

# Single Pair PoDL PSE Status Register and Variables

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# PSE Status Register & Variables

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- Duane Remein's unsatisfied comment reminds us of the link between register bits and variables
- PSE status and control needs to be consistent between:
  - Clause 30 Management
  - Clause 45 Status Register (Table 45-211j and 45.2.7b.2.x text)
  - Clause 104 State Diagram (104.4.3.3, Figs. 104-4, 5, 6 & 7)
  - ***Contents are not in alignment between or within clauses!***
    - For example, Table 45-211j vs 45.2.7b.2.x, some bits are duplicates in logic but have different names or descriptions
- This presentation attempts to align states, variables and status bits and map variables to status bits as a remedy to Remein's unsatisfied D2.0 comment #333

# Remein's Comment #333 on D2.0

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CI 45      SC 45.2.7a.2.4      P 30      L 44      # 333  
Remein, Duane      Huawei Technologies

Comment Type    **TR**      Comment Status    **A**      OK

MDIO registers affected by SD's should clearly be tied to a variable in the SD and not set/reset by a state transition as in "shall be set to one when the PSE state diagram (Figure 104-4) transitions directly from the state CLASSIFICATION\_EVAL to RESTART"

This issue exists for the following bit definitions; 12.1.15, 14, 13, 12, 11, 10 , 9:7, 6:3 and 2:0.

### *Suggested Remedy*

Provide a clear reference to a SD variable for bit 12.1.12. If one does not exist in the SD create it in the SD and xref here.

Response      Response Status    **U**

ACCEPT IN PRINCIPLE.

All the bit fields with their corresponding subclauses will be reviewed and editor given license to change as per the suggested remedy.

# PoDL PSE Status Register D2.1 (as is)

Name	Description (per the text, not Table 45-211j)	LH?
Power Removed	<u>1= PSE has entered OVERLOAD state (P31 L47-48)</u> (Table 45-211j description “power removed due to a fault” is misaligned)	LH
Valid Signature	1 = mr_valid_signature has transitioned to TRUE (P32 L3-4)	LH
Invalid Signature	PSE has entered state IDLE_DETECT (P32 L10)	LH
Class Timeout	PSE transitioned from CLASSIFICATION_EVAL to RESTART due to (!pi_detecting) * pi_sleeping	LH
Overload	<u>1= PSE has entered OVERLOAD state (P32 L24)</u>	LH
MFVS Absent	PSE transitioned from POWER_ON to SETTLE_SLEEP due to tmfvdo_timer_done (P32 L30-31)	LH
PSE Type	Encodes Type A, Type B or Type C PSE (constant)	
PD Class	Encodes Class 0 – 9 PD detected currently (OK as is)	
PSE Status	Encodes current PSE state machine status – see later	

