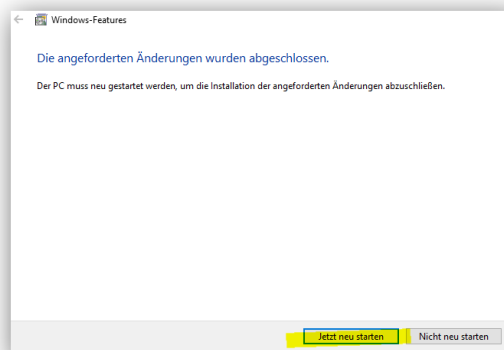
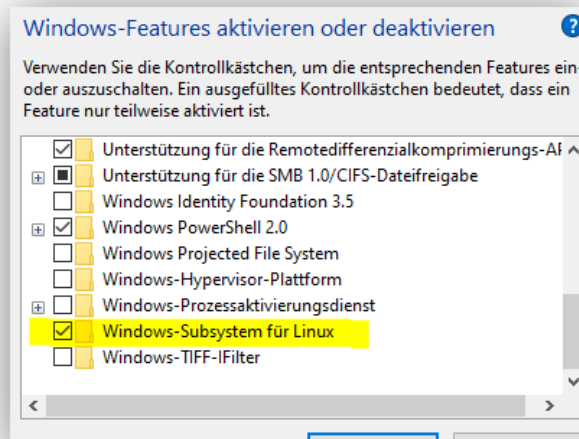
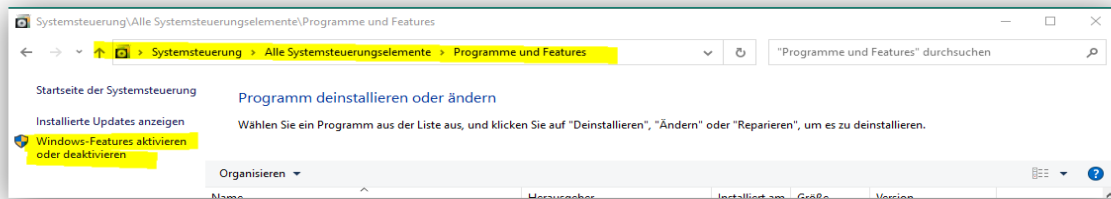
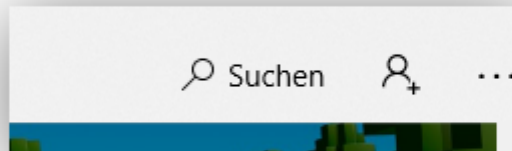
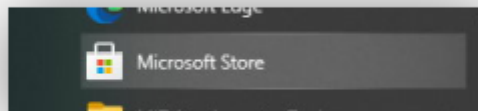


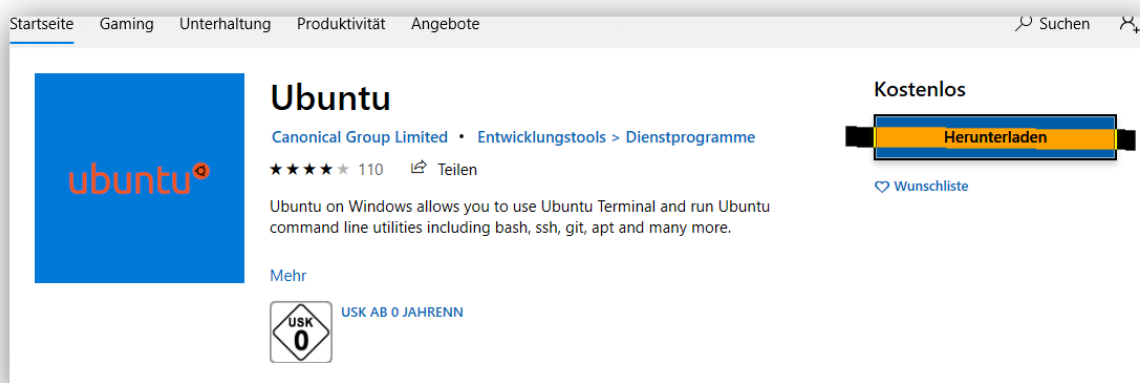
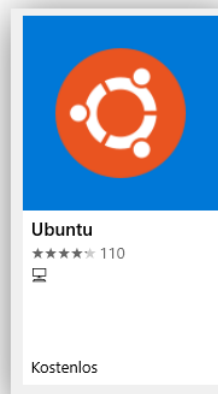
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WSL 1 - Ubuntu 20.04 LTS

