

High Security Industrial Modems



Performance that's out of this World



High security Industrial modems

As part of Mitsubishi's commitment to deliver the products and services that customers require now and in the near future, a series of brand new products have been developed. These units have been designed to meet the needs of traditional telemetry applications as well as some new and business critical applications.



Communication – the key

Communication is an essential part of any organisations operation. Often it is viewed as interpersonal but with the need to gain greater machine and process efficiencies, automated machines are also communicating on a greater scale. In a "fixed - local" environment such as a factory floor or a process plant the communication link between machines and indeed people is based on a network infrastructure of some form. However, when the target machine or process is "mobile" or remotely located the use of fixed networks is not possible. So what is the answer? One possible solution is to use a radio based system such as radio ethernet or packet radio. But circumstances are not always ideal for radio transmission. Issues such as power/range, weather conditions and siting by 'line of sight' are not always possible to maintain. An alternative solution could be the use of telephony, more commonly called modem technology. Modems are available in various different forms utilising different communication media such as:
PSTN – Public Switched Telephone Network, some times colloquially referred to as a "land line"
GSM – Global Standard for Mobile telephones, using the same technology as your mobile phone
SCA – Serial output, RS232/422/485 for connection to dedicated internal systems



Modems – what are the choices?

There are many different types and variations of modem available in todays IT and Automation market places. There is the immediate (hardware) differentiation of which type of communication media but as with most modern programmable products the main differences are in firmware and software. The

standard IT desk modem offers many features which include high speed access and data compression and is an ideal tool for accessing the internet or email from home. But some commercial, utility and industrial applications would benefit from added functions in areas such as application and engineering support or security, as well as something as simple as a rugged or DIN rail mounted design. Mitsubishi have developed a range of high security and high function industrial modems which answer just such issues.



Visit or Call?

In the design process the use of modems on automated equipment is rarely considered. It often does not even get considered for a cost benefit analysis. But taking that very valid design analysis could reveal some surprising results. Consider the following three scenarios which are all easily solved using Mitsubishi's High Security Industrial Modems but may not be possible with the standard IT modem –

Commissioning

A machine is installed at the end users factory but requires some final commissioning. The only Installation Engineers on site are not programmers. So what can be done? By using a PSTN modem with simultaneous voice and data transmission the Controls Engineer back at HQ can dial in to the machine on site and up/download PLC programs or HMI setups etc. At the same time the onsite engineer can report back the effects and results of the operational changes.
Cost if no modem is installed – 1 possibly 2 days of site time for a Controls Engineer in addition to the "downtime" of the engineers already onsite – estimate £1 to £4k

Cost of using modems – two modems + telephone time, less than £0.7k. In addition the site modem may not necessarily be permanently installed, i.e. it becomes a part of the installation and commissioning tool kit taken from site to site.

Breakdowns and monitoring

A machine is fitted with a GSM modem allowing it to communicate directly with engineering staff using SMS text messages during normal operation and in the event of breakdown. The system could be configured to report back the “work done” e.g. number of widgets produced, litres of water pumped at what pressure. This could all be sent as text strings to the maintenance or production teams to make sure performance is as expected. If an error occurs, a blockage, loss of “raw material”, out of wrappers then this can also be sent to a named individual engineer. If that engineer is unavailable then other telephone numbers could be called. If an RTU (Remote Telemetry Unit) version of the modem is used, up to 8 megabytes of data could be time and date stamped within the modem itself before sending a bulk data stream to a central database on a separate PC.

Cost if no modem is installed – Unknown lost production, damaged machine costs, could be many £000's.

Cost of using modems – one modem + telephone time, less than £400 with repeat costs of less than £100 per annum.

Alternatively the site modem may not necessarily have to be permanently installed, i.e. once consistent production figures are achieved after the “running in period” the modem could be applied to another machine.

Security

The internet is often seen as a label which is applied to all forms of mass electronic communication and data transfer. It is equally often linked with the chance of catching viruses or unauthorised access by computer hackers. While such events are few and far between, one single instance could be one too many. The Mitsubishi High Security Industrial Modems have password access built in to the modems own firmware and not as a piece of security on the “dialing” modem station. This means that anyone calling into the modem station will be prompted for a password which is verified by the answering modem before a connection is fully established, just like having a unique firewall on every outstation or RTU.

