P802.3bt D3.0 – Mark & Hold v111

Info (not part of baseline)

Purpose

Mark & Hold allows a PSE to remain in the mark state for an indefinite amount of time, provided it checks that the PD draws a valid mark current. See full proposal and rationale ➠lukacs_01_0517
This baseline will:

- Make the necessary changes to the PSE state diagram
- Define parameters for checking the mark current (interval, current pass/fail levels)
- Change incorrect descriptions / requirements related to T_{pon}

Changelog

v100 First full proposal
v110
- Fixed T_{pon} loophole that would allow an infinite amount of time to be spent between detection and entering markhold.
- Require that the PSE check the mark current validity at least once by adding "mark_valid" as a condition for leaving MARKHOLD. This prevents the PSE from zipping through MARKHOLD to reset the T_{pon} timer.
- These changes only for single-signature, propagate to dual-signature when reviewed.

v111 Updated dual-signature state diagram as indicated above.

145.2.5.1 State diagram overview and timing

If power is to be applied, the PSE turns on power within T_{pon}, as defined in Table 145–16, after a valid detection, or after leaving MARKHOLD, ~~in less than T_{pon} as defined in Table 145–16~~. If the PSE cannot supply power within T_{pon}, it initiates and successfully completes a new detection cycle before applying power. See 145.2.8.13 for details.

145.2.5.4 Variables

Add the following variables to 145.2.5.4 (create "_sec" variants along with the "_pri" versions):

markhold

A variable indicating if the PSE state diagram is in the MARKHOLD state.
Values:

FALSE: The PSE is not in the MARKHOLD state.
TRUE: The PSE is in the MARKHOLD state.

markhold_pri

A variable indicating if the PSE state diagram is in the MARKHOLD_PRI state.
Values:

FALSE: The PSE is not in the MARKHOLD_PRI state.
TRUE: The PSE is in the MARKHOLD_PRI state.

markhold_end

A variable that is asserted in an implementation dependent manner when the PSE is to proceed from the mark state to applying power.
Values:

FALSE: The PSE is not to proceed to MARKHOLD_EXIT.
TRUE: The PSE is to proceed to MARKHOLD_EXIT.

markhold_end_pri

A variable that is asserted in an implementation dependent manner when the PSE is to proceed from the mark state on the Primary Alternative to applying power.
Values:

FALSE: The PSE is not to proceed to MARKHOLD_EXIT_PRI.
TRUE: The PSE is to proceed to MARKHOLD_EXIT_PRI.

mark_valid

This variable indicates the presence or absence of a valid mark current; see $I_{Markhold}$ in Table 145–14.
Values:

FALSE: I_{Port} is less or equal than $I_{Markhold}$.
TRUE: I_{Port} is greater than $I_{Markhold}$.

mark_valid_pri

This variable indicates the presence or absence of a valid mark current on the Primary Alternative; see $I_{Markhold}$ in Table 145–14.
Values:
FALSE: $I_{Port\text{-}2P\text{-}pri}$ is less or equal than $I_{Markhold}$.
TRUE: $I_{Port\text{-}2P\text{-}pri}$ is greater than $I_{Markhold}$.

option_markhold

This variable indicates if the PSE uses the option of an extended duration last mark state.
Values:
FALSE: The PSE uses the extended duration last mark state.
TRUE: The PSE does not use the extended duration last mark state.

option_markhold_pri

This variable indicates if the PSE uses the option of an extended duration last mark state on the Primary Alternative.
Values:
FALSE: The PSE uses the extended duration last mark state.
TRUE: The PSE does not use the extended duration last mark state.

145.2.5.5 Timers

Add the following timers to 145.2.5.5:

tmh_timer

A timer used to monitor the absence of a valid mark current; see $T_{Markhold}$ in Table 145–14.

tmh_timer_pri

A timer used to monitor the absence of a valid mark current on the Primary Alternative; see $T_{Markhold}$ in Table 145–14.

tmh_timer_sec

A timer used to monitor the absence of a valid mark current on the Secondary Alternative; see $T_{Markhold}$ in Table 145–14.

