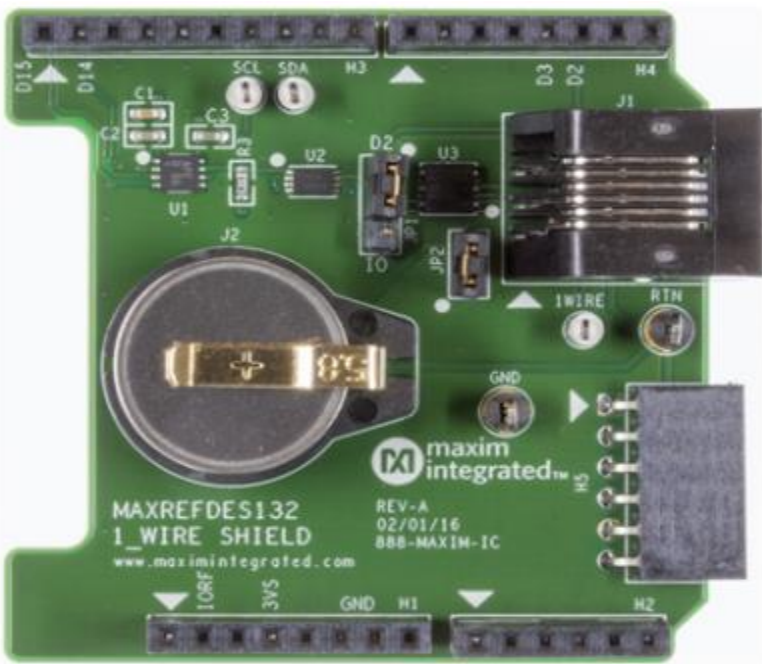| Part Number	Description
MAXREFDES132#	1-WIRE MASTER, ARDUINO SHIELD FORM FACTOR

MAXREFDES132# System Board

Overview

MAXREFDES132# provides a convenient platform for interfacing with 1-Wire®devices, 1-Wire Evaluation Kits (EV kits), and iButton® devices using the DS2484 I^{2}C-to-1-Wire master, or a bit-bang master on D2 of the Arduino form-factor pinout.

Introduction

Maxim's 1-Wire bus continues to flourish in the era of IoT. This unique protocol provides communication and power along a single wire, at relatively long distances. Now, with MAXREFDES132#, Maxim merges a reliable, hardware based 1-Wire master with Arduino and mbed.org platforms.

MAXREFDES132# provides a convenient platform for interfacing with 1-Wire devices, 1-Wire EV kits, and iButton through the DS2484 I^2C-to-1-Wire master, or a bit-bang master on D2 of the Arduino form-factor pinout. Both masters are supported by the ARM® mbed™ OneWire Library and the Arduino Library. Bit Banging is only supported on the MAX32600MBED platform, the DS2484 I^2C-to-1-Wire master can be used on any mbed platform.
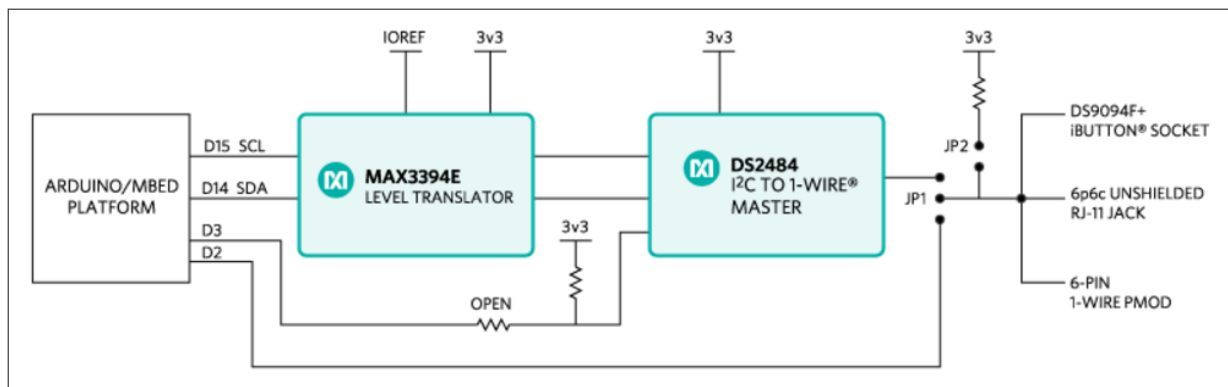
System Diagram

Figure 1.The MAXREFDES132# reference design block diagram.

