3.3   DIGITAL CIRCUITS (A1)

3.3.1   Introduction

The following paragraphs describe the circuits on the digital A1 PCB in detail. Refer to circuit diagram A1 (figure 10.8 in chapter 10).

3.3.2   Overview digital circuits

The digital circuitry of the ScopeMeter can be separated into three main parts:

- Microprocessor circuitry
- Digital ASIC (in the following text: D-ASIC) circuitry
- LCD circuitry

A block diagram, which clearly shows the connections between these main parts, is shown in figure 3.1.

3.3.3   MICROPROCESSOR circuitry (µP)

- Introduction

The ScopeMeter is controlled by a single chip microcomputer with on-board ROM (called Mask ROM in the following text). This microprocessor controls the total system operation and communication between the ScopeMeter and the outside world (key pad, RS-232-C interface). It also controls the communication between the internal system components.

- Detailed circuit description

See figure 3.1 and circuit diagram A1 (figure 10.8).

Microprocessor
The ScopeMeter uses an Intel 83C196 microprocessor (D1201), with on-board Mask-programmed ROM (Mask ROM). This microprocessor has a 16-bit multiplexed Address/Data-bus (called AD-bus in the following text). The address bits are latched in the M-ASIC D1210. The M-ASIC also buffers the microprocessor AD- bus.

The microprocessor's Mask ROM contains the startup software and a diagnostic kernel test (see chapter 7). It also contains the software to drive the serial RS-232-C interface. This enables the microprocessor to load software into the STANDARD ROM (Flash ROM).

STANDARD ROM D1221 contains the system software. For future software expansion the board is prepared for various ROM types. See the table below.

D1220		D1221	
28F200	28F400	28F010	28F020
128K*16	256K*16	128K*8	256K*8

The STANDARD RAM contains, amongst others, the actual ScopeMeter settings, waveforms (stored with the WAVEFORM key), front settings (stored with the SETUP key), and results of calculations on acquisition data. One of the following RAMs can be mounted: D1232 (M5M5256BRV, 32K*8), or D1230 (HM628128AR, 128K*8).
The RAMs are powered by the RAM POWER circuit, which is battery backed up.