Revision History:

Ver.: 3.4.0 24.04.25:

Features

```
  ESP32: Parallel output of LED data on up to 6 channels
  change FastLED to a stable version 3.9.12 coming from MobaLedLib github
repository
  change source for library ATTinyCore:avr to MobaLedLib github repo
  support of the new color test
  support of the ESP32 1,3" OLED display
  add MobaLedLib RGB-LED ring macro
  rp2040 support up to 8 parallel LED channels
  improve determination of OneDrive local path
  optional display of MobaLedLib time/LDR values on the display
  improved selection of old ProgGenerator filename when updating to new
release/beta
  on "Import from old program" the Arduino type setting is retained
  acceleration of ESP32 start time
  add SI_LocalVar to predefined system variables
  add replacement of "$" in macro arguments         see
https://www.stummiforum.de/t165060f7-MobaLedLib-LEDs-Servos-Sound.html#msg26
43729
  force a rebuild if ALT key is pressed
  empty compiler cache if last ATMega build failed  see
https://www.stummiforum.de/t222466f195-MobaLedLib-Arduino-Upload-geht-nicht.
html#msg2649211
  update rp2040 board version to 4.4.0
  improvement of overall PlatformIO build process
  support PlatformIO build for rp2040
  experimental support of ESP32 board version 2.0.17
```

Bugfixes

```
  ATMega: bug with wrong send buffer size for SEND_INPUTS fixed
  fix detection of first RGB_Heartbeat line while import
  "ESP32 and hieroglyphics for MLL time" see To-Dos#21
  unnecessary memory consumption due to extensions  see To-Dos#20
  error handling didn't work when downloading libraries/boards
  upgrade PlatformIO to 6.9.0 to fix build problem with DMX512
  fix problem with StartLedNumber update on invisible sheets
  improvement of start LED calculation in include sheets
  remove wrong platformIO beta warning
  fix problem with wrong MP3_Command value MP3_STOP which should be
MP3_ADVERT_STOP
  fix problem with PatternConfigurator icons
```

Changes

```
  Selectrix pin definition changed to SX_SIGNAL_PIN 13 and SX_CLOCK_PIN 4 to
support both ESP32 Adapter and the new ESP32 main board
  when using PlatformIO don't turn compile window to red in case of build
errors to keep colored error output
  changed version string schema to provide platform name
```

Ver.: 3.3.2 19.12.23:

Features

```
  LNet support for Arduino platform (main board >= 1.8.0 mandatory)
  New macros: Set_LEDNr, CopyNLEDs, Include, SingleLedSignal,
SingleLedSignalEx
  New icons
  Support of input type "feedback", process CAN messages from ATTiny_CAN_GBM
module
  Store_Status: support SwitchB, extend max. InCnt to 63
  Support of DCC/CAN/LNet momentary buttons (GEN_BUTTON_RELASE mode are now
setable in config sheet)
  Experimental support of MobaLedLib stored in OneDrive folder
  ATMega328PB support
```

Enhancements

```
  fix SwitchC issue with ESP32
  fix issue that AVR build fails caused by vbcr in LEDs_Autoprog.h ->
replace by vbcrlf
  add missing macros InCh_to_LocalVar, InCh_to_LocalVar1 and
Bin_InCh_to_TmpVar1 to sheet Lib_Macros
  fix #10763: include marco counts LEDNr wrong
  fix #10159: wrong line endings in fastbuild.cmd
  ensure that included sheet uses same protocol as the main sheet
```

Ver.: 3.2.1 09.08.22:

Features

```
  LED simulator
  Selectrix support for ESP32
  ColorPicker for Const Makro
  Macro RGB_Heartbeat_Color
  MobaLedLib Extensions support
  "Virtual pin" feature
  Retrigger support for patterns using GOTO mode
  DCC signal state signaled with ESP32 onboard LED
```

Enhancements

```
  fix CAN baudrate issue with ESP32 V1 chips
  fix ESP32 build issue with non-default Arduino home directory
```

```
  fix issue in case Arduino home directory doesn't exist
  add missing macros InCh_toTmpVar1 and BinCh_toTmpVar1
  fix RandMux bug on ESP32
  fix Set_ColTab bug on ESP32
  fix issue that Analog Pattern flags were ignored in Goto mode
```

Ver.: 3.1.0 28.11.21:

Features

```
  New TreeView based macro selection dialog with grouping and icons
  Add feature to control sound modules attached to the mainboard
  Add ServoMP3 feature - sound modules are attached to the servo board and
controlled via serial line
  Add feature Pin_Alias
  Add #define SWITCH_DAMPING_FACT to the Lib_Macros
  Add possibility to scroll with the mouse in the description box of the
TreeView dialog
  UserForm_Other is resizable now
```

