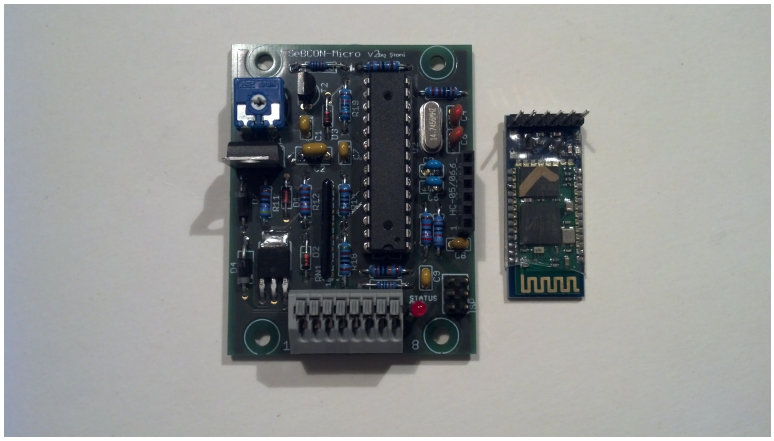
SeBCON-Micro© Bluetooth

Boost Controller for Redblocks – Volvo's famous turbo engine

B230FT	**121 KW (165PS)**	***700/900 Series 1990-1998 with Bosch LH 2.4 Jetronic System***
B230FK	**99 KW (135PS)**	***900 Series 1995-1998 with Bosch LH 2.4 Jetronic System***
B230FT	**114 KW (155PS)**	***700 Series 1985-1989 with Bosch LH 2.2 Jetronic System***
B23FT	**117 KW (160PS)**	***700 Series 1983-1984 with Bosch LH 2.0 Jetronic System***
B21FT	**91 KW (127PS)**	***240 Series 1981-1985 with Bosch LH 2.0 Jetronic System***

SeBCON's Guide

Version 1 (Firmware 1.00)



1 Introduction and Product Features

SeBCON-Micro is an electronic boost pressure controller developed for LH-Jetronic injection systems with conventional mechanical turbocharger control.

With the SeBCON-Micro, the charging pressure can be controlled cleanly from the serial pressure to the maximum possible charging pressure and thus a higher motor power can be achieved. The charging pressure is controlled by means of the air mass meter.

Properties:

- Preprogrammed, Plug-n-Drive
- Powered by a AVR® Atmega328 Micro controller
- Easy to install
- Auto boost for good driveability on part load
- Customized for the LH-Jetronic 2.0/2.2/2.4 fuel injection system
- Optimized for Stonis LH2.4 tuning chip
- ISP interface & slot for HC-05-6 Bluetooth modul
- Compact size (110mm x 52mm x 25mm), PCB is only 50mm x 63mm

Features:

- better throttle control
- better fuel economy
- boost proportional to throttle position
- cruise control compatible

2 Basics

SeBCON-Micro is already tested with the following equipment:

✓ Bosch LH-Jetronic 563, 932, 937, 962, 967, 977, 984
✓ Bosch EZK 148, 207, 219, EZK 148 chipped with Volvo 219 binary
✓ Chips from Stoni and BSR
✓ 2.5" air mass meter Bosch 0280 213 016
✓ 3.0" air mass meter Bosch 0280 213 012 ; A 0986 280 110
✓ Volvo 850, S/C/V70, S60, S80, XC90 Solenoid
✓ Pierburg Solenoid n. 7.22240.11 (Volvo Nr. 30670448)
✓ Volvo Turbo-Plus-Kit Solenoid Pierburg n. 7.21559.00 (Volvo Nr. 3517757)
✓ Garrett T2543
✓ Garrett T3- 42/48AR
✓ MHI TD04H-13C-6
✓ MHI TD04HL-15G-7
✓ MHI 16T

Requirements:

- It is recommended to install SeBCON-Micro in the passenger compartment
- Wastegate adjustment: Stock

3 Solenoid Valves

3-Way-Valve (default device)
Pierburg 7.22240.13.0 12V resp.
Volvo Part Nr.: **30670448** (7.22240.11) –
Volvo 850, S/C/V70, S60, S80 and XC90 turbo

recommended solenoid

Valve connections are marked as follows:

- **red** : from the turbocharger
- **yellow** : to the wastegate
- **blue** : drain

Boost pressure control valve
Skandix 1016708 (referred to Volvo 30670448)

http://www.skandix.de/en/search/?q=1016708

alternative solenoid

Valve connections are marked as follows:

unknown

Important:

When installing, make sure that:

- The drain port of the solenoids is not blocked
- The connecting hoses used are not buckled
- The connecting hoses are kept as short as possible
- The connecting hoses inner diameter correspond to the solenoid

- In case you insert the drain hose into the air filter box, ensure that the hose does not touch the filter element and so blocks the drain port.

Any of the above points will lead to an insufficient boost height/behavior.

4 Wiring

All necessary signals can be tapped directly at the LH-Jetronic control unit connector.

4.1.1 SeBCON to Bosch LH-Jetronic

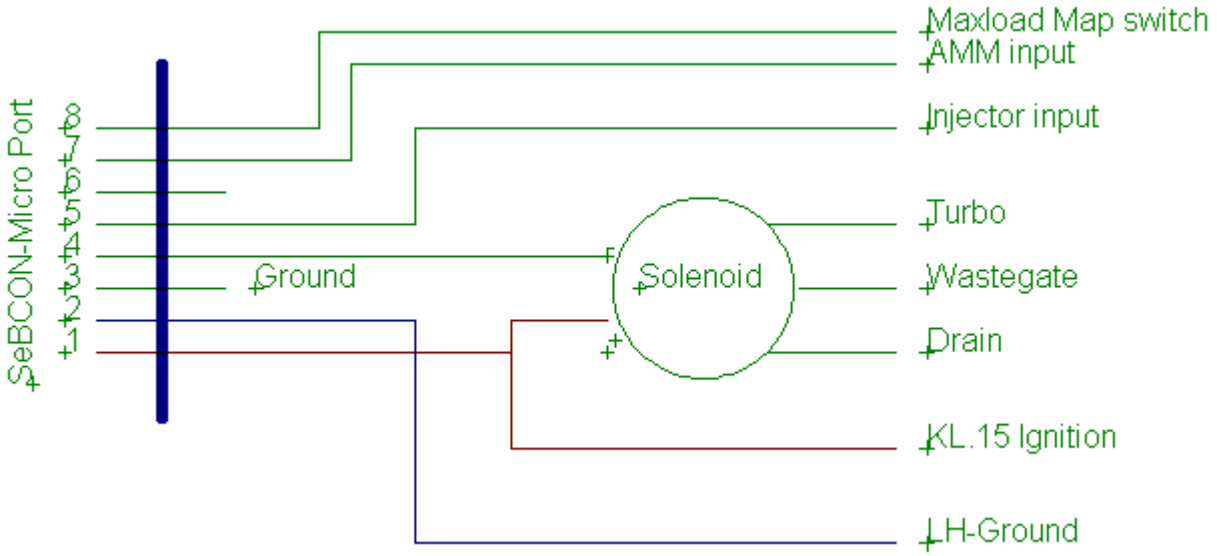
Function	SeBCON-Micro		LH 2.4		LH 2.2		LH 2.0	
Signal	Port	description	pin	cable	pin	cable	pin	cable
Power +12V	1	**Kl.15 Ignition !!**	35	BL	9	BL-Y	?	?
Ground	2	LH-Jetronic ground	17	SB	11	SB	?	?
Ground *	3	LH-Jetronic ground	-	-	-	-	-	-
Solenoid GND	4	Solenoid ground	-	-	-	-	-	-
Injector in	5	Injector signal	18	GR	13	GR	13	GN-W
--	6		-	-	-	-	-	-
Air-mass meter	7	AMM signal	7	BL-R	7	BL-R	7	W-R
Map-Switch *	8	Switch to Ground Port3	-	-	-	-	-	-

*** additional function**

::> **This configuration sheet is only valid for original Turbo Versions!**

Use max. 0.5mm² cables

4.1.2 Connection diagram



5 Adjustment

The height of the charge pressure (air mass) can be adjusted with the potentiometer.

Increase boost: clockwise
Decrease boost: counterclockwise

Adjustment range: 0–105%

0-99%: decrease the AMM signal
100%: put the AMM signal through
100–105%: increase the AMM signal

Maxload Map Switch

With this switch it's possible to switch to a additional Maxload Map. This is a fast way to switch between e.g. Eco and Sport Mode or whatever is programmed. Map2 provides by default additional Mid-Range power. If you don't want to use this function, leave port 3+8 unconnected.

Question:
I want to customize the custom maps, what do I need?

- Windows / Linux / Mobil Phone and a VT100 compatible terminal program
- SeBCON-Micro with Bluetooth Software and a HC-05-6 Bluetooth Modul

Question:
I want to re-install the firmware or install a software update, what do I need to do this?

- USBasp Controller (6-Pin) for the ISP-Interface
  https://startpage.com/do/search?q=usbasp
- eXtreme Burner – AVR 1.4.2 or higher; to write the new eprom data
  http://extremeelectronics.co.in/

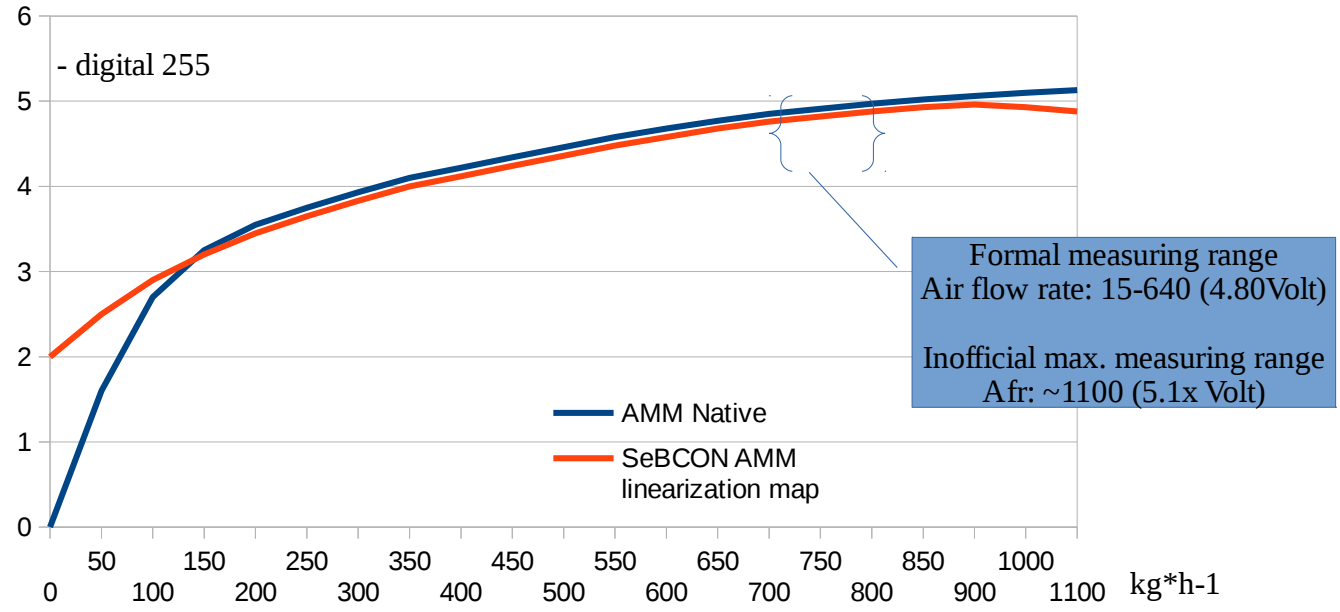
6 SeBCON Internals

How does SeBCON calculates the Solenoid values?

- Reading the LMM value, converting the analog to a digital value 0-255
- Correction of the digital LMM value using the AMM-linearization map
- Set the relative height of the curve using the potentiometer, range 0-110%
- Check whether the calculated value is higher than the value for the current speed stored in the maxload map; If so, the calculated value is replaced by the value of the maxload map.
- Check whether a lower value is stored for the current speed (knocking)
- Limit calculated value to digital 232 (if higher) to limit solenoids to 90% cycle time (component protection).
- Convert the final value to a 30Hz PWM signal between 0 and 90% and pass to the power amplifier of the solenoids.

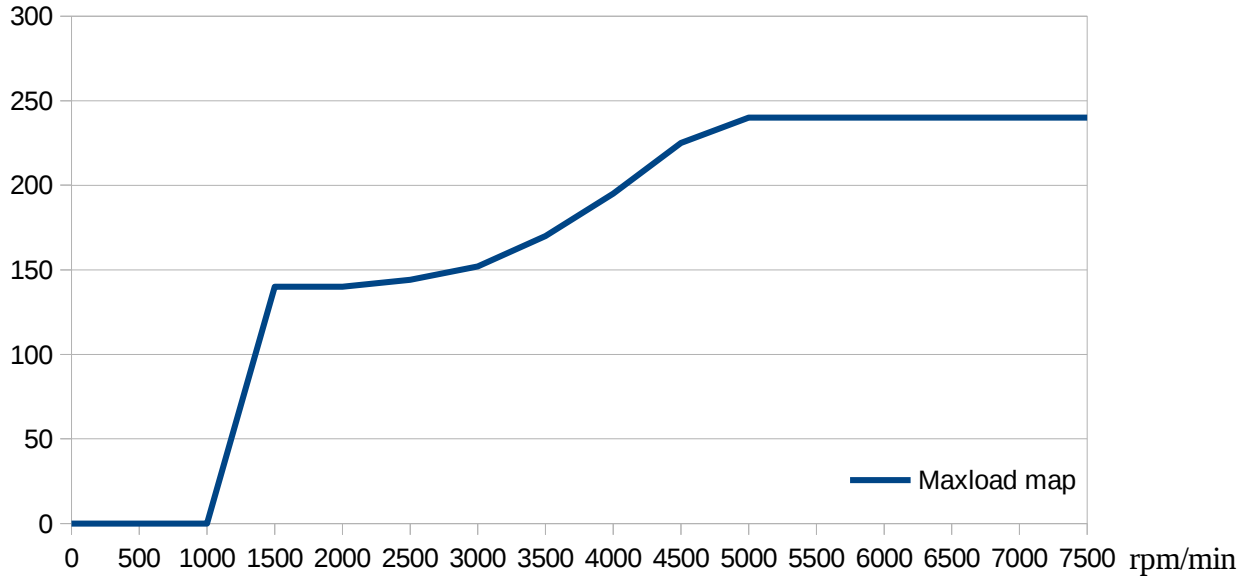
Bosch 80mm (3") Hot-wire air-mass meter
A 0280 213 012 (discontinued)
A 0986 280 110 (replacement)

AMM Voltage



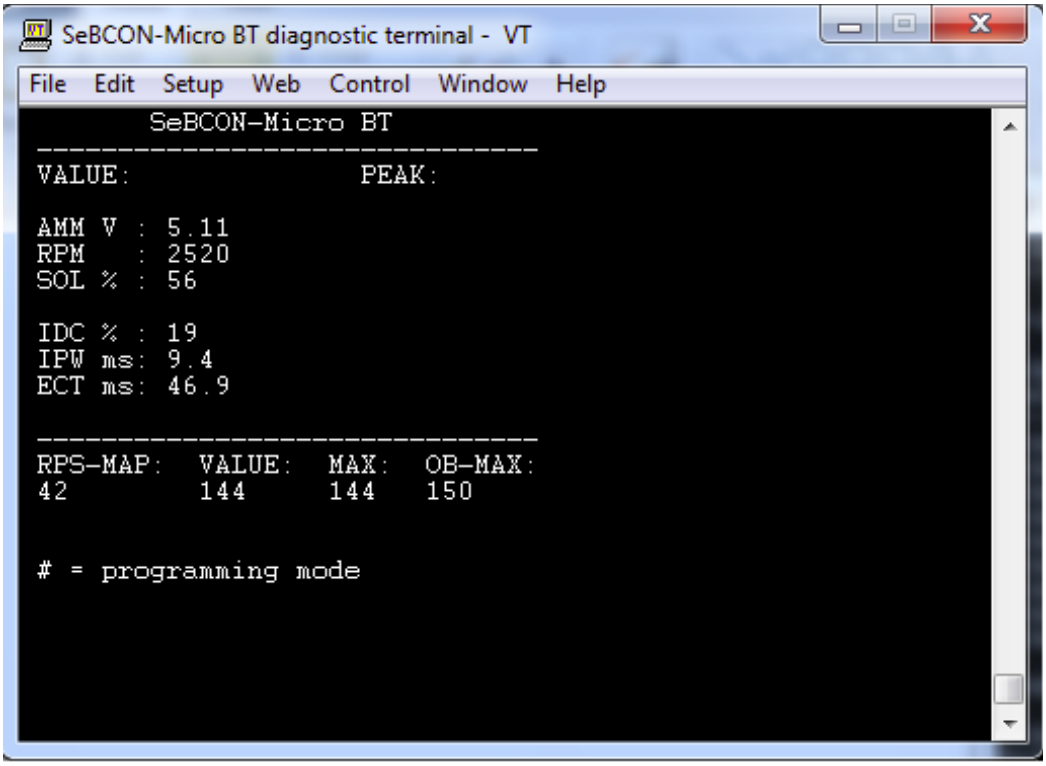
Solenoid Duty-Cycle

Digital 0-255 = 0-100% duty-cylce. Solenoid frequency is ~30Hz
Signal limit is 232 (unchangeable) = solenoid duty cycle 90% max.



7 Custom Maps and Software Options

Standard Menu:



AMM: Voltage of the air mass meter up to max. 5.50 volts
RPM: Current speed (in 60rpm gradation)
SOL: Activation of the solenoid in %

IDC: Injector Duty Cycle in %
IPW: Injector Impulswide in ms
ECT: Engine Cycle Time in ms

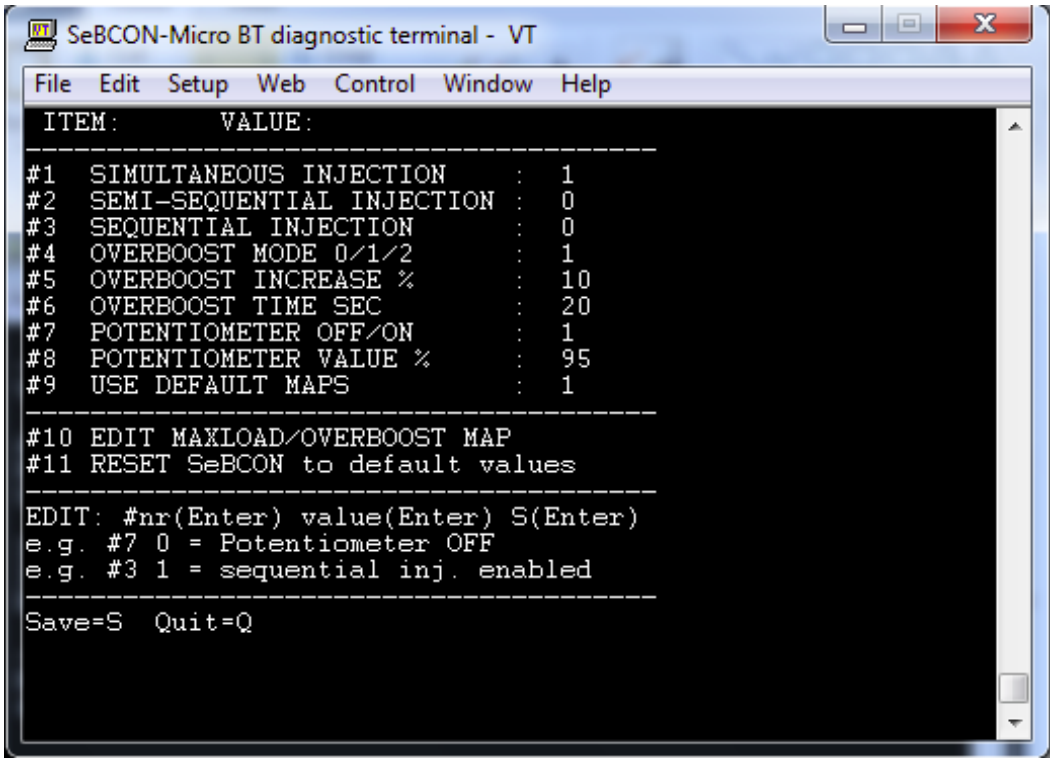
RPS: Current speed/sec

Current RPS MAP with associated VALUE, defined MAX value and defined overboost OB-MAX value.

