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Panasonic Kairos Control Protocol Command List

V1.4
(Kairos version 1.4.0)

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Change History

Version	Date	Kairos version	Changes
V1.0	22 June 2022	1.2.2, 1.2.3, 1.2.4, 1.3.2	First Version (Kairos v1.2.2)
V1.4	05 Jan. 2023	1.4.0	[1-2] - SCENES.<Scene Element>.all_fader is newly supported. - SCENES.<Scene Element>.fader_sync is newly supported. - SCENES.<Scene Element>.all_progress is deleted. [2-2] - Follow is added to Value of SCENES.<Scene Element>.Layers.<Layer Element>.pgm_pst_mode. [9-2] - <AUX>.name is added. [13-2] - <INPUTS>.name is added.

Introduction

The Panasonic Kairos Control Protocol can be used to allow external control devices / software to get access to parameters / functions of Kairos. The syntax of the protocol is simple and allows easy implementation to 3rd party devices / applications. The protocol uses TCP as the transport protocol and Kairos listens on port 3005 by default.

Message Sequence

The message sequence of the protocol basically consists of commands sent from external devices / applications (hereinafter called clients), and response messages sent from Kairos. Every command and response message ends with a '\r\n' character sequence or also referred to as 0D 0A in ASCII.

```
Client :    list:SCENES.Main.Layers\r\n
Kairos :    SCENES.Main.Layers.Background\r\n
            SCENES.Main.Layers.Layer-1\r\n
            SCENES.Main.Layers.Layer-2\r\n
            SCENES.Main.Layers.Group-1\r\n
            \r\n
```

There are also notification messages from Kairos which are triggered by some events or parameter value changes in Kairos. Subscription of the parameter using the 'subscribe' command is necessary in advance in order for Kairos to send notification messages for parameter value changes to clients.

```
Kairos :    APPLICATION:NEW\r\n
```

```
Kairos :    SCENES.Main.Layers.Layer-1.state=On\r\n
```

Objects

Objects and attributes are main components of messages and they are connected with '.' characters. Objects are in tree structure and objects in upper layers and object in lower layers are also connected with '.' characters.

```
            <Object>.<Object Element>.<Object>.<Object Element> . . . <Attribute>

  e.g. :    SCENES.Main.Layers.Layer-1.state
```

The expressions of <Object> and <Attribute> are constant but <Object Element> are changeable by users and can be different from one Kairos system to another. Therefore, clients need to obtain <Object Element> information from the Kairos in advance before issuing commands which contain <Object Element>. The 'list' command allows clients to obtain <Object Element> information.

Keep-Alive Messages

The protocol specification introduces a keep-alive message to allow Kairos to identify and remove orphaned connections. The keep-alive message is mandatory since Kairos v1.2.

The message itself is an empty message with the line ending character sequence "\r\n". Kairos won't send any response message.

Note: Earlier Kairos versions respond with an error message to this command.

Kairos will disconnect any client that didn't send a message within the time period of 10 seconds. To avoid accidental disconnections it is recommended to send at least one message within half the period, 5 seconds. A normal message has the same impact on the timeout behavior as the keep-alive message. This means if a client would send one message every 5 seconds, it is not required to send a dedicated keep-alive message to keep the connection active. Messages send from Kairos won't reset the timeout. E.g., in case of an active subscription, Kairos might send messages every 5 seconds but the client needs to actively send keep-alive messages to keep the connection active.

Escape Sequences

The protocol syntax has some specific characters that cannot be used in an object name description. For example, if an object is named "My.AUX" the "." character in the name needs to be escaped and the description will be "My.AUX". The html escape character sequences are used.

```
:     &#58;
.     &#46;
=     &#61;
\     &#92;
\r    &#13;
\n    &#10;
```

Command

list

The 'list' command allows clients to obtain object element information for a designated object from Kairos. Clients need object element information for most commands and it is advised that clients use this command to collect necessary object element information right after it establishes the TCP connection with Kairos. The object element information will not be informed automatically from Kairos unless being requested from clients when the information changes in Kairos. Therefore clients may need to obtain the latest information when necessary or periodically.

The following example shows a command for obtaining the object element information for SCENES object.

```
Client :    list:SCENES\r\n
Kairos :    SCENES.Main\r\n
            SCENES.ME1\r\n
            SCENES.ME2\r\n
            \r\n
```

The client obtains 'Main', 'ME1', and 'ME2' as the scene elements from Kairos in this example.

Below is another example of obtaining the list of scene elements.

```
Client :    list:SCENES\r\n
Kairos :    SCENES.Main\r\n
            SCENES.Templates\r\n
            \r\n
```

The "Templates" above is actually a scene directory that contains scene elements.

```
Client :    list:SCENES.Templates\r\n
Kairos :    SCENES.Templates.ME3\r\n
            SCENES.Templates.ME4\r\n
            \r\n
```

But the information whether the obtained items by the 'list' command are actually scene elements or scene directories cannot be retrieved by the protocol. The basic knowledge about the production structure is required for the client here.

Similar structure applies to the layer elements too. The information whether the obtained items by the 'list' command for layers are actually layer elements or layer groups cannot be retrieved by the protocol.

Get Attribute Value

When the client sends an attribute name, Kairos respond with the attribute value.

```
Client :    SCENES.Main.Layers.Background.sourceA\r\n
Kairos :    SCENES.Main.Layers.Background.sourceA=IN1\r\n
```

If clients need to obtain the latest values of certain attributes automatically whenever the values are changed in Kairos, clients can use the 'subscribe' command, which is explained later.

Set Attribute Value

Clients can set certain attribute values by sending the attribute name and its value with a '=' in between.

```
Client :    SCENES.Main.Layers.Background.sourceB=IN4\r\n
Kairos :    OK\r\n
```

subscribe

The 'subscribe' command requests Kairos to send the latest value of the designated attribute to the client every time the attribute value is changed in Kairos. The command allows clients to always have the latest attribute values.

```
Client :    subscribe:SCENES.Main.Layers.Layer-1.state\r\n
Kairos :    OK\r\n
```

With the above example, Kairos will send a message like below to the client whenever the attribute 'state' of the layer "Layer-1" is changed afterwards.

```
Kairos :    SCENES.Main.Layers.Layer-1.state=On\r\n
```

The subscriptions are canceled in Kairos once the TCP connection terminates between the client and Kairos. Therefore subscription is necessary every time the TCP connection is established.

unsubscribe

The 'unsubscribe' command can be used to cancel a subscription.

```
Client :    unsubscribe:SCENES.Main.Layers.Layer-1.state\r\n
Kairos :    OK\r\n
```

Operation Command

Some objects have certain operation command and they can be sent from clients to perform the designated operation on Kairos.

```
Client :    SCENES.Main.Transitions.L1.transition_auto\r\n
Kairos :    OK\r\n
```

In the above example, the client is requesting Kairos to perform the AUTO transition for the transition "L1".

Response from Kairos

When a command from clients are valid and accepted by Kairos, Kairos will send back the requested information or an "OK\r\n" as the response to the client. But when a command is not valid, Kairos will send back an "Error\r\n", "Permission Error\r\n", or "Enum Error\r\n" response depending on the context. The most probable error would be the incorrect object element name in the command.

Event Notification

The idea of the event notification is to inform clients about certain system state changes. The client receives this information and has to do some action to handle these cases if necessary.

New

The new event gets sent out to the clients in case of a data model recreation. This is the case when a new production / environment file gets loaded. Some elements queried by the client prior to this event might not exist anymore or new elements appear. In this situation Kairos can not keep subscriptions and all active subscriptions get invalidated.

```
Kairos :    APPLICATION:NEW\r\n
```

Client Implementation (Informative)

This is a suggestion of the client implementation for effective behaviors. Descriptions in this chapter is only informative and not specifications.

A. Upon TCP connection establishment or reception of "APPLICATION:NEW"

When the client establishes the TCP connection with Kairos or when the client receives "APPLICATION:NEW" from Kairos, the client issues the following commands to collect necessary information and prepares Kairos for informing to the client whenever data changes.

A-1. list
A-2. Get Attribute Value
A-3. subscribe

B. Periodically

The client issues the following command to collect the latest information periodically to keep updated.

B-1. list

C. Event Driven

The following commands can be triggered by events such as user operations.

C-1. Set Attribute Value
C-2. Operation Command

Command List

1. Scenes

1-1. Scenes - List

Object	Command / Example			Note
Scenes	**Command**		**list:SCENES\r\n** or **list:SCENES.<Scene Directory>\r\n**	The obtained list can contain both scene elements and scene directories. The information whether the obtained items are scene elements or scene directories cannot be retrieved.
	Example	Client	list:SCENES\r\n	
		Kairos	SCENES.Main\r\n SCENES.ME1\r\n SCENES.ME2\r\n SCENES.Templates\r\n \r\n	
		Client	list:SCENES.Templates\r\n	
		Kairos	SCENES.Templates.2Box\r\n SCENES.Templates.4Box\r\n \r\n	

1-2. Scenes - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
next_transition	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.next_transition**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List".
				Value		**<Transition Element>,<Transition Element>,…** Note:Number of <Transition Element> is equal to 0 or greater than 0. <Transition Element> can be obtained by the command in "3-1. Transitions - List".	
				Example (R)	Client	SCENES.Main.next_transition\r\n	
					Kairos	SCENES.Main.next_transition=SCENES.Main.Transitions.BgdMix,SCENES.Main.Transitions.L1,SCENES.Main.Transitions.L2,\r\n	
				Example (W)	Client	SCENES.Main.next_transition=SCENES.Main.Transitions.BgdMix,SCENES.Main.Transitions.L1,SCENES.Main.Transitions.L2\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.Main.next_transition\r\n	
					Kairos	OK\r\n	
all_duration	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.all_duration**	
				Value		**0 - 9999**	
				Example (R)	Client	SCENES.ME1.all_duration\r\n	
					Kairos	SCENES.ME1.all_duration=20\r\n	
				Example (W)	Client	SCENES.ME1.all_duration=30\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.ME1.all_duration\r\n	
					Kairos	OK\r\n	
tally	✓		✓	**Format**		**SCENES.<*Scene Element*>.tally**	
				Value		**0** (None) / **1** (Red) / **2** (Green) / **4** (Yellow) / **8** (Blue) / **16** (Magenta) / **32** (Cyan)	
				Example (R)	Client	SCENES.Main.tally\r\n	
					Kairos	SCENES.Main.tally=1\r\n	
				Example (S)	Client	subscribe:SCENES.Main.tally\r\n	
					Kairos	OK\r\n	
all_fader	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.all_fader**	
				Value		**0 - 0.999999 / 1** or **0 - 9.99999e-05 for less than 0.0001** (e.g. 1.23456e-06) Note : The number of significant digits is six.	
				Example (R)	Client	SCENES.Main.all_fader\r\n	
					Kairos	SCENES.Main.all_fader=0\r\n	
				Example (W)	Client	SCENES.Main.all_fader=0.333333\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.Main.all_fader\r\n	
					Kairos	OK\r\n	
fader_sync	✓		✓	**Format**		**SCENES.<*Scene Element*>.fader_sync**	
				Value		**0** (PGMPST) / **1** (AB)	
				Example (R)	Client	SCENES.Main.fader_sync\r\n	
					Kairos	SCENES.Main.fader_sync=0\r\n	
				Example (S)	Client	subscribe:SCENES.Main.fader_sync\r\n	
					Kairos	OK\r\n	

