

InteliNeo 530 BESS

Controller For Battery Energy Storage System Applications

SW version 2.1.0

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1 General information

1.1 Version information

This latest FW version is compatible with:

- IntelliConfig version 2.62.3.0 and newer
- IntelliSCADA version 3.2.0.0 and newer
- IntelliVision 5.2 FW 1.13.0.0 and newer
- Internal display (ICD) FW 2.7.0.0 and newer

1.2 Clarification of Notation

Note: This type of paragraph calls the reader's attention to a notice or related theme.

IMPORTANT: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

WARNING: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

CAUTION: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

Example: This type of paragraph contains information that is used to illustrate how a specific function works.

2 Changes in the version 2.1.0

2.1 New Features

Significant changes have been made to the operating principles of the entire system in IntelliNeo, as well as in other controllers that are part of the microgrid systems solution.

To understand these principles, we recommend studying the detailed description of the current functionalities of the IntelliNeo controller, which can be found in the [IntelliNeo Global Guide 2.1.0](#) document.

CAUTION: When using the IntelliConfig functions FW Upgrade / Current Configuration and Bulk/Offline Upgrade, we strongly recommend paying close attention to the report generated by this operation. Due to the nature of firmware upgrades, inconsistencies between the original and new configuration may occur, which can result in a non-functional configuration or, in certain situations, even create hazardous states. Careful review of the logs can prevent this issue.

Note: Specifically, when upgrading from version 1.2.0 or older to version 2.0.0 or newer, there is a change in the startup sequence settings: Setpoint Precharge Type = AC is imported into the new configuration as Setpoint Starting Sequence BCB Control = Start With Closed BCB. This reverses the order of steps in the startup sequence.

New functions in firmware:

- **BESS Energy equalization based on SOC (SOC Balancing)**
 - Energy equalization function for sites with multiple Battery Energy Storage Systems (BESS) provides coordinated management of energy distribution among several BESS units to ensure optimal performance, longevity, and economic efficiency. Energy equalization involves balancing the State of Charge (SOC) across multiple BESS within a distributed energy storage network. The SOC reflects in the load sharing with other BESS units in a way that all the BESS units will be charged or discharged to its target in same time period.
 - Ensuring with this function that no individual BESS in a network is overused or underutilized, which can lead to unequal degradation or inefficiency. The distribution of the energy between the BESS is given by combination of parameters such as SOC, Effective Capacity, Maximal Charge current and Maximal Discharge current.
- **Voltage controlled time overcurrent (ANSI 51C) new protection added**
- **Voltage restrained time overcurrent (ANSI 51V) new protection added**
- **Voltage ratio management of the BESS**
 - Newly IntelliNeo allows the user to define charge and discharge targets and hysteresis by the ES voltage meas value. Similarly to the target definition in percentage of SOC user can now set limits in percentage of the ES nominal voltage.
- **Ignoring Target value**
 - New LBI that allows ignoring predefined Target limits (SOC High Target, SOC Low Target, V Rel High Target, V Rel Low Target). The usage of the LBI supports the BESS to maximize charging or to deep discharge in order to recalibrate the SOC calculation run by the BMS.
- **DC Coupled PV monitoring support**
 - New LAI to receive the data from the DC PV communication devices for monitoring only.

- **Evaluation of BESS cycles**
 - New controller function of counting the BESS cycles utilizing depth of discharge algorithm.
 - **New IDMT curves**
 - New setpoint IDMT Curve which allows the user to choose what type of IDMT curve is needed for the specified protection reaction time. Protections that are influenced are Time Overcurrent, Voltage Controlled Time Overcurrent, Voltage Restrained Time Overcurrent, IDMT Overload, IDMT Reverse Power, IDMT Earth Fault Current.
 - **Cell protection evaluation**
 - Expansion of the inbuilt protection for Battery operation area. (Cell max voltage, cell min voltage, cell max temperature, cell min temperature)
 - **Energy Storage temperature protection**
 - **Expanded Mains parallel function support added - Mains Preference**
 - In cooperation with new IntelliMains 1010 v. 3.8.0 or IntelliMains 510 v. 1.4.0, the function is available for MINT applications.
 - **New control setpoint for Genset parallel operation - Gen P Optimal**
 - Newly IntelliNeo530 BESS adjust power target to maintain the Gen P Optimal power value on the Genset, while PV curtailment continues to target the #Gen P Min. The goal of the function is to leverage the peak of the genset efficiency when loaded ideally.
 - **Switchable ECU CAN1 Speed**
 - CAN baud rate can be set to either 250 or 500 kbps.
 - **State Decoders support**
 - BESS state machines, Alarm codes, Analog statuses – Enumerators can be converted into binary states with ease using new IntelliConfig function.
 - **Transition of BESS Power to Zero Follows Soft Unload Ramp**
 - New ramp added for smooth BESS unloading.
 - **BESS Time to Unload Counter**
 - BESS remains loaded even after reaching the BESS High SOC Target until the genset is started and connected to the bus (if available).
 - **Actual Power and load reserve from other devices on CAN visible in Values**
 - **Load Shedding Function Improvement**
 - Defines the number of stages to be shed when BESS enters island operation. Load Shedding will be evaluated based on Battery SOC, frequency and kVA, in addition to power in kW
 - **BESS Q Control in Island Operation Accepts Request in BESS Q Control = Analog**
 - Previously, the BESS performed Var Sharing. Now, it accepts requests from the analog input without limitations and does not consider current Q control limits of other sources.
 - **Support of opening BCB breaker using a LBI in Auto mode**
 - New LBI that allows control in Auto mode of the controller. The BCB breaker can be opened (with Soft unload procedure) by a LBI function, when LBI deactivated it closes again.
- Other changes added/modified with version:**
- **PLC Block Validator increased to 16**
 - **PLC Block Interpolation 8 newly added**

