SAMSUNG

DCS GATEWAY

DIGITAL COMMUNICATION GATEWAY SYSTEM

FEATURE DESCRIPTION GUIDE

SAMSUNG TELECOMS

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SAMSUNG ELECTRONICS

EU Declaration of Conformity (RTTE)

Samsung Electronics Co., Ltd.

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declare under our sole responsibility that the product

Digital Telephone Exchange model "DCS Gateway"

to which this declaration relates is in conformity with

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Chapter 1
Overview

This guide describes the various functions and features of the DCS Gateway business telephone system.

The DCS Gateway

The DCS Gateway is based on a modular design philosophy which allows system capacity to be increased cost effectively. The system interface and option cards can be installed into each shelf's universal card slots to provide full optimisation and flexibility.

The DCS Gateway has capacity for up to 672 ports when equipped with three shelves (basic shelf plus two expansion shelves). Additionally, up to eight DCS Gateways can be connected together in a multi-node configuration to increase the capacity to 5,376 ports.

Each shelf has provision for two power supply cards, a processor card, an analogue ringer card and 10 universal cards.

The system is non-blocking and uses a 32-bit main processor (MCPU2). The MCPU2 stores customer data in Flash RAM, incorporates eight DTMF senders / receivers and generates all tones required to manage and administer the system. A second processor card can be installed in a dedicated slot in the basic shelf to provide a back-up processor in the event that the primary processor fails. Each expansion shelf has a shelf processor (LPM3) installed to provide control functions for the cards installed on the shelf, and to provide an interface with the MCPU2.

The universal card slots (10 per shelf) can have any combination of digital trunks, analogue trunks, digital extensions, analogue extensions or service cards. The first four universal card slots on each shelf are double density and have 32-port capacity while the remaining six slots are single density at 16 ports. The first four slots are used to install "high-density" cards such as Primary Rate ISDN cards (30 channels) or 2 Mbs digital trunk cards. If high-density cards are installed in single-density slots, the slot following the card must be left vacant.

Where there are more than 80 digital extensions connected to any shelf, a second power supply card must be installed on that shelf in the dedicated slot provided. Where there are less than 80 digital extensions on the shelf, a second power supply card may be installed to provide redundancy. Where analogue extensions are installed, a ringer card (RGPS-K) is required to provide ring signals and message-wait LED power.

Key Features and Benefits

Reliable Service

The system provides excellent reliability and service, and employs the following technology:

- State of the art microprocessors
- Advanced VLSI circuit techniques
- Custom IC design
- Duplex architecture of the control shelf
- Duplex power device
- System diagnostic and management program

Economic Design

The system is also designed to provide excellent economy:

- Optimises circuit board density.
- Minimises power consumption using CMOS technology.
- Mounts parts effectively on the control card.
- Is capable of expanding to up to eight functions in the subscriber shelf.
- Provides cost management functions, including flexible long-distance communication inhibition and control of access to functions according to class of service (COS).

Flexible Module Method

System software and hardware can be added cost effectively. Furthermore, the system interface and option cards can be installed into each shelf's universal card slots to provide full optimisation prior to expanding the system.

- 4W E&M – 8-port G4W E&M card
- DTRK-E1 – DTRK3-EW digital trunk card
- LOOP – 16-port GLOOP2 card
- ISDN PRI – PRI4 (Primary Rate Interface 4) card
- ISDN BRI – BRI (Basic Rate Interface) card

The system provides two types of extension card:

- 16DLI – 16-port digital extension card
  DLI4 (Digital Line Interface 4) card
- 16GSLC – 16-port single line telephone extension card supporting analogue telephones and message-wait telephones.

INFOLINK

The system supports the Samsung proprietary protocol INFOLINK, which is the shared protocol for terminal devices and computers and which provides various services.

Diagnosis and Maintenance

The system provides various functions (described below) to help maintain the system more conveniently.

Maintenance & Administration Program (MAP)

MAP is the DCS Gateway programming software for maintaining the system. It is installed in a PC which is directly connected with the DCS Gateway. Information can be easily and quickly searched, edited and controlled using the MAP.

