Coding with NCS Expert

Enable/Disable factory Options as needed for educational/recreational purposes.

Summary of Activities:

In our previous milestone, we created an environment for tuning and diagnostics by installing essential tools such as INPA, NCSExpert, Ms4xFlasher, and TunerPro. Now, we will delve into BMW coding using NCSExpert, a straightforward program that enables reading, writing, and modifying configuration files in the vehicle's electronic control unit (ECU) and its various modules. When you read an ECU using NCSExpert, it extracts a configuration file called FSW_PSW.TRC, a trace file that contains the current coding settings for each scanned module. Examples of these modules include KOMBI (Instrument Cluster), CAS (Car Access System), and MRS (Multiple Restraint System), among others.

These modules can be accessed through NCSExpert, which outputs the trace file used to modify vehicle functions. For instance, you can add a digital speedometer to your instrument cluster, enable an upgraded comfort access system on a base model, or remove airbag settings in a racecar that no longer requires specific airbags. All these modifications are legitimate uses of NCSExpert. The only drawback is that the information read from a BMW's ECU is written in German. Thus, prior knowledge of the specific parameters or the use of another tool, such as NCS Dummy, is helpful.

Once the preferred settings have been changed in the module's code, you will save the file and overwrite the .trc file into an FSW_PSW.MAN file, which will then be exported back to NCSExpert for coding the vehicle.

**Description of Learning Completed:**

- Open NCS Expert tool located in the BMW standard tools suite installed and configured in the previous milestones.
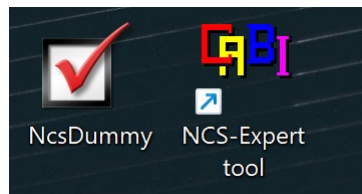

