

## Release Notes EmpirBus NXT Firmware V1.0.164

*Device firmware updates in this release*

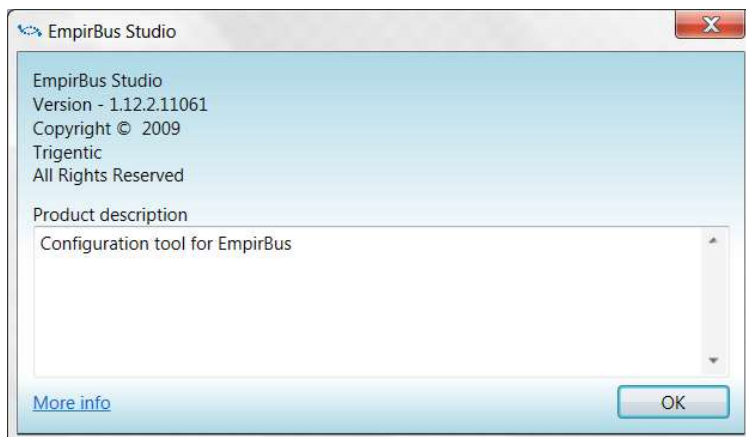
Unit Type	Version
Master Unit MCU	1.87*
DC Module DCM	1.69*
Membrane Panel 8BP	1.15
RS232 Unit	1.3
Switch Panel SP12	1.14*
Connect-50	1.33*
Programming Interface	1.2
Interface Unit ICU	1.1
* = New versions in this firmware	

### Compatibility

*When upgrading the firmware in an installation it is always recommendable to upgrade all the modules to the same firmware version throughout the whole system to ensure that all new features are supported.*

### EmpirBus Studio Requirement

*Important notice. Firmware Version 1.0.164 requires EmpirBus Studio version 1.12.2.11061 or higher. You can check your program version in menu "Help" – "About EmpirBus Studio". To upgrade EmpirBus Studio, connect your computer to internet and start the EmpirBus Studio software, and the automatic software upgrade check will update your software.*



## RECENT CHANGES IN FIRMWARE

- Added Humphree Fin support
- Fixed issue with count of used components in schematic.
- Fixed issue with NMEA2000 Alert Acknowledgement sent to wrong destination
- Fixed issue with extended temperature PGN
- Fixed issue with receive of trim tab status PGN not working.
- Production update, added support for new units.
- Fixed issue with power management in Connect 50.
- Added support for Vessel Heading PGN 127 250
- Added support for new product ICU
- Added support for new product RMK-6 Keypads
- Added support for Raymarine Shared Brightness Group Dimming
- Added support for command of Setpoint Temperature for PGN 130 312
- Added support for Rudder PGN 127 245
- Added support for Entertainment Device in Connect 50
- Added support for Lewmar Interface in Connect 50
- Added support for Sea Keeper in Connect 50
- Added support for ModBus in Connect 50 CUA Mode
- Added support for YachtControl proprietary PGN 61184
- Corrected bug with Multiswitch Input Type
- Added support for Whisper Power DC Power Cube
- Added support for Whisper Power AC Power Cube
- Added support for Isotta Blackbox
- Fixed issue with running indications on Connect-50
- Fixed issue with Window Wipers on Channels 17-31 on Connect 50
- Fixed issue with Whisper Power AC and DC Cube
- Fixed issue with Bootloader Mode in Connect50
- Added indication on unit for input frequency channels
- Added Whisper Power WPC-CAN Integration for Whisper Power Center (Inverter/Charger)
- Added Whisper Power WPC-BSI component (Battery Monitor)
- Added Whisper Power WPC-PMG component (Genverter)
- Added temperature source selection Exhaust gas temp to PGN 130 312
- Fixed issue with ISO Requests for Address Claim for devices on network transmitted frequently
- Added support for new product series SP12-NV, SP12-NH
- Added handling for multiple GPS position source on network
- Increased support for up to 4 half bridge/minus channels on Connect-50 units.
- Fixed issue with loop check for fire alarm channels on Connect-50 not working.
- Added new WiFi – channel support on Connect50 WiFi products
- Added new Cloud channel support on MCU & Connect50
- Updated USB Driver for MCU & Programming Interface.
- Added support for PGN127489, Engine Dynamic Parameters (supported by Connect50 and MCU)

