ASD SERIES

TIP-2E1 (MK-II)

USER GUIDE

(Software Version 2.3)

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Contents

1 Preface

1.1 General

Traditional E1 transmission network is using the PCM coding with time division multiplexing (TDM) technique which supports 2048 Kbps speed rate with very low transmission time delay. The E1 TDM network provides steady transmission, fixed bandwidth, highly transparency and small signal jitter and wander. That is quite suitable for real time services for voice and video transport.

The IP network is using packetized statistical multiplexing technique, which provides a much higher network resources reusing ratio. The seamless integration with the Ethernet and broadband network today, IP network becomes the most important and cost effective communication network.

Usually, both network platforms are used for different kinds of data and voice communication. As driven by the market demand, more and more requests to simplify and unify the network topology. By using the SDH / PDH to transport the TDM and IP services is very mutual today. On the other hand, in the telecom industry, it is more concentrate on terminal devices development for real time services on the IP network, such as VoIP terminal and multi-media gateway. Anyhow, the development of NGN and broadband internet, IP network is transforming to be the majority telecom network, not only because of the efficiency and simplicity of the packetized technology; it also provides multi-services and has a very good ‘Return Of Investment’. To obsolete the traditional TDM equipment is not practical, so how to transport the E1 data transparently on the IP network becomes a serious subject to the telecom industry. AiSai develop and design the TIP (TDM over IP) for the fulfillment of market requirement. The model TIP-2E1 MK-II is the second generation of the TIP product; which provides more features and unique bandwidth control to guarantee the transport of real time services over the non-real time network.

The most difficult part for the E1 data transport on the IP circuit emulation channel is how to reconstruct the data bit stream with accurate timing signal. To overcome the uncertain time delay, no timing control signal and retransmission of corrupted packets, AiSai develop our own advanced clocking control to solve the problem perfectly.

By the TIP-2E1 MK-II, it provides two different data packing methods for different network environment. The ‘Ethernet Packing’ is used for subnetwork internetworking. The high efficiency of ‘Ethernet Packing’ is suitable for tight bandwidth network such as Wireless Bridge connection, but it cannot get through the router. The ‘UDP/IP Packing’ can be used on the IP Ethernet. It can pass through the router or layer 3 switches, but more bandwidth will be consumed.

1.2 Features

- Excellent high transmission efficiency and low latency;
- Stable timing reconstruct, low jitter and wander;
- Minimal packet loss, no frequency variation, extra protection for framing synchronization;
- Support extra long packet and user definable packet size;
- Uplink bandwidth definable and packet QoS guaranteed;
- Support local and remote LOS, AIS alarm;
- Support auto-sensed 75 ohm / 120 ohm E1 interface, no configuration is needed;
- User select 'IP Packing' or 'Ethernet Packing' for different network requirement;
- Auto-sensed 10/100 Mbps Ethernet speed rate; auto adaptation for half / full duplex mode and MDI / MDIX cabling;
- Support hardware dip switches, simplify operation and easy for on-site control.

1.3 Application

The TIP-2E1 MK-II provides 1 – 2 transparent E1 channels and Ethernet bridging over the Ethernet or IP network (Diagram 1.1) for voice and data services. The QoS mechanism of the TIP-2E1 MK-II guarantees the highest priority for E1 real time transportation.

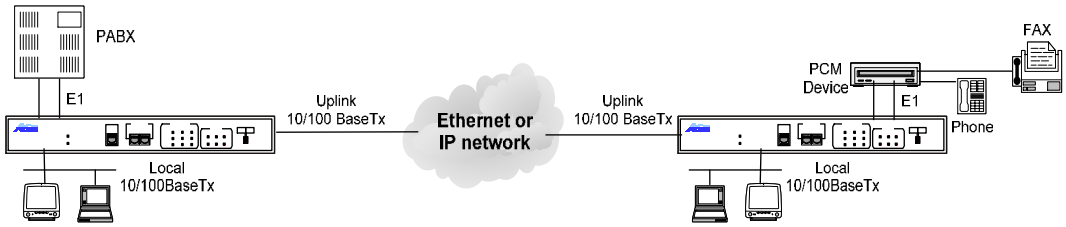


Diagram 1.1 – TIP-2E1 MK-II over IP Ethernet

Most the application of the TIP-2E1 MK-II is applied on the Wireless Bridge network (Diagram 1.2). The TIP-2E1 MK-II is compatible with most of the wireless manufacturers. It is just needed to adjust the packet length and/or buffer size when works with different wireless vendor equipment.

Remark: Lightning surge protector is a must for outdoor device and antenna of the wireless equipment.

