

INTRODUCTION

This publication provides a historical summary of the changes made to the application firmware and hardware of the DGC-2020ES Digital Genset Controller.

Revision history information for BESTCOMSPPlus® software is provided in the *BESTCOMSPPlus Software Revision History* document.

This information is provided for confidential use with the mutual understanding that it will not be used in any manner detrimental to the interests of Basler Electric.

FIRMWARE REVISION HISTORY

The revision history for DGC-2020ES application firmware is provided as follows. Revisions are presented in reverse chronological order.

Firmware Version and Date	Change
1.06.01, Dec-24	<ul style="list-style-type: none"> Improved exhaust system status symbols display on front panel. Corrected issue where CAN Bus Start/Stop configuration setting changed back to default on mtu engine ECU.
1.06.00, Nov-22	<ul style="list-style-type: none"> Added a new ECU configuration selection of Deutz proprietary Tier 4 exhaust system annunciation. Added a setting to disable/enable display of DEF level on front panel overview screen. Added a setting to disable/enable DEF pre-alarms. Added a setting for Battery and rpm display, which can be set to Battery, rpm, or Alternate.
1.05.00, Dec-21	<ul style="list-style-type: none"> Added CAN Bus Start/Stop Configuration for mtu. Added setting to display Fuel Level % on the Overview screen. Added Minimum Crank Time setting. Added a setting to allow user to select whether engine runtime hours source should be ECU or DGC. Added metered parameter to display the source of engine hours (ECU or DGC). Added metered parameters for Requested Engine RPM and Volvo Accelerator Pedal Position. Added an "Every N Weeks" option to Generator Exerciser. Added three-wire ATS programmable function. Modified heartbeat communications between DGC and I/O modules to use a specific address. Modified Amber Warning Lamp and Red Stop Lamp so they will not display if there are no active DTC's. Corrected issue where an Isuzu specific alarm was incorrectly categorized as a pre-alarm. Changed so that Battery caption shows on Overview screen in French and German. Corrected event log date formatting on front panel HMI. Changed Isuzu DEF LOW REFILL DEF alarm to pre-alarm.
1.04.01, Dec-19	<ul style="list-style-type: none"> Sens Battery Charger Communications <ul style="list-style-type: none"> Battery Charger Configuration - None, Standard, Sens. Parse Battery Charger PGN's. Battery Metering on Overview Screen - Multiplexes with Battery Voltage Display.

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Firmware Version and Date	Change
	<ul style="list-style-type: none"> ○ Battery Charger Status Metering Screens. ○ Battery Charger Pre-Alarms. ○ Battery Charger Parameters available to Configurable Protection. ● Tier 4 Requirements <ul style="list-style-type: none"> ○ Diagnostic Trouble Codes announce automatically. ○ New PGN and SPN Parsing. ○ Tier 4 Exhaust System Status annunciation on front panel – visible on all screens that appear automatically including pop-up screens. ○ ECU Red Lamp Status available in logic for physical Red Lamp implementation. ○ ECU Amber Lamp Status available in logic for physical Amber Lamp implementation. ○ Choice between text based overview screen or symbol based overview screen. ○ All symbolic functionality available on non-Asian font and Asian font screens. ● Tier 4 Cummins <ul style="list-style-type: none"> ○ Cummins Tier 4 symbol handling. ● Tier 4 Isuzu <ul style="list-style-type: none"> ○ Added parsing of Proprietary Isuzu Engine ECU J1939 Canbus communication to annunciate Tier 4 Exhaust System Parameter Information. ● Tier 4 Yanmar <ul style="list-style-type: none"> ○ Proprietary PGN Parsing. ○ Yanmar P Codes instead of or in addition to DTC's. ○ Yanmar Regeneration interlock handling. ○ Yanmar Tier 4 symbol handling and pre-alarm annunciation. ○ Regeneration timer shown when Regen is active. ● Tier 4 Volvo <ul style="list-style-type: none"> ○ Added support for Volvo EMS2.3 Tier 4 Selective Catalytic Reduction (SCR) Exhaust System parameter annunciation via Proprietary J1939 PGN. ● Tier 4 Daimler Benz <ul style="list-style-type: none"> ○ LIM symbol handling for Daimler Benz. ● Added a pre-alarm for <i>mtu</i> FAULT CODE ACTIVE. ● Added a setting to display fuel level on the overview screen when the actual fuel level is below a user-defined percentage. The display is suppressed at fuel levels above the setting threshold and engine RPM displays instead. ● <i>mtu</i>_COMBINED_RED and <i>mtu</i>_COMBINED_YELLOW status binary points are set based on presence of COMBINED YELLOW or COMBINED RED fault codes for <i>mtu</i> Smart Connect. ● Increased PT Primary range maximum to 999,999. ● Added KW Overload Pre-Alarms to DGC-2020ES. ● Added Requested Engine RPM and Volvo Accelerator Pedal Position to Engine Metering. ● Added "Every N Weeks" and "Nth Weekday of Month" options to Generator Exerciser. ● Implemented Message Number and Checksum in TSC1 PGN. ● Added a Block Input to the generator protection elements in the DGC-2020ES. ● Added Timer Metered Values: Logic Timers, Generator Protection Timers, Alarm and Pre-alarm Timers, Input Timers, Configurable Element Timers,

