# RAPIDlink RL10





Permaconn

Unit 3/9-11 South Street Rydalmere NSW 2116 +61 2 9352 1777 support@rapidlink.com rapidlink.com

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# 1 Introduction

RAPIDlink is a managed connectivity platform that makes secure, remote communications easy to set-up and manage.

The RL1O is a managed router that incorporates a high-speed 4G internet gateway with in-built wireless connectivity (4G and Wi-Fi) and a secure cloud-based management portal for full remote configuration and management.

Pre-provisioned with dual SIM cards, the RAPIDlink RL10 is fast and easy to commission and requires minimal time on site.

Configuration is highly flexible with wired and wireless options for upstream (WAN) and downstream connectivity, IP to 4G fail-over.

## 2 Features

- High speed 4G gateway with up to 150Mbps download and 50Mbps upload speed.
- Pre-provisioned SIM cards.
- Fully featured Internet router with secure remote control of settings via the RAPIDlink cloud portal (e.g., firewall/ port-forwards, DDNS, VPN config etc).
- Secure network connectivity to the RAPIDlink portal ensures you can privately manage the settings of the device from anywhere with an internet connection.
- Wi-Fi supports both upstream (WAN) and downstream (Access Point) connectivity.
- Dual SIMs for resilience and optimised 4G network coverage.
- Automatic failover from IP to 4G (if using WAN IP).
- 3 LAN ports (1 of these can be configured as WAN).
- 3 Inputs and 3 Outputs that can be remotely managed via the RAPIDlink cloud portal.
- Built-in watchdogs to automatically recover the device in the event of connection issues.
- Non-volatile memory stores all setup information in the event of a power failure.

# **3 RAPIDlink Portal**

The RAPIDlink cloud portal is provided by Permaconn, the Australian market leader in mission-critical comms for the security industry and is hosted on multiple secure Australian servers.

The portal enables full remote configuration of RAPIDlink routers, easy management of services and data allowances, and simple set-up of access rights for your staff and end-users.

Sign up or log in at <a href="https://www.rapidlink.com">https://www.rapidlink.com</a>

# 4 What's in the box?

- RAPIDLink RL10 router
- Three core antenna set (2 X 4G and 1 X Wi-Fi)
- Euro style terminal plug (1 X 2 Pin and 1 X 9 Pin)
- $3.3k\Omega$  "end-of line" resistors X 3 for use with input monitoring
- Flat head screwdriver
- 1 x metal ground plate

#### 4.1 Optional Accessories - available to purchase separately

- 12V DC Power Supply
- High-gain 4G antenna
- 3m, 5m and 10m antenna extension cables

# **5** Installation Procedure

#### 5.1 Summary

- 1. Create a RAPIDlink Portal account if you don't already have one. Visit <u>www.rapidlink.com</u>
- 2. Add the device to your account in the Portal
- 3. Subscribe the device to a Data Pack
- 4. Power-up the RAPIDlink device
- 5. Use the Portal to configure the RAPIDlink

#### 5.2 Create a RAPIDlink Portal account

You will need a company account to purchase and manage data services, and a user account to login to the RAPIDLink portal.

If you need to set up a new company account, please call Permaconn on 02 9352 1777.

If you do not already have a RAPIDlink portal account but you are joining an existing company account, then ask your administrator to send you an invitation.

#### 5.3 Adding a New RAPIDLink device to your account

- 1. Login to the RAPIDlink portal at www.rapidlink.com
- 2. Select your Company Dashboard to see the list of any existing devices
- 3. Click Add Device and enter the serial number of the new device. The serial number is located on a sticker on the underside of the device, and begins with the letter D.

Add New I	Device		
Device Serial:	*		
RLXX-	D		
Add Devie	ce Ø	Cancel	×

#### 5.4 Subscribe to a Data Pack

For a RAPIDlink device to communicate over the 4G network, it needs to have a valid monthly Data Pack subscription.

- 1. Select the device from your company's dashboard.
- 2. Click 'Change' button under 'Subscription'.

