

Announcing Major New IP Telephony Enhancements for Strata CIX

Toshiba is pleased to introduce Strata CIX Release 5.0, MIPU and SoftIPT 2.0 for exciting new IP applications.

Release 5.0 enables IP User Mobility, Redundancy at the desktop, Over-provisioning and the MIPU. The MIPU cards, with a new generation DSP, provide robust performance and support up to 24 ports using G.711 or G.729 without a daughter board. In addition, the MIPU is the platform for SIP Trunking.

Overview and Compatibility

The MIPU is available in two sizes, as shown in the table below.

Card	Channels	Part Number	Systems
MIPU16	16	MIPU16-1A	CIX100, 200, and 670 with R4.0 processors
MIPU24	24	MIPU24-1A	CIX100, 200, and 670 with R4.0 processors

The MIPU cards will be available for CIX40 systems in the future.

Value Proposition

- Supports:
 - IP Mobility
 - Redundancy at the Desktop
 - Over-Provisioning
 - SIP Trunking (future availability)
- Ease of deployment - configuration, installation, and maintenance
- Backward compatibility

Product Positioning

With the MIPU and LIPU cards, CIX Release 5.0 provides IP solutions such as IP desk phones, SoftIPT phones, SIP phones, Wireless SIP Phones, IP User Over-provisioning, IP User Hot-Desking and Mobility, Redundancy at the desktop, Strata Net via VoIP Networking. In addition, the MIPU cards will support SIP Trunking in the near future.

The MIPUs are the next generation VoIP cards in the Toshiba product line and is backward compatible with previous Strata CIX100, CIX200, and CIX670 with R4.0 processors. The MIPU cards can co-exist with LIPU cards in a single CIX system and in Strata Net environments.

The MIPU enables customers to leverage our time-tested Time Division Multiplex (TDM) background to better adapt to the customer's requirements for the present and the future.

New Features

Features of the MIPU include.

- Backward compatibility with LIPU
- Compatible in CIX100, 200, and 670 systems (refer to Figure 1)
- Log files collected remotely from the MIPU
- MIPU card uses one IP address.
- Tail-length echo cancellation increased from 32 ms to 64 ms (G.711 and G.729A)
- Quality of Service (QoS) threshold alarm notification and measurement
- IP Mobility support
- Connect between a node using G.711 A-Law codecs and a node using G.711 Mu-Law codecs.
- The maximum transmission interval of voice packet at using G.711 codec is 40ms. (It is 80ms in LIPU)
- RTP ports used by IPTs can be user modified
- Continuous rebooting (even after six failed attempts)

For a comparison of the MIPU and the LIPU refer to Table 1

Table 1 Comparison of MIPU and LIPU

Feature	LIPU / GIPH	MIPU
Channels	GIPH: 8 channels LIPU:16 channels LIPU+LIPS:32 channels	MIPU16:16 channels MIPU24:24 channels
Channel Limitation When LIPU is set Echo canceller tail length to 32ms in G.729A.	GIPH: 6 channels LIPU:12 channels LIPU+LIPS:24 channels	No Limitations
Voice Codec	G.711 (Mu-law/A-law), G.729A	Same
Echo Canceller	G.168 (04/2000) Tail Length is Max 32ms.	G.168 (08/2004) Tail Length is Max 64 ms
IP Address to use	GIPH and LIPU: 1 LIPU+LIPS: 2	1
RTP Packet Transmission Interval	20/ 30/ 40/ 80 ms	G.711: 20/ 30/ 40 ms G.729A: 20/ 30/ 40/ 80 ms
VoIP Protocol Support	Megaco+, SIP (Terminal), Strata Net IP	Megaco+, SIP (Terminal), Strata Net IP, and SIP Trunking
Priority Control	Diffserve, IEEE802.1p (*1)	Same as LIPU
NAT Traversal	xIPU does not support IPT transversal	Same as LIPU
VLAN	LIPU and LIPS cards can be set separately	All channels are set the same.
QoS Measurement	LIPU to IPT, Between IPT and IPT	Between MIPU and IPT Between IPT and IPT Between MIPU

Restriction

- MIPU does not support the IPT1000 series telephones
- Strata Net Nodes using LIPU/LIPS cards must be running CIX Release 4.0 software or later software.
- The MIPU has a single IP interface. Programming parameter LAN IF:1 is used to configure the card (MIPU16 or MIPU24) parameter LAN IF:2 is disregarded. The following are set per card:
 - Priority Control (Diffserve, IEEE802.1p)
 - VLAN
 - IP Address
- The maximum voice packet transmission interval of G.711 is changed from 80ms to 40ms.