- Load the preconfigured profile to make coding easier by simplifying the coding process.
 - File > load profile > Revtor's NCS Expert Profile
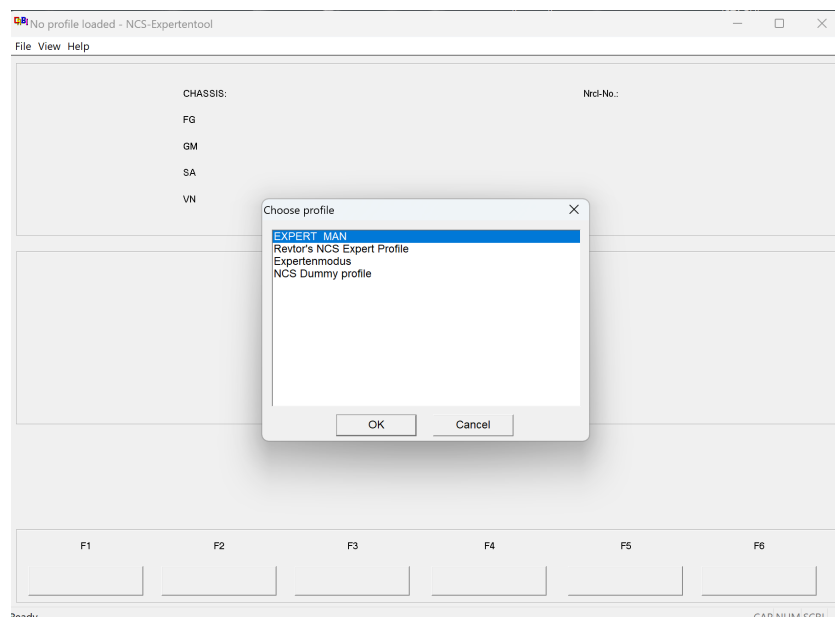
- Start (F1)- Make sure K-DCAN cable discussed in previous milestone is plugged into the vehicle and computer and set ignition in car to position 2 right before actually turning on the vehicle to begin reading the ECU.