Data Pa	ck Subscriptio	n	
Data Pack:	1GB Data Pack	Data Used: Data Available:	0МВ 1023МВ

3. Select the relevant Data Pack and click 'Next'.

	Data Pack	Monthly Data Allowed	Monthly Cost
	None	0 MB	\$0.00
۲	10GB Data Pack [DP-10GB-RL]	10,240 MB	\$48.00
			Next

4. Accept the Terms and Conditions and click 'Subscribe'.

	Current Data Pack	New Data Pack
Name	None	10GB Data Pack [DP-10GB-RL]
Monthly Data Allowed (from next month)	0MB	10,240MB
Monthly Data Cost (from next month, excludes GST)	\$0.00	\$48.00
Data Allowed This Month (indicative)	OMB	10,240MB
Data Cost This Month (indicative, excludes GST)	\$0.00	\$48.00
I have read and agree to	Permaconn's terms a	nd conditions. Subscribe

## 5.5 Power-up the RAPIDLink device

- 1. Attach the three antennas to the 4G Main, 4G Aux and Wi-Fi connectors. The 4G antennas are different to the Wi-Fi antenna, and these need to be connected to correct colour-coded connector.
- 2. Apply 12v DC to the power supply terminals.
- 3. Wait for the device to complete its boot up sequence. The STATUS LED will blink green when ready.
- 4. Check that the device is receiving a 4G connection by checking that the MOBILE LED is green.
- 5. Check the 4G signal strength by referring to the SIGNAL LED.
  - a. Green good signal strength.
  - b. Amber moderate signal strength.
  - c. Red poor signal strength try relocating antennas to a different location or try a high-gain antenna (available separately). Signal strength is also displayed in the Portal.

#### 5.6 Configure the RAPIDLink

RAPIDlink can be configured to support many different applications including:

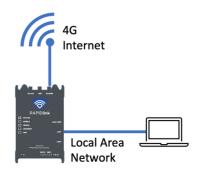
- 4G Internet Gateway to LAN.
- 4G Wi-Fi Hot Spot.
- Internet Gateway with 4G Failover.

Each of these scenarios is described below.

#### 5.6.1 4G Internet Gateway to LAN

The RAPIDlink device will operate as a 4G Internet Gateway without any further configuration.

Simply connect the local device or network into the LANI or LAN2 port. RAPIDLink will provide the local device with an IP address via DHCP and route traffic to the Internet via the 4G wireless link.





#### 5.6.2 4G Wi-Fi Hot Spot

To use the RAPIDlink as a Wi-Fi hotspot and allow local machines to access the internet:

- 1. Select the RAPIDlink from the Dashboard.
- 2. Click on the Wi-Fi tile.
- 3. Turn on Enable Wi-Fi.
- 4. Set the SSID network name.
- 5. Set a password to access the Wi-Fi access point.
- 6. Click Save.

Local machines will now be able to see and connect to the new Wi-Fi access point.

#### 5.6.3 Internet Gateway with 4G Failover

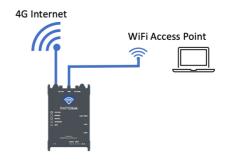
To use the RAPIDlink as an internet gateway that primarily uses an upstream Internet connection, but can failover to 4G:

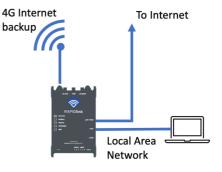
- 1. Select the device from the Dashboard.
- 2. Click on WAN to configure the WAN settings.
- 3. Select Upstream Ethernet (using WAN port).
- 4. Select connection Automatically (Using DHCP).
- 5. Click Use DNS from upstream DHCP.
- 6. Click Save.

Devices connected to the LAN ports of the RAPIDlink device can be externally accessed via 4G port forwards using the DDNS service provided. To access a local device utilizing either the WAN connection or via 4G (high availability inbound connection) the device needs to be configured to connect to the Permaconn managed VPN service; contact our support team for further details.

