Linduino Change Log

1.3.0. Mar 20, 2020

Library Changes:

LTC681X: Removing unwanted ISOSPI reversal.

New Libraries/ Demo Programs:

LTC7841 (DC2798A)

1.2.9. Oct 24, 2019

Library Changes:

LTC2944: Fixed LSB and full scale values.

1.2.8. Aug 29, 2019

New Libraries/ Demo Programs:

LTC2971 (DC2875A)

1.2.7. March 22, 2019

Demo Program Changes:

DC2259.ino: Bug fix in LTC6811_run_cell_adc_st(). Added all the missing commands

Library Changes:

LTC681x: Added functions for commands wrsctrl, rdsctrl, stscrl and axow. Added LTC681x_run_gpio_openwire() and LTC681x_run_openwire_multi(). Changed LTC681x_run_cell_adc_st(). Changed cellasic structure to compatible with LTC6810.

LTC 6811: Added functions for commands wrsctrl, rdsctrl and stscrl. Added LTC681x_run_openwire_multi()

New Libraries/ Demo Programs:

LTC6810 (DC2515)
LTC6812 (DC2350AA)
LTC6813 (DC2350AB)

1.2.6. Apr 13, 2018

New Libraries/ Demo Programs:

LTC6603 (DC1304A_B)
LTC5556 (DC2693A)

1.2.5. Feb 19, 2018

Library Changes:

LTC2348: Added family support for the entire 23XX family – LTC2344, LTC2348, LTC2333, LTC2353, LTC2357, LTC2358.

New Libraries/ Demo Programs:

LTC6952 (DC2609A)
LTC6953 (DC2610A)
LTC2972 (DC2675A)

1.2.4. Oct 24, 2017

Demo Program Changes:

DC1490.ino: Bug Fix - Displayed hex values have leading FFFF for inputs above half-scale. Added mask to fix.

Library Changes:

LTC2970: Bug fix for an incorrect masking bit.
LTC2460.cpp: Bug Fix - Data is read into a 32-bit word, then shifted. Values above half scale are wrongly interpreted as negative, added mask.

New Libraries/ Demo Programs:

LTC2662 (DC2692A)
LTC2992 (DC2561)
LTC3886 (DC2155A)

1.2.3. Sep 12, 2017

New Libraries/ Demo Programs:
LTC2600 (DC579A)
EasySMU: ±12V/±40mA Programmable-Voltage/Programmable-Current Source Measurement Unit

1.2.2. July 10, 2017

New Libraries/ Demo Programs:

LTC2508 (DC2222AB)
LTC2512 (DC2222AC)

Library Changes:

LTC2373: Code supports LTC2372 and LTC2374 as well.

1.2.1. June 1, 2017

New Libraries/ Demo Programs:

LTC6811 (DC2259)
LTC681x : LTC681x and bms_hardware library files to support LTC681x family.

Library Changes:

LTC68031: Bug fix for daisy chained Aux Measurement read back.
LTC68042: Bug fix for network PEC error check for AUX and STAT commands

1.2.0. March 31, 2017

New Libraries/ Demo Programs:

LTM9100 (DC2423A)
LTC2492 (DC1009AA)

Demo Program Changes:

DC1496BB.ino (LTC2942): Added support for LTC2941.
DC2094A (LTC2348): Added support for LTC2358, LTC2344.
DC1096B (LTC2642): Added support for LTC2641 and to choose unipolar vs. bipolar.

Library Changes:

LTM2893: Documentation fix.
LTC2640: Documentation fix. The code does not support LTC2631.
1.1.9. Feb 17, 2017

Demo Program Changes:

DC590_enhanced code: Adding functionality to 'k' command to read specifically pin 12 (MISO) when the command argument is 'C'.

Library Changes:

LTM2893: Documentation fixes.

New Libraries/ Demo Programs:

24xx_iso_spi in Example designs
LTC2944 (DC1812AB)
LTC2498 (DC1410AA)
LTC2449 (DC1410AB)
LTC5566 (DC2460A)

Other File Changes:

Doxygen Reference: Regrouped codes into newly defined groups.

1.1.8. Jan 26, 2017

New Libraries/ Demo Programs:

LTM2893 (DC2405A)

1.1.7. Dec 12, 2016

Demo Program Changes:

Fixed bugs on LTC4282, LTC4215, LTC4260, LTC4280 due to mismatch in function definition and declaration for various functions w.r.t. argument types and return variables.

