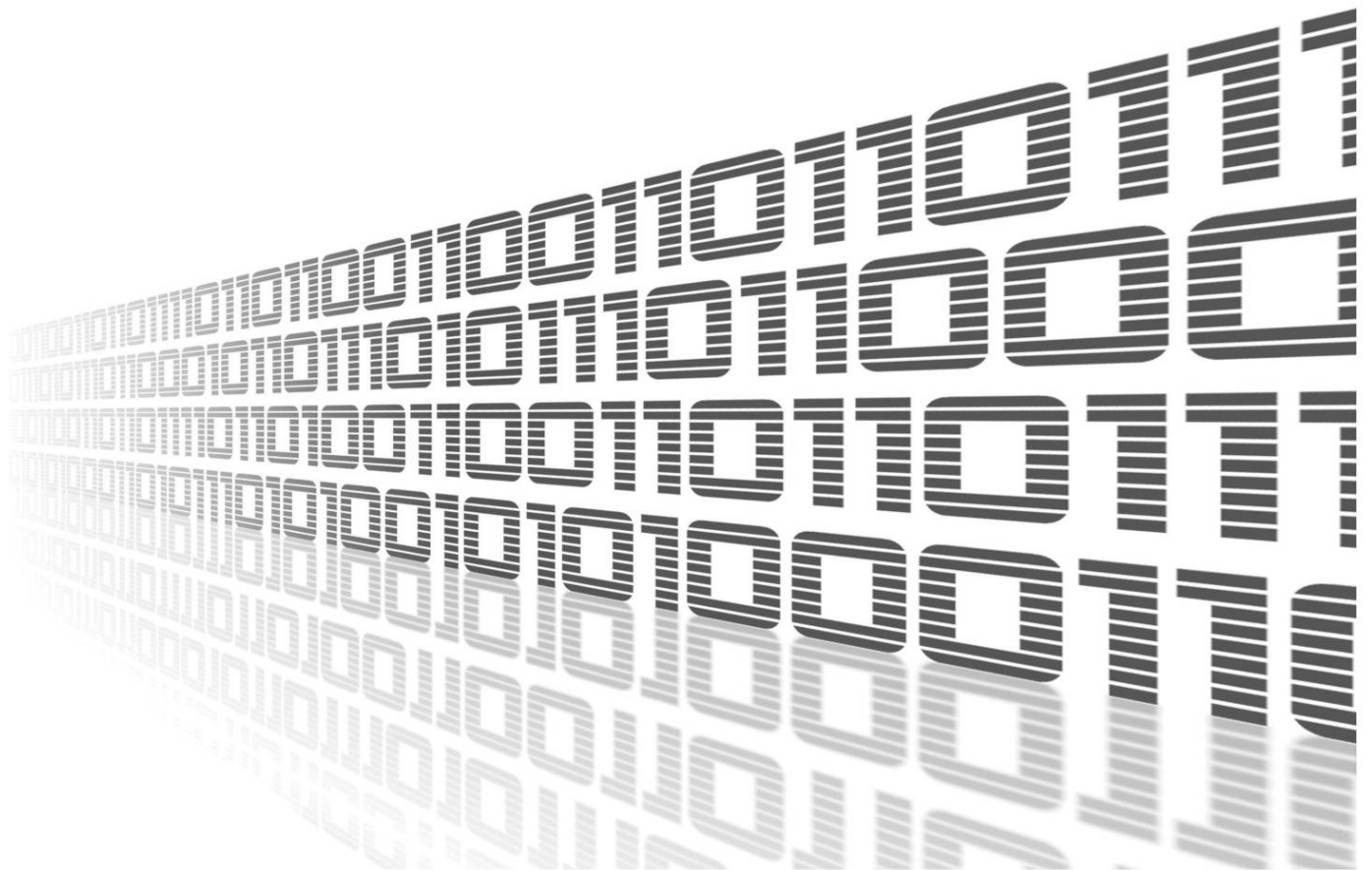




## Modbus to LwM2M





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# Used symbols

 *Danger* – Information regarding user safety or potential damage to the router.

 *Attention* – Problems that can arise in specific situations.

 *Information* – Useful tips or information of special interest.

 *Example* – Example of function, command or script.

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# 1. Changelog

## 1.1 Modbus to LwM2M Changelog

v1.0.0 (2020-08-28)

- First release.

## 2. Router App Modbus to LwM2M

### 2.1 Description



This Router app is not contained in the standard router firmware. Uploading of this router app is described in the Configuration manual (see Chapter [Related Documents](#)).

