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Firmware Release Notes

SM15K-Series Power Supplies

Firmware Update
It is strongly recommended to update units to the latest firmware version.
Download the SM15K Quick Start Guide for instructions, see **PRODUCTS\SM15K\DOWNLOADS** on our website.

SM70-CP-450
SM210-CP-150
SM500-CP-90
SM1000-CP-45
SM1500-CP-30

Version 202509-3
Firmware P0230

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1 Information on this document

1.1 Introduction

The SM15K-series firmware is continuously updated to improve functionality, enhance reliability, and resolve known issues. These release notes summarize the changes introduced in each firmware version and serve as a reference for users and service personnel.

Safety Notice: Before performing any firmware update, all safety precautions described in the SM15K product manual must be followed. Ensure that the power supply is installed, operated, and updated only under safe conditions.

To guarantee optimal operation, it is strongly recommended to update units to the latest available firmware. Detailed instructions for performing the update are provided in the SM15K Quick Start Guide, available on the **Delta Elektronika website**

For power supply models with a firmware version below P0109, an intermediate upgrade is required. Please consult Section 1.2 for details. If the firmware version is greater than P0119, proceed with the update to the latest firmware as described in Section 1.3.

The detailed list of changes per firmware version can be found in Chapter 2.

1.2 Firmware Upgrade

Important: If the current firmware version is P0109 or older, an intermediate upgrade is required before installing the latest version.

- First, update the unit to the intermediate firmware version P0119. This version is included in the ZIP package of the latest firmware.
- After upgrading to P0119, you may proceed with installing any version higher than P0119.

1.3 Firmware Update

If the current firmware version is greater than P0119, follow these steps:

1. Download the latest product manual from the Delta Elektronika website and follow the update instructions: **Products > SM15K > Downloads > Manuals > Product Manual SM15K series**.
2. Download the latest firmware update package from: **Products > SM15K > Downloads > Firmware > Firmware update SM15K series**.
3. Perform the update as described in the product manual.

1.4 Additional information

The following documents and files related to firmware updates are available on the website **Products > SM15K > Downloads**.

Document name	Type
Quick Start Guide SM15K-series	Guide
Product Manual SM15K-series	Manual
Firmware Release Notes SM15K-series	Release Notes
Firmware Package (Including firmware file and upgrade file for current firmware below P0109)	Firmware

1.5 Firmware update subscription service

A firmware update subscription service is offered free of charge. Subscribers receive notifications when new firmware versions are released, including links to the firmware files and release notes.

To subscribe, please use the **Newsletter subscription form** and select the relevant product series.

1.6 Contact

For additional guidance, remarks, or feedback, please visit our website and use the **contact form**. A structured technical contact form is available to provide detailed descriptions and upload files

In case of malfunction or breakdown, please fill out the **RMA-form** to get the product serviced.

2 Revision History

2.1 Legend

N = New feature
V = Valuable improvement
B = Bug fix

2.2 Changes from P0210 to P0230

Release date: May 20th, 2025

N **Support of INT-MOD-ANY module**
This firmware update adds support for the new plug-and-play INT-MOD-ANY interface module. Once the update is installed, SM15K-series power supplies will be able to be programmed using the INT-MOD-ANY module.

Please note that the firmware update must be performed without the INT-MOD-ANY module being connected. Make sure to unplug the module before starting the update process.

This firmware version enables voltage and positive current programming via the INT-MOD-ANY interface. A future update (P0230+) will expand this functionality to allow independent programming of both positive and negative current, as well as independent programming of positive and negative power.

N **Addition of Constant Current (CC) Regulation Controls**
This firmware update introduces additional controls in the web interface, allowing users to fine-tune the current regulation PI-parameters of SM15K-series power supplies. Users can now independently adjust the Proportional and Integral gains for both positive and negative current regulation. This helps to optimize the system's dynamic response, for example when working with large inductive loads.

B **Improvement of Master/Slave Functionality**
In systems with over 30 units in Master/Slave configuration, a rare condition could cause one unit to unexpectedly switch-off its output. This firmware update addresses this issue, ensuring stable and reliable operation even in high-unit-count configurations.

2.3 Changes from P0200 to P0210

Release date: April 25th, 2024

N **Enabling Master/Slave operation for SM1000-CP-45**
The Master/Slave operation functionality by using the INT-MOD-M/S-2 module is enabled for the SM1000-CP-45 model.

2.4 Changes from P0190 to P0200

Release date: April 4th, 2024

V **Improved Startup Behavior**
When switching-on the output while an external voltage is applied to it, the output current swing is reduced to the minimum.

B **Improved INT-MOD-ANA Range Select settings memory**
Range was not stored to non-volatile memory when selected via webserver. This is fixed now: after a power cycle the range setting remains unchanged.

B **Improved PV-Simulation stability**
When intensively used, the simulation occasionally stopped working. This bug is fixed now.

B **Improved Rin and Leadless Sensing Function settings behavior**
After setting the parameters, a power cycle was required to make the new settings active. This is fixed now: new settings can be used immediately.

