802.3da D1p3 Comment Support

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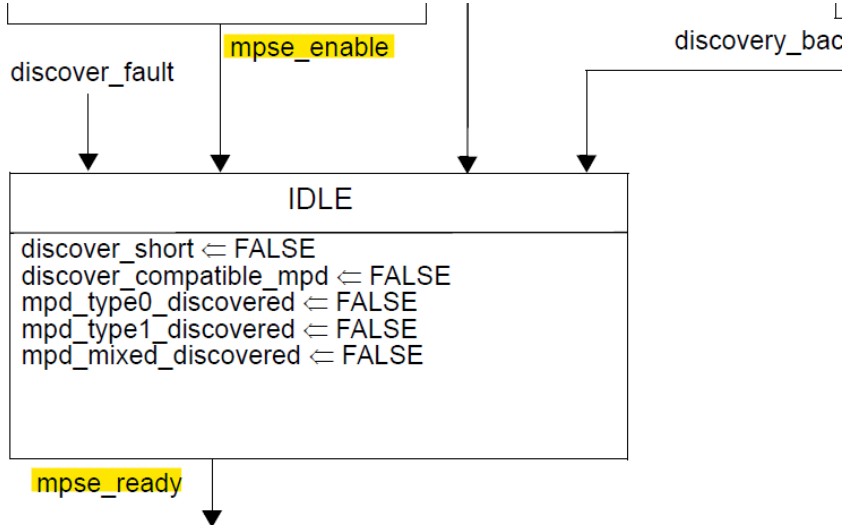
Booleans in State Diagrams

- 168.4.4.2, page 101 line 15:
  - mpse_enable, mpse_ready, mpd_type0_discovered, and mpd_type1_discovered are all boolean variables in the state diagram (used as TRUE/FALSE conditions). Their values must be TRUE or FALSE, not "enabled/disabled" or not defined.



169.4.4.2 Variables

The MPSE state diagram uses the following variables:

mpse_enable

A variable that selects MPSE operation. This variable may be set by the MPSE at any time.

Values: disable: All MPSE functions disabled (behavior is as if there was no MPSE functionality).

enable: Normal MPSE operation.

mpse_ready

A variable that is asserted in an implementation-dependent manner. This variable may be set by the MPSE at any time.

Values: disable: The MPSE is not ready to discover the mixing segment.

enable: The MPSE is ready to discover the mixing segment.

mpd_type0_discovered

A variable that indicates at least one valid MPD supporting only Type 0 is connected to the mixing segment.

mpd_type1_discovered

A variable that indicates at least one valid MPD supporting only Type 1 is connected to the mixing segment.

mpd_mixed_discovered

A variable that indicates at least one valid MPD supporting both Type 0 or Type 1 is connected to the mixing segment.

discover_fault

A variable indicating if $I_{Discovery}$ measured by the MPSE during the most recent discover_high or discover_low state is equal to or greater than $I_{Discovery\_LIM}$ as defined in Table 169–3. This variable is set per this description.

Values: FALSE: Measured $I_{Discovery}$ was less than $I_{Discovery\_LIM}$ during most recent discover_high or discover_low state.

TRUE: Measured $I_{Discovery}$ was equal to or greater than $I_{Discovery\_LIM}$ during most recent discover_high or discover_low state.

Suggested Remedy Text (Booleans, 1 of 2)

169.4.4.2 Variables

The MPSE state diagram uses the following variables:

mpse_enable

A variable that selects MPSE operation. This variable may be set by the MPSE at any time.
Values:

FALSE: All MPSE functions disabled (behavior is as if there was no MPSE functionality).

TRUE: Normal MPSE operation.

mpse_ready

A variable that is asserted in an implementation-dependent manner. This variable may be set by the MPSE at any time.
Values:

FALSE: The MPSE is not ready to discover the mixing segment.

TRUE: The MPSE is ready to discover the mixing segment.

mpd_type0_discovered

A variable that indicates at least one valid MPD supporting only Type 0 is connected to the mixing segment.
Values:

FALSE: No valid MPDs supporting only Type 0 are connected to the mixing segment.

TRUE: At least one valid MPD supporting only Type 0 is connected to the mixing segment.

From “8023-169_proposed_SDfixes_simple.pdf” page 101

Suggested Remedy Text (Booleans, 2 of 2)

mpd_type1_discovered

A variable that indicates at least one valid MPD supporting only Type 1 is connected to the mixing segment.

Values:

FALSE: No valid MPDs supporting only Type 1 are connected to the mixing segment.

TRUE: At least one valid MPD supporting only Type 1 is connected to the mixing segment.

mpd_mixed_discovered

A variable that indicates at least one valid MPD supporting both Type 0 or Type 1 is connected to the mixing segment.

Values:

FALSE: No valid MPDs supporting both Type 0 and Type 1 are connected to the mixing segment.

TRUE: At least one valid MPD supporting both Type 0 or Type 1 is connected to the mixing segment.