1-3. Scenes - Operation Command

Operation			Command / Example	Note
cut	**Command**		**SCENES.<*Scene Element*>.cut\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List".
	Example	Client	SCENES.Main.cut\r\n	
		Kairos	OK\r\n	
auto	**Command**		**SCENES.<*Scene Element*>.auto\r\n**	
	Example	Client	SCENES.ME2.auto\r\n	
		Kairos	OK\r\n	
strore_snapshot	**Command**		**SCENES.<*Scene Element*>.strore_snapshot\r\n**	
	Example	Client	SCENES.Templates.4Box.strore_snapshot\r\n	
		Kairos	OK\r\n	

2. Layers

2-1. Layers - List

Object			Command / Example	Note
Layers	**Command**		**list:SCENES.<*Scene Element*>.Layers\r\n** or **list:SCENES.<*Scene Element*>.Layers.<Layer Group>\r\n**	The obtained list can contain both layer elements and layer groups. The information whether the obtained items are layer elements or layer groups cannot be retrieved. <Scene Element> Can be obtained by the command in "1-1. Scenes - List".
	Example	Client	list:SCENES.Main.Layers\r\n	
		Kairos	SCENES.Main.Layers.Background\r\n SCENES.Main.Layers.Layer-1\r\n SCENES.Main.Layers.Layer-2\r\n SCENES.Main.Layers.Group-1\r\n \r\n	
		Client	list:SCENES.Main.Layers.Group-1\r\n	
		Kairos	SCENES.Main.Layers.Group-1.Layer-3\r\n SCENES.Main.Layers.Group-1.Layer-4\r\n \r\n	

2-2. Layers - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
sourceA	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.sourceA**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Layer Element> Can be obtained by the command in "2-1. Layers - List".
				Value		**<Source>** Note:<Source> can be obtained by the commands in "1-1. Scenes - List", "5-1. Ramrecorders - List", "6-1. Clip Players - List", "13-1. INPUTS - List", "14-1. GFXCHANNELS - List", and "15-1. INTSOURCES - List".	
				Example (R)	Client	SCENES.Main.Layers.Background.sourceA\r\n	
					Kairos	SCENES.Main.Layers.Background.sourceA=SCENES.ME1\r\n	
				Example (W)	Client	SCENES.Main.Layers.Background.sourceA=RR1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.Main.Layers.Background.sourceA\r\n	
					Kairos	OK\r\n	
sourceB	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.sourceB**	
				Value		**<Source>** Note:<Source> can be obtained by the commands in "1-1. Scenes - List", "5-1. Ramrecorders - List", "6-1. Clip Players - List", "13-1. INPUTS - List", "14-1. GFXCHANNELS - List", and "15-1. INTSOURCES - List".	
				Example (R)	Client	SCENES.ME1.Layers.Background.sourceB\r\n	
					Kairos	SCENES.ME1.Layers.Background.sourceB=IP1\r\n	
				Example (W)	Client	SCENES.ME1.Layers.Background.sourceB=SCENES.ME2\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.ME1.Layers.Background.sourceB\r\n	
					Kairos	OK\r\n	

sourceOptions	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.sourceOptions**
				Value		**<Source>,<Source>,<Source>,…** Note:Number of <Source> is equal to 0 or greater than 0. <Source> can be obtained by the commands in "1-1. Scenes - List", "5-1. Ramrecorders - List", "6-1. Clip Players - List", "13-1. INPUTS - List", "14-1. GFXCHANNELS - List", and "15-1. INTSOURCES - List".
				Example (R)	Client	SCENES.Main.Layers.Layer-1.sourceOptions\r\n
					Kairos	SCENES.Main.Layers.Layer-1.sourceOptions=BLACK,SCENES.ME1,SCENES.ME2,IP1,IP2,IP3,NDI1,STREAM1,STREAM8,CP1,RR1,\r\n
				Example (W)	Client	SCENES.Main.Layers.Layer-1.sourceOptions=BLACK,SCENES.ME1,SCENES.ME2,IP1,IP2,IP3,NDI1,STREAM1,STREAM8,CP1,RR1\r\n
					Kairos	OK\r\n
				Example (S)	Client	subscribe:SCENES.Main.Layers.Layer-1.sourceOptions\r\n
					Kairos	OK\r\n
preset_enabled	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.preset_enabled**
				Value		**0** (off) / **1** (on)
				Example (R)	Client	SCENES.Main.Layers.Layer-2.preset_enabled\r\n
					Kairos	SCENES.Main.Layers.Layer-2.preset_enabled=0\r\n
				Example (W)	Client	SCENES.Main.Layers.Layer-2.preset_enabled=1\r\n
					Kairos	OK\r\n
				Example (S)	Client	subscribe:SCENES.Main.Layers.Layer-2.preset_enabled\r\n
					Kairos	OK\r\n
pgm_pst_mode	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.pgm_pst_mode**
				Value		**Swap / Next / Next+Loop / Follow**
				Example (R)	Client	SCENES.ME2.Layers.Background.pgm_pst_mode\r\n
					Kairos	SCENES.ME2.Layers.Background.pgm_pst_mode=Swap\r\n
				Example (W)	Client	SCENES.ME2.Layers.Background.pgm_pst_mode=Next\r\n
					Kairos	OK\r\n
				Example (S)	Client	subscribe:SCENES.ME2.Layers.Background.pgm_pst_mode\r\n
					Kairos	OK\r\n
state	✓		✓	**Format**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.state**
				Value		**On / Off**
				Example (R)	Client	SCENES.Main.Layers.Group-1.Layer-3.state\r\n
					Kairos	SCENES.Main.Layers.Group-1.Layer-3.state=On\r\n
				Example (S)	Client	subscribe:SCENES.Main.Layers.Group-1.Layer-3.state\r\n
					Kairos	OK\r\n

