

Introduction

This publication provides a historical summary of the changes made to the application firmware and hardware of the DGC-2020HD 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-2020HD application firmware is provided as follows. Revisions are presented in reverse chronological order.

Firmware Version and Date	Change
3.09.03, February 2026 2.09.03, February 2026 1.09.03, February 2026	<ul style="list-style-type: none"> Added NTPv3 compatibility Changed breaker one-line diagram when system breaker configuration is auto detected Changed detection of successful start for supervisory cranking control type when start success RPM is set lower than Crank Disconnect RPM
3.09.02, September 2025 2.09.02, September 2025 1.09.02, September 2025	<ul style="list-style-type: none"> Added a binary point for System Manager Status Added alternate Rated KW Level Settings for Modbus Added an ATS Start Inhibit logic element Added binary points and metering for KW PID Active, Speed PID Active, KVAR PID Active, and Voltage PID Active Added Enable/Disable Fuel Level, Coolant Temperature, Down Ramp Start Percentage, and Oil Pressure Sensing settings Added Engine Oil Level to parameters that can be selected for configurable protection and analog outputs Added Fiat Powertrain Technologies (FPT) ECU support to J1939 CAN Bus communications Added functionality for broadcasting Generator Total AC Power PGN at a user-selectable rate Added functionality for secure Modbus log-in access Added functionality for Supervisory Control Added functionality for the DGC-2020HD to apply power between normal pulse cycles for clearing Diagnostic Trouble Codes from devices on the J1939 CAN Bus network Added functionality for user-selectable CAN Bus bit rates Added logic override for greater ease when paralleling to utility Added additional Modbus functions Added Volvo EMS 2_4 EU Stage 5 Exhaust System Annunciation capabilities Changed range of Sender Table parameters from 0–999999 to –999999–999999 so that negative values can be used when analog inputs are used for sender information Changed units of Engine Gaseous Fuel Supply Pressure parameter to inches of water Implemented "Gain Groups" for gain settings in KW, KVAR, Speed, and Voltage PID controllers

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 1 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Firmware Version and Date	Change
3.08.03, July 2024 2.08.03, July 2024 1.08.03, July 2024	<ul style="list-style-type: none"> Refined Status metering screen parameters Improved Demand Stop Inhibit
3.08.00, October 2023 2.08.00, October 2023 1.08.00, October 2023	<ul style="list-style-type: none"> Removed Russian language support Added a setting which specifies the minimum current for metering Added sequencing priority of each unit to the System Status > Generator Table Added Modbus registers for reading security port access settings Changed ranges of analog current outputs and inputs from 4-20 mA to 0-20 mA Added Demand Start Inhibit and Demand Stop Inhibit logic elements Added Deutz ECU configuration support Added settings for DEF Display Enable/Disable and DEF Pre-Alarms Enable/Disable Added an option to display engine rpm on the front panel instead of battery voltage Added Trip Reset logic element which resets trip fuel consumption Changed maximum demand level for analog load share line to use the Max kW Demand setting instead of a hard-coded value of 1 Changed Load Shed logic inputs to be "logic driven" or "forced on" instead of disabled/enabled Added Alarm Silence capability to Modbus Added Breaker Specific Synchronizer Binary Points Added a logic element for Return Timer Bypass in Mains Fail Transfer functionality Added a setting for CAN Bus Start/Stop configuration for MTU ECU configurations Corrected an issue where user-configurable labels were displaying incorrectly on the front panel Change to send Idle RPM as TSC1 speed request while cranking if the Idle Request logic element is true Added a non-volatile DTC History Log Corrected operation if a unit is given a LOAD TAKEOVER while the mains fail transfer state machine is at the end of the RETURN TIMER ACTIVE state Added a BREAKER MONITOR selection under the System Breaker Configuration setting to allow the DGC-2020HD Monitored Breakers to be used in cases where the DGC-2020HD does not control any Generator or Tie Breakers
3.06.03, May 2022 2.06.03, May 2022 1.06.03, May 2022	<ul style="list-style-type: none"> Corrected local analog input metering error on front panel HMI
3.06.02, February 2022 2.06.02, February 2022 1.06.02, February 2022	<ul style="list-style-type: none"> Enhanced operation when a large number of records are held in the Sequence of Events Recorder Corrected issue with incorrect display of user-configured labels in the Sequence of Events Recorder Corrected display of Diagnostic Trouble Codes
2.06.01, October 2021 1.06.01, October 2021	<ul style="list-style-type: none"> Corrected issue that may result in intermittent IRIG SYNC LOST PRE-ALARM's
2.06.00, September 2021 1.06.00, September 2021	<ul style="list-style-type: none"> Added a System Breaker Configuration of Generator with Two Tie Breakers Added Monitored Breakers which allow the DGC-2020HD to monitor breakers it does not control for segmentation purposes Added Timer Metered Values to BESTCOMSPi^{us}® and Modbus Implemented the capability of running six CEM-2020s in the DGC-2020HD

