

**Tibbo** TIBBO PROJECT SYSTEM [www.tibbo.com/tps](http://www.tibbo.com/tps)  
 MODULAR PROGRAMMABLE INDUSTRIAL CONTROLLERS



# TIBBO PROJECT SYSTEM

Take what you need. Leave out what you don't.

# Tibbo Project System

Not content to be yet another gray box, the TPS brings design aesthetics into the industry largely dominated by dull, predictably looking products. Excellent engineering, eye-pleasing appearance, engaging colors, as well as the use of premium materials and packaging have won us the coveted Red Dot Design Award.



reddot award 2014  
winner



TPP

## Tibbo Project PCB

A TPP is the motherboard of your Tibbo Project System. It carries the bare essentials: a CPU, memory, and an Ethernet port.

Each TPP offers a number of sockets for Tibbit modules and connectors. Your system's functionality is defined by what Tibbits you plug into the board.

Tibbits

## Tibbit® Blocks

Tibbits® (Tibbo Bits®) are blocks of prepackaged I/O functionality housed in brightly colored rectangular shells.

Tibbo supplies a wide variety of Tibbits: there are RS232/422/485 modules, DAC and ADC devices, power regulators, PWM generators, sensors for temperature, humidity, and pressure, and many others.

TPB

## Tibbo Project Box

Most projects require an enclosure. Designing one is a tough job that can also be prohibitively expensive.

Not to worry – we supply three different Tibbo Project Box enclosure kits for your system.

All kits can be ordered as a part of your system or purchased separately.

