1 PRODUCT DESCRIPTION

1.1 Electronic Module Description

Figure 1.1shows the different MultiReader electronic modules

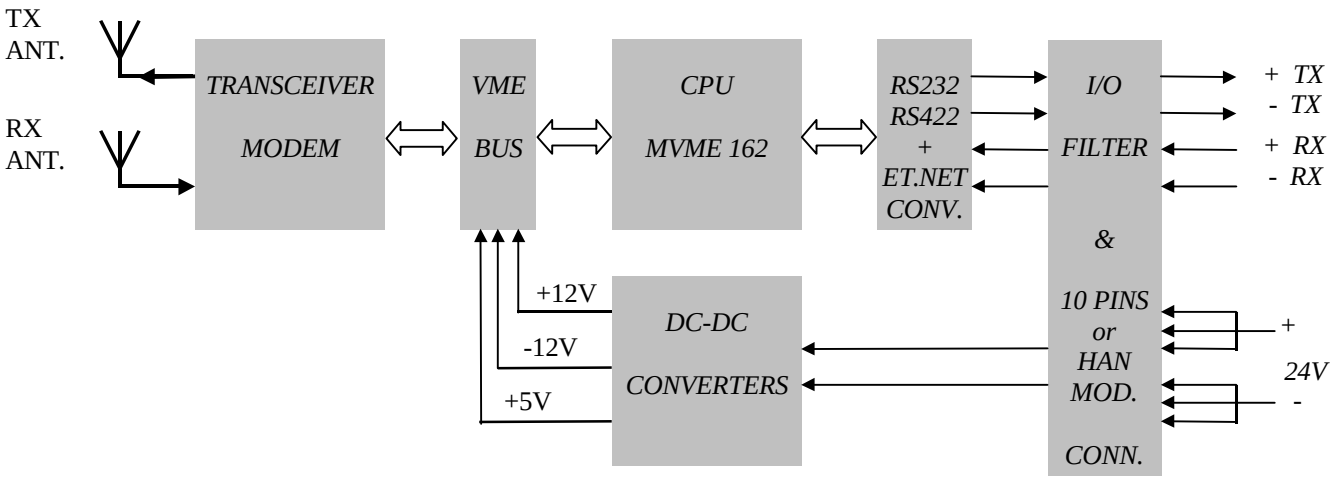


Figure 1.1MultiReader Block Diagram.

The **Transceiver Modem** and the **CPU** is separate double European board mounted in a Subrack with a VME bus as physical interface between the boards.

Power Supply voltage is supplied through the VME bus from three DC-DC converters generating +5V, +12V and –12V with +24V nominal input which is low pass filtered at the **I/O filter** board.

The **TX and RX antenna** is separate patch antennas with 19 dB gain and connected to the transceiver modem with two short coaxial cables.

The data signals to and from the **CPU** are converted between RS232 and RS422 in a **RS232/RS422 converter** connected to the console port of the CPU board through a ribbon cable. At the RS422 side of the converter the data signals (TX/RX) are low pass filtered in a so-called **I/O filter** which is mounted directly on a 10 pins circular connector through the cabinet chassis, or on Han-DD Module PCB adapters which are inserted in a Han-Modular housing frame.

In addition to the RS232-RS422 converter a twisted pair **Ethernet transceiver** may be used. The connection to the CPU board goes through a ribbon cable and a MVME162/Transceiver interface to the P2 connector.

1.2 Antenna

There is both a TX and RX patch antenna on one low loss Teflon PCB. Each antenna has 8x4 patches with the following specifications:

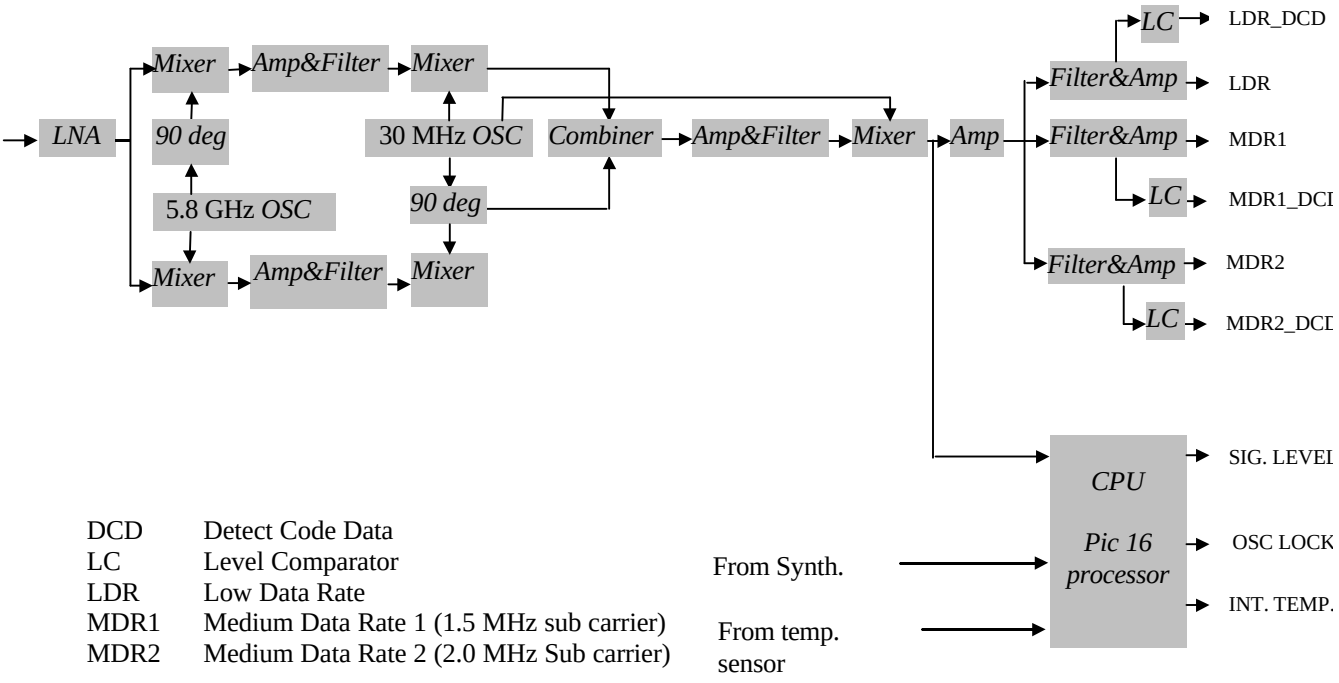
Polarisation:	LHC
Power Gain:	19 dB
Beamwidth horizontal plane:	17°
Beamwidth vertical plane:	10°
Highest side lobe level, horizontal plane:	<-17 dB
Highest side lobe level, vertical plane:	<-13 dB
Cross polarisation:	<-17 dB
Physical dimensions TX & RX antenna:	30cm x 30 cm

Each antenna has a 2-hole flange SMA connector with the flange soldered to the ground plane of the substrate and with the centre pin soldered to a plated through hole.

The antennas are connected to the Transceiver modem through 18cm coaxial cables.

1.3 Transceiver Modem

Receiver Analogue Part



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

Figure 1.2 Receiver Block Diagram (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.
- Oscillator (5.8 GHz) lock detection signal from the transmitter part.

1.4 Transmitter Analogue Part

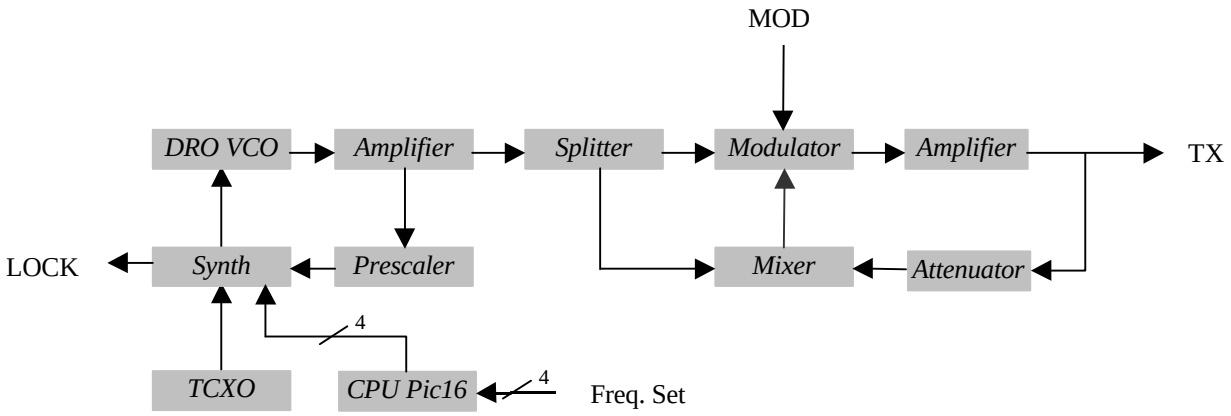


Figure 1.3 Transmitter Block Diagram (analogue part).

