STC-1xx Diagnostic Tool Based on PC

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STC-1xx Diagnostic Tool Based on PC

**Background:**

A Diagnostic Tool is needed to diagnose any issues with ETB and ECU modules. Error codes within these ECU modules are known as DTC (Diagnostic Test Codes). These DTC’s are specific error codes that are assigned to known issues that and ECU module may have. ECU modules detect errors within the system and flags errors along with the DTC. This diagnostic tool will be used to record errors with the module, which can then be shared with other engineers in discussing issues.

**Requirements:**

1. Able to Read DTC from ECU board
2. Ability to Clear DTC from ECU board
3. Able to store DTC’s along with User Comments.
4. Read Various Engine Parameters
5. Ability to run self-tests (including key-off and key-on tests)
6. Display System Status (Air Conditioning, Idle Control, …)
7. Ability to run Input/Output tests (Air Conditioning control, MIL, …)
8. Display ECU Software Version

**Timeline:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Jun 11 – Jun 15** | | | | | **Jun 18 – Jun 21** | | | | **Jun 25 – Jun 29** | | | |
| **Requirements** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Design** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Research** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Implementation** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Testing** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Validation** |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. Requirements (5 Days) - Gathering background information and asking the customer what they need.
2. Design (2 Days) - Designing the user interface of the software and the structure of the underlying code.
3. Research (3 Day) - Getting familiar with the software used to implement the Diagnostic Tool for STC-1XX and learning how to interact with the ECU using the PC.
4. Implementation (3 Days) – Creating and building the Diagnostic Tool.
5. Testing (2 Days) - Testing the software for any software bugs using stress tests and worst case scenarios.
6. Validation (1 Day) - Presenting the final product to the customer with the requirements met.

**Features:**

1. Self Diagnostic Tool
2. Read Engine Parameter
3. Freeze Frame Data
4. Self Test
5. System Status
6. Input/Output Test
7. Display ECU Software Version
8. **Self Diagnostic Tool**
   * *Read DTC* – Reads the DTC’s on the ECU board and displays each DTC on the screen along with a description. The user is able to add comments to the DTC’s and store the DTC’s along with comments in an external file.
   * *Clear DTC* – Clears all existing DTC’s on the NVM (Non-Volatile Memory)
   * *Learn* …
9. **Read Engine Parameter**
   * *Main Parameters* - …
   * *HEGO Sensor Voltage* – Displays the waveform of voltage read from the HEGO Sensor Voltage.
   * *Distance Travelled with MIL On* – Displays the distance travelled with MIL on.
10. **Freeze Frame Data**

Displays the engine conditions when a malfunction is detected. This is useful for determining the different car components that might have been a factor during malfunction.

1. **Self-Test**
   * *Key-Off Test* – Runs the Key-Off test and notifies the user if the system runs correctly without the engine on.
   * *Key-On Test* – Runs the Key-On test and notifies the user if the system runs correctly with the engine on.
2. **System Status**

Reads the live status of specific car components such as Air Conditioning, or Idle Control.

1. **Input/Output Test**

Allows the user to control specific car components like Air Conditioning and MIL.

1. **Software Version**

Displays the ECU Software version.