	GETTING STARTED with HT32SX		an_usgs
	User Manual	18/11/2019	V 1.0

# GETTING STARTED with HT32SX



## 1 INTRODUCTION

The HT32SX is a System-in-Package device build for the Internet of Things providing a **ready-to-use** connectivity solution. It means that you'll have strong reduction in your BOM cost, aiming a fast integration, simple design and **time-to-market** advantages. It provides both uplink (transmit) and downlink (receive) network communications. As a SigFox™ Monarch enabled device, it allows globetrotter devices to seamlessly roam across the planet taking advantage of the global SigFox™ network coverage without need of reconfiguration, this setup is done automatically.

The system provides an ARM Cortex M0+ 32bit, the STM S2-LP low power transceiver and an RF Front-End module combining all the advantages, integration, energy efficiency and convenience of advanced semiconductor packaging technology into a single chip with a 50Ω RF TX/RX interface.


### 1.1 About this document

The purpose of this document is to guide the user and explain how to access the SigFox™ network using the HT32SX. You can find all the technical documents and firmware examples in HT Micron's GitHub website (<https://github.com/htmicron/ht32sx>). In this user manual we'll use the hardware setup based on HT32SX evaluation board (HT32SX\_DK) and the first application that send a message to the

### 1.2 Requirements

To follow this manual, you'll need:

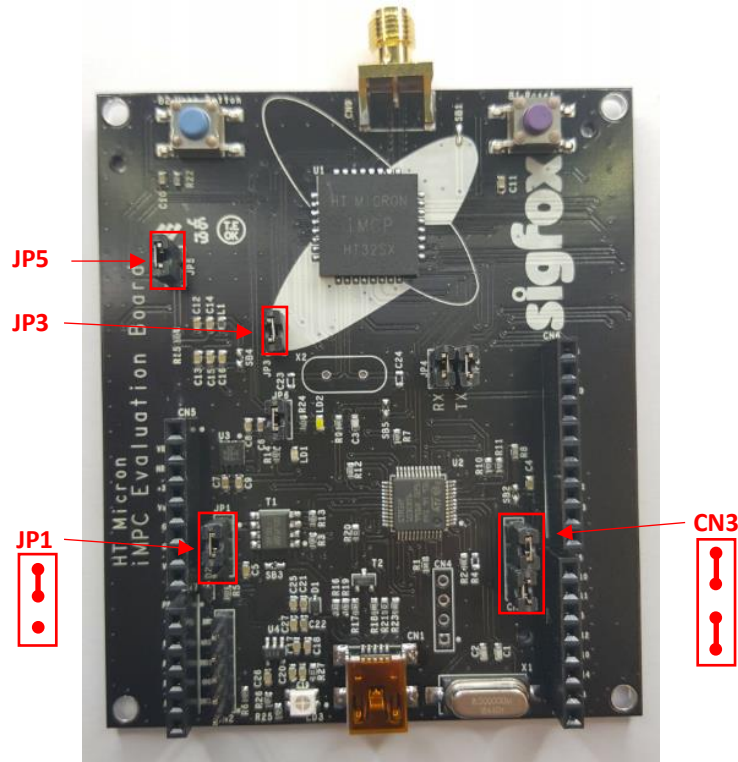
- Windows OS® (7, 8 and 10), Linux 64-bit, or macOS®
- USB cable: Type-A to Mini-B
- HT32SX\_DK board
- 915MHz antenna

	<b>GETTING STARTED with HT32SX</b>		an_usgs
	User Manual	18/11/2019	V 1.0

## 2 HARDWARE SETUP

Before start to use your HT32SX Evaluation Board with the application example, check the following:

- JP1 must be connected between pins 1 and 2 to use the USB power source
- JP3 and JP5 connected
- CN3 pins (1-2) and (3-4) connected




For more detailed description of this board setup and configuration, please visit <https://github.com/htmicron/ht32sx>.

