PROTEUS IoT BUILDER

IoT Builder is a unique product designed to make it quick and easy to control remote Arduino™ or Raspberry Pi® electronics from a mobile device.

Internet of Things Made Easy

Complete IoT Workflow:

The IoT Builder workflow is flexible and intuitive. Start by designing the product hardware on the schematic by adding electronic shields, sensors and breakout boards via the peripheral gallery. Then use the controls gallery to create the front panel, adding and placing dials, buttons, charts, etc. in the IoT Builder editor. Finally, use Visual Designer flowchart methods or Arduino C / Raspberry Pi Python code to bind the user interface to the electronics.

At any time during development the entire system can be tested and debugged in the Proteus VSM simulation. This executes the same compiled HEX file as the real hardware and will also simulate the interaction of the front panel with the electronics.

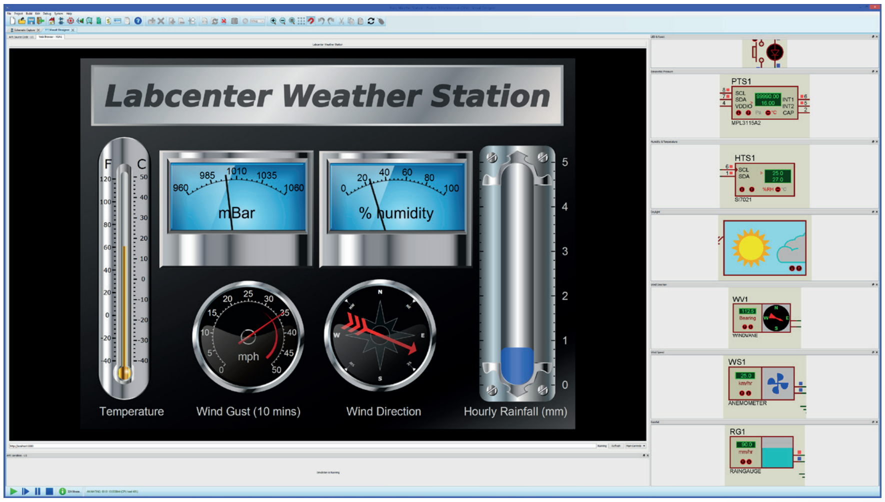
Once everything is working as expected, the firmware and front panel can be deploying to the physical hardware at the press of a button. The final step is to point the target device at the hardware, watch it acquire the front panel over TCP/IP and then control the remote hardware from your mobile phone, tablet or PC.

What can I do with it ?

You can use IoT Builder to design a user interface (switches, buttons, rotary dials, displays etc) for your mobile phone or tablet and then use Visual Designer or Proteus VSM to program the physical hardware to work with the remote GUI.

IoT Builder removes the necessity for the user to know about HTML, Javascript, Python and the TCP/IP interconnect. All of the complexity of the transport layer and the communication between the processor hardware and the remote front panel is abstracted from the users program, leaving the programmer to implement desired functionality.

The front panel is drawn in the panel editor and the logic for the user interface is programmed at a high level with either flowchart blocks (Visual Designer) or C method calls (Proteus VSM).
IoT builder is therefore well suited both for teaching the principles of IoT based applications to beginners and also as a rapid prototyping tool for more experienced developers.



Designed to work with Arduino Yun, ESP8266+Uno or Raspberry Pi 3

How It Works:

- Design your hardware with a library of ready-made shields/hats.
- Design your front panel with buttons, switches, dials, displays and charts.
- Link the UI and the hardware with flowchart methods in your firmware.
- Simulate the entire system and single step debug to find & fix problems.
- Control the simulation or the real hardware from your phone or tablet.

IoT BUILDER

Draw your user interface with drag and drop inside Proteus.

FRONT PANEL DESIGN

The front panel design is the remote user interface to your Raspberry Pi or Arduino appliance and what you will see and interact with on your mobile, tablet or internet browser. In IoT builder the front panel design is created by drawing rather than coding. Controls such as buttons, displays and dials are added to the project and then the user arranges them on the panel in a suitable way.

A rich library of controls is pre-supplied and several themes ranges from contemporary to steampunk are available to help creating stunning GUI control panels for your project. More advanced users can even use vector graphics tools such as Inkscape to design their own control themes.

PROGRAM CONTROL

The firmware program is where we need to interact with both the hardware peripherals of our appliance and the IoT controls on our remote front panel. This needs to work in both directions. For example, a button press on the front panel may turn on an LED in the appliance, but equally sensor data from the appliance may update a display on the front panel.
Since both the appliance and the front panel are designed in Proteus, IoT Builder is able to make life much easier during programming. The project tree contains a list of the peripherals you have added and also a list of the IoT controls in your front panel. You can then drag and drop these method calls directly from the project tree into your program.

Program your hardware with drag and drop onto flowchart or source file .

SIMULATE & DEBUG

IoT Builder uses Proteus VSM Simulation technology so that your firmware program is simulated along with any electronics you have added to the schematic. The remote user interface is also shown inside Proteus so you can quickly and easily test the interaction of your GUI with your virtual hardware.

Alternatively, you can use the free IoT Controller apps for IoS and Android to control the running simulation. When the phone or tablet is on the same network as the PC, the apps can discover and connect with the simulated hardware automatically so users can directly control the simulation from their mobile device.

DEPLOY

Once your system has been debugged and tested in simulation you can transfer to the physical hardware at the press of a button. After a one time configuration process Proteus can detect your hardware if it is on the same network and pre-configure the SSH options for you. In most cases therefore you can deploy to the physical hardware wirelessly at the press of a button. Alternatively, with Arduino hardware you can connect a USB cable to the Yun/ESP8266 which will appear as a programming target in your programmer dialogue.
Either way, Proteus takes care of transferring the front panel graphics, the webserver interface and the firmware program onto the real hardware.

Control the running simulation from your phone or tablet device.

Deploy to the real hardware with the press of a button.

Labcenter Electronics Ltd.
21 Hardy Grange, Grassington, N. Yorkshire, England, BD23 5AJ
Tell: +44 (0) 1756 753440, Fax: +44 (0) 1756 752857
Web: www.labcenter.com, Email: info@labcenter.com
Labcenter YouTube Channel: http://www.youtube.com/c/LabcenterElectronicsLtd

labcenter Electronics www.labcenter.com