TPS Tibbo BASIC Application

Tibbo Technology Inc.

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The TPS Tibbo BASIC application is a great tool for testing Tibbo Project System devices. The application allows you to control the I/O lines and serial ports of TPP2 and TPP3 boards. A very simple set of hardware 3 is minimally required for the tests, yet the application itself is sufficient for working with various Tibbits such as relays, sensor inputs, and so on*.

The application is written to work with Ethernet and Wi-Fi interfaces 5, with plans to support GPRS communications in the near future.

The application demonstrates how to control your TPS system via the DS Manager utility 9, through the web interface 11, and the AggreGate Server 13. The application also supports the LCD and keypad of TPS2L devices.

Before you delve into the actual configuration and use 8 of your TPS device, we recommend that you take a look at the LED signals 6 topic.

To test the TPS app you can either upload pre-compiled binaries which are available for all three TPS systems (TPS2, TPS2L, TPS3), or open the project in TIDE and compile it yourself 20.

Either way, the first time this application runs on your TPS device it will initialize a number of EEPROM settings. This will take some time at first boot, after which the device will reboot and start running normally. The first step you will need to take after that is configure the IP of the Ethernet port. DS Manager Utility 9 topic explains how to do this.

**Some Tibbits can't be tested through simple I/O manipulation. We are working to extend this app to include testing features for each and every Tibbit we offer.*

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Playing With the Hardware

The TPS application centers on controlling TPP's I/O lines. This topic introduces some simple techniques of checking I/O line states and applying external signals. We also describe the simplest way of testing the serial ports.

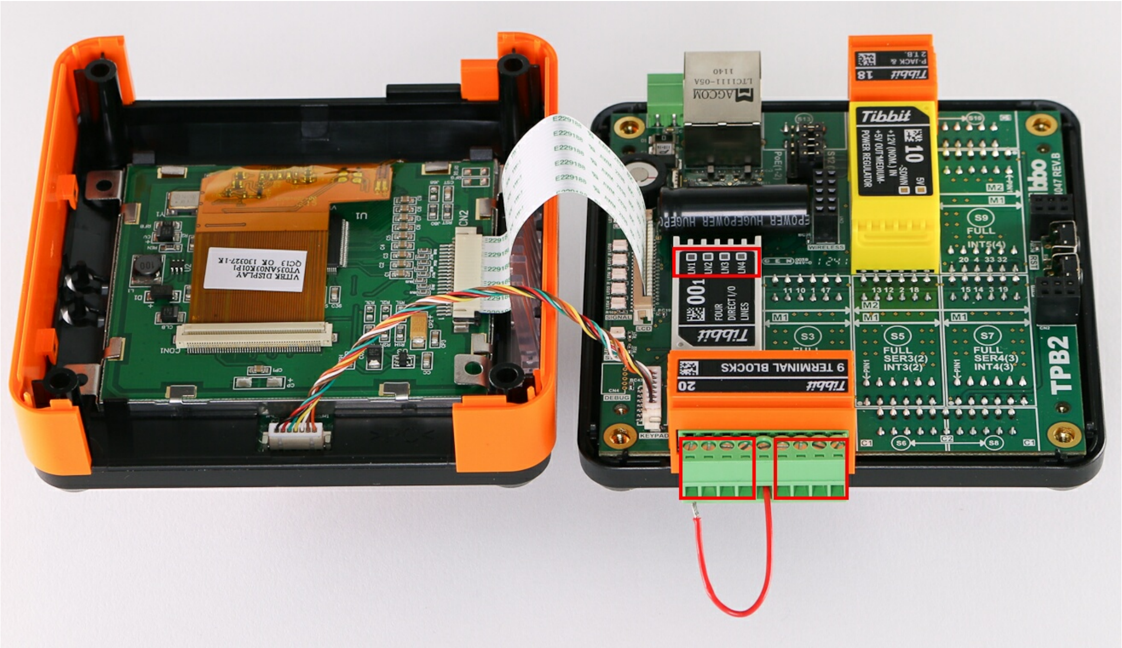
Working with I/O lines

All you need is one Tibbit#00-1, and one Tibbit#20. Tibbit#00-1 passes four CPU GPIO lines directly. Each line can work as an input or output. There are four LEDs on this Tibbit, one for each GPIO line. An LED is ON when the corresponding GPIO line is LOW. A line can be low for one of the two reasons:

- Because it is configured as an input and is "grounded" externally (that is, an external LOW signal is applied to it); or,
- Because it is configured as an output and the CPU is driving it LOW.

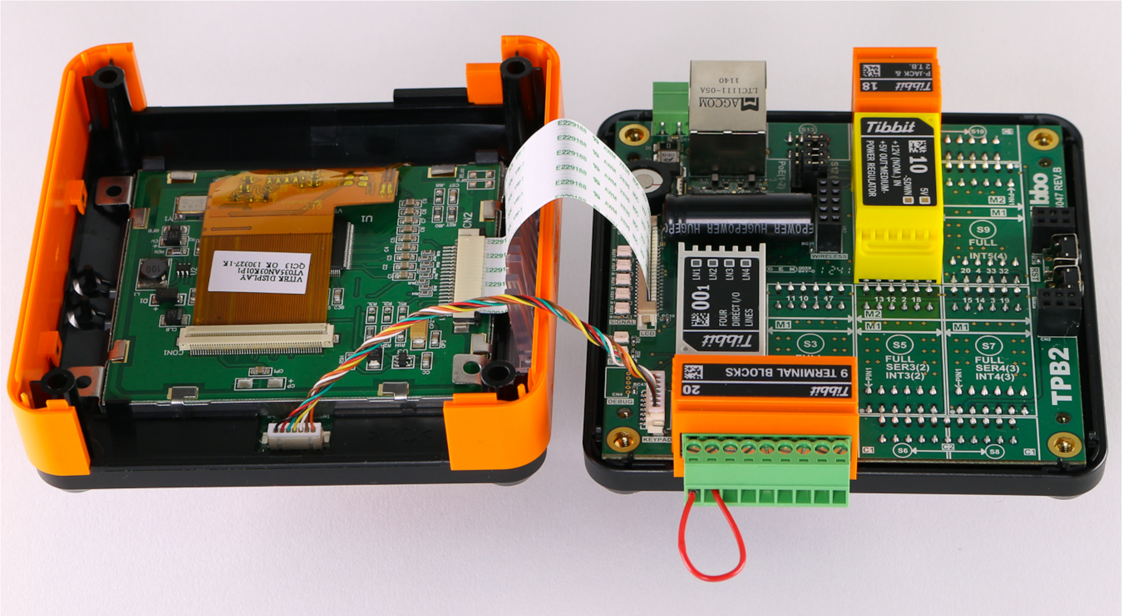
The web interface 11 or AggreGate 13 can be used to control the GPIO lines. Plug the Tibbit#00-1 into the desired socket, configure a line as an output, set it LOW, and an LED on top of the Tibbit will light up.

Want to apply a signal from the outside? Plug in Tibbit#20, and attach a short wire to the central terminal as shown below. This terminal is connected to the system ground. Four terminals to the left give you access to the I/O lines of one Tibbit module socket. Four terminals on the right provide access to the adjacent Tibbit module socket. Configure a GPIO line as an input, touch the corresponding terminal with the wire end, and an LED on top of the Tibbit#00-1 will light up. You are now driving the GPIO line LOW.



Testing serial ports

Again, all you'll need for a simple loopback test is one Tibbit#00-1 and one Tibbit#20. To test the serial port 1, plug the Tibbits and attach the wire as shown below. This will interconnect TX and RX lines. Now everything your send out of the serial port is received back into the serial port. This is the setup you will need for testing the serial port with AggreGate 13.



Ethernet and Wi-Fi interfaces

TPS devices presently support two network interfaces: Ethernet and Wi-Fi. The Ethernet port is implemented on Tibbo Project PCBs so it's always there. The Wi-Fi port is only available if there is the GA1000 802.11b/g Wi-Fi add-on module present. GPRS interface will also be supported in the near future.

Definition of an active interface

An interface is considered to be *active* when it is enabled and configured.

The Ethernet interface is always enabled. The interface is active when a "live" cable is plugged into the device AND the IP address of the Ethernet interface is configured. With DHCP off, the IP address is configured from the start ("configured" doesn't imply that the IP is correct). When the DHCP is on, the IP address becomes configured after the successful DHCP configuration of the IP. Unplugging the cable renders the Ethernet interface inactive.