*Modbus to LwM2M* router app provides seamless communication between Modbus/TCP devices and LwM2M device. LwM2M works as Modbus/TCP master to communicate with Modbus/TCP devices.

### 2.2 Installation

The latest version of *Modbus to LwM2M* router app can be downloaded from the Engineering Portal [EP] at <https://icr.advantech.cz/products/software/user-modules>.

In the GUI of the router navigate to *Customization* -> *Router Apps* page. Here choose the downloaded module's installation file and click to the *Add or Update* button.

Once the installation of the module is complete, the module's GUI can be invoked by clicking the module name on the *Router Apps* page. Figure 1 shows the main menu of the module. It has the *LwM2M*, *Mapping Table* and *Log* menu items. To return back to the router's web GUI, click on the *Return to Router* item.

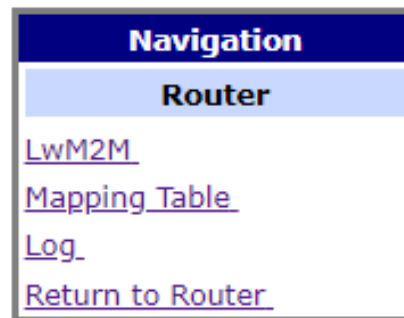


Figure 1: Main Menu

## 2.3 Module Configuration

Configuration of the router app can be done on the *LwM2M* page. This configuration page is shown in Figure 2. There are two sections on the page, *LwM2M Settings*, and *Modbus TCP*. The configuration items are described on the page next to the items. Do not forget to click the *Save* button below to save changes made on the page.

LwM2M Settings	
<b>LwM2M</b>	
<b>LwM2M Enable</b>	
<input type="button" value="Off"/> ▼	Enable the LwM2M Client.
<b>Log Enable</b>	
<input type="button" value="Off"/> ▼	Enable the LwM2M Log.
<b>Name</b>	
<input type="text" value="lwm2m"/>	Endpoint name of client.
<b>LwM2M Server Address</b>	
<input type="text" value="127.0.0.1"/>	The remote LwM2M Server Address.
<b>LwM2M Lifetime</b>	
<input type="text" value="300"/>	The LwM2M lifetime ( 30 - 300 ).
<b>LwM2M Server Port</b>	
<input type="text" value="5683"/>	The LwM2M Server Port Number ( 1 - 65535 ).
<b>PSK identity</b>	
<input type="text"/>	
<b>Pre-shared-key Mode</b>	
<input type="button" value="String"/> ▼	Pre-shared-key Mode.
<b>Pre-shared-key</b>	
<input type="text"/>	
<b>Update Time</b>	
<input type="text" value="1"/>	The lwm2m update time.
<input type="button" value="Upload Config"/>	
<b>Modbus TCP</b>	
<b>Modbus TCP Server Address</b>	
<input type="text" value="127.0.0.1"/>	The Remote Modbus TCP Address.
<b>Modbus TCP Server Port</b>	
<input type="text" value="502"/>	The Remote Modbus TCP Port Number ( 1 - 65535 ).
<b>Slave ID</b>	
<input type="text" value="1"/>	The Modbus TCP Slave number ( 1 - 256 ).
<b>Interval(ms)</b>	
<input type="text" value="1000"/>	The Modbus TCP Polling Interval.
<b>Timeout(ms)</b>	
<input type="text" value="1000"/>	The Modbus TCP Timeout.
<input type="button" value="Save"/>	

Figure 2: LwM2M and Modbus TCP Configuration Page

### 2.3.1 Configuration Uploading

Configuration of Modbus TCP and LwM2M devices mapping can be imported by a CVS file. Format of this file is shown in Figure 3 and the key columns are described in Table 1. Separator (delimiter) for the CSV file is a comma.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
IPSO SO	Name	#	Type	Device ID	Function Code	Address Start	Data Length	Designator	Serial	IP	Port	Trigger	Preload	Verify	Threshold	Datatype
10701	Vibration_Alarm	1	TCP	1	3	10811	1	/10701/0/101	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	7 Boolean
10702	Water_Alarm	1	TCP	1	3	10820	1	/10702/0/105	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	7 Boolean
10706	Max_Pressure	1	TCP	1	3	40054	2	/10706/0/201	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	4 IEEE, Re
10706	Min_Pressure	1	TCP	1	3	40062	2	/10706/0/202	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	4 IEEE, Re
10707	DC_Voltage	1	TCP	1	3	40802	2	/10707/0/302	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	4 IEEE, Re
10707	DC_Current	1	TCP	1	3	40804	2	/10707/0/303	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	4 IEEE, Re
10708	Temperature_Alarm	1	TCP	1	3	10808	1	/10708/0/105	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	7 Boolean
10708	Pressure_Alarm	1	TCP	1	3	10810	1	/10708/0/107	Port 1	192.168.0.12	502	none	none	0 Always	FALSE	7 Boolean

