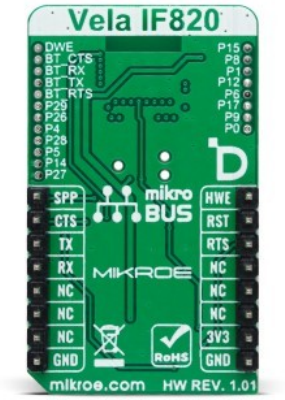
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Vela IF820 Click



PID: MIKROE-6513

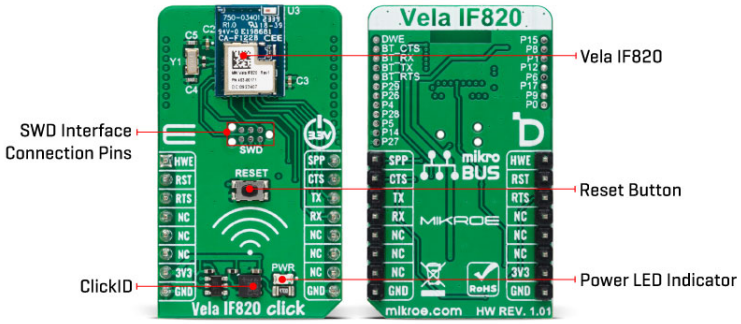
Vela IF820 Click is a compact add-on board for Bluetooth® wireless communication in various embedded applications. This board features the Vela IF820 (453-00171R), a dual-mode Bluetooth module with an integrated antenna from Ezurio, powered by the Infineon AIROC™ CYW20820 chipset with a high-performance Arm® Cortex®-M4 processor. Supporting Bluetooth® 5.4 with dual-mode (Classic & LE), it offers robust connectivity with BR/EDR and LE 1M/2M PHY, up to 10dBm EIRP output power, and excellent receiver sensitivity. The board communicates via UART with hardware flow control, includes power management features, and supports firmware debugging through SWD. Ideal for industrial automation, IoT devices, wireless sensor networks, medical monitoring, and smart home systems, it ensures reliable and high-performance Bluetooth communication.

For more information about **Vela IF820 Click** visit the official product page.

How does it work?

Vela IF820 Click is based on the Vela IF820 (453-00171R) module from Ezurio, offering an advanced solution for Bluetooth® communication with dual-mode support. This allows operation with both classic Bluetooth and Bluetooth Low Energy (LE), enabling an easy transition from legacy Bluetooth standards to modern LE technology within a single hardware solution. The Vela IF820 is powered by the Infineon Technologies AIROC™ CYW20820 chipset, featuring a high-performance Arm® Cortex®-M4 processor running at a maximum clock speed of 96MHz. Its architecture allows for standalone operation without requiring an external microcontroller, thanks to the integrated Bluetooth protocol stack stored in ROM.

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com



This module comes with an integrated antenna and complies with the Bluetooth® Core Specification version 5.4. It supports Basic Data Rate (BR) and Enhanced Data Rate (EDR) at 2Mbps and 3Mbps, as well as extended synchronous connection-oriented communication. Additionally, it provides Bluetooth® LE 1M PHY and 2M PHY support, ensuring robust wireless performance. With an output power of up to 10dBm EIRP and excellent receiver sensitivity (-94 dBm for Bluetooth LE at 1 Mbps), the Vela IF820 ensures reliable and efficient connectivity. Due to its versatile capabilities, this board is suitable for various applications, including industrial automation, wireless sensor networks, IoT devices, smart home systems, medical monitoring, and other embedded solutions requiring stable and high-performance Bluetooth communication.

The 453-00171R and the host MCU are communicated through a UART interface, using standard UART RX and TX pins and hardware flow control pins (CTS/RTS- Clear to Send/Ready to Send) for efficient data transfer. The module defaults to a communication speed of 115200bps, allowing for data exchange over AT commands. In addition to the interface pins, this board includes several auxiliary pins that enhance its functionality.

