KONGSBERG computers

D4.0091

PRELIMINARY SPECIFICATION

FOR

CI-501F

Prepared by:	Checked by:	Approved by:	This spec. replaces:
A Tvedt/F43			
Date: 19.6.78	Date:	Date:	

1 GENERAL

CI-501F is an interface between the KS-500 system and asynchronous serial data channels. The module functions on a DMA basis (direct memory access), transferring data between the external data lines and the system memory connected to the KS-500 bus. The module has four channels, each with a maximum speed of 9600 bits/sec. The module consists of one printed circuit board.

CI-501F contains a microprocessor which controls the module. The microprocessor software therefore determines the function of the module in a KS-500 system. For details, refer to the software specification. The main principle is shown in Figure 1.
The KS-500 processor controls CI-501F by giving it commands via the system memory. An address pointing to the command is transferred directly to CI-501F by an IOT instruction. CI-501F then reads the command from memory. When CI-501F has completed an operation (e.g. a data block has been transferred), it sets up status information in the system memory and generates an interrupt. The interrupt is generated by a bus call, and not via the IL-interrupt line.

2 FUNCTIONAL DESCRIPTION

2.1 KS-500 Bus Interface

CI-501F can be both a passive and an active module in KS-500 bus transfers.

2.1.1 Passive Interface.

As a passive module it decodes the bus-call corresponding to an IOT instruction, and clocks 16 databits from the bus into a data register. SKIP is given if the data register was ready to clock the data. Standard device number is 300, but any number from 200 to 377 can be obtained by straps on P1. In addition, bit 7 on the bus can be specified as 0 or 1 (this bit is controlled by tne Q-register in the KS-500 processor).

2.1.2 Active Interface.

As an active module, CI-501F can perform the following bus operations: memory read, memory write, I/O read and I/O write. There is full software control of the IA, IB lines and the 16 bits sent out in the bus address cycle and datacycle. This means that CI-500 also has access to all devices that can be reached by SDC instruction in the KS-500 processor. As an example, CI-501F can set bits in the interrupt vector registers in the Bus Controller or Interrupt Module. It can also communicate with other KS-500 buses via the Node Module (NO-500).
IB is clocked in the data-cycle in both read and write operations. CI-501F can thus check for transfer failure.