On-Line Board Exchange

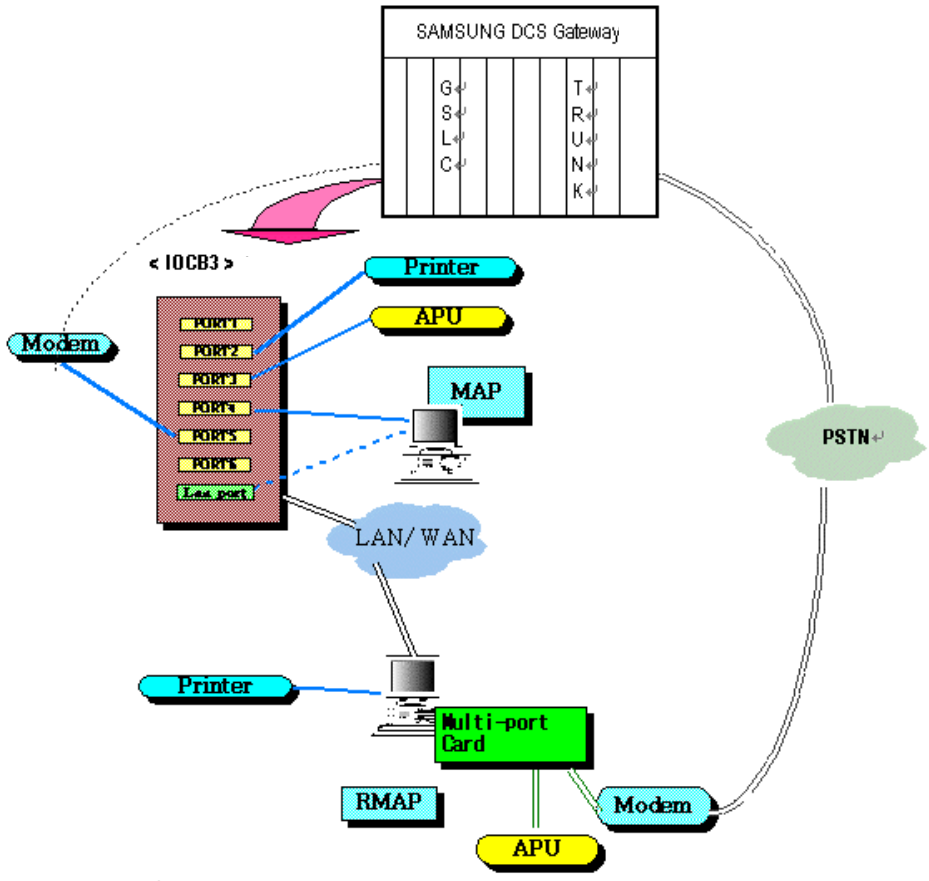
During maintenance, circuit boards can be exchanged without the need to power down the system. A BDR cord is connected to the front of the board to be exchanged to maintain power to the board during the exchange.

Diagnosis Function

Diagnosis is performed continuously by the system. You are alerted immediately if there is a failure within the system.

Network Structure of the DCS Gateway

The network structure of the DCS Gateway is shown below.



Chapter 2
Features

This chapter describes DCS Gateway features under the following headings.

- System / Telephone / Attendant Console Features
- Additional Features:
  QSIG, INTERNET GATEWAY, RMAP, ACD, CTI, ANNOUNCEMENT, EXTERNAL MUSIC, STATISTICS, DIAGNOSIS, ISDN, PMS, SMDR, MULTI-NODE

Included for each feature is:

- an overview of the feature;
- system configuration for implementation of the feature;
- related MAP menu for implementation of the feature.

System / Telephone / Attendant Console Features

Call Interception (QSIG)

If a caller in a Private Integrated-Service Network Exchange (PINX) calls but the call cannot be established, this function connects the call to another predefined number.

Call Offer (QSIG)

Allows the caller to notify a busy called party that their call is waiting so that the called party can terminate the current call and begin a conversation with the caller.

Call Transfer (QSIG)

Allows a subscriber to transfer calls to subscribers of another system in the PINX.

CCBS (QSIG) - Completion of Calls to Busy Subscribers

If a caller finds the called party busy or the network is congested, this function automatically establishes the call when the situation changes.

CCNR (QSIG) - Completion of Calls on No Reply

If the incoming trunk call is not answered, this function calls CCBS (see above) and detects the status of the called party at the request of the caller.

