

# KITV40 - Industrial Control System

KITV40 is a small single-board computer designed as a multi-purpose control unit to be used in industrial control systems, machines, devices, controllers, or data collection systems. It is based on the 16-bit V40 processor that is compatible with the Intel 86 processor. The following interfaces are designed to connect to peripheral devices and extension modules: system bus, IO bus, P bus and serial communication line. A number of digital and analogue extension modules are manufactured to be used with the interfaces stated above, enhancing the basic hardware and allowing to connect a number of various devices. Analogue A/D and D/A converters are used to monitor and control pressure, temperature and revolution speed. Digital inputs and outputs can be monitored and controlled by switches of various types. Power components (230/380V) can be directly controlled by additional output modules. You can also select additional modules to create a configuration best suited to the given application. The user may also connect his own modules.



## Basic Technical Specifications:

Size	122 x 138 x 25 mm, the board can also be placed in mounting frames onto the DIN/EN TS 32 and TS 35 bars				
Operating temperature	0 - 50 °C				
Power supply	+5 V/200 mA regulated or 9to24 VDC or 9to24 VAC				
Processor	V40 manufactured by NEC, 16 MHz (i8086 + 8259 + 8254 + 8251 + 8237)				
Memory	RWM 32 to 512 KB, standby lithium battery, a part of memory is random-write-protected ROM 64 to 512 KB				
Counters/timers	i8254	1x	system	channel	circuit timer available
	- 1x asynchronous		clock /	counter	
	- 1x counter available				
Serial channel	Serial asynchronous channel i8251 with max. transmission rate 19200Bd. Communication interface is an incomplete RS-232 (TxD, RxD) or COM bus				
DMA channel	i8237 type circuit				
Daily clock	RTC 64613A circuit, standby lithium battery. Year, month, day, hours, minutes, seconds				

Watch-Dog	MAX 690 security circuit - monitoring the supply voltage - PFI monitor generating a non-maskable interrupt in the event of a power failure - RESET generator - Watch-Dog security feature
Control signalling	LED diode
COM bus	used to connect COM modules to convert the TTL level to the level required by the given communication interface (RS-232, RS-485, ..)
SYSTEM bus	Interface designed to connect modules requiring specific control. The interface includes data, address and control signals of the processor and is designed to connect a single module. Signals : D0..D7, A0..A19, S0..S2, IOR/, IOW/, MRD/, MWR/, ALE, DMARQ, DMAAK, IRQx, RESET/, CLK , AEN/, CLKIN, CLKOUT, CTL, ...
IO bus	Interface designed to connect IO modules. Can connect as many as 8 modules that may contain input and output registers, i8255, i8254 circuits, A/D and D/A converters, digital inputs and outputs, galvanic separation. Signals : D0..D7, A0..A9, IRQ3, IRQ4, IOR/, IOW/, AEN/, RESET/
P bus	Interface designed to connect P modules: - 2x 3x 8 parallel I/O with the programmable direction switch - 8 parallel outputs all outputs are equipped with performance exciters and pass to the third state while the computer is reset; to connect these, write the value to the appropriate I/O address

## Extension Modules

For a brief list of the SofCon extension boards and the KIT modules, click [here](#).

- IO modules**  
 The IO bus allows to connect as many as 8 I/O boards. These boards contain analogue and digital inputs and outputs, counter inputs, communication channels, etc. SofCon also develops customer boards, if they are manufactured in series. For a detailed list of IO-boards, click [here](#).
- COM modules**  
 The COM bus allows to connect COM modules that transfer the TTL level of the COM bus to the RS232, RS485 levels, etc.
- P modules**  
 P modules contain power components, such as transistors, relays, solid state relays. You connect these modules either to P-bus or to galvanic-insulated inputs or outputs, for example, to the IODIO01, IODOO01, IODXO01 boards. The standard control for output modules is 24V, on demand also 5V or 12V. For a detailed list of P modules, click [here](#).
- Terminal boards**  
 Terminal boards are used as interface between the control system and its environment. From one side, there is a flat cable connection using cutting connectors, on the other side, there are cabling clamps. Terminal boards can be placed in mounting frames to be directly fitted onto the DIN/EN TS 32 and TS 35 anchoring bars. For a detailed list of terminal boards, click [here](#).
- EXPANDER modules**  
 Expander modules are designed to connect to the SYSTEM bus. Only one expander module, EXPPC00 is

available. It can be used for 8-bit ISA VGA card and PC XT compatible keyboard connection.

## Programming

To program SofCon control systems, you can use the two following platforms.

The first platform is [Borland Pascal Development Environment / ReTOS o.s.](#) This environment allows you to fully utilize all SW and HW features and to program all types of control tasks that require very fast responses. To achieve this, write the application directly in the Borland Pascal programming language and use a large number of the SofCon libraries. This platform requires professional programming skills

The other platform is [KIT-Builder Development environment](#). This environment provides easy programming of simple control tasks that do not require very fast responses. You write your application in the KIT-Basic language that is partly compiled and partly interpreted while the program is running. This platform does not require professional programming skills. You can use the graphic support to design terminal screens.

## Conclusion

We believe that with its high performance, low power supply and small size, the KITV40 microcomputer kit will satisfy a wide range of applications and find customers working in areas of regulation, automations and control.

Within a short time period and on demand, SofCon Ltd. is capable to design, manufacture and supply both hardware and software for any given application, or to participate as a consultant in solving specific tasks