

1.6.4.5 Network Diagram with Problematic Node

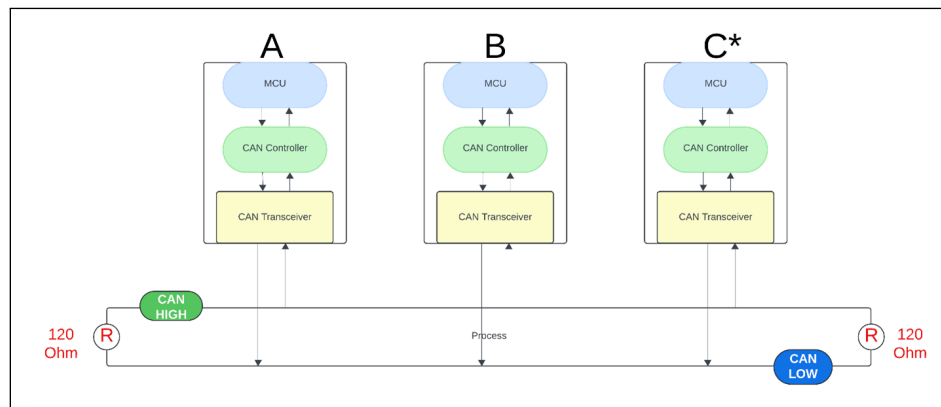


FIGURE 1.59 – CAN Bus Network with Three Nodes and Termination Resistors

* Node C identified as problematic

1.7 The KIT AURIX TC265 TFT

The KIT AURIX TC265DE is a versatile development platform designed around the Infineon AURIX TC26 TFTmicrocontroller, tailored for advanced automotive and industrial applications. This strategic report explores its key features, market positioning, and strategic advantages.

1.7.1 Key Features and Capabilities

The KIT AURIX TC265 TFT leverages the following core features :

- **Microcontroller Powerhouse** : Powered by the AURIX TC26xD, featuring dual 32-bit TriCore CPUs running at up to 200 MHz. It boasts up to 2.5 MB of Flash memory and 240 KB of RAM, ideal for handling complex computations and real-time processing.
- **Display and Storage** : Equipped with an XGA LCD display (320x240 pixels) and a microSD card slot, enabling advanced graphical user interfaces and robust data storage capabilities crucial for HMI applications.
- **Communication Interfaces** : Includes Ethernet PHY for high-speed networking, LIN transceiver for automotive field buses, and high-speed CAN transceiver for reliable and real-time control networks. These interfaces facilitate seamless integration into complex systems requiring robust communication protocols.
- **Additional Components** : Features such as a Real-Time Clock (RTC) with alarm, SRAM, and a unique MAC ID enhance time-sensitive data management. It also includes a micro-USB

connector, buzzer, LEDs, and push-button for versatile user interaction and system monitoring.



FIGURE 1.60 – The KIT AURIX TC265 TFT

1.7.2 Market Positioning

The KIT AURIX TC265 TFT is strategically positioned in the following markets :

- **Automotive Industry** : Positioned for critical automotive applications requiring high reliability, performance, and robust communication capabilities. Applications include engine control, chassis control, and advanced driver assistance systems (ADAS).
- **Industrial Automation** : Suited for industrial automation applications demanding real-time data processing, secure communication, and scalability. It finds applications in robotics, industrial IoT (IIoT), and smart factory environments.
- **Emerging Technologies** : Supports emerging technologies such as smart cities, autonomous vehicles, and renewable energy systems where reliability, performance, and connectivity are paramount.

1.7.3 Strategic Advantages

The strategic advantages of the KIT AURIX TC265 TFT include :

- **High Performance and Reliability** : Offers dual TriCore CPUs and extensive memory capabilities, ensuring robust performance in demanding environments.
- **Versatile Connectivity** : Provides a wide range of communication interfaces, enabling integration into diverse systems and networks.
- **Scalability and Flexibility** : Modular architecture allows customization and expansion to

meet evolving application requirements, enhancing long-term viability and adaptability.

- **Developer-Friendly Environment** : Supported by a comprehensive software development ecosystem including IDEs and toolchains, facilitating rapid prototyping and efficient development cycles.

1.7.4 CAN in KIT AURIX TC265 TFT

The KIT AURIX TC265 TFT board does indeed integrate a high-speed CAN transceiver to enable communication via the CAN bus. Specifically :

- The CAN0 component on the board is a high-speed CAN transceiver.
- It is connected to a 10-pin header (2x5) on the board to facilitate CAN connections.
- The AURIX TC26xD microcontroller at the core of the board manages CAN communications via this CAN0 transceiver.

=> Therefore, to communicate through a CAN bus, the KIT AURIX TC265 TFT board does have the necessary CAN transceiver integrated directly on the board. This allows the platform to easily interface with other nodes on a CAN network, which is essential for automotive and industrial applications.

Transceiver :

High-Speed CAN Transceiver : Infineon TLE6250 G

LIN Transceiver : Infineon TLE7259-2GE

Ethernet Gigabit PHY : PEF7071 (LANTIQ)

CAN Controller :

The CAN Controller is integrated into the main microcontroller, Infineon AURIX TC265.

Micro-Controller Unit (MCU)

Microcontroller : Infineon AURIX TC265 :

Architecture : TriCore™

Cores : Two 32-bit TriCore cores running up to 200 MHz

Memory : Up to 2.5 MB of flash memory and 240 KB of RAM

Package : LQFP-176

These components are essential for communication, control, and data processing in advanced automotive and industrial applications.



FIGURE 1.61 – The main components of the Kit AURIX TC265 TFT

1.8 CONCLUSION

In conclusion, this theoretical study highlights the essential role of proper impedance matching, termination, and noise mitigation in preserving the signal integrity of CAN bus communication. Our simulations have clearly demonstrated that adaptation issues and noise can lead to significant degradation in communication reliability, emphasizing the need for meticulous design and implementation in practical applications. The temporal analysis of the CAN bus, supported by robust error handling mechanisms, affirms the protocol's reliability and effectiveness in embedded systems. With an error detection capability that ensures less than one detected error per 1000 years of operation, the CAN bus stands out as a highly reliable communication solution. Its resilience in quickly recovering from interruptions and maintaining high performance underscores its suitability for a wide range of embedded applications, ensuring minimal disturbances and maximum operational efficiency.