

EKI-7700 Series X-Ring Pro Configuration SOP

Revision Date	Revision	Description	Author
March/2018	V1.0	Initial release	ICG AE Eddie.Wei / Raimen Liu

Abstract

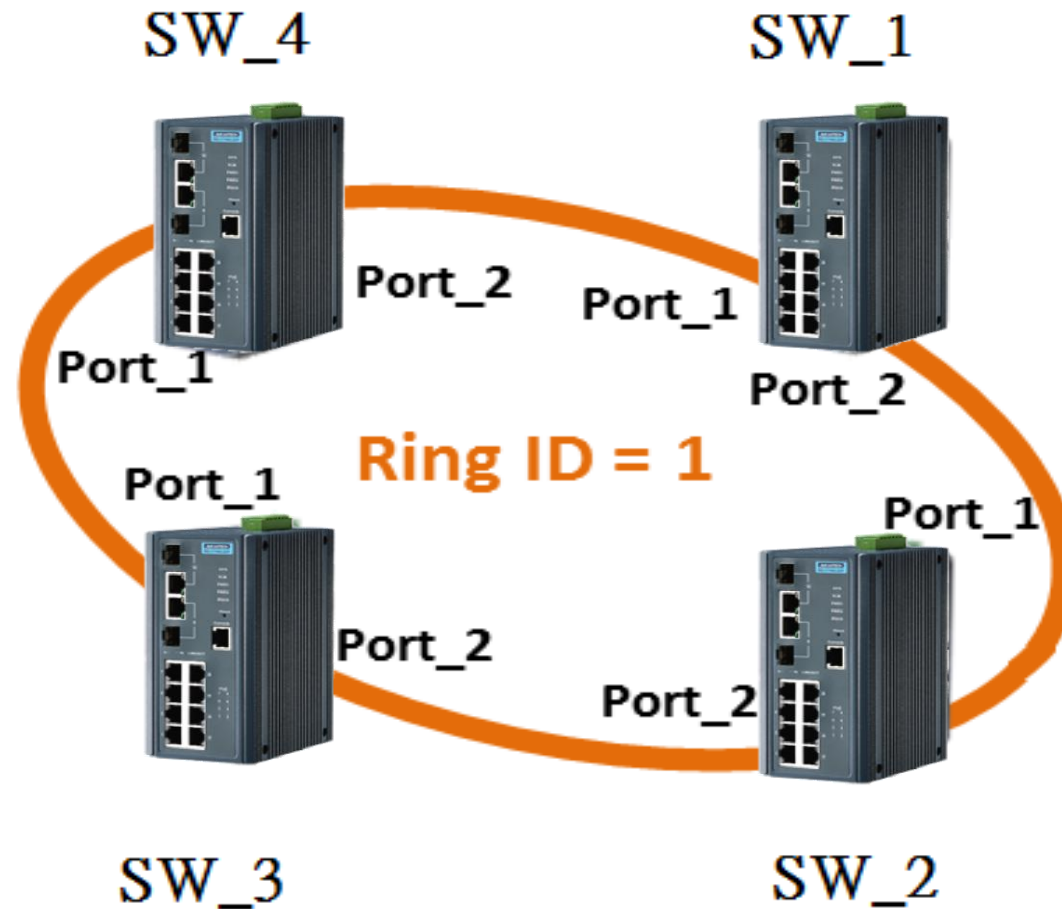
- ❖ **This SOP explains how to configure X-Ring Pro on Advantech EKI-7700 series industrial managed switch. The X-Ring structure include Single Ring, Couple Ring, Dual Ring and X-Chain.**
- ❖ **Related products:**
EKI-7428, EKI-7706, EKI-7708, EKI-7710, EKI-7712, EKI-7716, EKI-7720.
- ❖ **Requirement:** Advantech EKI-7700 series managed switch, RJ45 ethernet cable, PC
- ❖ **FAQ: X-Ring Pro, How to configure X-Ring Pro**
http://support.advantech.com/support/KnowledgeBaseSRDetail_New.aspx?SR_ID=1-1IIH2KF&Doc_Source=Knowledge+Base



Single Ring

Single Ring Structure

- Below diagram is the example for the single ring application.



