

Accessing the Rako Bridge from an external application.



Introduction

The Rako Bridge can be used to control the installation from an external device connected to either the Ethernet or the RS232 port.

RS232

Product:

WRA-232

The connection to the RS232 port is via a 3 pin connector. The port is configured 9600,8,N,1 (9600 Baud, 8 Bits, No Parity, 1 Stop Bit). The protocol is the same as the RAV232/RAV232+ products and can be found in the document, 'Rako RS232 Command Summary'.

<https://www.rakocontrols.com/media/1286/rako-rs232-command-summary.pdf>

TCP/IP

In the following examples the NetBios name for the bridge is assumed to be 'rakobridge' (the default). This name can be changed using the web interface or the IP address of the bridge can be used.

Telnet

Products:

RA/RTC/WA/WTC-Bridge

APR/WRE-Bridge

WRA-232 (No Feedback)

A Telnet type interface is available on port 9761. This does not require a login. The protocol is the same as the 'Rako RS232 Command Summary'. This interface is used by Rasoft so CANNOT be used at the same time.

The interface can be used by typing: telnet rakobridge 9761

HTTP

Products:

RA/RTC/WA/WTC-Bridge

APR/WRE-Bridge

Requests can be made via HTTP GET

A page containing the phrase "Success!" is returned. This indicates the message was successfully delivered to the bridge and does not indicate the circuit received the message.

From version 1.1.7:

Support Parameters

Room

Name	Room
Parameter	ro
Description	Room 0 = Whole House Room 1-255 = Standard accessible rooms Room 256-1019 = Extended range rooms Room 1020-1023 = Reserved
Example	/rako.cgi?room=5&ch=4&sc=3
Example Description	Sets room 5 with additional parameters

Channel

Name	Channel
Parameter	ch
Description	Channel 0 = All Channels Channel 1 - 15 = Standard Range Channel 16-255 = Extended Range
Example	/rako.cgi?room=5&ch=4&sc=3
Example Description	Sets channel 4 with additional parameters

Scene

Name	Scene
Parameter	sc
Description	Room and Channel parameters required. Scene 0 = Off Scene 1-16 = Standard range Scene 17+ = Reserved for future use
Example	/rako.cgi?room=5&ch=4&sc=3
Example Description	Sets scene 3 in Room 5 Channel 4

Level

Name	Level
Parameter	lev
Description	Room and Channel parameters required. Level 0 = 0% Level 255 = 100%
Example	/rako.cgi?room=10&ch=0&lev=255
Example Description	Sets 100% in Room 10 Channel 0

Command

Name	Command
Parameter	com
Description	Room and Channel parameters required. Command 0 = Off Command 1 = Fade Up Command 2 = Fade Down Command 3-6 = SC1-4 (Should use Scene parameter) Command 8 = Ident Command 15 = Stop Other commands are reserved for future use
Example	/rako.cgi?room=50&ch=0&com=1 (Press Event) /rako.cgi?room=50&ch=0&com=15 (Release Event)
Example Description	Starts fading in Room 50 on button press and stops fading on button release

Event

Name	Event
Parameter	event
Description	'run' parameter required with value 1 Supported Devices: WTC-BRIDGE, RTC-BRIDGE Currently used to test Events
Example	/rako.cgi?event=2&run=1
Example Description	Trigger Event 2

Custom String

Name	String
Parameter	string
Description	'run' parameter required with value 1 Supported Devices: WRA-232 Currently used to test Custom Strings
Example	/rako.cgi?string=3&run=1
Example Description	Trigger Custom String 2

XML

Products:

RA/RTC/WA/WTC-Bridge

An XML file can be downloaded which contains information about the current installation.

NOTE: the information first requires uploading to the Bridge from Rasoft.

<http://rakobridge/rako.xml>

An example of part of the XML file returned is shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<rako>
  <info>
    <version>2.3.2 RA</version>
    <buildDate>Aug 09 2016 11:32:27</buildDate>
    <hostName>RAKOBIDGE</hostName>
    <hostIP>192.168.25.64</hostIP>
    <hostMAC>00:04:A3:40:0B:85</hostMAC>
    <hwStatus>25</hwStatus>
    <dbVersion>-16</dbVersion>
  </info>
  <config>
    <requirepassword />
    <passhash>NAN</passhash>
    <charset>UTF-8</charset>
  </config>
  <rooms>
    <Room id="9">
      <Type>Lights</Type>
      <Title>Kitchen</Title>
      <mode>4+OFF</mode>
      <Scene id="1">
        <Name>Cooking</Name>
      </Scene>
      <Channel id="1">
        <type>Default</type>
        <Name>Downlights</Name>
        <Levels>FFBF7F3F000000000000000000000000</Levels>
      </Channel>
      <Channel id="2">
        <type>Default</type>
        <Name>Under cabinet</Name>
        <Levels>FFBF7F3F000000000000000000000000</Levels>
    </Room>
  </rooms>
</rako>
```

