# DAP145

DAP145 Industrial Wireless Access Point with RS485


Industrial & automation

Energy & utilities

Smart city

## WI-FI AND RS485 BRIDGING

Bridge RS-485 devices to IP with Serial-over-IP and Modbus

## FLEXIBLE WI-FI MODES

Mesh, STA, and Fast Roaming for coverage extension, backhaul, and industrial asset mobility

## CLOUD-READY DATA COLLECTION

Collect and convert industrial data with Data to Server tool and native protocol support

## DESIGNED FOR INDUSTRY

Narrow footprint with integrated DIN rail mounting and top-entry terminal block power

| Wireless | |
|---|---|
| Wireless mode | IEEE 802.11b/g/n, (Wi-Fi 4) Access Point (AP), Station (STA) |
| Wi-Fi security | WPA3 EAP, WPA3 SAE, WPA2 Enterprise-PEAP, WPA2 PSK; AES CCMP, TKIP, Auto Cipher modes, client separation |
| SSID/ESSID | SSID stealth mode and access control based on MAC address |
| Wi-Fi users | Up to 50 simultaneous connections |
| Wireless Connectivity Features | Wireless mesh (802.11s), fast roaming (802.11r), Relayd, BSS transition management (802.11v), radio resource measurement (802.11k) |
| Wireless MAC filter | Allowlist, blocklist |
| Wireless QR code generator | Once scanned, a user will automatically enter your network without needing to input login information |
| TravelMate | Forward Wi-Fi hotspot landing page to a subsequent connected device |

| Ethernet | |
|---|---|
| LAN | 2 x LAN ports, 10/100 Mbps, compliance with IEEE 802.3, IEEE 802.3u, 802.3az standards, supports auto MDI/MDIX crossover |

## Network

| | |
|---|---|
| Routing | Static routing, Dynamic routing BGP, OSPF v2, RIP v1/v2, EIGRP, NHRP , Policy based routing |
| Network protocols | TCP, UDP, IPv4, IPv6, ICMP, NTP, DNS, HTTP, HTTPS, SFTP, FTP, SMTP, SSL/TLS, ARP, VRRP, PPP, PPPoE, UPNP, SSH, DHCP, Telnet, SMPP, SNMP, MQTT, Wake On Lan (WOL) |
| VoIP passthrough support | H.323 and SIP-alg protocol NAT helpers, allowing proper routing of VoIP packets |
| Connection monitoring | Ping Reboot, Wget Reboot, Periodic Reboot, LCP and ICMP for link inspection |
| Firewall | Port forward, traffic rules, custom rules, TTL target customisation |
| Firewall status page | View all your Firewall statistics, rules, and rule counters |
| Port management | View device ports, enable and disable each of them, turn auto-configuration on or off change their transmission speed, and so on |
| Network topology | Visual representation of your network, showing which devices are connected to which other devices |
| DHCP | Static and dynamic IP allocation, DHCP relay, DHCP server configuration, status, static leases: MAC with wildcards |
| QoS / Smart Queue Management (SQM) | Traffic priority queuing by source/destination, service, protocol or port, WMM, 802.11e |
| DDNS | Supported >77 service providers, others can be configured manually |
| DNS over HTTPS | DNS over HTTPS proxy enables secure DNS resolution by routing DNS queries over HTTPS |
| Network backup | Wi-Fi WAN, VRRP, Wired options, each of which can be used as an automatic Failover |
| Load balancing | Balance Internet traffic over multiple WAN connections |
| Hotspot | Captive portal (hotspot), internal/external Radius server, Radius MAC authentication, SMS authorisation, SSO authentication, internal/external landing page, walled garden, user scripts, URL parameters, user groups, individual user or group limitations, user management, 9 default customisable themes and optionality to upload and download customised hotspot themes |
| SSHFS | Possibility to mount remote file system via SSH protocol |
| Traffic Management | Real-time monitoring, wireless signal charts, traffic usage history |
| IGMP Proxy | Possibility to relay multicast membership messages between hosts and a router, enabling multicast traffic to flow across different network segments |