- Select Chassis (F3) > Select vehicle, for this example I am using a 2002 e46 BMW 330i.
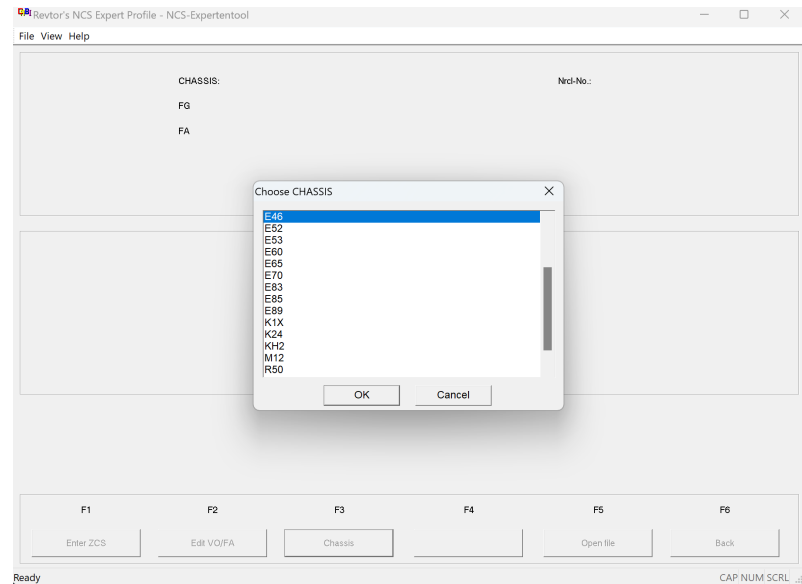
- Select ECU- for this example we will be enabling the European standard Hazard lights. These lights give a slightly cooler aesthetic with a faster tick speed within the hazard lights. This process is apart of the ALSZ module of the e46 MS43 ECU.
