



3G Global Communication Adapter

MMLink-3G

GWA-3G10

User Manual

Introduction

Introduction

MMLink-3G is Machine-to-Machine (M2M) communication adapter which provides UMTS wireless communication through the 3G cellular networks by using the onboard LAN interface.

Read this manual carefully before using MMLink-3G.

Precaution

Important Safety Information

This product is not intended for use in the following circumstances

- Area(s) where radio transmission equipment (such as cell phone) are not permitted.
- Hospitals, health care facilities and area(s) where cell phones are restricted by law.
- Gas stations, fuel storage and places where chemical are stored.
- Chemical plants or places with potential explosion hazard.
- Any metal surface that may weaken the radio signal level.
- The appliance is intended to be installed in restricted access location. Only service person or authorized person is allowed to access.

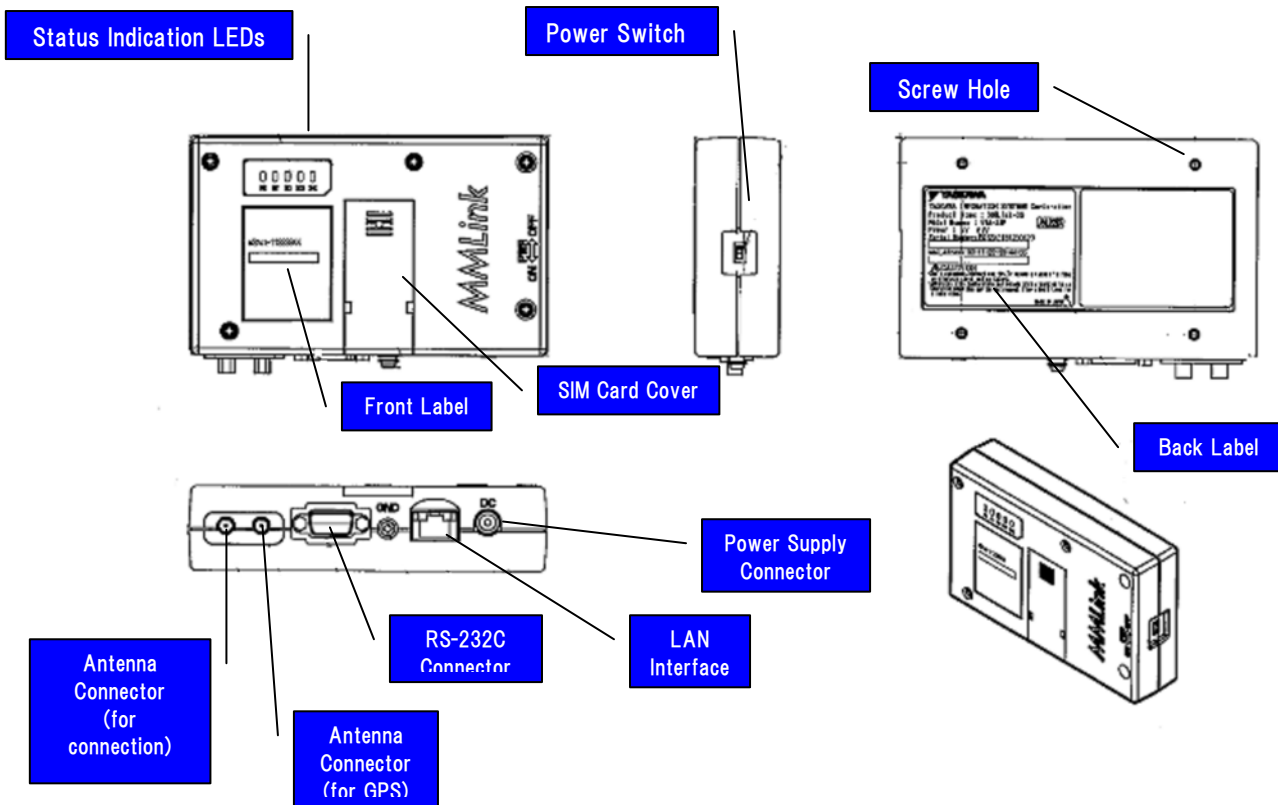
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Before Using

Name of Each Parts

The following are the parts of this adapter.



