CAN PROTOCOL

USE AND APPLICATION IN AUTOMOTIVE INDUSTRY

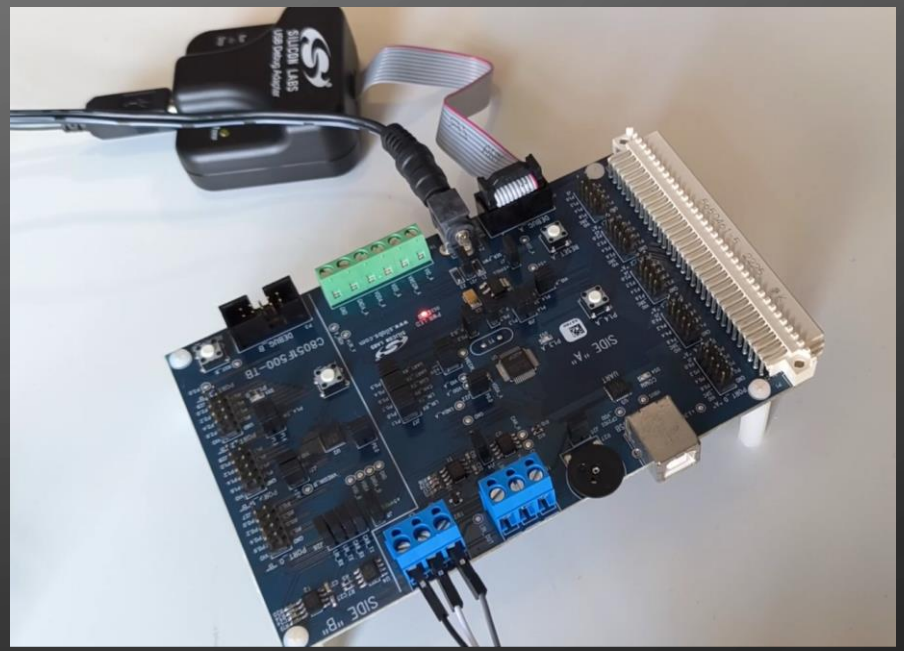
INTRODUCTION

- Controller Area Network or CAN is a robust serial communication bus found mostly in automotive and industrial environments. It uses a differential signal, which makes it more resistant to noise, along with a priority arbitration scheme for non-destructive message transmission. CAN is great for embedded applications that end up in hazardous environments or areas with a lot of electromagnetic interference.

- CAN is used as a standard for communication between Electronic Control Units or ECUs. It is also used for exchanging information among various vehicle subsystems.
- Advantages: High reliability, fault resistance and real-time communication
- Applications: Ignition sequence (preventin), Systems helping the driver, various sa SP, REF)

