



ESMT

Low Cost, High Performance, Easy to Use
- Temperature Monitor/Logger &
Parcel/Pallet Tracker for **Logistics**

ESMT &

Wireless Application Business

About ESMT : (Elite Semiconductor Microelectronics Technology)

- Fabless IC Design house , TSE listed in 2002/3
- \$ 100M capital, \$ 536M revenue 1H 2021
- Memory IC, Mix Signal IC, Power IC , Wireless IC

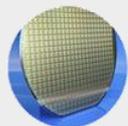


Wireless Application Business :

- RF Transceiver IC / SOC : ISM Sub-GHz / 2.4GHz & NFC
- Wireless LPWAN Modules
- Application Board : GPS Tracker & Temperature / Humidity Monitor



HQ : Hsinchu, Taiwan



ESMT

Target Logistic Sectors



- Parcel / Pallet Tracking
- Seafood/Agricultural Product Freshness Warranty
- Vaccines/Pharmaceutical Products Storage Condition



Benefit : Real-Time Solution

從動態溫度曲線圖可以觀察物流士運輸途中各項動作情形

發射器自動檢核 溫度達到7度時，車輪轉動5斤 抵達大發門市時溫度為1度 在大發門市熄火，但出門後溫度會是否未停在低溫

溫度曲線圖

Longitude ; Latitude ; Radius provided by WiFi hotspots (MAC@) or Sigfox network (fallback)

Efficiency **Time** **Logistics** **Customer** **Insurer** **Regulations** **Claims** **Anti-Tampering**

Temperature chart

Location	Average Temperature	Average Humidity
Antwerp (SE)	71.47	25.20
Antwerp (NW)	71.52	27.11
Brussels	70.38	21.45
Antwerp (NW)	76.43	25.50

SenLog-Mini : Real-Time Parcel/Pallet Tracker

Benefit :

- * Tracing and Monitoring to Increase Logistics **Management** Efficiency
- * Increases Stolen Goods Recovery to Reduce Insurer **Claims**
- * Synchronizes Transportation through Cloud to Reduce Customer Waiting **Time**

Advantage :

- * **Class 0u** for RC1~7
- * Low Cost for Single-Use
(**Recyclable : Casing Re-Design**)
- * Small Dimension
- * Quick Installation
- * Long Battery Life
- * One Button for Start / Stop
- * SoC on Chip Temp. Sensor
(F/W Configurable)



(Scenario)

SenLog-Pro : Real-Time Alert Temperature Logger for Cold Chain

Benefit :

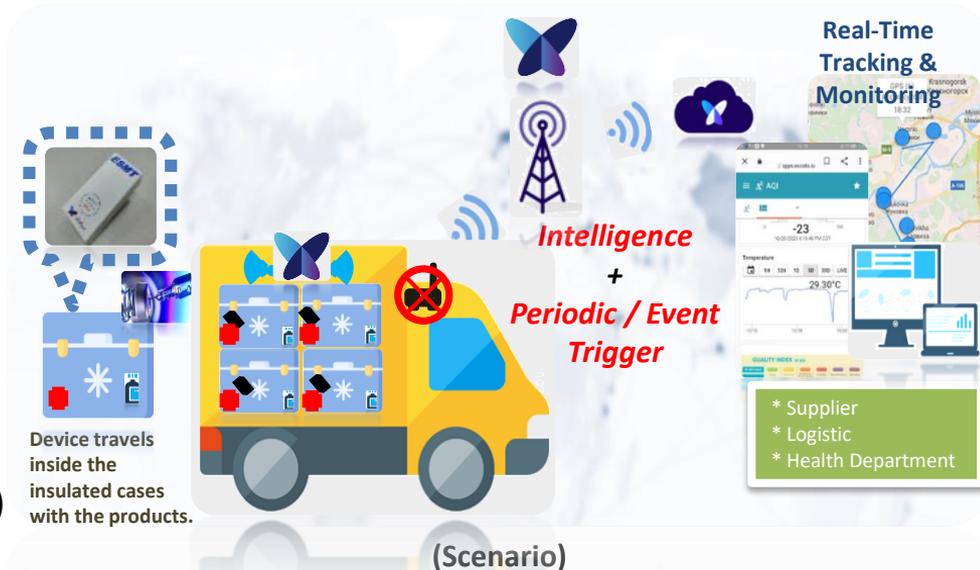
(Based on TriGo's Benefits to Add Following Points)

- * Data **Anti-tampering** Ensures Product Safety and Process Tracing
- * Data Upload to **Cloud** Automatically without Manual Labor to Reduce Operation **Cost**

Advantage :

