



GoRugged M1000 Family
- The Real Industrial Cellular Modem

Edition: Feb. 2012

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Corporate Profile



Robustel Technologies is a technology company with heavily investment in R&D, focus on industrial grade wireless machine-to-machine (M2M) communications and telecom grade mobile broadband/access development.



Aim to design and deliver innovative products and solutions for the M2M market, and to be leading provider for wireless device networking worldwide.






State-of-the-art products, including smart cellular modems, mobile gateways/terminals, AVL trackers, etc.

GoRugged M1000 Family

- **M1000:** Smart GPRS/EDGE Modem
- **M1000 Pro:** Serial to GPRS/EDGE Gateway (Automatic GPRS connection, no AT commands required, wakeup by serial data/SMS/Caller ID)
- **M1000 Java:** Smart GPRS Modem with Built-in JAVA
- **M1000 Lite:** Smart GPRS Modem: less feature version
- **M1000 CDMA:** Smart CDMA Modem



GoRugged Comparison Table

Overview of Robustel M1000 Series Modems					
Part #	M1000	M1000 JAVA	M1000 Lite	M1000 CDMA	M1000 Pro
Features					
Control via AT Commands	V	V	V	V	X
TCP/IP and UDP via AT commands (Non-transparent)	V	V	V	V	X
SMS Direct (Auto SMS, no AT commands required)	V	V	X	X	X
Auto reboot at preset time of a day	V	V	V	V	V
Auto reboot via Caller ID	V	V	X	X	V
Auto reboot via SMS	V	V	X	X	V
Auto GPRS connection (no AT commands required)	X	X	X	X	V
Transparent TCP client/server and UDP socket connections	X	X	X	X	V
Virtual COM	X	X	X	X	V
Various dial-up policy	X	X	X	X	V
Auto SMS of IP for dynamic IP SIM card	X	X	X	X	V
Firmware upgrade via serial interface	V	V	V	V	V
JAVA	X	V	X	X	X

