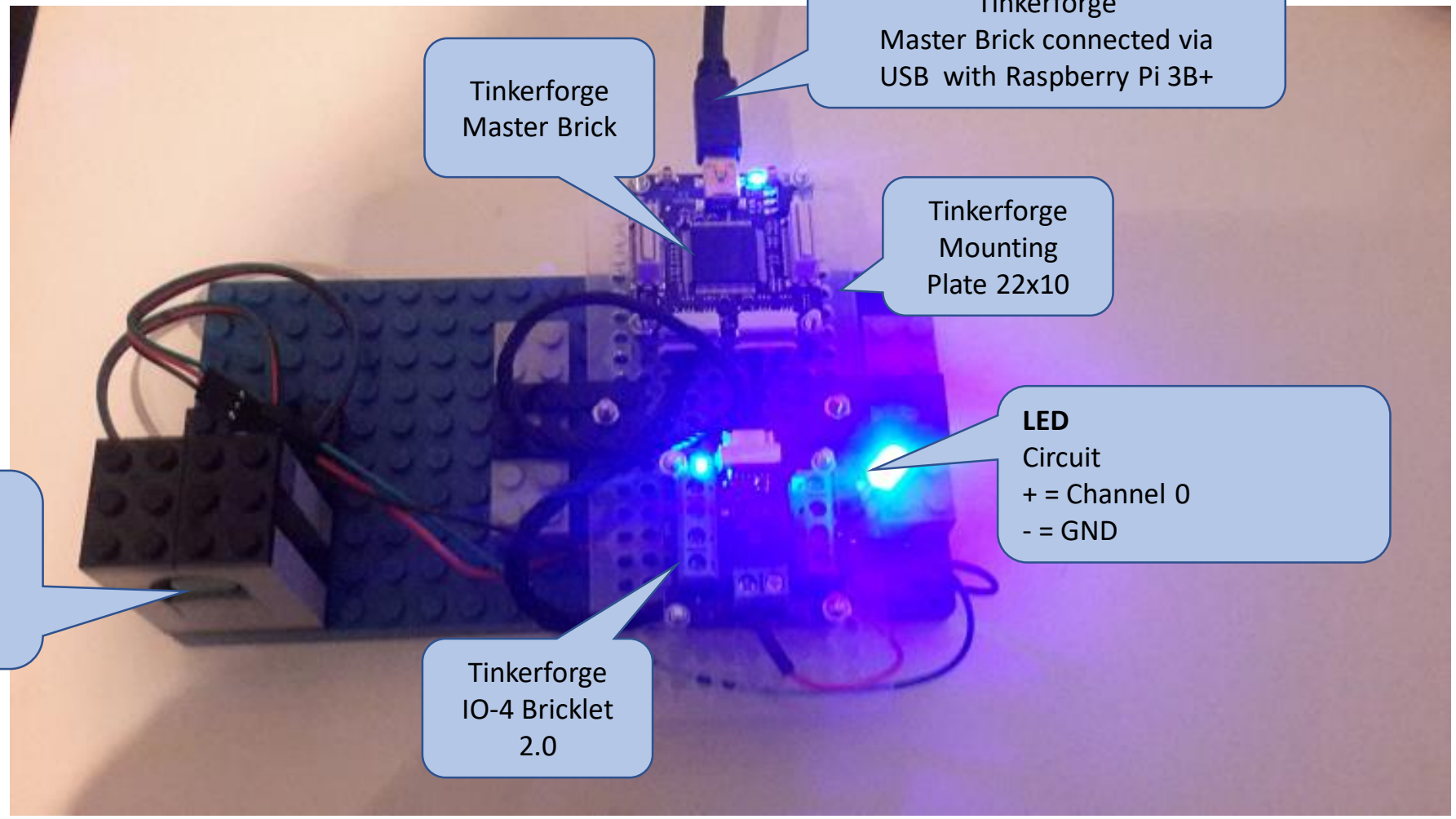
Domoticz Plugin

Tinkerforge IO-4 Bricklet 2.0

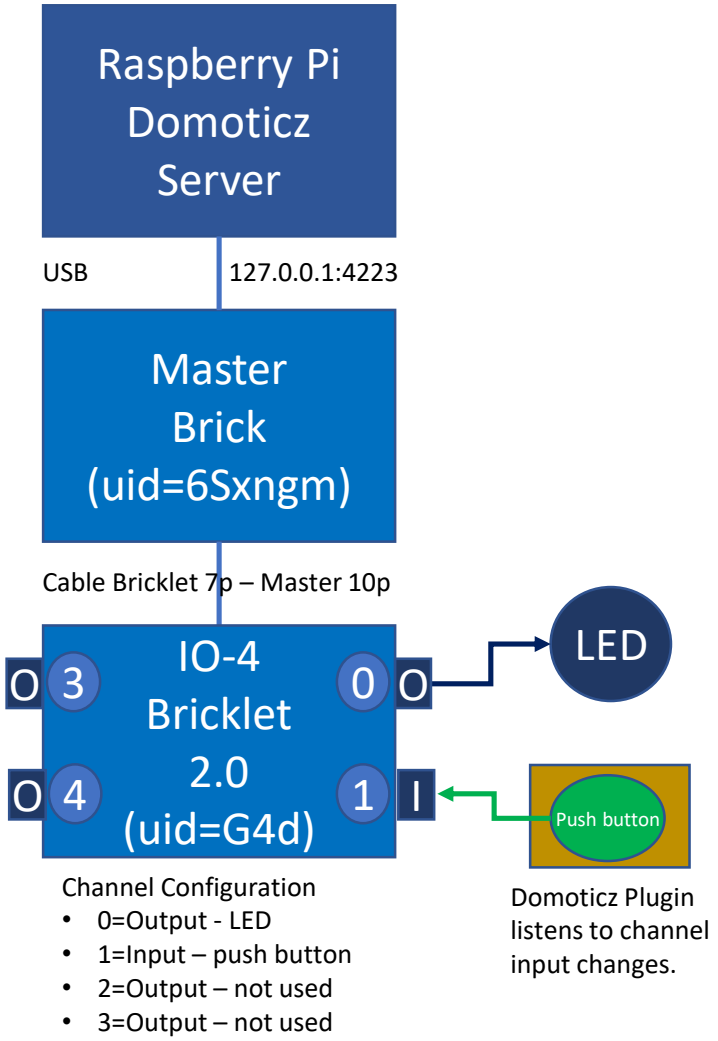
by Robert W. B. Linn

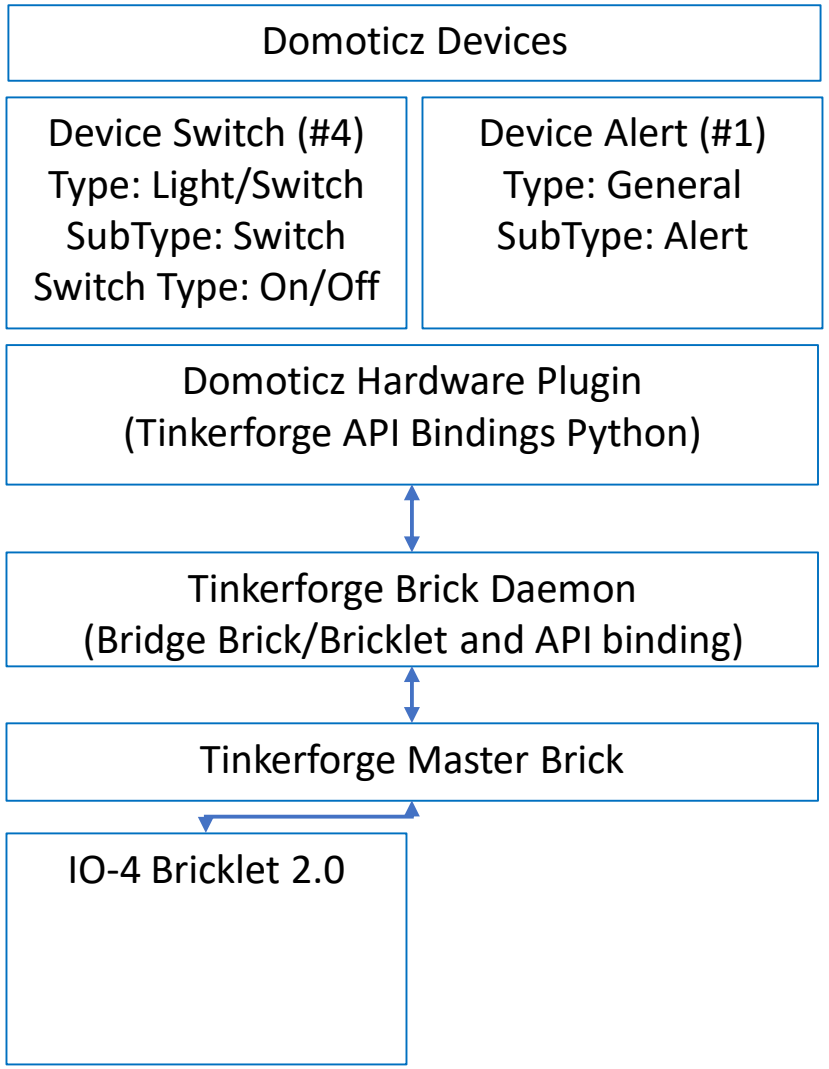
03.02.2020

Prototype

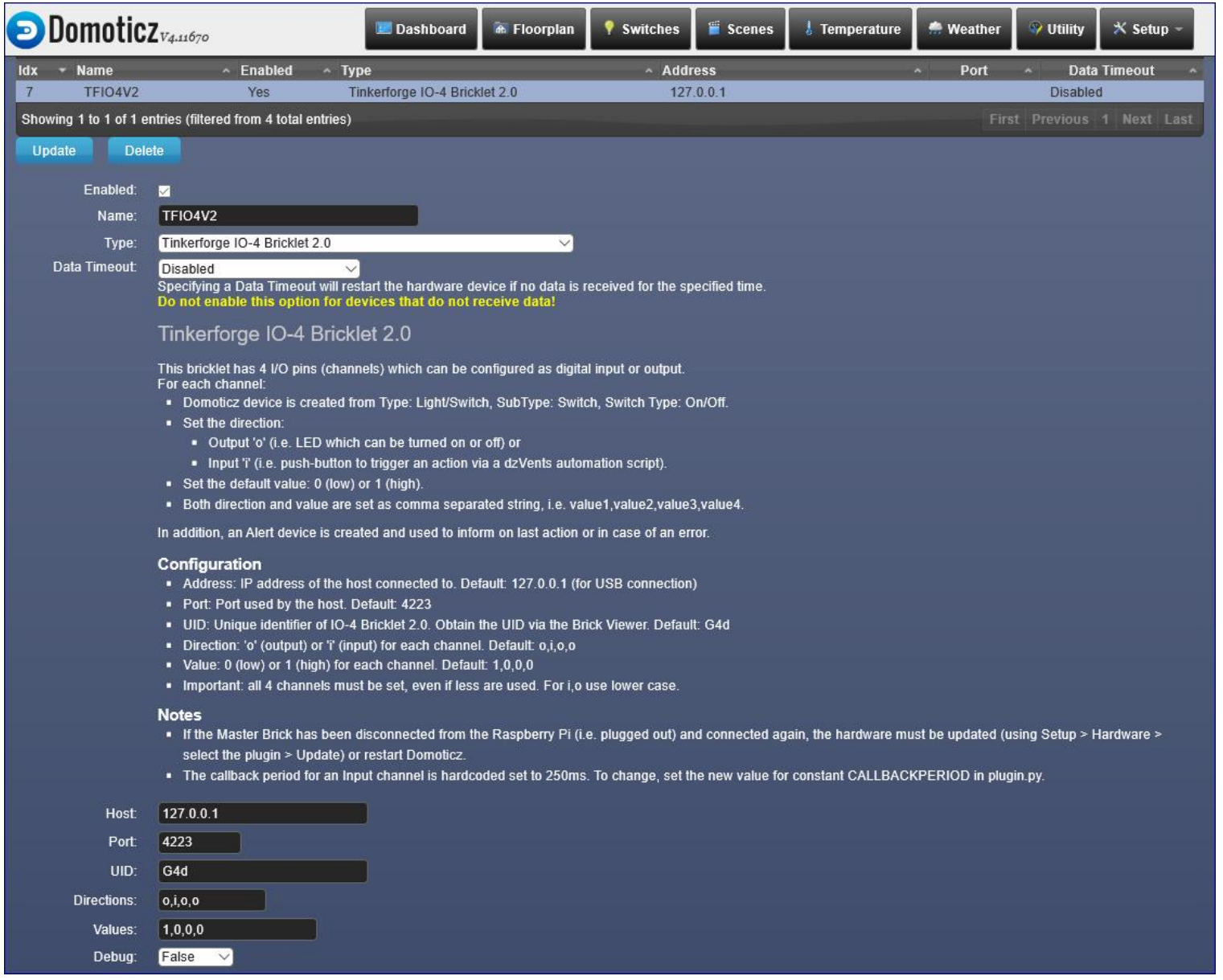

Tinkerforge
Master Brick connected via
USB with Raspberry Pi 3B+
Tinkerforge
Master Brick
Tinkerforge
Mounting
Plate 22x10
LED
Circuit
+ = Channel 0
- = GND
Push-button DFRobot
Circuit
+ = 3.3V (red)
