X-NUCLEO-LPM01A

STM32 Nucleo expansion board for power consumption measurement

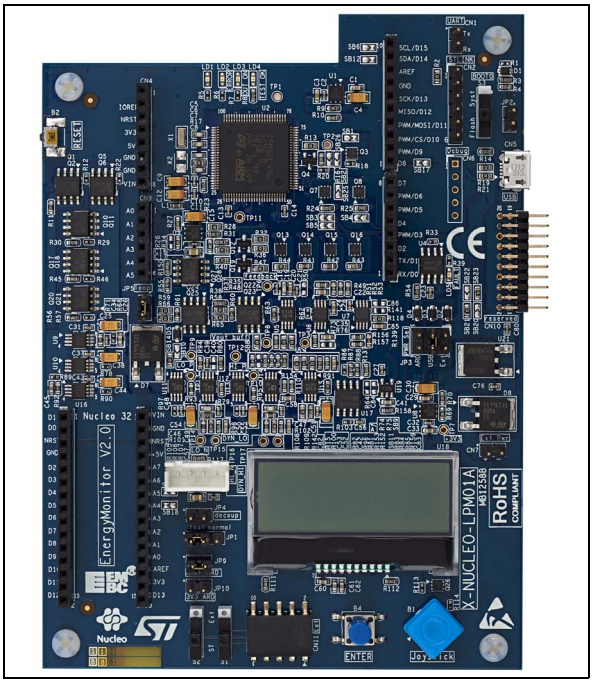
Data brief

Features

- STM32L496VGT6 microcontroller featuring Arm® Cortex®-M4 core at 80 MHz / 100 DMIPS and three 12-bit ADC at 5 Msps
- 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 Msps 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 advanced power consumption measurement capability.



Picture is not contractual.

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.

arm

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*

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