

THINGSTREAM CLICK

PID: MIKROE-3739

Weight: 28 g

Thingstream Click is an IoT gateway Click board™ with the Thingstream client SDK preinstalled. This enables the device to connect to the Thingstream global MQTT network and connectivity tools straight out of the box. Global connectivity is achieved by connecting to the strongest GSM network available across over 600 networks worldwide. This Click board™ makes it easy to bring Thingstream connectivity to embedded computers and MCUs by simply utilising the UART interface; this can be configured and managed using a minimal set of well-documented AT commands.

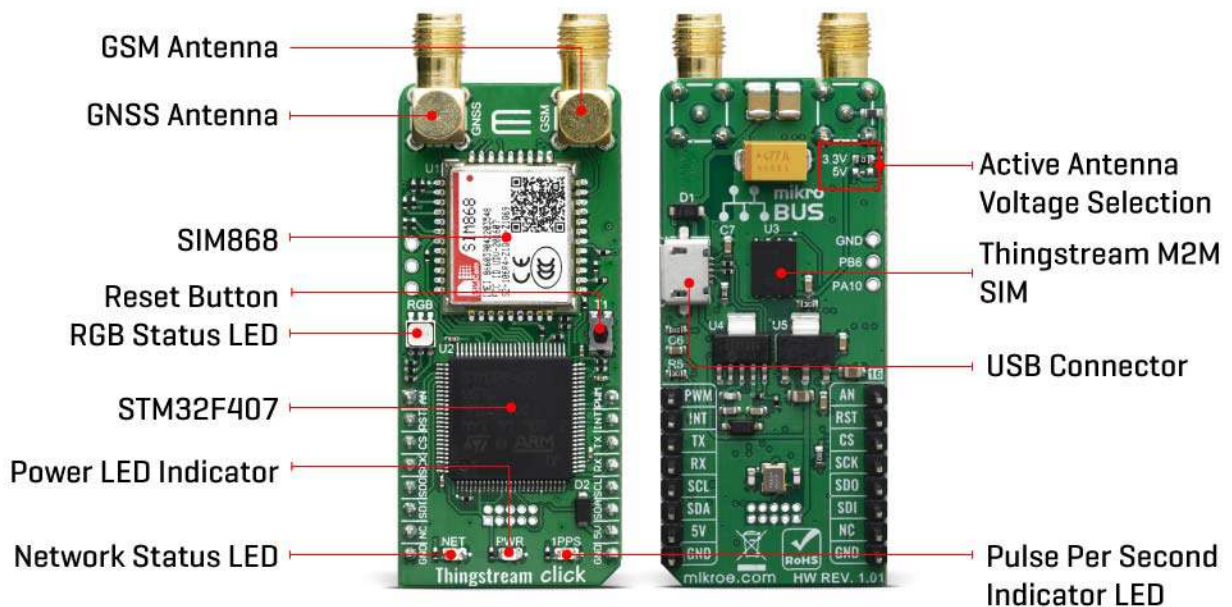
Thingstream Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

Thingstream Click enables low-cost, low-power IoT connectivity and simple software integration with the Thingstream MQTT broker and cloud-based data management platform. It is designed to be connected to existing production or prototype baseboards with a mikroBUS socket. In addition, This Click board™ also comes with a start-up package comprising free Thingstream account activation, an embedded Thingstream SIM and three months of free global cellular connectivity. The device is activated by a redemption unique to the embedded SIM.

Each Thingstream click board comes with three months of full access to the Thingstream global MQTT network and connectivity software tools and Data Flow Manager with up to 500 MQTT messages per month from the moment of activation.

HOW DOES IT WORK?