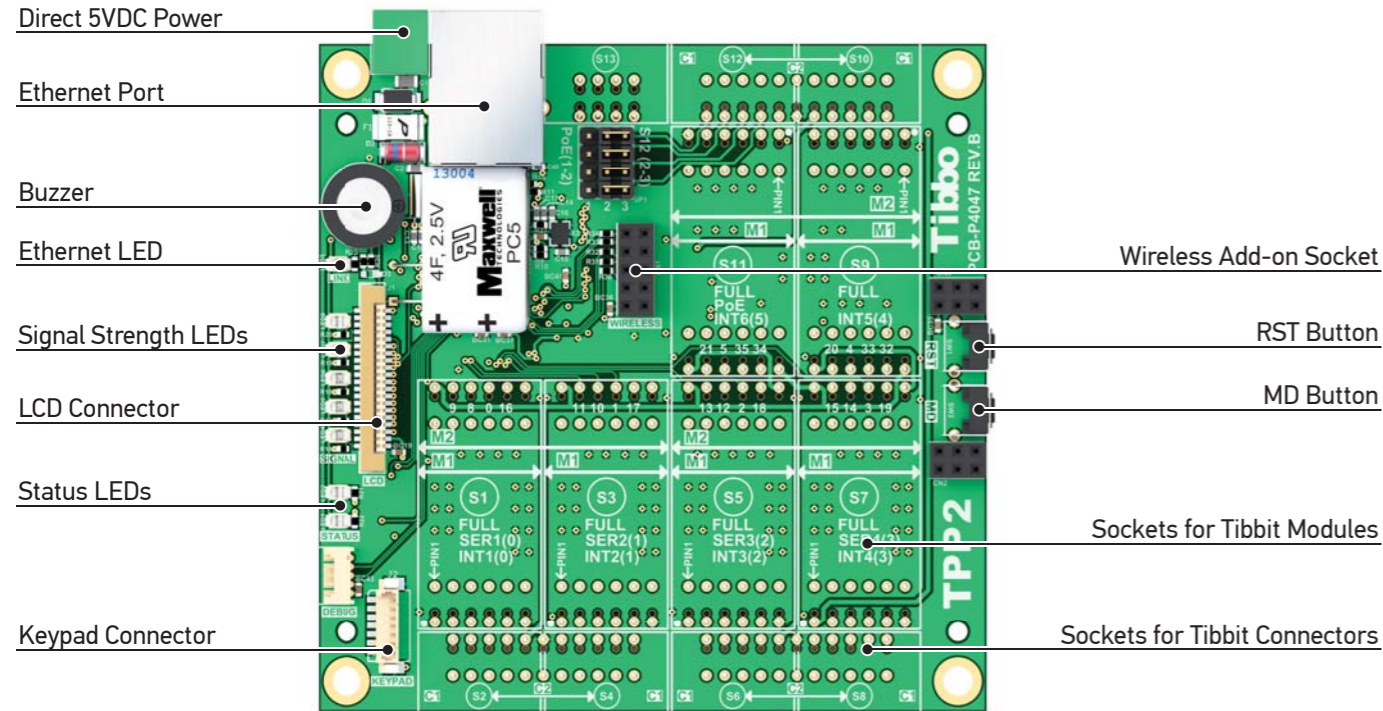
TPS

## Your Custom System

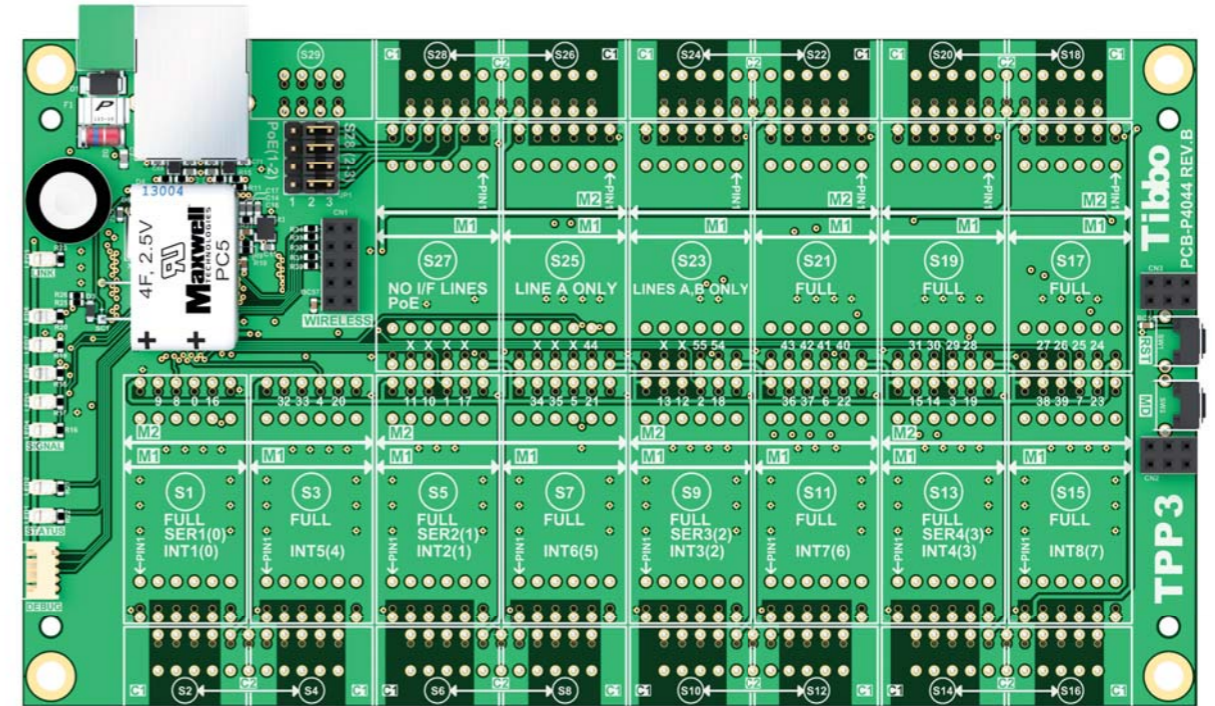
By combining a Tibbo Project PCB with necessary Tibbits and wrapping the assembly in a stylish housing you get exactly the device you require for your specific project.

No more, no less. Just what you need. No excess.

# Tibbo Project PCB



A TPP is the motherboard of your Tibbo Project System. It carries the bare essentials: a CPU, memory, and an Ethernet port. There is also a number of installation sockets for Tibbit modules and connectors.



## TPP2

### Size 2 Board

The TPP2 accommodates up to six Tibbit modules and six Tibbit connectors.

