



Pix-Cell



The **Pix-Cell** is a high performance, programmable Cellular Single Board Controller, that offers built-in digital and analog I/O combined with GSM/GPRS connectivity in a compact form factor. The heart of the GSM controller is a Microchip PIC18F6722 operating up to 32MHz which provides fast data processing.

Design your applications with an integrated **BASIC**, **PASCAL** or **C** compiler designed specifically for Pix-Cell GSM Controller.

Features:

- Small Size: 95x60x15mm.
- Microchip PIC18F6722 controller@32MHz.
- 128KB Flash for user memory application.
- 32kB of EEPROM Memory.
- 3 Protected Digital Inputs.
- 3 10-bit Analog Inputs.
- SPDT Relay Output.
- RS232 serial communication.
- GSM/GPRS Cellular Modem.
- Normal and Sleep Mode operation.

Application:

The Pix-Cell GSM/GPRS Module can be used in a wide range of applications, such as:

- Alarm Systems.
- Vending Machines.
- Lightning Control.
- Pumping Station.
- Reading of Meters.

Specification:

Power Requirement

Input Voltage Range	9-16 VDC
Input Current,no GSM f=32Mhz	48 mA@12Vdc
Input Current, GSM Transmitting	500 mA@12Vdc
Input Current,no GSM, f=32khz	17 mA@12Vdc

Inputs Characteristic

Number of inputs	3
Number of commons	1
Input impedance	6.6KOhm
Input voltage "ON" level range	2.5 – 40 Vdc
Input Voltage Surge protection	±100 V

Analog Characteristic

Number of channels	3
Input Range	0-5 Vdc All inputs 4-20mA@ Input3
Resolution	10-bit
Conversion Time	6 μS

Output Characteristic

Type of Output	Dry contact.
Number of output	1
Rating	50Vdc@0.5A



Pix-Cell Functions Libraries

Write your source code using the highly advanced Code Editor. Use the included **libraries** to speed up development with the Pix-Cell GSM Controller.

General Commands:

InitBoard;	Initializes all Inputs, Outputs, Clocks frequencies, Serial Communications Etc...
ClrWdt;	Clears the post-scalar of the watchdog.
Delay_ml;	Creates a software delay in duration of milliseconds.
GreenLed;	Sets the Green Led on board according to value.
UserSerialInit;	Initializes the User Serial unit with a desired baud-rate.
UserSerialRd;	Receives data (byte) via the User RS232 communication.
UserSerialWr;	Transmit data (byte) via the User RS232 communication.

Inputs Commands:

BitRdInput;	Reads the Digital Status of a specific input (1,2,3).
AllRdInput;	Reads the Digital Status of all inputs.
AnaRdInput;	Reads the Analog value of a specific input (1,2,3).
TempRd;	Reads the Temperature value from the sensor on-board.
RtcVoltRd;	Reads the Analog value of the RTC backup voltage.

Outputs Commands:

BitWrOut;	Sets the relay output according to the value.
PulseWrOut;	Sets the relay output 0-1-0 according to time duration.
PulseWrOutNot;	Sets the relay output 1-0-1 according to time duration.

Memory Commands:

MemRd;	Reads Data from User Memory according to specific Address.
MemWr;	Writes Data to User Memory according to specific Address.
Eeprom_Read;	Reads Data from Internal EEPROM according to Address.
Eeprom_Write;	Writes Data to Internal EEPROM according to Address.

GSM Module Commands:

GsmSerialInit;	Initializes GSM serial communication, 8 bit, No parity, Stop bit, Baud Rate...
GsmSerialRd;	Reads data from GSM Serial Com (Usart1).
GsmSerialWr;	Writes data to the GSM Serial Com.



Functions Libraries Continue

GsmOff;	Turns OFF the GSM Module.
GsmOn;	Turns ON the GSM Module.
RstGsm;	Resets the GSM module.
SendATCommand;	Send AT Commands to control the Cellular Module.
*GetGsmData;	Receives Data from the Cellular module into an array.
SmsInit;	Initialize the Cellular modem to accept SMS data.
SendSms;	Sends SMS message.
*ReadSms;	Reads SMS message.
DeleteSms	Delete SMS messages from module memory.

