Industrial Cellular Routers & Gateways

ICR-4453

Ultra High-Speed 5G Router & Powerful Edge Computing Gateway

Features

- 5G NR Cellular Connectivity, Sub-6GHz
- 3GPP Release 15, Support both NSA and SA modes
- Quad-core CPU with 1 GB RAM
- 2× SIM, eSIM Ready, TPM 2.0
- 5× Gigabit Ethernet (Optional 4× PoE+ PSE)
- SFP Connector for SFP modules up to 10 Gbps
- GNSS Receiver
- RS232, RS485, CAN BUS, 2× DI, 2× DO, USB Host
- Micro SD Card, SSD disc (Customization)
- Robust metal cover with wall and DIN mount options
- Wide operational temperature range
- Optional Dual-Band WiFi

Introduction

The ICR-4453 is an Ultra-high-speed 5G NR (New Radio) Router & Powerful Edge Computing Gateway focused on the global market. The 5G „gigabit" speed, low latency, and guaranteed quality (SLA) of connectivity is a real step to massive IoT and Enhanced mobile broadband (eMBB) applications - Mobile Internet access, Camera and security systems, Industrial systems, and many other high data demand applications. The router supports fallback via LTE (LTE-A Pro) and 3G networks for areas where 5G coverage is not developed yet.

The new router platform "v4" provides intelligence at the network edge with an extremely powerful Cortex A72 CPU at 1200 MHz, 4 GB eMMC memory, 4 MB flash memory, and 1024 MB RAM. The focus on high security underlines using TPM 2.0, and Tamper Button that ensure safe use in critical infrastructure systems.

The ICR-4453 is powered by the ICR-OS Linux operating system that provides a wide range of enhanced networking features. A secure Web interface allows users to configure and manage routers from remote locations. The router supports multiple configuration profiles, automatic firmware updates, etc. The router can be used as a powerful EDGE computing gateway because of the support of many ways of software customization. Users may insert Linux scripts and add new features by additional applications called Router Apps (User Modules).

There is an existing free library of Router Apps or the user may create own app using Advantech SDK. The gateway can easily run applications like Node-RED or Docker (planned) that open the way to a multi-container world.

The ICR-4453 is designed and manufactured for use in tough environmental conditions. Specifications include a wide operating temperature ranges from -40 to +75 °C. It accepts input voltage range from 9 V DC to 48 V DC and is equipped with sleep mode for reducing electrical consumption.

As a standard, ICR-4453 is equipped with five Ethernet 10/100/1000 Mbps (1× independent and 4× switch), SFP cage (independent port), one USB host 2.0, microSD reader, serial lines RS232 and RS485, CAN Bus, two binary inputs, and two binary outputs. This router contains two SIMs readers, which are placed on the rear side of the device. There is also the possibility to use one eSIM. ICR-4453 has two mPCIe connectors that can be used for two WiFi modules. The router is supplied in a robust metal casing for a wall mount (DIN mount is optional).

ICR-4453 is easy to manage using WebAccess/DMP, full-featured cloud-based management, provisioning, and monitoring tool for mass deployment. The WebAccess/VPN is a perfect way how to create secure virtual private networks on the Internet.

RouterApp WebAccess/DMP WebAccess/VPN

Order Codes

Model no. - Order Codes		REGION	5× Gigabit Ethernet	4× PoE PSE+	SFP cage (up to 10 Gbps)	RS232 RS485 CAN BUS	GNSS	I/O	4× ANT	2× SIM	WiFi 802ac
	ICR-4453	EUROPE NAM	✓		✓	✓	✓	✓	✓	✓	
	ICR-4453S	EUROPE NAM	✓	✓	✓	✓	✓	✓	✓	✓	
	ICR-4453W	EUROPE NAM	✓		✓	✓	✓	✓	✓	✓	✓
	ICR-4453WS	EUROPE NAM	✓	✓	✓	✓	✓	✓	✓	✓	✓