The board can optionally control a TFT LCD display and a 4-key capacitive keypad.

All TPP boards provide a socket for the GA1000 802.11b/g Wi-Fi module. In addition to a small onboard antenna, the module has a provision for an external antenna.

## TPP3

### Size 3 Board

The TPP3 more than doubles Tibbit capacity and accommodates up to 14 Tibbit modules and 14 Tibbit connectors.

As an example, you can install up to four full serial ports, up to 24 mechanical relays, or up to 46 sensor inputs.

The primary supply voltage for TPS devices is +5V. A few Tibbits additionally require +15V and/or -15V power.

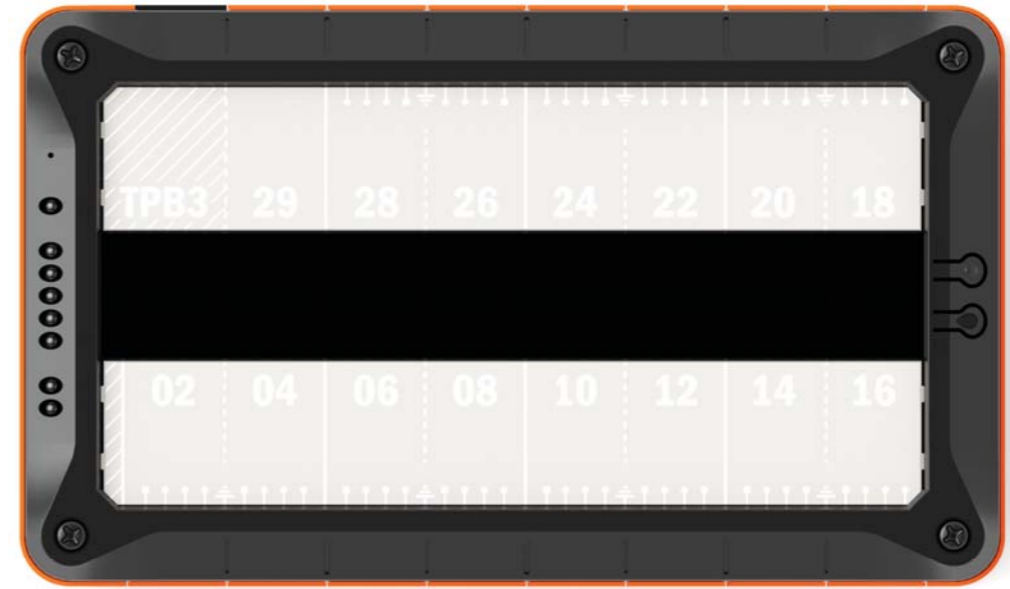
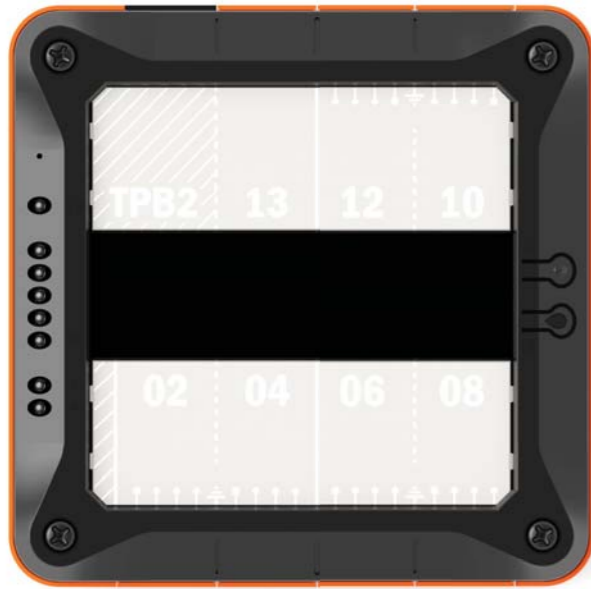
TPP boards can be directly powered from the regulated 5V power source. All other power options (12V, 24/48V, PoE, etc.) are implemented as Tibbits. There is also a dedicated Tibbit for generating +/-15V power from the main 5V line.

Power supply Tibbits can be connected in parallel for increased current budget or reliability.

