



The muon Drift Tubes pulsing scheme

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Calibration Working Group meeting

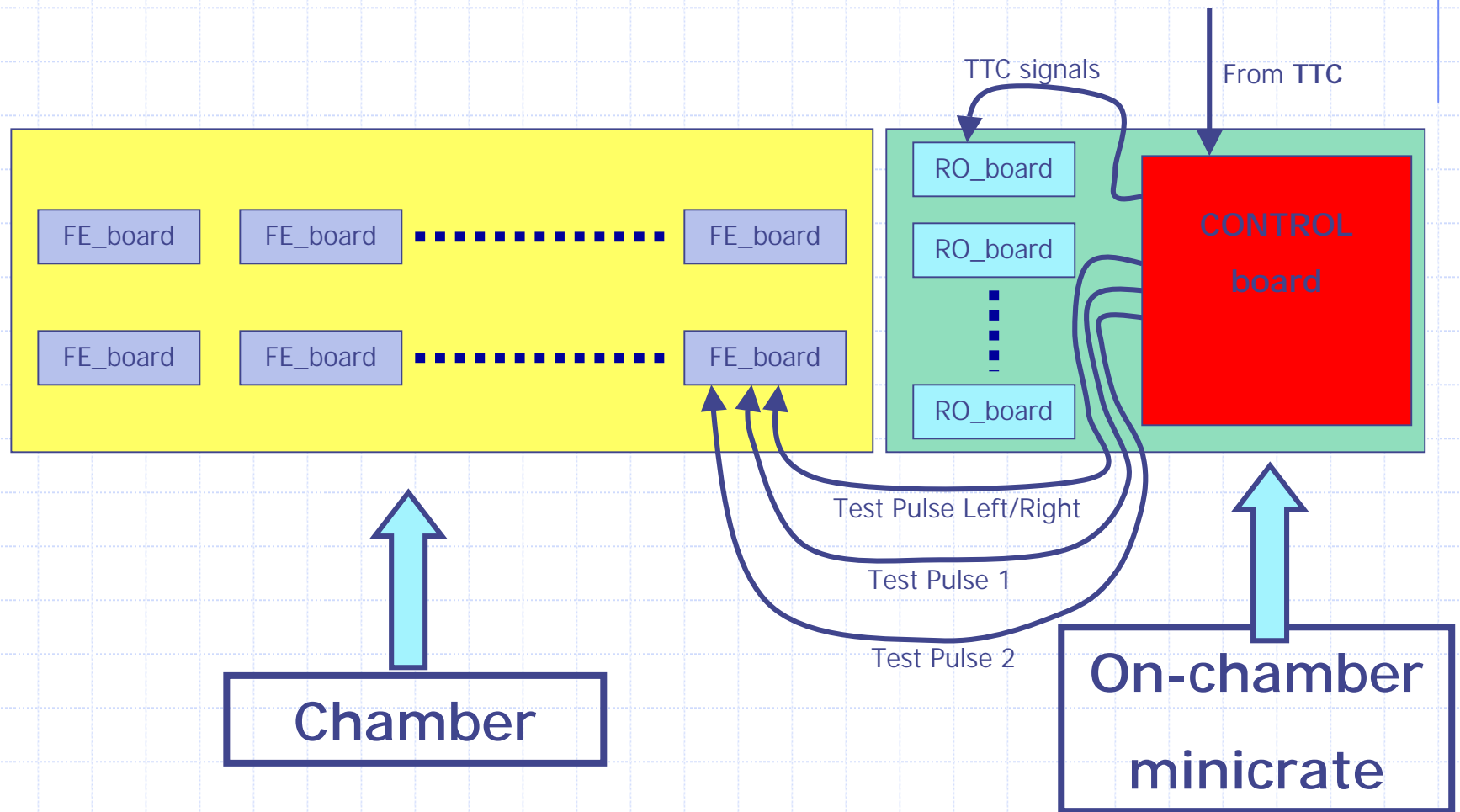
Why pulsing DTs ?

