

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7647-0AA00-1YA2

INDUSTRIAL IOT GATEWAY COMPUTER

Used with the applicable SIMATIC IOT2040 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens exact-article technical data, 6ES7647-0AA00-1YA2

Motherboard

Processor	- SIMATIC IOT2020: Intel Quark X1000, 400 MHz - SIMATIC IOT2040: Intel Quark X1020, 400 MHz
RAM	- SIMATIC IOT2020: 512 MB - SIMATIC IOT2040: 1 GB
BIOS SPI Flash	8 MB
Micro SD	Slot for one Micro SD card
Expansion slots	1 x Arduino shield
	1 x mini PCIe for PCIe cards 30 x 50.59 mm or 30 x 26.8 mm via adapter

Interfaces

All devices of the type SIMATIC IOT2000	
USB Type A, X60	USB 2.0 host, high current, max. 2.5 W/500 mA
USB Typ Micro B, X61	USB device interface
LAN interface X1 P1, RJ45 ¹	SOC LAN controller
Additionally with SIMATIC IOT2040	
LAN interface X2 P1, RJ45 ³	SOC LAN controller
COM X30, X31	- RS 232 ², max. 115 Kbps, D-sub connector, 9-pin - RS 422 ^{2 3}, max. 115 Kbps, D-sub connector, 9-pin - RS 485 ^{2 3}, max. 115 Kbps, D-sub connector, 9-pin Maximum permitted cable length at the RS 485: 30 m Maximum permitted cable length at the other COM ports: 1000 m

¹ For unique labeling, the LAN interfaces are numbered on the enclosure. The numbering by the operating system can differ.

² You can use any COM port as an RS 232, RS422 or RS 485 interface through the software-controlled interface parameter assignment. Possible parameters: "Auto-flow-control", "Onboard termination", "Half-duplex" or "Full-duplex"

³ Termination can be set with the software.

Additional information on parameter assignment is available in the SIMATIC IOT2000-Forum, see section "Software and commissioning (Page 24)".

7.4.2 Ambient conditions

Climatic ambient conditions

The temperature values have been checked in accordance with IEC 60068-2-1, IEC 60068-2-2 and IEC 60068-2-14. Permitted mounting positions, see section "Permitted mounting positions and mounting types (Page 17)".

Ambient temperature	
• Operation	0 ... 50 °C *
• Storage/transport	-20 ... 70 °C
Gradient	
• Operation	Max. 10 °C/h
• Storage	20 °C/h, no condensation
Relative humidity, tested in accordance with IEC 60068-2-78, IEC 60068-2-30	
• Operation	5 ... 85% at 30°C, no condensation
• Storage/transport	5 ... 95 % at 25/55 °C, no condensation
Atmospheric pressure	
• Operation	1080 ... 795 hPa, corresponds to an elevation of -1000 m to 2000 m
• Storage/transport	1080 to 660 hPa, corresponds to an elevation of -1000 to 3500 m

* Also note the following section "Power consumption of the components".

Mechanical ambient conditions

Vibration resistance, tested in accordance with IEC 60068-2-6	
• Operation	Vibration load 1g, 10 cycles per axle: • 5 to 8.4 Hz, deflection 3.5 mm • 8.4 to 200 Hz, acceleration 9.8 m/s²
• Storage/transport	• 5 to 8.4 Hz: Deflection 3.5 mm • 8.4 Hz to 500 Hz: Acceleration 9.8 m/s²
Impact resistance, tested in accordance with IEC 60068-2-27	
• Operation	150 m/s ² , 11 ms
• Storage/transport	250 m/s ² , 6 ms

7.4.3 Power demand of the components

Maximum power consumption of the auxiliary components

The information in the table below applies to the horizontal mounting position of the device at an ambient temperature of 50 °C.

Auxiliary components	Maximum permitted power consumption			Maximum total power
	+5 V	+3.3 V	+1.5 V	
All components				6 W ³
Arduino shield				Permitted power distribution: • Arduino shield: 4 W, Mini PCIe card: 0 W, USB: 2.5 W • Arduino shield: 2 W, Mini PCIe card: 1 W, USB: 2.5 W • Arduino shield: 0 W, Mini PCIe card: 2 W, USB: 2.5 W
Mini PCIe card	--	1.5 A ¹	0.3 A ²	
USB 2.0 high current	500 mA	--	--	

¹ May amount to maximum 3.0 A for up to 100 ms at start-stop torque of device

² May amount to maximum 1.2 A for up to 100 ms at start-stop torque of device

³ With maximum total power, the permissible ambient temperature for the vertical mounting position is reduced to 45 °C

Note

Device can overheat!

The power supply cannot make unlimited power available. The auxiliary components consume energy and produce heat.

The device may overheat. The device and the auxiliary components may be damaged.