Enhancements

```
  Show please wait screen when loading/updating the tree view
  The macro filter is also activated by typing letters in the list box
  Remove NmraDCC library installation workaround as version 2.0.10 fixes the
ESP32, no more need to install from private repository
  Add sheet Platform_Parameters containing all platform dependent settings
  Add Raspberry Pico Mainboard Leds, Mainboard Buttons, PushButtons
  Add experimental Raspberry Pico support
  Disable Autodetect when changing CPU type to ESP32 or Pico
  Change width of Form and new pos for Buttons at Form Other
  Splited the installation of several board packages into separate calls
because otherwise the installation fails.
  Update the filter if a row is selected which already contains a macro to
show the macro
  Improved the scrolling in the userform others
  Added a scroll bar to description in the TreeView dialog
  As ESP32 is no longer experimental set library U8g2 to mandatory
  Motorola II protocol for interface Arduino
  Allow relative path in ImageBoxAdder
  Reload all Icons when running GenReleaseVersion
  Support of BETA update directly from github
  Add the build date as a tooltip to the version information cell
  Add Excel version check
  Add library external command processing
```

Bugfixes

```
  Solved problem if the user has no additional board installed. In this case
the "packages" directory has to be created in
C:\Users<Name>\AppData\Local\Arduino15\
```

```
  Adapted the cmd files to work with 32 bit windows (Arduino is installed to
"Program Files" and not to "Program Files (x86)")
  Corrected start focus and tab index of the Userform_Other (Prior sometimes
the 'Abort' button had the focus)
  Added "On Error Resume Next" to prevent crash with Office 365 in
EnableDisableAllButtons()
  Replaced ".Add2" by ".Add" in Sort_by_Column because this new function is
not supported by Office 365
  (Hopefully) prevent formatting the "Start LEDNr" as date by setting the
NumberFormat to "General" when importing files.
  Fixed bug when loadimg the Excel File. The Pattern Configurator icons in
the lines have been deleted
  Fix issue on Scroll in UserForm_Other (focus lost)
  Prevent crash when the TreeView is closed with the 'x' button and reopened
again
  Fix some typos in start page text
  Fix issue that load of old configuration was not started while a Beta
update
  Fix issue #6894 BetaUpdate won't run with UserDir containing blank chars
  Fix LED_to_var - Led_Offs to 31. See #6899
  Fix VB6 FindWindow Issue #6914
  Fix another VB6 Issue in Userform_RunProgram
  Workaround for Excel 2007 isNumericBug
  Add missing EspSoftwareSerial library
  Fix Platform_Parameters: with AM328 SPI Pins are only usable if no CAN
module is in use
```

Ver.: 3.0.0 21.04.21:

```
  Release support of ESP32 and up to 49152 single LEDs
  Support controling DMX512 devices (up to 300 per channel)
  Bootloader Update and "New Bootloader full Mem"
  Up to nine independent LED channels
  Search function in macro selection
  TinyUniProg improvements
  Fixed problem scaling the house dialog for small screens (1366x768)
  Added seven new railway signal macros
  Ability to switch the LED portocol to WS2811 where the Red and Green
channel are swapped
  Faster method to download and execute the color test program
  Use only one column for start led number display, may be configured on
config page
  Add Macro #define COMMANDS_DEBUG traces DCC messages
  Corrected the "fire" macro
  Fix issue where directory names contain blanks
  Fix DCC offset problem when sending simulated DCC commands
  Speed up ResetTestButtons function
  And many, many more features and bugfixes, ... Let yourself be surprised!
```

Ver.: 2.1.1 14.11.20:

```
  Removed the old Debug functions to simulate DDC commands
TEST_PUSH_BUTTONS(), TEST_TOGGLE_BUTTONS() and TEST_BUTTONS_INCH()
  Experimental support for ESP32 added
```

Ver.: 2.1.0 02.11.20:

```
  8% additional configuration memory by changing the reserved size of the
fast bootloader from 2K to 512 byte
  Corrected the support for 64 time entries in the pattern_Configurator.
Unfortunately the prior changes have been made in a wrong worksheet and not
in the Main sheet => They have been lost when the release version was build
;-(
  Corrected the importing of data from old Prog_Generator
  Define at least 20 LEDs to be able to test them with the color test
program
  Disabling the Event which is called when Enter is pressed when the
workbook is closed. Hopefully this solves the problem that the
Pattern_Config is opened sometimes unintentionally
  Prevent crash if a wrong formula is entered like "-Test"
  Updating the arduino type in the "Options" dialog if the USB Port
detection is started
  Charlie_Buttons and Charlie_Binary control 3 channels (RGB) instead of 2
(GB)
  Corrected the maximal time for the Blinker function by adding PF_SLOW
  Disable the mouse scroll function for Office <= 2007 because here excel
generates a crash
```