Firmware Version and Date	Change
	<p>Exercise Timer, Crank Timers, Sender Fail Timers, and Programmable function timers.</p> <ul style="list-style-type: none"> • Added a "Quick Start Mode" setting and a "Quick Start Mode Override" Logic Element for <i>mtu</i> ECU7 and <i>mtu</i> ECU9 Smart Connect Configurations. • Increased Mains Fail Return Delay to 9,999 Seconds. • Added parsing of DLCC1 Direct Lamp Control 1 PGN and SCR System Cleaning PGN and Diesel Particulate Filter Active Regeneration Forced Status from the Diesel Particulate Filter Control 1 PGN and Pre-Alarms for REGENERATION ACTIVE, REGENERATION FORCED BY SW. • Added Suspect Parameter Number (SPN) descriptions for Diagnostic Trouble Codes for Woodward PG-Plus Engine ECU. • Modified resistive sender failure handling by adding minimum and maximum settings for the valid sender input resistive range for Oil Pressure, Coolant Temperature and Fuel Level sender inputs. Added a setting to allow the user to specify if the text "SF" should display rather than the metered value when a sender input is outside the valid resistance range. • Added Crank Case Pressure, Fuel Filter Differential Pressure, and Oil Filter Differential Pressure parsing from Canbus. • Changed minimum RPM for Rated RPM, Engine RPM, and Idle RPM settings to 25. • Currently Active Diagnostic Trouble Codes screen now appears automatically when Diagnostic Trouble Codes are present. • Added a Logic Element for ECU Connect Override which applies a Key On signal to the engine ECU and enable update of Canbus Data at any time except during Disconnecting State. • Rated Voltage, Overvoltage and Undervoltage Settings for Bus Condition Detection have been extended to 999,999 Volts. • Changed Max Engine Hours Run Time from 99,999 to 1,000,000. • Added an Arming Delay to Generator Protection Elements. This is required for reconfigurable machines and Dead Field Paralleling Applications. • DGC Crank Cycle Time now ranges from 1 to 300 seconds and the Rest Time now ranges from 5 seconds to 300 seconds. • Added a setting for RPM Raise/Lower retention. • Added Hysteresis Level setting (one each) for Low Fuel Alarm and Pre-Alarm, and the High Fuel Alarm. • Added EPS SUPPLYING LOAD to Event Log. • Added an Arming Delay to Configurable Elements. • Added a Cool Down Configuration setting that can be set to specify (1) cool down only if load applied, or (2) cool down always. • Created status inputs to make the mains fail transfer states available to logic. • Added the ability to disable the Low Coolant Level Alarm from a Diagnostic Trouble Code. • Added an Expected Engine ECU Address setting so the user can specify the J1939 address of the primary Engine ECU when multiple Engine ECU's are present and broadcasting valid Engine RPM. • Added a setting to specify ECU or SENDER as source of measurement data for Coolant Temp and Oil Pressure. • The Audible Horn now sounds any time any alarm occurs even if it is a repeat occurrence of an alarm or pre-alarm for which the horn was previously silenced. • The Fuel Level Sender Fail function is now disabled when the Fuel Level Function is set to DISABLED, NATURAL GAS, or LIQUID PROPANE.