7.4.4 Direct current supply (DC)

Technical specifications

Input voltage	DC 9...36 V
Power consumption	max. 10 W

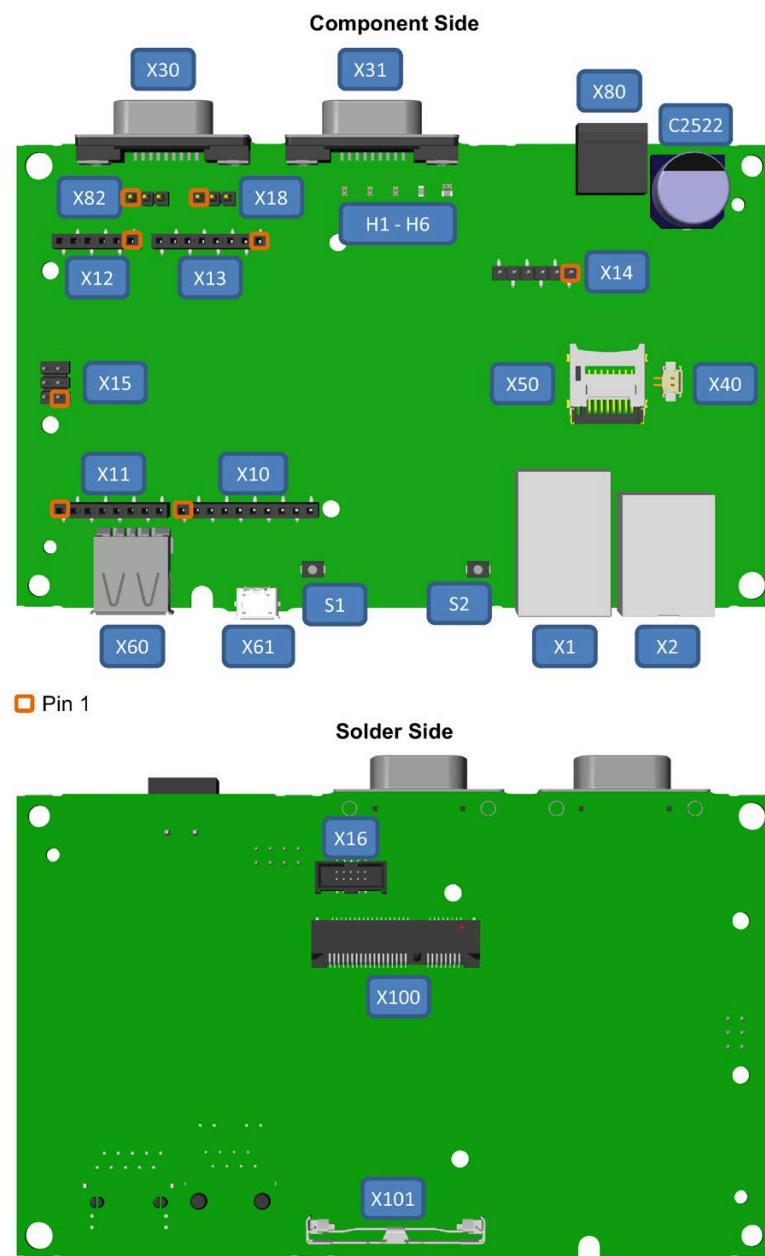
Typical power consumption

	Power consumption (at a rated voltage of 24 V)
Basic device	3.5 W
Arduino shields	See section "Power demand of the components (Page 41)"
USB ports	
Expansion cards	

7.5 Hardware descriptions

7.5.1 Motherboard

The following figures show the motherboard of the SIMATIC IOT2040. The interfaces X30, X31 and X2 are not present in SIMATIC IOT2020.



Component/interface	Description / inscription		Meaning, comment
H1	LEDs	PWR	Power (green)
H2		SD	Micro SD card active (green)
H3		USB	USB Power (5 V) is available (green)
H4		OC	OverCurrent (red)
H5/H6 *		USER	User LED (green/red*/orange*), programmable
S1	RESET		For a reset of the CPU
S2	USER		Status can be queried with programming
X1	Ethernet1		
X2	Ethernet2 ready for PoE		
X30, X31	COM D-Sub9		
X60	USB A		
X61	USB B Micro		
X14	UART Debug		
X40	Battery-Con		
X50	μSD slot		
X11, X13	Arduino, 8-pin (2x)		
X10	Arduino, 10-pin		
X12	Arduino, 6-pin		
X15	ICSP		Part of Arduino Interface
X16	JTAG Internal		
X80	Power supply		
X18	Jumper 3 pin SMD		Jumper defines IO voltage for Arduino shield: • Jumper on pins 1-2: 5 V • Jumper on pins 2-3: 3.3 V
X100	MiniPCle Con.		
X101	Latch		
X82	VIN Separation (power supply, 9...36 V DC)		Jumper defines VIN connection to the Arduino shield: • Jumper on pins 1-2: VIN is connected to the Arduino shield • Jumper on pins 2-3: VIN is not connected to the Arduino shield

* The LED H6 is only available with SIMATIC IOT2040.