

FEATURES

- Optional Single or Double Tinovi Soil Moisture/EC/Temperature sensor option
- Optional BME280 Air Temperature/Humidity/Pressure sensor option (Not waterproof)
- Optional OPT3001 light lux sensor option
- Optional 12v booster pulse solenoid reverse switch output option
- Pulse counter for utility meter reporting
- Water leak detector and valve close output trigger
- Dust and waterproof IP67
- Android application for Bluetooth LE setup
- Configurable HTTP URL and Authorization header for JSON data post
- Configurable MQTT connection parameters
- Up to 50m range with indoor WiFi router





ELECTRICAL			-	
PROPERTIES		Min/Sleep	Typical	Max
	Supply voltage (VCC), V	2.5	3.6	6
	Working current (VCC=3.6V), mA	Sleep 22uA	22	150
	Operating Temperature Range, Celsius	-20	25	70
	Sensor sleep mode consumes 20 uA, A Required battery is 3.7v 18650 . Or 26 After power up sensors wait 20 second connection from android application. If off Bluetooth hardware and starts norr restarted, before attaching to Bluetooth should be removed or reset button pre	Active mode cons 650 if configured Is for Bluetooth of f none is not con nal operation. Do h for configurations ssed.	sumption 30- d additionally configuration nected, devic evice should l on, it means b	150 mA. <i>y</i> . session e turns be pattery
PHYSICAL PROPERTIES	dimensions 80x130x35 Soil Sensor cable length 1.4m or optional	up to 5m		
SOIL SENSOR				
MEASUREMENT PROPERTIES	Soil Sensor	Resolut	ion Rang /avg Tole	ge rance
	Dielectric permittivity (ϵ) (Temperature corrected)	0.1ε ف	1 (aiı (wate	r) to 80 er) /5%
	Volumetric water content - VWC calcula from Dielectric permittivity ε . VWC = 0.002974 * pow(ε ,2) + 0.07424 -1.295;	tion *ε		
	Electrical Conductivity (mS/m) (0.1 mS/m = 1 uS/cm)	0.1 mS/n	m 03 mS/r 20% 300. mS/r 40%	00 n 800 n



Degree of water saturation in the soil	0.1%	0-100% /8%
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COMMANDS

To enter commands you need to connect to the device via bluetooth and switch to the log tab, the upper side there is the command entry line.

Кеу	Meaning
tare	Set weight cell to 0
scale <divisor></divisor>	Set scale divisor, you need to issue 'scale 1' to reset scale divisur, read scale on 1kg weight, and input this number in command.
ph <#> <ph></ph>	 pH (ADC) calibration 2 points. You need solutions with for example pH 4 and pH 7. 1. Submerge sensor to pH 4.0 solution and write command 'ph 0 4.0' 2. Submerge sensor to pH 7.0 solution and issue command 'ph 1 7.0' This will add 2 point calibration for pH sensor, line function via these 2 points will be used to calculate values from ADC reading.
adcp <x0 x1="" y0="" y1=""></x0>	Adc (pH) points if calibration is known, Where: x0 - pint 0 ADC reading y0 - point 0 return (Y) value x1 - pint 1 ADC reading y1 - point 1 return (Y) value Line function via these 2 points will be used to calculate values from ADC reading.
restore	Do not use this unless you do not know how to configure all data, because this will reset all device data to default values.

