RAPIX COMMISSIONING 4

TESTING AND DEBUGGING

18 MAY 2022

COURSE PURPOSE

Introduction to RAPIX Testing and Debugging.

This will help you to understand:

- Logs:
  - RAPIX Addressing/Integrator Log;
  - DALI Log;
  - Zone Controller Log.
- Project Report;
- Zone Controller Report;
- Testing techniques;
- Diagnostic techniques.

COURSE PURPOSE

Pre-requisites.

It is recommended that you have already completed:

- DALI Basics;

- RAPIX Introduction;

- RAPIX Commissioning 1 - RAPIX Addressing;

- RAPIX Commissioning 2 - RAPIX Integrator.

LOGS

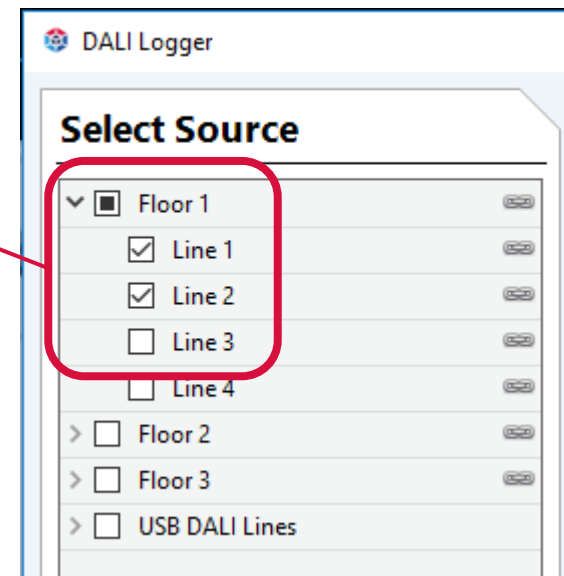# LOGS (TECHNICAL SUPPORT)

RAPIX Log

- Contains details of any errors;

- Generally only useful to Tech Support staff;

- Can be found in:

  - C:\ProgramData\Diginet\RapixAddressing\Logs

  - C:\ProgramData\Diginet\RapixIntegrator\Logs

  - C:\ProgramData\Diginet\RapixEmergencyDali\Logs

- Can exported using menu Export Logs;

- Can have different level of detail configurable in Options.

LOGS (DALI TRAFFIC)

DALI Log

- Starting the log:
  - 1. Click the **DALI Logger** button.
  - 2. Select the DALI Lines to log.
  - 3. Click the **Start Log** button.

LOGS (DALI TRAFFIC)

DALI Log

- Viewing the log:

Origin of the event:
- **Local**: this interface
- **Remote**: some other DALI Device

DALI Line of the event

DALI Address

DALI Command

Time of the event

Activity on DALI Line   Export...   Import...

⌄ **Filters** No filters enabled.   Q Search
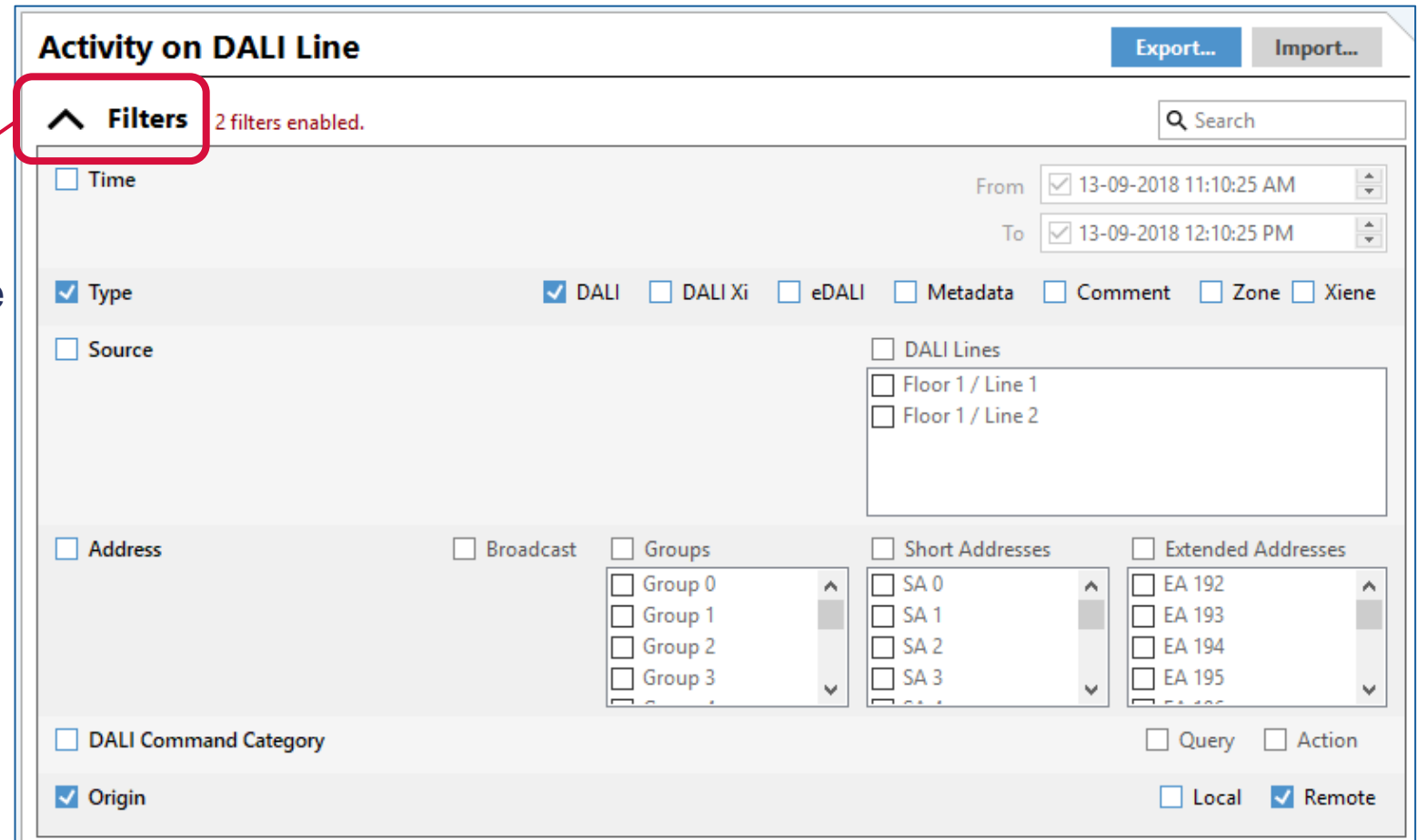
Time	Type	Source	Address	Command	Reply	Origin	Data
13-09-2018 11:18:44.439 AM	DALI	Floor 1 / Line 2	SA 55	QUERY ACTUAL LEVEL	254	Local	6fa0 fe
13-09-2018 11:18:44.480 AM	DALI	Floor 1 / Line 2	SA 55	QUERY STATUS	132	Local	6f90 84
13-09-2018 11:18:52.773 AM	Xi	Floor 1 / Line 2	EA 194	Xi Device Poll, Source Xi ..	DALI No	Local	18c2ee
13-09-2018 11:19:00.068 AM	DALI	Floor 1 / Line 1	SA 21	QUERY ACTUAL LEVEL	0	Local	2ba0 00
13-09-2018 11:19:00.114 AM	DALI	Floor 1 / Line 1	SA 21	QUERY STATUS	0	Local	2b90 00
13-09-2018 11:19:40.686 AM	DALI	Floor 1 / Line 2	SA 56	QUERY ACTUAL LEVEL	0	Local	71a0 00
13-09-2018 11:19:40.731 AM	DALI	Floor 1 / Line 2	SA 56	QUERY STATUS	129	Local	7190 81

LOGS (DALI TRAFFIC)

DALI Log

- Save to a file.

Click to export the log as a text file

LOGS (DALI TRAFFIC)

DALI Log

- Filtering the log.

Enter a keyword to show only events with this text

LOGS (DALI TRAFFIC)

DALI Log

- Complex Filtering
  - Click the Filters button
  - Select events you want to see
    - Time range
    - Message type
    - DALI Line
    - Specific Device(s)
    - Specific Groups
    - Message origin

LOGS (ZONE CONTROLLER)

Zone Controller Log:

- 1. Select Zone Controller in RAPIX Integrator.

- 2. Click Get Logs button.

- 3. Select where the log is to be stored.

- 4. Unzip/extract the log:

  - The one usually needed is "debug.log"

  - These are usually only useful to Tech Support staff.
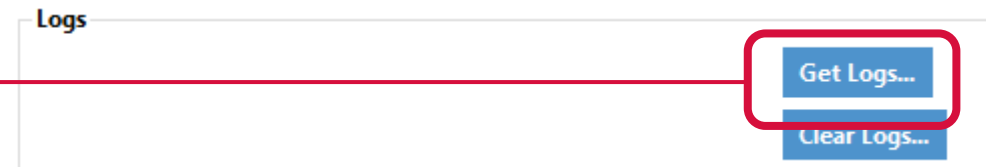
LOGS (ZONE CONTROLLER)

Zone Controller Log.

- There are different "levels" of logging:
    - Verbose: lots of detail.
    - Info: more detail than normal.
    - Warning: normal setting.
    - Error: minimum detail.

- Leave the log at "Warning" unless more detail is required.

- To change the log level, use the Zone Controller buttons:
    - Navigate to menu item "1.12.9 LOG LEVEL"
    - Press **OK**
    - Press ▲ ▼ to select required level
    - Press **OK**

1.12.9 LOG LEVEL
WARNING

RAPIX
LIGHTING
CONTROL SYSTEM

DALI ZONE CONTROLLER

LOGS (ZONE CONTROLLER)

Zone Controller Compact DALI Log.

- Records all DALI messages

- Records a few days to a few months of data (depending on how busy the site is)

- Can be imported into RAPIX Integrator to be viewed for debugging

- See https://ozuno.com/rapix-lighting-control-system/fault-finding-dali-systems-using-rapix/

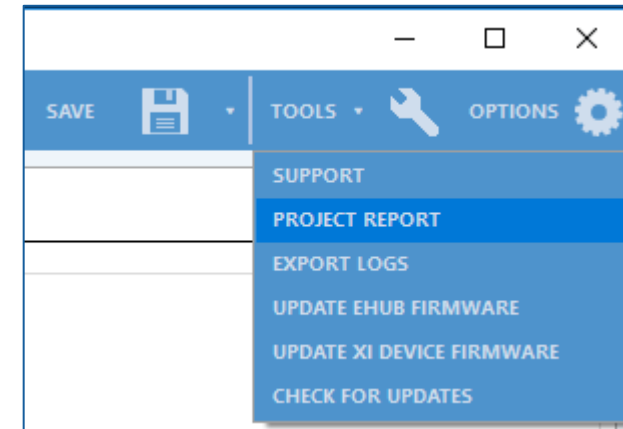# EXERCISE 1

USING THE LOG

PROJECT REPORT

PROJECT REPORT

Generating a Project Report.

- 1. Open the project;

- 2. Select **Project Report** from **Tools** menu;

- 3. Select where to save it;

- 4. Click **Save.**

PROJECT REPORT

What is in a Project Report?

- Format:
  - HTML File (single text file)
- Contents:
  - Project details
    - Number of devices etc.
  - Summary of:
    - Zone Controllers
    - Zones & Scenes
    - Schedules
    - Xi Operating Properties and Flags
    - DALI Devices
  - Project Warnings

PROJECT REPORT

Using a Project Report

- Everything is hyperlinked:
    - Allows for quick navigation

- Typical uses:
    - Finding what is in a Zone or Scene;
    - Finding what controls a Zone, or Scene;
    - Finding what controls a DALI Device or Group;
    - Finding how an eHub is configured;
    - Finding errors in the project;
    - "As-built" documentation.