Library Changes:

LT_I2C

Bug fixed in i2c_read_byte_data() and i2c_read_word_data(). The I2C bus was getting stuck in a constant loop with either master or slave holding the data line low after
continuous reading for long hours. To explain the reason for this, consider the following scenario:

Suppose the slave ACKs on Address byte (write bit) and NACKs on Command byte. The ret variable in the code is set to 1. Since there is no checking for the ret value at this point, the function does not return and goes forward. When the master sends the Repeated Start, the slave sees it as a usual Start. When the Address byte is sent again (read bit), the slave ACKs. But, since the ret variable is 1, the master tries to send a stop, while the slave tries to send over data. This causes the data line to be confused and the program to be stuck in a loop inside i2c_stop().

1.1.6. Oct 17, 2016

New Libraries/ Demo Programs:

   LTC2947 (DC2334A)
   DC2574A_KIT (LTC2947)

Library Changes:

LT_SMBUS Library:

   Moved I2C and SMBus files to LT_SMBUS library
   Fixed memory leak in LT_I2CBus.cpp
   Exposed i2cbus object in SMBus classes
   Added CRC block data calculation in LT_SMBus
   Removed TWI and used standard TwoWire
   Changed to LT_two.c so that it behaves cleanly when a master tries to communicate with a Linduino

LT_PMBUS Library

   Exposed smbus object in PMBus class
   Added Not In Transaction polling as comment in LT_PMBus.cpp
   Removed waitForAck on managers.
   Added PMBus Temp1 Offset support

LTPSM_PartFaultLogs Library

   Removed block read code and used non block methods for fault logs
   Fixed Polling on EEData Type Fault Logs.
   Converted fault log readers for LTC3883 and LTC3887 to use MFR_DATA.

LTPSM_InFlightUpdate Library
Changed In Flight Update memory management to statics
Removed In Flight Update dead code
Changed pointer size in nvm.cpp to avoid wrap around of data on large NVM datasets
Turned off debug printing in In Flight Update.

Demo Program Changes:

LTC2970 Sketches

Added LTC2970 support library.
Modified sketches to use new LTC2970 library.

DC1962C Sketches

Updated some sketches to use static memory rather than allocate and free.
Added Retention sketch
Fixed datalogger bugs.

LTC3882 Sketches

Fixed LTC3883 Address for DC1778A.

Sketches General

Added Sandbox sketch under User Contributed / LTPowerPlay
Removed twi includes from some sketches.

1.1.5. Sep 23, 2016

New Libraries/ Demo Programs:

- LTC2983
- LTC2984
- LTC2986

1.1.4. Sep 2, 2016

Library Changes:

- LTC3335 : Removed the use of low level I2C functions.
- LTC3676 : Removed the use of low level I2C functions.
- LTC2942 : Added code support for LTC2941.
- LT_I2C : Bug fix in i2c_read_block_data() to immediately exit from the function upon NACK after the command byte portion of the transaction.
- LTC2642: Removed unnecessary delay in SPI write function for the DAC.

New Libraries/ Demo Programs:

LTC2412
LTC2413 (family of LTC2412)
LTC2604
LTC2605
LTC2480
LTC2482
DC2430 – in User Contributed

Demo Program Changes:

DC1096B (LTC2642) : Removed unnecessary delay in the SPI write function.

1.1.3. May 10, 2016

Library Changes:

LTC2348 : Improved code and added support for LTC2358.
LTC3589 : Removed the use of low level I2C functions.
LT3965 : Removed the use of low level I2C functions.

New Libraries/ Demo Programs:

LTC2664 (DC2376A)
LTC2636 (DC1466) – code supports LTC2634 (DC1488A) as well.
LTC2637 (DC1534A) – code supports LTC2635 (DC1593A) as well.