Single Ring Configuration (1/2)

- Below screen shot show you the single ring configuration on the web:

SW_1~SW_4 (Each Ring must assign unique ring id, the maximum ring id is 255)

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID: 1, Port 1: GE1, Port 2: GE2, Add

Couple Setting

Couple Ring ID: 1-255, Port: Select Port, Master Ring ID: [Dropdown], Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Single Ring Configuration (2/2)

- Check status and configuration from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

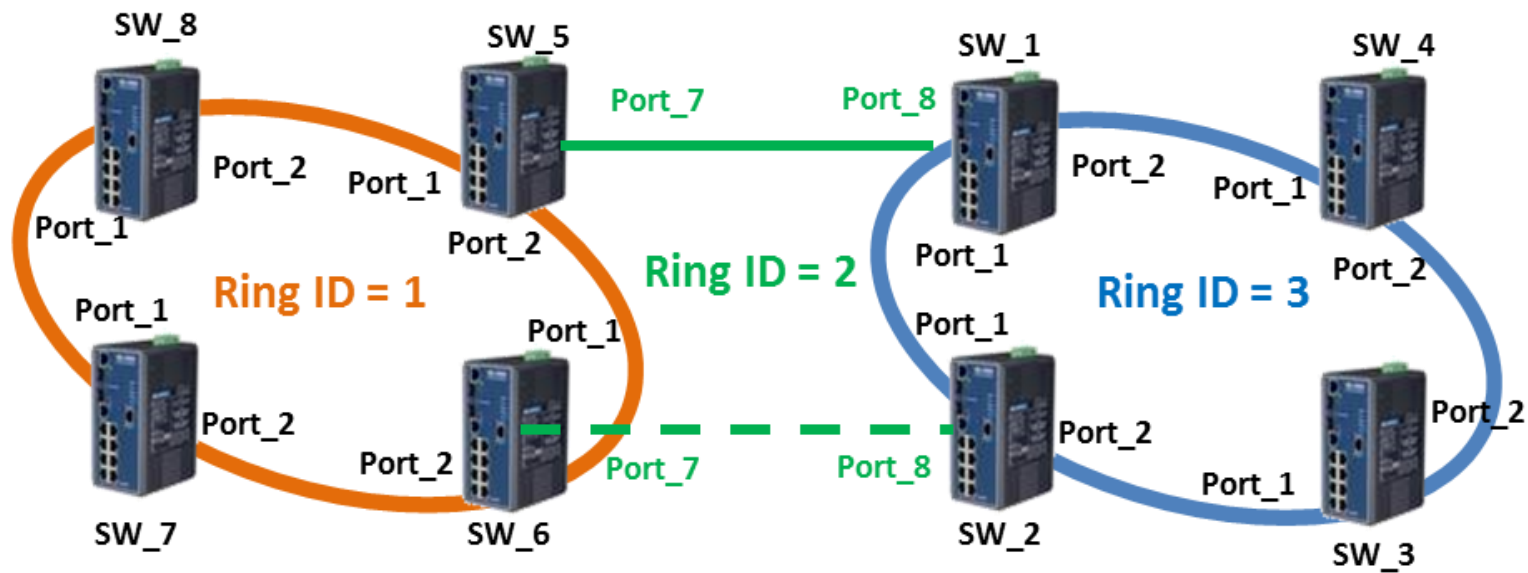
Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>



Couple Ring

Couple Ring Structure

- Below diagram is the example for the couple ring application.