JSON DATA

MESSAGE

You may configure to device http/https post ("Content-Type", "application/json") to configure the endpoint for receiving device data. Data is sent by http POST request containing single level JSON message containing fields:



Кеу	Meaning
id	Device ID base on MAC address
set	Setup byte (on water leak trigger changed)
bat	Bat percent
rssi	RSSI signal strength
s0_e25	Soil Sensor 0 Dielectric permittivity at 25c
s0_ec	Soil Sensor 0 Electric conductivity
s0_temp	Soil Sensor 0 Temperature
s0_vwc	Soil Sensor 0 Degree of water saturation in the soil
s1_e25	Soil Sensor 1 Dielectric pemitivity at 25c
s1_ec	Soil Sensor 1 Electric conductivity
s1_temp	Soil Sensor 1 Temperature
s1_vwc	Soil Sensor 1 Degree of water saturation in the soil
w_press	Water pressure if pressure sensor present
b_temp	Air temperature if BME280 air sensor present
b_hum	Air humidity if BME280 air sensor present
b_press	Air pressure if BME280 air sensor present
lux	Light LUX if OPT3001 Light sensor present
pulse	Pulse counter output
s_temp	Sht35 sensor temp
s_hum	Sht35 sensor humidity
scale	Load cell data reading
adc	Adc input data reading

CONTROL MESSAGE Device support binary base64 encoded POST response. HEX to base64 converter <u>link</u>

Control message contains 1st command byte followed by value:



- 1. 0x01 + device sleep time (data sending interval) adjustment. Message should contain 5 bytes, 1st byte is 0x01 and following 4 bytes is unsigned 32-bit integer time in seconds to sleep. For example sending HEX 010000000A or "AQAAAAo=" base64 will set interval to 10 seconds, but 0100000E10 or "AQAADhA=" base64 will set interval to 3600 secs = 1 hour.
- 2. 0x02 + data config byte :
 - a. Bit 0 enable Tinovi PM-WCS-3-I2C Soil sensor
 - b. Bit 1 enable BME280 air temp humidity sensor
 - c. Bit 2 enable OPT3001 light lux sensor
 - d. Bit 3 2nd soil sensor
 - e. Bit 4 enable pulse counter
 - f. Bit 5 reserved
 - g. Bit 6 Water Leak detector flag leak detected
 - h. Bit 7 read only -valve status
- 3. 0x03 + 0x01 or "AQ==" base64 -valve ON or 0x00 "AA==" base64 valve off
- 4. 0x04 + 2-byte valve pulse time millis
- 5. 0x05 + 4-byte max valve on time millis, 0 -disabled
- 6. 0x06 + 2-byte valve trigger ON VWC limit
- 7. 0x07 + 2-byte valve trigger OFF VWC limit
- 8. 0x08 + 4-byte pulse counter offset (pulse counter not supported)
- 9. 0x09 + 1-byte water leak valve OFF trigger enable =1 , disable =0
- 10. 0x0A + 1-byte sensor number 0 or 1 if soil moisture present calibrate AIR
- 11. 0x0B + 1-byte sensor number 0 or 1 if soil moisture present calibrate WATER
- 12. 0x0C + 1-byte sensor number 0 or 1 + 2 byte EC value if soil moisture present calibrate EC. Example sending 0C0585 will calibrate sensor for 1413 uS/cm
- 13. 0x0D + 4 byte valve open time in seconds valve will be closed after this time (device will sleep all that time and close valve on wake up)
- 14. 0x0E + 1 byte HTTP posting data format 1 = OUT_JSON or 2 -OUT_BIN_BASE64
- 15. 0x0F + 1 byte over air firmware update check cycles skip, default 10, if you posting messages once in 5 min, then FOTA check will be in 10 x 5 = 50 min intervals.