# Tibbo Project Box

Most projects require an enclosure. Designing one is a tough job that can also be prohibitively expensive. Not to worry – we supply three different Tibbo Project Box enclosure kits for your system.

All enclosures have mounting holes for wall installation. Optional DIN rail mounting kits are also available.



## TPB2

### Size 2 Project Box

This Box fits our size 2 Project PCB and can accommodate up to six Tibbit modules and six Tibbit connectors. The translucent top cover allows you to observe Tibbit LEDs. Provided paper inserts can be used for marking wires and cables.

## TPB2L

### Size 2 + LCD/Keypad

Like the TPB2, this Box houses size 2 project PCB. In addition, its top cover incorporates a 320x240 3.5" TFT LCD and four capacitive sensor keys.

The LCD and keypad allow you to use the TPS for applications requiring human interface.

## TPB3

### Size 3 Tibbo Project Box

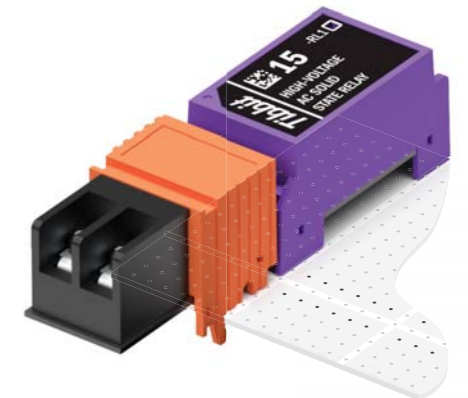
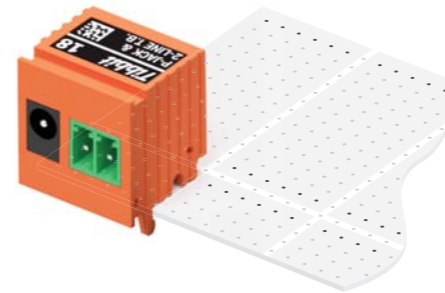
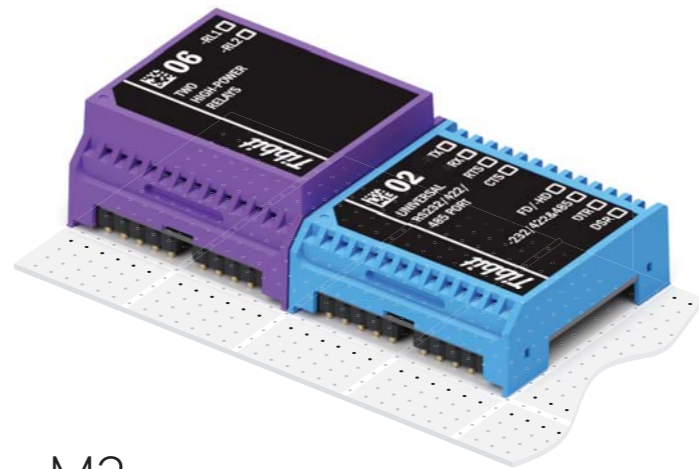
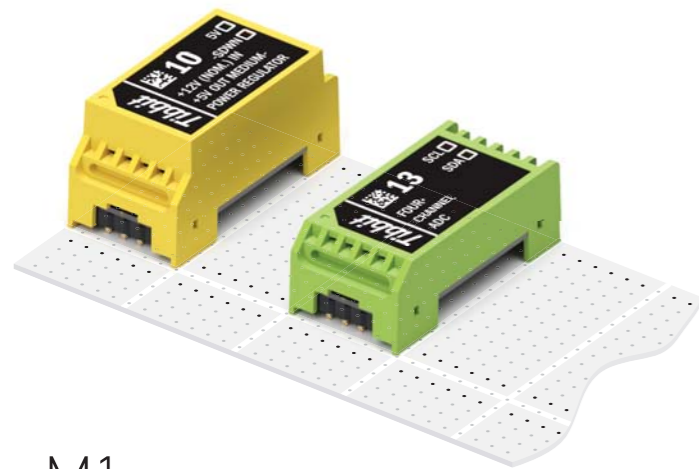
This Box is designed for our size 3 Project PCB and accommodates up to 14 Tibbit modules and 14 Tibbit connectors.

