Yet more DHT22 sensor code

by **joan** » Wed Mar 05, 2014 10:24 pm

This code has been updated.

http://abyz.co.uk/rpi/pigpio/code/DHT22_py.zip

The power parameter is only needed if you are sampling every 2 seconds or faster. Omit it otherwise. It specifies the gpio being used to switch power to the sensor.

The LED parameter gives visual feed-back whenever a sample is taken. The default, gpio 16, is the activity LED on Rev.1/2 boards. On Rev.3 boards use gpio 47. Alternatively connect your own LED.

My DHT22 arrived from China this morning. After decoding some of the more bizarre documentation known to man I now seem to have working Python code.

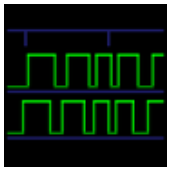
The DHT22 is powered from 3.3V and the output goes direct to gpio8.

If you power from 5V you'd have to muck about with external pull-ups and a resistor divider to get the circuit working properly.

For 5V operation I have done the following

Code: **Select all**

```
#!/usr/bin/env python

# 2014-07-11 DHT22.py

import time
import atexit

import pigpio

class sensor:
   """
   A class to read relative humidity and temperature from the
   DHT22 sensor.  The sensor is also known as the AM2302.

   The sensor can be powered from the Pi 3V3 or the Pi 5V rail.

   Powering from the 3V3 rail is simpler and safer.  You may need
   to power from 5V if the sensor is connected via a long cable.
```



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

```
   Connect pin 2 to a gpio.

   For 5V operation connect pin 1 to 5V and pin 4 to ground.

   The following pin 2 connection works for me.  Use at YOUR OWN
RISK.

   5V--5K_resistor--+--10K_resistor--Ground
                    |
   DHT22 pin 2 -----+
                    |
   gpio ------------+
   """

   def __init__(self, pi, gpio, LED=None, power=None):
      """
      Instantiate with the Pi and gpio to which the DHT22 output
      pin is connected.

      Optionally a LED may be specified.  This will be blinked for
      each successful reading.

      Optionally a gpio used to power the sensor may be specified.
      This gpio will be set high to power the sensor.  If the sensor
      locks it will be power cycled to restart the readings.

      Taking readings more often than about once every two seconds
will
      eventually cause the DHT22 to hang.  A 3 second interval seems
OK.
      """

      self.pi = pi
      self.gpio = gpio
      self.LED = LED
      self.power = power

      if power is not None:
         pi.write(power, 1) # Switch sensor on.
```

```
      self.powered = True

      self.cb = None

      atexit.register(self.cancel)

      self.bad_CS = 0 # Bad checksum count.
      self.bad_SM = 0 # Short message count.
      self.bad_MM = 0 # Missing message count.
      self.bad_SR = 0 # Sensor reset count.

      # Power cycle if timeout > MAX_TIMEOUTS.
      self.no_response = 0
      self.MAX_NO_RESPONSE = 2

      self.rhum = -999
      self.temp = -999

      self.tov = None

      self.high_tick = 0
      self.bit = 40

      pi.set_pull_up_down(gpio, pigpio.PUD_OFF)

      pi.set_watchdog(gpio, 0) # Kill any watchdogs.

      self.cb = pi.callback(gpio, pigpio.EITHER_EDGE, self._cb)

   def _cb(self, gpio, level, tick):
      """
      Accumulate the 40 data bits.  Format into 5 bytes, humidity
high,
      humidity low, temperature high, temperature low, checksum.
      """
      diff = pigpio.tickDiff(self.high_tick, tick)

      if level == 0:

         # Edge length determines if bit is 1 or 0.
```