Transition Indicators

State

**\* Note: Both bits have exact same behavior!**

# PSE State Diagram D2.1 (as is)

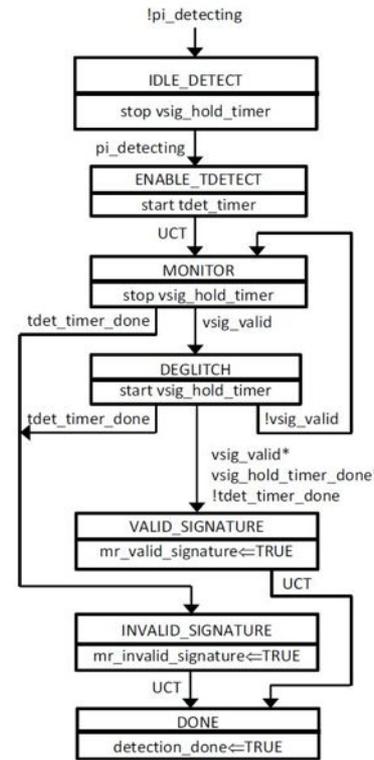
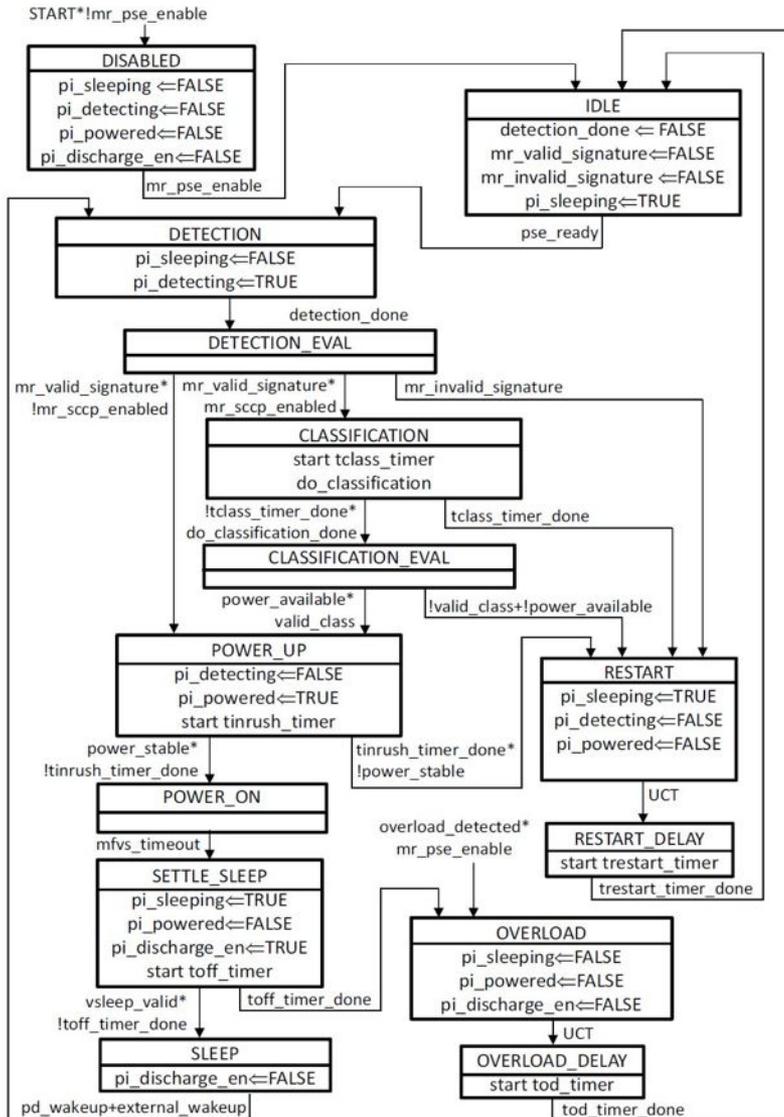


