

KTM59 series

Evaluation Kit User Manual

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1 Product Overview

The KTM59 series host software is designed to be used with the KTM59 programmer. This document introduces the components of the evaluation kit and the key functionalities of the host software, including register read/write, angle data acquisition, calibration, and firmware updates.

2 Evaluation Kit Components

2.1 Evaluation Kit Connection Diagram

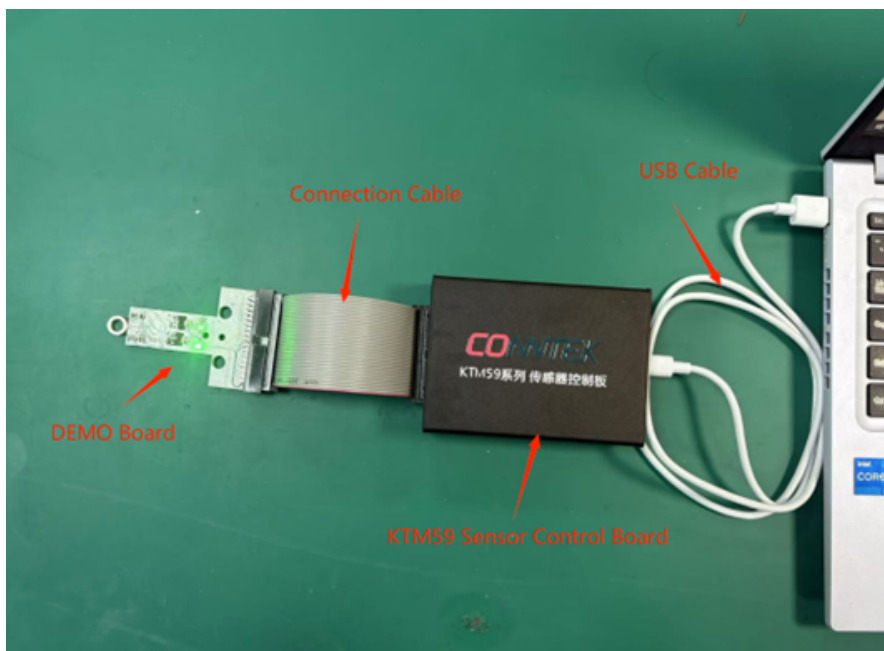
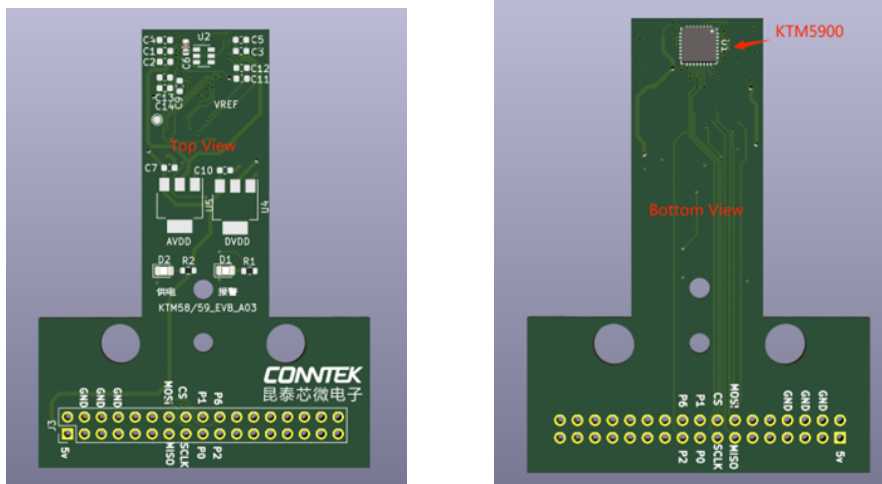


Figure 1: KTM59 Series Evaluation Kit Connection Diagram

The KTM59 evaluation kit, as illustrated in Figure 1, consists of the following components:

- **USB Cable:** Connects the evaluation board to the host computer.
- **KTM59 SCB Evaluation Box:** Equipped with an MCU preloaded with firmware for host software communication.
- **Ribbon Cable:** Facilitates the connection between components.
- **DEMO Board:** Contains the KTM59 series chip with exposed pins for convenient testing.