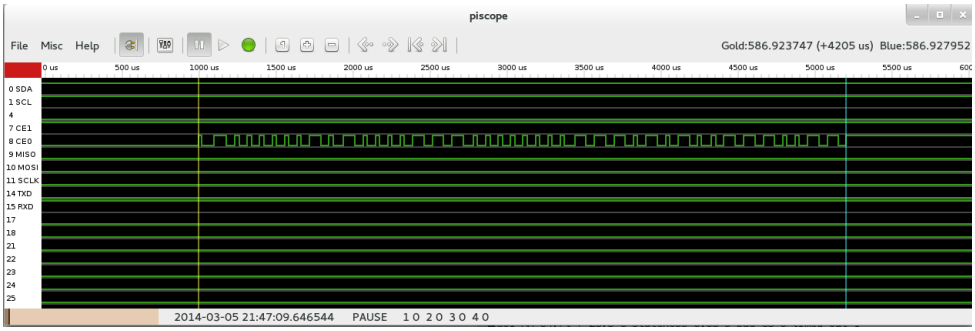
```
            val = 1
            if diff >= 200: # Bad bit?
               self.CS = 256 # Force bad checksum.
         else:
            val = 0

         if self.bit >= 40: # Message complete.
            self.bit = 40

         elif self.bit >= 32: # In checksum byte.
            self.CS  = (self.CS<<1)  + val

            if self.bit == 39:

               # 40th bit received.

               self.pi.set_watchdog(self.gpio, 0)

               self.no_response = 0

               total = self.hH + self.hL + self.tH + self.tL

               if (total & 255) == self.CS: # Is checksum ok?

                  self.rhum = ((self.hH<<8) + self.hL) * 0.1

                  if self.tH & 128: # Negative temperature.
                     mult = -0.1
                     self.tH = self.tH & 127
                  else:
                     mult = 0.1

                  self.temp = ((self.tH<<8) + self.tL) * mult

                  self.tov = time.time()

                  if self.LED is not None:
                     self.pi.write(self.LED, 0)

               else:
```

```
         elif self.bit >=24: # in temp low byte
            self.tL = (self.tL<<1) + val

         elif self.bit >=16: # in temp high byte
            self.tH = (self.tH<<1) + val

         elif self.bit >= 8: # in humidity low byte
            self.hL = (self.hL<<1) + val

         elif self.bit >= 0: # in humidity high byte
            self.hH = (self.hH<<1) + val

         else:               # header bits
            pass

         self.bit += 1

      elif level == 1:
         self.high_tick = tick
         if diff > 250000:
            self.bit = -2
            self.hH = 0
            self.hL = 0
            self.tH = 0
            self.tL = 0
            self.CS = 0

      else: # level == pigpio.TIMEOUT:
         self.pi.set_watchdog(self.gpio, 0)
         if self.bit < 8:       # Too few data bits received.
            self.bad_MM += 1    # Bump missing message count.
            self.no_response += 1
            if self.no_response > self.MAX_NO_RESPONSE:
               self.no_response = 0
               self.bad_SR += 1 # Bump sensor reset count.
               if self.power is not None:
                  self.powered = False
                  self.pi.write(self.power, 0)
                  time.sleep(2)
```