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PRELIMINARY SPECIFICATION FOR CI 501F
COMMUNICATION INTERFACE

19.6.78

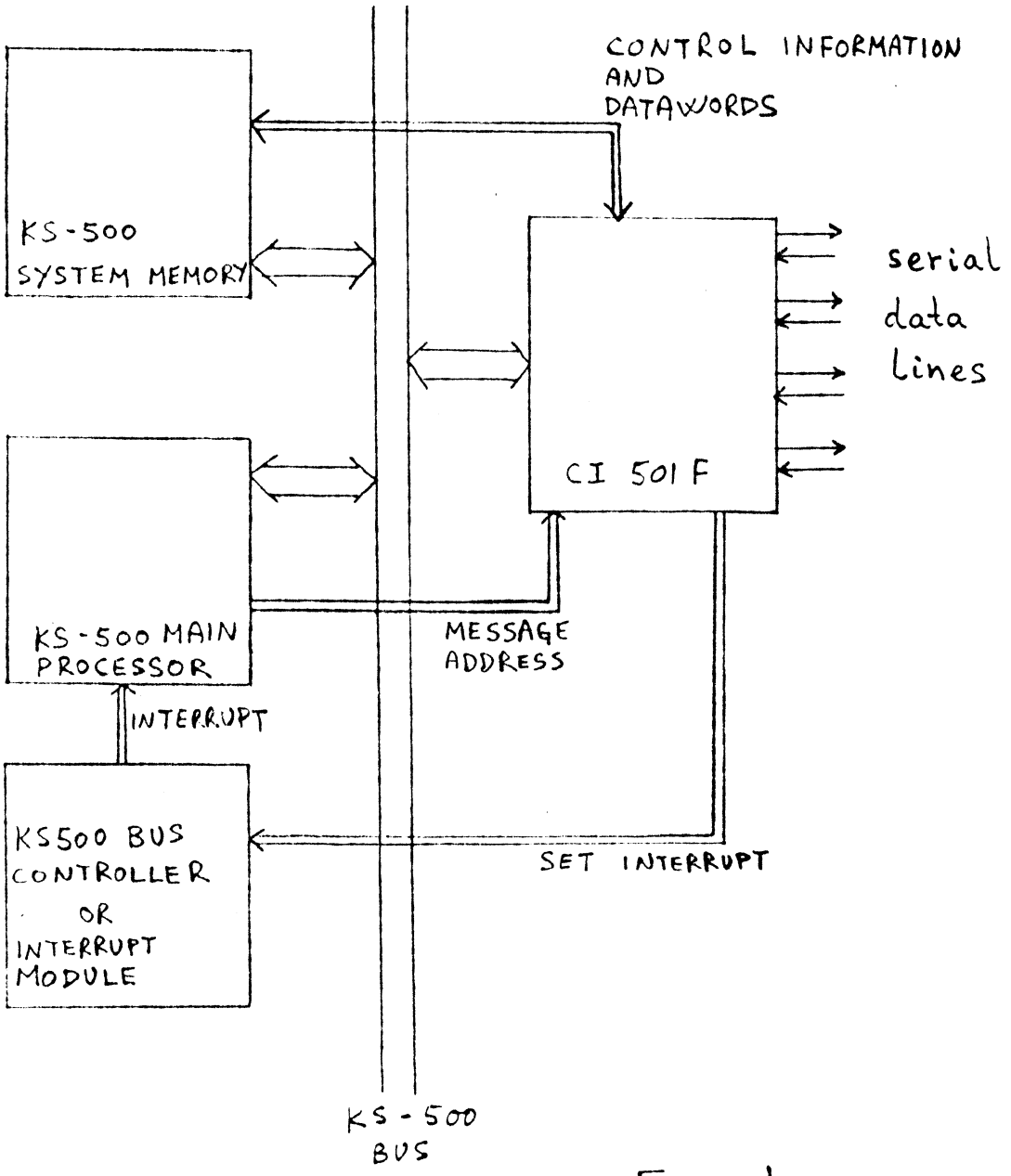

Fig. 1

2.2 Serial Data Interface

2.2.1 Full/half duplex

Each of the 4 data channels is capable of full duplex operation, i.e. simultaneous reception and transmission of data. Half duplex operation is also possible, and a 2-wire connection is possible when using the 20 mA current loop.

2.2.2 Baud Rates

Individual baud rates can be programmed for the 4 channels, but the same baud rate is used for transmission and reception.
The following baud rates can be used:

50	600
75	1200
110	1800
134,5	2400
150	4800
200	9600
300	

2.2.3 Serial Data Format

Character length can be 5, 6, 7 or 8 bits.
If specified, each character can be followed by a parity bit.
The parity can be odd or even. The number of stop bits following a character can be set to 1, 1½ or 2. On input, the microprocessor can check for parity error, framing error and overrun error.

2.2.4 Modem Control

One of the channels (channel no. 1) has 4 control signals that can be used for controlling an asynchronous modem. Two signals are output signals controlled by the microprocessor. Of the input signals, one can be read by the microprocessor while the other is a hardware stop of data transmission (this is CTS - "clear to send" in the V24 standard).

2.2.5 Busy Signals

All 4 channels are supplied with an input signal that can be read by the microprocessor. The signals can be used as a busy indication from the peripheral device. On channel no. 1 this signal is the same as one of the modem control inputs.

3 EXTERNAL CONNECTIONS

Unused pins to be left open unless otherwise noted.

3.1 Serial Data Lines

Three signal types are available:

1) 20mA current loop. Current limiting resistors are available in both receivers and transmitters. Optical isolators are used on each input and output.
If a channel is used as a 2-wire connection (one common current loop for input and output), then this must be specified in software.

2) RS232 signal levels

3) TTL signal levels. Signal marking is low level.

3.2 Control Lines

The modem control signals on channel 0 have RS232 compatible receivers/drivers. The CTS signal must be connected to +5V when not in use, because a low level will block data transmission.

The BUSY signals can be 20mA current loop or RS232 signal levels.

When the BUSY signals are not in use, they should preferably be grounded. Signal ground is available on adjacent pins. If the BUSY inputs are left open, the resulting logic level is unpredictable.

4 BUS CONNECTIONS

All signal lines to the KS-500 bus are according to the requirement specified in the "KS-500 BUS SPECIFICATION" D4.0045.

CI-501F is an active module, and must be placed in one of the active positions in the rack.

5 BOARD LAYOUT

The board layout is in accordance with the KS-500 F SPECIFICATION D4.0059.

6 ENVIRONMENT SPECIFICATION

The environment specification is according to "SPESIFIKASJON FOR KRETSKORT KS-500 FORMAT", F532.77.013. Until components with extended temperature range become available the operating temperature range is 0-70°C.

7 POWER REQUIREMENTS

7.1 +5V. 2,1 A.

Used for the logic circuits on the board.

7.2. +15V, 75 mA -15V, 75 mA.

Used for the RS232 drivers. If the RS232 drivers are not to be used, these power connections can be omitted.

7.3 Power for driving the current loops.

This is 20-24V with a consumption of 25 mA per loop. This power supply is connected to pins on the P2 plug. If galvanic isolation is not necessary, the +5V and -15V supplies can be used. These voltages are available on the P2 plug.