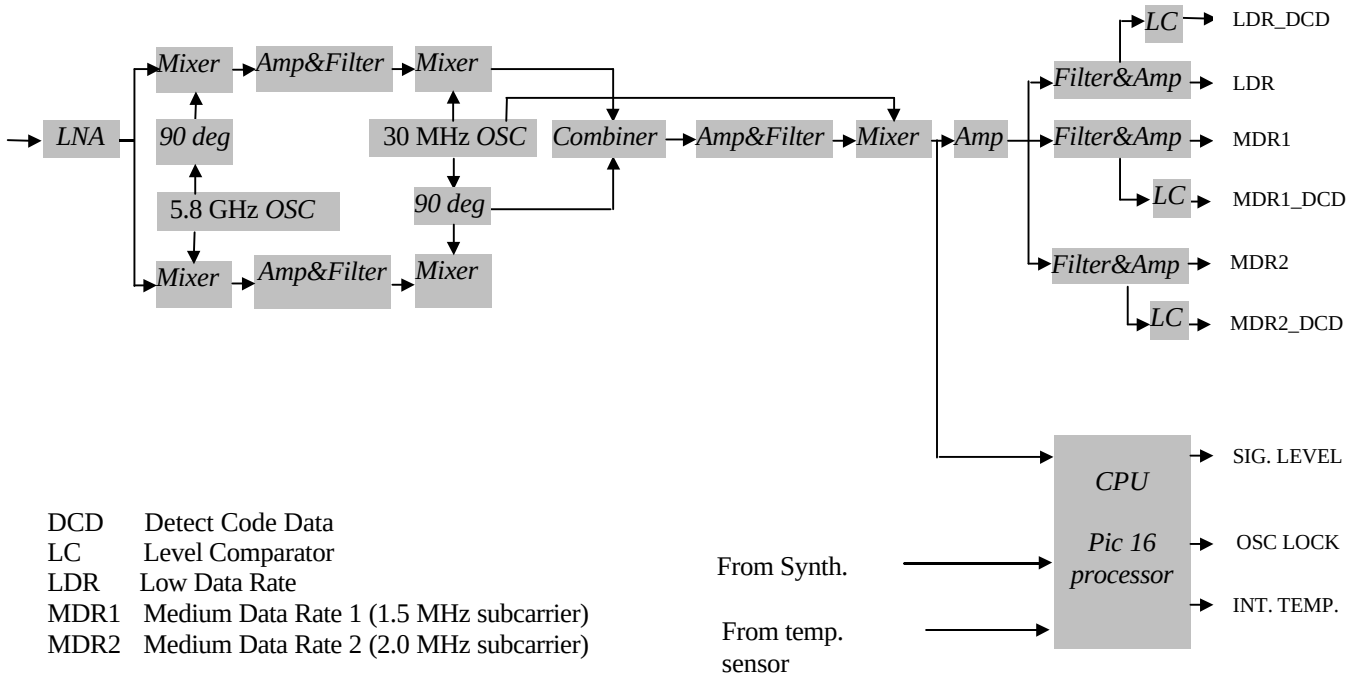
1 TRANSCEIVER MODEM

1.1 Receiver Analogue Part



DCD Detect Code Data
LC Level Comparator
LDR Low Data Rate
MDR1 Medium Data Rate 1 (1.5 MHz subcarrier)
MDR2 Medium Data Rate 2 (2.0 MHz subcarrier)

Figure 1.1 Receiver Analogue part.

The main functions of the analogue part of the receiver are:

- Front end amplification in a low noise amplifier (LNA) to obtain low noise figure.
- Quadrature mixer frequency conversion down to Baseband (0.5-2.5MHz).
- Baseband amplification and band pass filtering.
- Suppression of one (lower) side-band after signal up-conversion with a 30 MHz oscillator.
- BP filtering in phase linear SAW filters with centre frequency 32 MHz.
- Down-conversion to the Baseband with the same 30 MHz oscillator.
- Separation of LDR, MDR1 and MDR2 by the use of BP-filters and amplification.
- Signal level detection.
- Oscillator (5.8 GHz) lock detection signal from the transmitter part.
- Temperature measurement on the surface of the Transceiver Modem PCB.

1.2 Transmitter Analogue Part

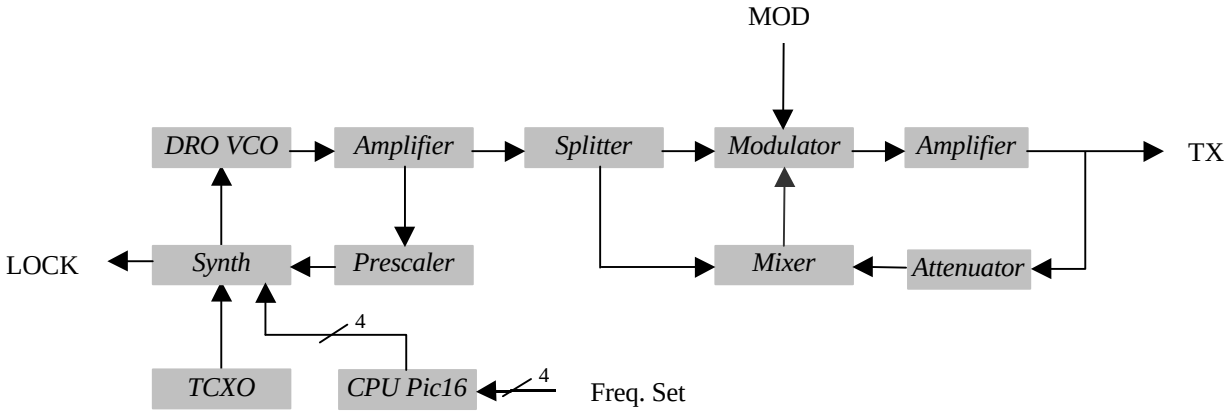


Figure 1.2 Transmitter Analogue part.

The main functions of the analogue part of the transmitter are as follows:

- Generation of four channels (5.7975, 5.8025, 5.8075, 5.8125 GHz) with high frequency stability (< ±5 ppm). This is obtained by using a Dielectric Resonator Oscillator (DRO VCO) which is locked to a Temperature Compensated X-tal Oscillator (TCXO). Two straps, generating the 4 digital codes 00, 01, 10, 11, is used to obtain the 4 channel frequencies.

- Amplitude modulation with very high linearity. This is obtained by using a PIN diode modulator, which is stabilised by using a feedback loop.

1.3 Digital Part

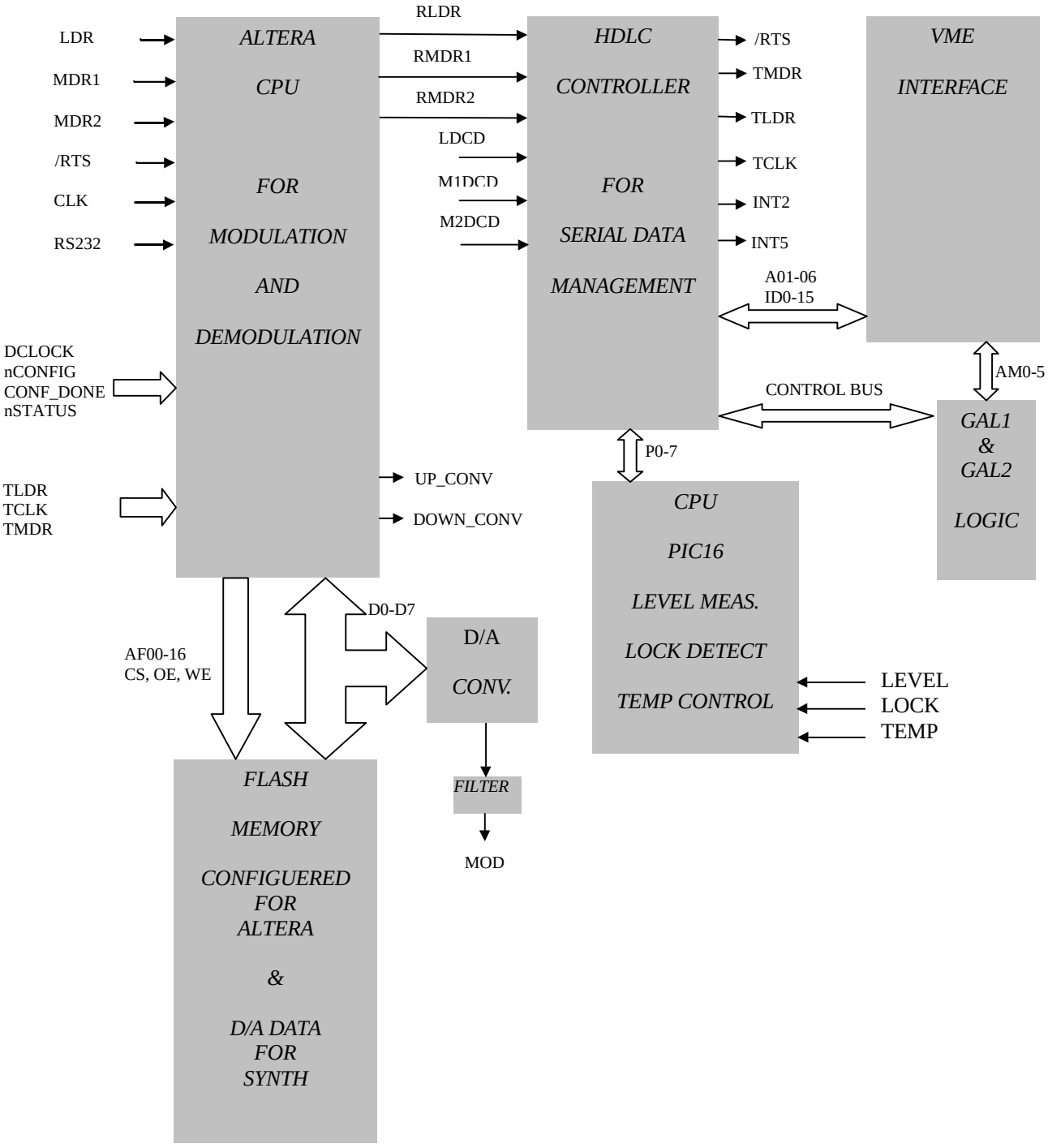


Figure 1.3 Digital part of the Transceiver Modem