Conditional Interception

For incoming trunk calls, this function transfers the call from specified callers to a predefined number.

If there is an incoming R2 trunk call, the system checks whether the conditional call transfer function in the class of service (COS) has been selected. If 'Yes', it searches the transfer table with the caller number to find matching entries. If any matching entries exist, it transfers the call to the corresponding number. This function transfers the call according to the conditions in the table and it actions the FWD (forward) function of the destination extension.

Direct Dialling Inward (DDI)

Enables the incoming DDI trunk caller to dial and connect to the party with the corresponding extension number, without going through the attendant console operator.

Executive Override (QSIG)

When the called party is busy, this function allows the caller to join in conversation with the called party.

Hot Line Service

Hot Line is a service that automatically dials the number predefined in the system when a particular extension user picks up the telephone handset.

MMC System Speed Dial Feature

Allows system speed dials (000–999) at the attendant console to be set and changed.

No Ring Feature

When using the Multiline service (described later), this function lights the extension line LED but prevents the extension from ringing.

CNIP (Calling Name Identification Presentation) (QSIG)

Provides the calling party's name so that it can be displayed to the called party.

CONP (Connected Name Identification Presentation) (QSIG)

Provides the connected party's name, called party's name, or busy party's name so that it can be displayed to the calling party.

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Path Replacement (QSIG)

Replaces the original connection with a new connection when an already established call between PINXs cannot be maintained, or when an improved connection is required.

Soft Keys

If you press the Scroll key, function menus appear on the LCD panel of the digital keyset (normally there are three menus displayed at the same time). The soft keys are used to select the menus.

Volume Keys

The Volume keys on the left side of the digital keyset are used to adjust the handset, speakerphone and ring volumes. The type of ring can also be selected. Press the "+" key to increase the volume or the "–" to lower the volume.

Warm Line

Warm Line is a service that dials the number predefined in the system at some time after the extension user picks up the telephone handset (compare with Hot Line, above).

Dial Keys

Digital keysets have dial keys that are used to enter numbers 0–9, and the symbols * and #.

CID (Caller ID)

If the type of trunk for an incoming call can present caller identification (caller ID or CID), this function receives the caller ID and either displays it or implements other functions.

CID Review

This function displays incoming CID. The maximum number for a port is determined in 'Station Options'. The subscriber can save this CID information when an incoming call through a CID trunk is answered. The Review key can then be used to review this information at any time. The subscriber can automatically make an outgoing call after checking the called number with this function.

CID Abandon

Allows the subscriber to check the CID of an incoming call that was not answered (because the No Answer Time expired or the caller hung up the phone).

CID NND

When a subscriber presses the CID menu soft key during a conversation, the NND menu is displayed. Repeatedly pressing the NND key shows the telephone number, caller name and call time in that order. (The keyset should be capable of displaying CID information for this to work.)

The subscriber can check CID information using the NND function while using the CID Abandon and CID Review functions, as well as during a call in progress.

CID STORE
The Store key can be used to save a number checked with the CID Review function to station speed dial locations Station Speed Dial 1 or Station Speed Dial 2.

Forward
If an extension is called that is unavailable or busy, the extension can be registered for call forwarding.

Forward All Call
Transfers all calls unconditionally to another extension when the number is registered for call forwarding. This function is also called CFU (Call Forwarding Unconditional).

Forward All Call Release
Releases (clears) the Forward All Call function.

Forward Busy Call
Automatically forwards the call when the called extension is busy. If the subscriber uses an ISDN line, the call will be forwarded only when both ISDN B channels are busy. This function is also called CFB (Call Forwarding Busy).

Forward Busy Call RLSE
Releases (clears) the Forward Busy Call function.

Forward No Answer Call
Automatically forwards the call after a predefined time when the called extension does not answer.

Forward No Answer RLSE
Releases (clears) the Forward No Answer function.

Attendant Console Loop-Selection Keys (Lp1–Lp8)
These keys are used to select the loop for an incoming call and connect it to the DCS Gateway attendant console.

Since the console can support eight loops, there are eight Loop-Selection keys (Lp1–8).

JOIN (Attendant Console Function Key)
Connects two extensions that have called the console on two different loops.

