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User's guide

Router Donyx
RS42 LTE CAT.6

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1. Specifications Sheet

This document applies to Router Donyx RS42 LTE CAT.6.

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2. General Information

The RS42 LTE CAT.6 is a compact industrial router designed for reliable data transmission over cellular networks using LTE, HSPA+, UMTS technologies.

Equipped with an LTE Cat 6 module, the router provides data transfer speeds of up to 300 Mbps (downlink) and 50 Mbps (uplink), making it suitable for bandwidth-intensive applications.

The RS42 LTE CAT.6 features industrial-grade interfaces, including GPI/GPO, PoE IN, and PoE OUT, to support a wide range of connectivity requirements in industrial environments. Additionally, it includes an integrated Wi-Fi access point supporting IEEE 802.11b/g/n standards, enabling wireless network deployment.

At the core of the RS42 LTE CAT.6 is a high-performance MIPS processor, ensuring reliable operation and efficient handling of networking tasks. The router runs on a customized firmware based on OpenWRT version 19, an open-source platform that enables flexible functionality and regular updates. This adaptability allows the RS42 LTE CAT.6 to meet diverse application needs, from simple connectivity to advanced network configurations.

Data transmission is secured with robust encryption protocols, ensuring the safety and integrity of transmitted information.

The RS42 LTE CAT.6 supports a comprehensive suite of network functions, including: DNS and Dynamic DNS (DynDNS), SSH Server, TFTP Client and Wget, SNMP, DHCP Server, Firewall and NAT, NTP Client, VLAN support.

Designed for both wireless and wired connectivity, the RS42 LTE CAT.6 is ideal for use cases such as:

- Payment terminals and ATMs
- Industrial equipment nodes
- Mobile offices
- Security and video surveillance systems
- Monitoring and control systems
- Other applications requiring fast, reliable Internet access

2.1. Cellular Standards

Table 1. Router Donyx RS42 LTE CAT.6 Cellular Standards

Cellular Module	UMTS	HSDPA/ HSUPA	HSPA+	LTE	GPS
LTE Cat 6	Yes	Yes	Yes	Yes	NO

Specifications may change without prior notice!

2.2. Hardware Specifications

Number of Cellular Modules	1 x LTE Category 6
Processor	MIPS 24KEc 580 MHz
Dynamic RAM	128 MB
Flash Memory Capacity	32 MB
Wi-Fi	2.4 GHz 802.11b/g/n
Ethernet Ports	2 x 10/100 Mbps
SIM Card Slots	2 x Mini SIM
Microfit4 Connector	Power, GPI/GPO
RST Button	Reset Button

2.3. Physical Specifications

- Maximum dimensions (including connectors): 130 × 95 × 35 mm
- Maximum weight: 240 g

2.4. Environmental Operating Ranges

- Enclosure Material: Aluminum
- Enclosure Protection Rating: IP30
- Operating Temperature Range: from -40°C to +65°C
- Storage Temperature Range: from -40 to 50°C
- Operating Humidity: from 10 to 80% noncondensing

2.5. Electrical Specifications

Power Supply Operating Characteristics:

- Supported Power Supply Voltage: 9–54 V DC
- Current consumption, maximum:
  - At power supply voltage +12 V – 800 mA
  - At power supply voltage +24 V – 400 mA

General Purpose Output (GPO):

- Output type: Open Drain

General Purpose Input (GPI):

- Voltage range for "High" level: 1.6 V to Vin
- Maximum input voltage: 30 V

2.6. Precautions

Restrictions on Router Usage Near Other Electronic Devices

- Power off the router in hospitals or in close proximity to medical devices (such as pacemakers, hearing aids, etc.). The router may cause interference with the operation of such equipment.
- Power off the router near gas stations, chemical plants, and blasting sites. The router may cause interference with the operation of equipment in these locations.
- Power off the router on aircraft and take measures to prevent accidental activation.
- At close range, the router may cause interference with the operation of televisions, radios, and other devices.

Environmental Protection

- Protect the router from dust and moisture.

Operational Considerations

- Adhere to permissible power supply and vibration standards at the device installation location.

3. Device Exterior

3.1. External Interfaces and Ports

The following figures display the front,back and plan views of the variants.

The rear views display powersupply, ports, and LEDs.

Figure 1. Front View

- **PORTS 1** - Ethernet Network Port, PoE IN
- **PORTS 2** - Ethernet Network Port, PoE OUT
- **SIM 1 - SIM 2** - SIM Card Trays
- **PWR** - Power Input Connector

The backviews display antenna connectors, and Reset Button.