- = GND (black)
Signal = CH1 (green)
Tinkerforge
IO-4 Bricklet
2.0

Communication - Overview





Domoticz – Add Hardware



Parameter Notes

The Master Brick is connected via USB to the Raspberry Pi. As Host address 127.0.0.1 (which is local host) and default port 4223 are set.

The UID of the bricklet is set to G4d.
The bricklet has an LED connected to channel 0 and a push-button to channel 1.

Channel configuration:
Channel 0 direction output (o) with value 1 (high). This means the LED is on when the plugin starts.
Channel 1 as input (i) with value 0 (low).
The channels 2 & 3 are not used and set as default output and low.

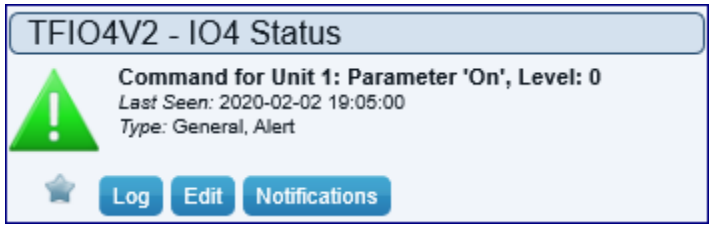
Debug is by default set to true but for this screenshot already tested the plugin and therefor no debug required = set to false.

Domoticz – Devices

Devices List

	Idx	Hardware	ID	Unit	Name	Type	SubType	
⚠	80	TFIO4V2	00070005	5	TFIO4V2 - IO4 Status	General	Alert	Command for Unit 1: Parameter 'Off', Level: 0
💡	79	TFIO4V2	00070004	4	TFIO4V2 - IO4 Channel 3	Light/Switch	Switch	Off
💡	78	TFIO4V2	00070003	3	TFIO4V2 - IO4 Channel 2	Light/Switch	Switch	Off
💡	77	TFIO4V2	00070002	2	TFIO4V2 - IO4 Channel 1	Light/Switch	Switch	Off
💡	76	TFIO4V2	00070001	1	TFIO4V2 - IO4 Channel 0	Light/Switch	Switch	Off

Device Widgets – Tab Switches for the 4 Switch devices, Tab Utility for the Status devices