2-3. Layers - Operation Command

Operation			Command / Example	Note
swap_A_B	**Command**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.swap_A_B\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Layer Element> Can be obtained by the command in "2-1. Layers - List".
	Example	Client	SCENES.Main.Layers.Background.swap_A_B\r\n	
		Kairos	OK\r\n	
show_layer	**Command**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.show_layer\r\n**	
	Example	Client	SCENES.Main.Layers.Layer-1.show_layer\r\n	
		Kairos	OK\r\n	
hide_layer	**Command**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.hide_layer\r\n**	
	Example	Client	SCENES.ME1.Layers.Layer-2.hide_layer\r\n	
		Kairos	OK\r\n	
toggle_layer	**Command**		**SCENES.<*Scene Element*>.Layers.<*Layer Element*>.toggle_layer\r\n**	
	Example	Client	SCENES.Main.Layers.Group-1.Layer-4.toggle_layer\r\n	
		Kairos	OK\r\n	

3. Transitions

3-1. Transitions - List

Object	Command / Example			Note
Transitions	**Command**		**list:SCENES.<*Scene Element*>.Transitions\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List".
	Example	Client	list:SCENES.Main.Transitions\r\n	
		Kairos	SCENES.Main.Transitions.BgdMix\r\n SCENES.Main.Transitions.L1\r\n SCENES.Main.Transitions.L2\r\n \r\n	

3-2. Transitions - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
duration	✓	✓	✓	**Format**		**SCENES.<*Scene Element*>.Transitions.<*Transition Element*>.duration**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Transition Element> Can be obtained by the command in "3-1. Transitions - List".
				Value		**0 - 9999**	
				Example (R)	Client	SCENES.Main.Transitions.BgdMix.duration\r\n	
					Kairos	SCENES.Main.Transitions.BgdMix.duration=20\r\n	
				Example (W)	Client	SCENES.Main.Transitions.L1.duration=30\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SCENES.Main.Transitions.L2.duration\r\n	
					Kairos	OK\r\n	

3-3. Transitions - Operation Command

Operation	Command / Example			Note
transition_cut	**Command**		**SCENES.<*Scene Element*>.Transitions.<*Transition Element*>.transition_cut\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Transition Element> Can be obtained by the command in "3-1. Transitions - List".
	Example	Client	SCENES.Main.Transitions.BgdMix.transition_cut\r\n	
		Kairos	OK\r\n	
transition_auto	**Command**		**SCENES.<*Scene Element*>.Transitions.<*Transition Element*>.transition_auto\r\n**	
	Example	Client	SCENES.Main.Transitions.L1.transition_auto\r\n	
		Kairos	OK\r\n	

4. Snapshots

4-1. Snapshots - List

Object	Command / Example			Note
Snapshots	**Command**		**list:SCENES.<*Scene Element*>.Snapshots\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List".
	Example	Client	list:SCENES.Main.Snapshots\r\n	
		Kairos	SCENES.Main.Snapshots.SNP1\r\n SCENES.Main.Snapshots.SNP2\r\n \r\n	

4-2. Snapshots - Operation Command

Operation	Command / Example			Note
recall	**Command**		**SCENES.<*Scene Element*>.Snapshots.<*Snapshot Element*>.recall\r\n**	<Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Snapshot Element> Can be obtained by the command in "4-1. Snapshots - List".
	Example	Client	SCENES.Main.Snapshots.SNP1.recall\r\n	
		Kairos	OK\r\n	
update	**Command**		**SCENES.<*Scene Element*>.Snapshots.<*Snapshot Element*>.update\r\n**	
	Example	Client	SCENES.Main.Snapshots.SNP2.update\r\n	
		Kairos	OK\r\n	

5. Ramrecorders

5-1. Ramrecorders - List

Object	Command / Example			Note
Ramrecorders	**Command**		`list:RAMRECORDERS\r\n`	
	Example	Client	`list:RAMRECORDERS\r\n`	

		Kairos	`RR1\r\n`
			`RR2\r\n`
			`RR3\r\n`
			`RR4\r\n`
			`RR5\r\n`
			`RR6\r\n`
			`RR7\r\n`
			`RR8\r\n`
			`\r\n`	