The Thingstream Click is equipped with the SIM868, an 802.11b/g/n quad-band GPS/GLONASS/GSM location tracking and mobile communication module from SIMCom. This allows the device to connect to the Thingstream global MQTT network over GSM. Thingstream Click enables rapid development of intelligent IoT applications and simplified connectivity with cloud platforms using just a small set of AT commands and a flow-chart style application builder (Data Flow Manager), removing the complexities of web, hardware, and communications related development. This Click board™ is preconfigured with all of the necessary protocols and communications settings to connect with the Thingstream global MQTT network and Data Flow Manager. This is implemented via the Thingstream client SDK which can be used for development of the firmware located on the onboard STM32F407 MCU. Results can be achieved quickly without a deep understanding of software engineering and web programming.



To find out more about AT commands and how to Click board™ see the following guides:

- AT Command Set manual
- Quick User Guide

Thingstream Click is equipped with various LED indicators. Separate LEDs are used to indicate the presence of a power supply, the network status and pulse per second indication (1PPS).

This Click board™ also contains a universal RGB LED for other feedback relating to the status of the Thingstream Click. This Click board™ requires both 3.3V and 5V power rails for proper operation.

Besides the onboard USB connector, all of the mikroBUS™ pins on this Click board™, are routed to the appropriate pins of the onboard STM32F407 MCU. That way, it is ensured that users will have plenty of space for future upgrades and development. This enables a very broad range of custom applications including support for I2C and SPI communication interfaces.

All available interfaces can be made available to the mikroBUS header. By default, the board only supports UART communication using AT commands. Other interfaces like SPI, I2C, PWM and Analog can be supported by firmware updates. If you require this functionality, please contact the Thingstream team.

This Click board™ uses 3.3V logic level only. To be able to use it with MCUs that use 5V logic level on their communication lines, a proper level-translation circuit should be used.

THINGSTREAM CONNECTIVITY PLATFORM

The Thingstream connectivity platform provides out-of-the-box, global IoT connectivity. As the only provider of truly global, low-power IoT connectivity, Thingstream's platform enables devices to simply connect to the strongest GSM network available, almost anywhere in the world and communicate using MQTT Messaging. Thingstream provides coverage for over 190 countries, across 600+ networks worldwide, providing access to the single largest IoT network of its kind.

Thingstream's connectivity platform enables two-way intelligent communication between device and IoT application and with proven scalability, the platform is ideal for delivering mass IoT deployments. It doesn't use TCP-IP and therefore, with no IP (Internet) dependency, things are inherently more secure and connectivity is delivered via a proven high availability, high performance global messaging platform.

Find out more about the Thingstream global MQTT network.

SPECIFICATIONS

Type	GPS/GNSS,Cloud Routers
Applications	A global connectivity solution for easy development of powerful MQTT-based intelligent IoT applications
On-board modules	SIM868, 802.11b/g/n quad-band GPS/GLONASS/GSM location tracking and mobile communication module STM32F407VGT6 – ARM® Cortex®-M4 based Microcontroller from STMicroelectronics
Key Features	Enables easy and fast connectivity between device and cloud applications, low power mode, simple serial interface for communication, GSM connection with coverage for over 190 countries, across 600+ networks worldwide
Interface	GPIO,UART,SPI,I2C
Click board size	L (57.15 x 25.4 mm)
Input Voltage	5V

PINOUT DIAGRAM

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

Notes	Pin					Pin	Notes
Analog Enabled GPIO	AN	1	AN	PWM	16	PWM	PWM Enabled GPIO

Reset	RST	2	RST	INT	15	INT	Interrupt Enabled GPIO
SPI Chip Enable	CS	3	CS	RX	14	TX	UART Transmit
Serial Clock	SC	4	SCK	TX	13	RX	UART Receive
Serial Data Out	SDO	5	MISO	SCL	12	SCL	I2C Clock
Serial Data In	SDI	6	MOSI	SDA	11	SDA	I2C Data
	NC	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
LD2	NET	-	Network status LED Indicator
LD3	1PPS	-	Pulse per second LED Indicator
LD4	RGB	-	Universal RGB Indicator
J1, J2	-	3.3V	Active antenna power supply voltage selection

SOFTWARE SUPPORT

We provide a library for the Thingstream 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

Library provides functions for powering up device, sending commands and controlling device, and function for parsing data read from GPS module.