All product specifications are subject to change without notice.
Last updated: 22-Jun-2021

ICR-4453, ICR-4453S, ICR-4453W, ICR-4453WS

Specifications

System	
CPU	Quad-Core ARM Cortex-A72, 1200 MHz
Memory	RAM - 1024 MB eMMC - 4096 MB (838 MB for Router Apps, 512 MB for customer data)
Watchdog	HW Watchdog
RTC	Battery backup RTC
TMP	Trusted Platform Module (TPM) 2.0
Interfaces	
Ethernet	5× Ethernet (4+1), RJ45, 10/100/1000 Mbps *Optional 4× PoE PSE, IEEE 802.3at, 25.5 W
SFP Cage	1× SFP cage (up to 10 Gbps)
Serial Lines	1× RS232 (Tx, Rx, GND, RTS, CTS) 1× RS485 (A(-), B(+), GND) 1× CAN (CAN_H, CAN_L) (14-pin terminal block)
I / O	2× Digital Input (3 mA consumption) 2× Digital Output (Open Drain, 48 V / 500 mA) (14-pin terminal block)
USB	1× USB 2.0 Host Connector
MicroSD Card	1× Micro SD Card Slot
Reset Button	Reboot / Factory reset
LED Indicators	System, 3-level signal strength, Data activity, SIM1/SIM2 status, 3G/4G/5G technology, 2× Input, 2× Output, User, ETH

Environmental	
Power Supply	9 – 48 V DC (2-pin terminal block)
Consuption	**Without WiFi** Idle 4.6 W / Average 6.1 W / Peak 14 W **With WiFi** Idle 5.9 W / Average 8.1 W / Peak 16 W **PoE PSE without WiFi** Idle 4.9 W / Average 6.1 W / Peak 128 W **PoE PSE with WiFi** Idle 6.2 W / Average 8.1 W / Peak 130 W
Sleep Mode	Yes, 24 mW, 310 mW for PoE PSE
Operating Temperature	-40 to +75 °C
Storage Temperature	-40 to +85 °C
Humidity	0 to 95 %
IP Cover	IP30
Physical Characteristics	
Dimensions	47 × 109 × 195 mm
Enclosure	Robust Metal Case, Grounding Screw
Mounting	Wall Mounting, DIN Rail (optional)
Weight	1275 g

GNSS	
Antenna	1× SMA connector, active (50 mA), passive
Systems	GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS
Protocol	NMEA
Ac Time-to-First-Fix	Cold 25 s, Warm 10 s
WiFi - optional	
Dimensions	3× R-SMA connectors, 3×3 MIMO
Enclosure	IEEE802.11 ac/a/b/g/n 2.4 GHz / 5 GHz
Mounting	WEP, WPA, WPA2, 802.1X
Weight	Access Point (unlimited clients), Station, Multirole STA & AP

Cellular Interface	
SIM Slots	2× SIM (Mini SIMs – 2FF) 1× eSIM Ready
Antennas	4× SMA connector
5G NR frequency bands	5G NSA Bands: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79 Transfer rate: 2.5 Gbps (DL), 650 Mbps (UL) 5G SA Bands: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79 Transfer rate: 2.1 Gbps (DL), 900 Mbps (UL)
LTE Parameters	Supported frequency bands: B1/B2/B3/B4(B66)/B5(B18/B19/B26)/B7/B8/B12(B17)/B13/B14/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46(LAA)/B48/B71 Transfer rate: 1 Gbps (DL), 200 Mbps (UL)
HSPA+/UMTS Parameters	Supported frequency bands: B1/B2/B3/B4/B5/B6/B8/B19 Transfer rate: 42 Mbps (DL), 5.76 Mbps (UL)