M1000 Overview

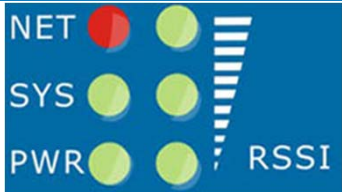
CE 1177, R&TTE
RoHS, WEEE

Antenna
• SMA Connector

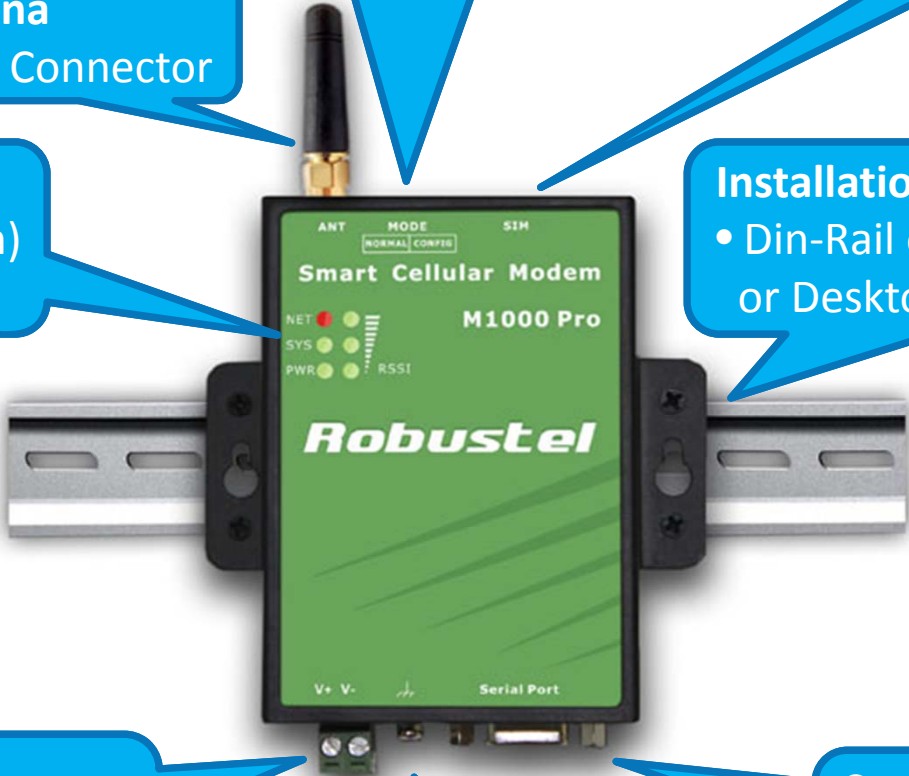
Mode Switch
• Normal or Config Mode

SIM Card

LED Indicators
• RSSI (Signal Strength)
• NET, SYS, PWR



Installation
• Din-Rail or Wall Mounting
or Desktop

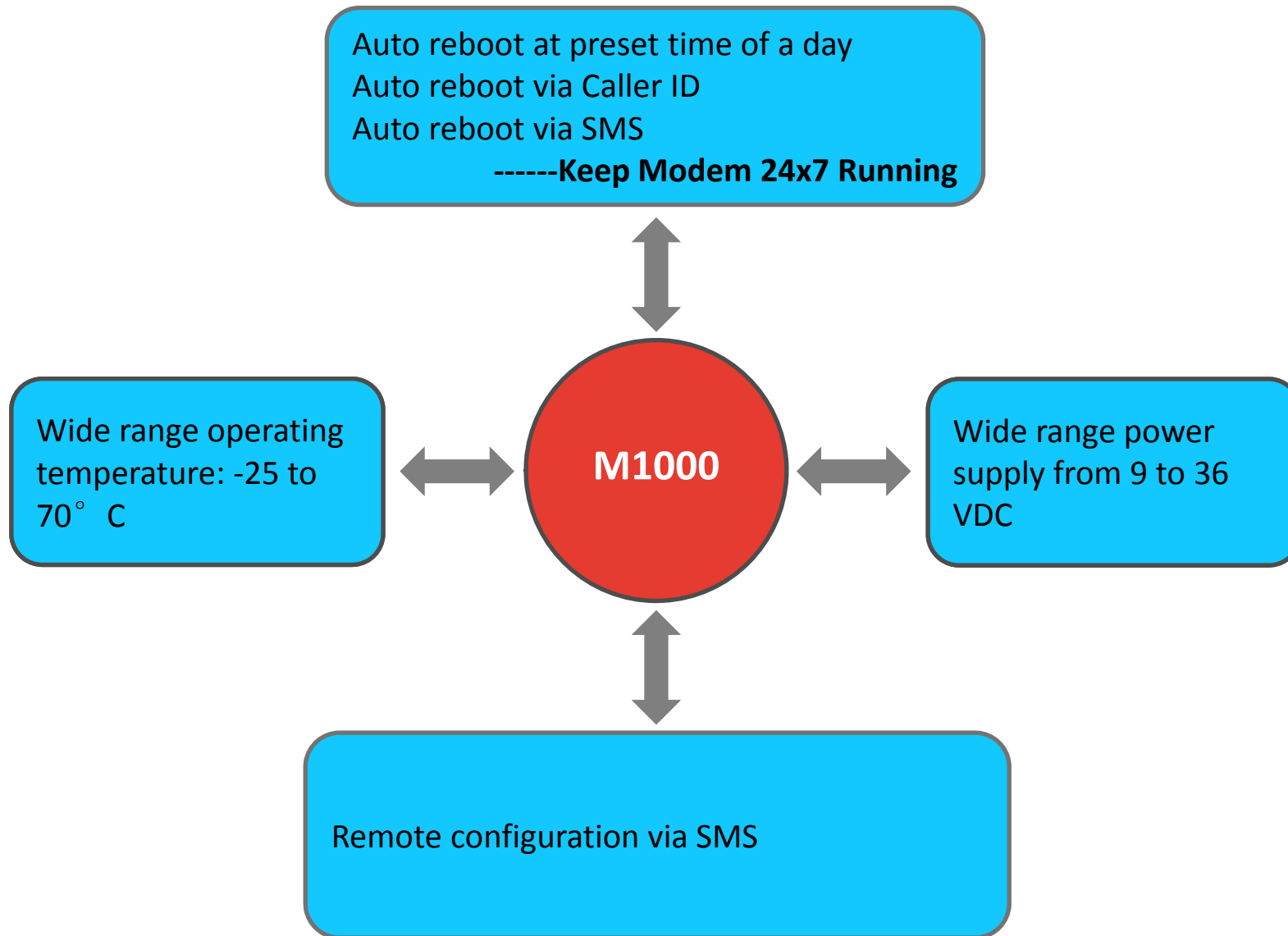


Power Supply: 2-PIN 5mm
pluggable terminal block
• DC 9-36V input

Grounding Screw

Serial Port: DB9F
• RS232 and RS485
selecting by s/w

Why M1000



Specifications

- Quad-Band GSM 850/900/1800/1900 MHz
- GPRS multi-slot class 10
- CSD data transmission rate up to 14.4 kbps
- RS232 & RS485 selectable by software, built-in 15KV ESD protection
- SIM Card reader: 3V, 1.8V
- 6 LED indicators: 3 level RSSI, PWR, RUN, NET
- Built-in real time clock with button battery
- Built-in watchdog and timer
- Power supply interface: 2-pin 5mm pluggable terminal blocks
- Input voltage: 9 to 36 VDC
- Operating temperature: -25 to 70 ° C
- Installation: 35mm Din-Rail or wall mounting or desktop

Features (M1000)

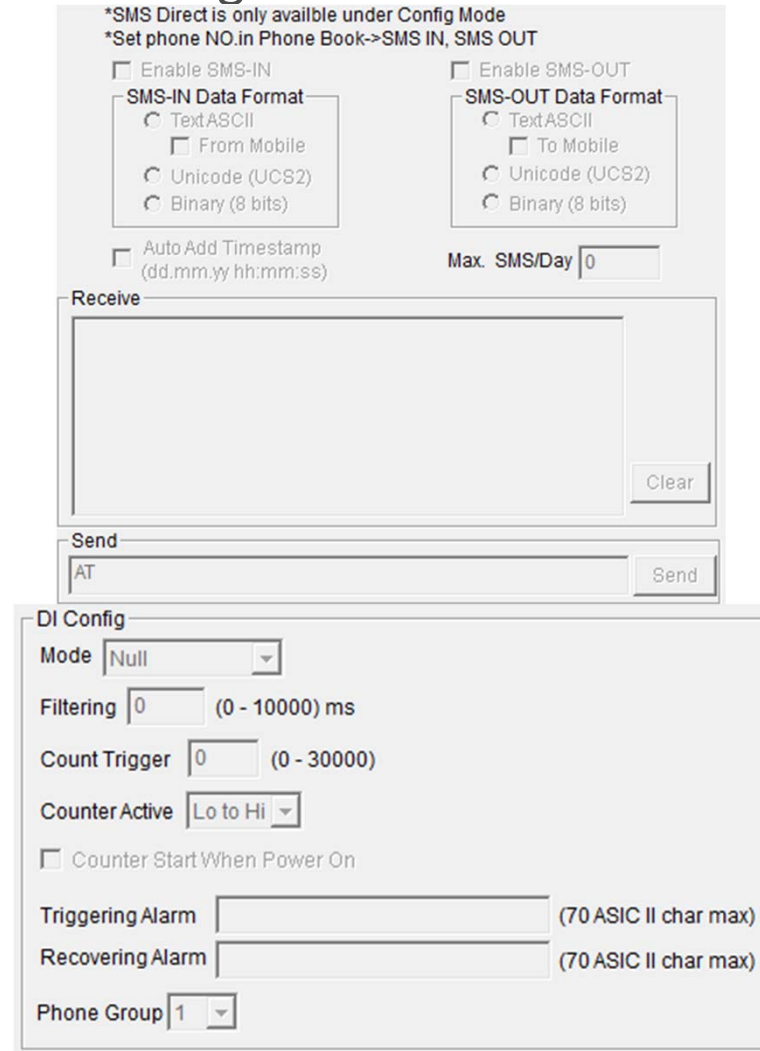
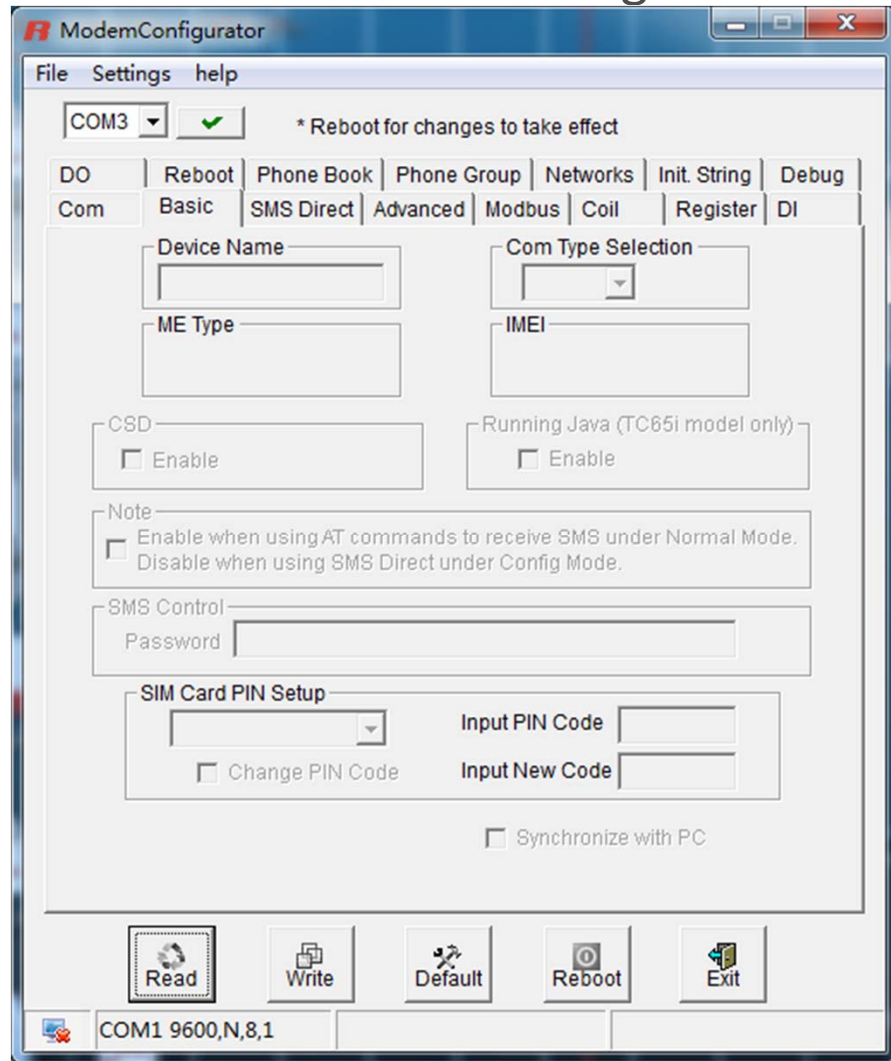
- **Configuration mode** and **Normal mode** selecting by switch
- Control via AT commands (Hayes 3GPP TS 27.007 and 27.005)
- PPP, TCP/IP stack for GPRS data transfer
- CSD Data Transmission Rate up to 14.4 kbps
- Send / receive SMS via AT commands (Under normal mode)
- Text and PDU SMS
- Point to point SMS (MT/MO)
- **SMS Direct** Mode can transparently converts serial data (Text, binary, and Unicode formats) to SMS or vice versa **without using AT Commands**, verification of incoming Caller ID is implemented to block uncertified users (Under Configuration Mode)
- Support Modbus RTU slave protocol, converts alarm to text format SMS without using AT commands
- Auto reboot at preset time of a day; Auto reboot via Caller ID/SMS
- 1xDI and 1xDO with wireless communications via SMS
- Remote configuration via SMS
- Firmware upgrade via serial interface