The Wi-Fi interface is disabled by default and needs to be enabled by the user 8. The interface is active when the device is associated with an access point (AP) AND the IP address of the Wi-Fi interface is configured. Successful association requires correct access point name, security mode, and password to be set. With DHCP off, the IP address is configured from the start. When the DHCP is on, the IP address becomes configured after the successful DHCP configuration of the IP. Loosing connection with the access point renders the interface inactive.

The Wi-Fi mode setting (accessible through the DS Manager 9 or web interface 11) actually provides three choices:

- *Disabled*: the Wi-Fi interface is off;
- *Enabled (on demand)*: the Wi-Fi interface is switched off while the Ethernet interface is active. Once the Ethernet cable is unplugged the Wi-Fi gets enabled and (starts attempting to) associate with an access point, configure the IP, etc. Wi-Fi interface becomes active when all steps execute successfully. Wi-Fi shuts down when the Ethernet cable is re-plugged.
- *Enabled (permanently)*: the Wi-Fi interface is turned on at boot. It attempts to

maintain association with an AP and keep its IP configured at all times, regardless of the Ethernet state.

Ethernet interface has priority over Wi-Fi

Ethernet generally has priority over Wi-Fi. Specifically:

- If both the Ethernet and Wi-Fi are active, the DS Manager 9 utility will see your device on the Ethernet interface and its IP. Unplug the Ethernet cable, and you will start seeing the device on the Wi-Fi interface and its IP.
- If both the Ethernet and Wi-Fi are active, connection to the AggreGate server 13 will be effected through the Ethernet interface. Unplug the Ethernet cable, and the application will close the TCP connection with the AggreGate server that was established through the Ethernet port and start a new connection through Wi-Fi.

The web interface 11 is available on both interfaces simultaneously.

LED Signals

The LEDs of your TPS device can tell you a lot -- if you know how to decipher their signals. Diagrams below will help. All diagrams should be interpreted as left-to-right step-by-step animation frames.

Ethernet link LED

This LED is yellow-orange in color. The LED is on whenever a "live" Ethernet cable is plugged into the device.

Green and Red Status LEDs

First off, you need to know that these LEDs are used by the device's OS (called TiOS) for system status indication. You can read about this here: http://docs.tibbo.com/taiko/leds.htm. The TPS app, when running, also uses this LED pair to tell you what's going on.

Patterns are...

Booting up:

O	O	O	O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O	O	O	O

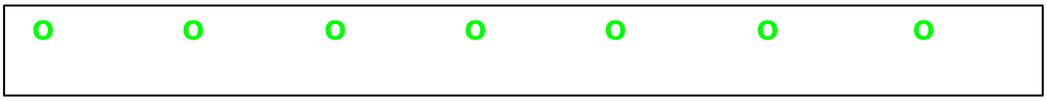
"Both LEDs on"

Looking for the AggreGate Server 13 (pinging it) or trying to establish a TCP/IP connection to the server. Having this pattern for an extended period of time means that the Server is inaccessible (or, perhaps, the Server's IP or port is incorrect):

O		O		O				O		O		O	

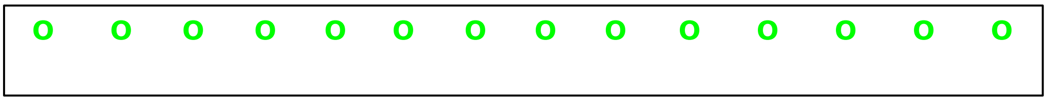
"Three green flashes, then pause"

Connecting to the Server and/or performing initial data sync:



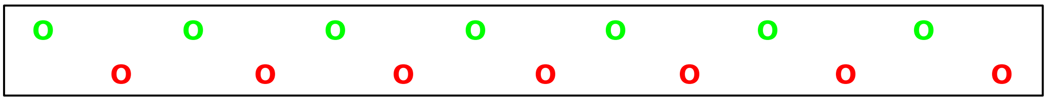
"Green flashing constantly"

Connection to the Server is established and the initial sync has been completed:



"Green on"

Web interface 11 configuration is in progress:

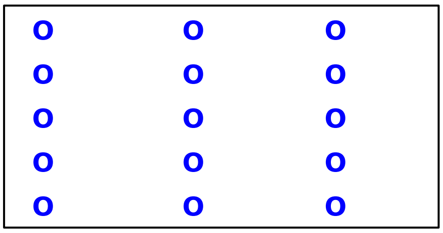


"Green -- red -- green -- red"

Blue LED bar

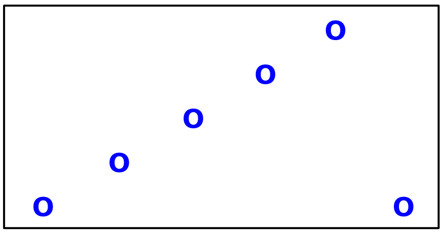
This bar consists of 5 blue LEDs. In this application they indicate the Wi-Fi status.

This pattern is displayed when the TPS is trying to access the Wi-Fi port but the hardware (GA1000) is either not present or malfunctioning:



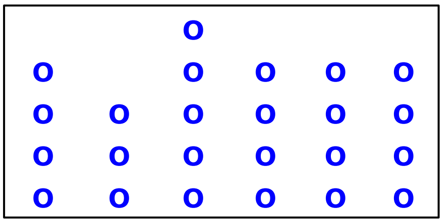
"All on -- all off -- all on --"

This pattern is displayed when the Wi-Fi interface is looking for or trying to associate with an access point (AP):



"Running light"

Whenever the Wi-Fi interface is successfully associated with an AP, the LEDs start to indicate the signal strength. The taller the bar, the stronger the signal is.



"Signal bar"

Configuration and Use

There are four methods of configuring your system, two ways of manipulating I/O lines of the TPP board, and a single way to send and receive data through the serial ports:

	Configuration	I/O manipulation	Serial port data TX/RX
DS Manager 9 utility	YES	NO	NO
Web interface 11	YES	YES	NO
AggreGate 13	YES*	YES	YES
Onscreen menu 18 (TPS2L only)	YES**	YES	NO

** Not all settings are available through the AggreGate. Specifically, Network, Wi-Fi, and AggreGate settings are not "exposed" to the AggreGate Server. This leaves you with the ability to only configure the serial ports.*

*** Since the TPS2L only has four keys for menu navigation and data entry, working with text and numerical settings may prove to be exceedingly difficult. Use the DS Manager or web interface for string editing.*

Configuration method priorities

The TPS application does not allow you to simultaneously access and configure your device through several configuration "channels". Here is the list of configuration methods in the order of decreasing priority:

The highest priority
Onscreen menu 18 -- all network activity shuts down when you enter the onscreen menu*
DS Manager 9 -- trumps the web interface, shuts down AggreGate connection when in use
Web interface 11 -- shuts down AggreGate connection when in use

AggreGate 13 -- server connection is terminated whenever you are in the onscreen menu, using DS Manager, or web interface access
The lowest priority

**Do not confuse this with the I/O line control from the "main" LCD screen, which is not a part of the menu and can proceed in parallel with the DS Manager, web interface, or AggreGate access.*

Use DS Manager first!

