

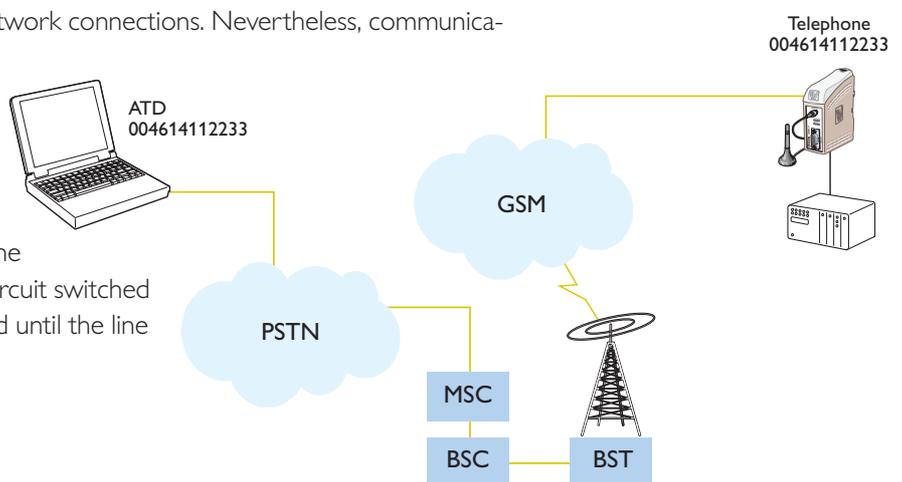
Differences between GSM and GPRS

CSD Circuit Switched Data TDM Time Division Multiplexing		GPRS General Packet Radio Service TDM Time Division Multiplexing													
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
<p>One timeslot is used which gives a maximum throughput of 14.4 kbit/s. The running cost is based on how long the connection is made regardless of the amount of data sent.</p>				<p>By using four timeslots and Coding Scheme 4 the maximum throughput will be 85,6 kbit/s. The running cost is based on the amount of data sent (number of packets) regardless of connection time.</p>											

Applications with GSM and GPRS

The possibility to utilise GSM and GPRS in data communication is an alternative to radio communication. Wireless applications are primarily used for communication where there are no leased lines or network connections. Nevertheless, communication using a GSM or GPRS modem requires certain basic conditions.

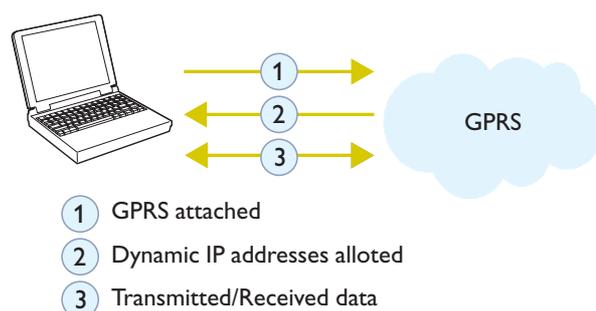
The GSM modem connects to the GSM network. A connection is made through the MSC and BSC and out on a PSTN line to the computer. As the GSM connection is made through a circuit switched network you are constantly connected until the line is disconnected.



Communication with GPRS uses another procedure. GPRS is based on IP communication and the connected unit must provide an IP address before a connection can be established.

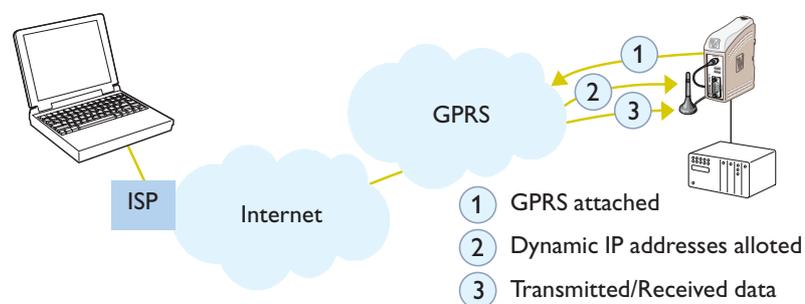
This is done by:

- ⌘ Connecting to the GPRS network.
- ⌘ A dynamic address is assigned.
- ⌘ The exchange of data can take place.

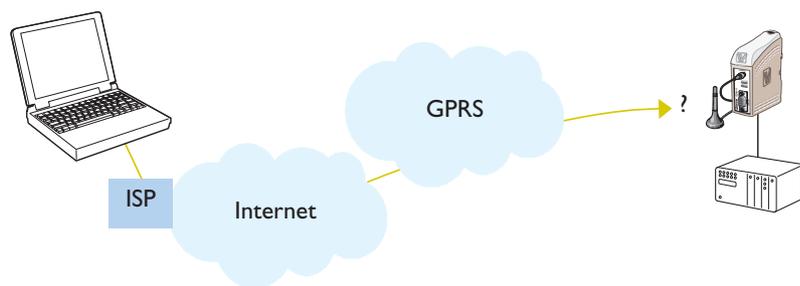


At the present moment in time not all operators can offer subscriptions with static address allocation. With dynamic allocation, you do not know from instance to instance which address has been assigned to the opposing equipment.