PROJECT REPORT

Example

- To find the devices that control a Zone:
  - 1. Click "Zones" in the Contents
  - 2. Scroll to the Zone in question
  - 3. The "Usage" table lists everything controlling the Zone
  - 4. Click on the listed eHubs, Schedules or Scenes for more details

Usage	Details
Direct Control	
Floor 1/Line 1/eHub 192 "Floor 1A"	Channel 2, Button 1, Toggle Dimmer
Schedule "Floor 1"	Every day at 9:00:00 PM Set Zone "Office 1" off.
Control via Scene "Floor 1 Off"	
Floor 1/Line 1/eHub 192 "Floor 1A"	Channel 4, After Hours, Scene Control

PROJECT REPORT

Project Warnings

- Warn of potential problems with the site configuration;

- **They should not be ignored!**

- Warnings include:

  - Devices not confirmed or synchronised;

  - Zones or Scenes that are empty;

  - Zones or Scenes that are not used anywhere;

  - DALI Devices that are not used by anything;

  - Zone Controllers or eHubs that require an update.

PROJECT REPORT

Device Warnings

- Only available if connected to the site;

- Warnings include:

    - Zone Controllers that are not communicating;

    - DALI Lines with no power;

    - DALI Devices that are missing;

    - DALI Devices with a lamp failure;

    - Emergency Devices with a failure;

    - DALI Devices that are not DALI compliant;

    - Missing eHub peripherals.

PROJECT REPORT

Customising a Project Report

- It is an HTML File
  - Can be edited with an HTML editor
  - Can manually edit the CSS styles
    - e.g. change colours
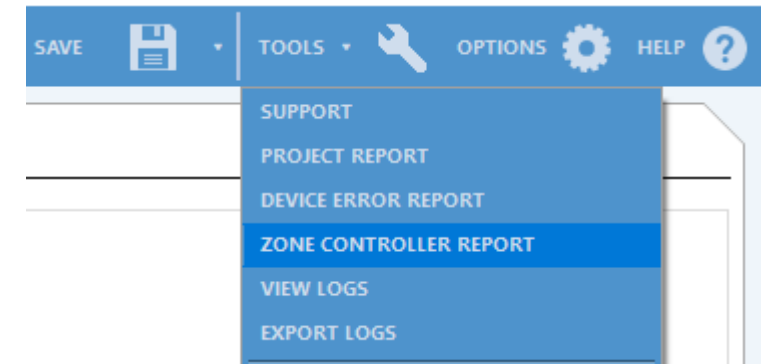 - Needs to be done each time the report is generated

ZONE CONTROLLER REPORT

ZONE CONTROLLER REPORT

Generating a Project Report.

- 1. Open the project;

- 2. Make sure that RAPIX Integrator is connected to the Zone Controllers;

- 3. Select **Zone Controller Report** from **Tools** menu;

- 4. Select where to save it;

- 5. Click **Save.**

ZONE CONTROLLER REPORT

The report will be opened in Excel (if installed).

The report shows live data for the whole site.

	A	B	C	D	E	F	G	H	I	J	K	O	P	Q	R	S	T	U	V	W
1	Zone Controller report generated 18/05/2022 2:52:18 PM																			
2																				
3	Name	IP	MAC	Serial	Master	O/S	Firmware	Project	CPU	RAM	Disk	Mesh	Controllers	Log	Clients	Line 1				
4		Address	Address	Number		Version	Version	Version	%	%	%	Message	Observed	Level	Connected	Name	Devices	Voltage	Message	Error Rate
5	Floor 1 ZC	172.020.205.001	54-4A-16-89-9B-34	00:00:03:7D	YES	6.0.0	9.1.3	711	3.3	5	17.3	0.1	2	warning	1	F1 L1	36	15.2	0	0
6	Floor 2 ZC	172.020.205.002	78-A5-04-BC-16-E7	C8:00:03:F4	NO	6.0.0	9.1.3	711	3.3	5	8.5	0.1	2	warning	1	F2 L1	19	15.4	0	0
7	Floor 3 ZC	172.020.205.003	78-A5-04-BC-14-6C	C8:00:03:EC	NO	6.0.0	9.1.3	711	3.1	5	4.1	0.1	2	warning	1	F3 L1	17	16.1	0	0
8																				

Zone Controller data

DALI Line data

EXERCISE 2

PROJECT REPORT

DALI STATISTICS

DALI STATISTICS

eHubs record statistics about their DALI Line

DALI Line Data

Refresh the data
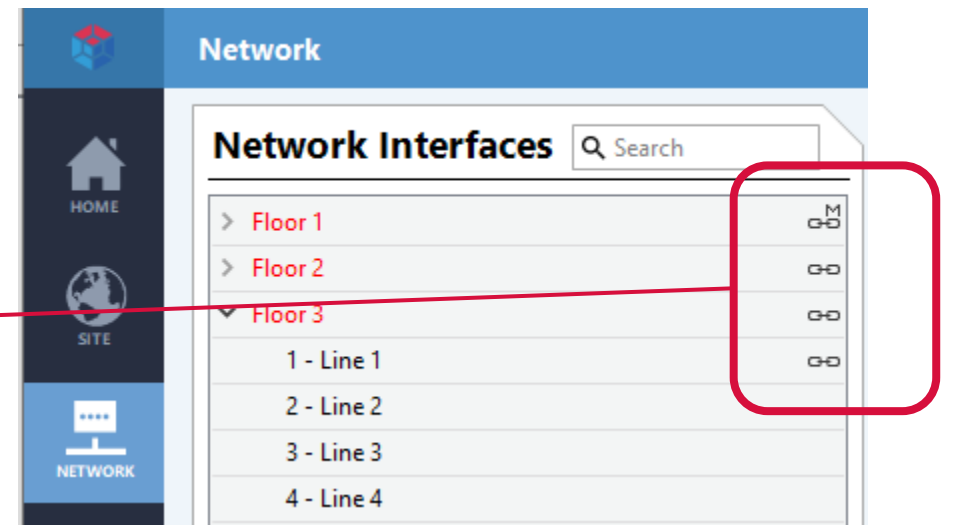
MASTER ZONE CONTROLLER

MASTER ZONE CONTROLLER

Master Zone Controller functions:

- Runs schedules

- Updates the project in other Zone Controllers

- Coordinates the Date & Time if NTP is not used

Master Zone Controller:

- Normally the one with the lowest IP Address

- Can be found from the Zone Controller menu

- Can be found from RAPIX Integrator (M indicates the Master)

MASTER ZONE CONTROLLER

Master Zone Controller redundancy:

- If the Master fails, a Slave will become the Master

- If communications between Zone Controllers fail:

  - Each separate group of Zone Controllers will have a Master

  - When the communications are fixed, all but one Master will change back to a Slave

TESTING TECHNIQUES

USB INTERFACE

TESTING TECHNIQUES

Checking DALI Lines - communication

- 1. Connect USB Interface to DALI Line

- 2. Press Identify

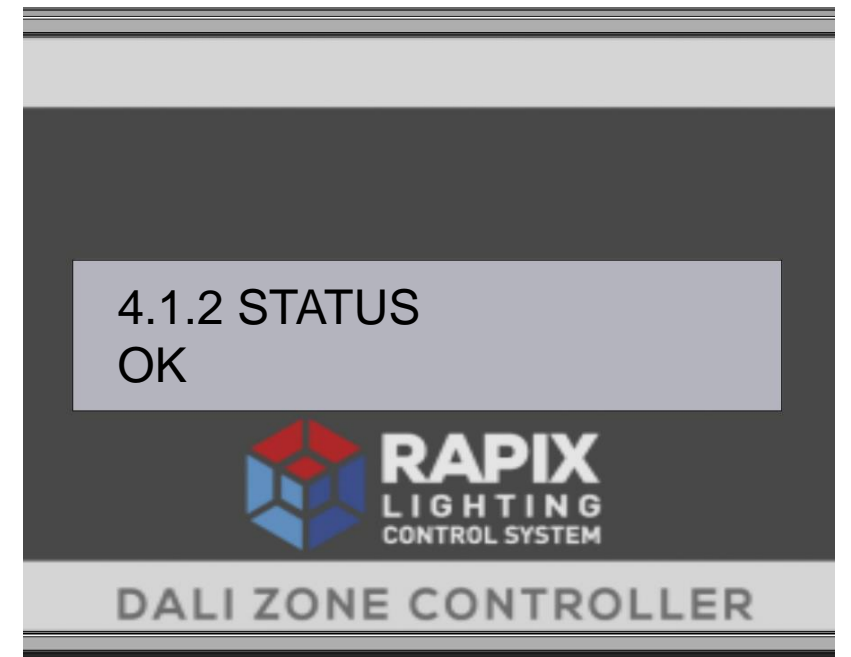- 3. All Devices on the DALI Line should be flashing.

TESTING TECHNIQUES

ZONE CONTROLLER

TESTING TECHNIQUES

Checking DALI Lines - connection

- 1. Use Zone Controller menu to navigate to "4.x.2 STATUS"
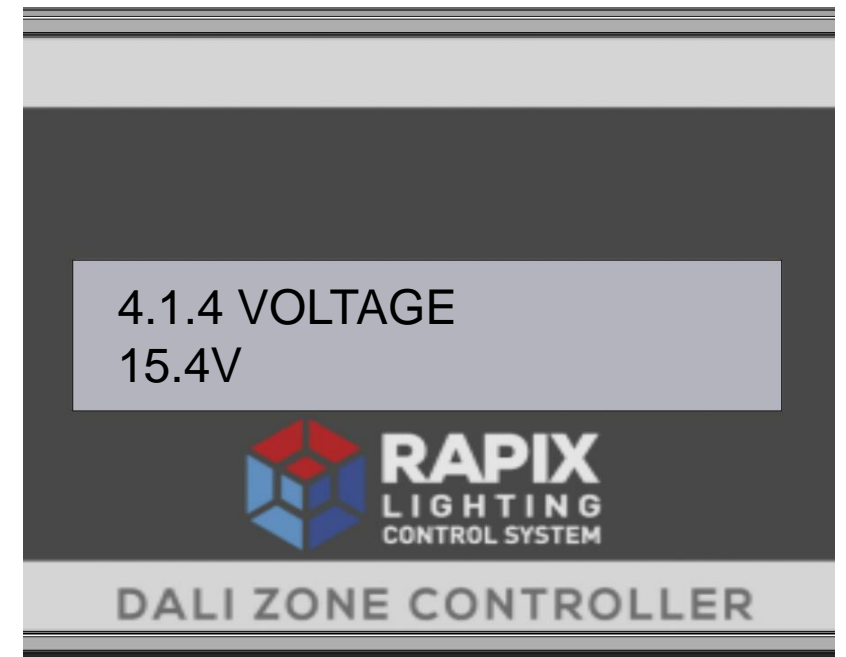
- 2. It will show whether the DALI Line is connected

4.1.2 STATUS
OK

TESTING TECHNIQUES

Checking DALI Lines - voltage

- 1. Use Zone Controller menu to navigate to "4.x.4 VOLTAGE"