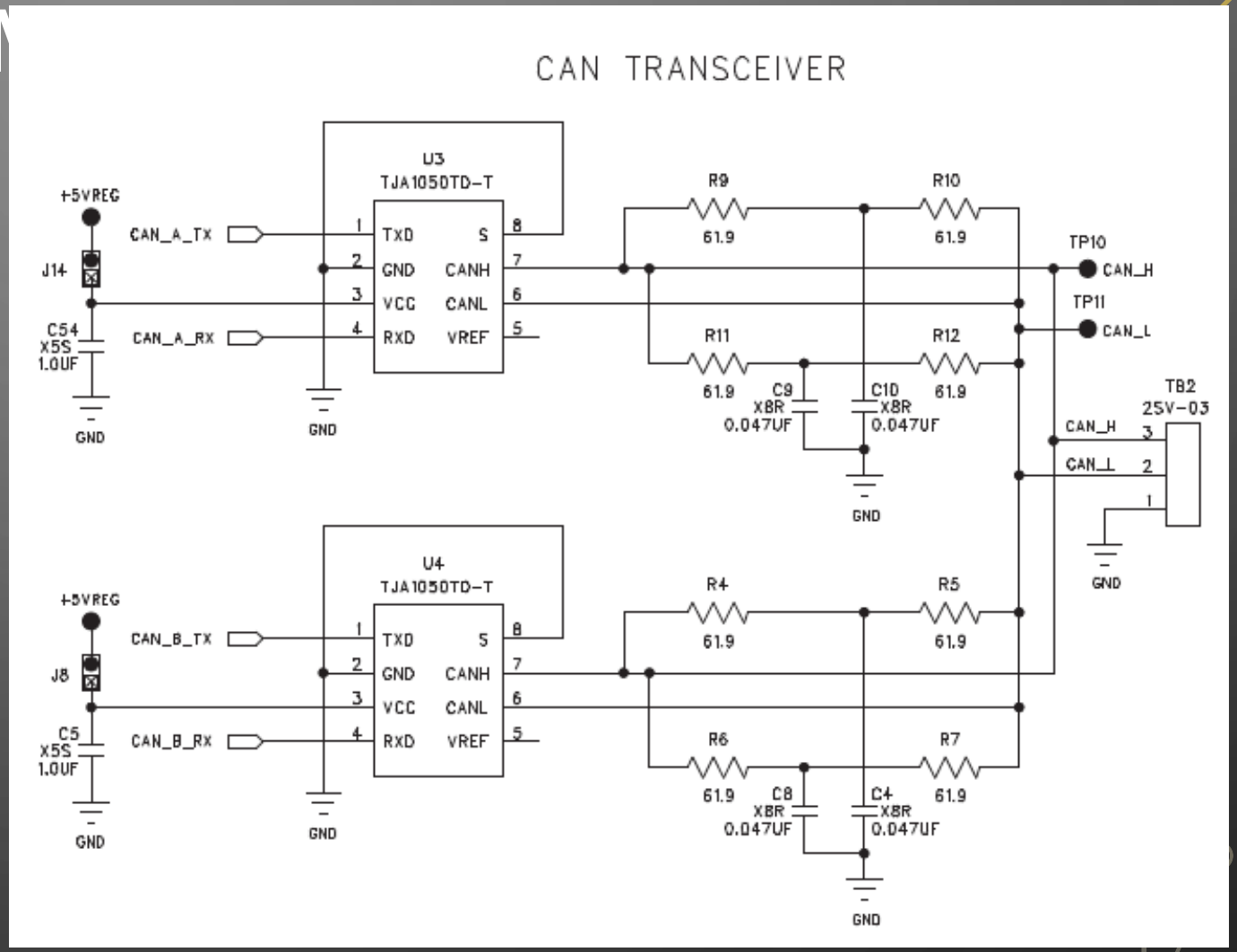
SIMULATION GOAL

- Main objective: Enabling LED on a different microcontroller via CAN protocol. Microcontroller A sends a command and microcontroller B receives it. CAN network is used for communication.



ELECTRONIC SCHE

- CAN transceiver: CAN_TX and CAN_RX are enabled via jumper connectors.
- Corresponding signals (High and Low as well as ground) enable communication between the two boards.



ELECTRONIC SCHEME

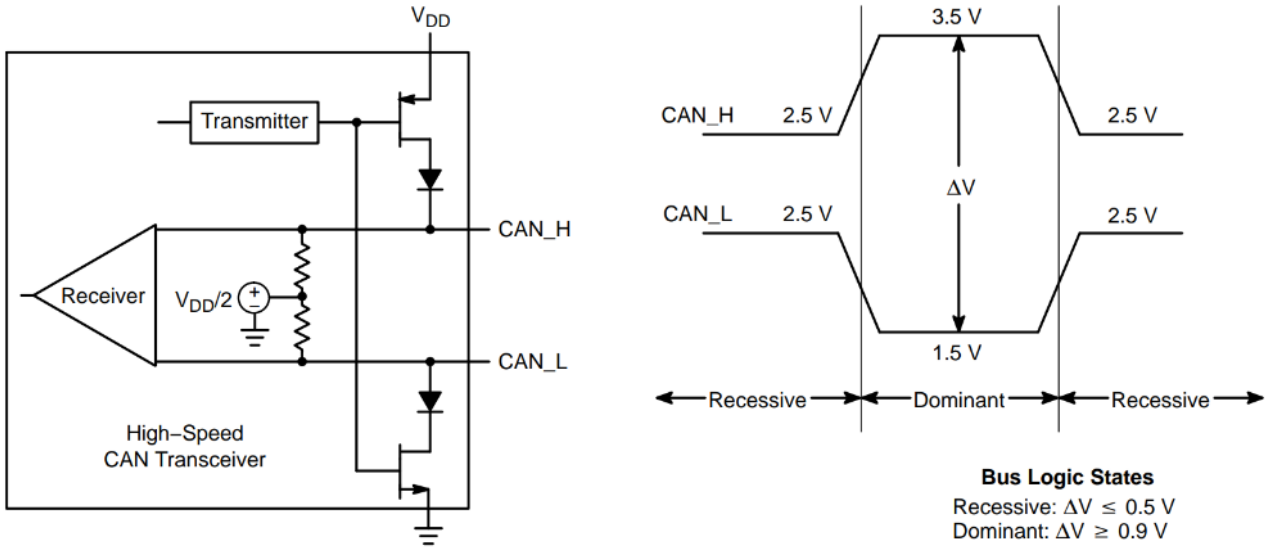
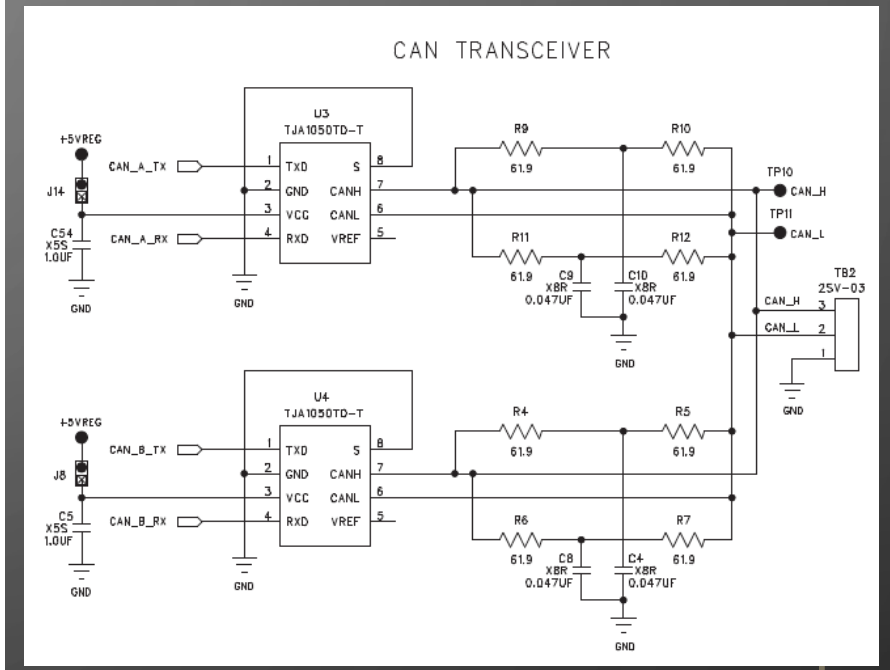


Figure 7. ISO 11898–2 Differential High–Speed CAN Bus



PREPARATION

- Before doing any work, it is essential to check the purpose of each pin from the spreadsheet.
- Needed pins are enabled via jumper connectors.