TPB enclosure kits are fully independent products which can be ordered as a part of your system or purchased separately. Each part of the enclosure can also be ordered individually.

# Tibbit® Modules & Connectors

Tibbits® (Tibbo Bits®) are blocks of prepackaged I/O functionality housed in brightly colored rectangular shells. Tibbits are divided into Tibbit modules (“M” devices) and Tibbit connectors (“C” devices).

Tibbit applications are not limited to the TPS. You can use Tibbits with virtually all popular microcontrollers (PIC, Atmel, ARM,...). Their pins have a classic 2.54 (0.1”) pitch, so they can be installed on prototyping boards.



M1

M2

C1

C2

H1

## Narrow Modules

M1 Tibbits are single-width devices occupying one module socket on a Tibbo Project PCB. Their footprint is roughly 7x14 “squares” (one “square” is 2.54x2.54mm or 0.1”x0.1”).

M1 devices have four I/O lines for interfacing with the outside world. We found four to be the *magic number*. It’s just right for a wide variety of I/O functions.

M1s can be short (M1S) or tall (M1T).

## Wide Modules

M2 Tibbits are double-width devices occupying two module sockets on a Tibbo Project PCB. Their footprint is roughly 14x14 “squares”.

With double the size comes the doubled internal space and I/O capacity. M2s have eight I/O lines. They are used for “grander things” that just wouldn’t fit into the M1 form factor (i.e. high-current relays, multiprotocol ports, etc.).

Like M1s, M2 devices can be short (M2S) or tall (M2T).

## Narrow Connectors

C1 Tibbits are single-width devices that work in tandem with M1 Tibbits and occupy one connector socket on a Tibbo Project PCB.

Some C1s are really just connectors of the power jack or DB9 variety. There are also C1s that sense the outside world (temperature, humidity, vibration, etc.) or perform other intelligent jobs.

C1s have the equal width and height with M1T devices.

## Wide Connectors

With double the width of C1s, C2 Tibbits are wide enough to house DB9 connectors and 9-row terminal block banks. They occupy two connector sockets on a Tibbo Project PCB and can interface to a single M2 or two M1 Tibbits.

C2s have the equal width and height with M2T devices.

## Hybrid Tibbits

H1 Tibbits are merged narrow modules and connectors. They occupy the combined space of one M1 and one C1 block.

The H1 form factor is used when it is unsafe or undesirable to interconnect M1 and C1 Tibbits via a Tibbo Project PCB (or any other host board).

Examples of such cases are high-voltage and high-frequency (radio) circuits.

Tibbits are colored according to their function:



# Available Tibbits®

Follow Tibbo news announcements.  
We will be constantly expanding the  
assortment of available Tibbits.



Follow us on Twitter  
@tibbo

Currently available Tibbits make the TPS an ideal candidate for use in the industrial automation systems, climate and building control solutions, security and access control panels, data collection terminals, lab automation devices, and many other control and automation applications.



#00<sub>1</sub> - #00<sub>3</sub>  
Digital  
I/O Lines



#01  
Four-line RS232 port  
(RX, TX, RTS, CTS)



#02  
Universal  
RS232/422/485 port



#03<sub>1</sub> - #03<sub>2</sub>  
Two low-power  
relays



#04<sub>1</sub> - #04<sub>4</sub>  
Opto-isolated  
inputs



#22  
Non-isolated  
PoE power regulator



#24  
Thermocouple  
temperature meter



#25  
Power regulator  
24/48V→5V



#26  
IR code  
processor



#27  
IR transmitter/  
receiver



#05  
RS485 port



#06  
Two high-power  
relays



#07  
Two solid-state  
relays



#08  
Clock/data & Wiegand  
port



#09-#10  
Power regulators  
12V→5V



#28  
Ambient light  
sensor



#29, #30, #35  
Temperature, humidity,  
and pressure meters



#31  
PIC-based  
ADC and PWM



#36  
3-axis  
accelerometer



#37  
RF connector



#11  
Four open  
collector outputs



#12  
Power regulator  
5V→+15V/-15V



#13  
Four-channel  
-10...+10V ADC



#14  
Four-channel  
-10...+10V DAC



#15  
High-voltage AC  
solid-state relay



#38  
Pushbutton



#39<sub>1</sub> - #39<sub>4</sub>  
LED  
(4 colors available)



