



# Instant HMI for Embedded Systems

## Tap Manager Mobile HMI



31 March 2023

[www.iotize.com](http://www.iotize.com)

**Introduce users to new Tap Manager adaptable HMI.  
Instantly create custom HMI for your STM32 systems  
directly on your mobile phone!**

**For:** Cortex M-based microcontroller applications  
**Requires:** MCU application board & firmware (ELF)  
IoTize TapNLink Primer  
Android mobile  
Tap Manager

Introduce users to new IoTize products  
Instantly create custom applications  
directly on your mobile device

For: Cortex M-based MCUs  
Requires: MCU application  
TapNLink Primer  
Android mobile device  
Tap Manager

## TnL-PRIMER-NBW



[Regional Distributors](#)





# Origin of the Solution



Founder: **Francis Lamotte**  
Offices: Grenoble, France  
Founded: **Feb 2017**  
Capital: **2 043 000** EUR  
Employees: **10** (80% R&D)

## Embedded Electronics

- Microcontrollers
- Embedded Software
- C, C++, Java

## Wireless

- Near Field Communication
- Bluetooth, Wi-Fi, LoRa, ...

## Mobiles & Cloud

- Cordova, Ionic
- Android, iOS, Windows
- MQTT, CoAP
- AWS, Bluemix, Watson, ...

## IoT Security

- Encryption
- Authentication



Customers

**Appliance**

HVAC

**Energy**

**Industry**

[www.iotize.com](http://www.iotize.com)

Customer Expectations  
New Features  
New Services & Business



# Complex Technology Landscape

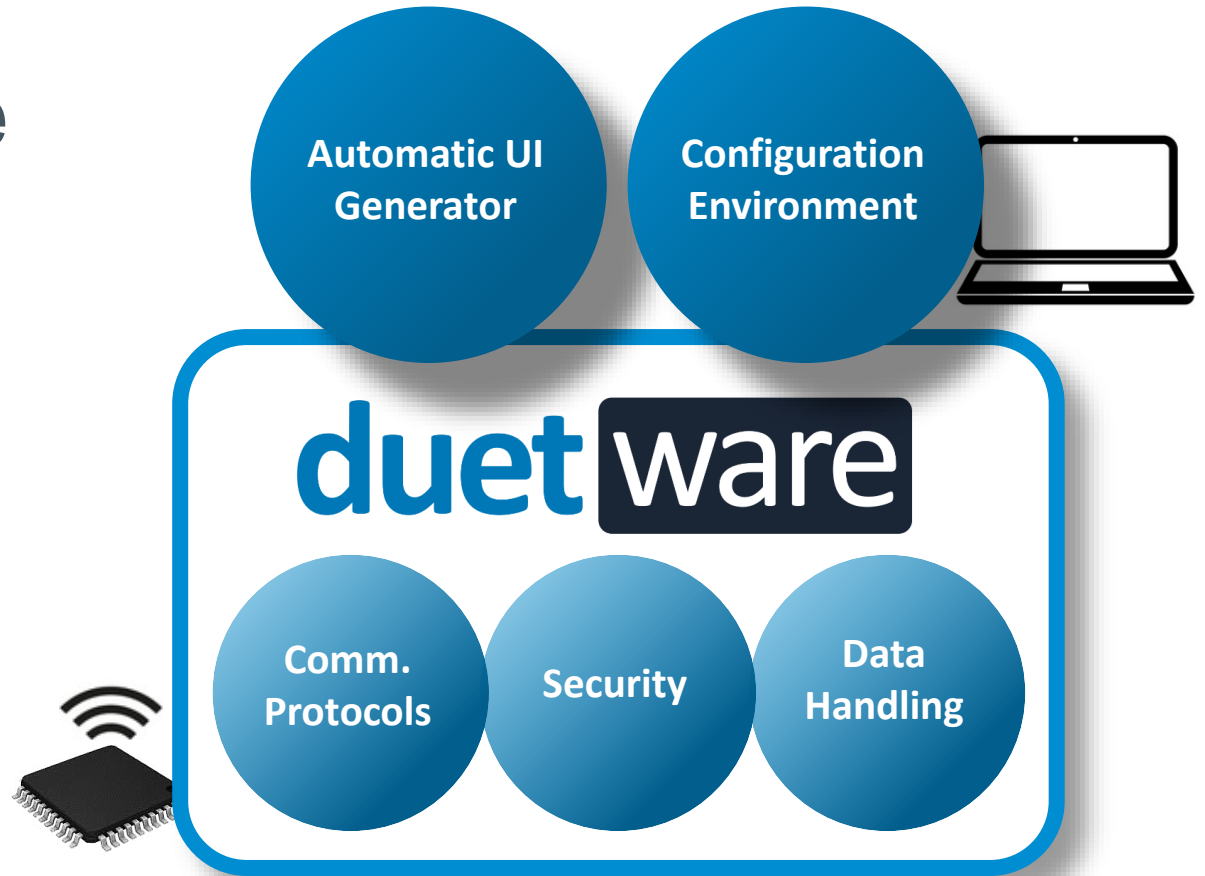
New Technologies  
Increased Complexity  
Lack of Resources

