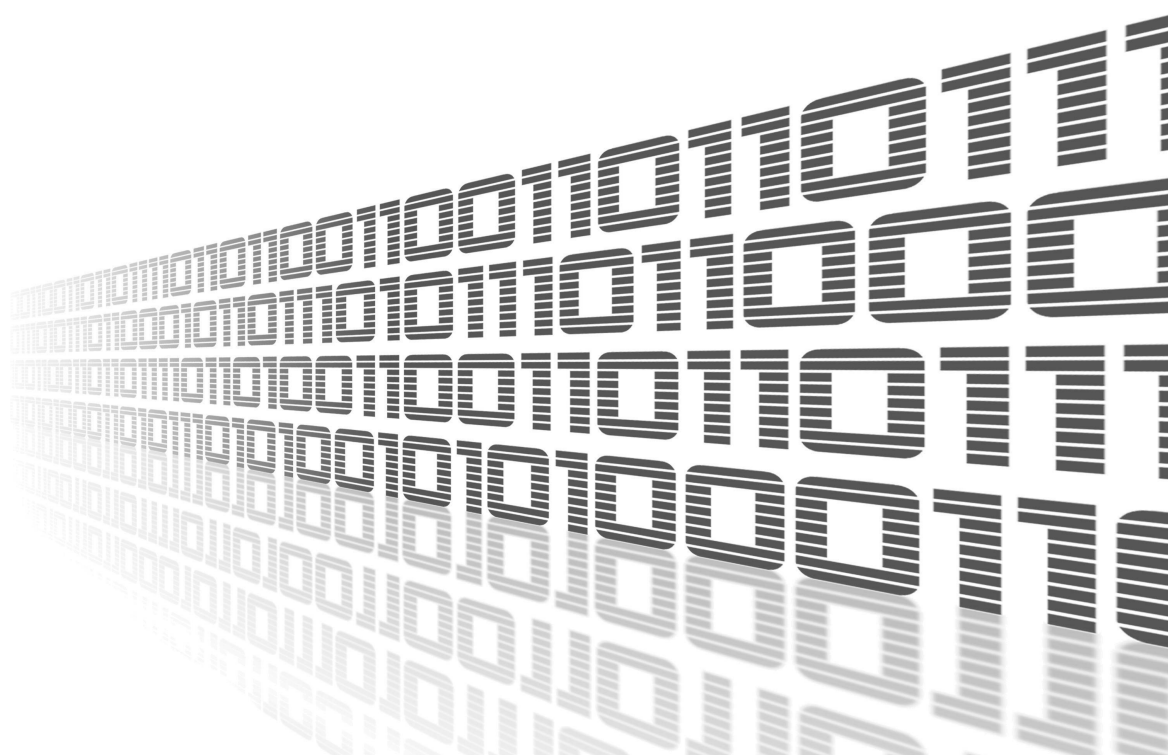




User Module

Node.js

APPLICATION NOTE



Used symbols



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



Attention – Problems that may arise in specific situations.



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



Example – example of function, command or script.



Advantech Czech s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic
Document No. APP-0080-EN, revised on June 18, 2020. Released in the Czech Republic.

Contents

1	Node.js User Module	1
1.1	Introduction	1
1.2	Building the Custom Nodes	1
2	Router Node	2
2.1	Node Properties	2
2.1.1	productName	2
2.1.2	platformCode	3
2.1.3	serialNumber	3
2.1.4	firmwareVersion	3
2.1.5	RTCBatteryOK	3
2.1.6	powerSupply	3
2.1.7	temperature	4
2.1.8	usrLED	4
2.1.9	bln	4
2.1.10	bOut	4
2.1.11	XBus	5
3	Related Documents	7

1. Node.js User Module

1.1 Introduction



The *Node.js* user module is not part of the router's firmware. It can be downloaded from <https://ep.advantech-bb.cz/user-modules>. The installation process for the user modules is described in the Configuration Manual (see [1], [2], [3] and [4]). **This user module is only compatible with v3 platform routers!**

The *Node.js* node is a proprietary server-side JavaScript runtime environment node available for Advantech cellular routers. This node is used by Advantech modules written in JavaScript, but can be used by any other third-party JavaScript application for routers administration and maintenance.

Router module contains this nodes addition to built-in nodes:

- **node-ffi** – addon for loading and calling dynamic libraries using pure JavaScript,
- **node-authenticate-pam** – asynchronous PAM authentication for NodeJS,
- **when.js** – [Promises/A+](#) and `when()` implementation, including a complete [ES6 Promise shim](#),
- **router node** – a proprietary node for Advantech's cellular routers described in this document in detail.

1.2 Building the Custom Nodes

An official way how to build and install a node is using `npm` command. However, it is not possible to find it on our routers as the router is embedded device with limited resources and some nodes require complex building environment and high performance because of other languages than JavaScript.

Fortunately, it is easy to prepare a node on a PC with Linux and then copy it to the router. For more details see <https://ep.advantech-bb.cz/support/faq/detail/building-the-custom-nodes-for-node-js-node-red>.

2. Router Node



This part of the document is dedicated especially to programmers.

