



# Scrambler initialization based on training sequence

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Contribution supporting comment #103 to D1.0

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# Scrambler initialization



- Until the link is established, the 64B/65B encoder generates continuously the same 65-bit code (IBLOCK\_T in D1.0)
- The RS-FEC is a systematic code, therefore the information bits belonging to the 65-bit blocks of each RS-FEC code-word can be recognized by the receiver and used for Transmit Block synchronization as well as data-aided clock recovery and equalizer filters adaptation, provided the additive scrambler is initialized at the beginning of the Transmit Block with a defined value known by the receiver
- The LFSR used in the scrambler is maximal-length with length much larger (i.e.  $2^{25} - 1$ ) than the Transmit Block
- Transmit Block synchronization may be implemented by cross correlation functions, therefore the reset value of the scrambler has influence in the secondary correlation peaks that should be minimized with respect to the main one indicating the first bit of the Transmit Block
- Per comment #103, Local Fault ordered sets should be transmitted during training phase (`tx_xmii_enable = FALSE`), which implies replacing IBLOCK\_T with LBLOCK\_T
- **The optimum initialization value for LBLOCK\_T blocks is 0x0FB9659**



Thank you!