The HWE (Host Wake) signal is used by the module to notify the host system when the Bluetooth device requires attention, ensuring efficient power management and responsiveness. The SPP (Serial Port Profile) pin is dedicated to managing Bluetooth SPP connections, typically serving for connection control or status indication, making it particularly useful for applications requiring reliable serial communication over Bluetooth. Additionally, the RST pin is dedicated to resetting the module, offering the same functionality as the onboard RESET button, ensuring a convenient way to restart the module when necessary.

The board features SWD pads designed for use with MIKROE's 6-pin Needle Cable, enabling optional flash programming and debug functionality via the SWD (Serial Wire Debug) interface. This allows for efficient firmware development, debugging, and troubleshooting, making it easier to optimize and maintain the module's performance. The back side of the board features multiple test points, providing access to 15 GPIO signals from the module, as well as the Bluetooth UART interface required for flashing EZ-Serial and HCI firmware. Additionally, the DWE pin is available, serving as a signal from the host to the module, indicating that the host MCU requires attention, ensuring efficient communication and system responsiveness.

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. It also comes equipped with a library containing functions and example code that can be

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

used as a reference for further development.

Specifications

Type	BT/BLE
Applications	Ideal for industrial automation, IoT devices, wireless sensor networks, medical monitoring, and smart home systems
On-board modules	Vela IF820 (453-00171R) - dual-mode Bluetooth module with an integrated antenna from Ezurio
Key Features	Bluetooth® Version: 5.4 (Classic & LE), based on Infineon AIROC™ CYW20820, BR/EDR (2Mbps, 3Mbps), LE 1M PHY, LE 2M PHY, integrated antenna, up to 10dBm EIRP output power, UART interface, programming and debugging, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Vela IF820 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Host Wake	**HWE**	1	AN	PWM	16	**SPP**	Bluetooth SPP Control
Reset / ID SEL	**RST**	2	RST	INT	15	**CTS**	UART CTS
UART RTS / ID COMM	**RTS**	3	CS	RX	14	**TX**	UART TX
	NC	4	SCK	TX	13	**RX**	UART RX
	NC	5	MISO	SCL	12	NC	
	NC	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
T1	RESET	-	Reset Button

Vela IF820 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Frequency Range	2402	-	2480	MHz
TX Output Power	-	-	+10	dBm
RX Sensitivity	-	-94	-	dBm

Software Support

Vela IF820 Click demo application is developed using the NECTO Studio, ensuring compatibility with mikroSDK's open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a mikroBUS™ socket.

Example Description

This example demonstrates the use of Vela IF820 Click board by processing data from a connected BT Classic device.

Key Functions

- velaif820_cfg_setup Config Object Initialization function.
- velaif820_init Initialization function.
- velaif820_cmd_set This function sends a specified set command to the Click module.
- velaif820_cmd_get This function sends a specified get command to the Click module.
- velaif820_read_packet This function reads a response or event packet from the Click module and stores it in ctx->evt_pkt structure.

Application Init

Initializes the driver and logger.

Application Task

Application task is split in few stages:

- VELAIF820_POWER_UP:

  Powers up the device and checks the communication.

- VELAIF820_CONFIG_EXAMPLE:

  Restores factory settings, sets BT Classic flags and reads the BT address and name.

- VELAIF820_EXAMPLE:

  Performs a BT terminal example by processing all data from a connected BT Classic device and sending back an adequate response messages.

Application Output

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following this tutorial.
- UART Terminal - Monitor data via the UART Terminal using a USB to UART converter. For detailed instructions, check out this tutorial.

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the NECTO Studio. The application code can also be found on the MIKROE GitHub account.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

Vela IF820 click example package

Vela IF820 click 2D and 3D files v101

Vela IF820 datasheet

Vela IF820 click schematic v101

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Mikroe:

MIKROE-6513