1.1.2. March 24, 2016

New Libraries/ Demo Programs:

LTC6951 (DC2248A)

1.1.1 Jan 29, 2016

Library Changes:

Removed inclusion of Wire.h in LT24XX_general library. Linduino.h covers up for Wire.h.
Linduino.h: Defined macros to differentiate Little Endian and Big Endian. Added a union to include array of two 16 bit words.
PMBUS Library: Added LT_PMBusDevice.cpp for better compile errors when porting.
PMBUS Library: Updated fault logging to use word transactions for some devices to reduce memory usage during programming.
PMBUS Library: Added virtual destructors to reduce warnings.
PMBUS Library: Removed C++11 variable initialization in device, rail, and group classes.
PMBUS Library: Various updates to code to eliminate compiler warnings in library files.
PMBUS Library: Updated DC1962C program sketch with newer hex data from most recent LT Powerplay revision.

Demo Program Changes:

DC1684AA.ino (LTC2758): Removed unnecessary characters.

New Libraries/ Demo Programs:

LTC3335 (DC2343A)
LTC4155 (DC1674A)
LT3965 (DC2218A)
LTM4676 (DC1811B)

Other changes:

Added LT_3887FaultLog class.

1.1.0 Dec 4, 2015

Library Changes:

Improvements to PSM polling code in LT_PMBus.cpp and LT_SMBusBase.cpp.
Reworked PSM device type code in LT_PMBus.cpp so that one routine decodes MFR_SPECIAL_ID

Demo Program Changes

DC1590B.ino (LTC3880) Doxygen documentation changes, update for API changes, added ClearFaults.
DC1936A.ino (LTC3882) Doxygen documentation changes.
DC1778A.ino (LTC3883) Doxygen documentation changes.
DC1633B.ino (LTC2933) Doxygen documentation changes.
DC1605B.ino (LTC2936) Doxygen documentation changes.
DC2313A.ino (LTC2937) Doxygen documentation changes.
New Libraries/ Demo Programs:

- DC2289A.ino (LTC2380-24)
- DC2364A.ino (LTC2873)
- DC1496BB.ino (LTC2942)
- DC2217A.ino (LTC4316)
- LTC4675
- LTC4677

New Fault Log sketches and example sketches to cover the following PSM devices:

- DC2022A.ino (LTC2975)
- DC2028A.ino (LTC2977)
- DC2198A.ino (LTC2980)
- DC2023A.ino (LTM2987)
- DC2263A.ino (LTC3887)

Other Changes:

User Contributed - DC1962C sketches: Added support for identification and programming of PSM devices and rails.

**1.0.9 Sep 23, 2015**

Library Changes:

- Replaced LTC6602 files with updated tested code.
- Fixed Doxygen Documentation on LTC2984 and LTC2983 files.

New Libraries/ Demo Programs:

- DC1011AB.ino LTC2496
- DC2024A.ino LTC4282
- DC2313A.ino LTC2937
- DC980.ino LTC2970

Demo Program Changes

- Deleting DC2023_Init.ino
- New DC1962 (LTC2984) sketches for store and programming.
1.0.8 Aug 12, 2015

New Libraries/ Demo Programs:

LTC2984

1.0.7 July 1, 2015

Library Changes:

LT_PMBus Library updated with support for polyphase rails and more NVM operations.

Demo Program Changes:

ultra_fix.ino (DC1926C)  Added Bricked Device Detector
faultlog.ino (DC1926C)  Fixed Time Stamp byte order, Added check for fault log existence, Added support for LTC2975

New Libraries/ Demo Programs:

DC1989A.ino  (LTM4676)

Other changes:

Renamed the .ino file for LTC6903 to DC726_A, and for LTC6904 to DC726_B.
Fixed documentation issues in LTC2338 files.

1.0.6 May 28, 2015

Library Changes:

LT_PSM  Refactored and new functions added.
LT_InFlightUpdate  Fixed "verify bug”.

Demo Program Changes:

DC570A.ino (LTC2440)  Fixed a bug (could not detect EEPROM)
DC572.ino  Replaced parseFloat() with read_float()
DC1684A.ino  Replaced parseFloat() with read_float()
DC1684B.ino  Replaced parseFloat() with read_float()
DC1096B.ino  Replaced parseFloat() with read_float()

Sketches for LT_PSM cleaned up to reflect refactoring LT_PSM.
New Libraries/ Demo Programs:

- DC1558_DC1808.ino (LTC3589)
- DC1651A.ino (LTC6803-1)
- DC1652A.ino (LTC6803-2)
- DC1684AA.ino (LTC2758)
- DC1684AB.ino (LTC2752)
- DC786A.ino (LTC4260)
- DC985A.ino (LTC4245)
- DC1704A.ino (LTC4280)
- DC2094A.ino (LTC2348)
- DC1605B.ino (LTC2936)
- DC1633B.ino (LTC2933)
- DC2382.ino (LTC2975)
- DC2023A.ino (LTC2987)
- DC2023A_Init.ino (LTC2987)

