IEEE 802.3dg
Task Force

100BASE-T1L PMA
State Machine Changes

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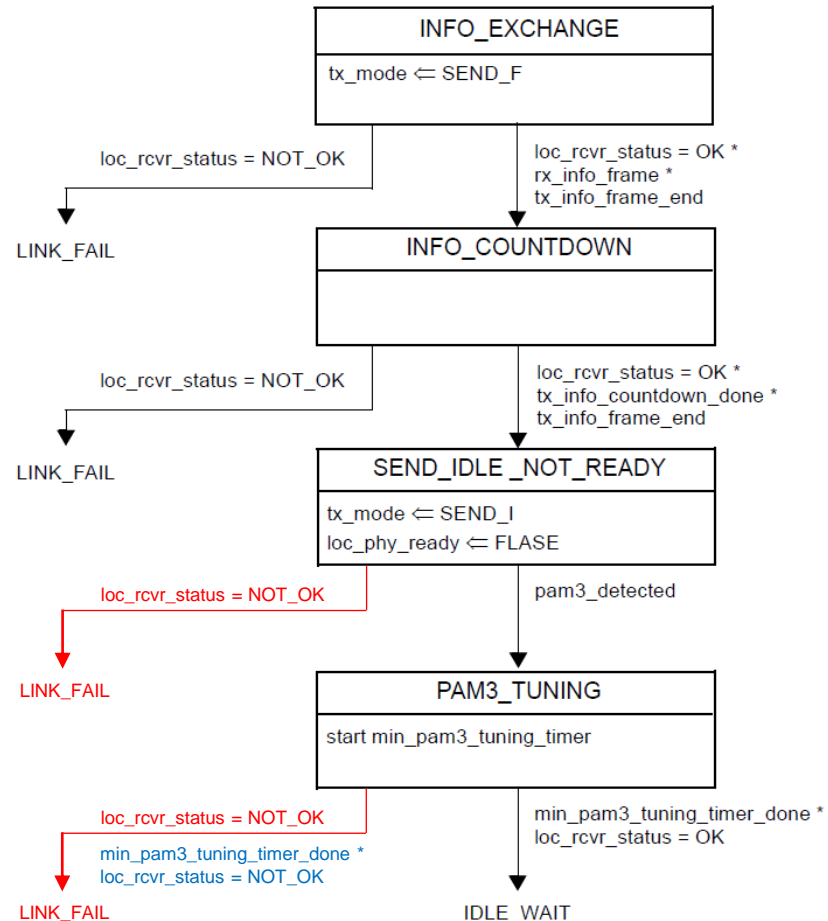**PEPPERL+FUCHS**

Suggested change to PHY Control State Machine

Figure 190–16—PHY Control state diagram, part b

- If loc_rcvr_status = NOT_OK, while in SEND_IDLE_NOT_READY or PAM3_TUNING states, the PHY Control state machine would stay in one of these states and not go to LINK_FAIL state (depending, if PAM3 symbols are detected or not).

- Finally the Auto-Negotiation state machine would bring the PHY Control state machine back to the start condition.

- From all other states the PHY Control state machine would go to LINK_FAIL in a similar condition (signaling earlier to the remote PHY that something is wrong by sending zeroes (SEND_Z)).

- This could be resolved by adding the two red colored additional exit conditions.

- If a risk is seen, that while switching from PAM2 to PAM3 the local receiver status can temporarily become NOT_OK, it makes sense, not to go to LINK_FAIL directly and allow the tuning timer to elapse first (in this case omitting the exit condition to LINK_FAIL in SEND_IDLE_NOT_READY state and using the blue colored, instead of red colored, exit condition in PAM3_TUNING state could make sense as alternative).

Other Changes to PHY Control State Machine

- Change exit condition of PAM2_TRAINING_WAIT state to:

  loc_rcvr_status = OK * ((config = LEADER * rem_rcvr_status = OK) + (config = FOLLOWER * rx_info_frame))