VALVE CONTROL	Valve controller switch max output continues current is 0.5A, (1A max pulse). Battery max current draw is almost 3 times more than your load current, if you apply 0.5A load current, your battery should support 1.5A current. Switch Supports reverse polarity latching relay. In open direction Red wire is Positive, Black negative, but in close direction Black - Positive and Red - Negative. Valve may be controlled via downlink messages, send 0x0301 to open valve, and 0x0300 to close valve. Device remembers last valve status sends it in read only setup byte bit 7: if setup bit 7 is set, then valve is open, if bit is cleared - valve is closed state. (See payload decoder sample- parameter "valve" - indicates valve status 0-close, 1-open). See CONTROL MESSAGES section for other valve control commands. An alternative to a booster dedicated 12v battery for the switch may be used. That allows up to 3A current via switching circuit from battery.
WATER LEAK DETECTOR	Water leak detector on the trigger will interrupt device sleep and send a message immediately with a water leak flag enabled in settings byte. It will repeat sending this flag (then will reset the flag. If valve OFF on water leak trigger is enabled, then valve off will be triggered). 2 electrode water leak detector is supported, triggered when resistance between electrodes is less than 250 kOhm. A water leak detector uses Green and White wires.
SOIL SENSOR CALIBRATION	Sensors are already factory calibrated, but in case needed they may be recalibrated using an Android application. Hold sensor(the sensor should be clean and dry) in air and issue this command air , response OK. Put the sensor in water and issue command water , response OK. For ec <us m=""> calibration put the sensor int to liquid and set the right sensor reading value in uS/m. We recommend Android mobile application for sensor setup and data reading/storage</us>
	 PM-WCS-3-I2C soil sensor DP CALIBRATION ON ANDROID APP 1. open the application and connect the device to the phone app 3. go to the app SETTINGS tab, 4. hold sensor(the sensor should be clean and dry) in the air – click button AIR 5. submerge sensor in the water or soil with water, click button WATER 6. go to the MAIN tab click read to test calibrated values
	PM-WCS-3-I2C soil sensor EC calibration on the Android APP
	connect the device to the app.
	1. Press BT READ . Remember the s0_ec(or s1_ec dependig to which slot are connected the soil sensor) value



lux	
Dielectric Permittivity s0_e25	1.42
Electrical Conductivity	39.90
Temperature s0_temp	16.47
Soil Moisture s0_vwc	0.00%
2nd.Dielectric Permittive s1_e25	ty 0.00
2nd.Electrical Conductiv	rity 0.00
2nd.Temperature s1_temp	0.00
A MAIN	SETTINGS

2. Submerge the sensor EC contacts(the stainless steel rivets on the end of the sensor) in your calibration solution.





3. Press BT READ . remember the s0_ec value. For this uncalibrated sensor in the picture below the s0_ec value is 193.1 and s0_temp is ~17 Celsius



DI KLAD DI LAII	& GO
Battery % g	2.76272
Counter	0
Signal RSSI ssi	0
Dielectric Permittivity	55.49
Electrical Conductivity	193.1
Femperature 0_temp	16.77
Soil Moisture :0_vwc	60.8
Settings et	0

4. Open the SETTINGS tab and type here your calibration solution value at 17 Celsius (it should be written on your calibration solution bottle uS/cm). In the picture below the uS/cm at 17 Celsius is 1199.



ATTer		366 S
NON		5
	°C °F HS/cm	67
and the second second	0 32.0 776	
and the second	5 41.0 890	67
	15 59.0 1147	0
	10 00.0 1199	3
	10 64 4 1225	w
STRIAL USE ONLY.	19 66.2 1251 20 68.0 1278 21 69.8 1305 22 71.6 1332 23 73.4 1359 24 75.2 1386 25 77.0 1413 26 78.8 1440 27 80.6 1467 28 82.4 1494 29 84.2 1521 30 86.0 1548 31 87.8 1575	V
	2	



SET CLIENTID	HINOVIG	40007AFE1	ru	
SET USER				
SET PASS			_	
1. To calibr To calibr	ate s0 se ate s1 se	nsor type 0 nsor type 1		
SET SUB				
TI ST MQTT Soil Moisture Se	2. Typ solutio	e your calib n value	ration	
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# 0 calibrate:	EC	1199 JS/m		
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4	5	6	_	
7	8	9	$\langle \times \rangle$	
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5. Press the EC button.