#40<sub>1</sub> - #40<sub>4</sub>  
Digital  
potentiometer  
(4 nominals available)



#41  
8-bit port



#42  
Real-time clock  
with backup battery



#16-#17  
Three PWMs with  
open collector and  
power outputs



#18  
Power  
jack



#19  
DB9M  
connector



#20  
Nine terminal  
blocks



#21  
Four terminal  
blocks

# Online Configurator

The modular design of the Tibbo Project System allows you to use it in a myriad different applications. Just plug in the Tibbits you want and you have your customized device. Question is, how do you know that the Tibbit arrangement you have in mind will work correctly? And if it does, how to order your configuration from Tibbo?

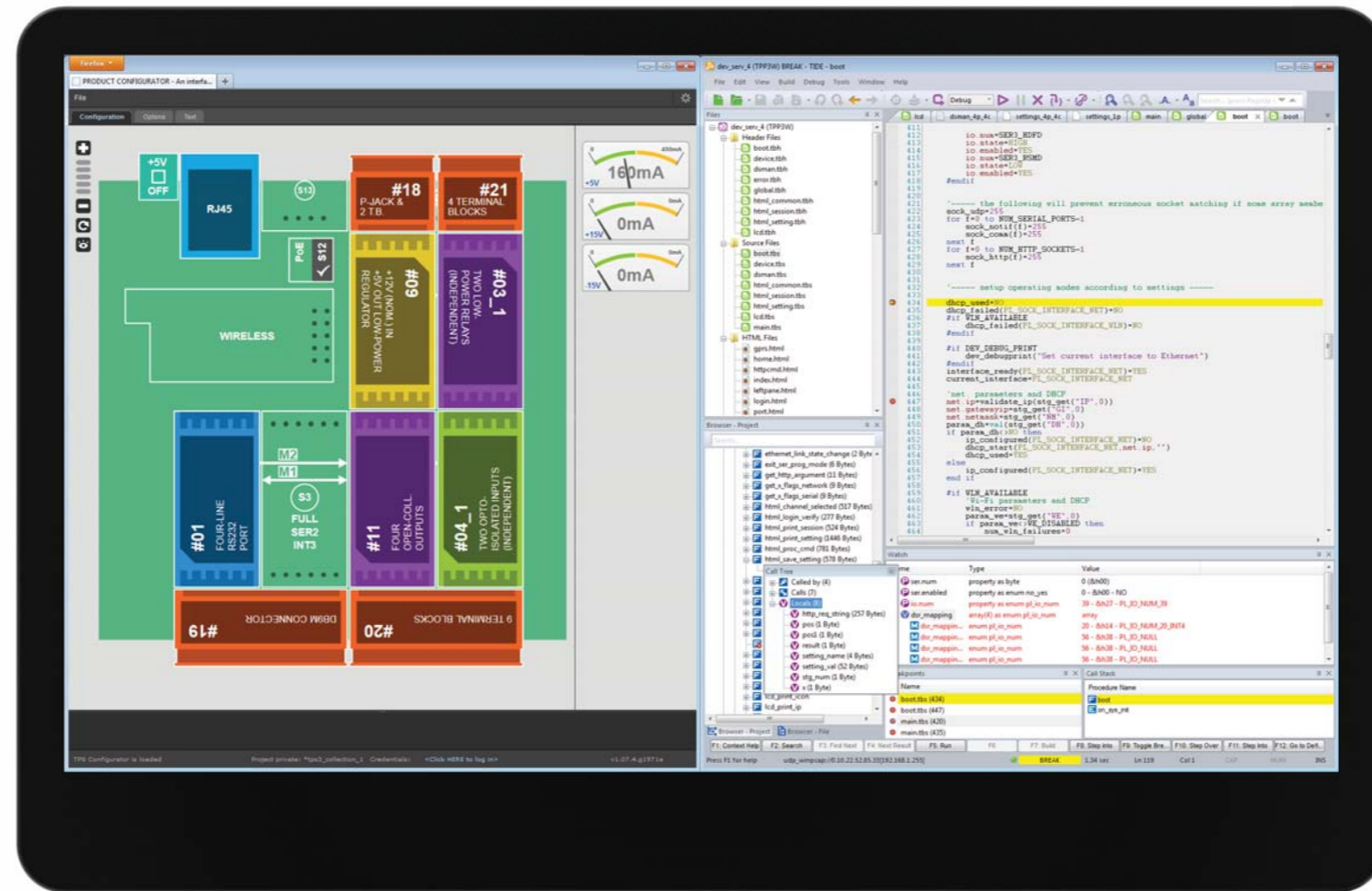
The answer is simple: start with our online configurator.