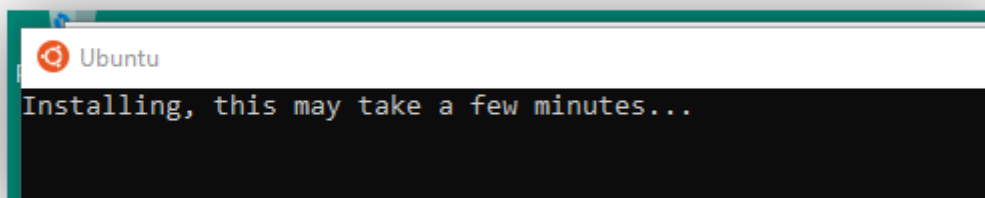
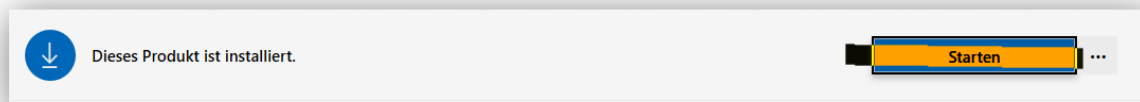
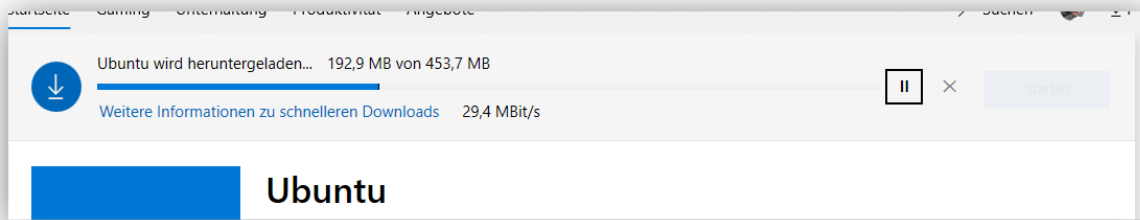
- **Systemsteuerung\Alle Systemsteuerungselemente\Programme und Features**
- **Windows-Features aktivieren oder deaktivieren**
- **Windows-Subsystem für Linux**
- **OK**
- **Rechner neu starten** (alles Wichtige vorher sichern)



- **ubuntu**

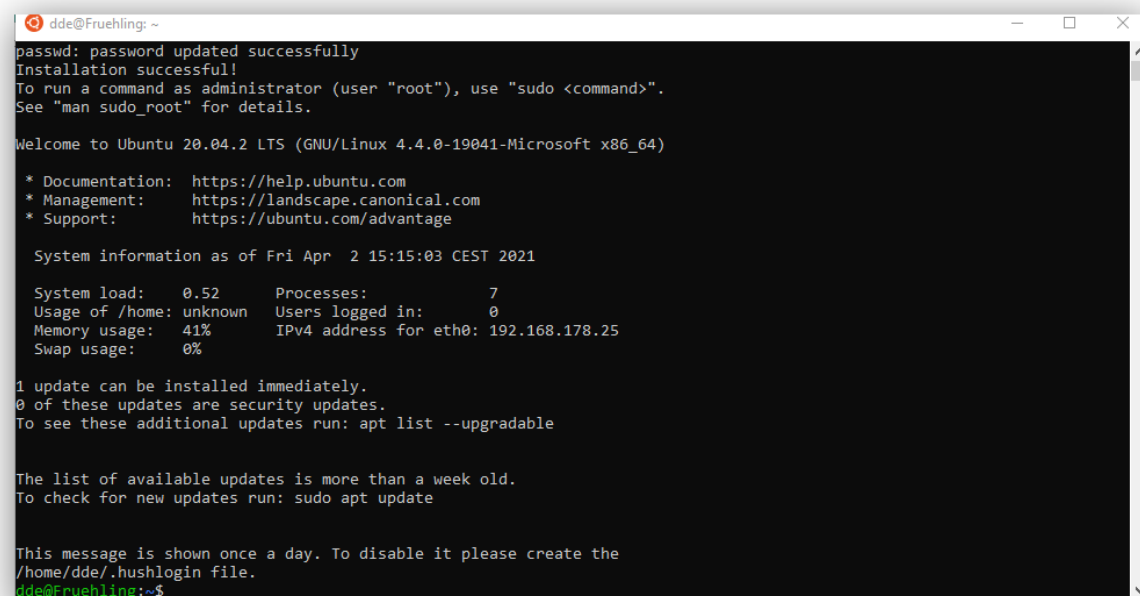


- **Jetzt muss man sich mit seinem Microsoft Konto anmelden**



Ein paar Minuten später:

- **username**
- **password**
- **password**



- `sudo apt update`
- `sudo apt upgrade`
- `sudo apt install gcc`
- `sudo apt install g++`
- `sudo apt install make`
- `sudo apt install git`
- `sudo apt install gdb`
- `sudo apt install build-essential`