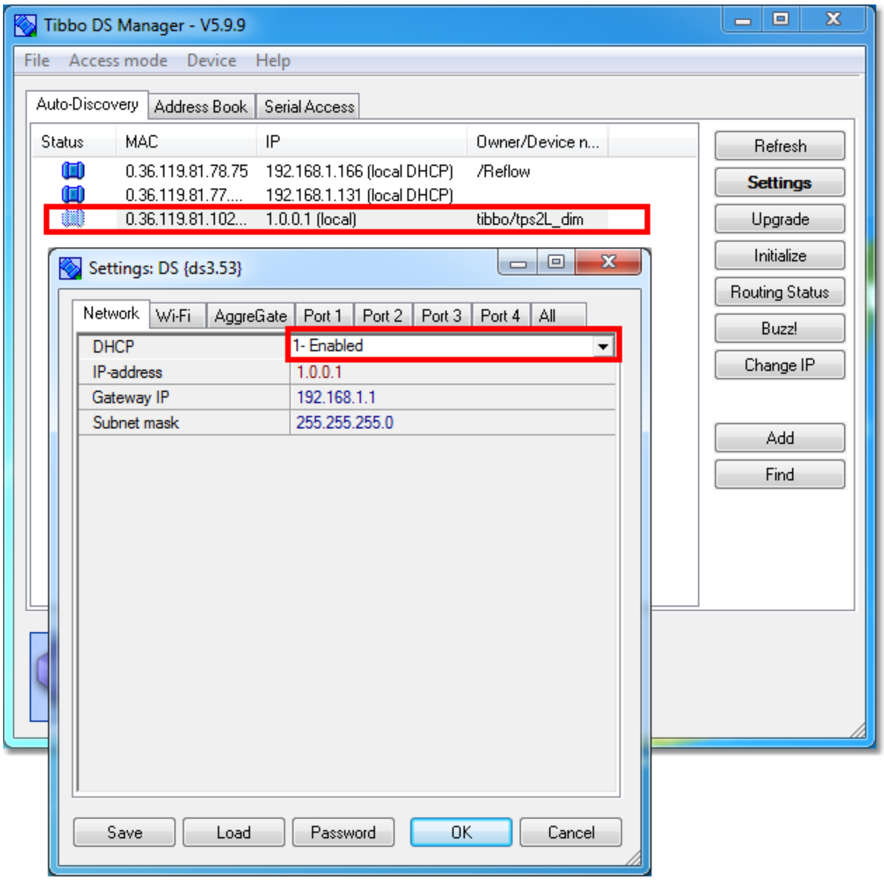
The key advantage of using the DS Manager utility is in its ability to discover and access devices with "incorrect" IPs. For systems without an LCD this is the only "cold" configuration method allowing you to set your device's IP address. In contrast, both the web interface 11 and AggreGate 13 require the IP to be "correct" first.

DS Manager Utility

The DS Manager utility is a part of Tibbo Device Server Toolkit. It is a configuration program that allows you to discover and configure compatible devices attached to your local network segment. Originally, this utility was meant for our serial-over-IP devices, hence its name. Later it proved to be useful for other products as well. You can download TDST here: http://tibbo.com/soi/tdst.html.

The key advantage of using the DS Manager utility is in its ability to discover and access devices with "incorrect" IPs. For systems without an LCD (and its onscreen configuration 18 menu) this is the only "cold" configuration method that allows you to set your device's IP address. In contrast, both the web interface 11 and AggreGate 13 require the IP to be "correct" first.

DS Manager will only see your device on one network interface 5 at a time.



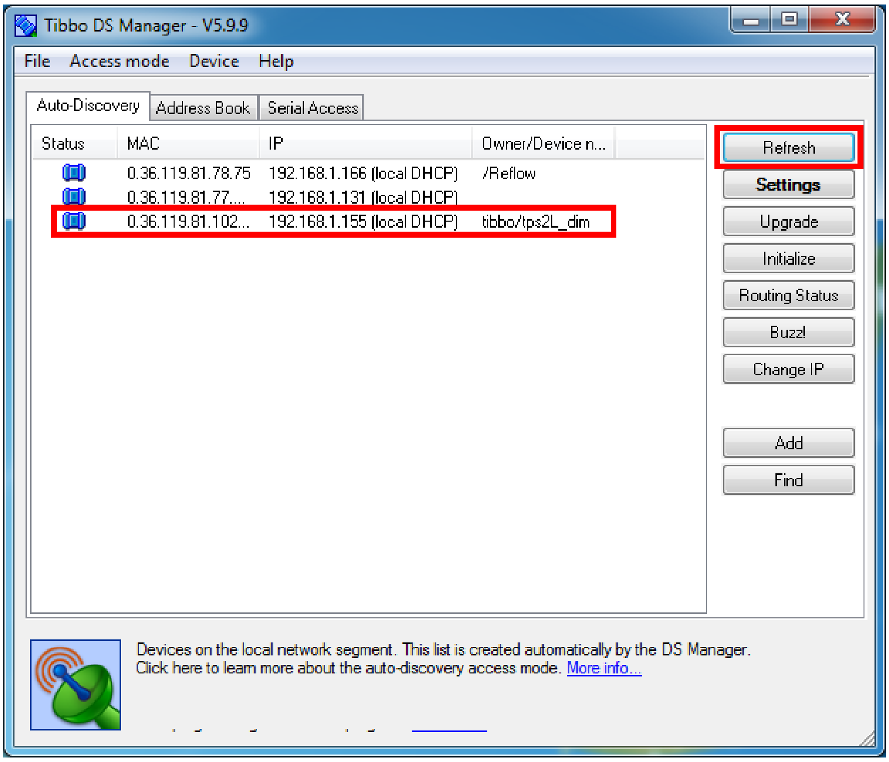
Tibbo DS Manager - V5.9.9
File Access mode Device Help
Auto-Discovery Address Book Serial Access
Refresh
Settings
Upgrade
Initialize
Routing Status
Buzz!
Change IP
Add
Find
Settings: DS {ds3.53}
Network Wi-Fi AggreGate Port 1 Port 2 Port 3 Port 4 All
Save Load Password OK Cancel

Status	MAC	IP	Owner/Device n...
	0.36.119.81.78.75	192.168.1.166 (local DHCP)	/Reflow
	0.36.119.81.77....	192.168.1.131 (local DHCP)	
	0.36.119.81.102...	1.0.0.1 (local)	tibbo/tps2L_dim

DHCP	1- Enabled
IP-address	1.0.0.1
Gateway IP	192.168.1.1
Subnet mask	255.255.255.0

To make your device accessible through the web interface, configure two settings: *DHCP* and *IP-address*. You can set the IP manually, but do make sure that you are using a free (unoccupied) IP. Easier approach is to enable DHCP and let the DHCP server take care of the IP configuration. And how will you know what IP address was assigned to your device? Through the same DS Manager utility! After you press OK in the settings dialog the new configuration will be stored into your TPS, after which it will reboot.

Once your system is back online, press *Refresh* in the DS Manager's main window. You will then see your device with a new IP:



Status	MAC	IP	Owner/Device n...
	0.36.119.81.78.75	192.168.1.166 (local DHCP)	/Reflow
	0.36.119.81.77....	192.168.1.131 (local DHCP)	
	0.36.119.81.102...	192.168.1.155 (local DHCP)	tibbo/tps2L_dim

Devices on the local network segment. This list is created automatically by the DS Manager. Click here to learn more about the auto-discovery access mode. More info...

Now you can point your browser to your device's IP and start using the web interface 11.

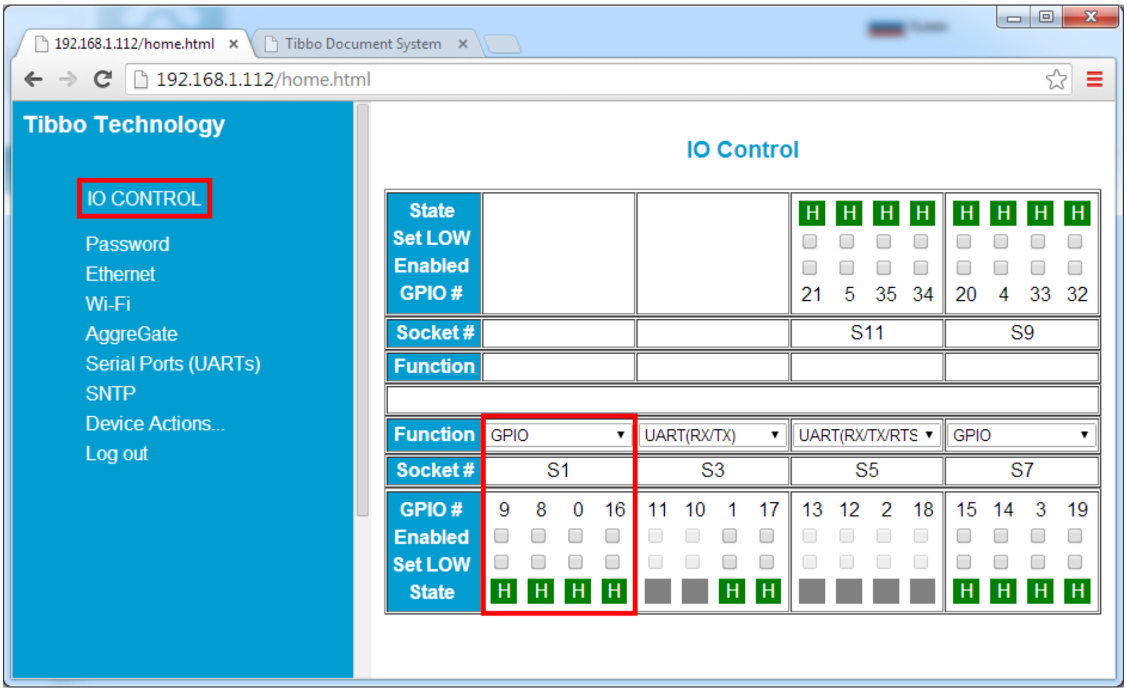
Web Interface

NOTE: the hardware setup needed for this test is described in Playing With the Hardware 3.

