

# SiteManager™ xx29, xx39 and xx49 Working with I/O Ports



This document describes how to operate the I/O ports of the SiteManager.

This document is supplementary to the “SiteManager Initial Contact” leaflets and the SiteManager product data sheets. These publications can be found on the Secomea web site.

*This guide is applicable to SiteManager firmware version 5.9 (15123) or newer.*

**Version 3.1, March 20, 2015**



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## Introduction

SiteManagers are equipped with 2 x input- and 2 x output ports that can be used to extend the primary functionality of the SiteManager.

The Input ports can be used to trigger alerts sent as Email or SMS messages from the GateManager, or trigger an SMS sent from SiteManager itself (SMS alerts are only applicable to xx39 models with integrated 3G modems). Additionally an Input port can be used to control when remote access is possible.

The Output ports can be used to trigger a signal to e.g. a PLC or HMI, based on manually toggling of a button in the SiteManager GUI. Additionally an Output port can signal when remote access is made via the SiteManager, or simply when the SiteManager is connected to the GateManager.

### 1. About GND, 0V GND and Shield

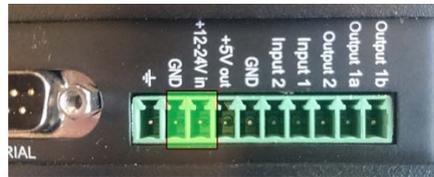
On the SiteManager the power should be applied between GND and +V as shown.

**Models: 10xx, 14xx, 32xx, 34xx**



Voltage **12-48V**

**Models: 11xx, 33xx**



Voltage: **12-24V**

On some industrial equipment, you will find that power should be supplied between terminals marked -V or 0V and +V, and where -V/0V, GND and Shield may have different potentials. The specifications for a USB port is that GND and Shield should have the same potential, and since the SiteManager has a USB port, the GND and Shield is per design short circuited internally.

It is also intentional that there are no separate -V/0V pins on the SiteManager, since the presence of the USB port would make it extremely difficult to protect the power regulation circuitry in the SiteManager, should you by accident apply voltage between -V/0V and GND.

This would typically not be an issue even in cases where GND and Shield are wired separately.

## 2. Digital Input Ports (ALL SiteManager models)

**IMPORTANT:** Examples in the following are only for illustration of the functionality. Always consult the specifications of the equipment you intend to connect.

### 2.1. Electrical information

Input port toggling on the SiteManager would typically be controlled by a mechanical switch or a relay connected to the GND and Input terminals. The Input port is when not connected in “Open state” (inactive) that corresponds to a connected mechanical switch is turned OFF. An input toggles to “Close state” (ON) when pulled from 2.34 V or above to 0.16 V or below.

The behavior for input voltages between 0.16 V and 2.34 V is undefined.

In the SiteManager there is an internal 10 Kohm pull-up resistor to 3.3 V, so an unconnected input port is in the “OFF” state.

### 2.2. Digital Input ports default functionality

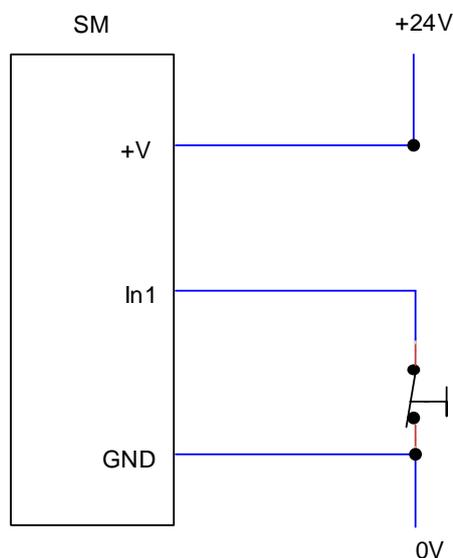
Input port 1 is default assigned to toggle GateManager Access. By connecting a simple on/off switch you can control when remote service should be allowed (see also section **2.5 Changing Input 1 default functionality**)

Input port 2 is not associated with anything as default.

### 2.3. Low-side Output switching equipment example

When a digital input port of the SiteManager is connected to equipment that has “low-side switching” conductor connections on the output, you can use the SiteManager input ports directly without any external components (such as pull up resistors or relays).

