

ATA663254 click

PID: MIKROE-2872

Weight:

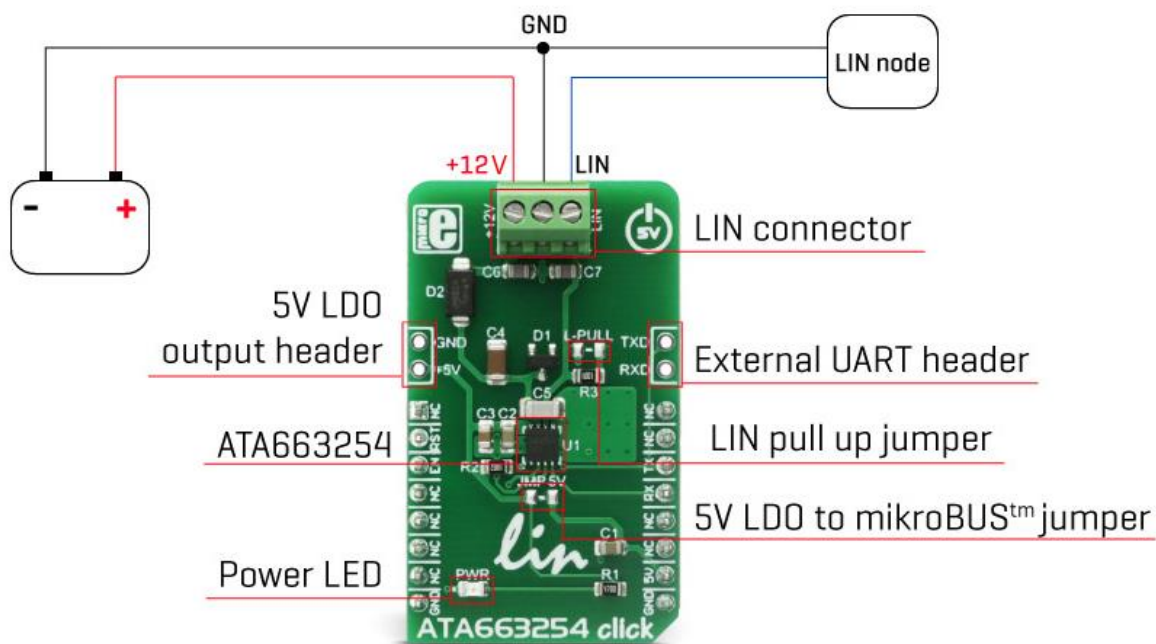
ATA663254 click is a fully integrated LIN transceiver device with an integrated 5V LDO voltage regulator. The combination of voltage regulator and bus transceiver makes it possible to develop simple but powerful slave nodes in LIN bus systems. The integrated LDO can be used to provide power to the host MCU so that no additional voltage regulators are required, only the power supply connected to the LIN connector is needed. ATA663254 click features the undervoltage protection, short-circuit protection, TXD time-out timer and its LIN physical layer complies with LIN 2.0, 2.1, 2.2, 2.2A and SAEJ2602-2 standard specifications.

These features make ATA663254 click a perfect solution for realizing small and portable LIN based networks that are commonly used in automotive applications for communicating with the vehicle sensor peripherals, but also for any application where robust and interference-free communication up to 20Kbps is needed.

How does it work?

LIN (Local Interconnect Network) is a serial network protocol used for communication between components in vehicles. LIN networks are cheaper than CAN networks and since the LIN network can have up to 15 slave nodes, it is often used as a subnetwork of CAN.

ATA663254 click uses the ATA663254 integrated LIN bus transceiver with the 5V voltage regulator from Microchip. The ATA663254 communicates with the MCU by using the UART RX and TX signals. Besides for communication, these pins also serve to signal the failsafe condition. The failsafe condition can be caused by the undervoltage on the LIN connector: less than 3.9V will cause the undervoltage condition, signaled by the LOW logic state on RX pin and HIGH logic state on the TX pin. A wake-up event from either silent or sleep mode is signaled by the LOW logic state on both of the RX and TX pins. This event is being received via the LIN bus and it is used to switch the ATA663254 click to an active state. RX and TX signals are also routed to the header on the edge of the click board™ so they can be used independently of the mikroBUSTM socket.