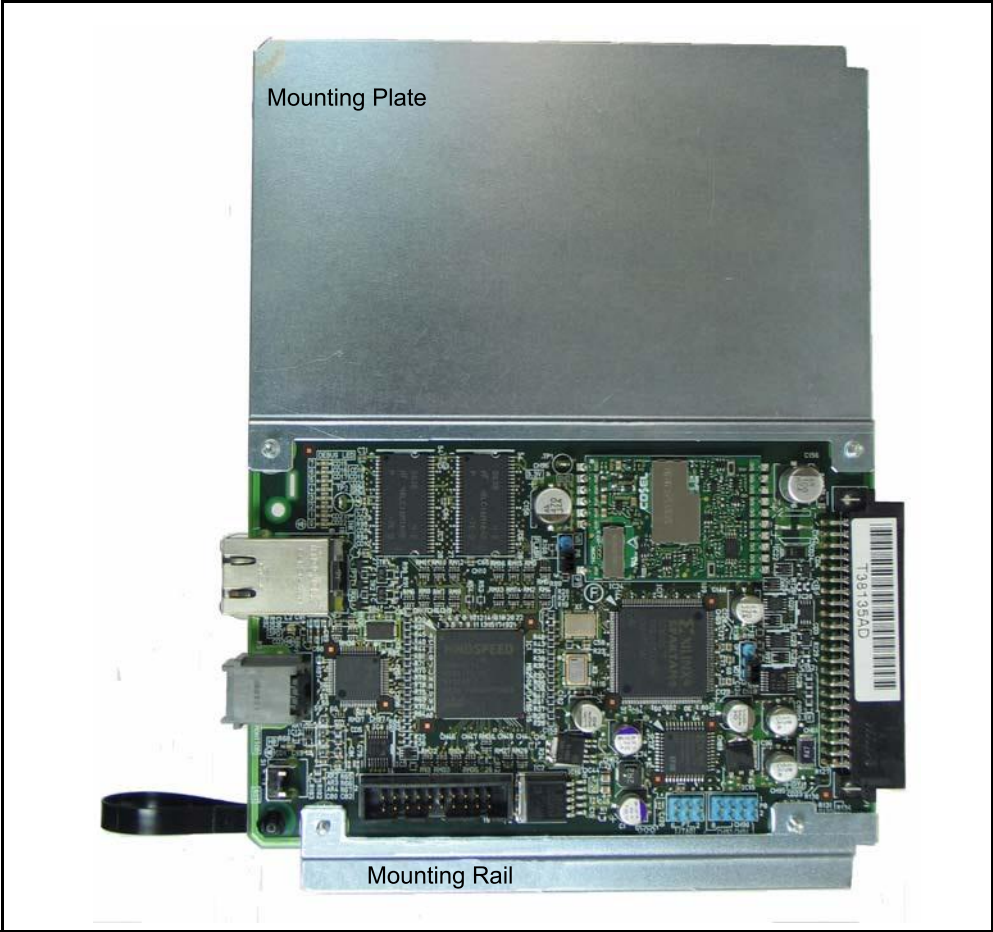


Figure 1 MIPU16/24 With Metal Plates for Mounting in CIX100, CIX200, and CIX670

Card Type Programming (Prog 100)

The card type specified in Program 100 is as follows

Hardware	Programming
MIPU16	MIPU16 (038)
MIPU24	MIPU24 (039)

MIPU Power Factors

The table below has the MIPU PCB power factors.

PCB	+5 V PF	-24 V PF
MIPU16	0.2	2.5
MIPU24	0.2	2.7

Strata Net IP

When using 17 to 24 channels for Strata Net IP on an MIPU24, all of the Strata Net IP channels will be supported by one channel group.

The “LAN IF:1” parameter in Program 325 has been modified to allow up to 24 channels.

The channels on the MIPU24 cannot be assigned to two groups, the MIPU has only one physical LAN interface and only one IP Address. If two channel groups are required use two MIPU16s instead of one MIPU24.

Cabinet Card Slot

The number of channels that can be used is based on card slot position.

The number of channels that can be used is shown below by the slot position in which it accommodates MIPU16, and MIPU24 in CIX100, CIX200, and CIX670.

Table 2 MIPU Card Location and Channel Availability

System	Card Slots		
		MIPU16	MIPU24
CIX100	Odd	16	24 ¹
	Even	16	16
CIX200	All	16	24
CIX670	Odd	16	24
	Even	16	16 ²

¹ The next even-numbered slot must be empty. If Automatic System Configuration places an MIPU24 into an odd-numbered slot and another card in the next (even-number) slot the MIPU will function with 16 channels.

² An MIPU24 will function with 16 channels when installed in even-numbered slots in a CIX100 or CIX670.

Important!

If an MIPU24 is inserted into a card slot programmed as an MIPU16 it will operate as an MIPU16. An MIPU16 in a card slot programmed as an MIPU24 will not operate at all, it will be put into a fault-make-busy state.

About IPT and SIP Station

The operation of 24 IP Stations (IPT and SIP Stations) or less is enabled by assigning IP Stations on the "LAN IF:1