--- System ist erstmals installiert ---

RailControl laden, und übersetzen

```
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
dde@Fruehling:~$ git clone https://github.com/teddydych/railcontrol.git
Cloning into 'railcontrol'...
remote: Enumerating objects: 222, done.
remote: Counting objects: 100% (222/222), done.
remote: Compressing objects: 100% (150/150), done.
remote: Total 11717 (delta 135), reused 132 (delta 72), pack-reused 11495
Receiving objects: 100% (11717/11717), 11.19 MiB | 4.67 MiB/s, done.
Resolving deltas: 100% (9482/9482), done.
dde@Fruehling:~$
```

```
Resolving deltas: 100% (9482/9482), done
dde@Fruehling:~$ cd railcontrol
dde@Fruehling:~/railcontrol$
```

```
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/gzread.o Hardware/zlib/gzread.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/adler32.o Hardware/zlib/adler32.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/gzwrite.o Hardware/zlib/gzwrite.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/inflate.o Hardware/zlib/inflate.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/infback.o Hardware/zlib/infback.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/trees.o Hardware/zlib/trees.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/crc32.o Hardware/zlib/crc32.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/inftrees.o Hardware/zlib/inftrees.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/gzclose.o Hardware/zlib/gzclose.c
cc -g -O2 -Wno-implicit-function-declaration -c -o Hardware/zlib/compress.o Hardware/zlib/compress.c
g++ -g Storage/sqlite3.o ArgumentHandler.o Config.o Languages.o Manager.o RailControl.o Version.o WebServer/WebServer.o WebServer/WebClientCluster.o WebServer/HtmlTagButtonCommandToggle.o WebServer/HtmlTagFeedback.o WebServer/HtmlTagAccessory.o WebServer/HtmlTagTrackBase.o WebServer/HtmlTagButtonPopup.o WebServer/HtmlTagRoute.o WebServer/HtmlFullResponse.o WebServer/HtmlTagSwitch.o WebServer/WebClientTrackBase.o WebServer/HtmlResponseNotFound.o WebServer/Response.o WebServer/HtmlResponseNotImplemented.o WebServer/WebClient.o WebServer/WebClientSignal.o WebServer/HtmlTagButtonCommand.o WebServer/HtmlTagSignal.o WebServer/HtmlTagInputInteger.o WebServer/HtmlTagInputSliderLocoSpeed.o WebServer/HtmlTagInputSlider.o WebServer/HtmlTag.o WebServer/HtmlTagButtonCommandPressRelease.o WebServer/HtmlTagInput.o WebServer/HtmlResponse.o WebServer/HtmlTagSelect.o WebServer/HtmlTagButton.o WebServer/WebClientTrack.o DataModel/AccessoryBase.o DataModel/Serializable.o DataModel/Track.o DataModel/TrackBase.o DataModel/Route.o DataModel/Relation.o DataModel/Switch.o DataModel/Feedback.o DataModel/LocoFunctions.o DataModel/Accessory.o DataModel/Loco.o DataModel/Cluster.o DataModel/LockableItem.o DataModel/Signal.o DataModel/LayoutItem.o DataModel/HardwareHandle.o DataModel/Object.o Hardware/Z21.o Hardware/Hsi88.o Hardware/Virtual.o Hardware/ZLib.o Hardware/Ecos.o Hardware/CCSchitte.o Hardware/CS2Ctp.o Hardware/LocoCache.o Hardware/ProtocolMaerklinCAN.o Hardware/HardwareHandler.o Hardware/OpenDcc.o Hardware/CS2Upd.o Hardware/M6051.o Hardware/RM485.o Logger/LoggerServer.o Logger/Logger.o Network/TcpServer.o Network/Serial.o Network/UdpConnection.o Network/TcpConnection.o Network/TcpClient.o Storage/Sqlite.o Storage/StorageHandler.o Storage/TransactionGuard.o Utils/Utils.o Hardware/zlib/deflate.o Hardware/zlib/gzlib.o Hardware/zlib/uncompr.o Hardware/zlib/zutil.o Hardware/zlib/inffast.o Hardware/zlib/gzread.o Hardware/zlib/adler32.o Hardware/zlib/gzwrite.o Hardware/zlib/inflate.o Hardware/zlib/infback.o Hardware/zlib/trees.o Hardware/zlib/crc32.o Hardware/zlib/inftrees.o Hardware/zlib/gzclose.o Hardware/zlib/compress.o -o railcontrol -lpthread -ldl
ide@Fruehling:~/railcontrol$
```

- `git clone https://github.com/teddych/railcontrol.git`
- `cd railcontrol`
- `make`