Domoticz - Plugin Pseudo Code

See plugin.py

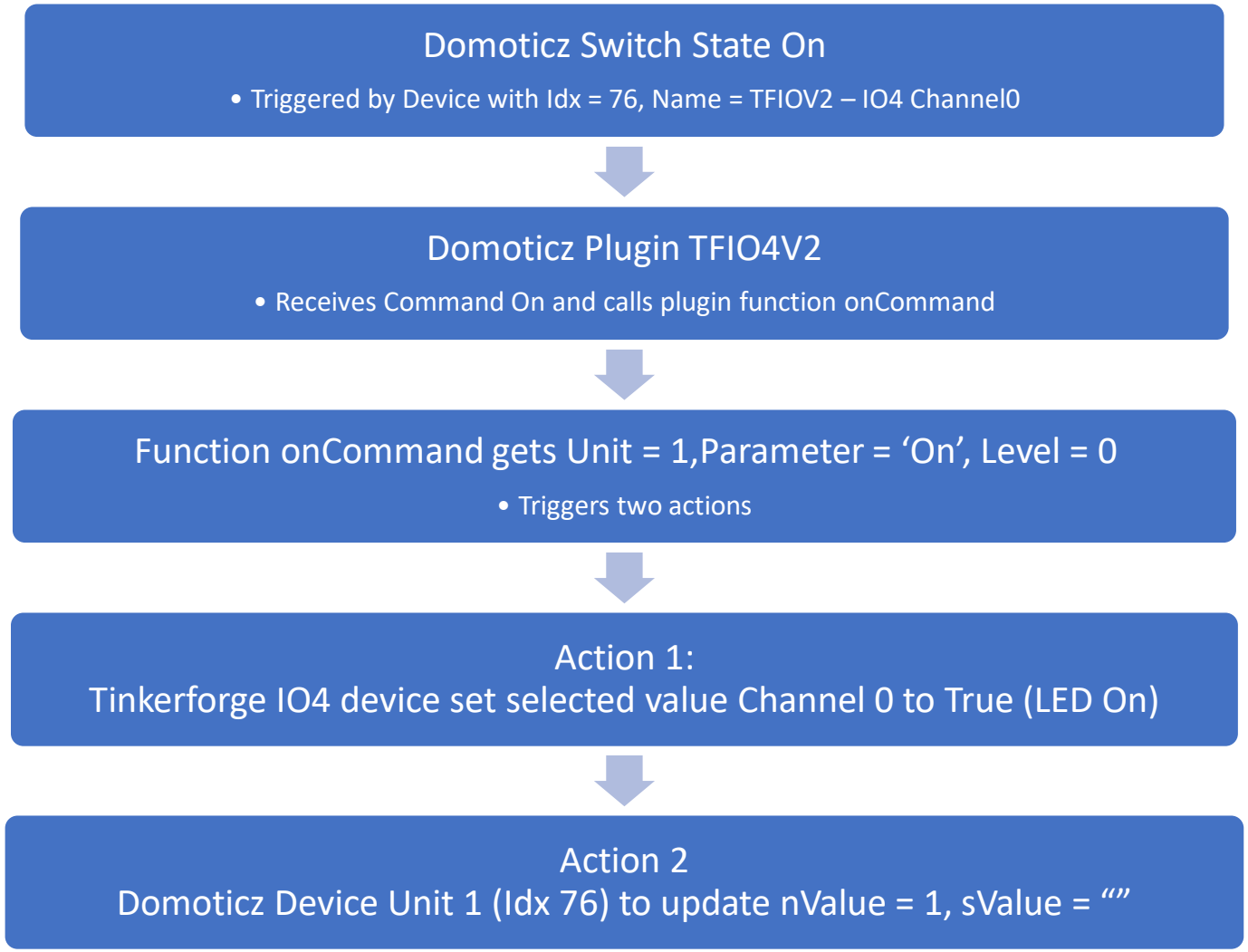
```
Define imports and amend path

Define constants for channel number ad callback period for input channels

Define class BasePlugin:
          Init
                    Connection state, array for channel direction & value
          onStart
                    Read the channel directions & values
                    If first time, create the devices type Light/Switch, subtype Switch, Switch type on/off
                    Connect to the Master Brick and configure the channels as input or output
                    Set the callback for input channels with callback period
          onCommand
                    Handle channel changes by setting channel state and update domoticz device state
          onInputCallback
                    Check channel changed and value, set device state
          updateStatus
                    To inform if command OK or ERROR with text
```