Router node (named "router") provides access to router specific functions and hardware. You can load the *Node.js* node in your code by `require("router")`, for example:

```
var r = require("router");
```



We will use the *r* variable from this example to access all the properties in the next examples in this notes.

Simple Example of Router Node Use

In the next figure is an example of loading the *Node.js* node.

```
# NODE_PATH=/usr/lib/node_modules/ node
> var r = require("router");
undefined
> console.log("Welcome to Advantech router " + r.productName);
Welcome to Advantech router ICR-323x
undefined
>
```

Figure 1: Loading the Node.js Node

2.1 Node Properties

2.1.1 productName

Read-only string variable loaded with router's product name. Example of usage:

```
console.log(r.productName);
```

Output: *SPECTRE-v3T-LTE*

2.1.2 platformCode

Read-only string variable loaded with router's platform code. It is supported by routers of v3 and v4 production platform. Example of usage:

```
console.log(r.platformCode);
```

Output: V3

2.1.3 serialNumber

Read-only string variable loaded with router's serial number. Example of usage:

```
console.log(r.serialNumber);
```

Output: ACZ1100000322054

2.1.4 firmwareVersion

Read-only string variable loaded with router's firmware version. Example of usage:

```
console.log(r.firmwareVersion);
```

Output: 6.2.1 (2019-10-16)

2.1.5 RTCBatteryOK

Read-only boolean variable loaded with router's RTC battery state. True means OK, false means bad. Example of usage:

```
console.log(r.RTCBatteryOK);
```

Output: true

2.1.6 powerSupply

Read-only decimal number variable loaded with router's power supply voltage. Example of usage:

```
console.log(r.powerSupply + ' V');
```

Output: 11.701 V

2.1.7 temperature

Read-only integer number variable loaded with router's internal temperature in Celsius degrees. Example of usage:

```
console.log(r.temperature + ' °C');
```

Output: 39 °C

2.1.8 usrLED

Write-only boolean variable for control router's "USR" LED. Example of usage:

```
r.usrLED = true;
```

Sets USR LED to ON (lighting).

2.1.9 bIn

Read-only array with values on router's binary inputs. Array has the items related to number of the binary inputs. E.g. the router has BIN0 and BIN1 so array has valid indexes 0 and 1. The array items can have values 0 or 1. Example of usage:

```
console.log("Second binary input: " + r.bIn[1]);
```

Output: First binary input: 0

2.1.10 bOut

Array related to router's binary outputs. It is similar as B_IN but you can also write values. Written value change output state. Example of usage:

```
console.log(r.bOut[0]);
```

Output: 1

```
r.bOut[0] = 0;
```

Sets the first binary output to 0.

2.1.11 XBus

Object for working with X Bus. X Bus is a proprietary bus for communication between processes. E.g. you can subscribe informations which network interface go up/down or SMS from a mwan daemon. You can also send/subscribe your own topics between your applications.

```
XBus.publish(topic, payload, store=false)
```

Sends message with topic String and payload String to X Bus. Example of usage:

```
r.xBus.publish("watchdog/proc/myapp", "Timeout: 300");
```

Sends to the system watch request to watch your "myapp" application. The application must send this message regularly no later then period defined in the previous message (300 ms in this example). Timeout 0 stops watching.

```
XBus.subscribe(topic, callback)
```

Subscribes to get messages with topic. Example of usage:

Function:

```
xbus.subscribe("status/mobile/mwan0", (msg) => {console.log(msg.payload);});
```

Asynchronous output:

Registration: Home Network

Technology: LTE

Signal-Strength: -88 dBm

Signal-Quality: -8 dB

```
XBus.unsubscribe(topic)
```

Unsubscribe from topic. Example of usage:

```
r.XBus.unsubscribe(id);
```

Stops receiving info about registration to network from previous example.

```
XBus.list()
```

Lists stored messages. Example of usage:

```
r.XBus.list();
```


Output:

```
[ 'iface/ipv4/mwan0/config',  
  'iface/ipv4/mwan0/running',  
  'iface/ipv4/mwan1/config',  
  'iface/ipv4/mwan1/running',  
  'status/mobile/mwan0',  
  'status/mobile/mwan1',  
  'watchdog/proc/bard',  
  'watchdog/proc/bard6',  
  'watchdog/proc/mwan1d',  
  'watchdog/proc/mwan2d',  
  'watchdog/proc/mwanxd' ]
```

XBus.read(topic)

Read stored message from XBus. Example of usage:

```
r.XBus.read('iface/ipv4/mwan0/config');
```

Output:

```
Up: 1  
Iface: usb0  
Address: 10.184.131.221  
Gateway: 192.168.253.254  
DNS1: 217.77.165.211  
DNS2: 217.77.165.81
```

3. Related Documents

- [1] Advantech Czech: **SmartStart Configuration Manual** (MAN-0022-EN)
- [2] Advantech Czech: **SmartFlex Configuration Manual** (MAN-0023-EN)
- [3] Advantech Czech: **SmartMotion Configuration Manual** (MAN-0024-EN)
- [4] Advantech Czech: **ICR-3200 Configuration Manual** (MAN-0042-EN)
- [5] User Modules: <https://ep.advantech-bb.cz/user-modules>
- [6] JS Foundation: <https://nodered.org/>



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