SMG-6100 Hardware
User's Manual

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www.moxa.com/product

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User's Manual

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Introduction

Thank you for purchasing the Moxa SMG-6100 smart machine-to-machine (M2M) gateway.

This manual introduces the hardware installation, connector interfaces and BIOS setup of the SMG-6100. For software configuration and management, please refer to the user's manual for your operating system.

The following topics are covered in this chapter:

❒ **Overview**
❒ **Package Checklist**
❒ **Appearance**
❒ **Dimensions**
❒ **Features**
❒ **Hardware Specifications**

Overview

The SMG-6100 is based on the Intel x86 processor and supports VGA, 4 Ethernet ports, 2 RS-232 serial ports, and USB. It comes in a standard 19-inch, 1U high form factor with built-in IPSec, making it an ideal communication platform for industrial machine-to-machine M2M applications.

The SMG-6100 can be used as a communication gateway with sophisticated M2M solutions to help construct a tunnel server (IPSec) and bi-directional IP communications. When used with Moxa's SMG-1100, the SMG-6100 can serve as a secure networking host over IPSec to back-end host computers and Modbus TCP Master/Slave devices. One of the key benefits in this architecture is to facilitate and accelerate the remote monitoring and management of Modbus devices.
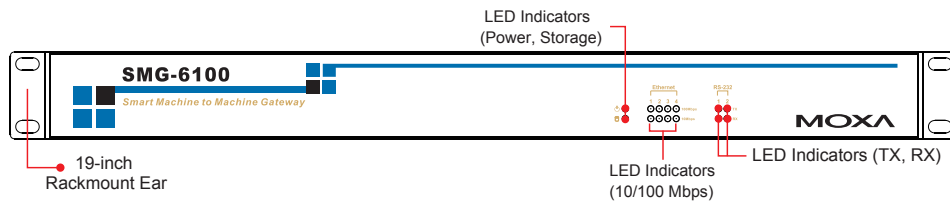
Package Checklist

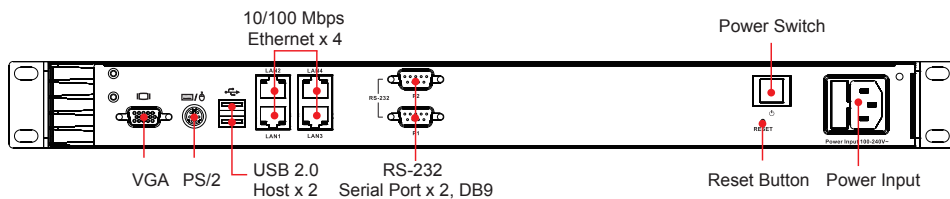Before installing the SMG-6100, verify that the package contains the following items:

- 1 SMG-6100 gateway
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Power cord
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Appearance

Front View

Rear View

Dimensions

Features

- Secure communication platform with tunnel server (IPSec) for 2-way IP communication to distributed SMG-1100s (Wireless Modbus Gateway).
- Networking host to back-end host computers and Modbus TCP Master/Slave devices.
- Supports unlimited Masters on serial or network side.
- Modbus and IPsec configuration tool.

Hardware Specifications

	SMG-6100
Ethernet Interface	
LAN	Auto-sensing 10/100 Mbps Ethernet x 4, using Realtek RTL8110SC Controller
Magnetic Isolation Protection	1.5 KV built-in
Serial Interface	
Number of Ports	RS-232 x 2 (reserved)
LEDs	
System	Power x 1, Storage x 1
LAN	10 Mbps x 4, 100 Mbps x 4
Serial	RS-232 TX x 2, RX x 2
Physical Characteristics	
Enclosure	SECC sheet metal (1 mm)
Weight	4.5 kg
Dimensions	440 x 253 x 45 mm (17.32 x 9.96 x 1.77 in)
Mounting	Standard 19-inch rackmount