- Connect50: Added support for PGN 65001, 65002, 65003, 65004, 65008, 65011, 65014,65017,65024,65027,65030
- Connect50: Added support for Binary Control
- Connect50: Added support for AC PGN 127744,127745,127746,127747,127748,127749
- Connect50: Added support for Charger PGN 127507
- Connect50: Added support for Inverter PGN 127509
- Connect50: Added new models support
- Fixed issue with Chiller Compressor status not reporting for Condaria Easy Chiller
- Fixed issue with multipart SMS transmit intermittently fails.
- Fixed issue with SP-8 Panels ID setting
- Fixed issue with SP-8 Panel backlight not turning on at system poweron
- Added Readout of IMEI number on display (MCU)
- Added new component Multi-And (supported by Connect50 and MCU)
- Added new component Multi Group Selector (supported by Connect50 and MCU)
- Update to MFD Dimmer component (simplifying connection in schematic)
- Update to MFD Component Feedback (Indicate Control or Load)
- Update to Dimmer Control Unit (rev7)
- Fixed issue with multiple simultaneous button presses on SP-8 panels
- Decreased Latency for Overcurrent measurement on C50
- Improved accuracy of delay timers for large configurations
- Fixed issues with WiFi driver (wifi not always initiating on poweron)
- Fixed issue on Connect 50 with output not engaging blink function if output was already on when blink control pin was raised
- Added support for Condaria AirCon on Connect50 model equipped with RS-485.  
*Note: Connect50 Supports 1 Air handler*
- Added support for Dometic AirCon on Connect50 model equipped with Extra CAN.  
*Note: Connect50 Supports 1 Air handler*
- Added support for new products EmpirBus SwitchPanels SP8
- Added Support for Firealarm on Connect50
- Added support for Commonline (Button with LED on single wire) on Connect50
- Added support for blink functionality on outputs on Connect50
- Increased support to 8 Dometic HVACs in MCU Gateway
- Increased support up to 10 compartments for Condaria AirHandlers.
- Added Integration with Humphree HCS
- Added Channel indications for Analog channels Connect50
- Added Undercurrent and Overcurrent support for outputs Connect50
- Added GSM support
- Added Support for Window Wipers Setup A,B,C
- Added support for remote fuse reset of window wiper from MFD
- Added support for fuse reset of channel number > 17 from unit fuse monitor component.
- Fixed issue with Limp Home Mode on Connect50 channels 17-31
- Connect50 & MCU Fixed issue with SMS Value Commands.
- Fixed issue with GSM not always starting up when powered on Connect50
- Fixed issue with Signal Drive not working on channels 15-16,22-24,30-31 Connect50

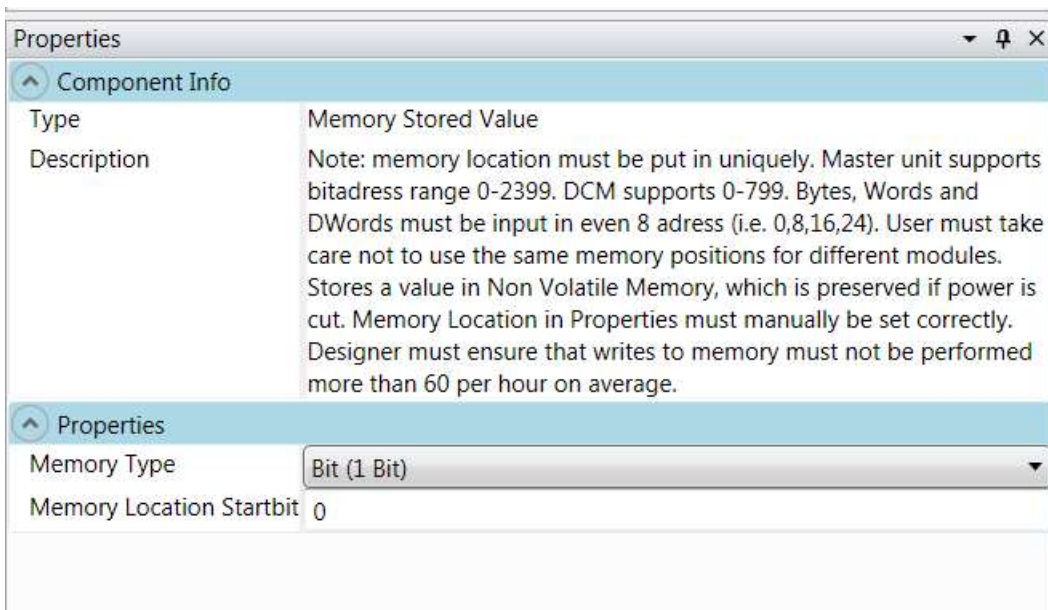
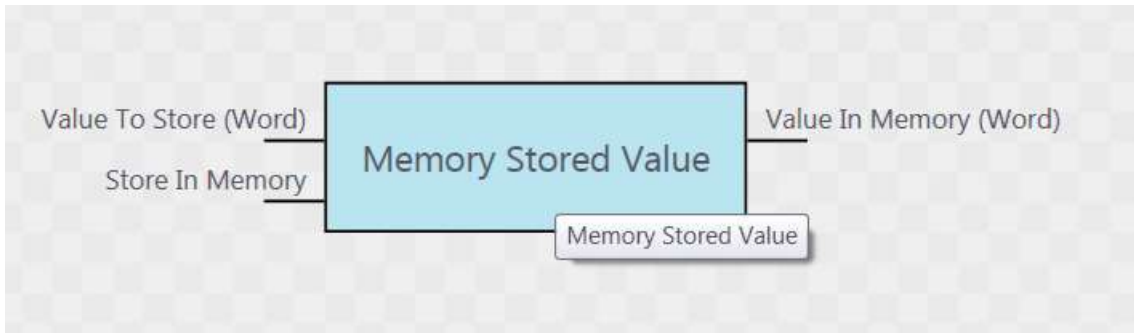
- Fixed issues with Signal Drive dimming
- Added VReg onboard Monitor for DCM
- Temperature Monitor Update for DCM
- Added Disable EnOcean control.
- Added GSM Functionality in PowerSave.
- Connect50 – Touch Panel Updated Responsiveness
- Added support for EmpirBus Application Specific PGN on Secondary CAN port.
- Connect-50 Added Touch Button Controller
- Connect-50 Added Manual Override Functionality
- Connect-50 Added Limp Home Mode Functionality
- Connect50 Address Claim Lost Bug Fix
- Connect50 Set ID Bug Fix
- DCM Fixed Issue with premature fuse trip in PowerSave Mode.
- MCU: Fixed Bug that could cause MCU to reboot while the USB cable was connected.
- MCU: Added support for Connect-50 as slave
- Connect50 memory management bug corrected
- 8BP StandAlone Operation Mode
- Support of new product: Connect-50 in standalone operation
- New Component added SignalType Merger / Splitter component
- Added New Component Shiftregister for values, enables time filtering of values
- Primary Communication Buffer Management performance at high bus load conditions corrected. Issue could cause buffer overflow and high latencies during prolonged periods of intensive traffic.
- Condaria Manager updated with quick response time.
- Fixed timeout issue with Condaria AirCon
- Fixed issue with RS232 bus reader
- Fixed issue with model 5 for 65280 not working for channel 2,4,6,8,10
- Added support for Victron Quattro to set currentlimitation on AC2 input and indicate which AC input is active.
- Whisper Power WPCI2000 control update to support newer WPCI2000 firmware.
- NMEA2000 COG & SOG, Rapid Update PGN 129026 – Support added to receive and decode Course Over Ground and Speed Over Ground.
- Digital Input LED Running indication Limit Increased.
- Fixed issue with Power PGNs not being actively received after configuration download without powercycling MCU.
- Fixed issue with fuse tripping prematurely on low dimming levels.
- Fixed issue with LED Running indication Limitation tripping prematurely at 24V
- Increased tolerance for Dual Fixed Switches
- Fixed issue with GSM Text “Alarm” not being changeable from configuration.
- Fixed issue with PGN 130312 Temperature not being transmitted after powercycle of MCU.
- Firealarm channel updated, fuse limiting value changed to Alarm Max instead of fixed 100mA.
- Updated halfbridge and lowside manager with switchover  $t_{min}$  from positive to negative drive.