A typical use is the following, where a mechanical single pole switch is connected between Input 1 and GND.

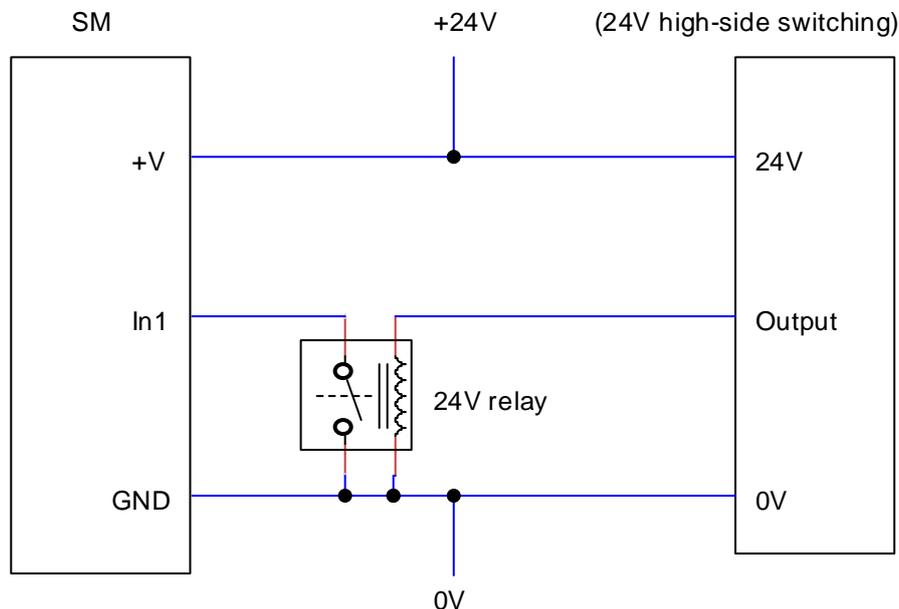


This exploits the default use of Input 1, which is to control the remote access. Short circuit of Input 1 and GND will by default disable the GateManager connection.

## 2.4. High-side Output switching equipment example

When an input port of the SiteManager is connected to equipment that has “high-side switching” connections on the output, you must apply a circuitry to pull the output towards zero.

The following example uses a 24V relay, which subsequently assumes the output of the equipment to support 24V operation (the coil voltage).



## 2.5. Changing Input 1 default functionality

As mentioned previously, Input 1 by default controls remote access.

In the SiteManager menu **System > I/O** you can determine if the default action is enabled, which is the case in this screen shot:

The screenshot shows the SiteManager web interface. The top navigation bar includes 'SETUP', 'System', 'GateManager', 'VPN', 'Routing', 'Maintenance', 'Status', 'Log', and 'HELP'. The 'System' menu item is highlighted in red. Below the navigation bar, the 'I/O' menu item is also highlighted in red. The main content area is titled 'I/O Ports' and contains two sections: 'Input Ports' and 'Output Ports'. The 'Input Ports' section has a table with the following data:

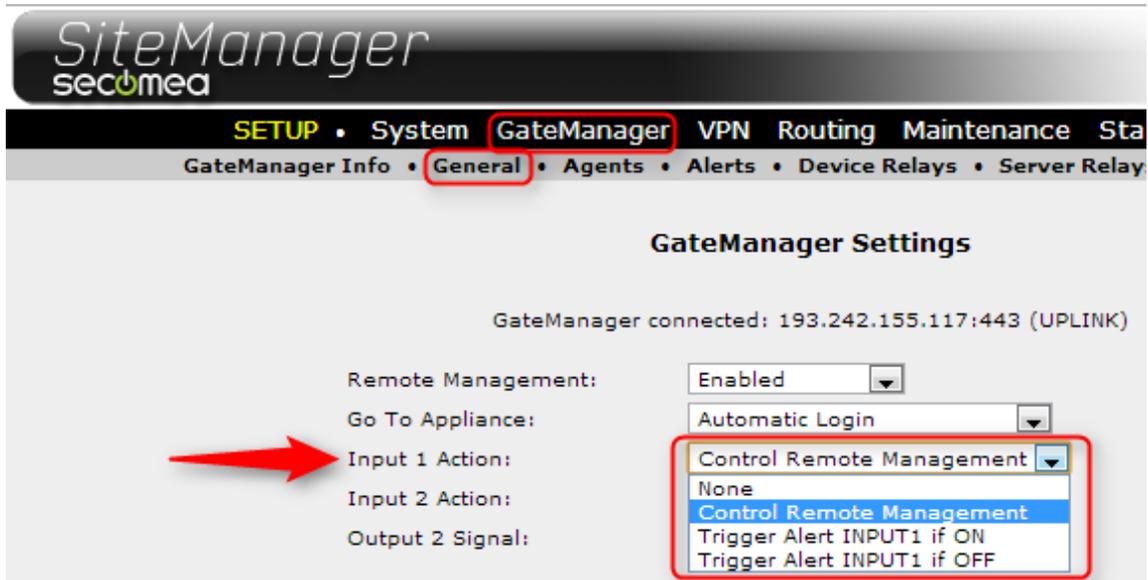
| Port | State | GateManager Action                            | Local Alert Action |
|------|-------|---|--------------------|
| IN 1 | OFF   | Toggle GateManager Access (Currently Enabled) | SMS ON to          |
| IN 2 | OFF   | Raise INPUT2 trigger if ON                    | Disabled           |

The 'Output Ports' section has a table with the following data:

| Port  | State | Action |
|-------|-------|--------|
| OUT 1 | OFF   | Toggle |
| OUT 2 | OFF   | Toggle |

A red arrow points to the 'Toggle GateManager Access (Currently Enabled)' option for IN 1. A 'Refresh' button is located at the bottom of the page.

If you want to use Input 1 for another purpose, you can disable the current action. Enter the menu **GateManager > General** and press the **[More>>]** button. The control of the "Input 1 Action" will be shown, and you can define it to trigger and alert instead.



## 2.6. Defining Input port Alerts

Alerts resulting from triggering Input ports can be sent locally from a SiteManager as SMS (xx39 models only), or via the GateManager as Email or SMS (all models).

Refer to the separate guide "**SiteManager Working with SMS and Email Alerts**" available in the support section on the Secomea web site.

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### 3. Digital Output Ports

**NOTE:** This section applies to:

**Output port 1 and 2** for models 10xx, 14xx, 32xx, 34xx

**Output port 2 only** for Models 11xx and 33xx

#### 3.1. Digital Output ports - Electrical information

The digital output ports are of the “open drain” kind, which means that (just like a switch) no voltage is output by the port itself, but must be controlled from a circuitry supplied by an external source (max 24V) or from the Vout (5V) pin.

**Do NOT apply voltage (e.g. 24V) directly to a SiteManager Digital Output port, as this could permanently damage the port.**

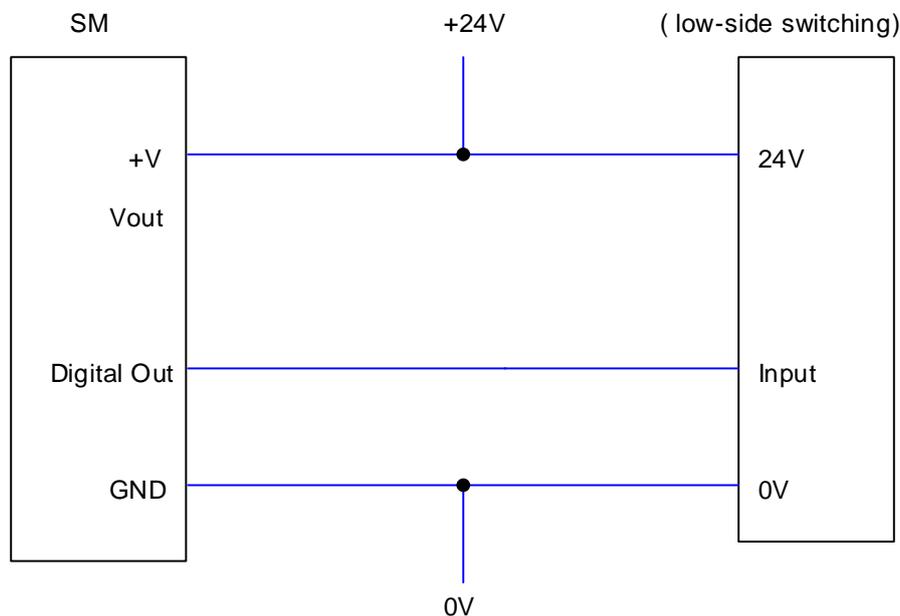
In the “OFF” (inactive) state, the impedance is min 24 Mohm; in the “ON” (active) state, the impedance is max 0.5 ohm.