| Security | |
|---|---|
| Authentication | Pre-shared key, digital certificates, X.509 certificates, TACACS , Internal & External RADIUS users authentication, IP & login attempts block, time-based login blocking, built-in random password generator |
| Firewall | Preconfigured firewall rules can be enabled via WebUI, unlimited firewall configuration via CLI, DMZ, NAT, NAT-T, NAT64 |
| Attack prevention | DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FIN, SYN-RST, X-mas, NULL flags, FIN scan attacks) |
| VLAN | Port and tag-based VLAN separation |
| WEB filter | Blacklist for blocking out unwanted websites, Whitelist for specifying allowed sites only |
| Access control | Flexible access control of SSH, Web interface, CLI and Telnet |
| Certificate Manager | Certificate creation tool allows to create CA, server, client, let's encrypt, SCEP certificates |
| 802.1x | Port-based network access control client |

| VPN | |
|---|---|
| OpenVPN | Multiple clients and a server can run simultaneously, 27 encryption methods |
| OpenVPN Encryption | DES-CBC 64, RC2-CBC 128, DES-EDE-CBC 128, DES-EDE3-CBC 192, DESX-CBC 192, BF-CBC 128, RC2-40-CBC 40, CAST5-CBC 128, RC2-64-CBC 64, AES-128-CBC 128, AES-128-CFB 128, AES-128-CFB1 128, AES-128-CFB8 128, AES-128-OFB 128, AES-128-GCM 128, AES-192-CFB 192, AES-192-CFB1 192, AES-192-CFB8 192, AES-192-OFB 192, AES-192-CBC 192, AES-192-GCM 192, AES-256-GCM 256, AES-256-CFB 256, AES-256-CFB1 256, AES- 256-CFB8 256, AES-256-OFB 256, AES-256-CBC 256 |
| IPsec | XFRM, IKEv1, IKEv2, with 14 encryption methods for IPsec (3DES, DES, AES128, AES192, AES256, AES128GCM8, AES192GCM8, AES256GCM8, AES128GCM12, AES192GCM12, AES256GCM12, AES128GCM16, AES192GCM16, AES256GCM16) |
| GRE | GRE tunnel, GRE tunnel over IPsec support |
| PPTP, L2TP | Client/Server instances can run simultaneously, L2TPv3, L2TP over IPsec support |
| Stunnel | Proxy designed to add TLS encryption functionality to existing clients and servers without any changes in the program’s code |
| DMVPN | Method of building scalable IPsec VPNs, Phase 2 and Phase 3 and Dual Hub support |
| SSTP | SSTP client instance support |
| ZeroTier | ZeroTier VPN client support |
| WireGuard | WireGuard VPN client and server support |
| Tinc | Tinc offers encryption, authentication and compression in it's tunnels. Client and server support. |
| EoIP | Ethernet over IP (EoIP) Tunneling is a MikroTik RouterOS protocol based on GRE RFC 1701 that creates an Ethernet tunnel between two routers on top of an IP connection |

**BacNET**

| | |
|---|---|
| Supported modes | Router |
| Supported connection types | RTU(RS485) |
| Configuration options | Support for multiple BACnet/IP interfaces, Network number assignment, Preconfigured BDT entries for BBMD (BACnet Broadcast Management Device) |

**OPC UA**

| | |
|---|---|
| Supported modes | Client, Server |
| Supported connection types | TCP |

**MODBUS**

| | |
|---|---|
| Supported modes | Server, Client |
| Supported connection types | TCP, RTU(RS485) |
| Custom registers | MODBUS TCP custom register block requests, which read/write to a file inside the router, and can be used to extend MODBUS TCP Client functionality |
| Supported data formats | 8-bit: INT, UINT; 16-bit: INT, UINT (MSB or LSB first); 32-bit: float, INT, UINT (ABCD (big-endian), DCBA (little-endian), CDAB, BADC), HEX, ASCII |

**Data to Server**

| | |
|---|---|
| Protocol | HTTP(S), MQTT, Azure MQTT |
| Data to server | Extract parameters from multiple sources and different protocols, and send them all to a single server; Custom LUA scripting, allowing scripts to utilize the router's Data to server feature |