Program.ino (User Contributed/DC1962)
Store.ino (User Contributed/DC1962)

Other changes:

- Made the library codes and Linduino code for LTC1592 (DC572) more user friendly.
- Renamed LTC2374-18 libraries with LTC2373-18 (DC2071AA.ino)

1.0.5 March 11, 2015

Library Changes:

- LT_PMBus.cpp Added file and modified to use PAGE command.

New Libraries/ Demo Programs:

- DC1096B.ino (LTC2642)
- DC572A (LTC1592)
- DC1339A (LTC2302)
- DC874A (LTC4215)
- DC998A (LTC4261)

Other changes:

- Added Fault Log decoding for LTC2974, LTC2977, LTC2978, LTC3880, LTC3882, LTC3883, and LTC3886.
1.0.4 December 16, 2014

Library Changes:

- **LTC6948.cpp**: Added code to detect register bit FRAC_NUM = 0, then set to INTN mode.
- **LT_I2CBus.cpp**: Added sketches for more PSM devices. Cleaned up PMBus stack with Group protocol.

Demo Program Changes:

- **DC1444A.ino (LTC2305)**: Menu and print title modifications.
- **DC1186A.ino (LTC2308)**: Reorganized.
- **DC1337A.ino (LTC2309)**: Some additional print functions included.
- **DC2025A.ino (LTC2668)**: Changes made to settle channel and trigger logic.
- **DC1846.ino (LTC6947)**: Added EEPROM Store/Restore, made menu modifications.
- **DC1959.ino (LTC6948)**: Added EEPROM Store/Restore, made menu modifications.

New Libraries/ Demo Programs:

- **DC2091A.ino (LTC5599)**
- **DC1649A.ino (LTC6945)**
- **DC1705C.ino (LTC6946)**
- **DC1795A.ino (LTC6950)**
- **DC1954A.ino (LTC6954)**
- **DC2071A.ino (LTC2374)**
- **DC2196A.ino (LTC2666)**
- **DC1633B.ino (LTC2933)**

Other changes:

- **LT_I2C.cpp**: Changed I2C clock to 100 KHz to match DC590.

Added faultlog.ino, FaultLog.h and FaultLog.cpp files to read and interpret fault log from NVM for:

- LTC2974
- LTC2977
- LTC2978
- LTC3880
- LTC3882
- LTC3883
Modified the following files in User Contributed/DC1962C to add sketches for more PSM devices. Cleaned up PMBus stack with Group protocol:

- faultog.ino
- logo.ino
- svid.ino
- hello_world.ino
- training.ino
- ultra_fix.ino

1.0.3 August 1, 2014

Global Changes:
Rename "Libraries" directory to "libraries" (lower case 'l'). Arduino for Linux does not like the upper-case 'L'. Windows works with either.

Library Changes:

- LT_I2C Library: quikeval_I2C_connect() modified to wait 55ms if the state of the MUX pin actually changes. This accommodates the 55ms connection delay of the LTC4315 used on the DC2026 rev B board. Also change the default bus frequency to 100kHz (from 400kHz) to match DC590B.

- LTC1859 Library - Modified
- LTC2309 Library - Modified
- LTC2378 Library - Modified
- LTC2484 Library - Correct SPI function call from 24 bits to 32 bits. Change ADC code pointer to signed 32 bit.
- LTC2497 Library - Correct I2C function call from 32 bits to 24 bits.
- LTC2460 Library - Correct SPI function call from 32 bits to 24 bits. Remove EOC_timeout notes from header.
- LTC2473 Library - Add timeout as an argument (was a fixed constant.)
- LTC24XX_general library - Add a default check for an ADC code of all zeros that needs to be detected for EasyDrive parts
- LTC2990 Library - Add additional bit masks
- LTC2991 Library - Add proper check for new valid data
- QuikEval_EEPROM Library - Fix read_quikeval_id_string function so that it is tolerant of a missing comma

Demo Program Changes:

- DC682.ino (LTC1859 program) - Reorganized
- DC1337.ino (LTC2309 program) - Reorganized
- DC1925.ino (LTC2378 program) - Minor changes
- DC1490.ino (LTC2460 program) - Remove EOC_timeout call
DC1716.ino (LTC2473 program) - Add timeout to read function call
DC939.ino (LTC2484 program) - Change a bunch of variables from unsigned to signed.
DC1011AA.ino (LTC2498 program) - Remove extra data read when in 2X mode. LTC244x family requires this, LTC2498 family does NOT.
DC1012AA.ino (LTC2499 program) - Remove extra data read when in 2X mode.
DC2197.ino (LTC2645 program) - Add options to enter duty cycle as a percentage
DC2025.ino (LTC2668 program) - Add SPI loopback test and notes on “internal use only” functions.
DC1697.ino (LTC2945 program) - Add “will attempt to proceed” note if demo board not connected.
DC1338.ino (LTC2990 demo program) - change some calls to use new mode masks.
DC590B.ino (DC590 emulator) - Correct spelling of “pseudo”, add delay in reset routine to better match actual DC590 behavior.
I2C_Address_Scan.ino (I2C address scanner) - Remove inclusion of SPI library, clarify what to do to start scan.

NEW Libraries / Demo Programs!:
LTPMBus - Functions for PMBus and Power System Management products

LTC1856
LTC2305
LTC2315
LTC2338
LTC2366
LTC2370
LTC2380
LTC2383
LTC2946
LTC2983
LTC6602
LTC6947
LTC6948
DC1962C Sketch
LTC3880 Sketch
LTC3882 Sketch
LTC3883 Sketch
LTC2974 Sketch
LTC2977 Sketch

Example Designs / User Contributed:
LTC2449_Datalogger.ino - Simple channel scanning routine. Demonstrates how to scan channels in multiplexed ADCs.
DC1962.ino - Power System Management demonstrations (LTC3880, LTC2974, LTC2977)

1.0.2.1 – March 31st, 2014
LTC2484 Library
   Fix for 2x multiple zero issue

1.0.2 – March 21st, 2014
LTC6904 Library
   DC726A.ino added
   LTC6904.cpp added
   LTC6904.h added
LTC6903 Library
   DC762B.ino added
   LTC6903.cpp added
   LTC6903.h added
LTC3676 Library
   LTC3676.cpp Added
   LTC3676.h Added
   DC1976.ino Added
LTC2498 Library*
   LTC2498.cpp Added
   LTC2498.h Added
   DC1011AA.ino Added
LTC2499 Library*
   LTC2499.cpp Added
   LTC2499.h Added
   DC1012AA.ino Added
LTC2460 Library*
   LTC2460.cpp Added
   LTC2460.h Added
   DC1490.ino Added
LTC2473 Library*
   LTC2473.cpp Added
   LTC2473.h Added
   DC1716.ino Added
LTC2497 Library*
   LTC2497.cpp Added
   LTC2497.h Added
   DC1012AB.ino Added
LTC2990 Library
LTC2990.cpp Added
LTC2990.h Added
DC1338.ino Added

LTC2440 Library*
LTC2440.cpp Added
LTC2440.h Added
DC570.ino Added

LT24XX unified library
LTC24XX_general.cpp Added
LTC24XX_general.h Added
LTC24XX_general_test Added

LTC2991 Library
Spelling correction in comments on LTC2991.h

LTC2484 Library *
LTC2484.cpp Modified to use General Library

LTC237X Library
Revision to cover more parts

* indicates that the library requires the General Library and needs LTC24XX_general.cpp and LTC24XX_general.h

1.0.1 – January 15th, 2014

LTC2668 Library
DC2025A.ino Added
LTC2668_backpage_app.ino Added
LTC2668.cpp Added
LTC2668.h Added

LTC2943 Library
DC1812A.ino Added
LTC2943.cpp Added
LTC2943.h Added

LTC2874 Library
DC1880A.ino Added
LTC2874.cpp Added
LTC2874.h Added

LTC6804 Library
DC1894.ino Added
DC1942.ino Added
LTC68041.cpp Added
LTC68041.h Added
LTC68042.cpp Added
LTC68042.h Added

LT_I2C.cpp
Fixed bug in i2c_read_word
Linduino.html
  Doxygen rerun to update for new parts

1.0
Initial Release