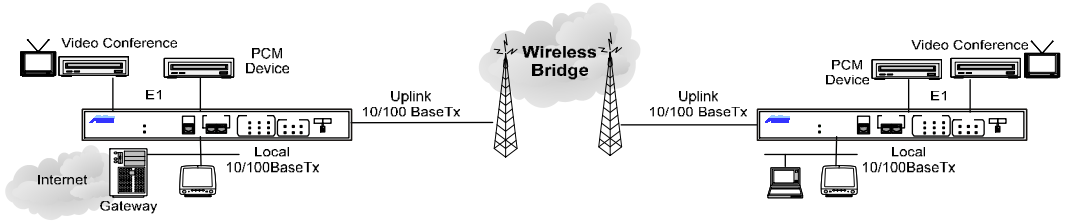


Diagram 1.2 – TIP-2E1 MK-II over Wireless Bridge

1.4 Clock Mode

To ensure the transparency transportation for the E1 data, TIP-2E1 MK-II is not only to transmit the data correctly, it has to receive the data precisely and reconstruct the bit stream accurately together with the timing signal. Usually, synchronization of transmit and receive on bidirectional transmission E1 signal is not a necessity. The clocking difference between transmit and receive terminal can be up to 100 ppm (part per million). The reconstruction of the bit stream is relied on receive clocking that is derived from the transmit data from remote device. TIP-2E1 MK-II adopts a state-of-art timing recovery technique that provides extra stable clocking frequency with low jitter and wander. It can satisfy most of the application environment.

The latency of packet transmission in Ethernet or IP network is uncertain. Most of the IP devices can reconstruct the stable and small jitter clock, but long time wander is uncontrolled, even though this wandering signal will not affect the master / slave clocking system. If both devices are using internal clock, a serious clock slip problem will happen suddenly when the frame buffer overflowed. Cater for this problem, TIP-2E1 MK-II provides another timing option, that is ‘Loop Timing’, it derives the timing signal from the received data, and the internal buffer will completely absorb any clock slip caused by the transmission network. Once the receive signal is lost, the TIP-2E1 MK-II will fallback to ‘Through Timing’ mode automatically to maintain the system stability. Two types of timing modes supported by TIP-2E1 MK-II are shown as below (Diagram 1.3).

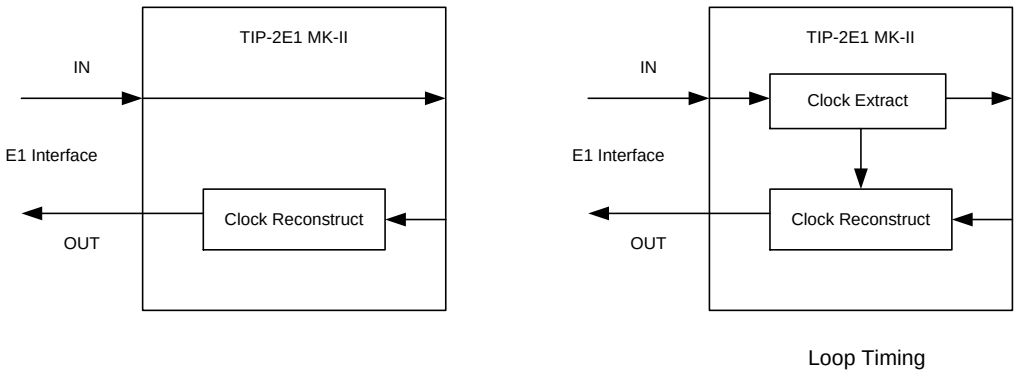


Diagram 1.3 – TIP-2E1 MK-II Timing Mode

To select the right system timing is the major factor to achieve the best service quality. Practically, when the attached E1 equipment is using the master clock mode, the TIP-2E1 MK-II should use the ‘Loop Timing’. If recovery (slave) clock mode is selected by the attached devices, ‘Through Timing’ should be used.

If both attached equipment are using a **synchronous** master clock derived from the same network clock source, both TIP-2E1 MK-II should use the ‘Loop Timing’. If both attached equipment are using **non-synchronous** master clock, clock slip is uncontrolled, ‘Through Timing’ should be used by both TIP-2E1 MK-II.

Attention:

1. Select the recovery (slave) clock on both E1 or PCM device on the same transmission link is unacceptable. Same regulation is applied on the TIP-2E1 MK-II as well.
2. Once the TIP-2E1 MK-II power up, to track down and lock the clock should take some times, around few minutes. Within the period, clock slipping and data error is normal.

According to the system setup as shown as below (Diagram 1.4), the selection of timing mode is listed as Table 1.1.

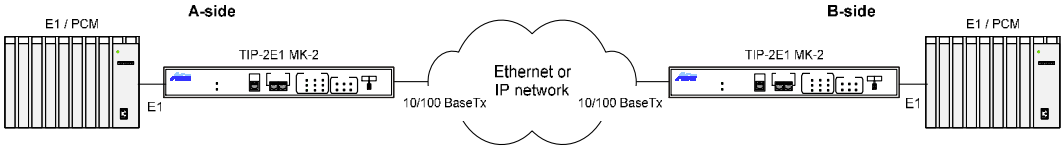


Diagram 1.4 – System Connection

A-Side PCM Clock Mode	B-Side PCM Clock Mode	A-Side TIP MK2 Timing Mode	B-Side TIP MK2 Timing Mode	Remark
Master clock	Master clock	Loop Timing	Loop Timing	A, B Master clock from same network source
Master clock	Master clock	Through Timing	Through Timing	A, B Master clock from different network source
Master clock	Slave clock	Loop Timing	Through Timing	
Slave clock	Master clock	Through Timing	Loop Timing	
Slave clock	Slave clock			Not allowed

Table 1.1 – Timing Mode Selection

2 Model TIP-2E1 (Mark-2)

The TIP-2E1 (Mark-2) supports two E1 (2Mbps) ports and two Ethernet ports (10/100BT) transport over the IP / Ethernet network. A real TDM over IP device that provide a more economy way to transport real time voice/video services over the IP network.