2.2 DEMO Board



(a) Top View of DEMO Board

(b) Bottom View of DEMO Board

Figure 2: Top and Bottom Views of the DEMO Board

The DEMO board includes necessary components such as capacitors, power conversion chips, LED indicators, and connection terminals. The board is soldered with a KTM59 series chip for evaluation purposes. The schematic of the demo board PCB has been shown below:

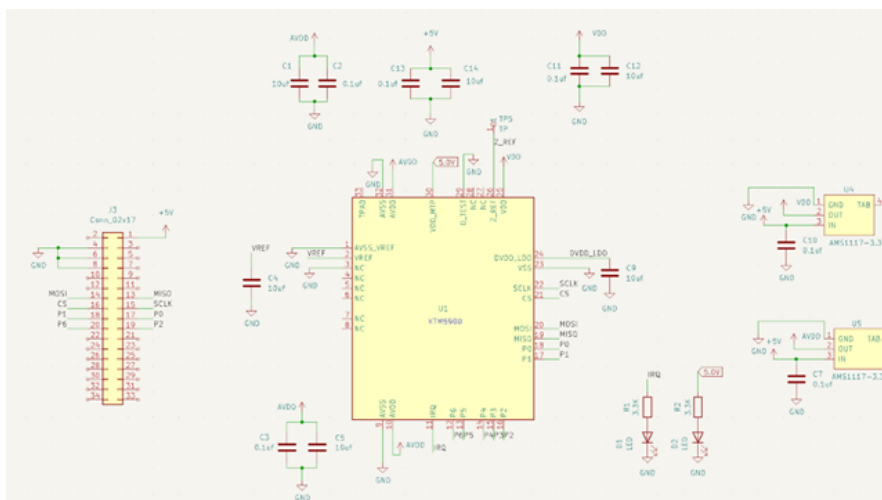


Figure 3: KTM59 Demo Board Schematic

3 User Interface Display

3.1 Main Interface

The main interface provides an overview of the system and its primary functionalities. Key sections include:

- **Menu Bar:** Allows access to functional interfaces, documentation, and language settings.

- **System Block Diagram:** Clicking the blue modules will navigate to corresponding configuration pages.
- **Communication Connection:** Upon connecting the USB hardware, the connection status will be displayed. A failure popup will indicate unsuccessful connection.
- **Alarm Detection:** Detects voltage over-limit, voltage under-limit, frequency issues, and mismatched TMR conditions.
- **Save Configuration:** Saves all current parameter settings to MTP.

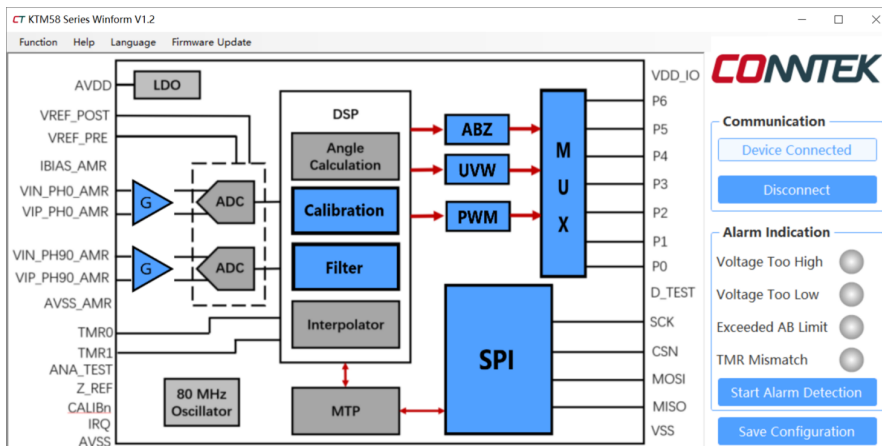


Figure 4: Main Interface of the Software GUI

3.2 Functional Interface

The functional interface includes essential operational modules:

3.2.1 System Control and Status

This section covers sensor configuration, system state monitoring, pin configuration, amplification modules, voltage settings, main frequency configurations, ADC settings, and signal monitoring.