5-2. Ramrecorders - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
autoplay	✓	✓	✓	**Format**		`<Ramrecorder>.autoplay`	<Ramrecorder> Can be obtained by the command in "5-1. Ramrecorders - List".
				Value		`0` (off) / `1` (on)	
				Example (R)	Client	`RR1.autoplay\r\n`	
					Kairos	`RR1.autoplay=0\r\n`	
				Example (W)	Client	`RR2.autoplay=1\r\n`	
					Kairos	`OK\r\n`	
				Example (S)	Client	`subscribe:RR8.autoplay\r\n`	
					Kairos	`OK\r\n`	
repeat	✓	✓	✓	**Format**		`<Ramrecorder>.repeat`	
				Value		`0` (off) / `1` (on)	
				Example (R)	Client	`RR1.repeat\r\n`	
					Kairos	`RR1.repeat=0\r\n`	
				Example (W)	Client	`RR2.repeat=1\r\n`	
					Kairos	`OK\r\n`	
				Example (S)	Client	`subscribe:RR8.repeat\r\n`	
					Kairos	`OK\r\n`	
tally	✓		✓	**Format**		`<Ramrecorder>.tally`	
				Value		`0` (None) / `1` (Red) / `2` (Green) / `4` (Yellow) / `8` (Blue) / `16` (Magenta) / `32` (Cyan)	
				Example (R)	Client	`RR1.tally\r\n`	
					Kairos	`RR1.tally=1\r\n`	
				Example (S)	Client	`subscribe:RR2.tally\r\n`	
					Kairos	`OK\r\n`	

5-3. Ramrecorders - Operation Command

Operation	Command / Example			Note
begin	**Command**		`<Ramrecorder>.begin\r\n`	<Ramrecorder> Can be obtained by the command in "5-1. Ramrecorders - List".
	Example	Client	`RR1.begin\r\n`	
		Kairos	`OK\r\n`	
step_back	**Command**		`<Ramrecorder>.step_back\r\n`	
	Example	Client	`RR2.step_back\r\n`	
		Kairos	`OK\r\n`	
reverse	**Command**		`<Ramrecorder>.reverse\r\n`	
	Example	Client	`RR3.reverse\r\n`	
		Kairos	`OK\r\n`	
play	**Command**		`<Ramrecorder>.play\r\n`	
	Example	Client	`RR4.play\r\n`	
		Kairos	`OK\r\n`	

pause	**Command**		**<Ramrecorder>.pause\r\n**	
	Example	Client	RR5.pause\r\n	
		Kairos	OK\r\n	
step_forward	**Command**		**<Ramrecorder>.step_forward\r\n**	
	Example	Client	RR6.step_forward\r\n	
		Kairos	OK\r\n	
end	**Command**		**<Ramrecorder>.end\r\n**	
	Example	Client	RR7.end\r\n	
		Kairos	OK\r\n	

6. Clip Players

6-1. Clip Players - List

Object			Command / Example	Note
Players	**Command**		**list:PLAYERS\r\n**	
	Example	Client	list:PLAYERS\r\n	
		Kairos	CP1\r\n CP2\r\n \r\n	

6-2. Clip Players - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example		Note
autoplay	✓	✓	✓	**Format**	**<Player>.autoplay**	<Player> Can be obtained by the command in "6-1. Clip Players - List".
				Value	**0** (off) / **1** (on)	
				Example (R)	Client	CP1.autoplay\r\n
					Kairos	CP1.autoplay=0\r\n
				Example (W)	Client	CP2.autoplay=1\r\n
					Kairos	OK\r\n
				Example (S)	Client	subscribe:CP1.autoplay\r\n
					Kairos	OK\r\n
repeat	✓	✓	✓	**Format**	**<Player>.repeat**	
				Value	**0** (off) / **1** (on)	
				Example (R)	Client	CP1.repeat\r\n
					Kairos	CP1.repeat=0\r\n
				Example (W)	Client	CP2.repeat=1\r\n
					Kairos	OK\r\n
				Example (S)	Client	subscribe:CP1.repeat\r\n
					Kairos	OK\r\n
tally	✓		✓	**Format**	**<Player>.tally**	
				Value	**0** (None) / **1** (Red) / **2** (Green) / **4** (Yellow) / **8** (Blue) / **16** (Magenta) / **32** (Cyan)	
				Example (R)	Client	CP1.tally\r\n
					Kairos	CP1.tally=0\r\n
				Example (S)	Client	subscribe:CP2.tally\r\n
					Kairos	OK\r\n

6-3. Clip Players - Operation Command

Operation	Command / Example			Note
begin	**Command**		**<Player>.begin\r\n**	<Player> Can be obtained by the command in "6-1. Clip Players - List".
	Example	Client	CP1.begin\r\n	
		Kairos	OK\r\n	
step_back	**Command**		**<Player>.step_back\r\n**	
	Example	Client	CP2.step_back\r\n	
		Kairos	OK\r\n	
play	**Command**		**<Player>.play\r\n**	
	Example	Client	CP1.play\r\n	
		Kairos	OK\r\n	
pause	**Command**		**<Player>.pause\r\n**	
	Example	Client	CP2.pause\r\n	
		Kairos	OK\r\n	
step_forward	**Command**		**<Player>.step_forward\r\n**	
	Example	Client	CP1.step_forward\r\n	
		Kairos	OK\r\n	
end	**Command**		**<Player>.end\r\n**	
	Example	Client	CP2.end\r\n	
		Kairos	OK\r\n	

7. Audioplayers

7-1. Audioplayers - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
repeat	✓	✓	✓	**Format**		**<Audioplayer>.repeat**	<Audioplayer> AP1 - AP4
				Value		**0** (off) / **1** (on)	
				Example (R)	Client	AP1.repeat\r\n	
					Kairos	AP1.repeat=0\r\n	
				Example (W)	Client	AP2.repeat=1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:AP4.repeat\r\n	
					Kairos	OK\r\n	