```

</Channel>
</Room>
</rooms>
</rako>

```

Scene Cache

Products:

RA/RTC/WA/WTC-Bridge

APR/WRE-Bridge (V1.2.6+)

The bridge caches the scene state of up to 64 rooms. The cache indicates the last scene set. If the fade buttons are used in the room the entry is deleted from the cache. The scene cache can be obtained from the following URL

<http://rakobridge/scenes.htm>

The reply is 2 byte per room in hexadecimal:

Byte 1								Byte 2							
B7	B6	B5	B4	B3	B2	B1	B0	B7	B6	B5	B4	B3	B2	B1	B0
Scene number				Room Number											

e.g 0x04041006 is room 4 scene 1 & room 6 scene 4

Note: The cache information can also be obtained by UDP.

The two byte format is the same as the UDP byte format in the next section.

UDP/IP

Products:

RA/RTC/WA/WTC-Bridge

APR/WRE-Bridge (V1.7.9 Limited support)

UDP Discover

All text is encoded with WINDOWS-1252

To find a bridge on the network send a UDP broadcast packet where the data consists of a single literal 'D'. The bridge will reply to the source IP address with:

Direction	Parameters			Example
	Byte	Bit	Function	
Client to UDP Broadcast	0	0:7	0x44: 'D' for request	0x44

The reply is send as a String:

Direction	Broadcast Reply From Bridge
Bridge To Client	NETBIOS_NAME\r\n Bridge MAC Address FF:FF:FF:FF:FF:FF \r\n

Scene Cache

This command requests data from the bridge, it can be used to request stored level per scene data and scene cache.

Level per scene data is uploaded from Rasoft and modified when scenes are stored on the Smartphone apps (Persistent).

Scene Cache data is tracked from Bridge power up (Volatile). This data holds the last used scene for a particular room.

There is no current way of recalling the dimmers level but using the level cache and scene cache together can produce a good approximation.

Request Command

Direction	Parameters			Example
	Byte	Bit	Function	
Client to Bridge	0	0:7	0x51: 'Q' for query	0x5101 Request Scene Cache 0x5121 Request Level and Scene Cache
	1	0:7	Type of request 0x01: REQ_SCENECACHE 0x20: REQ_LEVEL 0x21: REQ_SCENECACHE + REQ_LEVEL <i>Note Other bits are used but not part of the API</i>	

Request replies one of the following:

Scene Cache Reply

Direction	Parameters			Example
	Byte	Bit	Function	
Bridge To Client	0	0:7	0x43: 'C' for cache	0x4301FF No items Cached 0x43030C1CD5 Room 28 Scene 3 0x43050C1C040CC3 Room 28 Scene 3 Room 12 Scene 1
	1	0:7	Bytes to follow	
	2	2:5	Scene number <i>e.g. (buf[2] >> 2) & 0x0f</i>	
	2:3	0:10	Room number <i>e.g. ((buf[2] & 0x03) << 8) + buf[3]</i>	
	...4:5 ...6:7 etc	0:15	Repeats two bytes for amount of rooms <i>Maximum of 32 cached items</i> <i>Note: cache can be empty and return top example</i>	
Last	0:7	CRC Byte position depending on amount of cached items		

Level Cache Reply

Direction	Parameters			Example
	Byte	Bit	Function	
Bridge To Client	0	0:7	0x58: 'X' for data record	0x58 04 80 49 01 ff bf 7f 3f 00 00 00 00 00 00 00 00 00 00 00 00 00 04 80 49 02 ff bf 7f 3f 00 00 00 00 00 00 00 00 00 00 00 00 00 Room 73 Channel 1,2 Text has been split into records
	1	0:7	Data Record Type 0x04: Level cache reply	
	2	7	Active	
	2	6	Deleted	
	2	2:5	Reserved	
	2:3	0:9	Room	
	4	0:15	Channel	
	3	0:7	Scene 1 Level	
Continued from Byte 4-19	
	20	0:7	Scene 17 Level	
	20+		Repeat byte 1-20 for amount of records	
Last	0:7	CRC Byte position depending on amount of cached items		

EOF Reply

Direction	Parameters			Example
	Byte	Bit	Function	
Bridge To Client	0	0:7	0x58: 'X' for data record	0x4301FF No items Cached
	1	0:7	Data Record Type 0xFF: Level cache reply	
	2:3	0:15	Extended Checksum	
	4	0:7	CRC Byte position depending on amount of cached items	

Sending Commands