To ensure that the RAPIDlink can connect and be managed by the Portal, ensure that the upstream Internet connection allows outbound connections on the following ports:

Port	Protocol
11443	TCP
55300	UDP
59682	UDP





# 6 Data Pooling

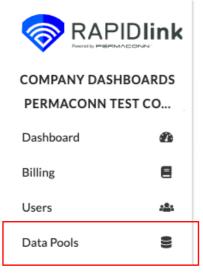
The Data Pooling feature allows multiple devices on the same size data pack to share their data across the pool.

When a device is in a Data Pool, it can use more than its allocated data so long as there is data available on other devices.

**Note:** when the data in a Data Pool is exhausted, all devices in that pool will stop transferring data until the pool is topped up, or the next month commences. To add more data to a Data Pool, simply top-up the data on any device in that pool

#### 6.1 Create a Data Pool:

1. Select the Data Pools option in the menu:



2. Click the Create New Data Pool button Permaconn Test Company Data Pools

Data Pool Name	Data Pack Name	Number of Devices	Data Usage
Create New Data Pool +			

3. Give the new Data Pool a name to help identify it later and choose the size of Data Packs that this pool will contain. Data Pools can only pool data from Data Packs of the same size.

Create New	Data P	ool
ata Pool Name *		
My Data Pool #1		
ata Pack *		
1GB Data Pack		•
Cancel 🗙	Create	+

#### 6.2 Add devices to the Data Pool

- 1. Select the device you want to add to the Data Pool from the Dashboard page
- 2. Click on the Data Pack Subscription tile

Data Pa	ck Subscription		
Data Pack:	1GB Data Pack	Data Used: Data Available:	ОМВ 1023МВ

3. Click on the Pool Data Pack option

## **Data Pack Subscription**

Data Pack		
Pack Name:	1GB Data Pack 1,024 MB	Change Data Pack 🤤
Top Ups & Credits for This Month:	0 MB	Top Up 🔹
Total Allowed Data This Month:	51,200 MB	
Auto Renew	Yes - at end of the month	Cancel Automatic Renewal
Data Pool:	None	Pool Data Pack 🛛 🔿

4. Select the desired Data Pool.

**Note:** you will only see existing Data Pools that have the same size as the Data Pack assigned to this device.

ect Data Pool *	
My Data Pool #1	•
I acknowledge that by adding this device to the data pool that data may	be consumed by other devices in the po
	be consumed by other devices in the po
	Confirm 🔿

#### Add Device to Data Pool

# 7 Using Inputs and Outputs

RAPIDlink provides three general purpose inputs and three general purpose outputs for monitoring and controlling external systems.

## 7.1 Input Electrical Wiring

Inputs are triggered by a switch from the input to ground in parallel with a  $3k3\Omega$  endof-line resistor (supplied). See figure 7.1 for an example wiring for Input 1.

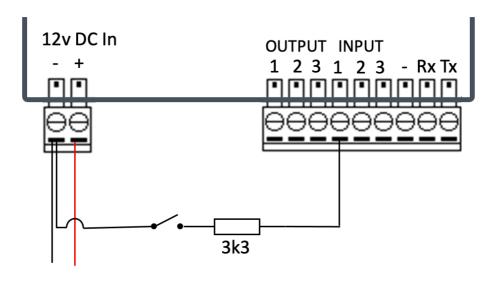


Figure 7.1 – Example circuit diagram using Input 1

Note: The input requires the end-of-line resistor to operate correctly.

## 7.2 Input in the Portal

Inputs can be monitored and configured through the RAPIDlink portal.

Selecting a RAPIDlink device will provide a summary of the state of inputs and outputs on that device (Figure 7.2). Clicking the blue arrow on the Inputs panel will take you to the Input detail page (Figure 7.3).

If an input changes state, this will be reflected in real time on both the summary and detail pages.

Using the above circuit diagram, when the switch is open, the input status is "Nominal". When the switch is closed, the input status is "Triggered". These status labels can be renamed on the input detail configuration page, see below.

		Dashboard / RLXX-D5104880			
		My-RL10 /			
COMPANY DASHBOA PERMACONN TEST C					
Dashboard	0	Information Connectivity	>		
Billing	8	Serial: RLXX-D5104880 Reachable: yes 2			
Orders	π	Model: RLV14G Signal Strength:			
Users	222	Owner: Permaconn rest Company			
Data Pools	8	Download Manual 🛛 🕑			
Customer Access	8				
PERSONAL DASHBOA		Data Packs and Top-Ups $\rightarrow$ WAN	<b>→</b>		
Account	0	Data Pack: 500MB Data Pack Data Used: 0MB Mode: disabled			
	65	Data Available: 500MB Status: offline			
Sign Out	6	Total Allowance: 500MB			
Sign Out					
		Wi-Fi	<b>→</b>		
		Not configured LAN/WAN: disconnected IP: 192.168.111			
		LAN1: disconnected Subnet Mask: 255.255.255	5.0		
		LAN2: disconnected			
		VPN	<b>→</b>		
		Status: Disabled O ports open for forwarding			
		Connection: Disconnected			
		VPN Address: Unknown			
		Inputs    Outputs  Outputs	>		
		Input1:   nominal  Output1: off  Pulse			
		Input2: Otriggered Output2: open Putse 7			
		Input3: O trissered			
		Output3: open Pulse +			

Figure 7.2 – Device Input/Output Summary

Inputs		
Input1:	• nominal	4
Input2:	✓ triggered	4
Input3:	✓ triggered	Ą

Figure 7.3 Input Status Detail Screen

## 7.3 Configuring the Inputs

Clicking on the spanner icon, will take you to the Input configuration options for that Input (Figure 7.4).

	Input Label		
	input1		
	Triggered Circuit Status Label	Nominal Circuit Status Label	
	triggered	nominal	
nput1:	Highlight Status		
	Nominal Status		
	Enable email notification		
	Shows in the app		
	Save Cancel		
Input2:	✓ triggered	Ą	

Figure 7.4 – Input configuration options

These options change the behaviour and labelling of the Input.

- **Input Label** an option to give the input a descriptive name. This name will be used in the Portal and in the mobile app.
- **Status Labels** an option to provide each state a descriptive name. For example, "open", "closed", "on", "off", "full", "low", "empty", "sealed", "violated" etc.
- **Highlight Status** selects which status is the "active" status (shown in blue, rather than in grey). There is also an option for having neither status highlighted.
- Email Notification select this option and provide an email address to receive notification of this input changing status. The automated email message will use the custom input and status labels if they have been provided.

This option is not recommended for frequently changing inputs. Consider using the RAPIDlink mobile app notifications instead. See below.

• Shows in the app – select this option to make this Input visible in the RAPIDlink mobile app.

## 7.4 Output Electrical Wiring

Outputs are Open Collector style outputs and acts as a sink to ground when activated. The output will drive a load up to 50mA. Loads of greater than 50mA will require an additional relay (not supplied).

#### 7.4.1 Example Wiring Diagram – External LED

The outputs can drive an LED and  $3k3 \Omega$  resistor (supplied) in series. See figure 7.5 below for details.

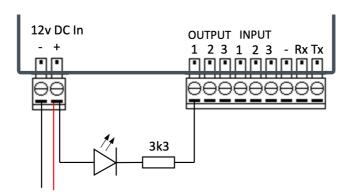
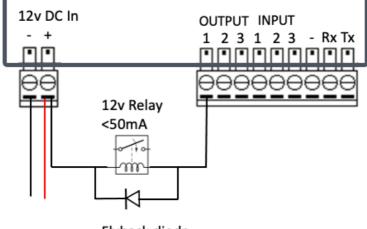


Figure 7.5 – Example circuit diagram for external LED

#### 7.4.2 Example Wiring Diagram – External 12v Relay

The outputs can be used to drive larger loads via a 12v relay (not supplied). The circuit diagram for a relay is show below in Figure 7.6 below.

Note: the use of an external relay requires a flyback diode (not supplied) to protect the internal circuitry of the RL10.



Flyback diode IN4007 or equivalent

Figure 7.6– Example circuit diagram for external 12v relay

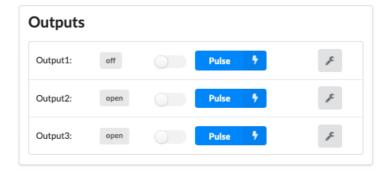
#### 7.5 Using Outputs

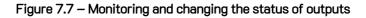
Outputs have two states, **Open** or **Closed** reflecting either an open-circuit or closedcircuit on in the electrical circuit respectively. These status labels can be renamed in the configuration. See below.

There are two actions available for an output:

- Change the status Turning the switch to on closes the circuit. Turning the switch to off opens the circuit.
- **Pulse the output** This changes the output to closed momentarily, then opens it again. Note: The status will always return to open after a Pulse, even if it started closed.

See figure 7.7 below





## 7.6 Configuring Outputs

Click on the spanner icon to access the configuration page. These options change the behaviours and labels of the Outputs. See Figure 7.8 below.

- **Output Label** an option to give the output a descriptive name. This name will be used in the Portal and in the mobile app.
- **Status Labels** an option to provide each state a descriptive name. For example, "open", "closed" or "on", "off".
- **Highlight Status** selects which status is the "active" status (shown as black on white, rather than grey). There is also an option for having neither status highlighted.
- Actions Available selects what actions should be visible in the portal and the mobile app.
  - o Open and Close only
  - o Pulse only
  - Open, Close and Pulse
- Shows in the app selecting this option makes the output visible in the RAPIDlink Mobile App

Outputs			
	Output Label		
	output1		
	Open Status Label	Closed Status Label	
	LED off	LED on	
	Highlight Status		
	Open Status		•
Output1:	Actions Available		
	Open, Close and Pulse 👻		
	Pulse Action Text		
	open door		
	<ul> <li>Shows in the app</li> </ul>		
	Save Cancel		

Figure 7.8 – Output Options

# 8 End User Mobile App

RAPIDLink has a companion Mobile App for Android and iOS that provides an end-user access to the input and output features of the device without providing them access to the configuration or billing information in the portal.

5:21 ⋪	ashboard
<b>My-RL10</b> Device Serial: d5104 Online: Yes	880
ビ Input	
Water Tank 1	🕒 Full
🖸 Output	_
Main Water Pump Pump Off	
Lighting System Lights Off	
Dashboard	Account

Figure 8.1 – Example of the RAPIDlink App configured for one input and two outputs

## 8.1 Setting up the Mobile App

#### 8.1.1 Download the App

The end user installs the RAPIDlink app to their mobile device from the Google Play and the iOS App Store.

#### 8.1.2 Register for an Account

If there is no existing end user account, the end user opens the app and selects the option "Don't have an account, Sign up!" (Figure 8.2)

The End User completes the registration form in the App (Figure 8.3). They will receive a verification code via email which they enter the App to complete the registration (Figure 8.4).

Once registered, the End User has an account but does not yet have access to any RAPIDlink devices (Figure 8.5). Configuring device permissions is done in the Portal and is described in the next section.

Once devices are associated with a user, they will appear in the Device List page of the App (Figure 8.6). Selecting a device will show the Device Dashboard (Figure 8.7).

16:12 🕅 🗢 🛔 • 💎 🛢	16:13 🛤 🗢 🛔 • 🔷 🛡 🕯	16:15 🛤 🗢 🛔 • 🔷 🕈 🔒	16:16 🕅 🗢 🛔 • 🔷 🕈 🗎
RAPIDlink	← Create Your Account	← Verify Email	Dashboard
	First Name	Verify Email	
×	Last Name	We have sent a registration confirmation code to your email bob⊚gmail.com Please enter your confirmation code:	
Username	Email		
Password 💿	+61 - Mobile Number	Resend Email	Q You do not yet have access to any RAPIDlink
Don't have an account? Sign up!	Password O		devices. This may be because your installer has not yet finished setting up your system.
LOGIN Forgat Password	Confirm Password  Password must be at least 8 characters long and contain at least 1 uppercase character and 1 mumber.  I have read and agree to the <u>Terms &amp; Conditions</u> SIGN UP		Please contact your installer, or the <u>RAPIDInk</u> team.
			Home Account

Figure 8.2

Figure 8.3

Figure 8.4

O Ok

Figure 8.5

Dashboard     Devices       Please Select a Device       Smith Family       Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2"       Image: Colspan="2"       Image: Colspan="2"			
Please Select a Device          Smith Family         Image: Comparison of the select of the se			
Smith Family My-RL10	< Dashboard	Devices	
• My-RL10		e Select a Device	
	Smith Family		
<b>□</b>	My-RL10		>
<b>□</b>			
Dashboard Account	•		
	Dashboard	Acc	ount

Figure 8.6

Figure 8.7

-----

## 8.2 End User Permission Summary

The permissions structure in RAPIDlink provides control over which App users can view and/or control which RAPIDlink devices.

RAPIDLink app permissions begin with a Customer Access Control Groups, which contains a set of devices, users, and permissions.

Within the Customer Access control Group, there are:

- one or more groups of RAPIDLink devices (Device Group)
- one or more groups of users (User Group).
- A set of permissions that User Group has on a Device Group. Permissions can be either **Monitor** (can view status of inputs and outputs) or **Monitor and Control** (can view status of inputs and outputs and change the state of outputs).

See Figure 8.8 below.

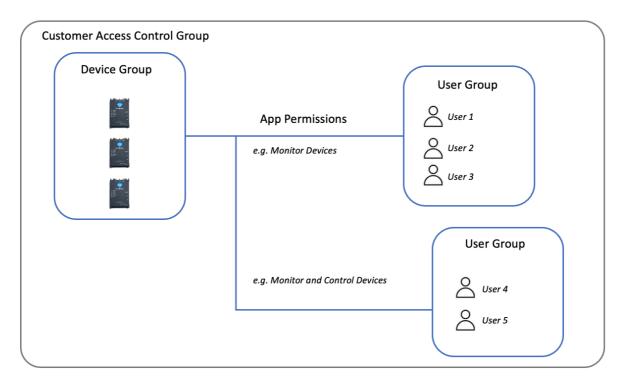


Figure 8.8 – Overview of RAPIDlink Mobile App End User Permissions

In this example, there are three RAPIDlink devices in a group. Users 1, 2 and 3 can see three devices in their App and they can monitor the state of the inputs and outputs on those devices. They cannot change the status of outputs.

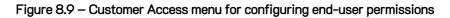
User 4 and User 5 can both see all three devices in the App, view the state of the inputs and outputs, as well as change the status of the outputs.

#### 8.3 Configuring End User Access

#### 8.3.1 Create a Customer Access Control Group

Select the Customer Access item from the main menu. (Figure 8.9) and create a new Customer Access Control Group.

RAPIDlink	Customer Access Control			
COMPANY DASHBOARDS PERMACONN TEST CO	Access Control rules are used to provide end-user customers with access to specific RAPIDlink devices via the mobile app. Create an Access Control Group to set up devices, end users and their permissions.			
Dashboard 🕉	Customer			
Billing	Bob Farm Bob Farm			
Orders 🐂	marcus test			
Users 🚢				
Data Pools	Create New Customer Access Control Group			
Customer Access	Name			
PERSONAL DASHBOARD	Smith Family			
MARC ENGLARO	Add Cancel			
Account O				
Messages 64				
Sign Out 🚱				



#### 8.3.2 Create a Customer User Group

Select the Customer Access Control Group you just created and create a new User Group. (Figure 8.10).

#### **Customer Access Control Group: Smith Family**

Customer User Group					
Create a User Group and add one or more use	Create a User Group and add one or more usersCreate				
User Group Name	Users				
Staff			Add User 🗊 Delete		
Create User Group User Group Name * Owners Save Cancel					

#### Figure 8.10– Add a new User Group

#### 8.3.3 Add users to the User Group

Select Add User to add one or more users to this User Group (Figure 8.11). All the users in a group will receive the same permissions. If you need different permissions for different users, then create additional User Groups.