Features (M1000 Pro)

- **Configuration mode** and **Normal mode** selecting by switch
- Configurable by Robustel **ModemConfigurator Pro** GUI
- Auto GPRS connection (no AT commands required) and watchdog for reliable communications
- Transparent TCP client, TCP server and UDP socket connections
- Modbus/RTU to Modbus/TCP
- Support Virtual COM (COM port redirector)
- Various dial-up policies
- ✓ Always online: automatic GPRS connection while it powered on, automatic redial while the line dropped
- ✓ Serial data wakeup
- ✓ Wakeup on Caller ID or SMS
- ✓ Wakeup at preset time of a day or periodically at preset interval
- Auto GPRS connect/reconnect, Keep Alive command to maintain socket connection
- Auto disconnect GPRS when idle, switch off wireless module to save power is optional
- Auto SMS of IP for dynamic IP SIM card
- Remote configuration via SMS
- Packetization methods: packet length / time interval / special end characters
- Auto reboot at preset time of a day; Auto reboot via Caller ID/SMS
- 1xDI and 1xDO with wireless communications via SMS and GPRS
- Firmware upgrade via serial interface

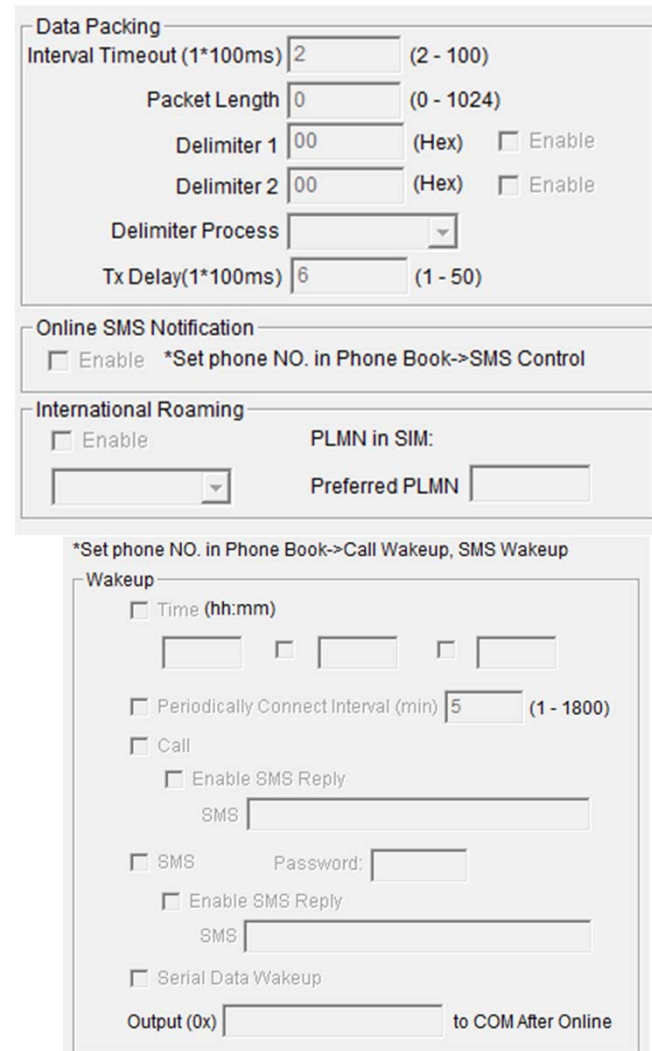
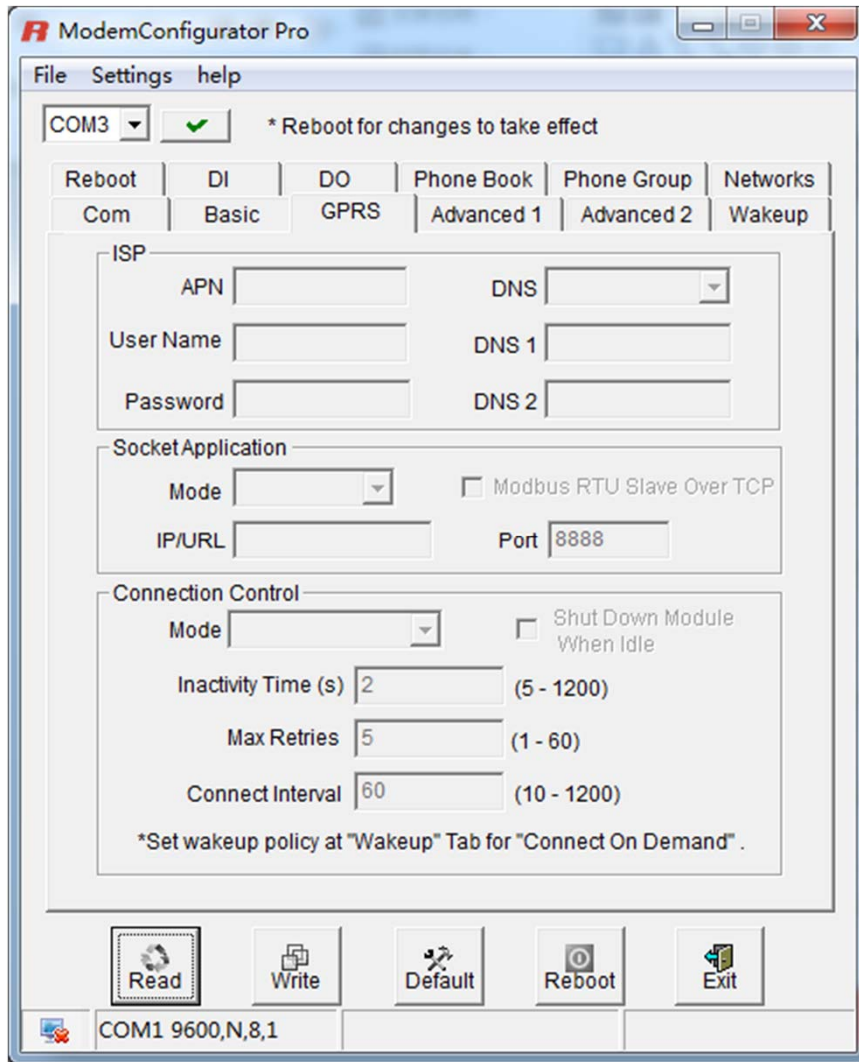
Modem Configurator

