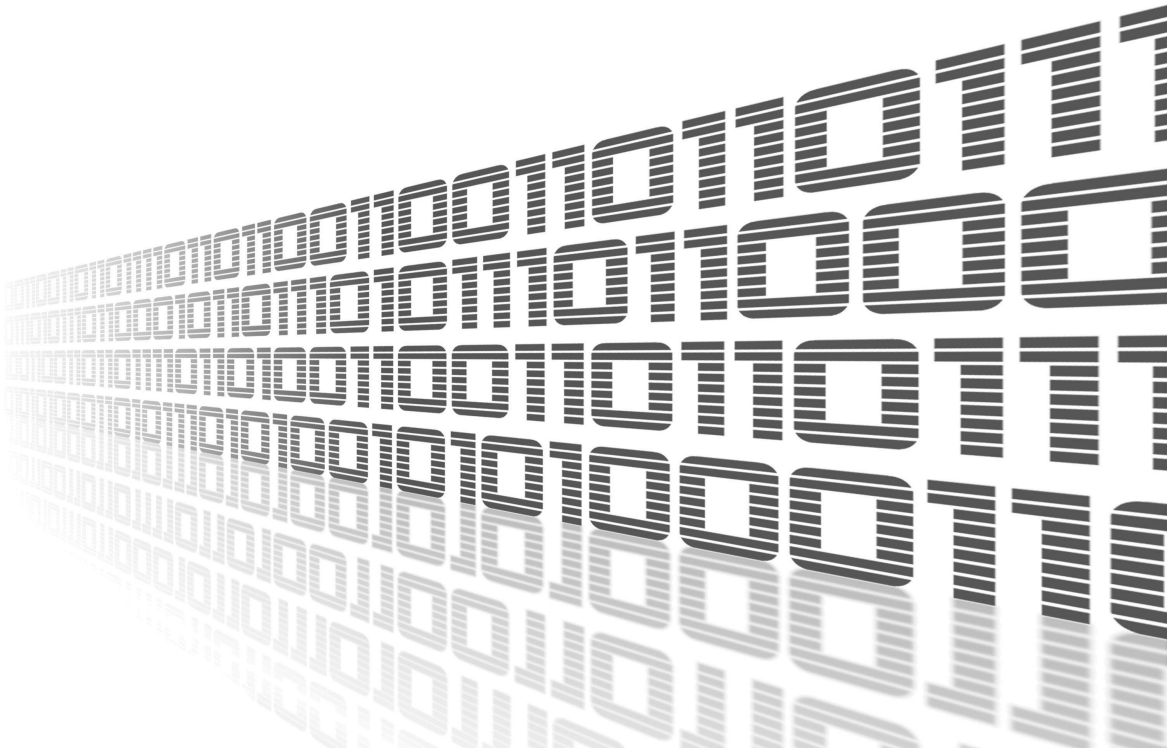
RouterApp

User Module

Modbus to LwM2M

APPLICATION NOTE



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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, notice – Useful tips or information of special interest.

Example – example of function, command or script.

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1.1 Description

This user module is not installed on *Advantech* routers by default. See the *Configuration Manual*, chapter *Customization –> User Modules*, for the description of how to upload a user module to the router.

Modbus to LwM2M user module provides seamless communication between Modbus/TCP devices and LwM2M device. LwM2M works as Modbus/TCP master to communicate with Modbus/TCP devices.

1.2 Installation

The latest version of *Modbus to LwM2M* user module can be downloaded from the Engineering Portal [EP] at `https://ep.advantech-bb.cz/products/software/user-modules`.

In the GUI of the router navigate to *Customization -> User Modules* 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 *User modules* 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.

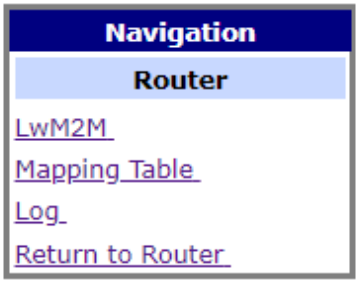

Figure 1: Main Menu

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1.3 Module Configuration

Configuration of the user module 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.