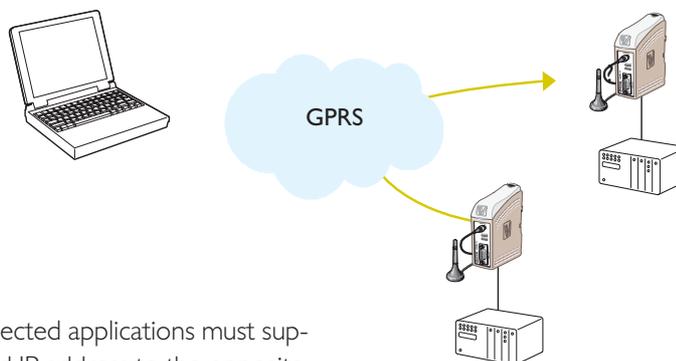
This is not a problem if the GPRS modem is connected to the master. The master takes the initiative for the connection and the modem has its IP address assigned. This means a connection can be established with equipment that has a fixed IP address, for example, a computer.



The problem occurs when a unit, for example, a computer wants to communicate with peripheral equipment and the computer generates the connection. No one knows the IP address that the computer should connect to, as these are assigned dynamically.

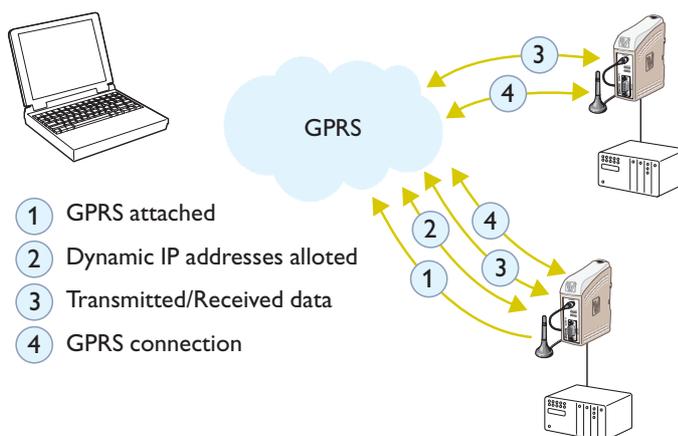


Another application where the same type of problem occurs is when two devices need to communicate and none of them is the master. The modem can not initiate IP communication as it does not know which address will be assigned.



There are solutions to this problem, but connected applications must support this. One example is to send the assigned IP address to the opposite side via SMS.

You must be aware that if any of the connected devices is subjected to a power failure the procedure must be repeated as it would have lost its IP address.



GPRS classes

GPRS equipment is available in three categories, these are defined as Class A, B and C.

Class A	Supports simultaneous GSM and GPRS operations
Class B	Supports GSM and GPRS operations, but not simultaneously.
Class C	The connection only supports GPRS or GSM data. When switching is necessary between GPRS and GSM you must reconnect the connection.

Multislot classes with 1 to 4 time slots.

GPRS Multislot class	Maximum slots		
	RX "downlink"	TX "uplink"	Max
Class 1	1	1	2
Class 2	2	1	3
Class 4	3	1	4
Class 6	3	2	4
Class 8	4	1	5
Class 10	4	2	5
Class 11	4	3	5
Class 12	4	4	5

RX: Maximum number of received time slots that MS can support per GSM TDMA-frame.

TX: Maximum number of time slots that MS can send per GSM TDMA-frame.

Max: Total number of time slots on the uplink and downlink that can be used simultaneously by the MS in the TDMA-frame.

UMTS (3G)

3G is the everyday name of a standard known as UMTS (**U**niversal **M**obile **T**elecommunications **S**ystem) in many countries, that describes the technology behind the third generation telephone system. In some countries 3G may imply other corresponding standards. The expression 3G comes from the fact that it is the third generation of mobile telephony, the first generation was analogue, followed by GSM, which is the most common system at present and now 3G has been launched.

The main difference between 3G and GSM is the transfer capacity, that is to say, how fast data can be sent and received by the telephone. The higher the transfer rate, the more the mobile network can be used for. The speed is about 40 times faster using 3G, which means you can use advanced services such as: Send and receive images, transfer moving pictures and utilise services based on the user's position. This is why 3G is known to many as mobile broadband.