# Universal Rugged
# Firewall / Router / Access Point

## General Description

The µGUARD is a Firewall / Router / Access Point with long-term availability. The design is optimized for low power consumption, small size (SwaP) and highest flexibility, plus the capability for extended temperature. The µGUARD can be expanded with additional 10 ports over the µMAGBES (managed 10-port switch). The µGUARD and µMAGBES adds additional reliable and unique products to MPL's Industrial Network Solutions.

## µGUARD Highlights

The standard operation temperature range is -20°C to +60°C and optionally available in extended temperature The internal two miniPCIe slots and the M.2 slot allow various extensions (WLAN, GPRS. LTE mSATA SSD...). The µGUARD is available as OpenFrame on a cooling plate to be mounted in existing housings or cabinets. Alternatively we have firewall solutions with RJ45, M12, or MIL-38999 connectors. Fiber can be provided over the TX2FX.

## Key features are:

- Wide Input voltage range 8–36VDC (others on request)
- GBit Ethernet ports (10/100/1000Mbit support)
- Easy integration of 10-port switch (µMAGBES)
- Long-term availability
- Proven OpenWRT operating system
- 2 x mPCIe slot
- 1 x M.2 slot with dual SIM support

## These features make

the µGUARD to the ideal and most secure solution for all rugged industrial, public transportation, and defense applications, where quality, reliability, low power consumption, and long-term availability are key. The flexibility of the well known OpenWRT OS gives you the security you need in your environment.

All MPL products are 100% engineered and manufactured in Switzerland.



µGUARD-A3OH Firewall with M.2 and 2x mPCI, with WiFi & additional Flash (115 x 75mm)



µGUARD-A12RD Firewall / Router / Access Point with 12x RJ45 ports and up to 4 SIM card slots



µGUARD-A3RD Firewall / Router / Access Point with 3x RJ35 ports and up to 4 SIM card slots



µGUARD-A3FMX Firewall for railway applications with 3x M12 X-coded and LTE

**The µGUARD** is available for different Industries and is the perfect solution for industrial environments, Railway, MIL/COTS, SWaP-C applications, or whenever a rugged long-term available computer is needed.



µGUARD used in Industrial Applications

µGUARD used in rugged Railway Applications

µGUARD for use in Military Environments

µGUARD used in Avionics

Web: www.mpl.ch
Email: info@mpl.ch

MPL AG, Täfernstrasse 20, Phone +41 56 483 34 34

CH-5405 Dättwil
Switzerland

**MPL**
High-Tech • Made in Switzerland

# Technical Features

## Board Data

| | |
|---|---|
| Processor | Dual Core 1.0GHz ARM SoC |
| Memory | 2GByte DDR3L with ECC, 512MByte NAND Flash |
| Dimensions | 75 x 115mm |
| Power | 8 up to 36VDC <6W (estimate without extensions) |

## Interfaces

| | |
|---|---|
| Ethernet | 3 x Ethernet 10/100/1000MBit, Auto MDI/MDIX, available on lockable header |
| mPCI/mSATA | 1 x mPCI/mSATA Combo Slot with lockable header for SIM card |
| mPCI | 1 x mPCI Slot with lockable header for SIM card |
| M.2 Slot | 1 x M.2 Slot Type B Key, for socket 2 USB3.0 WWAN, Type 3042-S3-B with dual SIM support |
| USB | 2 x USB2.0 on lockable headers |

## Environment

| | |
|---|---|
| Operating Temperature | -20°C to +60°C / -4°F to 140°F |
| Extended temperature | -40°C to +85°C / -40°F to 185°F (optional) |
| Storage Temperature | -45°C to +90°C / -49°F to 194°F |
| Humidity | 5% - 95% none condensing, optional coating available |

## Standard Compliance

The µGUARD Family is designed to meet or exceed the most common standards. Particular references are:

| | |
|---|---|
| EMC | EN 55022, EN 55024, EN 61000, MIL-STD-461E |
| Shock & Vibration | EN 60068 |
| Environmental & Safety | EN 50155, MIL-STD-810G, EN 60601, IEC / EN 62368 |
| Approval List | CE, IEC 60945, IACS E10 |

## Software

The µGUARD comes preinstalled with an adapted version of OpenWRT (www.openwrt.org). This Linux based embedded distribution provides all functionality required for operation as IPV4 and/or IPV6 firewall and router. The vast amount of additional packages available in conjunction with MPL support allows you to create a solution for every routing or firewall project.

Most of the configuration of the firmware installed can be done using a web based interface. For more specialized requirements, a console based configuration utility is available. All configuration is stored on the device in a human friendly text format and can be modified using a text editor, too.

Functions and protocols:
• TCP/IP V4 and V6, IPsec
• DNS server/forwarder
• QoS (Quality Of Service) capable
• Support for dynamic DNS providers
• SIIT(IPV4-over-IPV6 translation)
• OpenVPN support
• Miredo/Teredo (IPV6 over IPV4 tunneling)
• OpenConnect client support

• PPP (Point-to-Point Protocol)
• Firewall based on Linux iptables
• Network address translation
• SSH and telnet device access
• Multi WAN Setup (failover and load balancing)
• Snort (lightweight intrusion detection)
• DHCP Server for IPV4 and IPV6
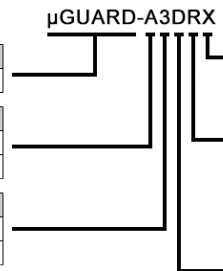• Routing daemons (OSPF, RIP, BGP, ...)

Further functionality can be installed using a package repository that contains more then 2000 precompiled applications ready to install. A software development kit (SDK), allowing to implement customer specific applications, is available as well.

### Ordering Information

µGUARD-A3DRX

| Product | Description |
|---|---|
| µGUARD | 3 Port Firewall |

| Option | Description |
|---|---|
| A | Standard |
| C | With 2 USB Ports |

| Ports | Description |
|---|---|
| 3 | Quantity of ports |
| 12 | Quantity of ports |

| Option | Description |
|---|---|
| X | -40°C to +85°C |

| Copper | Description |
|---|---|
| R | RJ45 |
| H | Horizontal Header |
| V | Vertical Header |
| MX/D | M12 (X or D coded) |

| Mount | Description |
|---|---|
| O | Open Frame |
| D | DIN-Rail |
| F | Flange |

For details regarding mechanical housing, please contact MPL

Web: www.mpl.ch
Email: info@mpl.ch

MPL AG, Täfernstrasse 20,
Phone +41 56 483 34 34

CH-5405 Dättwil
Switzerland

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