## 3 SOFTWARE SETUP

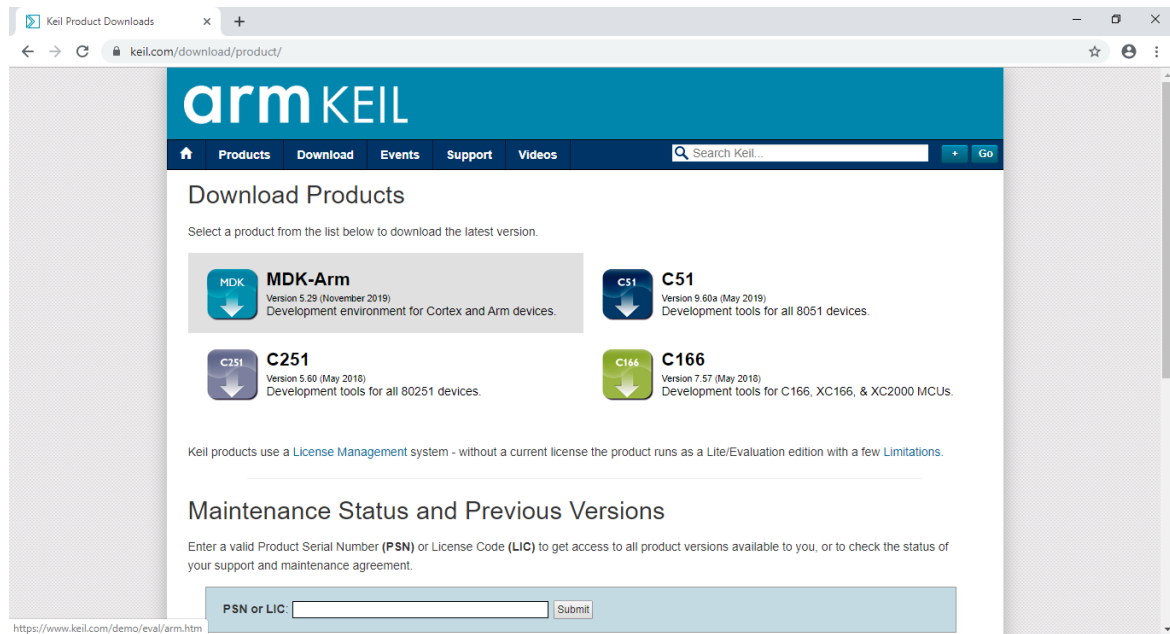
This section describes the necessary software to develop for the **iMCP – HT32SX**. Also, it details some specific situation with the default IDE (Arm KEIL).

Also, these programs are recommended:

- GIT (for Windows, [git-scm.com](https://git-scm.com) is recommended)
- STM32 ST-LINK ([www.st.com/en/development-tools/stsw-link004.html](http://www.st.com/en/development-tools/stsw-link004.html))
- ARM KEIL MDK (<https://www.keil.com/download/product/>),  
FREE license on: <http://www2.keil.com/stmicroelectronics-stm32>


	<b>GETTING STARTED with HT32SX</b>		an_usgs
	User Manual	18/11/2019	V 1.0

Install the ARM Keil from the above link, or from [keil.com/download/product/](http://keil.com/download/product/):

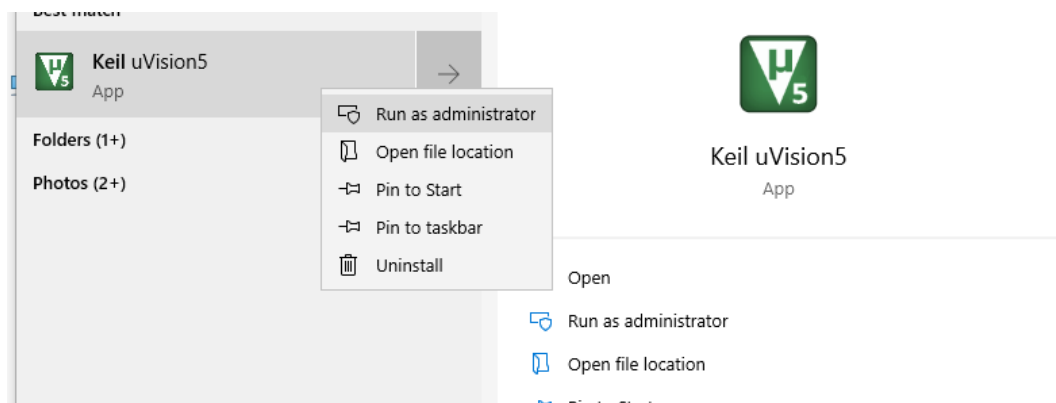


Access [www2.keil.com/stmicroelectronics-stm32/mdk](http://www2.keil.com/stmicroelectronics-stm32/mdk) to get the serial number to use in the next steps. Copy it.

