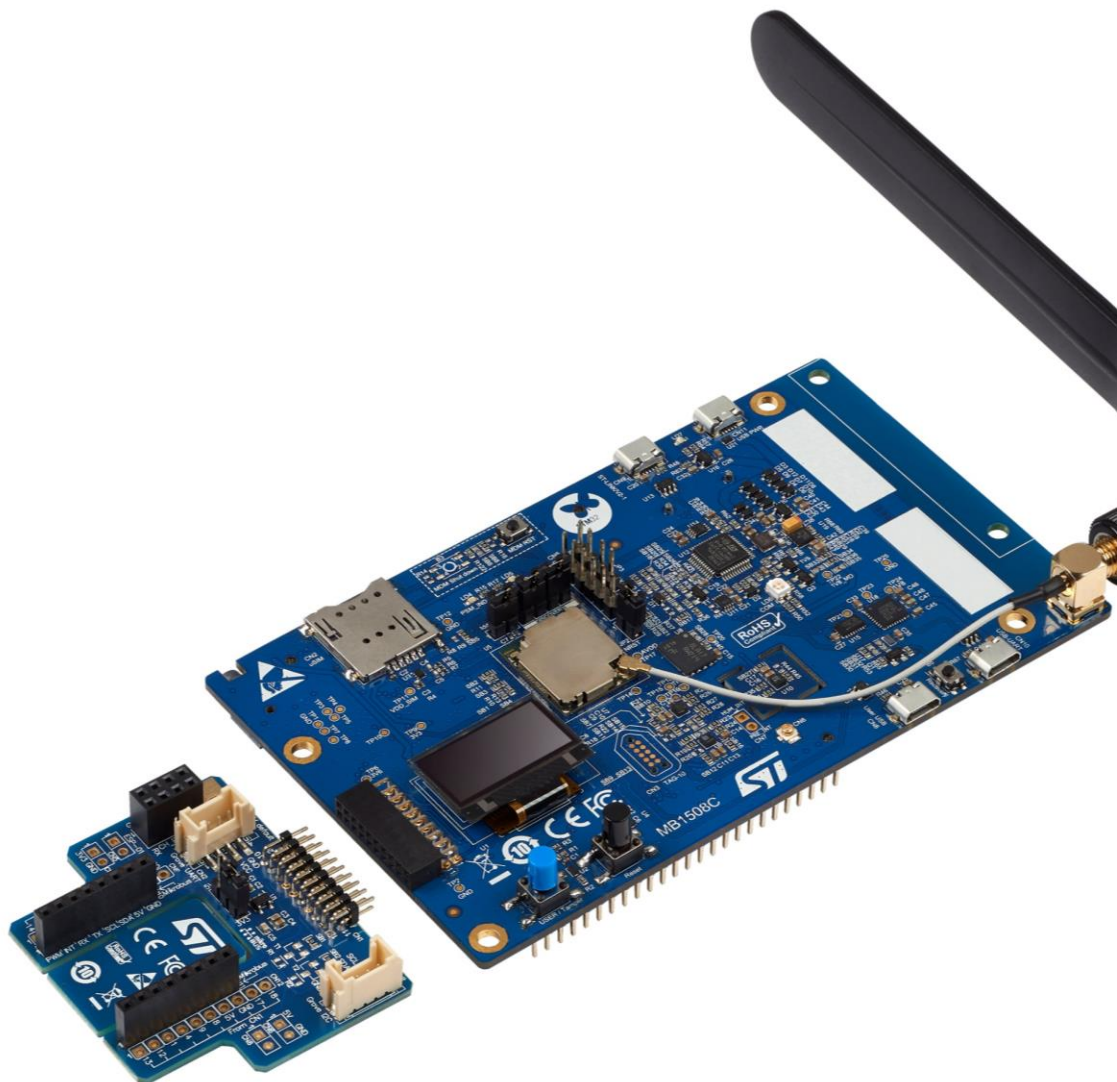




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# B-L462E-CELL1 Introduction to the discovery cellular kit