Switches and Buttons	
Reset Button	To reboot system hardware (on rear panel)
Environmental Limits	
Operating Temperature	-10 to 60°C (14 to 140°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 80°C (4 to 176°F)
Power Requirements	
Input Voltage	100 to 240 VAC/VDC auto-ranging (47 to 63 Hz for AC input)
Power Consumption	50W
Input Rating	100-240VAC, 47-63Hz, 1.0A-0.5A
Regulatory Approvals	
EMC	FCC, CE (Class A), EMC level 4
Safety	LVD, UL cUL, CCC
Reliability	
Alert Tools	Built-in buzzer and RTC (real-time clock) with battery lithium backup
Warranty	
Warranty Period	3 years (details: see www.moxa.com/warranty)

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Hardware Installation

The SMG-6100 smart M2M gateway is compact and rugged, making it suitable for industrial machine-to-machine applications. The LED indicators allow users to monitor performance and identify trouble spots quickly, and multiple ports are provided for connecting a variety of different devices. The SMG-6100 machine-to-machine gateway comes with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. This chapter describes hardware installation and connector interfaces of the SMG-6100 machine-to-machine gateway.

The following topics are covered in this chapter:

❒ **Placement Options**

   ➢ Desktop

❒ **Rack mounting**

❒ **Wiring Requirements**

❒ **Connecting the Power**

❒ **Reset Button**

❒ **Front Panel LED**

❒ **Connecting to a Display**

❒ **Connecting a PS/2 Keyboard and Mouse**

❒ **Connecting USB Devices**

❒ **LAN Ports**

Placement Options

Desktop

Place your SMG-6100 on a clean, flat, well-ventilated desktop. For better ventilation, leave some space between the SMG-6100 and other equipment. Do not place equipment or objects on top of the SMG-6100, as this might damage the computer's internal components.

Rack mounting

The SMG-6100 has rackmount supports for installing on a standard rack.

Four rackmount screws are required to attach the SMG-6100 to a standard rack.

Follow these steps to install the SMG-6100 on a rack.

Step 1:   Installing the rackmount supports.

Take the rackmount supports out of the packages. There are two rackmount ears and 12 screws. Each ear requires 6 screws to attach to the rack.

Step 2:   Installing the rackmount ears to the SMG-6100.

Use 6 screws to attach one rackmount ear to one side of the SMG-6100. Repeat this procedure for the ear on the other side of the SMG-6100.

Step 3:   Installing the SMG-6100 to a rack.

Gently slide the SMG-6100 onto the rack, and then use screws provided by the rack supplier to fix the rackmount support to the rail.

NOTE	That four screws are required to attach the SMG-6100 to the rack. Use two screws on the left side and two screws on the right side.

As a final check, make sure that the four screws are firmly attached to the rack.

Wiring Requirements

The following common safety precautions should be observed before installing any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.

⚠️ **ATTENTION**

Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

⚠️ **ATTENTION**

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your device.

Electrical Current Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.
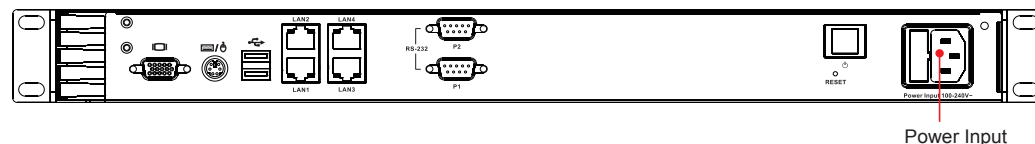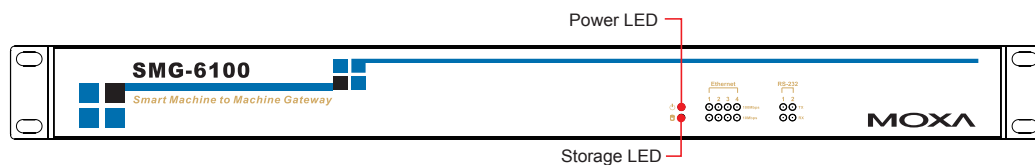
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.
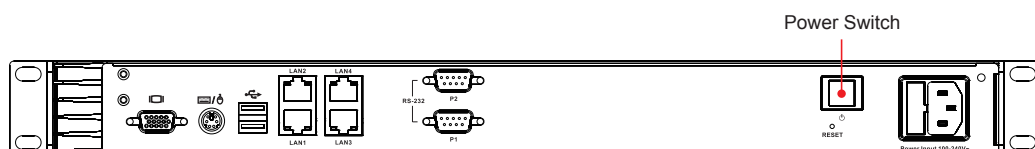
Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