The NRES pin of the ATA663254 IC is routed to the RST pin on the mikroBUSTM. RST pin is used to signal the undervoltage condition on the LDO regulator section. When the LDO voltage falls under the predefined threshold, the RST pin will be set to a LOW logic state, signaling this condition to the MCU. The LDO output is routed to a header located on the edge of the click so that the LDO can be used independently of the mikroBUSTM socket. Also, there is an SMD jumper that can be shorted if powering up the MCU via the mikroBUSTM 5V pin is required, on a custom board design. Note that the MikroElektronika development systems are not meant to be powered up by the mikroBUSTM power supply pins, so the ATA663254 click comes without the SMD jumper, by default.

The EN pin is used to enable the functionality of the device. When the EN pin is set to a HIGH logic level, the device is set to work in the normal mode, with the transmission paths from TXD to LIN and from LIN to RXD both active. When the EN pin is set to a LOW state, the device is put into silent mode, depending on the TX pin state. The EN pin has a pull-down resistor, so it is pulled to Ground if it is left afloat.


Besides the 5V LDO output header and the external UART header, the click is equipped with the three pole connector for an easy and secure connection to the LIN network and the 12V battery power supply.

Specifications

Type	LIN
Applications	It can be used for small and portable LIN based networks, that are commonly used in automotive applications, but also for any application where robust and interference-free communication up to 20Kbps is needed.
On-board modules	ATA663254 integrated LIN bus transceiver with the 5V voltage regulator from Microchip
Key Features	Complete integrated LIN solution, with a 5V LDO that can be used for powering up other LIN nodes in the network, as well as the MCU. The onboard connector provides a secure and easy connection to the LIN network.
Interface	GPIO,UART
Input Voltage	5V
Click board size	M (42.9 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **ATA663254 click** corresponds to the pinout on the mikroBUSTM socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset	RST	2	RST	INT	15	NC	
Enable	EN	3	CS	RX	14	TX	Transmit
	NC	4	SCK	TX	13	RX	Receive
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
	NC	7	3.3V	5V	10	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

ATA663254 click electrical specifications

Description	Min	Typ	Max	Unit
LIN operating voltage range	5	13.5	28	V
Integrated LDO output current		85		mA
Integrated LDO output voltage	4.9		5.1	V

Additional pins

Name	I/O	Description
+5V	O	+5V Supply Output
GND	/	Power Ground
RXD	I/O	External UART RX Pad
TXD	I/O	External UART TX Pad

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED indicator
JMPR1	JMP 5V	Unpopulated	Connects +5V output to mikroBUS™ socket
JMPR2	L-PULL	Unpopulated	External LIN pull up resistor

Note: The JMP 5V SMD jumper should not be populated if used with MikroElektronika development systems. It is reserved for powering up the custom-made systems via the 5V connector

Software support

We provide a library for ATA663254 click on our LibStock page, as well as a demo application (example), developed using MikroElektronika compilers and mikroSDK. The provided click library is mikroSDK standard compliant. The demo application can run on all the main MikroElektronika development boards.

Library Description

Defines and initializes driver's UART bus. Declares and defines driver's functions for sending and receiving data bytes, also for checking if the data byte is ready for reading.

`void ata663254_enable(uint8_t state);` - Function enables and disables click

`void ata663254_writeByte(uint8_t input);` - Function writes (sends) one byte in the RX buffer

`uint8_t ata663254_readByte();` - Function reads (receives) one byte from the RX buffer

`uint8_t ata663254_ready();` - Function checks if new data placed in the RX buffer

`uint8_t ata663254_getRstState();` - Function checks RST pin if undervoltage detection happens

Examples Description

- System Initialization - Initializes peripherals and pins
- Application Initialization - Initializes click driver
- The receiver part of the task logs each received byte to the UART bus, used for data logging. Transmitter part of the task sends a message every two seconds.

```
void applicationTask()
{
    // RECEIVER
    #ifdef __RX__
        if(ata663254_ready())
        {
            tmp = ata663254_readByte();
            mikrobus_logWrite(&tmp, _LOG_BYTE);
        }
    #endif

    // TRANSMITTER
    #ifdef __TX__
        uint8_t cnt;
        for (cnt = 0; cnt < 9; cnt++)
        {
            ata663254_writeByte(MESSAGE_DATA[cnt]);
        }
        Delay_ms(2000);
    #endif
}
```

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

Additional notes and information

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.

Downloads

mikroBUS™ Standard specification

LibStock: mikroSDK

ATA663254 click schematic

ATA663254 datasheet

LibStock: ATA663254 click library

ATA663254 click - 2D and 3D files

