | 15:55:12 | Discharge level | 025 AH, SOC: 2%, I:0-3A, L:3312, l:3299, H:3380, B:068, PT:028C, BT:032C, PV:93622, M:Charge |
| 09822 | 03/17/2019 | 16:05:12 | Discharge level | 025 AH, SOC: 4%, I:0-3A, L:3402, l:3391, H:3448, B:046, PT:027C, BT:032C, PV:95867, M:Charge |
| 09823 | 03/17/2019 | 16:15:12 | Discharge level | 024 AH, SOC: 5%, I:0-2A, L:3464, l:3457, H:3484, B:020, PT:027C, BT:031C, PV:97306, M:Charge |
| 09824 | 03/17/2019 | 16:25:12 | Discharge level | 024 AH, SOC: 7%, I:0-3A, L:3490, l:3481, H:3496, B:006, PT:027C, BT:031C, PV:97790, M:Charge |
| 09825 | 03/17/2019 | 16:35:12 | Discharge level | 024 AH, SOC: 8%, I:0-3A, L:3499, l:3491, H:3505, B:006, PT:026C, BT:031C, PV:98047, M:Charge |
| 09826 | 03/17/2019 | 16:45:12 | Discharge level | 023 AH, SOC: 10%, I:0-3A, L:3508, l:3501, H:3516, B:008, PT:026C, BT:031C, PV:98333, M:Charge |
| 09827 | 03/17/2019 | 16:55:12 | Discharge level | 023 AH, SOC: 11%, I:0-2A, L:3520, l:3515, H:3529, B:009, PT:026C, BT:031C, PV:98666, M:Charge |
| 09828 | 03/17/2019 | 17:05:12 | Discharge level | 022 AH, SOC: 13%, I:0-3A, L:3533, l:3526, H:3542, B:009, PT:026C, BT:030C, PV:99046, M:Charge |
| 09829 | 03/17/2019 | 17:15:12 | Discharge level | 022 AH, SOC: 14%, I:0-3A, L:3547, l:3541, H:3558, B:011, PT:026C, BT:030C, PV:99466, M:Charge |
| 09830 | 03/17/2019 | 17:25:12 | Discharge level | 022 AH, SOC: 16%, I:0-3A, L:3562, l:3556, H:3572, B:010, PT:025C, BT:030C, PV:99871, M:Charge |
| 09831 | 03/17/2019 | 17:35:12 | Discharge level | 021 AH, SOC: 17%, I:0-3A, L:3576, l:3570, H:3584, B:008, PT:025C, BT:030C, PV:100244, M:Charge |
| 09832 | 03/17/2019 | 17:45:12 | Discharge level | 021 AH, SOC: 19%, I:0-3A, L:3587, l:3581, H:3596, B:009, PT:025C, BT:030C, PV:100565, M:Charge |
| 09833 | 03/17/2019 | 17:55:12 | Discharge level | 020 AH, SOC: 20%, I:0-3A, L:3599, l:3593, H:3607, B:008, PT:025C, BT:030C, PV:100880, M:Charge |
| 09834 | 03/17/2019 | 18:05:12 | Discharge level | 020 AH, SOC: 22%, I:0-2A, L:3610, l:3606, H:3618, B:008, PT:025C, BT:029C, PV:101181, M:Charge |
| 09835 | 03/17/2019 | 18:15:12 | Discharge level | 020 AH, SOC: 23%, I:0-3A, L:3619, l:3613, H:3626, B:007, PT:025C, BT:029C, PV:101442, M:Charge |
| 09836 | 03/17/2019 | 18:25:12 | Discharge level | 019 AH, SOC: 24%, I:0-3A, L:3628, l:3622, H:3634, B:006, PT:024C, BT:029C, PV:101663, M:Charge |
| 09837 | 03/17/2019 | 18:35:12 | Discharge level | 019 AH, SOC: 26%, I:0-3A, L:3635, l:3629, H:3641, B:006, PT:024C, BT:029C, PV:101850, M:Charge |
| 09838 | 03/17/2019 | 18:45:12 | Discharge level | 019 AH, SOC: 27%, I:0-3A, L:3641, l:3635, H:3647, B:006, PT:024C, BT:029C, PV:102014, M:Charge |
| 09839 | 03/17/2019 | 18:55:12 | Discharge level | 018 AH, SOC: 29%, I:0-3A, L:3646, l:3640, H:3652, B:006, PT:024C, BT:029C, PV:102168, M:Charge |
| 09840 | 03/17/2019 | 19:05:12 | Discharge level | 018 AH, SOC: 30%, I:0-3A, L:3652, l:3647, H:3658, B:006, PT:025C, BT:029C, PV:102310, M:Charge |
| 09841 | 03/17/2019 | 19:15:12 | Discharge level | 017 AH, SOC: 31%, I:0-3A, L:3657, l:3652, H:3663, B:006, PT:025C, BT:030C, PV:102451, M:Charge |
| 09842 | 03/17/2019 | 19:25:12 | Discharge level | 017 AH, SOC: 33%, I:0-3A, L:3662, l:3657, H:3668, B:006, PT:025C, BT:029C, PV:102602, M:Charge |
| 09843 | 03/17/2019 | 19:35:12 | Discharge level | 017 AH, SOC: 34%, I:0-3A, L:3668, l:3663, H:3674, B:006, PT:025C, BT:030C, PV:102762, M:Charge |
| 09844 | 03/17/2019 | 19:45:12 | Discharge level | 016 AH, SOC: 35%, I:0-3A, L:3675, l:3670, H:3680, B:005, PT:025C, BT:030C, PV:102952, M:Charge |
| 09845 | 03/17/2019 | 19:55:12 | Discharge level | 016 AH, SOC: 37%, I:0-2A, L:3681, l:3677, H:3687, B:006, PT:025C, BT:030C, PV:103131, M:Charge |
| 09846 | 03/17/2019 | 20:05:12 | Discharge level | 016 AH, SOC: 38%, I:0-3A, L:3689, l:3684, H:3694, B:005, PT:025C, BT:030C, PV:103332, M:Charge |
| 09847 | 03/17/2019 | 20:15:12 | Discharge level | 015 AH, SOC: 40%, I:0-2A, L:3697, l:3694, H:3702, B:005, PT:025C, BT:030C, PV:103567, M:Charge |
| 09848 | 03/17/2019 | 20:25:12 | Discharge level | 015 AH, SOC: 41%, I:0-3A, L:3706, l:3701, H:3710, B:004, PT:025C, BT:031C, PV:103800, M:Charge |
| 09849 | 03/17/2019 | 20:34:57 | Contactora was Opened | Pack V: 103701mV, Switched V: 102793mV, Prechg Pct: 99%, Dischg Cur: 527mA |
| 09850 | 03/17/2019 | 20:34:57 | System Turned Off | |
| 09851 | 03/17/2019 | 20:34:58 | DEBUG: CAN NOT Receiving Syncs | |
| 09852 | 03/17/2019 | 20:34:58 | DEBUG: CAN Link Is Down | |
| 09853 | 03/17/2019 | 20:34:58 | DEBUG: Entered Idle State | |
| 09854 | 03/17/2019 | 20:35:04 | Current Sensor Zeroed | old: 2575mV, new: 2577mV, corrfact: 179 |
| 09855 | 03/17/2019 | 20:35:05 | Discharge level | 015 AH, SOC: 42%, I:000A, L:3702, l:3702, H:3705, B:003, PT:025C, BT:031C, PV:103704, M:Idle |


```
09856 03/17/2019 20:35:27 Voltage Across Contactor: 37818mV (Okay)
09857 03/17/2019 20:37:26 DEBUG: Resetting CAN0 due to error passive mode
09858 03/17/2019 20:37:27 System Turned On
09859 03/17/2019 20:37:27 DEBUG: Entered Charging State
09860 03/17/2019 20:37:27 SOC adjusted for voltage old: 15094232uAH (soc:42%), new: 11440000uAH (soc:56%), low cell: 3698 mV
09861 03/17/2019 20:37:27 DEBUG: CAN Link Is Up
09862 03/17/2019 20:37:27 DEBUG: Entered Standby State
09863 03/17/2019 20:39:14 DEBUG: Entered Charging State
09864 03/17/2019 20:39:14 Discharge level 011 AH, SOC: 56%, I:0-1A, L:3697, l:3697, H:3700, B:003, PT:025C, BT:030C, PV:103550, M:Charge
09865 03/17/2019 20:39:19 DEBUG: CAN Receiving Syncs
09866 03/17/2019 20:39:20 Contactor drive turned on Pack V: 103499mV, Switched V: 90663mV, Duty Cycle: 39%
```