- 2. The Voltage should be 15V to 16V

    - It must be in the range 9.5V to 22.5V to work

OR

- Use a multi-meter

4.1.4 VOLTAGE
15.4V

RAPIX
LIGHTING
CONTROL SYSTEM

DALI ZONE CONTROLLER

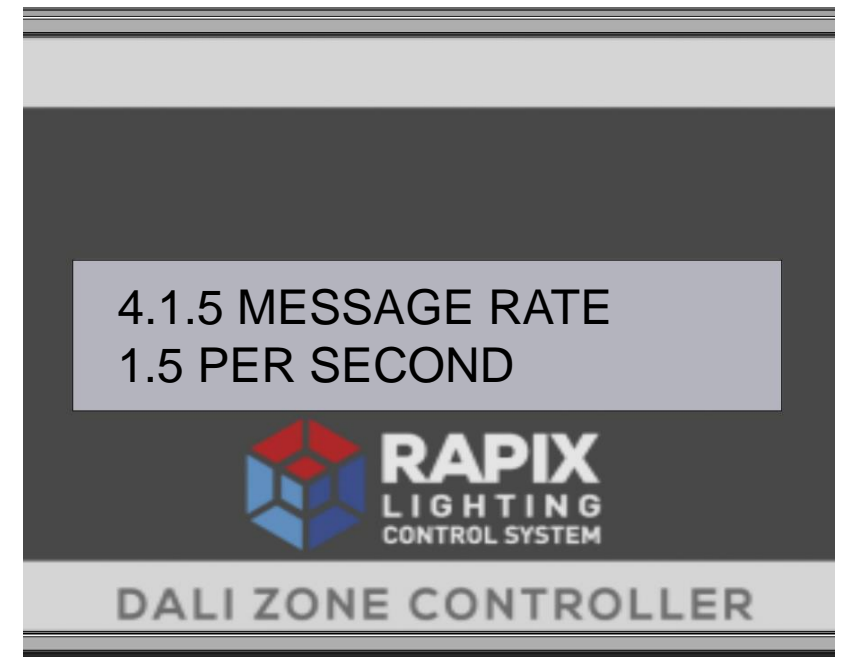# TESTING TECHNIQUES

Checking DALI Lines - communication

- 1. Use Zone Controller menu to navigate to "4.5.3 IDENTIFY"

- 2. Press OK

- 3. All Devices on the DALI Lines should be flashing.

TESTING TECHNIQUES

Checking DALI Lines - communication

- 1. Use Zone Controller menu to navigate to "4.x.5 MESSAGE RATE"

- 2. The line should not be too busy:

    - Maximum possible is 40

    - Short bursts of up to 25 is OK (e.g. during Line scan)

    - Should not average more than 10.

4.1.5 MESSAGE RATE
1.5 PER SECOND

RAPIX
LIGHTING
CONTROL SYSTEM

DALI ZONE CONTROLLER

TESTING TECHNIQUES

Checking DALI Lines - devices

- 1. Use Zone Controller menu to navigate to "4.x.3 SUMMARY"

- 2. It will show how many devices are on the Line.

4.1.3 SUMMARY
42 DEVICES

RAPIX
LIGHTING
CONTROL SYSTEM

DALI ZONE CONTROLLER
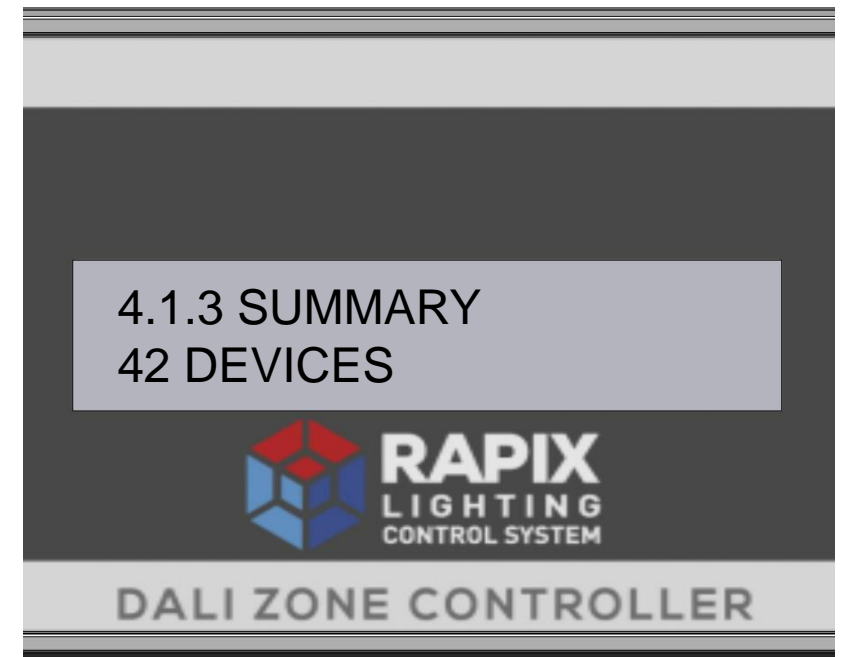
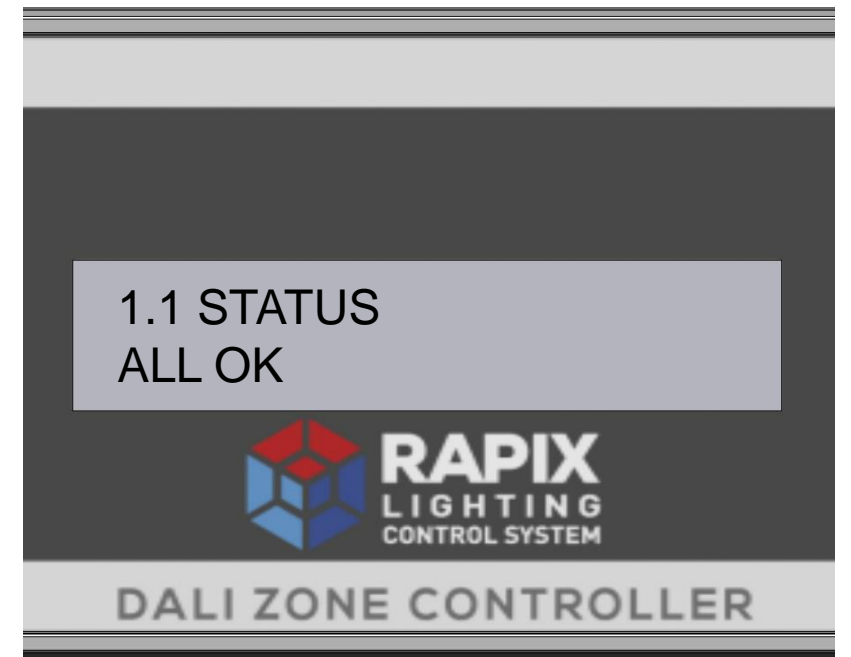# TESTING TECHNIQUES