Figure 2. Back View

- **Wi-Fi** - RP-SMA Connectors for Wi-Fi Antenna
- **AUX** - Mobile **AUX** Antenna Connector (Additional, Receive Only)
- **MAIN** - Mobile **Main** Antenna Connector (Primary, Transmit and Receive)
- **RST** - Reset Button

The planviews display LEDs.

Figure 3. Plan View

- Power/Boot Indicator
- SIM 1 Status Indicator
- SIM 2 Status Indicator
- Cellular Network Indicator (2G/3G/4G)
- Signal Strength Indicator (CSQ)

3.2. Power Input Connector

The Microfit4 power connector is used to connect the router to a power source.

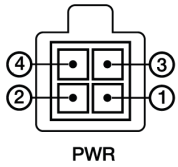

Figure 4. Power Connector

Table 2. Power Connector Pinout

Pin	Signal	Description
1	GPO	GPO_1 Contact
2	GPI	GPI_1 Contact
3	GND	Ground (Negative)
4	U+	Power (Positive)

3.3. Ethernet Network Ports

The Ethernet ports are used to connect local network devices and support speeds of 10/100/1000 Mbps.

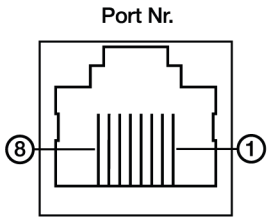

Figure 5. Ethernet Connector

Table 3. Ethernet Connector Pinout

Pin	Signal	Description
1	TX+	Transmit Positive
2	TX-	Transmit Negative
3	RX+	Receive Positive
4	VCC	Power Positive (Input or Output)
5	VCC	Power Positive (Input or Output)
6	RX-	Receive Negative
7	GND	Power Return (Input or Output)
8	GND	Power Return (Input or Output)

Port 1 supports Passive PoE-IN.

Port 2 supports Passive PoE-OUT.

3.4. Antenna Information

The router features the following antenna connectors:

Connector Type	Image	Purpose
1 x SMA Connectors		For cellular (Main) antennas
1 x SMA Connectors		For cellular (AUX) antennas
2 x RP-SMA Connectors		For Wi-Fi antennas

The **Main** antenna is the primary antenna and is used for both transmitting and receiving signals.

The **AUX** antenna is an auxiliary antenna and is used for receiving signals only.

The auxiliary antenna is recommended for use in environments with multipath propagation (e.g., dense urban areas) or in areas with high levels of signal noise. Using diversity reception with two antennas can improve signal quality and link stability in these challenging RF environments.

It is strongly recommended to use an antenna identical to the main antenna for the auxiliary port. Using dissimilar antennas for Main and AUX can degrade reception performance.

For installations deep within a building, in a basement or sub-basement, it is best to use an external antenna connected to the Main port. To minimize signal loss, the antenna cable length should not exceed 10 meters.

3.5. Reset button

The reset button can be used to reboot the router or restore it to factory default settings if access to the web interface or command-line interface is lost.

To reboot the device, press and hold the reset button for 3-8 seconds.

To restore factory default settings, press and hold the reset button for longer than 8 seconds.

Interrupting power to the router during a firmware upgrade or factory reset could render the device inoperable. Ensure that power is maintained throughout these processes.

3.6. Indicator Logic and Behavior

The router's indicators are located on the plan panel.

PWR Power/Status Indicator	
✳ Blinking Green	Firmware update in progress
● Solid Green	Normal operation
○ Off	No power
SIM Card 1/2 Activity Indicators	
○ Off	SIM card is not in use
● Solid Green	SIM card is in use
Cellular Network Indicator	
● Solid Green	4G (LTE) connection established
✳ Blinking Green	3G connection established
● Solid Red	2G connection established (if supported)
✳ Blinking Red	Connecting to the network
○ Off	No connection established
Signal Strength Indicator	
● Solid Green	High signal strength (70-100%)
✳ Blinking Green	Medium signal strength (35-70%)
● Solid Red	Low signal strength (0-35%)
○ Off	No connection established
LINK Port 1-2 LAN Port Status Indicator	
● Solid Green	Cable connected
✳ Blinking Green	Data transmission in progress
○ Off	No cable connected

4. Preparation and Connection

4.1. Connection

1. Connect the required antennas to their respective connectors. For proper operation, the M (Main) antennas must be connected.
2. Insert SIM cards into the designated SIM card trays.
3. Connect an Ethernet cable to the Ethernet ports (Port 1 … Port N, depending on the router model).
4. Connect the power adapter to the PWR connector.