In the example you can see the activated solenoid with the highest allowed clocking of 144 according to max. map. An activated overboost would set the value to 150.

With the IDC and IPW values, it is very easy to judge whether the injectors have an optimal size or are too large / small.

Options:



Simultaneous Injection:
e.g. LH2.4 Jetronic - delivers 2 injection pulses per engine cycle, 1 pulse per engine revolution

Sequential (+Semi) Injection:
e.g. Motronic systems - delivers 1 injection pulse per engine cycle = 2 engine revolutions

Semi: It is the same as a pure sequential system, except that a SEMI system has block-wise paired injector pairs, and the 'real' sequential has its own channel for each injector. For the Sebcon this difference does not matter.

Over boost Mode:
0=Overboost 1=Over boost limited in time 2=unlimited Over boost

Over boost Increase:
Percentage increase of the potentiometer value.

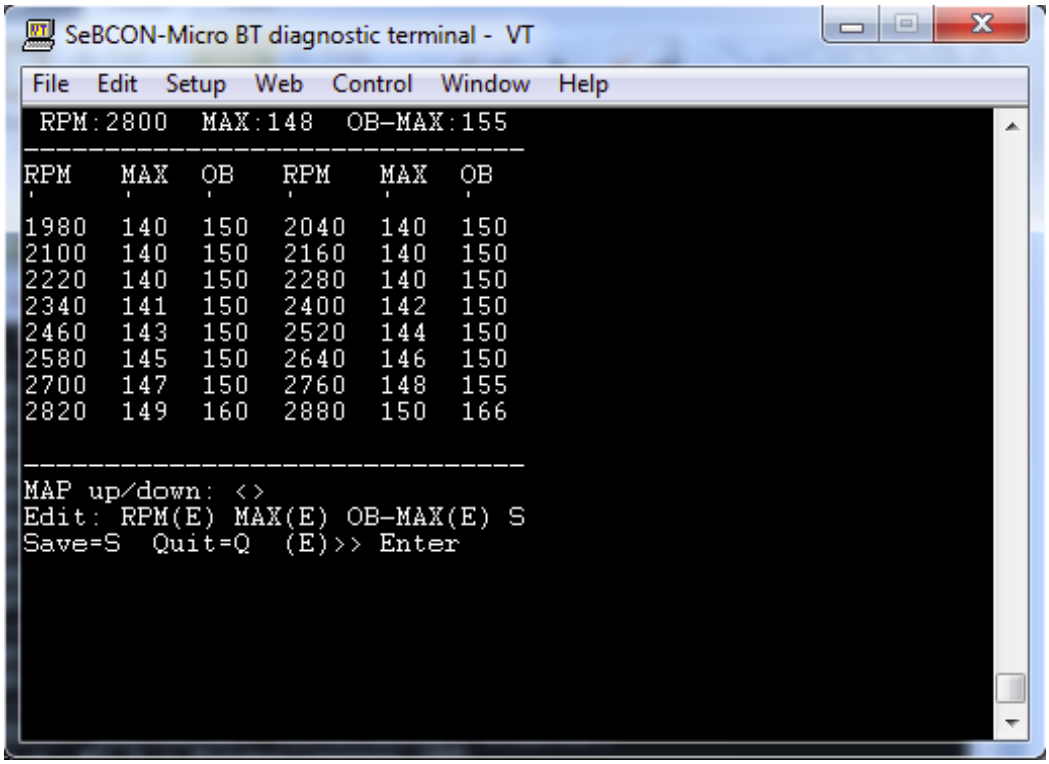
Over boost Time sec:
Over boost timeout: 0-255 seconds

Potentiometer OFF/ON:
Disables the on board potentiometer and sets instead the value which is set in potentiometer value.