From “8023-169_proposed_SDfixes_simple.pdf” page 101

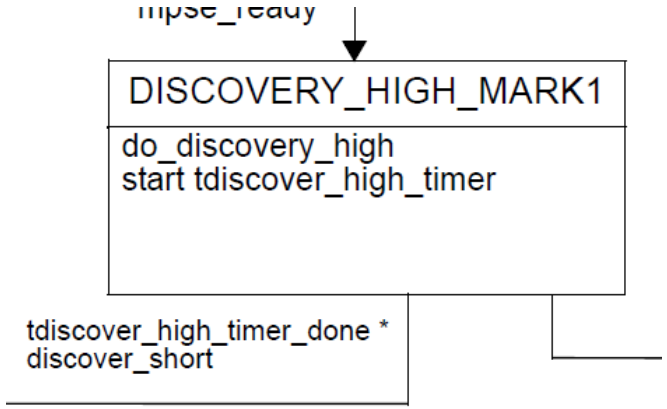
Settling Time for Mark and Low Event Measurements

- MPSE Discovery events need time to settle before measurement
- State diagram rules say actions occur “on entry” instantaneously
  - Therefore, discovery states need to be split so that voltage can be “presented”, timed to settle, and then measured.
- Text at Page 106 line 28 already says this, but it is contrary to the state diagram, so the state diagram prevails

Text vs. state diagram

When the MPSE is presenting a mark event voltage in a DISCOVERY_HIGH_MARKx state, as shown in the state diagram of Figure 169–3 and Figure 169–4, the MPSE shall supply V_{Mark} voltage to the TCI subject to the $T_{Discovery\_high}$ timing specification. The MPSE shall wait $T_{Mark\_measure}$ between the entrance of a DISCOVERY_HIGH_MARKx state and measurement of mark event current $I_{Discovery}$. $T_{Mark\_measure}$ and $T_{Discovery\_high}$ are referenced from the application of V_{Mark} min to ignore initial transients. If the current $I_{Discovery}$ measured in a DISCOVERY_HIGH_MARKx state exceeds I_{Mark_short} the MPSE shall return to the BACKOFF state.

When the MPSE is presenting a discover low event voltage in any of the DISCOVERY_LOW states (e.g., DISCOVERY_LOW_TARE or DISCOVERY_LOW_TYPE0), as shown in the state diagram of Figure 169–3 and Figure 169–4, the MPSE shall supply $V_{Discovery}$ voltage to the TCI subject to the $T_{Discovery\_low}$ timing specification. The MPSE shall wait $T_{Discover\_measure}$ between the entrance of a DISCOVERY_LOWx state and measurement of the discovery event current, $I_{Discovery}$. $T_{Discover\_measure}$ is referenced from the application of $V_{Discovery}$ max to ignore initial transients.