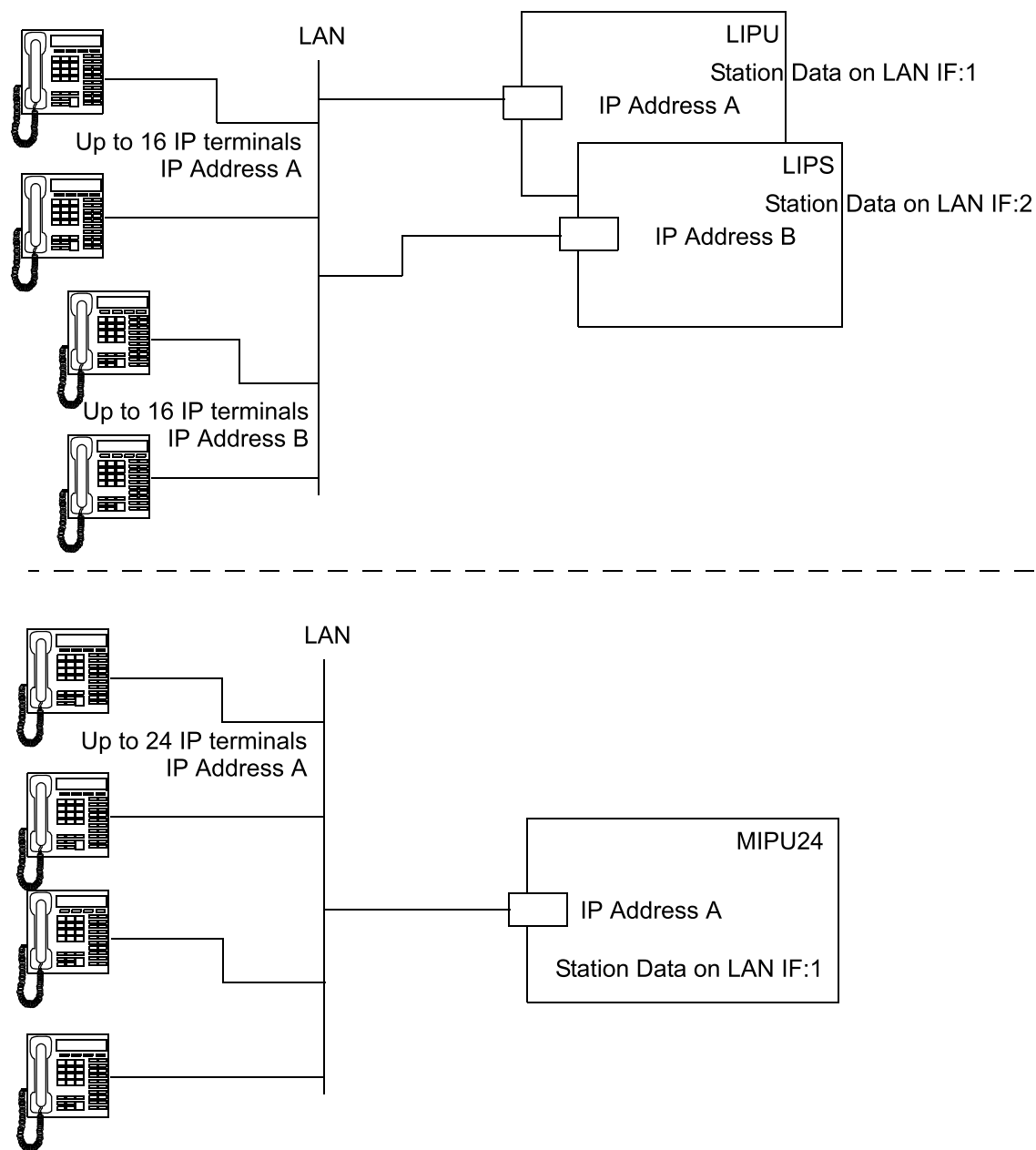


Figure 2 Accommodating 24 IP Stations on an MIPU24

Programming 24 Channels on the MIPU24

The programming procedure to support 24 channels on each IP equipment is as follows.

Strata Net IP

The number of valid channels on LAN IF:1 can be set up to 24 channels on the MIPU24. If a mix of Strata Net IP and IPTs are programmed on a MIPU24, simply set the number of Strata Net IP channels, the rest are available for the IPTs. Only one Strata Net IP channel group per MIPU card.

Prog	FK	Parameter	Value	Note
325 Full Strata Net IP Trunk Assignment	FK0	Channel group number	1-128	
	FK1	Slot position	0101-0706	Slot position of MIPU
	FK2	LAN interface number	1	Only "1" is valid.
	FK3	Number of valid channels	1-24	
	FK4	OLG	1-128	
	FK5	ILG	1-128	

IPT and SIP Stations

The programming for IPT and SIP Stations is the same as conventional programming.

Prog	FK	Parameter	Value	Note
260 Full IP Station Assignment	FK0	Prime DN	Five numerical characters or less	
	FK1	Station Type	IPT/SIP(/other)	Same as conventional types
	FK2	Slot position	0000-0706	Slot position for the MIPU
	FK3	LAN interface number	1	Only "1" is valid

Connection between G.711 A-Law and G.711 Mu-Law Nodes

In CIXR4.1MN0 and earlier software, the CODEC programming concerning G.711 Mu-Law or A-Law was based on the programming of the CODEC on the HW of that node. If the G.711 A-law/Mu-law codec setting was different than the other node, the voice communication had the problem. To avoid this problem G.729A must be selected as the inter-node codec. To connect between the nodes that are different in codec law, a new functions is provided

G.711 Mu-law and G.711 A-law are added into the list of codec types in parameter FK6 in Program 672. This is redefined as the codec type between own node and the other node which is described by FK0 in this program.

