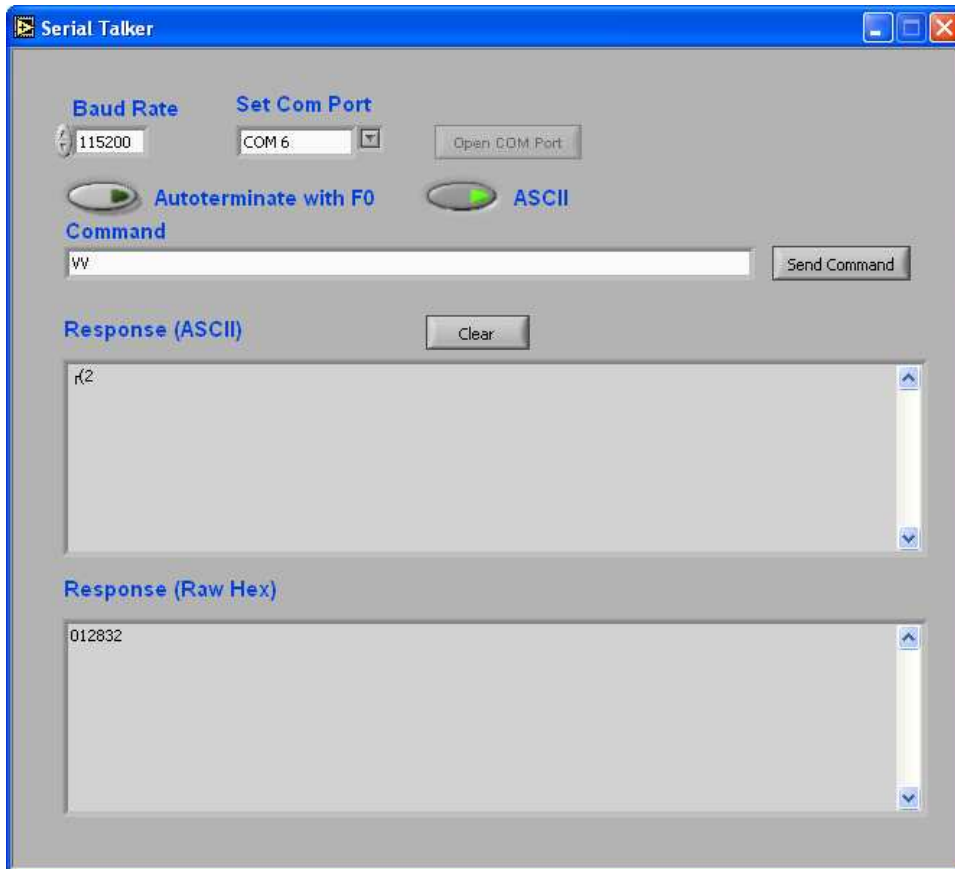


## **CalumSult Realtime ECU Command Protocol - Emulator**

- Emulator is located on USB Serial Converter B channel
- Command set is a rough sub-set of Romulator Command Set
- All commands are case sensitive
- Approx 1 second error timeout between characters, response will be ASCII '?' (hex 3F)
- All examples are with a B14 (64k rom) ecu
- All memory writes can be done without interfering with the ecu's operation. The daughterboard never denies the ecu access to memory (there are no 'hidden' or 'hard' writes, all writes to memory work the same and are invisible to the ecu). Support for 'hidden' write commands is purely for compatibility, you do not need to use these commands.