# Agenda

# Reduce time-to-market

# B-L462E-CELL1 Overview

# B-L462E-CELL1 Benefits

# ST Ecosystem

# Development process

# System partitioning

# SW architecture

# Reduce time-to-market to make cellular IoT

Integration in a module to make everything easier



**STMicroelectronics  
B-L462E-CELL1  
Cellular Discovery Kit**



**Worldwide  
LTE-M connectivity Service**



**Murata 1SE smallest Module Solution**  
(STM32, eSIM, LTE Cat M/NB)  
15.4 mm \* 18 mm

**This solution is ideal for**

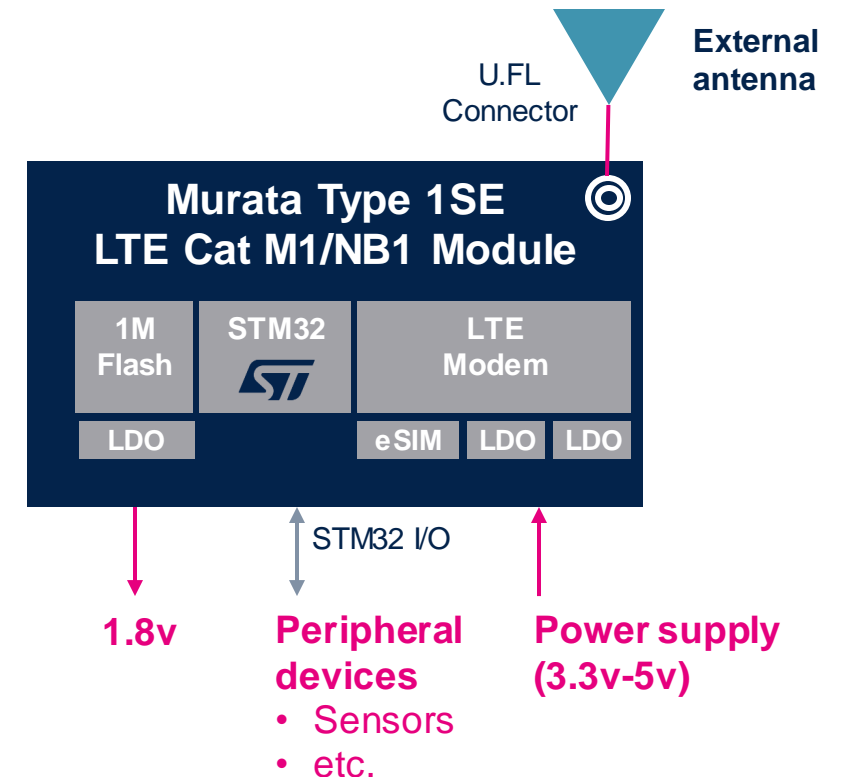
- Embedded Developers
- IoT evangelist
- OEMs
- Mass market

# Simplify your design with an all-in-one module

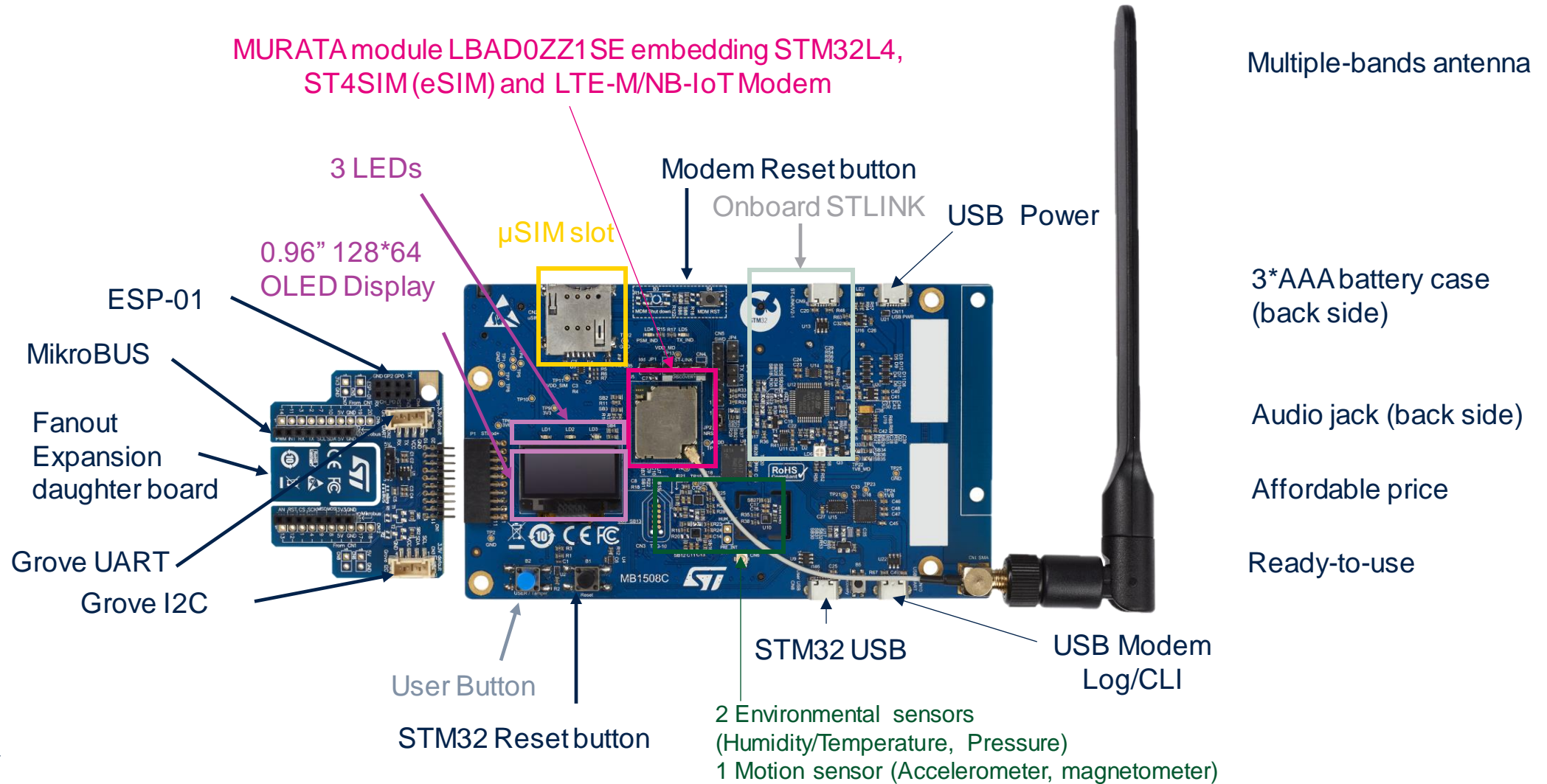
All-in-one module Type 1SE brings all you need for easy PCB design, HW certification, manufacturing and SW development