Figure 104-5—Detection state diagram

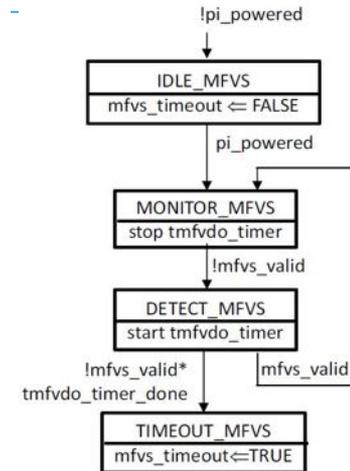


Figure 104-6—MFVS state diagram

# PSE State Diagram D2.1 (indicators)

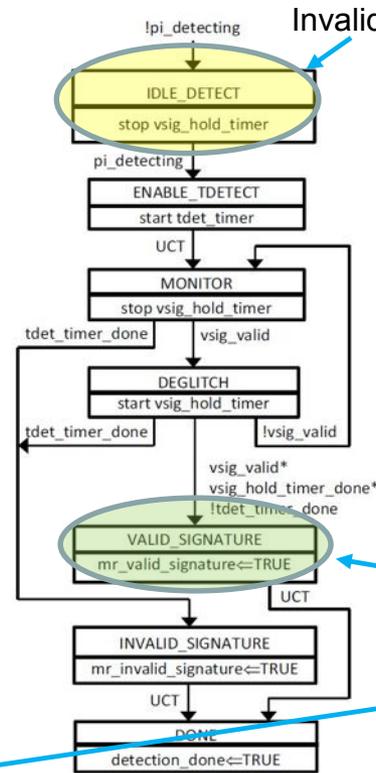
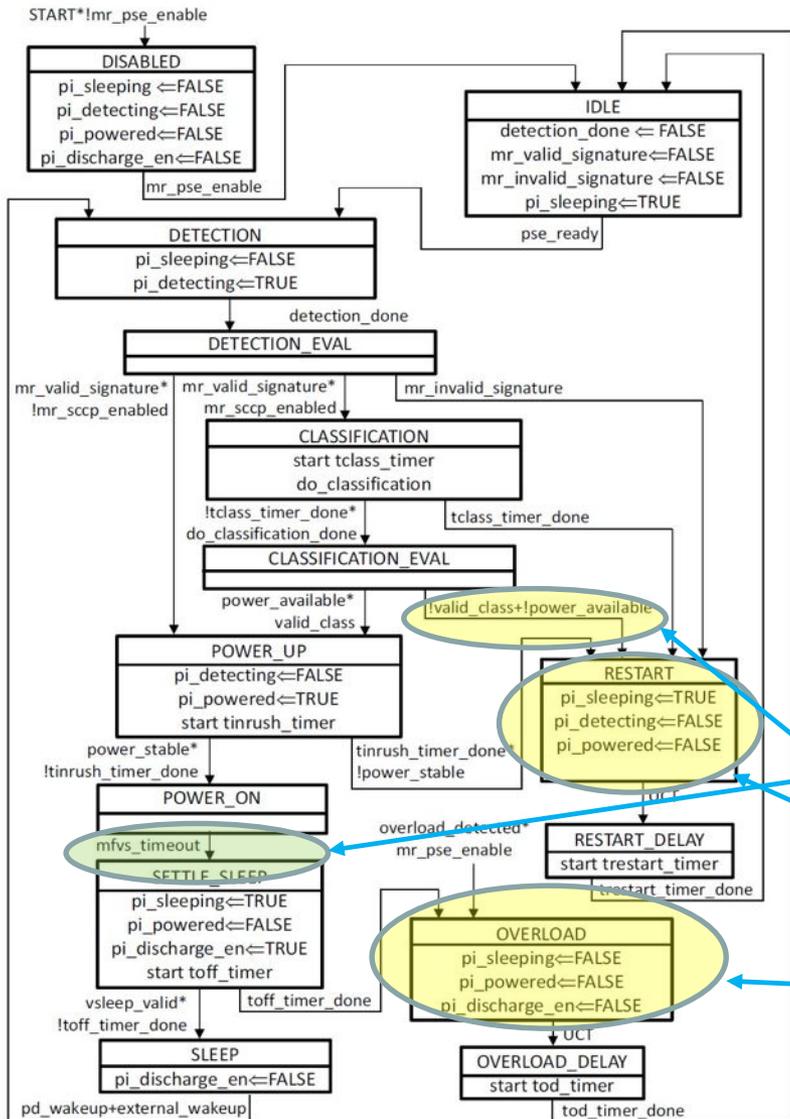


Figure 104-5—Detection state diagram

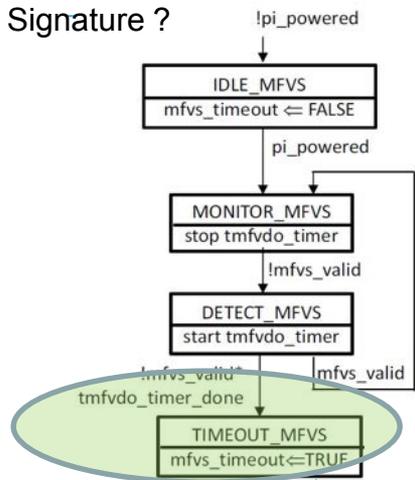


Figure 104-6—MFVS state diagram

Invalid Signature ?

Valid Signature

MFVS Absent

Class Timeout?

Power Removed and Overload?

