Unveiling RFID

The project:

Radio-Frequency Identification (RFID) is a wireless technology that uses electromagnetic fields to identify and track tags containing electronically stored information. RFID systems consist of a reader and a tag, communicating through radio waves. RFID finds applications in various fields, including inventory management, access control, contactless payments, and more. Different frequency bands like LF, HF, UHF, and NFC cater to specific use cases based on their range, data capacity, and power requirements. This hands-on project dives into RFID fundamentals, practical experimentation focusing on and understanding of key concepts. Participants will explore NFC and UHF read ranges, analyze environmental influences on reading performance, measure NFC antenna parameters, and experiment with antenna tuning. Additionally, they will identify and experiment with various transponder types. For those interested in software, optional activities include exploring reader-transponder communication, writing a test program for an NFC reader, and programming transponder data



Smith Chart for NFC Antenna Tuning at 13.56 MHz

This comprehensive exploration of RFID technology will take you from fundamental principles to real-world application. We will delve into the physics of RFID, the intricacies of tag and reader design, and various communication protocols, establishing a strong theoretical foundation. Simultaneously, hands-on experimentation will bridge theory and practice, equipping you with practical skills in RFID hardware, software, and system integration. Going beyond technical proficiency, we'll examine RFID's diverse applications, ethical considerations, and emerging trends, cultivating a holistic understanding that empowers you to confidently navigate the dynamic landscape of RFID technology and implement effective solutions.

The goal:

Deep Dive into RFID Fundamentals:





Clearly state that the goal is to provide a comprehensive understanding of RFID technology, going beyond the basics.

Theory and Practice:

Emphasize the balanced approach of theoretical knowledge and practical experimentation.

Targeted Learning: Mention that the project is tailored for Smart Automation at FH Campus 02 in Graz.



13.56 MHz RFID Field Strength Probe by SANGOMA and GIHIC

The result:

By combining theoretical knowledge, hands-on experience, and a broad perspective on RFID applications and ethical considerations, participants will be well-prepared to design, implement, and manage effective RFID solutions that address realworld challenges across diverse industries.



Practical Implementation of RFID Systems

Measuring Maximum Tag Read Range from Antenna in Laboratory Setup

MEMBERS:

1) Laura Stockinger 2) Souad Bensekkou 3) Michael Dobaj 4) Seppi Mirzaei 5) Seifallah Maatar