



MAX31328 RTC Shield Software User Guide

Rev 0; 06/21

Abstract

This document provides the information needed to program and evaluate the MAX31328 real-time clock (RTC) on the MAX31328 shield board (MAX31328SHLD) using the provided GUI software.

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General Description

The MAX31328 shield ([MAX31328SHLD](#)) is a fully assembled and tested PCB to evaluate the [MAX31328](#), low-current, real-time clock (RTC) with I²C interface. The shield operates from a single supply, either from USB or external power supply, and the onboard crystal provides a 32.768kHz clock signal. This device is accessed through an I²C serial interface provided by a [MAX32625PICO](#) board.

This document provides all the information needed to understand and use the various functions of the GUI software provided with the shield.

Requirements

MAX31328 Shield

The MAX31328SHLD is shown in **Figure 1**. It contains the MAX31328 IC soldered onto the board with test points for V_{CC}, GND, 32KHZ and INT/SQW. A programmed MAX32625PICO board should be connected to connectors P5 and P6 as seen in Figure 1.

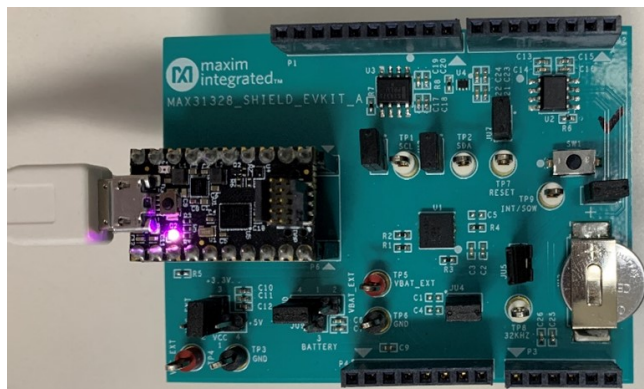


Figure 1. MAX31328SHLD connected to the MAX32625PICO.

MAX31328 RTC Shield Software

Maxim Integrated provides a graphical user interface (GUI) application to communicate with and program the device registers. The GUI runs on Windows® 7 or later and provides a user-friendly approach to understand, program, and test the various functions of the device. The following sections will explain this in detail.

Functional Description and Programming

Menu and Status Information

The GUI offers **File**, **Device**, and **Help** menus on the menu bar at the top of the window (**Figure 2**).

The **File** menu has options to save and load configuration information. This stores all the device register values to a .ini file that can be loaded anytime to restore the device state. The **Device** menu allows the user to reconnect to the shield if the need arises. The **Help** menu offers an option to open the **Maxim Webpage**.

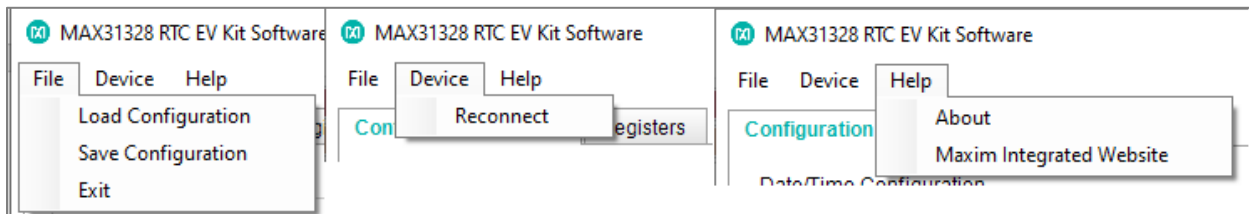


Figure 2. GUI menus for File, Device, and Help.

The status bar at the bottom of the GUI, as seen in **Figure 3**, shows information about the software's current mode of operation and the current shield board connection status. The **Status Log** helps keep track of all the actions performed by the user and the outcome of these actions (success/failure). These messages can also be logged to an external file using the **Log to File** checkbox.

Configuration & Time Tab

The GUI has two tabs in total, with three more static group boxes to the right of the tabs.