To power on the SMG-6100 connect the power line to the SMG-6100's AC power connector (located on the right side of the rear panel) using the power cord shipped with the product, and then turn on the power switch. If the power is properly supplied, the Power LED will light up first, and then the Storage LED will start blinking. It takes about 30 to 60 seconds for the operating system to boot up.
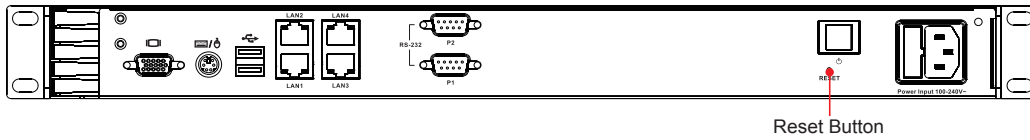

If you find the computer has not been powered on, press the Power Switch to start the system.
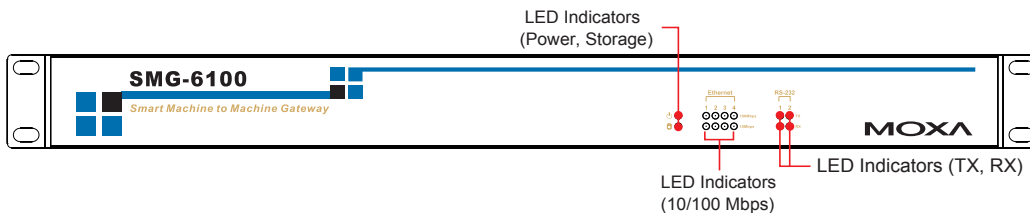
Reset Button

Pressing the Reset button initiates a hardware warm reboot. The button plays the same role as a desktop PC's reset button. After pressing the reset button, the system will reboot automatically. During normal use, you should **NOT** use the Reset Button. You should only use this button if the software is not working properly. To protect the integrity of data being transmitted or processed, you should always reset the system from the operating system with the software reboot function.
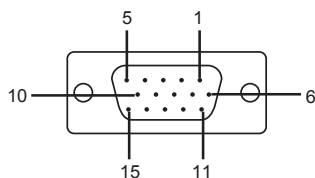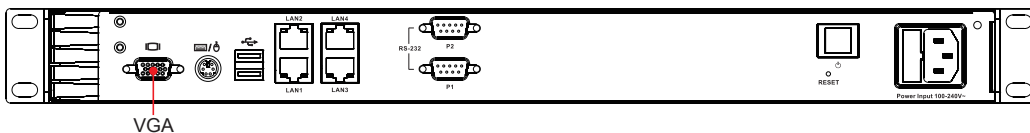
Reset Button

Front Panel LED

There are 14 LED indicators on the front panel. Information about each LED is given in the following table.

LED Indicators
(Power, Storage)

LED Indicators (TX, RX)

LED Indicators
(10/100 Mbps)

LED Name	Color	LED Description
Power	Green	Power is on.
	Off	No power input or power error.
Storage	Orange/ Blinking	Data is being written to or read from the storage unit.
	Off	Storage unit is idle.
Ethernet Port 100 Mbps	Green	100 Mbps of Ethernet Port is active.
	Off	No activity.
Ethernet Port 10 Mbps	Orange	10 Mbps of Ethernet Port is active.
	Off	No activity.
Serial Port TX 1-2	Green	Serial port is transmitting data.
	Off	No operation.
Serial Port RX 1-2	Orange	Serial port is receiving data.
	Off	No operation.