6. Go to the MAIN tab and press the BT READ

BT READ

button and see the calibrated EC value



BT Connected		d or(@gmail
BT READ BT EXIT	& GO		SIGN OUT
Battery % S	93.16554		REFRESH
Counter bc Signal RSSI rssi	0) 62leaf12) wifiweat her) 1leaflora 62
Dielectric Permittivity s0_e25 Electrical Conductivity	54.78 142.4) 2 2 62wifi03 14
s0_ec Temperature s0_temp	17.01	C) 62leaf11
Soil Moisture s0_vwc	60.3		
Settings set	0		
			£2) 106

(press the BT READ button more than one time). 142.4 is the calibrated value.

7. take out the sensor from the calibration solution. Dry the sensor EC contacts. Press BT READ. In Air should be 0..50.



ANDROID APP

https://play.google.com/store/apps/details?id=com.tinovi.wifi&hl=en



Android application lets you configure and calibrate soil moisture sensors for your device.

- 1. Your phone should support Bluetooth..
- 2. Turn on Bluetooth on your phone
- 3. Restart device by pressing restart button on device main board or removing and replacing battery.
- 4. Press the pair button and choose TINOVIXXXXXX device (pair with device, if adding for the first time).





115		
<	Choose Bluet	ooth device
8	TINOVIBCDDC2D	AF2A0
7 ″ B	allery. 0.00	
Disco	nnected PAIR	
	Pair with TINOVIB	CDDC2DAF2A0?
	Allow access to you history	r contacts and call
	Cancel	Pair

5. Wait up to 5-10 second while application shows Connected TINOVIXXXXXXX in main page, if no connection, repeat restart device and pair operation. Device may be restarted by removing, replacing battery or clicking the button in PCB board left bottom corner, when battery looks upwards.





The device and phone app are connected if you see the device's bluetooth name TINOVIXXXXXXX and EXIT & GO button. And when you press the READ button the device LED should blink and installed sensor data should appear.

- 6. Click read in the MAIN page to read sensor values for the test.
- 7. Switch to the SETTINGS tab to setup your device
- 8. In the WiFi section input your access point's SSID and pass and click according SET... buttons. SSID and PASS max length is 50 symbols.
- 9. Input your backend URL to let the sensor post data. Url max length is 150 symbols. Press the "SET URL" button.
- 10. You may press the "TEST" button, to check connection and URL, but unfortunately this does not work with SSL (HTTPS), In case HTTPS it will show Url connection failed, code -1. So if WiFi is OK, you may try the EXIT & GO button in the MAIN page, to exit Bluetooth configuration mode and let the device connect to your URL.
- 11. For Azure HTTPS you need to add auth SAS Token for auth header in the App, see docs how to generate SAS Token: <u>https://docs.microsoft.com/en-us/cli/azure/ext/azure-iot/iot/hub?vie w=azure-cli-latest#ext-azure-iot-az-iot-hub-generate-sas-token</u> OR via Visual Studio Code: <u>https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-mqtt-support</u>



<u>#for-azure-iot-tools</u>

- 12. For Azure MQTT: https://docs.microsoft.com/en-us/cli/azure/ext/azure-iot/iot/hub?vie w=azure-cli-latest#ext-azure-iot-az-iot-hub-generate-sas-token https://weblogs.asp.net/morteza/how-to-send-mqtt-messages-to-an-az ure-iothub-by-mqttfx-client
- 13. Alternatively for demo purposes we have developed our own dashboard for device testing. To register the device to Tinovi dashboard, you should authorize with your google account (only first time you open the application, then this button will disappear), input device name and click "REG TINOVI" button. This action will generate and set a device URL for posting data to https://www.tinovi.com/graf/ There you also may login with your google account.

14. Log in to the graphic platform use the same google account you use for Tinovi WiFi

	8 with Google	
application. Press		button

	Log in
User	email or username
Password	password
	Login
	8 with Google



G	Sign in - Google Accounts - Google Chrome 🛛 🗕 🔀
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G	Sign in with Google
	Sign in
	to continue to zerverio-4ab68.firebaseapp.com
	Email or phone
	To continue, Google will share your name, email address, language preference, and profile picture with zerverio-4ab68.firebaseapp.com.
	Create account Next
ype y	our google account email.





