

146.2.1 PMA_LINK.request

This primitive allows the Auto-Negotiation or the PHY Link Synchronization algorithm to enable and disable operation of the PMA, as specified in 98.4.2, respectively.

146.2.1.1 Semantics of the primitive

PMA_LINK.request (link_control)

The link_control parameter can take on one of the following two values:

DISABLE: Used by the Auto-Negotiation function to disable the PHY
ENABLE: Used by the Auto-Negotiation function to enable the PHY

146.2.1.2 When generated

Auto-Negotiation generates this primitive to indicate a change in link_control as described in 98.4.

146.2.1.3 Effect of receipt

This primitive affects the operation of the PMA Link Control function, as described in 146.4.4 and the PMA Link Monitor function, as described in 146.4.5.

146.2.2 PMA_LINK.indication

This primitive is generated by the PMA to indicate the status of the underlying medium as specified in 98.4.1. This primitive informs the PCS and the Auto-Negotiation functions about the status of the underlying link.

146.2.2.1 Semantics of the primitive

PMA_LINK.indication (link_status)

The link_status parameter can take on one of the following two values:

FAIL: No valid link established.
OK: The Link Monitor function indicates that a valid 10BASE-T1L link is established. Reliable reception of signals transmitted from the remote PHY is possible.

146.2.2.2 When generated

The PMA generates this primitive to indicate a change in link_status in compliance with the state diagram given in Figure 146-16.

97.2.1.2.3 Effect of receipt

The effect of receipt of this primitive is specified in 98.4.1.

146.2.3 PMA_TXMODE.indication

The transmitter in a 10BASE-T1L link normally sends over the MDI symbols that represent a MII data stream with framing, scrambling and encoding of data, control information, or idles.

146.2.3.1 Semantics of the primitive

PMA_TXMODE.indication (tx_mode)

PMA_TXMODE.indication specifies to PCS Transmit via the parameter tx_mode what sequence of symbols the PCS should be transmitting. The parameter tx_mode can take on one of the following three values of the form:

SEND_N: This value is continuously asserted during transmission of sequences of symbols representing an MII data stream in the data mode.
SEND_I: This value is continuously asserted when transmission of sequences of idle symbols is to take place.
SEND_Z: This value is continuously asserted in case transmission of zeros is required.

146.2.3.2 When generated

The PMA PHY Control function generates PMA_TXMODE.indication messages to indicate a change in tx_mode.

146.2.3.3 Effect of receipt

Upon receipt of this primitive, the PCS performs its transmit function as described in 146.3.3.

146.2.4 PMA_UNITDATA.indication

This primitive defines the transfer of symbols in the form of the rx_symb_vector parameter from the PMA to the PCS.

146.2.4.1 Semantics of the primitive

PMA_UNITDATA.indication (rx_symb_vector)

During reception the PMA_UNITDATA.indication conveys to the PCS via the parameter rx_symb_vector the value of symbols detected on the MDI during each cycle of the recovered clock.

146.2.4.2 When generated

The PMA generates PMA_UNITDATA.indication (rx_symb_vector) messages synchronously for every symbol received at the MDI. The nominal rate of the PMA_UNITDATA.indication primitive is 7.5 MHz, as governed by the recovered clock.

146.2.4.3 Effect of receipt

The effect of receipt of this primitive is unspecified.

146.2.5 PMA_UNITDATA.request

This primitive defines the transfer of symbols in the form of the tx_symb_vector parameter from the PCS to the PMA. The symbols are obtained in the PCS Transmit function using the encoding rules defined in 146.3.3.2 to represent MII data, idle data or zero data.

146.2.5.1 Semantics of the primitive

PMA_UNITDATA.request (tx_symb_vector)

During transmission, the PMA_UNITDATA.request simultaneously conveys to the PMA via the parameter tx_symb_vector the value of the symbols to be sent over the MDI. The tx_symb_vector may take on one of the values in the set {-1, 0, 1}.

146.2.5.2 When generated

The PCS generates PMA_UNITDATA.request (tx_symb_vector) synchronously with every transmit clock cycle.