(Based on TriGo's Advantages to Add Following Points)

- * **NIST-Traceable** Sensor :
 - Accuracy $\pm 0.5C^{\circ}$ typ.
 - Configurable Alarm Setting
- * **Temperature Sampling** :
 - 4 Data per Message max.
- * **Operating Mode** :
 - STD. Temperature Logger Mode
 - Sigfox Real-Time Mode (by Button)
- * **Micro USB** for Data Download
- * **Dual Color Status LED**



Solutions and Business Models



RF SoC with 24K
RAM / 128K Flash



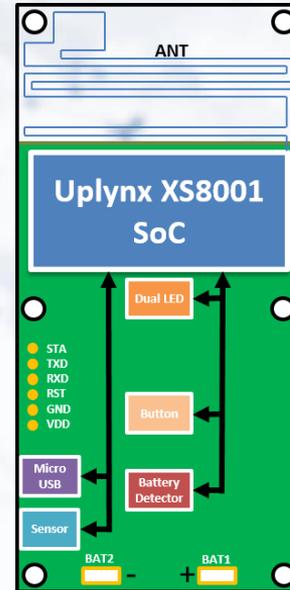
CoB Design with
PCB Antenna



Temp. Monitor
with Datalog Opt.



Easy for PoC &
Product Develop



Device Maker -
PCBA Solution



System Integrator -
Complete Device Solution

Get Your Brand-New Sigfox Products

Easy to Design New Product

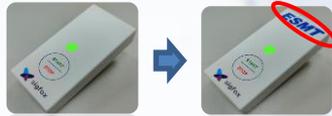


(ESMT PCBA)

(Customized Casing)

Design New Casing for Your Wireless IoT Product

Own New Product Effortlessly



(ESMT Device)

(Your Brand/Logo)

Own Wireless IoT Product with Your Brand/Logo Directly



Upgrading to New Product



(Legacy Temperature Logger)

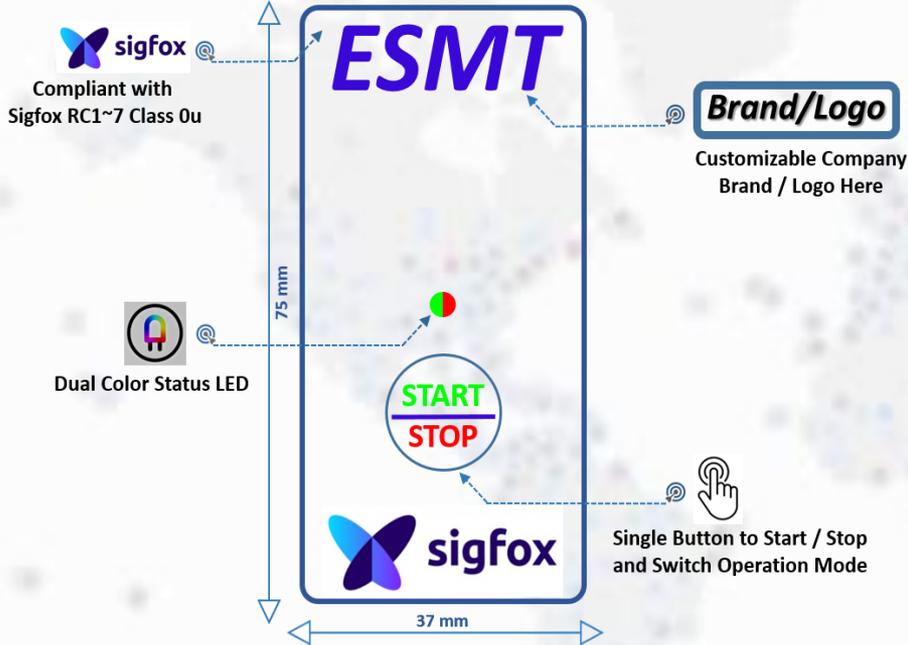
(ESMT Module)

(Antenna)

Min. Effort to Upgrade Your Product for Wireless IoT



Complete Device SPEC.

