

Keywords: DS1678,event,recorder,event recorder

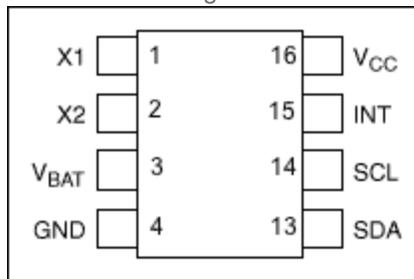
## APPLICATION NOTE 3643

# How to Use the DS1678 Real-Time Event Recorder

Nov 16, 2005

*Abstract: This note demonstrates an application using the DS1678 real-time event recorder. The software example includes basic operating routines. A schematic of the application circuit is included.*

## DS1678 Pin Assignment



## Description

This application note demonstrates how to use the [DS1678](#) real-time event recorder which logs events—level transitions on the **INT** input pin—into a 1024-word datalog memory array. The first event is recorded as a time stamp; subsequent events are recorded as elapsed time from the previous event. The time stamp and 1024-word datalog memory accommodate up to 1025 recorded events.

This example code includes functions for initiating a datalogging "mission." The user-selectable options are event resolution, trigger selection, and rollover (handling missions of more than 1025 events). The software also includes routines for ending a mission, for displaying the event datalog information, and for writing and reading the user RAM.

## Operation

The program uses two general-purpose port pins (GPIOs) on a microcontroller to communicate with the DS1678 through the DS1678's I<sup>2</sup>C serial interface. An additional port pin is used to toggle the DS1678's **INT** input to drive events. In a typical application, the **INT** input would be connected to circuitry that conditions the signals from the event source, e.g., a thermostat in a HVAC system. This connection allows the DS1678 to record, for example, the start time and duration of each cooling or heating cycle.

This example uses an 8051-compatible microcontroller, the [DS2250](#). User inputs and data outputs from

the program are passed through an RS-232 interface from a terminal emulator program on a PC to a UART on the microcontroller. The [Microcontroller Tool Kit](#) software utility can be used to program the DS2250 microcontroller.

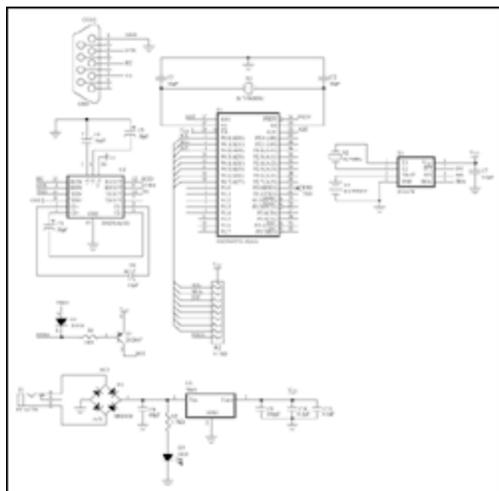
The software is shown in **Figure 1**. A schematic of the circuit is shown in **Figure 2**.

```
/*=====
/* DEMO178.C - This file is provided to show an example of communication */
/* routines for interfacing to the DS178. These routines are provided */
/* for example only and are not supported by Avnet */
/*=====
#include <stdio.h> /* Prototypes for I/O functions */
#include <DS178.h> /* Register definitions for DS178 */

#define ADR 0
#define ADDR 1
#define ADDR2 0x04 /* slave address */
#define M0 = 0x0; /* I2C pin definitions */
#define M1 = 0x1;
#define M2 = 0x2;
/* Function definitions */
void start();
void stop();
void I2Cwrite(u8data);
u8data I2Cread(u8data);
void readbyte();
void writebyte();
void I2C_start();
void I2C_stop();
void I2C_write(u8data);
void I2C_read(u8data);
void I2C_start();
void I2C_stop();
/* global variables */
void start() /* ===== I2C start ===== */
{
  M0 = 1; M1 = 1; /* Initiate start condition */
  M2 = 0;
}
void stop() /* ===== I2C stop ===== */
{
  M0 = 0; M1 = 0; M2 = 0; /* Initiate stop condition */
  M0 = 1; M1 = 1; M2 = 1;
}
void I2Cwrite(u8data) /* ----- write one byte ----- */
{
  u8data 0;
  for (i = 0; i <= 8; i++)
  {
    M0 = 0; M1 = 0; M2 = 0;
    M0 = 1;
    M1 = 0; M2 = 1;
    M0 = 0; M1 = 1;
    M2 = 0;
  }
  M0 = 1; /* Release the sda line */
  M1 = 0;
  M2 = 1;
  if (data > 0x7f) /* 8-bit data, unsigned char */
    M0 = 0;
}
```

[Download](#)

Figure 1. Program listing for interfacing a microcontroller to the DS1678.



[For Larger Image](#)

Figure 2. Schematic for the DS1678 demonstration board.

### Related Parts

[DS1678](#)

Real-Time Event Recorder

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