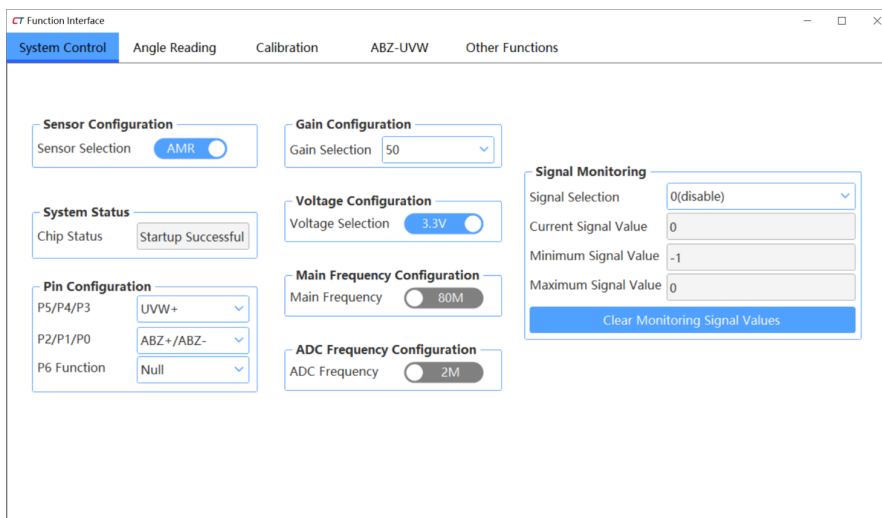


Figure 5: System Control GUI

3.2.2 Angle Acquisition

The angle acquisition module includes:

- SPI Output Configuration
- PWM Output Configuration
- Data Acquisition
- Multi-turn Control and Settings

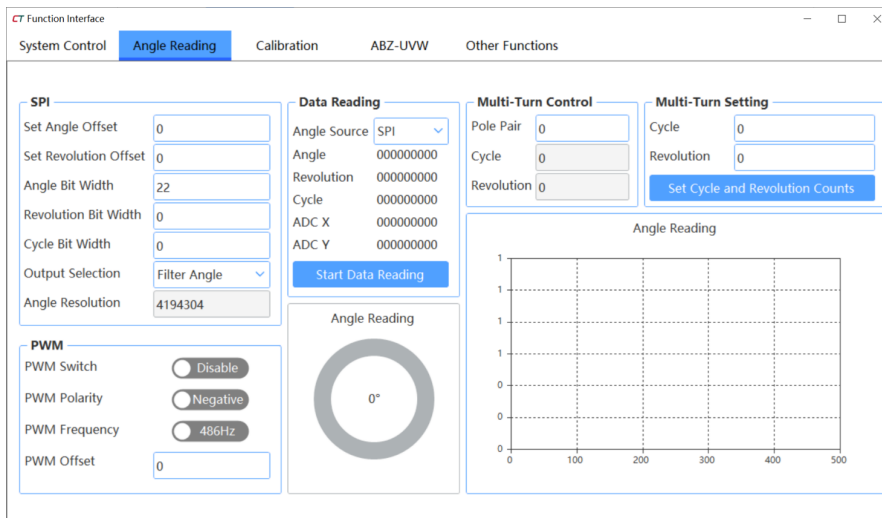


Figure 6: Angle Reading GUI

3.2.3 Calibration

Calibration functionalities include:

- Linear Calibration
- Non-linear Calibration
- Error Data Acquisition

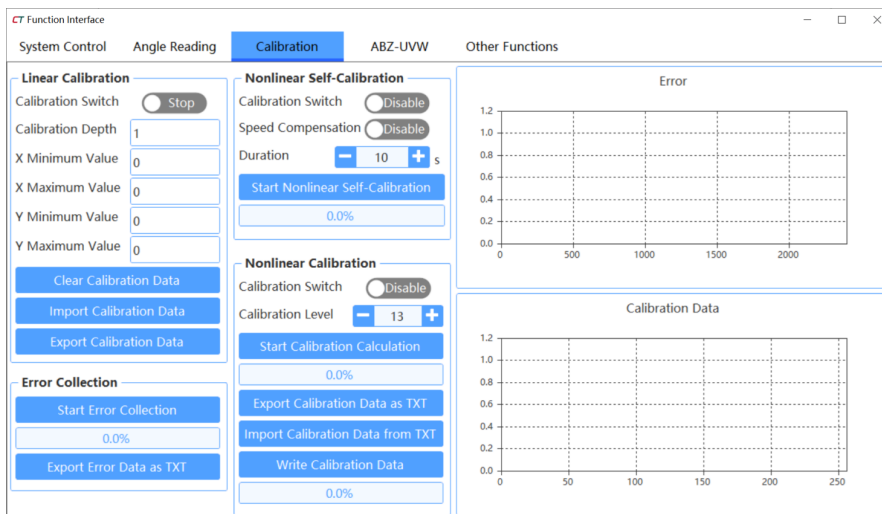


Figure 7: Calibration GUI

3.2.4 ABZ-UVW Outputs

This module configures ABZ outputs, UVW outputs, and position acquisition.

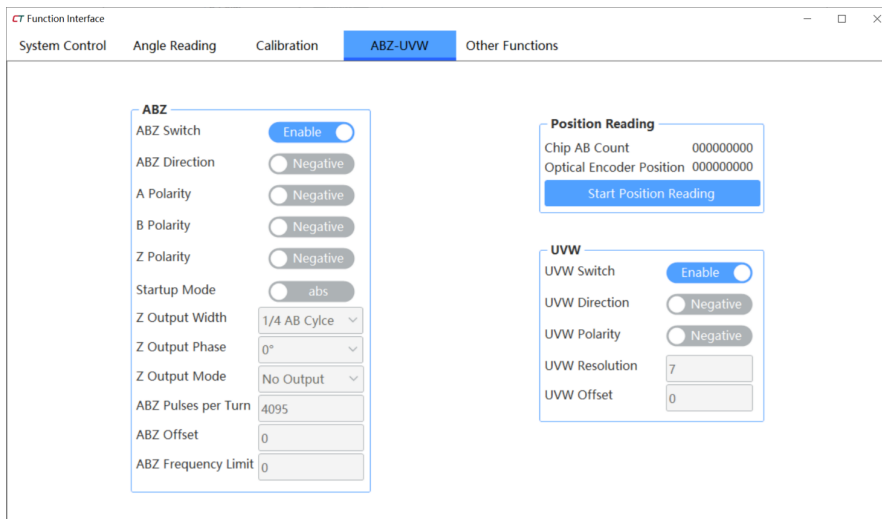


Figure 8: ABZ UVW GUI

3.2.5 Other Functionalities

Additional functionalities include hysteresis configuration, filtering depth settings, oscillator tuning, arbitrary register read/write, and acquisition speed fluctuation control.

