

InteliNeo 5500

Controller for parallel hybrid microgrid applications

SW version 2.1.0

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1 General information

1.1 Version information

This FW version is compatible with:

- IntelliConfig version 2.38.0.38 and newer
- IntelliSCADA version 2.5.0.10 and newer
- IntelliVision 5.2 FW 1.6.1.1 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

CAUTION: Important: 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.

- **Mains Preference and Other Power Management Options in Parallel with the Grid**
 - This feature primarily applies to MPTM applications. In cooperation with IntelliMains 1010 v. 3.8.0 or IntelliMains 510 v. 1.4.0, the function is also available for MINT applications.
- **Gen P Optimal**
 - The BESS targets the Gen P Optimal power value, while PV curtailment continues to target the #Gen P Min value. The difference between these two power levels allows for more efficient genset operation while maintaining curtailment functionality aimed at #Gen P Min.
- **Switchable ECU CAN Speed**
 - The CAN baud rate can be set to either 250 or 500 kbps.
- **State Decoders**
 - Analog E-num values can be converted into multiple binary values.
- **UGCB LED Support**
 - Enables easier management of UGCB and Universal genset via displays or IntelliSCADA.
- **Extended Range of Maximum Value Integrated via One PV/WT/BESS Slot**
 - Originally limited to 3276 kW, now extended to 3276.0 kW / 32760 kW / 327.60 MW depending on the selected power format.
- **Transition of BESS Power to Zero Follows Soft Unload Ramp**
 - Realized through ramping of the BESS Max Charging/Discharging Power.
- **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).
- **PVCB Pre-Close Function**
 - This function can be used if the PV inverter is energized from the AC bus.
- **Load Shedding Function Improvement**
 - Defines the number of stages to be shed when BESS enters island operation.

- **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.
- **PLC Block Breaker Update**
 - The PLC block Breaker has been updated to include internal failure states.
- **LAI Load Control: ANEXT Imp/Exp Load**
 - Added in MPTM applications. Intended to be used as an input for analog requests for Mains Import/Export.
- **Manual Curtailment Control**
 - Curtailment setpoint options have been extended – it is now possible to set a Manual Limit for PV production or manually define the curtailment output value.
- **Extended Number of Inputs and Outputs for ECU**
 - Now available: 400 analog inputs, 128 analog outputs, 256 binary inputs, 256 binary outputs.
- **Changes in Terminology and Settings for BESS Starting Sequence**
 - The setpoint *BESS Precharge Type* has been replaced by: *Starting Sequence BCB Control* and *Start To Dead Bus*.
- **Extended Number of Timers/Schedulers**
 - The number of timers/schedulers has been extended to 30.
- **Dynamic Isochronous Frequency and Voltage Control**
 - The weight of isochronous frequency and voltage control within the Load Sharing/Var Sharing loop can now be set as a function of P/Q or f/V.
- **Integration of the BESS without the BCB Control**
 - A new setpoint *BCB Control Type* can be set as *Fuse/Disc*.
- **Gridcodes for CZ – LFSM-O Situation Support**
 - Support for LFSM-O situations according to Czech grid codes.
- **Gen P Min via LAI**
 - Replaces the value entered via setpoint #Gen P Min if LAI is configured and in use.
- **Controller Accepts Negative Value of System Baseload via LAI Load Control: ANEXT Baseload**
 - The controller now accepts negative values for System Baseload.
- **Precharge Timeout Function**
 - The *Precharge TO* setpoint defines the latest time by which the precharge state must be completed – otherwise, an *Sd Start Fail* alarm is triggered.
- **Extended Number of Inputs and Outputs for J139 User Device (Extended)**
 - Now available: 16 analog inputs, 16 analog outputs, 24 binary inputs, 24 binary outputs.

2.2 Bug Fixes

- **Incorrect BESS Charge/Discharge Statistics** – Fixed wrong calculation of BESS charge/discharge kWh values.
- **ROCOF Protection** – Corrected issue where ROCOF protection did not trip during negative frequency changes.