Table 5. CAN Interface Headers (J17 and J26) Description

Header Pins	CAN0 Pin Description
J17[5–6]	CAN_TX (P0.6_A)
J17[7–8]	CAN_RX (P0.7_A)
J26[1–2]	CAN_TX (P0.6_B)
J26[3–4]	CAN_RX (P0.7_B)

Table 6. TB2 External CAN Interface Header Description

Pin #	Pin Description
1	CAN_H
2	CAN_L
3	GND

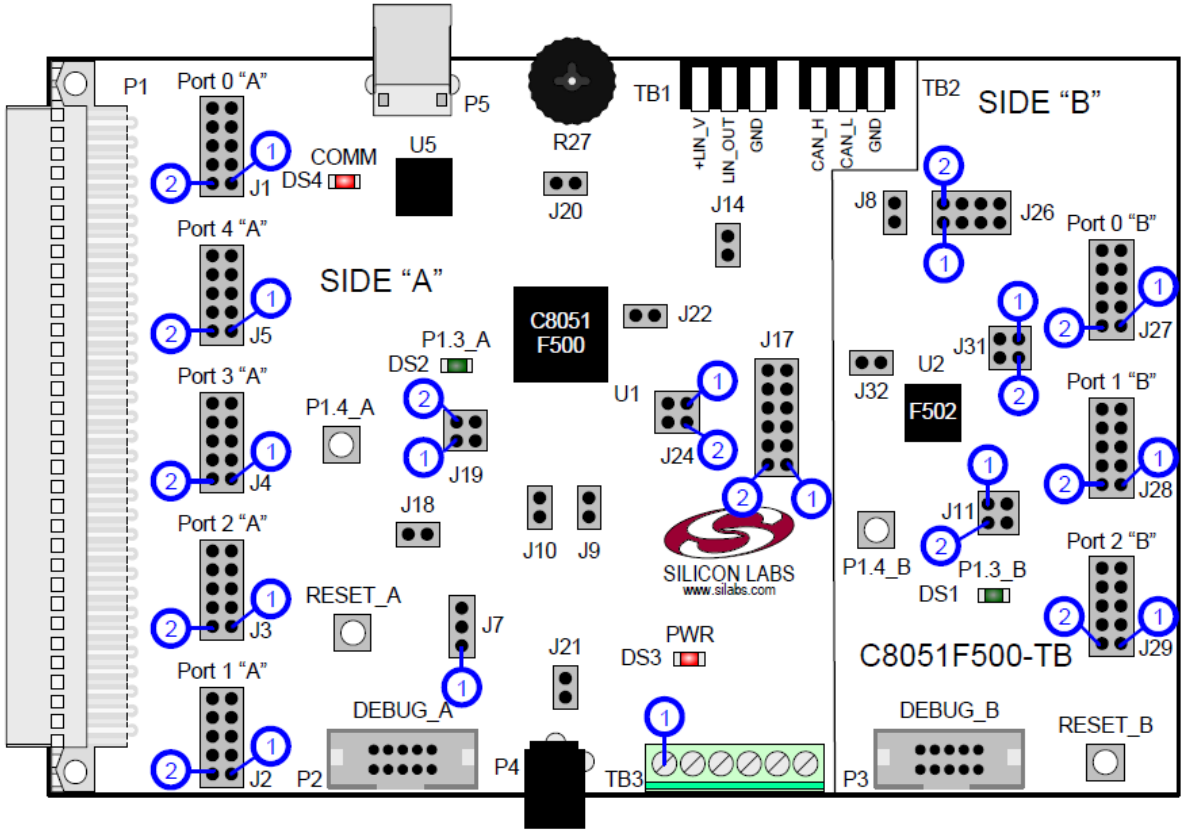
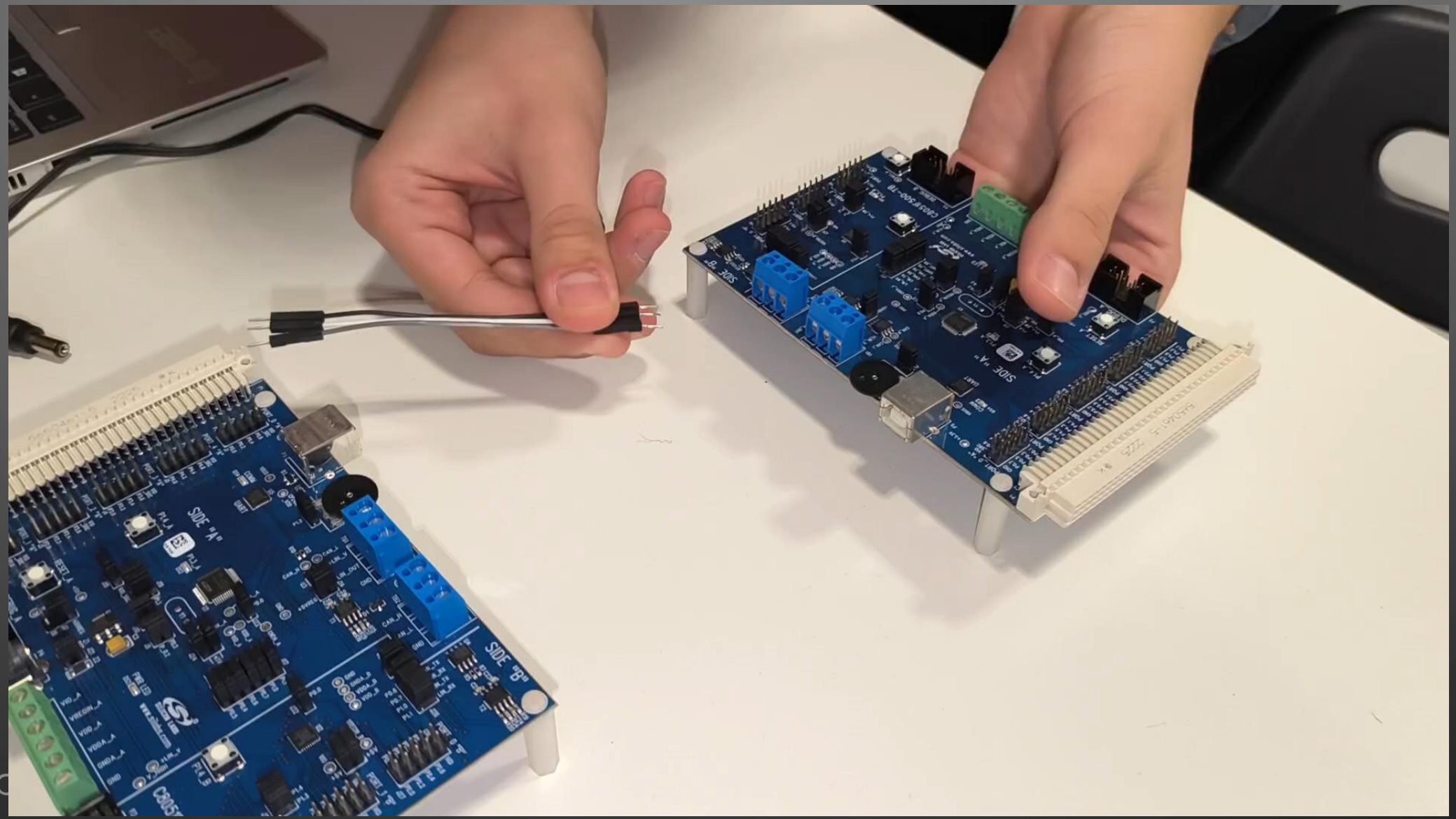
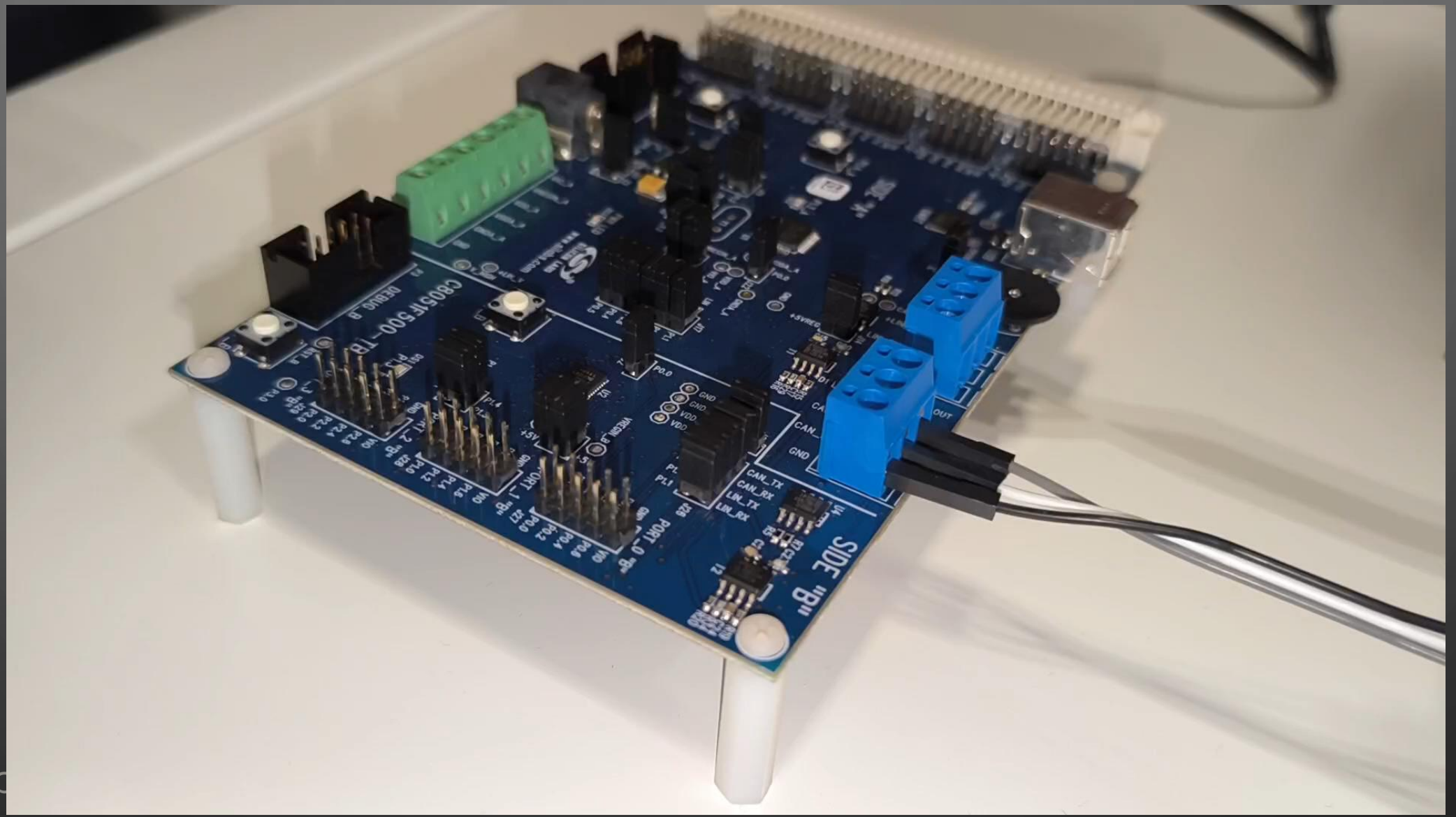


