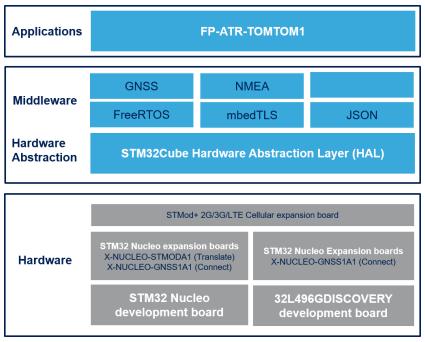
FP-ATR-TOMTOM1

Data brief

STM32Cube function pack for IoT node with GNSS and cellular connectivity for Asset Tracking applications based on TomTom online services



STM32 Open Development Environment

Features

- Complete firmware to connect an IoT node with GNSS module to a 2G/3G or LTE cellular network
- Support for Reverse Geocoding through TomTom online services
- Middleware libraries with support for FreeRTOS, mbedTLS, GNSS, NMEA and JSON parsing functionalities
- Sample implementation available for X-NUCLEO-GNSS1A1 and 2G/3G or LTE cellular expansion boards, when connected to a NUCLEO-F401RE or a 32L496GDISCOVERY board
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

FP-ATR-TOMTOM1 is an STM32Cube function pack which lets you connect your IoT node to a cellular network and send positioning coordinates, provided by a global navigation satellite system (GNSS) receiver, to TomTom online services. These coordinates are used to perform Reverse Geocoding which is the translation into a street address.

This software, together with the suggested combination of STM32 and ST devices, can be used, for example, to develop asset tracking applications.

The software is provided for STM32F401RE and STM32L496AG MCUs and it is easily portable across different MCU families thanks to STM32Cube.

It provides sample implementation for STM32 Nucleo platforms equipped with the X-NUCLEO-GNSS1A1 expansion board, featuring a GNSS receiver based on Teseo-LIV3F module, and the 2G/3G or the LTE cellular expansion board featuring a Quectel BG96 module.

The cellular expansion board, provided within the P-L496G-CELL01 and P-L496G-CELL02 packages, can be either connected directly to the STMod+ connector of a 32L496GDISCOVERY board, or to an STM32 Nucleo development board, through the X-NUCLEO-STMODA1 expansion board.

Product summary	
STM32Cube function pack for IoT node based on TomTom online services	FP-ATR-TOMTOM1
GNSS expansion board based on Teseo-LIV3F module for STM32 Nucleo	X-NUCLEO-GNSS1A1
Discovery kit with STM32L496AG MCU	32L496GDISCOVERY
STMod+ connector expansion board for STM32 Nucleo	X-NUCLEO-STMODA1

1 Detailed description

1.1 What can you do with STM32Cube function packs?

The STM32Cube function packs leverage the modularity and interoperability of STM32 Nucleo and X-NUCLEO boards, and STM32Cube and X-CUBE software, to create function examples, embodying some of the most common use cases, for each application area.

These software function packs are designed to exploit as much as possible the underlying STM32 ODE hardware and software components to best fit the requirements of final users' applications.

Moreover, function packs may include additional libraries and frameworks which do not present the original X-CUBE packages, thus enabling new functionalities and creating a real and usable system for developers.

1.2 What is STM32Cube?

STMCube™ is an STMicroelectronics initiative that helps you reduce development effort, time and cost. STM32Cube covers the STM32 portfolio.

STM32Cube version 1.x includes:

- STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.
- A comprehensive embedded software platform specific to each series (such as the STM32CubeF4 for the STM32F4 series), which includes:
  - the STM32Cube HAL embedded abstraction-layer software, ensuring maximized portability across the STM32 portfolio
  - a consistent set of middleware components such as RTOS, USB, TCP/IP and graphics
  - all embedded software utilities with a full set of examples

1.3 How does this function pack complement STM32Cube?

This software is based on the STM32CubeHAL. It extends STM32Cube by providing a board support package (BSP) for the 2G/3G and LTE cellular communication expansion boards, and the GNSS expansion board based on Teseo-LIV3F.

The drivers abstract low-level details of the hardware and allow the middleware components and applications to access data in a hardware-independent manner.

The package also includes some middleware libraries to implement functionalities such as NMEA protocol, MbedTLS, FreeRTOS and JSON parsing. Developers can use it to prototype end-to-end IoT applications related to asset tracking.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
02-Aug-2018	1	Initial release.
10-Oct-2018	2	Updated cover page image, features and description.