- **MPTM Import/Export Control** – Resolved bugs causing incorrect behavior of mains import/export control.
- **Warning Alarm Email Failures** – Fixed repeated history records caused by email 1/2 failure.
- **PLC Block Integration** – Fixed issue where reset caused output to switch to an invalid value.
- **VT Ratio Settings Swap** – Corrected swapping of “BESS VT Ratio” and “Mains/Bus VT Ratio” after controller restart when “3Ph CT Location” is set to Mains.
- **Uni Gen Run Request Logic** – Fixed incorrect setting of Uni Gen Run Request due to wrong association with BESS load reserve availability and IntelliNeo controller mode.
- **PLC PID Block Output Control** – Fixed incorrect control of Output Velocity (“OVel”) in PID block.
- **PID Output Offset Issue** – Resolved issue where output remained offset when only proportional gain was set ($P > 0$) and input crossed a limit and returned, requiring manual reset.
- **Breaker Closing Behavior** – Fixed issue where breaker continued closing despite BO fail being active.
- **DST Switching Mode** – Corrected behavior where time did not change when the date was updated.
- **Various Minor Bugs** – Several smaller issues have been resolved to improve overall stability and performance.

3 Changes in the version 2.0.1

3.1 Bug Fixes

- Frequency measurement to three decimal places (1mHz) was not accurate.
- High voltage frequency measurement causes watchdog issue.

4 Changes in the version 2.0.0

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 5500 Global Guide 2.0.0** document, specifically chapters *6.2 Hybrid-Microgrid application Functions*, *6.3 Multiple source-types operating in MINT application*, *6.4 MPTM application*.

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 – Not compatible yet
 - IntelliGen 500 – Not compatible yet
 - IntelliMains 510 – Not compatible yet
 - IntelliGen 200 – Not compatible yet
 - IntelliMains 210 – Not compatible yet
- **IntelliGen NT, IntelliSys NT, IntelliMains 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.
- **PV curtailment calculation algorithm has been updated** – is based on different principles - see chapters *6.2.17 PV Output control*, *6.2.18 PVCB Control* in IntelliNeo 5500 Global Guide.
- **New Dynamic Spinning Reserve (DSR) calculation** – see chapter *6.3.2 Power management in a system combining BESS, PV and Gensets* in IntelliNeo 5500 Global Guide.
- **New principles of P and Q control in on-grid application** – see chapters *6.3.5 Active Power Control in On-grid application*, *6.3.6 Reactive Power Control in On-grid application* in IntelliNeo 5500 Global Guide.
- **BESS AC Values measured over Modbus** – see chapter *6.2.14 BESS AC values measured over LAIs* in IntelliNeo 5500 Global Guide.
- **Extended number of controller without the SW key and with the SW key SKCAN2EXP01** – Up to 8 units on the intercontroller CAN line are supported without the SW key, and up to 32 units with the SW key SKCAN2EXP01 with FW 2.0.0. For more information refer the chapter *6.1.29 SW Key Features* in IntelliNeo 5500 Global Guide.

- **HMI for InteliNeo has been changed** – The principles of HMI view has been changed for InteliNeo, especially for MINT application. InteliNeo is considered as MINT controller and HMI is designed to display only information about sources integrated by this specific InteliNeo. The "Site view" has been removed.

5 Changes in the version 1.2.0

5.1 New Features

> Universal Genset Support

- » This Function is only available with the SW key.
- » IntelliNeo 5500 can integrate up to 4 universal gen-sets.
- » Universal Genset is only supported in the MINT application.
- » Universal Gensets Support functionality requires the gen-set to operate as Modbus server device.
- » Universal Genset can be configured as User Modbus Device or as standard device via ECU list.
- » BESS integrated via IntelliNeo no longer uses the power management settings (like priority etc.).
- » These settings have been transferred to the Universal Genset.
- » BESS running is no longer influenced by load reserves. It is driven by the new LBI BESS Remote Start/Stop.
- » The BESS start/Stop is no longer associated with the common System Start/Stop signal shared on inter-controller CAN line. This signal is only accepted by the Universal Genset.
- » Values added for Universal Genset Support

> PLC

- » Interpolation8 PLC block has been added. This block performs a linear transformation of the input to output. The transfer curve is defined in 8 points. 16 PLC blocks are available. This PLC Block replaces the original Interpolation block.
- » The number of PLC blocks Convert has been extended to 32. This PLC block is recommended for the conversion of user setpoint to Value inside the configuration.
- » The PLC Block Ramp has the new option to set the time units for definition of ramping rate per second or per minute.