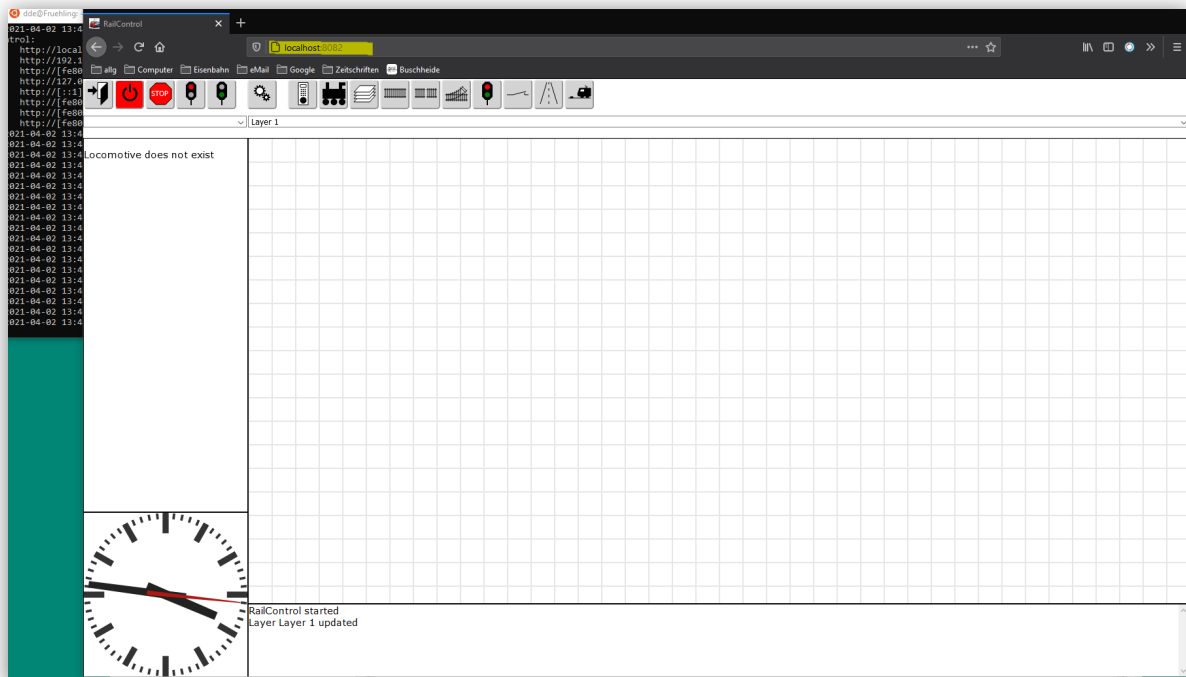
Erster Test

```
ees.o Hardware/zlib/crc32.o Hardware/zlib/inft
thread -ldl
dde@Fruehling:~/railcontrol$ ./railcontrol
```

```
dde@Fruehling:~/railcontrol$ ./railcontrol
2021-04-02 13:44:09.325812: Info: Main: Starting RailControl
2021-04-02 13:44:09.326424: Info: Main: Version: 19
2021-04-02 13:44:09.327170: Info: Main: Compile date: 2021-04-02 15:37:50
2021-04-02 13:44:09.327710: Info: Main: Last GIT commit hash: 1fbee81368ab84d4a8a1c4465a46b7a2ecc82809
2021-04-02 13:44:09.328337: Info: Main: Last GIT commit date: 2021-03-31 16:42:31
2021-04-02 13:44:09.328959: Info: Main: Copying from railcontrol.conf.dist to railcontrol.conf
2021-04-02 13:44:09.330555: Info: Config: Reading config file railcontrol.conf
2021-04-02 13:44:09.331542: Info: Config: Parameter found in config file: dbfilename = railcontrol.sqlite
2021-04-02 13:44:09.331749: Info: Config: Parameter found in config file: dbkeepbackups = 10
2021-04-02 13:44:09.332276: Info: Config: Parameter found in config file: webserverport = 8082
2021-04-02 13:44:09.333131: Info: SQLite: Opening SQLite database with filename railcontrol.sqlite
2021-04-02 13:44:09.334769: Info: SQLite: Creating table hardware
2021-04-02 13:44:09.541626: Info: SQLite: Creating table objects
2021-04-02 13:44:09.835580: Info: SQLite: Creating table relations
2021-04-02 13:44:09.953680: Info: SQLite: Creating table settings
2021-04-02 13:44:10.078358: Info: WebServer: Webserver started
2021-04-02 13:44:10.079407: Info: WebServer: Please type one of the following links in your browser to connect to RailControl:
http://localhost:8082/
http://192.168.178.25:8082/
http://[fe80::c12:d5e8:aa02:142b]:8082/
http://127.0.0.1:8082/
http://[::1]:8082/
http://[fe80::466:c177:57fb:3164]:8082/
http://[fe80::d6c:1697:b634:11bb]:8082/
http://[fe80::38ca:2cb4:505c:1c05]:8082/
2021-04-02 13:44:10.175824: Info: Manager: Debounce thread started
```

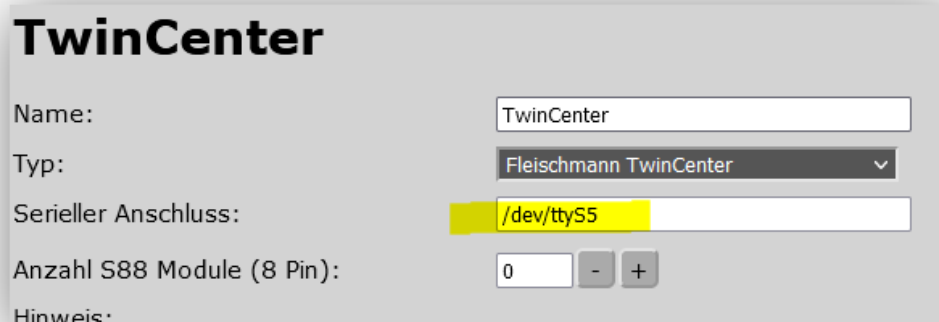
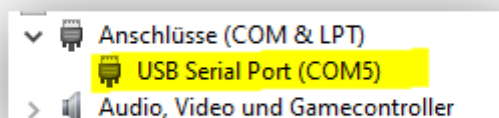
- `./railcontrol` (beim ersten Mal meldet sich die Firewall)
- unter Windows einen Browser öffnen und **localhost:8082** aufrufen

Ergebnis



serielle Schnittstelle (geht bei mir nicht, warum?)