## Version

Checks for version of Realtime daughterboard



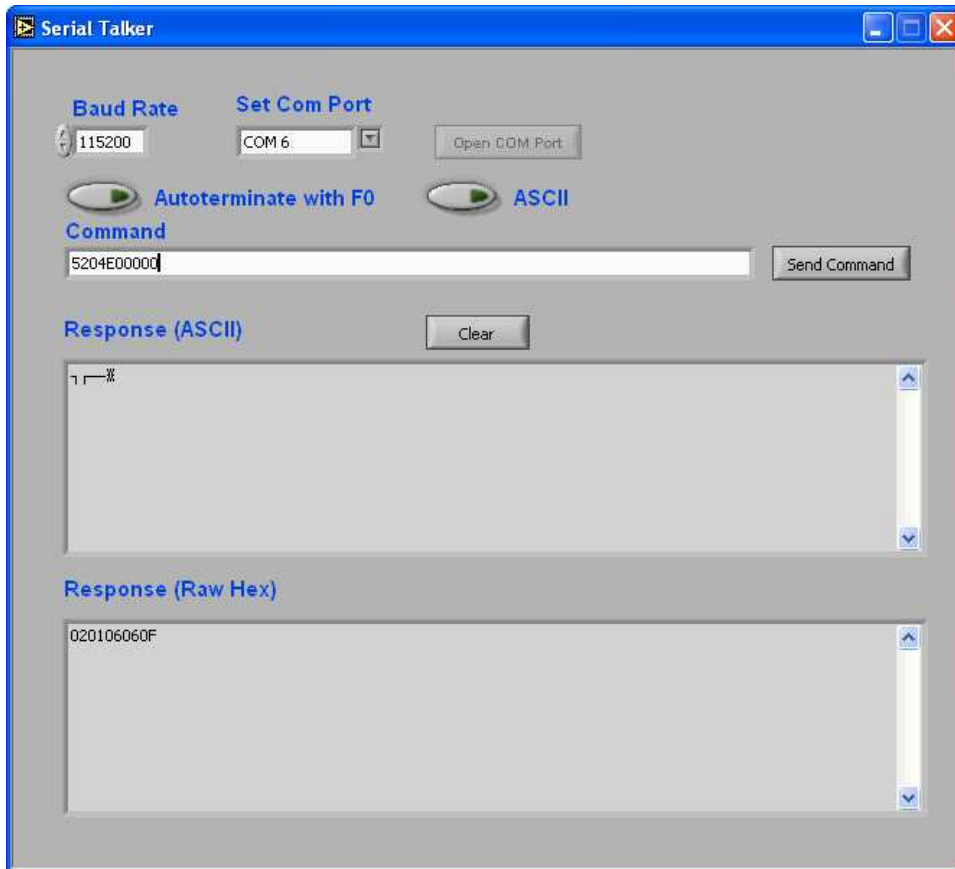
**SEND** – ASCII – VV (Hex – 5656)  
2 bytes

**RESPONSE** – Hex – 01283x

Response is version 1.40 (01.28 converted from hex to dec), type I or II (32k or 64k rom size) depending on x. Last byte is an ASCII character (1 or 2), so type I (B13 and S13, 32k rom) will respond 31, and type II (B14 and S14, 64k rom) will respond 32.

## Read Block

Reads a block of memory. Block can be 1-256 bytes long



**SEND** – Hex – 52xxyyyyzz  
5 bytes

**RESPONSE** – Hex – <requested bytes><checksum>

xx is the number of bytes to read. 00 will grab 256 bytes.

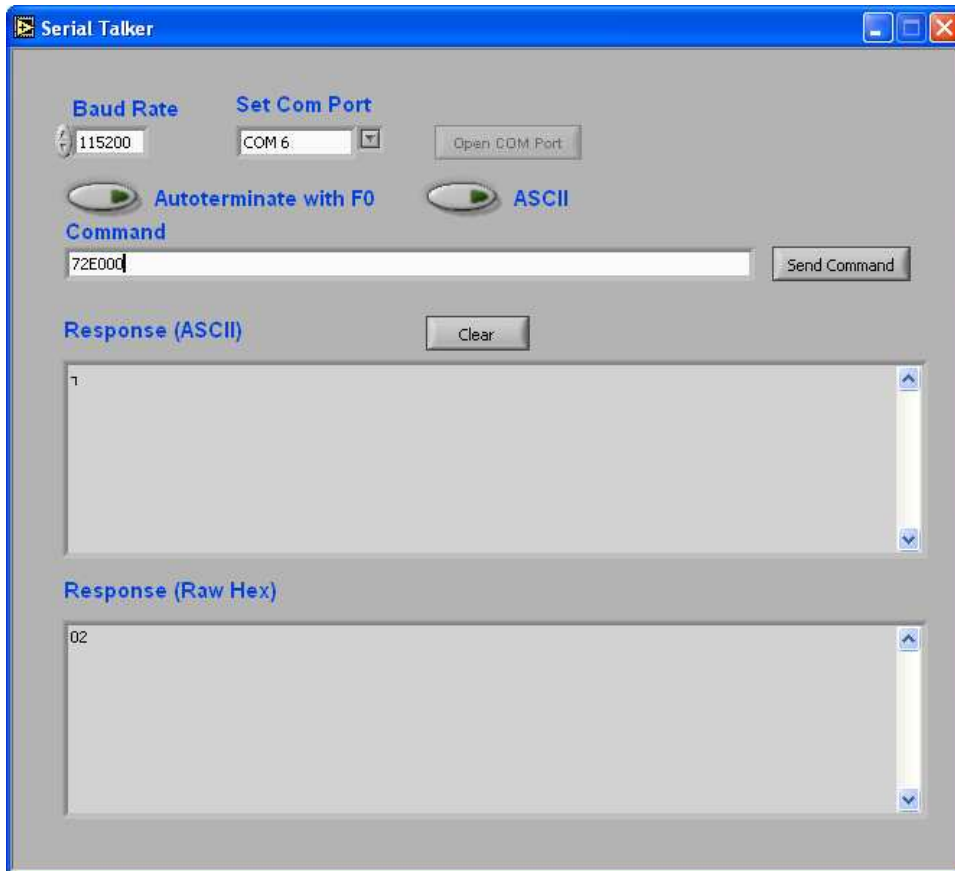
yyyy is the starting address.

zz is the checksum of the command. The daughterboard ignores this byte, so 00 can be inserted instead of calculating the checksum.

In the above example 4 bytes are requested, starting at address 'E0000'. The daughterboard responds with the 4 bytes starting at that address, '02010606', then adds the checksum of these bytes, '0F'. This checksum is correctly computed.

## Read Single Byte

Reads a single byte.



**SEND** – Hex – 72xxxx  
3 bytes

**RESPONSE** – Hex – <requested byte>

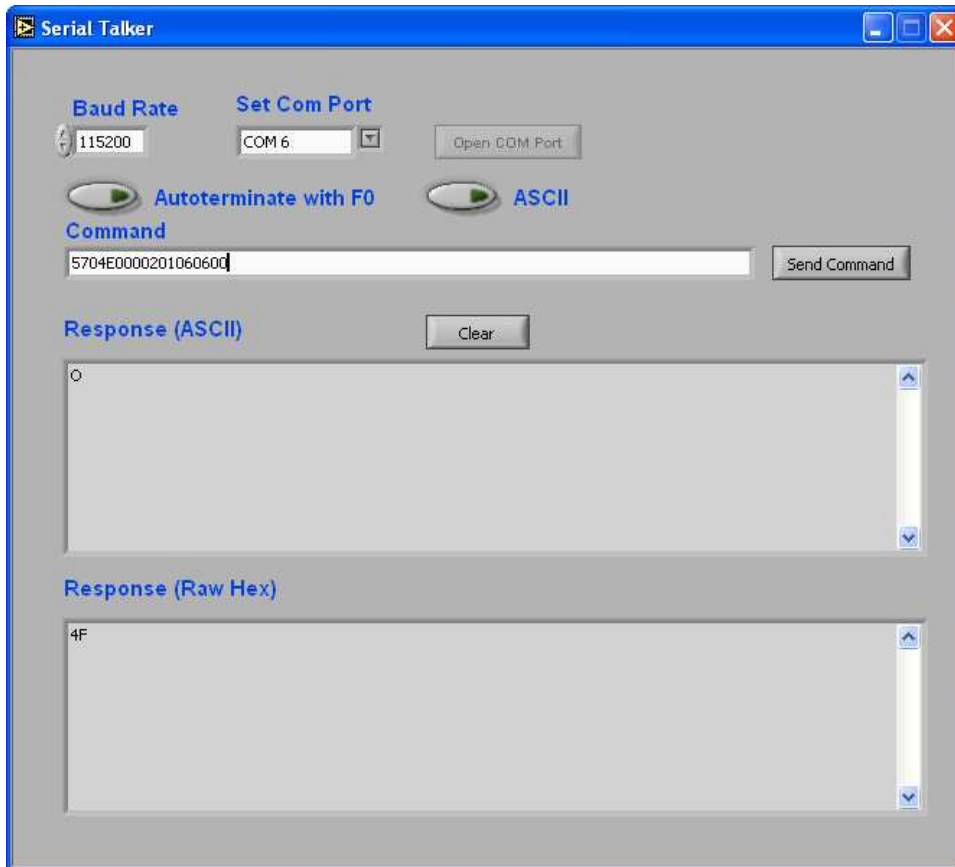
xxxx is the address of the byte to be read.

The response is simply the contents of that memory location.

In the above example address 'E000' is requested, and '02' is returned

## Write Block

Writes a block of memory. Block can be 1-256 bytes long. All writes (all write commands) do not interfere with the ecu reading the memory and can be done at any time. This is the preferred block write command.



**SEND** – Hex – 57xyyyyy<data to write><checksum>  
5 bytes + <length of data to write>

**RESPONSE** – ASCII – ‘O’ – Hex – 4F

xx is number of bytes to write. 00 will specify a length of 256.

yyyy is the starting address to write to.

<checksum> byte is ignored by daughterboard.

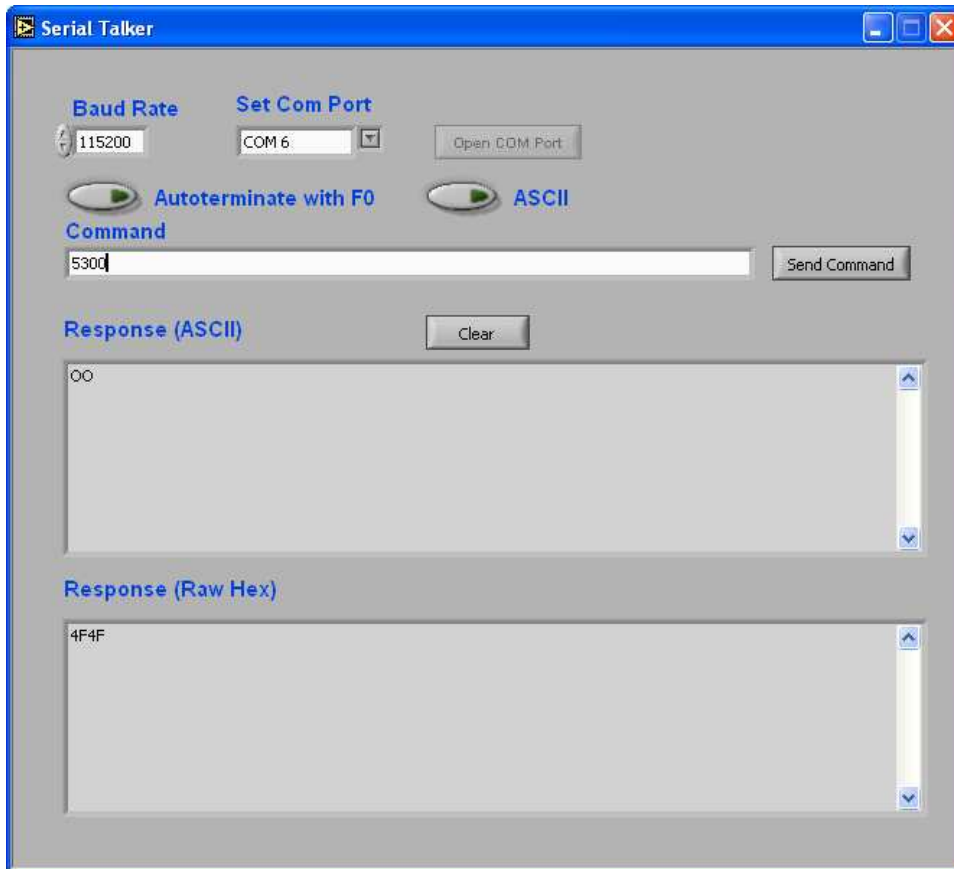
Daughterboard responds only after data has been successfully written.

In above example, 4 bytes (02 01 06 06) are written to address ‘E0000’. 00 is inserted in the checksum byte location. The daughterboard responds with ‘O’ when the write is complete.

‘Hidden write’ (77 instead of 57) command is treated the same as above. Support for hidden write is included only for compatibility purposes; do not use this command on new software.

## Status

Checks status of daughterboard



**SEND** – Hex – 53<checksum>  
2 bytes

**RESPONSE** – ASCII – ‘OO’ (Hex 4F4F)

Checksum byte is ignored. Daughterboard responds as soon as possible. No response is given until daughterboard finishes current operation. Daughterboard will never respond with busy.

## ***Write Block – version X***

This use of this write block version is not supported. Use 'W' or 'w'.