- NMEA2000 WaterDepth, PGN 128267 – Support added to receive and decode Water Depth, Offset and Maximum Depth Range
- NMEA2000 Rate Of Turn PGN 127251 – Support added to receive and decode Rate Of Turn.
- NMEA2000 AC Input Status PGN 127503 and AC Output Status PGN 127504 – Support added for MCU Units to receive and decode AC Voltage, Current, Frequency, Breaker Size and Power. 10 Component Instances (combined) are supported.
- Comparator – Added support for more datatypes (signed&unsigned, byte, word, dword)
- NMEA2000 components Battery Status, Trimtab, DC detailed Status, Engine Params added data unavailable status detection when transmitting unit is lost/powering off.
- Added EmpirBus NXT API component for 3<sup>rd</sup> party communication. Provides generic programming interface for control and monitoring of Customized Application Specific data. See Document: “Application Specific PGN” for details (available on request)
- Fixed issue with delay before first measurement of analog temperature sensor inputs after channel power on.
- New Constants added, signed versions of byte, word, dword.
- New Edge Filter Component – Flank detection component
- NMEA2000 Attitude PGN 127257 – Support added to receive and decode Yaw. Pitch and Roll information.
- Signal Converter – Added new conversion model “Digital Conversion by table”, can be used to easily trigger digital states from analog signals such as tank level at 25%, 50%, 75%, 100%
- Signal Converter – Added new high resolution conversion option for linear conversion
- Pulse Button Control – Added built in edge detection option.
- NMEA2000 Engine Parameters Rapid Update PGN 127488 – Added support to receive and decode in DCM Active master mode.
- PIN Code Component – New component for MCUs, used for pin-protection functions such as burglar alarm. Example usage, activate the protection when leaving the boat locking down all navigation equipment etc. and require the PIN code to be entered to activate equipment.
- NMEA2000 Alert Service Integration. Service supports texts in up to 5 languages for each individual alert. Example usage, with Raymarine MFD screens pop-up alerts can be presented on the screen.
- Heartbeat PGN in DCMs. Enables possibility to supervise / alarm when a unit is no longer available on bus and execute appropriate actions. Example usage: If power is cut to one
- Corrected SMS value feedback to show more than 6 digits.
- Fixed issue with USB Driver for MCU. This affected that not all units were found when searching for them in download configuration or bootloading dialog. Also corrects issues with bootloading failing mid-process.
- DCM, this can be indicated by an alarm.
- Added support for Air-condition Control. Functionality to supervise and control room compartment air handlers, set temperature, control cooling/heating, fan, chillers, heaters and more. Up to 6 individual compartments can be controlled and monitored.
  - AirMar/MarineAir Systems Elite
  - CruisAir Q-Logic
  - Dometic Truck Control
  - Micro Air

- MarvAir OLED
- MarvAir OLED Touch
- MarvAir HydroMatic II
- Condaria TopClimate
- Added soft start/stop ability to Signal Drive Outputs
- Added support for decoding J1939 AC Power PGNs for MCU units. Up to 15 instances are supported in combination of the following PGNs:
  - 65001 – Bus Phase C Basic AC Quantities
  - 65002 – Bus Phase B Basic AC Quantities
  - 65003 – Bus Phase A Basic AC Quantities
  - 65004 – Bus Average Basic AC Quantities
  - 65008 – Utility Phase C Basic AC Quantities
  - 65011 – Utility Phase B Basic AC Quantities
  - 65014 – Utility Phase C Basic AC Quantities
  - 65017 – Utility Average Basic AC Quantities
  - 65021 – Generator Phase C Basic AC Quantities
  - 65024 – Generator Phase B Basic AC Quantities
  - 65027 – Generator Phase C Basic AC Quantities
  - 65030 – Generator Average Basic AC Quantities
- Added support for new NMEA Power PGNs for MCU Units. Up to 15 instances are supported in combination of the following PGNs:
  - 127744 – AC Power/Current Phase A
  - 127745 – AC Power/Current Phase B
  - 127746 – AC Power/Current Phase C
  - 127747 – AC Voltage/Frequency Phase A
  - 127748 – AC Voltage/Frequency Phase B
  - 127749 – AC Voltage/Frequency Phase C
- Added support for control and supervision of Whisper Power Centre.
- Added algorithms to Analog Signal Processor, Multiplication, Subtraction, Division.  
Increased startup current tolerance for 4-20 mA channels
- Added support for new Product MCU GSM with Voice Capability.
- Added support for new Product MCU-11/42 with Ethernet Capability.  
*Enables configurable control and monitoring over Ethernet*
- New Component NMEA2000 Wind Data 130306.  
*Enables reception and data processing of wind data such as speed and direction.*
- Master Module GSM channels increased up to 20 channels (previously 10)  
Master module Ethernet channels up to 20 channels configurable.
- NMEA2000 Battery Voltage component revised with battery voltage scale to allow voltages above 65V.
- New Dual Fixed Multiswitch input type.  
*Supports detection of 2 fixed switches on a single channel, using resistor values 120 and 220 Ohms*
- New Digital Input Closing to Plus with Weak Pulldown  
*Enables connection of signals with limited driving capacity / current*

