MachineLink 4G

Flexible IoT communications

Vodafone
Power to you

The Vodafone MachineLink 4G is a powerful and feature rich 4G IoT Router ideal for business continuity solutions and global IoT applications requiring fast internet speeds.

What it does

The Vodafone MachineLink 4G is an intelligent, yet user friendly 4G IoT device ideal for highly complex IoT and Industrial IoT applications. Featuring high speed WiFi, two Gigabit Ethernet ports, a USB port, built-in GPS and extensive support for various communications protocols, the MachineLink 4G is the all-in-one wireless IoT solution. Globally compatible with Vodafone networks and integrated with Vodafone's Global M2M Platform, the device features a powerful edge processor running a Linux based OS and offers excellent development opportunities for custom applications using the Software Development Kit (SDK).

Package contents

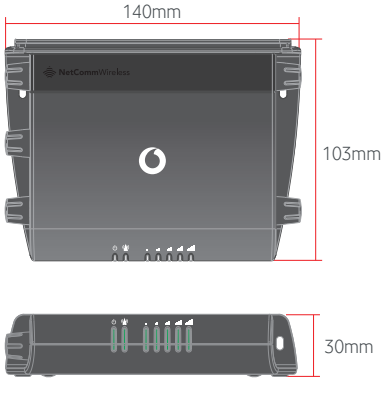
In the box:

- 1 x Vodafone MachineLink 4G
- 2 x 4G antennas
- 2 x WiFi antennas
- 1 x 1.5m yellow Ethernet cable 8P8C
- 1 x DIN rail mounting bracket
- 1 x Four-way terminal block
- 1 x Quick start guide and safety manual
- 1 x WiFi activation card

Available accessories:

- Standard PSU (6 interchangeable plugs)
- GPS Patch Antenna with 3m RF cable

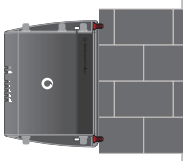
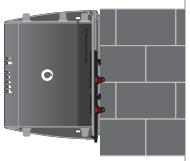
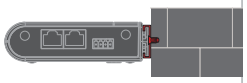
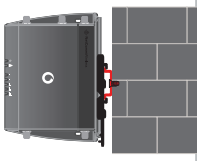
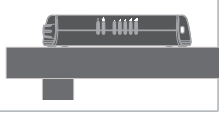
Weight and dimensions



Weight: 203g

Mounting options

The Vodafone MachineLink 4G can be installed quickly and easily in a variety of locations.

Description	
Option 1 Mount flat against the wall	
Option 2 Mount perpendicular to the wall	
Option 3 Mounted via DIN rail bracket	
C Section DIN rail mount Slide onto a rail	
Top hat DIN rail mount Mount on a bracket and slide onto a rail	
Desk mount Stand on a desk	

Processor and storage
- Powerful 800Mhz ARM8 processor with128MByte DDR3 RAM
- 256MByte Flash memory storage (~120MB available on board space for user storage)
- microSD card slot for expandable storage

Operating system
- Embedded Linux 3.2.0 & Software Development Kit (SDK)

Peak data speed
LTE data rates:

Category 3
- Downlink: Up to 100 Mbps (20 MHz bandwidth)
  Up to 50 Mbps (10 MHz bandwidth)
- Uplink: Up to 50 Mbps (20 MHz bandwidth)
  Up to 25 Mbps (10 MHz bandwidth)

UMTS (WCDMA)/HSDPA/HSUPA/HSPA+/ DC-HSPA+:

HSPA+ rates
- Downlink: Up to 42 Mbps (category 24)
- Uplink: Up to 5.76 Mbps (category 6)

GSM/GPRS/EDGE:
- EDGE throughput up to 236 kbps

Cellular bands
- Multi-band FDD capable

LTE:
- Band 1 (2100 MHz)
- Band 3 (1800 MHz)
- Band 7 (2600 MHz)
- Band 8 (900 MHz)
- Band 20 (800 MHz)

UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+:
- Band 1 (2100 MHz)
- Band 2 (1900 MHz)
- Band 5 (850 MHz)
- Band 8 (900 MHz)

GSM/GPRS/EDGE:
- GSM 850 (850 MHz)
- EGSM 900 (900 MHz)
- DCS 1800 (1800 MHz)
- PCS 1900 (1900 MHz)

GNSS:
- GPS: 1575.42 MHz

Connectivity
- 2 x 10/100/1000 Base-T Ethernet RJ45 ports with Auto MDIX
- Micro USB 2.0 (type AB) OTG interface with 0.5A supply capability
- 1 x 1-Wire® interface

1-Wire® interface
- Supports the 1-Wire® bus system to communicate with devices such as digital thermometers and weather instruments.
- Provides low-speed data, signaling and power over a single line.
- Supports the ability to act as the master controller in a 1-Wire® system.
- Configurable as digital input and digital output.

Embedded global SIM
- Secure soldered-down 2G/3G/4G SIM (ETSI MFF2 DFN-8 USIM)
- User configurable SIM preference

SIM card reader
- Lockable tray reader with push-button-to-release
- Supports mini USIM/SIM format (2FF)
- Automatic detection and switch-over when an optional 2FF SIM is inserted.

Reset button
- Reset button (recessed, requiring pen/paperclip) with three functions: reboot, reboot into recovery mode, and reset unit to factory defaults.

Antenna connectors
- 2 x SMA connectors for 3G/4G (1x Main and 1x RX Diversity)
- 2 x Reverse polarity female SMA connectors for Wireless LAN (MIMO)
- 1 x SMA connector for GPS

LED indicators
- 8 x Tri-colour (Red/Amber/Green) LEDs. Power, Network and 5 x Signal Strength indicators on the front panel, and WLAN LED on the left side endplate.
- Easy and clear LED status display for connection status, connected network type, WLAN connection mode and connection errors.

Cellular
- Profile managed packet data connections – configuration of up to six profiles.
- NAT disable for framed route configuration
- Transparent bridge mode using PPPoE to allow the router to transparently forward public WAN IP address to a downstream device
- SIM security management (PIN configuration, enable and disable)
- Automatic and manual cellular band selection
- Automatic and manual operator selection

Customised roaming algorithm
**This feature works with Vodafone roaming SIM cards only.
- Prioritised network connection across the globe.
- Network access technology preference
- Cost effective mode that allows cellular connection to hop among different networks of the same carrier, before moving on to another carrier's more expensive option.
- Signal assurance watchdog that allows the router to automatically ignore poor cellular connections if the received signal falls below a configured threshold.
- Embedded and manually configured preferred roaming lists
- Filterable system roaming log

GPS
- Embedded GPS receiver (1575.42Mhz)
- Stand-alone GPS
- SMA connector for external active GPS antenna
- Active antenna voltage: 3.05V
- Maximum current: 50mA
- Tracking sensitivity under open sky: -161dBm
- Acquisition (standalone) sensitivity: -145dBm
- Time to first fix (TTFF): Cold 32s, Warm 29s, Hot 1s
- Odometer reading available via Web-UI, CLI and SDK

Wi-Fi/WLAN
- 802.11n 2T2R WiFi with transmission speeds up to 300Mbps.
- Simultaneous access point/wireless client modes.
- Multiple configurable SSID networks
- MAC-based client filtering security
- AP hotspot with configurable landing/redirect page URL
- WiFi bridge mode (WDS one-to-one)
- Public hotspot service (client mode)

Network and routing
- Static routing, RIP (v1/v2), port forwarding and DMZ
- Dynamic DNS
- VRRP for redundant router failover
- DHCP server, including :
  - Address reservation by MAC address
  - Custom DNS server definitions
  - DHCP relay
  - DHCP list display in Web-UI
  - Advanced DHCP option configuration (option 42 NTP, option 66 TFTP, option 150, option 160)
- Data stream manager providing ability to create mappings between input and output ports (e.g. SMS, GPS, and USB) and perform required translation or data processing by each virtual tunnel.
- Modbus server TCP/IP gateway and client TCP/IP agent with up to 247 slaves connected to the serial TCP/IP Gateway.
- Modbus RTU/ASCII frames support.