Detailed Circuit Description

Figure 1 is a block diagram of MAXREFDES132#.

The MAX3394E two-channel bidirectional level-translator provides compatibility between 5V and 3.3V platforms using the IOREF pin of the Arduino form factor.

The DS2484 I^{2}C-to-1-Wire master provides internal user-adjustable timers that relieve the system host processor from generating time-critical 1-Wire waveforms, supporting both standard and overdrive 1-Wire communication speeds. In addition, the 1-Wire bus can be powered down under software control through D3 of the Arduino form-factor pinout.

D2 can be used to bit bang the 1-Wire bus by installing JP1 on pins 1-2 and installing JP2 to connect the provided pullup to the bus. Bit Banging is only supported by the OneWire Library on mbed for the MAX32600MBED board.

Detailed Description of Firmware

A OneWire Library that supports all of our silicon masters from one common API has been developed for ARM Cortex®-M micros using the online development environment mbed.org. The library and example programs can be found at the following links.

- mbed.org
  - Library
  - Demo Program
- Arduino
  - Library
  - Example programs for Arduino can be found in the library download folder OneWire/examples

The demo program iterates through the devices on the 1-Wire bus, and prints their 64-bit ROM IDs to a terminal. If the DS1920 is found, a temperature conversion is executed and the temperature is displayed in the terminal.
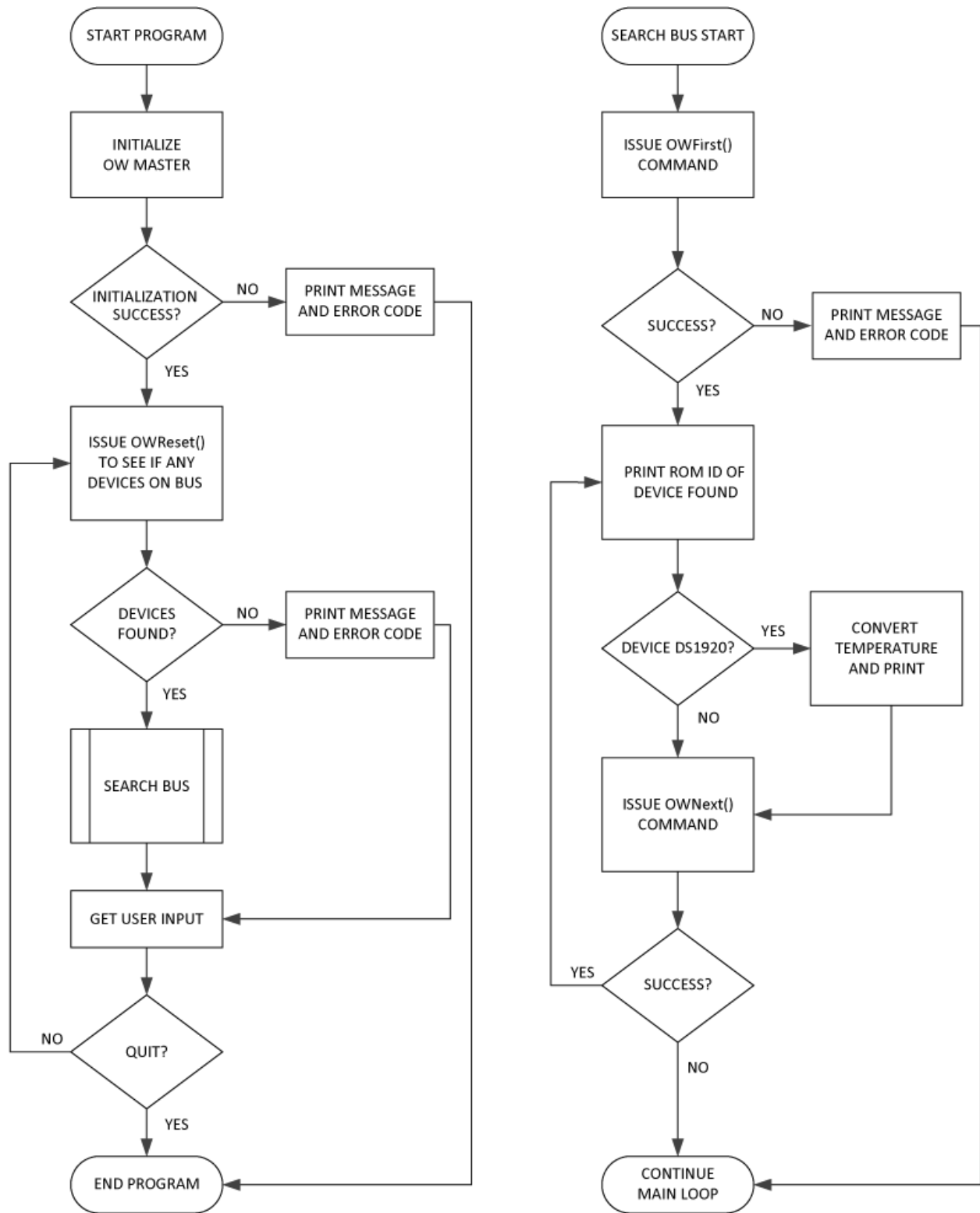
Figure 2. Demo program flow chart.

