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GPS 4 click

PID: MIKROE-2704

GPS 4 click carries the L70 compact GPS module from Quectel. The click is designed to run on either 3.3V or 5V power supply. It communicates with the target microcontroller over UART interface, with additional functionality provided by the following pins on the mikroBUS™ line: PWM, AN, RST.

L70 module features

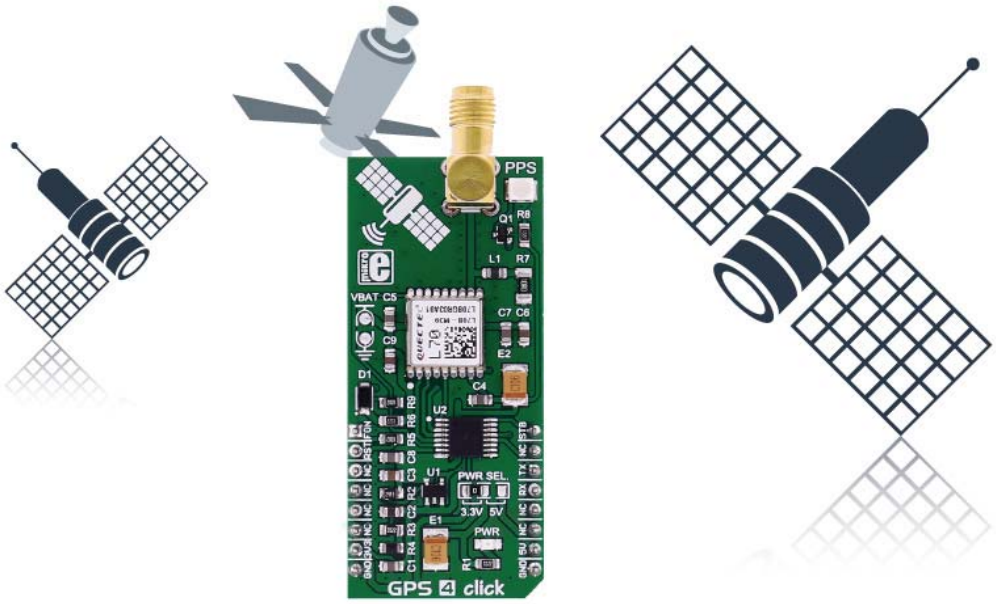
L70, an SMD type module, brings the high performance of MTK positioning engine to the industrial applications with a compact profile, ultra low power consumption and fast positioning capability.

Combining advanced AGPS called EASY™ (Embedded Assist System) and proven AlwaysLocate™ technology, L70 achieves the highest performance and fully meets the industrial standard. EASY™ technology ensures L70 can calculate and predict orbits automatically using the ephemeris data (up to 3 days) stored in internal RAM memory, so L70 can fix position quickly even at indoor signal levels with low power consumption.

With **AlwaysLocate™ technology**, L70 can adaptively adjust the on/off time to achieve a balance between positioning accuracy and power consumption according to the environmental and motion conditions.

How it works

A constellation of satellites sends a continuous signal towards Earth. Onboard every satellite is an atomic clock, and all of them are synchronized, thanks to a reference time scale defined by the whole system. So, that the signals coming from the different satellites of the same constellation share the same reference time scale.



The user wanting to use GPS to determine its position must have an antenna that receives the signals coming from the satellites, and a receiver that translates these signals. The antenna position will be deduced from the measurements of the time delay between the emission time (satellite) and the reception time (receiver) for at least 4 signals coming from different satellites.

Specifications

Type	GPS
Applications	Navigation devices based on GPS
On-board modules	Quectel's L70
Key Features	Ultra low power consumption in tracking mode, 12mA, High sensitivity, -165dBm@Tracking, -148dBm@Acquisition
Key Benefits	AlwaysLocate™, an intelligent controller of periodic mode
Interface	UART
Input Voltage	3.3V or 5V
Click board size	L (57.15 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **GPS 4 click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin			mikroBUS		Pin	Notes
Module Force ON	**FORCE ON**	1	AN	PWM	16	**STANDBY**	Module Standby
Module Reset	**RST**	2	RST	INT	15	NC	
	NC	3	CS	TX	14	**TX**	Module Transmit line
	NC	4	SCK	RX	13	**RX**	Module Receive line
	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

Jumpers and settings

Designator	Name	Default Position	Default Option	Description
JP1	VCC-BCKP	ON	VCC	BCKP Battery connection; unsolder when battery is connected
JP2	VCCIO		3V3	Level selector

Buttons and LEDs

Designator	Name	Type	Description
LD1	PWR	LED	Power Indication LED
LD2	PPS	LED	GPS tracking indicator

Programming

Code examples for GPS 4 click, written for MikroElektronika hardware and compilers are available on Libstock.

Code snippet

The following code snippet shows the function that feeds the data into a buffer until the sentence is ready for parsing, and sets the appropriate flag when such event occurs.

```
01 void gnss_put( char input )
02 {
03     static bool sentence_flag;
04
05     if( ( input != 'r' && input != 'n' ) && buffer_position < BUFFER_MAX )
06     {
07         buffer[ buffer_position++ ] = input;
08     }
09     else if( input == 'r' )
10     {
11         sentence_flag = true;
12     }
13     else if( input == 'n' && sentence_flag )
14     {
15         buffer[ buffer_position ] = '';
```

```
16          buffer_position = 0;
17          strcpypvt( process_buffer, buffer );
18          sentence_flag = false;
19          process_flag = true;
20      }
21      else
22      {
23          buffer_position = 0;
24      }
25  }
```