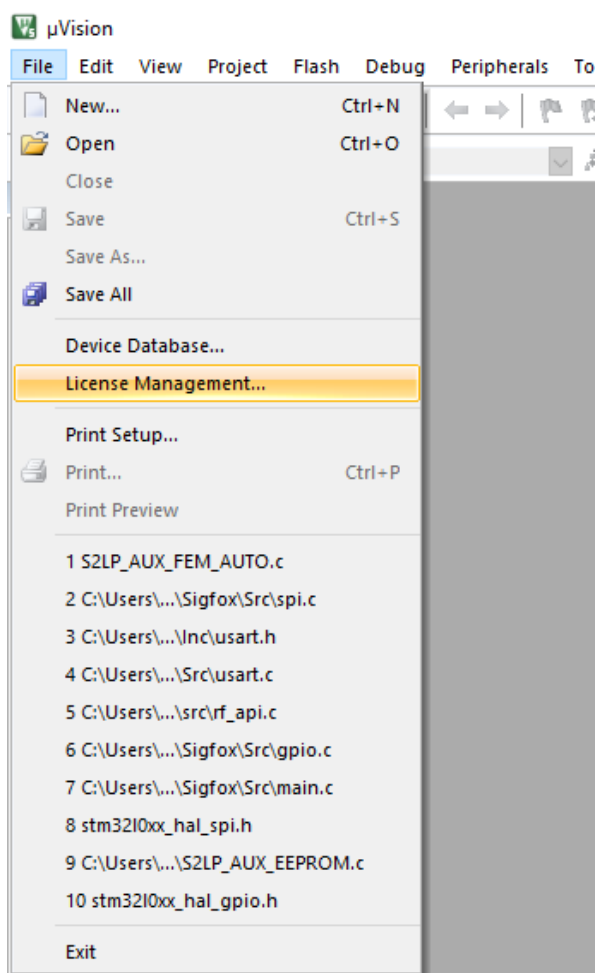


	<b>GETTING STARTED with HT32SX</b>		an_usgs
	User Manual	18/11/2019	V 1.0


Open Keil as administrator.



Open the File > License Manager.