145.2.5.6 Functions

do_mark

This function produces the classification mark event voltage V_{Mark}, as defined in Table 145–14. This function does not return any variables.

do_mark_pri

This function produces the classification mark event voltage on the Primary Alternative V_{Mark}, as defined in Table 145–14. This function does not return any variables.

do_mark_sec

This function produces the classification mark event voltage on the Secondary Alternative V_{Mark}, as defined in Table 145–14. This function does not return any variables.

Add a new functions as follows:

do_markhold

This function produces the classification mark hold event voltage $V_{Markhold}$, as defined in Table 145–14. This function does not return any variables.

do_markhold_pri

This function produces the classification mark hold event voltage $V_{Markhold}$ on the Primary Alternative, as defined in Table 145–14. This function does not return any variables.

do_markhold_sec

This function produces the classification mark hold event voltage $V_{Markhold}$ on the Secondary Alternative, as defined in Table 145–14. This function does not return any variables.

145.2.5.7 State diagrams

Change Figure 145–13 as follows:

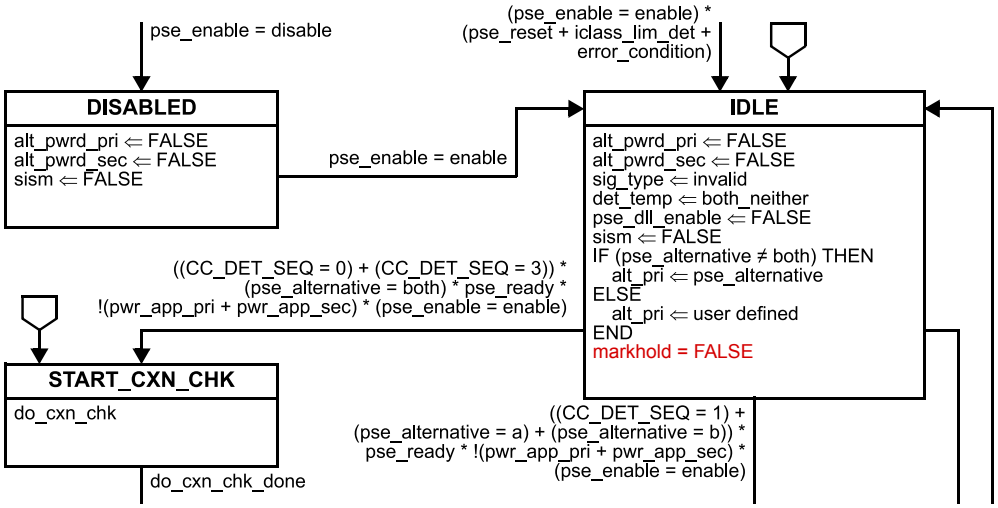

Figure 145–13 — Top level PSE state diagram

Change Figure 145–13 as follows:

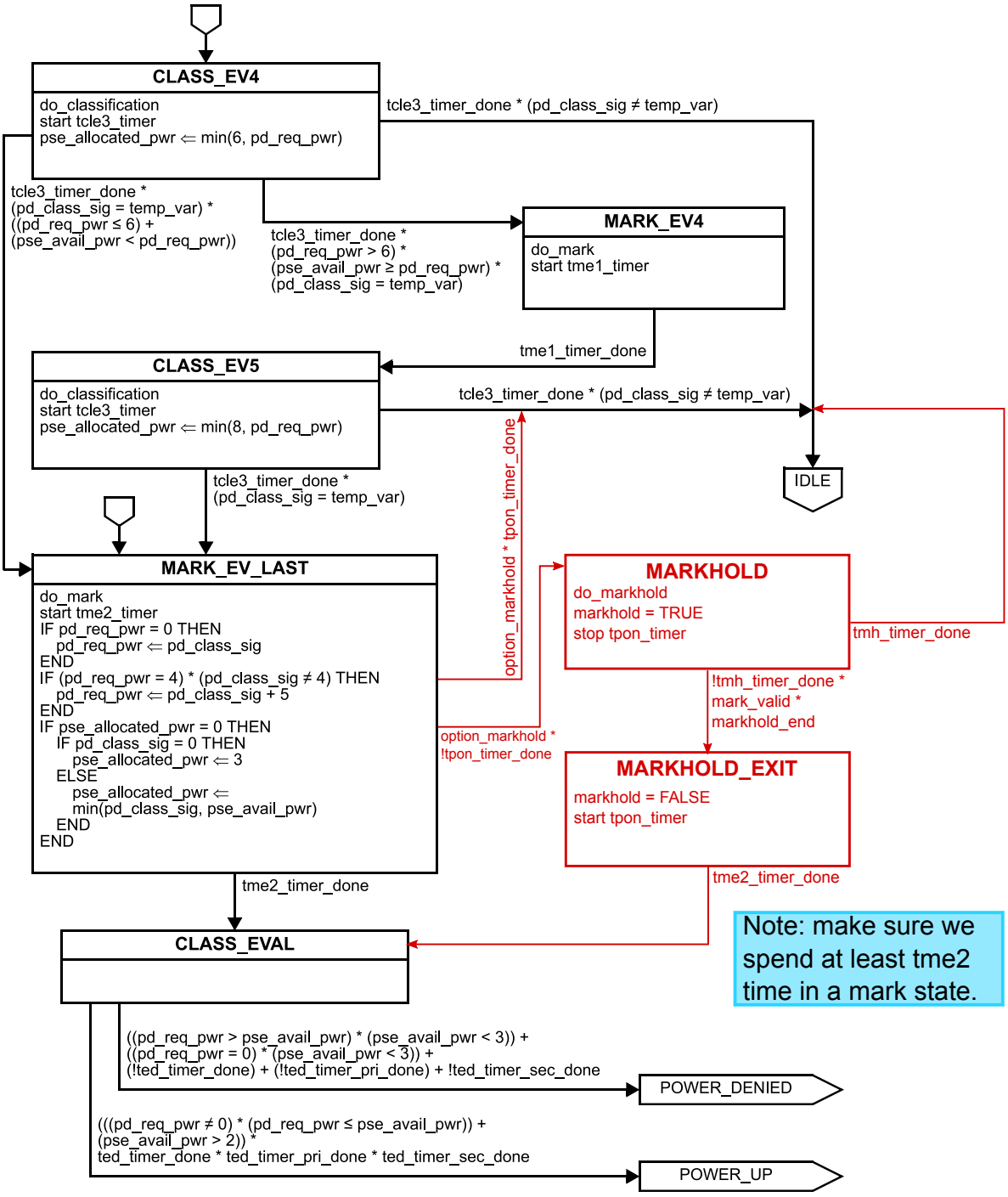

Figure 145–13 — Top level PSE state diagram (continued)

Info (not part of baseline)

No changes to Figure 145–13 on page 130, however shown here because T_{pon} is checked here last.