Connecting to a Display

Your SMG-6100 comes with a D-Sub 15-pin female connector to connect to the VGA monitor. Be sure to remove the power before you connect or disconnect the monitor cable.
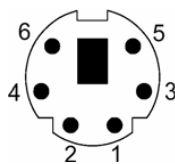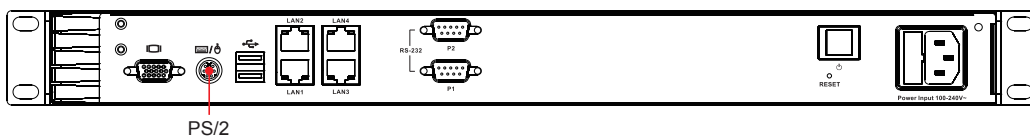
VGA

Pin No.	Signal Definition
1	RED
2	GREEN
3	BLUE
4	---
5	GND

6	CRT_DETECT#
7	GND
8	GND
9	+5V
10	GND
11	---
12	DDC_DATA
13	HSYNC
14	VSYNC
15	---

Connecting a PS/2 Keyboard and Mouse

Your SMG-6100 comes with a PS/2 mini-DIN connector to connect to a PS/2 keyboard and PS/2 mouse by using a Y-type cable. This 6-pin mini-DIN connector has the pin assignments shown below.

PS/2

Pin No.	Signal Definition
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	GND
4	VCC
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock

Use the Y-type cable to convert the mini-DIN connector into two 6-pin mini-DIN connectors to connect both a PS/2 keyboard and PS/2 mouse at the same time. (The Y-type cable is not included in the accessory package. It should be purchased separately. You may also use the USB ports to connect your USB-based keyboard and mouse.)

PS/2 Mouse
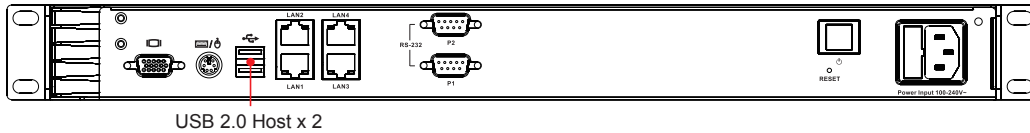

PS/2 Keyboard

⚠ ATTENTION

Please note that without the Y-type cable, the PS/2 connector on the SMG-6100 can only work with a PS/2 keyboard. A PS/2 mouse will not function when directly connected to the PS/2 connector on the SMG-6100.
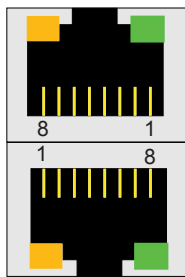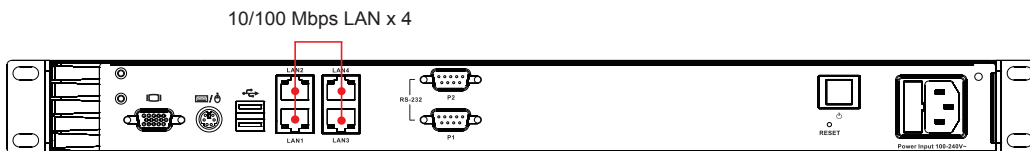
Connecting USB Devices

The SMG-6100 has two USB 2.0 ports on the rear panel. All of the ports are UHCI, Rev 2.0 compliant and support Plug & Play and hot swapping. These ports can be used to connect USB devices, such as a keyboard, mouse, USB flash disk, and USB CD-ROM.

USB 2.0 Host x 2

LAN Ports

The SMG-6100 has 4 10/100 Mbps LAN ports. When the cable is properly connected, the LEDs on the RJ45 connectors will glow to indicate a proper connection.

10/100 Mbps LAN x 4

Pin No.	Signal Definition
1	TX+
2	TX-
3	RX+
4	---
5	---
6	RX-
7	---
8	---

LED	Color	Description
Ethernet Port 100 Mbps	Green	100 Mbps of Ethernet Port is active.
	Off	No activity.
Ethernet Port 10 Mbps	Orange	10 Mbps of Ethernet Port is active.
	Off	No activity.

The default IP addresses and netmasks of the LAN ports are as follows:

	Default IP Address	Netmask
LAN 1	192.168.127.253	255.255.255.0
LAN 2	192.168.126.254	255.255.255.0
LAN 3	192.168.125.254	255.255.255.0
LAN 4	192.168.124.254	255.255.255.0

A

Safety Installation Instructions

A. RTC Battery Warning

CAUTION: There is a risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

B. Rackmount Warning

The following or similar rackmount instructions are included with the installation instructions:

(1) Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

(2) Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

(3) Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

(4) Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

(5) Reliable Grounding: Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., by using power strips).

B

Regulatory Statement Approval

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A: FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Community

Warning:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.