WAN failover/fall back
- Business continuity guarantee for wired networks via instantaneous failover/failback to/from 4G/3G/2G networks
- Intelligent delay mechanism for controlling failover/failback procedure

VPN
- PPTP client for VPN connectivity to remote PPTP VPN server
- IPSec tunnel termination (for up to 5 tunnels)
- GRE tunneling
- OpenVPN (client, server and P2P)

Administration and configuration
- Web-based user interface (HTTP/HTTPS) for full device status and configuration
- Password protected configuration file backup and restore for quick device configuration and device cloning
- Telnet command line interface for status monitoring, configuration and control
- SNMP v1/v2 including cellular specific MIB, config and firmware download
- TR-069 client for remote device configuration, configuration backup and restore, and firmware upgrade
- SMS client (send/receive) including inbox, sent items
- Ping monitor watchdog (Reset connection on repeated ping failure)
- Diagnostic Log Viewer (Remote and local)
- System status and security logs
- NTP server support for network time sync of device's system clock
- Device user guide stored on the device and accessible via the Web-based user interface (HTTP/HTTPS)
- Advanced diagnostics and control via SMS
  - Query status information – such as signal strength, WAN IP, uptime, and many more
  - Configure device remotely via SMS – such as APN, authentication settings, and many more
  - Execute commands via SMS – such as reboot, reset to defaults, go offline, and many more
  - Secure SMS management using sender whitelisting and password management
  - SMS acknowledgement replies for queries and commands

Firmware management
- Firmware upgrade locally via LAN or remotely over-the-air (HTTP/ HTTPS, SNMP, TR-069)
- Multiple firmware image storage on device and dynamic install
- Triggered firmware upgrade via SMS (initiate download & install from HTTP/HTTPS)

Event Alert Engine
- Receive proactive network & device alerts
- User configurable
- Support for SMS / SMTP / TCP / UDP

Software development kit
- Develop and install custom software applications
- Open Linux standard development environment
- Develop applications/scripting in standard ANSI C/Shell script and LUA
- Package manager built into Web-UI for Application installation/ removal
- API (C, LUA and Shell libraries) to the unit's internal runtime database to allow full status monitoring configuration and control of the device from custom applications

Temperature
- Operating temperature range (class A): -30°C to +70°C
- Operating temperature range (class B): -40°C to +85°C*
  (* with possible performance deviation)

Environmental conditions
- Operating humidity 0-95% (RH)
- Storage humidity 0-95% (RH)
- Ingress Protection rating (IP52)

Power supply
- Power input and I/O via 4 way termination block receptacle
- Field terminable power input via screw type terminal block included
- DC power (8 - 40V DC)
- 1 x Dedicated ignition input on 4 way connector
- Power consumption 6W, recommended DC supply via terminal block (12V 1.5A)
- Vehicle compatible protection on DC Input Jack. (ISO7637 standard)

Dimensions & weight
- Device dimensions (excluding external antenna): 140mm (L) x 103mm (W) x 30mm (D) / 203g

Mounting options
- Wall mount support in multiple orientations via embedded mounting holes
- DIN rail mount support via plastic bracket included in box (top hat section rail TH 35 IEC60715)
- C rail mount support via mounting rail built into housing (C section rail C30 IEC60715)

Certifications
- CE (Europe)
- eMark (Europe)
- RoHS (Europe)
- WEEE (Europe)
- REACH (Europe)
- IC (Canada)
- FCC (USA)
- RCM (Australia) - Pending
- ICASA (South Africa) - Pending
- GCF (Europe)

Only Vodafone can offer you a complete IoT solution on a global scale.

For more information about our IoT solutions, please contact your Vodafone account manager,
email. **iot@vodafone.com**,
or visit **www.vodafone.com/iot**

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