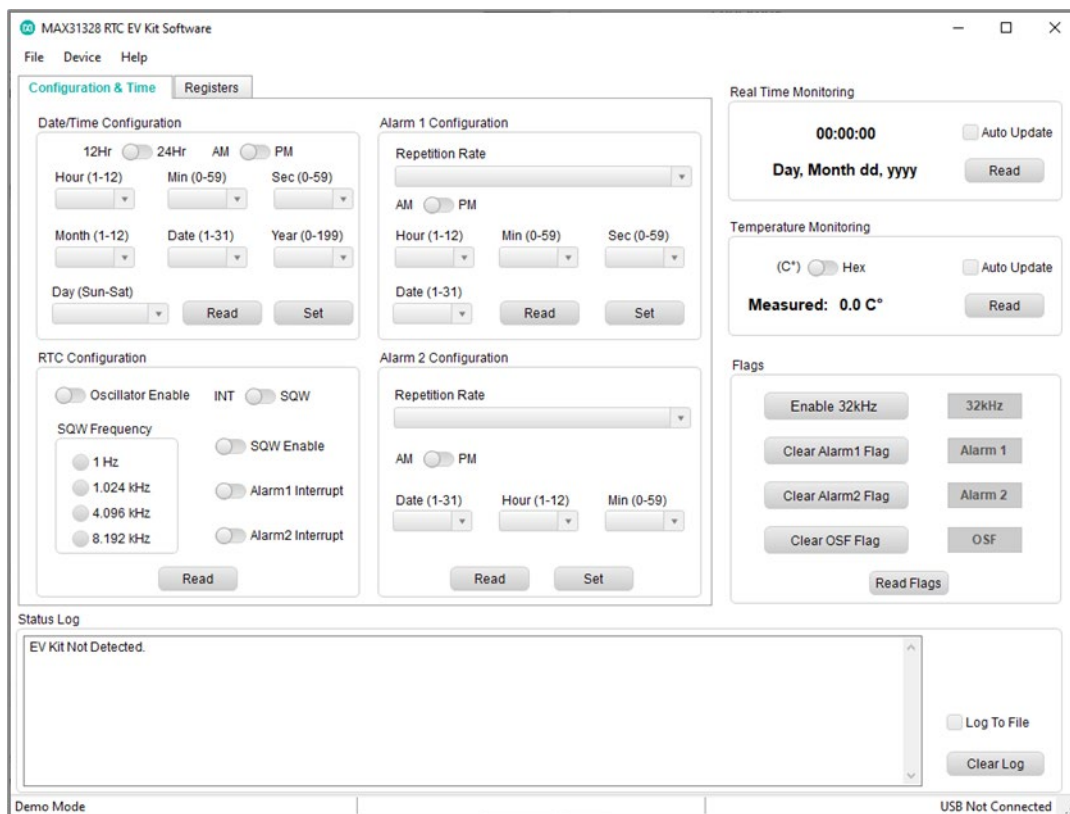


Figure 3. The Configuration & Time tab.

The Configuration & Time tab shown in Figure 3 has options to configure the device and clocks and program the date and time. This is the default tab that opens when the software is launched. If the device is powered and connected to the PC at the time of software launch, all the GUI fields are populated with the current values read from the device.

Date/Time Configuration

This group box has toggle switch for **12Hr/24Hr** mode selection, **AM/PM** selection for **12Hr** mode, and combo boxes for **Hour**, **Min**, **Sec**, **Month**, **Date**, **Year**, and **Day** selections.

Read: The current date and time values can be read from the device using the **Read** button in this group box. The status log indicates when the read operation is completed and all GUI elements in the group box are updated.

Set: The user needs to enter the desired date and time values by selecting valid values in all the combo boxes of this group box and click on the **Set** button to program these values to the device. The status log indicates when the operation is completed. This action starts the device's internal oscillator if it is not already running.

RTC Configuration

Oscillator Enable: This toggle switch can be used to enable or disable the internal oscillator.

INT/SQW: This toggle switch can be used to toggle the INT/SQW pin between interrupt and square-wave modes. The **SQW Frequency** radio buttons can be used to select the square-wave frequency.

SQW Enable: This toggle switch can be used to enable or disable the square-wave.

Alarm1/Alarm2 Interrupt: These toggle switches can be used to enable or disable the corresponding alarm interrupts.

Read: Press the **Read** button to read all settings in this group box. The status log indicates when the read is completed.

Alarm 1 Configuration

Repetition Rate: This combo box can be used to select the alarm repetition rate. Perform this step first when configuring the alarm.

Date/Time Selections: Based on the repetition rate selected, some or all the remaining combo boxes in this group box will be enabled. The exact alarm match condition can be selected using these combo boxes.

Read: The **Read** button can be used to read the current Alarm 1 values from the device.

Set: The **Set** button can be used to write the current Alarm 1 values to the device.

Alarm 2 Configuration

Repetition Rate: This combo box can be used to select the alarm repetition rate. Perform this step first when configuring the alarm. Alarm 2 offers fewer repetition rates than Alarm 1.

Date/Time Selections: Based on the repetition rate selected, some or all the remaining combo boxes in this group box will be enabled. The exact alarm match condition can be selected using these combo boxes.

Read: The **Read** button can be used to read the current Alarm 2 values from the device.

Set: The **Set** button can be used to write the current Alarm 2 values to the device.

