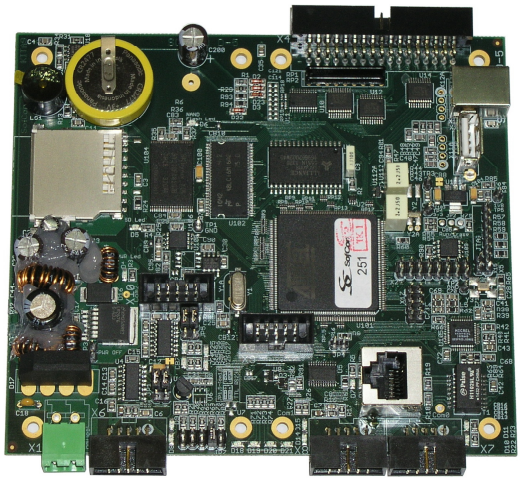
Control Units
KitA9
Industrial PC Control Unit 32bit, 200MHz

SofCon AUTOMATIZAČNÍ TECHNIKA

2.10

- CPU ARM9 200MHz
- OS Linux with RT extension
- SDRAM 32MB
- RAM 512kB, battery stand-by
- NAND Flash 256MB [1)]
- SPI DataFlash 2MB [1)]
- 5x UART (4+1 Debug)
- 2x USB 2.0 (1x Host, 1x Device)
- Ethernet 10/100
- IOBus
- Real-time clock
- WatchDog
- Power Fail Detect
- Beeper
- SD/SDHC card slot
- Power supply unit 5V/3A



Basic characteristic

KitA9 is an industrial control unit. It is based on a 32bit processor AT91SAM9260 with 32MB RAM, 256MB NAND Flash disk, 5 serial communication UART ports and 2 USB ports. The board is equiped with Ethernet, IOBus extension, 512kB battery backed-up RAM, FLASH memory, SD card slot, bus drivers and pulse power supply unit.

IOBus is a SofCon designed bus allowing the connection of SofCon IO cards, such as digital and analog input/output cards, communication cards (RS232, RS485, CAN), programmable IO cards etc. Control application SW may be developed e.g. in Linux operating system extended with RT Preempt Patch. We expect to use the MOSAIC environment for the future.

The application may be debugged directly in the control system which is connected to PC by the Ethernet network or by serial port (debug UART). Control sub-programmes for SofCon IO cards are available in their source form in both Pascal (Free Pascal) and C, C++ (gcc) languages.

User aplication can be stored on internal NAND flash disk, on SPI Flash or on SD card. SD card is removable even when the control unit is switched on after "software disconnection" (suitable for software upgrade, working data export etc.).

Order data

KitA9.XYZZ

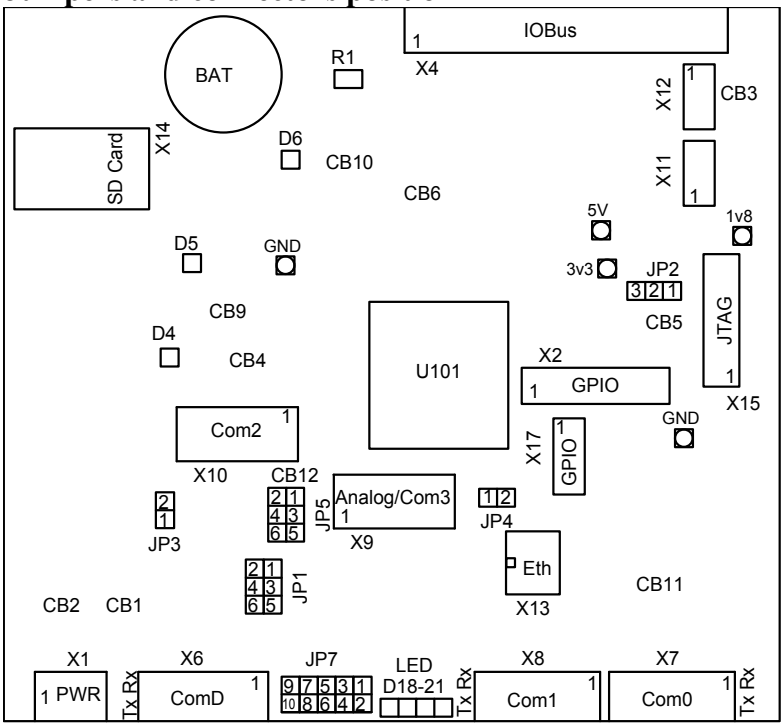
XY	Processor	Uart X10	NAND flash	SPI flash	USB	ETH	Uart X9 /analog	Connectors X4, X7, X8	ZZ	Customer firmware
01	SAM9260	Ne	256M	2MB	1/1	Ano	Ano	KITBOX	00	standard
11	**SAM9260**	**Ano**	**256M**	**2MB**	**1/1**	**Ano**	**Ano**	**KITBOX**	00	standard
02	SAM9260	Ne	256M	Ne	0/1	Ne	Ne	down		
04	SAM9260	Ne	1GB	2MB	1/1	Ano	Ne	down		

Supply on special request: connectors, SD card, extension cards, COM converters ...
A non-standard SW as per customer instructions may be developped by mutual consent.
1) A new customer version **KitA9.XYZZ** may be supplied on special request for quantities >50pcs
(NAND Flash: 512MB, 1GB, 2GB, SPI Data Flash: 4MB, 8MB)