- **Easy integration** on a simple PCB (Smallest Cellular Module 15mm\*18mm)
- **Few external components** (a power-supply, antenna and peripherals needed)
- **Minimum “regulatory” certifications** required for the end-device (Certified Module)
- **Long life on battery**, up to 10 Years (Ultra Low power)
- **Immediate connectivity to internet**, device-to-cloud encryption (Embedded eSIM element)
- **Complete ecosystem** with STM32L4 (SW portfolio and tools, dev boards)



# A ready to use development board B-L462E-CELL1 overview



# A ready to use development board

## B-L462E-CELL1

- **STM32 Ecosystem**
  - STM32L462 with Ultra Low Power and security
- **Connect from the start**
  - eSIM with Data Plan (50MB/90 Days) for **connectivity out-of-the box**
  - eSE: embedded **Secure Element for cloud connection**
- **Ready for a wide range of applications**
  - OLED Display, 3 users LEDs and 1 user button
  - Environmental and Motion ST sensors
  - Audio connector for voice call (future use)
- **Easily expandable**
  - STM32+ Fan-out board: expansion connectors for Grove Seeed Studio I<sup>2</sup>C & UART, mikroBUS, ESP-01
  - STM32 and Modem I/Os available from the Module are accessible via standard header connector
- **Standard Development tool interface**
  - Onboard ST-LINK V2 debugger & Virtual Com Port
- **Comes with the appropriate SW library (X-CUBE-CELLULAR)**
  - Hides the complexity of the management of cellular and related connectivity. Handles the AT commands.
  - Delivered in Source code and Business Friendly license
  - Includes an example of basic example of application enabling Modem Low Power (PSM)
- **Board Support Package Drivers and IoT application are included**
  - This will help you demonstrate onboard peripherals