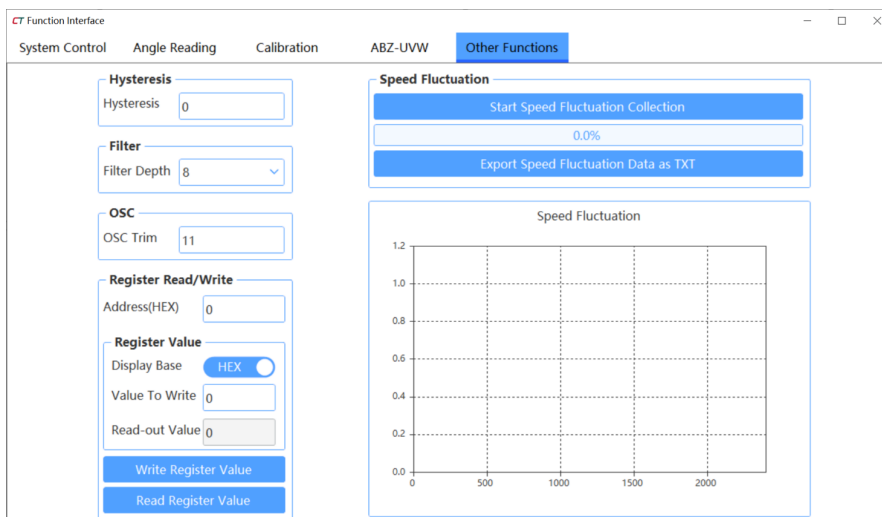


Figure 9: Other Functions GUI

3.3 Firmware Update

The firmware update process includes:

1. Connect the USB communication.
2. Select the BIN firmware file.

3. Click the update button and monitor progress.

If the update fails, an IAP Failure popup will appear.

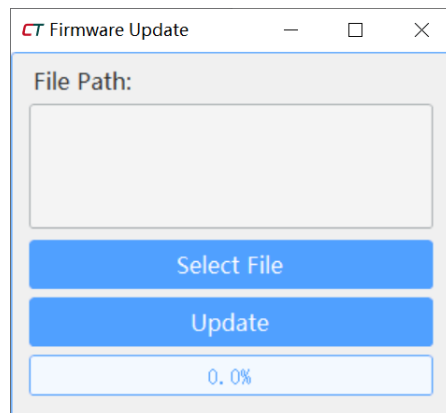
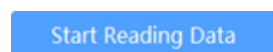


Figure 10: Firmware Update GUI

4 Control Button Illustration Guide

4.1 Buttons

Clicking a button executes the corresponding operation as indicated.



4.2 Text Boxes

Text boxes are used for various input and output functions, and they are categorized as configurable, read-only, or special-purpose text boxes.

4.2.1 Configurable Text Box

The configurable text box allows users to input parameters corresponding to the label description. After entering the value, press Enter to apply the configuration. If the write operation fails, a Write Failed warning popup will appear.



For example, in Figure ??, the text box corresponds to the Angle bit width. Enter the desired value and press Enter to configure.

4.2.2 Read-Only Text Box

The read-only text box is used for displaying values that are automatically updated. These text boxes have a gray background, indicating that the content cannot be manually modified.

Chip Status

Startup Successful

As shown in Figure ??, the values in the read-only text box will automatically refresh based on system feedback.

4.2.3 Special Text Box

The special text box allows modifications but does not immediately apply the changes. Configuration is applied only after clicking the corresponding buttons.

Multi-Turn Setting

Cycle

0

Revolution

0

Set Cycle and Revolution Counts

In Figure ??, these text boxes are used for configuring parameters such as Cycle and Turns. After modifying the values, users must click the Set Cycle or Set Turns buttons to apply the settings.

4.3 Dropdown Boxes

The dropdown box allows users to select a configuration from a predefined list. If the configuration fails, a Switch Failed warning popup will appear.

P6 Function

Null

Null

PWM

Capture

Anchor

Calibration

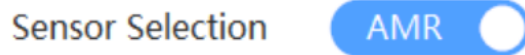
Zero

SystemClock

As shown in Figure ??, selecting a desired option from the dropdown list writes the corresponding value to the system.

4.4 Switches

Switches are used to toggle between two states. If the switch operation fails, a Switch Failed warning popup will appear.



In Figure ??, clicking the switch toggles the configuration between two states, such as ON/OFF.

4.5 Value Adjusters

The value adjuster allows users to modify numerical values incrementally. Users can either click the up/down arrows to increase or decrease the value or directly input a desired value.



For instance, in Figure ??, the value adjuster modifies a parameter by a fixed step size. The label preceding the value adjuster indicates the meaning of the parameter.