2.1 Front Panel

From the front panel, TIP-2E1 (MK-II) provides 3 sets of LED indicators; Ethernet interface connectors for the uplink and local Ethernet and the dip switches control for the system diagnostic.

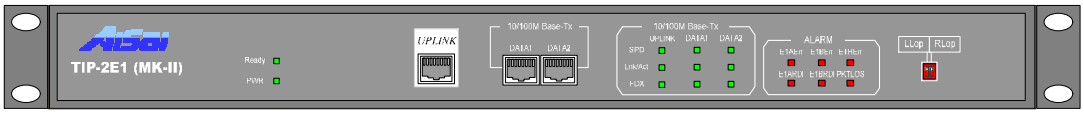


Diagram 2.1 –TIP-2E1 (MK-II) Front Panel

2.1.1 Power / Device Status LED Indicators

‘PWR’ is the Power indicator, green. Once the device is switched “ON”, the ‘PWR’ will light up.

‘Ready’ is the operating status of the system, green. Flashing indicates the device is in normal operation.

When the device is switched “ON”, ‘PWR’ and ‘Ready’ is lit up together, and the other indicators are flashing intermittently, the status indicates the device is booting up and in self diagnostic mode.

For no more than 60 seconds of time, the ‘Ready’ should start to flashing, and the other indicators will reflect the interface situation, the status indicates the device is in normal operation.

If the ‘Ready’ is not flashing after the boot up, the device is in abnormal operation and must reboot again. If symptom persists, the device is assumed malfunction.

2.1.2 Ethernet / Port Status LED Indicators

The TIP-2E1 (MK-II) has three RJ45 sockets that are used for uplink (‘UPLINK’) and local Ethernet (‘DATA1’ and ‘DATA2’) connection. The uplink port is used to interface the IP transport network equipment, such as Wireless Bridge; and the local Ethernet port for local LAN devices access.

In the Wireless Bridge application, the uplink bandwidth is always limited, if both E1 and Ethernet services are needed, the bandwidth of the Ethernet ports must in tight control. So it is recommended the Ethernet services should make connect to the local Ethernet port of the TIP-2E1 (MK-II). When more Ethernet devices are being used and Ethernet

switch is required, different equipment connection will affect the whole system performance. If the switch is put in the middle of the Wireless Bridge and the uplink port of the TIP-2E1 (MK-II), the data stream cannot be prioritized and bandwidth will be out of control, then the E1 real time service is not guaranteed.

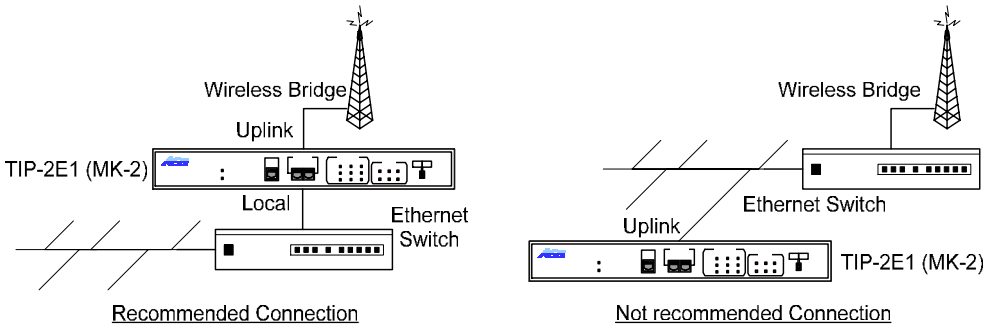


Diagram 2.2 –TIP-2E1 (MK-II) With Ethernet Switch System Connection

The pin assignment of the Ethernet port is listed as Table 2.1.

	Pin	Description
1 8 RJ45 Socket	1	RxD +
	2	RxD -
	3	TxD +
	6	TxD -

Table 2.1 – Ethernet Port Pin Assignment

There have 3 LED indicators for each individual Ethernet port, the indication from top to bottom is listed as Table 2.2.