HOLD (Attendant Console Function Key HLD)
Used to hold incoming calls after answering.

RELEASE (Attendant Console Function Key RLS)
This key is used for a number of functions:

- To terminate the call in progress
- To cancel the selected function
- To erase the line displayed on the LCD panel when in MMC mode.

Calling / Called Indication (Attendant Console)

Calling indication (CLG) means the subscriber calling the attendant console.
Called indication (CLD) means the subscriber whom the attendant console calls.

CON/ANS (Attendant Console Function Key)

Used to answer incoming calls, as an alternative to pressing individual loop keys. It is also used to connect the called party (CLD) and the calling party (CLG) to allow them to speak with each other.

When connecting the called and calling parties, the CON/ANS key may not work if pressed very quickly after dialling the called number. This is because the DCS Gateway prevents the connection before the number that has been dialled on the trunk has been connected. If this should happen, wait for a moment and press the CON/ANS key again.

Time Display & DTS (Attendant Console Program Key TMDP (DTS))

Displays the current date and time on the LCD panel in “day/date/month/time” format. Can also be used to directly choose a specific trunk line (Direct Trunk Selection, DTS) while pressing a Loop-Selection key.

Note
The DTS function is not used in the UK.

MMC (Attendant Console Program Key)

Used to enter MMC mode from the console.

CLEAR (Attendant Console Program Key)

Forcibly hangs up a busy line. The call is hung up if the CLEAR key is pressed while in “break-in” status.

SAVE / REPEAT (Attendant Console Program Key SAVE/RPT)

Save and redial the trunk number at a later time after failing to connect a trunk number.

MESSAGE (Attendant Console Program Key MESSG)

Delete a message indication left on an extension or leave a message indication on an extension from the console.

MUTE (Attendant Console Program Key)
Mute a call from a specific subscriber's phone.

WAKE (Attendant Console Program Key)
Enter or clear the time for a reminder/alarm (wake-up) call to an extension from the console.

DND (Attendant Console Program Key)
Set or cancel the "Do Not Disturb" function for extensions.

FORWARD (Attendant Console Program Key FWD)
Set or cancel forwarding for extensions, and the number to which the calls are forwarded.

SYSTEM SPEED (Attendant Console Program Key SYS SPD)
Call a System Speed Dial number from the console by entering a 4-digit code.

PAGE (DTMF) (Attendant Console Program Key)
The function of this key depends on the status of the console, as follows:

- When the console is not performing any special functions, Paging functions (such as Zone Paging, Digital Phone Paging, and Radio Paging) are executed.
- When there is a trunk call to the console, the Meet Me function (Orbit Parking Announcement) is executed.
- When making trunk calls from the console, the DTMF Sending function is executed. This detects dial key presses.

BILLING (Attendant Console Program Key BILL)
Charge the appropriate rates for the called trunk call.

ACCOUNT (Attendant Console Program Key ACC)
Assign an account number to the connected call.

REDIAL (Attendant Console Program Key)
Correct misdialled digits when making a trunk call, or redial the last number dialled.

BREAK IN (Attendant Console Program Key MON)
Break in on a busy line and establish a three-way call with the operator.

SUPERVISION (Attendant Console Program Key SPV)
Used to monitor the status of the incoming trunk call.

SERIAL (Attendant Console Program Key)

Used to return a trunk call to the attendant console when the call has finished at the connected extension (e.g. to connect the call to another extension).

International Call

The ICC (International Collect Call) function charges international telephone rates to the called party.

Toll Call

This is a call to establish telephony communication between the subscriber in one local switch coverage area (STD zone) and a subscriber in another STD zone. The toll call is charged by distance and call time, unlike many local trunk calls which are not time-dependent for billing purposes.

Local Call

This is a trunk call within the local switch coverage area.

Lock Out Timer

This is a memory block to monitor extensions where the handset has not been hung up properly for a predefined time (9.5 –10 seconds) when there is no call in progress. This block consists of a time counter and acceptance location information. This function is released when the handset is hung up properly. If the extension is in “lock out”, callers to this extension receive busy tone.

Pager Call

This is a Pager call.

Information Call

This is a chargeable information call.

Outgoing Trunk

This is a trunk used to make outgoing calls to the public network.