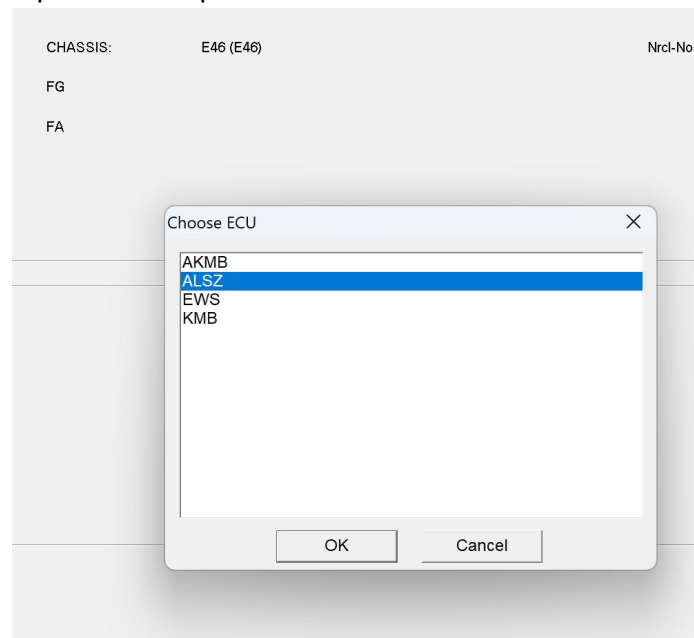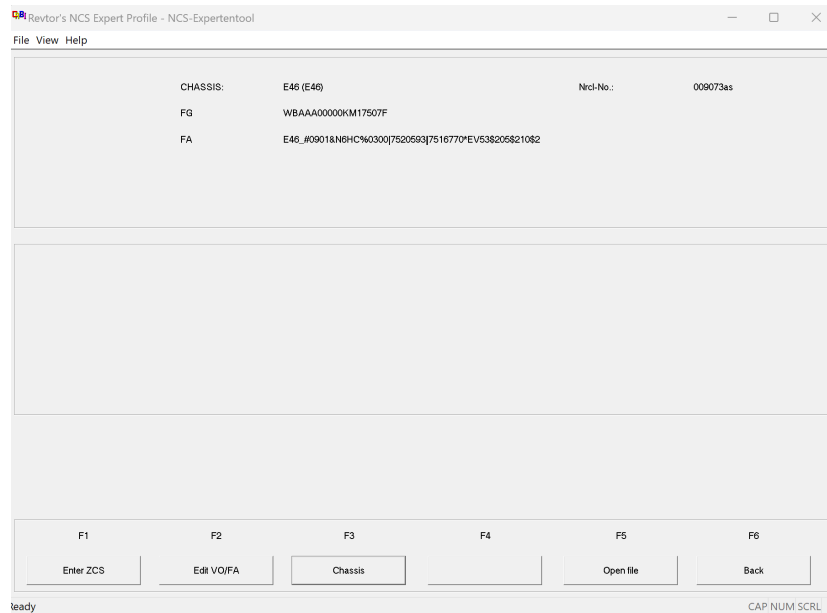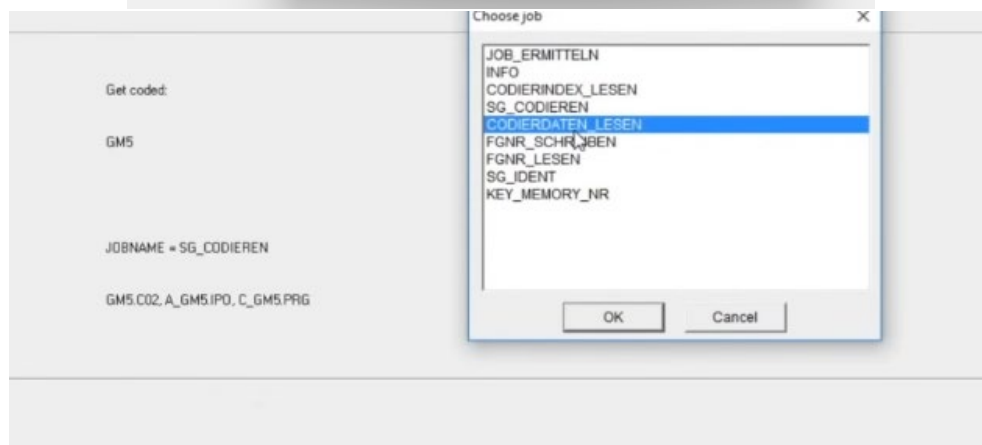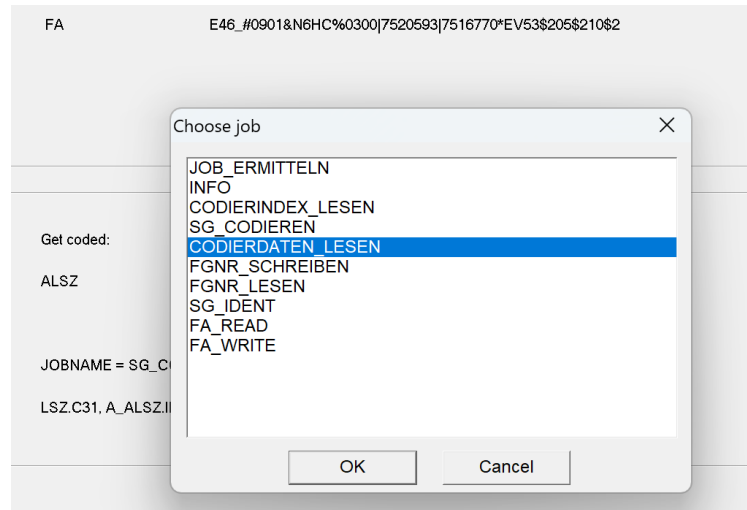
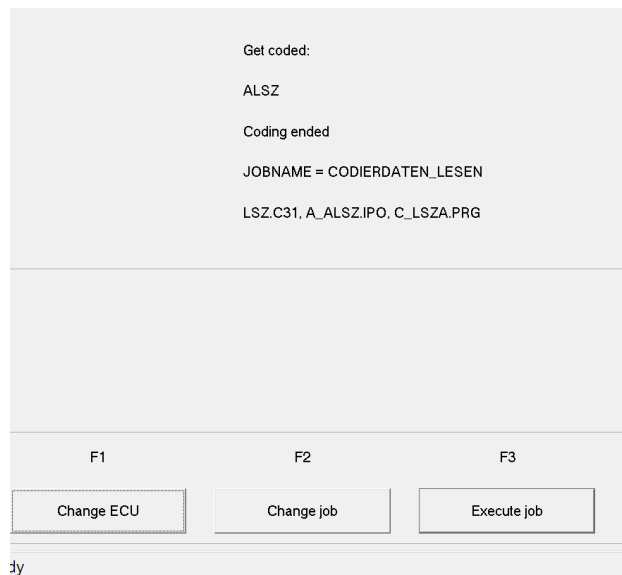- Back (F6)
- Process ECU > Select ECU Module
  By default, it will read all the ECU modules, which is not ideal. We will select the correct module housing the code we wish to manipulate.
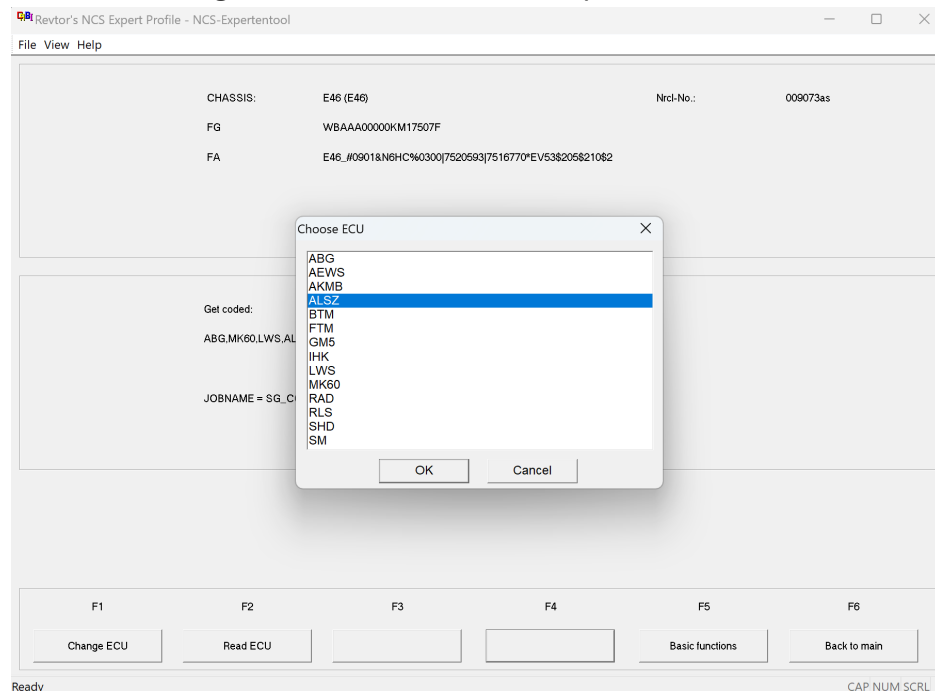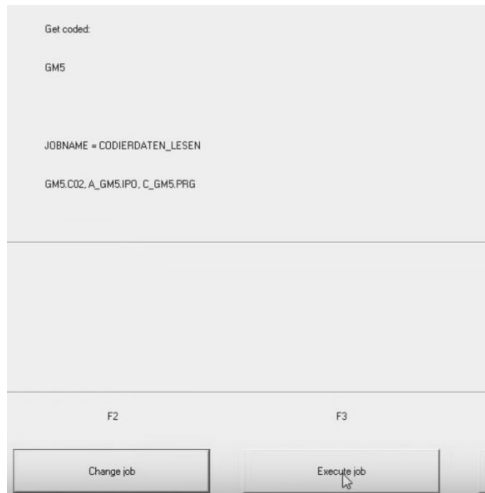