# Fully supported by STM32 development tools and ecosystem

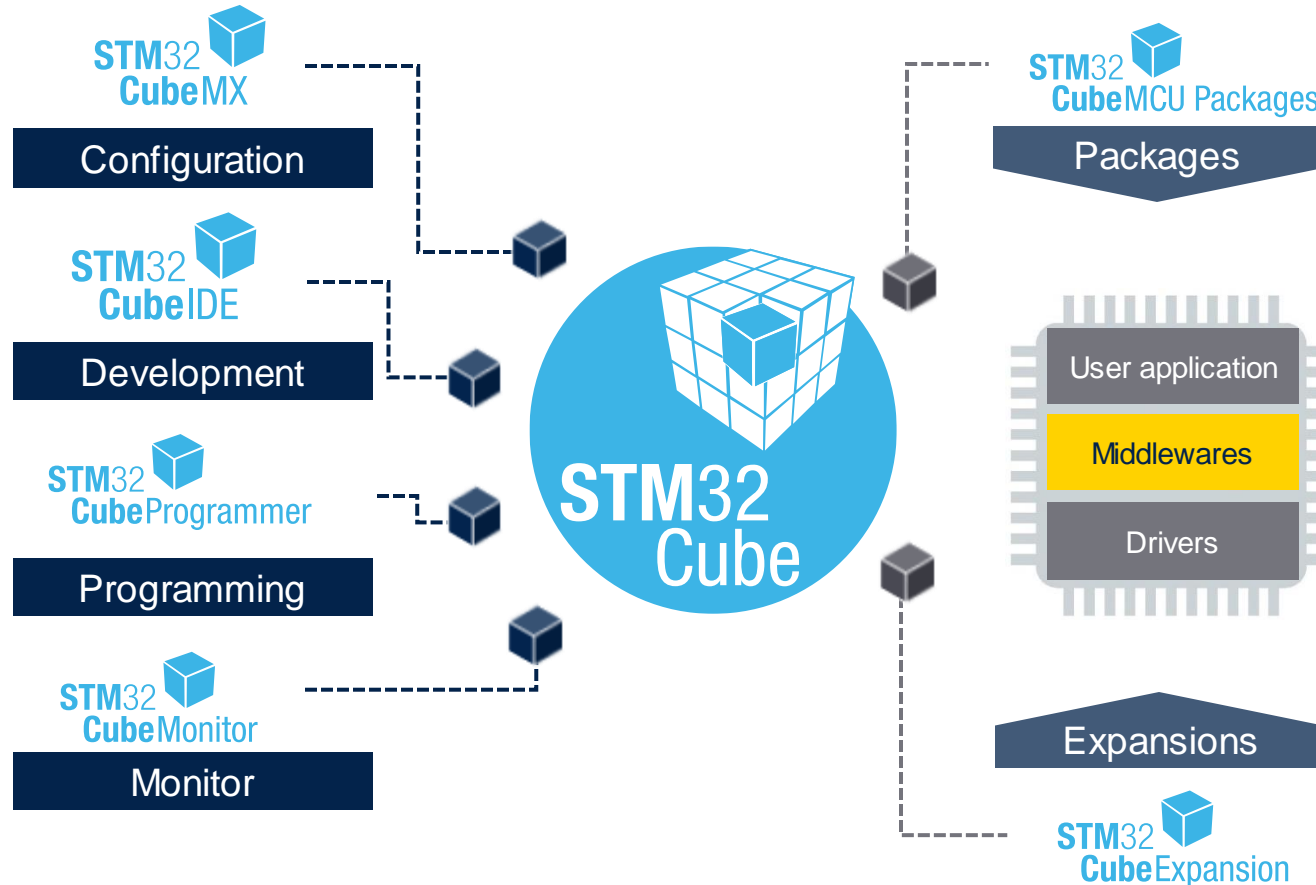
Software Tools



Embedded Software