The web interface allows you access to all of the device's settings, as well as play with I/O lines. Your device's IP address must be properly configured before you will be able to use the web interface. Use the DS Manager 9 utility or the onscreen setup menu 18 (for devices with the LCD/keypad) to set the IP.

After pointing the browser to your device's IP you will be prompted to enter the password. The password string is empty by default so just click *Login*.

The first screen you are presented with is the one for I/O line manipulation:



IO Control

State			H H H H	H H H H
Set LOW			☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Enabled			☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
GPIO #			21 5 35 34	20 4 33 32
Socket #			S11	S9
Function				
Function	GPIO ▾	UART(RX/TX) ▾	UART(RX/TX/RTS ▾	GPIO ▾
Socket #	S1	S3	S5	S7
GPIO #	9 8 0 16	11 10 1 17	13 12 2 18	15 14 3 19
Enabled	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Set LOW	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
State	H H H H	■ ■ H H	■ ■ ■ ■	H H H H

The table on the IO CONTROL page represents the layout of your TPP board. For comparison see these two diagrams in the *Programmable Hardware Manual*:

- TPP2: http://docs.tibbo.com/phm/tiles_and_sockets.htm
- TPP3: http://docs.tibbo.com/phm/tiles_and_sockets2.htm

A single socket, such as "S1", typically has four control lines. Line numbers ("9, 8, 0, 16") indicate the io.num index (http://docs.tibbo.com/taiko/io_lines_method_1.htm).

Some sockets have alternative functions. All alternative functions of a socket are listed in the Function drop-down for this socket. This application currently supports two alternative choices and both are related to the UART (serial port) capability:

- *UART (RX/TX)* -- two lines are occupied by the serial port, remaining two lines still function as GPIOs. Selecting this item from the drop down enables the corresponding serial port, which will be reflected on the Serial Ports (UARTs) configuration page (see the left pane).
- *UART (RX/TX/RTS/CTS)* -- all four lines are assigned to the serial port because the RTS/CTS flow control is additionally enabled. Again, the Serial Ports (UARTs) configuration page will reflect this.

For the time being, actual sending and receiving of the serial data was only made possible using AggreGate 13.

For sockets with alternative functions, direct I/O line manipulation is only possible when "GPIO" is selected in the Function drop-down.

Each I/O line is controlled using two check boxes -- *Enabled* and *Set LOW*:

- When the *Enabled check box* is not checked the line acts as an input and shows the externally applied I/O state. The application responds to externally applied stimuli with a 3-5 second delay. This is because the polling method is used to update line states.
- When the *Enabled check box* is checked the line becomes an output and its state

is defined by the *Set LOW check box*. The line will output HIGH when the check box is unchecked, or LOW when it is checked.

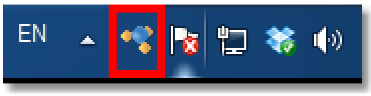
AggreGate

AggreGate is Tibbo's device management platform that allows you to configure, control, and monitor devices remotely. AggreGate is at the heart of sophisticated remote management and M2M solutions. Read about it here: http://aggregate.tibbo.com/.

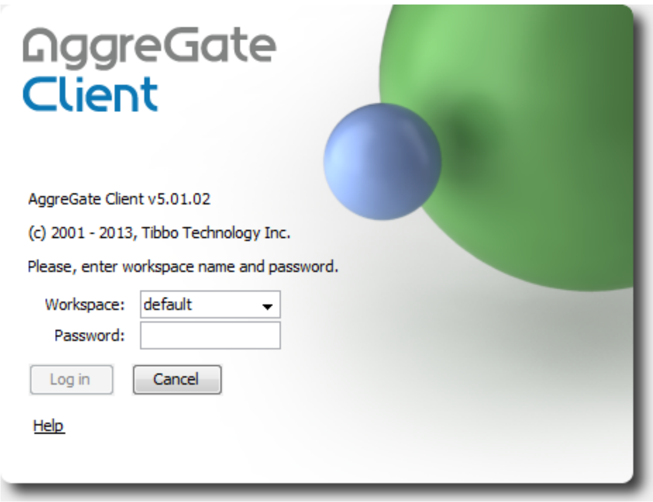
The AggreGate product consists of two components: the Server and the Client. You can get them here: http://aggregate.tibbo.com/downloads.html. Downloading "AggreGate" gets you the Server and the Client parts and you may install both on the same PC. The steps...

Connecting to the Server

Start the AggreGate Server. A tray icon will indicate that it is running:



Start the Client. You will be asked to create a workspace. use the default workspace. The password is *default*:



AggreGate Client v5.01.02

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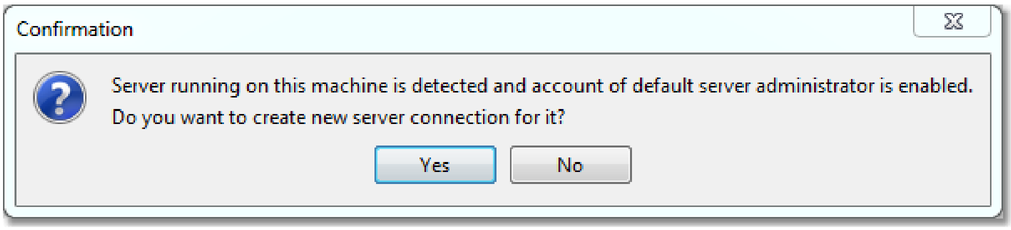
Please, enter workspace name and password.

Workspace: default

Password:

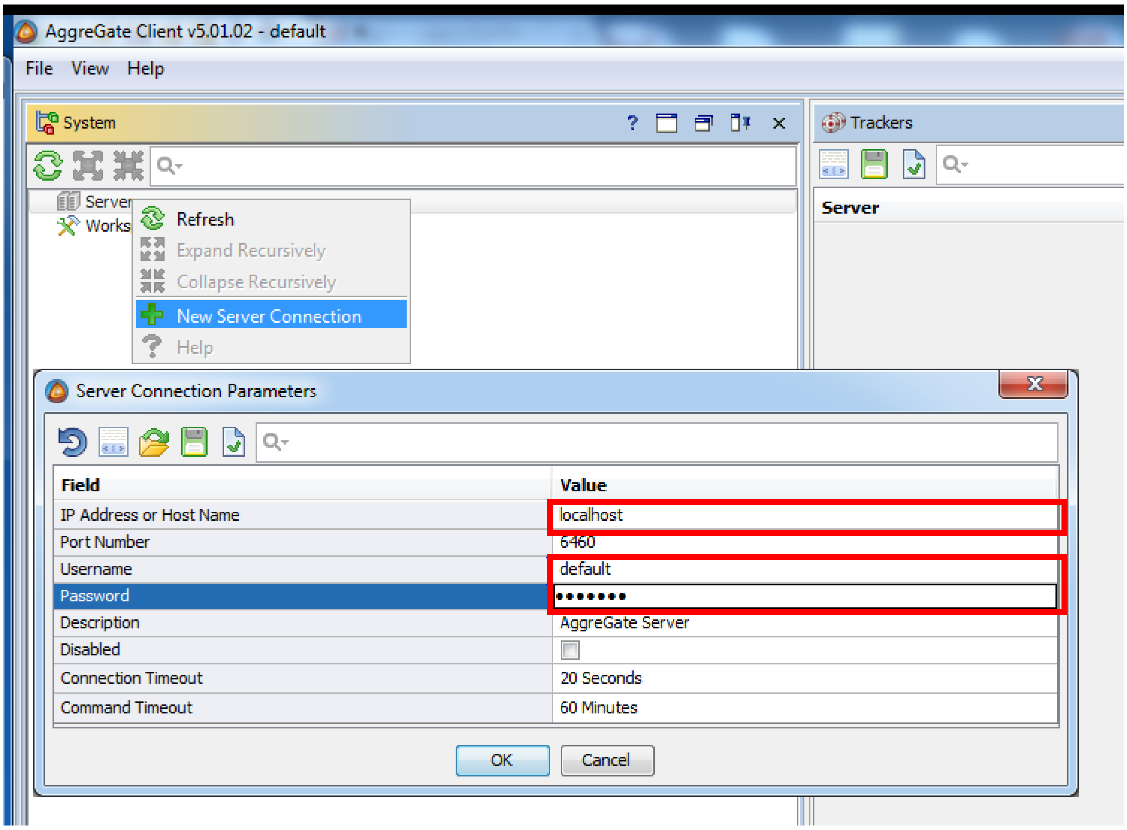
Once you log in, and provided that you are running the Server on the same PC with the Client, you will get the following prompt:



Server running on this machine is detected and account of default server administrator is enabled. Do you want to create new server connection for it?