7-2. Audioplayers - Operation Command

Operation	Command / Example			Note
begin	**Command**		**<Audioplayer>.begin\r\n**	<Audioplayer> AP1 - AP4
	Example	Client	AP1.begin\r\n	
		Kairos	OK\r\n	
play	**Command**		**<Audioplayer>.play\r\n**	
	Example	Client	AP2.play\r\n	
		Kairos	OK\r\n	
pause	**Command**		**<Audioplayer>.pause\r\n**	
	Example	Client	AP3.pause\r\n	
		Kairos	OK\r\n	
end	**Command**		**<Audioplayer>.end\r\n**	
	Example	Client	AP4.end\r\n	
		Kairos	OK\r\n	

8. Macros

8-1. Macros - List

Object	Command / Example			Note
Macros	**Command**		**list:MACROS\r\n** or **list:MACROS.<Directory>\r\n** or **list:SCENES.<*Scene Element*>.Macros\r\n** or **list:PANELPROFILES.<*Profile*>.PanelMacros\r\n**	The obtained list can contain both macro elements and directories. The information whether the obtained items are macro elements or directories cannot be retrieved. <Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Profile> Profile1 - Profile8
	Example	Client	list:MACROS\r\n	
		Kairos	MACROS.M-1\r\n MACROS.M-2\r\n MACROS.New Directory-1\r\n \r\n	
		Client	list:MACROS.New Directory-1\r\n	
		Kairos	MACROS.New Directory-1.M-3\r\n MACROS.New Directory-1.M-4\r\n \r\n	
		Client	list:SCENES.Main.Macros\r\n	
		Kairos	SCENES.Main.Macros.Main-M-1\r\n SCENES.Main.Macros.Main-M-2\r\n \r\n	
		Client	list:PANELPROFILES.Profile1.PanelMacros\r\n	
		Kairos	PANELPROFILES.Profile1.PanelMacros.P1-M-1\r\n PANELPROFILES.Profile1.PanelMacros.P1-M-2\r\n \r\n	

8-2. Macros - Operation Command

Operation	Command / Example			Note
play	**Command**		**MACROS.<*Macro Element*>.play\r\n** or **SCENES.<*Scene Element*>.Macros.<*Macro Element*>.play\r\n** or **PANELPROFILES.<*Profile*>.PanelMacros.<*Macro Element*>.play\r\n**	<Macro Element> Can be obtained by the command in "8-1. Macros - List". <Scene Element> Can be obtained by the command in "1-1. Scenes - List". <Profile> Profile1 - Profile8
	Example	Client	MACROS.M-1.play\r\n	
		Kairos	OK\r\n	
stop	**Command**		**MACROS.<*Macro Element*>.stop\r\n** or **SCENES.<*Scene Element*>.Macros.<*Macro Element*>.stop\r\n** or **PANELPROFILES.<*Profile*>.PanelMacros.<*Macro Element*>.stop\r\n**	
	Example	Client	MACROS.New Directory-1.M-3.stop\r\n	
		Kairos	OK\r\n	
record	**Command**		**MACROS.<*Macro Element*>.record\r\n** or **SCENES.<*Scene Element*>.Macros.<*Macro Element*>.record\r\n** or **PANELPROFILES.<*Profile*>.PanelMacros.<*Macro Element*>.record\r\n**	
	Example	Client	SCENES.Main.Macros.Main-M-1.record\r\n	
		Kairos	OK\r\n	
stop_record	**Command**		**MACROS.<*Macro Element*>.stop_record\r\n** or **SCENES.<*Scene Element*>.Macros.<*Macro Element*>.stop_record\r\n** or **PANELPROFILES.<*Profile*>.PanelMacros.<*Macro Element*>.stop_record\r\n**	
	Example	Client	PANELPROFILES.Profile1.PanelMacros.P1-M-1.stop_record\r\n	
		Kairos	OK\r\n	

9. AUX

9-1. AUX - List

Object	Command / Example			Note
AUX	**Command**		**list:AUX\r\n**	
	Example	Client	list:AUX\r\n	
		Kairos	IP-AUX1\r\n IP-AUX2\r\n IP-AUX3\r\n IP-AUX4\r\n IP-AUX5\r\n IP-AUX6\r\n IP-AUX7\r\n IP-AUX8\r\n IP-AUX9\r\n IP-AUX10\r\n IP-AUX11\r\n ... \r\n	