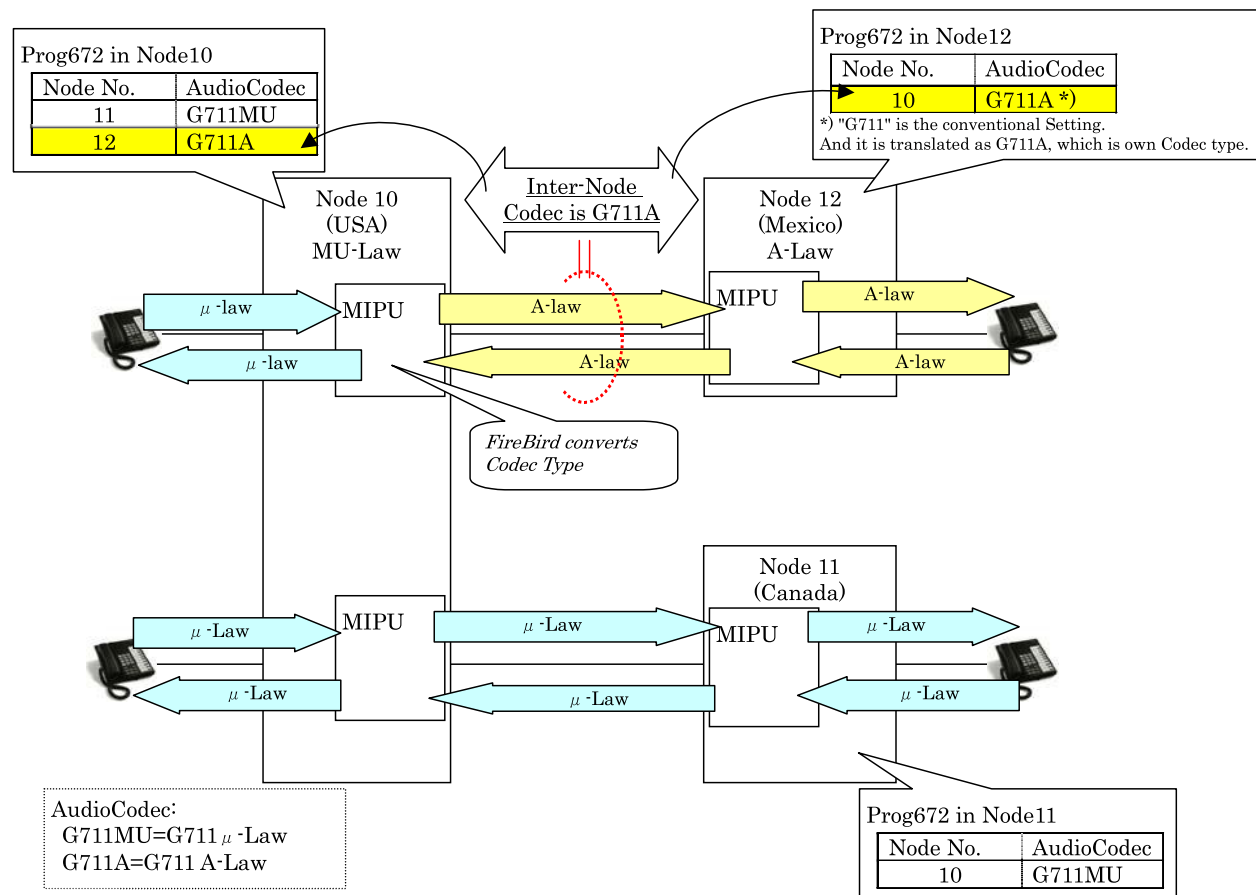


Figure 3 Codec type on Strata Net IP voice communication

Remote Collection of MIPU Log Files

MIPU can collect log files and store the files for remote access through the LAN interface using FTP, the same as the firmware updating procedure.

There are three Log Files, Trace, Error and QoS. The QoS log is described in the [QoS Measurement \(QoS Alarm\)](#) section of this document

eManager controls the procedure and the parameters, as follows:

- FTP Server Information: User Name, Password, Filename (this is only for Immediately mode). 10 sets of FTP server settings can be stored in the CIX database.
- MIPU Information: Slot position
- Transfer modes are: Immediately, Automatically or Stop

Table 3 Log Collection Modes and Actions

Mode	Sending Timing	Valid Period
Immediately	When this mode is set log files start sending immediately. The file is sent one time, then returns to the previous status when it is finished.	Until finished sending (only one time)
Automatically	When any log file is full	Until the mode is set as "Stop"
Stop	Changes the mode from "Automatically" to "Stop" does not to stop sending files if files are being sent.	Until the mode is set to "Automatically" or, if in "Immediately", when finished sending.

Rule of automatically transferred File Name is shown below.

Type of Log	Prefix	Unique Information	Time	Suffix
Error	ipuerror	[ID][Cabinet Slot]	[MM][DD][YY][HH][FF][SS]	log
Trace	iputrace			
QoS	ipuqos			

Unique Information is ID:CIX-ID, Cabinet Slot: cabinet and slot number.
time means MM: month, DD: day, YY: year, HH: hour, FF: minutes, SS: second

(Example of transferred file name) CIXID:1, S102, at 10/16 17:30:15

Error Log file: ipuerror_0010102_1016173015.log

Trace Log file: iputrace_0010102_1016173015.log

QoS Log File: ipuqos_0010102_1016173015.log

MIPU Log Collection

The procedure of setting is shown below.

1. CIX is set FTP server information. (The maximum number of this setting is 10)
(Each setting has a setting number)
2. CIX is set the transfer mode and FTP setting number about the target MIPU
3. CIX relay these setting to the target MIPU. Then this MIPU works as this setting.

When MIPU restarts, the setting of this feature is recovered after it starts working.

Error Codes

When an error occurs, the error code detected in the MIPU is reported in the Error log in the SD™ or SM™ card on the CIX processor and in the Error Management Information Block (MIB) variable for this feature.

Error Code is from 3xx to 5xx: Same as FTP error code.

Error Code	Meaning
0xx	(Original Error Code)
0	IDLE: Initial or ready to send in auto mode. (Not error).
1	Setting: CIX is setting specified mode to MIPU (Not error).
2	SENDING: MIPU is sending log files (Not error).
3xx	Positive Intermediate reply
332	Need account for login.
4xx	Transient Negative Completion reply
421	Service not available, closing control connection. This may be a reply to any command if the service knows it must shut down.
425	Can't open data connection.
426	Connection closed; transfer aborted.
5xx	Permanent Negative Completion reply
500	Syntax error, command unrecognized. This may include errors such as command line too long.
501	Syntax error in parameters or arguments.
530	Not logged in.
550	Requested action not taken. File unavailable (e.g., file not found, no access).
552	Requested file action aborted. Exceeded storage allocation (for current directory or data set).
553	Requested action not taken. File name not allowed.

RTCP

MIPU supports RTCP protocol to RTP handled by MIPU. The action of RTCP on MIPU is as follows. The CIX does not have programming items for RTCP on MIPU.

- The RTCP port number is equal to RTP port number + 1.
- The packet interval of RTCP is equal to 5 second.
- MIPU does not support RTCP Extended Report (RFC3611).
- NAT traversal of RTCP is not supported.

The following table shows the pair of endpoints that transmit RTCP packets to each other.

Table 4 RTP session supported RTCP

RTP Endpoint Session	IPT	SIP ¹	Media Gateway	Strata Net IP
IPT	X	X	X	—
SIP ¹	X	X	X	—
Media Gateway	X	X	—	—
Strata Net IP	—	—	—	X
X Available — Nonexistent cases				

¹ Depends on SIP terminal specifications.

QoS Measurement (QoS Alarm)

QoS Measurement

The QoS statistics information of each RTP session is collected and recorded. The following table shows the endpoint pairs that support QoS measurement.

When the RTCP is not guaranteed (ex. NAT traversal), the QoS statistics are not guaranteed.

	Destination Endpoints				
Measurement Target	IPT	IPT (NAT)	SIP	Strata Net IP	Media Gateway
IPT	OK	NG ¹	OK	— ²	OK
IPT (NAT)	NG	NG	NG	—	NG
SIP	N/A ³	N/A	N/A	—	N/A
Strata Net IP	—	—	—	OK	—
Media Gateway	OK	NG	OK	—	—

¹ Measurement statistics are Not Guaranteed

² Nonexistent case

³ Not Available

When RTP session is disconnected, QoS statistics information is recorded. The information recorded by this feature, is as follows.

long	sent;	// The number of packets sent
long	received;	// The number of packets received
long	delay;	// The average delay time
long	jitter;	// The average jitter
long	lossOfFraction, lossOfWhole;	// Ratio of packet loss

- QoS statistics information is recorded to file for QoS measurement.
- The file for QoS measurement can be get by the same way as that of getting log file remotely.
- The format of file for QoS measurement is comma-separated test. The following table shows the recorded information to this file.