Indicators in Yellow have definition problems



# Proposed indicators (for D2.2)

Name	Description	LH?
<del>Power Removed</del> <u>Reserved</u>	Value always 0	
Valid Signature	1 = mr_valid_signature has transitioned to TRUE	LH
Invalid Signature	1 = mr_invalid_signature has transitioned to TRUE	LH
Class Timeout	1 = tclass_timer_done has transitioned to TRUE	LH
Overload	1= overload_detected * mr_pse_enable	LH
MFVS Absent	1=mfvs_timeout has transitioned to TRUE	LH

# Indicator Behavior Changes

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- Invalid signature will only indicate when an invalid signature has been detected
  - Previously set every time detection was entered
- Overload doesn't indicate when OVERLOAD state is entered due to failed SETTLE\_SLEEP
  - May be fixed by changes to overload\_detected in 104.4.6.2.1, addressed in comment #12 to D2.1

# PSE Status Values Common Sense

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- Disabled = {DISABLED}
- Sleeping = {SLEEP, SETTLE\_SLEEP}
- Delivering Power = {POWER\_UP, POWER\_ON}
- Searching = {DETECTION, CLASSIFICATION + EVALS}
- Error = { OVERLOAD, OVERLOAD\_DELAY }
- Idle= {RESTART, RESTART\_DELAY, IDLE}

# PSE State Diagram D2.1

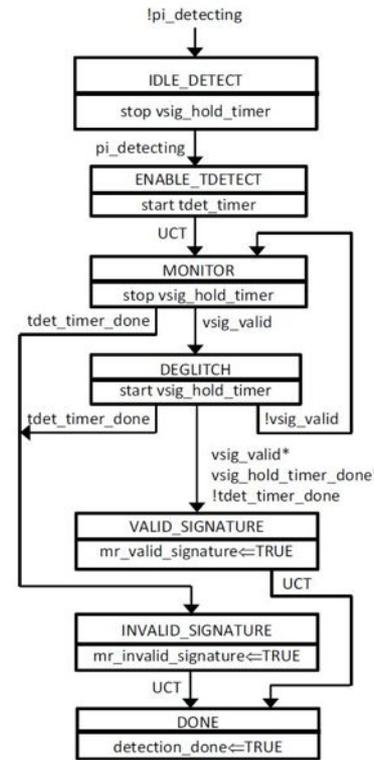
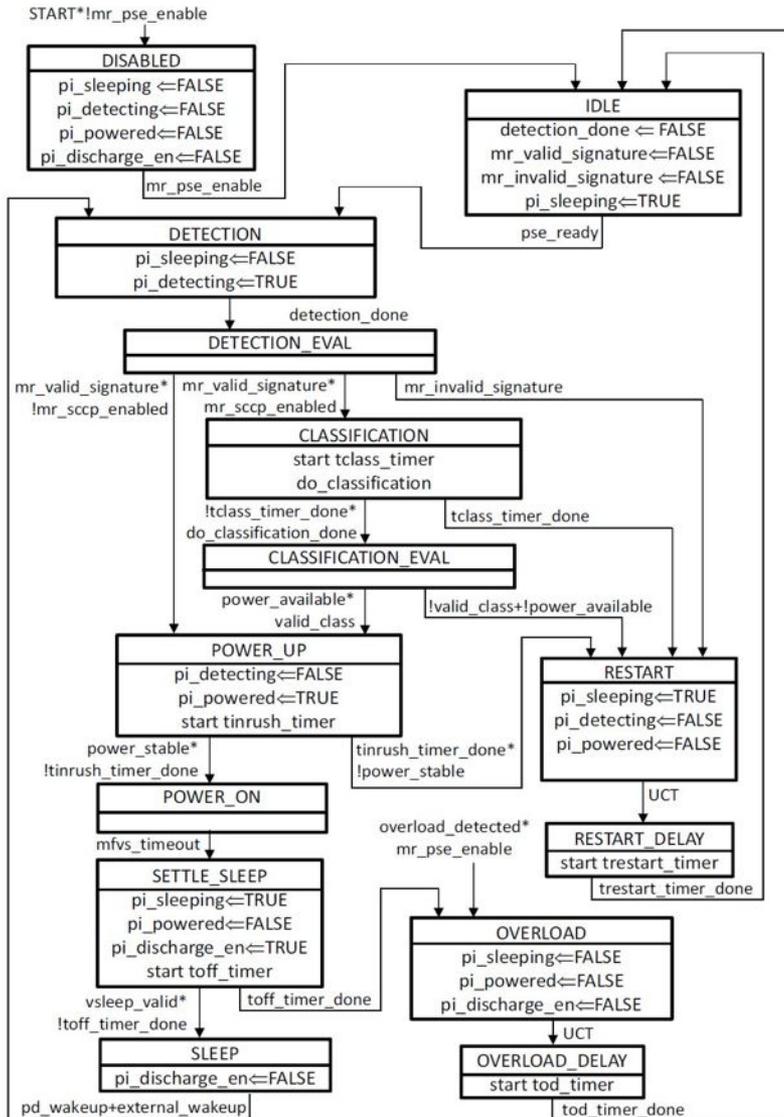