9-2. AUX - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
source	✓	✓	✓	**Format**		**<*AUX*>.source**	<AUX> Can be obtained by the command in "9-1. AUX - List".
				Value		**<Source>** Note:<Source> can be obtained by the commands in "1-1. Scenes - List", "5-1. Ramrecorders - List", "6-1. Clip Players - List", "13-1. INPUTS - List", "14-1. GFXCHANNELS - List", and "15-1. INTSOURCES - List".	
				Example (R)	Client	IP-AUX1.source\r\n	
					Kairos	IP-AUX1.source=SCENES.Main\r\n	
				Example (W)	Client	SDI-AUX1.source=CP1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:STREAM-AUX1.source\r\n	
					Kairos	OK\r\n	
sourceOptions	✓	✓	✓	**Format**		**<*AUX*>.sourceOptions**	
				Value		**<Source>,<Source>,<Source>,…** Note:Number of <Source> is equal to 0 or greater than 0. <Source> can be obtained by the commands in "1-1. Scenes - List", "5-1. Ramrecorders - List", "6-1. Clip Players - List", "13-1. INPUTS - List", "14-1. GFXCHANNELS - List", and "15-1. INTSOURCES - List".	
				Example (R)	Client	IP-AUX1.sourceOptions\r\n	
					Kairos	IP-AUX1.sourceOptions=BLACK,WHITE,MATTES.ColA,MATTES.ColB,MATTES.ColC, IP1,NDI1,STREAM1,\r\n	
				Example (W)	Client	SDI-AUX1.sourceOptions=BLACK,WHITE,MATTES.ColA,MATTES.ColB,MATTES.ColC, IP1,NDI1,STREAM1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:NDI-AUX1.sourceOptions\r\n	
					Kairos	OK\r\n	
tally_root	✓	✓	✓	**Format**		**<*AUX*>.tally_root**	
				Value		**0** (None) / **1** (Red) / **2** (Green) / **4** (Yellow) / **8** (Blue) / **16** (Magenta) / **32** (Cyan)	
				Example (R)	Client	IP-AUX1.tally_root\r\n	
					Kairos	IP-AUX1.tally_root=0\r\n	
				Example (W)	Client	NDI-AUX1.tally_root=1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:STREAM-AUX1.tally_root\r\n	
					Kairos	OK\r\n	
name	✓	✓	✓	**Format**		**<*AUX*>.name**	
				Value		**String of text**	
				Example (R)	Client	IP-AUX1.name\r\n	
					Kairos	IP-AUX1.name=AUX-ip1\r\n	
				Example (W)	Client	NDI-AUX1.name=NDIout\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:SDI-AUX1.name\r\n	
					Kairos	OK\r\n	

10. Triggers

10-1. Triggers - List

Object	Command / Example			Note
Triggers	**Command**		**list:TRIGGERS\r\n** or **list:TRIGGERS.<Directory>\r\n**	The obtained list can contain both trigger elements and directories. The information whether the obtained items are trigger elements or directories cannot be retrieved.
	Example	Client	list:TRIGGERS\r\n	
		Kairos	TRIGGERS.New Trigger-1\r\n TRIGGERS.New Trigger-2\r\n TRIGGERS.New Directory-1\r\n \r\n	
		Client	list:TRIGGERS.New Directory-1\r\n	
		Kairos	TRIGGERS.New Directory-1.New Trigger-3\r\n TRIGGERS.New Directory-1.New Trigger-4\r\n \r\n	

10-2. Triggers - Operation Command

Operation	Command / Example			Note
send	**Command**		**TRIGGERS.*<Trigger Element>*.send\r\n**	<Trigger Element> Can be obtained by the command in "10-1. Trigger - List".
	Example	Client	TRIGGERS.New Trigger-1.send\r\n	
		Kairos	OK\r\n	

11. GFXSCENES

11-1. GFXSCENES - List

Object	Command / Example			Note
GFXSCENES	**Command**		**list:GFXSCENES\r\n**	
	Example	Client	list:GFXSCENES\r\n	
		Kairos	GFXSCENES.Example\r\n \r\n	
	Command		**list:GFXSCENES.*<GFXSCENES Element>*\r\n**	
	Example	Client	list:GFXSCENES.Example\r\n	
		Kairos	GFXSCENES.Example.Name-A\r\n GFXSCENES.Example.Name-B\r\n GFXSCENES.Example.Counter-A\r\n GFXSCENES.Example.Delim\r\n GFXSCENES.Example.Counter-B\r\n GFXSCENES.Example.Clock\r\n GFXSCENES.Example.Title\r\n GFXSCENES.Example.Sub-Title\r\n \r\n	

11-2. GFXSCENES - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
<Text Element>.text	✓	✓	✓	**Format**		**GFXSCENES.*<GFXSCENES Element>*.*<Text Element>*.text**	<GFXSCENES Element> Can be obtained by the command in "11-1. GFXSCENES - List". <Text Element> Can be obtained by the command in "11-1. GFXSCENES - List". <Counter Element> Can be obtained by the command in "11-1. GFXSCENES - List".
				Value		**String of text**	
				Example (R)	Client	GFXSCENES.Example.Name-A.text\r\n	
					Kairos	GFXSCENES.Example.Name-A.text=TEAM-A\r\n	
				Example (W)	Client	GFXSCENES.Example.Name-A.text=TEAMA\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:GFXSCENES.Example.Name-A.text\r\n	
					Kairos	OK\r\n	
<Text Element>.text_options	✓	✓	✓	**Format**		**GFXSCENES.*<GFXSCENES Element>*.*<Text Element>*.text_options**	
				Value		**list of Strings of text separated by comma**	
				Example (R)	Client	GFXSCENES.Example.Name-B.text_options\r\n	
					Kairos	GFXSCENES.Example.Name-B.text_options=TEAM-B,TEAMB,\r\n	
				Example (W)	Client	GFXSCENES.Example.Name-B.text_options=TEAM-B,TEAMB,B-TEAM\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:GFXSCENES.Example.Name-B.text_options\r\n	
					Kairos	OK\r\n	

<Counter Element>. value	✓	✓	✓	**Format**		**GFXSCENES.*<GFXSCENES Element>*.*<Counter Element>*.value**	
				Value		**-9999 - 0 - 9999**	
				Example (R)	Client	GFXSCENES.Example.Counter-A.value\r\n	
					Kairos	GFXSCENES.Example.Counter-A.value=0\r\n	
				Example (W)	Client	GFXSCENES.Example.Counter-A.value=1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:GFXSCENES.Example.Counter-A.value\r\n	
					Kairos	OK\r\n	

