

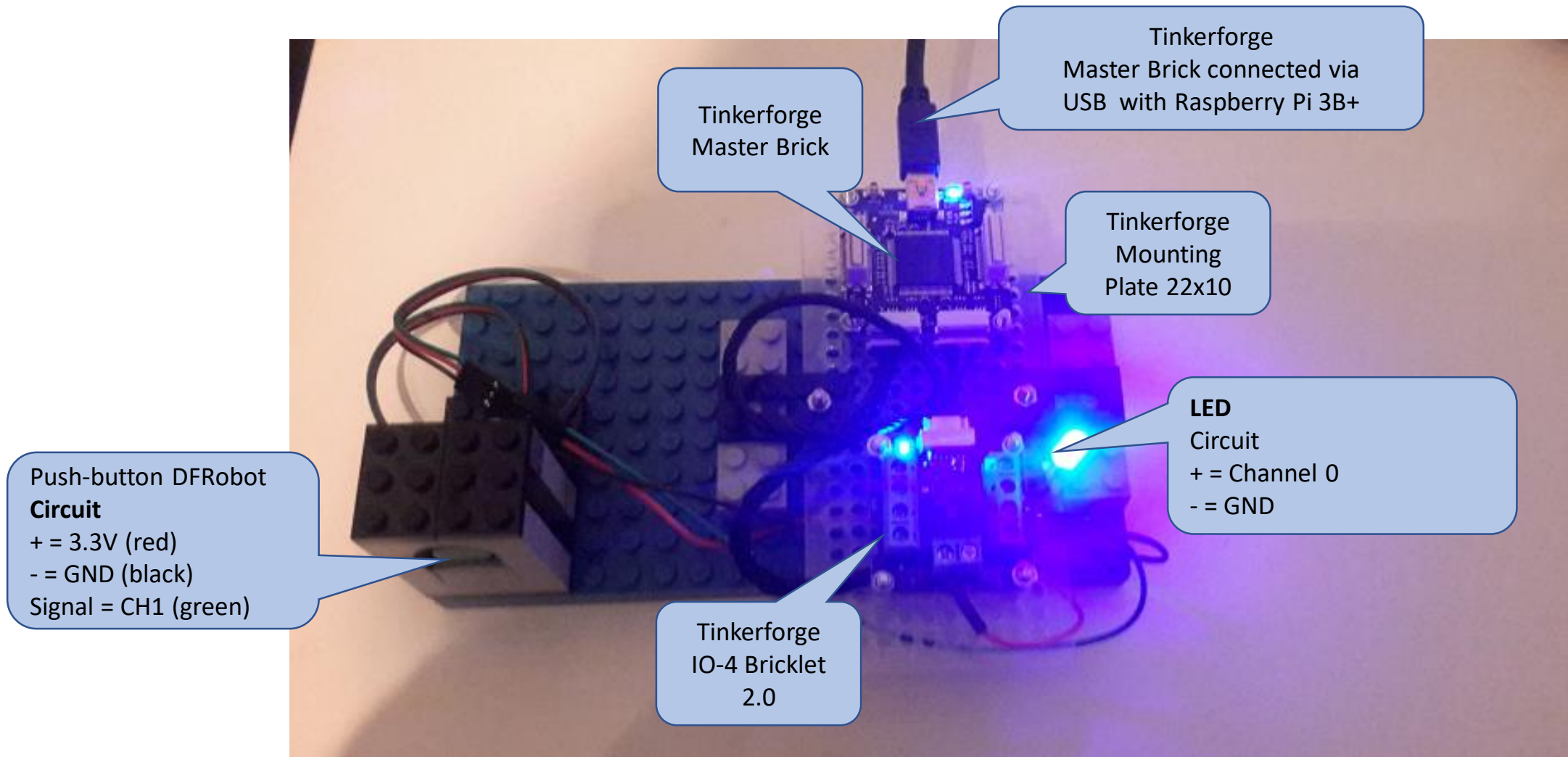
Domoticz Plugin

Tinkerforge IO-4 Bricklet 2.0