- ◆ Simulate tracks on a single chamber
 - ➔ Test setup during installation
- ◆ Test Front End response
 - ➔ Special runs
- ◆ Monitor readout and trigger synchronization
 - ➔ Abort gap

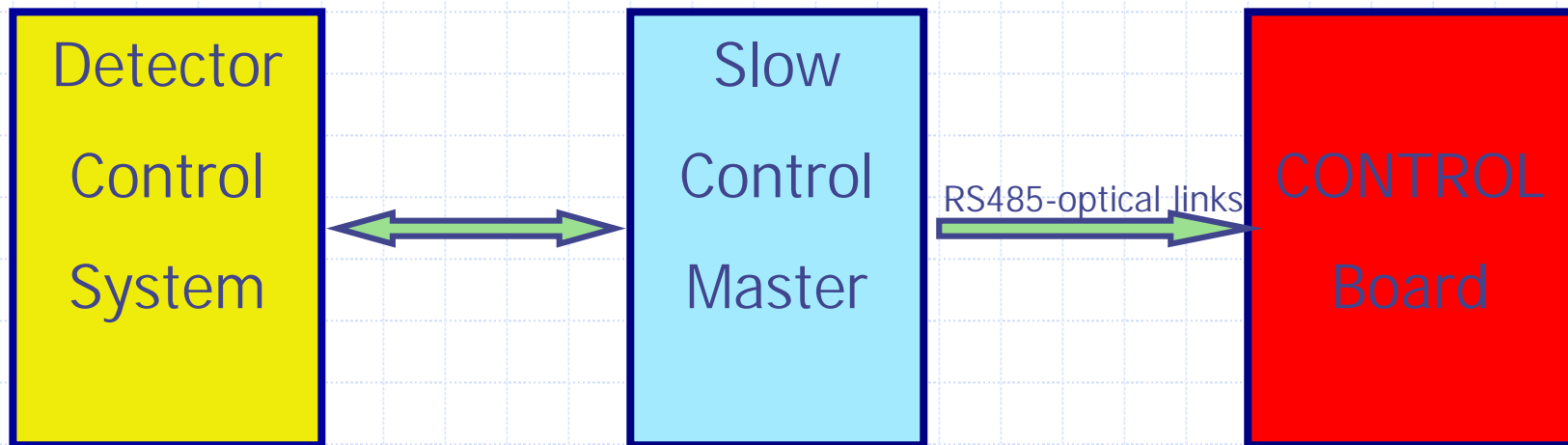
The muon drift tubes

- ◆ Each of the 60 sectors (4 chambers):
 - sends data to one channel of the DDU
- ◆ Each chamber (<1024 channel):
 - 8 layers of $R\phi$ wires connected to FE_boards and RO_boards
 - is controlled by one Control Board
 - preamplifier input can receive a test pulse