The only information required to add a user is an email address. This address must match the email address the end user used when they registered for the App in section 8.1.2 above.

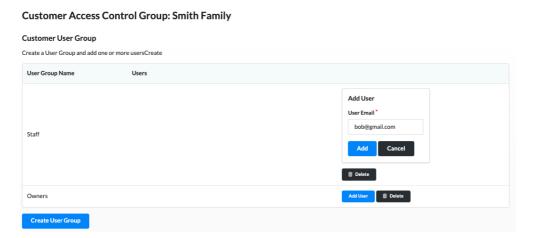


Figure 8.11 Add users to the User Group using just their email address

#### 8.3.4 Create Device Group

Create a new Device Group.

#### **Customer Access Control Group: Smith Family**

Customer User Group			
Create a User Group and add one or more users	Create		
User Group Name	Users		
Staff		Add User 🗊 Delete	
Owners		Add User 🗊 Delete	
Create User Group			
Device Group			
Create a Device Group and add one or more dev	vices then define their end-user permissions		
Device Group Devices Name	User Groups		
Create Device Group			
Device Group Name *			
NSW Devices			
Save Cancel			



#### 8.3.5 Add Devices to the Device Group

Add one or more RAPIDLink devices to this group by using the serial number of the device.

Device Group			
Create a Device Gro	oup and add one or more devices then define	their end-user permissions	
Device Group Name	Devices	User Groups	
NSW Devices	Add Device Device Serial * D 510 488 0 Add Cancel	+ Add User Group	🖀 Delete

Figure 8.13 – Adding a Device to a Device Group

**Note:** A single RAPIDlink device can only be in one Device Group. If the device is already in another Device Group in any Customer Access Control Group, the system will show an alert message at this step.

#### 8.3.6 Add User Groups to the Device Group and Set Permissions

Press the Add User Group and select from the list of available User Groups.

Set the permissions for each User Group.

**Note:** If no permissions are granted, the End User will be able to see the device in the App in the device list, but will receive an error saying "No Configuration – This device is not yet configured for the App"

Device Group	oup and add one or more devices the	teles their and user permissions
Device Group Name	Devices	User Groups
NSW Devices	Add Device Device Serial* D 510 488 0 Add Cancel	Add User Group Please a select user group * Staff App Permissions Can monitor device Can monitor and control device Save Cancel

Figure 8.14 – Add User Groups and Select Permissions

# 9 Troubleshooting

## 9.1 RL10 - LED Status Indicators

RAPIDlink LEDs	Activity	Indication
	Green Flashing	Processor OK
STATUS	Red Flashing	Processor Rebooting
	Off	Processor Off / No power
	Green Flashing	Data traffic on 3G/4G
MOBILE	Green ON	No data traffic on 3G/ 4G but unit is connected
	Amber On	Available but on standby (not currently in use)
	Red On	Unit is offline/ Not connected
	Green ON	Good signal strength
SIGNAL	Amber On	Moderate signal strength
	Red On	Poor signal strength
	Off	No signal strength
	Green Flashing	Data traffic on IP network (non-mobile)
INTERNET	Green ON	No data traffic on IP but unit is connected
	Amber On	Connectivity issue (firewall, VPN, data-pack, etc)
	Red On	Unit is offline
	Green ON	Wi-Fi AP mode connected with internet
WI-FI	Amber On	Wi-Fi AP mode connected but no internet
	Red On	Wi-Fi AP mode enabled but not connected
	Off	Wi-Fi AP mode not enabled

## 9.2 Reboot the RL10

To reboot the RL10, either remove power or use a small screwdriver to press the Reset button in the Reset slot (see right)

#### 9.3 Factory Reset the RL10

To restore the factory setup on the unit:

- 1. Power up the RL10.
- 2. Use a small screwdriver to press the Reset button unit until all LEDs flash green together, this indicates a successful Reset.
- 3. Keep the device powered until the reset is complete and the STATUS LED returns to green.





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