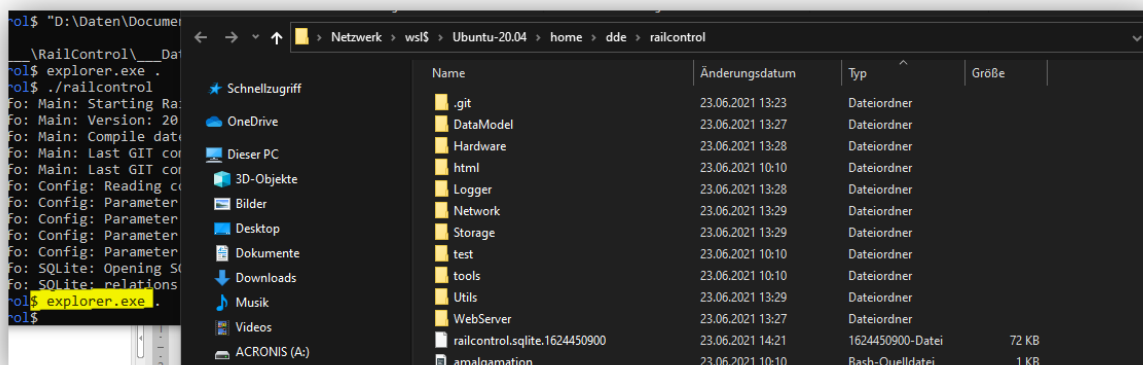
- unter Windows **COM5** (bei mir)
- unter WSL **/dev/ttyS5**



Dateien kopieren

- **explorer.exe** . (den Punkt nicht vergessen)

```
2021-06-23 11:56:49.622437: Info: SQLite: opening SQLite database wi  
2021-06-23 11:56:49.632175: Info: SQLite: relations is up to date  
dde@DESKTOP-RD4KMNQ:~/railcontrol$ explorer.exe .
```

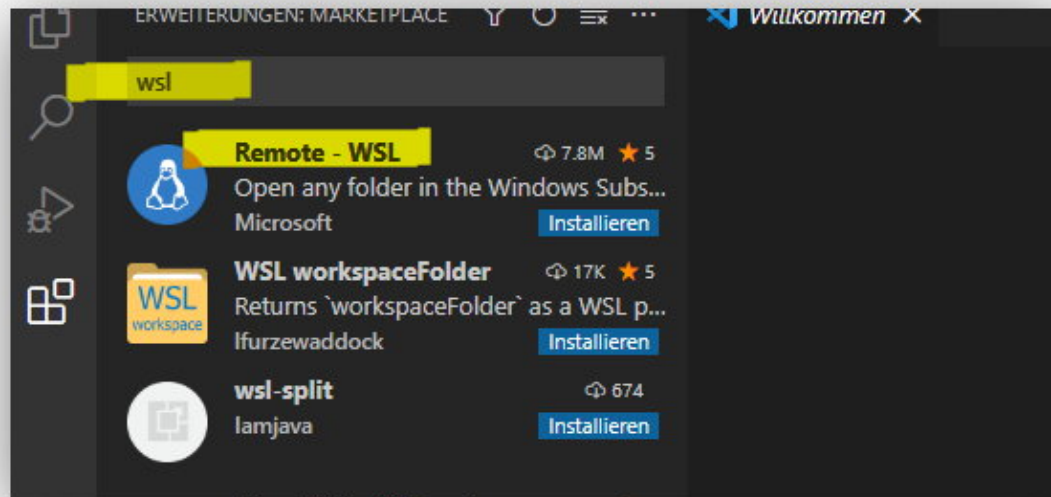


jetzt kann man Dateien einfach hin und her ziehen.

- z.B. railcontrol.sqlite

Visual Studio Editor

- Link: [Download](#)
- Installieren
- Aufrufen
- WSL installieren





- Visual Studio Code Editor wieder schließen
- Ubuntu starten

```
railcontrol  
dde@Fruehling:~$ cd $HOME/railcontrol/  
dde@Fruehling:~/railcontrol$
```