On-chamber control network

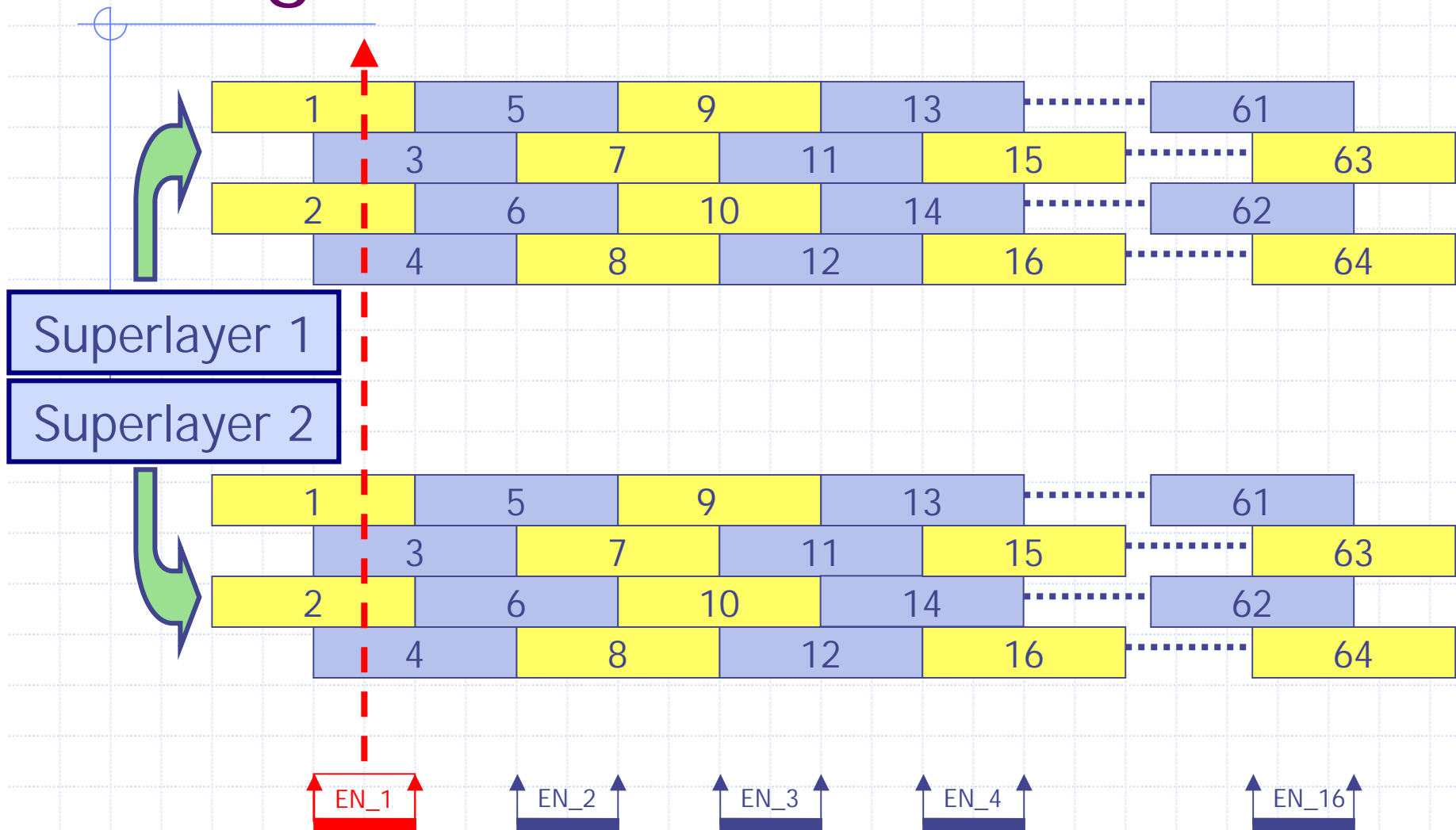


Loading pattern sequences on Control Boards



- ◆ Patterns are loaded on the Control Board and Readout board registers via slow control
- ◆ Feedback can be given to Run Control via the Detector Control System
- ◆ Patterns can be loaded without stopping data taking

Pulsing a DT chamber: cells 1,2,3,4

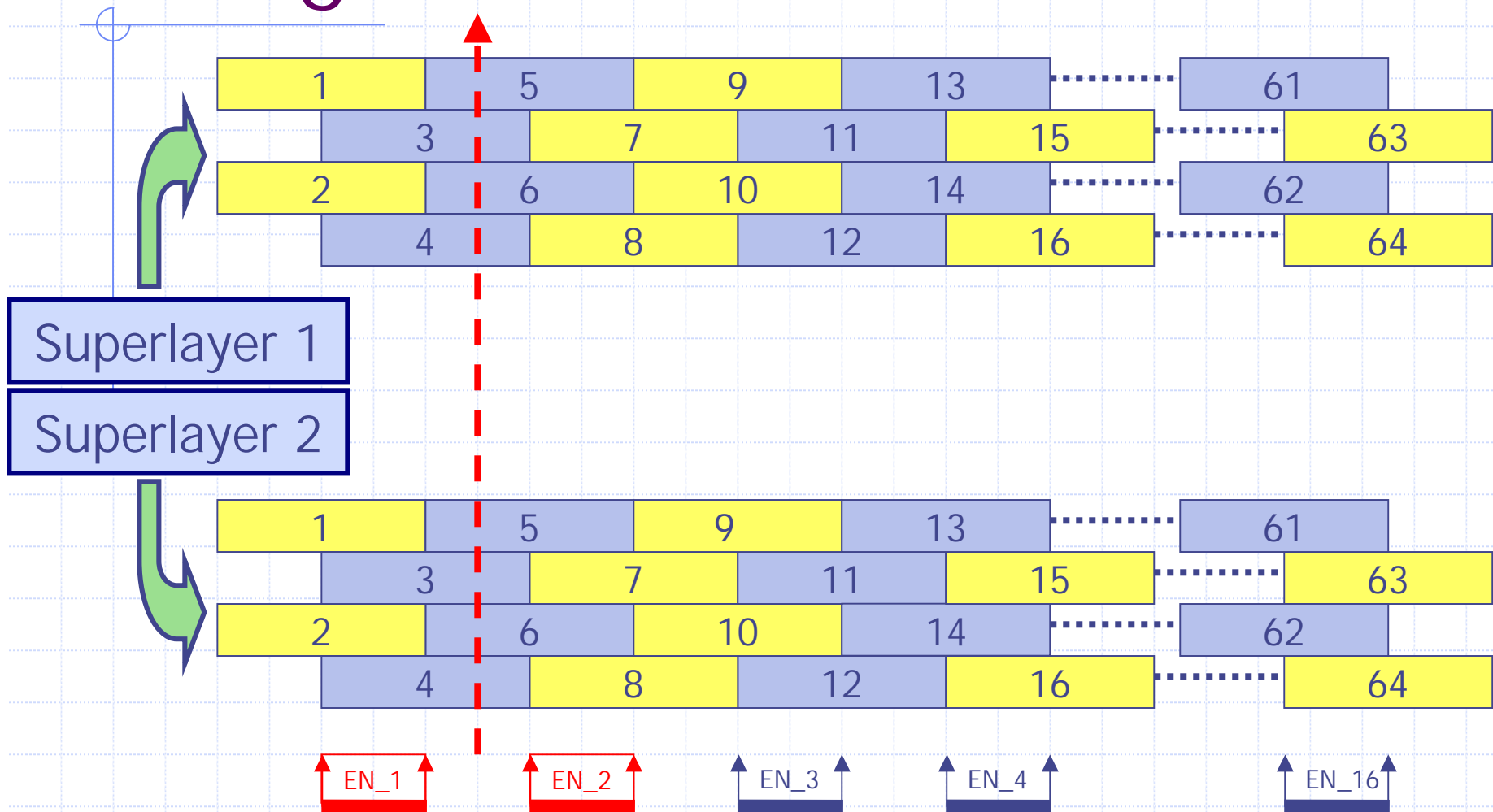


Pulsing a DT chamber: cells 1,2,3,4

◆ Activate:

- Enable_1
- Yellow cells and blue cells (*Test Pulse Left/Right*)
- Delay_1-2 (*Test Pulse 1*) and delay_3-4 (*Test Pulse 2*) are set (<400 ns)