Checking Ethernet

- 1. Use Zone Controller menu to navigate to "3.1 ETHERNET"

- 2. It will show if the Ethernet is connected.

- Alternatively:

  - Check Zone Controller Ethernet LED.
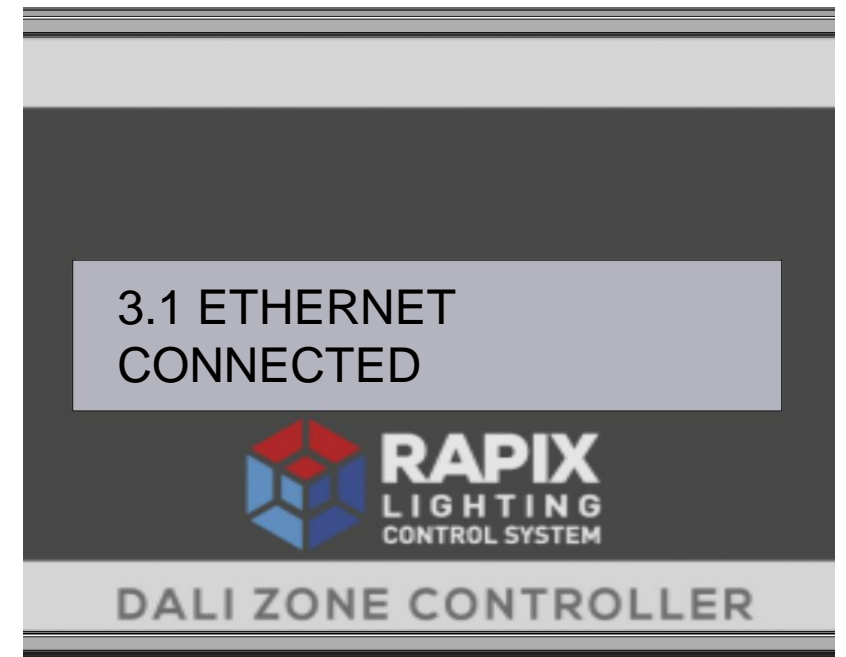
TESTING TECHNIQUES

Checking for Errors

- 1. Use Zone Controller menu to navigate to "1.1 STATUS"

- 2. It will show any major errors.

TESTING TECHNIQUES

Diagnostics

- 1. Use Zone Controller menu to navigate to "1.12 DIAGNOSTICS"

- 2. Press OK

- 3. Menu items show various details of use:

    - Clients connected (e.g. RAPIX Integrator)

    - CPU, memory and Flash usage

    - Message rate between Zone Controllers

    - Other Zone Controllers observed

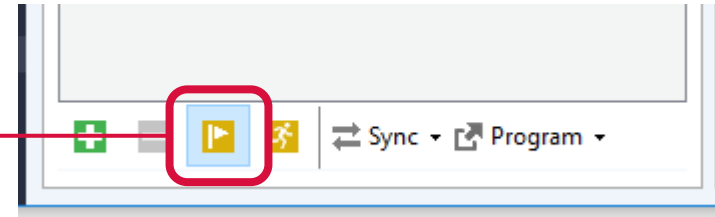   - Whether the Zone Controller is Master or Slave