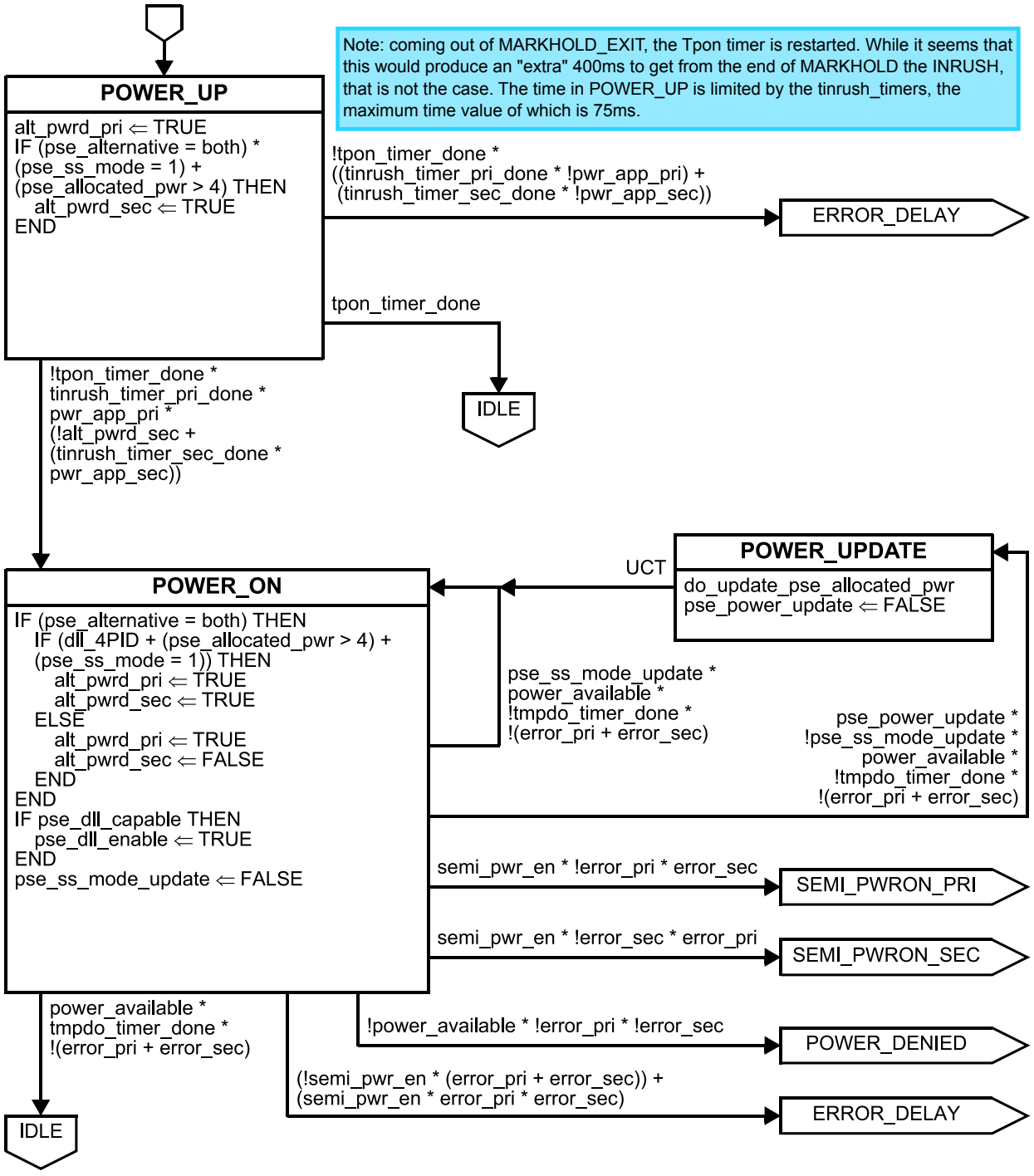

Figure 145–13 — Top level PSE state diagram (continued)

Change Figure 145–15 as follows, change Figure 145–16 in the same way for Secondary:

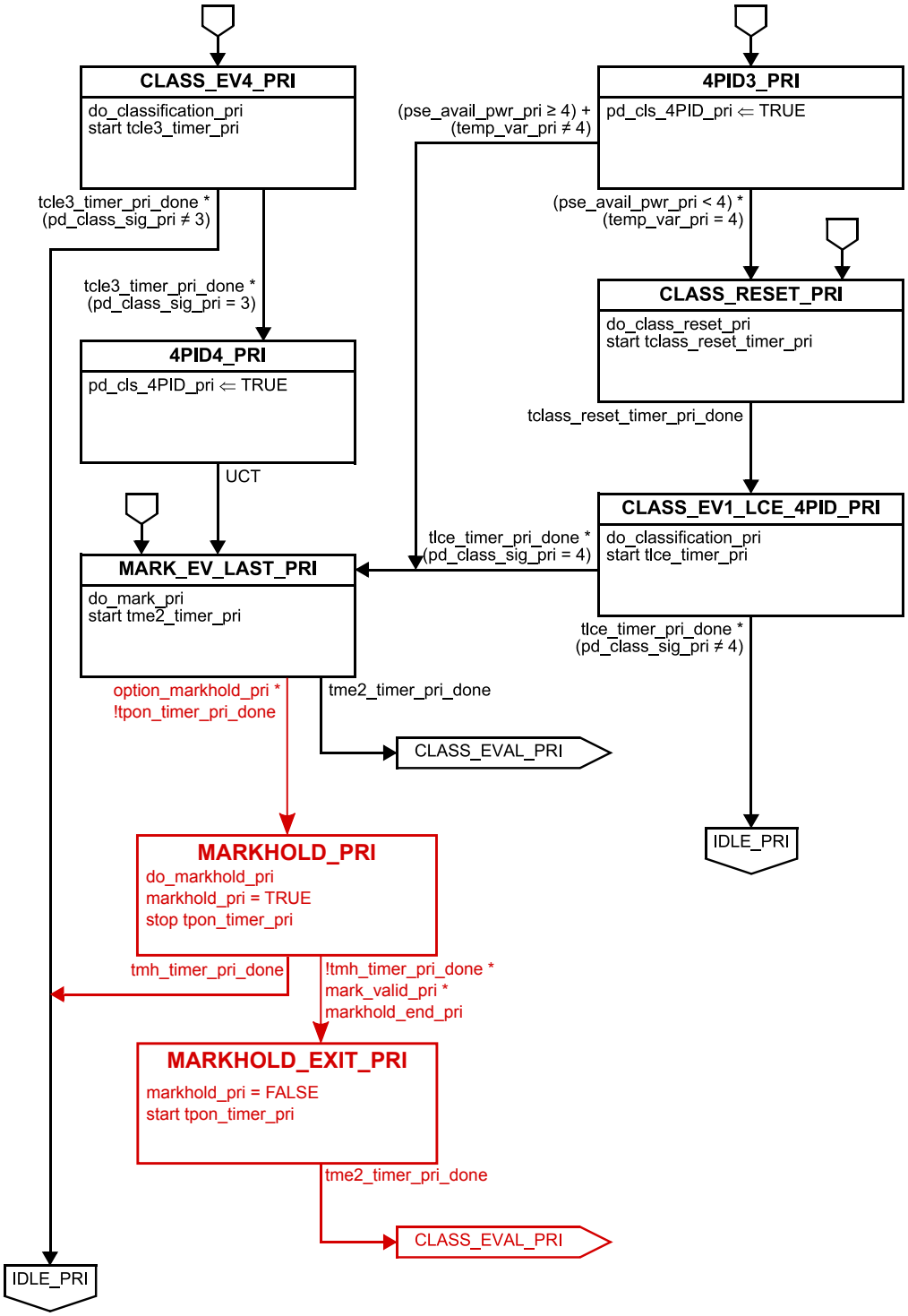

Figure 145–15 — Primary Alternative dual-signature semi-independent PSE state diagram (continued)

Add a new Figure before 145–17 as follows:

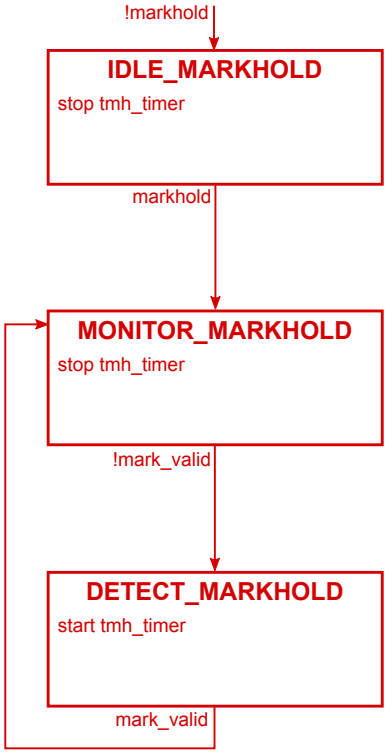

Figure 145–16a — PSE mark monitor state diagram for single-signature PDs or 2-pair operation

