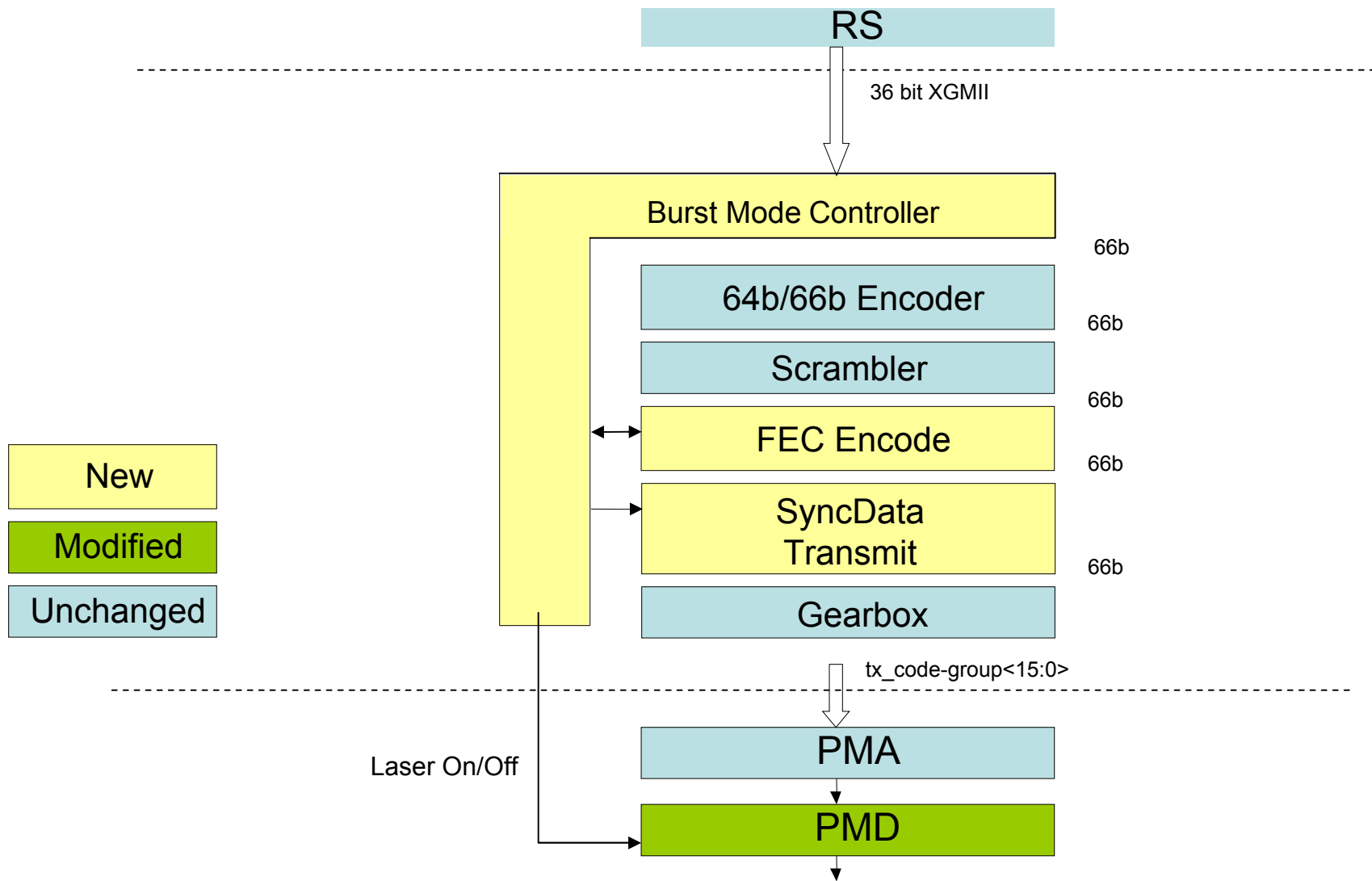


Upstream Synchronization Framework Update

Jeff Mandin

ONU PCS Functional Block Diagram (transmit direction)



Elements in the Functional Block Diagram

a) *Burst Mode Controller (BMC)*

- Functional element which includes 2 processes:
 - data detector process
 - burst mode control process
 - Invokes “laser-on/laser-off” function in PMD
 - Controls the generation of synchronization patterns (ie. burst preamble and delimiter) during initialization
 - <Performs necessary alignment and reset of the datapath>

b) *FEC encoder*

- Builds FEC codewords (ie. calculates and inserts parity to datastream)
- Reports “End of Burst” to the BMC

c) *Sync Data Transmit*

- During the initialization phases: periodically writes the appropriate initialization data pattern (*Initdata*) to the gearbox
- After initialization: passes the output from the FEC encoder to the gearbox

Elements in the Functional Block Diagram (2)

a) *64b66b encoder*

- No changes, but the contents of the input vector `tx_raw<71:0>` (clause 49.2.13) will be aligned by the Burst Mode Control process

b) *Scrambler*

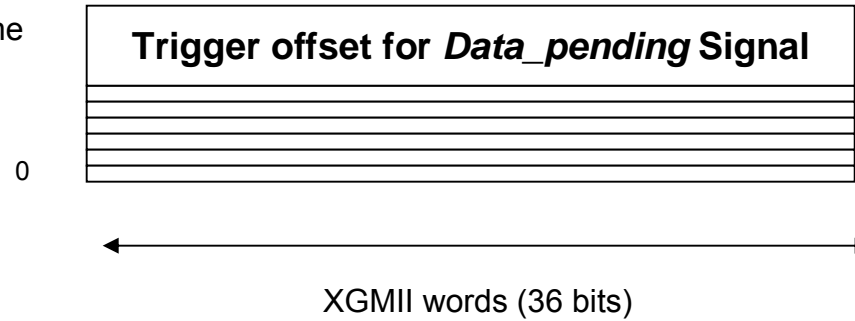
- No changes, but the scrambler is (optionally) reseeded and restarted by the Burst Mode Control process

c) *Gearbox*

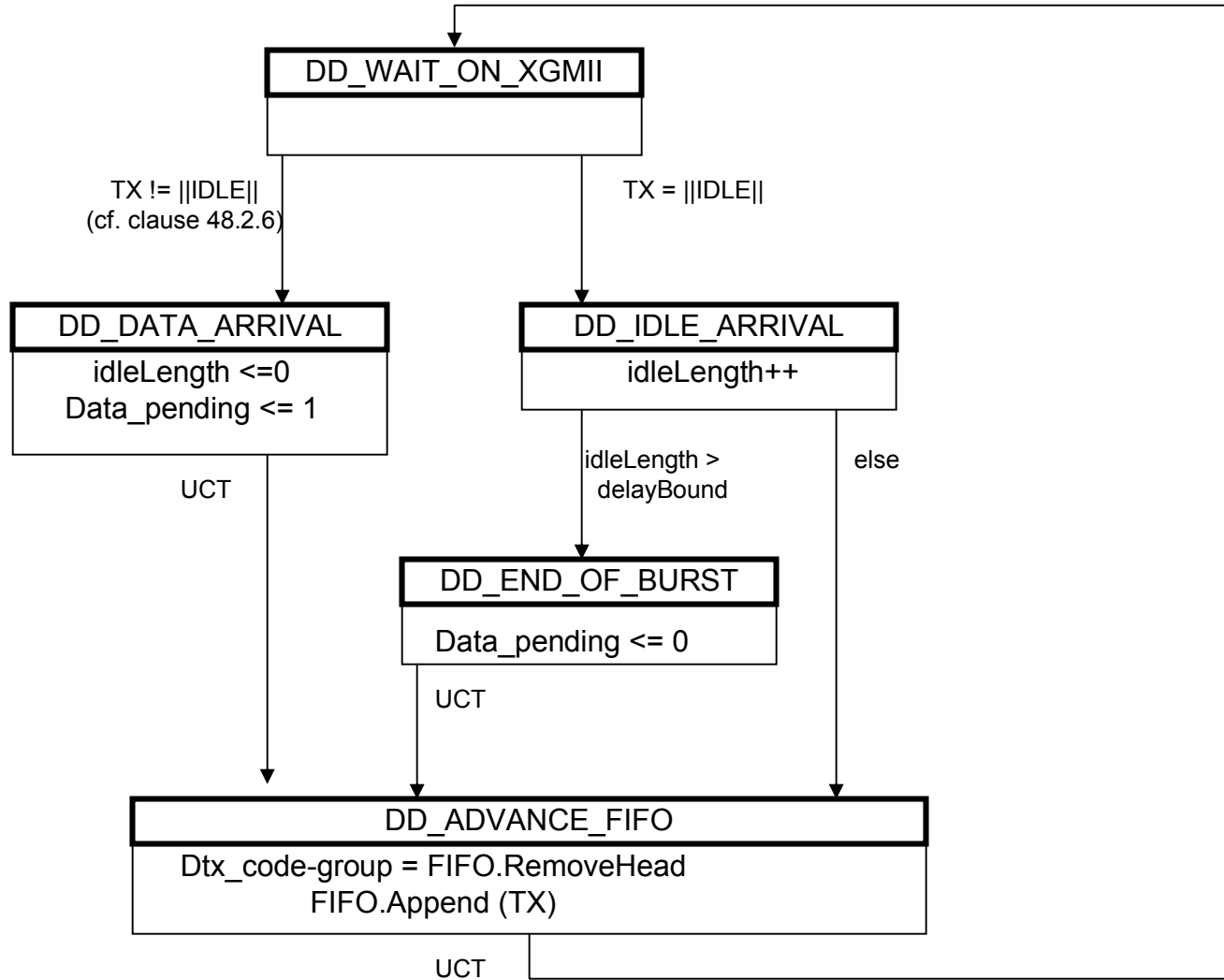
- No changes, but the gearbox can be reset or realigned by the Burst Mode Control process

Data Detector Delay Line (FIFO)

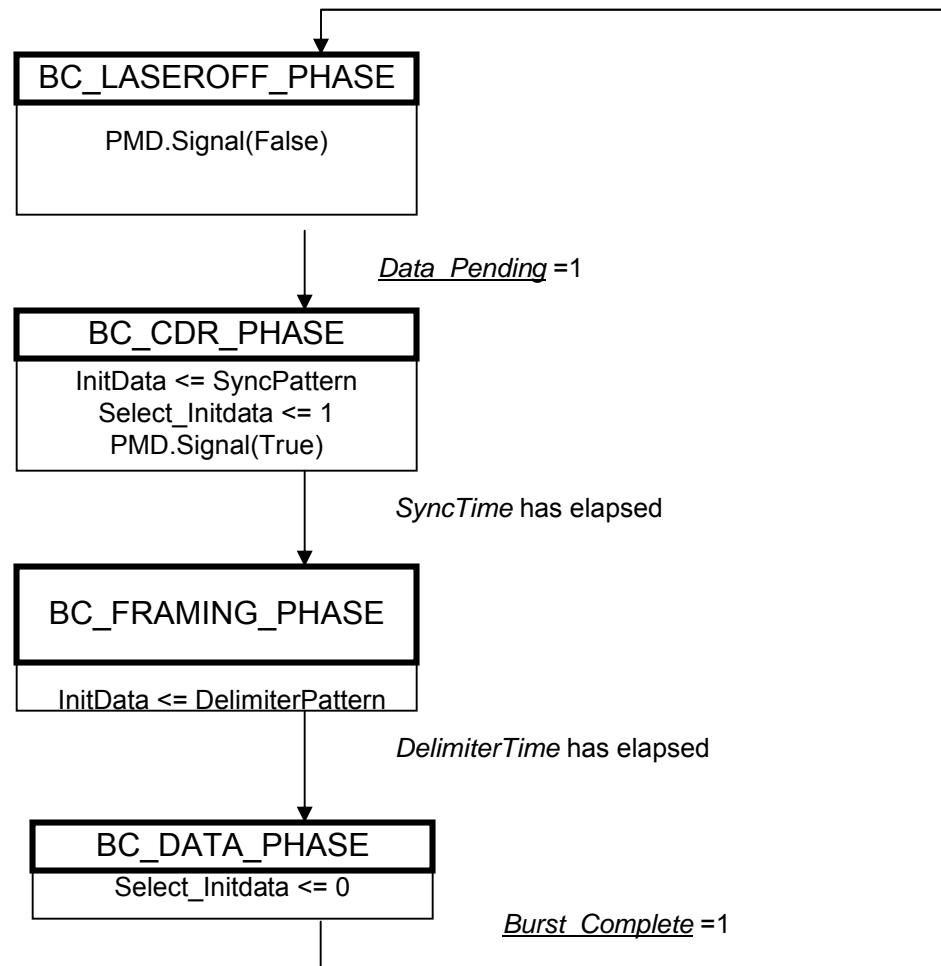
(SyncTime + DelimiterTime
+ 16 leading IDLES)



Data Detector State Diagram



State Diagram for *Burst Mode Control*

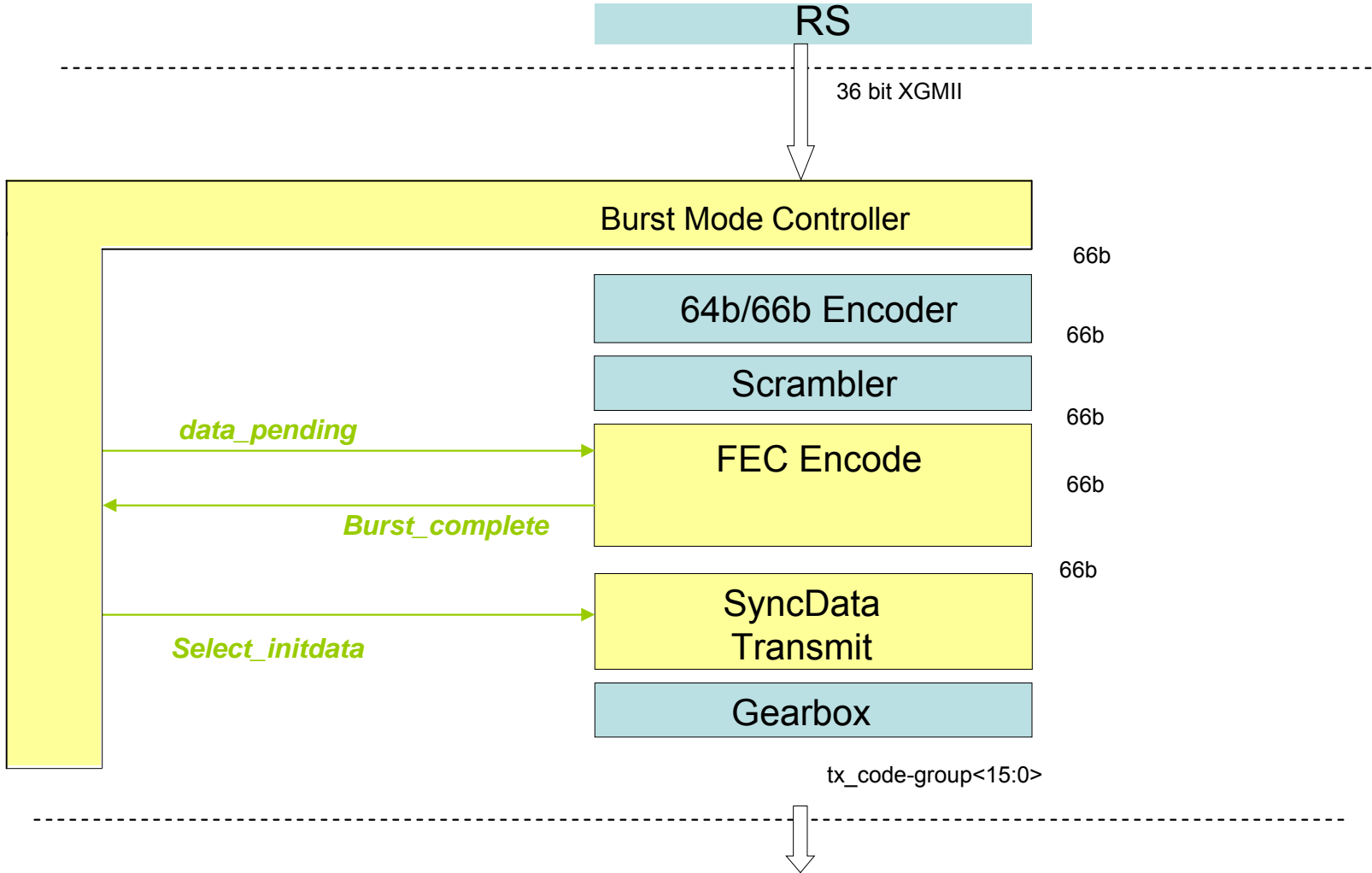


Entry to Framing_Phase

Additional actions are performed when the BMC transitions to data_phase:

- a) Align the contents of the input vector tx_raw<71:0> (clause 49.2.13) so that /S/ will appear in column 0 and similarly align the gearbox output (eg. Clearing the FIFO of the gearbox when the correct alignment is achieved)
- b) Reset the FEC encoder so that codeword build restarts
- c) Optionally: reseed the scrambler
 - ONU shouldn't be *required* to maintain the same seed between bursts
 - Start of burst always contains the same data, so there might be a security or DC-balance advantage to reseed.

ONU PCS Functional Block Diagram (transmit direction)



Thank you