**MQTT Gateway**

| | |
|---|---|
| Modbus MQTT Gateway | Allows sending commands and receiving data from MODBUS Server through MQTT broker |

**DNP3**

| | |
|---|---|
| Supported modes | Station, Outstation |
| Supported connection | TCP, RTU(RS485) |

| DLMS/COSEM | |
|---|---|
| DLMS Support | DLMS - standard protocol for utility meter data exchange |
| Supported modes | Client |
| Supported connection types | TCP, RTU(RS485) |

| API | |
|---|---|
| Teltonika Networks Web API (beta) support | Expand your device's possibilities by using a set of configurable API endpoints to retrieve or change data. For more information, please refer to this documentation: https://developers.teltonika-networks.com |

| Monitoring & Management | |
|---|---|
| WEB UI | HTTP/HTTPS, status, configuration, FW update, CLI, troubleshoot, multiple event log servers, firmware update availability notifications, event log, system log, kernel log, Internet status |
| FOTA | Firmware update from server, automatic notification |
| SSH | SSH (v1, v2) |
| Email | Receive email message status alerts of various services |
| TR-069 | OpenACS, EasyCwmp, ACSLite, tGem, LibreACS, GenieACS, FreeACS, LibCWMP, Friendly tech, AVSystem |
| MQTT | MQTT Broker, MQTT publisher |
| SNMP | SNMP (v1, v2, v3), SNMP Trap, Brute force protection |
| JSON-RPC | Management API over HTTP/HTTPS |
| RMS | Teltonika Remote Management System (RMS) |

| IoT Platforms | |
|---|---|
| ThingWorx | Allows monitoring of: Device name, HW version, Serial number, FW version, WAN IP. Allows actions from the cloud: FW update, Reboot |
| Cumulocity - Cloud of Things | Allows monitoring of: Device name, HW version, Serial number, FW version, WAN IP. Allows actions from the cloud: FW update, Reboot |
| Azure IoT Hub | Can be configured with Data to Server to send all the available parameters to the cloud. Has Direct method support which allows to execute RutOS API calls on the IoT Hub. Also has Plug and Play integration with Device Provisioning Service that allows zero-touch device provisioning to IoT Hubs |
| AWS IoT Core | Utility to interact with the AWS cloud platform. Jobs Support: Call the device API using AWS Jobs functionality |

| System Characteristics | |
|---|---|
| CPU | Mediatek, 580 MHz, MIPS 24KEc |
| RAM | 128 MB, DDR2 |
| FLASH storage | 16 MB serial NOR flash |

| Firmware/Configuration | |
|---|---|
| WEB UI | Update FW from file, check FW on server, configuration profiles, configuration backup |
| FOTA | Update FW |
| RMS | Update FW/configuration for multiple devices at once |
| Keep settings | Update FW without losing current configuration |
| Factory settings reset | A full factory reset restores all system settings, including the IP address, PIN, and user data to the default manufacturer's configuration |

| FIRMWARE CUSTOMISATION | |
|---|---|
| Operating system | RutOS (OpenWrt based Linux OS) |
| Supported languages | Busybox shell, Lua, C, C++ |
| Development tools | SDK package with build environment provided |
| GPL customization | You can create your own custom, branded firmware and web page application by changing colours, logos, and other elements in our firmware to fit your or your clients' needs |
| Package Manager | The Package Manager is a service used to install additional software on the device |

| Serial | |
|---|---|
| RS485 | Terminal block connector: D+, D-, R+, R- (2 or 4 wire interface) |
| Serial functions | Console, Serial over IP, Modem, MODBUS gateway |

| Power | |
|---|---|
| Connector | 3-pos plugable terminal block |
| Input voltage range | 9-30 VDC, reverse polarity protection, surge protection >31 VDC 10us max |
| PoE (passive) | Passive PoE over spare pairs. Possibility to power up through LAN1 port, not compatible with IEEE802.3af, 802.3at and 802.3bt standards, Mode B, 9 - 30 VDC |
| Power consumption | Idle: < 1 W / Max: < 2 W |

| Physical Interfaces | |
|---|---|
| Ethernet | 2 x RJ45 ports, 10/100 Mbps |
| Status LEDs | 2 x LAN type LED, 1 x Power LED |
| Power | 1 x 3-pin power connector |
| Antennas | 1 x RP-SMA for Wi-Fi |
| RS485 | 1 x 6-pin terminal block for 2-wire or 4-wire interface |
| Reset | Reboot/User default reset/Factory reset button |
| Other | 1 x Grounding screw |