Status Indication LEDs

Status Indication LEDs can indicate the status of this adapter.



Name	Color	Description								
PWR	GREEN	Light when power is on.								
ANT	ORANGE/ GREEN/ RED	<p>Indicate the received signal level.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Signal status: Bad</td> <td>Off</td> </tr> <tr> <td>Signal status: Poor</td> <td>Light on with red color</td> </tr> <tr> <td>Signal status: Average</td> <td>Light on with orange color</td> </tr> <tr> <td>Signal status: Good</td> <td>Light on with green color</td> </tr> </table>	Signal status: Bad	Off	Signal status: Poor	Light on with red color	Signal status: Average	Light on with orange color	Signal status: Good	Light on with green color
Signal status: Bad	Off									
Signal status: Poor	Light on with red color									
Signal status: Average	Light on with orange color									
Signal status: Good	Light on with green color									
STS	ORANGE/ GREEN/ RED	<p>Indicate the running status of this adapter. (Note)</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Idle</td> <td>Off</td> </tr> <tr> <td>Initializing</td> <td>Blink with green color</td> </tr> <tr> <td>Information 1</td> <td>Light on with orange color</td> </tr> <tr> <td>Information 2</td> <td>Light on with red color</td> </tr> </table>	Idle	Off	Initializing	Blink with green color	Information 1	Light on with orange color	Information 2	Light on with red color
Idle	Off									
Initializing	Blink with green color									
Information 1	Light on with orange color									
Information 2	Light on with red color									
DATA	GREEN	<p>Indicate the communication status between this adapter and the wireless network.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Not communicating</td> <td>Off</td> </tr> <tr> <td>Communicating</td> <td>On</td> </tr> </table>	Not communicating	Off	Communicating	On				
Not communicating	Off									
Communicating	On									
CD/RI	GREEN	<p>Indicate the CD signal statue.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Wireless network disconnected</td> <td>OFF</td> </tr> <tr> <td>Wireless network connecting</td> <td>On</td> </tr> <tr> <td>Wireless network connected</td> <td>On</td> </tr> </table>	Wireless network disconnected	OFF	Wireless network connecting	On	Wireless network connected	On		
Wireless network disconnected	OFF									
Wireless network connecting	On									
Wireless network connected	On									

Note: About the information display of STS LED

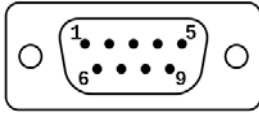
Please contact the Customer Support Services when information 1 or information 2 is ON.

Information 1 : probably hardware failure.

Information 2 : probably SIM card is unreadable.

RS-232C Connector

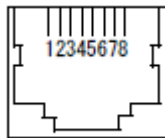
Pin Assignments



D-sub Connector PIN Assignments			
Pin No.	Signal	Pin No.	Signal
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	GND	—	

LAN Interface

Pin Assignments

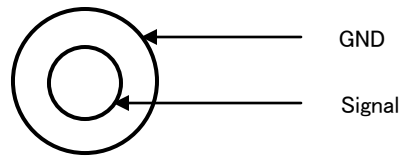


RJ-45 Connector Pin Assignments	
Pin No.	Signal
1	Tx+
2	Tx-
3	Rx+
4	—
5	—
6	Rx-
7	—
8	—

Note:
MDI/X auto-cross/straight cable support.

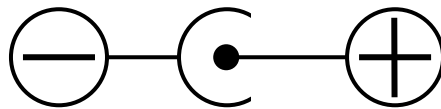
Antenna Connector (SMA)

Pin Assignments



Power Supply Connector (DC)

Pin Assignments



Basic Operations

Connecting the antenna and cables

Before using this adapter please do the following preparations.