146.2.5.3 Effect of receipt

Upon receipt of this primitive the PMA transmits on the MDI the signals corresponding to the indicated symbols after processing with optional transmit filtering and other specified PMA Transmit processing.

146.2.6 PMA_RXSTATUS.indication

This primitive is generated by PMA Receive to indicate the status of the receive link at the local PHY. The parameter `loc_rcvr_status` conveys to the PCS Receive and PMA PHY Control function the information on whether the status of the overall receive link is satisfactory or not. The criterion for setting the parameter `loc_rcvr_status` is left to the implementer. It can be based, for example, on observing the mean-square error at the decision point of the receiver and detecting disparity errors during reception of the symbol stream.

146.2.6.1 Semantics of the primitive

PMA_RXSTATUS.indication (`loc_rcvr_status`)

The `loc_rcvr_status` parameter can take on one of two values of the following form:

OK: This value is asserted and remains true during reliable operation of the receive link for the local PHY.

NOT_OK: This value is asserted whenever operation of the link for the local PHY is unreliable.

146.2.6.2 When generated

PMA Receive generates PMA_RXSTATUS.indication messages to indicate a change in `loc_rcvr_status` on the basis of signals received at the MDI.

146.2.6.3 Effect of receipt

The effect of receipt of this primitive is specified in 146.3.3.2.4, 146.3.4, 146.4.4, Figure 146-8, and Figure 146-15.

146.2.7 PMA_REMRXSTATUS.request

This primitive is generated by PCS Receive to indicate the status of the receive link at the remote PHY as communicated by the remote PHY via its encoding of its `loc_rcvr_status` parameter. The parameter `rem_rcvr_status` conveys to the PMA PHY Control function the information on whether reliable operation of the remote PHY is detected or not. The parameter `rem_rcvr_status` is set to the value received within the idle data stream of the remote PHY.

146.2.7.1 Semantics of the primitive

PMA_REMRXSTATUS.request (`rem_rcvr_status`)

The `rem_rcvr_status` parameter can take on one of two values of the following form:

OK: The receive link for the remote PHY is operating reliably.

NOT_OK: Reliable operation of the receive link for the remote PHY is not detected.

146.2.7.2 When generated

The PCS generates PMA_REMRXSTATUS.request messages to indicate a change in `rem_rcvr_status` based on the PCS decoding the `loc_rcvr_status` bit in the idle data received from the remote PHY.

146.2.7.3 Effect of receipt

The effect of receipt of this primitive is specified in Figure 146-15.

146.2.8 PMA_SCRSTATUS.request

This primitive is generated by PCS Receive to communicate the status of the descrambler for the local PHY. The parameter `scr_status` conveys to the PMA Receive function the information that the descrambler has achieved synchronization.

146.2.8.1 Semantics of the primitive

PMA_SCRSTATUS.request (`scr_status`)

The `scr_status` parameter can take on one of two values of the following form:

OK: The descrambler has achieved synchronization.
NOT_OK: The descrambler is not synchronized.

146.2.8.2 When generated

PCS Receive generates PMA_SCRSTATUS.request messages to indicate a change in `scr_status`.

146.2.8.3 Effect of receipt

The effect of receipt of this primitive is specified in Figure 146-8 and Figure 146-15.

146.2.9 PMA_TXEN.request (tx_enable_mii)

This primitive is generated by PCS Data Transmission Enable function to communicate the status of the `tx_enable_mii` signal to the PMA. The parameter `tx_enable_mii` conveys to the PMA PHY Control function the information about the actual data transmission status.

146.2.8.1 Semantics of the primitive

PMA_TXEN.request (`tx_enable_mii`)

The `tx_enable_mii` parameter can take on one of two values of the following form:

TRUE: Transmission is enabled.
FALSE: Transmission is disabled.

146.2.8.2 When generated

PCS Data Transmission Enable function generates PMA_TXEN.request messages to indicate a change in `tx_enable_mii` variable.

146.2.8.3 Effect of receipt

The effect of receipt of this primitive is specified in Figure 146-15.