

## **In-Circuit Debugger (ICD)**

One of the great advantages to the Basic Atom software is the In-Circuit Debugger (ICD). With the ICD you can watch your program run in the Atom chip/module and find any bugs or programming mistakes as they happen. It's like making everything happen in slow motion so you can see where the error occurred. Once you use it you won't ever want to develop without it.

The ICD is completely controlled by software. No additional hardware is required. When you have a completed program, you would normally press the "Program" button to compile and download your program into the Atom chip/module. To use the ICD you simply press the "Debug" button instead. The difference between the "Program" button and the "Debug" button is hidden. They both compile and then program the Atom chip/module but the "Debug" adds another hidden step, it adds a block of code to your program that is used by the ICD.

When your program is running, the added ICD block of code sends variable values, internal register values and other details to the PC through the programming cable. The ICD, built into the programming screen IDE, will display that data in the way you require, by using the ICD debug tool bar. These functions allow you to run the program automatically, command by command, in slow motion or step through the program by using the PC mouse to advance the program command by command. This gives you total control of how the program advances.







### Toggle Breakpoint

The Toggle Breakpoint button allows you to turn a breakpoint on or off at any point in the program. A breakpoint is a highlighted line that will stop execution of the program when it gets to that command line. This is handy if you want to see what variables and I/O pins look like when a specific command is encountered in the program without having to step through each command. To use it, just position the cursor to the line you want the program to stop at. If a break point is not set on that line, right click on your mouse and select "Toggle Breakpoint". This will highlight that command line in red and enable the breakpoint action. To turn it off, just right click on it again to turn it off.



### Animate

This is a nice feature of the ICD. The Animate function will automatically step through your program command by command in slow motion. Each command being executed is highlighted in green. When the command is completed the next line is highlighted. This allows you to watch and verify the program is flowing where you expect to go. If the "Auto Update" feature is selected (described below) then variables and internal information will be updated after each command. To view those values though, you will have to pause the program as the animate mode runs too fast to read the data.



### Run

This option allows you to run the program in the Atom chip/module at full speed (minus minor delay for the debugger block of code) without stopping to check for variables or other data. The green command line indicator will not step through each command.