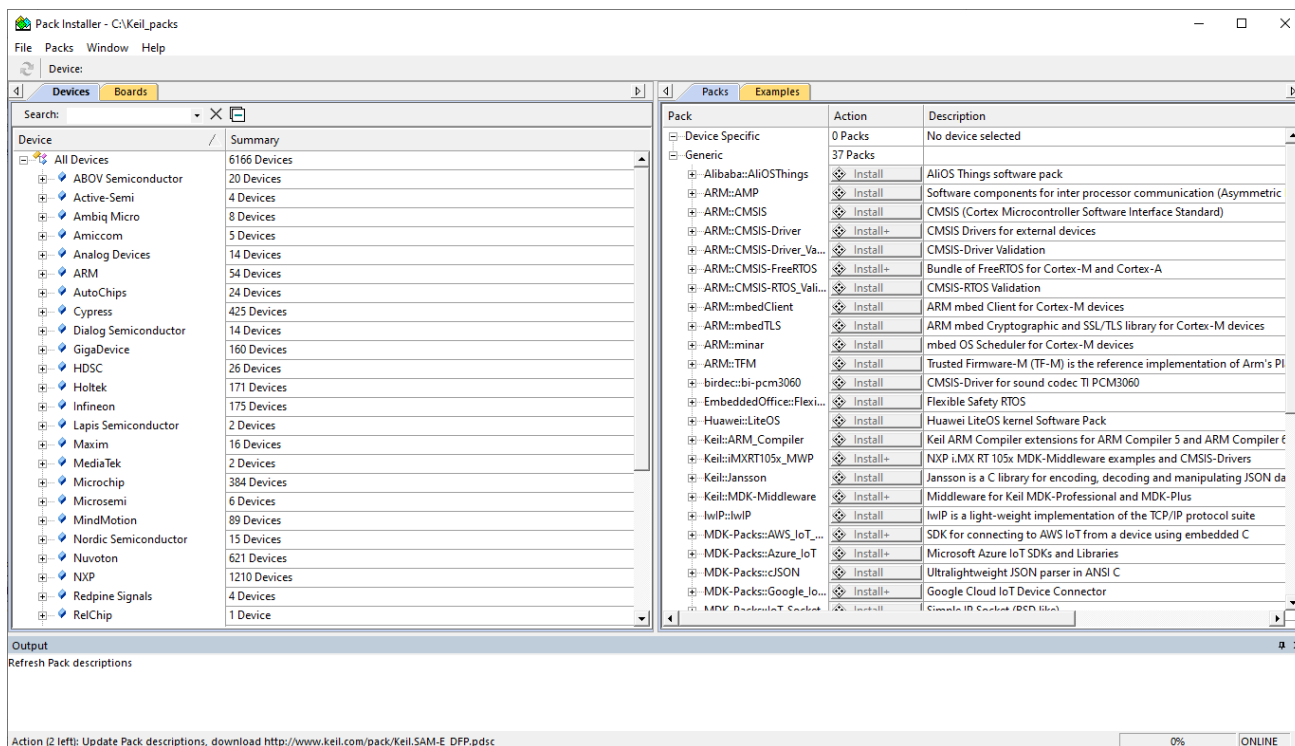
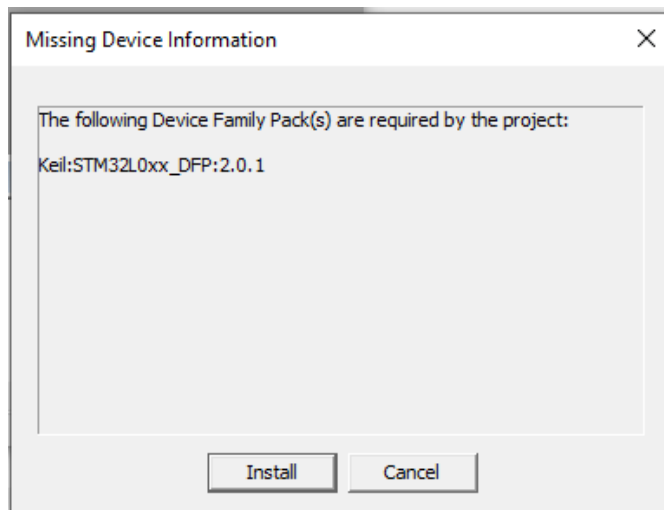



	GETTING STARTED with HT32SX		an_usgs
	User Manual	18/11/2019	V 1.0

Close the License Manager and open the sample project downloaded from GitHub in the Keil software.

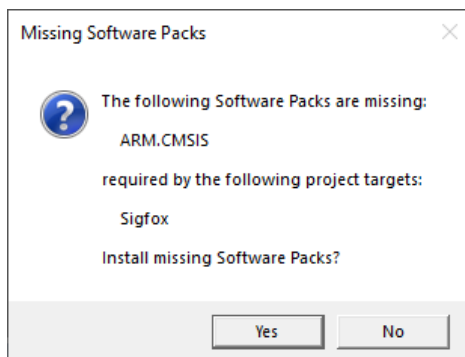
[https://github.com/htmicron/ht32sx/tree/master/firmware\\_applications/Push\\_Button/Sigfox](https://github.com/htmicron/ht32sx/tree/master/firmware_applications/Push_Button/Sigfox).

It will bring an alert about missing packages. Click in the Install button and wait for the package manager to finish updating the internal lists and installing the package.