TIE

This is a leased line used to link telephone systems which are geographically separated. Tie lines are often used for calls between headquarters and local offices.

Multiline Service

The Multiline service assigns multiple extension numbers to a single phone and allows multiple phones to share extension numbers. Therefore, a single phone can behave as though it is a number of phones, and incoming calls directed to the shared extension number can be answered at any of the extensions on which it appears. Various options can be set up using the Multiline service by setting the outgoing port type as ‘Digiphone’ and the service item as ‘Multiline’.

LPS1–LPS16 (Digital Phone)

These keys are used to choose the loop for a digital phone to connect an incoming call.

Auto Dialling

This function allows the user to assign frequently-used phone numbers or function codes to Auto Dial function keys.

DSS/BLF

DSS (Direct Station Select) allows users to call extensions directly by pressing a single key. The BLF (Busy Lamp Field) function allows users to check the status of designated extensions. The extension status is indicated by an LED. If the LED is off, the station is idle; if it is blinking the line is ringing; and when it is on, the extension is busy.

Buzzer

This function is used to communicate between an executive and a secretary. The buzzer is used to signal incoming calls. When one party operates the buzzer for the other party, the buzzer tone will be generated on the other party's phone.

DND (Do Not Disturb)

Where the "Do Not Disturb" function is operated, the subscriber can make outgoing calls but incoming calls are blocked. The operator can override DND, if required.

Conference

Digital phones have a facility to be able to hold a conference by connecting with several parties simultaneously. The DCS Gateway can have up to 12 conference groups and a maximum of eight subscribers in each conference group.

The conference group can include both internal and external subscribers. Parties can leave the conference, and new members can be added, at any time.

Camp On

When there is an incoming call to a busy line, this function establishes the call when the current call at the extension finishes. The caller or operator presses a function key or selects a call menu to camp on the call.

Auto Camp On

When a particular subscriber is called and is busy, this function camps the call onto the busy extension instead of processing it as busy. Camp on is done automatically without the need to press a function key or select a menu.

Camp-On Test

This is a special test which displays the change state by monitoring AC voltage, high resistance, low resistance, and electrostatic capacity for Tip/Ring, Tip-GND, and Ring-GND for a predefined duration. The test for each item continues until the user issues a stop command.

Camp Ring Pickup

When 'call fetch - Camp' is enabled and the fetched call is disconnected during conversation, this function rings the phone to reconnect the call.

Camp-On Call Back

When calling a busy extension, the Camp-On Call Back function can be initiated to hold the call until the called extension terminates its current call. When the called extension becomes free, both the calling and the called extension telephones will ring simultaneously.

Trunk Call Back

If there are no trunk lines available when an extension wants to call externally and the Camp-On Call Back function is invoked, the extension will ring when there is an available trunk (this is called the Trunk Call Back function). If the extension handset is picked up, external dial tone is heard.

Group Camp

When an extension calls a specific group, it is possible to camp on to this group when all the group lines are busy. When camping on to a group, the phones at both ends ring simultaneously when any extension in the group hangs up its current call.

Group Camp On Busy

When trying to transfer an incoming call to the representative phone number of a group and all group members are busy, the call can be camped on to the group so the call is connected as soon as any member of the group terminates the call.

ANS / RLS

If the ANS/RLS key is pressed when a call is in progress, this function releases the current call and allows the user to dial another call.

The difference between this and operating the Speaker key is that the number can be dialled without the phone being put in the ‘idle’ state. If there are two called parties, the call is transferred and the telephone goes into the ‘dial’ state when the ANS/RLS key is pressed.

Message Waiting

Outgoing Call Function

When calling an extension, the Message Waiting function can be set so that the message waiting LED on the extension flashes. If the called extension does not have a message-waiting LED, ring tone will be heard instead of dial tone when the extension handset is lifted.

Answering Function

Where a message indication has been left for an extension, the message-waiting LED will flash.

Leaving a Message

If you call an extension and the extension user is not available or the line is busy, you can turn on the message-waiting LED of the extension.

Checking a Message

Where an extension has a message indication left, the message-waiting LED will flash. When the extension's 'message' key is pressed, the phone that left the message will be called

Deleting a Message

The message waiting LED can be turned off using the Message Deletion function code, or by pressing the message deletion key if programmed on a digital station.

