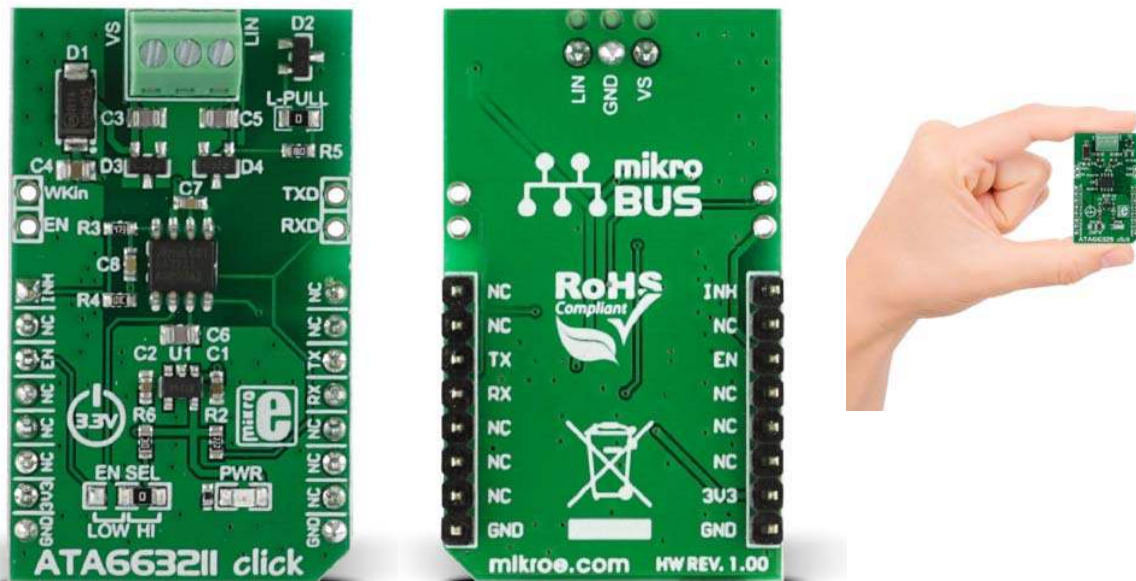# ATA663211 click

PID: MIKROE-2335

Weight: 35 g

ATA663211 click carries an Atmel LIN transceiver IC designed to handle low-speed data communication in vehicles and in industrial applications with electrically harsh environments. The LIN connection is established by attaching wires to the onboard screw terminals.

The click communicates with the target MCU through the UART interface and runs on a 3.3V power supply.

ATA663211 click can aslo be used as a standalone LIN transceiver, without being connected to a mikroBUS™ socket. An onboard LDO (low-dropout regulator) enables it to get its power supply through the VS line screw terminal.

LIN transceiver

LIN or Local Interconnect Network is a protocol used for communicating between components in vehicles. These days cars have hundreds of sensor applications to measure things like temperature, pressure, air flow, speed, etc. All these applications need to communicate with the main system.

The LIN bus was created by European car manufactures in order to establish a new, uniform communication standard. It can be used with CAN (Controller Area Network), but LIN is more cost-effective for simple sensor networks in vehicles.

For more information see our Learn article on the LIN network protocol.

Low current consumption

The IC has three very low power modes: normal, sleep and fail-safe. In sleep mode the current consumption is typically 9µA – this is the lowest current consumption mode. It automatically switches to fail-safe mode at system power-up or after a wake-up event. In fail-safe mode it typically uses 80µA.

Applications

Automotive industry and other electrically harsh environments.

Key features

- Atmel ATA663211 IC
    - Compliant with LIN 2.0, 2.1, 2.2, 2.2A and SAEJ2602-2
    - Data communication up to 20Kbaud
    - Power consumption 9µA in sleep mode
    - Bus pin is over-temperature and short-circuit protected
    - Interference and damage protection according to ISO7637
- Can be used as a standalone device
- Screw terminals for LIN connection
- LDO for regulating external power supply
- 3.3V power supply

Type	LIN
Applications	Automotive industry and other electrically harsh environments
On-board modules	Atmel LIN transceiver IC
Key Features	Data communication up to 20Kbaud, Power consumption 9µA in sleep mode, Bus pin is over-temperature and short-circuit protected
Key Benefits	Can be used as a standalone device, LDO for regulating external power supply
Interface	UART
Power Supply	3.3V
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)

What does a LIN transceiver do

LIN or Local Interconnect Network is a protocol used for communication between components in vehicles. The car industry has changed profoundly during this century. Cars have hundreds of sensor applications to measure things like temperature, pressure, air flow, speed, etc. All these applications need to communicate with the main system. The LIN bus was created by European car manufactures in order to establish a new, uniform communication standard. It can be used with CAN (Controller Area Network), but LIN is more cost-effective for simple sensor networks in vehicles.

