

# MMprog

## Transponder programmer



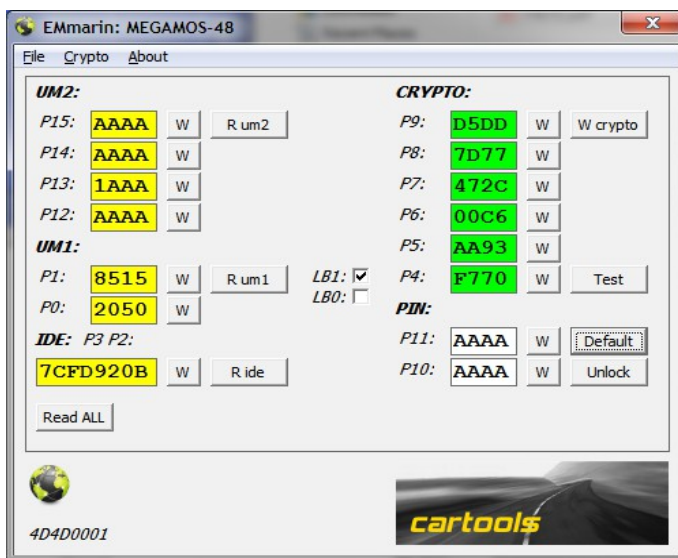
MMprog\_48 software

### Compatible with:

original transponders from EMmarin and all known Megamos-48 emulators:

- EM4070 (V4070) - have UM1 only, haven't UM2 and PIN
- EM4170 - have UM1 & UM2

### Main screen:



### IDE:

originally it is factory programmed and not rewritable. All emulators allow to update it making key cloning possible.

### LOCK bits:

Unlocked state: **LB1=1, LB0=0.**

Most of UM1+UM2 chips and all known emulators do not check LB1, actually only LB0 acts as a lock bit.

### PIN:

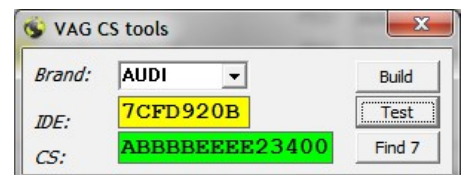
UM1+UM2 transponders can be unlocked using PIN (4 bytes). It is a good idea not to forget to store known PIN before locking transponder.

### VAG CS tools:

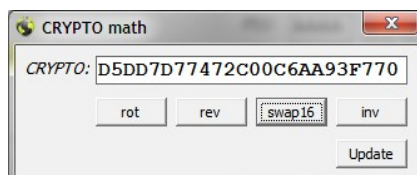
**Build:** makes CRYPTO from IDE and CS, main screen is updated, nothing is written into transponder. You can write updated data into transponder from main screen if you wish.

**Test:** test CS, actual IDE is read from transponder, CRYPTO is not updated on main screen.

**Find7:** search for 7th CS byte using brute force, test all possible values from 0x00 to 0xFF. IDE is read from actual transponder.



### CRYPTO math:



**rot:** reorder bits in each byte: 0..7 to 7..0 (MS to LS, reverse bits);

**rev:** reorder bytes: 0..11 to 11..0 (reverse bytes);

**swap16:** reorder 16-bit words (16-bit swap, MMLL to LLMM);

**inv:** invert bits ( do 0xFF-X or X eor 0xFF);

**Update:** update CRYPTO on main screen.

Every time window is opened, CRYPTO is taken from MAIN screen (pages P9...P4).