Position	Label	Color	Description
Top	SPD	Green	Light Up: 100 Mbps speed rate Distinguish: 10 Mbps speed rate
Middle	Link / Act	Green	Light Up: Ethernet port link up Flashing: Data is passing through Distinguish: Ethernet port link disconnected
Bottom	FDX	Green	Light Up: Full duplex operation mode Distinguish: Half duplex operation mode

Table 2.2 – Ethernet Port Indicators

2.1.3 Alarm LED Indicators

There have three sets of alarm indicators that indicate the first E1 port (A port) alarm status; the second E1 port (B port) alarm status and the Ethernet transmission quality. The detail description is listed as Table 2.3.

Label	Color	Description
E1AErr E1BErr	Red	Light Up: E1-A or -B port loss of receive signal Flashing: E1-A or -B port receive AIS alarm Distinguish: E1-A or -B port in normal state
E1ARDI E1BRDI	Red	Light Up: Remote E1-A or -B port loss of receive signal Flashing: Remote E1-A or -B port received AIS alarm Distinguish: Remote E1-A or -B port in normal state
ETHErr	Red	Light Up: No remote MAC or gateway MAC receive Flashing: Internal buffer overflow Distinguish: Ethernet port in normal state
PKTLOS	Red	Light Up: Ethernet port no packet receive Flashing: Packet loss on Ethernet port Distinguish: Ethernet port in normal state

Table 2.3 – Alarm Indicators

2.1.4 Loopback Control Dip Switches

There have two dip switches control for the loopback of local ('LLop') and remote ('RLop') E1 interfaces. The function of the dip switches is listed as Table 2.4.

LLop Position	RLop Position	Function
OFF (UP)	OFF (UP)	Loopback disable
ON (DOWN)	OFF (UP)	Local E1 ports loopback
OFF (UP)	ON (DOWN)	Remote E1 ports loopback
ON (DOWN)	ON (DOWN)	Reset unit to factor default after 30 seconds

Table 2.4 – Alarm Indicators

When the switch of 'LLop' is put to down position ('ON'), two E1 ports of the local device will be in loopback mode. When the switch of 'RLop' is put to down position ('ON'), two E1 ports of the remote device will be in loopback mode (Diagram 2.3)

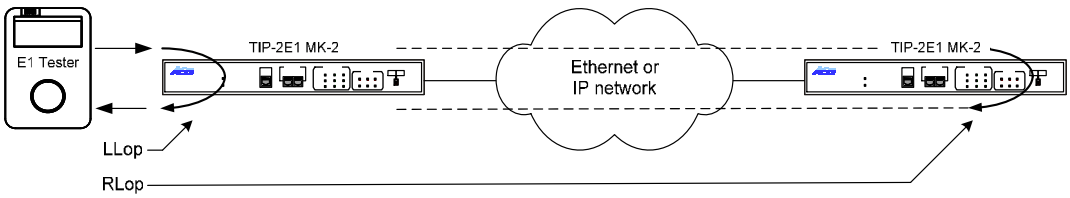


Diagram 2.3 –TIP-2E1 (MK-II) With Ethernet Switch System Connection

'LLop' is normally used to verify the E1 cables and cable connection. 'RLop' is used for whole connection path test, includes the TIP-2E1 (MK-II) and the IP Ethernet network.

The loopback command from remote end will has higher priority. When the 'RLop' issued from the remote end, the local E1 ports will be in loopback mode, and the 'LLop' will not function.

Extend Feature: when both the dip switches set to “ON”; after 30 seconds, the user defined parameters will be cleared and all settings will be back to factory default. The operation mode is controlled by the rotary switch located on the rear panel and used to simplify the user set up. Please refer to section 2.2.5 for mode setting.

Remark: After 30 seconds for both dip switches set to “ON”, the ‘Ready’ indicator will be lit up and the unit will start the power reset cycle. The factory default setting will take active after the reset. The default parameters are listed on Table 2.7 in section 2.2.5.

Caution: The factory default setting will override all the user settings. Please ensure the necessity to use this function.

2.2 Rear Panel

The TIP-2E1 (MK-II) supports two types of power supply, 220VAC and -48VDC supply as shown as below (Diagram 2.4).

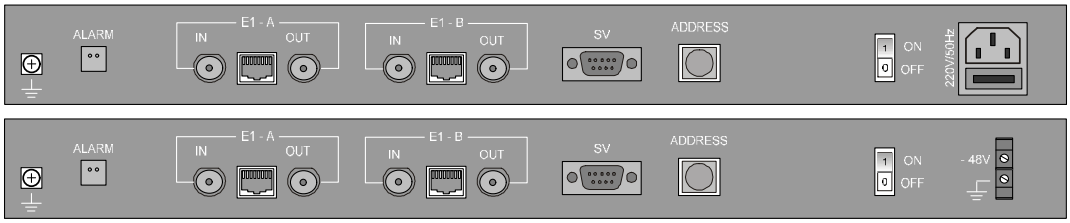


Diagram 2.4 – TIP-2E1 (MK-II) Rear Panel

2.2.1 Electrical Grounding Connector

The chassis grounding screw is located on the left corner of the rear panel. The unit must be grounded properly with the building ground.

Caution: The other direct attached device should also be grounded to avoid the signal interference and for electrical protection.