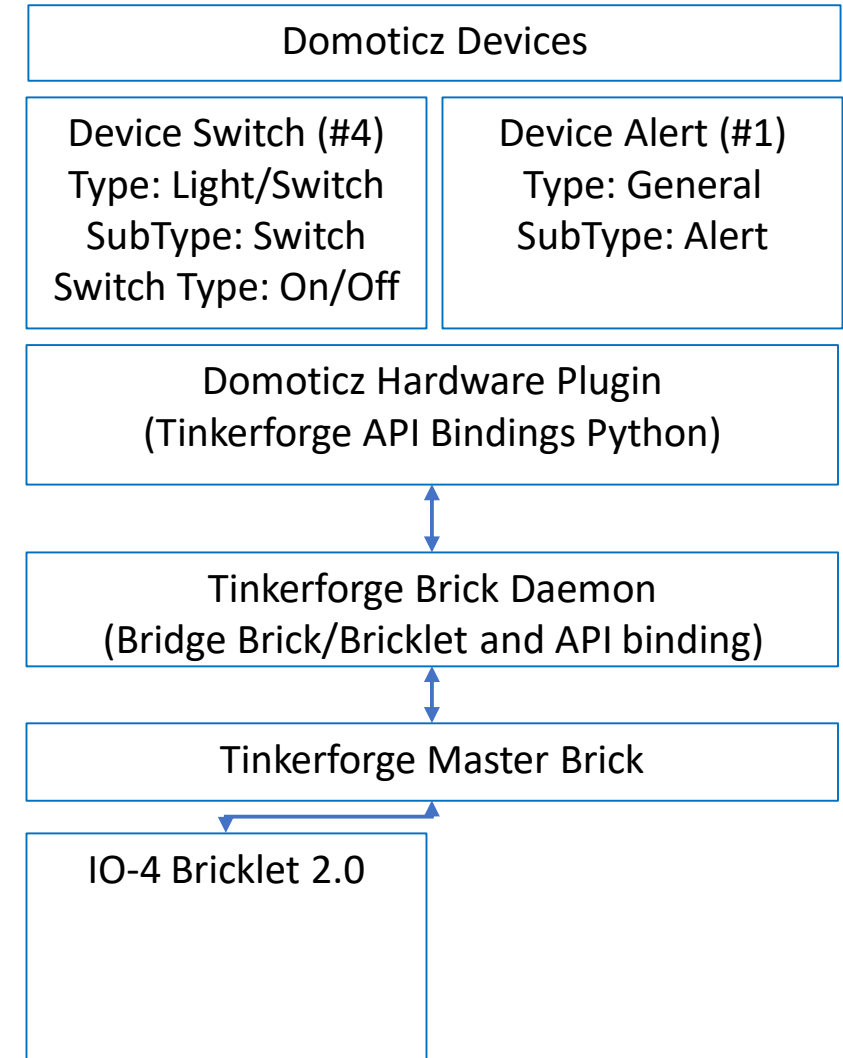
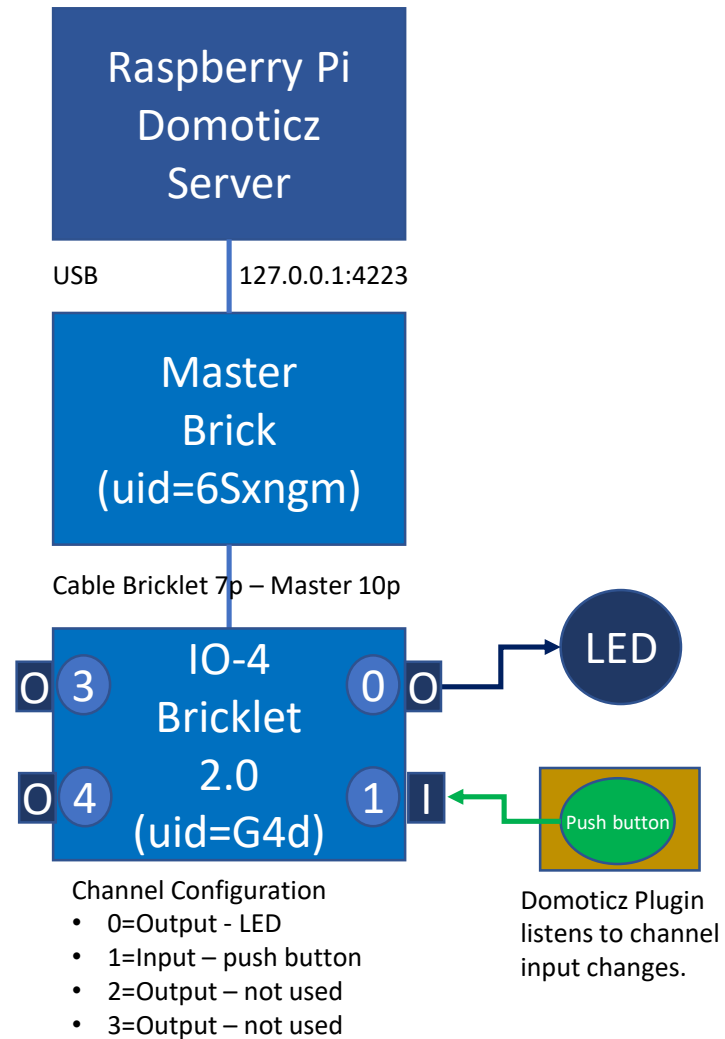
by Robert W. B. Linn