Maximum sink current is 0.2A, which means the Output port is protected by 0.2A fuses mounted in extension to the FET transistors of the Output ports; but it is still very important to dimension the external circuitry to not overload the ports. At 24V you should therefore apply pull-up resistors at minimum  $24V/0.2A = 120 \text{ ohm}$  ( $24V \cdot 0.2A = 4.8W$ ), but it is recommended to not exceed 3W, meaning a pull-up resistor of 220 ohm is recommended. These pull-up resistors must be applied externally, unless you are using a relay which has high enough impedance.

A 12V or 24V relay can be applied to an output port directly if the relay is supplied with the corresponding working voltage (12V or 24V respectively) and with a "trigger current" at max 0,2A. (A larger relay would require more current, and subsequently would require an additional "assisting" relay for the SiteManager output ports to trigger it)

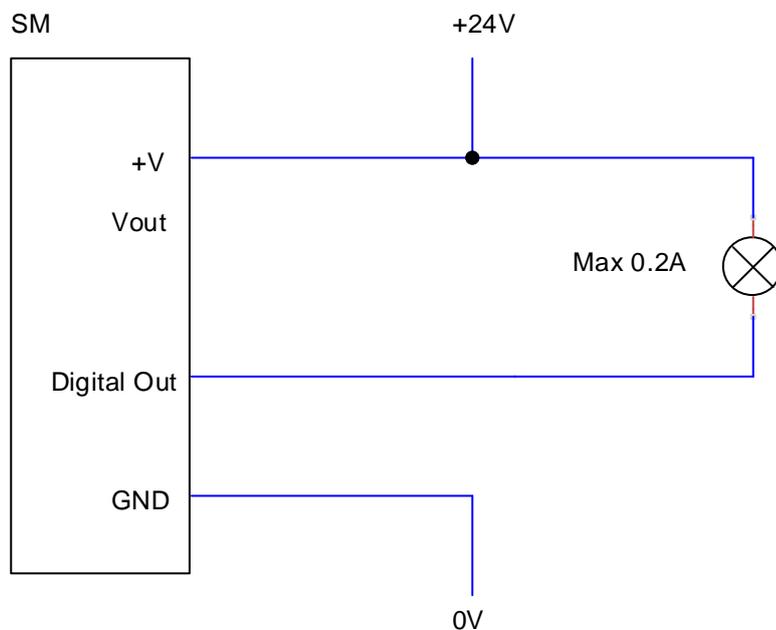
### 3.2. Low-side Input switching equipment example.

When a digital output port of the SiteManager is connected to equipment that has “low-side switching” conductor connections on the input, you can use the SiteManager’s digital output ports directly without any external components (such as pull up resistors or relays).



With a “trigger current” of 0,2A, the digital ports of the SiteManager should also be powerful enough to pull a relay directly (even an electromechanical one).

You could also choose to control e.g. a 24V LED light tower up to 4.8 Watts:



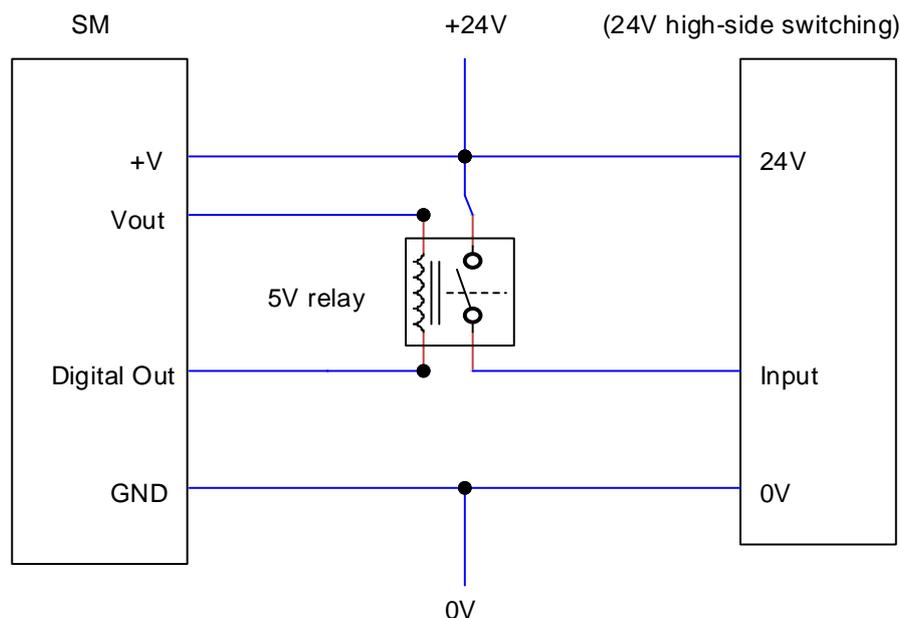
### 3.3. High-side Input switching equipment example.

When a digital output port of the SiteManager is connected to equipment that has “high-side switching” conductor connections on the input, you must apply additional circuitry to pull the output towards +.

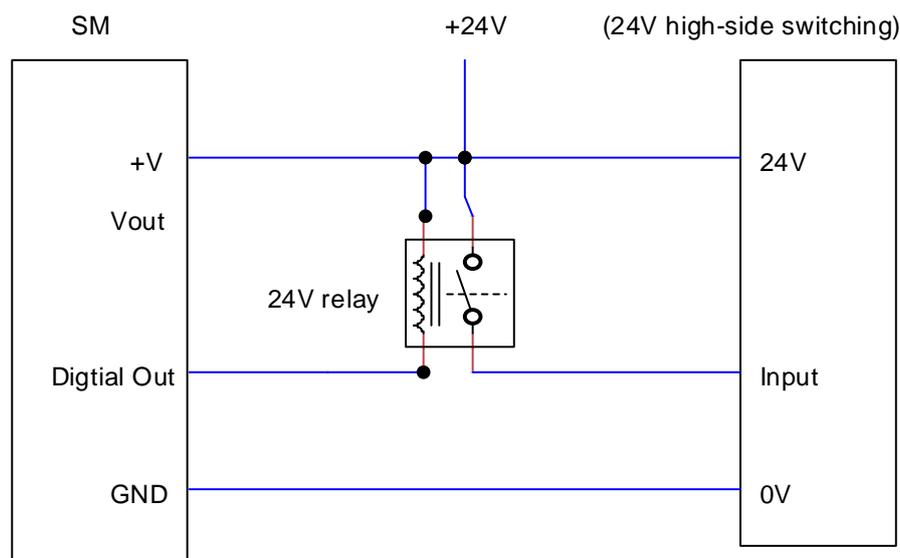
Be careful about just applying a resistor to pull the output high, as the effect and resistor value must be calculated based on the power consumption and switching voltage level of the attached equipment.

A safer setup will be to use a Relay.

The following example uses a 5V relay, which means you can use the Vout of the SiteManager to pull the output high.



In the following example a 24V relay is used, which means an external source must keep the level high.



