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Single Wire CAN Click

PID: MIKROE-4225

Single Wire CAN Click is a compact add-on board that contains an IC for a single wire data link capable of operating with various protocols such as the Controller Area Network (CAN). This board features the NCV7356D1R2G, Single Wire CAN transceiver from onsemi, which operates from a supply voltage from 5V to 27V with bus speed up to 40 kbps. It supports many additional features like an under-voltage lockout, a timeout for faulty blocked input signals, output blanking time in case of bus ringing, and a very low sleep mode current. This Click board™ can be used in industrial equipment, in-vehicle, and industrial networking, and in applications where the high data rate is not required and a lower data rate can achieve cost reductions.

Single Wire CAN 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?

Single Wire CAN Click is based on the NCV7356D1R2G, a Single Wire CAN transceiver from onsemi, which operates from a supply voltage from 5V to 27V with a bus speed up to 40 kbps. It can access several modes such as Normal Mode with reduced dominant output voltage and reduced receiver input voltage, High-Speed, High Voltage Wake-Up, or Sleep Mode. The transmission bit rate in Normal communication is 33 Kbits/s, while a typical bit rate of 83 kbit/s is recommended for High-Speed communication. In Normal Transmission Mode, the Single Wire CAN Click supports controlled waveform rise and overshoot times, while the High−Speed Mode is only intended to be operational when the bus is attached to an off−board service node.

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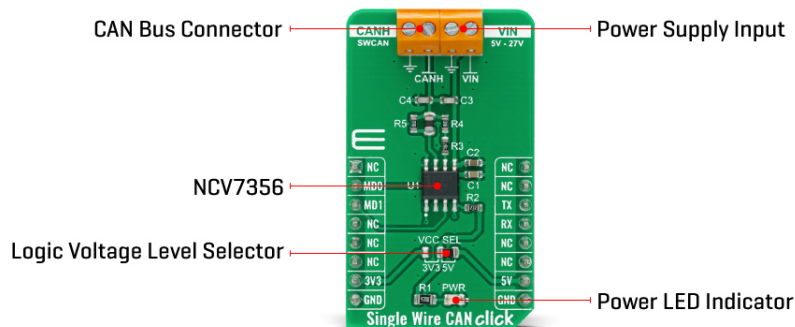Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

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.

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

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CAN Bus Connector — Power Supply Input

NCV7356

Logic Voltage Level Selector

Power LED Indicator

Single Wire CAN click

The Single Wire CAN bus pin CANH is composed of a pull−up amplifier for driving this Click board™. The minimum output driver capability is 50 mA, but output shorts to the ground can reach 350mA. Normal CANH output voltage is between 4.4 V and 5.1 V. These amplitudes increase to between 9.9 V and 12.5 V for system selection in Wake−Up Mode. The bus Wake−Up from Sleep Input Voltage Threshold is between 6.6 V and 7.9 V, but to maintain normal communication, the threshold is 2.1 V. The CANH pin can also act as a bus read amplifier.

The NCV7356D1R2G communicates with MCU using the UART interface at 9600 bps with commonly used UART RX and TX pins. It possesses additional functionality such as Operational Mode Selection MODE 0 and MODE 1 routed at RST and CS pins of the mikroBUS™, on whose selected logical states one of the four possible operational modes can be selected. The transceiver provides a weak internal pulldown current on each of these pins which causes the transceiver on default to enters to sleep mode when they are not driven. Single Wire CAN Click can also re-enter the Sleep Mode if there is no mode change within typically 250 ms.

This Click board™ communicates with MCU using the UART interface for the data transfer. The onboard SMD jumper labeled as VCC SEL allows logic level voltage selection for interfacing with both 3.3V and 5V MCUs. More information about the NCV7356D1R2G's functionality, electrical specifications, and typical performance can be found in the attached datasheet. However, the Click board™ comes equipped with a library that contains easy to use functions and a usage example that may be used as a reference for the development.

Specifications

Type	CAN
Applications	Can be used in industrial equipment, and applications such as in-vehicle and industrial networking.
On-board modules	Single Wire CAN Click is based on the NCV7356D1R2G, a Single Wire CAN transceiver from onsemi, which operates from a supply voltage from 5V to 27V with a bus speed up to 40 kbps.
Key Features	Low power consumption, fully integrated receiver filter, loss of ground protection,

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	undervoltage lockout, and more.
Interface	GPIO,UART
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

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

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
Mode Select 0	**MD0**	2	RST	INT	15	NC	
Mode Select 1	**MD1**	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	**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	Right	Power Supply Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Single Wire CAN Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	5	-	27	V
CANH Voltage	-20	-	+40	V
Maximum Sleep Mode Current	-	-	60	µA
Operating Temperature Range	-40	-	+125	°C

Software Support

We provide a library for the Single Wire CAN Click on our LibStock page, as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Library Description

The library covers all the necessary functions to control Single Wire CAN click board. Library

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performs a standard UART interface communication.

Key functions:

- void singlewirecan_set_operating_mode (uint8_t op_mode) - Set operating mode function.
- void singlewirecan_write_data (uint8_t *tx_data) - Write multi bytes function.

Examples description

The application is composed of three sections :

- System Initialization - Initializes UART, sets CS and RST pins as output.
- Application Initialization - Initialization driver enables - UART, performs an operating mode, also write log.
- Application Task - (code snippet) This is an example that demonstrates the use of the Single Wire CAN click board. This application task writes message data via UART every 3 seconds. Results are being sent to the Usart Terminal where you can track their changes.

The full application code, and ready to use projects can be found on our LibStock page.

Other mikroE Libraries used in the example:

- UART

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. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

mikroSDK

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

Single Wire CAN click 2D and 3D files

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[NCV7356 datasheet](#)

[Single Wire CAN click example on Libstock](#)

[Single Wire CAN click schematic](#)

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