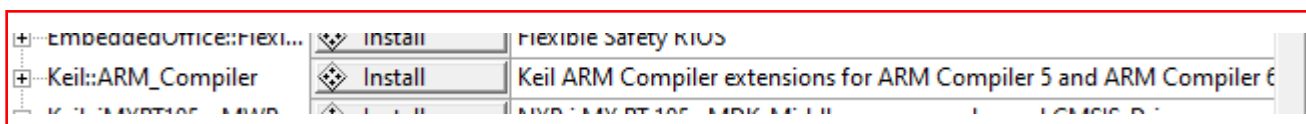


	GETTING STARTED with HT32SX		an_usgs
	User Manual	18/11/2019	V 1.0

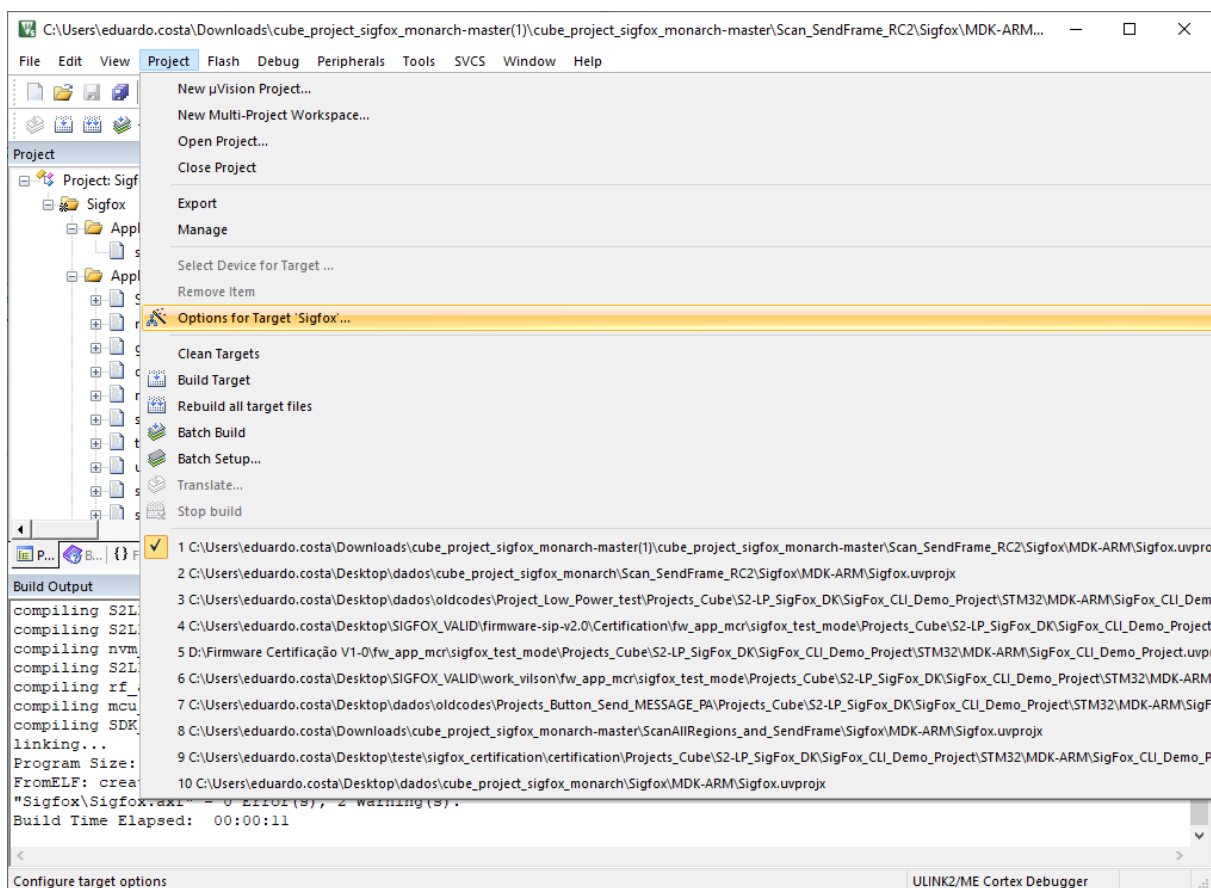
After the first missing package is installed, install the second one:




Also, select the Keil ARM Compiler from the list after this one finishes:

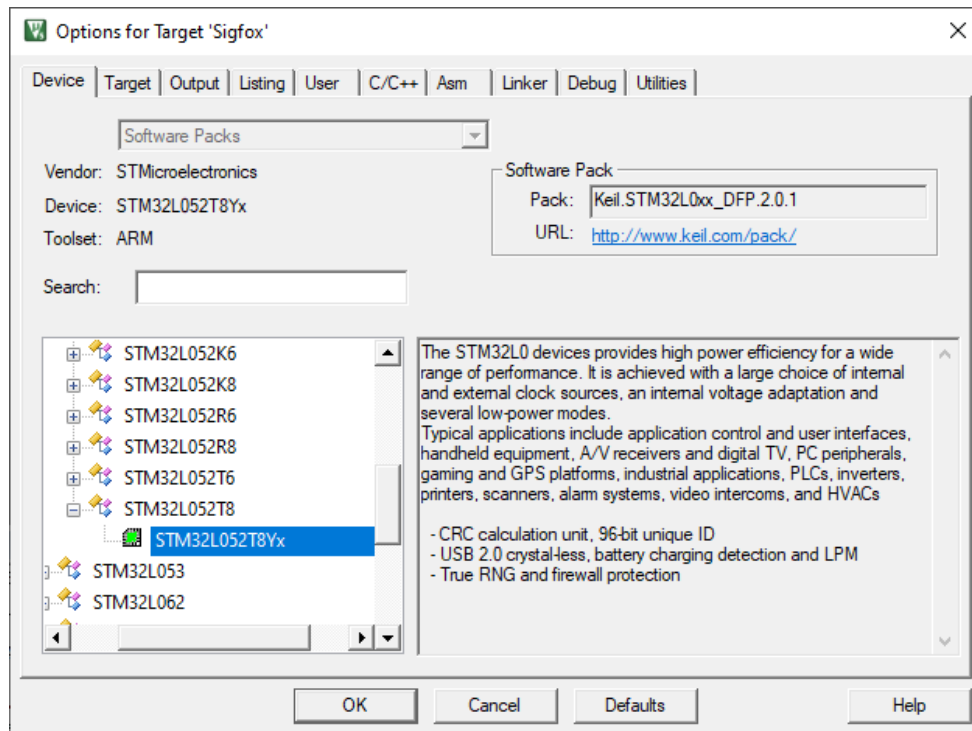


Closes the Keil and everything related open. After, open the Keil project again. At this point you may be able to build the code. If you get an error about the wrong device being selected, do the following: go to project → options for target Sigfox:



	<b>GETTING STARTED with HT32SX</b>		an_usgs
	User Manual	18/11/2019	V 1.0

After, go to the first tab:



And select the device STM32L052T8Yx and press OK.

## 4 APPLICATION CODE

### 4.1 Code repository


The code is available at the GitHub™

[https://github.com/htmicron/ht32sx/tree/master/firmware\\_applications/Push\\_Button/Sigfox](https://github.com/htmicron/ht32sx/tree/master/firmware_applications/Push_Button/Sigfox) , branch *version\_1.0*. To clone it, use:

```
git clone --single-branch --branch version_1.0
https://github.com/htmicron/ht32sx/tree/master/firmware_applications/Push_Button/Sigfox.git
```

Additional to the code, we also distribute the compiled program in the *hex* format at the same repository in the GitHub.



	GETTING STARTED with HT32SX		an_usgs
	User Manual	18/11/2019	V 1.0

## 5 REFERENCES

For additional information about SigFox libraries designed by ST Microelectronics, please refer to the UM2173 document (note: the function names still the same, but the code was adapted to use in the iMCP design, so it is different from the one distributed by ST).

## 6 CONTACT INFORMATION

### Brazil Head Office – São Leopoldo, RS

HT Micron Semiconductors

Unisinos Avenue, 1550

São Leopoldo - RS

ZIP 93022-750

Brazil

Tel: +55 51 3081.8650

E-mail (Support) [support\\_iot@htmicron.com.br](mailto:support_iot@htmicron.com.br)

E-mail (General Enquiries) [htmicron@htmicron.com.br](mailto:htmicron@htmicron.com.br)

---

Copyright 2019 HT Micron Semicondutores S.A.

Licensed under the Apache License, Version 2.0 (the "License");  
you may not use this file except in compliance with the License.

You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software  
distributed under the License is distributed on an "AS IS" BASIS,

WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and  
limitations under the License.

---