



## Using the Siemens M20 GSM Module Application Note #8

### **Overview**

The Siemens M20 GSM Module is a cost-effective wireless communication device used primarily in Europe to facilitate PC to datalogger connections. This application note will outline the issues involved with the wiring between the M20 Module and datalogger as well as the programming required in the M20 for proper operation.

### **Wiring**

The SC32A is required when using the M20 module because the output signals from the Campbell Control Modules are of a digital (0 to 5V) type, the SC32A provides the conversion from these signals to RS-232 (negative to positive voltage, often -9V to +9V). Alternately the SC932 may be used if AC power is available at the datalogger.

The key with using the SC32A is that power must be supplied by the module. This is accomplished by connecting the DSR output of the M20 to the power input of the SC32A, supplied through the DTR input of the SC32A. When using the SC932 power is supplied by the AC adaptor so the DTR output of the M20 may be used to facilitate hardware handshaking. See the wiring chart below.

M20 DB-9	Description	SC32A	SC932
1	Data Carrier Detect (DCD)		
2	Receive Data (RXD)	2	2
3	Transmit Data (TXD)	3	3
4	Data Terminal Ready (DTR)		20
5	Ground (GND)	7	7
6	Data Set Ready (DSR)	20	
7	Request to Send (RTS)		
8	Clear to Send (CTS)		
9	Ring Indication (RING)		

Note: The RTS (pin 7) and CTS (pin 8) connections of the M20 should be jumpered together.

### **Module Configuration**

The keys to module configuration are five fold. First the module must be set to automatically answer the call (assuming it will be used to answer the phone), second, the module must have it's DTR handling disabled, third, the proper bit rate must be set, fourth, the PIN code mechanism should be disabled, and fifth, these settings must be saved to it's non-volatile memory and then set for recall if the module should be powered down and up (whether intentional or due to loss of power at the site).

Module settings are adjusted by connecting the M20 Module to a computer using a serial port connection. If using Windows, use the **HyperTerminal** program to connect to the M20. Setup the connection using 19200 bits per second (unless the module has already been configured in which case use 9600 bits per second), 8 Data Bits, No Parity, 1 Stop Bit, and No Flow Control. To verify the computer to M20 connection type **ATE1** <ENTER> in the terminal window of HyperTerminal. You should see **OK** returned by the modem.

### Module Configuration – Auto-Answer

The module must be configured to answer the phone call when it is received. The S register 0 must be set to a number other than 0 (0 usually disables auto-answer) to automatically enable the answer feature. Use the command **ATS0=1 <ENTER>**, you should see returned the **OK** prompt. To verify the contents of register 0 use the command **ATS0? <ENTER>**, the value of the register will be displayed.

### Module Configuration – DTR Disable

The Data Terminal Ready (DTR) signal is usually used in conjunction with the RING signal to control the modem. When a call is detected the RING signal is activated on the modem, normally the module expects the DTR to go high to signal answering the call. In this case we do not have the luxury of this hardware handshake, it should be disabled (unless using the SC932 Interface in which case it can be left in its default state which is enabled). With the Auto-Answer enabled and DTR disabled the module will ALWAYS answer an incoming call. This is actually a good way to test the module before deploying with the SC32A. Connect the module to a phone line, dial the number and listen for the answer and carrier detect tone, a high pitched tone followed by a garbled sound. Use the command **AT&D0 <ENTER>** to disable the DTR handling. The **OK** prompt should be returned after entering the command.

### Module Configuration – Set Bit Rate

The proper bits per second must be set in the module. This is done with the +IPR command, type **AT+IPR=9600 <ENTER>**. Note: If the initial rate of 19200 bits per second was being used you will now need to reset the rate of HyperTerminal to 9600, close HyperTerminal and restart.

### Module Configuration – Disable PIN Code

For ease of use the PIN code should be disabled. The software being used with the M20 provides security, in any some form of communication software, either MultiLogger or PC208W, is required to communicate with the attached datalogger, this intrinsically provides a high degree of protection. The PIN code may be disabled with the +CLCK command, type **AT+CLCK="SC",0,"nnnn"<ENTER>**, where nnnn is the current PIN code. The **OK** prompt should be returned after pressing <ENTER>.

### Module Configuration – Save Settings for Recall

Unless the Auto-Answer, DTR settings, Bit Rate and PIN code settings are saved to non-volatile memory as the default profile they will be lost at the next power-up of the module. Use the command **AT&W** to set the current settings as the default profile.

### Module Configuration – Summary of Commands

Modem commands can be strung together as part of a single AT command. For example, to enable auto-answer, disable DTR, and then save as the default profile at power-up use the following command:

**AT&FS0=1&D0&W<ENTER>**

Command	Description
&F	Resets the modem to the factory defaults. This is always a good idea to ensure all settings are returned to "normal". <b>Note: This sets the baud rate to 19200.</b>
+IPR=9600	Set the bits per second (bps) rate to 9600.
&D0	Disable Data Terminal Ready (DTR).
S0=1	Sets the number of rings the module will listen for before answering the call. This setting enables the auto-answer feature of the module as well.
+CLCK="SC",0,"nnnn"	Disable PIN code, where nnnn is the PIN code.
&W	Writes the current configuration as default profile.
&V	Display current profile.

Generally speaking there should be no other module settings that need adjusting. During the connection phase the remaining settings such as bps rate, error control method, etc. are negotiated and agreed upon between the calling modem and the answering modem.

#### **Other Considerations**

Power must be supplied to the M20 Module, this is best done with a separate battery from the datalogger or better, an AC Adaptor. Operating the Module from a separate battery ensures that given an extended on-time which could deplete the battery, the datalogger will continue to acquire measurements at its prescribed intervals.

The IGNITION line may be used to turn on the Module at prescribed intervals or times for communication. This is useful when operating the M20 from battery power to maximize battery life. It is also useful to permit datalogger control of the module so that it may be reset by the datalogger. Connect the IGNITION input of the M20 to one of the dataloggers control ports to use this feature.

Contact your service provider regarding use of the M20 for data communication. Oftentimes a special DATA service is required and a second phone number for the Module is required for use as a data line.

Download the M20 Manual for complete information on the Module.

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