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 2 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Firmware Version and Date	Change
	<ul style="list-style-type: none"> Increased the number of configurable elements to 32 Modified DTC pop-up screens. Both SPN and FMI show on the top level screens that pop up automatically Added Protection Source Label (user-configurable label for Gen, Bus1, and Bus2 inputs) to the annunciations of generator protection alarms and pre-alarms Added Input Range Minimum and Maximum settings for the DGC-2020HD analog inputs and AEM-2020 analog inputs so that a valid minimum and maximum for the out-of-range indication can be set Added a setting to allow the user to select whether engine runtime hours source should be ECU or DGC because some ECUs do not report hours correctly Setting group in effect is shown along with alarm or pre-alarm annunciation when generator protection elements trip Added a block input to configurable protection that can be set from logic similar to the block inputs for the generator protection elements Added analog var sharing ability to the DGC-2020HD using one of the analog inputs Increased Max Pulse Cycle time to 1440 minutes Increased Max Settling Time to 150,000 milliseconds Added a Minimum Crank Time setting to cranking parameters Added Max kW Demand setting and Max kvar Demand setting to allow for full range operation of derated machines Added Latched Pre-Alarm as an alarm configuration selection for those items that allow a user to set the alarm configuration Added Offset to Spinning Reserve similar to the Offsets in Load Shed
2.05.05, December 2020 1.05.05, December 2020	<ul style="list-style-type: none"> Corrected an issue that was identified with programmable logic timers and logic counters where a portion of the timers and/or counters timers may not operate after uploading settings to the DGC-2020HD without power cycling the unit
2.05.03, June 2020 1.05.03, June 2020	<ul style="list-style-type: none"> Corrected mode change issue caused by specific input combinations
2.05.01, December 2019 1.05.01, December 2019	<ul style="list-style-type: none"> Implemented Breaker Labels as part of Tie Breaker Open and Close Fail pre-alarms in DGC-2020HD Corrected an issue where CEM-2020 CAN Bus address could change to 254 if a DGC-2020HD with a single CEM-2020 configured is powered up with no CEM-2020 actually on the CAN Bus
2.04.03, July 2018 1.04.03, July 2018	<ul style="list-style-type: none"> Added style options for DIN Rail and Rear Panel mounting configurations
2.04.02, May 2018 1.04.02, May 2018	<ul style="list-style-type: none"> Maintenance release
2.04.00, May 2017 1.04.00, May 2017	<ul style="list-style-type: none"> Added configurable DTC detection Added J1939 battery charger communications Added Isuzu engine ECU communications Added minimum and maximum resistance settings to senders Added logic elements for ECU connect override, kW control inhibit, and kvar control inhibit Added a setting to enable or disable automatic saving to nonvolatile memory after a Modbus write Improved time display on HMI Improved generator exerciser functionality Improved handling of high Ethernet traffic Changed so ECU data is parsed all the time CAN Bus is enabled