Figure 4. C8051F500 Target Board with Pin Numbers

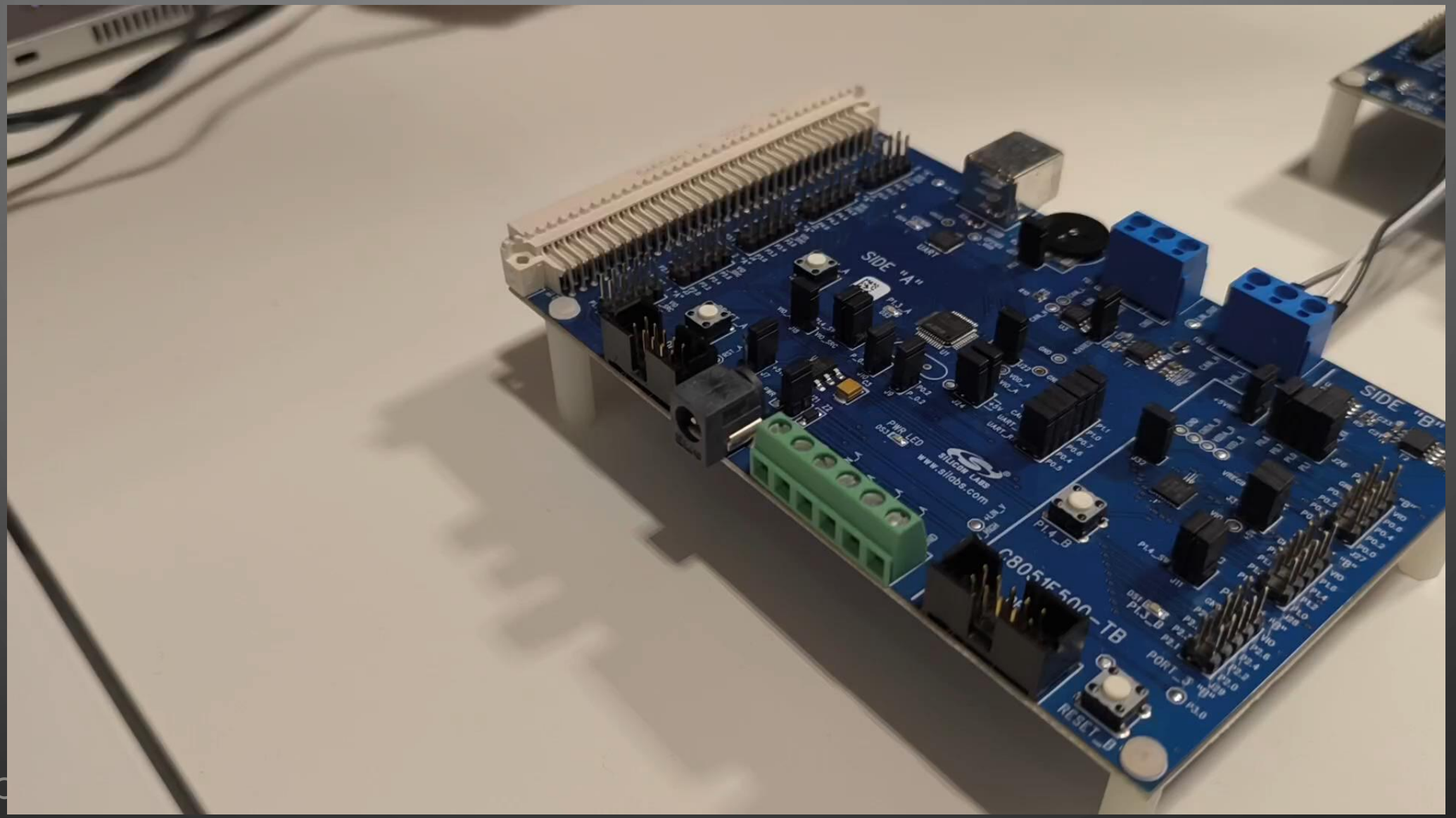
VIDEO



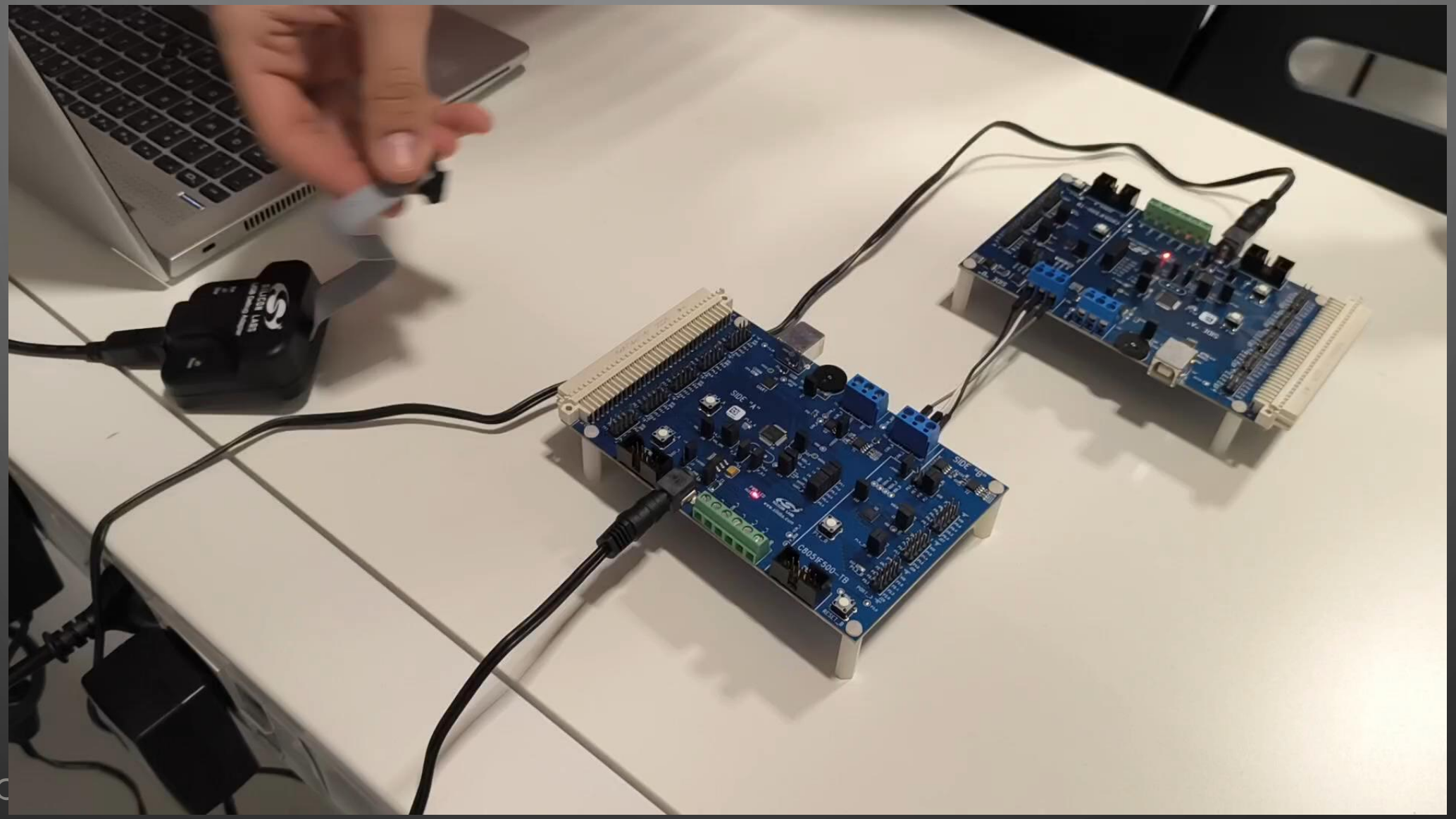