Click YES and you are connected to the Server. If it somehow didn't go this way or your Server is on a different computer then you can connect to it manually.

Right-click on the *Servers* in the tree on the left and choose *New Server Connection*. In the *Server Connection Properties dialog* fill out the IP address (or host name) of the server. Set both the *Username* and *Password* to "default". Click *OK* and you should get your connection.

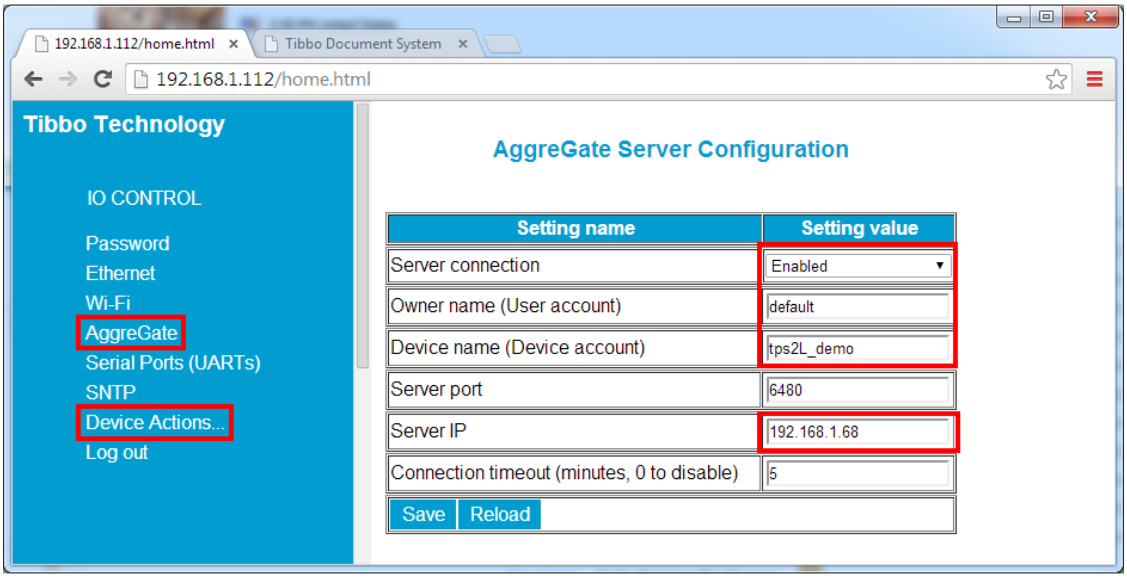


Field	Value
IP Address or Host Name	localhost
Port Number	6460
Username	default
Password	•••••••
Description	AggreGate Server
Disabled	□
Connection Timeout	20 Seconds
Command Timeout	60 Minutes

Configuring your TPS device for AggreGate

We will demonstrate how to do this through the web interface 11.

Open the web interface and click *AggreGate* (a menu item in the left pane). Enable *Server connection*, set the *Owner name* to *default*. Define any device name you want, for example *tps2L_demo*. Fill in the Server's IP address (host names cannot be used here). Click *Save*. Wait till new setting values are displayed on the screen and click *Device Actions...*, then *Reboot*. The reboot is necessary for the new setting values to take effect.



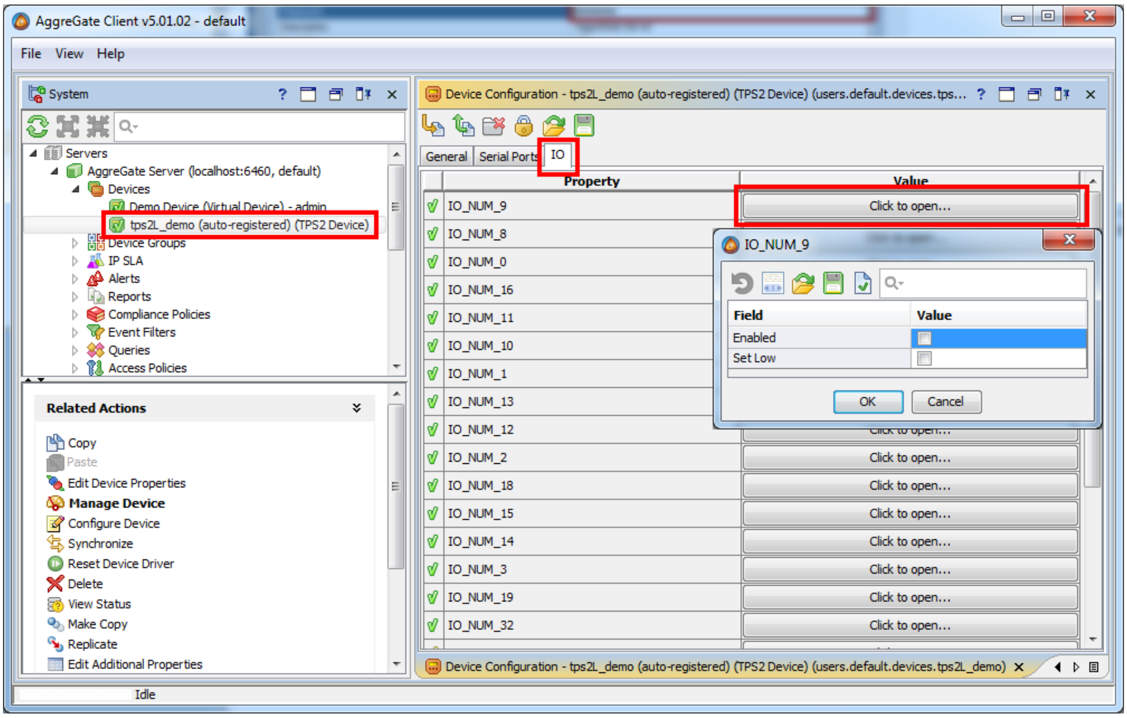
AggreGate Server Configuration

Setting name	Setting value
Server connection	Enabled
Owner name (User account)	default
Device name (Device account)	tps2L_demo
Server port	6480
Server IP	192.168.1.68
Connection timeout (minutes, 0 to disable)	5

Once the TPS boots up it will connect to the Server and the new *tps2L_demo* device will appear in the tree.

Controlling I/O lines

NOTE: The hardware setup needed for this test is described in Playing With the Hardware 3.



Device Configuration - tps2L_demo (auto-registered) (TPS2 Device) (users.default.devices.tps...

Property	Value
IO_NUM_9	Click to open...
IO_NUM_8	
IO_NUM_0	
IO_NUM_16	
IO_NUM_11	
IO_NUM_10	
IO_NUM_1	
IO_NUM_13	
IO_NUM_12	Click to open...
IO_NUM_2	Click to open...
IO_NUM_18	Click to open...
IO_NUM_15	Click to open...
IO_NUM_14	Click to open...
IO_NUM_3	Click to open...
IO_NUM_19	Click to open...
IO_NUM_32	Click to open...