11-3. GFXSCENES - Operation Command

Operation	Command / Example			Note
<Counter Element>. increase	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Counter Element>*.increase\r\n**	<GFXSCENES Element> Can be obtained by the command in "11-1. GFXSCENES - List". <Counter Element> Can be obtained by the command in "11-1. GFXSCENES - List". <Clock Element> Can be obtained by the command in "11-1. GFXSCENES - List".
	Example	Client	GFXSCENES.Example.Counter-A.increase\r\n	
		Kairos	OK\r\n	
<Counter Element>. decrease	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Counter Element>*.decrease\r\n**	
	Example	Client	GFXSCENES.Example.Counter-A.decrease\r\n	
		Kairos	OK\r\n	
<Counter Element>. reset	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Counter Element>*.reset\r\n**	
	Example	Client	GFXSCENES.Example.Counter-A.reset\r\n	
		Kairos	OK\r\n	
<Clock Element>. start	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Clock Element>*.start\r\n**	
	Example	Client	GFXSCENES.Example.Clock.start\r\n	
		Kairos	OK\r\n	
<Clock Element>. stop	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Clock Element>*.stop\r\n**	
	Example	Client	GFXSCENES.Example.Clock.stop\r\n	
		Kairos	OK\r\n	
<Clock Element>. reset	**Command**		**GFXSCENES.*<GFXSCENES Element>*.*<Clock Element>*.reset\r\n**	
	Example	Client	GFXSCENES.Example.Clock.reset\r\n	
		Kairos	OK\r\n	

12. Audiomixer

12-1. Audiomixer - List

Object	Command / Example			Note
Audiomixer	**Command**		**list:AUDIOMIXER\r\n**	
	Example	Client	list:AUDIOMIXER\r\n	
		Kairos	AUDIOMIXER.Channel 1\r\n AUDIOMIXER.Channel 2\r\n AUDIOMIXER.Channel 3\r\n AUDIOMIXER.Channel 4\r\n AUDIOMIXER.Channel 5\r\n AUDIOMIXER.Channel 6\r\n AUDIOMIXER.Channel 7\r\n AUDIOMIXER.Channel 8\r\n AUDIOMIXER.Channel 9\r\n AUDIOMIXER.Channel 10\r\n AUDIOMIXER.Channel 11\r\n AUDIOMIXER.Channel 12\r\n AUDIOMIXER.Channel 13\r\n AUDIOMIXER.Channel 14\r\n AUDIOMIXER.Channel 15\r\n AUDIOMIXER.Channel 16\r\n \r\n	

12-2. Audiomixer - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
volume	✓	✓	✓	**Format**		**AUDIOMIXER.volume** or **AUDIOMIXER.*<Channel>*.volume**	<Channel> Can be obtained by the command in "12-1. Audiomixer - List".
				Value		**-1 - 0.12 (-0.263363, etc.)**	
				Example (R)	Client	AUDIOMIXER.volume\r\n	
					Kairos	AUDIOMIXER.volume=-1\r\n	
				Example (W)	Client	AUDIOMIXER.Channel 1.volume=-0.123\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:AUDIOMIXER.Channel 16.volume\r\n	
					Kairos	OK\r\n	
mute	✓	✓	✓	**Format**		**AUDIOMIXER.mute** or **AUDIOMIXER.*<Channel>*.mute**	
				Value		**0** (off) **/ 1** (on)	
				Example (R)	Client	AUDIOMIXER.mute\r\n	
					Kairos	AUDIOMIXER.mute=0\r\n	
				Example (W)	Client	AUDIOMIXER.Channel 1.mute=1\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:AUDIOMIXER.Channel 16.mute\r\n	
					Kairos	OK\r\n	

13. INPUTS

13-1. INPUTS - List

Object	Command / Example		Note
INPUTS	**Command**	**list:INPUTS\r\n**	
	Example	Client	list:INPUTS\r\n
		Kairos	IP1\r\n IP2\r\n IP3\r\n IP4\r\n IP5\r\n IP6\r\n IP7\r\n IP8\r\n IP9\r\n IP10\r\n IP11\r\n ... \r\n

13-2. INPUTS - Get Attribute Value (R) / Set Attribute Value (W) / Subscribe (S)

Attribute	R	W	S	Format / Value / Command Example			Note
name	✓	✓	✓	**Format**		***<INPUTS>*.name**	
				Value		**String of text**	
				Example (R)	Client	STREAM1.name\r\n	
					Kairos	STREAM1.name=SRT01\r\n	
				Example (W)	Client	SDI1.name=Camera16\r\n	
					Kairos	OK\r\n	
				Example (S)	Client	subscribe:IP1.name\r\n	
					Kairos	OK\r\n	

14. GFXCHANNELS

14-1. GFXCHANNELS - List

Object	Command / Example			Note
GFXCHANNELS	**Command**		**list:GFXCHANNELS\r\n**	
	Example	Client	list:GFXCHANNELS\r\n	
		Kairos	GFX1\r\n GFX2\r\n \r\n	

15. INTSOURCES

15-1. INTSOURCES - List

Object	Command / Example			Note
INTSOURCES	**Command**		**list:INTSOURCES\r\n**	
	Example	Client	list:INTSOURCES\r\n	
		Kairos	BLACK\r\n WHITE\r\n \r\n	