

5/11/2012

4 CHANNEL HUB

1 | GETTING STARTED

The 4 Channel Hub allows you to connect four different 1-wire “sub-networks” in a star topology, where all of your devices can connect to a central point rather than being daisy-chained. Among other benefits, this helps you limit the length of the cable needed between a master to each slave device. (For more information about hubs and network topology, see our discussion in the How To section on the Hobby Boards website.)

Features

- 4 independent 1-wire channels
- RJ45 jacks for easy connectivity to your 1-wire network
- Acts as a Power Injector as well as a Hub
- Field upgradable firmware

Included with Product

- 4 Channel Hub device, fully assembled

Required but NOT included

- 1-Wire master
- CAT5 cable
- External power of 9-24v DC
- Software to control the 4 Channel Hub

Optional

- Recommended: moisture resistant coating especially if the device will be used outdoors (note this can be added as an available option to your device order)
- Recommended: use of dielectric compound on all device connections

- Recommended: protective case

2 | TECHNICAL SPECS

Controller

- The 4 Channel Hub uses a custom controller chip.

Connections

- 1-Wire input and pass-through connections are made through a dual RJ45 jack, for easy connectivity to your 1-Wire network.
- Four 1-Wire channels are connected through RJ45 jacks
- Power is supplied through a 2.1mm center pin positive power connector. Optionally power can be supplied through the CAT5 cable connected to the RJ45 input jack.

Power Requirements

The maximum power draw is 20mA at +9v DC.

3 | INSTALLATION

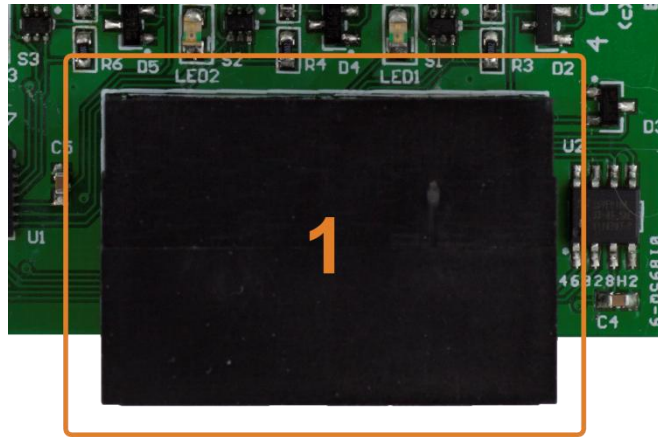
Assembly

No assembly is required for this device.

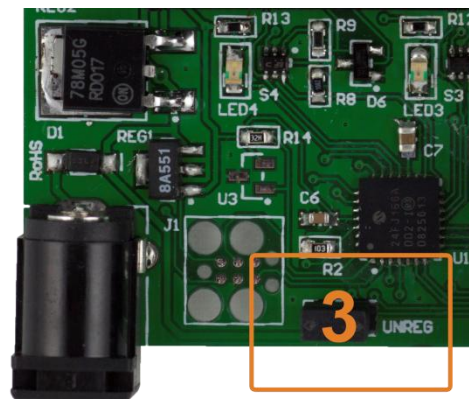
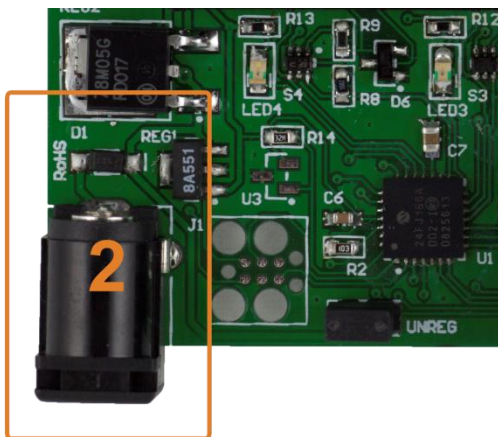
4 | OPERATION

Connecting 1-Wire and Power

The Hobby Boards 4 Channel Hub is designed to be connected to a 1-Wire network.



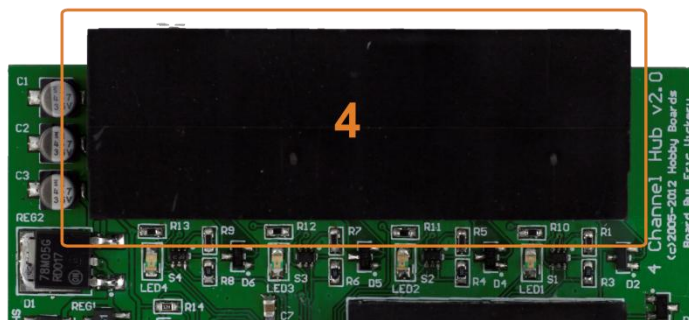
To connect the 4 Channel Hub to your 1-Wire network, simply use a standard network cable and connect it to the left hand side of the dual RJ45 jack (1). This input must connect (directly or indirectly) to a 1-Wire Master. The right hand side of the jack is provided to allow pass-through connections, and is un-switched (i.e. it is not one of the four controlled channels).