IO_NUM_9

Field	Value
Enabled	□
Set Low	□

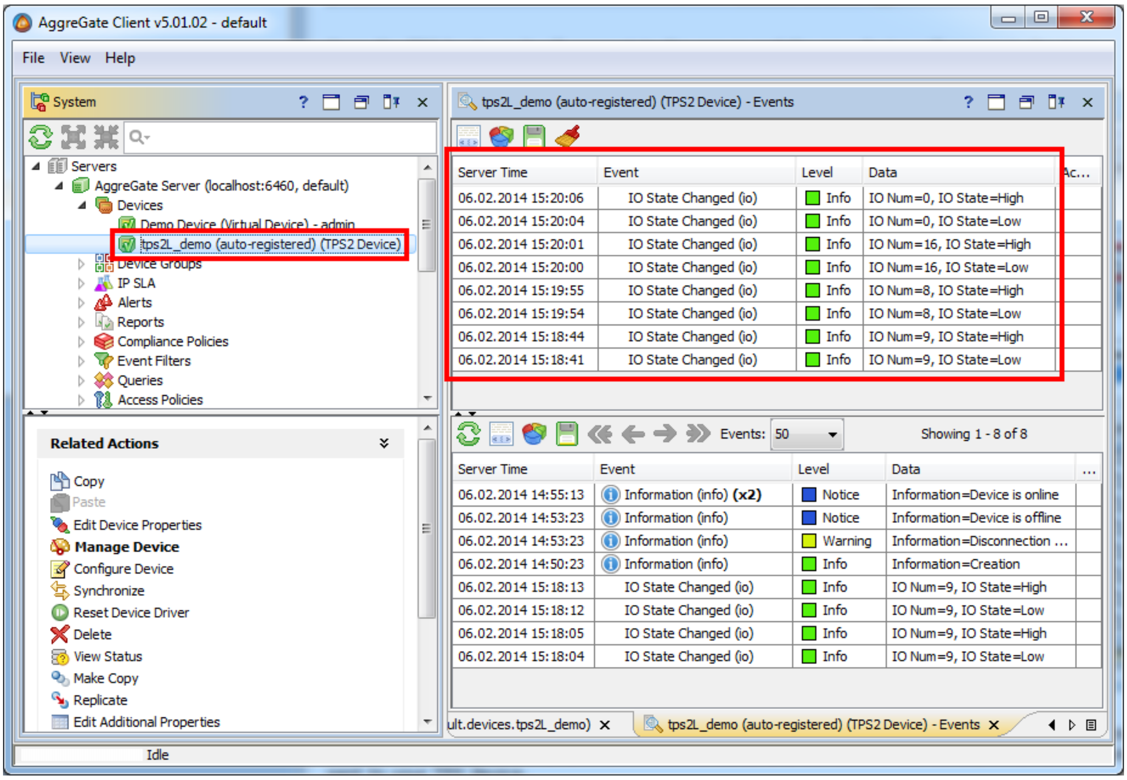
Device Configuration - tps2L_demo (auto-registered) (TPS2 Device) (users.default.devices.tps2L_demo)

To view available device controls, double-click on the *tps2L_demo* device in the tree. *Device configuration window* on the right will show several tabs. Click on the *IO tab*, then on any *Click to open...* button. The dialog for the GPIO line will show

Enabled and *Set LOW* check boxes, which are already familiar to you from the Web Interface 11 topic. Changes you make will be immediately sent to your TPS device.

Monitoring I/O state changes

I/O line state change notifications are implemented as events. Right-click on your demo device in the tree and select *Monitor Related Events*. The *Events window* will open. You can now observe events generated in response to external stimuli you apply to the I/O lines of your TPP board.



Server Time	Event	Level	Data	Ac...
06.02.2014 15:20:06	IO State Changed (io)	🟩 Info	IO Num=0, IO State=High	
06.02.2014 15:20:04	IO State Changed (io)	🟩 Info	IO Num=0, IO State=Low	
06.02.2014 15:20:01	IO State Changed (io)	🟩 Info	IO Num=16, IO State=High	
06.02.2014 15:20:00	IO State Changed (io)	🟩 Info	IO Num=16, IO State=Low	
06.02.2014 15:19:55	IO State Changed (io)	🟩 Info	IO Num=8, IO State=High	
06.02.2014 15:19:54	IO State Changed (io)	🟩 Info	IO Num=8, IO State=Low	
06.02.2014 15:18:44	IO State Changed (io)	🟩 Info	IO Num=9, IO State=High	
06.02.2014 15:18:41	IO State Changed (io)	🟩 Info	IO Num=9, IO State=Low	

Server Time	Event	Level	Data	...
06.02.2014 14:55:13	Information (info) **(x2)**	🟦 Notice	Information=Device is online	
06.02.2014 14:53:23	Information (info)	🟦 Notice	Information=Device is offline	
06.02.2014 14:53:23	Information (info)	🟨 Warning	Information=Disconnection ...	
06.02.2014 14:50:23	Information (info)	🟩 Info	Information=Creation	
06.02.2014 15:18:13	IO State Changed (io)	🟩 Info	IO Num=9, IO State=High	
06.02.2014 15:18:12	IO State Changed (io)	🟩 Info	IO Num=9, IO State=Low	
06.02.2014 15:18:05	IO State Changed (io)	🟩 Info	IO Num=9, IO State=High	
06.02.2014 15:18:04	IO State Changed (io)	🟩 Info	IO Num=9, IO State=Low	

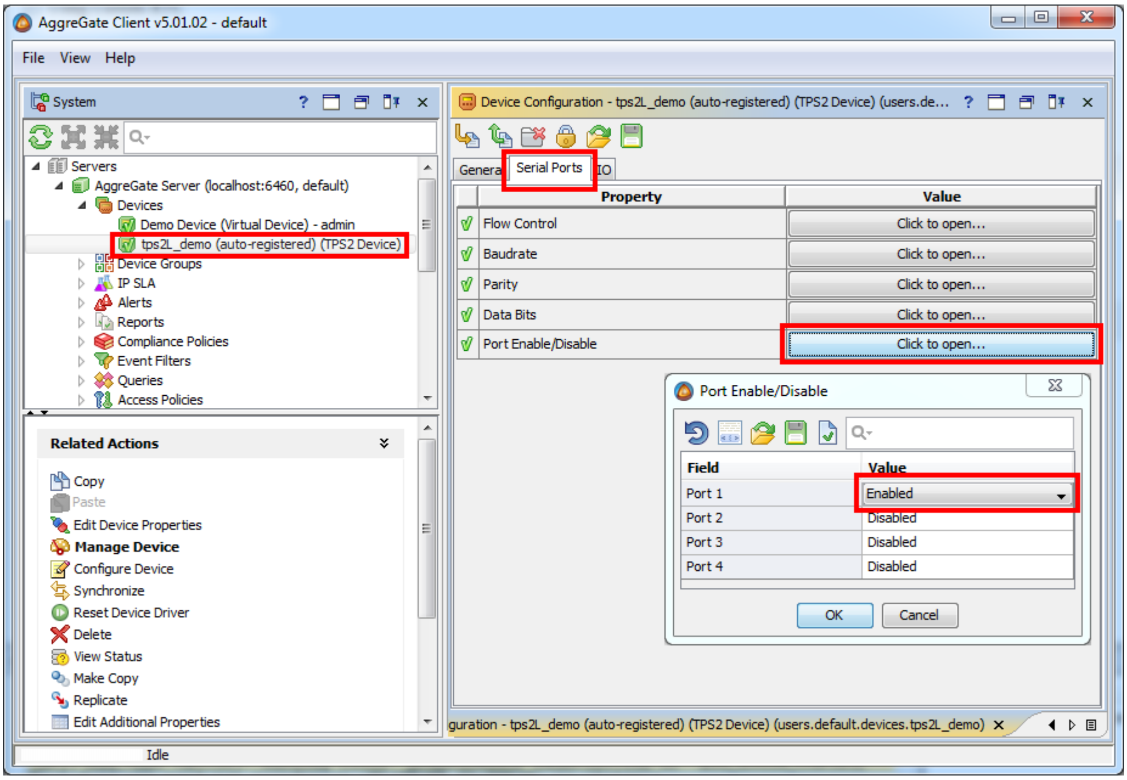
Testing serial ports

NOTE: The hardware setup needed for the test is described in Playing With the Hardware 3 (Testing serial ports section).

