# TATA-340-PP40 MCU FUNCTIONAL TESTING PROCEDURE

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

# AARTECH SOLONICS LIMITED

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## 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

| Pin No. | Signal on Pin |
|---|---|
| 1 | NC |
| 2 | CAN LOW |
| 3 | GND_I/P |
| 4 | NC |
| 5 | NC |
| 6 | NC |
| 7 | CAN HGH |
| 8 | NC |
| 9 | +28 VDC |

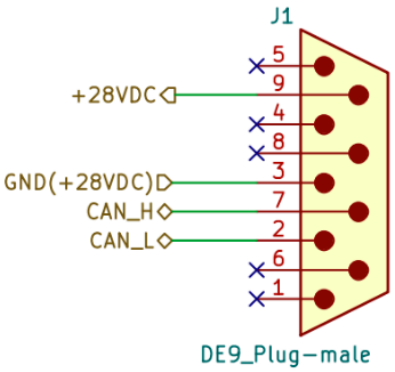


**Fig. 1.1 DB09 Pinout**

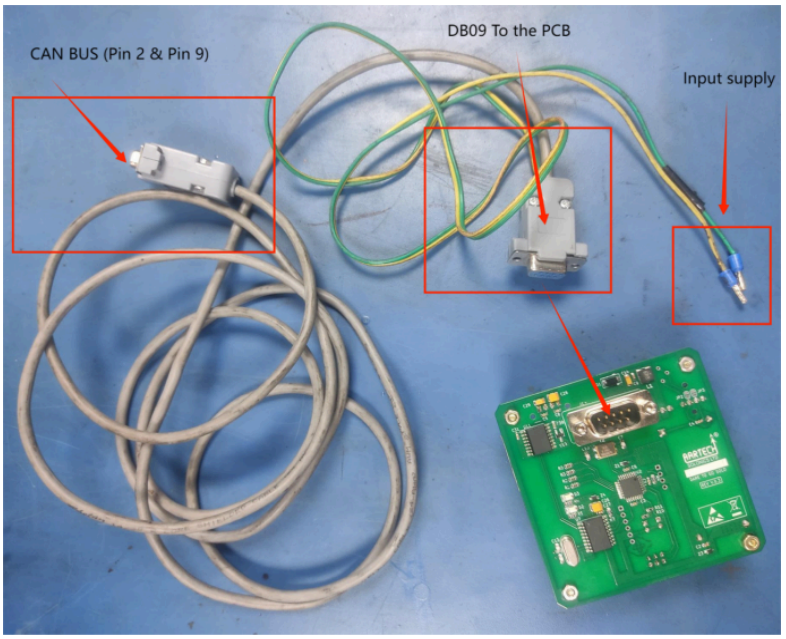


**Fig. 1.2 Reference Cable Image**

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

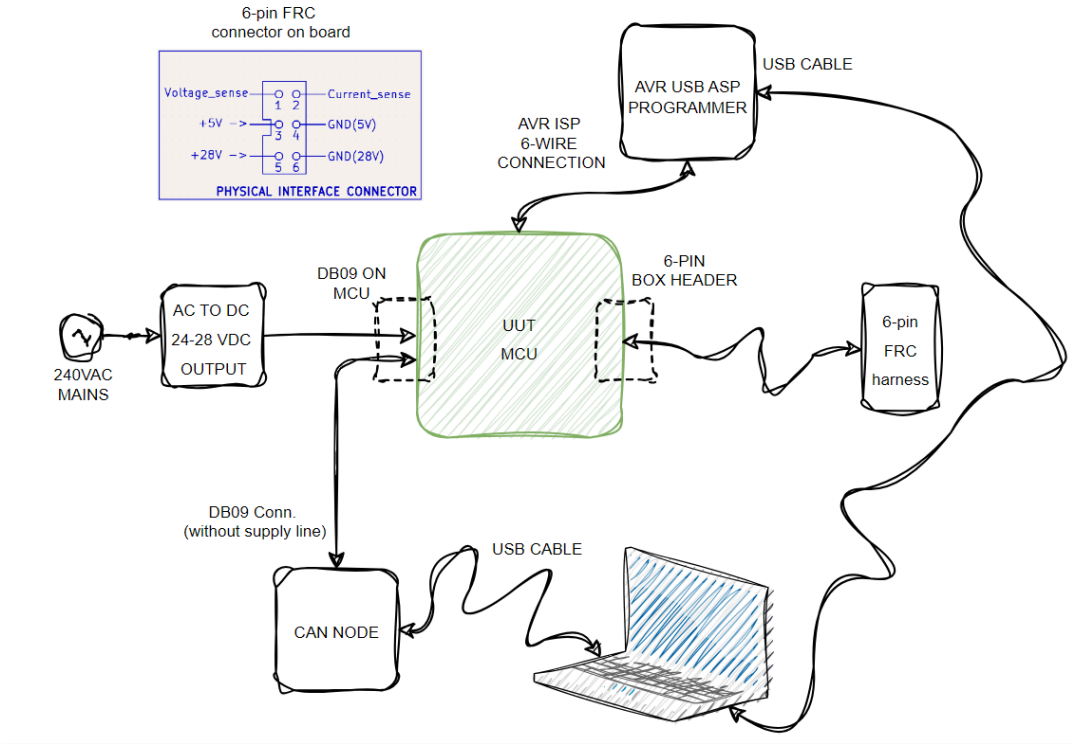


**Fig. 2.1**

## 3. PROGRAMMING THE MICROCONTROLLER

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

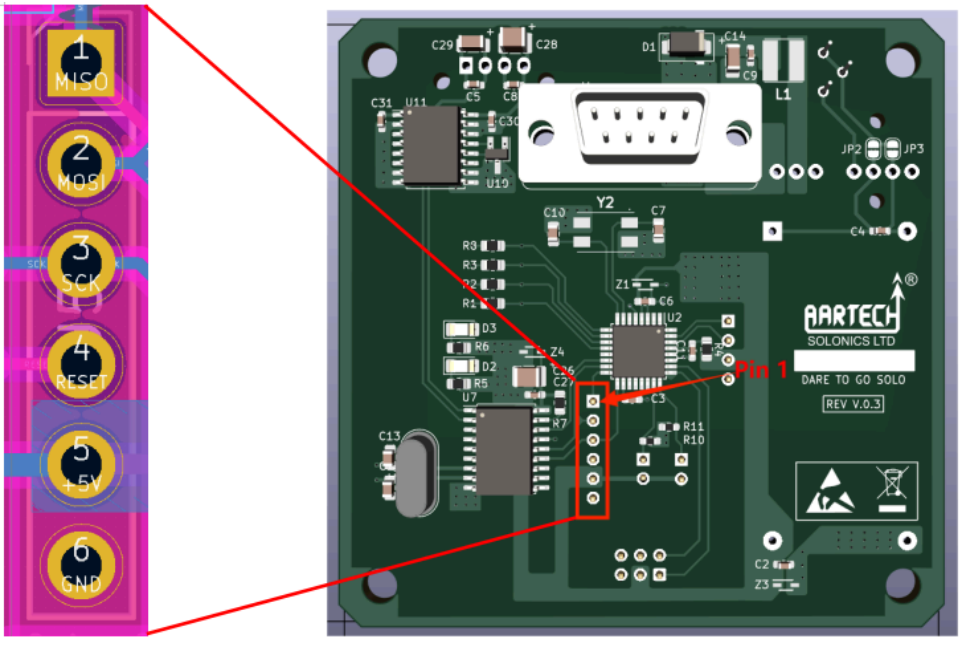


**Fig. 3.1**

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

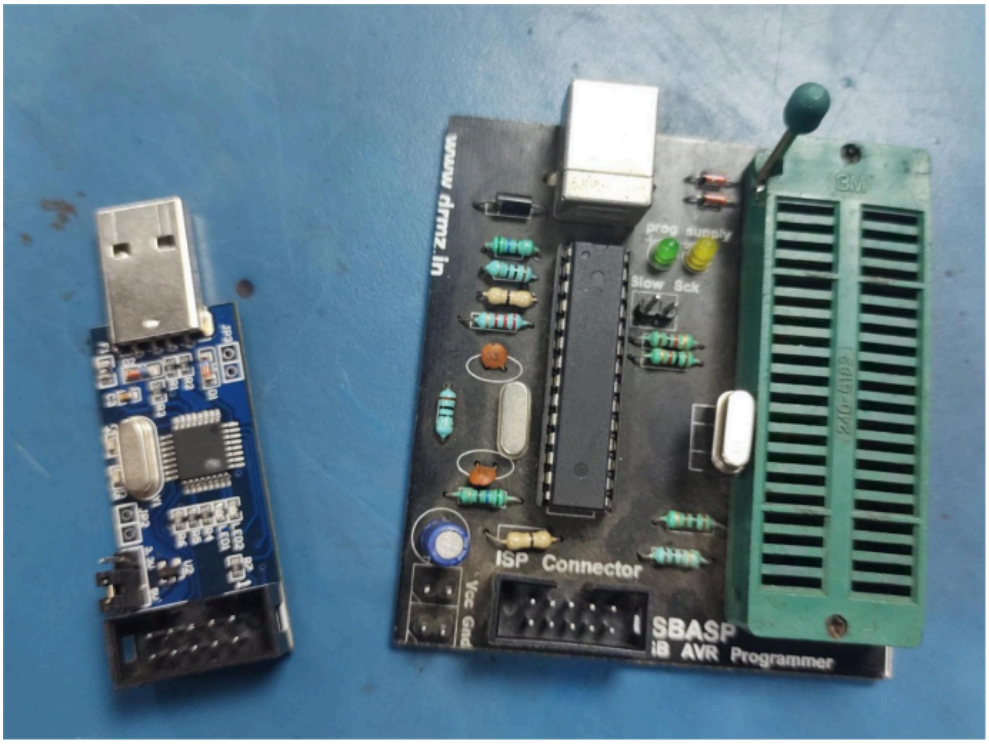