Code Example

This Code example, illustrates how easy is to work with the Pix-Cell GSM Controller. This example waits for a logical pulse signal on Input Number 1. After it's receives, the Green LED is turn ON and an SMS Message is send to a Mobile Phone.

```
void main()
{
    unsigned char phone_num[]="+97252000000",msg[]="Alarm is ON";
    InitBrd();           // Initialize the PixCell GSM Board functions.
    GreenLED(0);        // Turn OFF the green LED (UControl Driver)
    while (!CheckModem()); // Checks if the modem is connected (UControl Driver)
    while (!SmsInit()); // Iniatilize the GSM modem for SMS (UControl Driver)
    while (1)
    {
        while (BitRdInput(1)); // waits until a logical 1 is received on Input 1
        (UControl Driver)
        Delay_ml(15); // Delay of 15mS for stability of the input.
        while (!BitRdInput(1)); // waits until the input signal return to logical 0.
        GreenLED(1); // Turn the green LED ON
        if (SendSms("+97252000000","Alarm is ON")) GreenLED(0); // Send a SMS.
        //you can also use this form: SendSms(phone_num,msg);
    }
}
```



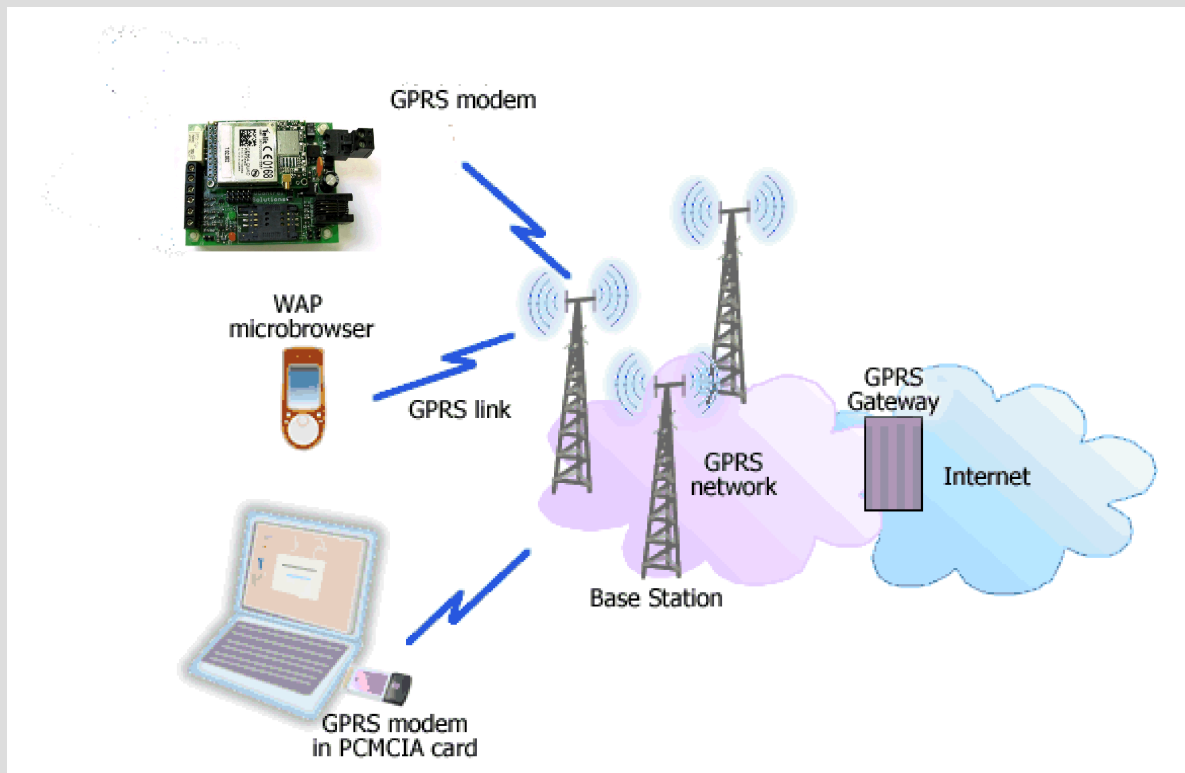
GPRS Connection

In order to establish a GPRS connection with the Pix-Cell C-SBC controller, the User must issue this six simple AT commands:

- **AT+CGDCONT=1,"IP","internet","0.0.0.0",0,0**
- **AT+USERID="UControl Solutions"**
- **AT+PASSW="Pix-Cell SBC"**
- **AT+SKTSET=0,"80","85.130.160.99",0**
- **AT+SKTSAV**
- **AT+SKTOP**

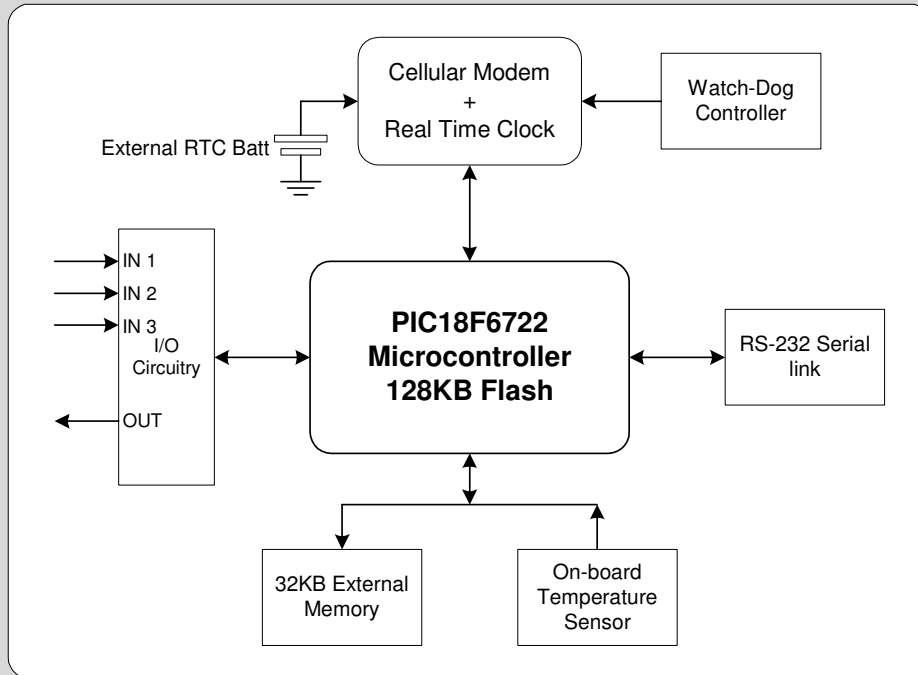
As a result, the GSM Module will establish a connection with the Remote Server and Data can be exchange with the HTTP server program on the remote host machine.

GPRS Connection Diagram

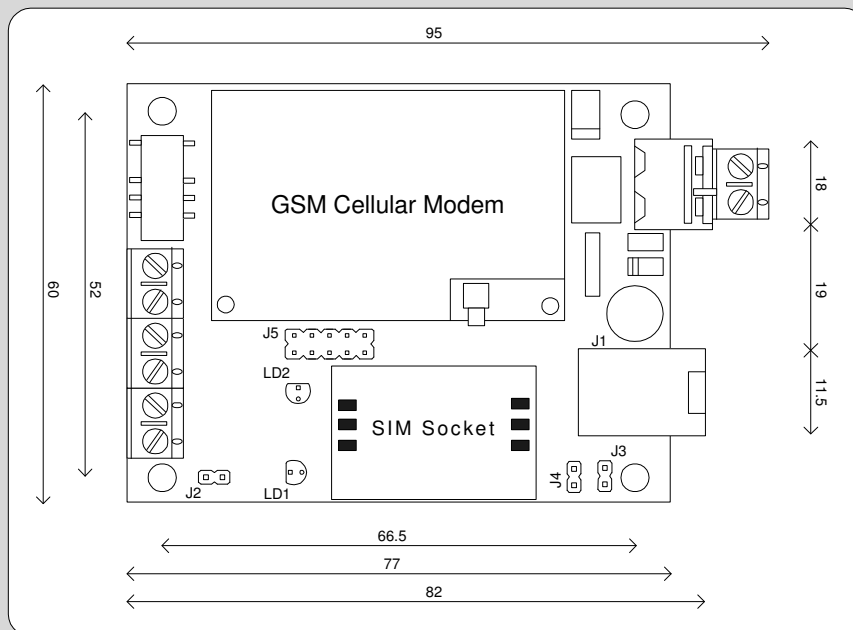




Pix-Cell GSM Controller Block Diagram



Dimensions:



All dimensions are in mm