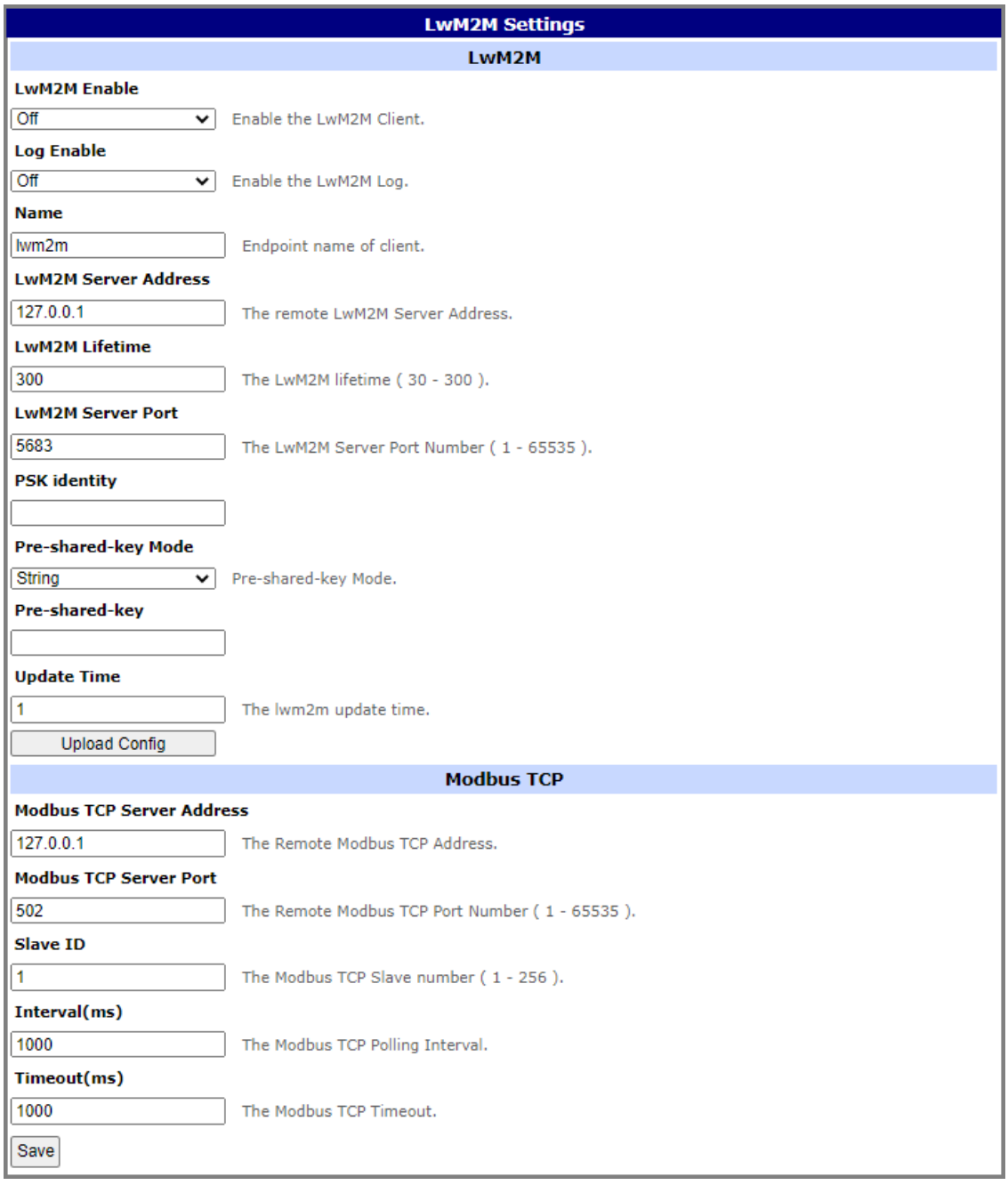

Figure 2: LwM2M and Modbus TCP Configuration Page

1.3.1 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 *Object ID*, *Short ID* and *Resource ID*. Format: `/Object_ID/Short_ID/Resource_ID`
Q	Data Type	LwM2M data type with options: • 7 Boolean • 4 IEEE, Reversed Word • 1 Double Precision

Table 1: Description of the Key Columns

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1.4 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 1.3.1.

LwM2M Settings

Mapping Table

Name	Object ID	Modbus Address	Data Length	Data Type
Vibration_Alarm	/10701/0/101	10811	1	Boolian
Water_Alarm	/10702/0/105	10820	1	Boolian
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	Boolian
Pressure_Alarm	/10708/0/107	10810	1	Boolian

Figure 4: Example of Mapping Table

1.5 Log Messages

The *Log* page displays the log messages of the LwM2M user module. This loggin can be enabled on the LwM2M configuration page, see Chapter 1.3.

LwM2M Settings

Log

```
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
```

Refresh Download

Figure 5: Log Example

2. Related Documents

[1] Advantech Czech: **v2 Routers – Configuration Manual** (MAN-0021-EN)
[2] Advantech Czech: **SmartFlex – Configuration Manual** (MAN-0023-EN)
[3] Advantech Czech: **SmartMotion – Configuration Manual** (MAN-0024-EN)
[4] Advantech Czech: **SmartStart – Configuration Manual** (MAN-0022-EN)
[5] Advantech Czech: **ICR-3200 – Configuration Manual** (MAN-0042-EN)

[EP] Product related documents and applications can be obtained on *Engineering Portal* at `https://ep.advantech-bb.cz/` address.

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