- Change the job to Reading coding data (CODIERDATEN_LESEN) in german, this process extracts the current coding data associated with the selected ECU and stores the information in the trace file for editing.

FA   E46_#0901&N6HC%0300|7520593|7516770*EV53$205$210$2

Choose job   ✕

```
JOB_ERMITTELN
INFO
CODIERINDEX_LESEN
SG_CODIEREN
CODIERDATEN_LESEN
FGNR_SCHREIBEN
FGNR_LESEN
SG_IDENT
FA_READ
FA_WRITE
```

                    OK   Cancel

Get coded:

ALSZ

JOBNAME = SG_C

LSZ.C31, A_ALSZ.I

Get coded:

GM5

JOBNAME = SG_CODIEREN

GM5.C02, A_GM5.IPO, C_GM5.PRG

Choose job   ✕

```
JOB_ERMITTELN
INFO
CODIERINDEX_LESEN
SG_CODIEREN
CODIERDATEN_LESEN
FGNR_SCHREIBEN
FGNR_LESEN
SG_IDENT
KEY_MEMORY_NR
```

                OK   Cancel

- Select Execute job.

Get coded:

ALSZ

Coding ended

JOBNAME = CODIERDATEN_LESEN

LSZ.C31, A_ALSZ.IPO, C_LSZA.PRG

F1	F2	F3
Change ECU	Change job	Execute job

- ...dy

Get coded:

GM5

JOBNAME = CODIERDATEN_LESEN

GM5.C02, A_GM5.IP0, C_GM5.PRG

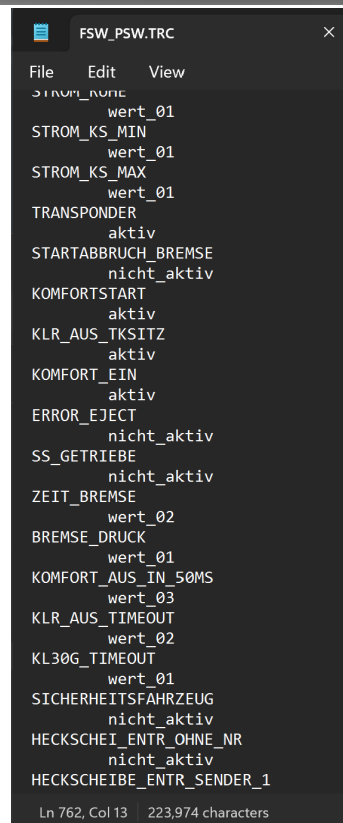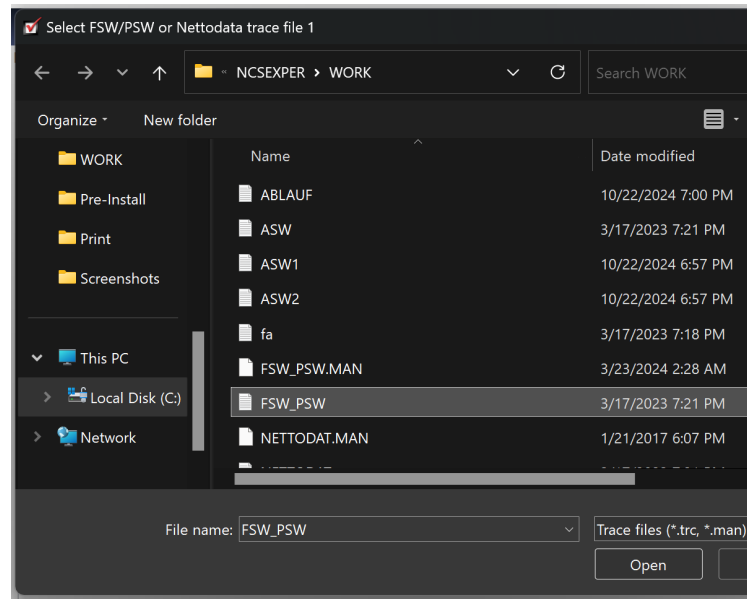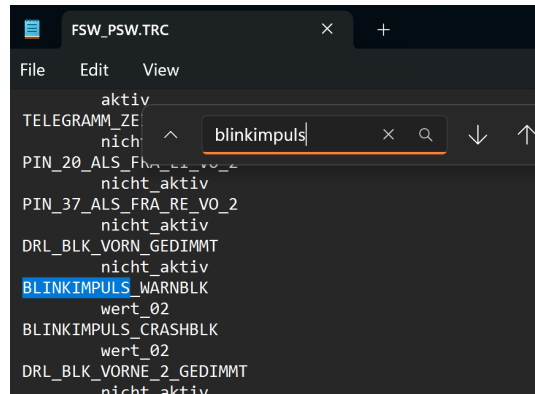| F2	F3
Change job	Execute job