- M1000 could be configured via Modem Configurator



Modem Configurator Pro

- M1000 Pro could be configured via Modem Configurator Pro



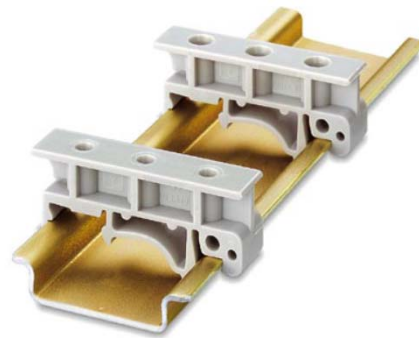
Accessories



Antennas



Serial Cable



Din-Rail



Power Supply Adapter

Application Cases



LED Signage



PLC Alarm Management



Vending Machine Management



POS Connectivity



Automatic Meter Reading



Bulk SMS



Slot Machine Monitor



Gaming Machine Monitor



CNC Machine Monitor



Automatic Weather Station

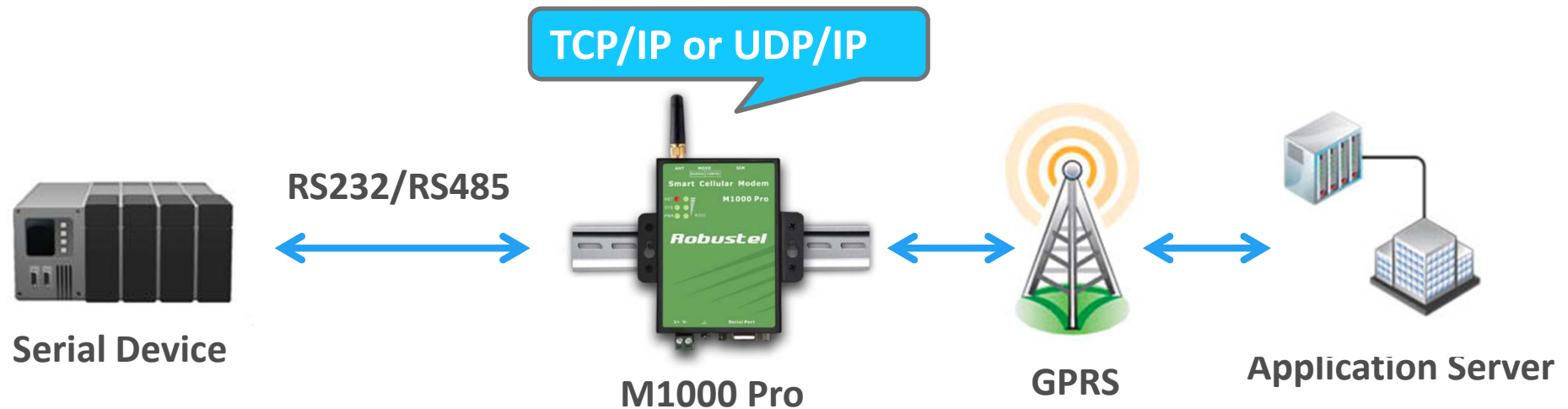


PBX Remote Management



Solar Inverter Remote Monitor

M1000 Pro Topology Concept



In general, the purpose of communication with the device will be for one of two reasons:

- **Monitoring** - Status monitoring data, such as the level or temperature of a storage tank, the velocity and pressure of a pipeline, the condition of a controller or the status of a register. Status monitoring data is often “polled.” The application sends out periodic queries and gets responses to those queries.
- **Transaction data** – Discrete event data, such as cash or credit transactions, PBX call records or mission-critical and safety related alarms.

Discrete event data is usually “unsolicited.” The application does not expect to get information on any regular basis, and therefore the failure to hear from the device is the normal case.

Most applications will likely involve one or both of these methods and data is transmitted in TCP or UDP packets.

LED Signage Publication via GPRS



The fast growing Digital Signage market, including transportation sectors, retail, sports/events and is proving ideal for the adoption of GPRS connectivity to update the content. This is due to the location for the digital signage is remote and does not easily facilitate the use of fixed line connectivity, or is a temporary location.

Scenario:

- 1.M1000 Pro works as TCP client with any IP (Transparent TCP);
- 2.Application Server works as TCP server with public fixed IP or public dynamic IP with domain name;
- 3.M1000 Pro works under always online, maintain the line by Keep-Alive packet, auto re-dial while GPRS dropped;
- 4.After TCP connection established, which is a bi-directional socket connection, the Application Server could update the LED content any time to any LED Signage.

PLC Remote Management via GPRS



Virtual COM is a software driver that adds a virtual serial port (e.g. COM5) to the operating system and redirects the data from this port via a TCP/IP network to another hardware interface, which is specified by its IP address and port number. **Virtual COM over GPRS has been widely used in remote control applications.**

Scenario A:

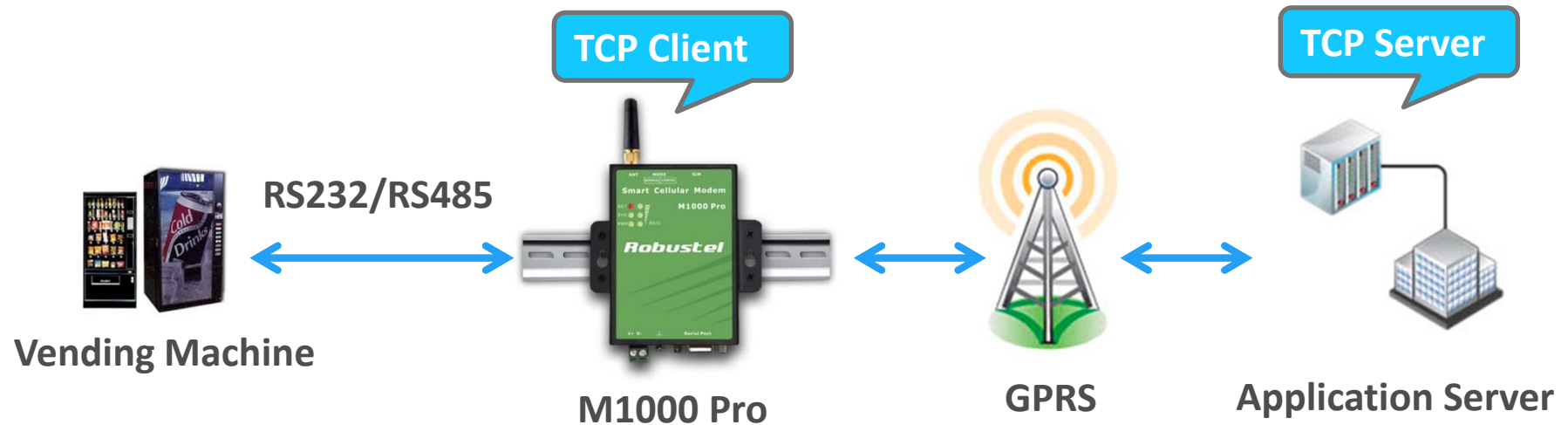
1. M1000 Pro works as TCP server with fixed public IP or dynamic public IP (using Auto SMS Notification, each time when M1000 Pro has a new IP will auto send SMS including IP to preset phone);
2. PC installed virtual COM software works as TCP client with any IP, connect to TCP server on demands.

Scenario B:

1. PC installed virtual COM software works as TCP server with fixed public IP or dynamic IP with domain name;
2. M1000 Pro works as TCP client with any IP;
3. M1000 Pro works under wakeup by SMS/Caller ID modes, after wakeup auto connect to the TCP server, and disconnect when reach maximum idle time (no data flow).

In both scenarios, after TCP connection established, which is a bi-directional socket connection, you can operate the PLC via virtual serial port just like connecting your PC with PLC via serial port locally.

Vending Machine Management via GPRS



Generally, the vending machines are spreading out in many locations. To maintain each machine would cost great time and labor. M1000 Pro invents a Vending Machine Monitor and Report System to undo the problem of machine maintaining.

Scenario:

1. M1000 Pro works as TCP client with any IP (Transparent TCP);
2. Application Server works as TCP server with public fixed IP or public dynamic IP with domain name;
3. M1000 Pro works under always online, maintain the line by Keep-Alive packet, auto re-dial while GPRS dropped;
4. After TCP connection established, which is a bi-directional socket connection. Once the specific circumstances occurred (e.g., when people buy some goods or ran out of goods), M1000 Pro will automatically send data to the server. After user receives information, user can send some one over to solve the problem. Also user could remote modify the price when needed.

POS Connectivity via GPRS

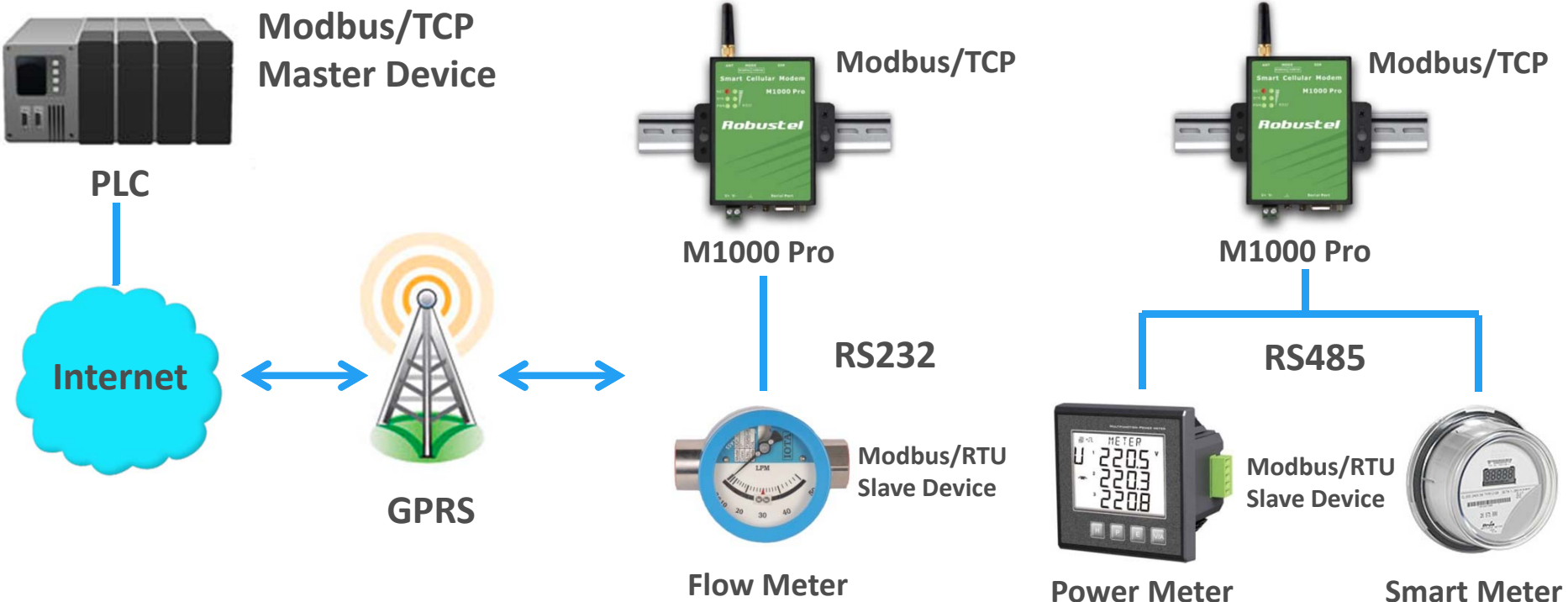


POS machines connecting to M1000 Pro, benefiting from wide coverage GPRS, user could install the POS machines at the place no fixed line access, such as subway, exhibition hall, temporary shop.

Scenario:

1. M1000 Pro works as TCP client with any IP (Transparent TCP);
2. Transaction Server works as TCP server with public fixed IP or public dynamic IP with domain name;
3. M1000 Pro works under wakeup by serial data mode, when there is a credit card transaction it will auto connect to GPRS and send transaction data to the server. When reach maximum idle time (no data flow), GPRS will auto disconnect.

Modbus/RTU to Modbus/TCP via GPRS



The PLC supports Modbus/TCP protocol, and the remote site supports Modbus/RTU protocol. The objective is to connect the remote site with Modbus/RTU to Modbus TCP protocol via GPRS.