- Primary Path
- Backup Path (Dotted Line)

Couple Ring Configuration – Ring ID = 1 (1/2)

- Below screen shot show you the couple ring configuration on the web:
SW_7, SW_8

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID: 1 Port 1: GE1 Port 2: GE2 Add

1 2

Port 1 and Port 2 of SW_7 and SW_8 belong to same partition with **Ring ID = 1**

Couple Setting

Couple Ring ID: 1-255 Port: Select Port Master Ring ID: Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Couple Ring Configuration – Ring ID = 1 (2/2)

- Check status and configuration of SW_7, SW_8 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Couple Ring Configuration – Ring ID = 1, 2 (1/3)

- Port 1 and Port 2 of **SW_5** and **SW_6** are also belong to same partition with **Ring ID = 1**

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
1	GE1	GE2	2 Add

1

Couple Setting

Couple Ring ID	Port	Master Ring ID	
1-255	Select Port		Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Port 7 belong to different partition with **Ring ID = 2** and associating it to **Partition 1** by selecting “**Ring 01**” in the Master Ring Port

Couple Ring Configuration – Ring ID = 1, 2 (2/3)

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Couple Ring Configuration – Ring ID = 1, 2 (3/3)

- Check status and configuration of **SW_5** and **SW_6** from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>
2	Couple	Disconnect	GE7	BLK			<input type="button" value="Delete"/>

Couple Ring Configuration – Ring ID = 2, 3 (1/3)

- Port 1 and Port 2 of **SW_1** and **SW_2** are also belong to same partition with **Ring ID = 3**

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID: 3 Port 1: GE1 Port 2: GE2 Add

Couple Setting

Couple Ring ID: 1-255 Port: Select Port Master Ring ID: Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Port 8 belong to different partition with Ring ID = 2 and associating it to Partition 3 by selecting “Ring 03” in the Master Ring Port

Couple Ring Configuration – Ring ID = 2, 3 (2/3)

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
3	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Couple Ring Configuration – Ring ID = 2, 3 (3/3)

- Check status and configuration of SW_1 and SW_2 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
3	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>
2	Couple	Disconnect	GE8	DWN			<input type="button" value="Delete"/>

Couple Ring Configuration – Ring ID = 3 (1/2)

- Below screen shot show you the X-ring Pro configuration on the web:
SW_3, SW_4

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID: 3 Port 1: GE1 Port 2: GE2 Add

1

2

Port 1 and Port 2 of SW_3 and SW_4 belong to same partition with **Ring ID = 3**

Couple Setting

Couple Ring ID: 1-255 Port: Select Port Master Ring ID: Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Couple Ring Configuration – Ring ID = 3 (2/2)

- Check status and configuration of SW_3, SW_4 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