Real-Time Monitoring

Auto Update: When this checkbox is selected, the software will read the date and time from the device at 1s intervals and update the date/time labels in this group box. When unchecked, no further reads will occur, and the date/time labels will remain static.

Read: This button can be used for a one-time read and update of the date/time labels in this group box.

Temperature Monitoring

Auto Update: When this checkbox is selected, the software will read the temperature from the device at 1s intervals and update the temperature label in this group box. When unchecked, no further reads will occur, and the temperature label will remain static.

Read: This button can be used for a one-time read and update of the temperature label in this group box.

Flags

Indicators: The color of the flag indicators indicate the current states of the flags in status register. They will turn green for logic 1 and red for logic 0.

Enable 32KHZ: This button enables or disables the 32KHZpin. When set to logic 1, the 32KHZ pin is enabled and outputs a 32.768kHz square-wave signal. When set to logic 0, the 32KHZ pin goes to a high-impedance state.

Clear Buttons: These buttons can be used to clear the status flags.

Read Flags: The **Read Flags** button can be used to read the status register and display the current status of all flags.

Registers Tab

The **Registers** tab provides access to all device registers (**Figure 4**).

To read registers, select the corresponding checkboxes and click **Read**.

To write to registers, enter the desired 8-bit value in hex format (e.g. 0xAB) in the corresponding **Value** field, select the corresponding checkboxes and click **Write**.

The status log indicates success/failure of the register read/write action.

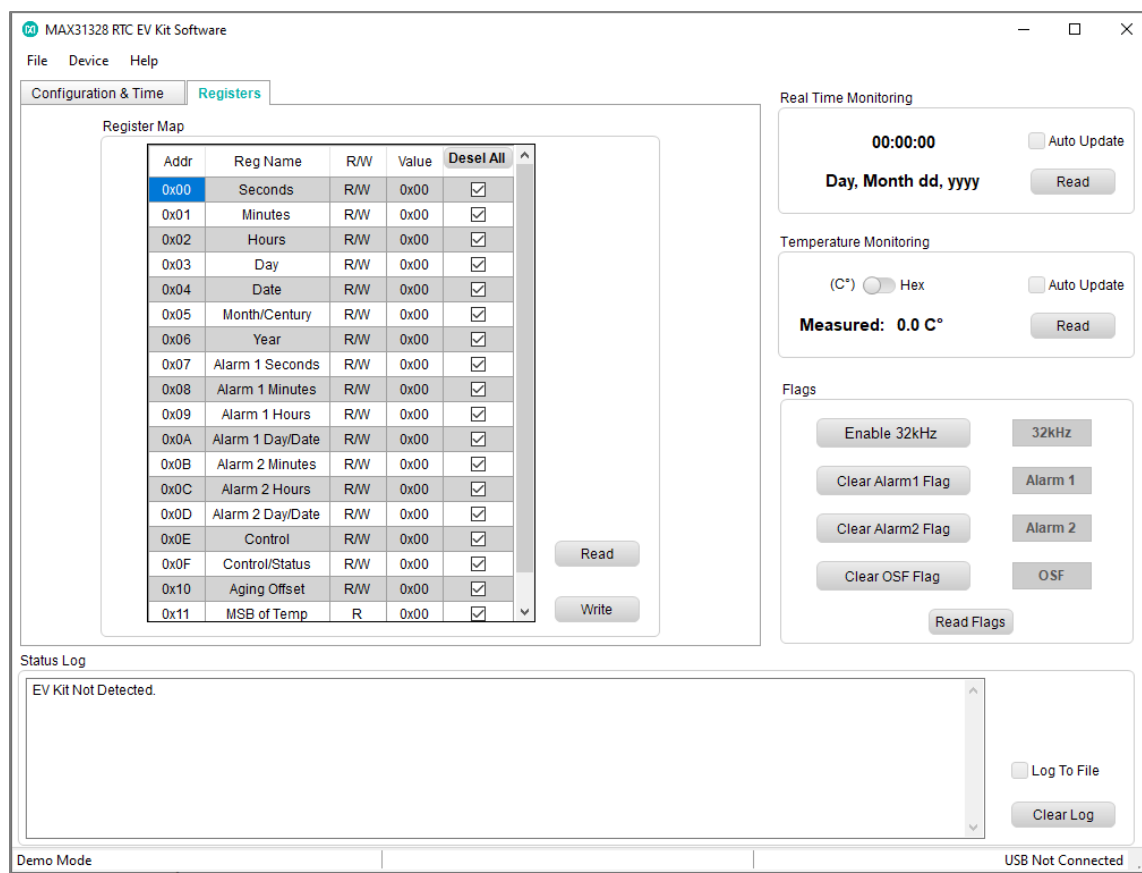


Figure 4. Registers tab.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/21	Initial release	—

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