Program Key

The various functions provided by the digital phone can be selected via the LCD display using the Scroll key and soft keys. To access the most commonly used functions more conveniently, the functions can be directly accessed via the programmable keys.

To assign a function to a programmable key, first press the MMC key (normally the TRSF key) to enter MMC mode and then press the key to which you want to assign a function.

Redial

The redial function calls the last dialled number without the need to actually enter the number again.

Direct Call Pick Up

Calls to an extension can be picked up by another extension provided the number of the ringing extension is known.

Group Call Pick Up

Extensions can be assigned to a specific group. Extensions assigned to a group can pick up calls for members of the same group by pressing the PICKUP key.

Station Speed Dial

With this function, each extension can assign (or 'store') frequently-used telephone numbers to a speed dial key and use this key to dial the numbers. When storing trunk numbers, store the number with the trunk access code.

System Speed Dial

This function stores numbers that are frequently used by many extensions as abbreviated codes. System Speed Dial numbers can be made available to all extensions.

Room Status

Where a DCS Gateway is installed in a hotel/motel and a PMS (Property Management System) is installed, room status can be managed via guest-room phones.

Room Status Display

If a PMS is installed in a hotel/motel (see above), room status information can be transmitted to the PC on which PMS is running. This function allows hotel management to provide appropriate services to guests.

User-Defined Room Status Display

See *Room Status* and *Room Status Display*, above.

Executive Override (EOV)

Each extension in the DCS Gateway is assigned a class of service (COS). High-level COS categories are provided which have many more features than lower COS categories. The EOV function is one of these features. When an extension with the appropriate COS phones an extension which is busy, the EOV function can be invoked to "barge in" on the conversation.

Follow Me

This function forwards incoming calls from your extension to another extension. However, unlike the Forward function, the Follow Me function is set at the extension to which the calls are to be forwarded.

Follow Me Forward

This function changes the forward number to another telephone other than the telephone that is set for mobile forward through the Follow Me function.

COM Dial

If a subscriber who is assigned as a member of the COM group wants to place a call to another member, only the COM group member's assigned numbers are dialled.

Orbit Parking

Orbit parking is used to connect an incoming trunk call to an extension. If the user is not available, the trunk call can be 'parked' on the orbit number while searching for the user. When the call is parked on the orbit number, dial tone is heard by the calling party.

In order to connect to the call parked on the orbit number, the orbit phone number can be dialled from any extension. If there is no response after a fixed time after parking, the call is returned to the extension that parked the call.

DGP Paging

Digital phones that are assigned in the DGP announcement group are able to broadcast announcements to the group through the speakerphones. To assign the DGP announcement group, see your System Administrator.

Radio Paging
This function sends calls to pagers through a transmitter working with the DCS Gateway.

Zone Paging
The Zone Paging function allows announcements to be made through the speakerphone to extensions in a specific region. Zone paging can be divided into specific zone announcements and whole area announcements. Specific zone announcements cover a specified region or zone, whilst whole area announcements include all extensions.

Wake-up Ring
This function rings an extension at a time specified by the extension user (referred to variously as a wake-up / reminder / alarm call).

Wake-up Set/Reset
This function enables or disables the wake-up / reminder /alarm function for an extension.

Wake-up No Answer Inquiries
If a wake-up call is not answered by an extension, the system stores this call so that the console can query it.

External Call Lock
When an extension user is not available, a password can be entered to block external (trunk) calls. The password is also needed to cancel the call lock.

Privacy
An extension that has the 'Inhibiting Break-In' function included in their COS are protected against break-in on their conversations from extensions which have access to the Executive Override (EOV) function.

Clear Call Forwarding
Call forwarding can be cleared so that the forwarded extension can receive incoming calls again.

Clear Follow Me
Clears the Follow Me function.

Clear DND
Clears the Do Not Disturb function to allow an extension to receive calls again.

Clear External Call Lock
Cancels the external call lock feature by entering a password at the extension.

Clear Wake-up Calls
Cancels previously registered wake-up calls.

Trunk Flash
On completion of a trunk call, a follow-on call can be made without hanging up the phone by using the trunk flash facility.