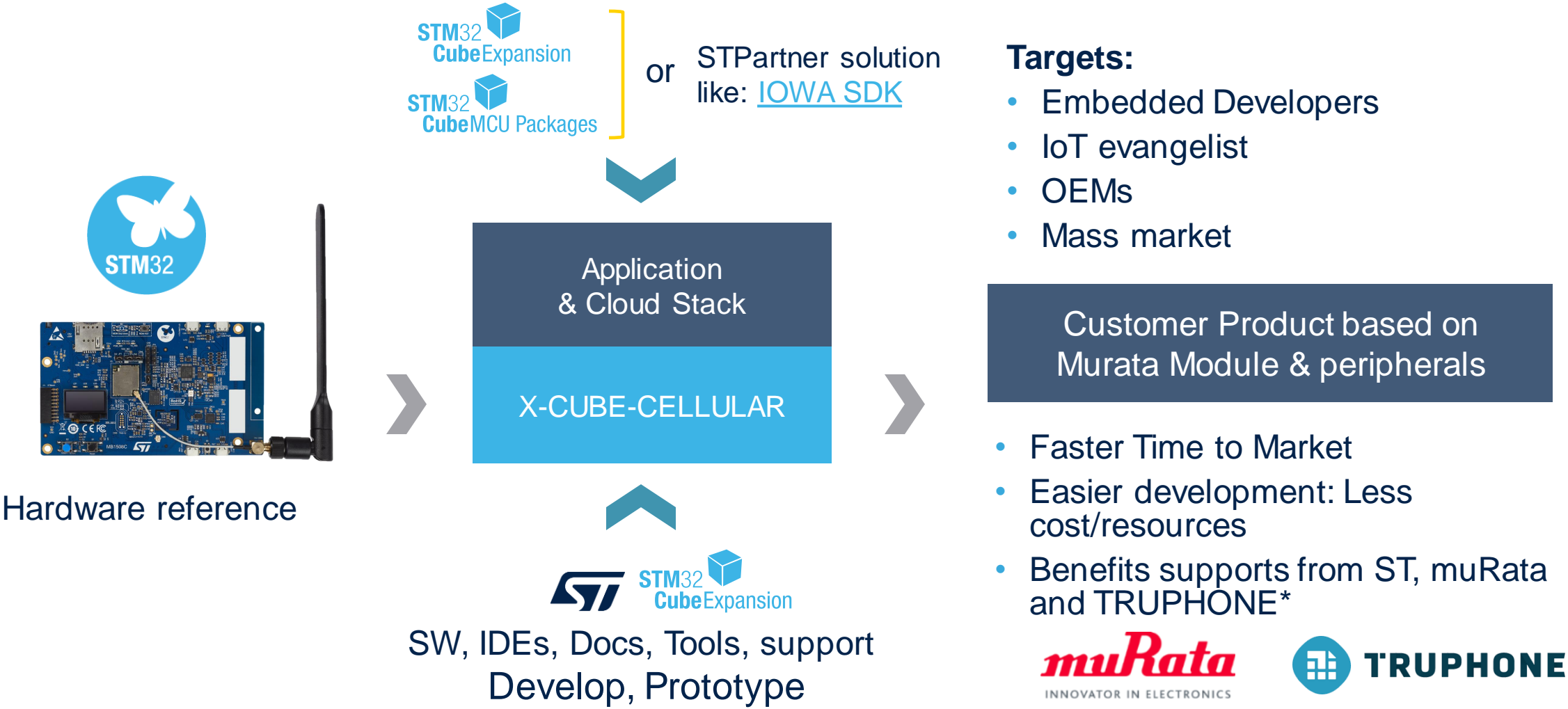
**IAR**  
SYSTEMS  
arm KEIL

or



X-CUBE-CELLULAR

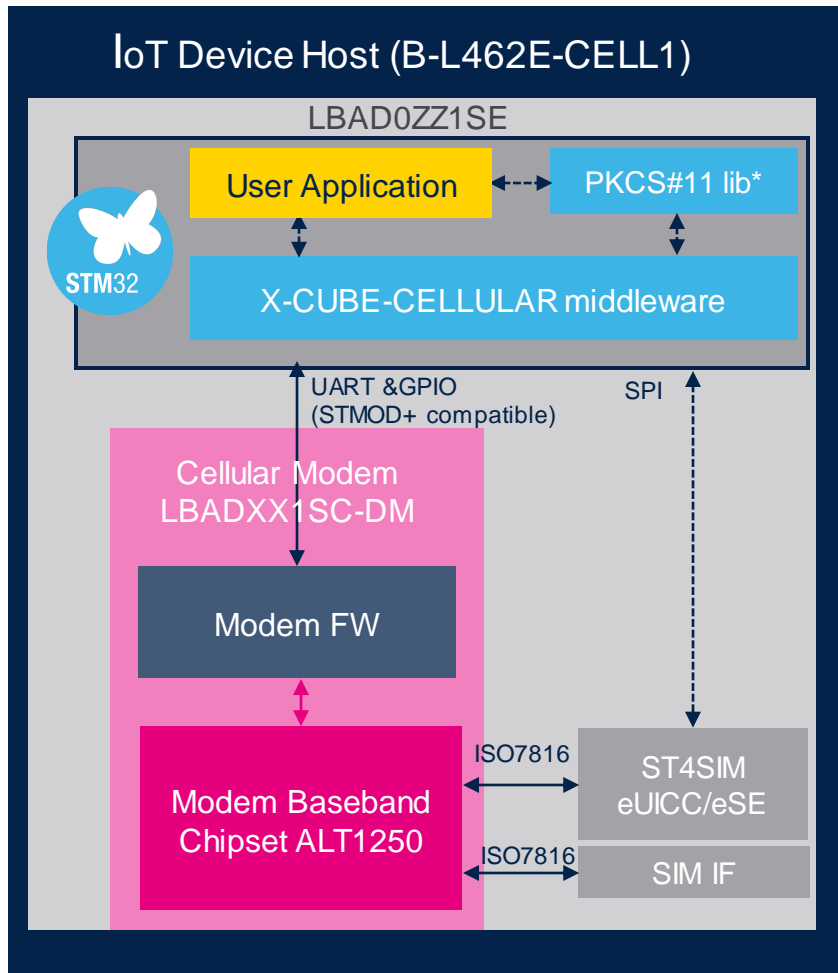
# Simplified product development process