UDP packets can be sent to port 9761 with the following format:

Direction	Parameters			Example
	Byte	Bit	Function	
Client to Bridge	0	0:7	0x52: 'R' for request	0x5207000400310 105BE Room 4, Channel 0 Scene 5 0x5208000f00340 17F0035 Room 15, Channel 0 Level 50%
	1	0:7	Bytes to follow <i>5+data length</i>	
	2:3	0:9	Room	
	4	0:7	Channel	
	5	0:7	Command	
	6..x	0:7	Data[0..6] (Data Byte Count Min:0, Max:7)	
	Last	0:7	Checksum	

Refer to 'Command List' table for more information.

The reply is either "AOK" or "AERROR"

Status Messages

From version 1.2.2, status messages are sent out using UDP broadcast on port 9761. The format of the status messages is the same as the command packets except it starts with 0x53 and the CRC does not include the bytes-to-follow byte.

Direction	Parameters			Example
	Byte	Bit	Function	
Bridge to Client	0	0:7	0x53: 'S' for status	0x530A00050031 0104000000C5 Room 5, Channel 0 Scene 4 0x530A0064003101 0300000067 Room 100, Channel 0 Scene 3
	1	0:7	Bytes to follow <i>5+data length</i>	
	2:3	0:9	Room	
	4	0:7	Channel	
	5	0:7	Command	
	6..x	0:7	Data[0..7] (Data Byte Count Min:0, Max:8)	
	Last	0:7	CRC (Checksum)	

UDP Instructions

Below is a table of available instructions for sending and for status messages. This is not the full extent of commands if you are trying to implement undefined commands it is recommended to contact us.

Instructions

Command	Name	Description	Data 0	Data 1
0x00	OFF			
0x01	FADE_UP	Fade the circuit in direction. Must be stopped with STOP (Release event)		
0x02	FADE_DOWN			
0x03	SC1	Legacy use SET_SCENE (This command appears in feedback so recommended to monitor)		
0x04	SC2			
0x05	SC3			
0x06	SC4			
0x08	IDENT	Causes the circuit to pulse or LED to flash in Ident pattern		
0x0C	LEVEL_SET	Legacy use SET_LEVEL Both data bytes must be level value (This command appears in feedback so recommended to monitor)	Level	Level
0x0D	STORE	When a keypad has finished saving a scene		
0x0F	STOP	Stop Fading		
0x2D	CUSTOM_232	Trigger a specific Custom String	Flags	String Id
0x2F	HOLIDAY	Set holiday mode (Refer to Flags table)	Flags	
0x31	SET_SCENE	Important:: Flags should be set to 'Use Default Rate'	Flags	Scene#
0x32	FADE		Flags	Level
0x34	SET_LEVEL		Flags	Level

Flags

Command	Name	Data 0	Bit	Description
0x2D	CUSTOM_232	Flags	0:7	Reserved
0x2F	HOLIDAY	Flags	0:1	0x00: STOP_PLAYBACK 0x01: START_PLAYBACK 0x02: START_RECORD 0x03: STOP_RECORD
0x31	SET_SCENE	Flags	0	Use Default Fade Rate
			1:7	Reserved
0x32	FADE	Flags	0	Fade Up (false) / Fade Down (true)
			1:6	Reserved
			7	Use Default Fade Rate
0x34	SET_LEVEL	Flags	0	Use Default Fade Rate
			1:6	Reserved

Any Reserved values should be set to 0

Example UDP Commands

Room 7, Channel 0, Fade Up

Byte	Value	Description
0	0x52	Character 'R' for main commands
1	0x05	5 Bytes after this
2	0x00	Room Number High (Used for rooms above 256)
3	0x07	Room Number Low (Room 7)
4	0x00	Channel 0
5	0x01	FADE_UP Instruction
6	0xF3	Checksum (256 - (0x05 + 0x00 + 0x07 + 0x00 + 0x01) % 256)

Room 7, Channel 0, Scene 5

Byte	Value	Description
0	0x52	Character 'R' for main commands
1	0x07	7 Bytes after this
2	0x00	Room Number High (Used for rooms above 256)
3	0x07	Room Number Low (Room 7)
4	0x00	Channel 0
5	0x31	SET_SCENE Instruction
6	0x01	Flags 'Use Default Rate'
7	0x05	Scene 5
8	0xBB	Checksum

Room 277, Channel 1, Level 64%

Byte	Value	Description
0	0x52	Character 'R' for main commands
1	0x07	7 Bytes after this
2	0x01	High Room number (room / 256)
3	0x15	Low Room number ((room % 256) + High Room)
4	0x01	Channel 1
5	0x0C	CAN_LEVEL Instruction
6	0x01	Flags 'Use Default Rate'
7	0xA3	64% (64 * 2.55)
8	0x32	Checksum