Table 5 QoS Report Format and Syntax

Field No.	Value	Format	Max Number Of Character	Notes
1	Data Type	A	1	" " normal "A" Alarm
2	Protocol	X	1	X = 0 ~ 4 0: Media Gateway 1: IPT 2: Strata Net IP 3: Media Gateway 4: SIP Trunk
3	Time Stamp	MO/DD HH:MI:SS	14	MO = month (01 ~ 12) DD = day (00 ~ 31) HH = hour (00 ~ 23) MI = minute (00 ~ 59) SS = second (00 ~ 59)
4	Local IP Address	XXX.XXX.XXX.XXX	15	XXX = 0 ~ 255
5	Local RTP port	XXXXXX	5	XXXXXX = 0 ~ 99999
6	Remote IP Address	XXX.XXX.XXX.XXX	15	XXX = 0 ~ 255
7	Remote RTP port	XXXXXX	5	XXXXXX = 0 ~ 99999
8	Number of send packets	XXXXXXXXXX	10	XXXXXXXXXX = 0 ~ 4294967295
9	Number of receive packets	XXXXXXXXXX	10	XXXXXXXXXX = 0 ~ 4294967295
10	Jitter	XXXXXXXXXX	10	XXXXXXXXXX = 0 ~ 4294967295
11	Delay	XXXXXXXXXX	10	XXXXXXXXXX = 0 ~ 4294967295
12	Packet loss	XXXXXXXXXX	10	XXXXXXXXXX = 0 ~ 4294967295

The example of recording format.

A,1, 06/28 12:10:50, 192.168.0.100,16384,192.168.1.200,16385, 1234567890, 1234567890,1234567890, ,1234567890,1234567890, ↓
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QoS Alarm

- Strata Net IP, Media Gateway
- The thresholds to the following parameters can be programmed by Prog 152. When which of these values exceeds the threshold value, and when these values return to normal value (less than threshold value), the event is recorded in the CIX error log and MIPU error log.
 - Packet Loss Ratio
 - Jitter
 - Delay
- IPT

The threshold programming (Prog 152) is the same as that of Strata Net IP or Media Gateway. But an IPT cannot detect abnormal values of QoS parameters in a timely manner. Because the IPT sends the QoS statistics information to the xIPU when the RTP session is disconnected, the xIPU checks the QoS information at this time, and if there are any values beyond the threshold, the event is recorded in the CIX error log and the MIPU error log.

Specification of DSP Parameters Configuration

The DSP on the MIPU is configured by downloading a DSP Configuration File from the eManager computer to the MIPU. This process is more efficient and more accurate than using an eManager command. The LIPU parameters can be set by using Program 163 from a DKT, IPT or eManager, the MIPU DSP parameters can only be set with a Configuration file from eManager. The new process, compared with the LIPU process, is shown in [Figure 4 on Page 15](#). The DSP configuration file can be saved in the system backup memory or on the eManager computer.

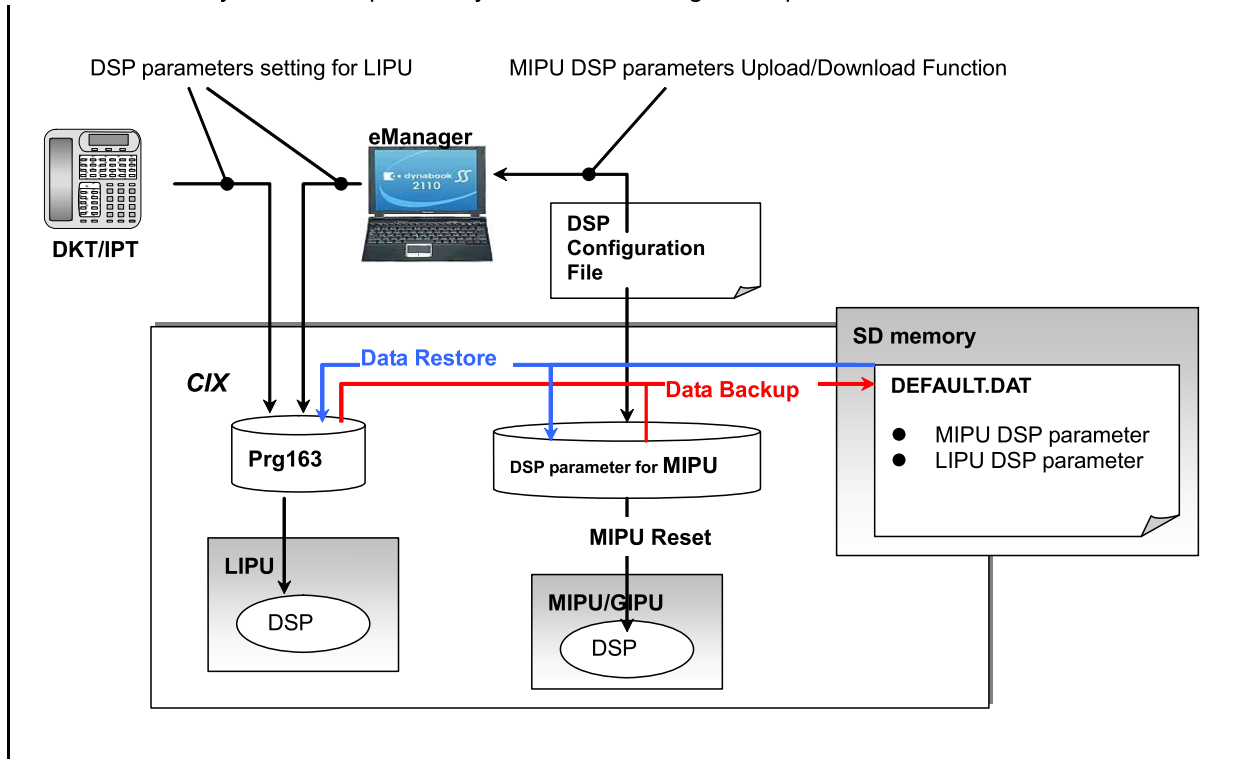


Figure 4 DSP Configuration File Load

Using eManager to set the DSP parameters by configuration file has the following features:

- eManager can convert the current DSP parameters to an MIB.
- eManager can monitor the CRC and stop the download if there is a mismatch
- CIX can backup the DSP parameters from the MIPU to the SD/SM card.
- The DSP parameter can be restored from the SD/SM card.