Ver.: 2.0.0 18.10.20:

```
  Support for the new buffer gate on mainboard version 1.7 added
```

Ver.: 1.9.6 K 16.10.20:

```
  Don't gray out the other rooms in the House/Gaslight dialog. Instead the
important buttons use bold font
  User interface:
      Corrected the entering of selextrix data and the position of the USB
simulation buttons
      Corrected the "Dialog" Button. The "Type selection" dialog was called
twice in DCC mode.
  Disabled the "ENABLE_CRITICAL_EVENTS_WB" to hopefully get rid of the crash
which is generated if lines are deleted in the Pattern_Configurator. By
disabling this events the LED numbers are not updated if lines ade hidden or
shown again.
  Corrected the NEON_DEF2D entry. Channel 1 was used instead of channel 2.
This caused the occupation of a new RGB channel if NEON_DEF1D and NEON_DEF2D
was used in a sequence
  Improve the detection probability in "DetectArduino()". Prior the arduino
was not always detected at the first trial.
  Corrected the error detection for the ATtiny upload
```

```
  Increased the number of Time entries from 30 to 64 and corrected the
entries 24-30
  New Charliplexing software which supports the 64 time channels
```

Ver.: 1.9.6 J 11.10.20:

```
  The Mainboard_LED function also acceppts the arduino pin numbers D2-D5,
D7-D13 amd A0-A5
```

Ver.: 1.9.6 I 10.10.20:

```
  Possibilitiy added to ignore problems with the baud rate detection
```

Ver.: 1.9.6 H 10.10.20:

```
  Improved the loading of MLL_pgf files
```

Ver.: 1.9.6 G 10.10.20:

```
  Added additional pins to the Mainboard_LED function. Now nearly every pin
could be used as LED pin (New channels 0, 5-16).
  New method "LED_to_Var()" to set variables controlled by the LED values.
  Improved the "Mainboard_Hardware_Test.MLL_pgf". Now the mainboard could be
tested without the PushButton4017 board.
```

Ver.: 1.9.6 F 07.10.20:

```
  Programming of the fast bootloader added
  Jürgen has added "Update_Start_LedNr" to the end of
Read_PGF_from_String_V1_0() because other wise NUM_LEDS is 0
  New function "Mainboard_LED(MB_LED, InCh)" which could be used to use the
mainboard LEDs as status LEDs
  Added macro "WeldingCont()" which continuously flickers while the input is
active.
  Don't use the Heartbeat LED at PIN A3 if the CAN bus is used AND the
SwitchB or SwitchC is used.
  Generate an error message if Mainboard_LED(4..) is used together with
SwitchB or SwitchC.
  Created an example file to test the MobaLedLib main board:
"Mainboard_Hardware_Test.MLL_pgf" This file is stored in the directory
"Prog_Generator_Examples" which is copied to the library destination at
startup.
  Added DayAndNightTimer which could be used with then Scheduler function
```

Ver.: 1.9.6 E 07.08.20?:

```
  Deletted >100000 columns in the DCC sheet which slowed down the loading of
.MLL_pfg files
  Added a status display when loading the .MLL_pfg files
```

```
  Don't read/save the "Examples sheet from/to .MLL_pfg file
```

Ver.: 1.9.6 D 04.08.20:

```
  Limit the maximal servo value to 210 (Old 220) to avoid promlems with
measurement errors at 2kHz
  Additional Delay and check if the old directory has been deleted when
updating the Beta version
```

Ver.: 1.9.6 C 28.07.20:

```
  Corrected Servo programming (Flash was erased when setting the Reset pin
as output)
  Corrected decimal separator problem when loading pattern examples
  New macros for servo with SMD WS2811 Herz_BiRelais_V1...
```

Ver.: 1.9.6 22.07.20:

```
  Preview LEDs in the Pattern_Configuarator could be moved on top of a
picture or under a transparent picture (by Misha)
  Speedup building and uploading of the Arduino program 10 sec. instead of
23 sec. (by Juergen)
```

Ver.: 1.9.5 15.06.20:

```
  The versions 1.0.2 - 1.9.4 are not released test versions.
  Since there are a huge number of changes since version 1.0.1 all details
are described here:
https://www.stummiforum.de/viewtopic.php?f=7&t=165060&sd=a&start=2410
```