Firmware Version and Date	Change
	<ul style="list-style-type: none"> • Low Fuel Level Status is now activated by any low fuel level alarm or pre-alarm whether it is from a programmable function or based on metered fuel level. • Corrected labeling of Mains Fail Return Fail Pre-alarm on the HMI. • Added "Mains Fail Transfer Inhibit" and "Automatic Breaker Operation Inhibit" status to the DGC front panel. • Modified Battle Override functionality so that DGC will start immediately if it is in Disconnecting State while an alarm is active, Battle Override is applied, and a new run request is issued. • Improved Hysteresis functionality for Low Fuel Level Alarm. • Illuminate the LOW FUEL LED on the RDP-110 if either a LOW_FUEL_PREALARM or a LOW FUEL ALARM is active.
1.03.00, May-16	<ul style="list-style-type: none"> • Added Cylinder Cutout Enable Override logic element • Added a setting for Expected Engine ECU Address • Added a setting for CAN Bus Low Coolant Level Alarm Enable • Changed to set Expected Engine ECU Address to 0 when ECU CONFIG is GM/DOOSAN. • Added Chinese language support • Modified checksum handling to prevent a false Checksum Fail pre-alarm • Changed alarm annunciation so alarms are not suppressed if the OFF mode logic element is held true and prevents unit start attempt if the OFF mode logic element is held true and an alarm is active • Improved J1939 transmit buffer handling • Changed how the DGC-2020ES sends an Acknowledgement PGN indicating No Acknowledgement (NACK) when a request PGN is received that had the Global Address as the Destination Address • Improved ac line-to-line voltage calculation to allow for hardware gain differences between voltage channel inputs
1.02.00, Oct-14	<ul style="list-style-type: none"> • Added <i>mtu</i> Speed Demand Switch setting from logic capability • Added a rest timer for cyclic cranking • Added Mains Fail Return Fail pre-alarm and Mains Fail Max Return Time setting • Added John Deere to list of ECU configurations • Changed DEF EMPTY pre-alarm to DEF LOW SEVERE • Changed DEF ENGINE DERATE pre-alarm to DEF INDUCEMENT • Added descriptive text for Diagnostic Trouble Codes (DTC's) broadcast by Mercedes, PSI, and <i>mtu</i>-ECU9 engine ECU's • Added ECU9 Fault Code list for <i>mtu</i>
1.01.01, Apr-14	<ul style="list-style-type: none"> • Made the J1939 data menu available through the HMI when the unit is configured for Scania ECU type
1.01.00, Jan-14	<ul style="list-style-type: none"> • Changed to make horn always sound for pre-alarm after alarm silence button is pressed • Extended minimum range of Low Coolant Temp Pre-alarm down to 0 degrees F • Changed to prevent default run statistics after firmware upload • Modified Diesel Particulate Filter Soot Level and Regeneration Required Status Information to use the Diesel Particulate Filter Status parameter (SPN 3701) • Added a one-line diagram to the Front-Panel Overview screen • Improved the Event Log • Increased number of events to 50 • Added Scania Engine ECU support • Added Diesel Exhaust Fluid Level on Overview screen on systems which have Selective Catalytic Reduction with Diesel Exhaust Fluid implemented

Firmware Version and Date	Change
	<ul style="list-style-type: none"> • Added Diesel Exhaust Fluid Tank Level and Percent kW Load to Configurable Metering • Modified Cummins Proprietary J1939 communications to support Cummins QSX-15 model and run at RPM selected under Speed Setup • Modified Volvo Proprietary J1939 communications to support RPM selection • Added ATS Programmable Function Setting to HMI • Removed Contact Input Recognition Parameter as a setting for the ATS Programmable Function • Removed Contact Input Recognition Parameter as a setting for the Low Coolant Level, Batt Charger Fail, and Fuel Leak Detect Programmable Functions • Removed Contact Input Recognition Parameter as a setting for the Low Fuel Level Programmable Function • Added logic point for DPF Lamp Status from Diesel Particulate Filter Control 1 PGN • Changed to prevent Oil Pressure Crank Disconnect from operating if there is a valid RPM Source • Removed the letter "DPF" from DPF Regenerate Required and DPF Regeneration Inhibited Strings • Added Selective Catalytic Reduction Parameters to the list of strings displayed for SPN's in Diagnostic Trouble Codes • Modified front panel so that if <i>mtu</i> Fault Codes are in effect while an alarm or pre-alarm is in effect, the DGC-2020ES will alternate between the Alarm or Pre-alarm display and the <i>mtu</i> Fault Code display • Added a Mains Fail Transfer Status screen on the front panel • Changed to prevent unit from starting the machine when Battle Override is engaged after an alarm occurs, but the OFF button has never been pressed to clear the alarm, if the DGC pulses while in the alarm state, at the end of the pulse cycle • Generator Status string now displays Alarm if Battle Override is applied after an alarm shutdown
1.00.00, Mar-13	<ul style="list-style-type: none"> • Initial release

HARDWARE REVISION HISTORY

The revision history for DGC-2020ES hardware is provided as follows. Revisions are presented in reverse chronological order.

Hardware Version and Date	Change
H, Jun-21	<ul style="list-style-type: none"> • Improved connector kit to use UV-printed labels.
G, Aug-16	<ul style="list-style-type: none"> • Front panel upgraded with a membrane switch overlay
F, Jul-15	<ul style="list-style-type: none"> • Released firmware version 1.03.00 and BESTCOMSPlus 3.14.00
E, Nov-14	<ul style="list-style-type: none"> • Released firmware version 1.02.00 and BESTCOMSPlus 3.07.00
D, May-14	<ul style="list-style-type: none"> • Released firmware version 1.01.01
C, Apr-14	<ul style="list-style-type: none"> • Released firmware version 1.01.00
B, Jun-13	<ul style="list-style-type: none"> • Maintenance release
A, Mar-13	<ul style="list-style-type: none"> • Initial release



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