And password. Click Next. You will be redirected back to tinovi.com/graf platform.





- 15. Connect the device to Tinovi WiFi application as described above(paragraph 1 to 7).
- 16. To configure the device to send data to Tinovi graf platform go to app settings tab and make 8 steps picture below.



	11:34 0.0KB/s 🗇 😁 🚥	\$ 🖘 🖅
	READ SETTINGS	
	S0 🗌 S1 🗌 Air 🗌 Lig	ht 🗌 Pres 🗌 Pulse
	Sht25 Temp1 Ter	^{mp2} Check which sensors
	SET CONFIG	will be read and press SET CONFIG
	SET PULSE CNT.	
	Sleep:	
	SET SLEEP SEC. 10	
	WiFi:	
	2 ^{-ssid} 1. Your Wi	Fi router SSID name
	s 4 PASSWORD 3. YOU	r WiFi router password
	G Sign In 5. Pres	ss to sign with google
6. Create de	vice Name REG TINC 7	
	SET 8 http://tinovi.or /wifinode424	com/api/v1/dp/json 100000
	SET AUTH H	-
	Output Format 🖲 JSON 🔿 R	BINARY TEST
	MQTT:	
	CET LIDI	
	A 49	
	MAIN SETTI	NGS LOG

17. ===1. Type your 2.4GHz router SSID. 2. Press SET SSID. 3. Type the router WiFi password. 4. Press SET PASSWORD. 5. Press google sign in button and proceed to sign in.6. In this field figure out(create) the name of the device. 7. Press REG TINOVI button.



8. Pres	s the SET URL but	tton.		
18. Press	READ SETTINGS	button and ch	neck if all settings are	saved.
19. Now g	o to the app MAIN	tab and press	EXIT & GO	button.

The device will turn off the Bluetooth and disconnects from the phone app, then the device goes to the working mode: wake up for a few seconds to read and send sensor data to the graph platform server, then goes to sleep mode for time typed in the app SET SLEEP SEC. field.

20. Now go back to the internet browser graph platform. Click on the Devices menu. You should see your device in the list.

If not see the device check your device setting again, check if the device onboard LED blinking with the SET SLEEP SEC. interval. Check if the device appears on your WiFi internet router DHCP client list. Make shoor you have a 2G internet router.

21. Click	the Edit button.					
	Devices > List Ne	w				
	Devices					
	ID	Name				
	swifinodemm600000	85wifi	online	O Disconnect	C Edit	×



22. Click Device console tab

< Solution Devices > List E	dit			
📽 wifinodemm600000	Edit Device Dev	vice Console	Data Search	Status Report
In/Out Log				
C Data Send				
Name	Va	al		
bc	13	357		
s0_temp	17	7.99		
s0_e25	1.	35		
bat	98	3.53953		
rssi	-6	4		
set	1			
s0_ec	38	3.2		
s0_vwc	0			

Wait a SET SLEEP SEC time to see sensor actual values.

23. Go to Data Search tab and check the checkbox below "OR Last Rows "







< 🛢 D	evices > List	Edit			
🕫 wifi	nodemm600000	Edit Device	Device Console	Data Search	Status Report
From					
2020-08	3-25 @ 03 : 09	: 59 . 224			
To (set no	N)				
2020-08	3-25 @ 15 : 09	: 59 . 225			
OR Last R	ows				
v 500					
Output F	ormat: Table		 Search Invali 	d date or range	

Wait a minute while information downloads from the server and appears on your screen.