Finally, test the serial port operation. The serial port must be enabled for the test to work. You can use DS Manager 9, web interface 11, or AggreGate itself. Let's see how this is done in AggreGate. Assuming it is the first port you want to test:

Double-click on your TPS device in the tree. Click on the *Serial Ports tab*, then *Click to open...* for the *Port Enable/Disable entry*.

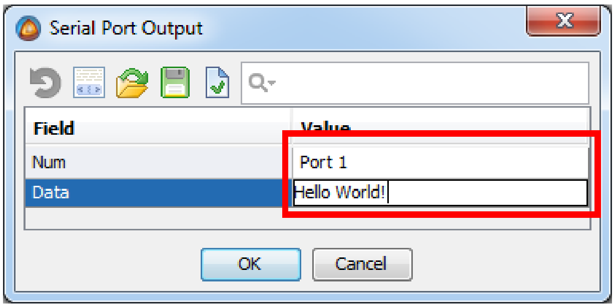
Enable the first serial port. Click *OK*, wait until the device sync finishes (the device icon is green again), and reboot your TPS device.


AggreGate Client v5.01.02 - default
File View Help
System
Servers
AggreGate Server (localhost:6460, default)
Devices
Demo Device (Virtual Device) - admin
tps2L_demo (auto-registered) (TPS2 Device)
Device Groups
IP SLA
Alerts
Reports
Compliance Policies
Event Filters
Queries
Access Policies
Related Actions
Copy
Paste
Edit Device Properties
Manage Device
Configure Device
Synchronize
Reset Device Driver
Delete
View Status
Make Copy
Replicate
Edit Additional Properties
Idle
Device Configuration - tps2L_demo (auto-registered) (TPS2 Device) (users.de...
General
Serial Ports
IO
guration - tps2L_demo (auto-registered) (TPS2 Device) (users.default.devices.tps2L_demo)
Port Enable/Disable
OK
Cancel

Property	Value
Flow Control	Click to open...
Baudrate	Click to open...
Parity	Click to open...
Data Bits	Click to open...
Port Enable/Disable	Click to open...

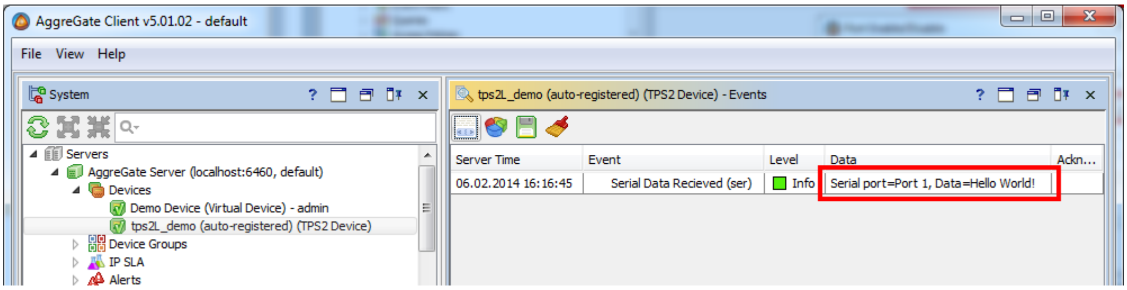
Field	Value
Port 1	Enabled
Port 2	Disabled
Port 3	Disabled
Port 4	Disabled

Once your TPS is back online and connected to the Server, right-click on the device in the tree and select *Serial Port Output*. In the dialog, enter the test string you want to send out (it has to be "Hello World!", you know this, right?). Hit *OK*.



Field	Value
Num	Port 1
Data	Hello World!

If you made the serial loopback as described in Playing With the Hardware 3, the serial data you've just TXed will be RXed back and received by AggreGate in the form of an event:


AggreGate Client v5.01.02 - default
File View Help
System
Servers
AggreGate Server (localhost:6460, default)
Devices
Demo Device (Virtual Device) - admin
tps2L_demo (auto-registered) (TPS2 Device)
Device Groups
IP SLA
Alerts
tps2L_demo (auto-registered) (TPS2 Device) - Events

Server Time	Event	Level	Data	Ackn...
06.02.2014 16:16:45	Serial Data Recieved (ser)	🟩 Info	Serial port=Port 1, Data=Hello World!	

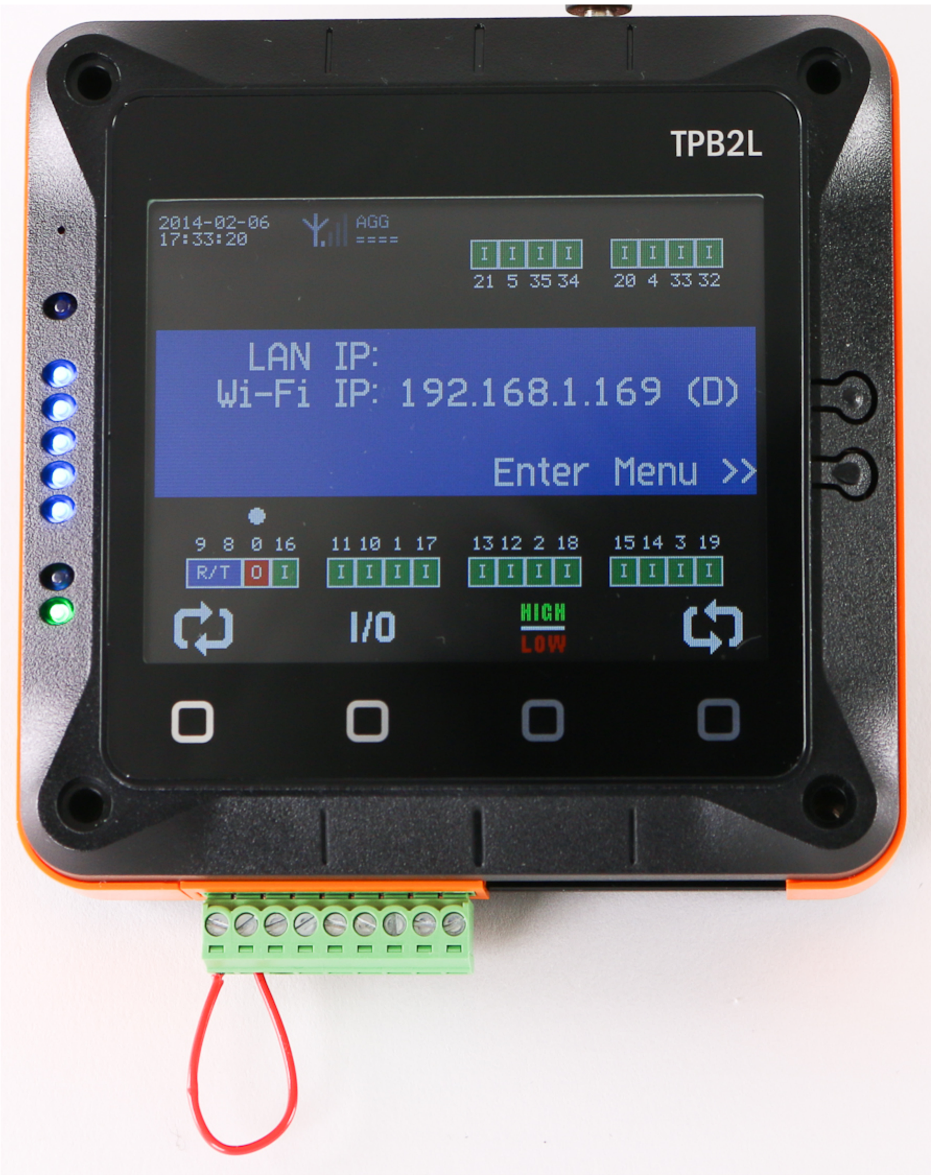
Using LCD/Keypad (TPS2L Only)

Anything with LCD and Keypad looks like ~~a lot of~~ more fun, and the TPS app is no exception!

The "main screen" allows you to move the cursor (pointer) by pressing the first (leftmost) and the fourth keys. Configure the currently selected I/O line as input or output by pressing the second key. For outputs, toggle their state HIGH or LOW by pressing the third key. For inputs, apply external stimuli using techniques described in Playing With the Hardware 3.

The main screen also displays the state of Ethernet (marked "LAN") and Wi-Fi interfaces 5. Photo below shows the situation where the Ethernet cable is not plugged while the Wi-Fi is on and active. The Wi-Fi's IP is configured using DHCP (hence, the "D" letter).