Ver.: 1.9.4 14.06.20:

```
  Added Misha's Multiplexer to the Prog_Generator
```

Ver.: 1.0.7 07.06.20:

```
  Corrected the LED Animation, the "Start LedNr" in combination with
"HerzHerz_BiRelais()"
```

Ver.: 1.0.6 06.06.20:

```
  Added Mishas LED Previev and Mux functions to the Pattern_Configurator
  Using Harolds new pyProgGen_MobaLedLib
  Using the new USB port detection also in the Pattern_Configurator
```

Ver.: 1.0.5 31.05.20:

```
  Automatically install all libraries
  Using the Sketchbook path for the working directory
```

Ver.: 1.0.4 23.05.20:

```
  Automatically detecting COM port the Arduino is connected to
  Improved the HV_Reset() in the Tiny_UniProg according to Juergens tipp
  New macros InCh_to_TmpVar1() and Bin_InCh_to_TmpVar1() which start with
state 1 instead of 0
  New macros for Servos and Herzstueck polarisation
  New Push Button macros which read DCC and hardware buttons
  Added macros Andreaskreuz with lamp test
```

Ver.: 1.0.3 01.05.20:

```
  Test of additional LED channels and EEPROM Storage
```

Ver.: 1.0.2 18.04.20:

```
  Test of switch and variables
```

Ver.: 1.0.1 17.01.20:

```
  Corrected the upload in version 1.0.0 because some files have not been
update ;-(
```

Ver.: 1.0.0 16.01.20:

```
  New Charlieplexing program for the Servo_LED module which could be used to
drive Viessmann and other "Multiplexed" light signals
  Configuration upload from the Pattern_Configurator over the LEDs "Bus" to
the Charlieplexing module. The module is configured on the railway layout.
  Direct programming support for the Tiny_UniProg module from excel (One
click to install the software)
  Flashing of the software for the Charlieplexing Module from excel (One
click to install the software)
  Enhanced Color Test program with a lot of new features
  New Black and White TV simulation (configurable)
  Simulation of defective neon lights added
  1001 of other small changes and improvements
```

Ver.: 0.9.3 08.12.19:

```
  Engagement of Pattern_Configurator and Program_Generator => Easy exchange
between the tools
  CheckColors function: Live view of the colors and brightens of the LEDs
  Existing lines could be edited in the Prog_Generator
```

Ver.: 0.9.2 30.10.19:

```
  Corrected the XPattern function (used in the Light signals)
  Corrected the Excel Programs
```

Ver.: 0.9.1 06.10.19:

```
  Corrected the functions Flash(), RandWelding() and PushButton_w_LED_0_? in
the Prog_Generator
  Corrected single LEDs in the House() and GasLights() function.
```

Ver.: 0.9.0 27.09.19:

```
  New Excel User interface to configure the LEDs
  Single LED functions for the House() macro
  Macros for Light signals, Construction lightning, ... added to the library
```

Ver.: 0.8.0 16.07.19:

```
  Added new assembly document for the main PCB from Alf and Armin
```

Ver.: 0.7.9 09.07.19: Moved the Pattern_Configurator to the „extras“ directory and updated the excel version.

```
  Nice graphical display of the LED brightness and the Goto mode
  Reduced the size by extracting the examples
  Added a menu to save/load/delete example sheeds
  User interface is automatically switched to English (Example descriptions
still German)
```

Ver.: 0.7.8 09.04.19:

```
  Added examples
      00.Overview
      25.Analog_Push_Button
```

Ver.: 0.7.7 17.02.19:

```
  Added Support for Sound modul JQ6500
  Corrected the random mode of the Counter() function
  Improved the serial input debug function
  Moved the Heartbeat function in own H-file"
  12.03.19:
      added ButtonNOff() macro
```

Ver.: 0.7.5 19.01.19:

```
  Added examples:
      Burning house (Push button action with fire, smoke, sound and fire
truck). Shown in the video: https://vimeo.com/311006857
      DCC (Digital Command Control) decoder example with two Arduinos. Shown
in the video: https://vimeo.com/311996452
  Added function Bin_InCh_to_TmpVar() and RGB_Heartbeat2()
  Added zip file with the RGB LED distribution PCBs
  Improved the fire algorithm
```

```
  Corrected the binary mode of the counter (CF_BINARY)
  Corrected the initialization of the Pattern function if the Goto mode is
used.
  Updated the English documentation to the same state like the German.
  Using the correct version of the Pattern_Configurator.xlsb
```

Ver.: 0.7.0 20.12.18:

```
  First released version
```

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