## 4. Relay Output Port (isolated)

**NOTE:** This section applies to:

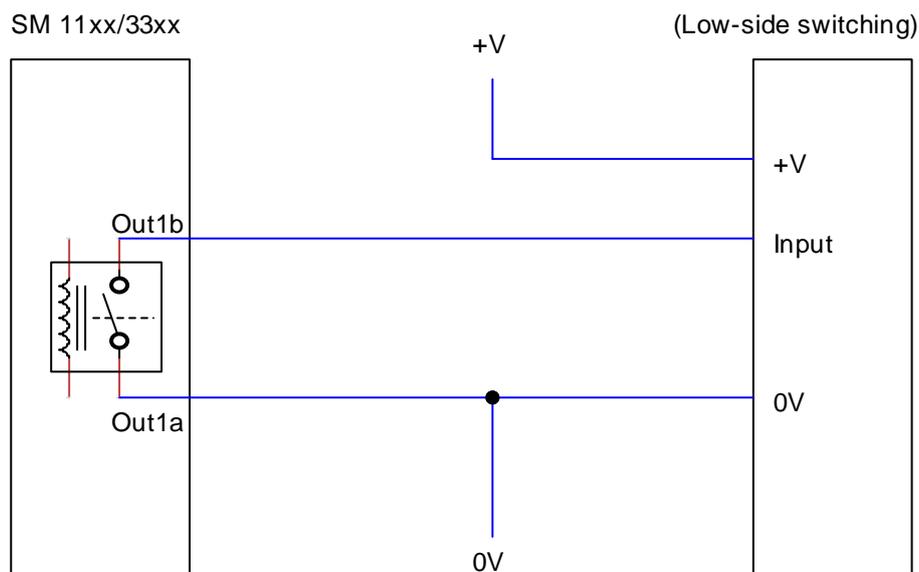
**Output port 1** for Models 11xx and 33xx only

### 4.1. Relay output ports - Electrical information

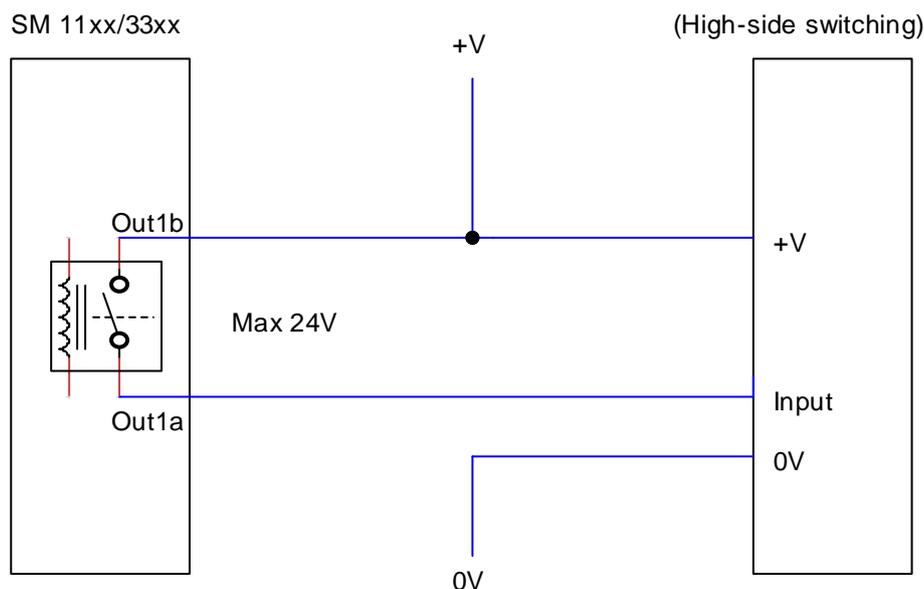
The Relay Output1 is a “dual pin” port where both pins are isolated when OFF and short-circuited when ON.

Maximum sink current is 0.5 A. Maximum Voltage is 24V.

### 4.2. Low-side Input switching equipment example

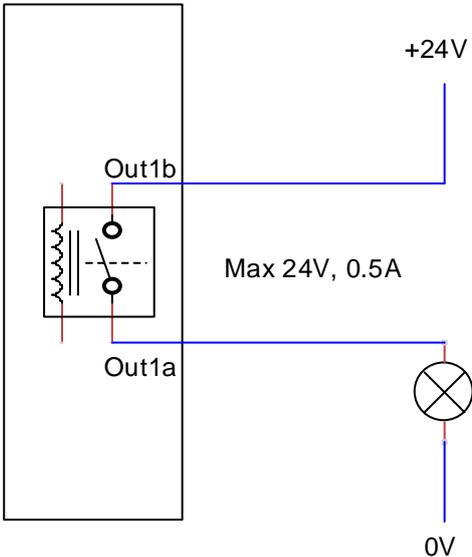


### 4.3. High-side Input switching equipment example



By default Output 1 is configured to go ON when Output port 1 is by default configured to go active when e.g. a LinkManager is connected, and can be used to turn on a signal that notifies the users that the device is being serviced. The signal could be a LED light tower up to 12 Watts.

