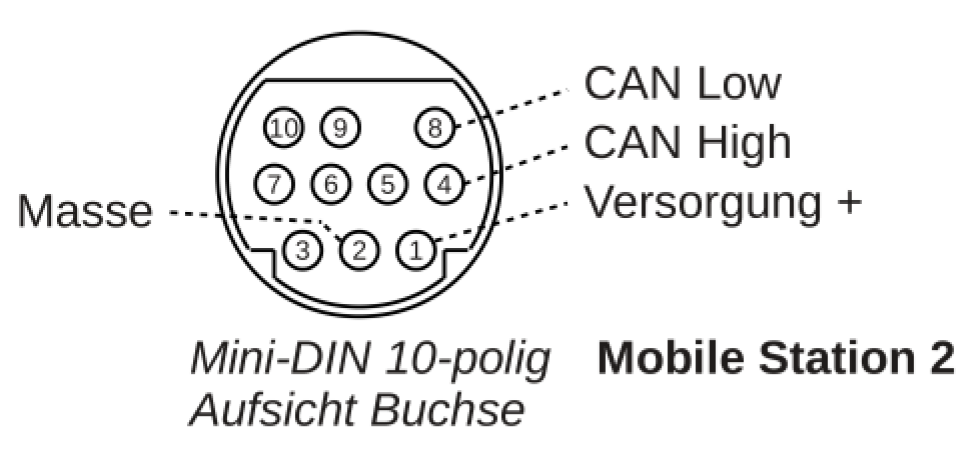
# InterfaceS88GleisboxRPi

Inhoud

[InterfaceS88GleisboxRPi 1](#_Toc127625964)

[Connection to Gleisbox 1](#_Toc127625965)

## Connection to Gleisbox



## Installation of CAN/SPI

***Controlling Märklin Digital Railroad with Raspberry Pi(Raspi)and Rocrail***

Please consider a little donation, so I can continue creating such great Projects.

Software part:

Setting up the Raspberry PI to act as Central Station 2

Downloading the Raspbian image on a PC:

This manual workes best with an older version: raspbian-2015-05-07/2015-05-05-raspbian-wheezy.zipfrom http://downloads.raspberrypi.org/raspbian/images/

But for a new PI3 you better download: raspbian-2016-09-28/2016-09-23-raspbian-jessie.zip

Unzip the image and write 2015-05-05-raspbian-wheezy.img to SD Card with Win32 Disk Imagerhttps://sourceforge.net/projects/win32diskimager/

Put SD Card in Pi and start your PI.

Installing on the PI:

Raspi will start up with the Raspi-config.You can now hit the enter key to Expand the filesytem, but this is optional.But what you need to do is go to Advanced Options.Move Cursor down to A6 SPI, and enable it.Now you can finish the setup and reboot your PI.

You can also check this link for reference with some screenshots as guide:http://skpang.co.uk/blog/archives/1165After Pi has rebooted, log in with:

user: pipassword: raspberry

Take attention that the reasperry is setup for english keyboard, and on german keyboards, the keys Z and Y areswitched.

Now we have to add 2 lines to the file: /boot/config.txtso type:sudo nano /boot/config.txtScroll at the end of the file, and you should see this line:dtparam=spi=onIf you don't see above line, add it, and right afterwards add this at the end:

For Jessie release before 2016-05-10, add this:dtoverlay=mcp2515-can0-overlay,oscillator=16000000,interrupt=25dtoverlay=spi-bcm2835-overlay

For Jessie release from 2016-05-10 and later, add this:

dtoverlay=mcp2515-can0,oscillator=16000000,interrupt=25dtoverlay=spi-bcm2835-overlay

User info for using a RPI 4 with Buster (2019-09-26 Kernel 4.19):dtoverlay=mcp2515-can0,oscillator=16000000,interrupt=25dtoverlay=spi-1csbcm2835 Info: Use version bcm2835-1.62. Version 42 did not work.(Thanks to Florian for this info!)

Save and exit with:Ctrl+o -> Enter -> Ctrl+xNow reboot your Pi withsudo rebootAfter the reboot, and after you logged in again, type following line to test your Board:sudo ip link set can0 up type can bitrate 250000You should get no error message.If you get the error message: Can't find CAN0 device, then your board is probably faulty.to ensure your CAN Baord is mounted, type:ifconfigand you should be able to see your mounted board as can0 like this:can0 Link encap:UNSPEC HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00UP RUNNING NOARP MTU:16 Metric:1RX packets:0 errors:0 dropped:0 overruns:0 frame:0TX packets:0 errors:0 dropped:0 overruns:0 carrier:0collisions:0 txqueuelen:10RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)eth0 Link encap:Ethernet HWaddr b8:27:eb:97:f1:68inet addr:192.168.1.18 Bcast:192.168.188.255 Mask:255.255.255.0UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1RX packets:125 errors:0 dropped:0 overruns:0 frame:0TX packets:149 errors:0 dropped:0 overruns:0 carrier:0collisions:0 txqueuelen:1000RX bytes:12903 (12.6 KiB) TX bytes:22629 (22.0 KiB)lo Link encap:Local Loopbackinet addr:127.0.0.1 Mask:255.0.0.0UP LOOPBACK RUNNING MTU:65536 Metric:1RX packets:40 errors:0 dropped:0 overruns:0 frame:0TX packets:40 errors:0 dropped:0 overruns:0 carrier:0collisions:0 txqueuelen:0RX bytes:3856 (3.7 KiB) TX bytes:3856 (3.7 KiB)wlan0 Link encap:Ethernet HWaddr 74:da:38:1a:c0:2fUP BROADCAST MULTICAST MTU:1500 Metric:1RX packets:0 errors:0 dropped:2 overruns:0 frame:0TX packets:0 errors:0 dropped:0 overruns:0 carrier:0collisions:0 txqueuelen:1000RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)At this point you know that your first chip the MCP2515 is working properly and communicating with the PI.Now lets see if the second chip the MCP2551, is also working and is able to listen on the CAN Bus.For this, lets install some CAN Helper tools, so type this into your PI:To avoid getting this error: ./autogen.sh: line 20: autoreconf: command not found

lets do this first:sudo apt-get install autoconfsudo apt-get install libtoolNow install the CAN Helper tools:git clone https://github.com/linux-can/can-utils.gitcd can-utils./autogen.sh./configuremakesudo make installNow we can test our board. Connect the Märklin Gleisbox with your Raspberry, and with a Mobile Station 2.and power it up.Now type following command to listen on the CAN Bus and dump it on the screen:sudo ./candump can0When you press now the STOP Button on your Mobile Station 2, you should get following lines:pi@raspberrypi ~/can-utils $ sudo ./candump can0can0 00002F17 [7] 00 00 00 00 09 00 04can0 00002F17 [6] 00 00 00 00 08 07can0 00017B1F [7] 00 00 00 00 09 00 04can0 00002F17 [5] 00 00 00 00 01can0 00017B1F [6] 00 00 00 00 08 07can0 00017B1F [5] 00 00 00 00 01This is my output after pressing the STOP Button a few times:can0 00002F17 [7] 00 00 00 00 09 00 04can0 00002F17 [6] 00 00 00 00 08 07can0 00017B1F [7] 00 00 00 00 09 00 04can0 00002F17 [5] 00 00 00 00 01can0 00017B1F [6] 00 00 00 00 08 07can0 00017B1F [5] 00 00 00 00 01can0 00002F17 [5] 00 00 00 00 00can0 00017B1F [5] 00 00 00 00 00can0 00002F17 [7] 00 00 00 00 09 00 04can0 00002F17 [6] 00 00 00 00 08 07can0 00017B1F [7] 00 00 00 00 09 00 04can0 00002F17 [5] 00 00 00 00 01can0 00017B1F [6] 00 00 00 00 08 07can0 00017B1F [5] 00 00 00 00 01can0 00002F17 [5] 00 00 00 00 00can0 00017B1F [5] 00 00 00 00 00Awesome, at this point, the board is working perfectly. Time to setup my tool which will communicate withRocrail Server to control our railroad.Go back to home directory first:cd ..

First we need a tool to access the GPIO ports of the Pi:wget http://www.airspayce.com/mikem/bcm2835/bcm2835-1.42.tar.gztar zxvf bcm2835-1.42.tar.gzcd bcm2835-1.42./configuremakesudo make checksudo make installNow we can do the main program:cd ..

wget http://www.ifoedit.com/PiCanS88.tartar xvf PiCanS88.tarcd PiCanS88makeNow you can start it with (where the IP would be the IP of your Rocrailserver):sudo ./PiCanS88 -f -b 192.168.2.255 -v -d 192.168.2.96 -m 1Explanation of possible options:

-f (stay in forground and show details on screen)-v (show details on screen)-b 192.168.2.255 (broadcast address of your local home network)-d 192.168.2.96 (IP address of the Computer where your Rocrail server is running)-m 1 (number of connected S88 modules with 16 signals each) - (If you have modules with only 8 signals, using2 of such in a row will be seen as one module!)

Your Pi is now fully setup to act as a Central Station and to work with Rocrail. So lets create a quick script, thatstarts everything up, once we boot our Pi.I will name my script: startcs2, so type this line:sudo nano startcs2.shand add following lines into it:sudo ip link set can0 up type can bitrate 250000sleep 2ifconfigsudo/home/pi/PiCanS88/PiCanS88 -f -b 192.168.2.255 -v -d 192.168.2.96 -m 1You will have to adjust the two addresses to your home network.For example, if you have Rocrail Server running on your PC, open a command prompt on your PC, and type:ipconfigThen you will retrieve the IP address of your PC and the IP address of the default Gateway. Example: your IP192.168.1.47, Gateway: 192.168.1.1So in above script you will enter following line:

sudo/home/pi/PiCanS88/PiCanS88 -f -b 192.168.1.255 -v -d 192.168.1.47 -m 1If you have more then one S88 modules connected, you will have to adjust the option "-m" aswell with yournumber of connected modules.

Save and exit with:Ctrl+o -> Enter -> Ctrl+xBecause this will be a script, we have to make this file executable with:sudo chmod u+x,g+x,o+x startcs2.shCrosscheck with:ls -ll-rwxr-xr-x 1 root root 152 Apr 10 17:24 startcs2.shour script is now executable and could be started after a reboot with:./startcs2.shI assume you will be using this Pi just for your railraod and want to have the script started automatically onpower up, so lets edit the autostart by doing this:sudo nano /etc/rc.localYou will see this:#!/bin/sh -e#

# rc.local## This script is executed at the end of each multiuser runlevel.# Make sure that the script will "exit 0" on success or any other# value on error.## In order to enable or disable this script just change the execution# bits.## By default this script does nothing.# Print the IP address\_IP=$(hostname -I) || trueif [ "$\_IP" ]; thenprintf "My IP address is %s\n" "$\_IP"fiexit 0add your script to start, before the exit line like this:#!/bin/sh -e## rc.local## This script is executed at the end of each multiuser runlevel.# Make sure that the script will "exit 0" on success or any other# value on error.## In order to enable or disable this script just change the execution# bits.## By default this script does nothing.# Print the IP address\_IP=$(hostname -I) || trueif [ "$\_IP" ]; thenprintf "My IP address is %s\n" "$\_IP"fi/home/pi/startcs2.shexit 0Save and exit with:Ctrl+o -> Enter -> Ctrl+x

You Pi is now all setup to act as a almost full Central Station 2 for your Märklin Railroad. Enjoy.

Solution for watching the output in ssh session:

Big time gratitude goes to Christian Karrié for providing this solution!

If you are using the autostart script, and wonder how to see the output of my program, here is the solution provided by Chris:

We'll need a tool called screen:

sudo apt-get install screen

now change your autostart script to this:sudo ip link set can0 up type can bitrate 250000sleep 2ifconfigscreen -dmS cs2 bash -c 'sudo/home/pi/PiCanS88/PiCanS88 -f -v -b 192.168.2.255 -d 192.168.2.96 -m 1'

In your ssh session you can link to the running process at any time with:

sudo screen -r cs2

and exit with:

Ctrl+A -> d

(Thanx to Christian Karrié for this solution)

Fixing the Wifi-Disconnet problem:

I was facing a problem, when I started using a PI with an Edimax USB Wifi stick.After a few minutes I couldn't reach my Pi inside the network.Reason was an energy saving "feature", which disconnected the Pi off the network.Here's the solution to avoid this:

1 - Network settings:

Check your network settings, if wireless-power management is off. Type:

iwconfigThis is my output:

wlan0 IEEE 802.11bgn ESSID:"IWD546312" Nickname:"<WIFI@REALTEK>"Mode:Managed Frequency:2.437 GHz Access Point: D4:0E:11:2F:FD:ABBit Rate:72.2 Mb/s Sensitivity:0/0Retry:off RTS thr:off Fragment thr:offPower Management:offLink Quality=99/100 Signal level=94/100 Noise level=0/100Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0Tx excessive retries:0 Invalid misc:0 Missed beacon:0

Power Management is already off. If yours should be on, do this:

sudo nano /etc/network/interfaces

Add this at the end:wireless-power off

Save and exit with:Ctrl+o -> Enter -> Ctrl+x

and reboot:

sudo reboot

2 - Turn off Edimax Powersaving mode:

Check if you have a Realtek device by typing this:

lsmod

This is my output:

Module Size Used bycan\_raw 6736 0can 27502 1 can\_rawsnd\_bcm2835 18365 0snd\_pcm 73475 1 snd\_bcm2835snd\_seq 53078 0snd\_seq\_device 5628 1 snd\_seqsnd\_timer 17784 2 snd\_pcm,snd\_seqsnd 51038 5 snd\_bcm2835,snd\_timer,snd\_pcm,snd\_seq,snd\_seq\_devicemcp251x 8640 0can\_dev 9227 1 mcp251x8192cu 528365 0spi\_bcm2835 4061 0evdev 9950 3joydev 8879 0uio\_pdrv\_genirq 2958 0uio 8119 1 uio\_pdrv\_genirq

If you can find the module: '8192cu' like in the output above, then create a new config file:

sudo nano /etc/modprobe.d/8192cu.conf

And add this line:options 8192cu rtw\_power\_mgnt=0 rtw\_enusbss=0

Save and exit with:Ctrl+o -> Enter -> Ctrl+x

and after you reboot, this annyoing disconnect problem will be gone:

sudo reboot

Did you find this guidehelpful? How about saying thanks by donating a small amount.

For suggestions orcomments send an email to Derrow@yahoo.com

*Copyright ©1997 - 2021 Decision Developments.All rights reserved. Unauthorized usage of shown material is prohibited.*