   Allow the router sufficient time to boot. After 1-2 minutes, the PWR indicator will stop flashing, indicating that the router's operating system has successfully loaded. You can then connect to the router via its web interface.
5. Ensure that the IP address 192.168.1.1 is not in use on the local network and that the host computer is either configured to obtain an IP address automatically via DHCP, or has a static IP address assigned within the 192.168.1.0/24 subnet.
6. Open a web browser and enter http://192.168.1.1 in the address bar.
7. Log in using the default credentials: username root and password root.

4.2. SIM Card Installation

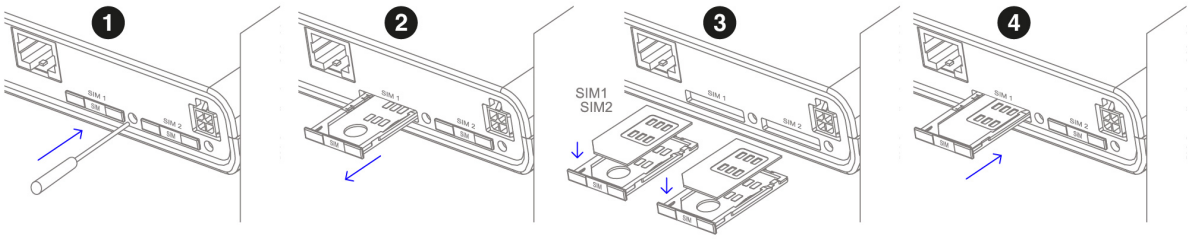

Figure 6. SIM Card Placement

1. Using a thin object, press the SIM tray eject button. The button is located to the right of the tray.
2. Remove the SIM tray.
3. Place the SIM card in the tray as shown in the diagram.
4. Insert the SIM tray into the router, ensuring it is properly aligned with the SIM holder guides.

SIM trays are inserted with the SIM card facing UP.

5. If the SIM tray is difficult to insert, it is likely misaligned with the guides. Carefully remove the tray and try again.

5. How to use

5.1. Local Network settings

This configuration assumes the router is connected to a PC via port3.

1. Releasing Ports from the Default Bridge:
   - Navigate to Network→Bridge→bridge0.
   - Remove port1, port2, and port4 from the bridge.
   - Apply and commit the changes.

Do not remove the port currently connected to your PC. This will result in loss of access to the router.

2. Creating a New Bridge:
   - Navigate to Network→Bridge.
   - Click "Add" to create a new bridge. Name the bridge lan.
   - Apply and commit the changes.
3. Adding Ports to the New Bridge:
   - Navigate to Network→Bridge→lan.
   - Add the desired ports to the bridge (e.g., port1).
   - Apply and commit the changes.
4. Configuring the IP Interface for the Bridge:
   - Navigate to IP→Interface.
   - Click "Add". From the dropdown menu, select the previously created bridge interface (lan). Set the type to static.
   - Navigate to the newly created interface IP→Interface→lan.
   - In the "IP Addresses" field, assign the desired IP address(es) to the interface. For example: 192.168.192.168/24.
   - Apply and commit the changes.

5.2. VLAN settings

This configuration example demonstrates how to create a VLAN interface, assign it to a physical port, and configure an IP address for the VLAN.

1. Creating the VLAN Interface:
   - Navigate to Network→Device.
   - Click "Add". In the resulting window, set the name (e.g., vlandev) and type to vlan.
2. Configuring the VLAN Interface:
   - Navigate to Network→Device→vlandev.
   - In the "Peer Device" field, specify the physical port to which the VLAN will be tagged (e.g., port 1).
   - In the "VID" field, assign the VLAN ID (e.g., 321).
3. Assigning an IP Address to the VLAN Interface:
   - Navigate to IP→Interface.
   - Click "Add". From the dropdown menu, select the previously created VLAN interface (vlandev). Set the type to static.
   - Navigate to the newly created interface IP→Interface→vlandev.
   - In the "IP Addresses" field, assign the desired IP address(es) to the interface. For example: 192.168.192.168/24
4. Saving the Configuration:
   - Apply and commit the changes.

5.3. Mobile settings

Mobile network configuration is performed in the Mobile→Modem section.

The configuration revolves around the concepts of "modem" (the cellular module) and sim<n> (referring to the SIM card in the corresponding SIM slot on the router).

Depending on the number of cellular modules installed, the section will display modem1 through modem_n.

After installing SIM cards, the mobile network will attempt to connect using default settings.

To enable a modem, select the checkbox next to its name. Clicking on the row itself provides access to all available settings for that modem.

The **Status** section displays status information from the cellular operator.

Modem Configuration Fields:

Setting	Description
Disabled	Enables/disables the modem.
SIM Slots	Enables/disables individual SIM cards. Available for multi-SIM modems.
Primary SIM	Specifies which SIM card is the primary (preferred) SIM.
Return To Primary	Specifies the time interval after which the router will attempt to switch back to the primary SIM card after failing over to a secondary SIM.
Connect Timeout	The time allowed for the SIM card to connect to the cellular network. After this timeout, the router power-cycles the modem and attempts to reconnect. Measured in seconds.
Specific Bands	Selection of specific frequency bands. For example: b<x> (4G/LTE), wcdma<x> (3G/UMTS), gsm<x> (2G/GSM).
Force MCCMNC	Allows restricting the selection of cellular operators. Specifies the Mobile Country Code (MCC) and Mobile Network Code (MNC) to uniquely identify the desired network. Useful for private cellular networks.
Protocol	Selection of connection protocol: PPP or Auto.
Metric	Numerical value indicating route preference. Lower values are preferred. (Optional)
Default Route	Enables this modem as the default route.

Use Peer DNS	Enables/disables the use of DNS servers provided by the cellular operator.
MTU	Maximum Transmission Unit (MTU) value.
Status > Modem > Name	Displays the model name of the cellular module installed in the router.

The **Reset** button at the top of the section restarts the selected modem.

This quick start guide provides essential information for configuring the Ethernet interface on your industrial router. For advanced configuration options, consult the full user manual.

5.4. Using General Purpose Inputs

Router RS42 LTE CAT.6 provides General Purpose Input/Output (GPI/GPO) accessible through a 4-pin MicroFit connector. The router provides one GPO pin and one GPI pin.

GPO Operation

To control power loads (such as powering external devices, interfaces, or sensors), configure the GPO output settings in the router's web interface.

Table 4. GPO Electrical Characteristics

Pin	Type	Maximum Current (mA)
GPO	Open Collector	150

Exceeding the maximum current will trip the fuse.

The GPO output switches the ground (GND) connection.

An example connection diagram is shown below:

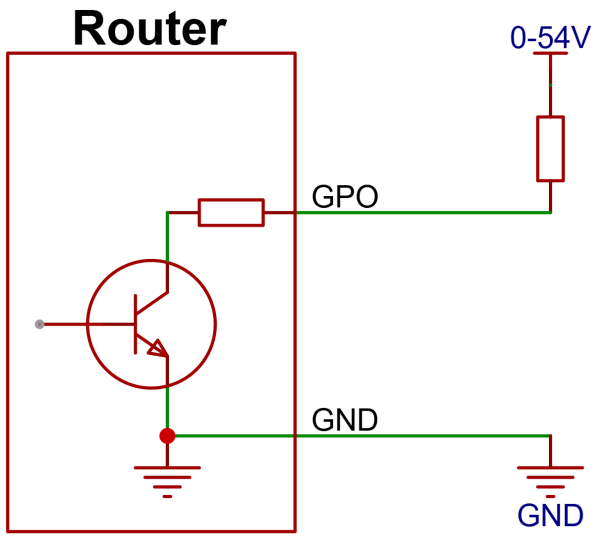

Figure 7. Connection Diagram for GPO

GPI Operation

To control external devices and read their status, configure the GPI input settings in the router's web interface.

The GPI input can be high (logic 1) or low (logic 0).

Table 5. GPI Electrical Characteristics

Pin	Logic Level	Maximum Input Voltage (V)
GPI	1	3-54
	0	0-0.5

Do not apply a voltage to the GPI input that exceeds the router's supply voltage of 54V.

An example connection diagram is shown below:

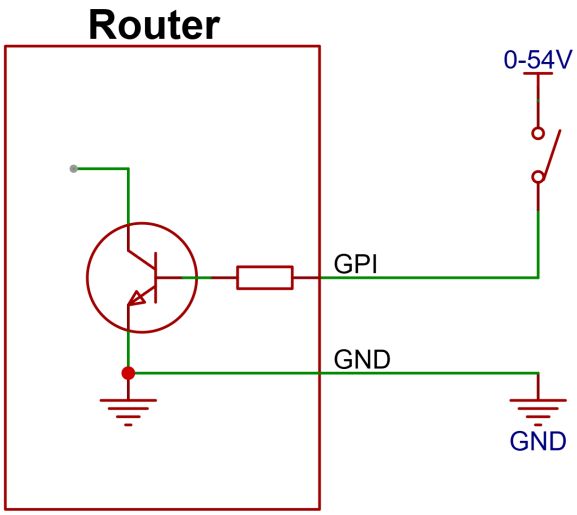

Figure 8. Connection Diagram for GPO

6. Customer Support

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