N **New unit in SM15K series**
Firmware P0200 is the first firmware update compatible with the SM1000-CP-45.
Note: Master/ Slave functionality not enabled yet.

2.5 Changes from P0180 to P0190

Release date: October 4th, 2023

V **Improved Fan Control**
The fan-control firmware has been modified, resulting in improved cooling capability.

N **Added INT-MOD-ANA Range Select**
The webserver provides a new option to select between 0-5V and 0-10V range for the optional INT-MOD-ANA interface.

2.6 Changes from P0170 to P0180

Release date: May 31st, 2023

V **Measure:Power? SCPI command**
When using the Measure:Power? SCPI command, the output power of the unit is calculated. The voltage

measurement used to calculate the power has been moved from the output terminals to the sense connector. Thus, the output power calculated during remote sensing is now the power at the terminals of the load.

B **INT-MOD-ANA accuracy**
Improved calibration to remove offset on the monitoring outputs of the INT-MOD-ANA interface card.

2.7 Changes from P0160 to P0170

Release date: April 5th, 2023

V **Vsense PID control**
The range of Proportional and Integral control settings is increased. Allows better tuning to different load conditions.

N **Unit console**
The web server provides a button under Administration, Info to display some inner system values for diagnostics.

V **Inrush**
Improved inrush current limitation.

B **Function Vlow setting**
Input value for Vlow of Function Rin and Leadless Sense via SCPI didn't work properly. This is fixed now.

V **Increased gain**
Both the SCPI commands CALIbrate:VOLtage:MEAsure:GAIn and CALIbrate:CURrent:MEAsure:GAIn allow higher gain.

2.8 Changes from P0151 to P0160

Release date: January 11th, 2023

B **Invalid password**
In case a password is active, no longer a false message is shown when starting a firmware update.

B **Slow recovery time**
When switching back from Master/Slave to normal operation, the internal control speed is set back to normal operation properly.

V **PV simulation**
Input values of parameters are limited in ratio to avoid very sharp PV characteristic.

N **INT MOD SER**
When an INT MOD SER is inserted, the default configuration is set to RS232, 9600, 8 bits, no parity, half duplex. Rather than not enabled. This to make things more convenient.

2.9 Changes from P0150 to P0151

Release date: June 29th, 2022

B **Output Voltage**
Output voltage didn't reach 0V in some circumstances.

2.10 Changes from P0143 to P0150

Release date: April 22nd, 2021

B **Instruments**
Overflow fixed of SCPI command MEASURE:INSTRUMENT.

B **INT MOD CON**
Relay contact assignment works properly again for all selectable signals.

2.11 Changes from P0140 to P0143

Release date: December 18th, 2020

B **Temperatures**
Negative ambient temperature caused the output to switch off. This is fixed now.

V **Sequencer**
Jitter between sequence steps is significantly reduced.

2.12 Changes from P0130 to P0140

Release date: May 29th, 2020

V **SM70-CP-450 Master/Slave**
The maximum units for SM70-CP-450 in a master/slave configuration changed from 6 to 60 units.

N **SM210-CP-150 Master/Slave**
The SM210-CP-150 can be used in a master/slave configuration up to 60 units.

B **INT MOD CON**
Linking the relay contacts to the output status is working again.

B **Photo Voltaic (PV) Simulation**
Settings on front and web show the maximum settings of voltage and current correctly, according to the given parameters, like Gpv and Tpv.

2.13 Changes from P0120 to P0130

Release date: February 7th, 2020

N **Photo Voltaic (PV) Simulation**
A whole new function has been added. Possibility to configure the power supply system as a solar panel plant for simulation purposes. Either in stand-alone mode, as well as master/slave configuration. Includes MPPT and a built-in graphical visualisation for ease of use without the need for external software applications.

V **Current overshoot reduction**
Further improvement on reducing current overshoots after changes in current settings.

N **Master / Slave**
Power-on default setting for Output ON/OFF is possible now.

V **Master / Slave**
Improvement of balancing between units in parallel mode.

N I**nstrument**
Instead of only the possibility to disable or enable a measurement instrument (Ah or Wh), two extra settings have been added: Suspend and Resume.

N **Regulation Defaults**
It is possible to force all regulation settings back to factory default. The control can be found on the web interface under Configuration, Regulation, Miscellaneous.

2.14 Changes from P0110 to P0120

Release date: November 26th, 2019

V **Current overshoot reduction**
Positive and negative current are 'soft started' by ramping up the set points. This to minimize overshoots at for example diode based applications.

Improved positive current reaction time to reduce overshoots when the power supply switches from CV to CC operation (diodes).

Improved accuracy when switching the output ON. This will reduce initial peak currents at low resistance voltage sources (batteries).

V **Voltage overshoot reduction**
Remote sense is blocked while positive and negative current settings are 'soft started'. This to prevent run-away of the sense control resulting in voltage overshoots.

N **Protection**
Maximum output voltage setting is 101% of its nominal rating. Overload indication (OL) is set to 102.5% of the nominal rating but the unit will continue to operate up to its self-protect level which is about 105% of the its nominal rating.
If the output voltage exceeds its self-protect level, the output is automatically disabled and remains disabled with the indication "PROT". The user may reset the self-protected state by switching the output to OFF.

