101.3 Physical Coding Sublayer (PCS) for EPoC

This subclause will be modelled after 76.3 for 10G-EPON, with all the necessary changes for EPoC, e.g., changing FEC definition structure, presence of line coding and its type, scrambling / interleaving. The current structure is just first order approximation and will be modified as more contributions for PCS structure and functions arrive.

101.3.1 Overview

This subclause defines the Physical Coding Sublayer (PCS) for {EPoC_PMD_NAME}, supporting TDD and FDD mode operation over the point-to-multipoint coaxial medium architecture. The EPoC PCS is specified to support the operation of up to 10 Gb/s in the downstream direction and up to 10 Gb/s in the upstream direction, where the upstream and downstream data rates are configured independently, in the function of the assigned RF spectrum.

This subclause also specifies a forward error correction (FEC) mechanism to increase the available link budget and the Idle control character insertion and Idle control character deletion mechanisms - part of the data rate adaptation function combining the MAC and MAC Control Clients operating at 10 Gb/s with EPoC PCS and PMD layers operating at the data rates below 10 Gb/s.

{Figure 101-X} shows the relationship between the EPoC PCS sublayer and the ISO/IEC OSI reference model.

101.3.1.1 EPoc_PMD_Name PCS

The EPoC PCS extends the 10GBASE-PR PCS described in {Clause 76} to support TDD and FDD mode of operation over the point-to-multipoint coaxial medium architecture. Figure 101–1 illustrates the functional block diagram of the downstream path in the EPoC PCS and Figure 101–2 shows the functional block diagram of the upstream path in the EPoC PCS.

101.3.2 PCS transmit function

In the CLT, the PCS transmit function operates in a continuous (TDD mode) or burst (FDD mode) fashion at the data rate of up to 10 Gb/s, depending on the allocated RF spectrum and the configured operation mode. In the CNU, the PCS transmit function operates in a burst fashion (TDD and FDD modes) at the data rate of up to 10 Gb/s, depending on the allocated RF spectrum and the configured operation mode. Figure 101–1 illustrates the transmit direction of CLT PCS and Figure 101–2 illustrates the transmit direction of the CNU PCS.

The EPoC PCS includes a mandatory FEC in the transmit direction, along with 64B/66B encoder as well as an Idle control character deletion function performing data rate adaptation and FEC overhead compensation functions.

In the transmit direction, the EPoC PCS includes an Idle control character deletion function performing the function of data rate adaptation and a FEC overhead compensation, followed by a 64B/66B encoder, and a mandatory FEC encoder.

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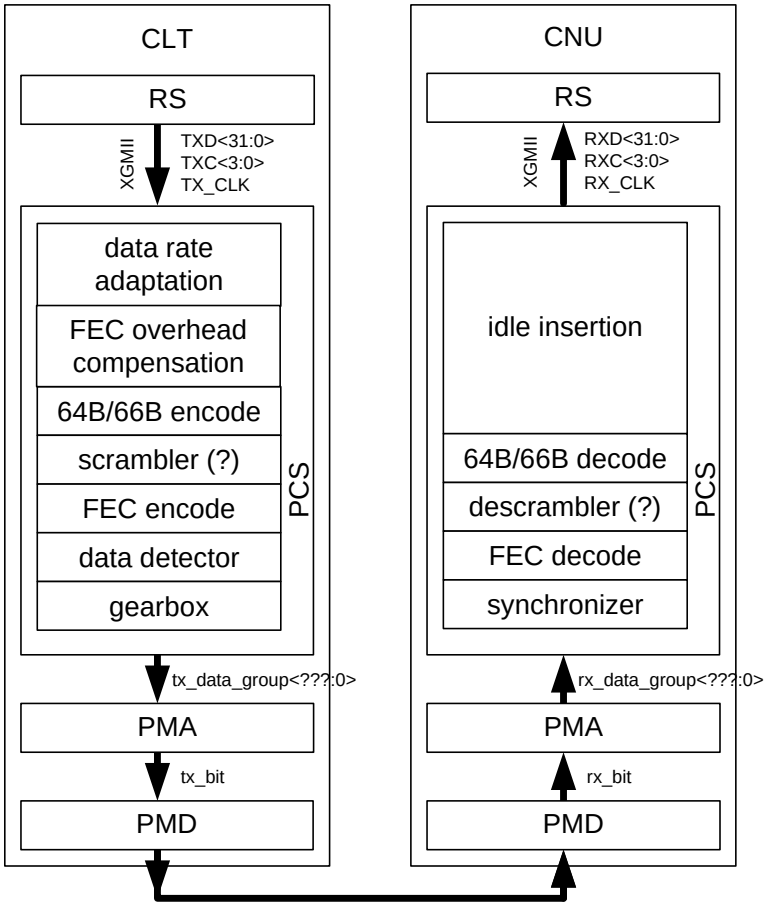

Figure 101–1—EPoC PCS functional block diagram, downstream path

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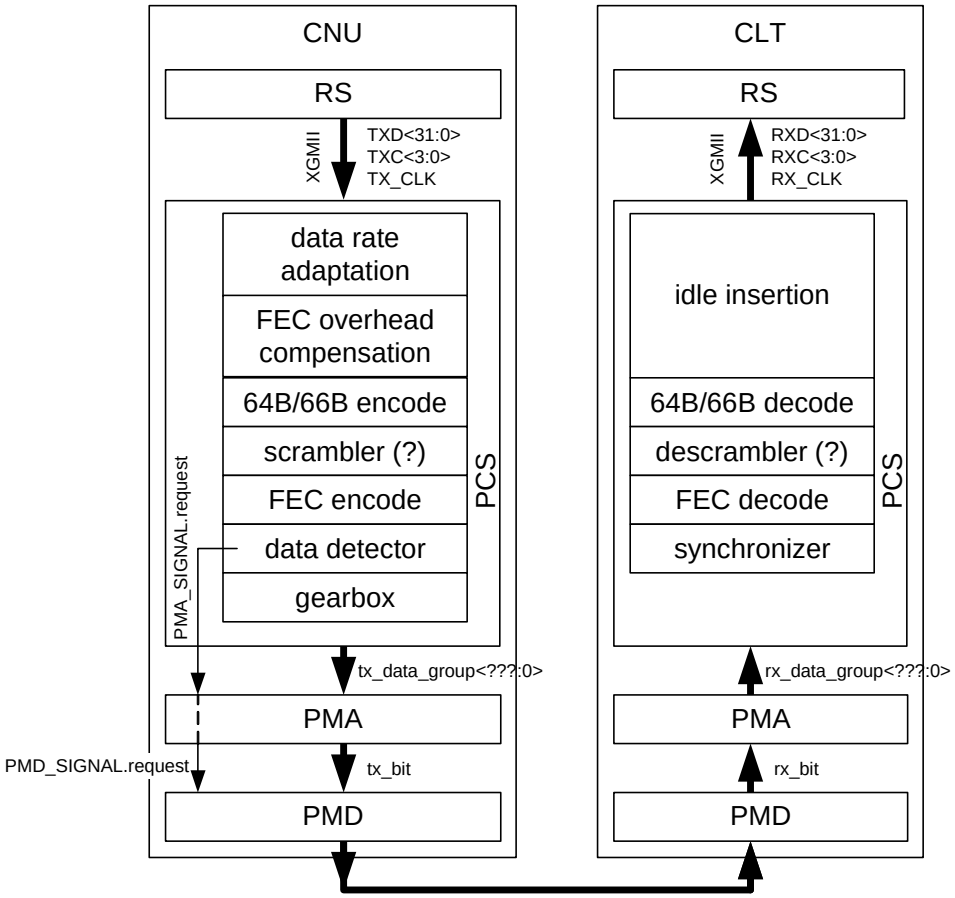

Figure 101–2—EPoC PCS functional block diagram, upstream path

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101.3.3 PCS receive function

In the CLT, the PCS receive function operates in a burst fashion (for both FDD and TDD modes) at the data rate of up to 10 Gb/s, depending on the allocated RF spectrum and the configured operation mode. In the CNU, the PCS transmit function operates in a continuous (FDD mode) or burst (TDD mode) fashion at the data rate of up to 10 Gb/s, depending on the allocated RF spectrum and the configured operation mode. Figure 101–1 illustrates the receive direction of CNU PCS and Figure 101–2 illustrates the receive direction of the CLT PCS.

In the receive direction, the EPoC PCS includes a mandatory FEC decoder, followed by a 64B/66B decoder and an Idle control character insertion function performing the function of data rate adaptation and a FEC overhead compensation.

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