Running directly in your browser's window, the configurator lets you "assemble" your device while making sure that there are no mistakes that will prevent it from working correctly. The configurator also allows you to play with available options: add the Wi-Fi interface, a Tibbo Project Box enclosure, DIN rail mounting kit, and so on. You can even specify whether you want to receive your order as a fully assembled Tibbo Project System or as a set of parts which you will put together yourself.

Immediately upon creating a valid configuration you will be able to order it from our online store. Your unique device's price and even its shipping weight will be automatically calculated and displayed.

Want to share your unique configuration with others? Make your project available to your friends or the entire Tibbo community.

Want to start from a tried and tested configuration? Our website has many projects created by Tibbo and its customers.



# Tibbo Integrated Development Environment

The power of TPS would not be fully realized without a versatile programming language and application development system.

Enters the Tibbo IDE software – our modern, lightweight, and easy to use development environment for creating embedded applications in Tibbo BASIC.

Tibbo IDE allows you to quickly put together sophisticated projects featuring Ethernet and Wi-Fi communications, file and database manipulation, LCD and keypad control, and, of course, interaction with Tibbits.

The unique feature of Tibbo IDE (and Tibbo OS running on our devices) is the ability to cross-debug your applications directly through the network and without relying on any special debugging hardware such as a JTAG board.

Simply connect your Tibbo Project System to the Ethernet LAN, select it as the debug target in the IDE, and you are all set!

To access the Configurator: [www.tibbo.com/www-builder](http://www.tibbo.com/www-builder)  
To order your unique TPS device: [www.tibbo.com/buy/tps/tpc](http://www.tibbo.com/buy/tps/tpc)

Download the latest Tibbo IDE release here:  
[www.tibbo.com/tide](http://www.tibbo.com/tide)

