

Silent Start

For 10/25/50G Bidi PHYs

Silent Start Requirements

- ▶ Not required in OLT PHYs (“D” type PHYs)
- ▶ In ONUs (“U” type PHYs)
 - ▶ Higher management function
 - ▶ No transmission allowed until a good received signal is seen
 - ▶ Should not “flicker” (ie., transmission should not go in and out due to a marginal received signal)
- ▶ Need to determine if feature is require or optional in both PHYs

Potential status & control keys from PMA/PCS

- ▶ BASE-R and MultiGBASE-T receive link status (Cl 45.2.3.15.1)
 - ▶ Indicates whether the PCS is in a fully operational state. It is only true if block_lock is true and hi_ber is false.
 - ▶ Reflected in MDIO register 3.32.12. A latch low view of this status is reflected in MDIO register 3.1.2 and a latch high of the inverse of this status, Receive fault, is reflected in MDIO register 3.8.10.
 - ▶ BASE-R and MultiGBASE-T PCS high BER (Cl 45.2.3.15.4).
 - ▶ Indicates the state of the hi_ber variable ($> 10 \times 10^{-4}$)
 - ▶ Reflected in MDIO register 3.32.1.
 - ▶ BASE-R and MultiGBASE-T PCS block lock (Cl 45.2.3.15.5)
 - ▶ Indicates when receiver acquires block delineation.
 - ▶ Reflected in MDIO register 3.32.0.
- ▶ PMD_global_transmit_disable (Cl 45.2.1.8)
 - ▶ Optional in most PMDs
 - ▶ Disables transmission.

Proposal

- ▶ Describe function in Introduction clause (157)
- ▶ Use PCS_status as defined in 49.2.14.1 to control Silent Start feature
 - ▶ If PCS-status indicates the PCS receive path is up and running normally for some per-determined time period (1 sec ?) the upstream PMD may transmit.
 - ▶ If PCS_status indicates there is a PCS receive path fault the PMD transmission shall be disabled.
- ▶ PMD_global_transmit_disable as defined in Cl 45.2.1.8 (register 1.9.0, optional in 10/25/50GBASE-R PHYs)
 - ▶ make mandatory in 10/25/50GBASE-BxR-U PHYs

Proposed text for Cl 157

157.x Silent Start

The access networks, especially ONUs, typically serviced with Multi-Gigabit Ethernet BiDi PHYs and related devices are, by nature, less well controlled than other telecommunications networks. Thus it is necessary to provide ONU PHYs with constraints such that, if inadvertently attached to an incompatible network, the newly connected ONU does not disrupt established services on the existing network. The silent start feature provides this protection.

All members of the Multi-Gigabit Ethernet BiDi PHY family are required to include PCS registers or variable equivalents that:

- 1) indicate the receive status of the PCS (see 45.2.3.15.1), and
- 2) disable the PHYs transmitter(see 45.2.1.8).

By monitoring the PCS receive status indicator and appropriately setting the PHY transmitter control, upper layer management can prevent transmission by a Multi-Gigabit Ethernet BiDi ONU PHY when connected to an incompatible network (e.g., an EPON network).

Transmission by a Multi-Gigabit Ethernet BiDi ONU PHY is disallowed whenever a receive fault is declared by the status indicator; once the status indicator declares the PCS is receiving a proper Multi-Gigabit Ethernet BiDi PHY signal for a pre-determined time period (e.g., 1 second) transmission may be enabled.

Existing Text in PMD

158.4.6 PMD global transmit disable function

The `PMD_global_transmit_disable` function is optional. When asserted, this function shall turn off the optical transmitter so that it meets the requirements of the average launch power of OFF Transmitter in Table 52-7, Table 52-12, or Table 52-16.

If a `PMD_transmit_fault` (optional) is detected, then the `PMD_global_transmit_disable` function should also be asserted.

If the MDIO interface is implemented, then this function shall map to the `PMD_global_transmit_disable` bit as specified in 45.2.1.8.7.

NOTE—PMD Transmit Disable 0 is not used for serial PMDs.

159.5.6 PMD global transmit disable function (optional)

The PMD global transmit disable function is optional and allows the optical transmitter to be disabled.

When the `PMD_global_transmit_disable` variable is set to one, this function shall turn off the optical transmitter so that it meets the requirement of the average launch power of the OFF transmitter in Table 159-6.

If `PMD_fault` is detected, then the PMD may set the `PMD_global_transmit_disable` variable to one, turning off the optical transmitter.

160.5.6 PMD global transmit disable function (optional)

The PMD global transmit disable function is optional and allows the optical transmitter to be disabled.

When the `PMD_global_transmit_disable` variable is set to one, this function shall turn off the optical transmitter so that it meets the requirements of the average launch power of the OFF transmitter in Table 160-6.

If a `PMD_fault` is detected, then the PMD may set the `PMD_global_transmit_disable` variable to one, turning off the optical transmitter.

Text for PMD Clause

158.4.6 PMD global transmit disable function

PMDs compliant with this clause shall include the PMD_global_transmit_disable function which allows the optical transmitter to be disabled.

When asserted, this function shall turn off the optical transmitter so that it meets the requirements of the average launch power of OFF transmitter in Table 158-6.