2.2.2 System Alarm Connector

System alarm connector provides two alarm relay contacts (Prompt and Deferred alarm) for connection with the building alarm system on the top of the equipment rack. When alarm occurs, the corresponding pin will be grounded. The contact is opened when the unit is in normal operation.

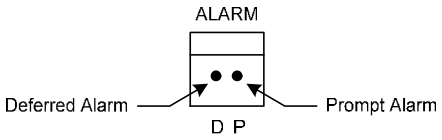


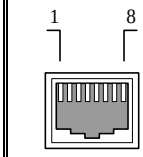
Diagram 2.5 – Alarm Socket

2.2.3 E1 Interface

The TIP-2E1 (MK-II) equips two sets of E1 interface on the rear panel. Each channel of E1 has a pair of BNC connector for 75 ohm E1 interface and one RJ45 socket for 120 ohm E1 interface.

The impedance of the E1 interface is auto-sensed when the cable connected to different connector. No specified parameter or setting is needed.

For the stability of transmission on the balanced E1 interface, pin 2 and 3 must be a pair of twisted wire and pin 6 and 7 must be another pair of twisted wire. E1 RJ45 connector pin assignment is listed as Table 2.5.



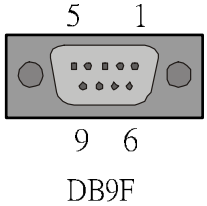
RJ45 Socket

Pin	Description
1	E1 - IN
2	
3	Ground
4	E1 - OUT
5	
6	Ground

Table 2.5 – 120 ohm E1 Interface Pin Assignment

2.2.4 Console Port

A DB9F connector is used for ‘SV’ console service port, it combines the RS232 and RS485 interfaces for the system control and monitoring. The pin assignment is listed as Table 2.6.



DB9F

Pin	RS232	RS485	Description
1	NC	NC	No Connect
2	RxD	NC	RS232 Receive Data
3	TxD	NC	RS232 Transmit Data
4	NC	SEL	RS232 No Connect RS485 Short with Pin 5
5	GND	SEL	RS232 No Connect RS485 Short with Pin 4
6	NC	RxN	RS485 Receive Positive
7	NC	RxP	RS485 Receive Negative
8	NC	TxN	RS485 Transmit Positive
9	NC	TxP	RS485 Transmit Negative
Shelf	CGND	CGND	Shielding ground

Table 2.6 – SV Interface DB9F Pin Assignment

2.2.5 Operation Mode Switch

To accommodate the parameter setup for different application, a 16-positions rotary switch is located on the rear panel. Each position of the switch (0 – F) has a pre-saved parameter setting for quick selection without using console commands in the field. Normally, the predefined setting is used in a pair for local and remote unit, for example mode 0 and 1; mode 2 and 3 … etc. End user can accord to the real situation to change the parameters through the console, and save settings to the individual operation mode. User can access the console port for parameters changing.

For some reasons, user may want to reset the parameter settings to factory default by using the extended function of the front panel dip switches ('LLop' and 'RLop'). The factory default parameters are listed as Table 2.7.

Parameter	Setting		
	Mode 0 / 2 / 4	Mode 1 / 3 / 5	
Local unit MAC address	00:02:DE:E5:B8:70	00:02:DE:E5:B8:71	
Remote unit MAC address	00:02:DE:E5:B8:71	00:02:DE:E5:B8:70	
Local IP address	172.16.96.245	172.16.96.246	
Remote IP address	172.16.96.246	172.16.96.245	
User defined MAC frame type	0xC0C0		
Subnet mask	255.255.0.0		
Gateway	172.16.96.202		
VLAN_TAG	No		
VLAN_TAG_Control Info	0x (8100) 0000		
IP encapsulation	Yes		
UDP port number	52719		
ARP protocol	Enable		
Uplink bandwidth	3500 Kbps full duplex		
Timing mode	Through timing		
Prompt alarm mask	0x18		
Deferred alarm mask	0x05		
	Mode 0 / 1	Mode 2 / 3	Mode 4 /5
E1 encapsulation packet length	1 x 128 Bytes	3 x 128 Bytes	11 x 128 Bytes
Jitter buffer size	4	30	30

Table 2.7 – Factory default mode setting

Default setting preset 3 sets of parameter for most typical application. Operation mode 0 and 1 define with shortest packet length and achieve shorter time delay. Mode 2 and 3 define a medium length of packet with medium time latency. Mode 4 and 5 has the longest packet length and longer time delay.

Caution: The factory default setting will override all the user settings. Please ensure the necessity to use this function.

2.2.6 Power Switch and Socket

There have 2 types of electrical power supply: 220VAC, or - 48VDC, and have to be specified in ordering. Before making any connection with the power supply, please put the power switch to “OFF” position for safety.

3 Installation

3.1 Mechanical

The TIP-2E1 (MK-II) can be placed at the table top or mounted on a 19” equipment rack. If it is to be mounted on the rack, the four 10 mm high stands should be removed with a screw driver. The mechanical dimension is shown as Diagram 3.1.

