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XBee 3 Click





PID: MIKROE-5299

XBee 3 Click is a compact add-on board suitable for mission-critical wireless applications. This board features the XB8X-DMUS-001, a low-power CE/RED certified Digi XBee® RF module delivering superior performance and interference immunity from Digi International. The module can run either a proprietary DigiMesh® or point-to-multipoint networking protocol utilizing a low-power Silicon Labs MCU and an ADF7023 transceiver, along with an integrated SAW filter that offers industry-leading interference blocking. Operating between 863MHz and 870MHz (868MHz), it allows use in several regions, including approved European countries. This Click board™ is ideal for applications requiring range, data redundancy, and reliability.

XBee 3 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

XBee 3 Click as its foundation uses the XB8X-DMUS-001, a Digi XBee® CE/RED certified RF module suitable for mission-critical wireless applications from Digi International. The XB8X-DMUS-001 can run a proprietary DigiMesh® or point-to-multipoint networking protocol utilizing a low-power Silicon Labs MCU and an ADF7023 transceiver with an integrated SAW filter offering industry-leading interference blocking. It also supports low-power sleeping nodes and has an RF line-of-sight range of up to 14km (rural range line of sight) in a combination of coverage, data redundancy, and data reliability.

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ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

ISO 9001: 2015 certification of quality management system (QMS).

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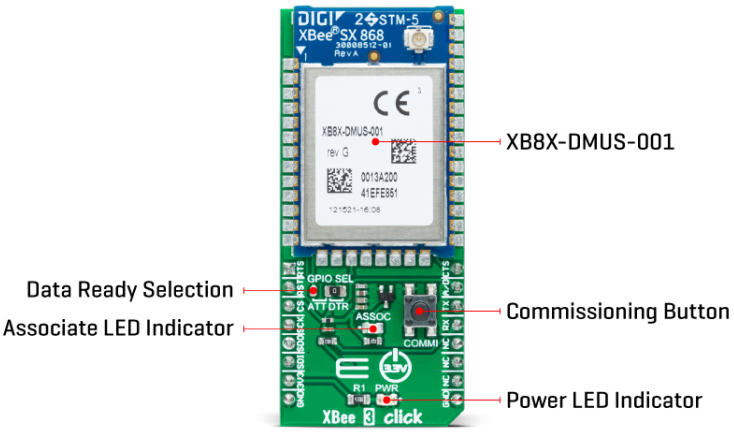

The XB8X-DMUS-001 module is pre-certified for use in European countries. Operating between 863MHz and 870MHz (868MHz), it allows use in several regions, including approved European countries. It also leverages surrounding frequencies for LBT+AFA (Listen-Before-Talk and Adaptive-Frequency-Agility), significantly reducing interference by listening to the radio environment before any transmission starts and automatically shifting to a new channel when interference is detected.

This Click board™ comes with a configurable host interface allowing communication with MCU using the chosen interface. The XB8X-DMUS-001 can communicate with MCU using the UART interface with commonly used UART RX, TX, and hardware flow control pins UART CTS and RTS (Clear to Send and Ready to Send) or using the SPI interface (XBee module will work as an SPI-slave only). In the case of the SPI interface, the users can use it to configure the module and write the library by themselves.

The XBee 3 Click is associated with many other features, such as the reset function and the possibility of visual and digital indicators. An active-low reset signal routed on the RST pin of the mikroBUS™ socket activates a hardware reset of the system, while a yellow LED indicator marked as ASSOC represents a visual indication of the module's connection to the network. If the LED is constantly on, it means that the module is not connected to the mobile network, while the case of standard flashing of the LED represents the normal operating mode.

The A/D pin routed on the INT pin of the mikroBUS™ socket represents a type of interrupt whose function can be selected by positioning an onboard SMD jumper to an appropriate position labeled as DTR or ATT. DTR position is a "Data terminal ready" function used to tell the XBee module that the host MCU is ready to communicate, while the ATT position (SPI Attention) represents an indicator for the SPI interface whenever the XBee module has data for the host MCU. In addition, the board also has a commissioning pushbutton marked as COMMI which, combined with an ASSOC LED, provides various simple functions to aid in deploying devices in a network.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

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Type	ZigBee
Applications	Can be used for applications requiring range, data redundancy, and reliability
On-board modules	XB8X-DMUS-001 - Digi Xbee® RF module from Digi International
Key Features	Low power consumption, CE/RED certified, SAW filter for performance in noisy RF environments, Listen-Before-Talk and Frequency Agility for interference immunity, DigiMesh networking topology for redundancy and reliability, and more
Interface	SPI,UART
ClickID	No
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on XBee 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
UART RTS	**RTS**	1	AN	PWM	16	**CTS**	UART CTS
Reset	**RST**	2	RST	INT	15	**A/D**	Data Ready Indicator
SPI Chip Select	**CS**	3	CS	RX	14	**TX**	UART TX
SPI Clock	**SCK**	4	SCK	TX	13	**RX**	UART RX
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	ASSOC	-	Associate LED Indicator
JP1	GPIO SEL	Right	Data Ready Selection DTR/ATT: Left position DTR, Right position ATT
T1	COMMI	-	Commissioning Button

XBee 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V

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Frequency Range	863	863	870	MHz
Urban Range Line of Signt	-	-	2.5	km
Rural Range Line of Signt	-	-	14.5	km
RF Data Rate	10	-	80	Kbps
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the XBee 3 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for XBee 3 Click driver.

Key functions

- xbee3_get_serial_number This function sends a get serial number command.
- xbee3_set_device_name This function sets the device name (node identifier).
- xbee3_set_destination_address This function sets the destination address high and low bytes.

Example Description

This example demonstrates the use of an XBee 3 Click board™ by showing the communication between the two click boards configured in transparent mode.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.XBEE3

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MikroElektronika compilers.

mikroSDK

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This Click board™ is supported with mikroSDK - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

XBee 3 click example on Libstock

XB8X-DMUS-001 datasheet

XBee 3 click 2D and 3D files

XBee 3 click schematic

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