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Software	
Operating System	ICR-OS (Linux based)
SW Customization	Router App (User Modules)*
Application Development	Open Linux, *Python, BASH, C/C++, *Node-RED, *Docker
Networking Features and Protocols	DHCP, NAT/PAT, SSH, VRRP, PPPoE, SNMP, SMTP, Dynamic DNS client, DNS proxy, VLAN, QoS, *DMVPN, NTP Client/Server, *Routing protocols RIP, BGP, OSPF, IS-IS, NHRP, Backup Routes, Port Forwarding, Host Port Routing, Ethernet Bridging, Load Balancing, IPv6 Dual Stack
Industrial Protocols and IoT	*Modbus RTU/TCP gateway, *IEC 60870-5-101 to 104 gateway, *DF1, *DNP3, *MQTT, *LWM2M
Security	HTTPS, SSH, SFTP, DMZ, Firewall (IP Filtering, MAC address filtering, Inbound and outbound Port filtering) VPN Tunneling – OpenVPN, *EasyVPN, IPsec with IKEv1 and IKEv2, GRE, L2TP, PPTP Authentication – RADIUS, TACACS+, *SCEP Encryption – DES, 3DES, AES, RSA, MD5, SHA
Firmware Management	Automatic firmware updates – server, locally via LAN or remotely via WAN Over-the-Air cellular module firmware updates
Diagnostic/Log	Status – Signal Strength, Data Usage, Detailed Long Term Statistics One CLICK report – Current Configuration, Factory Identification, Routing Table Log – System Log, Reboot Log, Kernel Log Remote Diagnostics (via SSH)
Event Engine	StartUp script & Up/Down script (Own rules based on Digital Inputs, Network Parameters, Data Usage, Timer, Power, Device Temperature) Report Types: SMS, email, SNMP Trap
Configuration	Web server, SSH, Four configuration switchable profiles, Automatic configuration update from server, Backup & Restore configuration
Advanced Software Tools	WebAccess/DMP – Remote Device Provisioning, Monitoring & Management Platform WebAccess/VPN – Advanced Secure Networking Platform

*Functionality is available with installed Router App (User Module)

Standards & Regulations	
Radio	EN 301 511, EN 301 908-1, EN 301 908-2, EN 301 908-13, EN 303 413, EN 301 893, EN 300 328
EMC	EN 301 489-1, EN 301 489-17, EN 301 489-19, EN 301 489-52, EN 610000-6-2, EN 55032, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6
Safety	EN 62 368-1, IEEE 802.3
Transportation	E-mark, EN 45545-2
National	CE
Mechanical	EN 60068-2-27, EN 60068-2-64, EN 60529
Climatic	EN 60068-2-2, EN 60068-2-1, EN 60068-2-14, EN 60068-2-30
Environmental	REACH, RoHS3, WEEE

Accessories

Part Number	Description	Included in the package
BB-CON-WR2	2-pin PWR connector	✓
	14-pin Serial / IO connector	✓
	Wall mount kit	✓
2× BB-DIN-ICR32	DIN clip - 2 pcs	Optional
RPS-ICR4-WR2-M	Wall mount Power supply, 12 V/1.5 A, EU, UK, US, AUS plugs	Optional

For more accessories (Antennas, Power Supplies) visit www.advantech.com

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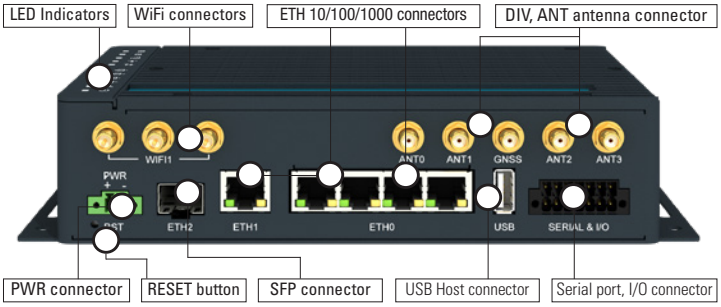
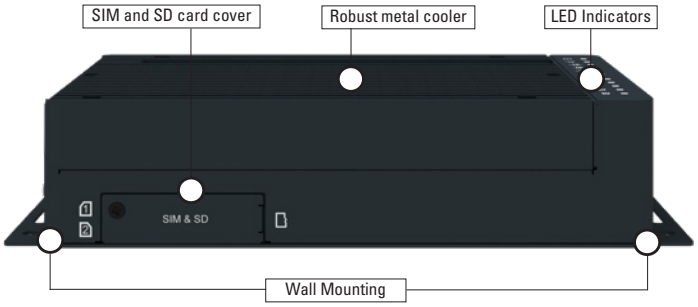
Views

