AMK

AMKASYN

VARIABLE SPEED DRIVES

AMKASYN

Communication Card
AB-K02

3297.1E

Part No.: 25793

AMK

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Contents

1 PC Plug-in Card AB-K02

1.1 Short description of function

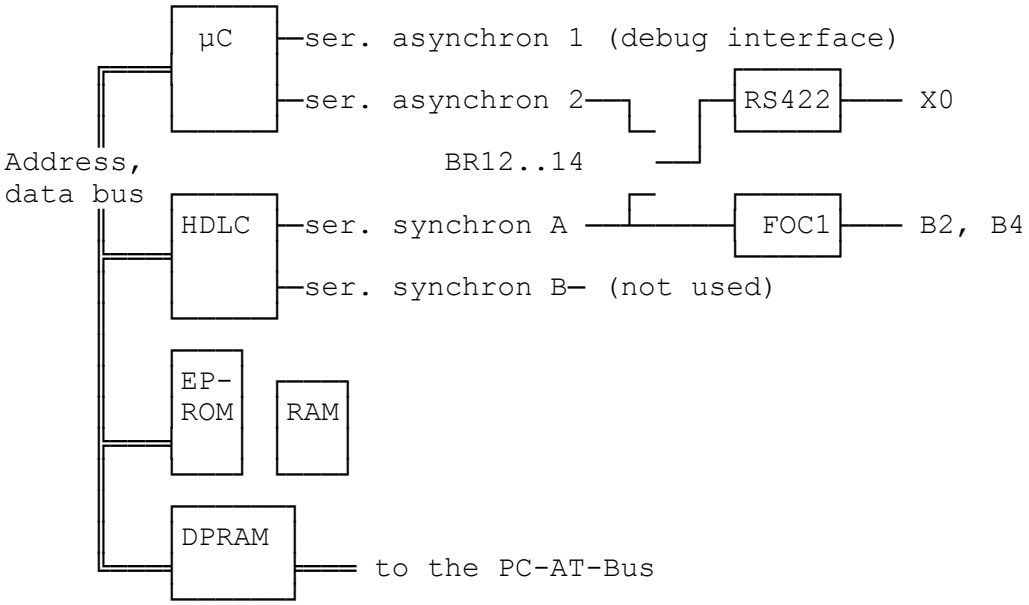
The AB-K02 is an intelligent communication card for use in a PC with PC AT bus. It serves for the data processing linkage of AMK products of the AMKASYN series to PC-based external systems. The AB-K02 occupies an 8 bit slot in the PC with a one half card length. The data exchange between the AB-K02 and the PC is processed through a dual port memory 4 kbytes in size. The address range for the 4 K wide dual port memory is set on the AB-K02 using jumpers. The communication coupling to AMKASYN products (AZ computers) is through a RS 422 interface (15-pin D-Sub) with a baud rate of 19.2 kbd. The transmission is 8 bit binary coded: 1 start and stop bit, no parity.

For data security a CRC check sum is added to each transmitted data block. The CRC check sum is formed according to the generator polynomial described in CCITT V.41. Further data security processes are performed at higher protocol level in the form of acknowledgment, repetition and timeout mechanisms.

The protocol traffic and the protocol contents for the communication with drives of the AMKASYN series are described in the "S-Bus Communication" documentation (komamc_5.doc).

The fiber optic connections attached to the AB-K02 are intended for use with SERCOS interfaces, but are currently not supported by the operating software.