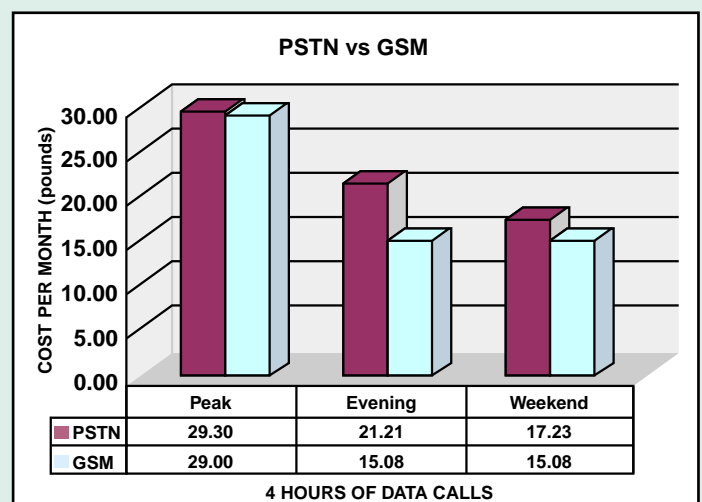
Cost if standard IT modem is installed – two modems up to £100 each plus the worry; and if you are hacked you have the cost of unknown lost production, damaged machine costs, could be many £000's.

Cost of using High Security modems – two modems upto £350 each, no hassle, no worry.



Remote data logging

Sometimes it does not matter how hard you try it is just not possible to run network cables to every application you want to gather data from. Remote pumping stations would be a good example of a practical need for data logging for performance measurement and the need to monitor operational uptime but using a GSM modem or a GSM RTU modem would provide the necessary link to the outside world. Some consideration maybe required to the cost effectiveness of GSM calls, however, many users would be surprised at the answer. By using certain “data” only call packages GSM rates start to drop below that of PSTN. Telemetry and modem systems are not just tools for specialist applications. With Mitsubishi's range of High Security Industrial modems they can be used for a variety of non traditional applications, but still provide a cost effective way of managing and lowering the total cost of ownership.



General Specifications

Environment Specifications

Parameter	Min	Max	Unit	Notes
Operating ambient temperature	0	55	°C	
	32	131	°F	
Storage ambient temperature	-20	75	°C	
	4	167	°F	
Operating ambient humidity	10	90	%RH	Non-condensing
Storage ambient humidity	10	90	%RH	Non-condensing
Operating ambience	-	-	-	No corrosive gasses or dust

Operational Specifications

Parameter	Min	Max	Unit	Notes
Cooling method	-	-	-	Self cooling
PSTN modems; A2S-MODEM, DIN-MODEM-2, DESK-MODEM-2, A2S-RTU, DIN-RTU-2				
Power Rating		1.9	W	DC
Input Voltage	12	32	V	DC
Input Current	56 (32V)	152 (12V)	mA	At noted voltage (DC)
GSM modems; A2S-MODEM-GSM, DIN-MODEM-GSM, DESK-MODEM-GSM, A2S-RTU-GSM, DIN-RTU-GSM				
Power Rating		3.0	W	DC
Input Voltage	15	32	V	DC
Input Current	196 (32V)	418 (15V)	mA	At noted voltage (DC) (not including Handset)
Peak Input Current		450	mA	At 217 Hz, power level 5

Communications specifications

GSM	
RF Antenna connector	MMCX 50ohm Jack(female)
Operating systems	GSM 900MHz, DCS 1800Mhz, PCS 1900Mhz
Power out	GSM - Power levels 19 to 5, 5dBm to 33dBm per ETSI DCS - Power levels 15 to 0, 0dBm to 30dBm per ETSI PCS - Power levels 15 to 0, 0dBm to 30dBm per FCC
Host Protocol	AT Commands including GSM 07.07 and GSM 07.05
PSTN	
Host Protocol	AT Commands including
Voice Call	Supported with external Handset

Physical Specifications

Model	H (mm)	W (mm)	D (mm)	Mass (g)	Notes
A2S-MODEM	130	35	93	66	
A2S-RTU				88	
A2S-MODEM-GSM				88	
DIN-MODEM-2	130	35	93	77	Add 3mm for DIN clip
DIN-RTU-2				98	
DIN-MODEM-GSM				98	
DESK-MODEM-2	38	130	98	77	Height includes feet
DESK-MODEM-GSM				98	

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