Directory Search

- Navigate to WORK folder in C: drive, C:\NCSEXPER\WORK to locate the trace file which we will be editing its code.
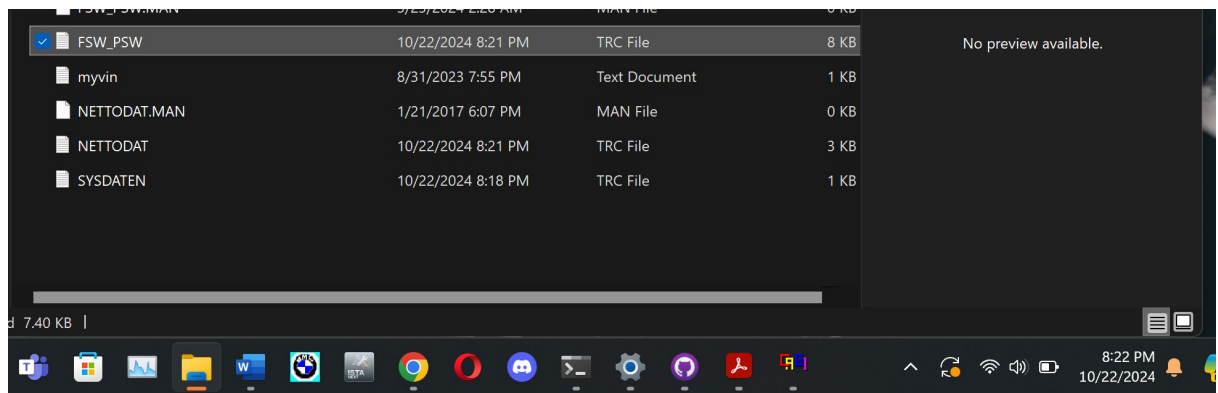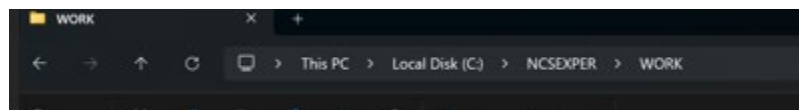
- Open FSW_PSW.TRC and locate the lines of code you wish to manipulate. (open trace file to edit and man file to write to ecu)

- Use CTRL+F to find option to code.

- Change option from enabled (aktiv) to not enabled (nicht_aktiv) or vice-versa as needed. To enable euro hazard lights the command *BLINKIMPULS_WARNBLK* needs to be set to *wer_04*, where it was originally set to *02*.

Since the codes are in German, there are many conversion charts online that show the meaning to each code and how to manipulate them.

ANHAENGERMODUL_PWM_WERT	Trailer module power value.	wert_01 / wert_02
ANHEBUNG_175_KM/H	Increase at 108mph.	wert_01 / wert_02 / wert_03
ANZAHL_QUICK_RUNDEN	Amount of quick rounds.	wert_01
AUSWERT_GRADIENT	Trailer gradient.	aktiv / nicht_aktiv
AUSWERT_PROP_ABWEICHUNG		aktiv / nicht_aktiv
BEGRENZUNGSLICHT_IN_PARK	Sidemarkers in park position.	aktiv / nicht_aktiv
BETR_STD_NICHT_LOESCHEN	No deleting of usage hours.	aktiv / nicht_aktiv
BI_XENON	Bi-xenon headlamps.	aktiv / nicht_aktiv
BIXENON_EIN_BEI_LICHTHUPE	Flash to pass is bixenon & halogen together.	aktiv / nicht_aktiv
BL_ERSETZ_DEFEKT_SL	Brake lights as replacement for burned park lights.	aktiv / nicht_aktiv
BL_ERSETZT_DEFEKT_BLK	Brake lights as replacement for burned blinkers.	aktiv / nicht_aktiv
BLINKIMPULS_CRASHBLK	Crash warning blinker impulse speed.	wert_01 – wert_04
BLINKIMPULS_WARNBLK	Hazard lights impulse speed.	wert_01 – wert_04
BLK_DIMMEN	Dimmed turn signals.	aktiv / nicht_aktiv
BLK_H_L_PICT	Rear left turn signal in dashboard.	aktiv / nicht_aktiv
BLK_H_R_PICT	Rear right turn signal in dashboard.	aktiv / nicht_aktiv
BLK_V_L_PICT	Front left turn signal in dashboard.	aktiv / nicht_aktiv
BLK_V_R_PICT	Front right turn signal in dashboard.	aktiv / nicht_aktiv
BLS_PRUEFEN	Brake light switch check.	aktiv / nicht_aktiv
BREMSLICHT_ALS_STANDLICHT	Break lights as parking lights.	aktiv / nicht_aktiv
CC_ABBLENDLICHT	Check control low beams.	aktiv / nicht_aktiv
CC_BLINKER_HINTEN	Check control rear turn signals.	aktiv / nicht_aktiv
CC_BLINKER_VORN	Check control front turn signals.	aktiv / nicht_aktiv
CC_BREMSLICHT	Check control brake light.	aktiv / nicht_aktiv
CC_BREMSLICHT_MITTE	Check control middle brake light.	aktiv / nicht_aktiv
CC_FERNLICHT	Check control high beams.	aktiv / nicht_aktiv
CC_KENNZEICHENLEUCHTE_LI	Check control license plate lights.	aktiv / nicht_aktiv
CC_NSL_LINKS	Check control fog light left.	aktiv / nicht_aktiv
CC_RUECKLICHT_2_RECHTS	Check control right reverse light.	aktiv / nicht_aktiv
CC_RUECKLICHT_3_LINKS	Check control left reverse light.	aktiv / nicht_aktiv

- File > Save as >Save as type: All files > Overwrite .MAN file.
  Once all the coding options have been configured to your liking, we then save the updated .TRC file and overwrite it as the *FSW_PSW.MAN* file
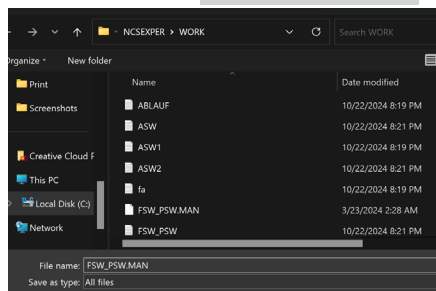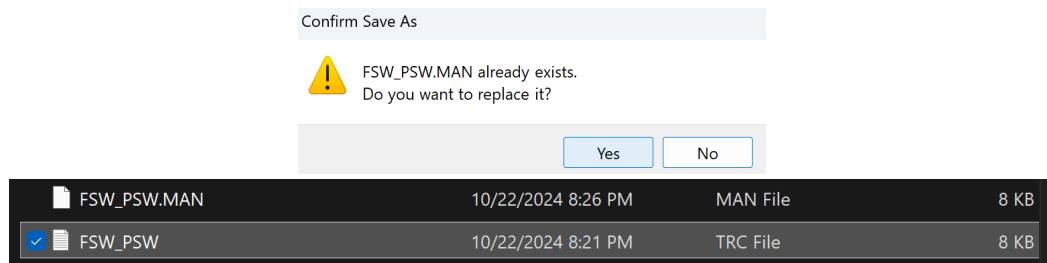
To confirm the file is correct, you will see the .MAN file date modified section has been updated.

NCSDummy option

- This same process can be enumerated in English using NCSDummy where you do not need to source an external conversion table since the language is converted using the NCSDummy application.
- Similar to NCSExpert, Select Chassis. In this case I am using an e46.
- Select trace file- Browse> Select FSW_FSW.TRC Trace File located at C:\NCSEXPER\WORK
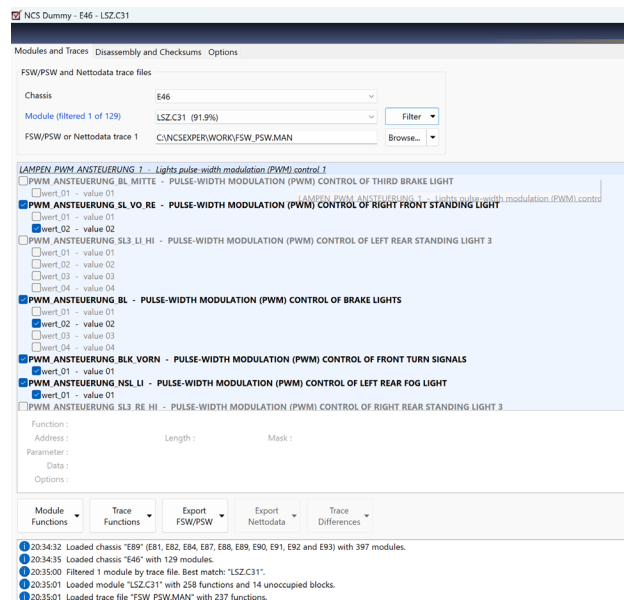
- Select Module, in this case since we already scanned the module using NCSExpert, we can select filter by current trace file
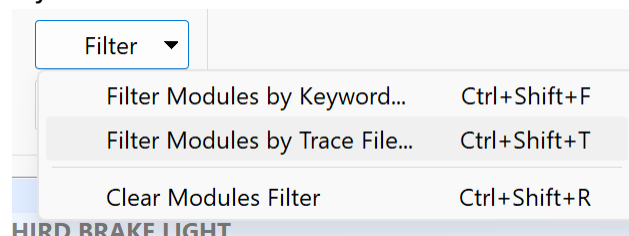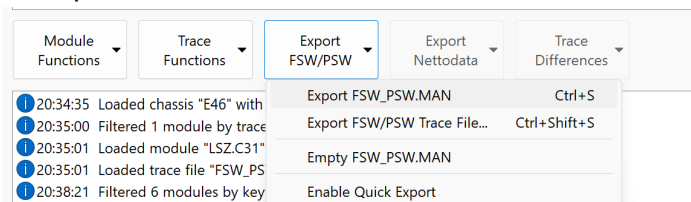
- Locate coding options wanting to edit, you can scroll and view or filter by the name "hazard" or "blinkimpuls" for the German name.
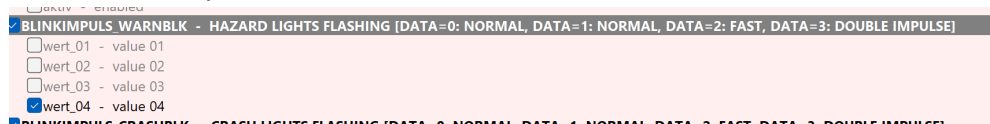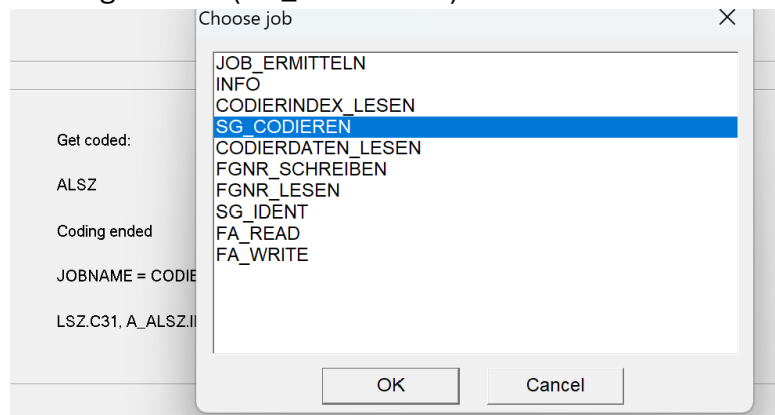

- Simply enable options wanted.
  In this case we set Hazard lights flashing to value 4.

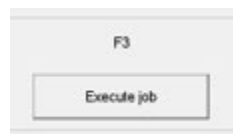- Export FSW/PSW > Export FSW_PSW.MAN

Back to NCS Expert.

- Change Job to coding in NCS. (SG_CODIEREN).

- Execute job (F3).

- Once "coding ended" is shown job is complete and the vehicles settings have been updated via coding, you can take the key out of the ignition then reinsert the key to restart the ecu.

```
CHASSIS:          E46 (E46)

FG                WBAAA00000KM17507F

FA                E46_#0901&N6HC%0300|7520593|7516770*EV53$205$210$2
```

```
Get coded:

ALSZ

Coding ended

JOBNAME = SG_CODIEREN

LSZ.C31, A_ALSZ.IPO, C_LSZA.PRG
```

Here is a YouTube video of before and after the hazard lights coding using NCSExpert.

https://youtu.be/6vE-_V1nmqQ

References

Scribd. (n.d.). *E46 NCS coding list fsw - PSW*. Scribd.
https://www.scribd.com/doc/300308710/e46-Ncs-Coding-List-FSW-PSW

Admin. (2023, March 29). *Expert.com*. NCS. https://ncs-expert.com/