The version number of the DSP Configuration File can be displayed using eManager, Program 161 FK-19 as a part of firmware version. The MIPU version will display as MIPU_XX_XXY_AZXX

- MIPUXX_XX: firmware version
- Y: Boot loader version
- AZXX: DSP Configuration File version
 - A: Country
 - Z: Major version 0 ~ 9
 - XX: Minor version 00 ~ 99

MIPU Program Update

The address for downloading the DSP Configuration file is:

ftp://MIPU IP Address/update/mipu/Configuration File Name

eManager will need to set the DataFileName as shown below.

Table 6 **Mandatory Variables for updIpDkuGetFile**

updIpDkuCommand	updIpDkuFtp- IpAddress	FTP Server Information			
		User Name	Password	Data Dir	Data FileName
updIpDkuGetFile	M	M	M	O	M
(Sample 1)	133.114.38.25	toshiba	tais	—	ftp://133.114.38.25/update/
(Sample)	133.114.38.25	toshiba	tais	—	ftp://133.114.38.25/update/lipx52

Voice Parameter Programming

How to use the voice parameter

New voice parameters for MIPU are added, because the MIPU hardware is different from that of LIPU.

The CIX programming items concerned with voice parameters are as followings.

- Prog 107: PAD table assignment
Programming PAD table to decide PAD value to the pair of connection of endpoint type.
- Prog 150 FK19: Echo Canceller Tail Length for MIPU
- Prog 152: Voice Packet Configuration Assignment
Programming of Packet interval, QoS threshold, and so on. The index linked with these tables that are set to each IP stations and nodes.
- Prog 163 LIPU Voice Processor Control Table Assignment
Programming to tune DSP of LIPU. The value of DSP tuning parameters are set to the pair of station type installed to LIPU and destination station type.
(There is no System Programming Command for the DSP parameters on the MIPU. CIX provides a new method to configure the DSP parameters for MIPU DSP based on the DSP Configuration File.)
- Prog 250 FK07: Voice Packet Configuration Table Index Programming
Voice configuration table index programming for IPT. This index is linked with index of Prog 152.
- Prog 672: Node ID Detail Information Table Assignment
Voice configuration table index (linked with Prog 152) programming for the destination node of Strata Net IP connection.

PAD table

The parameter values for MIPU are added to PAD table of Prog 107.

Table 7 Program 107 PAD Table

		PAD Device or Group Number of Receiver (Listener)																
		Analog Telephone	DKT	Analog Trunk	T1 Trunk	ISDN Station	ISDN Trunk	CONF Bridge	Music Source	Ext. Paging	IPT1000 Telephone	IPT2000 Telephone	LIPU Strata Net	BIPU Strata Net	PRI Strata Net	MIPU-IPT2000	MIPU Strata Net	MIPU SIP Trunk
PAD Device No. of Sender (Speaker)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Analog Telephone	0	0	0	6	6	6	X	-	0	0	0	0	0	0	0	0	0
2	DKT	0	0	0	6	6	6	0	-	0	3	0	0	0	0	0	0	0
3	Analog Trunk	0	0	6	6	6	6	X	-	6	0	0	0	0	0	0	0	0
4	T1 Trunk	6	6	6	0	0	0	0	-	6	3	0	0	0	0	0	0	0
5	ISDN Station	6	6	6	0	0	0	0	-	6	3	0	0	0	0	0	0	0
6	ISDN Trunk	6	6	6	0	0	0	0	-	6	3	0	0	0	0	0	0	0
7	Conference Bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Music Source	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Ext. Paging	0	0	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0
10	IPT1000 Telephone	-6	3	-6	0	0	0	-6	-	-6	0	0	0	0	0	0	0	0
11	IPT2000 Telephone	12	3	12	12	12	12	12	-	6	0	0	0	0	0	0	0	0
12	LIPU Strata Net	12	0	12	12	12	12	12	6	6	0	0	0	0	0	0	0	0
13	BIPU Strata Net	0	0	-3	-3	-3	-3	-3	-3-	3	0	0	0	0	0	0	0	0
14	PRI Strata Net	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0
15	MIPU IPT2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	MIPU Strata Net	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	MIPU SIP Trunk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 8 PAD Table for Strata Net IP on MIPU

Change of voice attribute table

Prog 163 now has voice attribute table for IPTs, SIP stations and Strata Net IP connected to xIPU. The cases of each endpoints connected to MIPU will be added to this table.

