Modules, Modems, Gateways & Routers Overview

When searching for a cellular wireless device for a particular application or installation, an understanding of the differences between each type or category of device is an important first step.

To aid clarification, we use the following descriptions for each of these device categories throughout our web-site.

Many of the devices we supply are available in several variants, each supporting different wireless technologies - GPRS or '2G', UMTS or '3G' and LTE or '4G'. Although these all refer to Cellular based communications networks, they are themselves generic terms. For simplicity when reviewing device type & capabilities, we've grouped together under the general term Global System Mobile or 'GSM'.

'GSM' Modules

These devices are designed to be mounting onto a Printed Circuit Board either directly soldered or by an interconnector. They require a specifically designed power supply, a SIM holder and external antenna to function as a complete GSM system.

Whilst they may typically be configured to 'auto-answer' incoming data *calls* (Circuit Switched Data) they otherwise require some form of control (micro-processor) to manage their operation. This is especially true for 'internet' data applications where detailed management is required to access and control the data-flow.

Whilst GSM modules normally meet certain government, network and type approvals, end products using them will normally require additional testing and / or certification prior to their sale in any particular country or region.

'GSM' Modems / Terminals

These devices are designed to be mounted separately to the equipment which requires the 'GSM' communications however, they may be co-housed in a single case such as industrial cabinet. They have industry standard connectors for power input, data communications and antenna(s). A SIM card needs to be inserted into a SIM holder or slot on the GSM device.

Essentially a GSM Modem or Terminal consists of a GSM module (as above) with the necessary power management, interfaces and SIM circuitry to operate and meet the required approvals & certifications.

The GSM modem can be configured to 'auto-answer' incoming data *calls* via Circuit Switched Data (CSD). Alternatively for 'IP' based connectivity these require control (by the connected host equipment) to manage their operation. This is true for both outgoing CSD *calls* i.e. 'dialling out' and for opening or accepting 'internet' or IP data connections, where more detailed management is required.

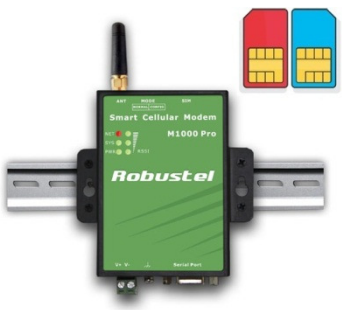
Some instruments and PC software packages include the necessary control capability to support out-going calls and / or IP connections. Confirming the capabilities and thus suitability is important when selecting products to evaluate.

Some Modems / Terminals support customer developed and installed applications such those for the Java™ open software platform. Such applications can manage the wireless module operation and Modem interface(s), creating an intelligent product which fulfils 'internet' IP data connectivity and application requirements. This can be reviewed further if required.

Finally, but importantly, GSM Modems / Terminals are tested and certified to certain government, network and type approvals as indicated in their specification. No further testing or certification is required to deploy them as designated and thus time-to-market is significantly improved.

'GSM' Gateways

Gateway devices are designed to be mounted separately to the equipment requiring connectivity. They too have industry standard connectors for power, data communication and antenna(s). Being a cellular device, a SIM is also required for operation and a SIM holder or slot is provided.



As well as a 'GSM' module & the necessary support circuitry these devices include additional processing capability allowing them to operate autonomously as a self-managing communications 'Gateway'.

Once configured, they provide 'IP' ('internet') communications for devices with limited or no built-in capability to manage a modem. They can act as an IP server or client – i.e. either make or accept IP connections & provide a transparent link to a remote server / PC.

GSM Gateways are provided with various government, network and type approvals. No further testing or certification is required to deploy them in the designated region. This combined with only minimal configuration and testing being required provides a solution with very fast time-to-market.

'GSM' Routers

GSM Routers have industry standard connectors for power input, antenna(s) and communications. One or more SIM card holders are also provided – the latter to aid with roaming or when data limits are reached. GSM routers are typically located separately to the equipment requiring connectivity.

Routers normally provide Ethernet / RJ45 data connectors and are capable of supporting multiple connected devices. Industrial versions provide additional interfaces such as serial and USB to support a wider range of industrial applications. Additionally they have extended power supply input, environmental specifications and ruggedised design.

As well as the 'GSM' module & support circuitry, a powerful processor is used to handle the routing of high-speed data to multiple external devices. This also provides additional capabilities in terms of configuration, security, flexibility and maintaining the wireless connection.

Routers have various government, network and type approvals and certifications so no further testing or certification is usually required to deploy them in the in their designated region. Minimal configuration and testing is required providing a very fast time-to-market.

Summary

The following summary table indicates devices we currently support within each product category.

Type of device	IP Connectivity	Networks supported (ACTE product range)	Interface Options (ACTE product range)
Module	Controlled by host microprocessor	2G (GPRS), 3G, 4G (LTE)	UART, USB
Modem / Terminal	Controlled by host equipment or PC	2G (GPRS), 3G	RS232, RS485, USB, Ethernet
Gateway	Self-managed - incoming & outgoing connections	2G (GPRS), 3G	RS232, RS485
Router	Self-managed - multiple incoming & outgoing connections	2G (GPRS), 3G, 4G (LTE)	RS232, RS485, USB, Ethernet

Additional Notes

The ability to connect to or 'poll' a remote device on a wireless cellular network requires using a fixed IP SIM card. We can advise on suitable solutions with secure access methods for these devices.