Step 1. Attach the antenna to the antenna connector

Use the antennas that attached to this adapter. (Note 1)
Ensure that no excessive force is applied to the antenna connector.

Step 2. Ensure that the equipment and this adapter is powered off.

Step 3. Connect the power supply to the power connector

Use the power supply that attached to this adapter. (Note 2)

Step 4. Connect the equipment to this adapter.

Connect a LAN cable to this adapter's LAN connector.

Note:

1. Please contact the Customer Support Services to obtain the information about recommended antennas by the manufacturer.

2. Please contact the Customer Support Services to obtain the information about recommended power supply (AC adapter) by the manufacturer.

Switching on the Adapter

Turn on the Power Switch on the side of this adapter.

It takes about 30–60 seconds until it is ready to communicate after switched on.

STS LED will keep blinking with green color while initializing, and will be turned off once initialization is normally completed.

Wait at least 5 seconds between powering off and on.

When performing packet communications, check the signal level on the ANT LED.

Switching off the Adapter

Turn off the Power Switch on the side of this adapter.

Check if the PWR LED is off.

It takes 3–5 seconds to shut down after turning off the Power Switch.

Packet Communications

- This adapter is available in the UMTS worldwide coverage.
- High-speed packet communications.
 - DL: at maximum. 14.4 Mbps
 - UL: at maximum. 5.76 Mbps

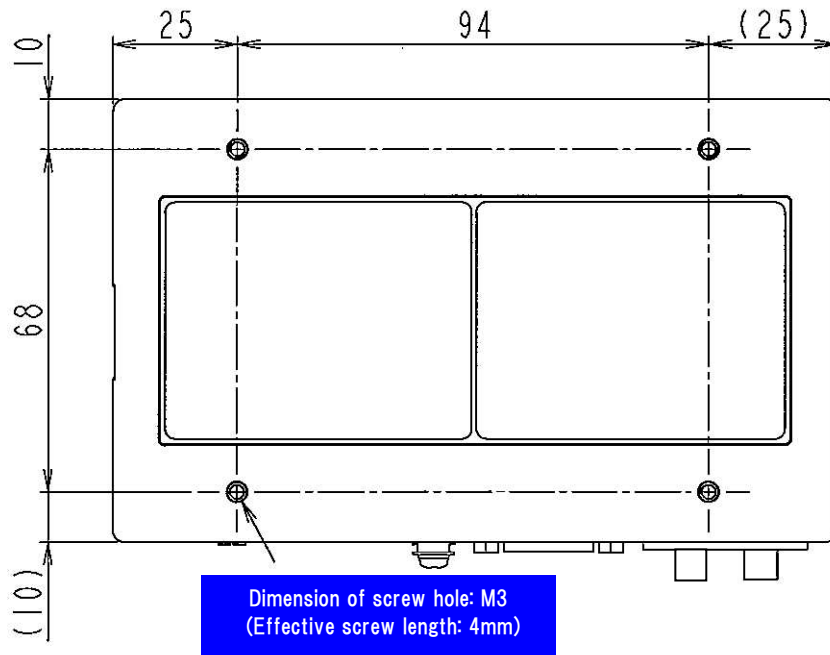
The line speed may be affected by communication environment and the contract with a carrier.

Fees

- Terms and packet communications services, contract fees, monthly fees, communication fees will be charged depending on the amount of data sent and received. For more information please contact Customer Support Services.
- If you are using Internet access services, your internet service provider will charge you for the service fee. For fee details, please contact your provider for help.
- Subscribing to dedicated lines will require a fee depending on connection fees and options contracts. For fee details, please contact your provider for help.