Top left corner shows the Wi-Fi signal strength (which is also indicated by the blue LED bar 6). The AGG icon next to it reflects the AggreGate 13 connection status. Active connections are marked "====". Data transmissions is shown as "=>==" (AggreGate connection status is also displayed by the Red and Green status LEDs 6).

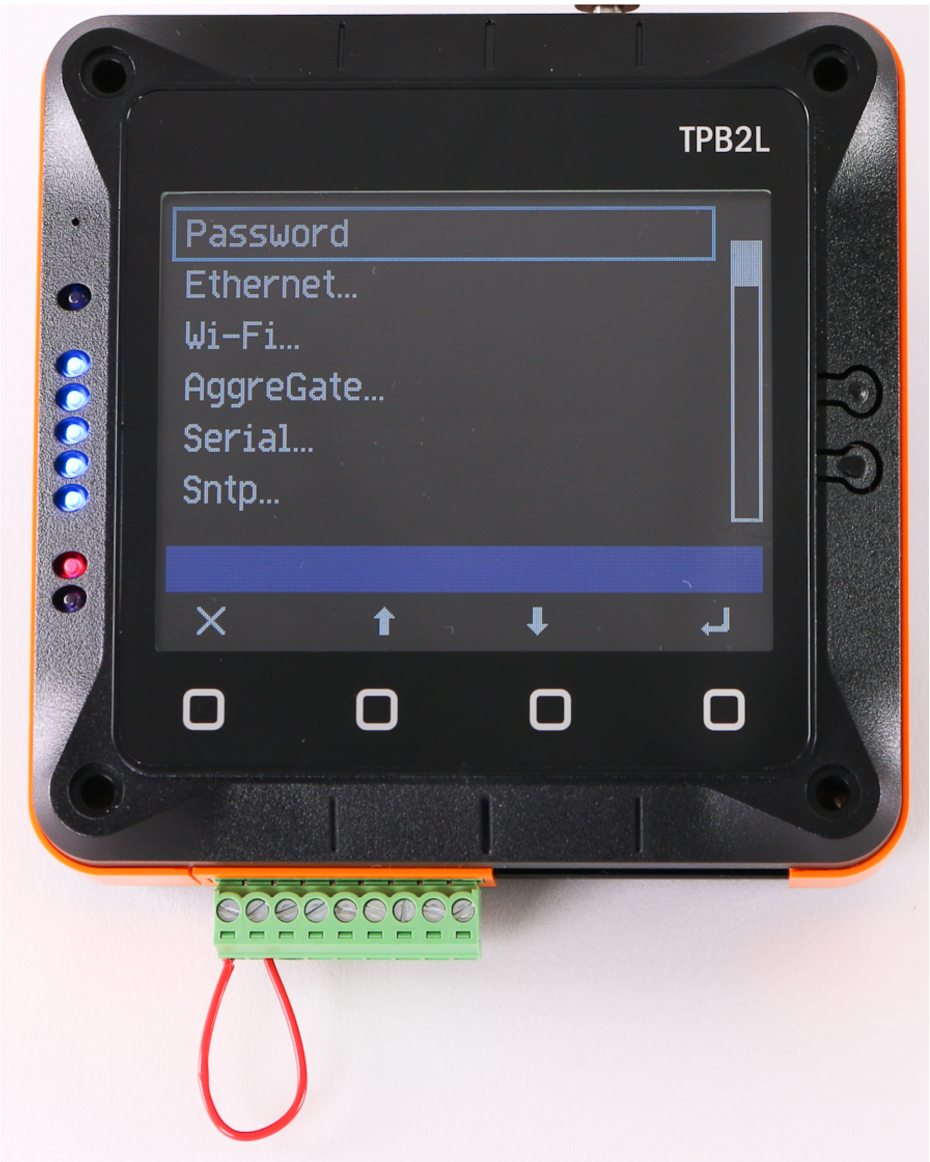


Onscreen menu

To access the onscreen menu press the MD (setup) button. This is not a virtual button on the screen but a physical plastic button. "Enter Menu >>" is pointing at it.

The onscreen menu only allows you to configure the device. You can't manipulate the I/O lines or test serial ports.

Four sensor keys provide enough navigational convenience, but editing text strings will require some getting used to. You won't be having too much fun scrolling through the alphabet by repeatedly pressing a single key. We advise using the DS Manager[9] utility or web interface[11] configuration for this sort of thing.



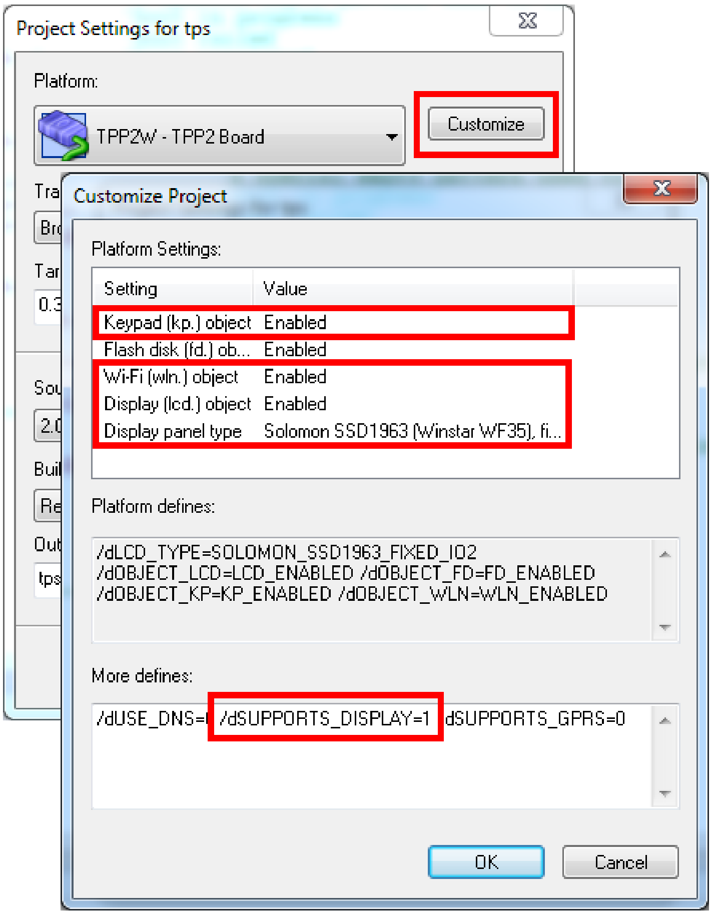
Working With the Source Code in TIDE

This is not a TIDE manual, so we will just assume that you know your way around TIDE. This topic contains an important bit of information pertaining to compiling the project for TPS2, TPS2L, and TPS3 devices.

As usual, you need to choose the right platform when compiling: *TPP2W* for TPS2 and TPS2L devices, or *TPP3W* for TPS3 devices. Now, that's not all!

You need to make sure that all necessary objects are enabled. In the *Project Settings dialog* click the *Customize button*. M sure that the *Wi-Fi (.wln) object* is enabled. For the TPS2L additionally enable *Keypad (.kp)* and *LCD (.lcd)* objects. *Display panel type* must be set to *Solomon SSD1963 (Winstar WF35), fixed I/O-2*. Additionally, the *SUPPORT_DISPLAY define* in the *More defines textbox* must be set to 1: */dSUPPORTS_DISPLAY=1*.

For the TPS2 device which doesn't have the LCD and keypad please disable *Keypad (.kp)* and *LCD (.lcd)* objects AND set */dSUPPORTS_DISPLAY=0*.



Setting	Value
Keypad (kp.) object	Enabled
Flash disk (fd.) ob...	Enabled
Wi-Fi (wln.) object	Enabled
Display (lcd.) object	Enabled
Display panel type	Solomon SSD1963 (Winstar WF35), fi...

```
/dLCD_TYPE=SOLOMON_SSD1963_FIXED_IO2
/dOBJECT_LCD=LCD_ENABLED /dOBJECT_FD=FD_ENABLED
/dOBJECT_KP=KP_ENABLED /dOBJECT_WLN=WLN_ENABLED
```

```
/dUSE_DNS=( /dSUPPORTS_DISPLAY=1 dSUPPORTS_GPRS=0
```

Update History (for this Manual)

10FEB2014

Initial release