Operational description of BMW KeyReader

The following regards to the BMW KeyReader block diagram.

1. After connecting the BMW KeyReader to personal computer and power supply the BMW KeyReader is set to operative mode.

2. By means to read a transponder command data is send to the RS232 Interface. After the command has been successfully carried out data is send back to the personal computer.

3. The RS232 interface changes data signal level from +/-12V DC to 5V DC TTL level or from 5V DC TTL level to +/-12V DC depending on the direction of the data flow.

4. Micro controller 1 sets micro controller 2 into EEPROM write mode after specific command. Micro controller 1 is driven by a 8 MHz oscillator.

5. Micro controller 2 carries out commands send from PC to set specific commands to the digital-/analog-interface for reading transponders. Or it receives data streams send by the transponder via the digital-/analog-interface. The data is then set to telegrams which are to be send to the PC via the RS 232 interface.

6. The digital-/analog-interface modulates and demodulates data:
   - TTL command data from micro controller 2 is modulated on a 125kHz carrier to be send to the transponder
   - Data streams send by the transponder is demodulated from the 125kHz carrier into TTL signal

   The digital-/analog-interface is driven by a 4 MHz oscillator and generates a 125kHz carrier frequency for communication with transponders.

7. Used transponders all are driven at 125kHz. Therefor all transponders also uses the 125kHz signal for transmission in so called manchester code.