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From									
2020-08-	-25	@ 03	: 0	9 : 59	. 224				
To (set now)								
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OR Last Ro	WS								
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Output Fo	rmat:	Table				Search Invalid o	date or i	range	
s0_temp	bc	rssi	set	bat	s0_e25	time	s0_ec	s0_vwc	
18.02	1400.0) -64.0	1.0 9	8.62904	1.34	2020-08-25 14:16:48.93	4 39.0	0.0	
18.02	1399.0) -64.0	1.0 9	8.89759	1.34	2020-08-25 14:16:39.81	3 38.7	0.0	
18.01	1398.0) -64.0	1.0 9	8.98711	1.34	2020-08-25 14:16:30.79	9 38.9	0.0	
18.02	1397.0) -64.0	1.0 9	8.80808	1.34	2020-08-25 14:16:21.89 [.]	1 38.8	0.0	
18.02	1396.0) -64.0	1.0 9	8.62904	1.34	2020-08-25 14:16:12.99	0 38.8	0.0	
18.03	1395.0) -65.0	1.0 9	8.80808	1.34	2020-08-25 14:16:04.07	9 39.1	0.0	
18.02	1394.0) -64.0	1.0 9	8.98711	1.34	2020-08-25 14:15:54.96	9 38.7	0.0	
18.02	1393.0) -65.0	1.0 9	8.53953	1.34	2020-08-25 14:15:45.94	3 38.7	0.0	
18.01	1392.0) -65.0	1.0 9	8.89759	1.34	2020-08-25 14:15:36.85	2 38.3	0.0	
18.02	1391.0) -64.0	1.0 9	8.62904	1.34	2020-08-25 14:15:27.82	3 38.9	0.0	
18.02	1390.0) -64.0	1.0 9	8.80808	1.34	2020-08-25 14:15:18.80	8 38.4	0.0	
18.03	1389.0)-64.0	1.0 9	8.62904	1.34	2020-08-25 14:15:09.80	2 38.4	0.0	
18.01	1388.0	0-65.0	1.0 9	8.80808	1.34	2020-08-25 14:15:00.90	7 39.0	0.0	
18.04	1387.0	0-64.0	1.0 9	98.53953	1.34	2020-08-25 14:14:51.87	7 38.9	0.0	
18.02	1386.0	0-65.0	1.09	8.62904	1.34	2020-08-25 14:14:42.76	5 39.1	0.0	
10.01	1385.0	0.65.0	1.0 9	0.02904	1.34	2020-06-20 14.14.33.85	0 30.0	0.0	
17.02	1383.0)-64.0	1.0 9	0.00900	1.54	2020-08-25 14.14.24.73	0 38 5	0.0	
18.01	1382.0)-64.0	1.0 9	80808	1.00	2020-08-25 14:14:15:48	9 38 8	0.0	
18.01	1381.0	0-63.0	1.0 9	8.62904	1.34	2020-08-25 14:13:57 19	8 38 5	0.0	
18.02	1380.0	0-63.0	1.0 9	8.80808	1.34	2020-08-25 14:13:48.09	2 38.4	0.0	
18.04	1379.0)-65.0	1.0 9	8.80808	1.34	2020-08-25 14:13:39.17	3 39.0	0.0	
18.02	1378.0) -64.0	1.0 9	8.80808	1.34	2020-08-25 14:13:30.15	3 38.8	0.0	
18.01	1377.0	0-64.0	1.0 9	8.98711	1.34	2020-08-25 14:13:20.94	7 38.8	0.0	
18.01	1376.0) -65.0	1.0 9	8.62904	1.34	2020-08-25 14:13:11.75 [,]	1 38.6	0.0	
40.00	4075 0		4.0.0		4.04	0000 00 05 4 440.00 00	100.4	0.0	

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24. To see data on graphics you need to configure the dashboard. Go to the Dashboard menu.



Choose Add Panel > Graph from the menu.



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						no title (click here)		. ~
	1.(0 —							
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Then press on the

- 27. To save Your configuration press on the diskette button on top
- 28. You can click on individual metrics to highlight them. Hold ctrl to select more than one metric.