Figure 3: CSV File Example

To import this file, go to *LwM2M* configuration page, click on the *Upload Config* button, choose the file, and then click the *Upload* button. If uploaded successfully, click the *Return* button and finally click on the *Save* button *LwM2M* on the bottom of the configuration page. The new mapping configuration will take effect immediately.

Column	Field	Description
A	IPSO SO	LwM2M Object ID
B	Name	The name to identify the mapping.
G	Address Start	Designate the Modbus to starting address for the Modbus registry.
H	Data Length	For range 1 9999 or 10000 19999, the unit is bit(s). For range 30001 39999 or 40000 49999, the unit is word(s).
I	Designator	Designate LwM2M Object. Include <i>Object ID</i> , <i>Short ID</i> and <i>Resource ID</i> . Format: /Object_ID/Short_ID/Resource_ID
Q	Data Type	LwM2M data type with options: <ul style="list-style-type: none"> <li>• 7 Boolean</li> <li>• 4 IEEE, Reversed Word</li> <li>• 1 Double Precision</li> </ul>

Table 1: Description of the Key Columns



## 2.4 Mapping Table

As shown in Figure 4, the *Mapping Table* page just displays the mapping table of Modbus TCP and LwM2M devices. This table can be imported by a CSV file, see Chapter 2.3.1.

LwM2M Settings				
Mapping Table				
Name	Object ID	Modbus Address	Data Length	Data Type
Vibration_Alarm	/10701/0/101	10811	1	Boolean
Water_Alarm	/10702/0/105	10820	1	Boolean
Max_Pressure	/10706/0/201	40054	2	Flot
Min_Pressure	/10706/0/202	40062	2	Flot
DC_Voltage	/10707/0/302	40802	2	Flot
DC_Current	/10707/0/303	40804	2	Flot
Temperature_Alarm	/10708/0/105	10808	1	Boolean
Pressure_Alarm	/10708/0/107	10810	1	Boolean

Figure 4: Example of Mapping Table

## 2.5 Log Messages

The *Log* page displays the log messages of the LwM2M router app. This login can be enabled on the LwM2M configuration page, see Chapter 2.3.

LwM2M Settings	
Log	
<pre> 2020-08-21 10:50:51.263, [cfg] lifetime=300, update_time=1 2020-08-21 10:50:51.264, [cfg] modbus id=1, interval=1000, timeout=1000 2020-08-21 10:50:51.264, [csv] parser /opt/LwM2M/etc/config.csv 2020-08-21 10:50:51.265, [csv] line=11, active=9 2020-08-21 10:50:51.267, [lwm2m] Trying to bind LwM2M Client to port 56830 2020-08-21 10:50:51.268, [lwm2m] Connecting coaps://127.0.0.1:5683 2020-08-21 10:50:51.270, [modbus] "127.0.0.1":502 slave:1 interval:1000 timeout:1000 2020-08-21 10:50:51.272, [lwm2m] LwM2M Client "lwm2m" started on port 56830 2020-08-21 10:50:51.273, [lwm2m] Trans(Send): message code:Post, type:confirmables 2020-08-21 10:50:51.277, [lwm2m] State: STATE_REGISTERING 2020-08-21 10:50:51.278, [modbus] create 2020-08-21 10:50:51.279, [modbus] connecting 2020-08-21 10:50:52.278, [lwm2m] 123 reg_status: STATE_REG_PENDING 2020-08-21 10:50:53.280, [lwm2m] Trans(Send): message code:Post, type:confirmables </pre>	
Refresh	Download

Figure 5: Log Example

## 3. Related Documents

You can obtain product-related documents on *Engineering Portal* at [icr.advantech.cz](http://icr.advantech.cz) address.

To get your router's *Quick Start Guide*, *User Manual*, *Configuration Manual*, or *Firmware* go to the [Router Models](#) page, find the required model, and switch to the *Manuals* or *Firmware* tab, respectively.

The *Router Apps* installation packages and manuals are available on the [Router Apps](#) page.

For the *Development Documents*, go to the [DevZone](#) page.