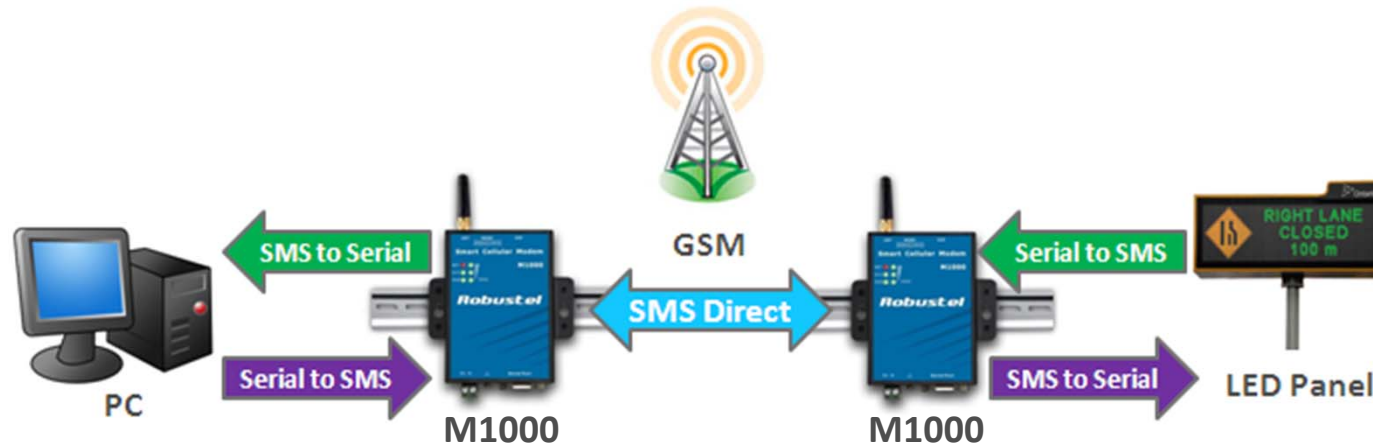
Scenario A:

M1000 Pro works as Modbus/RTU to Modbus/TCP Gateway, connecting to Modbus RTU slave devices, using GPRS for data transmission with fixed public IP; PLC supports Modbus/TCP, with any kind of IP.

Scenario B:

M1000 Pro works as Modbus/RTU to Modbus/TCP Gateway, connecting to Modbus RTU slave devices, using GPRS for data transmission with fixed private IP; PLC supports Modbus/TCP, with fixed or dynamic IP from the same private network.

SMS Direct Concept



A major benefit of GSM technology is that it supports short messages (SMS) for easy communication over the mobile network. Robustel's proprietary SMS Direct allows you to expand your applications and reduce cost. For example, SMS Direct can be used to update the message on a highway display panel, place refill orders for vending machines, handle maintenance for remote rental equipment, or even help create an SMS alarm by directly transforming text, binary, or unicode data from a legacy device to short messages, but without using AT Commands. SMS Direct is particularly suitable for devices that communicate infrequently, or lack access to the local network. SMS Direct converts ASCII and binary data to short message transparently (both back and forth). In addition, a caller ID (phone number) identification can be used to block the message sent from the uncertified users, broadcast messages, and unwanted SMS advertisements.

Robustel's proprietary SMS Direct has the following features:

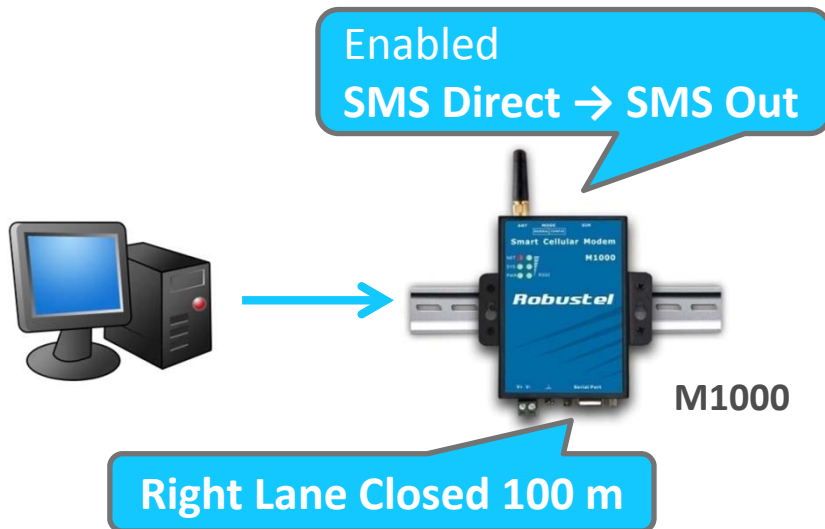
1. Transparently converts serial data to short message or vice versa **without using AT Commands**.
2. Text, binary, and Unicode formats are supported.
3. Verification of Incoming Caller ID is implemented to block uncertified users.
4. The configuration profile can be easily stored, and then copied to other modems.

LED Signage Publication via SMS Direct

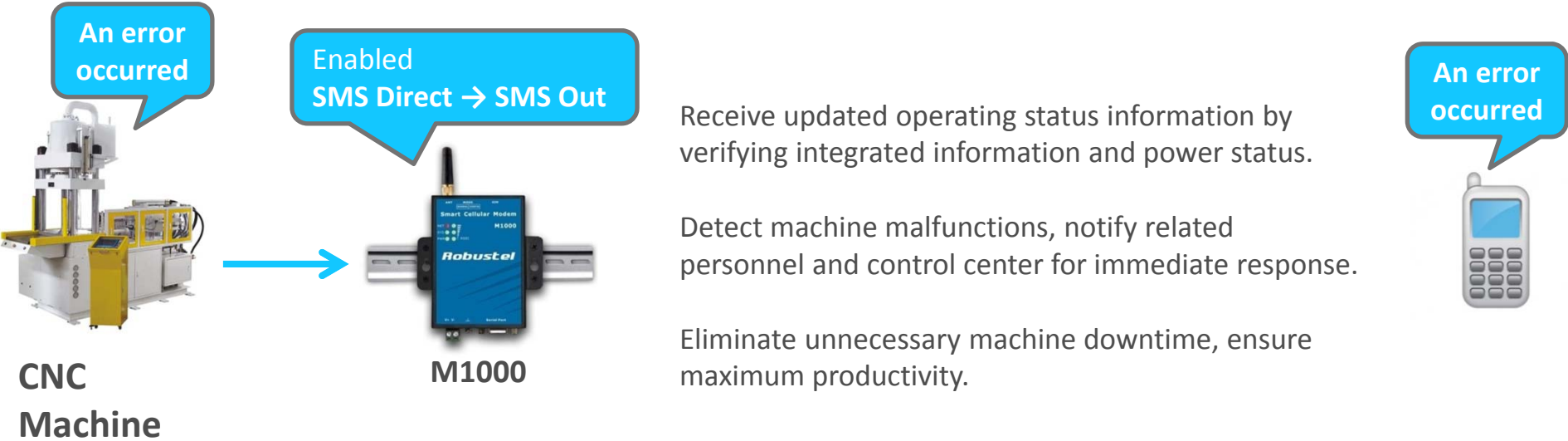
Industries such as transportation or finance often use LED signage to present information, such as traffic congestion information or real-time stock quotes.