Add a new Figure after 145–16a as follows:

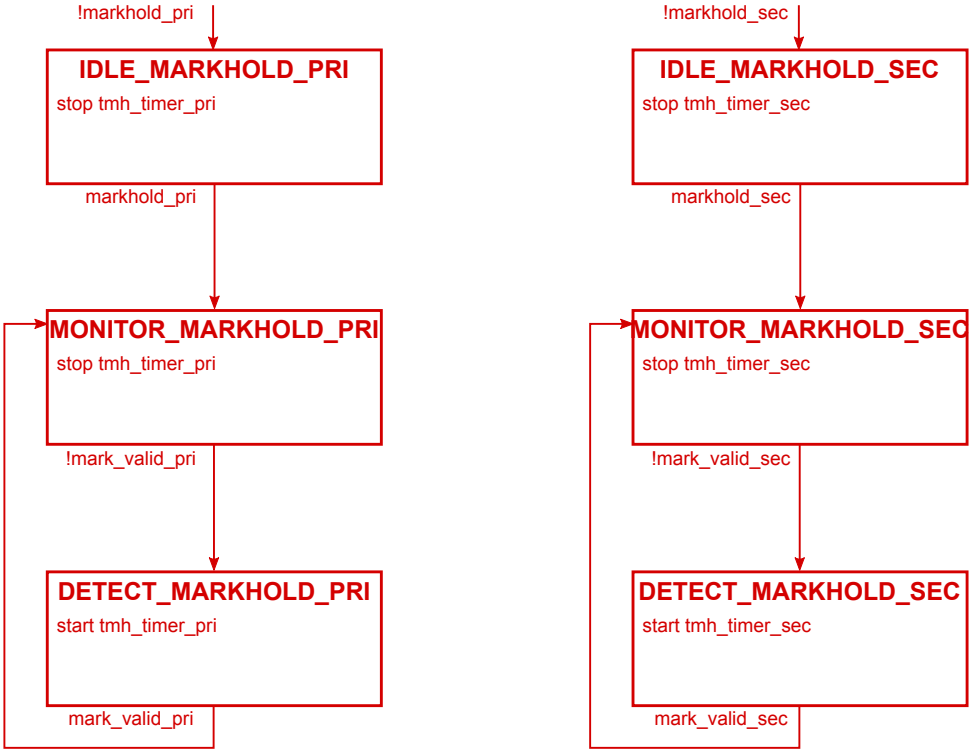

Figure 145–16b — PSE mark monitor state diagram for dual-signature PDs

145.2.7.1 PSE Multiple-Event Physical Layer classification

Info (not part of baseline)

The numbers below in Table 145–14 are placeholders and should be considered (TBD).
Note that the mark voltage in the mark range needs to be at least 8.5 volt to support Type 1 PDs that may worst case show a 26.3kΩ resistance with 1.9V of offset. The resulting minimum voltage to reach 250µA is then 8.5V.

Add the following item to Table 145–14:

Table 145–14 — PSE Physical Layer classification electrical requirements

Item	Parameter	Symbol	Units	Min	Max
2a	Mark hold event voltage	$V_{Markhold}$	V	8.5	10
14a	Mark current dropout time	$T_{Markhold}$	ms		100
14b	Mark current valid threshold	$I_{Markhold}$	mA	0.15	0.25

145.2.8.13 Power turn on time

The specification for T_{pon} in Table 145–16 applies to the PSE power up time for a PD after completion of detection, or after leaving MARKHOLD.

PSEs, when connected to a single-signature PD, shall reach ~~the~~ POWER_ON ~~state~~ within T_{pon} after completing detection on the last pairset, or after leaving MARKHOLD. When connected to a dual-signature PD, PSEs shall reach ~~the POWER_ON state~~ POWER_ON_PRI or POWER_ON_SEC for ~~a~~ the given pairset within T_{pon} after completing detection on the same pairset, or after leaving MARKHOLD_PRI or MARKHOLD_SEC.