Figure 104-5—Detection state diagram

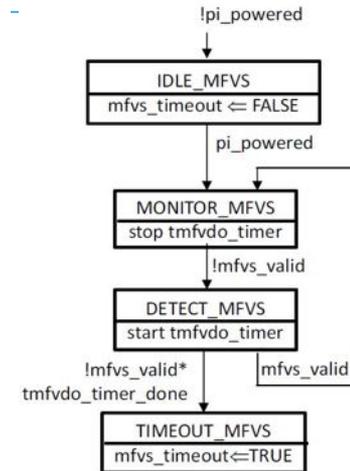


Figure 104-6—MFVS state diagram

# PSE Status Mappings (D2.1 as is)

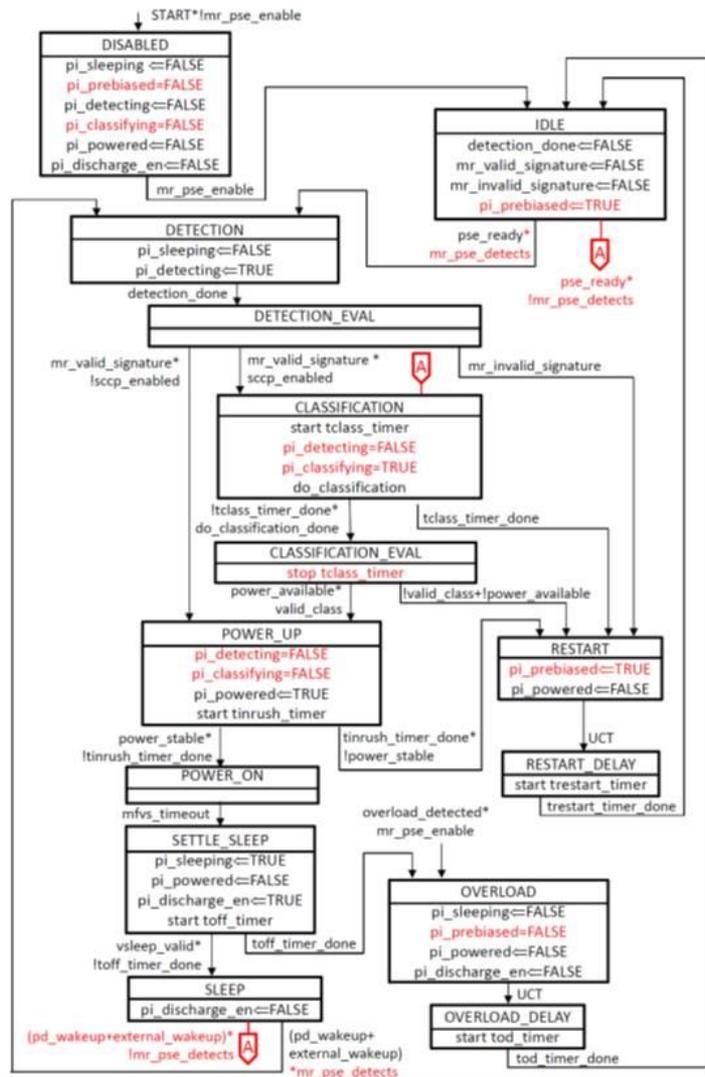
Status	Clause 30	Clause 45.2.7b.2.9 text	Clause 104 variables
disabled	DISABLED	DISABLED	!mr_pse_enable
sleep	SLEEP	SLEEP	pi_sleeping (also true in RESTART, RESTART_DELAY & IDLE)
delivering Power	POWER_ON, SETTLE_SLEEP	POWER_ON	pi_powered (also true in POWER_UP; false in SETTLE_SLEEP)
searching	DETECTION, CLASSIFICATION, CLASSIFICATION_EVAL, POWER_UP	DETECTION, CLASSIFICATION, CLASSIFICATION_EVAL, POWER_UP	pi_detecting (also true in DETECTION_EVAL)
unknown	IDLE, RESTART, RESTART_DELAY, OVERLOAD_DELAY, DETECTION_EVAL, unknown	IDLE not due to overload_detected, RESTART, RESTART_DELAY, OVERLOAD_DELAY, SETTLE_SLEEP, DETECTION_EVAL, unknown	Otherwise
error	(rolled into unknown)	OVERLOAD	overload_detected (LH)
Reserved	(not defined)	IDLE due to overload_detected	(not defined)