VIDEO


C8051F500-TB
DEBUG_B
PORT_0_B
SIDE "B"
CAN_TX
CAN_RX
LIN_TX
LIN_RX
GND
VDD
OUT

VIDEO



VIDEO



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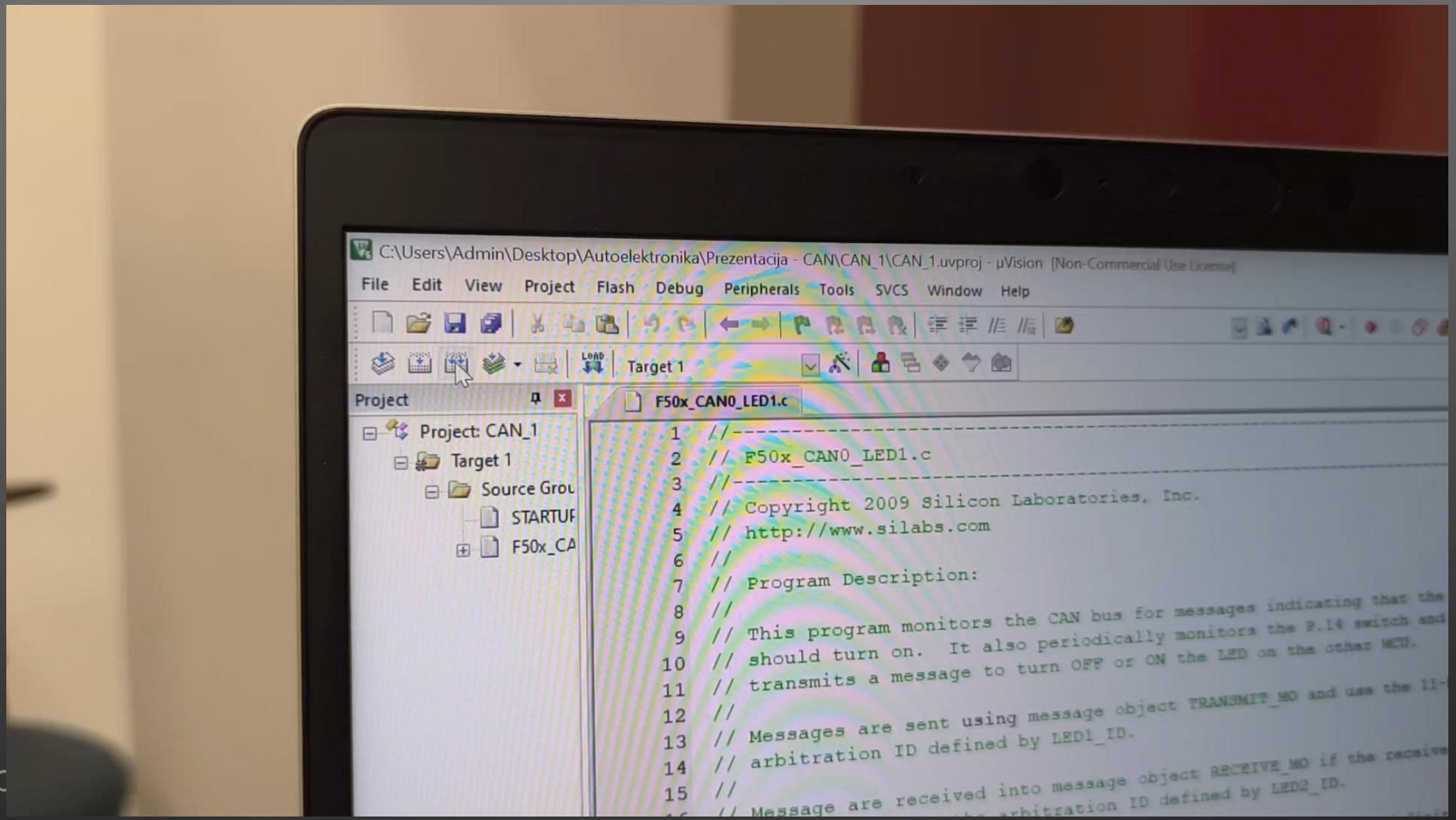
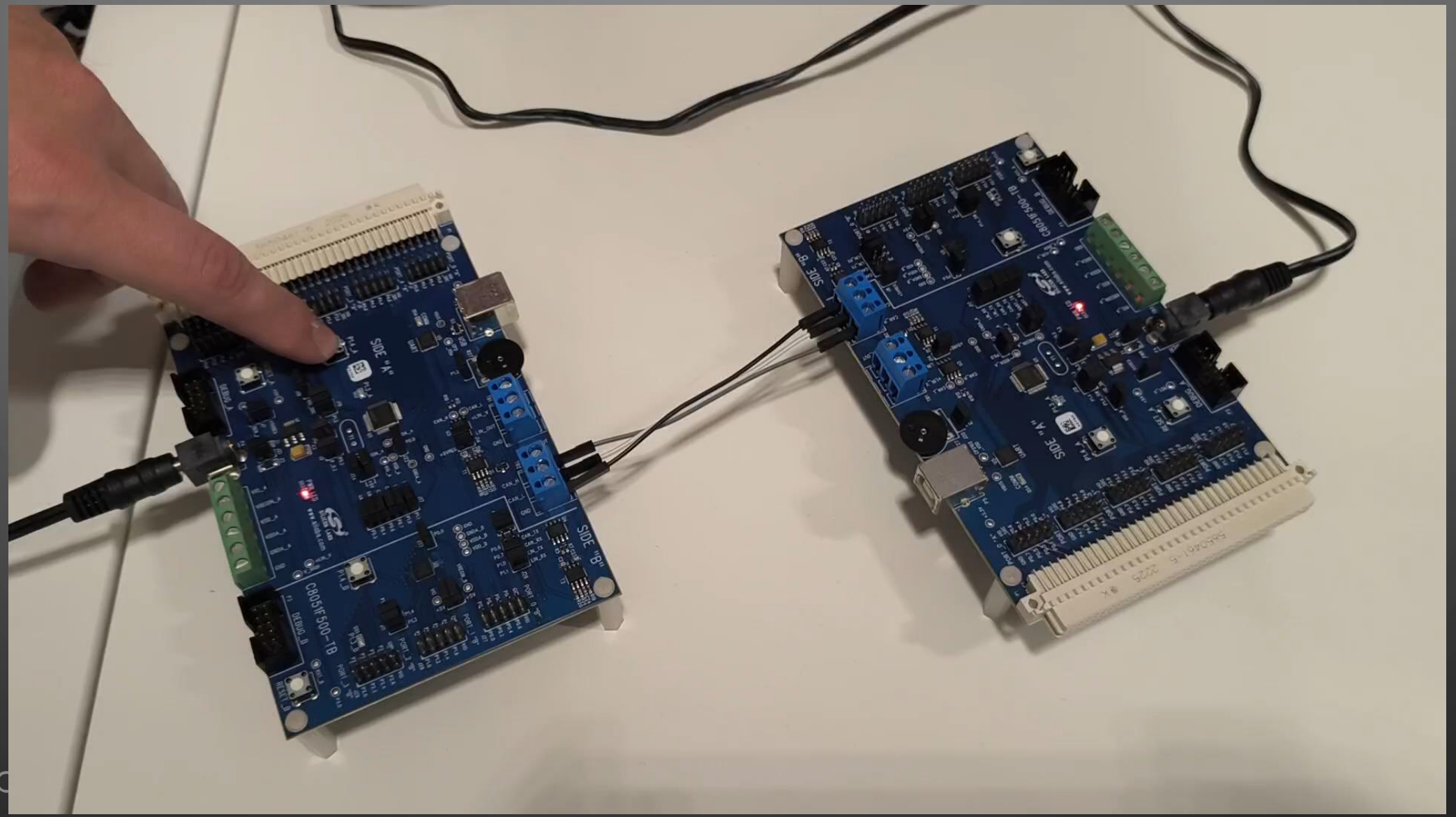