TESTING TECHNIQUES
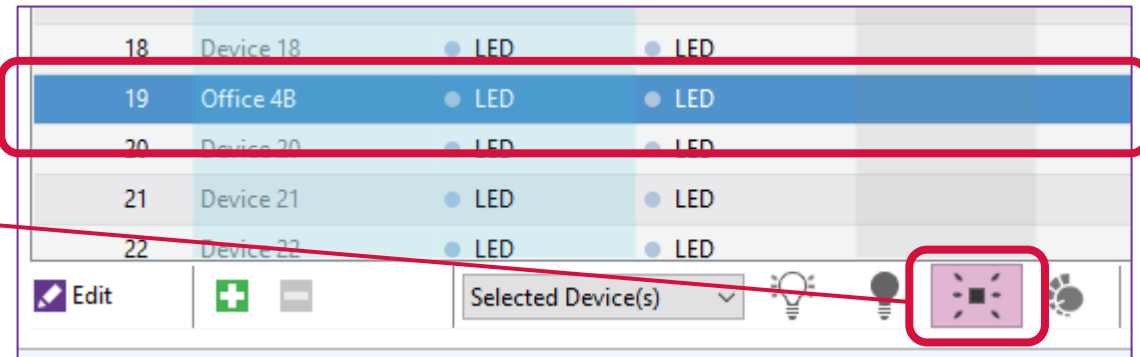
RAPIX INTEGRATOR

Checking DALI Lines

- 1. Select DALI Line in RAPIX

- 2. Click Identify

- 3. All Devices on the DALI
    Line should be flashing.
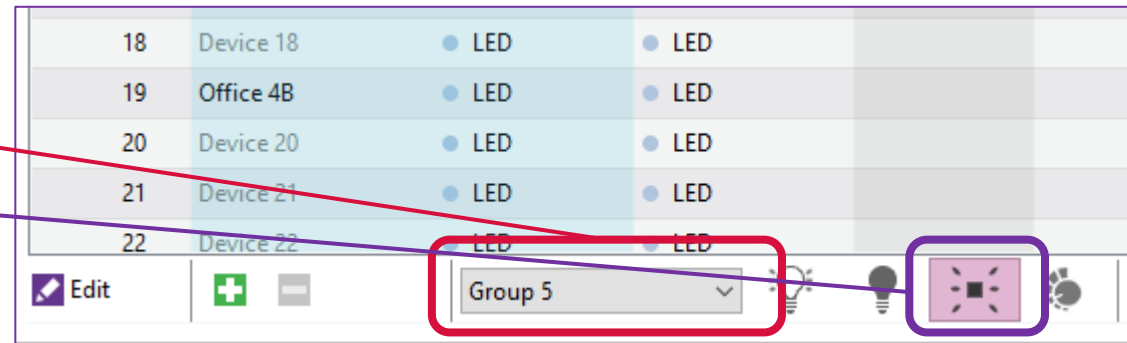
TESTING TECHNIQUES

Checking DALI Devices

- 1. Select device
- 2. Identify it
- 3. Device should be flashing.
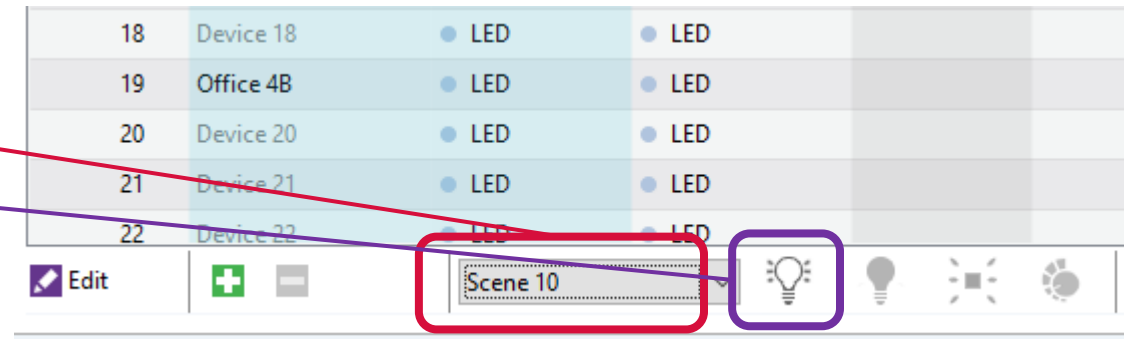
TESTING TECHNIQUES

Checking DALI Groups

- 1. Select Group
- 2. Identify it
- 3. Devices in Group should be flashing.

18	Device 18	● LED	● LED
19	Office 4B	● LED	● LED
20	Device 20	● LED	● LED
21	Device 21	● LED	● LED
22	Device 22	LED	LED

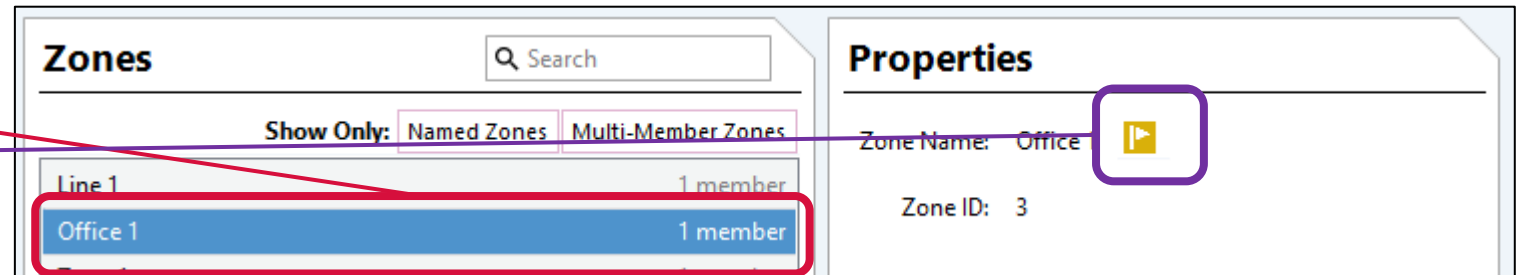Edit   Group 5

Checking DALI Scenes

- 1. Select Scene
- 2. Set the Scene
- 3. Devices in Scene should be at their scene level.

TESTING TECHNIQUES

Checking Zones

- 1. Select Zone
- 2. Identify
- 3. Devices in Zone should be flashing.
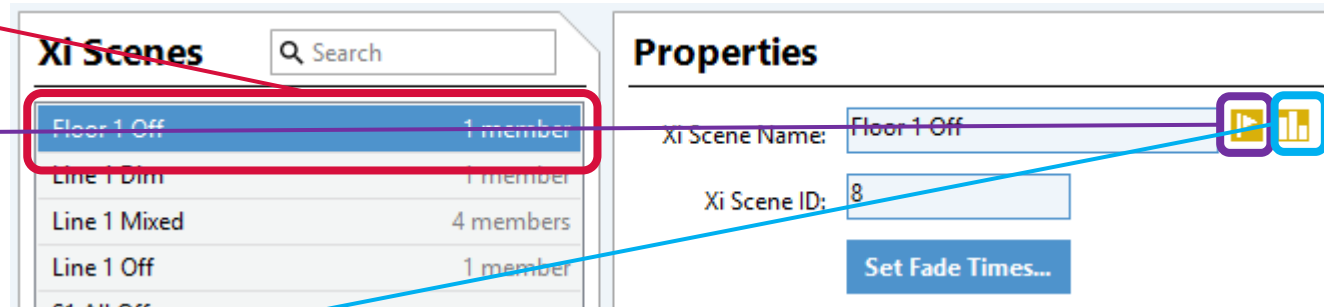
TESTING TECHNIQUES

Checking Xi Scenes

- 1. Select Xi Scene

- 2. Identify
  - Devices in Scene should be flashing

- 3. Set Scene
  - Devices in Scene should be at their scene level

TESTING TECHNIQUES

Testing Sensors

- Walk-test
    - Makes sensor time-out faster.
    - Whole Line:
        - 1. Select DALI Line
        - 2. Click walk-test button

TESTING TECHNIQUES

Testing Sensors

- Walk-test
  - Makes sensor time-out faster.
  - Whole Line:
    - 1. Select DALI Line
    - 2. Click walk-test button.
  - Single Sensor:
    - 1. Select Sensor
    - 2. Click walk-test button.