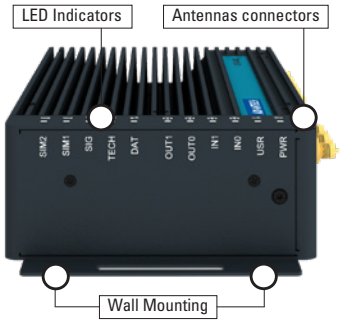
FRONT VIEW



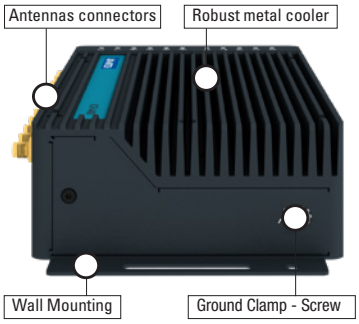
REAR VIEW



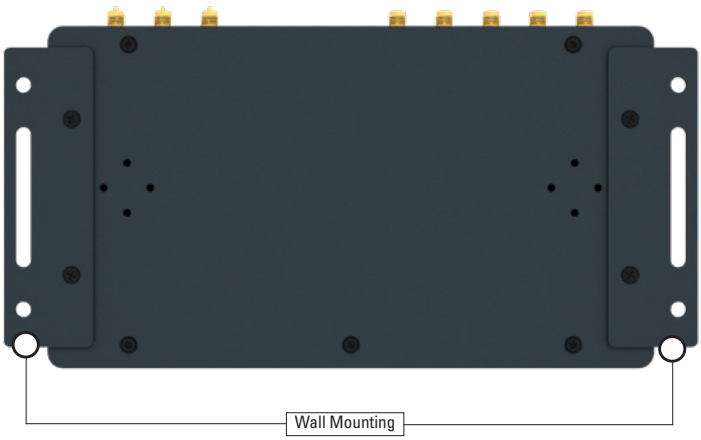
LEFT SIDE VIEW



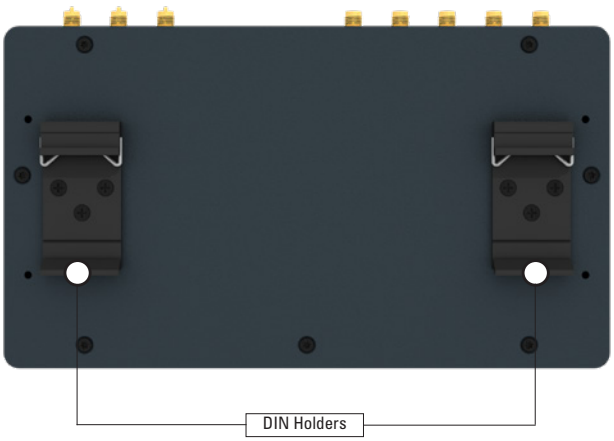