B

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29. Mouse select part of the graphic to zoom in



30.



Test Pulse counter on tinovi.com/graf dashboard

The device has optional pulse counting input. This pulse counter input can be connected to smart meters pulse output, example smart electricity meter or water meter to centralise consumption data or see smart meters data online.

The device reads pulse counter input only while it is in the sleep.

To activate pulse counter input, connect the device to the mobile phone application, go to the settings tab, **check Pulse checkbox** and press SET CONFIG to save. Please take in account that while the pulse counting input is ON the device's battery consumption in sleep is bigger.

Connect the device on the tinovi.com/graf dashboard. Find your device on the device list, click Edit and click to Device Console tab.



There you see the pulse counter value, each time you(or connected smart meter) connect to



short(connect together and open immediately)the red and black wires(this pins on the device board) the pulse counter value increases by one(don't permanently connect these wires, connect and open them just like you click some push button). For example if the current pulse counter value is x, and if you "click" the pulse input 5 time while the device sleeps, in the next wake up the pulse counter value increases by 5, so you see total value(x+5).

In brief

1. wires are open(not connected)



2. configure the device(check pulse checkbox, wifi and another setting for work)

3. disconnect the device from the phone and let it work "normally" on their battery

4. check that the device is online(online data should changes after the devices LED blink). When the devices LED blink 1 time it's mean that the device wakes up for a few(5..8 seconds) seconds and read sensor data, connect to your wifi router and send the data to the online server(then the device goes to sleep to save the battery power, the sleep time is configured by you in the mobile phone application by each device individually), and then you see these data on your graph dashboard account).

The input "pulse" and "leak" is waiting While the device is in sleep (if the "Pulse" checkbox was checked in that particular device settings).

5. test the pulse and the leak

-connect-disconnect few times red and black and see what the "pulse" value is changed -connect green and white and check if the device is wake up immediately(no waiting for the sleep time end)

The pulse value can be reseted to null when the reset button pressed or battery drone completely. There is a possibility to set a custom value sending a message to the device.

Please remember the pulse counter wires always stay opened(not connected together)

Test Leak detector input wires

To use the device's leak detector input In the devices application settings the pulse checkbox should be checked.

Setup SLEEP SEC. 30 seconds or more.

Make sure that the green and white wires are open.

Press exit&go on the MAIN tab. While the device is in sleep connect and open the white and green wires. The device should wake up one extra time and send data. If the leak detection wires are connected together permanently the device does not go to sleep.

PM-WCS-3-I2C sensor EC calibration

Connect the device to the app.

1. Press BT READ. remember the s0_ec value x1

2. Submerge the sensor EC contacts(the stainless steel rivets on the end of the sensor) in your calibration solution.

3. Press BT READ. remember the s0_ec value x2





4. Open the SETTINGS tab and type here your calibration solution value x3(it should be write on your calibration solution bottle uS/cm)

5. Press the EC button.

6. Go to the MAIN tab and press BT READ button(always press the BT READ button more than one time). remember the s0_ec value x4.

Now the x4 value should be +/- similar to x3*0.1

x4=~x3*0.1

7. take out the sensor from the calibration solution. Dry the sensor EC contacts. Press BT READ. The s0_ec should be close to 0.

tips: when you calibrate EC the sensor should be submerged in the EC calibration solution, when you calibrate WATER the sensor should be submerged in water.





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PM-IO-6-WIFI IO Module

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READ SETTINGS	
S0 🗌 S1 🗌	Air 🗌 Light
SET CONFIG	
SET PULSE CNT.	30
Sleep:	
SET SLEEP SEC.	20
WiFi:	
SET SSID ubn	t-local
SET PASSWORD	
mydevicename	REG TINOVI
SET URL http /jso	://tinovi.com/api/v1/dp n/genericamt800000
Output Format 🔘	JSON O BINARY
SET OTA CHECK.	10
A	
MAIN	SETTINGS LOG
	0 <