TRUPHONE\* is an ST Authorized Partner

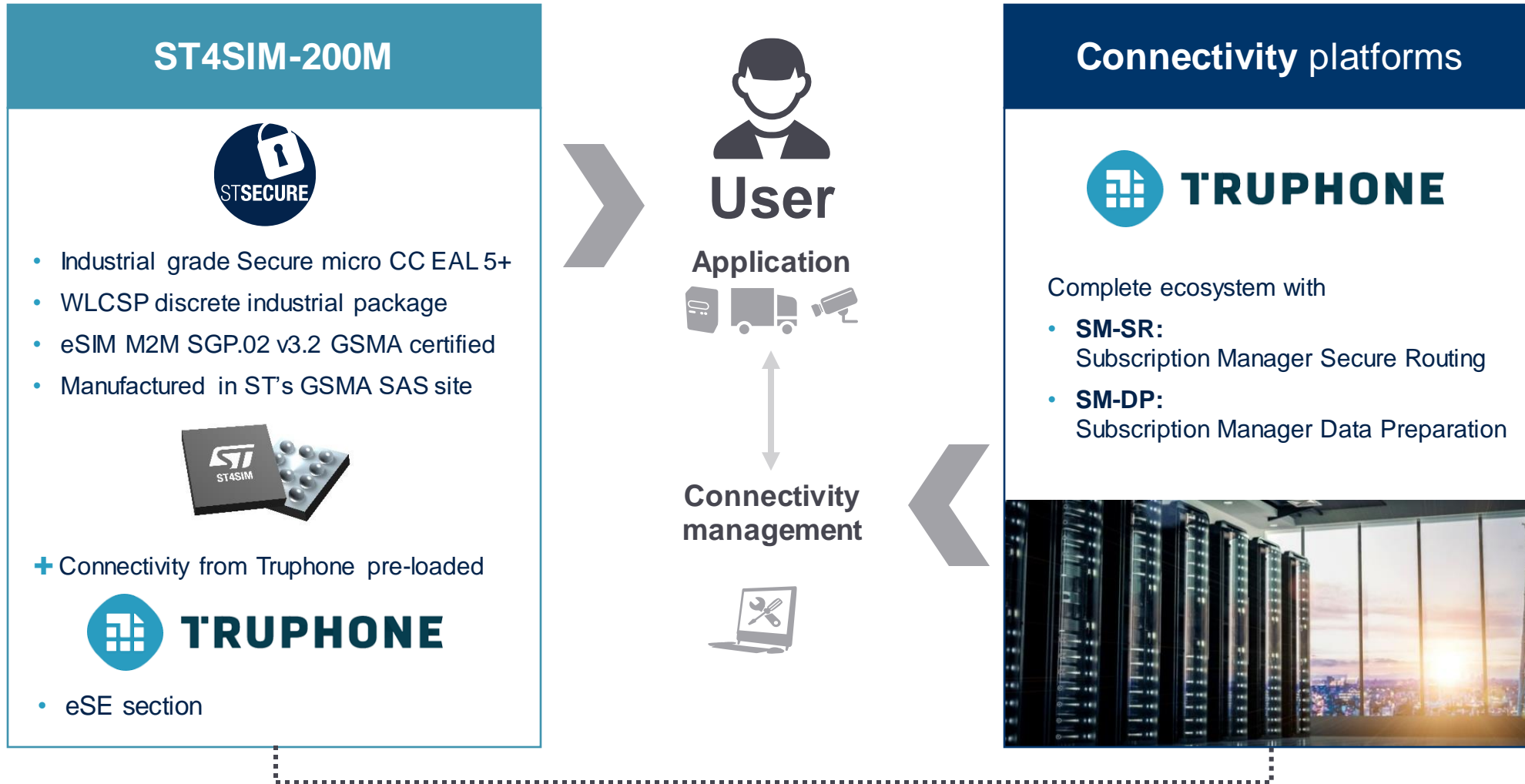


# Cellular device IoT system partitioning

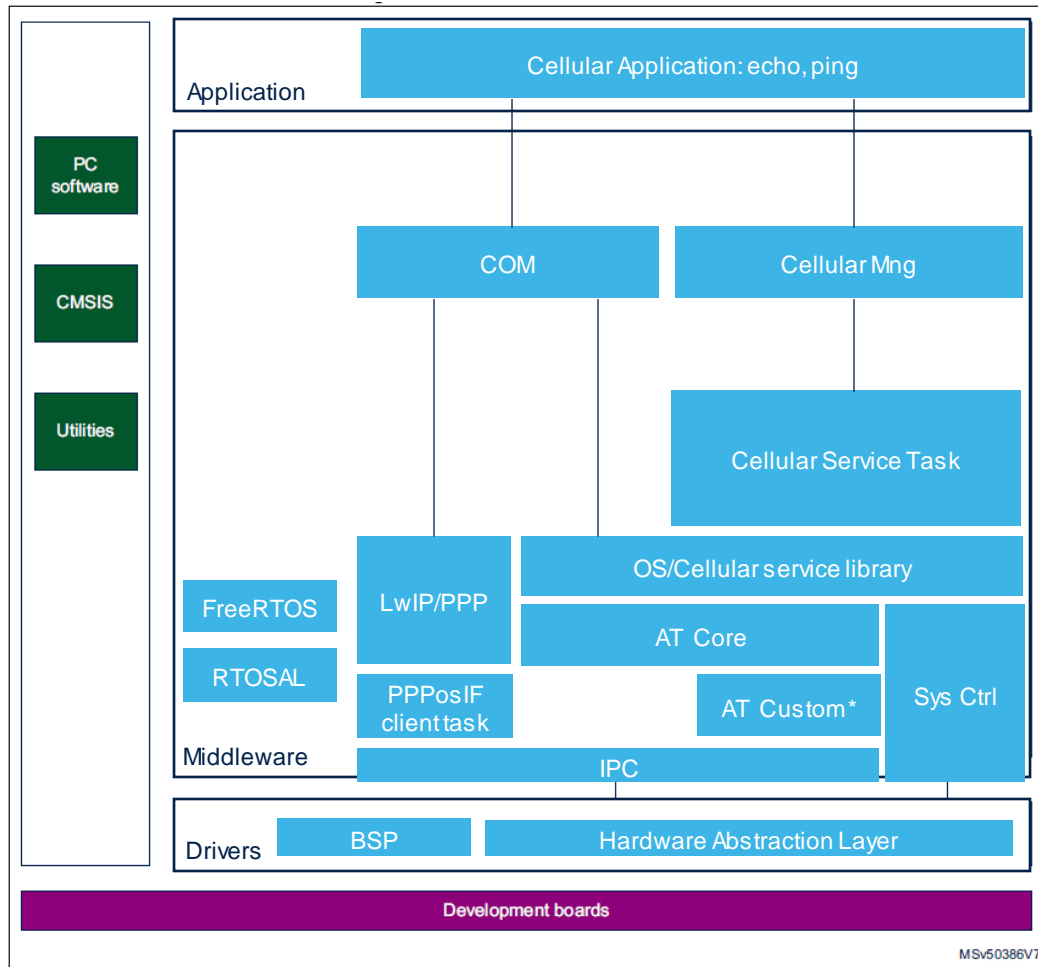


- **User Application** - The IoT application uses API provided by X-CUBE-CELLULAR to control cellular service and exchange TCP/IP over internet
- **PKCS#11(optional\*)** - Library to provide standard Services to application to use security services provided by eSE applet running on ST4SIM-200M
- **X-CUBE-CELLULAR middleware** – Supports BSD socket API for IP connectivity. A simple API to initialize, configure, start and monitor the cellular service. Handles communication with Modem over AT commands Provides direct communication with ST4SIM using APDU protocol over SPI Support remote SIM provisioning
- **Cellular Modem** - MURATA Type 1SC-DM based on ALT1250 Baseband Chipset from Sony. Modem FW supports Dual Mode LTE-M & NB-IoT
- **eUICC/eSE** - Based on ST4SIM-200, eSIM programmed with Truphone bootstrap profile. Supports also embedded Secure Element applet to store and protect sensitive data and provides security services
- **External SIM I/F** - for μSIM slot