Cellular technology can allow such messaging and communication for previously untapped, hard-to-wire locations, such as on highways and on buildings.

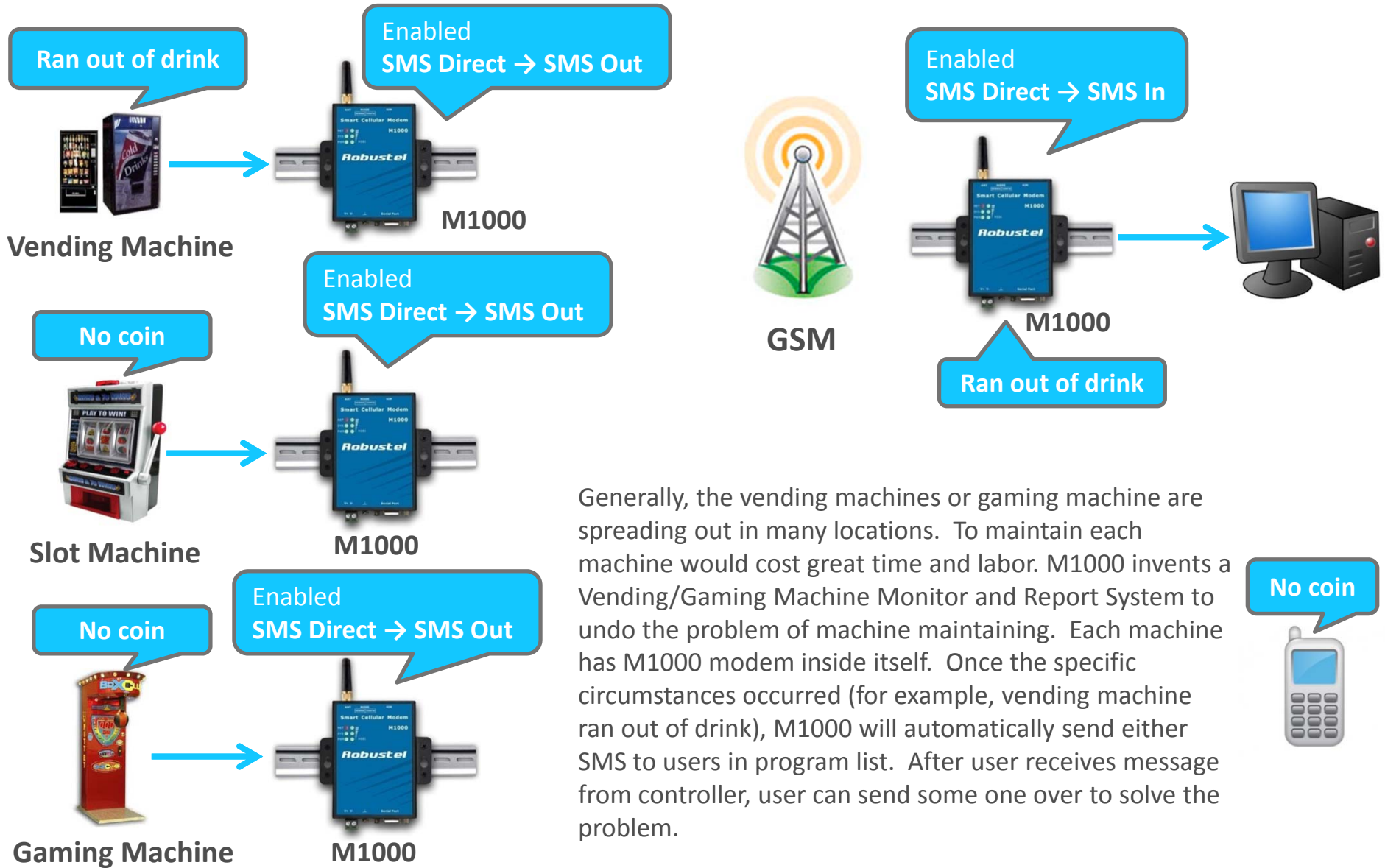
The SMS Direct function allows users to remote update the information via our M1000 modem or mobile phone, after receiving the SMS from remote site then the M1000 connecting to the LED signage will automatically output the information from serial port with defined format, such as ASC II or Unicode. Verification of incoming Caller ID is implemented to block uncertified users.



PLC Alarm Management via SMS Direct



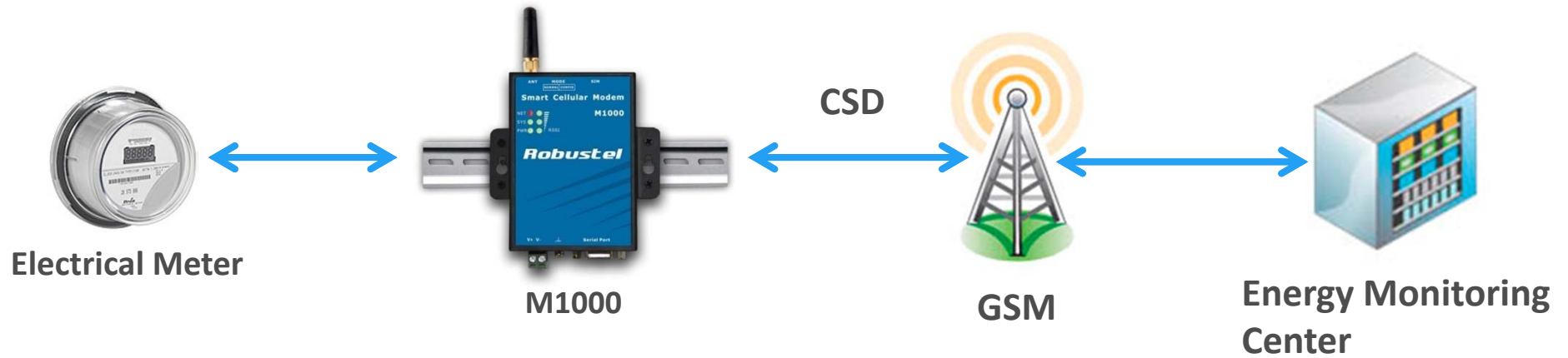
Vending Machine Management via SMS Direct