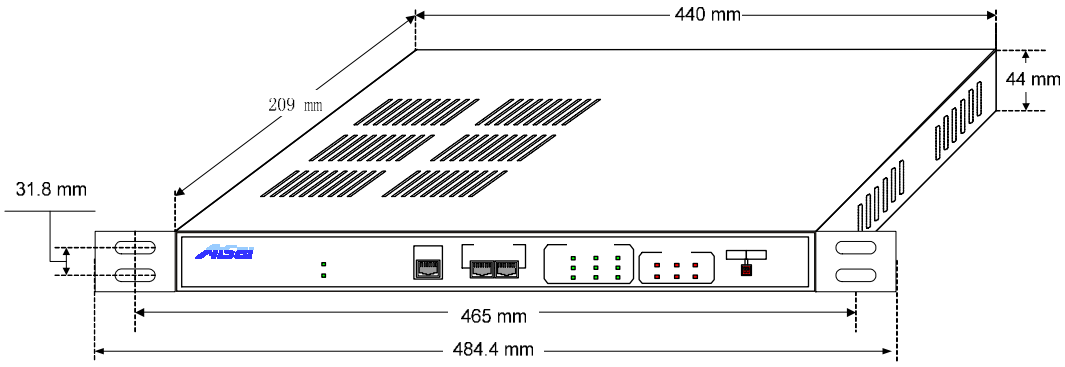


Diagram 3.1 – TIP-2E1 (MK-II) Mechanical Dimensions

3.2 Electrical

3.2.1 Power Connection

The TIP-2E1 (MK-II) consumes less than 10W of power.

According to power option, select the right power supply for the equipment. For the DC power, connect the – 48 supply to the power connector with label “– 48V” and the ground point to the next connector. The screws on the power connector must be tightly fastened. For AC 220V equipment, connect the device to the 220V outlet with standard power cord supplied with the equipment. Note that there is a 1A fuse in the 220V socket which could be replaced when burned. The DC supply uses PPTC auto resumed fuse, no customer replacement is required.

It is strongly recommended to turn power switch to “OFF” position before any connect or disconnect the power cord.

Be sure to make the chassis ground with the grounding screw located in the left corner.

Caution: To avoid electric shock, the AC 220V outlet must have good grounding.

3.2.2 E1 Connection

The E1 ports on the TIP-2E1 (MK-II) are used for the connection of the E1 equipment such as digital multiplexer or PCM terminal. Both 75 ohm and 120 ohm interfaces are provided. Only one of the interfaces is allowed to use. User can use either one according to the need. The E1 interface impedance is matched with the attached device and the cable connection adaptively.

The 120 ohm balanced E1 interface is supported by the RJ45 socket and the pair of BNC connectors is used for 75 ohm unbalanced E1 interface. The pin assignment of the RJ45 is listed as Table 2.5 in section 2.2.3.

3.2.3 Ethernet Connection

Connect the uplink Ethernet port to the Ethernet transport network, such as the Wireless Bridge or the IP Ethernet network, and connect the local data port to computers or an Ethernet switch for local data applications.

The pin assignment of the uplink and two local Ethernet data port is listed as Table 2.1 in section 2.1.2. The Ethernet connector is confirmed to HP auto-MDIX spec. It will automatically adapt to parallel or crossed cable.

Caution: When connecting with a Wireless Bridge device, the uplink Ethernet cable often connect to the outdoor unit, posing danger to lightning strikes that can damage the equipment seriously. To protect the equipment as well as any personnel, surge protection devices with good grounding connection is strongly recommended. Poor earth connection may also hinder the operation of the Ethernet port, causing severe packet losses.

4 Operation

Connect the console port with a RS232 cable to the PC running ‘Hyper terminal’ or any VT100 emulation program. All the parameters can be modified by user through the console command port.

4.1 Console Port Access

For the console port access, the Hyper terminal should be set with the following parameters:-

Bits per second: 9600
Data bits: 8
Parity: None

Stop bits: 1
Flow control: None

After setup the PC, press ‘Enter’, the unit should response the following that indicates the successful connection.

ETHMUX 2.x.x.
Please input passwd:

where ETHMUX 2.x.x shows the current software version.

After type in the correct password, the command menu will appear. The default password is “tsinghua” (case sensitive).

The command menu is organized into 3 levels. Most commands are activated by selecting the number given at the beginning of each command; others are by direct input of the parameter value, depending on the parameter type.

Usually, current parameter value is shown at the end of each menu line, within square brackets.

After login, if no key action is detected within 90 seconds, system will log off automatically to prevent unauthorized access.

The parameters will not be changed until specifically saved with ‘SAVE CONFIG’ command. Parameters are saved to one of 16 memory locations associated with the mode address switch position. Saved parameters can take effect only if the mode address is set to the right position.