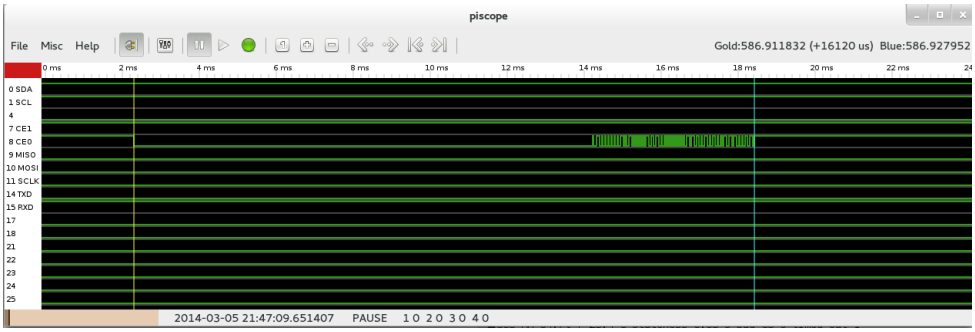
```
                    self.powered = True
            elif self.bit < 39:     # Short message receieved.
                self.bad_SM += 1    # Bump short message count.
                self.no_response = 0

            else:                   # Full message received.
                self.no_response = 0

    def temperature(self):
        """Return current temperature."""
        return self.temp

    def humidity(self):
        """Return current relative humidity."""
        return self.rhum

    def staleness(self):
        """Return time since measurement made."""
        if self.tov is not None:
            return time.time() - self.tov
        else:
            return -999

    def bad_checksum(self):
        """Return count of messages received with bad checksums."""
        return self.bad_CS

    def short_message(self):
        """Return count of short messages."""
        return self.bad_SM

    def missing_message(self):
        """Return count of missing messages."""
        return self.bad_MM

    def sensor_resets(self):
        """Return count of power cycles because of sensor hangs."""
        return self.bad_SR

    def trigger(self):
```

```
         if self.LED is not None:
            self.pi.write(self.LED, 1)

         self.pi.write(self.gpio, pigpio.LOW)
         time.sleep(0.017) # 17 ms
         self.pi.set_mode(self.gpio, pigpio.INPUT)
         self.pi.set_watchdog(self.gpio, 200)

   def cancel(self):
      """Cancel the DHT22 sensor."""

      self.pi.set_watchdog(self.gpio, 0)

      if self.cb != None:
         self.cb.cancel()
         self.cb = None

if __name__ == "__main__":

   import time

   import pigpio

   import DHT22

   # Intervals of about 2 seconds or less will eventually hang the
DHT22.
   INTERVAL=3

   pi = pigpio.pi()

   s = DHT22.sensor(pi, 22, LED=16, power=8)

   r = 0

   next_reading = time.time()

   while True:

      r += 1
```

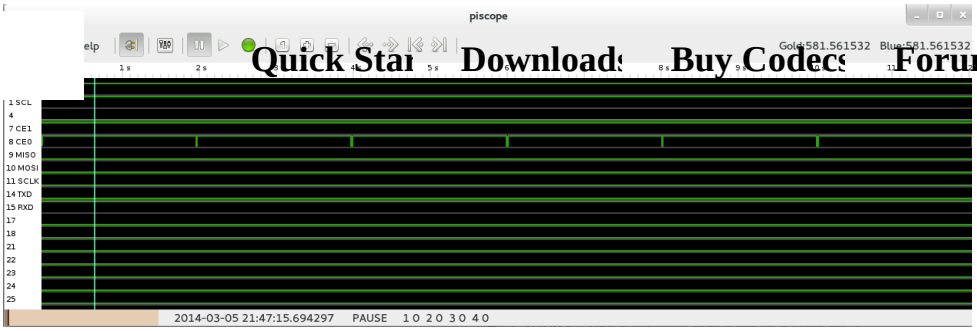
```
      time.sleep(0.2)

      print("{} {} {} {:3.2f} {} {} {} {}".format(
         r, s.humidity(), s.temperature(), s.staleness(),
         s.bad_checksum(), s.short_message(), s.missing_message(),
         s.sensor_resets()))

      next_reading += INTERVAL

      time.sleep(next_reading-time.time()) # Overall INTERVAL second
polling.

   s.cancel()

   pi.stop()
```



dht22-a.png (29.93 KiB) Viewed 11949 times



dht22-b.png (29.78 KiB) Viewed 11949 times



dht22-c.png (28.01 KiB) Viewed 11949 times

Code: Select all

```
...
205 RH=64.6% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
206 RH=64.9% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
207 RH=65.5% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
208 RH=65.0% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
209 RH=64.6% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
210 RH=64.8% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
211 RH=64.9% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
212 RH=64.8% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
213 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
214 RH=64.2% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
215 RH=64.3% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
216 RH=64.6% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
217 RH=64.8% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
218 RH=64.8% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
219 RH=64.8% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
220 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
221 RH=64.3% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
222 RH=64.1% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
223 RH=64.5% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
224 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
225 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
226 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
227 RH=64.0% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
228 RH=64.6% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
229 RH=64.5% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
230 RH=64.1% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
231 RH=64.1% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
232 RH=64.3% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
233 RH=64.2% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
234 RH=64.2% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
```

```
237 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
238 RH=64.3% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
239 RH=64.5% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
240 RH=64.5% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
241 RH=64.4% T=23.5 C staleness=0.03 s bad CS=0 timed out=1
...
```

Last edited by joan on Sat Aug 02, 2014 1:27 pm, edited 7 times in total.
by **danjperron** » Fri Mar 07, 2014 12:21 am
Nice Joan,

I will be able to free the SPI since I was using it to decode the DHT22 and pigpiod was already running.

