### 76.3.2.5.1 Burst Mode operation (ONU only)

In addition to inserting the parity data into the data stream, the Data Detector process in the 10GBASE-PR-U PCS generates the PMA_SIGNAL.request(tx_enable) primitive to turn the laser on and off at the correct times, by detecting the presence of data in the transmitted bit stream.

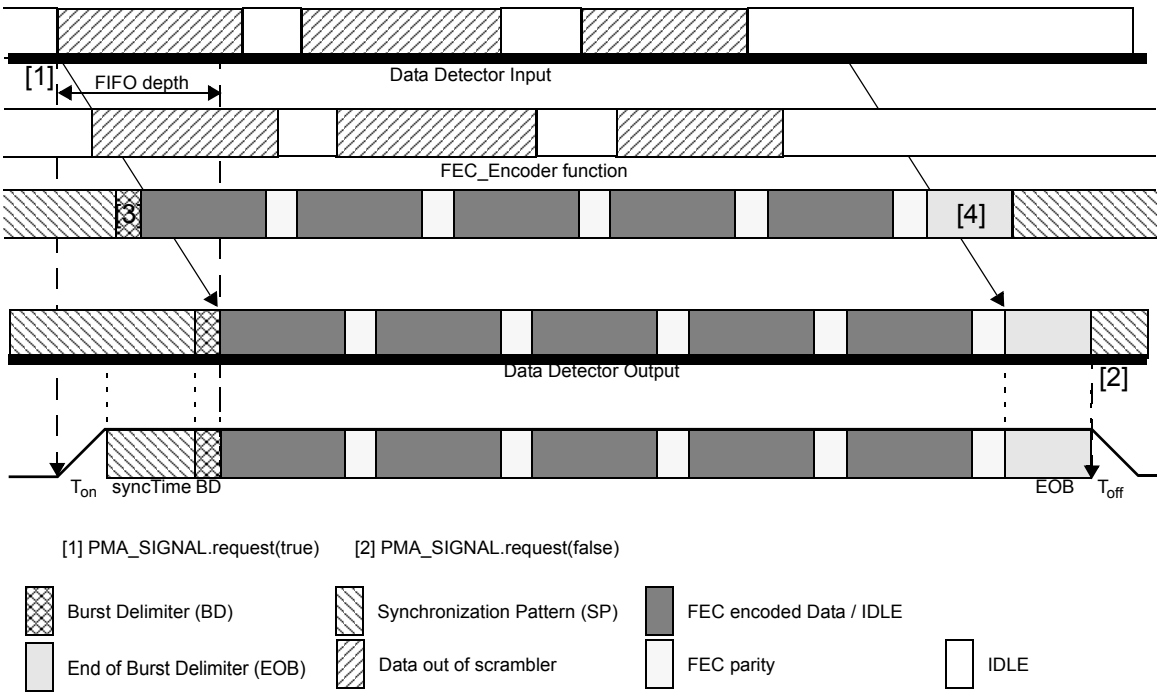


**Figure 76–14—Laser control as a function of buffer fill**

Upon initialization, the laser is turned off. When the first 66-bit block containing data arrives at the buffer, the Data Detector sets the PMA_SIGNAL.request(tx_enable) primitive to the value ON, instructing the PMD sublayer to start the process of turning the laser on (see point [1] in Figure 76–14).

When the buffer becomes empty (i.e., contains only 66-bit blocks with Idle characters), the Data Detector sends the End of Burst Delimiter (substituting a number of subsequent IDLE blocks with END_BURST_DELIMITER, as shown in Figure 76–17(b) - see point [4]) and after that sets the PMA_SIGNAL.request(tx_enable) primitive to the value OFF (see point [2] in Figure 76–14), instructing the PMD sublayer to start the process of turning the laser off. Between packets, Idle blocks arrive at the buffer. If the number of these Idle blocks is insufficient to fill the buffer then the laser is not turned off.

The Data Detector contains a delay line (FIFO buffer) storing code-groups to be transmitted. Figure 76–14 shows the relationship of filling the buffer and the generation of laser control signal (PMA_SIGNAL.request(tx_enable)). The length of the FIFO_DD buffer at the ONU shall be chosen such that the delay introduced by the buffer together with any delay introduced by the PMA sublayer is long enough to turn the laser on and to allow a laser synchronization pattern, Burst Delimiter pattern (substituting one IDLE block with BURST_DELIMITER, as shown in Figure 76–17(b) - see point [3]) and a predefined number of Idle blocks to be transmitted. The laser synchronization pattern allows the receiving optical detector to adjust its gain ($T_{receiver\_settling}$) and synchronize its receive clock ($T_{CDR}$). The Burst Delimiter allows the receiver to easily identify the beginning of FEC protected portion of the ONU transmission. The Idle control characters are used to synchronize the descrambler and establish start-of-packet delineation.