Too Slow = Lost Opportunities



## 'No Code' Software Ecosystem

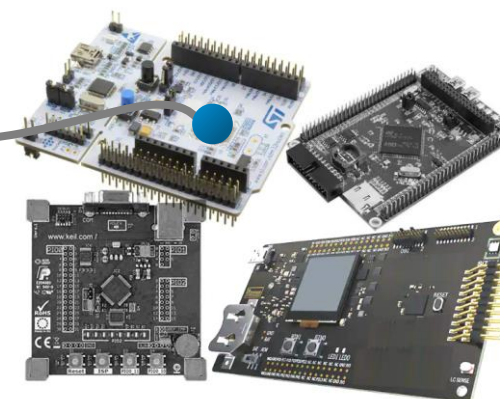
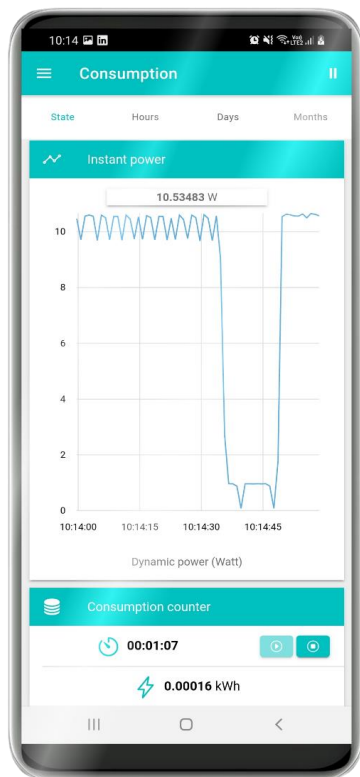
Design Software  
+  
Embedded Software





Just plug it in,  
& configure...

...our tools do  
the rest for you.





Connectivity in Minutes,  
without the Risks of a System Redesign



[www.iotize.com](http://www.iotize.com)



**VS**



## Your User's World

- Popular smartphone interfaces
- Freedom of in-hand controls
- User-maintained
- Easy HMI updates

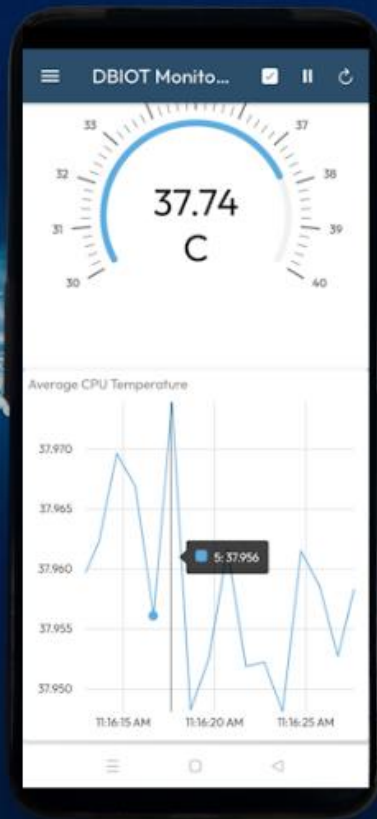
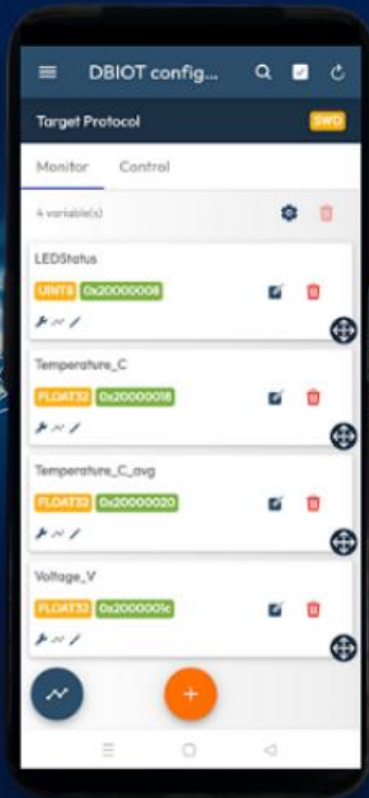
## Designer's World

- Designer-specific controls
- On-appliance controls
- Wear & age with use
- HMI updated in next hardware

# Complex Technology Landscape

NFC, Bluetooth, WiFi  
iOS, Android  
App Development Tools  
Java, HTML, CSS  
Security, Encryption  
Access Control





**Just Connect  
& Configure**

## Debug Port

2 Signals  
Power supply  
SWD protocol

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Cortex M



## 2 GPIO

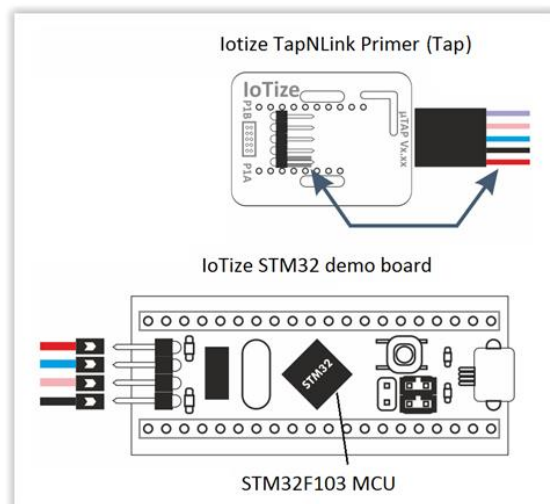
Non-Cortex MCU

Final Design

S3P protocol \*



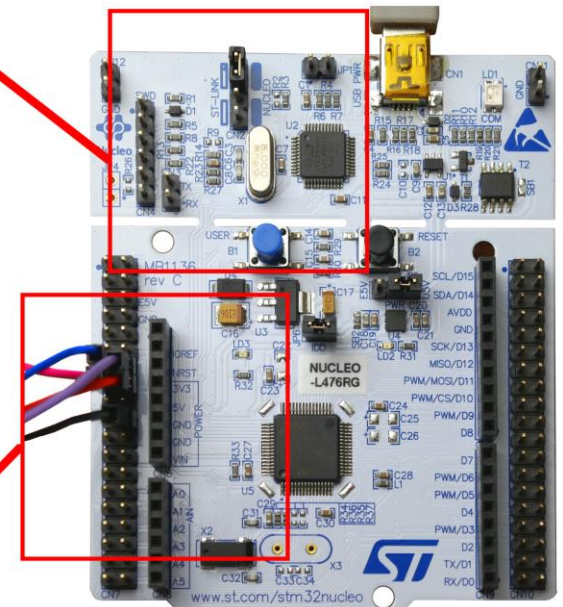
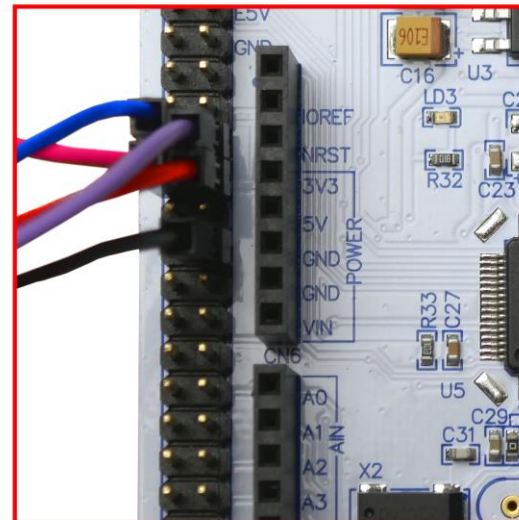
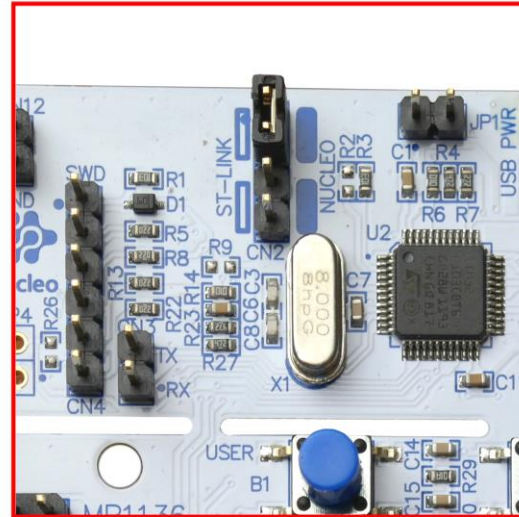
## TapNLink Primers



Type	Signal	5-pin header	wire	10-pin header (ARM)
Power	Vcc3.3	1	Red	1
Power	Gnd	2	Black	3, 5, 9
Digital	CLK	4	Pink	4
Digital	IO	3	Blue	2
Digital	RST	5	Purple	10



## Nucleo Example



## Nucleo Example

	...	Morpho Connector - CN7	...	
Blue wire (SWDIO)	Pin 13 (PA13)		Pin 14 (NRST)	Violette wire (NRST)
Pink wire (SWDCK)	Pin 15 (PA14)		Pin 16 (+3V3)	Red wire (Vcc)
	Pin 17		Pin 18	
Black wire (GND)	Pin 19 (GND)		Pin 20	
	Pin 21		Pin 22	
	...		...	

# Install Tap Manager on Your Mobile



## Tap Manager

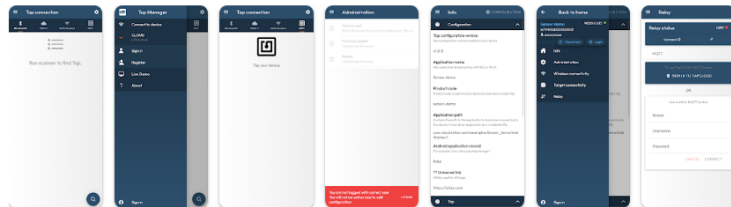
IoTize SAS

100+ Downloads

Everyone

Install on more devices

This app is available for all of your devices



## Tap Manager

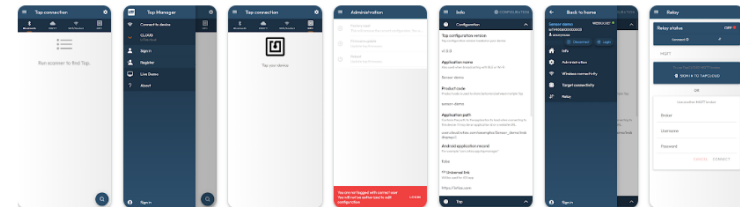
IoTize SAS

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Install on more devices

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## NFC Tap to Connect

( NFC smartphone  
Approach to 3cm  
Automatic connection )



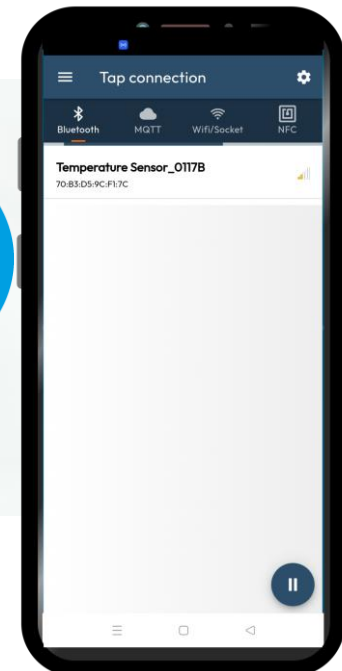
## Scan in Tap Manager for:

Bluetooth

( No Pairing Code )

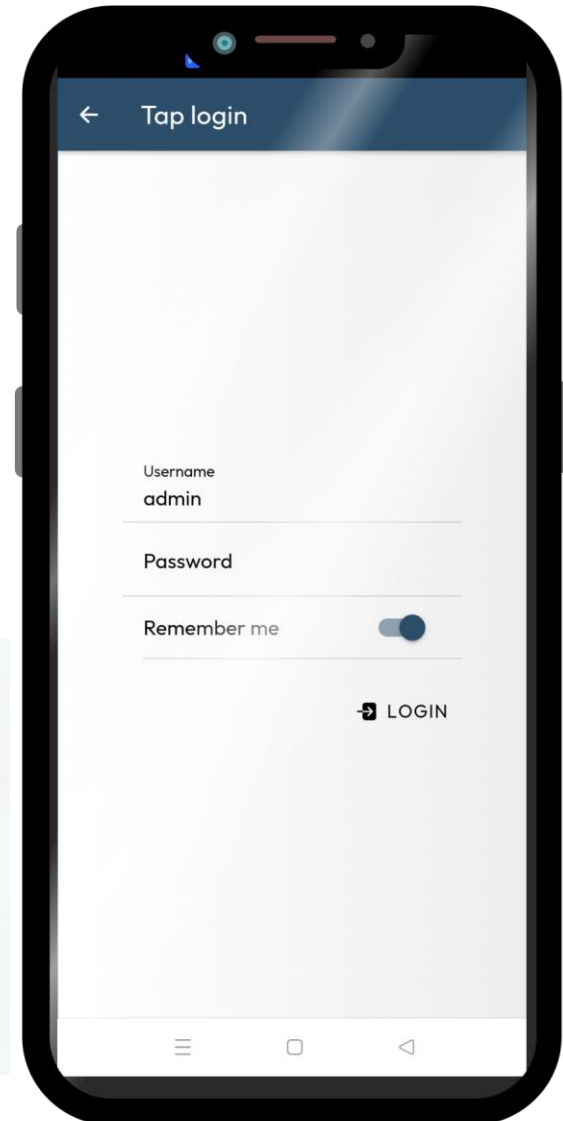
Wi-Fi hotspot

( WPA: ABCD1234 )



## Administrator Access

( Password: admin  
Login: admin )