But what is the difference between LIN and CAN network protocols? CAN is an a really complex interface, and with so many electronic components in a car the manufactures needed a cheaper alternative. The LIN interface is simpler than CAN — LIN uses a single wire communication and the slave nodes are clocked by only one master. CAN interface has nodes that can act independently, receive messages and act. It can have more than one master on the CAN bus. A LIN network is usually made of up to 16 nodes - one master and 15 slaves. This serial communications protocol is also well suited for other industrial applications with electrically harsh environments.

Screw terminals

The click has three screw terminals: VS line for the power supply (up to 40V), GND for ground and LIN line for connecting to the other transceiver LIN line.

Maximum Ratings

This table shows how the pinout on **Grid-EYE click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Description	Min	Typ	Max	Unit
Supply voltage VS	-0.3	/	+40	V
Logic pins voltage levels (RxD, TxD, EN,NRES)	-0.3	/	+5.5	V
Logic output DC currents	-5	/	+5	mA
LIN - DC voltage - Pulse time < 500ms	-27	/	+40 +43.5	V V
INH -DC voltage	-0.3	/	Vs+0.3	V
WKin voltage levels - DC voltage -Transient voltage according to ISO7637 (coupling 1nF), (with 2.7K serial resistor)	-0.3 -150	/	+40 +100	V
ESD according to IBEE LIN EMC Test specification 1.0 following IEC 61000-4-2 - Pin VS, LIN to GND, WKin (with ext. circuitry acc. applications diagram)	+-6			kV
ESD HBM following STM5.1 with 1.5kW/100pF - Pin VS, LIN, INH to GND - Pin WKin to GND	+-6 +-5			kV
HBM ESD ANSI/ESD-STM5.1 JESD22-A114 AEC-Q100 (002)	+-3			kV

CDM ESD STM 5.3.1	+-750			V
Machine Model ESD AEC-Q100-RevF(003)	+-200			V
Junction temperature			+150	C
Storage temperature	-55		+150	C

Pinout diagram

This table shows how the pinout on ATA663211 click corresponds to the pinout on the mikroBUS™ socket.

Notes	Pin	mikroBUS™		Pin	Notes
controls an external voltage regulator	**INH**	1	AN	PWM	16	NC	Not connected
Not connected	NC	2	RST	INT	15	NC	Not connected
controls the operating mode of the device	**EN**	3	CS	TX	14	**RX**	UART Transmit
Not connected	NC	4	SCK	RX	13	**TX**	UART Receive
Not connected	NC	5	MISO	SCL	12	NC	Not connected
Not connected	NC	6	MOSI	SDA	11	NC	Not connected

+3.3V power input	**+3.3V**	7	3.3V	5V	**10**	NC	Not connected
Ground	**GND**	8	GND	GND	**9**	**GND**	Ground

Additional pins and jumpers

In addition to mikroBUS the click has four additional pins:

- WKIN — high-input voltage pin used to wake up the device from sleep mode.
- EN — controls the operating mode of the device.
- TXD and RXD — additional UART transmit and receive lines.

EN SEL jumper enables pin selection mode (by default it is always on, good for standalone purposes) otherwise can be LOW - then it is connected to EN pin on the mikroBUS.

Programming

Maximum baud rate which achieved with 2 meter long cable is 19200 bps. Supported compilers C : ARM AVR FT90x PIC PIC32 The following code snippet shows a simple routine which prints received data on a terminal. Any time a click board receives 8 bytes of data it will print received data on another UART. In this case UART3 is used for ATA663211 and UART1 is used to log data.

```
1  void main()
2  {
3      system_init();
4
5      while( 1 ) {
6
7          if( Button( &GPIOA_IDR , 5, 100, 1 ) ){
8              ata663211_send( TX_DATA, sizeof( TX_DATA ) );
9              UART1_Write_Text( "Data Sent" );
10         }
11
12         if( ( chk = ata6563_rdy() ) == 8 ){
13             ata663211_read( buf, chk );
14             UART1_Write_Text( buf );
15         }
16     }
17 }
```