RIGHT SIDE VIEW



BOTTOM VIEW - WALL MOUNT KIT

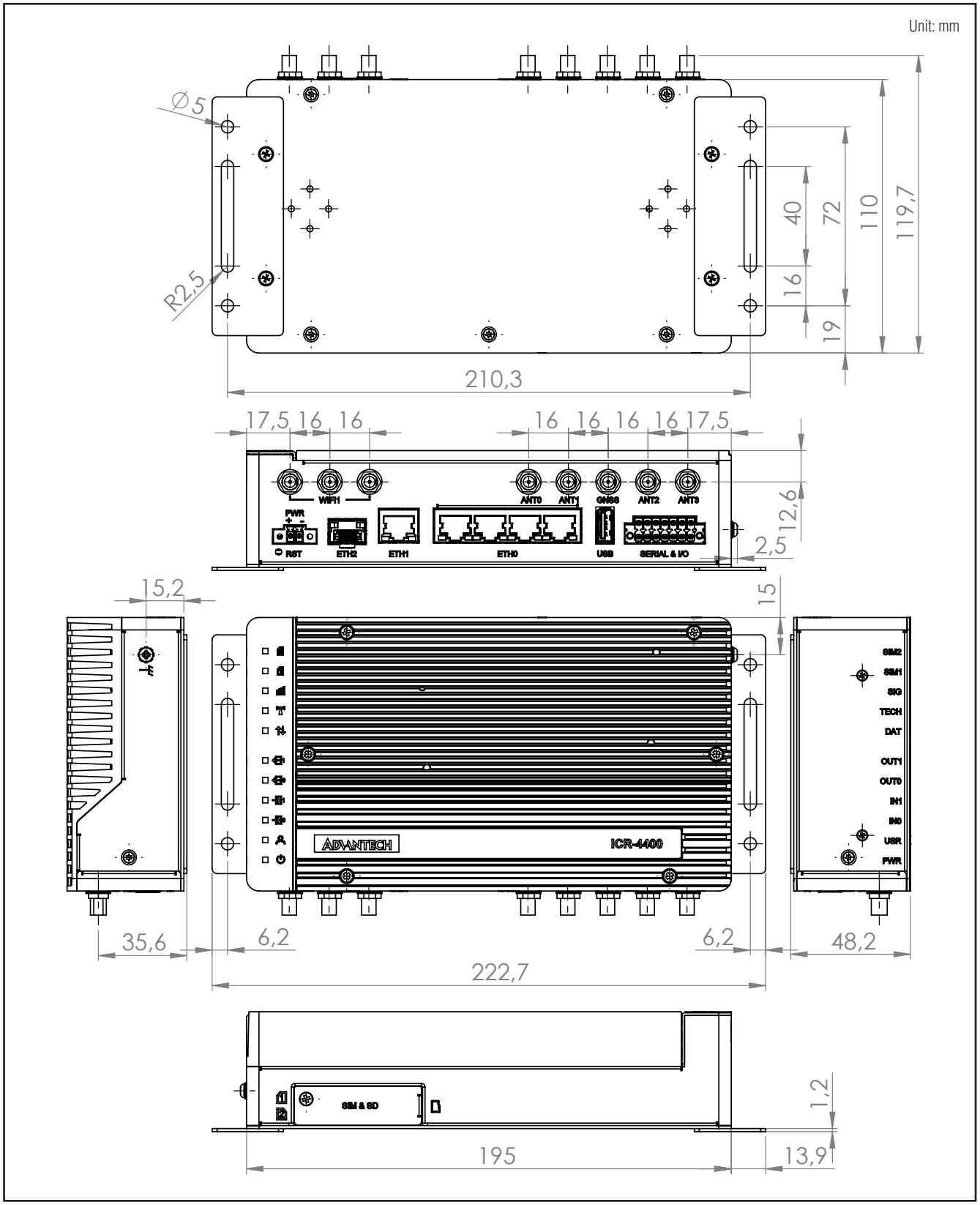


BOTTOM VIEW - DIN HOLDERS



Dimensions - Technical Drawing - Wall Mount

Unit: mm