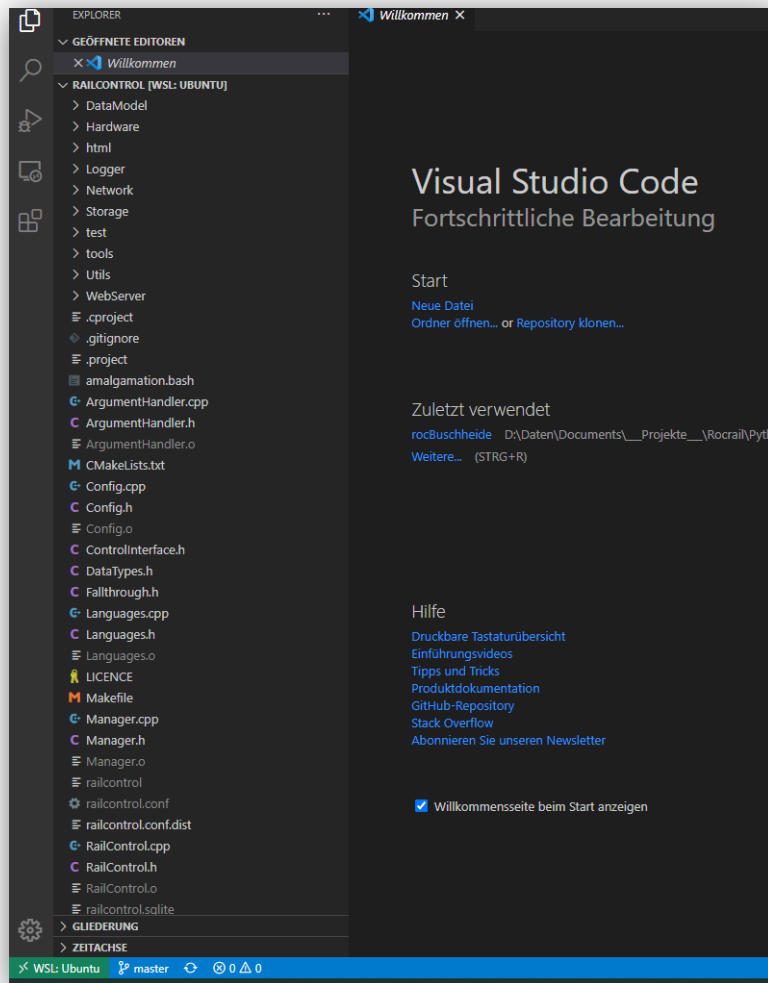
```
dde@Fruehling:~$ cd $HOME/railcontrol/  
dde@Fruehling:~/railcontrol$ code .
```

```
dde@Fruehling:~$ cd $HOME/railcontrol/  
dde@Fruehling:~/railcontrol$ code .  
Installing VS Code Server for x64 (c185983a683d14c396952dd432459097bc7f757f)  
Downloading: 26%_
```

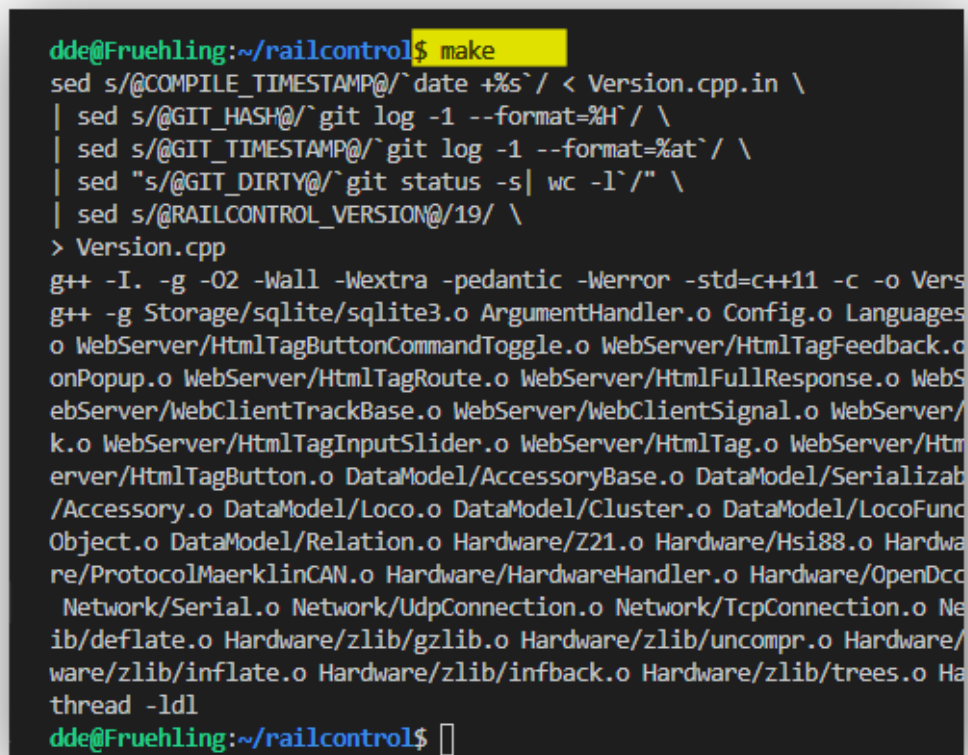
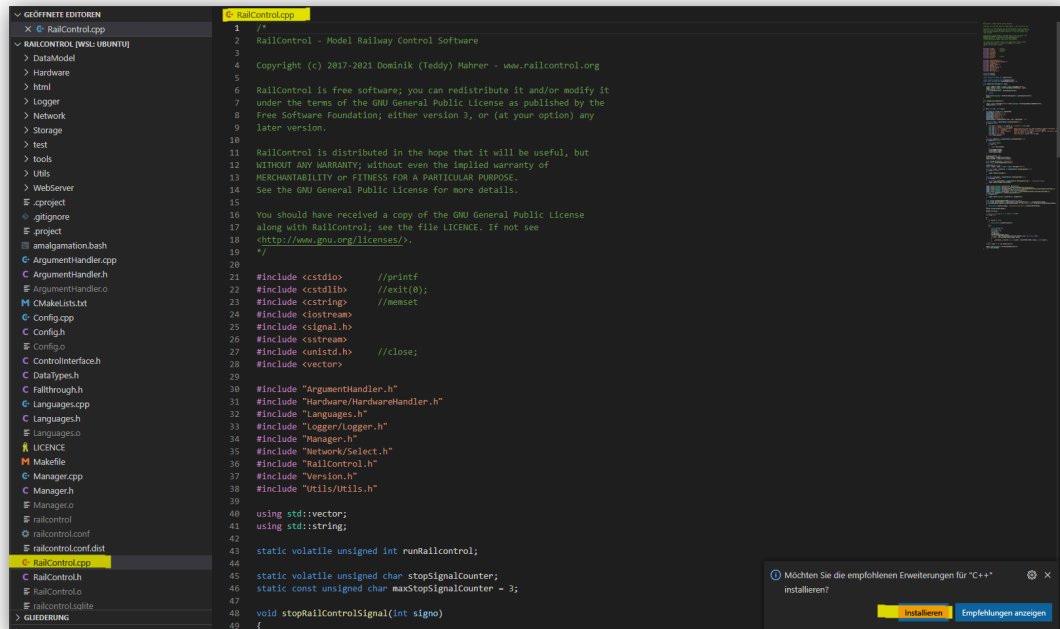


```
dde@Fruehling:~$ cd $HOME/railcontrol/  
dde@Fruehling:~/railcontrol$ code .  
Installing VS Code Server for x64 (c185983a683d14c396952dd432459097bc7f757f)  
Downloading: 100%  
Unpacking: 100%  
Unpacked 1718 files and folders to /home/dde/.vscode-server/bin/c185983a683d14c396952d  
dde@Fruehling:~/railcontrol$
```