Pulsing a DT chamber: cells 3,4,5,6

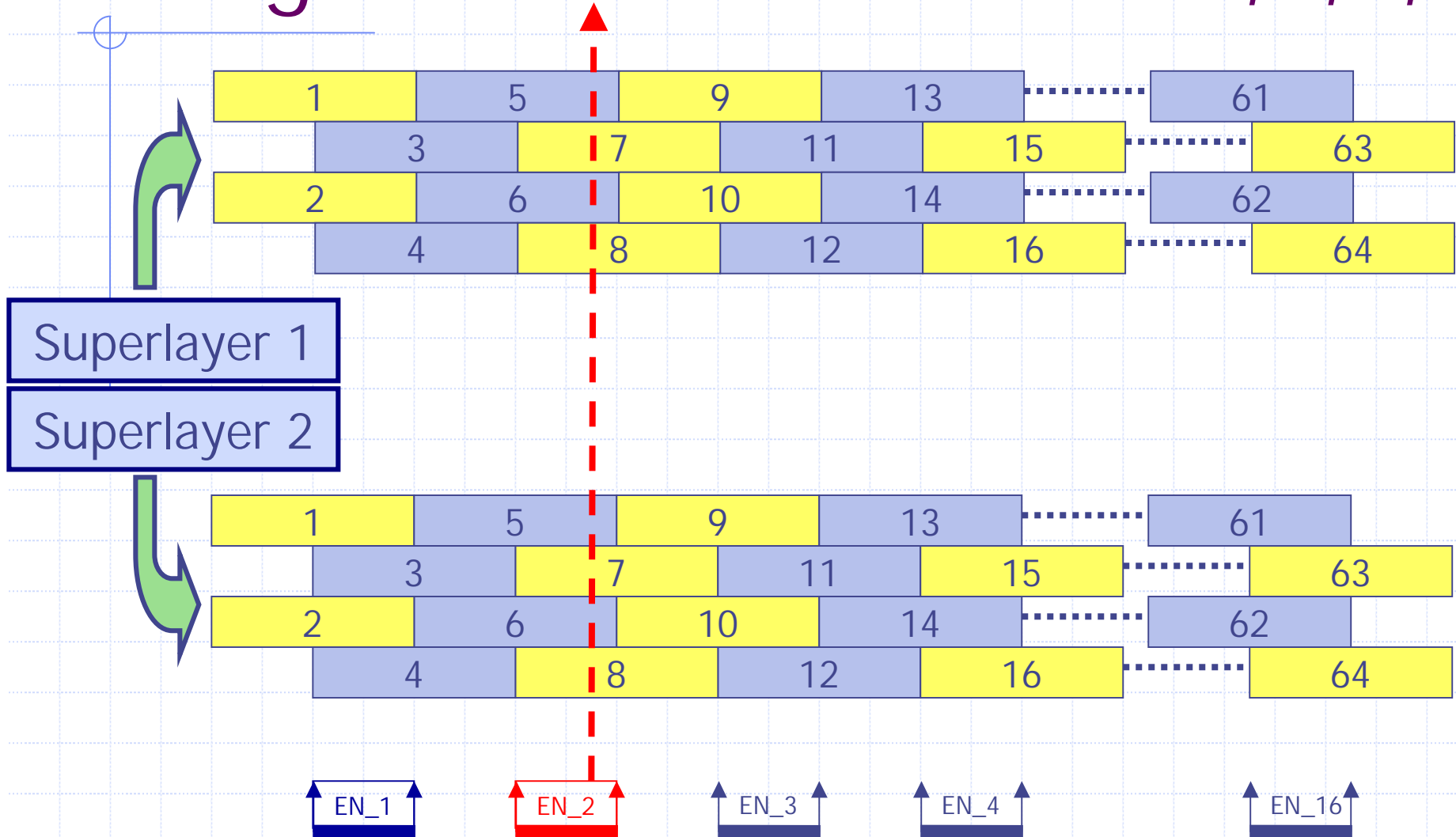


Pulsing a DT chamber: cells 3,4,5,6

◆ Activate:

- Enable_1 and Enable_2
- Blue cells (*Test Pulse Left/Right*)
- Delay_5-6 (*Test Pulse 1*) and delay_3-4 (*Test Pulse 2*) are set (<400 ns)