B.T.W. I create a service with pigpiod.
ref:http://blog.scphillips.com/2013/07/getting-a-python-script-to-run-in-the-background-as-a-service-on-boot/

Code: Select all

```
i@raspberrypi ~ $ cat /etc/init.d/pigpiod
#!/bin/sh

### BEGIN INIT INFO
# Provides:          pigpiod
# Required-Start:    $remote_fs $syslog
# Required-Stop:     $remote_fs $syslog
# Default-Start:     2 3 4 5
# Default-Stop:      0 1 6
# Short-Description: PI GPIO service with pwm
# Description:       PI GPIO service with pwm
### END INIT INFO

# Change the next 3 lines to suit where you install your script and
what you want to call it
DIR=/usr/local/bin
DAEMON=$DIR/pigpiod
DAEMON_NAME=pigpiod

# This next line determines what user the script runs as.
# Root generally not recommended but necessary if you are using the
Raspberry Pi GPIO from Python.
DAEMON_USER=root
```

Posts: 1242

Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

```
PIDFILE=/var/run/$DAEMON_NAME.pid

. /lib/lsb/init-functions

do_start () {
    log_daemon_msg "Starting system $DAEMON_NAME daemon"
    start-stop-daemon --start --background --pidfile $PIDFILE
--make-pidfile --user $DAEMON_USER --chuid $DAEMON_USER --startas
$DAEMON
    log_end_msg $?
}
do_stop () {
    log_daemon_msg "Stopping system $DAEMON_NAME daemon"
    start-stop-daemon --stop --pidfile $PIDFILE --retry 10
    log_end_msg $?
}

case "$1" in

    start|stop)
        do_${1}
        ;;

    restart|reload|force-reload)
        do_stop
        do_start
        ;;

    status)
        status_of_proc "$DAEMON_NAME" "$DAEMON" && exit 0 || exit $?
        ;;
    *)
        echo "Usage: /etc/init.d/$DAEMON_NAME
{start|stop|restart|status}"
        exit 1
        ;;

esac
exit 0
```

Code: Select all

```
sudo chmod 755 /etc/init.d/pigpiod
```

I insert it into the services

Code: Select all

```
cd /etc/init.d
sudo update-rc.d pigpiod defaults 99
```

I added into the service list

Code: Select all

```
complete -W "$(ls /etc/init.d/)" service
```

And finally start the service manually to see if it works.

Code: Select all

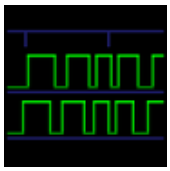
```
sudo service pigpiod start
```

Thank you ,
Daniel

by **joan** » Fri Mar 07, 2014 7:51 am
Good work on the start-up script.

A note of caution on the DHT22. Mine has locked up a couple of times after several hours of reading. I couldn't find a programmatic way of resetting the DHT22 so pulled its plug. A Google shows that I'm not alone in having reliability problems. However there is a chance that the way I'm triggering the device reads causes the problem, or indeed my breadboard. I'll be interested in any reliability problems you have compared to SPI.

SPI does seem to have quite a few novel and unexpected uses.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

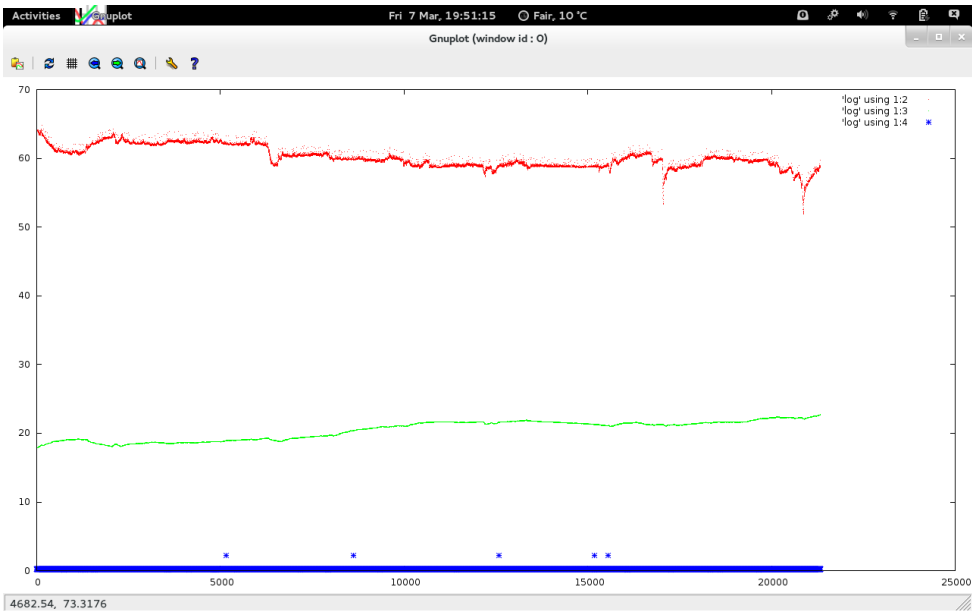
by **danjperron** » Fri Mar 07, 2014 7:36 pm
Maybe a pull up problem. I had my SPI system running for 3 weeks with no interruption and no false reading or hang. the system reads it every 5 minutes twice since the first read out is always the last state it was 5 minutes ago. A minimum of 1 second is needed between any new reading.

Posts: 1242

Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

by **joan** » Fri Mar 07, 2014 7:57 pm
I've just left it running today taking readings every 2 seconds. Just over 21,000 so far with 5 checksum failures, no timeouts, no freezes.



5V (5K+10K resistor) reading every 2 seconds

DHT22-log.png (45.26 KiB) Viewed 11819 times

by **joan** » Sat Mar 15, 2014 1:13 pm
I left the sensor and breadboard in an undisturbed place and left it running. I thought it had crashed but without thinking I had put a limit of 30000 samples (felt like a lot).

No checksum error, no timeouts, no freezes.

Powered from 3V3. Sample every 2 seconds.

DHT22.py-2s.png (44.86 KiB) Viewed 11619 times

by **danjperron** » Sat Jun 21, 2014 1:20 am
Oops, something change in pigpio.

My service script didn't work anymore but I found a workaround.

Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

Posts: 1242

Joined: Thu Dec 27, 2012

Code: Select all

```
#!/bin/sh

### BEGIN INIT INFO
# Provides:          pigpiod
# Required-Start:    $remote_fs $syslog
# Required-Stop:     $remote_fs $syslog
# Default-Start:     2 3 4 5
# Default-Stop:      0 1 6
# Short-Description: PI GPIO service with pwm
# Description:       PI GPIO service with pwm
### END INIT INFO

# Change the next 3 lines to suit where you install your script and
what you want to call it
DIR=/usr/local/bin
DAEMON=$DIR/pigpiod
DAEMON_NAME=pigpiod
DAEMON_LOCK=pigpio

# This next line determines what user the script runs as.
# Root generally not recommended but necessary if you are using the
Raspberry Pi GPIO from Python.
DAEMON_USER=root

# The process ID of the script when it runs is stored here:
PIDFILE=/var/run/$DAEMON_LOCK.pid

. /lib/lsb/init-functions

do_start () {
    log_daemon_msg "Starting system $DAEMON_NAME daemon"
#    start-stop-daemon --start --background --pidfile $PIDFILE
--make-pidfile --user $DAEMON_USER --chuid $DAEMON_USER --startas
$DAEMON
    start-stop-daemon --start --background --pidfile $PIDFILE --user
$DAEMON_USER --chuid $DAEMON_USER --startas $DAEMON
    log_end_msg $?
}
do_stop () {
```

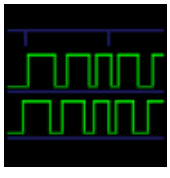
```
    log_end_msg $?
}

case "$1" in

    start|stop)
        do_${1}
        ;;

    restart|reload|force-reload)
        do_stop
        do_start
        ;;

    status)
        status_of_proc "$DAEMON_NAME" "$DAEMON" && exit 0 || exit $?
        ;;
    *)
        echo "Usage: /etc/init.d/$DAEMON_NAME
{start|stop|restart|status}"
        exit 1
        ;;

esac
exit 0
```

This script will use /var/run/pigpio.pid create by /usr/local/bin/pigpiod and will use it to stop the service.

