147.3.2.8 Timers

xmit_max_timer
: Defines the maximum time the PCS Transmit state diagram can stay in DATA state.
The xmit_max_timer shall be implemented in such a way that, upon expiration, an even number of nibbles has been sent to prevent the MAC from counting false alignment errors.
Duration: 2 ms ± 100 µs
NOTE—This is approximately 25% greater than maxEnvelopeFrameSize specified in 4.2.7.1.

unjab_timer
: Optionally times the minimum duration the PHY suppresses any transmission before reverting to normal operations.
Duration: 16 ms ± 100 µs

147.3.2.9 Jabber functional requirements

The PCS Transmit function shall contain the capability to interrupt a transmission that exceeds a time duration determined by xmit_max_timer. If the packet being transmitted continues longer than the specified time duration, the PCS Transmit shall send an ESD, ESDJAB symbol sequence to notify the receivers, then it shall inhibit further transmissions for at least the duration of unjab_timer. The PCS Transmit may return to normal operation automatically after unjab_timer elapsed and the error condition has been cleared, or it can keep silent until reset.

147.3.3 PCS Receive

147.3.3.1 PCS Receive overview

The PCS Receive function shall conform to the PCS Receive state diagram in Figure 147–7 and Figure 147–8, and associated state variables.

The state diagram defined in Figure 147–7 is triggered by the reception of a SYNC symbol from the PMA Receive function and waits for two SSD symbols to start regenerating the packet preamble whose start has been replaced with the SYNC, SYNC, SSD, SSD sequence by the PCS Transmit function as described in Figure 147–4. After the second SSD is received, the PCS Receive function discards the next nine symbols which shall instead be used to achieve lock of the self-synchronizing descrambler.

During the descrambler locking time, the special value 5 is conveyed to the MII via the pcs_rxd variable in order to rebuild the original preamble transmitted by the MAC.

The DATA state, in which 5B symbols are decoded into MII data, is left when ESD or ESDBRS followed by either ESDOK, ESDERR, or ESDJAB symbol is encountered, or when the PMA detects SILENCE on the media (e.g. the transmitter prematurely stops data transmission).

~~The variables, functions, and timers used in Figure 147–7 are defined as below. For the definition of pcs_reset, SILENCE, SYNC, SSD, ESD, ESDOK, ESDJAB, and ESDERR see 147.3.2.2.~~

147.3.3.2 Variables

duplex_mode
: This variable indicates whether the PHY is configured for full-duplex operation (DUPLEX_FULL) or half-duplex operation (DUPLEX_HALF). If Multidrop mode MDIO register bit 1.2297.10 is set to one and multidrop mode is supported according to bit 1.2298.10 then duplex_mode is set to DUPLEX_HALF. Else, if Auto-Negotiation is enabled then duplex_mode is set by the priority resolution defined in 98B.4. Otherwise,

this variable is set by MDIO register bit 3.2291.8. If MDIO is not implemented, duplex_mode is set by equivalent means.
Values: DUPLEX_FULL or DUPLEX_HALF

precnt

Counter for preamble regeneration.

pcs_rxdv

The RX_DV signal of the MII as specified in 22.2.2.7.

pcs_rxer

The RX_ER signal of the MII as specified in 22.2.2.10.

pcs_rxd

PCS decoded data synchronous to RX_CLK.

pcs_reset

See 147.3.2.2.

RXn

Received 5B symbol generated by PMA receive at time n.

147.3.3.3 Constants

Refer to section 147.3.2.3.

~~SILENCE~~

~~The 5B symbol defined as 'I' in 4B/5B encoding.~~

147.3.3.4 Functions

DECODE

In the PCS Receive function, this function takes as its arguments one 5B symbol, decodes the corresponding nibble as defined in Table 147–1, descrambles it as defined in 147.3.3.7, and returns the descrambled result as defined in 147.3.3.7. If a violation of the encoding rules is detected, PCS Receive asserts the signal RX_ER for at least one symbol period.

147.3.3.5 Abbreviations

RSCD Alias for Receive Symbol Conversion Done, synchronous to PCS RX clock.