

# CloudGate



User guide

## CloudGate Basics

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# 1. CloudGate Basics

The CloudGate M2M Gateway from Option provides LAN to WWAN routing and GPS functionality in a simple, cost-effective base unit. The CloudGate can be configured locally or remotely from a PC, tablet, or smartphone, and is certified on all major U.S. cellular operators (CDMA/EvDO and WCDMA/HSPA+).

With two expansion card slots for additional radio and wired interfaces, customizable software and configuration images, and a cloud-based provisioning system, the CloudGate is a flexible, intelligent platform for wireless M2M connectivity.

## Base Unit Design

The CloudGate base unit design features LAN-to-WWAN and GPS interfaces and advanced error detection and repair watchdogs. When a component or software process loses connectivity, the device automatically resets or repowers itself. You can also schedule the device to reset at specific intervals to ensure daily, error-free operation.

Finally, CloudGates can be monitored and provisioned remotely, which vastly reduces the technician time on site, and enables firmware updates and new software features to be deployed quickly and efficiently.

## Expansion Slots

To expand the capabilities of the base unit, you can add up to two expansion cards and deploy customized software, or developer images. Option offers several expansion cards with WLAN and Serial interfaces and a hardware development kit for system integrators to develop their own cards. Likewise, a software development kit is available to partners who need custom software for a site-specific application.

For more information on the CloudGate developer program, contact Option Customer Support.

## Feature Overview

### Reliability and Security

- Software and hardware watchdogs continually monitor for loss of connectivity and will repair the problem if detected
- Software and configuration images are protected with digital signatures

- Secure, redundant firmware and configuration images ensure the unit can revert to previous working settings if a problem is detected
- Management functions are protected by certificate or password and applied over encrypted links

## Flexibility

- Two hardware expansion slots allow for additional radio and/or wired interfaces
- Expansion cards are designed with board-edge connectors for easy installation and replacement in the field
- Hardware and software development kits are available to partners for developing custom expansion cards and software images

## Provisioning

- The CloudGate Universe allows for efficient deployment of firmware, configuration file and developer application updates to multiple CloudGates at once

## More Resources

- CloudGate Datasheets

## 1.1. Base Unit Hardware

The mechanical housing for each base unit is identical. The bottom front and bottom back panels can be customized to accommodate different expansion cards and interfaces. Internally, the main board is designed around a WWAN module<sup>1</sup> and Ethernet interface.



The base unit incorporates two hardware expansion slots for additional radio and wired interfaces. Option offers a range of expansion cards but also licenses the expansion card format and connector details so that third party hardware developers can design their own expansion cards to fit specific needs.

The CloudGate base unit consists of:

- Light weight aluminum housing with DIN rail and wall mounting options
- Customizable bottom front and bottom back panels
- Two SMA-type antenna interfaces: WWAN Main and WWAN Div/GPS<sup>1</sup>
- WLAN, GPS, System, and WWAN LEDs showing system status and signal strength<sup>1</sup>
- 10/100 MB/s RJ-45 Ethernet interface
- 9-33 VDC power in with Micro-Fit™, dual row, 4-circuit connector
- Two hardware expansion slots for additional radio or wired interfaces
- Internal main board with WWAN module, Ethernet interface and GPS<sup>1</sup>
- Freescale i.MX280 450MHz Processor
- 64 MB Ram (variant dependent)
- 128 MB Flash (variant dependent)
- WWAN module<sup>1</sup>

## Base Unit Variants

The following variants exist:

## CloudGate LTE WW (CG0114)

- Contains the LN930 WWAN 4G module that supports 2G/3G/4G technology.
- Can be used world-wide

## CloudGate 3G Americas (CG0192)

- Contains the GTM689 WWAN 3G module that can handle CDMA/EVDO and WCDMA technology.
- Used in the U.S. and Canada and has the correct certification and approvals for these countries.

## CloudGate 3G EMEA (CG0112)

- Contains the GTM681 WWAN 3G module that can handle only WCDMA technology.
- Used in Europe and has the correct certification and approvals for these countries.

