Table of Contents

PREFACE **2**
CHAPTER ONE OVERALL INTRODUCTION **3**
1.1 SUMMARY 3
1.2FEATURES 3
CHAPTER TWO FUNCTION SPECIFICATION **3**
2.1 MAINFRAME FRONT PANEL SPECIFICATION 3
2.2 INTRODUCTION OF BOTTOM PANEL 5
2.3 MAINFRAME REAR PANEL SPECIFICATION 5
CHAPTER THREE TECHNICAL SPECIFICATIONS **6**
3.1 OPERATING ENVIRONMENT 6
3.2 POWER SUPPLY SECTION 6
3.3 MECHANICAL SPECIFICATIONS (W ×H ×D MM) 6
3.4 G.703 64K UNIDIRECTIONAL INTERFACE SPECIFICATION 7
3.5 ETHERNET INTERFACE SPECIFICATION 7
CHAPTER FOUR INTRODUCTION TO CENTRALIZED FRAME **7**
4.1 FRAME FRONT PANEL DISCRIPTION 7
4.2 DISCRIPTION OF FRAME REAR PANEL 7
CHAPTER FIVE INSTALLATION **8**
5.1 SAFETY REQUIREMENT 8
5.2 INSPECTION UPON UNPACKING 9
5.3 POWER SUPPLY 9
5.4 TEST 9
5.5 CONFIGURATION AND CONNECTION 9
CHAPTER SIX ACCESSORIES **10**
6.1 METHOD OF MAKING LINES 10
6.2 DIAGNOSIS AND TROUBLESHOOTINGS 11
6.3 WARRANTY CARD 12

Preface

Version Description

Manual version: V1.0

Copyright Notice

Disclaimer

This manual is made according to currently available information and subject to change without further notice. Whilst every effort has been made to ensure the accuracy and reliability of the contents contained herein, the Company cannot be held liable for any harm or damage resulting from any omissions, inaccuracies or errors contained in the manual.

Brief Introduction

This User Manual describes the installation and operation of G. 703 Unidirectional 64K-ETH Protocol Conversion Device. Before you use our device for the first time, please read all the included materials carefully, and install and operate this series of products in keeping with items listed in the manual, so as to avoid damaging the device resulting from malpractice. Thank you for choosing our products.

Environmental Protection

This product complies with the design requirements associated with environmental protection. The storage, use and disposal of the product should be conducted in accordance with related national laws and regulations.

We welcome you to put forward advice and suggestion to our work, which shall be viewed as the ultimate support to us.

Chapter One Overall Introduction

1.1 Summary

This device realizes the conversion of G.703 64K digital interface to Ethernet interface, and it is a high-performance self-learning long-distance Ethernet bridge. Its small size and low cost make it very suitable for cost-sensitive bridging applications, or as an extender or segmented distributor in a local area network based on bit stream structure. The equipment can continuously learn the MAC address connected to the LAN, and decide the data to be sent or to be filtered according to the destination MAC address of the data frame.

The device has high integration level, high reliability, low power, small size, full-featured, and other characteristics, and its abundant warning instructions make the launch of the project easy.

1.2Features

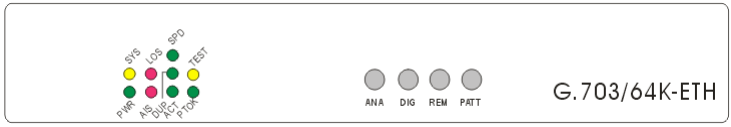
● This integrated circuit is based on our own intellectual property rights. G.703 64K unidirectional digital line adopts HDB3 encoding, and the interface channel and coding mode are in line with the ITU-T G.703. All-digital clock recovery technology and integrated phase locked loop are adopted and the jitter performance is far superior to G.823, G.742 protocol standard;

● This device provides loopback tests and pseudo-random pattern tests, and can be can be used as a simple channel error detector, used to facilitate the launch of the line and fault location; it also has muting function of the broadcast storm, and the use of loopback functions will not lead to the failure of the Ethernet;

● Ethernet have five modes, namely 10M / half-duplex, 10M / full-duplex, 100M / half-duplex, 100M / full-duplex, adaptive mode to be choosed.

Chapter Two Function Specification

2.1 Mainframe Front Panel Specification



2.1.1 Front Panel Indicators Specification

There are 9 indicators on the front panel, and their functions are:

Indicator	Function	Discription	
PWR	Indication of power supply status	On	Power supply is OK.
		Off	Power is off.
SYS	Indication of following status of operating parameters	On	Operating parameters follow the configuration of network management system.
		Off	Operating parameters follow the configuration of DIP switches.
LOS	64K unidirectional path loss indicator	On	Local end device transmission channel 64K unidirectional path loss worning
		Off	In normal operation.
AIS	Reserved		
SPD	Ethernet working rate indicator	On	100M
		Off	10M
		Flash	Data pack transferring.
DUP	Indicator of Ethernet full/half duplex	On	Full duplex.
		Off	Half duplex.
ACT	Indicator of Ethernet connection and activity	On	Ethernet interface connected correctly.
		Off	Disconnected.
TEST	Indication of test status	On	Local device is in test mode.
		Off	In normal operation.
PTOK	Indication of pseudo-random code test	On	Pseudo-random code test passed.
		Off	Bit error detected while in pseudo-random code test mode.

2.1.2Front Panel Switches Specification

There are 4 key switches, and their functions are:

Switch	Function	Discription	
ANA	Local loopback	ON	Loopback from 64K unidirectional path to Ethernet path
		OFF	Local loopback is off.
DIG	Loopback from Local to remote	ON	Loopback from Ethernet to 64K unidirectional path

		OFF	Loopback from local to remote is off.
REM	Reserved, Invalid		
PATT	Pseudo-random code transmitting for bit error test.	ON	Transimit Pseudo-random test code to transmission channel
		OFF	Such function is off.

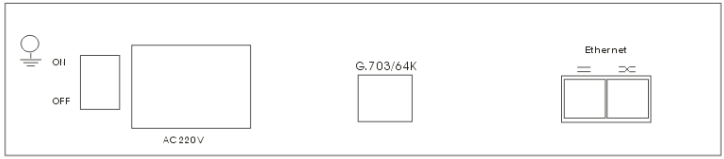
2.2 Introduction of bottom panel

Switch Name		Function	Discription				
S1	[1]	Clocking mode select	ON	Host(inner) clocking, use the clock generated by the inner crystal oscillator			
			OFF	Following clocking, operation clock is fetched from received line signals.			
	[2..4]	VLAN status configuration	Switch / Function		2	3	4
			10M half duplex		ON	ON	ON
			10M full duplex		ON	ON	OFF
			100M half duplex		ON	OFF	ON
			100M full duplex		ON	OFF	OFF
			auto-negotiation		OFF	OFF	OFF
	[5:8]	Reserved, invalid					

Note：Principles in clock selection:

1. Avoid that all devices adopt circuit clock. If a clock is provided by a device in the circuit, the other devices are set to adopt circuit clock, otherwise, the equipment is set to internal clock mode.
2. It is recommended that only one device provides clock.

2.3 Mainframe Rear Panel Specification



2.3.1 Power Supply

The power supply has two options: AC and DC, which should be specified upon ordering. The device supports both voltages 220V and 48V. The device supports two power versions: 220V and –48V, with up to 20% fluctuation. Note that the DC power supply has positive and negative poles. The negative/positive pole of –48V power source should be plugged into the negative/positive pole of the power input on the device. **The power is off when the switch is on "OFF" position. Otherwise the power is on.**

2.3.2 G.703 64K unidirectional digital interface

120Ω physical interface: RJ45

2.3.3 Ethernet Interface（LAN Interface）

There are two RJ45 interfaces on the back panel. One marked with two parallel lines is straight-through interface, and the other marked with crossover lines is crossover interface, which has a reverse connection method. Do not use the two interfaces at the same time.

Chapter Three Technical Specifications

3.1 Operating Environment

The device has a wide range of operating temperature and is able to work normally and stably in highly adverse environment.

Working Temperature	0℃ ～ +50℃
Storage Temperature	－40℃ ～ +70℃
Relative Humidity	10 %～95 %
Atmospheric Pressure	70～106 kpa

The environment should be free from corrosive and solvent gases, dust, and magnetic interference.

3.2 Power Supply Section

Using high-quality power adaptor, the device has a wide fluctuation tolerance and strong anti-interference and isolation quality to ensure a stable operation.

Input voltage	AC 220V / DC－48V
Voltage fluctuation	165VAC～265VAC or－36VDC～－72VDC
Power consumption	＜5 W

3.3 Mechanical Specifications (W×H×D mm)

External dimension Width210mm×Height41mm×Depth143mm

3.4 G.703 64K unidirectional interface specification

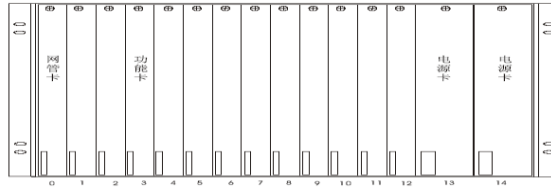
Electrical characteristics: accord with ITU-T G.703 standard.
Transfer characteristics: accord with ITU-TG.823 standard.
Jitter characteristics: accord with ITU-TG.823 standard.
Rate: 64Kbps±50ppm.
Coding mode: HDB3.
Resistance of interface: 120Ω.
Type of interface: RJ45 (120Ω).

3.5 Ethernet Interface Specification

Rate of Ethernet interface: 10M/100M self adjustable, 10M half duplex , 10M full duplex , 100M half duplex , 100M full duplex optional Ethernet interface is compatible with IEEE 802.3 protocol and supports IEEE 802.1Q.

Chapter Four Introduction to Centralized Frame

4.1 Frame Front Panel Discription



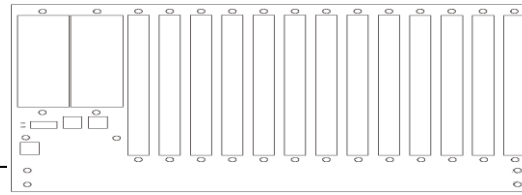
4.1.1 Operation Card

Maximally, 13 operation cards can be inserted into one frame. Mixed use of operation cards of various series of our devices is supported, and the operation is the same as desktop devices.

4.1.2 Power Supply Card

Customer can insert the required power supply card according to actual configuration. The power supply card has temperature display, and voltages 220V, -48V and powers 75W, 100W and 150W are available. Power supply hot standby supported.

4.2 Discription of Frame Rear Panel



4.2.1Address Switch

There are 8-bit DIP switches on rear (back) panel, and it can be used to set address if the network needs to be administered.

4.2.2Cascade Interface

There are 2 RJ45s on the right of the rear (back) panel used as cascade interface if .the network needs to be administered.

Chapter Five Installation

5.1 Safety Requirement

Please read the following safety items before installation to avoid physical injury and damage to this product or any other products connected. To avoid potential hazard, the product can be used only within specified scope. **Maintenance can be conducted only by technical personnel authorized by our company.**

1. Avoid fire or physical injury.

2. All power supply should be shut off during installation, which can be turned on only when all terminals have been connected correctly and checked to be free from mistakes.

3. Connect and disconnect in a properly. When device is powered up, do not connect or disconnect data cable without due cause.

4. Grounding. The product should be linked to the ground through earthed conductor. To avoid electric shock, the earthed conductor must be in connection with the ground. Make sure that the product is correctly earthed before connecting with the input or output terminals.

5. Correct connection. Users are expected to use accompanied accessories. In the event that special connections are needed, please pay attention to the corner allocation requirements.

6. Don't operate when there is no cover plate over the device . Do not operate the product if the cover plate or panel has been dismounted.

7. No contact with bare circuit is allowed. Do not touch bare connectors or

components when power is on.

8. No operation is allowed if there is suspicion of failure. Call authorized maintenance personnel for examination and reparation should the product be suspected of damage.

9. Good ventilation. Do not operate under humid or explosive environment.

10. Maintain the surface of the product clean and dry.

5.2 Inspection upon Unpacking

After unpacking the product, inspect the type, quantity and condition of device and accessories inside according to the list of contents specified in this manual. Contact the Company or its distributors and agencies immediately should abnormal circumstances arise.

5.3 Power Supply

Check the power supply of the device. The power input should be configured in accordance with related requirements. Pay particular attention to the voltage and polarity if the power supply is DC.

5.4 Test

Please first carry out the following test before usage:

1. Check whether all the swithes on the front panel are in correct position, turn on the power, the PWR light and LOS light will light constantly, and the other indicators shall be out.
2. Connect two devices with twisted pair cable and set the work mode, the LOS lights of the two devices will be out.

5.5 Configuration and Connection

If the indicators of the equipment work normally as described in paragraph 5.4, turn off the power, and set clock according to the conditions of the network. Turn on the power, and the equipment will be in normal operation condition.

If the devices can't operate normally as the above 5.4 describes, please look up diagnosis and troubleshootings. If fails in removing malfunctions, please contact our company or distributors and agents of our company at once.

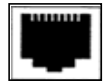
Chapter Six Accessories

6.1 Method of making lines

6.1.1 Methods of making 64K unidirectional cable

Methods of making 64K unidirectional cable:

Wiring scheme of the 64K unidirectional cable interface is as following:



Pin 1(+), 2(-): Input

Pin 4(+), 5(-): Output

1，2，3，4，5，6，7，8 →

6.1.2Making of Ethernet Interface Connecting Cable

(EIA/TIA568A standard)			(EIA/TIA568B standard)		
Pin No.	Connection signal	Sequence of twisted pair line	Pin No.	Connection signal	Sequence of twisted pair lines
1	TX+(transmission)	White and green 1	1	TX+(transmission)	White and orange
2	TX-(transmission)	Green	2	TX-(transmission)	orange
3	RX+(receive)	White and orange	3	RX+(receive)	White and green
4	Not to be used	Blue	4	Not to be used	Blue
5	Not to be used	White and blue	5	Not to be used	White and blue
6	RX-(receive)	Orange	6	RX-(receive)	Green
7	Not to be used	White and brown	7	Not to be used	White and brown
8	Not to be used	Brown	8	Not to be used	Brown

Ethernet interface Connecting Cable adopts twisted pair line with its specific making methods divided into two international standards, which are EIA/TIA568A and EIA/TIA568B. Position the tail of crystal head downward (i.e. the flat side upward), determine the lines with figures as 1 2 3 4 5 6 7 8 from left to right, and the distributions of each line are as

follows:

RJ-45 twisted pair line is specified as follows:

1)1, 2 used to send; 3, 6 used to receive; 4, 5， 7, 8 are bi-directional lines.

2)1, 2 must be pair twisted; 3, 6 pair twisted; 4, 5 pair twisted; 7, 8 pair twisted.

Making of straight-through line:

Both heads are connected as per T568B line sequence standard.

Making method of crossover line:

One head is connected as per T568A line sequence while the other head is connected as per T568B line sequence. The follows are specific connection conditions:

- The equipment is connected with PC and router: straight-through line shall be adopted with the same connecting method on both ends of network line.
- The equipment is concatenated with switch (or HUB): crossover line shall be adopted with different connecting method on both ends of network line.

6.2 Diagnosis and Troubleshootings

Phenomena	Potential Cause	Measures
Power indicator of device PWR lamp fails to be ON.	1. Control switch is not in place 2. Incorrect connection of power polarity 3. External power supply is not plugged in 4. Conductor dropped into machine frame that leads the power supply to be short circuited with the ground. 5. Malfunctions of power supply module	1. Press the switch in place 2. Change the polarity of power supply 3. Plug the external power supply 4. Remove the conductor 5. Contact the supplier

Warning after the connection of the 64K unidirectional interface	1. The making of connection cable is not correct. 2. Transmission distance exceeds the standard specification. 3. The clock setting mode in the circuit line is incorrect.	1. Make the lines correctly. 2. 120Ω: 500M 3. Set the clock mode of the other equipements.
Ethernet interface can ping through, but there are packet-loss problems	1. Network line is not made in twisted line form 2. There are too much concatenated HUBER in the network 3. Working modes are not corresponded with each other 4. There are wrong configurations of clock mode of device in the links.	1. Make the lines Correctly 2. Change the structure of network and decrease the multi-level concatenated HUBER 3. Set the correct working mode 4. Adjust the other device clock mode on the line.

6.3 Warranty Card

Our company is committed to provide users with the following terms:

1. Warranty service

1) Within the charge free warranty term (within 12 months since the purchase of the product), damaged parts can be exchanged free of charge and maintenance charges will be free in the conditions that the device is considered to be malfunctioned in normal service by our company.

2) Within the charged warranty term (more than 12 months and within 36 months since the purchase of the product), damaged parts will be charged for corresponding cost with free maintenance service in the conditions that the device is considered to be malfunctioned in normal service by our company.

2. Users can not enjoy warranty service with the following cases and corresponding cost of damaged parts replacing and maintenance service will be charged

（1） Exceed 36 months since the purchase of the product

（2） If you can't provide certificate of purchasing date, and serial No. of product shows that ex-works term has exceeded 36 months;

（3） Include but not limit to the abnormal service conditions such as violent knocking, extrusion, drop, liquid immersion that cause damages;

（4） Fragile label on the device is damaged;

（5） User disassembles this product himself

（6） Force majeure that leads to product damage, such as earthquake, flooding and lightening stroke;

3. The newly installed parts after maintenance will be repaired free of charge within 12 months since the installation date.

4. When malfunction occurs, users can choose to send it to our company to receive maintenance service or to post it to maintenance points of our company all over the country to be repaired.

5. Our company does not undertake any responsibilities for losses caused by abnormal operation; for losses really caused by product itself, including but not limited to all direct or indirect losses due to data loss, our company will only undertake responsibilities within the selling price of products.

Repair and Maintenance Record

Product Name: G.703 64K-ETH unidirectional protocol converter		**Device No.:**
Maintenance date		**No. of Service Bill**
1		
2		
3		
4		
5		