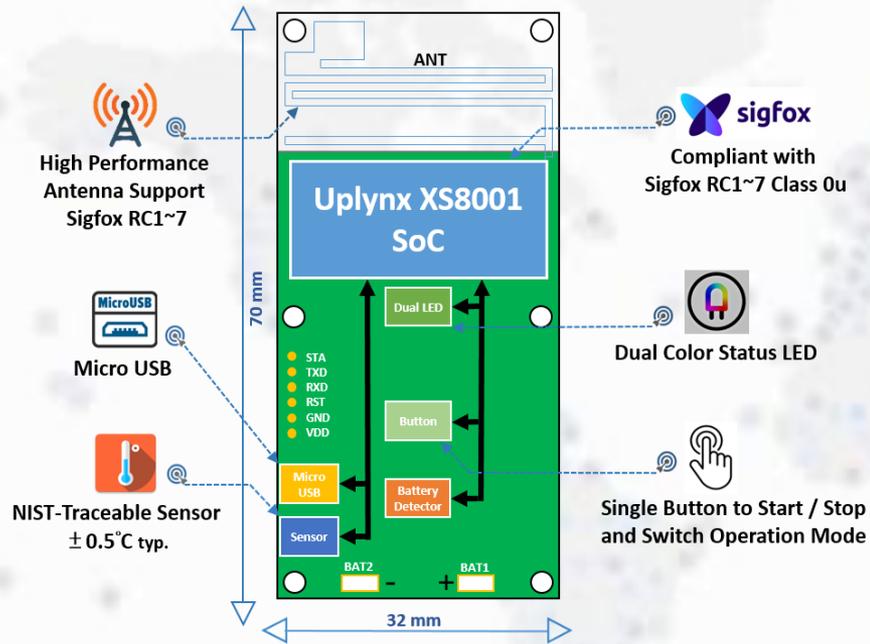


- NIST-Traceable Sensor**
± 0.5°C typ.
- Micro USB for Data Dumping (Not Exposed)**
- Internal Flash Support**
9000 Data Log Entries
- IP64 , ABS Enclosure**
- Switch Between Temp. Logger Mode and Sigfox Real-Time Mode**
- Up to 2 Yrs Battery Life on 2*AAA with Voltage Detector**
- Small Dimension :**
75x37x17mm
- Weight : 40 gram**
- Sampling Period :**
2.5min ~ 24Hrs
- Up to 4 Temperature Readings upload per Message**
- Operating Temperature Range :**
-10°C ~ 60°C
- Easy to Use and Install**

(Pre-Test)

sigfox **EN12830:2018**

PCBA SPEC.



High Performance Antenna Support
Sigfox RC1~7

Micro USB

NIST-Traceable Sensor
± 0.5°C typ.

sigfox
Compliant with Sigfox RC1~7 Class 0u

Dual Color Status LED

Single Button to Start / Stop and Switch Operation Mode

Switch Between Temp. Logger Mode and Sigfox Real-Time Mode

Design Your Own Casing

(Pre-Test)

Internal Flash Support 9000 Data Log Entries

Operating Temperature Range : -30°C ~ 80°C

Sampling Period : 2.5min ~ 24Hrs

Small Dimension : 70x32x3.2mm

Up to 4 Temperature Readings upload per Message

Weight : 7 gram

sigfox **EN12830:2018**

Sigfox Class 0u: FCC / CE / ARIB T-108 Pre-Test

2. Summary of Test Results

Test Specification	FCC Part 15, Subpart C (SECTION 15.247)		
Test Item	Spec	Result	Remark
Radiation Output Power (Max.)	≤ 1Watt	Pass	902.2MHz:23.09dBm 920.8MHz:21.81dBm
Radiated Emissions (above 1 GHz)	PK:74dBuV/m	Pass	1GHz-9.02GHz
	AV:54dBuV/m		
Radiated Emissions (below 1 GHz)	PK:46dBuV/m		

2. Summary of Test Results

Test Specification	ETSI EN300 220		
Test Item	spec	Result	Remark
Maximum Peak Output Power*	≤ 25mWatt	Pass	Conducted power=13.35dBm
Radiated Emissions(above 1 GHz)	PK:-30dBm	Pass	1GHz-12.75GHz
Radiated Emissions(below 1 GHz)	PK:-54dBm	Pa:	

2. Summary of Test Results

ARIB STD-108			
Test Item	spec	Result	Remark
Conducted Power	≤ 20mWatt(13dBm)	Pass	923.2MHz:12.26dBm
TX Unwanted Emissions	30MHz-710MHz:-36dBm/100KHz	Pass	
	710MHz-900MHz:-55dBm/1MHz	Pass	
	900MHz-915MHz:-55dBm/100KHz	Pass	
	915MHz-930MHz:-36dBm/100KHz	Pass	
	930MHz-1000MHz:-55dBm/100KHz	Pass	
	1000MHz-1215MHz:-45dBm/1MHz	Pass	
	1215MHz-5 harmonic:-30dBm/1MHz	Pass	
Frequency Tolerance	±20ppm	Pass	
OBW	920.6MHz-928MHz:200KHz	Pass	
ACILP	922.3MHz-928.1MHz	Pass	

*Max. Peak output power=Conducted power +



Thank you

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