Additional Definition: IPT, SIP station, Strata Net IP connected to an MIPU

Table-1 Voice Processor(VP141) ControlParameters Table for PT connected to LPU-X

No.	Device Type ¹¹	Echo Cancellation					Gain Control				Echo Cancellation2						
		NLP	Th	ADPT	CNG	BYPASS	CGC		VGC		Beta		Abs Th		Rel Th	Hang Time	IPT Mode
							En	De	In	Out	Mant	Exp	1 st	2 nd			
1	IPT (connected to BIPU-M)	Enable	2	Inhibit	Disable	Not Bypass	9	11	7	9	4	4	4	4	3	1	4
2	DKT	Enable	2	Always	Disable	Not Bypass	9	11	8	9	4	4	4	4	3	1	4
12	IP TRUNK (connected to LIPU-X)	Enable	2	Always	Disable	Bypass	9	9	9	9	4	4	4	4	3	1	4
13	IP TRUNK (connected to LIPU-X as "BIPU mode")	Enable	2	Always	Disable	Bypass	9	9	9	9	4	4	4	4	3	1	4
14 ²	External paging device	Enable	4	Always	Disable	Not Bypass	11	9	4	9	4	4	4	4	1	1	4
15 ²	Paging Group	Enable	2	Always	Disable	Not Bypass	9	11	7	9	4	4	4	4	1	1	4
16	IPT (connected to MIPU)	Enable	2	Always	Disable	Bypass	9	9	9	9	4	4	4	4	3	1	4
17	SIP (connected to MIPU)	Enable	2	Always	Disable	Bypass	9	9	9	9	4	4	4	4	3	1	4
18	IP-QSIG (connected to MIPU)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4
19	IP-QSIG (connected to MIPU as "BIPU mode")	Enable	2	Always	Disable	Bypass	9	9	9	9	4	4	4	4	3	1	4

Table 9 Sample Table of Voice Configuration in Program 163

MIPU Compatibility

Compatibility with Existing Services

MIPU offer the same services as LIPU, except for new additional services and modification for changing DSP. New additional services or modification of MIPU are applied only to MIPU, not to LIPU.

Compatibility in an IP System

- The CIX software must be version R5.0 or later.
- The existing IP terminals (IPT, SIP) can be installed on MIPU cards.
- MIPU and LIPU can be installed in the same CIX system.
 - User Mobility allows IPTs to move between LIPU and MIPU.
 - Strata net between LIPU and MIPU is supported.
- Strata Net IP (Strata Net IP)
 - Updating all nodes: No problem.
 - Updating only one node of Strata net: No problem.
 - Adding one new node with an MIPU to existing Strata Net: No problem. If an MIPU24 is added, the 24 channels of the MIPU cannot be divided between Channel Groups.
- IP Port Assignment:
 - The number of UDP ports required for the MIPU is different than the LIPU, refer to the table below.

Card Type	Number of UDP Ports	Port Range
MIPU24	256	16384 to 16511
MIPU16 (Same as LIPU)	128	16384 to 16511

Hardware Compatibility

- MIPU can be used on existing CIX hardware.

When used is a system that is a node in a Strata Net IP network the LIPU and BIPU must be at the revision (or later) shown below.

- For Strata Net IP LIPX53, LIPU_01_03 or LIPU_02_01
- For Strata Net IP BIPU9G

Software Compatibility

Compatibility of CIX software

- The CIX software must be updated to R5.0 or later to support the MIPU.
- R5.0 CIX software also supports LIPU and BIPU cards.

Compatibility of CIX Programming Data

- New CIX configuration items for MIPU are added and some existing configuration items are modified. Configuration data used for these items cannot be taken over old CIX software that does not support MIPU.
 - Program 161 about LAN IF:2 is not used.
 - Program 325 about LAN IF:2 is not used.
- New CIX configuration items for MIPU are added and some existing configuration items are modified. So CIX configuration data to use these items cannot be taken over old CIX software that does not support the MIPU.
- The MIPU24 has a single IP Address. The LIPU/LIPS card set has 32 channels and uses two IP Addresses. The LIPU IP address in program parameter LAN IF:1, the LIPS IP address in LAN IF:2. Programming parameters for the LIPU/LIPS is not compatible with the MIPU.

Compatibility of Firmware of IPU

- The MIPU firmware is not compatible with the LIPU.
- If LIPU firmware is written to an MIPU by mistake the MIPU will not be damaged. The MIPU will reject the update and flag the attempt as a failure to update.

Automatic configuration of MIPU and IPT

- On initial boot, CIX configures the items concerned with the MIPU automatically. The initial value of IPU IP address is decided by the order of slot positions of xIPU cards.
- When the Automatic System Configuration uses a MIPU24 or MIPU16, and places a card in the next card slot it will set that slot as follows:
 - **CIX200 Slot101**
If slot101 is empty, LIPX16 programming was configured automatically in R4. In R5 software MIPU16 programming is configured.
 - Automatic configuration of IPT is the same for LIPU and MIPU.
 - When IPT assigned to cabinet and slot number 0000 it is the same as an LIPU.

MIPU Installation

MIPU installation requires CIX software R5.0 or later.

Updating CIX Software

- Any CIX system running R4.0 and later software can update to R5.
- CIX100 and CIX670 systems running R3 or earlier software will require a new processor card to update to R5.
- CIX28 systems cannot update to R5

Programming When Replacing an LIPU with an MIPU

In some cases, it is possible to change the card type from LIPU to MIPU without deleting the LIPU data.

Current Card Type	New Card Type
LIPU16	MIPU16
LIPU/LIPS (LIPU32)	MIPU24

However, the MIPU24 can have only one Channel Group (CHG) assigned. If there are two CHGs assigned to the LIPU/LIPS the LAN IF:2 must be deleted to change the card type.

When replacing an LIPU/LIPS card set with an MIPU24, remember that the channels available change from 32 to 24.

The programming process to replace an LIPU with an MIPU is as follows.

1. When LIPU/LIPS is changed to MIPU24, remove the Strata Net IP CHG on LAN IF:2 if assigned (Prog 306).
2. Change the card type from LIPU to MIPU (Prog 100.)
3. If the deleted CHG is required, assign it to another LIPU or MIPU (Prog 325).
4. Change the System IP Data and Voice Packet Configuration as necessary. (Prog 150, Prog 152)

New Installation

There are two methods of recognition of MIPU cards.

- Programming Card Type configuration manually.
- Automatic Configuration, before power on, insert the MIPU card into a card slot.

After the MIPU is installed, the MIPU is programmed in the same way as LIPUs.

- IP address programming on Prog 161. (IP address of LAN IF 2 is discarded)
- IPT programming on Prog 260. (Max 24 terminals can be set to use LAN IF 1).
- Strata Net IP (Strata Net IP) programming on Prog 325. (Up to 24 channels can be set on LAN IF 1).