03.02.2020

Prototype



Communication - Overview



Domoticz – Add Hardware

Domoticz

V4.11670

Dashboard

Floorplan

Switches

Scenes

Temperature

Weather

Utility

Setup

Idx	Name	Enabled	Type	Address	Port	Data Timeout
7	TFIO4V2	Yes	Tinkerforge IO-4 Bricklet 2.0	127.0.0.1		Disabled

Showing 1 to 1 of 1 entries (filtered from 4 total entries)

FirstPrevious1NextLast

Update

Delete

Enabled:☒

Name:

TFIO4V2

Type:

Tinkerforge IO-4 Bricklet 2.0

Data Timeout:

Disabled

Specifying a Data Timeout will restart the hardware device if no data is received for the specified time.
Do not enable this option for devices that do not receive data!

Tinkerforge IO-4 Bricklet 2.0

This bricklet has 4 I/O pins (channels) which can be configured as digital input or output.
For each channel:

- Domoticz device is created from Type: Light/Switch, SubType: Switch, Switch Type: On/Off.
- Set the direction:
 - Output 'o' (i.e. LED which can be turned on or off) or
 - Input 'i' (i.e. push-button to trigger an action via a dzVents automation script).
- Set the default value: 0 (low) or 1 (high).
- Both direction and value are set as comma separated string, i.e. value1,value2,value3,value4.

In addition, an Alert device is created and used to inform on last action or in case of an error.

Configuration

- Address: IP address of the host connected to. Default: 127.0.0.1 (for USB connection)
- Port: Port used by the host. Default: 4223
- UID: Unique identifier of IO-4 Bricklet 2.0. Obtain the UID via the Brick Viewer. Default: G4d
- Direction: 'o' (output) or 'i' (input) for each channel. Default: o,i,o,o
- Value: 0 (low) or 1 (high) for each channel. Default: 1,0,0,0
- Important: all 4 channels must be set, even if less are used. For i,o use lower case.

Notes

- If the Master Brick has been disconnected from the Raspberry Pi (i.e. plugged out) and connected again, the hardware must be updated (using Setup > Hardware > select the plugin > Update) or restart Domoticz.
- The callback period for an Input channel is hardcoded set to 250ms. To change, set the new value for constant CALLBACKPERIOD in plugin.py.

Host:

127.0.0.1

Port:

4223

UID:

G4d

Directions:

o,i,o,o

Values:

1,0,0,0

Debug:

False

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

TFIO4V2 - IO4 Channel 0

On


Last Seen: 2020-02-02 10:43:53
Type: Light/Switch, Switch, On/Off

 [Log](#) [Edit](#) [Timers](#) [Notifications](#)

TFIO4V2 - IO4 Channel 1

Off


Last Seen: 2020-02-02 10:43:53
Type: Light/Switch, Switch, On/Off

 [Log](#) [Edit](#) [Timers](#) [Notifications](#)

TFIO4V2 - IO4 Channel 2

Off


Last Seen: 2020-02-02 10:43:53
Type: Light/Switch, Switch, On/Off

 [Log](#) [Edit](#) [Timers](#) [Notifications](#)

TFIO4V2 - IO4 Channel 3

Off


Last Seen: 2020-02-02 10:43:53
Type: Light/Switch, Switch, On/Off

 [Log](#) [Edit](#) [Timers](#) [Notifications](#)

TFIO4V2 - IO4 Status


Command for Unit 1: Parameter 'On', Level: 0
Last Seen: 2020-02-02 19:05:00
Type: General, Alert

 [Log](#) [Edit](#) [Notifications](#)

Domoticz - Plugin Pseudo Code

See [plugin.py](#)

Define imports and amend path

Define constants for channel number and 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