Pulsing a DT chamber: cells 5,6,7,8



Pulsing a DT chamber: cells 5,6,7,8

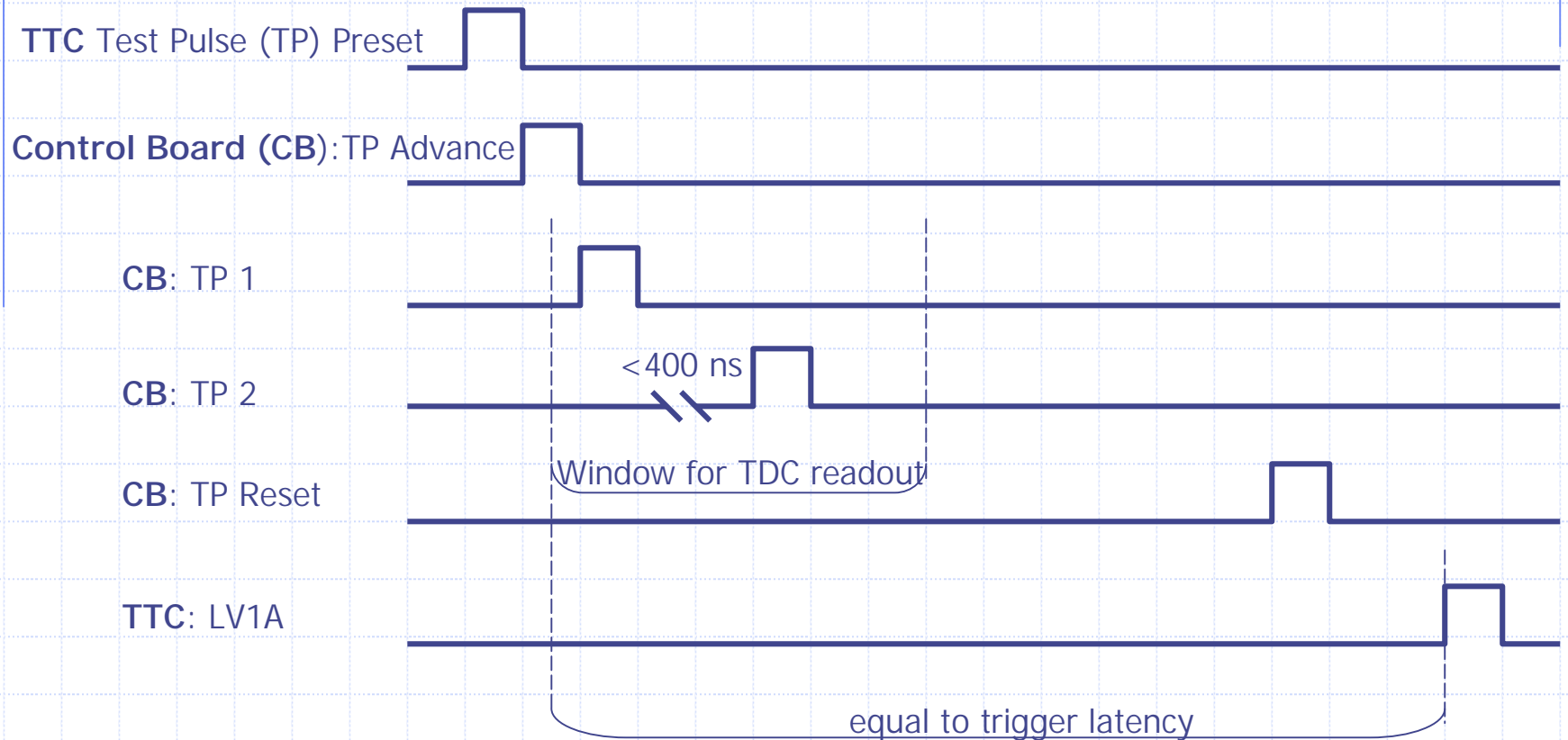
◆ Activate:

- Enable_2
- Blue cells and yellow cells (*Test Pulse Left/Right*)
- Delay_5-6 (*Test Pulse 1*) and delay_7-8 (*Test Pulse 2*) are set (<400 ns)

Sequence of control signals

- ◆ RO_boards and Control_Board get the sequence of patterns
- ◆ TTC sends the Test Pulse Preset
- ◆ Control Board generates
 1. Test Pulse Advance: load next pattern
 2. Test Pulse Inject: pulse chamber
 3. Test Pulse Reset: go to *readout* mode
- ◆ TTC sends LV1A

Control signals: timing diagram



Data volume

- ◆ Depending on chamber size, 4 to 8 tracks are generated
- ◆ In each sector, 1 out of 4 chambers will be pulsed
- ◆ Maximum data volume is equivalent to 2 tracks per sector