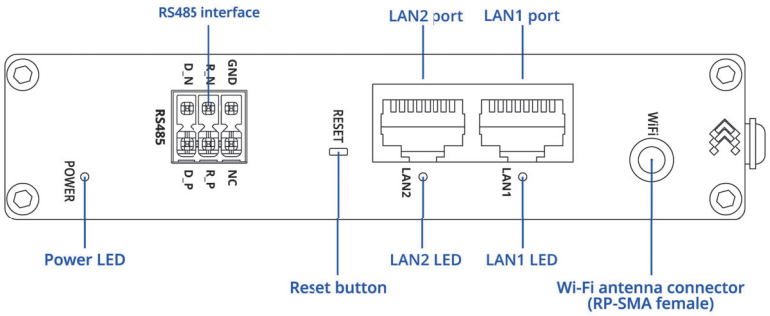
| Physical Specification | |
|---|---|
| Casing material | Anodized aluminium housing and panels |
| Dimensions (W x H x D) | 113.10 x 25 x 68.6 mm |
| Weight | 149.2 g |
| Mounting options | Integrated DIN rail bracket; wall mount and flat surface (additional kit needed) |

| Operating Environment | |
|---|---|
| Operating temperature | -40 °C to 75 °C |
| Operating humidity | 10% to 90% non-condensing |
| Ingress Protection Rating | IP30 |

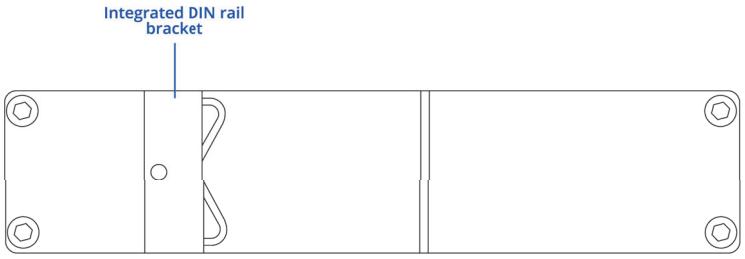
| Regulatory & Type Approvals | |
|---|---|
| Regulatory | CE/RED, UKCA, CB, RCM, FCC, IC, EAC, UCRF, WEEE |

# Hardware

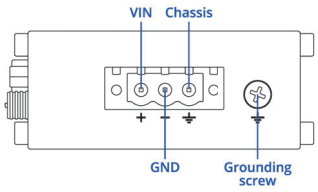
### FRONT VIEW




### BACK VIEW

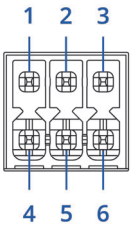



### POWER CONNECTOR




### 1 x 6 -PIN TERMINAL BLOCK

1. Driver negative signal (D_N)
2. Receiver negative signal (RN)
3. Device ground (GND)
4. Driver positive signal (D_P)
5. Receiver positive signal(R_P)
6. Power input 9-30 VDC (NC)

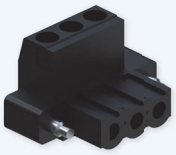


## Ordering

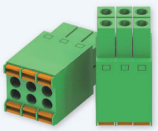
**Standard package***


DAP145


QUICK START GUIDE



3PIN POWER CONNECTOR



2X3PIN CONNECTOR

*Standard package contents may differ based on standard order codes.

For more information on all available packaging options – please contact us directly.