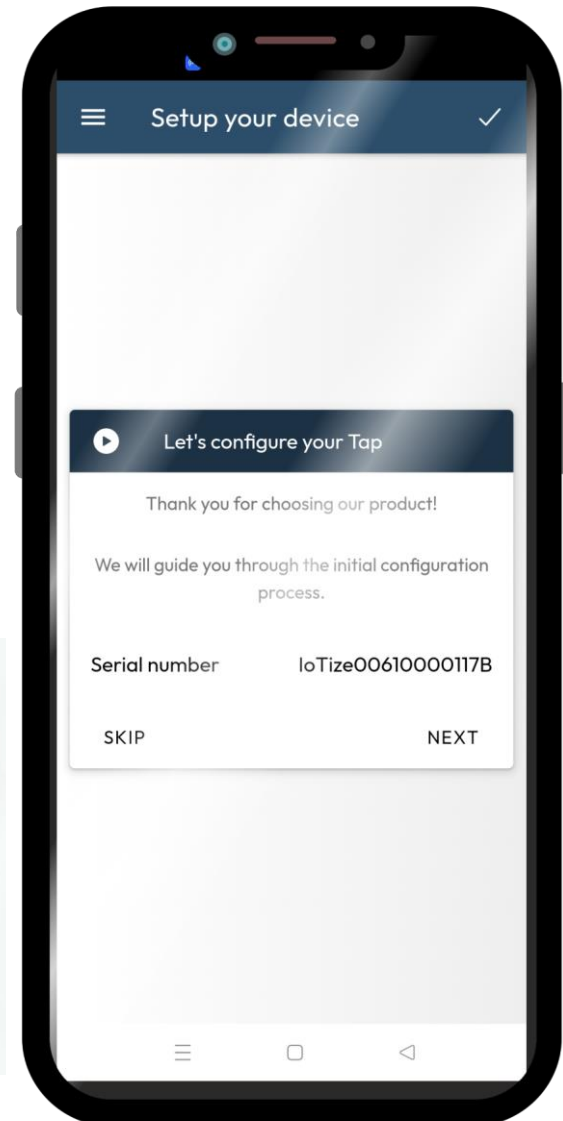


## Configuration Wizard

Detects TapNLink is not Configured

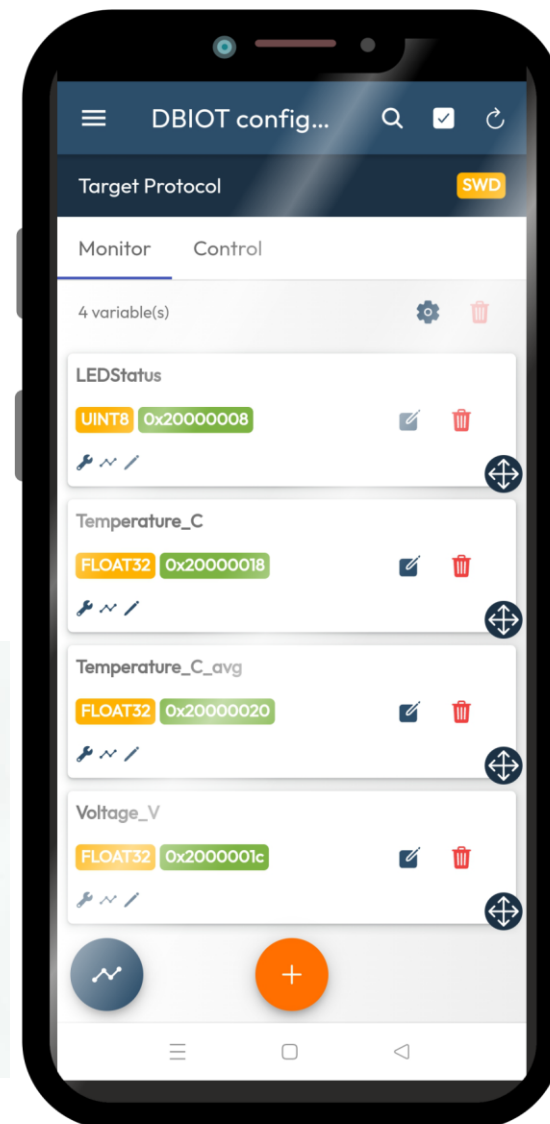
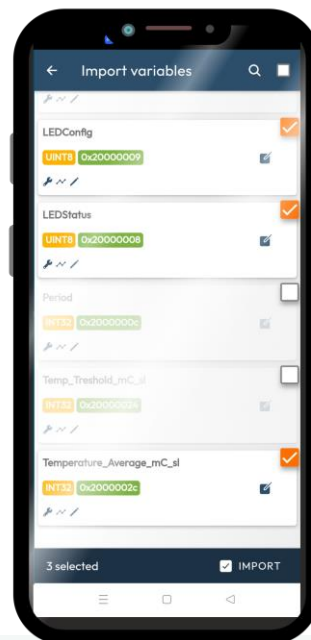
- Select the Model
- Create TapCLOUD account (optional)
- Name your TapNLink
- Configure WAN (optional)
- Select MQTT (optional)
- Select Target Protocol (SWD)
- Select SVD file for MCU (optional)
- Select ELF file for firmware \*\*\*
- Select Variables