The 4 Channel Hub requires a DC voltage between 9 to 24VDC. This will be supplied in one of two ways. Power can be supplied using a power adapter connected to the power connector (2). Alternatively, power can be supplied through the 1-Wire network (1). If power is supplied through the 1-Wire network, the jumper labeled UNREG must be in place (3). If power is supplied through the power connector pin, the jumper should be removed.

Connecting Channels

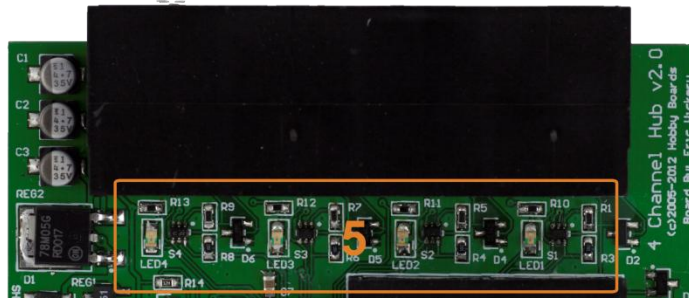
The 4 Channel Hub allows connection of four independently switched channels, each of which connects a branch of your 1-Wire network. These channels are normally off, and must be explicitly turned on to allow 1-Wire connectivity.



To connect a branch of your 1-Wire network to a channel on the 4 Channel Hub, simply use a standard network cable and connect it to one input of the quad RJ45 jacks (4). Any of the four channels may be used. Note that the channels are numbered in order from right to left in the above picture, corresponding to the number on the LED label below it – the software controlling each channel will control these channels by number.

LED Display

The 4 Channel Hub provides four LEDs (5) to display the status of each channel.



According to the status of its channel, each LED will be:

- ON, when the channel is active
- OFF, when the channel is inactive
- FLASH, if the channel is shorted

Software Requirements

The 4 Channel Hub requires 1-Wire software to read, interpret and display the data provided by the device. Our website provides links to software providers for your convenience. Many software providers support Hobby Boards devices shortly after they are released. Device support changes frequently, so please check with your software provider to see whether this device is supported or not. Your software provider can also give you information on how to configure the software and read the results. NOTE that the 4 Channel Hub is not compatible with software drivers for the previously released 6-Channel Hub – software support must explicitly be for this 4-Channel Hub version.

5 | PROGRAMMING NOTES

The 4 Channel Hub uses a custom 1-Wire chip. The device follows familiar 1-Wire programming standards, and we assume you will be familiar with 1-Wire programming before you read these instructions. If you need a refresher, we recommend that you use the 1-Wire links available on our website in order to find good source material.

(NOTE that unlike our previously released 6-Channel Hub, this newer 4 Channel Hub does not use main / aux channels; each channel is independently controlled.)

Note the 4 Channel Hub does not support 1-Wire overdrive speeds.

Family Code

The 4 Channel Hub has a family code of 0xEF.

All Hobby Boards custom 1-Wire devices will have a family code of either 0xEE (if they support built-in temperature readings) or 0xEF (if they do not).

Commands Available for the 4 Channel Hub

The following standard 1-Wire commands are supported:

SEARCH ROM (0xF0)

MATCH ROM (0x55)

READ ROM (0x33)

SKIP ROM (0xCC)

Once the 1-Wire Master has addressed the device, the following ROM commands can be issued. All ROM function commands are 8 bits long.

READ VERSION (0x11) – Returns two separate bytes with the firmware version of the device. The data is returned minor version byte first, followed by the major version byte.

READ TYPE (0x12) – Returns one byte containing the type of the device. The 4 Channel Hub will return 0x05.

SET CONFIG (0x60) – Takes one byte. The second bit sets the Single Channel Flag (see below for explanation of the Single Channel Flag). We recommend calling Get Config first, and when using Set Config, send the byte that was returned by Get Config changing only the second bit to set the Single Channel Flag.

GET CONFIG (0x61) – Returns one byte. The second bit is the Single Channel Flag; other bits are not used.

Single Channel Flag – Sets whether multiple channels can be active at the same time. If the flag is set (1), only a single channel can be active at any given time; if the flag is cleared (0) multiple channels may be used simultaneously. We recommend using the single channel mode for optimal 1-wire network performance.

SET CHANNELS (0x21) – Takes one byte. The lower four bits each represent which channel should be set (Channel 1 is represented by the LSB). The next bit (0x10) is a flag indicating whether each channel should be turned on (1) or turned off (0). The upper three bits are not used. When the device is in single channel mode if multiple channels are set to on then nothing will happen and the command will be ignored. If only one channel is set to on then any channels that are currently on will be turned off and the one channel set will be on.

GET ACTIVE CHANNELS (0x22) – Returns one byte. The lower four bits each indicate whether the given channel is on; LSB is channel 1. Each bit will be set (1) if the corresponding channel is active.

GET SHORTED CHANNELS (0x23) – Returns one byte. The lower four bits each indicate whether the given channel is shorted; LSB is channel 1. Each bit will be set (1) if the corresponding channel is shorted.

ROM IDs used by the 4 Channel Hub

Each Hobby Boards Device has a unique 64-bit ROM code. The format of the code is as follows:

Position	Function	Code
First 8 bits	Family code	0xEF
Next 48 bits	Serial number	Unique
Last 8 bits	CRC of first 56 bits	