1.2 Block Circuit Diagram and Hardware Description

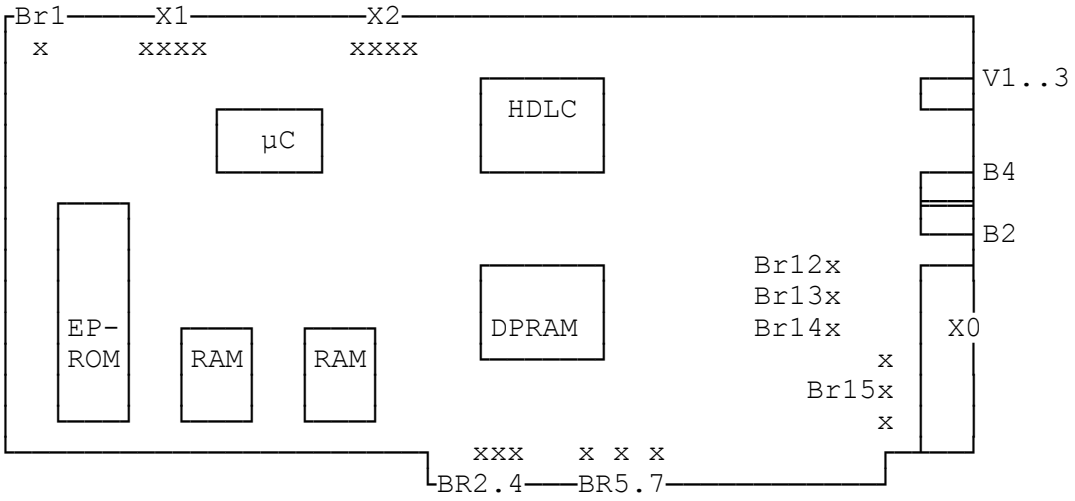


From the two serial, asynchronous interface channels 1 and 2 of the microcontroller, channel 2 is brought out as RS422 interface at the connector X0 (15-pin D-Sub). Channel 1 serves exclusively for test and service purposes and can not be used for applications.

A 2-fold HDLC communication module is provided with a fiber optic connection according to SERCOS specification (DIS) as extension for fast, bus-oriented communication connections (Note: the 2nd HDLC channel is not used).

The RS422 output (X0) can be placed optionally in addition on channel A of the HDLC module or on the serial asynchronous interface channel 1 of the microcontroller (can be set using jumpers). Note: The serial, asynchronous channel 1 can no longer be used if it is used for channel A of the HDLC module.

1.3 Layout Overview



Key:

B2	FOC transmitter channel A
B4	FOC receiver channel A
X0	Serial asynchronous interface RS422 (UART 2) designed as 15-pin S-Sub female connector.
X1	Debug interface
X2	Test signals
V1..V3	LEDs

1.4 Address Space Allocation on the PC AT Bus

The AB-K02 occupies an address space of 16 kbytes in the range from 640 kbytes to 1 Mbyte. The address allocation can be set using the jumpers BR5, BR6 and BR7 (see table). Out of the 16 kbytes of address space, the first 4 kbytes are occupied by the DUAL PORT memory of the AB-K02. In the second 4 kbyte range, interrupts can be triggered on the PC side on the AB-K02 and processor inputs of the AMC2031 microcontroller can be written. The remaining 4 kbyte ranges are not used.

Jumper			PC bus	Remarks
Br 5	Br 6	Br 7	address	
x	x	x	C0000	4 kbytes are allocated
x	x		C4000	per address space
x		x	C8000	
x			CC000	
			D0000	
	x		D4000	
		x	D8000	
			DC000	

x = jumper plugged in

The following ranges are normally allocated:

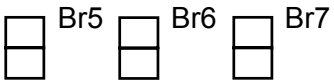
Address range			Use
A0000	-	AFFFF	EGA, VGA screen buffer
B0000	-	B7FFF	Monochrome adapter or EGA
B0000	-	B0FFF	Monochrome screen buffer
B1000	-	B7FFF	Reserved for screen buffer
B8000	-	BFFFF	Adapter for CGA, EGA, VGA
B8000	-	BBFFF	CGA buffer
BC000	-	BFFFF	CGA, EGA screen buffer
C0000	-	C5FFF	EGA, VGA Bios ROM
C6000	-	C7FFF	Bios ROM extensions
C8000	-	CCFFF	Floppy disk drive extensions
CD000	-	CFFFF	User PROM for I/O range
D0000	-	DFFFF	User PROM range

Software products which determine the current allocation of this address space of a PC (e.g. QEMM386 from Quarterdeck) are offered in the trade.

1.5 Setting of the Jumpers

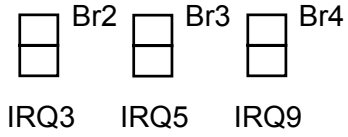
1.5.1 Address Allocation on the PC AT Bus:

See previous section.



1.5.2 Assignment of the PC Interrupts

Three programmable binary outputs on the AB-K02 can be placed by plugging the jumpers BR2...BR4 onto the interrupt inputs IRQ3,5,9 of the PC.



This option is not used currently, i.e. the jumpers BR2...BR4 are not plugged in as default.

1.5.3 Assignment of the RS422 Interface X0

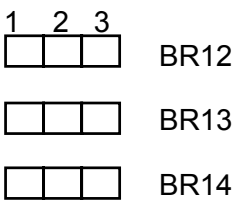
The jumpers BR12...BR14 permit the optional assignment of the RS422 interface X0 to channel A of the HDLC module or to the serial asynchronous interface channel 1 of the microcontroller.