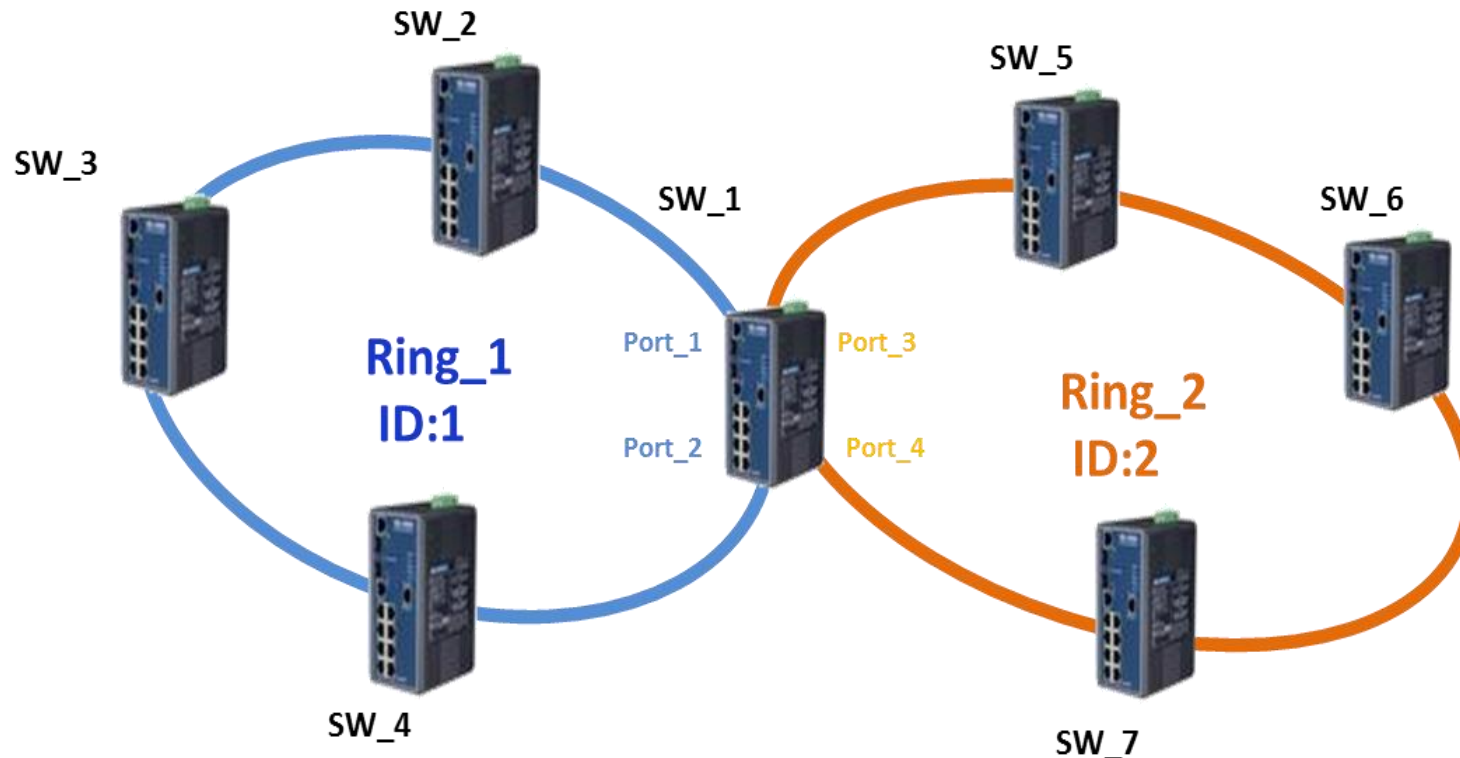
Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
3	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Dual Ring

Dual Ring Structure

- Below diagram is the example for the dual ring application.
 - Two adjacent rings share one switch.
 - Ideal for application that have inherent cabling difficulties.



Dual Ring Configuration – SW_1 (1/3)

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
<input type="text" value="1"/>	<input type="text" value="GE1"/> ▼	<input type="text" value="GE2"/> ▼	<input type="button" value="Add"/>

1

2

- Port 1 and Port 2 => Ring ID 1
- Port 3 and Port 4 => Ring ID 2

Couple Setting

Couple Ring ID	Port	Master Ring ID	
<input type="text" value="1-255"/>	<input type="text" value="Select Port"/>	<input type="text" value=""/> ▼	<input type="button" value="Add"/>

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Dual Ring Configuration – SW_1 (2/3)

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

3

4

- Port 1 and Port 2 => Ring ID 1
- Port 3 and Port 4 => Ring ID 2

Couple Setting

Couple Ring ID: Port: Master Ring ID:

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Dual Ring Configuration – SW_1 (3/3)

- Check status and configuration of SW_1 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

- Port 1 and Port 2 => Ring ID 1
- Port 3 and Port 4 => Ring ID 2

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>
2	Basic	STANDBY	GE3	DWN	GE4	DWN	<input type="button" value="Delete"/>

Dual Ring Configuration – SW_2, SW_3, SW_4 (1/2)

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

1

2

- Port 1 and Port 2 => Ring ID 1

Couple Setting

Couple Ring ID: 1-255

Port: Select Port

Master Ring ID: [Dropdown]

Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Dual Ring Configuration – SW_2, SW_3, SW_4 (2/2)

- Check status and configuration of SW_2, SW_3, SW_4 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

■ Port 1 and Port 2 => Ring ID 1

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

Dual Ring Configuration – SW_5, SW_6, SW_7 (1/2)

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
<input type="text" value="2"/>	<input type="text" value="GE1"/> ▼	<input type="text" value="GE2"/> ▼	<input type="button" value="Add"/>

1

2

- Port 1 and Port 2 => Ring ID 2

Couple Setting

Couple Ring ID	Port	Master Ring ID	
<input type="text" value="1-255"/>	<input type="text" value="Select Port"/>	<input type="text" value=""/> ▼	<input type="button" value="Add"/>

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
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Dual Ring Configuration – SW_5, SW_6, SW_7 (2/2)

- Check status and configuration of SW_5, SW_6, SW_7 from web.