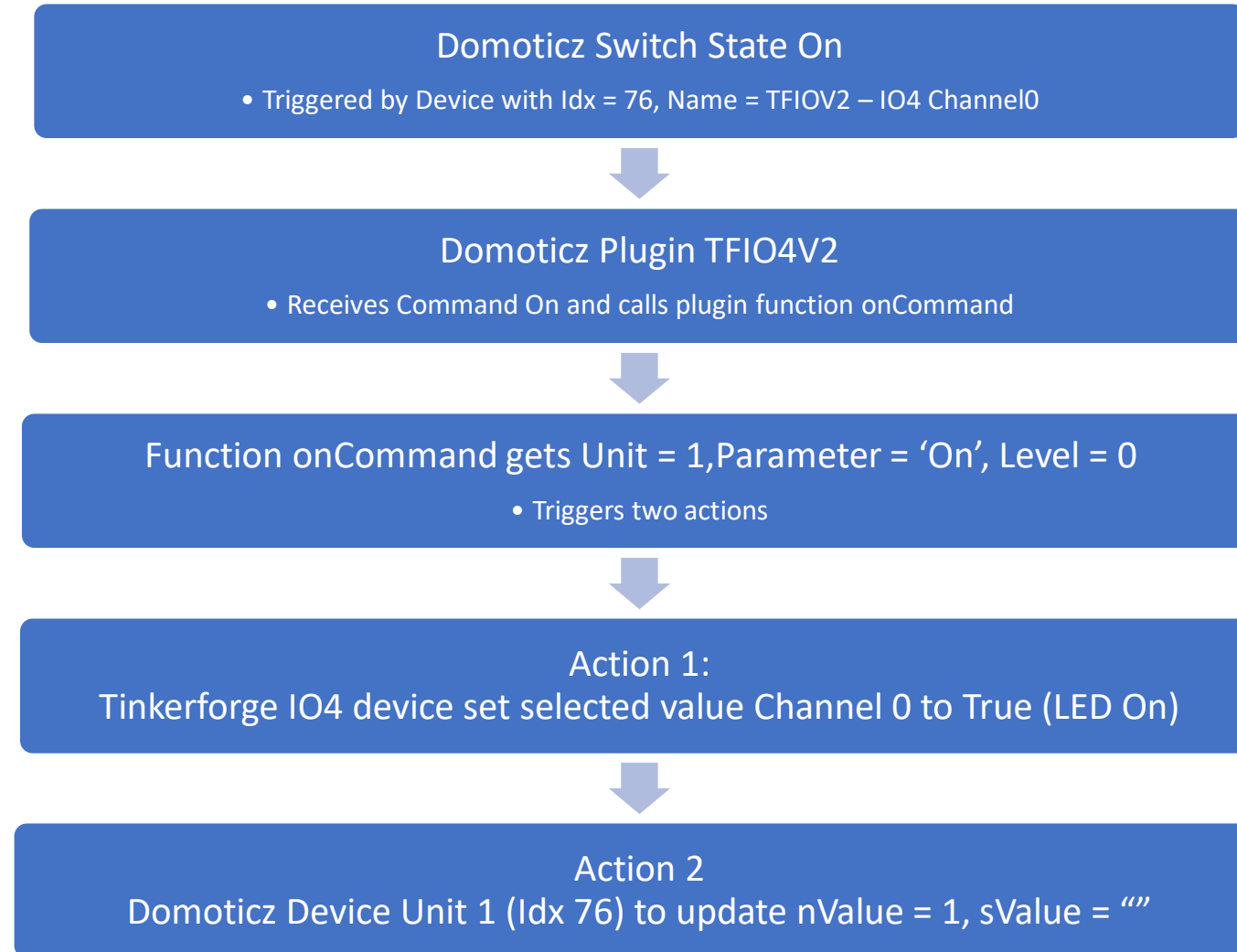
 Check channel changed and value, set device state

 updateStatus

 To inform if command OK or ERROR with text

Device Action – Domoticz Switch State On

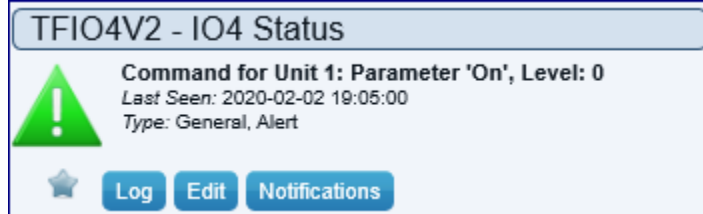
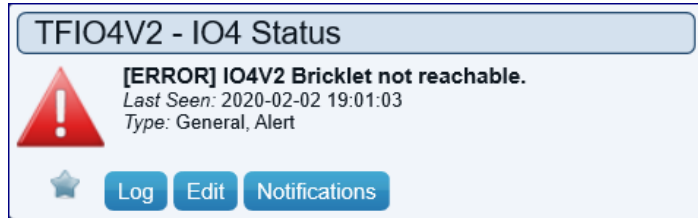
See [plugin.py](#)