The "log viewer" makes it possible to draw graphs from the data contained in the logs. Here are some examples during my full battery drain test. The original version is interactive, in other words when you place the mouse cursor on a point of the curve, the Viewer displays the corresponding data, as shown below during a strong request of the motor which caused the voltage to drop the battery at 93 V.

Zero Log Viewer

538XXAZA1GCJ06548_MBB_2019-03-17

14/02/2019 to 17/03/2019 odo: 10057 - 10770

| | | | |
|-----------|------|------|---------------|
| distance | 713 | 19.8 | ride hours |
| max rpm | 5027 | 36.0 | average speed |
| riding | 4° | 30° | temperature |
| max motor | 57° | 11% | min limit |
| motor | -59 | 311 | amps |
| battery | -51 | 307 | amps |

Events

°C

km

1

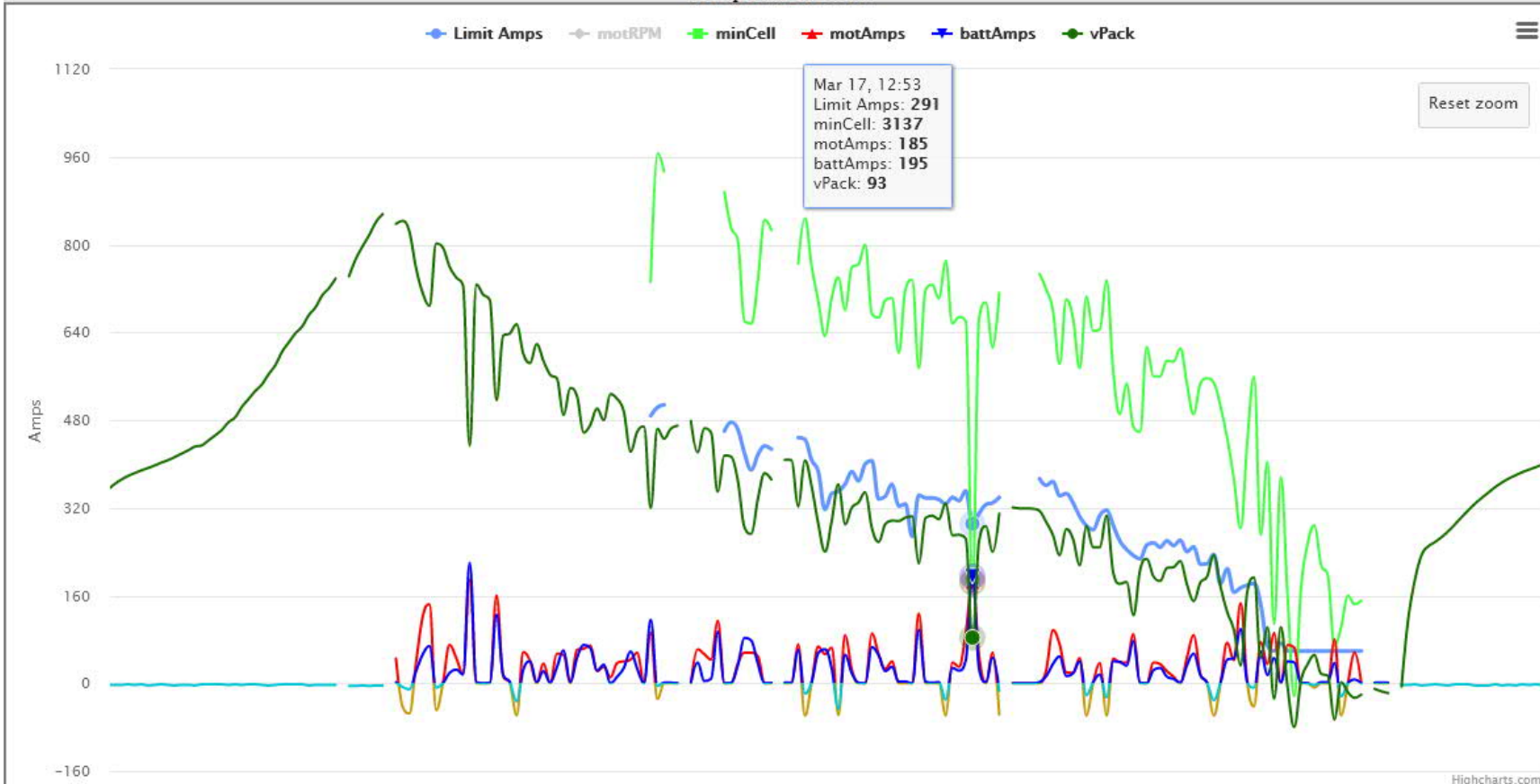
2

3

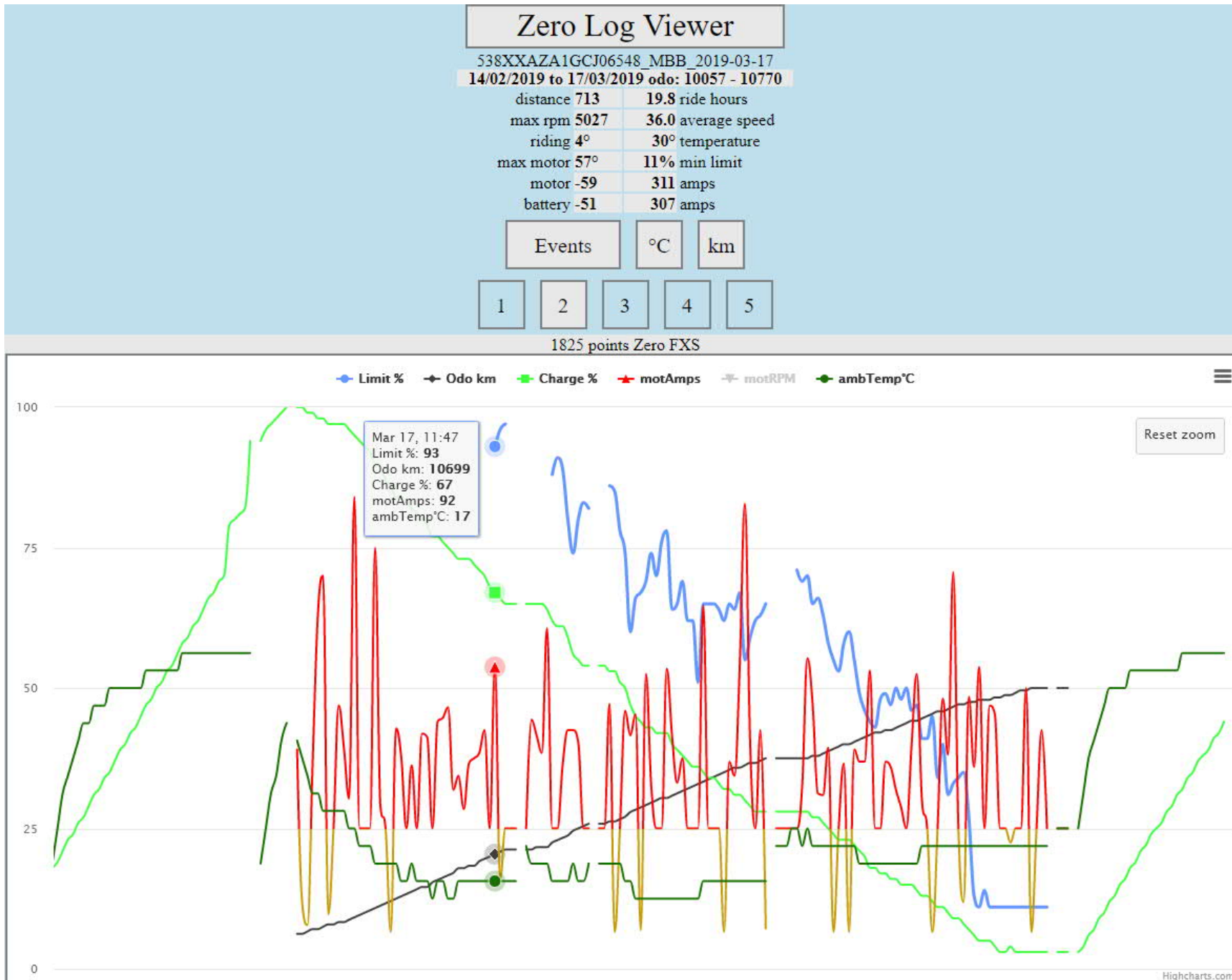
4

5

1825 points Zero FXS



The curve in blue shows the power limitation that starts on my bike when the SOC is below 70% (in this specific case at 67%):



Temperatures:

Zero Log Viewer

538XXAZA1GCJ06548_MBB_2019-03-17

14/02/2019 to 17/03/2019 odo: 10057 - 10770

| | |
|---------------|--------------------|
| distance 713 | 19.8 ride hours |
| max rpm 5027 | 36.0 average speed |
| riding 4° | 30° temperature |
| max motor 57° | 11% min limit |
| motor -59 | 311 amps |
| battery -51 | 307 amps |

Events

°C

km

1

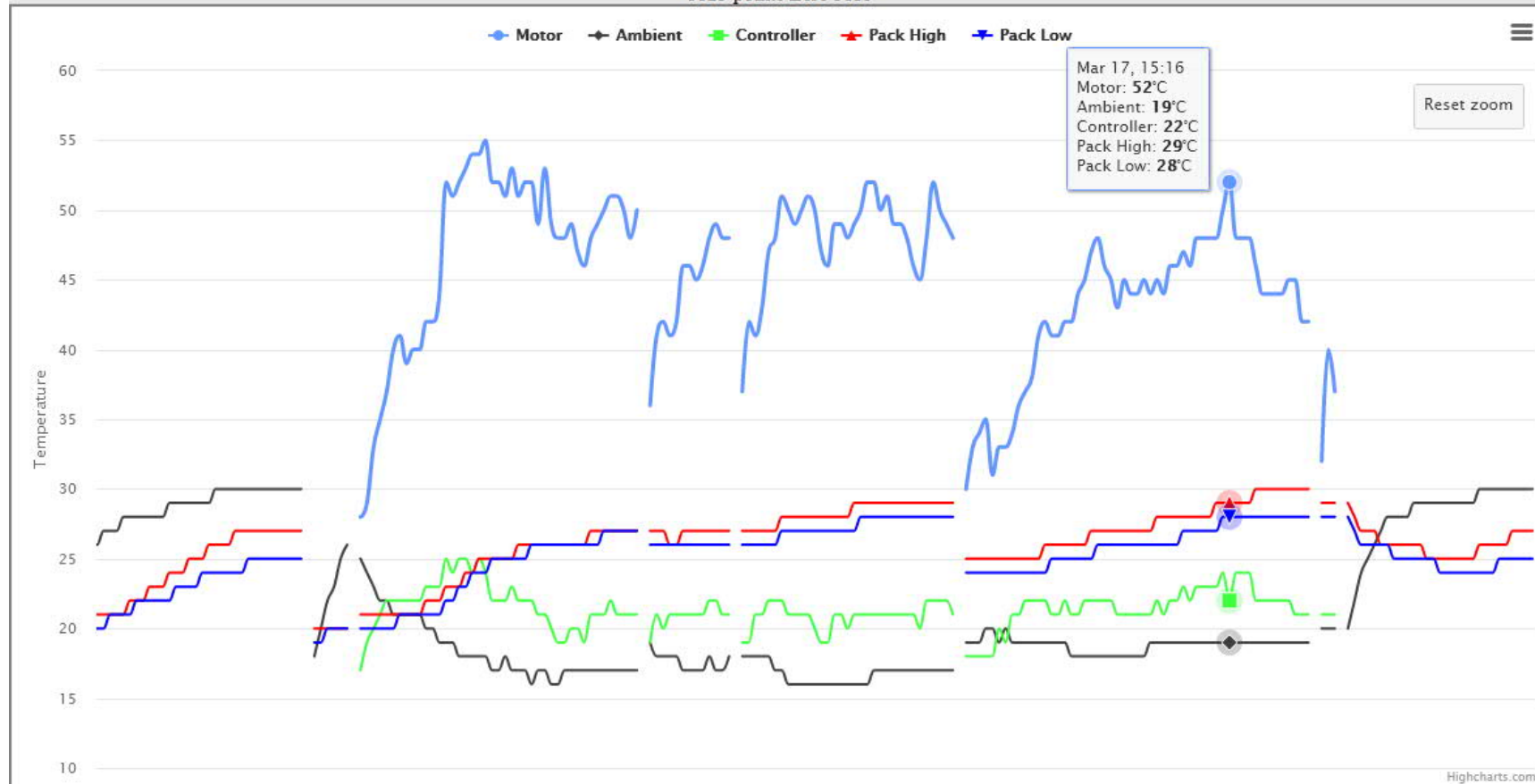
2

3

4

5

1825 points Zero FXS

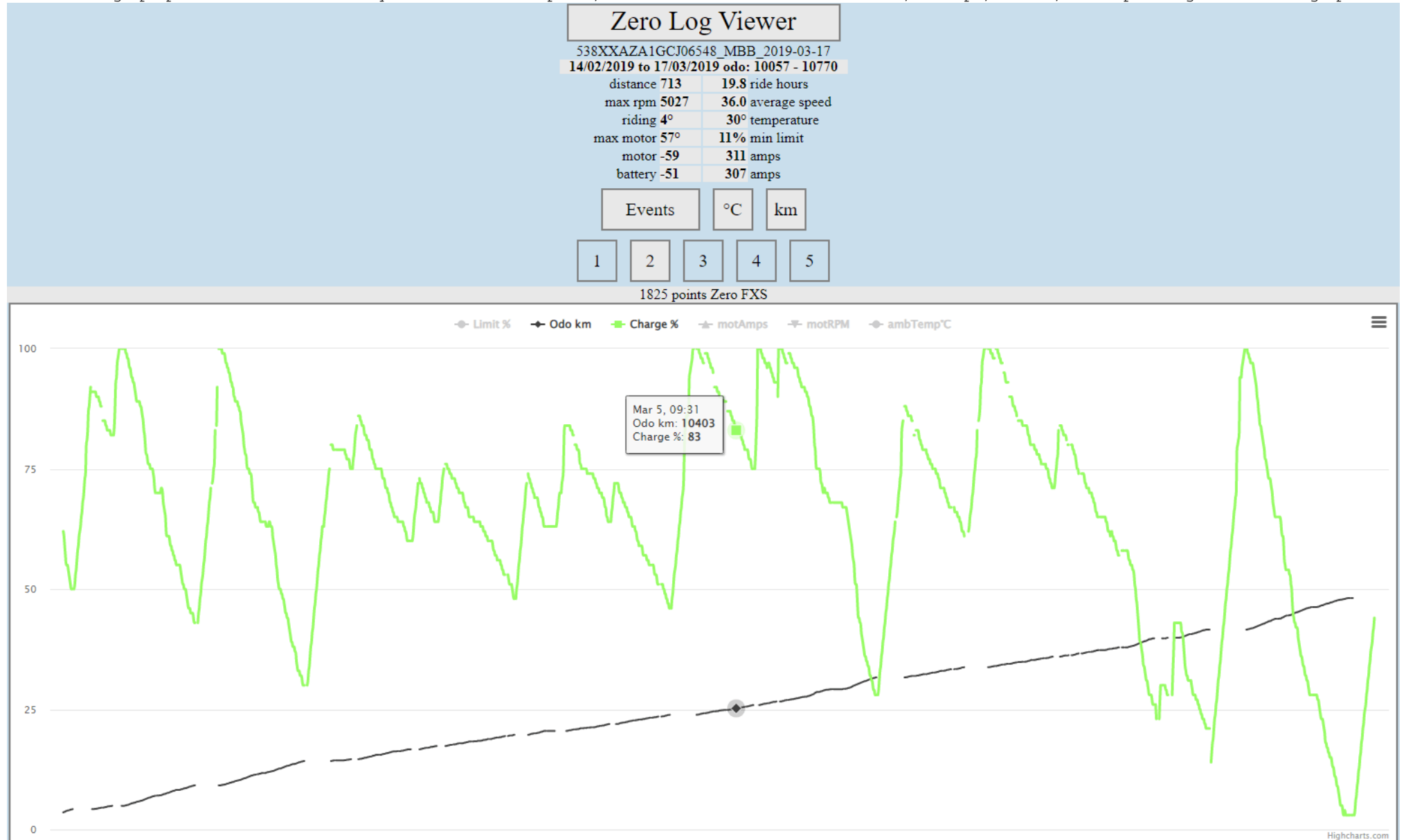


Highcharts.com

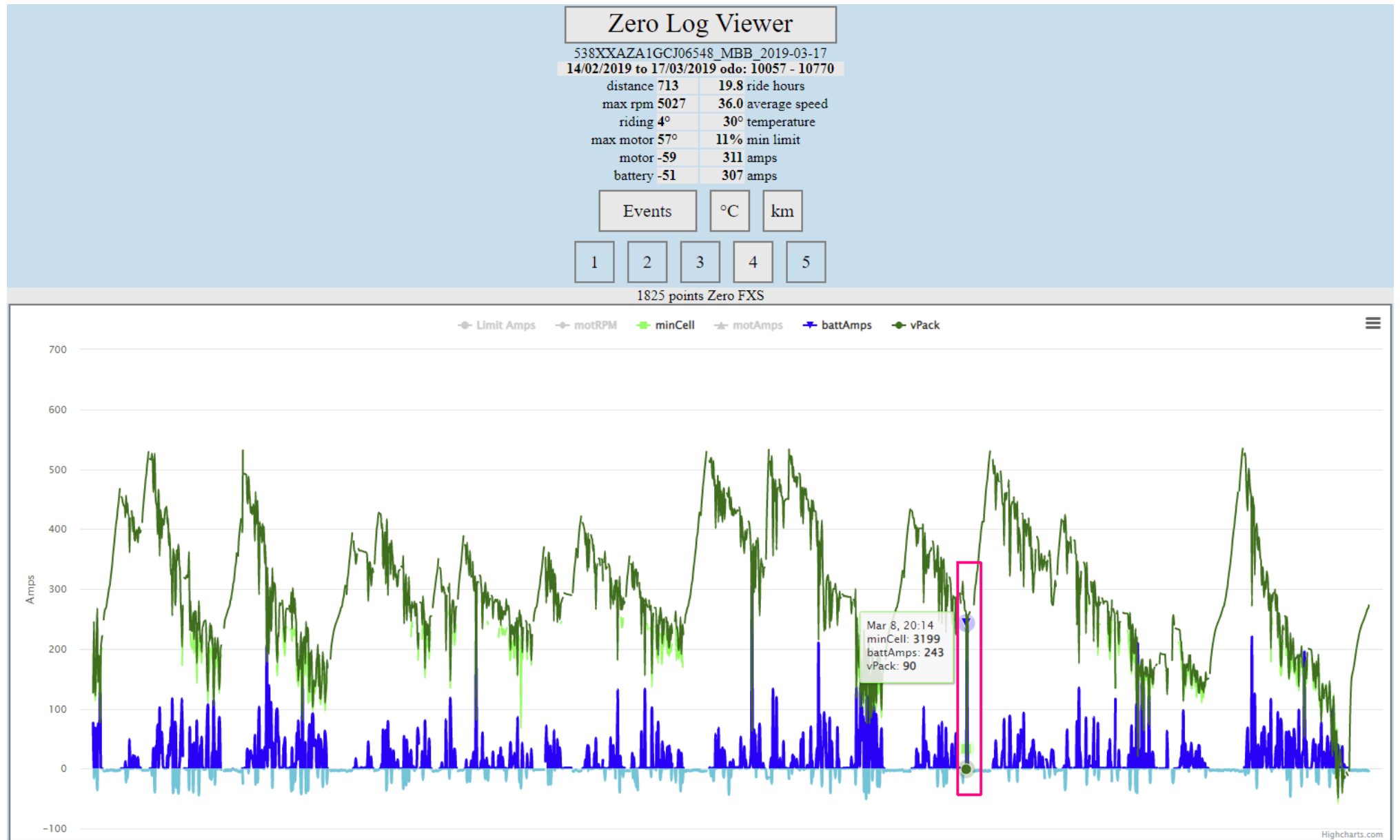
By default, the graphs show all the data stored in the log. The memory stores data for a period of between 500 and 700 km depending on the case and the use made of the motorcycle. If the motorcycle has not been used, the logs can therefore restore the state of charge of the motorcycle over very long periods (as well as all the other data).

To zoom in on the graphs, simply select a portion of the graph by clicking on the graph with the mouse from the start of the desired period to the end of the desired period. This is what was done for the graphs presented above.

Here is the graph presented in its entirety. Here the second panel, in which we have disabled Limit %, motAmps, motRPM, ambTemp°C to get a clearer graph:



The 4th panel, in which we disabled Limit Amps, motRPM, motAmps to see more clearly:



Zoom on the part framed in red:

Zero Log Viewer

538XXAZA1GCJ06548_MBB_2019-03-17
14/02/2019 to 17/03/2019 odo: 10057 - 10770
distance 713 19.8 ride hours
max rpm 5027 36.0 average speed
riding 4° 30° temperature
max motor 57° 11% min limit
motor -59 311 amps
battery -51 307 amps

Events

°C

km

1

2

3

4

5

1825 points Zero FXS