2.15 Changes from P0109 to P0110

V **Current overshoot**
When turning on the output, the unit starts in CC-mode, reducing current overshoots. This is required for e.g. battery and laser applications.

N **Speed control**
The control speed of the Voltage regulation can be adjusted via the web interface. This is useful when working with e.g. large capacitive loads.

B **INT MOD ANA calibration**
Calibration of the analogue inputs and outputs could get mixed up after saving. In that case, recalibration is required after installing this new package.

B **Updating speed**
Updates are processed faster due to a bug fix.

2.16 Changes from P0108 to P0109

N **Temperature compensation**
Calibration commands are available for temperature drift compensation to improve current measurements even more.

2.17 Changes from P0107 to P0108

N **Firmware version auto synchronization**
Installed interface modules are checked for their firmware version during start-up. If they do not meet the requirements of the unit, the interface modules can be auto-synchronized with it.

N **Functions**
Simulation of Internal resistance (Ri) and Leadless sensing is available now. No extra hardware required.

N **Ethernet logging**
A logging mechanism is available for Ethernet communication. Received commands, queries or both can be logged to a file. The file is available via an Ethernet command, as well as via the web interface.

N **Wh and Ah instrument**
Ethernet commands are implemented to measure Ampere Hour (Ah), Watt Hour (Wh), minimum/maximum output current or power.

N **Time and date**
Ethernet commands are implemented to set and read time and date.

N **Temperature**
An Ethernet command is implemented to read the highest temperature in the power supply.

N **Sequencer advanced mode**
In the web console, an extra button is available to monitor the internal variables and timers of the sequencer. The new feature is very helpful during sequence development or debugging.

V **Master/Slave parallel**
Up to 60 units can be connected in parallel now.

V **Remote sensing**
Stability of the regulation is improved.

V **Improved output ripple**
Very fast ripple rejection, is case of AC grid fluctuations.

B **Master / Slave AC fail recovery**
Smooth restart of output voltage after an AC fail recovery.

2.18 Changes from P0106 to P0107

B **Fixing disabled front panel**
After updating it might happen that the front panel is not working anymore. Especially when making a big jump in package version.

2.19 Changes from P0105 to P0106

N **INT MOD ANA**
The interface INT MOD ANA can be used in the SM15000 series. Also in combination with Master/Slave operation.
The analog input “Vprogram” is linked to the voltage setting.
“Iprogram” is linked to both the positive and the negative current setting.
Positive and negative power settings cannot be set via this interface. Use Front, Web, Eth, etc instead.

N **Master/Slave operation**
Now available for SM1500-CP-30 as well.

2.20 Changes from P0104 to P0105

N **Master/Slave series operation**
Up to 6 pcs SM500-CP-90 can be connected and controlled in series. Please contact factory if one or more units were delivered before Q4 2018.

N **Master/Slave series operation Limitation**
The total system output voltage is limited to 750V when 2 or more SM500-CP-90 are connected in series. This applies if at least one of the units was delivered before Q4 2018. Please contact factory for upgrading to 1000V.

N **INT MOD CON**
The four relay contacts can be linked to system status, like ACF, DCF, Output, etc. Furthermore, the contacts can not only be controlled by Ethernet, but also from the web page.

V **Sequencer**
When the sequencer is linked to a programming source like Front, the front knobs will still be active, and the sequencer can manipulate these settings.

B **Sequencer**
The command SP is no longer limited, so it can be used for Master/Slave systems up to 300KW.

2.21 Changes from P0103 to P0104

N **Master/Slave operation**
Up to 20 pcs SM500-CP-90 can be connected and controlled in parallel.

V **Front / Eth/ Web**
Ready for Master/Slave operation and control of systems up to 300KW.

V **INT MOD SER**
Ready for systems up to 300KW.

N **Interface updating**
Installed interfaces are automatically detected and updated during a unit firmware update.

B **PROG:SEL:LABEL?**
When two or more labels exist, only one was replied.

B **Sequencer**
INC and DEC commands didn't work properly on SCN and SPN.
With the commands CJL and CJG, MC and MP didn't work properly on negative values.

2.22 Changes from P0102 to P0103

V **Regulation**
Output regulation is significantly improved for capacitive loads.

V **Temperature control**
The regulation of the temperature could lose its smooth behaviour under certain conditions. Overshoots of the fans speed are suppressed now.

N **Knob A**
The function of Knob A can also be chosen on the web server page.

B ***PUD?**
An empty PUD resulted in two linefeeds when queried by *PUD?. Now it replies with just one terminator.

B **Communication**
A memory leak is repaired in the operating system, which resulted in communication problems after several days of continues operation.

2.23 Changes from P0101 to P0102

N **Stepsize**
Via Ethernet commands the digital step size of the voltage and current programming can be queried.

V **Manual**
Content of the manual is updated.

B **Program:catalog?**
Entire list is replied instead of just one entry.