# ST4SIM solution for type 1SE – LBAD0ZZ1SE

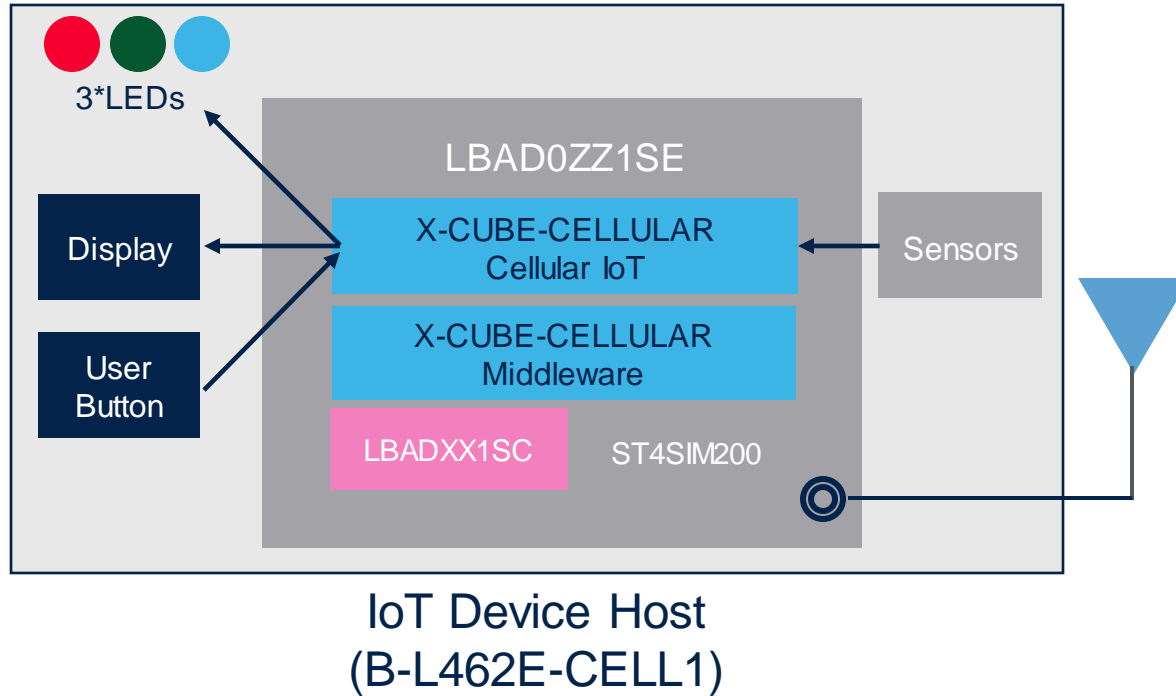


# X-CUBE-CELLULAR software architecture



- COM (API):
  - BSD socket
  - ICC SmartCard API to exchange APDU (with ST4SIM)
- Cellular\_Mngt(API): to initialize, configure and start the cellular service and get runtime Cellular & SIM information
- Cellular Service Task: Modem and Cellular Networks services control. Handles event from Modem.
- OS Library/Cellular Service library expose low level driver to exchanges AT commands with Modem
- AT Core, a task receives and process responses from Modem
- AT custom: the specific AT command handler dedicated to Modem
- Modem System control: manages Modem specific power on sequence/Reset/Low power
- RTOSAL: a common API for ARM CMSIS RTOS V1/V2 for FreeRTOS
- IPC: Inter Processor Communication
- BSP and HAL driver (STM32CubeFW MCU package)

# A dedicated library available out-of-the-box



- Echo and Ping application to verify the end-to-end connectivity
- Display and refresh information on the screen
  - Data from sensors (Temperatures, Humidity, Pressure)
  - Cellular network information (RSSI, operator name, IP address), SIM status
  - RTC Clock which is initialized with date and time received from the Network
- Manage User Press button and control LEDs state

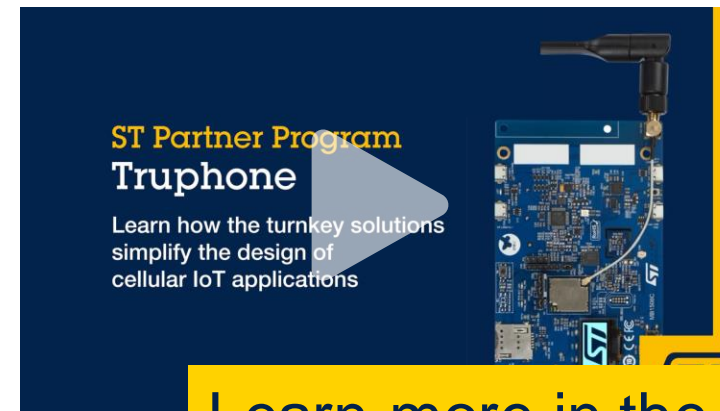
reference: [X-CUBE-CELLULAR IoT](#)

# Kick start your cellular application now!

- The 1SE module allows to quickly transform a PoC/Prototype into a product.
- B-L462E-CELL1 provides all the resources needed to develop the application software to demonstrate an end-to-end solution very quickly, including security.
- Leverages the STM32 ecosystem of tools and software portfolio from ST and its partners to accelerate solution definition and deployment.



[Watch the getting started video](#)



[Learn more in the Webinar](#)

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# Our technology starts with You



Find out more at [www.st.com/B-L462E-CELL1](http://www.st.com/B-L462E-CELL1)

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