jmGPIO GUI Module

This is a graphical user interface for jmCLIG firmware module jmLPC17xx_gpio.c

The firmware module must be compiled and loaded into the chip before using this graphical user interface.

The firmware can be used with a standard communication application, like HyperTerminal, but jmGPIO is more user friendly and provides bit locks to limit access to pins on MBED prototyping board (DIP5 to DIP30 and LED1 to LED4).

This module does not start or uses a process inside the chip. Actions are immediate.

This module can read and write to GPIO registers. These registers can set chip pins as output pins and change the levels on it.

Care should be taken when you turn a microcontroller pin as an output pin. You should make sure that nothing is wired to that pin that can make a short to ground or a short to the supply. Beware of pins previously used as input, because these are potential short circuit hazards if external hardware is still connected to those pins.

Start jmGPIO Module in jmSerialCom.
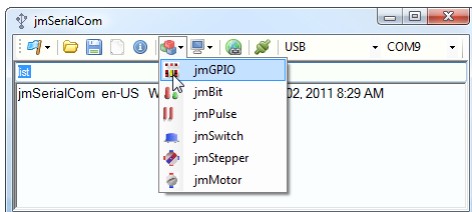
jmGPIO loads and sends a message to the chip (chip must be connected)

The message is invisible in the text zone area of jmSerialCom if echo is not enabled.
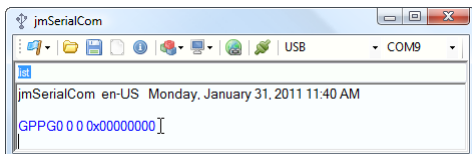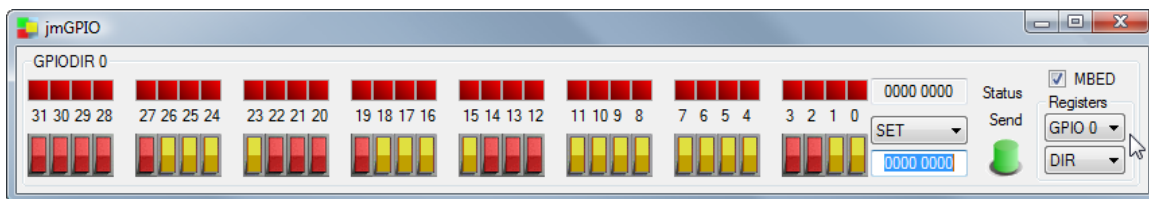
The chip response format for this module is :
GPPG0 port register value
Here, chip response was GPPG0 0 0 0x00000000
This response updates register status and update LEDs.

Selecting Register

You can access a register by selecting the GPIO port and then by selecting a register for that port.
Any change in Port or Register selection, will send a message to the chip. The chip will respond with content value of that register to update the GUI.

How to

This graphical control enables you to read and write to GPIO registers 32 bits at a time.

Theses registers are used to set directions of output pins and to change output levels on those pins.
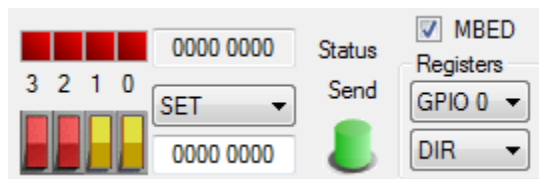
A red switch indicates that this bit is locked and cannot be used. Either this bit does not exist in that register or it has been locked by MBED check box.
A yellow switch indicates that this bit can be modified.

MBED Bits

This check box locks bits that are used by MBED prototyping board for other functions. If you use MBED prototyping board, keep this check box checked.

When checked, you have access to MBED DIP5 to DIP30 and LED1 to LED4.

Examples

Controlling MBED LEDs with this control.

Coming out of reset, all pins are turned into inputs, so we have to turn pins wired to LEDs to outputs.
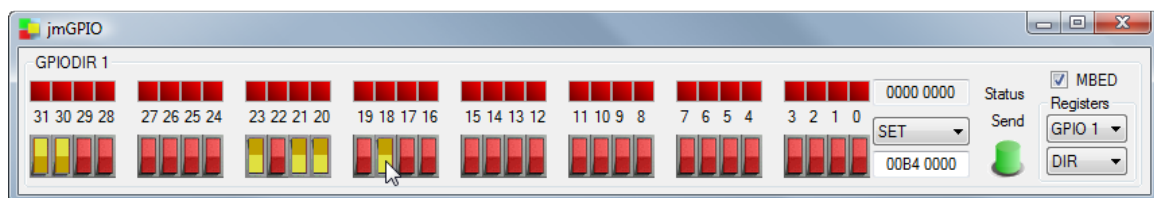
LED1 Port1.18   LED2 Port1.20   LED3 Port1.21   LED4 Port1.23

Select GPIO 1, click switches 18, 20, 21 and 23 or edit the textbox.

Clicking a switch change the textbox or editing the textbox changes the switches.

Note that the Action selection box selection is SET. That's what we want, we want to set these bits in the Direction register to set them as output pins. Note also that DIR register is selected by default.

Hit Send button to send the command to the chip.