- New Component Analog Signal Processor  
*Supports averaging and addition of analog values*
- New Component NMEA2000 Engine Parameters PGN 127488
- Enables processing of Engine Data such as RPM, Boost pressure and Engine Tilt/Trim
- New MFD channel type Signal Values added
- Added support for new product , MCU Gateway
- GSM Handler updated to handle concatenated (long) SMS messages.
- Commonline filtering for high noise environments
- DC Module Touch Control Handler has been revised with a new User Interface for Manual Override and Fuse Reset control.
- Multiswitch indications.  
Multiswitch channels now shows an indication on the channels running LED indicating which switch is activated. Indication shows when button is pressed by flashing the LED.
- DC Module - fixed issue with Output Channels configured with activated openload detection not responding to on/off control.
- USB Driver updated – Solves issues with USB Communication and issues with bootloading devices over USB.

## Appendix A – Memory Stored Value Rev 2



The memory stored values use a non-volatile linear memory matrix. The address is input as startbit-index. User must ensure to use unique addresses for all Memory Stored Values placed in schematic. Byte, Word and DWord addresses must start at even offsets. The MSV can be either bit,byte,word or dword, but all use the same memory, so the address ranges used must be unique throughout all placed MSV components.

Memory Type	Memory Location Used (Startbit set in properties)	Memory Locations Used (Last Bit)	Rules
Bit	STARTBIT	STARTBIT	
Byte	STARTBIT	STARTBIT+7	Must start at even 8 i.e. 0,8,16,24,32
Word	STARTBIT	STARTBIT+15	Must start at even 8 i.e. 0,8,16,24,32
DWord	STARTBIT	STARTBIT+31	Must start at even 8 i.e. 0,8,16,24,32



**Example, 8 Variables to be used, 1 of each kind:**

**Var1 = Bit, Var2=Byte,Var3=Word, Var4=DWord**

The 1 Bit variable can be positioned anywhere in memory, so we set

Var 1 = Bitaddress 0

The Byte variables must be placed with memory index of even 8, so it cannot start on position 2, hence we skip to position 8. Each BYTE uses 8 bit addresses.

Var2 = Bitaddress 8. This means Position 8-8+7 = 8-15 are now in use.

Var3 is placed on 16, uses 16-31, Var 4 is placed on 32 and uses 32-63

Memory Location (Bit Address)	Variable
0	Used by Var 1
1	Unused
2	Unused
3	Unused
4	Unused
5	Unused
6	Unused
7	Unused
8	Used by Var2
9	Used by Var2
10	Used by Var2
11	Used by Var2
12	Used by Var2
13	Used by Var2
14	Used by Var2
15	Used by Var2
....	...

A summary of the memory used in the example

Memory Type	Memory Location Used (Startbit set in properties)	Memory Locations Used (Last Bit)	Rules
Var 1 (BIT)	0	0	
Var 2 (BYTE)	8	15	Must start at even 8 i.e. 0,8,16,24,32. Uses 8 Bits
Var 3 (WORD)	16	31	Must start at even 8 i.e. 0,8,16,24,32 Uses 16 Bits
Var 4 (DWORD)	32	63	Must start at even 8 i.e. 0,8,16,24,32 Uses 32 Bits

The important thing to remember, is that no memory locations used may overlap. The entire bitrange used by one MSV is in use and no bit positions can be used by another MSV, or overwrite will occur.