

Time-saving embedded tools

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





PID: MIKROE-4331

ISO 9141 Click is a compact add-on board that contains a monolithic bus driver with ISO 9141 interface. This board features the L9637, a monolithic integrated circuit containing standard ISO 9141 compatible interface functions from ST Microelectronics. It's designed to provide bidirectional serial communication compatible with ISO9141 standard. It has many features such as wide input/output voltage range, controlled output slope for EMI, Standby Mode with low current consumption, overtemperature Shut-Down function, and more. This Click board[™] is suitable for automotive diagnostic applications such as powertrain for ICE (CNG/LPG engine control or diesel/gasoline injection), an automotive gateway in telematics and networking, and many more.

ISO 9141 Click is supported by a <u>mikroSDK</u> compliant library, which includes functions that simplify software development. This <u>Click boardTM</u> comes as a fully tested product, ready to be used on a system equipped with the <u>mikroBUSTM</u> socket.

How does it work?

ISO 9141 Click is based on the L9637, a monolithic bus driver designed to provide bidirectional serial communication in automotive diagnostic applications according to the specification "Diagnostic Systems ISO9141" from ST Microelectronics. The L9637 is also known as the K-Line Transceiver that provides a bidirectional link, called K, and a separate comparator, called L, to the related diagnosis bus that can be connected on terminal labeled with K and L on this Click board[™]. The K and L pins are protected against overvoltages and reverse battery condition. During the lack of power supply or ground, all pins show high impedance characteristics.

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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.





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



The L9637 has a wide supply voltage in a range from 4.5V to 36V, as well as several modes of operation like Standby Mode with low current consumption and overtemperature Shut-Down Mode. The overtemperature Shut-Down Mode switches OFF the K output if the L9637's temperature increases above the thermal shut down threshold. To reactivate K again the temperature must decrease below the K switch ON temperature value. To achieve no fault for power supply under-voltage conditions the outputs will be switched OFF and stay at high impedance.

ISO 9141 Click communicates with MCU using the UART interface with the default baud rate of 9600bps, and commonly used UART RX and TX pins for the data transfer. The UART input TX and output RX of K are associated with the logic voltage level from mikroBUS[™] (VCC) with its integrated pull-up resistances. Also, the L comparator output pin named LO has a pull-up resistance connected to VCC. All bus defined inputs L and K have supply voltage-dependent thresholds together with sufficient hysteresis to suppress line spikes.

This Click board[™] is easy to program because it does not require an overly demanding configuration. Only what is necessary for the errorless work is the selection of the appropriate mode of operation, whether the Click board[™] will work as a receiver or transmitter. In this way, the transmitter will send the data every 2 seconds while the receiving side will receive the data in a "byte-by-byte" format. This can also be seen in an example code that contains easy to use functions that may be used as a reference for further development.

This Click board[™] is designed to be operated with both 3.3V and 5V logic voltage levels that can be selected via VCC SEL jumper. This allows for both 3.3V and 5V capable MCUs to use the UART communication lines properly. However, the Click board[™] comes equipped with a library that contains easy to use functions and an example code that can be used as a reference for further development.

Specifications

Туре	CAN
Applications	Can be used for automotive diagnostic applications such as powertrain for ICE (CNG/LPG engine control or diesel/gasoline injection), an automotive gateway in telematics and networking, and many more.

Mikroe produces entire development toolchains tor all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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.





Time-saving embedded tools

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

On-board modules	ISO 9141 Click is based on the L9637, a monolithic bus driver designed to provide bidirectional serial communication in automotive diagnostic applications according to the specification "Diagnostic Systems ISO9141" from ST Microelectronics.
Key Features	Wide input and output voltage range, overtemperature shut down function, bidirectional K I/O pin with supply voltage dependent input threshold, Stand-by Mode with very low current consumption, and more.
Interface	UART
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on ISO 9141 Click corresponds to the pinout on the mikroBUS^m socket (the latter shown in the two middle columns).

Notes	Pin	● ● mikro™ ● ● ● BUS			TM-	Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
	NC	3	CS	RX	14	ТХ	UART TX
	NC	4	SCK	ТΧ	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	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Supply Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

ISO 9141 Click electrical specifications

Description	Min	Тур	Max	Unit
Supply Voltage	4.5	-	36	V
K output current	-	60	-	mA
Transmission frequency	-	-	50	kHz
Operating Temperature Range	-40	-	+150	°C

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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.





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

Software Support

We provide a library for the ISO 9141 Click as well as a demo application (example), developed using MIKROE <u>compilers</u>. The demo can run on all the main MIKROE <u>development boards</u>.

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

Library Description

This library contains API for ISO 9141 Click driver.

Key functions

- iso9141_generic_write This function writes a desired number of data bytes by using UART serial interface.
- iso9141_generic_read This function reads a desired number of data bytes by using UART serial interface.

Example Description

This example demonstrates the use of an ISO 9141 Click by showing the communication between the two Click boards.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our <u>LibStock^m</u> or found on <u>MIKROE github</u> <u>account</u>.

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.ISO9141

Additional notes and informations

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

mikroSDK

This Click board^{\mathbb{M}} is supported with <u>mikroSDK</u> - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board^{\mathbb{M}} demo applications, mikroSDK should be downloaded from the <u>LibStock</u> and installed for the compiler you are using.

For more information about mikroSDK, visit the <u>official page</u>. **Resources**

<u>mikroBUS</u>™

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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.





Time-saving embedded tools

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

<u>mikroSDK</u>

Click board[™] Catalog

Click boards™

Downloads

ISO 9141 click 2D and 3D files

L9637D datasheet

ISO 9141 click schematic

ISO 9141 click example on Libstock

Mikroe produces entire development toolchains for all major microcontroller architectures. Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



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.



Mouser Electronics

Authorized Distributor

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

Mikroe:

MIKROE-4331