4.2 Parameter Definition

4.2.1 Basic and Advanced Parameters

Operation behavior of TIP-2E1 (MK-II) depends on a number of parameters. They are divided into two groups, i.e. the basic parameters listed in Table 4.1., and the advance parameters listed in Table 4.2. All these parameters can be set or modified by the user. Initially, the parameters are set to default value shown as Table 2.7 in section 2.2.5.

Parameter	Option	Description
USE IP	Yes	Use IP encapsulation for E1 data packets; source and destination address needed to be specified. The encapsulation is able to cross different domains; bandwidth efficiency is a bit lower.
	No	Do not use IP encapsulation, higher bandwidth efficiency, but limited to same domain and cannot pass through a router.

Parameter	Option	Description
USE VTAG	Yes	Add 4 VLAN bytes to Ethernet packet, with first 2 bytes set to 0x8100, and last 2 bytes as VLAN ID set by user, suitable for networks supporting VLAN priority for QoS guarantees of E1 transport.
	No	Do not use VLAN header when the network does not support VLAN priority, efficiency is higher.
USE ARP	Disable	Destination MAC address should be specified by user.
	Enable	Destination MAC is acquired through ARP Protocol.
PACKET SIZE	N = 1 to 11	Number of N x128 bytes from E1 data stream packed into each packet. The longer the packet, the higher bandwidth efficiency, but longer times delay.
TIMING	Through	E1 clock reconstruct from remote data stream.
	Loop	E1 clock reconstruct from local data stream.
UP-LINK B/W	The maximum full duplex uplink bandwidth available to the TIP-2E1 (MK-II). The bandwidth should not less than 3.5 Mbps to guarantee a minimum data transport.	
ALARM MASKS	MASK-P	Used to set alarm conditions that will trigger prompt alarm output. Factory default is 0x18.
	MASK-D	Used to set alarm conditions that will trigger deferred alarm output. Factory default is 0x05.
JITTER BUFFER	1 - 31	Buffer size for packet jitter absorption, bigger buffer will absorb more jitter.

Table 4.1 – Basic parameters

Parameter	Description
LOCAL MAC	The physical Ethernet MAC address of local unit.
REMOTE MAC	The physical Ethernet MAC address of the remote unit, useful only when ARP is not enabled.
LOCAL IP	The IP address of local unit.
REMOTE IP	The IP address of the remote unit.
SUBNET MASK	IP sub-network mask.
GATEWAY IP	IP address of the default gateway router. When local and remote IP addresses are not within the same sub-network, the gateway routing must be used.
ETH FRAME TYPE	Ethernet frame type byte. When local and remote units are in the same sub-network, IP header can be omitted, and both should have the same Ethernet frame type.

VLAN TAG	User definable 4-byte VLAN TAG header, to be used to control the packet's behavior in a VLAN aware network. Please refer to the VLAN equipment User Guide for the header definition.
UDP PORT	E1 data are packed into UDP packets when IP encapsulation mode is selected. Both local and remote unit must use the same UDP port number.

Table 4.2 – Advance parameters

4.2.2 Bandwidth Requirement

Uplink bandwidth parameter is useful for applications where available uplink bandwidth is very limited, such as in most wireless LAN bridge connections. Under such conditions, this parameter must be set to match the available bandwidth. The TIP-2E1 (MK-II) will limit the throughput of local data packet so that the total bandwidth of E1 packets plus local data packets does not exceed this upper limit. The uplink bandwidth parameter does not limit E1 packets, that is, if a bandwidth specified is less than E1 transmission requirement, the actual bandwidth will not be limited. When this parameter is larger than the actual bandwidth, the local data packets will take more bandwidth than it should be given, competing with E1 packets, and causing E1 packet losses. It is recommended to specify a slightly lower value than the actual bandwidth, leave a margin for guaranteed E1 quality.

It should be noted that the bandwidth is specified in full duplex notion, while most wireless LAN bridges quote bandwidth in half duplex, such that a "10M" link will actually provide 5M full duplex bandwidth. Sometimes, the nominal bandwidth include transmission overhead, in that case, the actual bandwidth is less than 1/2 of the nominal.

The E1 packets for each E1 channel take about 2.3 Mbps bandwidth, depends on packet size parameter. The TIP-2E1 (MK-II) automatically adapts to the actual E1 used. If an E1 input is left open, it will not allocate uplink bandwidth for that E1, leaving more bandwidth for local data.

4.2.3 Alarm Mask Setting

The alarm masks are used to specify alarm conditions that will trigger alarm output at the alarm port on rear panel. When alarm conditions are met, the respective prompt alarm (ALM-P) or deferred alarm (ALM-D) pins will be at ground potential, otherwise they will be floating.

The selection of alarm conditions for ALM-P and ALM-D is done by setting respective alarm masks. Table 4.3 lists the meaning of each mask bit. A '1' in the mask selects that alarm condition for output, and a '0' will mask out that alarm. For example, setting ALM MASK-P to 0x18 means that the uplink alarm as well as E1-A LOS will cause prompt alarm output; and setting ALM MASK-D to 0x05 means that E1-A and/or E1-B AIS will cause deferred alarm output.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Unused			Uplink alm	E1-A LOS	E1-A AIS	E1-B LOS	E1-A AIS

Table 4.3 – Alarm Mask Bit Setting

4.2.4 Packet Size Setting

Packet size parameter specifies the number of E1 data bytes in each packet. Other overhead bytes such as IP header etc., depending on other options, will be added to the data, resulting larger final packet.