## CloudGate 3G JP/APAC (CG0122)

- Contains the GTM661 WWAN 3G module that can handle only WCDMA technology.
- Used in Japan and Asia Pacific and has the correct certification and approvals for these countries.

## CloudGate Ethernet (CG0102)

- Does not contain a WWAN module.
- Can be used in Europe, US and Canada

Note 1:

The CG0102 is a CloudGate without a WWAN module, so it has no 3G functionality. It does not support GPS. The front plate has no RF connectors.

A detailed HW description of the different models can be found in the CloudGate Hardware Guide.

## Related Topics

Expansion Cards

Mounting the CloudGate

Mechanical Drawings

Front and Back Panels

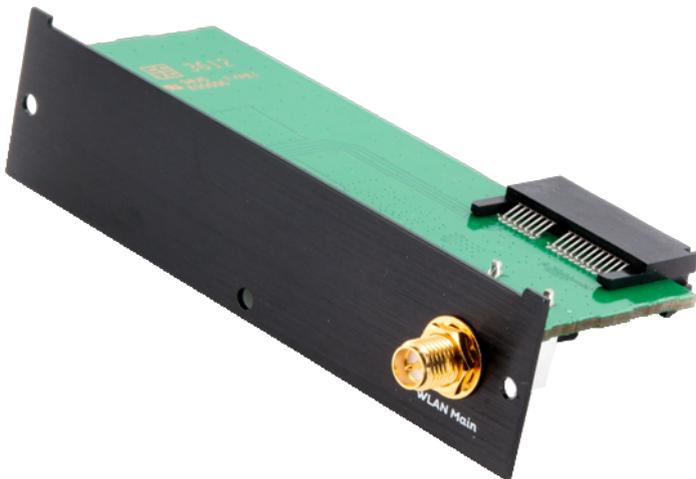
## 1.2. Expansion Cards

Option offers a several expansion cards. For custom solutions, Option also licenses a hardware development kit. Third parties can design their own expansion cards to fit specific needs.

The expansion cards offered by Option include:

- WLAN expansion card (CG2101)
- WLAN access point card (CG2102)
- Low cost serial card (CG1101)
- Industrial serial card (CG1102)
- Ethernet switch with PoE (CG1103)
- Ethernet switch (CG1104)
- Developer card (CG1105)
- Telematics card (CG1106)
- Telematics card with I/O expander (CG1106 + CG3101)
- Telematics card with CAN I/O expander (CG1106 + CG3102)
- Breadboard card (CG1108)

### WLAN Expansion Card - CG2101



- Provides 802.11 bgn
- Simultaneous Access Point and Station mode for providing service or connection as a wireless LAN
- Failover to WLAN client for WAN connectivity
- Dual SSID

## WLAN Access Point Card - CG2102



- Provides 802.11 abgn
- Access Point wireless LAN

## Low Cost Serial Card - CG1101



- Provides a single RS-232, 921.6 kbaud maximum speed.

## Industrial Serial Card - CG1102



- One RS-232 port with 921.6 kbaud maximum speed.
- 2 KV isolated RS-485 serial port, 921.6 kbaud, full duplex or half duplex; 2 wire or 4 wire with switchable termination.

## Ethernet Switch with PoE - CG1103



- Power over Ethernet (requires special power supply)
- 4-port 10/100Base-T with 2 ports class 4 or 4 ports up to class 3 PoE
- $\mu$ SD card

## Ethernet Switch - CG1104



- 4-port 10/100Base-T
- $\mu$ SD card

## Developers Card - CG1105



- Extended format with headers on all interfaces to attach to development equipment
- Pre-wired RS-232 port, GPIO connected temperature sensor, a relay and SD card slot.

