

First bit zero encoding

Radovan Augustín
rado_augustin@yahoo.com

This document describes First bit zero encoding, encoding of message transmitted on serial link. It allows exact detection of start of transmitted message.

Message structure

Encoded message has structure:

Message		
<i>Start byte</i>	<i>Data MSB bytes</i>	<i>Data</i>
0xAA	0..M bytes with value 0..0x7F	0..N bytes with value 0..0x7F

Length of message and message parts are known to transmitter and receiver, but if needed, length information can be added to message. First byte of message is *Start byte* with value 0xAA, this is only byte in message which has most significant bit set to 1 and it allows exact detection of start of message. Next bytes are *Data MSB bytes*, one byte contains 7 most significant bits from bytes in *Data*, thus these bits define most significant bits in *Data* bytes. Most significant bits in *Data* bytes are set to zero.

Invariants:

Start byte can have value other than 0xAA and bit other than most significant bit in *Start byte* can be *selected bit* with specified value 0 or 1. Next bytes in message have value of *selected bit* set to negated value of *selected bit* in *Start byte*. *Data MSB bytes* contain values of *selected bit* from *Data* bytes and *Data* bytes contain *selected bit* set to negated value of *selected bit* in *Start byte*.

Example of message:

Unencoded *Data* 7 bytes: 0xF0 0x71 0xF2 0x73 0xF4 0x75 0xF6

Message with encoded data:

Message								
<i>Start byte</i>	<i>Data MSB bits</i>	<i>Data</i> byte 0	<i>Data</i> byte 1	<i>Data</i> byte 2	<i>Data</i> byte 3	<i>Data</i> byte 4	<i>Data</i> byte 5	<i>Data</i> byte 6
0xAA	0x55	0x70	0x71	0x72	0x73	0x74	0x75	0x76

Revisions:

November 2013 Initial release

June 2015 Added clarification of invariants