Installation

■ Installation Dimensions (Back Case)



Features

Summary of Features

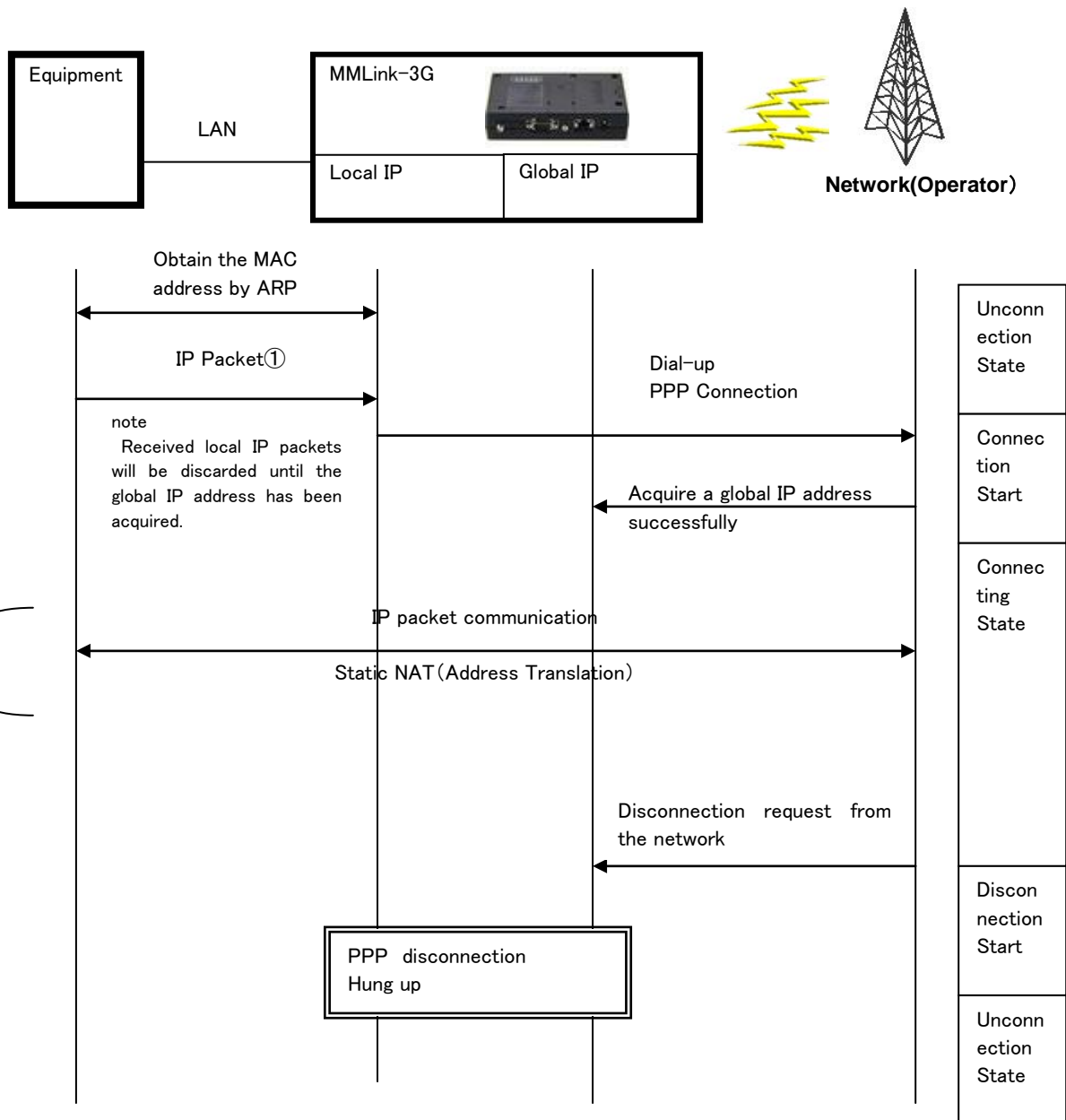
The following is a summary of the features.

Feature	Description
Simple Router (Static NAT)	IP packets received from equipment connected to this adapter can be transmitted to the WAN by IP address transforming.
Simple Location Information Acquisition	Location information can be acquired using a simple command by TCP / IP communications from the LAN interface of this adapter.
SMS Auto Connection	This adapter automatically connects to the wireless network after receiving an SMS message.
Remote Diagnosis	The network connectivity of this adapter can be checked.
Fail-Safe	This adapter can detect communication failures and recover automatically.

