

8022N Digital Board Hardware Description

A) Overview

The Tone Only Pager is a POCSAG pager. It has three keys and 12 character (9-segment type) LCD display. It is controlled by ART AR5010E-7403 8-bits MCU. The POCSAG data is received by the POCSAG decoder and will store to the memory (RAM) of the MCU. The block diagram of digital module is shown in figure 1. The user can use the key to read the received message. The message will display on LCD glass and will scroll if more than 12 character. When the new user message is arrived, the pager can set the alert signals to user such as buzzing sound or vibration from vibrator.

B) POCSAG decoder

The POCSAG decoder is built in MCU. It is mainly used to connect between RF module and digital module. The decoder will control the RF module ON & OFF and receive the FSK data. The decoder will decode the FSK signal and acknowledge to the MCU if CAP code is correct. When the new message arrive, the decoder will generate the interrupt to the MCU. The decoder will also generate the low battery signal to the MCU if voltage is below 1.1V. The 76.8K Hz crystal is used to drive the POCSAG decoder.

C) MCU

The core MCU is ART AR5010E-7403 which will handle all the work of pager. The MCU has initial procedures that read the initial setting from EEPROM and setup the I/O device. The MCU will receive the RF signal through RF board and POCSAG decoder. After MCU receive the signal with respect address, it will turn the buzzer on or motor on to acknowledge the user. The user can access the pager by the key input to read the message from the LCD. The 76.8 KHz a crystal is also used to drive the MCU. The DC/DC converter step up the battery voltage 1.5V to supply voltage 2.7V for MCU, decoder and EEPROM operation. A 2.4V voltage detector is used as reset circuit to the MCU.

D) I/O DEVICE

LCD -	The fully ON LCD display profile is shown on the block diagram. It contains 12 nine-segment characters and 13 icons on the top. It can be checked in the initial mode.
EEPROM -	93C46, 1K bit serial EEPROM, is used to save the configuration information.
Buzzer & Motor -	is used to acknowledge the user.
Lamp -	is used to see the LCD in darkness place.