Coding oiltemp instead of mpg(KVA) in BMW instrument cluster (Kombi)

Credits: intershopper (author of original document “Öltemperatur statt KVA im E60 Kombi codieren“), with help from acolt and hates (all from bmw-syndikat.de forum).
Translation, additional notes and screenshots by mik325tds.

Disclaimer: The author or poster of this document cannot be held liable for damage to or loss of function of any component of a vehicle by following this documentation.

Prerequisite: You’ll need an OBD cable and Ediabas (Tool32) from the BMW toolset and some experience in using hexadecimal numbers.

Start Tool32 and load the correct .prg for your car’s instrument cluster. For the E60 it is Komb60.prg and for the E90 it I KOMB87.prg.

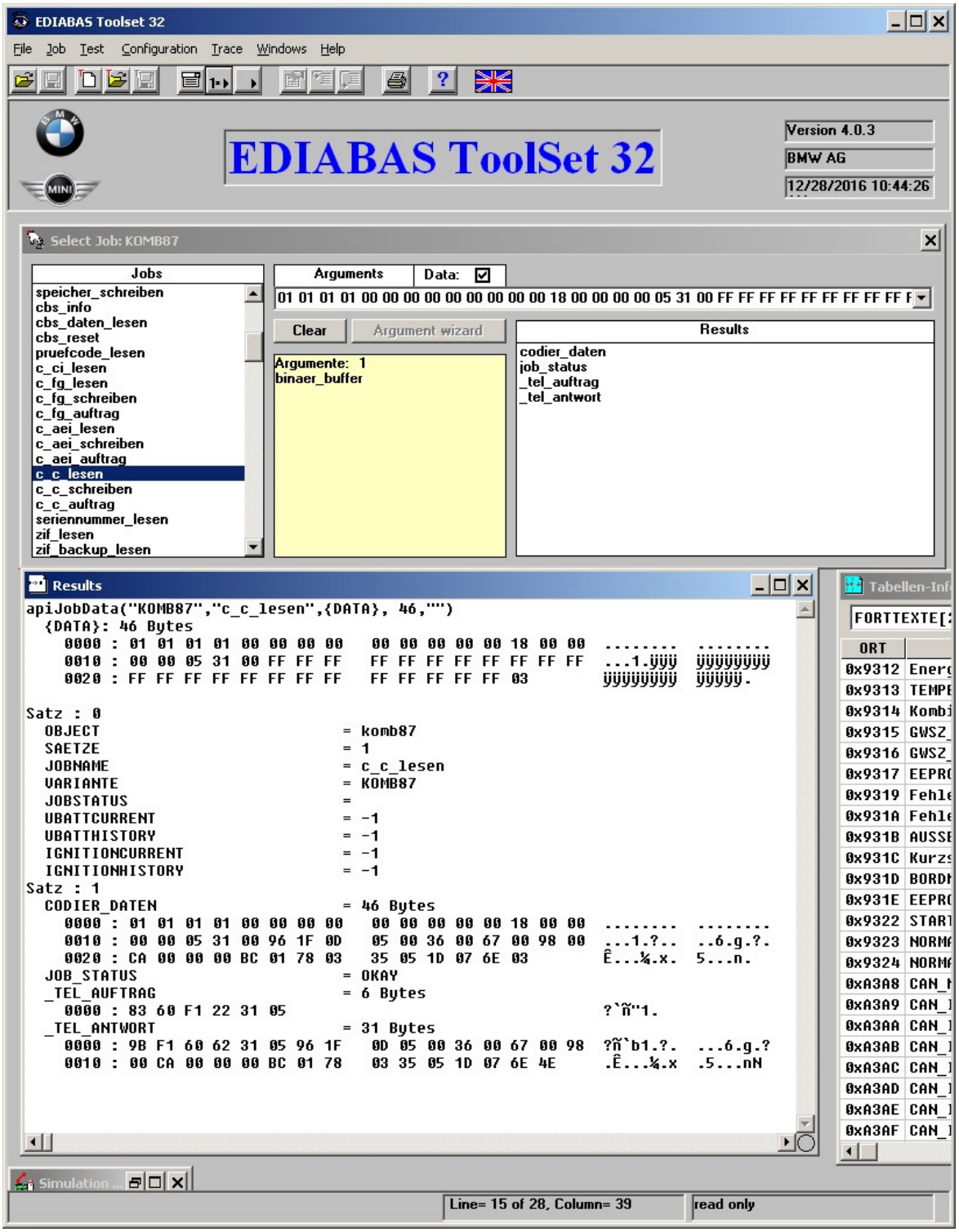
Execute Job:
“c_c_lesen” with the following argument (do not forget to checkmark “Data”):


```
01 01 01 01 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 FF
FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
FF 03
```

After copying the above data into the argument field, execute the job once by clicking

.

Results should look like this:



The coding data result is:
0000 : 01 01 01 01 00 00 00 00 00 00 00 00 00 18 00 00 ....

0010 : 00 00 05 31 00 96 1F 0D 05 00 36 00 67 00 98 00 ...1.?.. ..6.g.?.
0020 : CA 00 00 00 BC 01 78 03 35 05 1D 07 6E 03 Ê...¼.x. 5...n.

Note that the blue FF's in the argument:
01 01 01 01 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF 03

are now filled with the actual coding data in Red:
01 01 01 01 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 96 1F 0D 05 00 36 00 67 00 98 00 CA 00 00 00 BC 01 78 03 35 05 1D 07 6E 03

In order to code the Oiltemp to the lower right gauge you need to change the values highlighted in Blue. Leave the rest as they were read from your results window:
01 01 01 01 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 96 1F 0D 05 00 36 00 67 00 98 00 CA 00 00 00 BC 01 78 03 35 05 1D 07 6E 03

The numbers 05 36 67 98 CA are used for the scale divisions. In order to use them for the Oiltemp we need to add an offset (46-48) to the following proposed scale division: 50°C, 75°C, 100°C, 125°C, 150°C:

Oiltemp in °C	+	Offset	=	Decimal	Hex value
50		48		98	62
75		48		123	7B
100		48		148	94
125		48		173	AD
150		48		198	C6

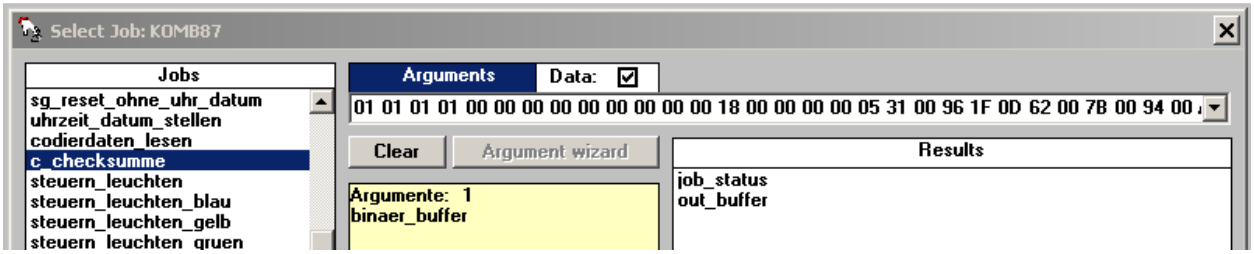
You may choose a different scaling for your vehicle. In order to convert Decimal numbers to hexadecimal numbers you may use Windows calculator in the "Programmer view" or Excel with the formula =DEC2HEX().

The 1D 07 6E will have to be replaced with 0D 07 6F. While the purpose of 0D and 07 is unknown at this point, we do know that 6F switches the gauge to Oiltemp.

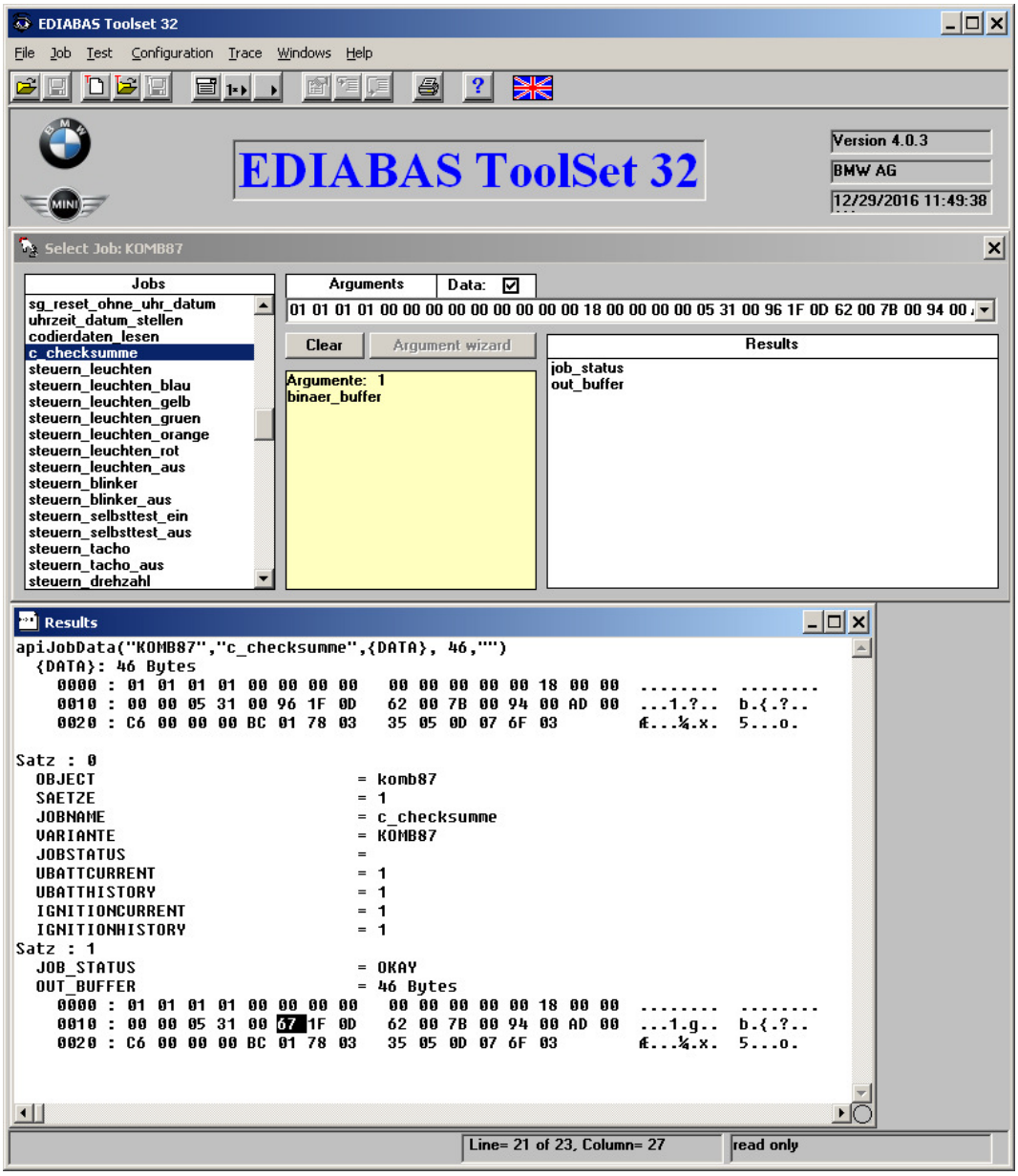
The new argument looks like this now:
01 01 01 01 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 96 1F 0D 62 00 7B 00 94 00 AD 00 C6 00 00 00 BC 01 78 03 35 05 0D 07 6F 03

Before we can code this argument to the Kombi we'll need to generate a correct checksum for the changed values. This is done by executing the job
"c_checksumme"
with the argument (do not forget to check mark "Data")

01 01 01 01 00 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 96 1F 0D 62 00 7B 00 94 00 AD 00 C6 00 00 00 BC 01 78 03 35 05 0D 07 6F 03



The results should look like this:

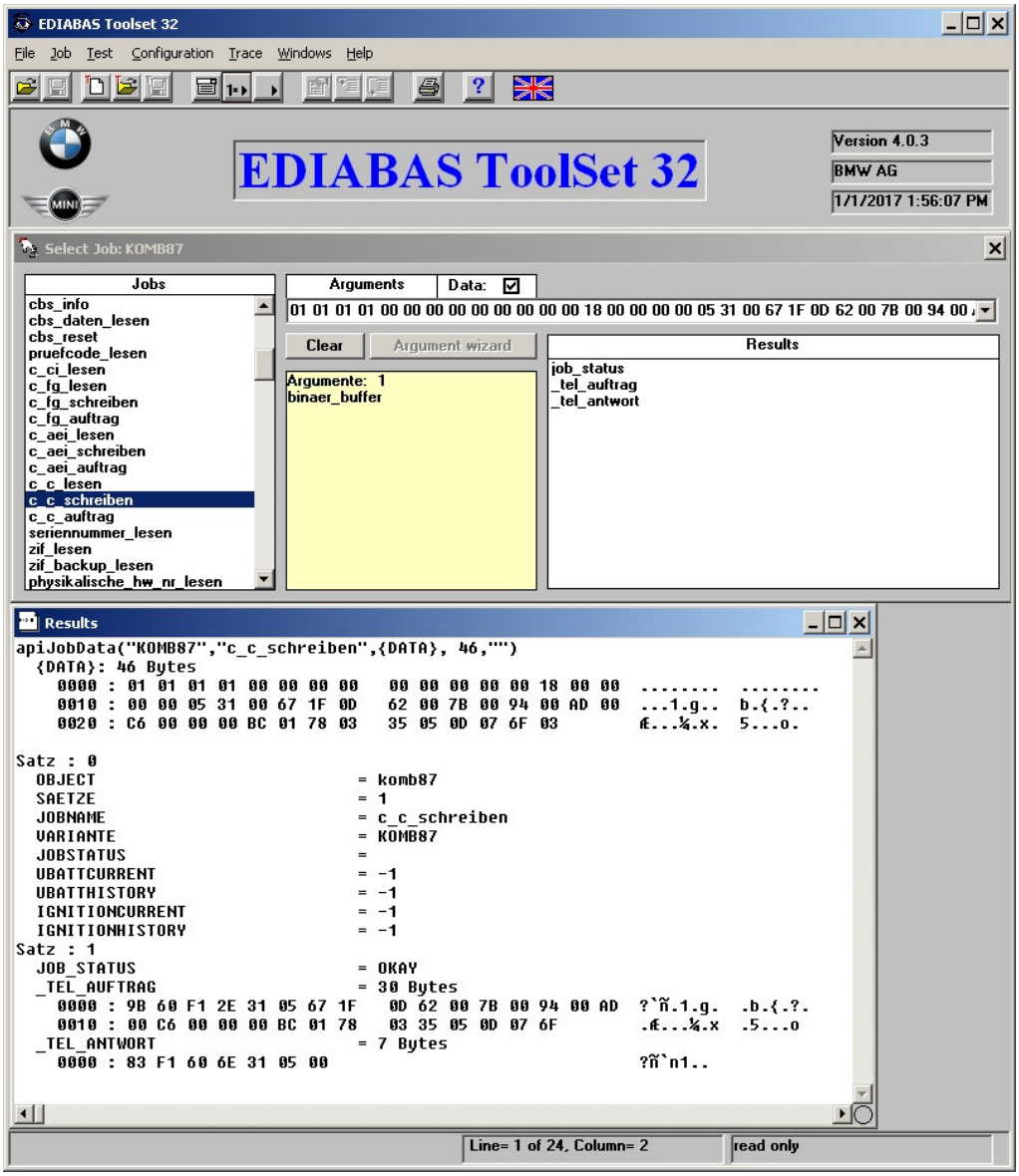


Note that the highlighted field in the result now contains the corrected checksum 67. Your checksum might be different depending on what is read from the original coding data and offsets chosen.

```
0000 : 01 01 01 01 00 00 00 00   00 00 00 00 00 18 00 00  ........ ........
0010 : 00 00 05 31 00 67 1F 0D   62 00 7B 00 94 00 AD 00  ...1.g..  b.{.?..
0020 : C6 00 00 00 BC 01 78 03   35 05 0D 07 6F 03
```

01 01 01 01 00 00 00 00 00 00 00 00 00 18 00 00 00 00 05 31 00 67 1F 0D 62 00 7B 00 94 00 AD 00 C6 00 00 00 BC 01 78 03 35 05 0D 07 6F 03

Now copy the updated buffer as above into the argument field, select the job “c_c_schreiben”, verify that Data is check marked and execute the job once. Results should look similar to this:



Now execute job “steuergeraete_reset” and set your time and date by executing job “uhrzeit_datum_tellen”. This is a very convenient job, as the time and date is automatically taken from your laptop.

If your .prg provides the job “steuern_oeltemperatur” you can now test the gauge by setting any temp (eg. 100) in °C as an argument (data not checked). If the needle doesn’t exactly match your input, you may need to vary the offset in the calculation above. When done, execute job “steuern_oeltemperatur_aus”.
If your .prg does not provide the job “steuern_oiltemperatur” you can check the gauge by reading the oiltemp with Inpa or Ediabas from your Engine controller and comparing it to the gauge.

Special thanks to acolt and Hates (both bmw-sydikat.de).