Daniel

by **joan** » Sat Jun 21, 2014 7:27 am

Do you know what actually changed? I've never knowingly changed anything in this area since the daemon was introduced in version 3.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

by **danjperron** » Sat Jun 21, 2014 12:26 pm

And now it is working fine.

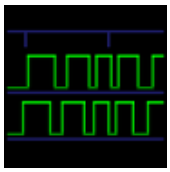
Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

by **joan** » Sat Jun 21, 2014 1:15 pm

As an aside I have a hypothesis about why the DHT22 locks up eventually with my code but not with SPI.

My code drives the line low as part of the trigger sequence and then turns the line into an input which allows it to pull-up to 3.3V. It seems possible that you need to actively drive the line high for a short period (40 micros) rather than just let it pull-up. I don't understand why that would be. Unfortunately this hypothesis can only be disproved.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

by **danjperron** » Sat Jun 21, 2014 3:40 pm

I notice something when I used pigpio in PWM mode , the R/C servo will glitch (making a small noise of quick movement) after a long period. Is it due to a counter going from 0xffffffff to 0x0? I really don't know. since I didn't look on how you did the pwm , it is just a theory.

I was reading a book and sudendly the R/C servo, hook to my webcam, make a moving sound , just a glitch. I notice it a couple of times. I should check the time interval and this could gives a clue about the problem.

Daniel

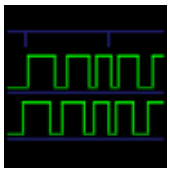
Posts: 1242

Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

by **joan** » Sat Jun 21, 2014 4:28 pm

> danjperron wrote:I notice something when I used pigpio in PWM mode , the R/C servo will glitch (making a small noise of quick movement) after a long period. Is it due to a counter going from 0xffffffff to 0x0? I really don't know. since I didn't look on how you did the pwm , it is just a theory.
>
> I was reading a book and sudendly the R/C servo, hook to my webcam, make a moving sound , just a glitch. I notice it a couple of times. I should check the time interval and this could gives a clue about the problem.
>
> Daniel



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

It's not something I've noticed, but I rarely leave servos connected for extended periods, Do you have any feel for the periods involved?

There is the "check temperature to calculate RAM refresh rate" glitch twice a second (perhaps 8 micros each time). I have the check disabled but don't remember it causing problems for my servos in the past.

I will try to see if I could create some kind of detector to get the glitch interval.

Daniel

Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

by **danjperron** » Sun Jun 22, 2014 2:02 am
B.T.W.

The sequence number when you create a service daemon is not taken in consideration any more. Wheezy use a dependency scheme.

If you want to use the sequence number, you will need to create /etc/init.d/.legacy-bootordering

Sequence number could be important if you create another daemon which use pigpiod. Be sure you put a number higher than the one you put for pigpiod.

Code: Select all

```
sudo touch /etc/init.d/.legacy-bootordering
update-rc.d pigpiod defaults 50
```

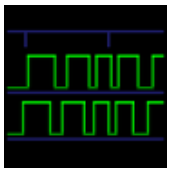
Posts: 1242

Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

Sorry about that parentheses about pigpiod . But this is important enough if you want to use autostart pigpiod in service deamon.
by **joan** » Sun Jun 22, 2014 7:23 am

> danjperron wrote:B.T.W.
>
> The sequence number when you create a service daemon is not taken in consideration any more. Wheezy use a dependency scheme.
> ...