- **PLC block Breaker new function behavior**
 - Behavior changed - It includes the internal failure states now
- **Activation of the Safety Mode function to be optional**
 - Newly the Safety mode function can be disabled
- **BESS P Control = Setpoint (New behavior change)**
 - New option that allows operator directly set the power command. When set to "Setpoint" power command is defined with the setpoint BESS Manual P Request.
- **LBO Synchronizing newly added**
- **Support of custom SNMP MIB Table Editor**
- **SOC Delay protection evaluation**
- **Values BESS Max Charging P and BESS Max Discharging P newly added**
 - Two new values that reflects controller internal logical to inform user what is current available charge and discharge power after applying all the limits in the controller (SOC Charge/Discharge disable...)
- **Configurable Ethernet ports**
 - User can define if ethernet interface is considered as Trusted Interface or Untrusted Interface
- **System use notification text**
- **User Text for User Buttons order update**
- **Renaming of certain com. objects from CAN to newly ICC**
- **Expanded function of Modbus communication**
 - Controller can communicate with Modbus devices on addresses 0, 248, 249, 250, 251, 252, 253, 254 and 255
- **Support of the 32 bit analog signal in ECU value editor**
- **Dynamic ISOC Control f/V weight**
- **CAN 2 communication lost detection**
- **Energy Storage (ES) and Power conversion system (PCS) protections evaluation with PCS in started state.**
 - Protection to be evaluated with LBI PCS Ready To Start = 1
- **Increase number of supported IOs per J1939 per User device Increase to 24 BIN,24 BOUT, 16 AIN and 16 AOUT**
- **Improvement of Gridcode support (regional requirements)**
- **ROCOF function improvement**

2.2 Compatibility with other ComAp controllers

New compatibility starting with this version. To ensure mutual compatibility, it is necessary to combine versions according to the following list:

- InteliNeo 6000 – v. 2.0.0
- InteliNeo 5500 – v. 2.0.0
- InteliGen 1000 – v. 3.8.0
- InteliMains 1010 – v. 3.8.0
- InteliGen 500 – 2.4.0
- InteliMains 510 – 1.4.0

- InteliGenG4 200 – 2.3.0
- InteliMains 210 G2– 3.2.0

2.3 Compatibility with ComAp pc tools:

New compatibility starting with this version.

- InteliConfig - v. 2.62.3 and higher

2.4 Bug Fixes

- Under specific conditions, the controller does not resume communication with the ECU over Modbus RTU after a connection loss. **Bug fixed.**
- **First and Second Battery Strings to connect to DC BUS**
- **Wrong calculation of statistics BESS Charge/Discharge kWh**
- **BESS Unloaded to 0 immediately when Target SOC has reached**
- **Slow stop protection is fixed**

3 Changes in the version 2.0.0

3.1 New Features

For this version, significant changes have been made to the operating principles of the entire system in IntelliNeo, as well as in other controllers that are part of the microgrid systems solution.

To understand these principles, we recommend studying the detailed description of the current functionalities of the IntelliNeo controller, which can be found in the [IntelliNeo Global Guide 2.0.0](#) document.

The most significant changes have been made in the following areas:

- **Multiple IntelliNeo operation within one site** – Adjustments to inter-controller communication leading to the differentiation of individual types of sources within the system. Based on this change, it is possible to aggregate similar information across the entire system, contributing to an easier and more stable way of managing energy flows across the entire site. Among other things, this principle allows the cooperation of multiple IntelliNeo controllers within one site.
- **Compatibility with other ComAp controllers** – The above-described changes in principles also apply to other controllers that are part of the microgrid solution, namely IntelliGen and IntelliMains. To ensure mutual compatibility, it is necessary to combine versions according to the following list:
 - IntelliNeo 6000 – v. 2.0.0
 - IntelliNeo 5500 – v. 2.0.0
 - IntelliGen 1000 – v. 3.3.0
 - IntelliMains 1010 – v. 3.3.0
 - IntelliNeo 530 BESS – 2.0
 - IntelliGen 500 – 2.4
 - IntelliMains 510 – 1.3
 - IntelliGen 200 – Not compatible yet
 - IntelliMains 210 – Not compatible yet
- **IntelliGen NT, IntelliSys NT, Intelli Mains NT line are not supported** – The controllers are not directly compatible with IntelliNeo over CAN communication once the firmware is updated to version 2.0. Alternative solutions can be implemented in the following ways:
 - Integration of existing gensets equipped with NT-line controllers using the Universal Genset function using the IntelliNeo 6000 or IntelliNeo 5500.
- **New Dynamic Spinning Reserve (DSR) calculation** – see chapter *Power management in a system combining BESS, PV and Gensets* in IntelliNeo 530 Global Guide.
- **New principles of P and Q control in on-grid application** – see chapters *Active Power Control in On-grid application*, *Reactive Power Control in On-grid application* in IntelliNeo 530 Global Guide.
- **MutliBMS support of up to 8 BMS devices**- see chapter *Mutli BMS* in IntelliNeo 530 Global Guide.
 - This function is locked behind the SW key - contact ComAp sales if you are interested for this function.
- **Make Bulk changes to Modbus registers and function** - available with IntelliConfig 2.60
 - Allow to import and export ecu list to a predefined .XLSX file (newly able to modify the .xlsx file)
- **Dead Bus evaluation and starting**
 - Function LBO Stop Bus Energize to allow the battery to connect to the dead bus to create a grid forming

- **System able to accept negative value of System Base Load via LAI ANEXT Baseload**
- Control the power of the gensets using Gen P Min controlled via new LAI.

3.2 Bug Fixes

- Possible to control P/Q in the whole operating area
- Reverse synchro of BESS in charging mode
- Value Es Max Charging/Dischaging Power respect 0,1 kW Power Format

4 Changes in the version 1.2.0

4.1 New Features

> BESS AC Values over Modbus

- » The AC output values (V & I) of the BESS (PCS) can now be read over Modbus instead of measured directly via the controller unit terminals. See section *BESS AC values measured over LAIs* in the InteliNeo 530 BESS Global Guide.

> BUS AC Values over Modbus

- » The BUS AC values (V) can now be read over Modbus instead of measured directly via the controller unit terminals. See section *BUS AC values measured over LAIs* in the InteliNeo 530 BESS Global Guide.

> BCB Type

- » The BCB can now be configured as a Breaker for when control of the BCB is needed or Isolator for when there is no control of the BCB needed or there is no BCB present. See setpoint *BCB Type* in the InteliNeo 530 BESS Global Guide.

> Extended the number of available LAOs

- » The maximum number of LAOs have been extended from 64 to 128 to accommodate an increase in the number of values read over CAN/Modbus.

> Extended the number of available LAIs

- » The maximum number of LAIs have been extended from 228 to 400 to accommodate an increase in the number of values read over CAN/Modbus.

4.2 Bug Fixes

- > An issue where the ES Run Request would remain active even when a shutdown alarm was present has been fixed.
- > Incorrect behavior of Local Baseload Power Management in systems with Gensets when Parallel to Mains has been resolved.
- > An issue affecting frequency measurement resolution has been resolved allowing accurate measurement to 3 decimal places (00.000 Hz).

5 Changes in the version 1.0.2.1

5.1 Bug Fixes

- An issue in the Modbus RTU pause time prevented more than one Modbus RTU device being connected to the controller simultaneously, this bug has been fixed.
- Occasional invalid Modbus TCP data when two controller units were connected as Modbus Server and Client caused a controller error, this bug has been fixed.
- An issue with mapping of ECU BOUT's where only the first 32 could be mapped correctly has been fixed.
- LBI configured to block an ECU communications failure alarm did not function correctly, this bug has been fixed.

6 Changes in the version 1.0.1.1

6.1 Bug Fixes

- Voltage Regulation Output (VRO) did not work during synchronization, this bug has been fixed.
- The setpoint values for *Nominal Voltage Ph-N* and *Nominal Voltage Ph-Ph* were not synchronized allowing for a mismatch, this bug has been fixed.

7 Available related information

Documents (*.pdf)	Description
InteliNeo 530 BESS 2.1.0 Global Guide	The manual provides general information on how to install and operate InteliNeo 530 BESS controller.
InteliNeo 530 BESS Datasheet	Basic technical information about the InteliNeo 530 BESS controller.

Table 1.1 Available documentation

7.1 Available files

Firmware (*.exe)
For InteliNeo 530 BESS
InteliBESS530-Product-Suite-1.2.0.exe

Table 1.2 Available firmware

Archives (*.aig4)
For InteliNeo 530 BESS
InteliBESS530-HC-1.2.0.aig4
InteliBESS530-HC-ExtendedFeatures-1.2.0.aig4

Table 1.3 Available archives

8 Notes

8.1 Document history

Revision number	Related sw. version	Date	Author
3	2.1.0.0	13.01.2026	ComAp
2	2.0.0.0	24.04.2025	ComAp
1	1.0.1.5	3.12.2024	ComAp