SM 11xx/33xx



## 5. Output ports default functionality

Output port 1 is by default set to go active when connecting to the SiteManager or its Agents, using LinkManager, LinkManager Mobile or the "Go To Device" buttons from GateManager. The purpose is to signal, e.g. by turning on an external warning light, to the local service people that the machine is currently being serviced remotely.

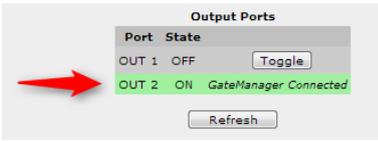
Output port 2 is by default set to NO predefined action, but it can be configured to the same values as Output 1. I.e. if you want to use a digital Output port 2 on a SiteManager 11xx or 33xx model to signal remote service, and use the isolated Output ports 1a/1b for other purposes, you can change this under **GateManager > General > [More>>]**.

The screenshot shows the SiteManager web interface. The navigation menu includes SETUP, System, GateManager, VPN, Routing, Maintenance, Status, Log, and HELP. The GateManager Settings page is displayed, showing the following configuration:

- Remote Management: Enabled
- Go To Appliance: Automatic Login
- Input 1 Action: Control Remote Management
- Input 2 Action: Trigger Alert INPUT2 if ON
- Output 1 Signal: LinkManager Connected
- Output 2 Signal: None
- GateManager Address: \* LinkManager Connected

Red arrows point to the 'Output 1 Signal' and 'Output 2 Signal' dropdown menus.

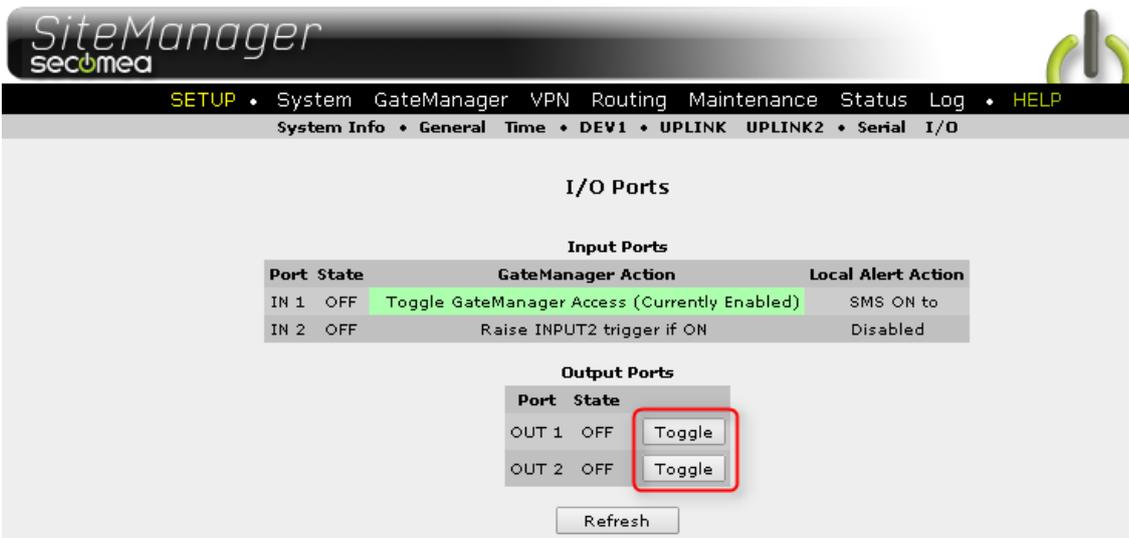
When an Output port function is selected for an Output port under GateManager Settings, the active state will be displayed as follows under **System > I/O**.



### 5.1. Manual toggling of Output port state

Both Output ports can be manually set ON or OFF via the toggle button in the SiteManager web GUI under **System > I/O**.

Note that an Output that is triggered ON by a value defined under GateManager Settings as mentioned above cannot be forced OFF.



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## Notices

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Secomea A/S  
Denmark

CVR No. DK 31 36 60 38

Tel.: +45 88 70 86 50  
Fax: +45 88 70 80 60  
E-mail: [sales@secomea.com](mailto:sales@secomea.com)  
[www.secomea.com](http://www.secomea.com)