C:\Users\Admin\Desktop\Autoelektronika\Prezentacija - CAN\CAN_1\CAN_1.uvproj - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Target 1
Project
Project: CAN_1
Target 1
Source Grou
STARTUF
F50x_CA
F50x_CAN0_LED1.c
1 //---
2 // F50x_CAN0_LED1.c
3 //---
4 // Copyright 2009 Silicon Laboratories, Inc.
5 // http://www.silabs.com
6 //
7 // Program Description:
8 //
9 // This program monitors the CAN bus for messages indicating that the
10 // should turn on. It also periodically monitors the P.14 switch and
11 // transmits a message to turn OFF or ON the LED on the other MCU.
12 //
13 // Messages are sent using message object TRANSMIT_MO and use the 11-
14 // arbitration ID defined by LED1_ID.
15 //
16 // Message are received into message object RECEIVE_MO if the receive
arbitration ID defined by LED2_ID.

VIDEO



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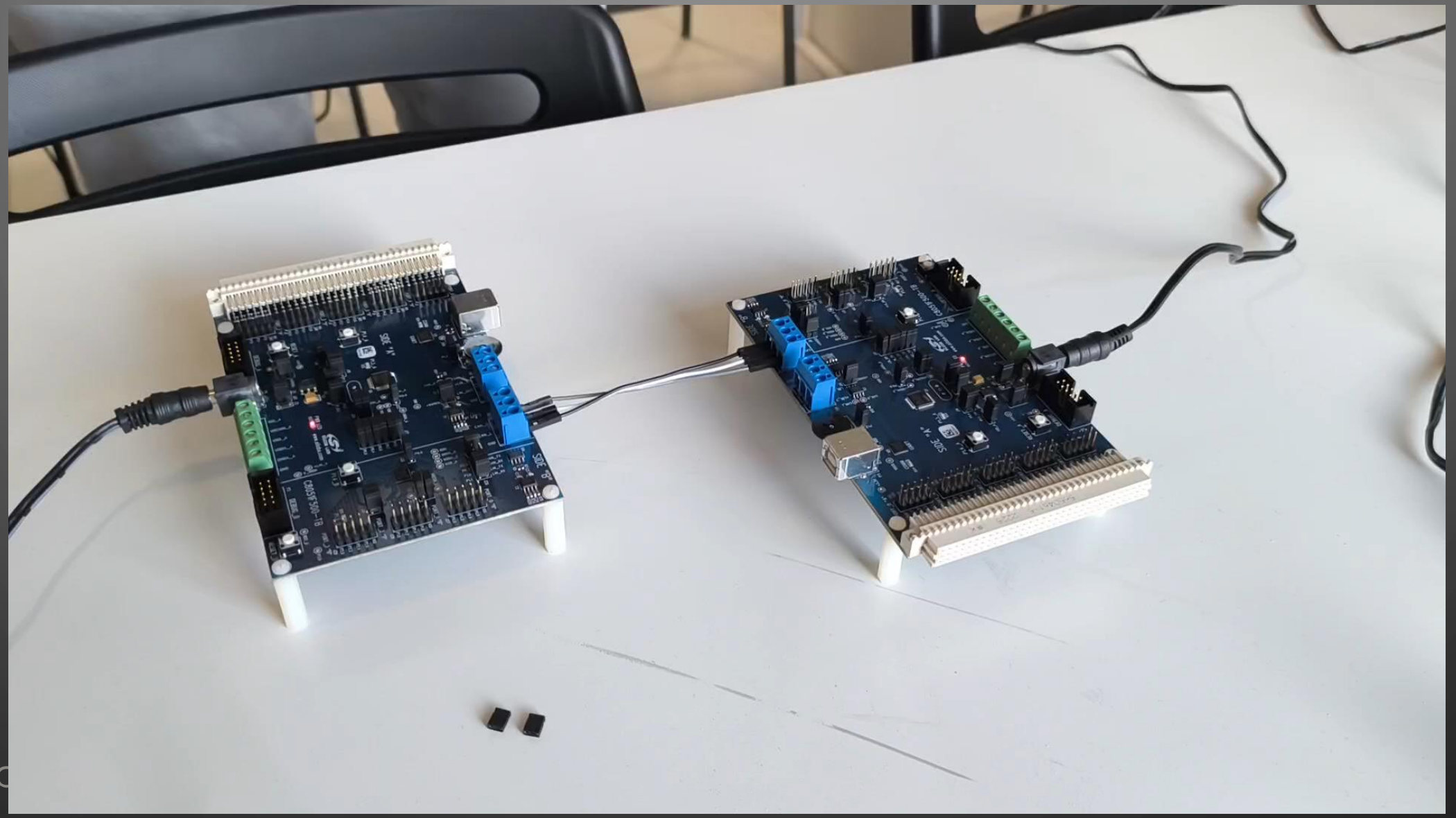

CONCLUSION AND DISCUSSION

- While the CAN protocol was designed for and is still used primarily in road vehicles, the vehicle bus format has been incorporated into aircraft, aerospace, and railway systems. CAN protocol has rightfully earned its place in automotive industry. It is fast, reliable, and doesn't require extensive programming knowledge to achieve wanted results.
- Questions, general discussion

THANK YOU FOR YOUR ATTENTION!