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 3 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Firmware Version and Date	Change
	<ul style="list-style-type: none"> • Changed so the HMI returns to the overview screen after displaying a one-line diagram for 15 minutes • Changed to ramp to a new mode setpoint when changing mains power control mode • Combined ARP Ping detection status into existing Link Loss pre-alarms • Added Daimler CPC4 as an ECU type • Added Crankcase Pressure, Fuel Filter Differential Pressure, and Oil Filter Differential Pressure parsing from CAN Bus and made them available to configurable protection • Increased logic gate limit to 1,024 • Added the capability to add or drop a specific load step from the load shedding table while maintaining coordination in the table • Made currently active DTCs a pop-up metering screen on the HMI • Added 16 more logic timers for a total of 32 • Added 8 more logic counters for a total of 16 • Changed minimum rpm to 25 for Rated rpm, Engine rpm, and Idle rpm • Added EPS Supplying Load to the event log • Added an on-screen keyboard for entering strings on the front panel
2.03.06, January 2017 1.03.06, January 2017	<ul style="list-style-type: none"> • Changed email formatting so emails are not rejected by some SMTP servers
2.03.03, October 2016 1.03.03, October 2016	<ul style="list-style-type: none"> • Enhanced readability of monochrome LCD • Changed to prevent issuing of breaker open request on power up when configured as a segmented system
2.03.00, September 2016 1.03.00, September 2016	<ul style="list-style-type: none"> • Added configuration, protection, limiting, and control support for VRM-2020 Voltage Regulator Expansion Module • Added style option for Load Anticipation function • Added parsing of Proprietary Isuzu Engine ECU J1939 CAN Bus communication to announce Tier 4 Exhaust System Parameter Information • Added logic elements for "AVR Lower Limit" and "AVR Upper Limit" • Added Speed Trim and Droop Features • Added Voltage Trim and Droop Features • Added a Logic Element for Analog Load Share Override • Added Settings to configure Run Time Hours Display, Fuel Level Display, and Pre-Alarm annunciation Display on the Overview Screen • Added a setting to allow user to modify the domain name used in emails from Basler products • Added more setpoint adjustment capability to volt trim, speed trim, kW, var, and PF controllers • Added Balanced Engine Hours sequencing mode and use engine hours as secondary sort for Balanced/Staggered Service Time • Added Automatic IP address assignment when no DHCP server available • Added Chinese and Russian language support
2.02.00, October 2015 1.02.00, October 2015	<ul style="list-style-type: none"> • Added Color Touch Screen LCD style option • Added Load Anticipation function • Increased number of Logic Control Relays (LCR) from 16 to 64 • Added Engine ECU Address setting to specify which ECU to correspond with when multiple ECUs are detected on the network • Added support for Volvo EMS2.3 Tier 4 SCR Exhaust System parameter annunciation via proprietary J1939 PGN • Added configurable math functions • Added new system breaker configurations: Generator and Tie Breaker Control and Tie Breaker and Tie Breaker Control • Added metering screen to display state of all Broadcast Logic elements for all DGC-2020HDs in network

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 4 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Firmware Version and Date	Change
	<ul style="list-style-type: none"> • Added metering screen to display state of all Modbus virtual switches. • Added Logic Input Counter Gate element • Added 96 Modbus virtual switches • Added Cylinder Cutout Enable Override logic element • Added setting to enable retention of speed adjustments after shutdown • Added setting to specify normally open or normally closed operation for all programmable contact inputs • Added Weekday of Month mode for generator Exercise Timer • Added hysteresis settings for Low Fuel Alarm and Pre-alarm and High Fuel Level Pre-alarm • Improved redundant Ethernet handling and diagnostic capabilities • Added droop offset setting for AVR and GOV droop modes • Added synchronizer mode selections • Added setting to specify which side of tie breaker is used for power measurements • Added setting to specify ECU or sender as source for coolant temperature and oil pressure data • Added engine hours to the alternating display with the battery voltage and coolant temperature on the front panel overview screen
1.01.00, April 2015	<ul style="list-style-type: none"> • Added new features and enhancements for complex bus control including current imbalance protection, generator differential protection, automatic mains fail enhancements, Ethernet load sharing enhancements, mains power control modes, kW and var/PF controller enhancements, segmented bus system support, breaker management enhancements, multiple controller breaker operation, auto synchronizer enhancements, seven-day timer, rest timer, configurable alarm levels for protection, contact output text strings on front panel, real-time clock enhancements, selectable event log parameters, configurable protection parameters, remote speed biasing, ability to select whether positive power indicates mains import or generator export, email capabilities, programmable logic enhancements, load shedding, demand start/stop enhancements, breaker power sum • Enhanced J1939 communications • Added ability to enable or disable memory of raise/lower commands • Enhanced voltage trim function • Added various alarms and pre-alarms for Tier 4 Selective Catalytic Reduction (SCR) and Diesel Particulate Filter (DPF) exhaust systems • Added user-programmable initializing message on HMI • Extended activation delay for low battery voltage detection • Increased range of Over and Undervoltage protection • Increased number of configurable protection elements • Added Droop Offset setting for AVR and Governor bias controllers • Added positive and negative ROCOF modes to the 81 function • Improved breaker operation sequence • Modified Raise/Lower speed commands to be bound by the RPM Bandwidth setting • Modified generator protection to be active only when generator is running, where applicable • Improved Reset button operation security • Added an activation delay to prevent nuisance reverse rotation pre-alarms • Improved generator breaker and alarm indication • Improved Engine RPM Modbus™ register • Added name of the generator protection to the alarm on the HMI • Modified Intergenset Communications Fail pre-alarm • Corrected Modbus access level issue