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.

1.5 Digital Part

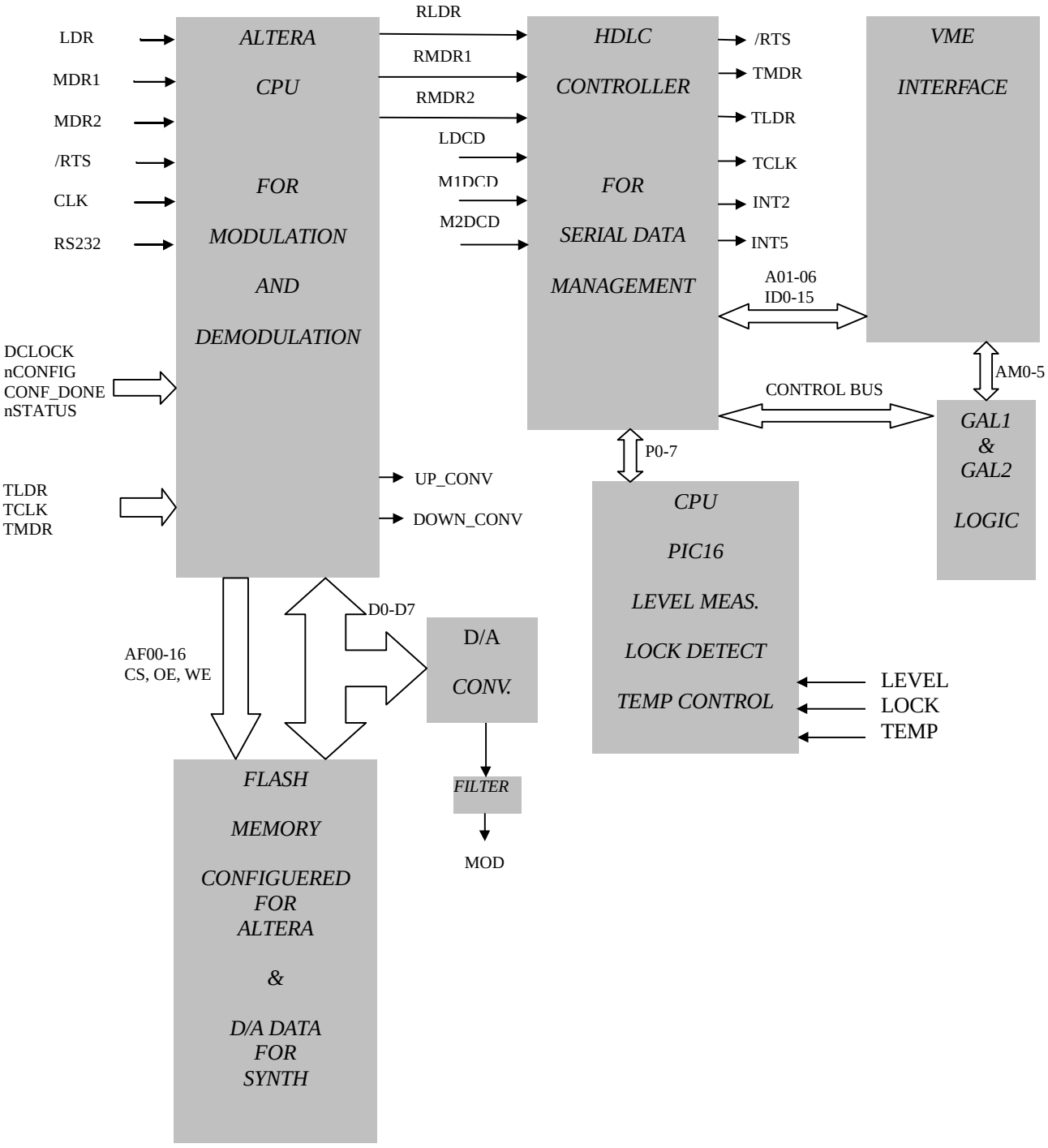


Figure 1.4Digital part of the Transceiver Modem