Device Action – Domoticz Switch State On

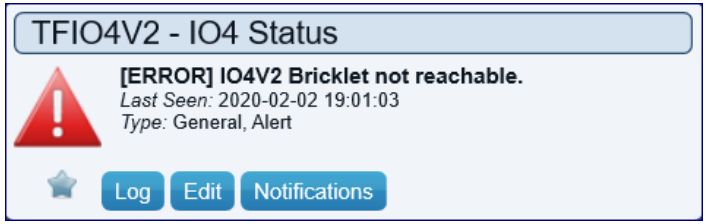
See plugin.py

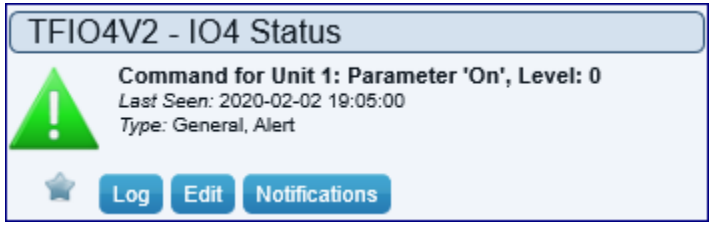


Domoticz - Add Hardware Log

```
2020-02-02 18:44:17.913 (TFIO4V2) Debug logging mask set to: PYTHON PLUGIN QUEUE IMAGE DEVICE CONNECTION MESSAGE ALL
2020-02-02 18:44:17.913 (TFIO4V2) 'HardwareID':'7'
2020-02-02 18:44:17.913 (TFIO4V2) 'HomeFolder':'/home/pi/domoticz/plugins/TFIO4V2/'
2020-02-02 18:44:17.913 (TFIO4V2) 'StartupFolder':'/home/pi/domoticz/'
2020-02-02 18:44:17.913 (TFIO4V2) 'UserDataFolder':'/home/pi/domoticz/'
2020-02-02 18:44:17.913 (TFIO4V2) 'Database':'/home/pi/domoticz/domoticz.db'
2020-02-02 18:44:17.913 (TFIO4V2) 'Language':'en'
2020-02-02 18:44:17.913 (TFIO4V2) 'Version':'1.0.0'
2020-02-02 18:44:17.913 (TFIO4V2) 'Author':'rwbL'
2020-02-02 18:44:17.913 (TFIO4V2) 'Name':'TFIO4V2'
2020-02-02 18:44:17.913 (TFIO4V2) 'Address':'127.0.0.1'
2020-02-02 18:44:17.913 (TFIO4V2) 'Port':'4223'
2020-02-02 18:44:17.913 (TFIO4V2) 'Key':'TFIO4V2'
2020-02-02 18:44:17.913 (TFIO4V2) 'Mode1':'G4d'
2020-02-02 18:44:17.913 (TFIO4V2) 'Mode2':'o,i,o,o'
2020-02-02 18:44:17.913 (TFIO4V2) 'Mode3':'1,0,0,0'
2020-02-02 18:44:17.913 (TFIO4V2) 'Mode6':'Debug'
2020-02-02 18:44:17.913 (TFIO4V2) 'DomoticzVersion':'4.11670'
2020-02-02 18:44:17.914 (TFIO4V2) 'DomoticzHash':'f6af0fa0c'
2020-02-02 18:44:17.914 (TFIO4V2) 'DomoticzBuildTime':'2020-02-02 12:21:53'
2020-02-02 18:44:17.914 (TFIO4V2) Device count: 0
2020-02-02 18:44:17.914 (TFIO4V2) ChannelDirections:o,i,o,o
2020-02-02 18:44:17.914 (TFIO4V2) ChannelValues:1,0,0,0
2020-02-02 18:44:17.914 (TFIO4V2) Creating new Devices
2020-02-02 18:44:17.914 (TFIO4V2) Creating device 'IO4 Channel 0'.
2020-02-02 18:44:17.915 (TFIO4V2) Device created: TFIO4V2 - IO4 Channel 0
2020-02-02 18:44:17.915 (TFIO4V2) Creating device 'IO4 Channel 1'.
2020-02-02 18:44:17.916 (TFIO4V2) Device created: TFIO4V2 - IO4 Channel 1
2020-02-02 18:44:17.917 (TFIO4V2) Creating device 'IO4 Channel 2'.
2020-02-02 18:44:17.917 (TFIO4V2) Device created: TFIO4V2 - IO4 Channel 2
2020-02-02 18:44:17.918 (TFIO4V2) Creating device 'IO4 Channel 3'.
2020-02-02 18:44:17.918 (TFIO4V2) Device created: TFIO4V2 - IO4 Channel 3
2020-02-02 18:44:17.919 (TFIO4V2) Creating device 'IO4 Status'.
2020-02-02 18:44:17.920 (TFIO4V2) Device created: TFIO4V2 - IO4 Status
2020-02-02 18:44:17.238 Status: (TFIO4V2) Started.
2020-02-02 18:44:17.910 Status: (TFIO4V2) Entering work loop.
2020-02-02 18:44:17.910 Status: (TFIO4V2) Initialized version 1.0.0, author 'rwbL'
```

