

UM10955

JN5179-USB-Dongle User Manual

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User manual

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1.0	20151209	First release
1.1	20160224	Section 4.1.1 : updated. Section 4.2: updated. Section 4.3: added.

Contact information

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1. Introduction

This chapter introduces the NXP JN5179 USB Dongle (OM15021), which provides a hardware development platform for wireless microcontroller applications with a USB interface.

1.1 Overview

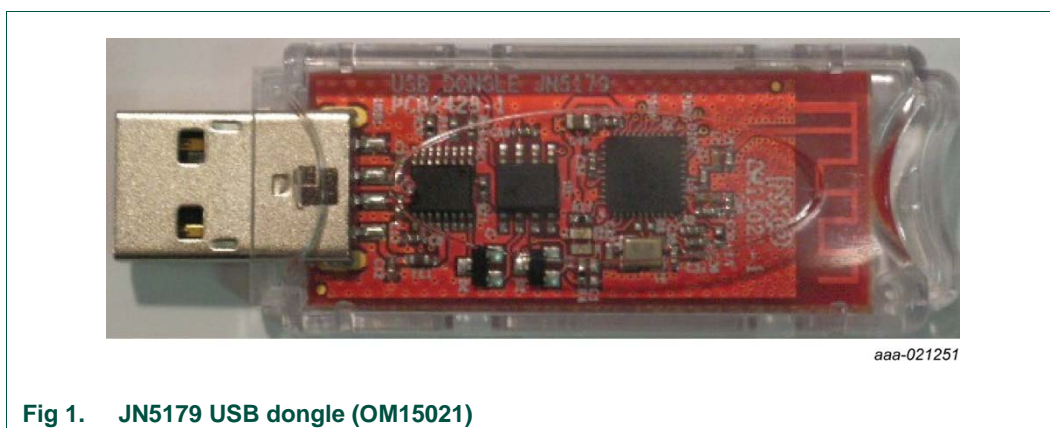
The JN5179 USB Dongle features a JN5179 wireless microcontroller and allows communication with this JN5179 device from a USB connection. The JN5179 device can act as a node of a wireless network. Thus, the dongle provides an easy way of interfacing a host machine (such as a PC) to a wireless network based on the IEEE802.15.4, ZigBee Smart Energy or ZigBee-Home Automation networking protocol. An FTDI device provides the USB connection between the host machine and the JN5179 device, which in turn provides the radio interface to the wireless network.

Typical uses of the dongle include:

- A complete and stable hardware environment for the development of IEEE802.15.4, ZigBee Smart Energy and ZigBee-Home Automation networking applications, facilitating an accelerated time-to-market for wireless network products
- The basis of a packet sniffer for IEEE 802.15.4-based wireless communications
- A means of integrating the host machine into a wireless network, typically as the network Coordinator

The small-footprint PCB of the dongle provides all the necessary components for a wireless microcontroller with access to a USB connection. All RF layout and decoupling issues are handled by the design of this dongle. Therefore, this design is ready for application development without the necessity of hardware development.

The JN5179 USB dongle, shown [Fig 1](#), is supplied in the JN5179-EK005 Evaluation Kit.



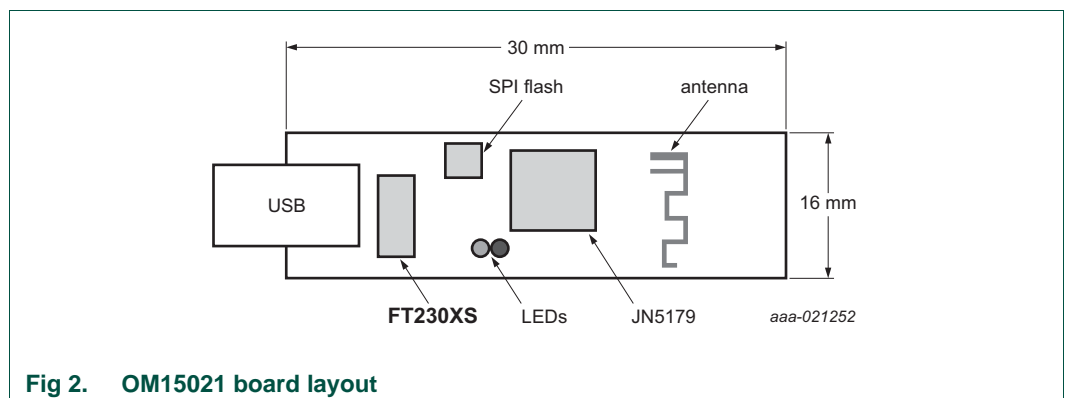
1.2 Features

The dongle has the following features:

- USB 2.0 Full-Speed Compatible Interface
- IEEE 802.15.4-based wireless microcontroller (JN5179) with the following radio characteristics:
 - Transmit power: 8.5 dBm (typ.), can be increased to 10 dBm (typ.)
 - Transmit current: 19.6 mA (typ) at 8.5 dBm / 23.3 mA (typ.) at 10 dBm
 - Receive sensitivity: -96dBm (typ.)
 - Receive current: 13 mA (typ.)
- Integrated printed RF antenna
- General-purpose LEDs (one green, one orange)
- Serial Flash memory device (4 Mbits)
- 32-kHz crystal oscillator

2. Hardware overview

2.1 Dongle layout



2.2 Dongle block diagram

The [Fig 3](#) illustrates the main hardware blocks of the dongle.

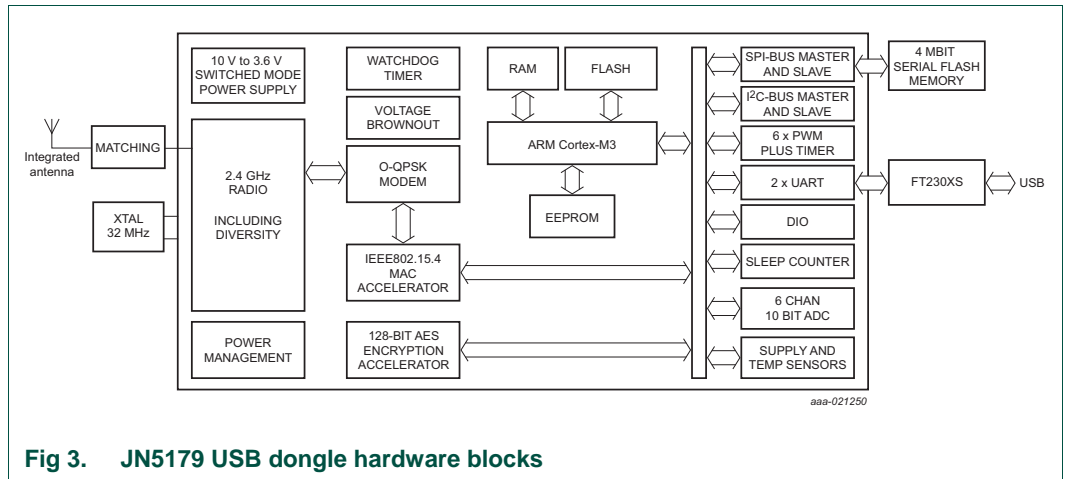


Fig 3. JN5179 USB dongle hardware blocks

2.3 Hardware components

The hardware components on the board are described in the following sub-sections.

- JN5179 wireless microcontroller – see [section 2.3.1](#)
- FTDI FT230XS driver device – see [section 2.3.2](#)
- LEDs – see [section 2.3.3](#)

2.3.1 JN5179 device

The JN5179 circuit on the board is based around the standard JN5179-001-M00 module. However, it is built on a 2-layer board, as the DIOs do not need to be externally available.

The JN5179 device uses an integrated antenna on the PCB of the dongle.

2.3.2 FT230XS device

The FT230XS device is connected to the USB connector and acts as an interface between the PC and the JN5179 device. The FT230XS will enumerate on the PC as a virtual COM port connected directly to UART0 on the JN5179 device.

The IO controls C2 and C3 in the FT230XS device need to be set to 'GPIO Mode' to allow the RESET and PGM signals to operate correctly. To do this, execute the following instructions.

1. Download the application FT_Prog from the FTDI website www.ftdichip.com
2. Insert the JN5179 USB Dongle into a USB port of your computer and wait for the device to enumerate
3. Start FT_Prog and click Scan and Parse (the magnifying glass button)
4. Update the IO controls C2 and C3 to I/O MODE – see [Fig 4](#)