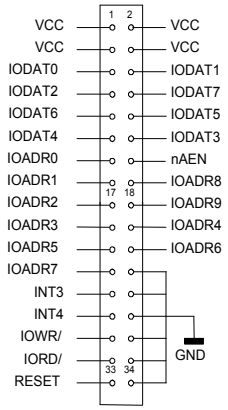
Technical data

Dimensions	122 x 138 x 20 mm
Operating temperature	-40°C to 85°C
Power supply	10 - 24 VAC or 10 - 32 VDC *(PWF below ca 16V (pin PC19))*
Power take-off	max 0,5A at 5V supply voltage
Operating ambiance	Industrial without air-conditioning, free of aggressive gases and fume
Processor	AT91SAM9260 200MHz, support OS Linux with RT, (4kB RAM, 0kB Flash) Option: AT91SAM9xE 200MHz, support OS Linux with RT, (32kB RAM, 512kB Flash)
Memory	32MB SDRAM 512kB battery backed-up static RAM mapped to the control unit memory space 2MB SPI FLASH mapped as a disk or as a file.(up to 8MB)
Semiconductor disk	Internal NAND Flash 256MB (up to 2GB), external SD/SDHC card
IOBus Interface	Interface designed for IO cards connection. Up to 8 cards may be connected, they may contain input and output registers, counters, A/D and D/A convertors, digital inputs and outputs, galvanic separation.
Serial channels	5x UART (RS232, 2x RS232/TTL, TTL, RS232 Debug) 4x FIFO 512B by DMA, Debug without FIFO Ethernet 10/100, 2x USB (1x host / 1x device)
WatchDog	WDT, 1x software adjustable minimum operational period from 30,5µs to 15s IRQ, RST may be generated.
Power supply unit	Pulse, output 5V/3A

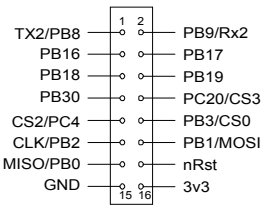
Jumpers and connectors position



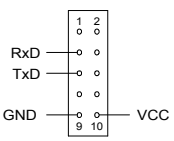
X4
IO Bus



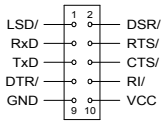
X2



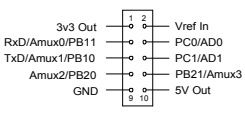
X6, X8, X10
ComD, Com1, Com2



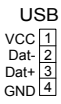
X7
Com0



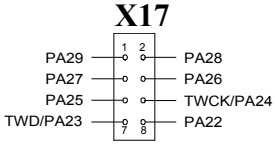
X9
Com3 / Analog



X11, X12
USB



X17



System console on ComD (X6) is set to 115200Bd, 8bit, 1stop, parity None VT100 (system terminal keyboard and monitor). ComD does not have FIFO.
X15: debug interface JTAG

Jumpers and connectors description

LED: indication diodes

LED	GPIO	Meaning
D18	PC28	heartbeat of CPU
D19	PC29	User1
D20	PC30	User2
D21	PC31	User3
D4	-	PWR 5V
D5	PA3	SD card act.
D6	PC14	NAND flash act.

JP7: User jumpers and reset.

JP7	GPIO	Význam	
1-2	nRST	Reset	
3-4	PC27	RunAppl	*
5-6	PC26	Clear Backup RAM	*
7-8	PC25	Set default IP	*
9-10	PC24	User	
sudé	GND	-	

Default IP = 10.0.0.250, Mask = 255.0.0.0
*) jumpers are read only after start.

Setting COM1 and COM3

Com1 (X8)	JP1	Com3 (X9)	JP5
RS232	1-3,2-4	RS232	1-3,2-4
TTL	3-5,4-6	TTL(3V3)	3-5,4-6

Power supply unit switch off, processor erasure:

Zdroj	JP3
OFF	ON
ON	OFF

JP2	Flash 9xE
1-2	Erase
2-3	Run

ComD (X6) contains only Rx, Tx, Gnd, RS232
Com0 (X7) is full TTL,
Com1 (X8) contains only Rx, Tx, Gnd, podle JP1.
Com2 (X10) contains only Rx, Tx, Gnd, RS232
Com3 (X9) **may be connected only with Rx, Tx, Gnd, 5V Out**,
it is strictly forbiden to connect anything to the other pins! (levels acc.to JP5)*

JP2: Erasure of the processor internal flash (only for SAM9xE)
– entry into basic loading mode.
1-2 (anytime when power supply is on) erases the processor internal FLASH memory.
2-3 Common operating.
JP4: Erasure of boot SPI flash U106 (only for SAM9260)

*On X9 optionaly, analog signals may be connected through a SofCon reduction. Currently not available.

Jumper **JP4** (GPIO PB28) serves to erase booting SPI flash U106 for SAM9260 processor.
Processor is unable to boot after this erasure and this memory must be loaded in SofCon company again.
(default disconnected, tested after reset)

The Soldering coupler blocks CBx are preset at manufacturing and it is not allowed to modify them.

CB1 a **CB2** serves to bypass the D17 bridge D17 at DC power supply to reduce losses, not necessary.
CB3 serves to connect power supply from USB (in case we do not want to use X1 for power supply).
CB4 serves to connect reset to booting SPI flash U106 (default disconnected).
CB5 is connected for SAM9260 processor, and is disconnected for SAM9xE.
CB6 is set according to the fitted SRAM size.
CB7 a **CB8** serves to measure power take-off from both 3V3 and 1V8 sources.
CB9 a **CB10** serves to disconnect memories that proccesor can boot from (only for AT91SAM9260).
CB12 connects analog input AD1 to source input voltage measuring. It can be used in X9 if disconnected.

Power supply	CB1,CB2
AC	OFF
DC	ON

Vcc USB	CB3
Kit <- USB	ON
Kit<- X1	OFF

CS SPI0	CB9
OK	ON
Disconnected	OFF

CS Nand	CB10
OK	ON
Disconnected	OFF

CB1-2,3,6,11 are at the bottom of the board.