If a PMD_transmit_fault is detected, then the PMD may set the PMD_global_transmit_disable variable to one, turning off the optical transmitter.

For higher level behavior associated with this variable please see 157.x.

Editor's Note: if a variable mapping table is included in Clause 158 the following statement should be removed under editorial license.

If the MDIO interface is implemented, then this function shall map to the PMD_global_transmit_disable bit as specified in 45.2.1.8.7.

159.5.6 PMD global transmit disable function

Same as for 158 with adjustment for clause numbering, omitting Editors note and last sentence.

160.5.6 PMD global transmit disable function

Same as for 158 with adjustment for clause numbering, omitting Editors note and last sentence.

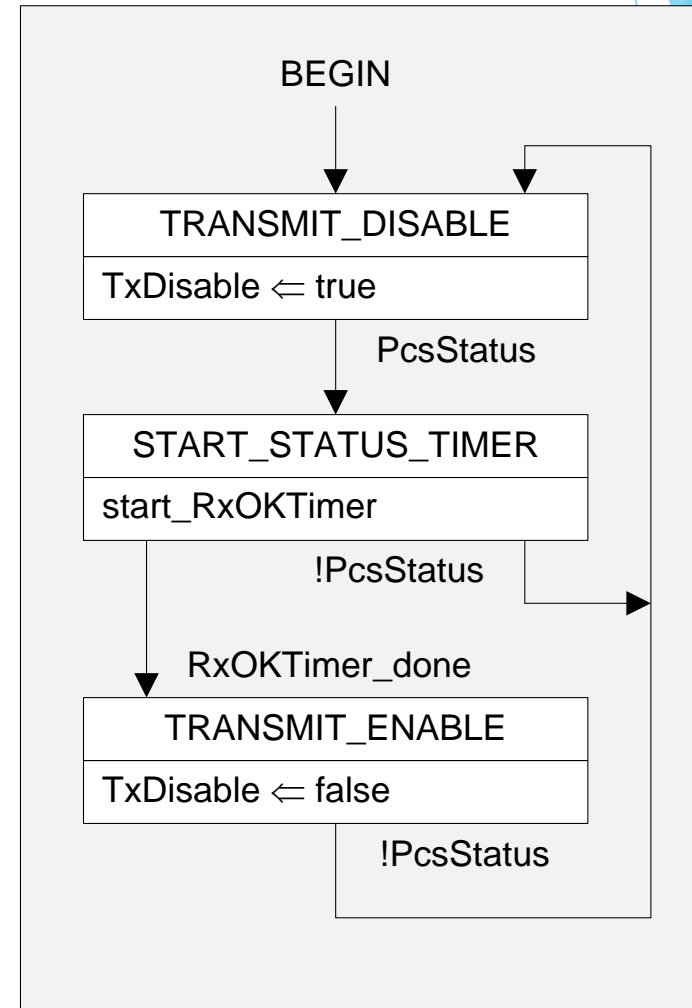
Thank You

Backup

Slides presented on 4/18 ad hoc call

Variables & State Diagram

- ▶ TxDisable - Boolean variable when set to true PHY transmission is allowed, when set to false PHY transmission is disallowed. Maps to Cl 45.2.1.8 (register 1.9.0) PMD_global_transmit_disable
- ▶ PcsStatus - Boolean variable when set to true indicates the PCS is in a fully operational state. When set to false indicates the PCS is in a non-operational state. Maps to Cl 45.2.3.15.1 (register 3.32.12) BASE-R and MultiGBASE-T receive link status
- ▶ RxOKTmr - A timer used to ensure the PHY transmission enable includes hysteresis. The RxOKTmr is set to {1 second} on start.



How to include Silent Start requirement

- ▶ How would the TF prefer like to include the silent start requirement in the draft?
- ▶ Silent Start as described here is really a Management requirement
 - ▶ Read PHY Rx Status
 - ▶ All PCSs have a requirement to include this
 - ▶ Set PHY Tx Control accordingly
 - ▶ Mandating Tx Control point is easy
 - ▶ How to mandate the overall feature may be delicate
- ▶ Option 1 - Duplicate the feature description (~1.5 pg) in each PMD clause including text, variable definitions & SD
- ▶ Option 2
 - ▶ Describe the feature fully in Cl 157 (Intro) including variable definitions and State Diagrams (note typically Intros don't include requirements)
 - ▶ Create a requirement statement (“shall”) in the PMD clause (158, 159 & 160) to mandate the Silent Start feature for PHYs including PMDs as described in “this clause”
 - ▶ Ex: “Devices including a 10GBASE-BxR-U PMD shall include the Silent Start feature described in 157.x.y.” & “10GBASE-RxR-U PMDs shall include the TxDisable variable described in 157.x.y.”
 - ▶ Create PICS in PMD clause
- ▶ Other Options
 - ▶ Us informative text in Intro. (157)
 - ▶ In PMD cl point to 157 info.

Motion

Accept as baseline the text specifying the Silent Start feature in *remein_3ca_1_1905.pdf* slides 5 & 7

Moved: Duane Remein

Second:

For: _____ Against: _____ Abstain: _____

Technical ($\geq 75\%$) Motion Passed/Failed by voice without opposition