Simple Router (Static NAT)

This adapter can communicate with the WAN using TCP/IP packets by connecting your equipment to it via LAN.

The following diagram shows the operations of the equipment connected to MMLink-3G.



Settings for the Simple Router (Static NAT)

Your equipment needs be equipped with the protocols below.

7		Application Layer
6		Presentation Layer
5		Session Layer
4	TCP	Transport Layer
3	IP	Network Layer
2	Ethernet	Data Link Layer
1		Physical Layer

} TCP/IP protocol is required.

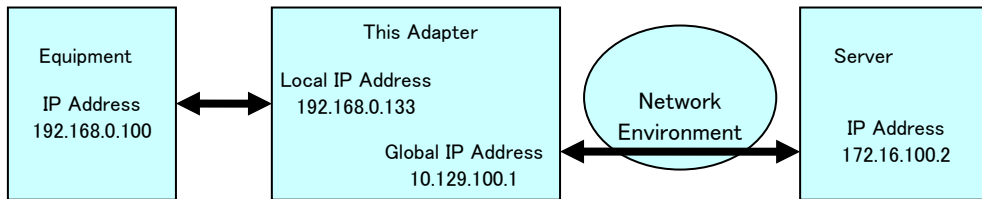
- The TCP/IP settings of this adapter

IP Address	192.168.0.133
Subnet Mask	255.255.255.0

The TCP/IP settings of equipment

IP Address	192.168.0.100
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.133

- Static address translation



How to Use the Simple Location Information Acquisition Command

You can get the location information via a command by using a specific TCP/IP port.

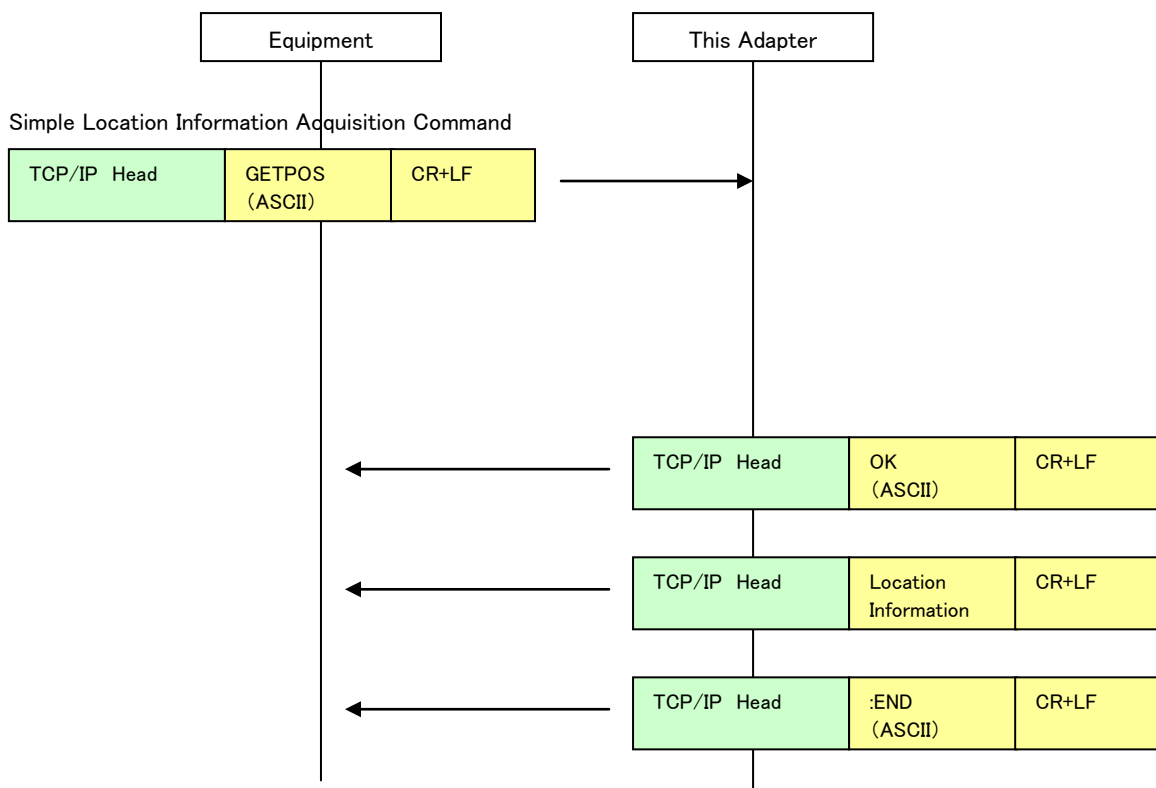
Note:

Location information obtained by this command is based on cellular system, so it's different from the GPS positioning.

■ The setting of the service port

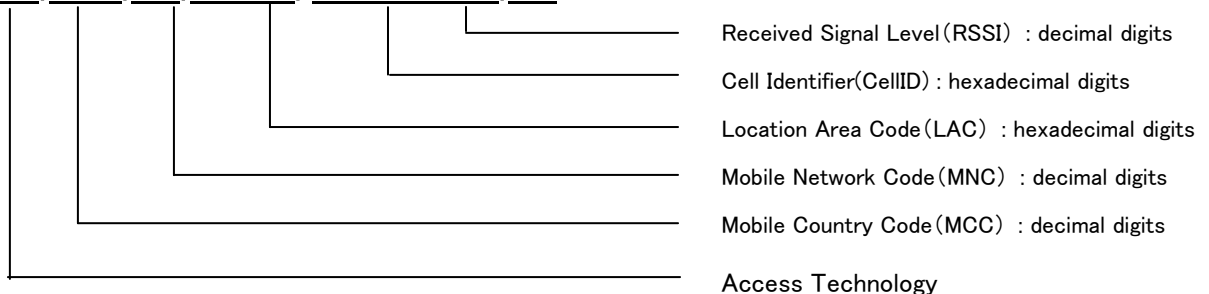
Please use the following dedicated TCP/IP port to perform the Simple Location Information Acquisition Command.

Port No.	777
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The format of the location information. <ASCII String>