## Telematics Card - CG1106



- 3 axis 12 bit accelerometer
- Dual SIM socket
- Two USB interfaces
- DTE interface

## Telematics Card with I/O Expander (CG1106 + CG3101)

Same features as the Telematics card plus following ones provided by the I/O expander:

- 5 inputs (digital or analog)
- 2 analog inputs
- 6 digital outputs
- AUX serial port
- 1-wire interface

## Telematics Card with CAN I/O Expander (CG1106 + CG3102)

Same features as the Telematics card plus following ones provided by the CAN I/O expander:

- 5 inputs (digital or analog)
- 2 analog inputs
- 4 digital outputs
- AUX serial port
- 1-wire interface
- CAN bus interface

## Breadboard Card - CG1108



- Breadboard area for hardware prototyping
- Expansion connector signals available on test points
- area for 3.5mm pitch front connector

## Related Topics

[Installing Expansion Cards](#)

[Configuring Expansion Cards](#)

# CloudGate

## UNIVERSE



The CloudGate Universe is the configuration and deployment mechanism for the CloudGate. From the factory, CloudGate base units have no customization.

On power-up, the CloudGate connects to the CloudGate Universe over the wired Ethernet port and automatically downloads the appropriate update. If the Ethernet interface is unavailable, then the CloudGate uses the WWAN interface to download the updates.

Tip: You can set the CloudGate Universe enable or disable the automatic downloads.

The CloudGate downloads the following files from the CloudGate Universe:

- CloudGate firmware: device firmware provided by Option.
- CloudGate radio firmware: updates changes to wireless operator firmware
- CloudGate config file: configuration settings that can be applied to one or more CloudGates
- CloudGate application: customized software that provides additional functionality to the CloudGate or controls third-party expansion cards.

## Related Topics

[CloudGate Universe Guide](#)

[3G Connection Tab](#)

# Custom Developer Applications

To extend the base unit functionality provided by the CloudGate firmware, you can install developer software images onto an overlay file system and adapt the CloudGate to specific needs. Developer applications can be created for custom applications and middleware, and to control third-party expansion cards.

Option licenses a software development kit which allows third parties to design developer images. For information on the CloudGate developer program, contact Option Customer Support.

## Related Topics

[CloudGate Universe](#)

## 1.5. Network Interfaces

For connecting to the Internet, the CloudGate base unit comes with an Ethernet interface and a WWAN<sup>1</sup> (3G) interface. An optional WLAN interface is available only when the WLAN expansion card is installed.

While the WWAN<sup>1</sup> network interface is always a direct connection to the Internet, or WAN, the Ethernet interface and optional WLAN interface can act as either a WAN or a local Area Network (LAN). The LAN interface allows local devices to connect to the Internet through the CloudGate.

The network interfaces available on the CloudGate are:

- Ethernet interface: can be a WAN or LAN connection depending on the behavior of the WAN/LAN switchover feature at start-up or can be set manually.
- WWAN<sup>1</sup> interface: always a WAN connection because it connects directly to the internet.
- WLAN interface: optional WLAN expansion card can be configured as either a WLAN client, which will act as a WAN interface, or as a WLAN access point, which will act as a LAN interface.

### Choosing a WAN or LAN Interface

The CloudGate can have only one WAN connection at a time. However the CloudGate can be connected to several different LAN networks simultaneously.

In choosing the network interface, you can specify:

- Manual: the network interface is selected through the on device web interface on the Home page.
- Automatic: a priority list defines which network interface to use to connect to the WAN/internet. The network interface at the top of the list will try to connect to the WAN/internet first. If this succeeds then the CloudGate continues to use this network interface to connect to the WAN/internet. If the connection to the internet fails, the CloudGate tries the second interface in the priority list and so on. The priority list is defined in the on device web interface on the Home page.

Warning: In firmware versions 1.12.0 and older, the ability to choose between automatic mode and manual mode and to set a connection priority list are not available. These firmware versions always try to connect to the internet over the Ethernet interface first. When this interface is not able to connect to the internet, the CloudGate will try to connect to the internet via the WWAN interface.

Note1

The CloudGate Ethernet (CG0102) has no WWAN module!

## Related Topics

[Configuring the Base Unit](#)

[Ethernet Tab](#)

[3G Connection Tab](#)

[WAN/LAN switchover feature](#)



**P T I O N**



WIRELESS TECHNOLOGY