Potentiometer Value: Potentiometer substitute value (e.g. if Potentiometer not accessible)
If the potentiometer is active, the set value is displayed; if the potentiometer is deactivated, the manually set value is displayed.

Use Default Maps:
1=Sebcon Maps ; 0 = Custom Maps, which by default contain the same values as the Sebcon Maps.

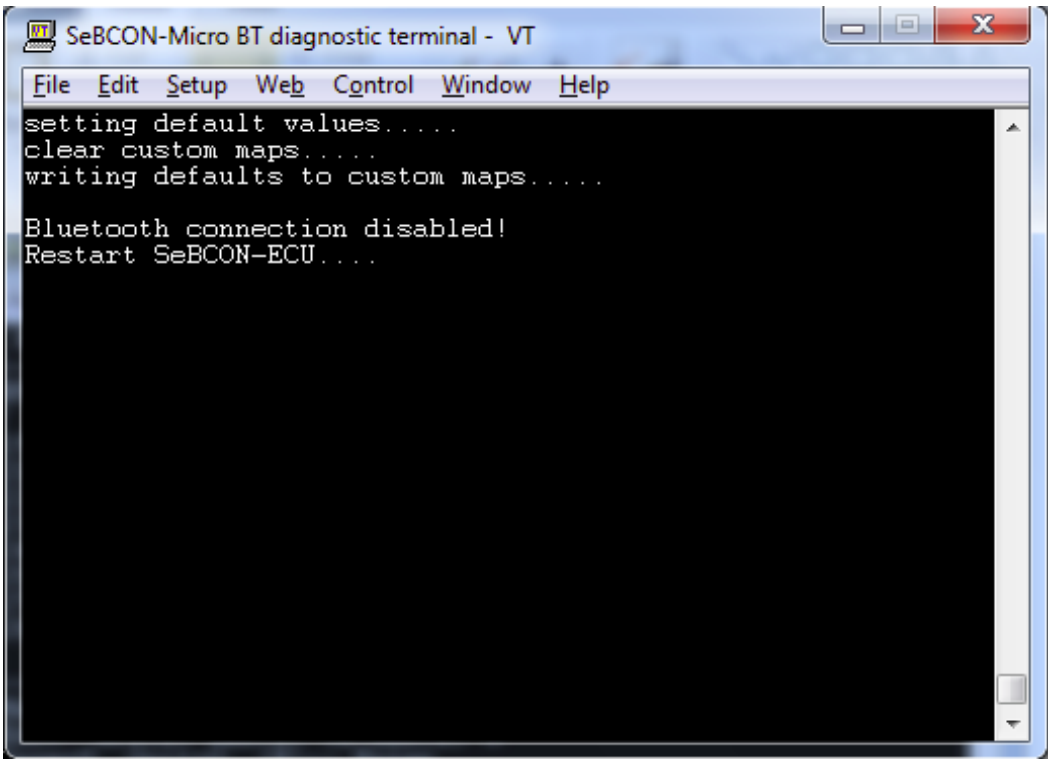
Map-Editor:



With the map editor all maps can be viewed and changed.
The maps that are displayed are always **custom maps** (default and overboost map).

The user-defined maps are only active if the option **USE DEFAULT MAP = 0** has been set, otherwise the internal Sebcon maps are used, which are not changeable. The custom maps are the same as the internal maps in their original state. A **RESET TO DEFAULTS** resets the user-defined maps to the internal standard values.

Reset to default values:



8 Installing the Bluetooth Modul under Windows

- Add new Bluetooth device **HC-05**
- Pairing Code: ***1234***
- After successful add look in the *Device Manager* under *Ports (COM and LPT)* to see which COM port the module had got.

9 Technical specifications

Power supply:

- 8-16Volt
- 200mA

Microprocessor:

- ATMEGA328P 32KB Flash / 1KB EEprom / 2KB Ram
- 14.7456 MHz

Interfaces:

- ISP - **I**n **S**ystem **P**rogramming Interface
- Bluetooth Interface
- 2x 10-Pin header

Bluetooth Modul:

- HC-05-6
- Pairing code: **1234**
- Baudrate: 9600