- In SEND_IDLE state loc_phy_ready is set to TRUE. This results in the far end PHY signaling rem_phy_ready = TRUE. If both PHYs signal ready, then normal operation (state SEND_IDLE_OR_DATA) can start. Exit condition of SEND_IDLE state needs to be changed to:

  loc_rcvr_status = OK * rem_phy_ready

- If either loc_rcvr_status = NOT_OK or pma_refresh_status = FAIL, the link should be restarted. Exit condition of SEND_IDLE_OR_DATA state needs to be changed to:

  loc_rcvr_status = NOT_OK + rem_refresh_status = FAIL
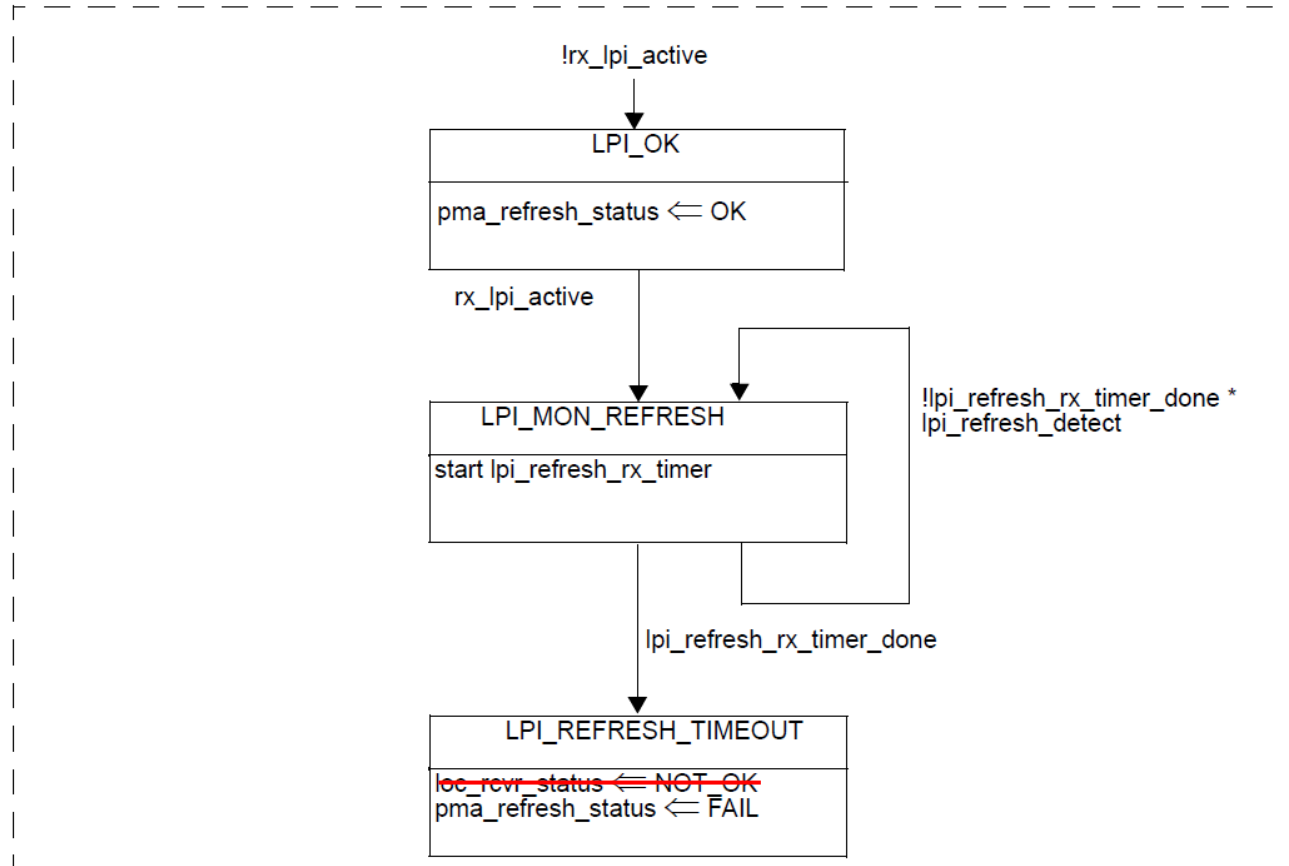
Suggested change to EEE Refresh Monitor State Machine

Figure 190–19—EEE Refresh monitor state diagram

- loc_rcvr_status is generated by PMA receive function.
- Thus, the EEE refresh monitor is not expected to have write access to this variable in parallel to the PMA Receive function, as this may end up in a conflict.
- Setting pma_refresh_status <= FAIL should be enough to do, as by setting this variable, the PHY Control state machine exits SEND_IDLE_OR_DATA state to LINK_FAIL state, which brings the link down by sending zeroes (and causes the same behavior as setting loc_rcvr_status to NOT_OK).

Thank you!

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