Key functions:

- `void thingstream_cmd_single (char *p_cmd)` - Function for sending commands to device
- `char *thingstream_gps_parser (char *data_in, char *cmd, uint8_t data_pos)` - Function for parsing GPS data
- `void thingstream_module_power (uint8_t power_state)` - Function for powering up module

Examples description

The application is composed of three sections :

- System Initialization - Initializes necessary GPIO pin, UART used for the communication with GSM module and UART used for information logging
- Application Initialization - Initializes driver, power on module and sends few command for the default module configuration
- Application Task - Waits till GPS module turns on then reads data from buffer parses it and logs it.

```
void application_task ( )
{
    char *p_data;
    char rsp_com[ 50 ] = {0};

    if ( gps_rsp_ready == 0 )
    {
        mikrobus_logWrite( " - Waiting to GPS to start... ", _LOG_LINE );

        thingstream_cmd_single( &THINGSTREAM_GPS_INFO[ 0 ] );
        p_data = thingstream_gps_parser( &demo_buf[ 0 ], &demo_cmd[ 0 ], 1 );
        strcpy( &rsp_com[ 0 ], p_data );

        while ( rsp_com[ 0 ] != '1' )
```

```

    {
        thingstream_cmd_single( &THINGSTREAM_GPS_INFO[ 0 ] );
        p_data = thingstream_gps_parser( &demo_buf[ 0 ], &demo_cmd[ 0 ], 1 );
        strcpy( &rsp_com[ 0 ], p_data );

        Delay_ms( 1000 );
    }
    mikrobus_logWrite( " - GPS - ", _LOG_LINE );
    gps_rsp_ready = 1;
    int_flag = 0;
}
else
{
    thingstream_cmd_single( &THINGSTREAM_GPS_INFO[ 0 ] );
    while ( int_flag != 1 );
    int_flag = 0;
}

mikrobus_logWrite( " ----- ", _LOG_LINE);
p_data = thingstream_gps_parser( &demo_buf[ 0 ], &demo_cmd[ 0 ], 3 );
if ( p_data == 0 )
{
    mikrobus_logWrite( " Latitude : No data available!", _LOG_LINE);
}
else
{
    strcpy( &rsp_com[ 0 ], p_data );
    mikrobus_logWrite( " Latitude : ", _LOG_TEXT );
    mikrobus_logWrite( rsp_com, _LOG_LINE );
}

Delay_ms( 500 );

p_data = thingstream_gps_parser( &demo_buf[ 0 ], &demo_cmd[ 0 ], 4 );
if ( p_data == 0 )
{
    mikrobus_logWrite( " Longitude : No data available!", _LOG_LINE);
}

```

```

}
else
{
    strcpy( &rsp_com[ 0 ], p_data );
    mikrobus_logWrite( " Longitude : ", _LOG_TEXT );
    mikrobus_logWrite( rsp_com, _LOG_LINE );
}

Delay_ms( 500 );

p_data = thingstream_gps_parser( &demo_buf[ 0 ], &demo_cmd[ 0 ], 5 );
if ( p_data == 0 )
{
    mikrobus_logWrite( " Altitude : No data available!", _LOG_LINE);
}
else
{
    strcpy( &rsp_com[ 0 ], p_data );
    mikrobus_logWrite( " Altitude : ", _LOG_TEXT );
    mikrobus_logWrite( rsp_com, _LOG_LINE );
}
mikrobus_logWrite( " ----- ", _LOG_LINE);
mikrobus_logWrite( " ", _LOG_LINE);

Delay_ms( 5000 );
}

```

Additional Functions :

All additional functions such as timer initialization and default handler.

The full application code, and ready to use projects can be found on our [LibStock](#) page.
Other mikroE Libraries used in the example:

- UART
- Conversions
- C_String

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.