RS422 (X0) assigned to channel 1 of the serial interface (default allocation):

BR12	2-3
BR13	2-3
BR14	2-3

RS422 (X0) assigned to channel A of the HDLC module:

BR12	1-2
BR13	1-2
BR14	1-2



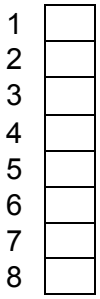
1.5.4 AB-K02 System Reset

A "system reset" is generated by setting the jumper BR1 on the AB-K02 card.
BR1 must always be opened.


BR1

1.5.5 RS422 Bus Termination

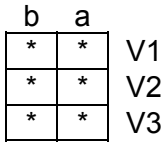
The bus terminating resistors (120 ohms) for the transmit/receive lines of the RS422 interface become effective by setting the jumpers BR15.



With 120 Ω termination: jumpers 1-2, 3-4, 5-6, 7-8
Without bus termination: Remove all jumpers

1.5.6 Allocation of the LEDs

Top view:



LED	Color	Use
V1a	green	No assignment
V1b	green	No assignment
V2a	green	No assignment
V2b	red	Coupled with reset signal
V3a	red	Flashing if token is present, only with optical fibre
V3b	red	Flashing if software major loop is in operation on board (software is processed on AB-K02 card)

1.5.7 Connections for Test and Service Purposes X1, X2

The connections X1 and X2 are intended exclusively for test and debug purposes.

CAUTION !!! No jumpers may be plugged at X1 and X2.
Jumpers can impair operation of the card.

1.5.8 PIN Allocation X0 (RS422)

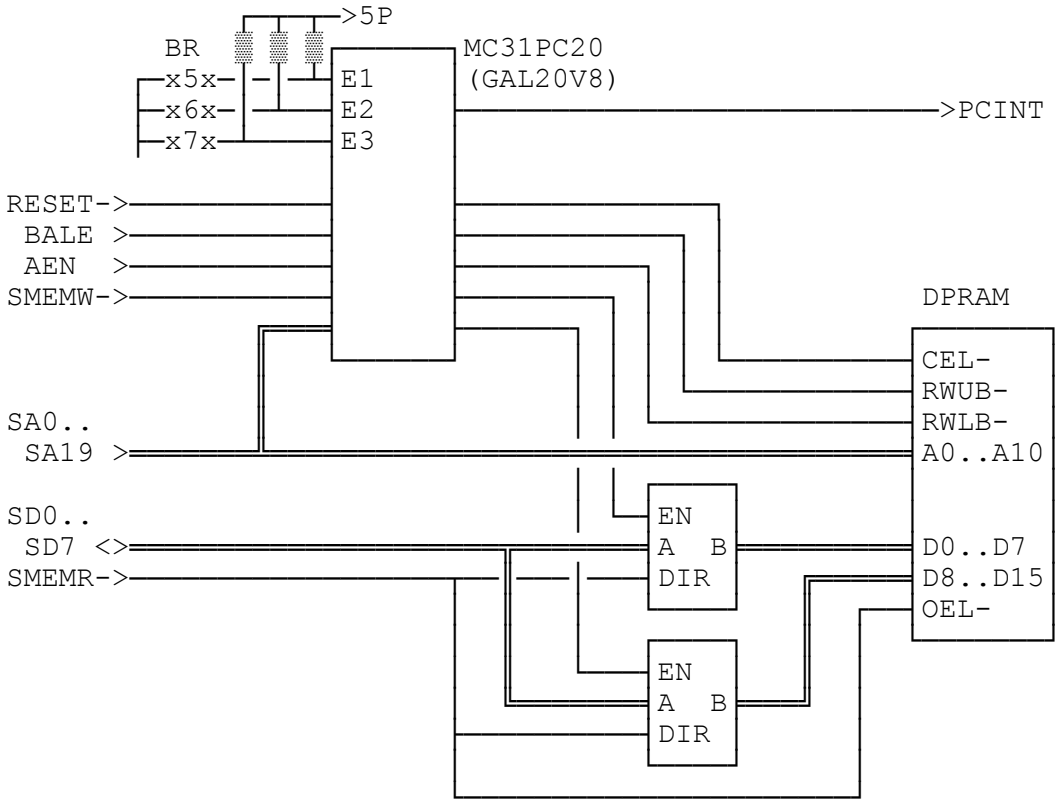
X0	
1	Shield, PE
2	TxD-
3	RxD-
4	RTS
5	CTS
6	TxD-
7	Signal Ground
8	TxD
9	Signal Ground
10	5 P
11	5 P
12	TxD
13	RxD
14	RTS-
15	CTS-

1.5.9 Operation with PC

The AB-K02 card is designed according to the IBM Technical Reference Manual so that it is possible to address the card on the bus side in the address range between 640 kbytes and 1 Mbyte (0xc0000....0xd0000). Take care when installing the card that an address conflict with already existing cards (EGA, VGA, Hercules, network cards, etc..) is avoided (see "Address setting" section).