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

OK, I think I understand now. This is the number which determines the order in which programs are started in /etc/init.d type scripts. So rather than prefix the priority to the script name you now have to use a different solution or use the legacy option.

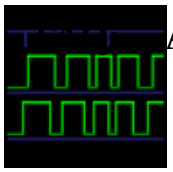
I wonder how you are meant to fix the ordering in the new scheme of things.
by **rgrbic** » Sun Jun 22, 2014 8:13 am
You should put pullup resistor in the case of 3.3V supply too.
At 127.0.0.1
Twitter: @rgrbic
IoT-projects.com

Posts: 127

Joined: Thu Jun 12, 2014 1:07 pm

by **joan** » Sun Jun 22, 2014 8:29 am

Yes, I always pull the output up to 3.3V, through a voltage divider if using 5V, otherwise just through a 5k resistor.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

by **danjperron** » Sun Jun 22, 2014 11:55 am
About the pull-up resistor,

I test a DHT11 and the slew rate of the rising slope is problematic.

I had to use 1K pull-up resistor for the signal to top high (to VCC) and get valid data.

Otherwise the signal is not going up enough.Looks like a saw wave signal and there is no valid data.

And the falling edge is ok.

I suspect a bad sensor. I will order another one because I don't think is in specification. Looks like it has a big capacitor couple on a base of a open collector transistor.

Posts: 1242

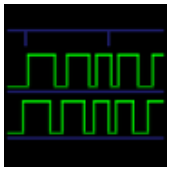
Joined: Thu Dec 27, 2012 4:05 am

Location: Québec, Canada

Daniel
by **joan** » Fri Jun 27, 2014 9:51 am
I've been looking into preventing the DHT22 hanging for some time. Eventually I decided to power the sensor from a gpio so I could reset it when it stops responding.

By looking at the times I need to power cycle the sensor it has become apparent that there is a strong correlation with the time a 3kW appliance is switched on.

It seems not to be a software problem after all.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

by **rgrbic** » Fri Jun 27, 2014 9:56 am
What kind of cable are you using for DHT22 and is this sensor near this appliance?
At 127.0.0.1
Twitter: @rgrbic
IoT-projects.com

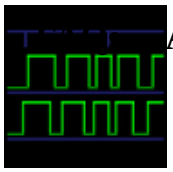
Posts: 127

Joined: Thu Jun 12, 2014 1:07 pm

by **joan** » Fri Jun 27, 2014 10:14 am

> rgrbic wrote:What kind of cable are you using for DHT22 and is this sensor near this appliance?

ring.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

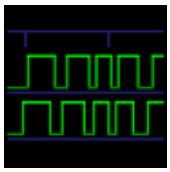
by **rgrbic** » Fri Jun 27, 2014 10:33 am

Posts: 127

Joined: Thu Jun 12, 2014 1:07 pm

> joan wrote:
>
> > rgrbic wrote:What kind of cable are you using for DHT22 and is this sensor near this appliance?
>
> The DHT22 is plugged into breadboard. The appliance is about 20 feet away on a different ring.

Put a capacitor between dht22 supply pins (Vcc and GND), like 0.1 uF
At 127.0.0.1
Twitter: @rgrbic
IoT-projects.com
by **joan** » Fri Jun 27, 2014 10:47 am
I have a 104 cap between pins 1 and 4.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

by **rgrbic** » Sat Jun 28, 2014 9:32 am

Try to put one more (electrolytic) capacitor between vcc and gnd.
At 127.0.0.1
Twitter: @rgrbic
IoT-projects.com

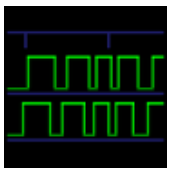
Posts: 127

Joined: Thu Jun 12, 2014 1:07 pm

by **joan** » Sat Jun 28, 2014 9:57 am

> rgrbic wrote:Try to put one more (electrolytic) capacitor between vcc and gnd.

I've previously tried up to a 64 microfarad electrolytic. My main aim is to determine whether the software or the hardware is at fault. I'm 99% sure it's not a software problem.



Posts: 7007

Joined: Thu Jul 05, 2012 5:09 pm

Location: UK

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