Domoticz - Add Hardware Log

```
2020-02-02 18:44:17.913 (TFI04V2) Debug logging mask set to: PYTHON PLUGIN QUEUE IMAGE DEVICE CONNECTION MESSAGE ALL
2020-02-02 18:44:17.913 (TFI04V2) 'HardwareID': '7'
2020-02-02 18:44:17.913 (TFI04V2) 'HomeFolder': '/home/pi/domoticz/plugins/TFI04V2/'
2020-02-02 18:44:17.913 (TFI04V2) 'StartupFolder': '/home/pi/domoticz/'
2020-02-02 18:44:17.913 (TFI04V2) 'UserDataFolder': '/home/pi/domoticz/'
2020-02-02 18:44:17.913 (TFI04V2) 'Database': '/home/pi/domoticz/domoticz.db'
2020-02-02 18:44:17.913 (TFI04V2) 'Language': 'en'
2020-02-02 18:44:17.913 (TFI04V2) 'Version': '1.0.0'
2020-02-02 18:44:17.913 (TFI04V2) 'Author': 'rwbL'
2020-02-02 18:44:17.913 (TFI04V2) 'Name': 'TFI04V2'
2020-02-02 18:44:17.913 (TFI04V2) 'Address': '127.0.0.1'
2020-02-02 18:44:17.913 (TFI04V2) 'Port': '4223'
2020-02-02 18:44:17.913 (TFI04V2) 'Key': 'TFI04V2'
2020-02-02 18:44:17.913 (TFI04V2) 'Mode1': 'G4d'
2020-02-02 18:44:17.913 (TFI04V2) 'Mode2': 'o,i,o,o'
2020-02-02 18:44:17.913 (TFI04V2) 'Mode3': '1,0,0,0'
2020-02-02 18:44:17.913 (TFI04V2) 'Mode6': 'Debug'
2020-02-02 18:44:17.913 (TFI04V2) 'DomoticzVersion': '4.11670'
2020-02-02 18:44:17.914 (TFI04V2) 'DomoticzHash': 'f6af0fa0c'
2020-02-02 18:44:17.914 (TFI04V2) 'DomoticzBuildTime': '2020-02-02 12:21:53'
2020-02-02 18:44:17.914 (TFI04V2) Device count: 0
2020-02-02 18:44:17.914 (TFI04V2) ChannelDirections:o,i,o,o
2020-02-02 18:44:17.914 (TFI04V2) ChannelValues:1,0,0,0
2020-02-02 18:44:17.914 (TFI04V2) Creating new Devices
2020-02-02 18:44:17.914 (TFI04V2) Creating device 'IO4 Channel 0'.
2020-02-02 18:44:17.915 (TFI04V2) Device created: TFI04V2 - IO4 Channel 0
2020-02-02 18:44:17.915 (TFI04V2) Creating device 'IO4 Channel 1'.
2020-02-02 18:44:17.916 (TFI04V2) Device created: TFI04V2 - IO4 Channel 1
2020-02-02 18:44:17.917 (TFI04V2) Creating device 'IO4 Channel 2'.
2020-02-02 18:44:17.917 (TFI04V2) Device created: TFI04V2 - IO4 Channel 2
2020-02-02 18:44:17.918 (TFI04V2) Creating device 'IO4 Channel 3'.
2020-02-02 18:44:17.918 (TFI04V2) Device created: TFI04V2 - IO4 Channel 3
2020-02-02 18:44:17.919 (TFI04V2) Creating device 'IO4 Status'.
2020-02-02 18:44:17.920 (TFI04V2) Device created: TFI04V2 - IO4 Status
2020-02-02 18:44:17.238 Status: (TFI04V2) Started.
2020-02-02 18:44:17.910 Status: (TFI04V2) Entering work loop.
2020-02-02 18:44:17.910 Status: (TFI04V2) 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, TFI04 - IO4 Channel 0,Light/Switch,Switch,On/Off - LED Blue
-- Idx=77, TFI04 - 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
    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, TFI04 - IO4 Channel 0,Light/Switch,Switch,On/Off - LED Blue
-- Idx=77, TFI04 - 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
end
}
```