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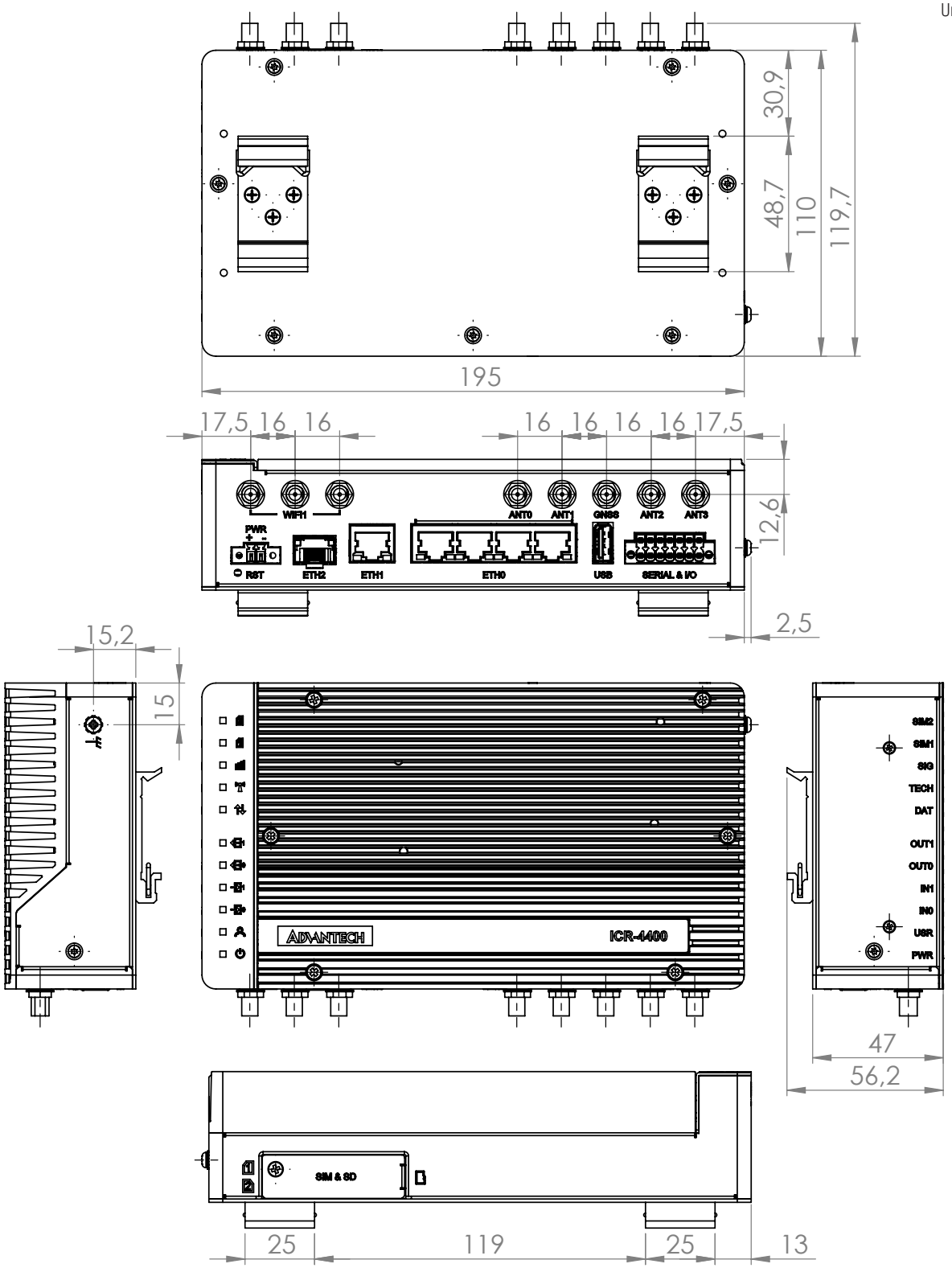
Dimensions - Technical Drawing - DIN Holders

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