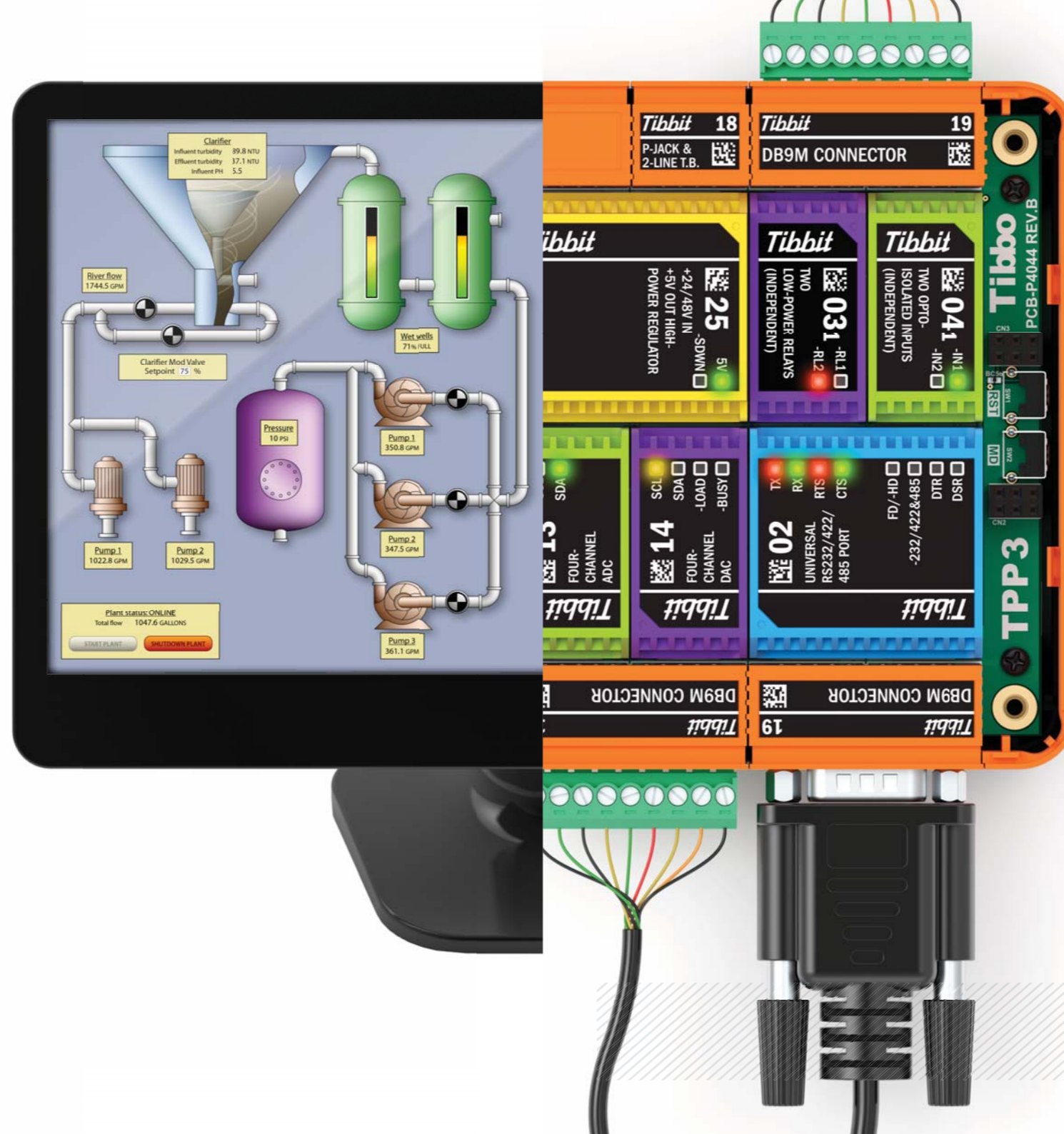
# AggreGate<sup>®</sup> Device Management System

AggreGate is a Java-based device management software that can be deployed under Windows or Linux.

AggreGate allows you to remotely configure, monitor, and control connected devices. The software aggregates your devices' data into a single common database where you can slice and dice it according to your needs, as well as allow transparent access to this data from third-party applications.

Each connected device is viewed by the AggreGate Server as an object comprising properties, methods, and events. The Server learns about all newly connected devices through metadata transmitted by them on connection. As a result, the Server automatically understands the "features" of each connected device.

Importantly, your TPS and other devices need not maintain a constant connection to the Server in order for you to be able to configure them. Once the initial metadata transmission completes, the Server creates a snapshot of all properties and methods available on the device. You can then make changes to this snapshot data at any time, even when the device itself is not connected. The changes you make are cached by the Server and sent to the device at the first opportunity. This powerful feature allows you to control devices with unstable or



intermittent visibility. It also masks the complexity of device communications, allowing third-party software to "view" your distributed system as a simple database.

Further, the Server allows you to combine connected devices into groups and control them "in bulk". Basing on the state of properties and generated events you can set the Server to send alerts or take actions. You can also run queries, design reports, and create visual dashboards – all without writing a single line of Java code.

## Comprehensive Support in Tibbo BASIC

To aid you in creating connected Tibbo BASIC applications Tibbo provides a set of sophisticated libraries.

Very little coding is required to complete the job – for the most part you simply edit the properties, methods, and events of your device's AggreGate model. This is done through the innovative library configurator built into the Tibbo IDE software.

AggreGate Agent and other Tibbo BASIC libraries are free and distributed together with Tibbo IDE.

Download the latest version of AggreGate software here:  
<http://aggregate.tibbo.com/downloads>