- `cd $HOME/railcontrol/`
- Code `.` (den Punkt nicht übersehen)
- Visual Studio Editor wird wieder im Hintergrund gestartet



- Eine beliebige cpp-Datei durch Doppelklick öffnen
- C++ installieren
- Code Editor schließen
- Über Ubuntu mit code . wieder starten (an den Punkt denken)
- Neues Terminal öffnen
- z.B. make eingeben



Zweiter Test

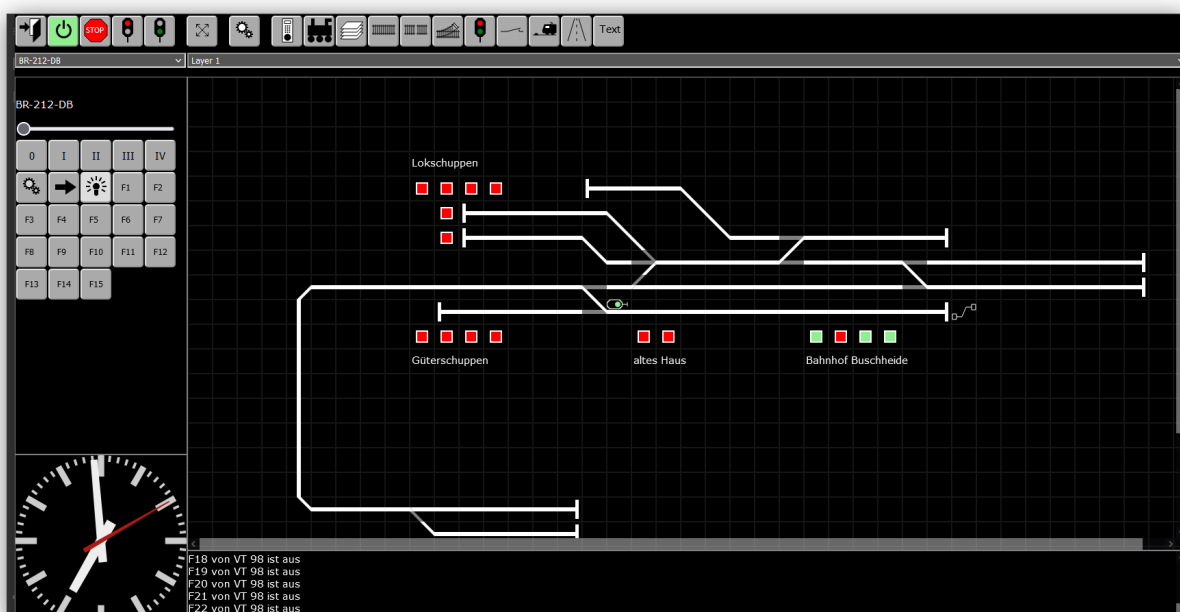
- `./railcontrol`

```
re/ProtocolMaerklinCAN.o Hardware/HardwareHandler.o Hardware
Network/Serial.o Network/UdpConnection.o Network/TcpConne
ib/deflate.o Hardware/zlib/gzlib.o Hardware/zlib/uncompr.o
ware/zlib/inflate.o Hardware/zlib/infbac.o Hardware/zlib/t
thread -ldl
dde@Fruehling:~/railcontrol$ ./railcontrol
```

```
2021-04-02 18:33:36.029974: Info: WebServer: Please type one of the following links in your browser to connect to RailControl:
http://localhost:8082/
http://192.168.178.25:8082/
http://[fe80::c12:d5e8:aa02:142b]:8082/
http://127.0.0.1:8082/
http://[::1]:8082/
http://[fe80::466:c177:57fb:3164]:8082/
http://[fe80::d6c:1697:b634:11bb]:8082/
http://[fe80::38ca:2cb4:505c:1c05]:8082/
2021-04-02 18:33:36.030494: Info: Manager: Loaded layer 1: Layer 1
2021-04-02 18:33:36.031868: Info: Manager: Debounce thread started
```