The chip will report back changes to the register bits, LEDs and status box will be updated.
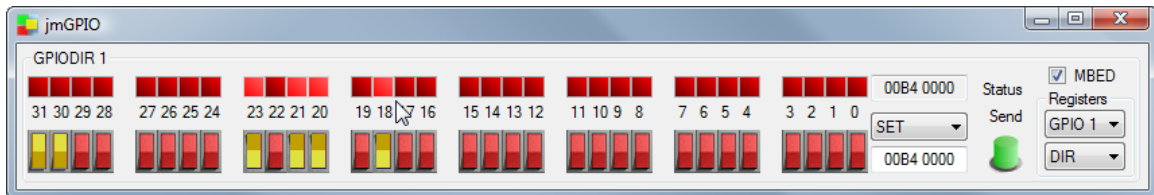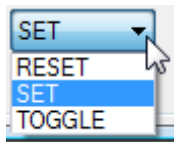

Now that we have these pins set as outputs, they are ready to be written to. You can start another jmGPIO form or change the register for accessing the outputs.

Select PIN register. Status and LEDs will be update with the content of this register.
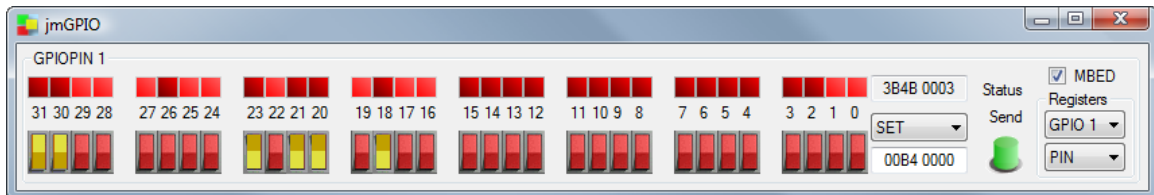
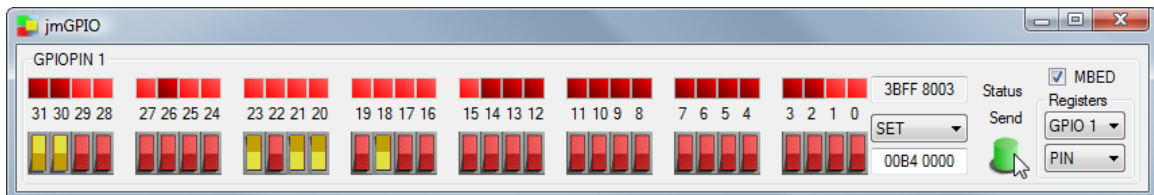Here, all MBED LED bits are off and real LEDs are off.

Actions

You can select action to do for the selected bits.

SET, RESET or TOGGLE bits.

As switches are already selected for MDEB LEDs, you just have to select the action for these bits. Here SET is selected and Send Button was clicked.

We can see the LEDs turned on, on the prototyping board and GUI updated accordingly.
Try TOGGLE or RESET actions. The picture below show the TOGGLE action on the LED bits.

All LEDs toggle their state and are now all off as well as their graphic representation on the screen.
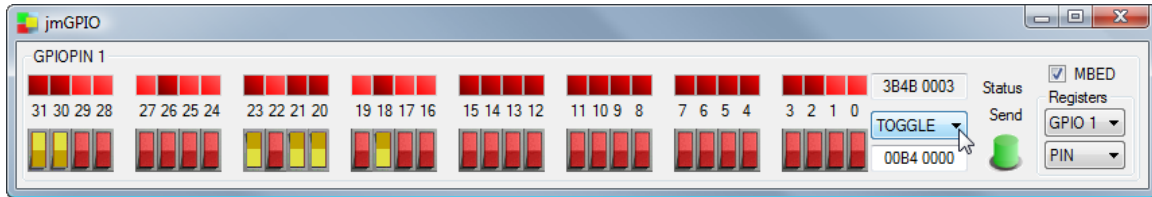
You can also deselect one or more switches and see that only selected bits by the switches are modified by the action when the button Send is clicked.
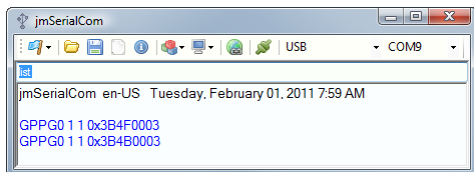
Remember, red switches can be used for other purposes. You can't use them, but their states are updated at the same time this control is updated.

Deselect bits 23, 21 and 20 and keep selected bit 18.

Send TOGGLE action a couple of times.
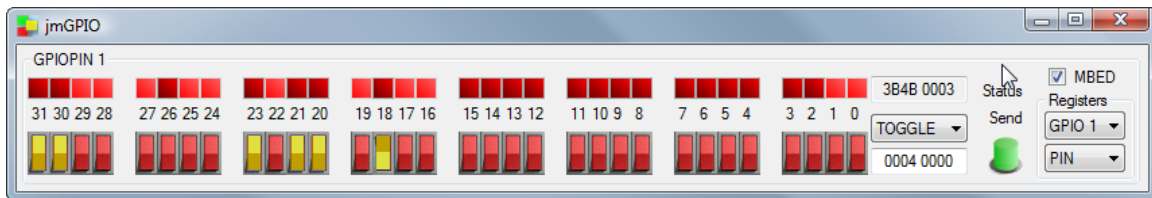
If you look at the text zone in jmSerialCom you will see messages coming out of the chip.

Here only bit 18 is selected and TOGGLE has been clicked two times.

MASK CLR and SET registers

These registers provide different ways of doing the same thing I just did only with PIN register and action selection box. When you use these registers, you don't use action box, but only switches, register and Send button. Consult chip datasheet for more information on those registers.

♪ If all switches are low, nothing will change no matter which action is sent. To enable changes to a bit, this bit must be selected first.

End of jmGPIO document.