**LCD Libraries – Connected via an IO Expander**

This Library is for Parallel LCDs connected via an IO Expander  
  
The library contains SUBS for:  
  
\* Sending an LCD Control Code  
\* Writing a Byte  
\* Writing a String (DATA or a Literal e.g. "My name is Andre"). It also allows for using the "@" character as a DATA terminator instead of zero because sometimes DATA strings have zeroes in them. The "@" is hardcoded in the Library, but you can change it to something else if you like.  
\* Writing a specified number of Digits without Leading Zeroes or Spaces for a Number (Constant, Variable or Literal)  
\* Writing a specified number of Digits with Leading Zeroes for a Number (Constant, Variable or Literal)  
\* Writing a specified number of Digits with Leading Spaces for a Number (Constant, Variable or Literal)  
  
Nowadays there are many cheap I2C backpacks available for parallel LCDs. These backpacks all use a PCF8574 I2C IO expander. I have three different brands of backpacks and they are all essentially the same, except some do not have the SDA and SCL pull-up resistors on board - like the HobbyKing "Arduino" LCDs with an I2C backpack. The most popular backpacks (and cheapest on Alliexpress.com) are exactly the same as the "SainSmart LCD2004".  
  
These backpacks make the use of a parallel LCD really easy and convenient; just make sure that your LCD has connections in the same sequence as the backpack. Also, some LCDs have a Backlight current limiting resistor on board and some don't - Check. It is a MISSION to replace the backlight LED/s!!!  
  
There is a SUB in the program called "WRITE\_LCD:", which you can modify to suit other hardware output methods (instead of the backpack), e.g. 74HC595, MCP23008, without having to change any of the other code. Just make sure that your connections and the "LCD\_BUS\_Data" Bits are the same.  
  
I have attached some documentation for the "LCD2004" backpack.