Ergebnis

- `./railcontrol` (beim ersten Mal meldet sich die Firewall)
- unter Windows einen Browser öffnen und `localhost:8082` aufrufen



hier mit meiner vorhandenen `railcontrol.sqlite` - Datei

Aktualisieren

```

74 | argumentMap[ silent ] = 's';
PROBLEME  AUSGABE  DEBUGGING-KONSOLE  TERMINAL

dde@Fruehling:~/railcontrol$ git pull
remote: Enumerating objects: 34, done.
remote: Counting objects: 100% (34/34), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 22 (delta 20), reused 22 (delta 20), pack-reused 0
Unpacking objects: 100% (22/22), 4.10 KiB | 17.00 KiB/s, done.
From https://github.com/teddych/railcontrol
 1fbee81..be014e8  master    -> origin/master
Updating 1fbee81..be014e8
Fast-forward
 DataModel/Loco.cpp      | 267 ++++++
 DataModel/Loco.h        | 51 +++++
 DataModel/ObjectIdentifier.h | 6 +
 DataTypes.h             | 3 +-
 Manager.cpp             | 52 ++++++
 Manager.h               | 20 +++
 WebServer/WebClient.cpp | 32 +++++
 WebServer/WebClient.h   | 1 +
 WebServer/WebClientTrack.cpp | 3 +-
 9 files changed, 341 insertions(+), 94 deletions(-)
dde@Fruehling:~/railcontrol$

```

```

WebServer/WebClientTrack.cpp | 3 +-
9 files changed, 341 insertions(+), 94 deletions(-)
dde@Fruehling:~/railcontrol$ make
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o ArgumentHandler.o ArgumentHandler.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o Config.o Config.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o Languages.o Languages.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o Manager.o Manager.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o RailControl.o RailControl.cpp
sed s/@COMPILE_TIMESTAMP@/date +%s/ < Version.cpp.in \
| sed s/@GIT_HASH@/`git log -1 --format=%h` \
| sed s/@GIT_TIMESTAMP@/`git log -1 --format=%at` \
| sed "s/@GIT_DIRTY@/`git status -s`| wc -l"/ \
| sed s/@RAILCONTROL_VERSION@/19/ \
> Version.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o Version.o Version.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/WebClientCluster.o WebServer/WebClientCluster.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/WebServer.o WebServer/WebServer.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagSwitch.o WebServer/HtmlTagSwitch.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagButtonCommandToggle.o WebServer/HtmlTagButtonCommandToggle.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagFeedback.o WebServer/HtmlTagFeedback.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagAccessory.o WebServer/HtmlTagAccessory.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagInputInteger.o WebServer/HtmlTagInputInteger.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagTrackBase.o WebServer/HtmlTagTrackBase.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagButtonPopup.o WebServer/HtmlTagButtonPopup.cpp
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11 -c -o WebServer/HtmlTagRoute.o WebServer/HtmlTagRoute.cpp

```

```

g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11
g++ -I. -g -O2 -Wall -Wextra -pedantic -Werror -std=c++11
g++ -g Storage/sqlite/sqlite3.o ArgumentHandler.o Config.o
WebServer/HtmlTagButtonCommandToggle.o WebServer/HtmlTag
onPopup.o WebServer/HtmlTagRoute.o WebServer/HtmlFullResp
ebServer/WebClientTrackBase.o WebServer/WebClientSignal.o
k.o WebServer/HtmlTagInputSlider.o WebServer/HtmlTag.o We
erver/HtmlTagButton.o DataModel/AccessoryBase.o DataModel
/Accessory.o DataModel/Loco.o DataModel/Cluster.o DataMod
Object.o DataModel/Relation.o Hardware/Z21.o Hardware/Hsi
re/ProtocolMaerklinCAN.o Hardware/HardwareHandler.o Hardw
Network/Serial.o Network/UdpConnection.o Network/TcpConn
ib/deflate.o Hardware/zlib/gzlib.o Hardware/zlib/uncompr.
ware/zlib/inflate.o Hardware/zlib/infbck.o Hardware/zlib
thread -ldl
dde@Fruehling:~/railcontrol$

```

- git pull
- make