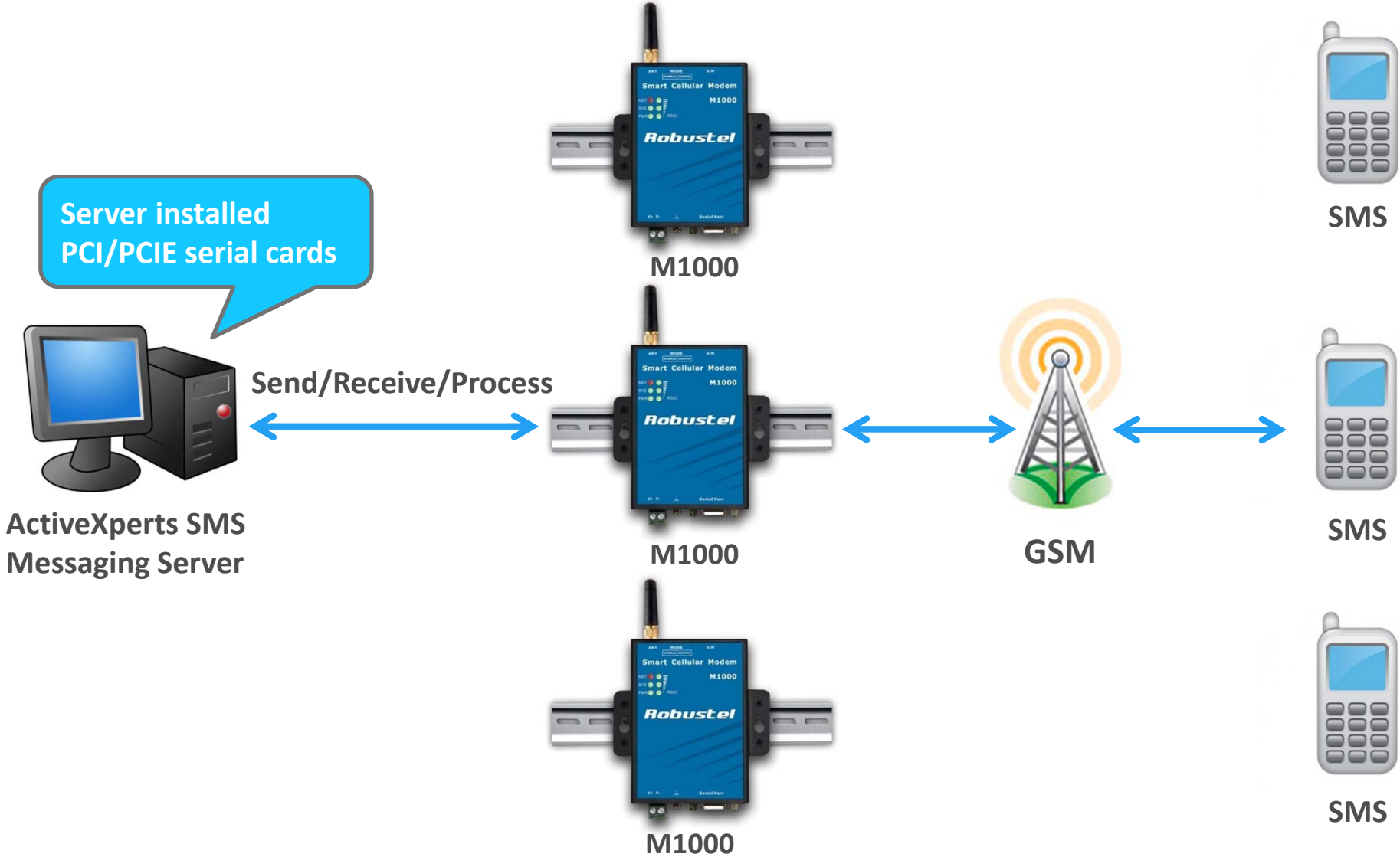
Generally, the vending machines or gaming machine are spreading out in many locations. To maintain each machine would cost great time and labor. M1000 invents a Vending/Gaming Machine Monitor and Report System to undo the problem of machine maintaining. Each machine has M1000 modem inside itself. Once the specific circumstances occurred (for example, vending machine ran out of drink), M1000 will automatically send either SMS to users in program list. After user receives message from controller, user can send some one over to solve the problem.



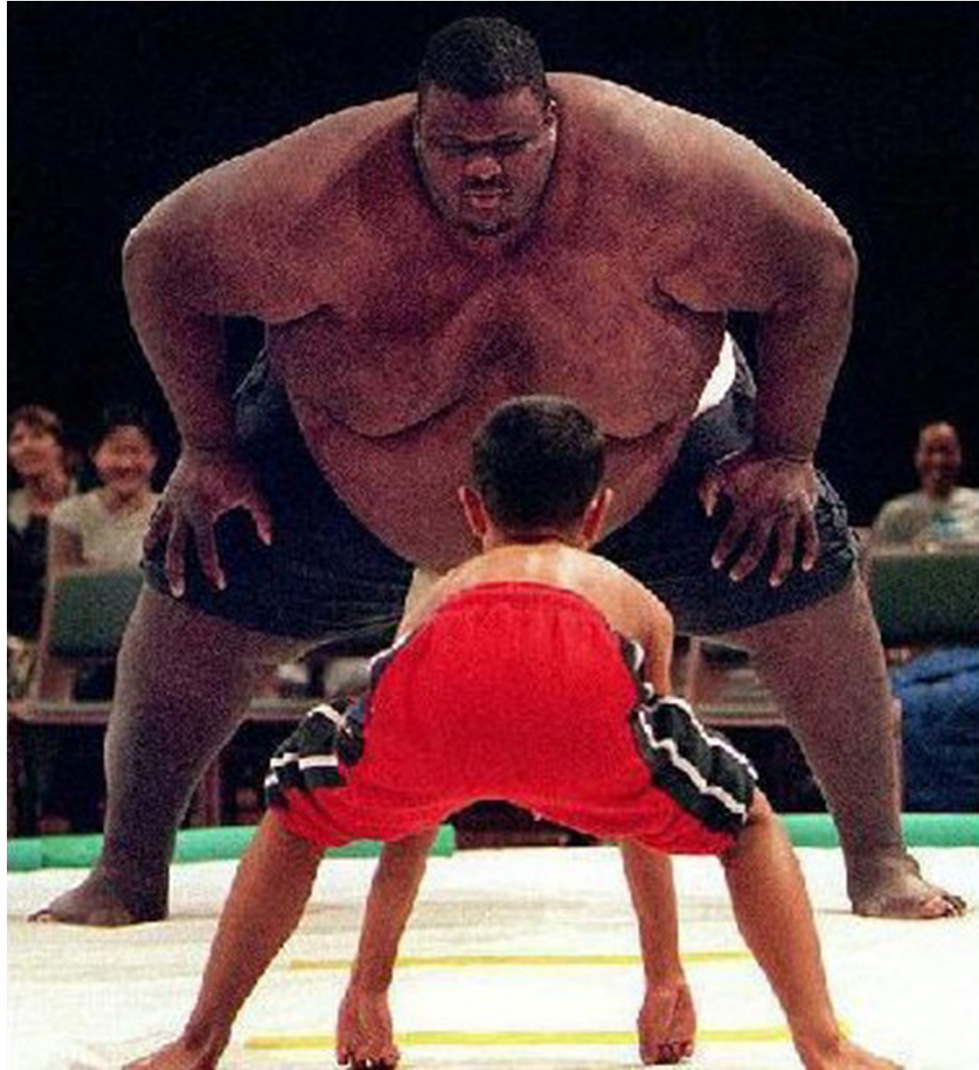
Automatic Meter Reading via CSD



Bulk SMS



Whatever is Your Battle – Good Luck



Thank you!

Robustel

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