## Classification codes

**HS Code:** 851762

**HTS:** 8517.62.00

**Available versions**

| | | |
|---|---|---|
| DAP145 ****** | N/A | DAP145000000 / Standard package<br>DAP145000200 / Mass packing code |

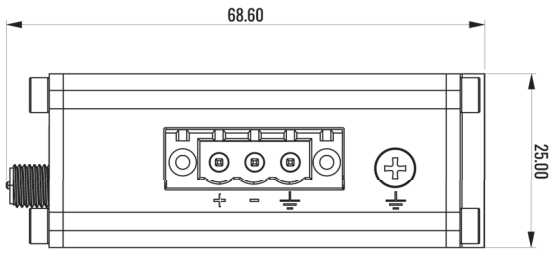
## DAP145 spatial measurements

**Available versions**

| | |
|---|---|
| Device housing (W x H x D)* | 113.10 x 25 x 68.6 mm |
| Box (W x H x D): | 141 x 74,5 x 28.2 mm |
| | *Housing measurements are presented without antenna connectors and screws; for measurements of other device elements look to the sections below |

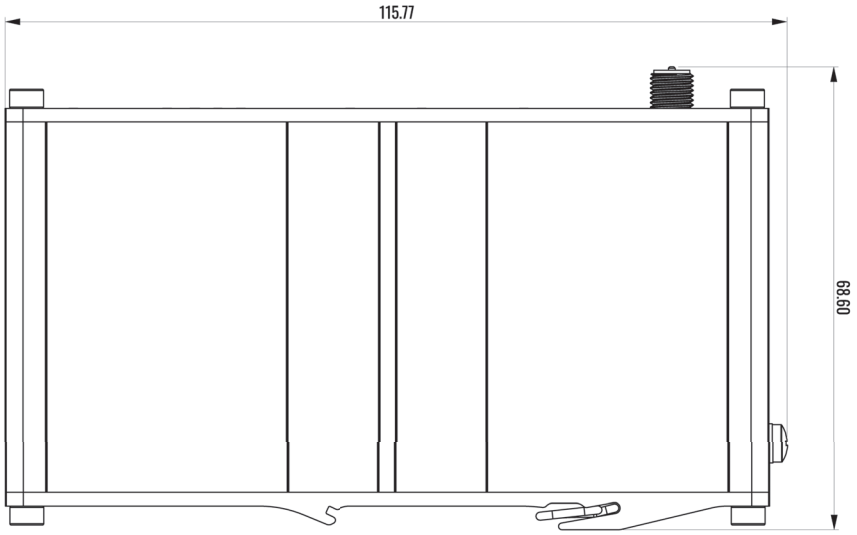
### TOP VIEW

The figure below depicts the measurements of device and its components as seen from the top:



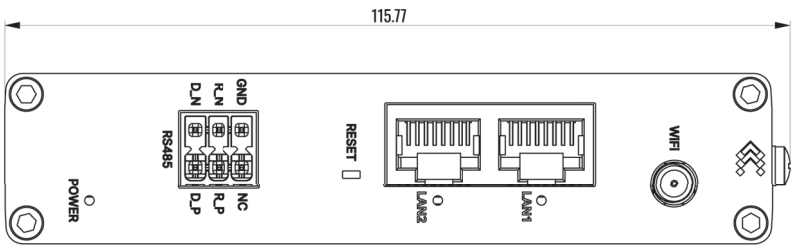

### RIGHT VIEW

The figure below depicts the measurements of device and its components as seen from the right side:



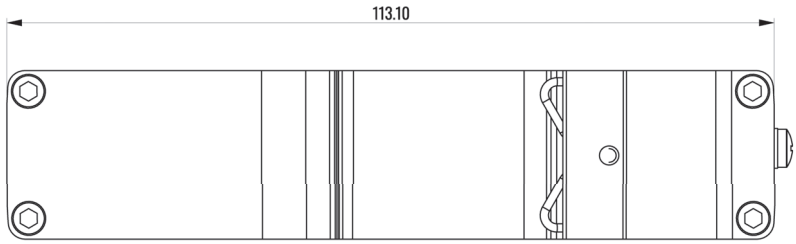

### FRONT VIEW

The figure below depicts the measurements of device and its components as seen from the front panel side:



## REAR VIEW

The figure below depicts the measurements of device and its components as seen from the top:




## MOUNTING SPACE REQUIREMENTS

The figure below depicts an approximation of the device's dimensions when cables and antennas are attached: