

TATA-340-PP40 MCU FUNCTIONAL TESTING PROCEDURE

Note : This document explains MCU software & hardware functional testing procedure and programming

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https://github.com/BhavaySen/TATA340PP40_MCU

1. SETUP FOR TESTING (TOOLS & EQUIPMENTS)

1. Power supply
Output Rating : 24VDC to 28VDC (Max. I/P limit of MCU : 28VDC),1A
2. Multimeter
3. DB09-Connector Interface Cable : For CAN-Bus and Power supply

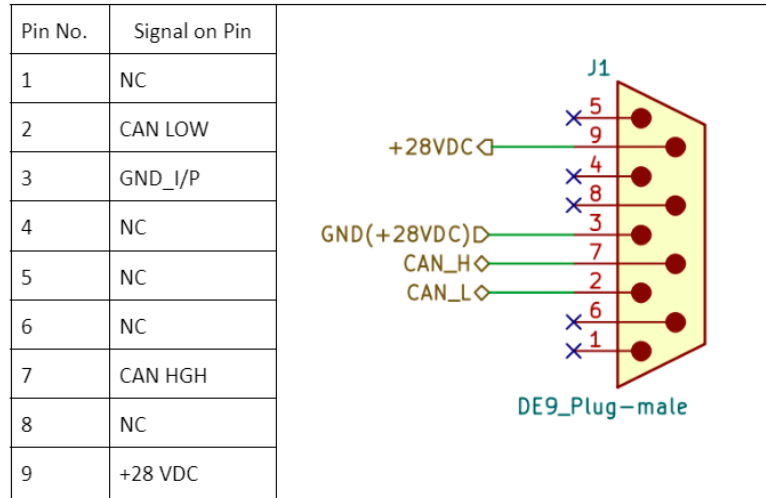


Fig. 1.1 DB09 Pinout

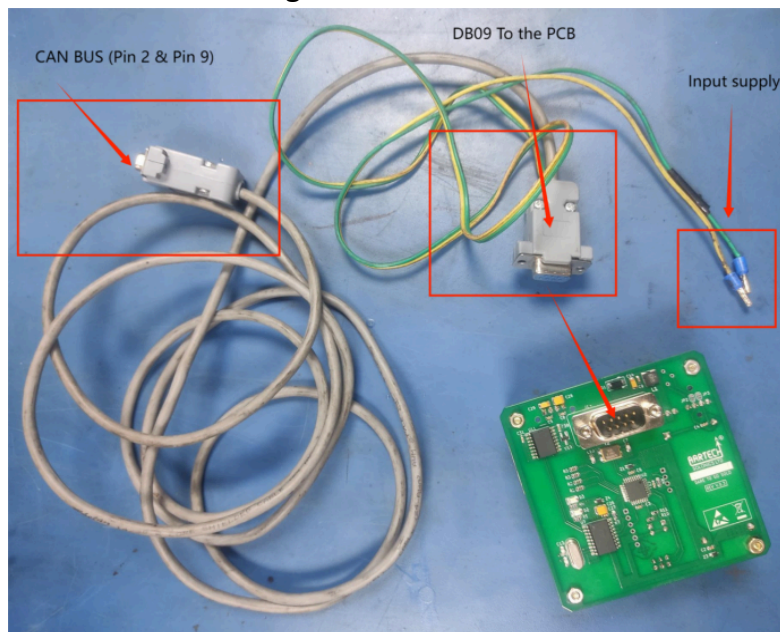


Fig. 1.2 Reference Cable Image

4. CAN READ NODE (Please refer to the documentation -Update here -)
5. USB-A to USB Micro-B CABLE
6. LAPTOP/WORKSTATION
7. AVRDUDE
8. Serial Terminal (Putty, Arduino serial, Termite etc)
9. AVR USB ASP PROGRAMMER and FRC cable
10. 6-Pin Modified Programming cable
11. UUT (Unit Under Test)