4.6 Charts

4.6.1 Line Chart

The line chart displays data over time, where the x-axis represents the index and the y-axis represents the data value. Users can zoom into specific areas by selecting the desired region, or reset the zoom level by right-clicking on the chart.

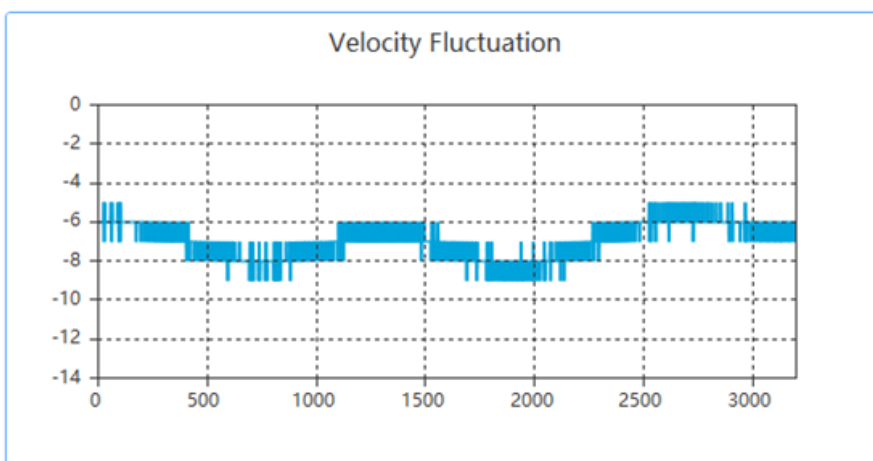


Figure 11: Line Chart Example

As shown in Figure 11, the line chart visualizes the trend of data values over a series of indices.

4.6.2 Ring Chart

The ring chart is primarily used for angle data visualization. The blue section represents the current angle value, while the gray section indicates the remaining angle in a full circle (0 to 360 degrees).

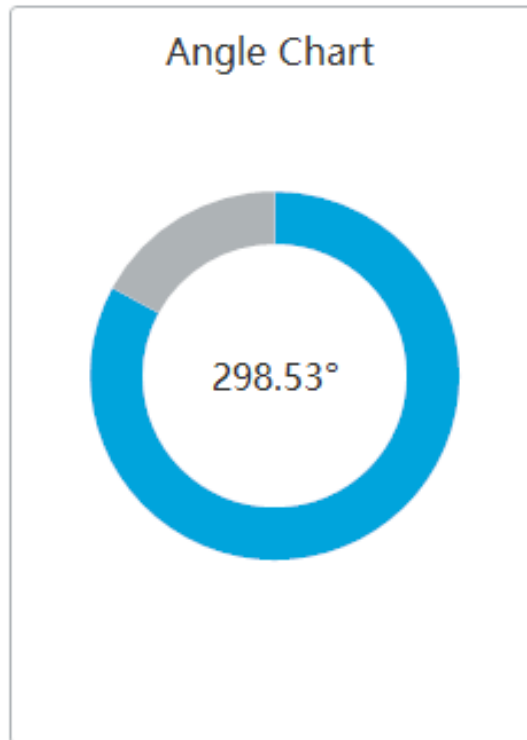


Figure 12: Ring Chart Example

In Figure 12, the text at the center of the ring chart displays the current angle value, and the chart dynamically updates as the angle changes.

5 Frequently Asked Questions (FAQ)

5.1 How to Perform Non-linear Calibration?

The steps for non-linear calibration are as follows:

1. Set the desired calibration level.
2. Click the Non-linear Calibration Calculation button.
3. Verify the calibration data. If acceptable, write the data to the system by clicking the appropriate button.

To save or load calibration data:

- Export data as a TXT file using the Export Non-linear Calibration Data button.
- Import external calibration data using the Import Non-linear Calibration Data button.

Revision History

Version	Date	Author	Summary
0.1	October 2022	Liu Junbo	Initial Version
0.2	December 2024	Zhang Kaixin	Added Evaluation Kit Connection Description