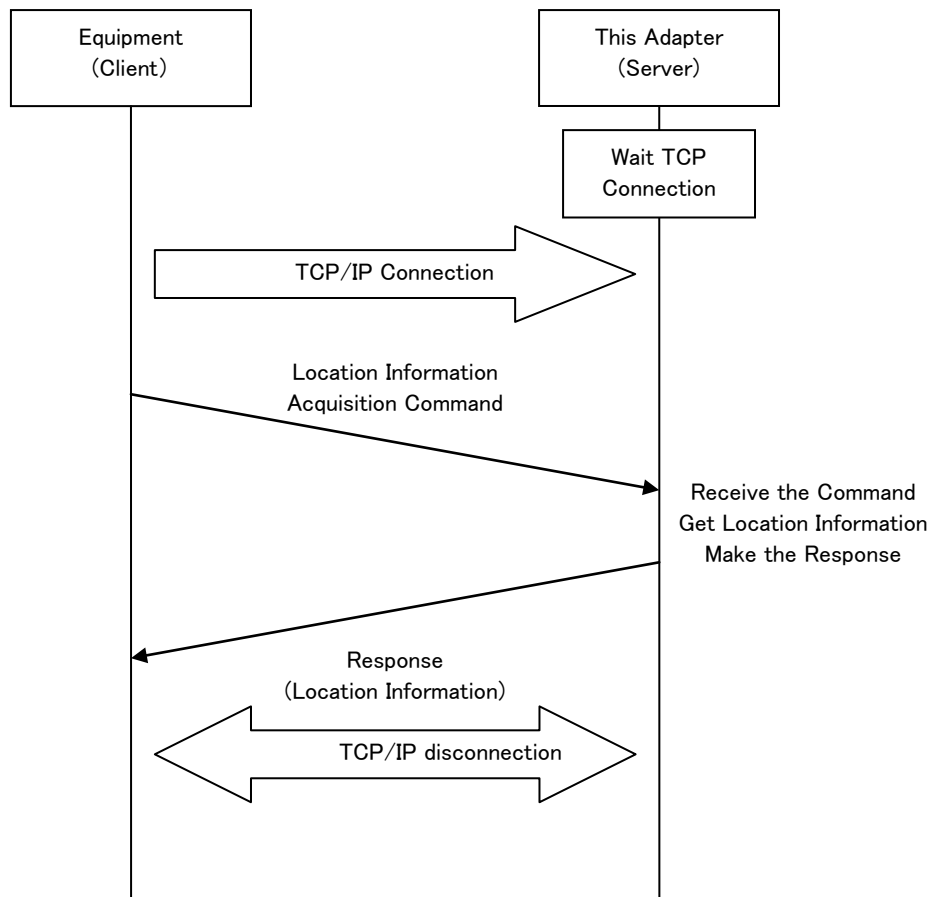
3G,262,03,9C57, 7E7D68B,20



The communication sequence is as follows:

This adapter is a TCP Socket Server, and the equipment is a TCP Socket Client. They need to connect or disconnect using TCP/IP.

The simple router feature is enabled while the service port is using, so you can acquire the location information while normal data communication.



SMS Auto Connection

This adapter supports automatic connection to the wireless network by an SMS message.

When this adapter receives an SMS, the following processes will be performed.

- In the case, This adapter has not been connected to the wireless network Automatically connect to the wireless network. The TCP/IP communication will be ready once the connection is successful.
- In the case, This adapter has been connected to the wireless network already Wireless network connection will be kept.

Remote Diagnosis

This adapter supports network connectivity detection by an ICMP packet.

By sending an ICMP packet as below, you can verify whether this adapter is connected to the wireless network.

- When received a ICMP 13 from the wireless network, this adapter will respond by sending ICMP 14,

Note:

ICMP type 13 packets are not routed to the equipment that is connected to this adapter.

This feature is only for checking the connection state of the adapter, so the data in the packet is meaningless.

Fail-Safe

This adapter communicates with wireless network by the wireless module equipped. In some cases, the wireless module cannot continue communication normally due to poor network conditions (such as out of service, a weak signal level, and the base station design change and communication failure), combined with functions of the wireless module itself.

This adapter can detect such communication failures and recover automatically.

When failures were detected, this adapter will reset itself automatically, so the communication between this adapter and the equipment will temporary stop.

Although frequency of the automatic recovery is rare, please implement the following fail-safe features to your equipment in principle.

- Reconnect this adapter if the LAN interface is disconnected,
- If your system does not recover by a normal retry procedure, please reset this adapter.

Specifications

■ Product Name and Model

Name: MMLink-3G

Model: GWA-3G10

■ Hardware Specifications

Items	Specifications
Dimensions	144 × 88 × 34mm (Excluding protrusions)
Case	Resin (Black Color)
Wireless Module	<ul style="list-style-type: none"> •Five Band UMTS (WCDMA/FDD) 800/850/900/1900/2100MHz •Quad-Band GSM 850/900/1800/1900MHz •UMTS/HSPA+ /GSM/GPRS/EDGE
Communication I/F	RS-232C × 1 (Full wiring) LAN × 1 (RJ-45)
Antenna	SMA Connector × 2
SIM	SIM Card Slot × 1
Power Supply	DC5V ± 5%
Typical Quiescent current	2.0A below
Temperature for use	-20~+55°C
Temperature for storage	-30~+80°C
Humidity for use	10~90%RH (non condensing)
Humidity for storage	10~90%RH (non condensing)
Water proof / Dust proof	IP4X (Excluding the connector)

Compliance Statements:

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.

Modifications not expressly approved by YASKAWA could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, users and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiofrequency radiation exposure Information:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAN ICES-3 (B)/NMB-3(B)