X-Ring Pro Groups Settings

Ring ID: Port 1: Port 2:

Couple Setting

Couple Ring ID: Port: Master Ring ID:

■ Port 1 and Port 2 => Ring ID 2

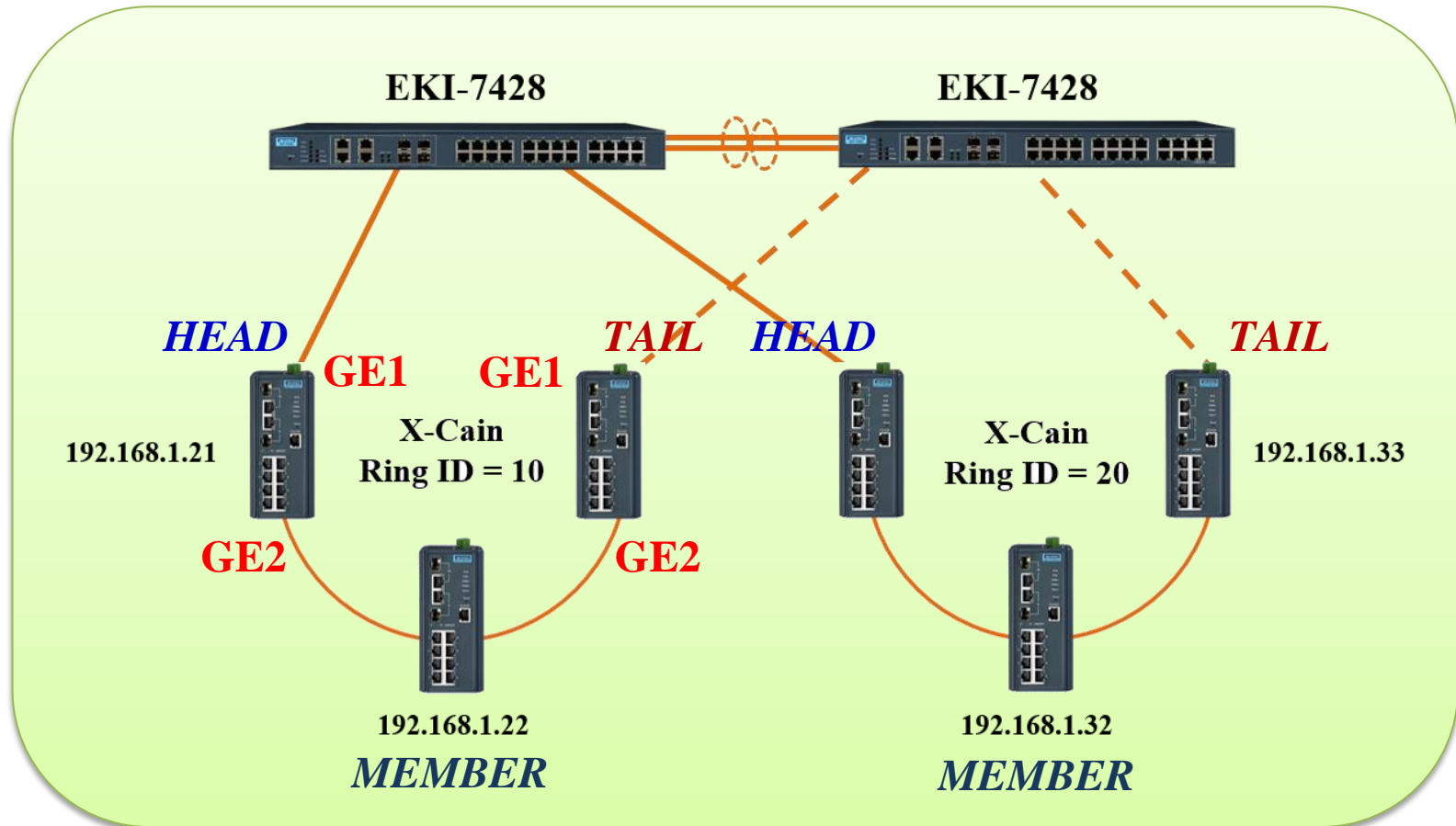
Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
2	Basic	STANDBY	GE1	DWN	GE2	DWN	<input type="button" value="Delete"/>