**Fig. 3.2**

## 3.1 DOWNLOADING AVRDUDE & SETTING UP THE DRIVERS

**3.1.1 Download Link :** *https://www.nongnunv.org/avrdude/*
***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/avrdude/*
**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.

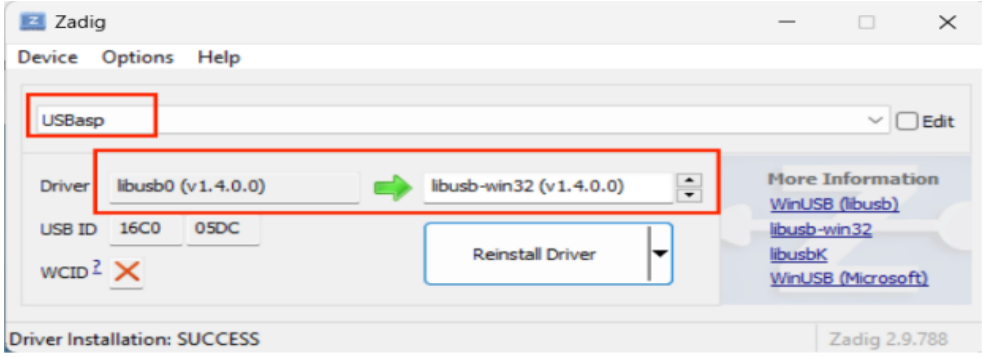


**Fig. 3.3**

## 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**

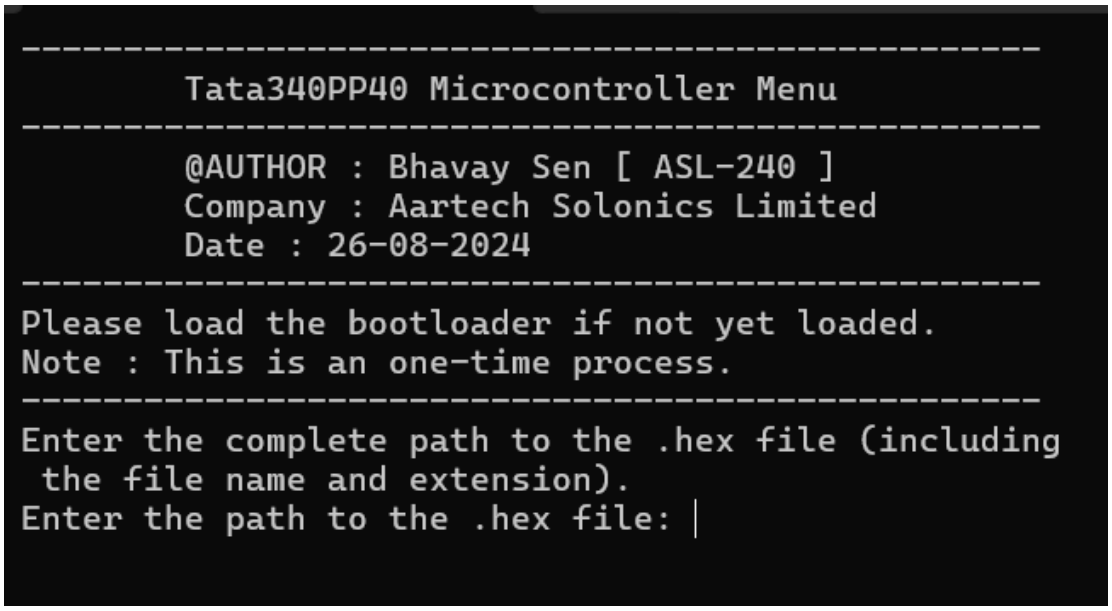


**Fig. 3.4**

**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)