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 5 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Firmware Version and Date	Change
	<ul style="list-style-type: none"> Fixed a few logic points not latching appropriately Improved arming delay and cooldown mode interaction Modified exercise timer Improved real and reactive power ramping in the controllers Corrected legacy Modbus map Consolidated configurable protection and metering to a single list Corrected 81O/U inhibit in single-phase configuration Improved synchronizer Shortened Ethernet connection timeout Improved control sequence during a power cycle Improved MCS5 protocol interpretation Improved logic timers resolution Improved kW and kvar controllers Increased number of configurable protection elements to 32
1.00.05, September 2014	<ul style="list-style-type: none"> Changed legacy Modbus registers 94812 bit 22, 94814 bit 12, and 94832 bit 16 for global low coolant level and 94813 bit 24 for global emergency stop alarm
1.00.03, April 2014	<ul style="list-style-type: none"> Corrected a firmware conflict with the disconnect timer Minor firmware improvements
1.00.02, February 2014	<ul style="list-style-type: none"> Added configurable hysteresis settings to generator protection elements Added Return Timer to Mains Fail Transfer Status screen on [Subject] front panel
1.00.00, January 2014	<ul style="list-style-type: none"> Initial release

Hardware Revision History

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

Hardware Version and Date	Change
W, October 2022	<ul style="list-style-type: none"> Updated internal documentation
V, February 2022	<ul style="list-style-type: none"> Released firmware versions 2.06.02 and 1.06.02
U, February 2019	<ul style="list-style-type: none"> Touchscreen moved from the membrane assembly to the LCD itself
T, September 2018	<ul style="list-style-type: none"> DGC-2020HD is a Listed Device as a Protective Relay applicable to the Canadian and US safety standards and requirements by UL
S	<ul style="list-style-type: none"> This revision letter not used
R, July 2018	<ul style="list-style-type: none"> Added style options for DIN Rail and Rear Panel mounting configurations.
Q	<ul style="list-style-type: none"> This revision letter not used
P, January 2017	<ul style="list-style-type: none"> Changed potting material
O	<ul style="list-style-type: none"> This revision letter not used
N, October 2016	<ul style="list-style-type: none"> Released firmware version 2.03.03
M, September 2016	<ul style="list-style-type: none"> Released firmware version 2.03.00 and BESTCOMSP<i>Plus</i> version 3.15.00
L, February 2016	<ul style="list-style-type: none"> Changes invisible to the user
K, October 2015	<ul style="list-style-type: none"> Released firmware versions 1.02.00 and 2.02.00 and BESTCOMSP<i>Plus</i> version 3.11.00 Added Color Touch Screen LCD style option.
J, August 2015	<ul style="list-style-type: none"> Changes invisible to the user
I	<ul style="list-style-type: none"> Version letter not used
H, June 2015	<ul style="list-style-type: none"> Released firmware version 1.01.00 and BESTCOMSP<i>Plus</i> version 3.09.00
G, September 2014	<ul style="list-style-type: none"> Released firmware version 1.00.05 and BESTCOMSP<i>Plus</i> version 3.08.02
F, September 2014	<ul style="list-style-type: none"> Changes invisible to the user
E, May 2014	<ul style="list-style-type: none"> Changes invisible to the user

Publication 9469300890	Revision M	Revision History	Date 02/26	Page 6 of 8
----------------------------------	----------------------	-------------------------	----------------------	-----------------------

Hardware Version and Date	Change
D, May 2014	<ul style="list-style-type: none"> Released firmware version 1.00.03 and BESTCOMSP<i>lus</i> version 3.06.00
C, May 2014	<ul style="list-style-type: none"> Changes invisible to the user
B, Mar 2014	<ul style="list-style-type: none"> Released firmware version 1.00.02
A, January 2014	<ul style="list-style-type: none"> Initial release

Publication 9469300890	Revision M	<h2><i>Revision History</i></h2>	Date 02/26	Page 7 of 8
----------------------------------	----------------------	----------------------------------	----------------------	-----------------------

For terms of service relating to this product and software, see the *Commercial Terms of Products and Services* document available at www.basler.com/terms.



Publication 9469300890	Revision M	<i>Revision History</i>	Date 02/26	Page 8 of 8
----------------------------------	----------------------	--------------------------------	----------------------	-----------------------

For terms of service relating to this product and software, see the *Commercial Terms of Products and Services* document available at www.basler.com/terms.