**This Configures TapNLink**



## Select Using ELF file

- ELF file generated with debug symbols
- Select variables you are interested in
- You can always add more variables later

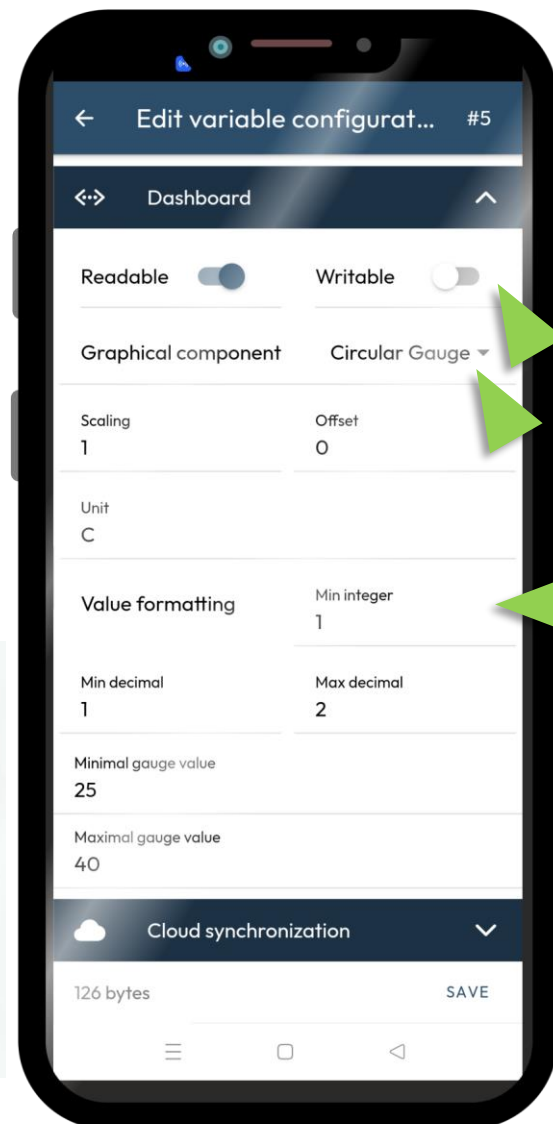


*Note: SVD files allow similar import of MCU registers.*

## Set Variable Displays

Without graphic configuration, displays numeric values

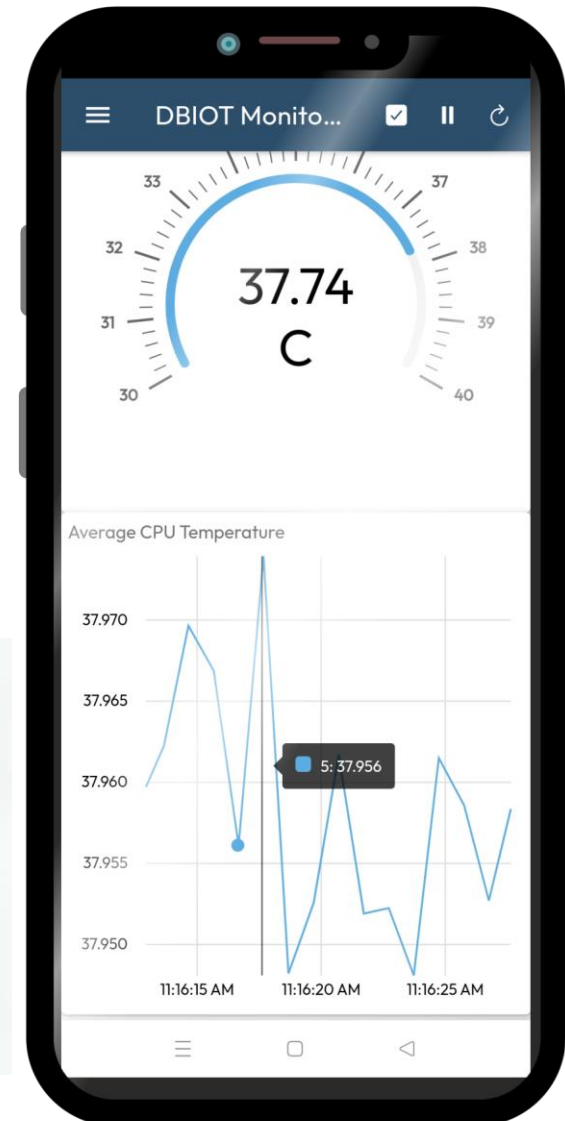
- Display name
- Access type (read/write)
- Graphical display type & parameters
- Organized variables in pages