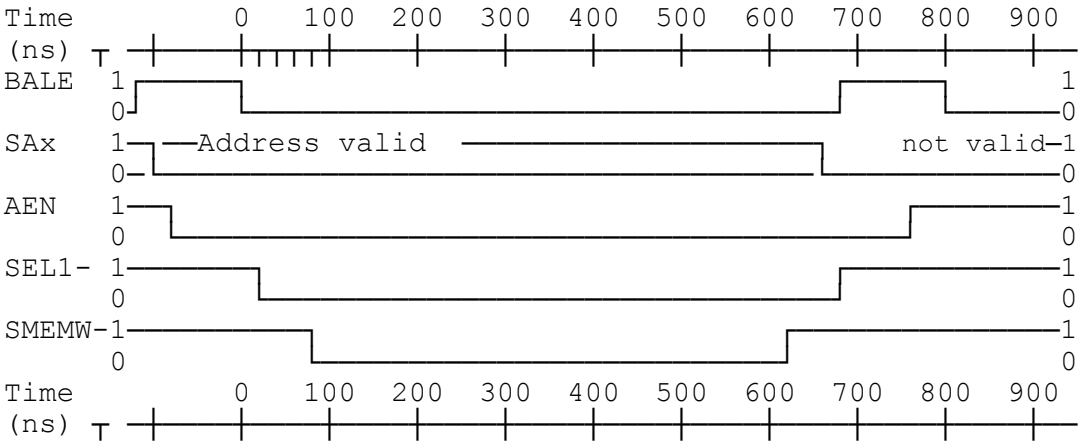
The address range between 640 kbytes and 1 Mbyte is intended for such card extensions according to the Technical Reference Manual. Nevertheless this actually protected range is used for memory access (high memory range). Corresponding drivers (e.g. himem.sys) check this memory range for the presence of cards and display ranges of the system memory in address ranges that are not used by extension cards. Various drivers of this type do not recognize the presence of the AB-K02 (because of DPRAM), so that address conflicts can occur because of this. In these cases remove the high memory drivers or use another high memory driver. Certain high memory drivers also allow address ranges to be masked out selectively (QEMM.SYS). The drivers delivered with MS-DOS 5.0 exhibit no restrictions in this respect.

1.5.10 AT Bus Interface

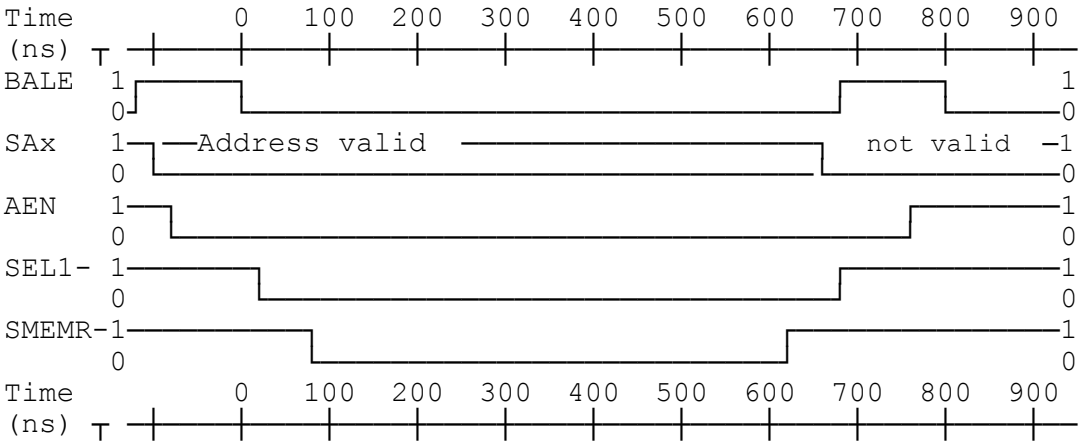


Bloc circuit diagram: DPRAM coupling through the AT bus (AB-K02)

1.5.11 Timing (measured with Logic Analyzer)



Timing diagramm: W R I T E c y c l e (AT bus, FLS computer)



Timing diagramm: R E A D c y c l e (AT bus, FLS computer)