- > **Load Shedding function** has been extended to include options based on BESS Frequency, BESS kVA and BESS SOC
- > **Anti-islanding protection** type of the BESS operated in P-Q mode has changed from Shutdown to 'BCB Open'. New behaviour when anti-islanding protection is triggered, the BESS opens the BCB, shuts down the Precharge request to deenergize the PCS DC circuit and is ready to reconnect to bus via AC precharge when busbar gets energized again.
- > **If IntelliNeo 5500 operates** in modbus server mode on RS485 it's modbus address is set independently on the Terminal Address using the setpoint Modbus Server Address.
- > **Modbus Master** - broadcast control supported. Broadcast is realized via usage of Modbus device with address "0". Commands 5, 6, 15, 16 are supported.
- > **Support of CAN J1939** has been added as ECU User Device and supports communication speeds of 250 kbit/s.
- > **Combination of datapoints achievable** and direct Modbus reading/writing is possible using the standard ECU Generic Unit- Sunspec. This combination is not available for User Devices.
- > **PV Curtailment Counter function** has been extended. New Values Maximal PV kWh and values of PV curtailed energy were added.
- > **Function "Production Mode"** has been added.

- **Setpoint Evaluated Voltage Protections** was added. Voltage protections can be optionally evaluated on Ph- Ph Voltage or PH-N voltage.
- **Setpoint Terminal Comm Address** was added. Already running communication e.g. with Scada might be stopped running because of a change in addressing.
- **Automatic assignment of functions** Actual P, Actual Q and Nominal P or kWh to PV inverters when added as ECU devices from ECU library - Standard (8.6.0.9)

5.2 Bug Fixes

- Voltage regulation does not work during the synchronisation to the bus. Bug was fixed.
- When 3-phase current measurement on Mains is used (Setpoint: 3Ph CT Location = Mains), the values Mains PF and Mains Load Character are wrongly calculated. Bug was fixed.
- When 3-phase current measurement on Mains is used (Setpoint: 3Ph CT Location = Mains) AND Mains Import Measurement is set as NOT-Mains CT, the values Mains P, Q, S are wrongly calculated instead of showing "0". Bug was fixed.
- Some Mains Values like phase values of P, Q, S didn't reflect the actual power format. Bug was fixed.
- LBO System Reserve OK - The LBO System Reserve OK shows the correct value even the BESS is disabled for discharging

6 Changes in the version 1.1.0

6.1 New Features

- Option "Write On Change" has been implemented in functionality Modbus Master. See the "Refresh Type" parameter in datapoint configuration in IntelliConfig.
- The Function Modbus Registers Block reading has been implemented. User is allowed to create the datapoints and assign them a register group. The Group of register is then read at once using the one modbus polling request. See configuration of a modbus user device in IntelliConfig.
- Modbus Master - 32 bit values reading available as user definition of the modbus datapoint.
- Vector Shift and ROCOF protection settings available in MINT application. See the Setpoints in the group Lost Of Mains Protections.
- Option to select if the Voltage protection are evaluated upon the Ph-Ph Voltage or Ph-N Voltage. See the setpoint Basic Settings/ Voltage Settings/ Evaluated Voltage Protections.
- Sunrise/Sunset function has been implemented. See the Setpoints in the group Scheduled/ Sunrise/Sunset Function.
- Configuration Locking function is newly available.
- Modbus Interface for superordinate systems functionality is now available.
- New User Setpoint management was added. It is now possible to create the user groups and subgroups of the setpoints. See the IntelliConfig.

7 Changes in the version 1.0.1.5

Note: For detailed information see the Global Guide.

7.1 Bug Fixes

- The Earth Fault Current Protections (the IDMT reaction) which is evaluated on the Aux Current terminals T 34/T35 did not work correctly. The Bug was fixed.
- The Earth Fault Current protection (Level /Delay reaction) which was evaluated on EM-BIO8-EFCP module did not work correctly. The bug was fixed.
- The Value of Mains Import in MPTM application was calculated incorrectly. The bug was fixed.

8 Available related information

Documents (*.pdf)	Description
InteliNeo 5500 2.1.0 Global Guide	The manual provides general information on how to install and operate InteliNeo 5500 controller.
InteliNeo 5500 Datasheet	Basic technical information about the InteliNeo 5500 controller.

Table 1.1 Available documentation

8.1 Available files

Firmware (*.exe)
For InteliNeo 5500
InteliNeo5500-Product-Suite-2.0.0.exe

Table 1.2 Available firmware

Archives (*.aig4)
For InteliNeo 5500
InteliNeo5500-HC-2.0.0.aig4
InteliNeo5500-HC-ExtendedFeatures-2.0.0.aig4

Table 1.3 Available archives

9 Notes

9.1 Document history

Revision number	Related sw. version	Date	Author
5	2.1.0	31.10.2025	Pavel Mareš
4	2.0.1	4.7.2025	Wendy Truong
3	2.0.0	31.10.2024	Pavel Mareš
2	1.1.0	27.11.2023	Pavel Mareš / Oto Meran
1	1.0.1.5	18.7.2023	Oto Meran