Quick Start

Required equipment:

- Windows® PC with a USB port
- MAXREFDES132#
- Compatible Arduino form-factor mbed platform

Procedure

The reference design is fully assembled and tested. Follow the steps below to verify board operation.

mbed.org

1. Connect MAXREFDES132# to your platform.
2. Ensure JP1 and JP2 are configured properly for the 1-Wire master you would like to use.
     1. DS2484: JP1 on pins 2-3, JP2 removed.
     2. Bit Bang: JP1 on pins 1-2, JP2 installed. Bit Bang is only supported on MAX32600MBED platform.
3. Install the provided DS1920 iButton, or user supplied 1-Wire device.
4. Connect USB cable from the PC to your platform.
5. If you have never used mbed, setup an account and add your platform to your online compiler according to the instructions on your platform's product page.
6. If you are using Windows and have never used serial communications between your PC and your mbed platform, follow the instructions.
7. Navigate your browser to the following link.
8. Click the 'Import this program' button and import the demo as a 'program'
9. Ensure that the #define for the 1-Wire master you want to use is uncommented and all others commented out
10. Compile and download the resulting binary to your platform.
11. Open Hyperterminal, or your favorite terminal emulator to find the appropriate COM port for your platform, and configure the connection for 9600bps, 8-N-1 with no flow control.
12. Ensure the terminal is configured for 'Auto' receive and 'CR+LF' transmit.
13. Press the reset button on your platform and exercise the demo.

Arduino

1. Download the OneWire Library and install it to your libraries folder following the directions.
2. Connect MAXREFDES132# to your Arduino board.
3. Ensure JP1 and JP2 are configured properly for the 1-Wire master you would like to use
     1. DS2484 – JP1 on pins 2-3, JP2 removed

2.   Bit-Bang master – JP1 on pins 1-2, JP2 installed.
4.   Install the provided DS1920 iButton, or user supplied 1-Wire device
5.   Connect USB cable from the PC to your Arduino board.
6.   Ensure that you have the COM port that your Arduino board is connected to selected in the Arduino IDE.
7.   Download the example program to your Arduino board and open the Serial terminal.

Features

- DS2484 1-Wire master
- F5 iButton socket
- 6P6C RJ-11 jack
- mbed.org library and Arduino libraries
- Arduino® shield form factor

Applications

- 1-Wire Network
- Data Logging
- Rapid Prototyping

Competitive Advantages

- Portable
- Compact
- Flexible
- Cost effective