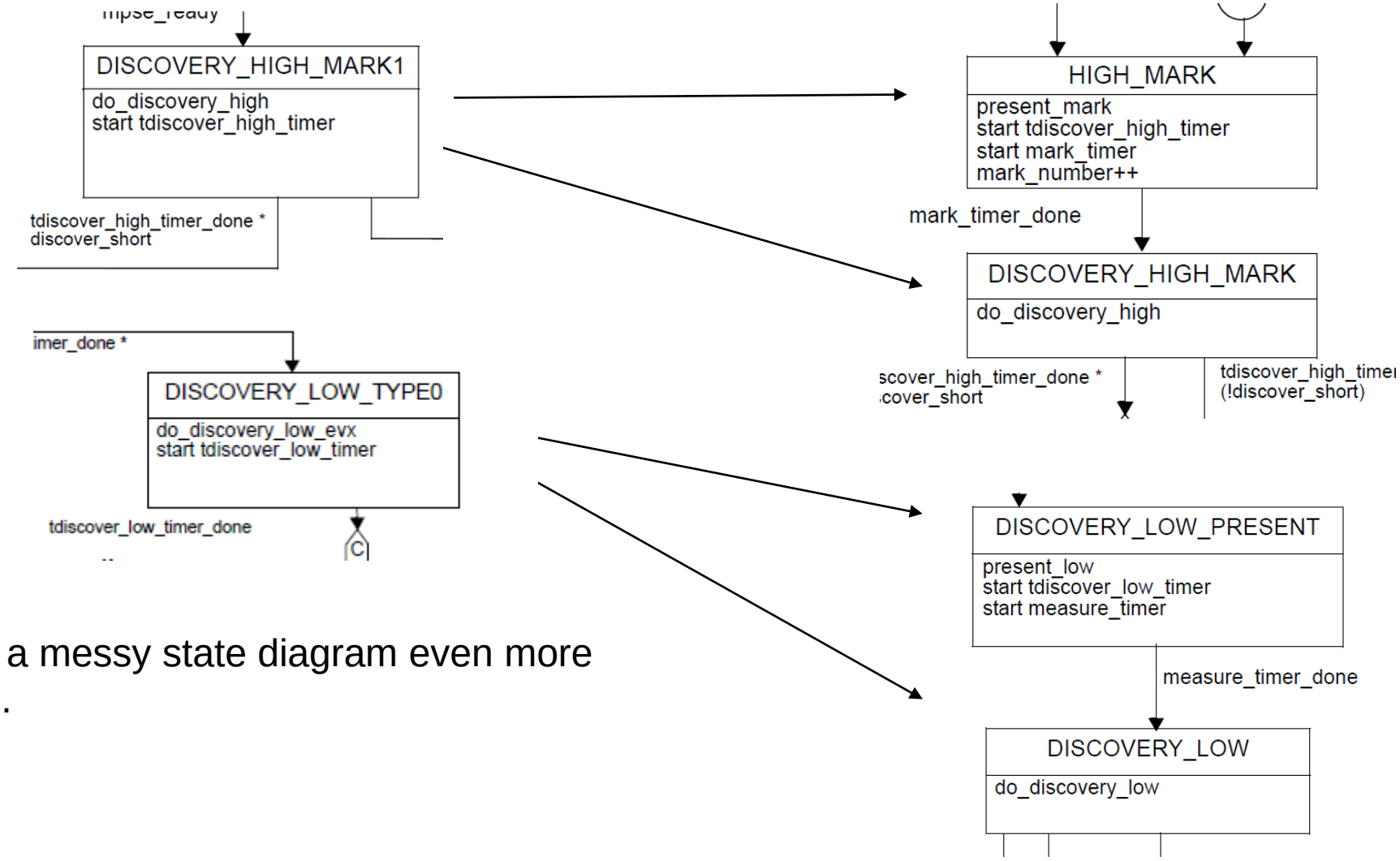
Exit only on timer…

21.5.1 Actions inside state blocks

The actions inside a state block execute instantaneously. Actions inside state blocks are atomic (i.e., uninterruptible).

After performing all the actions listed in a state block one time, the state block then continuously evaluates its exit conditions until one is satisfied, at which point control passes through a transition arrow to the next block. While the state awaits fulfillment of one of its exit conditions, the actions inside do not implicitly repeat.

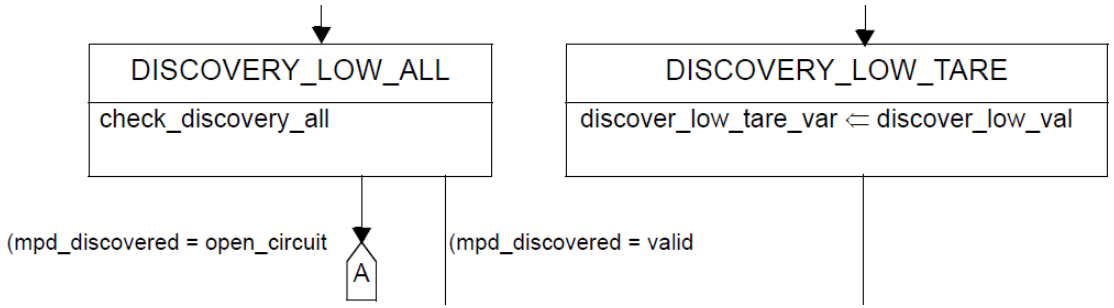
Representing Settling Time

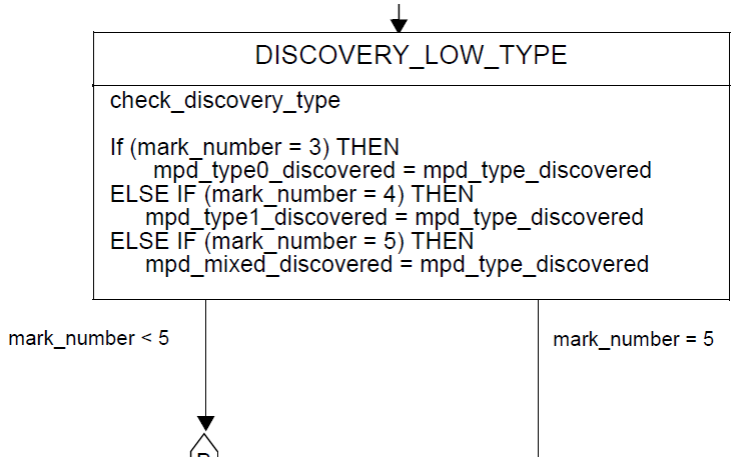


BUT – this makes a messy state diagram even more difficult to follow….

Reorganize around Recurring Mark/Low events

- Introduce mark_number (count the mark/low events)
  - One set of states to present marks / measure marks, and present low / measure low
  - Separate states for 1st finger (ALL) & 2nd (TARE), combined state for type discoveries
    - Checking state conditions and setting variables done based on mark_number





Proposed MPSE Discovery State Diagram

- 8023-169_proposed_SDfixes_disc_diag.pdf
  - P101-104: Variables, Timers, Functions
    - Text includes new variables, timers and function needed for reorganization and delays
    - Also includes fixes from “simple” for Boolean variables in text
  - P105-106: reorganized state diagrams (includes conditioning change on mpse_enable, and changes to BACKOFF in other comments)
    - Note – now there IS an entry/exit tag “B”
  - P107-108 – includes removal of duplicate shalls and rewording of 169.4.6 to align with new diagram.