MIPU IP Address Assignment

The MIPU can be assigned a static IP address or it can use DHCP. The dynamic address option (DHCP) is only for SIP Trunk applications. MIPU cards used as IP Telephone interfaces must have a static IP Address.

- To assign a static IP Address enter the address, subnet mask, and default gateway data into FK01, FK02 and FK03 in program 161.
- To assign DHCP set FK21 to Enable and leave FK01 ~ FK03 blank. After the you click on the Submit button FK01 ~ FK03 will display the current DHCP address assignments.

Additional and Changed Programming Commands for MIPU

Prog	FK	Parameter	Value	Default
100	FK1	PCB Type	Added - MIPU_16 and MIPU_24 The accommodation condition of MIPU is the same as LIPU with the same number of channels.	-
107	FK1	PAD Sender Device	Added - 15:MIPU_IPT2000, and 16:MIPU_STRATA NET, and 17: SIP Trunk	-
	FK2	PAD Receive Device	Added 15:MIPU_IPT2000, and 16:MIPU_STRATA NET, and 17: SIP Trunk	-
150	FK19 (new)	Echo Canceller Tail Length for MIPU	1:echoCancel 16ms 2:echoCancel 32ms 3:echoCancel 64ms Only for MIPU. (BIPU and LIPU use FK10)	(refer to modified command spread sheet) *1
152	FK8 (new)	Packet Interval for MIPU	1:10ms/ 2: 20ms/ 3:30ms/ 4:40ms/ 5:80ms ("80ms" is treated as "40ms" if the codec is selected as G.711.) (Corresponding to FK1)	2:20ms *1
	FK9 (new)	Jitter Buffer Type for MIPU	1:Fixed / 2: Adaptive (Corresponding to FK2)	2: Adaptive
	FK10 (new)	Jitter Buffer Length for MIPU	0 to 200 ms (Corresponding to FK3)	100 ms
	FK11 (new)	Maximum Acceptable for MIPU	10 to 400 ms (Corresponding to FK4)	200 ms
	FK12 (new)	Packet Loss Ratio for MIPU	0 to 10% (Corresponding to FK6)	5%
	FK13 (new)	Packet Loss Threshold for MIPU	0 to 10% (Corresponding to FK7)	1%

161	FK7	LIPU Version Number Display1	MIPUXXXX-AYZZ (15 digits) MIPUXXXX: firmware version AYXX: DSP Configuration File version (Y: Major version 0~9, XX: Minor version 00~99)	-
	FK21	DHCP for MIPU	Enable: MIPU can get an IP Address via DHCP. Disable: IP Address must be assigned. Note: LIPU, LIPS, and BIPU do not support DHCP.	-
163	FK0	Device Type	Added 16: IPT (connected to MIPU) 17: SIP (connected to MIPU) 18: IP TRUNK (connected to MIPU) 19: IP TRUNK (connected to MIPU as "BIPU mode") 20: SIP Trunk	-
200	FK43	Security Code	My Phone Manager Password IP Mobility: DN Login Password (Refer to FK49)	-
	FK49	Use Login Authentication	Enabled: Password required to login DN Disabled: No password required to login DN	-
	FK50	Use Transfer Registration	Enabled: (Allow IP Mobility) This DN can be logged in at another station Disabled: (IP Mobility not allowed for this DN) This DN cannot be logged in at another station	-
	FK51	Connecting Equipment Number	Display Only -- Displays the equipment number of the xIPU this DN is connected to.	-
260	-	-	The maximum number of IPTs programmed on one MIPU (MIPU24) is 24.	-
672	FK6	Voice Codec Type	Added 3:G.711MU and 4:G.711A 1:G.711 is kept to maintain interchangeability. When installing a new card or changing, 1:G.711 is not used as much as possible.	2 (G.711)

*1 - Shared channels for Strata Net IP can be set on only MIPU24. And if so, Strata Net IP cannot be set on the same MIPU24 on LAN IF:2 (IP Stations are can be set on LAN IF:2 if enough channels remain)

Table 10 MIPU and LIPU Reset Differences

CASE			LIPU	MIPU
LAN network parameters	Prg 161-FK1	"IP Address" is changed	Reset	Reset
	Prg 161-FK2	"Subnet Address" is changed	Reset	Reset
	Prg 161-FK3	"Default Gateway" is changed	Reset	Reset
	Prg 161-FK4	"IP Address" is changed (LIPS)	Reset	Not Used
	Prg 161-FK5	"Subnet Address" is changed (LIPS)	Reset	Not Used
	Prg 161-FK6	"Default Gateway" is changed (LIPS)	Reset	Not Used
	Prg 161-FK21	"DHCP Client" is changed.	Not Used	Reset
	N/A	MIPU get new IP Address, Subnet Address or Default Gateway from DHCP Server.	Not Used	Reset ¹
Program update	-	After Program update is finished	Reset	Reset
Changing DSP parameters	Prg 163	DSP parameters are changed from eManager or DKT/IPT	Not Reset	Not Used
	MIPU DSP configuration	DSP parameters are changed from eManager.	Not Used	Reset
Restoring DSP parameter from default.dat	Prg 163	Restoring the programming data	Not Reset	Not Used
	MIPU DSP configuration	Restoring the programming data ²	Not Reset	Reset

¹ If "Default Gateway" is already set on Prg161FK3, MIPU doesn't reset.

² CIX R5.0 has the DSP parameters database. CIX can backup the MIPU DSP parameters to the default.dat file, and restore the MIPU DSP parameters from the default.dat file. If you restore the default.dat to the CIX system, the MIPU DSP parameters in the CIX database are downloaded to all MIPUs, and the MIPUs will be restarted automatically. (The MIPUs will be restarted every time the restore is done, even if the DSP parameters in CIX database are default.) User Backup/Restore operations are the same.

Licensing

No new licensing for IP Mobility or SoftIPT 2.0. However, when available SIP Trunking will require licensing.

Training

Training is available as a Tech Summit on www.toshibatraining.com