Mobile configuration, service, and diagnostic access to CAN systems

The solution from IoTize brings secure mobile access to CAN systems from phones and tablets. CAN data can be visualized on and created from Android and iOS platforms using an app builder.

When it comes to access from mobile platforms like phones and tablets to CAN systems, then so far solutions often required customize coding to exchange data with and visualize on Android or iOS platforms. The latest solution by IoTize simplifies the process and brings easy and secure mobile access to CAN systems based on a combination of NFC, Bluetooth, and WLAN communication. The Tapioca gateway illustrated in Figure 1 has just 5 connections (Power, CAN, shield) and measures 8 cm x 5 cm x 2 cm. It is equipped with multiple wireless interfaces: NFC, Bluetooth, and WLAN.

The Tapioca hardware interface is only one of the devices of the entire solution provided by IoTize. The configuration of the interface is handled in the IoTize Studio software provided at no extra charge. It can import the commonly used “candb” format which is used to define signals in CAN frames. The imported data immediately allows selecting signals from the CAN system by point and click. The integrated app builder allows connecting graphical input and output elements to the selected signals. A locally generated HTML page shows the layout as it will later be presented in the app. The screenshot in Figure 2 shows the “Resource View” of the software with the imported signals.

From CAN data base file to your custom app

Figure 3 illustrates the workflow involved to create a mobile app to access your CAN system. First you need a candb/dbc file with the CAN signals in your system. Import this to IoTize Studio. In IoTize Studio, configure your mobile app. Which signals are used and displayed where and how? All imported signals can be selected and associated with a graphical element such as gauge, slider, chart, pie, and others. Further configuration includes which of the communication channels (NFC, BT) are used. Once you com-

![Figure 1: IoTize Tapioca communication interfaces (Source: Emsa)](image1)

![Figure 2: IoTize Studio configuration software with imported signals and app preview (Source: Emsa)](image2)
completed the configuration, it can be transferred to the IoTize server building to your custom app that you need to download and install on your mobile device. The same configuration is also transferred to the Tapioca device(s) that later provide(s) the access to the CAN system.

After the app is installed and access has been granted (e.g. through NFC authorization), the mobile app can connect to the gateway and display and set the configured signals.

**Access management**

Access authorization is managed by creating user profiles in IoTize Studio. The user profiles are loaded into the Tapioca devices as part of the configuration data. Only mobile apps that authenticate themselves with the proper user profile credentials get access to the gateway and ultimately to the CAN system. As shown in Figure 4, no servers are required for the login process.

The configuration loaded into the Tapioca interface may contain a custom Java program. On this level, Java has full access to all signals and also to the various wireless interfaces. This is illustrated in Figure 5. Using MQTT services, data signals can be transferred securely via an MQTT broker, allowing the mobile app to also access the CAN system remotely. Another potential use case could be to use the locally-connected mobile device as an Internet gateway and transfer signals to a cloud using MQTT services. If the Tapioca interface is directly connected to a hotspot, such transfers can also happen directly, without the mobile device being present.

**IoTize and Emsa**

Emsa supported IoTize in CAN-related matters as a consultant and helped them with a CAN and potentially CANopen interface for their product line. Emsa accompanied them to define and test the first prototypes. For the IoTize CAN hardware, Emsa will also operate as a distributor.

**Security**
CiA email-services

A word from the CiA Managing Director

The year of CiA's 30th anniversary is coming to an end. In June, we held a wonderful half-day birthday event and invited several old and new CiA colleagues. After two years of Covid-related meeting restrictions, the event was very welcome. This year, CiA published its annual report (EN, DE, and SP). The success was unprecedented, but with the still existing travel restrictions we were rather satisfied. It was not that bad (British understatement).

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