TESTING TECHNIQUES

Using Phone

- See RAPIX Addressing training for details.

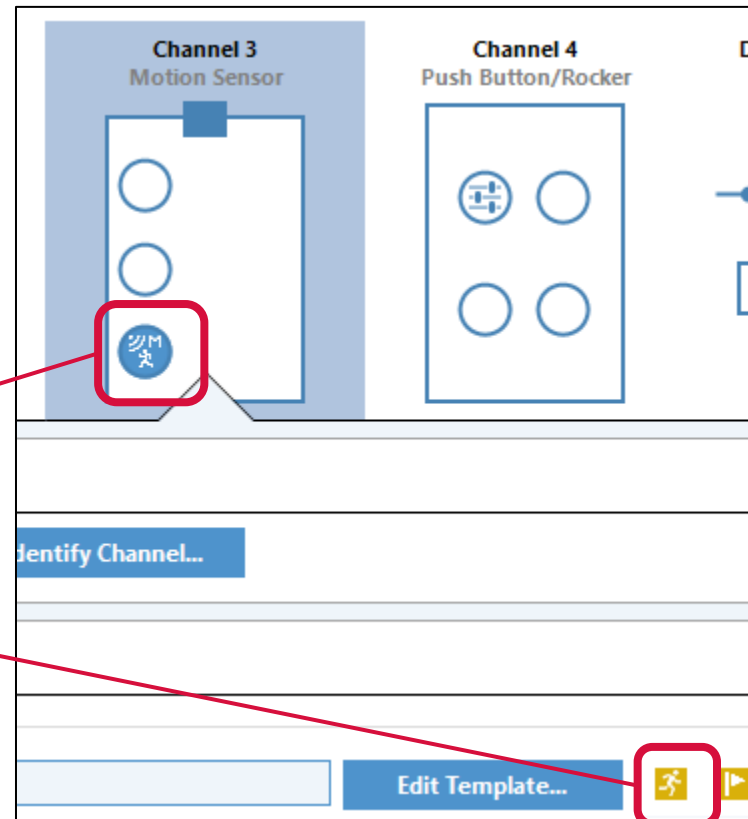Flash whole DALI Line

Flash Selected Device

Toggle Selected Device

EXERCISE 3

TESTING TECHNIQUES

DEBUGGING TECHNIQUES

DEBUGGING TECHNIQUES

Problem: **A Zone cannot be controlled**

Cause	Solution
Wiring problems	**Check that mains power is connected to the devices** Toggle the whole DALI Line to see if the device flashes
DALI Device configured incorrectly	Check device configuration Toggle it from RAPIX Integrator to see if device flashes Check Project Report for errors
DALI Line communication problems	Toggle whole DALI Line to see if device flashes Check DALI Line voltage at various points Check if there are enough power supplies Check that the DALI Line is not too long
Faulty DALI Device	Toggle whole DALI Line to see if device flashes Check Project Report for errors

DEBUGGING TECHNIQUES

Problem: **A Zone cannot be controlled from a different DALI Line**

Cause	Solution
As for previous table	*As for previous table*
Zone Controllers not synchronised	Transfer project to Zone Controllers
Zone Controllers not running	Check that all Zone Controllers are running
DALI Line not connected to Zone Controller	Check that DALI Line is connected using Zone Controller menu Check that DALI Line is connected using RAPIX Integrator
Ethernet infrastructure problems	Check that Zone Controllers have Ethernet connection Check that Zone Controllers can communicate with each other (use menu showing how many controllers have been observed) Check that RAPIX Integrator can connect to Zone Controllers

DEBUGGING TECHNIQUES

Problem: **A Zone cannot be controlled reliably**

Cause	Solution
DALI Line communication problems	Check DALI communication rate (using Zone Controller or log) Check DALI Line voltage at various points Check if there are enough power supplies Check that the DALI Line is not too long Check for electrical interference (requires an oscilloscope)
Faulty DALI Device	Check Project Report for errors Try replacing the device
Interference from other devices	Remove any non-RAPIX devices
Faulty wiring	Check that connections are secure

DEBUGGING TECHNIQUES

Problem: **A Zone is being controlled unexpectedly**

Cause	Solution
Configuration problems	Check the logs to see what caused the Zone to change Check Project Report for errors Check the Project Report to see what is controlling the Zone • Check the configuration of everything controlling the Zone
Interference from other devices	Remove any non-RAPIX devices

DEBUGGING TECHNIQUES

Problem: **The system is behaving unexpectedly**

Cause	Solution
Configuration problems	Check the logs to see what caused the behaviour Check Project Report for errors Check the Project Report to verify the system configuration Check all eHub templates
Interference from other devices	Remove any non-RAPIX devices

DEBUGGING TECHNIQUES

Notes

For reliable operation:

1. **The voltage at all points on the DALI Line must be 9.5V to 22.5V**

2. **The voltage drop along a DALI Line must be less than 2V**

3. **Avoid using more than about 2/3 of the DALI Power Supply capacity**

4. **The length of the DALI Line should be less than 300m**

5. **Use DALI Compliant devices**