

Linux-based Automation Controller UFK040404

Introduction

This (DIN-rail mountable 5 modules wide) programmable controller can be interfaced with a variety of sensors and actuators. The device has outstanding performance, versatility and reliability.

The device is modular, consisting of a control computer board (Khadas VIM1) and a special Modbus-compatible I/O-board (UF040404). The boards are connected via UART cable, providing also 5 Vpower supply to the computer board.

The operating system of the controller's internal computer is Ubuntu Linux, which can be freely managed, upgraded and/or changed by the admin user. The control computer board with a 4-core ARM-processor has 2GB of RAM and uses 8 GB of eMMC non-volatile memory. <image>

There are no restrictions on programming languages or application software.



On the image on the left, the input-output (I/O) signals of the controller are listed next to the corresponding pins of the pluggable terminal blocks (with 3.5mm pitch spacing).

See also the suggested representation of the controller in the electrical wiring diagrams on the next page (HDMI output not shown).

The controller conforms to the following EU standards: EN 55022 criterion B, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6.

tur						
µSB−A host receptable	U <u>S1</u>	051	PAC	A	<u>XM</u> ,2	£5485 Une A
µSB−A host receptable	U <u>S 2</u>	U52		в	<u>XM</u> ,1	₽5485 lîne B
µSB−C receptable	U <u>SB</u>	U\$3		REF	<u>е, м х</u>	\$\$485 REF (weak digital ground)
Ethernet receptable	ĘTH	ETH		D01	<u>X0</u> ,1	<pre>piscrete output 1 (sourcing, max load 1A)</pre>
Discrete input 1	X <u>1,1</u>	D[1		D02	<u>X0</u> ,2	Discrete output 2 (sourcing, max load 1A)
Discrete input 2	X <u>1,2</u>	DI2		DOB	Е, <u>ОХ</u>	Discrete output 3 (sourcing, max load 1A)
Discrete input 3	X <u>1.3</u>	D13		D04	<u>X0</u> ,4	Discrete output 4 (sourcing, max load 1A)
Piscrete input 4	X <u>1.4</u>	D[4		DG2	<u>X0</u> ,5	.pigital ground
Pigital ground	X <u>1,5</u>	DG1		DG3	<u>Х</u> ¥,З	.pigital ground
Analog input 1 (0"28mA)	X <u>A,1</u>	A[1		1W	<u>XW</u> .2	DneWire data (max 18 DS18828 temperature sensors)
Analog input 2 (0.,20mA)	X <u>A.2</u>	AIZ	+	5V	<u>XW</u> 1	"5V 1A AUX (usable for power input or output, fused)
Analog input 3 (0,10V)	Х <u>А,</u> Э	AIB		V.9	<u>XP</u> ,1	Discrete output power supply 12,36V DD
Analog înput 4 (018V)	X <u>A.</u> 4	A[4		VS	<u>XP</u> ,2	Main power supply 7,28V DC
Analog ground	X <u>A.5</u>	AGD		GND	<u>хр</u> ,з	Power ground

Electrical wiring diagram of the controller

Technical data

Mounting: 35 mm DIN-rail, width 5 modules (88 mm) Operational environment: Temperature from -20 to +60 °C. Humidity up to 95% (non-condensing). Tested and approved for both home/office and industrial use.

Power supply:

Main supply voltage: 7..28 VDC 2.2 W. Output supply voltage: 7..36 VDC, power depends on load.

Main processor:

S905x ARM, 4 core, 1.5 GHz RAM: 2 GB, Flash: 8 GB, Op-system installed: Ubuntu Linux Video: HDMI USB-interfaces: 2 x USB-A + 1 x USB-C Internet connectivity: WiFi (802.11b/n/g), wired LAN (10/100BaseT) or GSM dongle

I/O/processor: PIC18F46K80

Discrete inputs (DI): 4 channels, voltage (max 27V) or pulled-down signal *Every discrete input is equipped with a 32-bit counter.* DI channels are also usable for interfacing with up to two Wiegand-readers.
Analog inputs (AI): 2 channels 0..20mA and 2 channels 0..10V; all with 12 bit ADC.
Discrete outputs (DO): 4, sourcing 1 A max per channel, protected. Output voltage depends on output supply voltage. Output on every channel is available at steady level or as pulses with defined length. Pulse output can be in monovibrator or multivibrator mode (with defined period).
Temperature sensor support: Dallas onewire, for up to 18 sensors DS18B20.
I/O extensibility: via RS485 / ModbusRTU or Ethernet / ModbusTCP. RS485 communication parameters 9k6..115k2, parity None or Even.

For detailed information about the I/O-capabilities and Modbus-registers in use, check the manual for the I/O-module UF040404.