The packet size is N x 128 Bytes, where N = 1 to 11. The longer packet will have less overhead, and result a better efficiency. The trade-off is longer transport latency. But if the transmission link quality is not good enough, more retransmission occurs. Transport efficiency will be low down and latency will be much longer.

4.3 Menu Operation

After type in the correct password, user can get into the main menu and modify the parameter as per request.

4.3.1 Main Menu

The main menu is display as below.

CURRENT MODE SETTING 0
(0)QUIT
(1)CHANGE PASSWORD
(2)BASIC CONFIG
(3)ADVANCED CONFIG
(4)SHOW CURRENT CONFIG
(5)SAVE CONFIG
Please select [0]:

Note that the first line indicates the current mode address switch position as a reminder. Select one of the numbers bring out the second level command menu, ‘0’ will log off.

4.3.2 Change Password

Select ‘1’ at main menu, brings up the ‘CHANGE PASSWORD’ menu:

Please input old password:

Input old password here, if correct, system will ask for new password and retyping. If correct, the system will ask again

change password? (Yes or No) :

Input ‘y’ to conform, and next line appears:

your password has been changed

Otherwise, the password is not changed.
Note: if forget your password, please seek help from AiSai support.

4.3.3 Basic Parameter Menu

The ‘BASIC CONFIG’ menu is display as below and the corresponding setting is shown on the square brackets.

(0)QUIT
(1)USE IP [YES]
(2)USE VTAG [NO]
(3)USE ARP [YES]
(4)PACKET SIZE[5x128]
(5)TIMING [THROUGH]
(6)UP-LINK B/W[3500 kbps]
(7)ALM MASK-P [0x18]
(8)ALM MASK-D [0x05]
(9) JITTER BUFFER [3]
Please select [0]:

4.3.4 Advanced Parameter Menu

The ‘ADVANCED CONFIG’ menu is display as below and the corresponding setting is shown on the square brackets.

(0)QUIT
(1) LOCAL MAC [00:02:DE:E5:B8:70]
(2)REMOTE MAC[00:02:DE:E5:B8:71]
(3)LOCAL IP [172.16.95.245]
(4)REMOTE IP [172.16.95.246]
(5)SUBNET MASK [255.255.0.0]
(6) GATEWAY IP [172.16.95.202]
(7) ETH FRAME TYPE [0xC0C0]
(8)VLAN TAG [0x0000]
(9)UDP PORT [52719]
Please select [0]:

4.3.5 Show Current Config Menu

‘SHOW CURRENT CONFIG’ displays all the current parameter values no matter saved or not, such as:

LOCAL/REMOTE MAC 00:02:DE:E5:B8:71/00:02:DE:E5:B8:70
LOCAL/REMOTE IP 172.16.95.246/172.16.95.245

NETMASK/GWIP	**255.255.0.0/172.16.95.202**
ETYPE/VTAG/UPORT	**0xC0C0/0x0000/2142**
IPHEAD/ARP/VTAG	**YES/YES/NO**
PCKLEN/BUFFSIZE	**1x128/4x128**
BW/TIMING	**3500 Kbps/THROUGH**
PALM/DALM	**0x18/0x05**

4.3.6 Save Config Menu

The 'SAVE CONFIG' menu is display as below

(0) RETURN TO TOP MENU
(1) SAVE CURRENT SETTING
Please select[0]:

When commend (1) is selected, system asks to which address the current parameters should be saved.

Save to [0] (0~F):

Input the intended location number to save. Current mode switch position is shown in square bracket. Press Enter without number will save to this position.

5 Specifications

5.1 Capacity

Two E1 ports, one 10/100Base-Tx uplink Ethernet port, two 10/100Base-Tx local data Ethernet ports.

5.2 E1 Interface

Comply with ITU-T G.703 recommendation
75Ω (BNC) / 120Ω (RJ45) auto-adapt
End-to-end delay (minimum delay setting) ± 6ms
Output frequency offset (through timing, stabilized) ± 5 ppm
Output jitter (through timing) ± 0.1UI

5.3 10/100Base-Tx port

Comply with IEEE 802.3
10Mbps / 100Mbps Adaptive
Half / Full Duplex Adaptive
Support 802.1Q MAC

5.4 Power

AC: 165V~265V/50Hz or
DC: - 38V ~ - 62V or + 38V ~ + 62V
Power Consumption: ≤10W

5.5 Operating Condition

Temperature: (0 ~ 50) ^{o}C
Humidity: ≤ 90% (non-condensing)

5.6 Dimension

W × H × D: 440 × 44 × 209 mm

5.7 Weight

2.5 kg

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