Domoticz – Error Handling





Errors are handled by using try .. Except.
In case of an error, the IO4 Status device (Type General, SubType Alert is set to highest alert level 5 (red) with error text.

If no error, the IO4 Status device is set to level 1 (green) with the last command information.

Function onCommand
To check if the IO4 bricklet is reachable, its chip temperature is determined prior any command. If the chip temperature can not be obtained, then the bricklet is not reachable and an error is thrown.

Function onStart
If the plugin is started, errors are handled for setting the configuration of the bricklet. If the configuration can not be changed, because the bricklet is not reachable and an error is thrown.

Example Error

```
2020-02-03 10:36:10.531 (TFIO4V2 - IO4 Status) Updating device from 1:'Command for Unit 1: Parameter 'Off', Level: 0' to have values 5:'[ERROR] Set configuration - IO4V2 Bricklet not reachable.'.
2020-02-03 10:36:10.550 Error: (TFIO4V2) [ERROR] Set configuration - IO4V2 Bricklet not reachable.
```

Domoticz – dzVents Lua Automation Script Example 1

```
-- Tinkerforge IO4 v2 Bricklet Plugin - Test Script
-- dzVents Automation Script: tfio4v2_pushbutton_led
--
-- There are two switch devices used:
-- (Idx, Name, Type, SubType - Hardware Connected)
-- Idx=76, TFIO4 - IO4 Channel 0,Light/Switch,Switch,On/Off - LED Blue
-- Idx=77, TFIO4 - IO4 Channel 1,Light/Switch,Switch,On/Off - Push-Button DFRobot
-- Test:
-- Turn the LED Blue on, when pressing the push-button down and off again when released.

IDXLEDBLUE = 76
IDXPUSHBUTTON = 77

return {
            on = {
                        devices = {
                                    IDXPUSHBUTTON
                        }
            },
            execute = function(domoticz, device)
                        domoticz.log('Device ' .. device.name .. ' was changed to ' .. device.state, domoticz.LOG_INFO)
                        if (device.state == 'On') then
                                    domoticz.devices(IDXLEDBLUE).switchOn()
                        else
                                    domoticz.devices(IDXLEDBLUE).switchOff()
                        end
            end
}
```

Domoticz – dzVents Lua Automation Script Example 2

```
-- Tinkerforge IO4 v2 Bricklet Plugin - Test Script
-- dzVents Automation Script: tfio4v2_blink_led
--
-- There are two switch devices used:
-- (Idx, Name, Type, SubType - Hardware Connected)
-- Idx=76, TFIO4 - IO4 Channel 0,Light/Switch,Switch,On/Off - LED Blue
-- Idx=77, TFIO4 - IO4 Channel 1,Light/Switch,Switch,On/Off - Push-Button DFRobot
-- Test:
-- Turn every minute the LED Blue ON | OFF triggered by changing the state of the push-button switch

IDXPUSHBUTTON = 77

return {
            on = {
                        timer = {
                                    'every minute',
               },
    },
            execute = function(domoticz, timer)
                        domoticz.log('Timer event was triggered by ' .. timer.trigger, domoticz.LOG_INFO)
                        if (domoticz.devices(IDXPUSHBUTTON).state == 'On') then
                                    domoticz.devices(IDXPUSHBUTTON).switchOff()
                        else
                                    domoticz.devices(IDXPUSHBUTTON).switchOn()
                        end
            end
}
```