X-Chain

X-Chain Structure

- Three roles in X-Chain: Head, Tail, Member
- Take X-Chain Ring ID = 10 as a configured example.



X-Chain Configuration – Head (Ring ID 10)

ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

- 802.1Q VLAN
- Q-in-Q
- GARP
- 802.3az EEE
- Multicast
- Jumbo Frame
- Spanning Tree
- X-Ring Elite
- X-Ring Pro
- X-Ring Pro Settings
- X-Ring Pro Groups
- Loopback Detection
- MAC Address Table
- Security

Chain Setting

Chain Ring ID	Role	Head Port	Member Port	
10	Head	GE1	GE2	Add

Couple Setting

Couple Ring ID	Port
1-255	Select

Pair Setting

Pair Ring ID	Port
1-255	Select

The diagram illustrates the X-Chain configuration. Two EKI-7428 switches are connected via a fiber link. The left switch is connected to the HEAD node (192.168.1.21) of the X-Cain Ring ID 10. The right switch is connected to the HEAD node (192.168.1.33) of the X-Cain Ring ID 20. The MEMBER nodes are 192.168.1.22 and 192.168.1.32. Connections are labeled GE1, GE2, HEAD, and TAIL. A red arrow points from the Chain Setting table to the diagram.

X-Chain Configuration – Member (Ring ID 10)

ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Chain Setting

Chain Ring ID	Role	Member Port	Member Port	
10	Member	GE1	GE2	Add

Couple Setting

Couple Ring ID	Port
1-255	FE1 FE2 FE3 FE4

The diagram illustrates the X-Chain configuration. Two EKI-7428 switches are connected via a fiber link. Below them are two X-Chain rings. Ring ID 10 has a HEAD node (192.168.1.21) and a MEMBER node (192.168.1.22). Ring ID 20 has a HEAD node (192.168.1.33) and a MEMBER node (192.168.1.32). Connections are shown between the switches and the HEAD nodes, and between the HEAD and MEMBER nodes in each ring. A red arrow points from the Chain Setting table to the diagram.

X-Chain Configuration – Tail (Ring ID 10)

ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Chain Setting

Chain Ring ID	Role	Tail Port	Member Port	
10	Tail	GE1	GE2	Add

Couple Setting

Couple Ring ID	Port
1-255	FE1 FE2 FE3 FE4

The diagram illustrates the X-Chain configuration. Two switches, EKI-7710E-2C-AE and EKI-7428, are connected to the HEAD nodes of two X-Cain rings. Ring ID 10 (Tail) has three nodes: HEAD (192.168.1.21), TAIL (192.168.1.23), and MEMBER (192.168.1.22). Ring ID 20 (Head) has three nodes: HEAD (192.168.1.33), TAIL (192.168.1.32), and MEMBER (192.168.1.31). The connections are as follows: EKI-7710E-2C-AE connects to HEAD of Ring 10 (GE1) and HEAD of Ring 20 (GE1). EKI-7428 connects to TAIL of Ring 10 (GE1) and TAIL of Ring 20 (GE1). The diagram also shows the internal connections between nodes in each ring: HEAD-GE1-TAIL-GE2-MEMBER-GE1-HEAD for Ring 10, and HEAD-GE1-TAIL-GE2-MEMBER-GE1-HEAD for Ring 20.

X-Chain Configuration – Check Status Ring ID 10

HEAD

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Head	TRANSIT	GE1	FWD	GE2	FWD	Delete

MEMBER

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Member	TRANSIT	GE1	FWD	GE2	FWD	Delete

TAIL

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Tail	MASTER	GE1	BLK	GE2	FWD	Delete



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