# Proposed PSE Status Mappings (D2.2)

Status	Clause 30	Clause 45	Clause 104 variables
disabled	DISABLED	DISABLED	!mr_pse_enable
sleep	SLEEP, SETTLE_SLEEP	SLEEP, SETTLE_SLEEP	pi_sleeping (new definition, new variable (pi_prebiased) needed to put Vsleep to PI during RESTART,IDLE)
delivering Power	POWER_ON, POWER_UP	POWER_ON, POWER_UP	pi_powered
searching	DETECTION, DETECTION_EVAL, CLASSIFICATION, CLASSIFICATION_EVAL	DETECTION, DETECTION_EVAL, CLASSIFICATION, CLASSIFICATION_EVAL	pi_detecting
idle	IDLE, RESTART, RESTART_DELAY	IDLE, RESTART, RESTART_DELAY	pi_prebiased * !pi_sleeping
error	OVERLOAD, OVERLOAD_DELAY	OVERLOAD, OVERLOAD_DELAY	overload_held (new variable added)
unknown	unknown	unknown	Otherwise



# Proposed Revised SD (A. Gardner)



- Revises Detection so that it is optional
  - pi\_detecting turns off after DETECTION\_EVAL
  - pi\_classifying is added
- Includes pi\_prebiased & stop tclass\_timer changes proposed here
  - Still may need 104.3.3 variable changes
  - Still need SD changes for overload\_held, definition,
- These changes mean searching now maps to:
 

pi\_detecting + pi\_classifying

# Proposed PSE Status Mappings w/Gardner SD Revisions (D2.2)

Status	Clause 30	Clause 45	Clause 104 variables
disabled	DISABLED	DISABLED	!mr_pse_enable
sleep	SLEEP, SETTLE_SLEEP	SLEEP, SETTLE_SLEEP	pi_sleeping (new definition, new variable (pi_prebiased) needed to put Vsleep to PI during RESTART,IDLE)
delivering Power	POWER_ON, POWER_UP	POWER_ON, POWER_UP	pi_powered
searching	DETECTION, DETECTION_EVAL, CLASSIFICATION, CLASSIFICATION_EVAL	DETECTION, DETECTION_EVAL, CLASSIFICATION, CLASSIFICATION_EVAL	pi_detecting + pi_classifying
idle	IDLE, RESTART, RESTART_DELAY	IDLE, RESTART, RESTART_DELAY	pi_prebiased * !pi_sleeping
error	OVERLOAD, OVERLOAD_DELAY	OVERLOAD, OVERLOAD_DELAY	overload_held (new variable added)
unknown	unknown	unknown	Otherwise

# Thank You!