

STM32 Nucleo expansion board for power consumption measurement

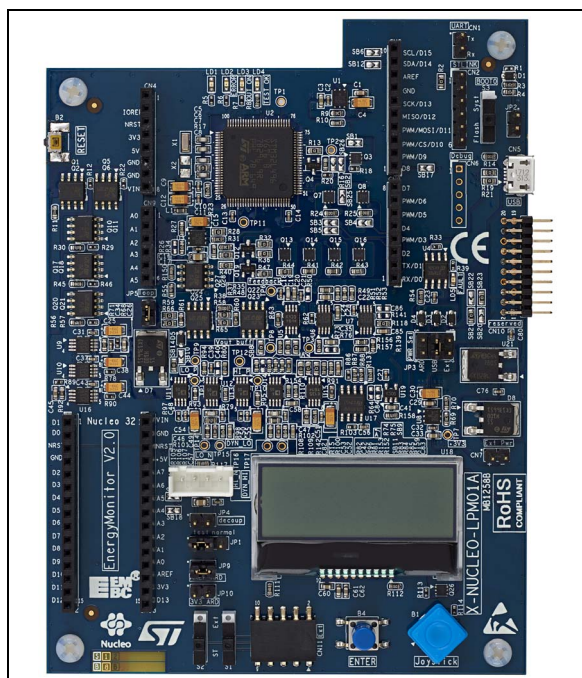
Data brief

Features

- STM32L496VGT6 microcontroller featuring Arm® Cortex®-M4 core at 80 MHz / 100 DMIPS and three 12-bit ADC at 5 Mps
- Programmable voltage source from 1.8 V to 3.3 V
- Static current measurement from 1 nA to 200 mA
- Dynamic measurements:
 - 100 kHz bandwidth, 3.2 Mps sampling rate
 - Current from 100 nA to 50 mA
 - Power measurement from 180 nW to 165 mW
 - Energy measurement computation by power measurement time integration
 - Execution of EEMBC ULPMark™ tests
- Mode standalone:
 - Monochrome LCD, 2 lines of 16 characters with backlight
 - 4-direction joystick with selection button
 - Enter and Reset push-buttons
- Mode controlled:
 - Connection to a PC through USB FS micro-B receptacle
 - Command line (virtual COM port) or
 - STM32CubeMonitor-Power PC tool.
- 4 status LEDs
- Target board connectors:
 - Arduino™ Uno and Nano connectors
 - Basic connector (white): 4 wires
- Flexible input power-supply options:
 - USB micro-B (VBUS)
 - External power connector (7 V to 10 V)
 - Arduino Uno and Nano connectors (pin 5 V)

Description

The X-NUCLEO-LPM01A is a 1.8 V to 3.3 V programmable power supply source with



Picture is not contractual.

advanced power consumption measurement capability.

It performs consumption averaging (static measurement up to 200 mA) as well as real-time analysis (dynamic measurement up to 50 mA with 100 kHz bandwidth).

The X-NUCLEO-LPM01A operates either in standalone mode (using its LCD, joystick and button to display static measurements), or in controlled mode connected to host PC via USB (using the STM32CubeMonitor-Power software tool with its comprehensive graphical user interface).

It can be used to supply and measure the consumption of STM32 Nucleo-32, Nucleo-64 or Nucleo-144 boards, using Arduino connectors. Alternatively, it supplies and measures the consumption of any target connected by wires via the basic connector.

General information

The X-NUCLEO-LPM01A expansion board firmware runs on the STM32L496VGT6 Arm®-based device.



System requirements

- Windows® OS (7, 8 and 10), Linux® 64-bit or macOS®
- USB Type-A to Micro-B cable

Embedded software

The X-NUCLEO-LPM01A expansion board firmware is preloaded.

The latest firmware version (reference code: STM32-LPM01-XN) can be downloaded from the www.st.com/stm32softwaretools web page.

The firmware controls the board and provides a plug-and-play solution for current measurement.

It can be used in two main modes:

- Standalone mode: power-supply the board by USB cable or external +5V source, then follow the instructions on LCD screen.
- Controlled by host mode: refer to [Section : PC software tool](#).

For more information on embedded software and FW upgrade procedure, refer to user manual UM2269.

PC software tool

The X-NUCLEO-LPM01A expansion board can be controlled by a computer through USB.

Computer driver for USB virtual COM port (VCP) is required: 'STM32 Virtual COM Port Driver' (reference code: STSW-STM32102) can be downloaded from www.st.com.

The board can be controlled:

- Via a COM port terminal with commands. Type command 'help' for list of commands available. For more information on commands, please refer to user manual UM2269.
- Via a graphical user interface using the STM32CubeMonitor-Power software tool (reference code: STM32CubeMonPwr) available at www.st.com/stm32softwaretools. For more information on STM32CubeMonitor-Power, please refer to user manual UM2202.

Ordering information

To order the STM32 Nucleo expansion board for power consumption measurement, refer to [Table 1](#):

Table 1. Ordering information

Order code	Description
X-NUCLEO-LPM01A	STM32 Nucleo expansion board for power consumption measurement

Revision history

Table 2. Document revision history

Date	Revision	Changes
26-Sep-2017	1	Initial version
2-Mar-2018	2	Added General information

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved