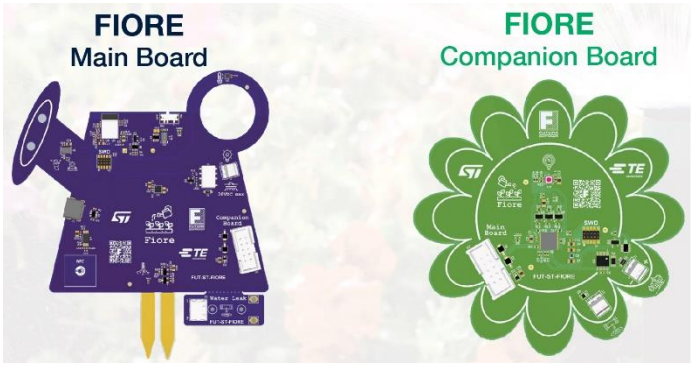
Fiore Demonstration Kit

Data Brief

Overview

Fiore is an IoT irrigation demonstration kit designed by Future Electronics in partnership with ST Micro. The Fiore platform consists of two boards with all key components like MCUs, sensors, power and wireless communication devices manufactured by ST Micro. The Main Board (watering can board) senses the soil moisture levels and automatically communicates with the Companion Board (flower board) which controls a submersible water pump to start and stop watering the plant. The Companion Board also contains motor current monitoring, tank water level monitoring and leak detection functions. User can wirelessly access the system via Bluetooth to get real time sensor data including humidity, temperature and pressure.

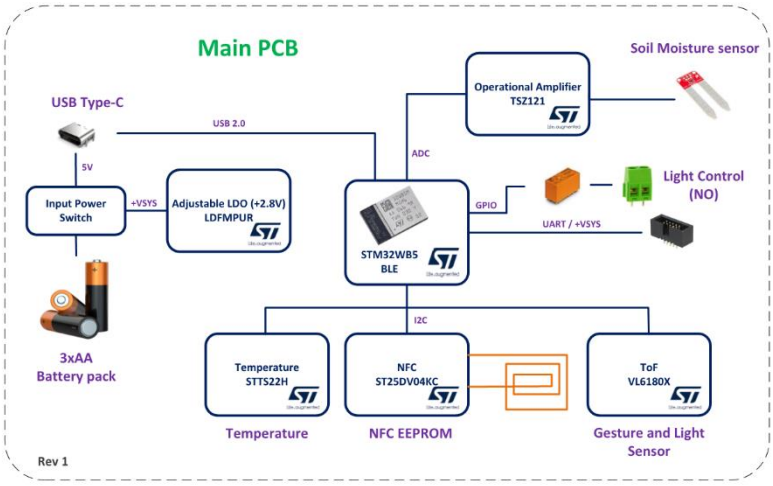


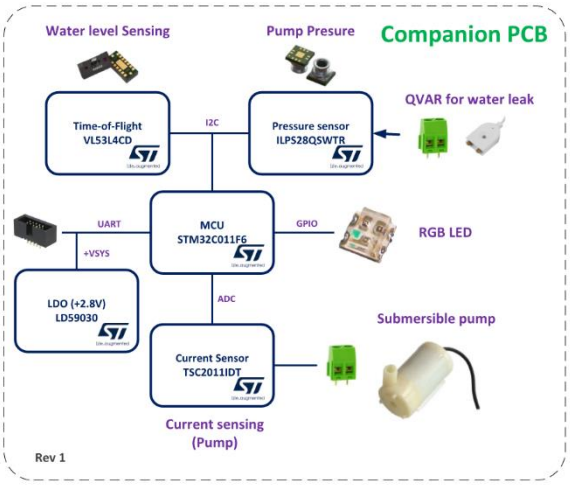
Ordering Part Number:
FUT-ST-FIORE

Features

- Main Board:
  - Embedded Wireless MCU (STM32WB5) supports Bluetooth® Low Energy 5.3 and IEEE 802.15.4 communication protocols, Zigbee®, and Thread
  - Soil moisture monitoring (TSZ121)
  - Gesture detection and light control with ToF sensor (VL6180X)
  - Temperature sensor (STTS22H)
  - NFC interface (ST25DV04KC) for BLE configuration
  - Low power LDO (LDFMPUR)
- Companion Board:
  - Low cost, low power MCU (STM32C0)
  - Water level monitoring with ToF sensor (VL53L4CD)
  - Pump pressure monitoring and water leak detection with pressure sensor (ILPS28QSWTR)
  - Water pump current monitoring with current sensor (TSC2011)
  - Low power LDO (LD59030)

System Block Diagram





Key Components

Function	Part Number	Description	Manufacturer
MCU	STM32WB5	Ultra-low-power Module - Dual core Arm Cortex-M4 MCU 64 MHz, Cortex-M0+ 32 MHz with 1 Mbyte of Flash memory, Bluetooth LE 5.3, 802.15.4, Zigbee, Thread, Matter, USB, LCD, AES-256	ST Micro
NFC	ST25DV04KC	Dynamic NFC/RFID tag IC with 4-Kbit EEPROM, and fast transfer mode capability	ST Micro
Sensor	VL6180X	Proximity sensor and ambient light sensing (ALS) module	ST Micro
Analog	TSZ121	Very high accuracy (5 µV) zero drift 5 V CMOS Op-Amp, single, GBP=400kHz	ST Micro
Sensor	STTS22H	Low-voltage, ultra-low-power, 0.5 °C accuracy I2C/SMBus 3.0 temperature sensor	ST Micro
Power	LDFM	500 mA very low drop voltage regulator	ST Micro
MCU	STM32C0	Mainstream Arm Cortex-M0+ MCU with 32 Kbytes of Flash memory, 6 Kbytes RAM, 48 MHz CPU, 2x USART, timers, ADC, comm. I/F, 2-3.6V	ST Micro
Sensor	VL53L4CD	Time-of-Flight high accuracy proximity sensor	ST Micro
Sensor	ILPS28QSWTR	Dual full-scale, 1260 hPa and 4060 hPa, absolute digital output barometer with Qvar detection in a water-resistant package	ST Micro
Analog	TSC2011	High voltage, precision, bidirectional current sense amplifier	ST Micro
Power	LD59030	300 mA very low dropout linear regulator IC	ST Micro

Application Examples

- Industrial IoT
- Smart Farming
- Smart Home
- Horticulture