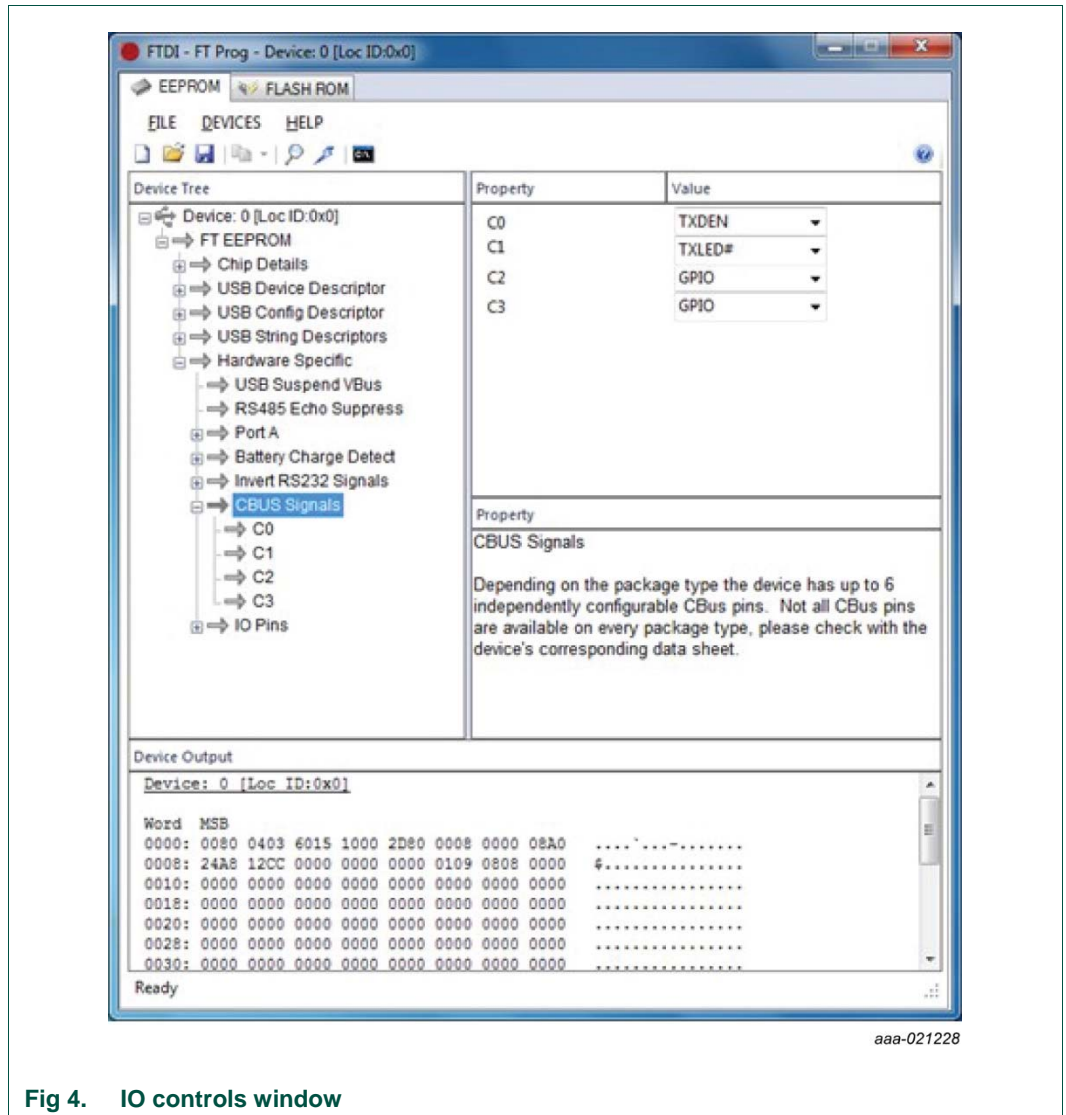


Fig 4. IO controls window

5. Click Program Devices (the lightning button)
6. On the resulting screen, click Program – see [Fig 5](#)

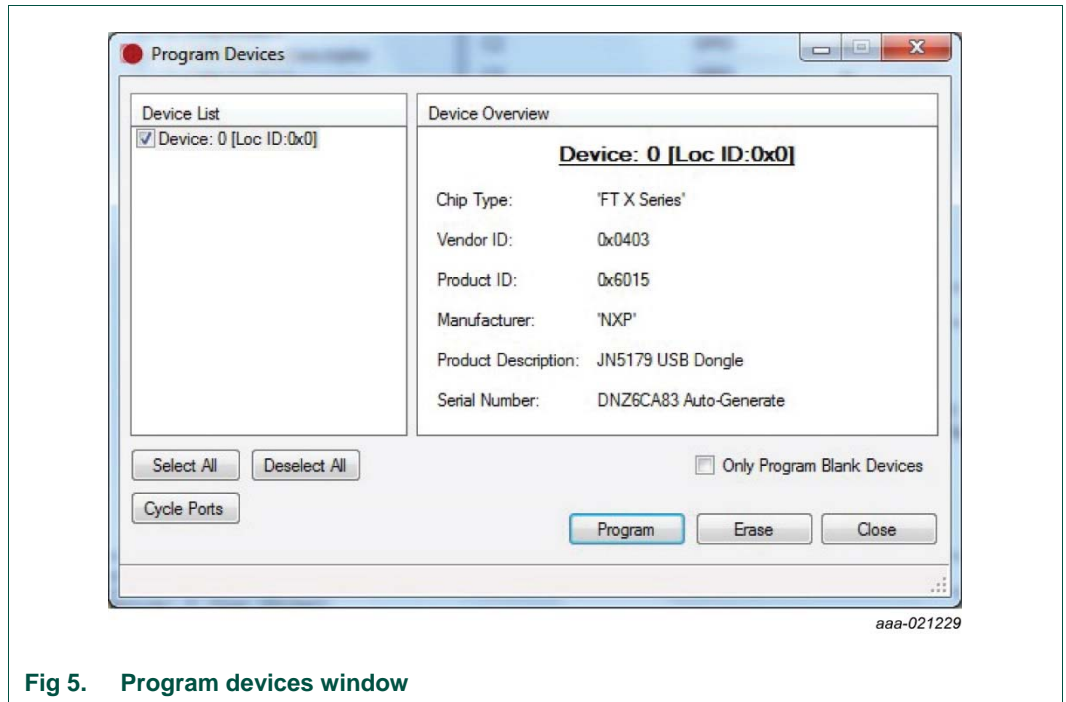


Fig 5. Program devices window

2.3.3 LEDs

There are two surface-mounted LEDs that can be controlled by the JN5179 wireless microcontroller (see Fig 2 for locations):

- LED D1 (orange)
- LED D2 (green)

Both LEDs are connected to DIO14 and DIO15. These DIOs can be used to control the LEDs as indicated in the Table 1.

Table 1. DIO control of LEDs

		DIO14	
		Low	High
DIO15	Low	D1: Off	D1: Off
		D2: Off	D2: On
	High	D1: On	D1: Off
		D2: Off	D2: Off

3. Flash programming

When the JN5179 USB dongle is powered up, it attempts to run an application from the internal Flash memory of the JN5179 device. This may be a self-contained application that sends and receives wireless data, and which does not need to communicate with the host. Alternatively, it may communicate via the USB with an application running on the

host, such as a Windows program, and also communicate with a wireless device or network.

In order to program an application binary into Flash memory, the JN51xx Production Flash Programmer can be used, which is described in the JN51xx Production Flash Programmer User Guide (JN-UG-3099). This programming utility will place the JN5179 into its programming mode. It will then download the program to the Flash memory and reset the JN5179 device, causing the application to be executed.

4. Compliance statements and documentation

The FCC ID number of the JN5179 USB dongle is XXMJN5179U0

The IC ID number of the JN5179 USB dongle is 8764A-JN5179U0

4.1 FCC statements and documentation

This section contains the Federal Communication Commission (FCC) statements and documents.

4.1.1 FCC interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

WARNING!

FCC radiation exposure statement:

This portable equipment with its integrated antenna complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance follow the instructions below;

Avoid direct contact to the antenna, or keep it to a 20 cm minimum distance while using this equipment. This device must not be collocated or operating in conjunction with another antenna or transmitter.

4.2 Industry Canada statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Industry Canada RF radiation exposure limits set forth for general population (uncontrolled exposure). This device must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) il ne doit pas produire de brouillage, et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Le présent appareil est conforme aux niveaux limites d'exigences d'exposition RF aux personnes définies par Industrie Canada. Cet appareil doit être installé afin d'offrir une distance de séparation d'au moins 20 cm avec l'utilisateur, et ne doit pas être installé à proximité ou être utilisé en conjonction avec une autre antenne ou un autre émetteur.

4.3 Module integration special warnings for US and Canada

- The JN5179-001-U0 module is considered as component that will be operated in combination with the final equipment. Then, the final equipment (including power supply system) still needs to re-confirm that the whole system complies with intentional and unintentional emission requirements.
- The statement warning of 20 cm separation distance and warning of collocation should appear in the user manuals of end products.
- The end product's regulatory label should mention:
"Contains FCC ID: XXMJN5179U0 and IC: 8764A-JN5179U0".

5. Abbreviations

Table 2. Abbreviations

Acronym	Description
BOM	Bill Of Materials
DIO	Digital Input/Output
FCC	Federal Communication Commission
IC	Industry Canada
PCB	Printed Circuit Board
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus

6. References

- [1] **JN5179** – JN5179 Data Sheet
- [2] **OM15021_JN5179_USB_Dongle_2V0** – OM15021 USB dongle PCB files

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