

### Forming your Chain of Modules

Your chain of SIM-board USB Modules can be formed by any of the following methods:

#### USB cable connection:

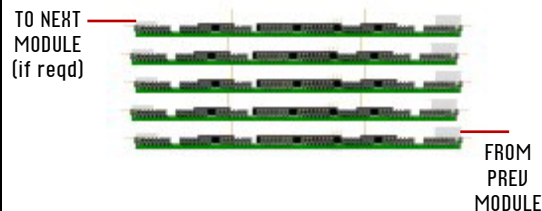
Connect USB cables from the "TO NEXT" and "FROM PREV" ports of each module in the chain. This method allows for the modules to be placed around your simulator environment where they are needed.



or

#### Stack pin connection:

Use the 2 sets of long pins on each module to mate with another module from behind by placing the pins gently into the spare holes of the new module PCB. This method allows a stack of modules to be created in a confined space, but does reduce the visibility of the module components and serial number. You may need to place a layer of insulating material between modules to avoid metal-to-metal contact (use paper or foam or similar material).



### Powering your SIM-boards

Each chain of SIM-boards can be powered by either USB power from the PC USB port (known as USB BUS POWER), or by an external power source that you connect to the SIM-board USB Master Module (known as EXT POWER).

#### USB BUS POWER (this is the default setting)

The USB port on your PC to which you attach your SIM-board USB Master Module can supply enough power to drive the Master Module and a few Function Modules connected on the chain. How many modules your USB port can power will depend on your computer specification and internal hub arrangement. External (add-on) USB hubs may also provide varying amounts of power able to drive varying maximum module counts.

It is recommended that you use USB bus power unless (a) you have more than 5 modules in your chain, or (b) if your total chain length exceeds about 10m (30ft), or (c) if some of your modules do not show up as detected in the SIM-board Universal Controller. In any of these cases, you should switch to running your chain from EXT POWER (see below).

#### EXT POWER

You should configure your chain to run on external power whenever you have more than 5 modules in your chain, or whenever the total chain length exceeds 10m (30ft), or if you experience connection problems when using USB power. Under each of these circumstances, the voltage and current able to be supplied to the chain may not be sufficient to drive all the modules in your chain at once, and for this reason you will need to connect an external DC power supply source to the socket marked EXT PWR on your SIM-board USB Master Module.

### INSTRUCTIONS FOR CHANGING BETWEEN USB BUS POWER and EXTERNAL POWER

#### CAUTION!

#### BEFORE MAKING ANY CHANGES TO THE SIM-BOARD POWER SUPPLY SETTINGS:

- DISCONNECT YOUR SIM-BOARDS FROM YOUR PC
- DISCONNECT ALL POWER SUPPLIES USED BY ANY SIM-BOARD FUNCTION MODULES OR USED BY ANY SIM-BOARD CONTROLLED HARDWARE ITEM FROM THE MAINS

To configure your chain to use **EXTERNAL POWER**:

- Move the jumper on the BUS SRC pins of the Master Module from the BUS SRC USB pins to the BUS SRC EXT pins;
- On EACH function module in the chain, move the 2 jumpers on the PWR SELECT pins from the USB pins to the EXT pins;
- Now connect your chosen DC power supply to the socket marked EXT PWR on your Master Module. The supply should be between 9V and 24V, with a center-positive barrel.

To configure your chain to use **USB BUS POWER**:

- Disconnect and remove any DC power supply connected to the EXT PWR socket on the Master Module;
- Move the jumper on the BUS SRC pins of the Master Module from the BUS SRC EXT pins to the BUS SRC USB pins;
- On EACH function module in the chain, swap the 2 jumpers on the PWR SELECT pins from the EXT pins to the USB pins.

**SERIOUS DAMAGE CAN RESULT IF THE JUMPER SETTINGS ON YOUR MASTER MODULE AND YOUR FUNCTION MODULES DIFFER FROM EACH OTHER. ALWAYS DOUBLE CHECK THAT EACH MODULE IS CONFIGURED WITH THE SAME SETTING OF EITHER "USB" POWER or "EXT" POWER THROUGHOUT YOUR CHAIN OF MODULES.**