2. BLOCK DIAGRAM OF TEST SETUP

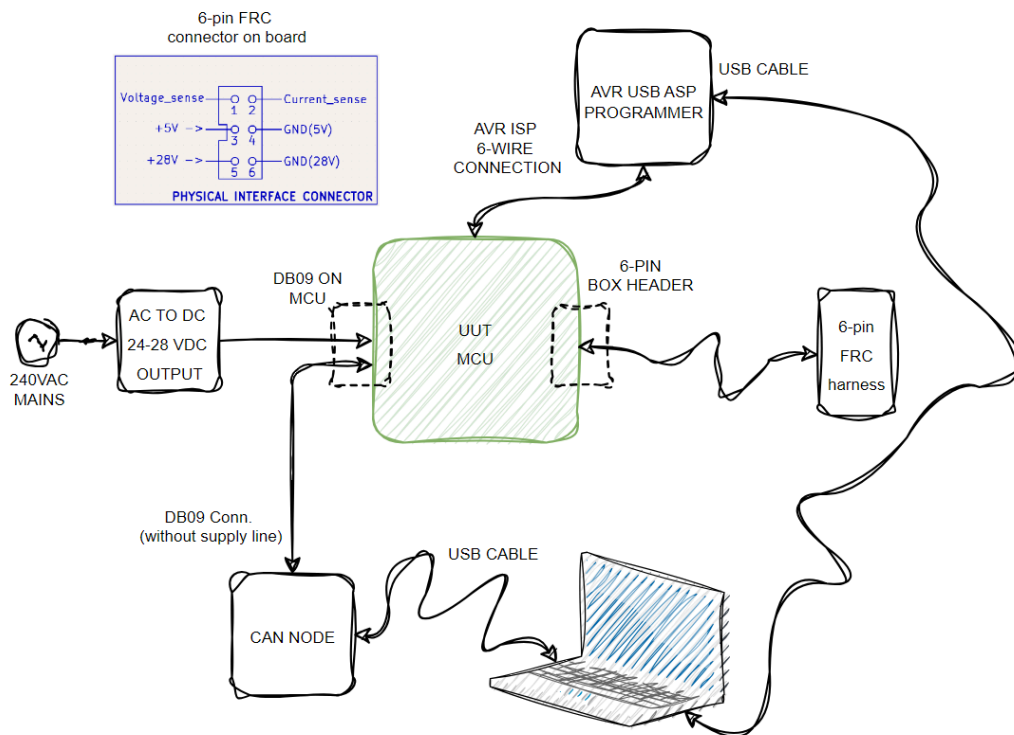


Fig. 2.1

3. PROGRAMMING THE MICROCONTROLLER

PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6
MISO	MOSI	SCK	RESET	+5V	GND

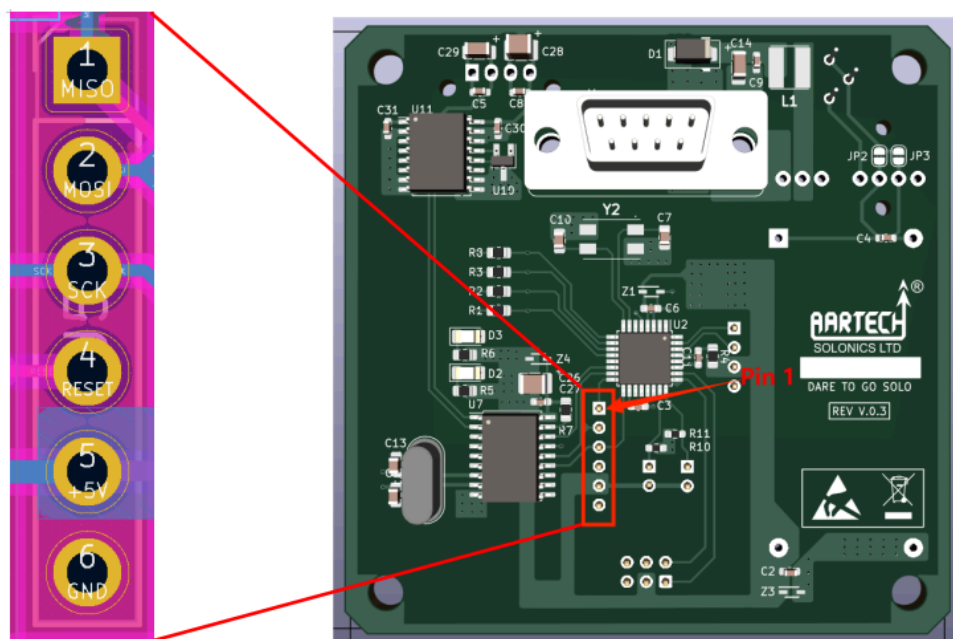


Fig. 3.1

Programming is done with ICSP in this card, to program the board we require item No. 9 (AVR USB Programmer).