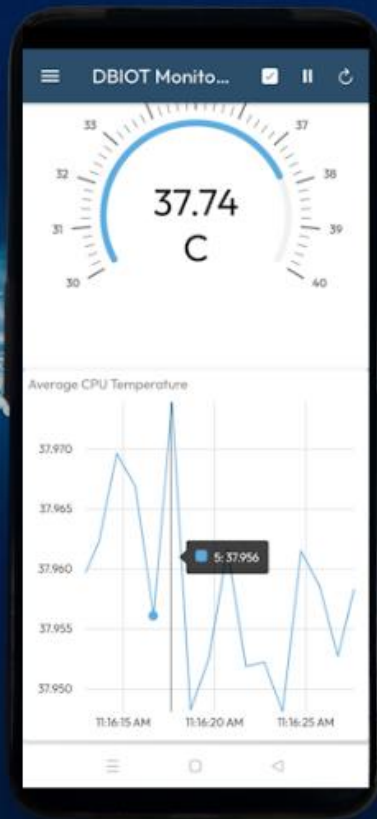
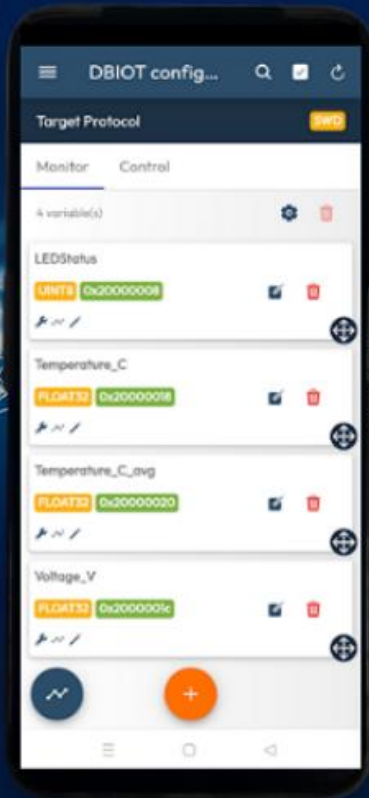




## Your HMI for Your System

- Launched at each connection
- Modifiable at anytime
- Requires Tap Manager app





**Just Connect  
& Configure**



## Need More? That's Normal...

- Create autonomous, branded app

No Problem! Configuration is compatible with IoTize complete solution (IoTize Studio & App Generator). Generated app project gives you full control of graphics, styles, splash screen. Generate publishable apps for iOS & Android.

- Drive components & sensors directly

No Problem! Go to the full solution for access to the embedded Virtual Machine in TapNLink. With a few lines of Java, TapNLink can be your CPU and directly drive external sensors and actuators. Examples at: <https://support.iotize.com/>

- Send data to the cloud platform

Data logging to Cloud platforms is being integrated into Tap Manager. This feature is being tested currently.

[www.iotize.com](http://www.iotize.com)



# Questions

## Recognized for Innovation





# Thank You



## Francis Lamotte

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**END**