ModuLab Core Card Firmware History

Purpose

This document summarizes the changes made to the firmware fitted to the following Solartron ModuLab ECS and MTS core modules since the initial release.

- ModuLab PSTAT1MS
- ModuLab MAT1MHz
- ModuLab XM PSTAT1MS
- ModuLab XM MAT1MHz
- EchemLab XM
- EchemLab XM (HV)
- SolarLab XM
- EnergyLab XM
- MaterialsLab XM

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The Core card requires two different types of firmware to operate, one for the ARM processor, which supports communications, and the other for the instrument's DSP. Each set of firmware has its own version number. The table below lists the major firmware revisions for the combination of the two.

Revision	Date	Changes Included
ARM 01.07.02 DSP 03.06.01	June 2016	• Support for EchemLab XM, SolarLab XM, EnergyLab XM and MaterialsLab XM • Increased number of steps to 250 • Fixed Measure on Change with Integration period < 1ms • Fixed 5ms gap in fast PV Decay data
ARM 01.06.08 DSP 03.05.08	July 2015	• Introduce Gstat resistors to reduce noise on WE • Fixed spike when switching off CE with high loads • Fixed auto-range when a Decision step follows an Open Circuit step
ARM 01.06.08 DSP 03.05.06	June 2015	• Add AC calibration to Aux channels • Add engineering command to aide production calibration • Fix bug for high data rate steps to ensure CE is released when step ends
ARM 01.06.08 DSP 03.05.01	Mar 2015	• Support for 100V 100A boosters • Fix bug with Loops & OC steps
ARM 01.06.08 DSP 03.04.00	Oct 2014	• Support for MTS XM HV AC Calibration
ARM 01.06.08 DSP 03.03.00	Oct 2014	Bug Fixes: • Change frequency limits to current range to reflect XM performance • XM core card only performs with XM option cards
ARM 01.06.08 DSP 03.02.01	Aug2014	Bug Fixes: • Added support for ModuLab MTS XM

ARM 01.06.08 DSP 03.01.02	July 2014	Bug Fixes: • Added support for ModuLab XM • Fixed problem when opening FRA webpage • Fixed measurement period > 10 minutes • Added support for resetting charge to zero • Fixed problems with HV and Internal booster
ARM 01.06.01 DSP 03.00.16	Mar 2014	Bug Fixes: • Bug fixes for DSSC
ARM 01.06.01 DSP 03.00.15	Jan 2014	Bug Fixes: • Support for DSSC • Solves problem with auto range and temperature • Resolve voltage spikes • Add range change delay filter to voltage cannel • New integration setup for impedance
ARM 01.05.00 DSP 02.08.14	July 2013	Bug Fixes: • On Safety limit turn off External booster CE before Core • Updated FPGA to stop loop experiments completing early
ARM 01.05.00 DSP 02.08.12	June 2013	Bug Fixes: • change 30uA range frequency limit to 5KHz.
ARM 01.05.00 DSP 02.08.11	April 2013	Bug Fixes: • Wrong AC amplitude being applied when an OC before AC step with auto range • NVP correct number of pulses generated • Reduce min step duration
ARM 01.05.00 DSP 02.08.00	May 2012	Bug Fixes: • Reduce External Booster spikes when switches between OC and Gstat.
ARM 01.05.00 DSP 02.07.00	Dec 2011	Bug Fixes: • Mref remove switching RL215 RL214 • OC bug with CE being applied • Periodic noise solved with latest fpga • Internal booster stay on 3A range if > 2.4A • Mega sample / sec solved
ARM 01.04.02 DSP 02.06.22	Oct 2011	Common code for ECS and MTS cards
ARM 01.02.00 DSP 01.11.00	April 2010	Bug Fixes: • Solve OC reading 11.5V & end of experiment marker appearing in wrong place • Correct reject cal constants being applied for IRComp • Cyclic with vertex1 V.Previous followed by sweep • Linear sweep when start value = end value
ARM 01.02.00 DSP 01.10.00	Jan 2010	Bug Fixes: • Use of Aux channels causes voltage to go to zero when doing impedance. • DC current not giving correct level when IR Compensation being applied.
ARM 01.02.00 DSP 01.09.00	June 2009	Bug Fixes: • Pulse steps not returning results in some cases. • When performing a Cyclic Voltammetry step with step termination set the end value was not reached

ARM 01.02.00 DSP 01.08.00	May 2009	Enhancements: • Added support for Decision steps to run different sets of steps depending on measured values. Bug Fixes: • Incompatible firmware could be loaded into the Pstat. • Voltage vs. Previous was not working in some situations • 2A booster instability/ trip on auto current range
ARM 01.01.00 DSP 01.06.00	March 2009	Enhancements: • Improved Impedance auto current range selection • Voltage vs. Previous now uses logical value instead of measured value where possible. Bug Fixes: • Charge was not being measured correctly with On Pulse measurement • Voltage vs. Previous following a SWV step was using the wrong voltage • Impedance steps would not run for longer than 70 minutes • LSV and CV steps with slow scan rates did not work • Fixed voltage vs. OC for CV step when not the first step.
ARM 01.01.00 DSP 01.05.00	January 2009	Enhancements: • Current vs. Previous now supported. Bug Fixes: • FRA generator amplitude in gstat was not set correctly in some situations. • Experiments with external boosters were not validated correctly. • Step termination within loops was not working correctly.
ARM 01.01.00 DSP 01.04.00	January 2009	Bug Fixes: • IR compensation was not working correctly with auto current range • Communications did not recover from transmission error • FRA generator amplitude was not set correctly in some situations • An experiment requiring an HV module would attempt to run even if one is not fitted
ARM 01.01.00 DSP 01.03.00	December 2008	Bug Fixes: • Fixed occasional lockup on impedance steps

ARM 01.00.00 DSP 01.02.00	December 2008	Bug Fixes: • Some experiments with External Booster were incorrectly reported as invalid. • NPV waveforms were not generated correctly in some situations. • Staircase waveforms were not generated correctly in some situations. • Improved pstat-gstat transitions with Booster 2A. • Polarography was output was not working correctly. • DPV as not working correctly with Aux channel enabled. • Voltage vs. Previous step did not work if the previous step was gstat. • Loop termination was not working if there was no step after the loop.
ARM 01.00.00 DSP 01.00.00	November 2008	Initial release.

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5 ASHVILLE WAY
MOLLY MILLARS LANE
WOKINGHAM, RG41 2PL
UNITED KINGDOM
Phone: +44 (0) 1252 556 800
Fax: +44 (0) 1252 556 899

801 SOUTH ILLINOIS AVENUE
OAK RIDGE
TN 37831-2011
USA
Phone: +1 865 425 1360
Fax: +1 865 481 2410

Visit our website for a complete list of our global offices and authorized agents

solartron.info@ametek.com **www.solartronanalytical.com**