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.

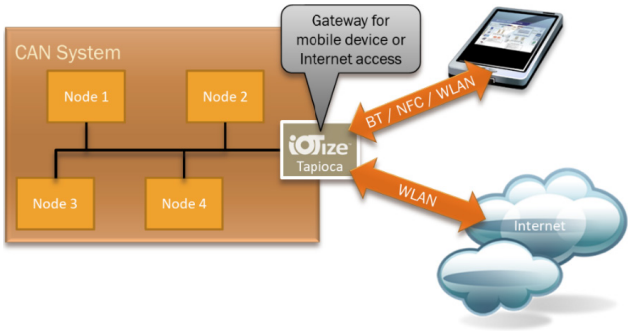

Figure 1: IoTize Tapioca communication interfaces (Source: Emsa)

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- ▷

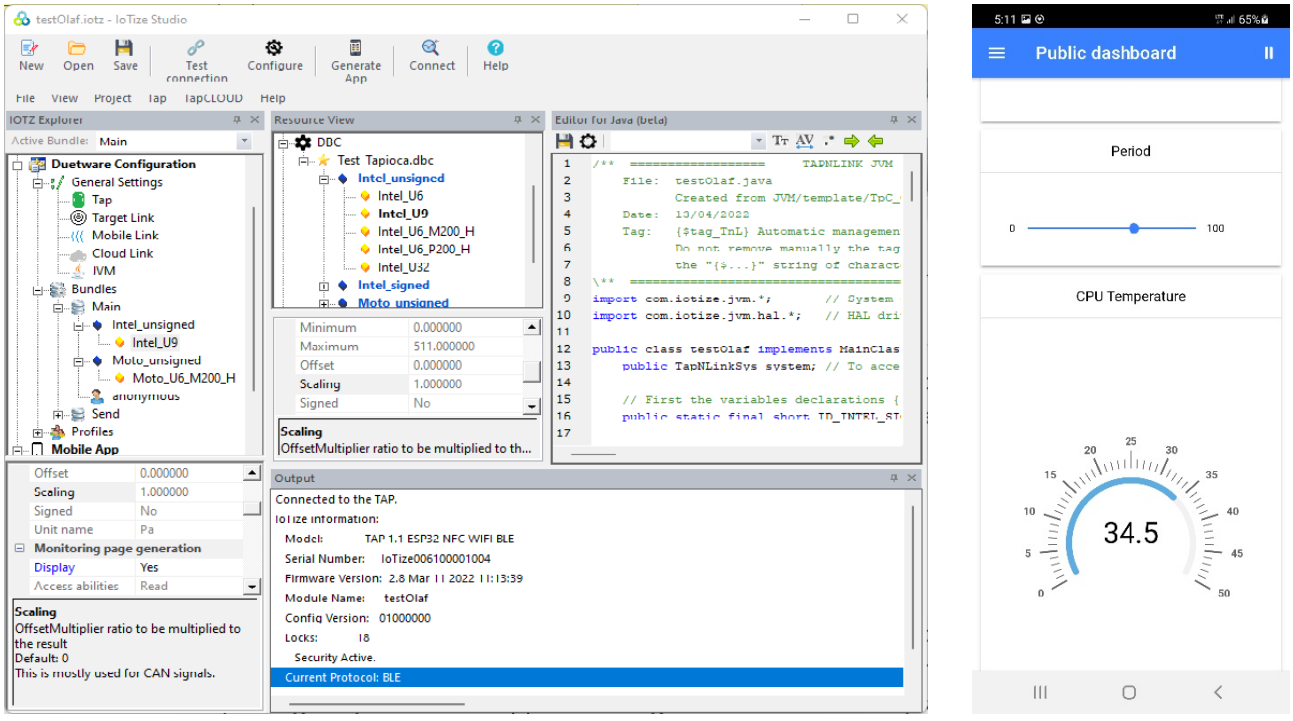

Figure 2: IoTize Studio configuration software with imported signals and app preview (Source: Emsa)

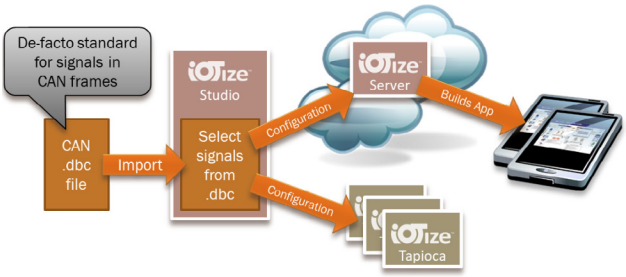

Figure 3: IoTize configuration workflow (Source: Emsa)

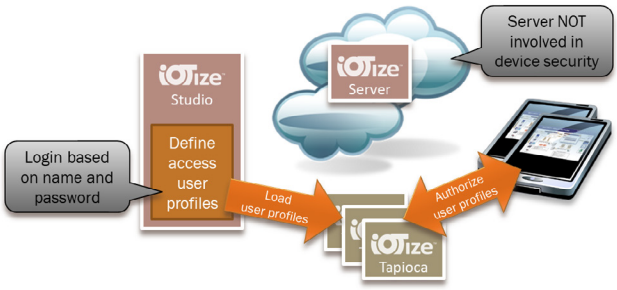

Figure 4: IoTize login and authorization (Source: Emsa)

pleted 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.

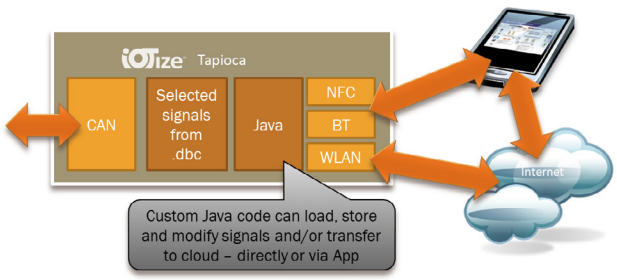

Figure 5: Advanced automated signal handling with Java (Source: Emsa)

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 distributer. ◀

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CiA email-services

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CAN Info Mail

This monthly email is for all CAN fellows

December 2022

A word from the CiA Managing Director

The year of CiA's 30th anniversary is coming to its end. In June, we had a wonderful two-day birthday event. I met in person old and new CiA fellows. After two years with just online meetings because of the Covid-19 pandemic, this was very pleasing. In this year, CiA participated again in some trade shows (Innotrans, Bauma, and SPS). The success was not overwhelming, but with the still existing travel restrictions we were rather satisfied: "It was not that bad" (British understatement).

(Source: Adobe Stock)

December issue of CAN Newsletter magazine

The fourth and last issue of the free-of-charge CAN Newsletter magazine 2022 has been released. It continues with the "history and trends" series featuring 'CAN in healthcare' and 'CAN in non-automotive applications'. CiA's Holger Zeltwanger gives an outlook on 'CiA's future and CAN XL'. A range of applications reports are also provided and include: 'CAN-based drive control for a robotic manipulator', 'Showing that electric aviation is possible and beyond', 'Converting mixed sensor data to CAN (FD)'.

Topics such as 'The new dynamic parameters of CAN SIC' and 'CAN transceiver fault detection with algorithm' are also covered. Additionally, 'Securing CAN: Introduction to CryptoCAN' and 'Mobile configuration, service, and diagnostic access to CAN systems' comprise the magazine. Brief news are provided in the section standards and specifications.

The articles can be downloaded individually or you can download the entire magazine.

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CiA Member News

This monthly email is for CiA members only.

November 2022

A word from the CiA Managing Director

CAN SIC (signal improvement capability) transceivers as specified in CiA 601-4 are gaining acceptance. The benefit is obvious: The system designer has more flexibility regarding network topologies including the length of not terminated stubs, and the network overall length at a given arbitration bit rate. But there is also a trade-off related to the CAN SIC concept: a limitation of the arbitration bit rate as explained in Annex A.1 of CiA 601-4. Rational is, that multiple nodes execute the "Active Recessive Drive" to the network lines while another node continues to drive the network lines to dominant. Since all nodes need to read dominant state of the winning node for the arbitration process, all "SIC" nodes driving "Active Recessive" need to have finished their SIC time before the sample point is reached for all nodes all over the network. This limits either the arbitration bit rate respectively the maximum node distance although the SIC transceivers provide a shorter loop delay of 190 ns compared to classic (high-speed) CAN transceivers requiring up to 255 ns. These arbitration bit rate limitations do not apply, if all nodes of the network change to recessive at the same bit position.

Bauma 2022 review

CiA has been a part of the Bauma tradeshow for construction, building materials, and mining machinery industries in Munich (October 24 to 30, 2022). We reported about the CAN-related novelties from the fair in our CAN Newsletter Online.

CiA home game: SPS 2022

CAN in Automation has also successfully participated at the SPS exhibition, hosted in its home-town Nuremberg from November 08 to 10, 2022. About 70 product panels from 31 CiA member companies have attracted visitors to the CiA stand.

The CAN Newsletter also published several articles on products and developments found regarding CAN.

In case you like to receive an monthly update on:

- Latest trends in CAN-based networking
- In-depth articles about CAN-based solutions
- CiA events
- CAN products
- CiA community
- Participation opportunities in CiA activities

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