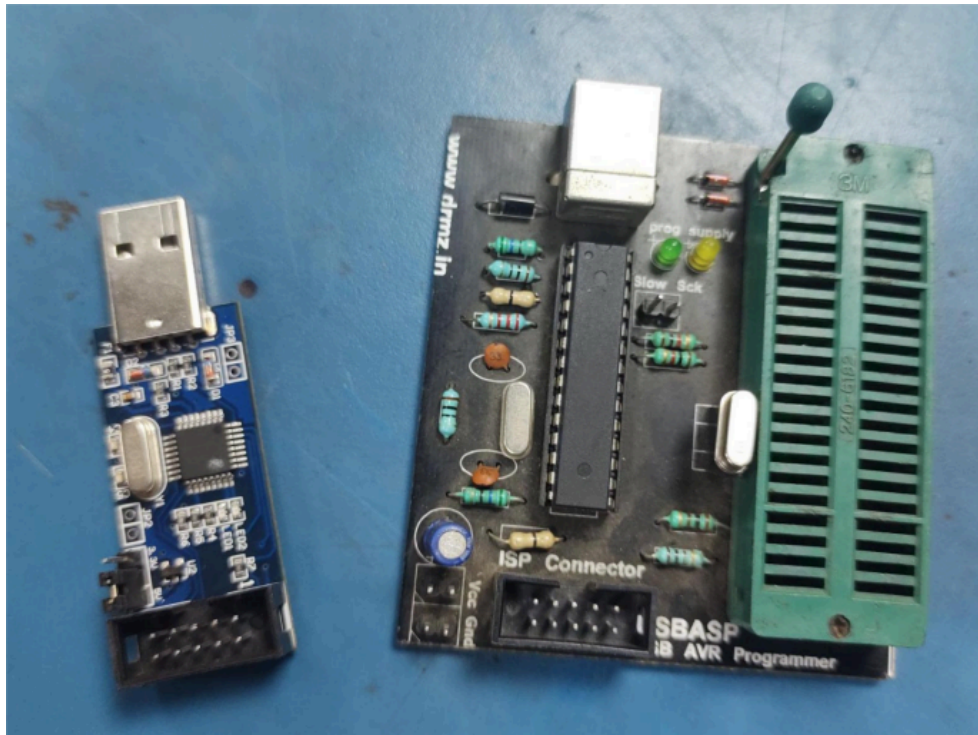


Fig. 3.2

3.1 DOWNLOADING AVRDUDE & SETTING UP THE DRIVERS

3.1.1 Download Link : <https://www.nongnunv.org/avrduke/>

Step 1 : Create a folder name “AVRDUDE” in your “C:” directory

Step 2 : Unzip the downloaded package in the AVRDUDE folder and copy the path to avrdude.exe [“ C:\AVRDUDE “]

Step 3 : In windows search menu > search “Environment variables” > system variable > Path > Edit > then add this path there.

3.1.2 exe Link : <https://download.savannah.gnu.org/releases/avrduke/>

Driver : <https://zadig.akeo.ie/> > Use settings shown in Fig. 3.3 to install correct drivers. Run cmd prompt and run “avrdude” to check if it is correctly installed or not.

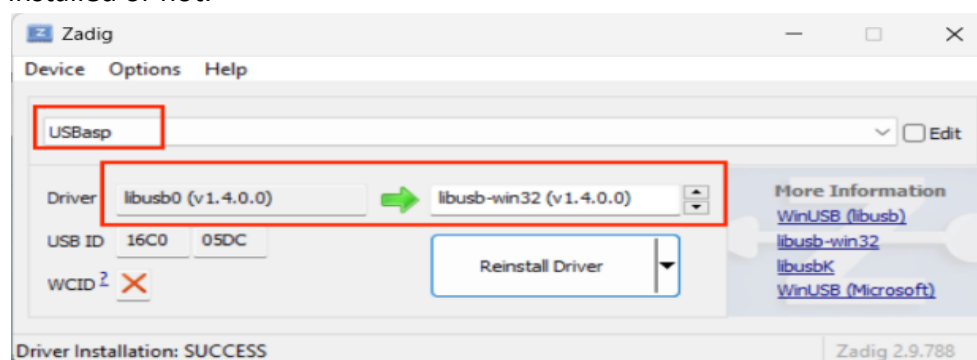


Fig. 3.3

3.2. USING THE “TATA340PP40_MCU_PROGRAMMING.bat file” TO PROGRAM AND CONFIGURE THE MCU

PLEASE NOTE, THIS FILE WILL ONLY RUN IF ABOVE PROCESS IS DONE CORRECTLY. ALL DRIVERS AND FILES ARE DEPENDENCIES FOR THIS FILE.

Step 1 : Double click on batch file to run it

```
-----  
Tata340PP40 Microcontroller Menu  
-----  
@AUTHOR : Bhavay Sen [ ASL-240 ]  
Company : Aartech Solonics Limited  
Date : 26-08-2024  
-----  
Please load the bootloader if not yet loaded.  
Note : This is an one-time process.  
-----  
Enter the complete path to the .hex file (including  
the file name and extension).  
Enter the path to the .hex file: |
```

Fig. 3.4

3.2.1. Program the microcontroller with the hex-file/Software-file provided.

In the folder/package provided please use the latest version of hex file. In order to download the program into the microcontroller first run the batch file by double clicking on it.

STEP 1 : Copy the path of the hex file including the name firmware_ver.hex

STEP 2 : Hit enter

Confirm that code is working by visually confirming the blinking of green & red LED at Boot.

4. TEST NODE SET-UP AND PROGRAMMING

Refer Document :

TATA-340-PP40_FABRICATED_CAN_RECEIVER_NODE_&_MCU_FUNCTIONAL_TESTING_PROCEDURE.pdf

5. REFERENCE

1. TATA340PP40 MCU SCHEMATIC V.0.3
2. HEALTH STATUS FRAME-CANBUS - V.0.3_revision2_18-10-23
3. program_mcu_TATA340.bat (Script to load the program)