Pre-dial
The pre-dial function on digital phones allows external numbers to be dialled without the digits being forwarded to the exchange. The numbers can be forwarded to the exchange when the user is ready and the call subsequently established.

Auto Intercom
This function is normally used to communicate between an executive and a secretary. When one party presses the Auto Intercom function key, ringing tone is heard if the other party is busy. If the other party is free, the extension automatically answers the call and conversation can commence via the speakerphones.

Direct Trunk Selection (DTS)
This function enables an extension to directly select a trunk line when making an outgoing trunk call. (Not used in the UK.)

Dispatch
The Dispatch function allows calls to be made to all subscribers in the same group in order to hold a conference or make an announcement. If the number of members in the group exceeds the maximum number allowed for conference (eight), only certain members can participate in the conference. The rest can only hear announcements.

Multi-Language
This function enables digital phones with a display, or the attendant console, which normally display only in English, to display other languages specified by the system.

Forced Authorisation Code (FAC)
This function enables an extension with a COS that denies access to outgoing trunk calls to make a trunk call after entering an FAC code. This function can also be used as an extension user's Account Code.

Caller ID (CID)
When the type of trunk can provide caller identification (CID), this function receives CID and displays it to the called extension.

Record

With this function, the extension user can use the record key during a call to record the conversation or conference in the VMS (Voice Mail System).

Call Connect

When an incoming call is received while a call is already in progress, the new call can be answered without hanging up the phone by using the CONN key.

Call Hold

The Call Hold feature allows an extension to place a call on hold while answering another call.

Account Code

Account codes can be assigned to each extension to allow call costs to be booked to particular accounts. This feature is useful in assigning call costs to particular jobs or clients.

Save & Repeat

With this function, the subscriber can save the number just dialled and use it to dial the same number automatically in the future. Once a trunk number is saved, the subscriber can repeatedly use the same number to dial automatically unless another number is saved subsequently.

When calling an external trunk number that is busy or does not answer, the number can be saved so that it can be called later without the need for redialling.

Assigning Wake-up Calls

Using the Wake Up Call function, alarm calls can be made to extensions at designated times. Up to four wake-up calls per day can be registered for an extension. Calls can be designated for a fixed time every day for a set number of days (up to nine) or to call on one day only.

Set/Clear Emergency Mode

The attendant console can be set in Emergency mode if the operator has to leave the console urgently, or when a caller has to leave an urgent message. In Emergency mode, the caller hears the emergency mode message after a fixed time.

Emergency mode is set or cancelled by pressing the Emergency mode key, if it is programmed on the console.

Last Number Redial

This function automatically redials the last number the extension called. Extension number and trunk subscriber number can be redialled.

Message Waiting Answer

When message waiting is enabled, this function responds to the message that is left when the user presses the Message key or enters a code. The extension that left the message indication is called.

Message Reminder

If the called party does not answer or the line is busy, the caller can use this function to set a message waiting indication to inform the party that there is a message waiting.

Station Camp-On Call Back

This function enables the caller to a busy extension to camp on to that extension. The call is connected when the called extension becomes free.

Trunk Camp-On Call Back

When a subscriber tries to make an outgoing trunk call and the call cannot be connected because all trunks are busy, the subscriber can use this function to reserve a trunk and be connected to a trunk when one becomes available.

Account Service

If there is a printer for call billing or a TIMS device is installed, this service allocates call costs to each extension's unique account. Even when the extension user operates another user's phone, the user's unique account number can be entered so that the bill is added to his or her account.

S/W Bridging

When a Multiline extension is in use, phones that share the same number can press the LPS key to connect to a call to establish a conference call (if allowed in the MAP).

ALI

This function expands the functions of an ordinary phone to digital phone functions by connecting it to the KDB-S (daughterboard) of a digital phone. The phone can be set as a Multiline phone.

All Call Forward LED

If a Multiline is registered for the All Call Forward function, this function makes the LPS LED of a digital phone flash.

Caller Ring

This function assigns a different ring type to each extension or trunk caller so that the extension user can identify specific call types when incoming calls are received.

Semi-Auto Redial

When a user establishes a call via the Speaker key on a digital phone and gets busy tone, this function can be invoked by pressing the Redial key so that the number is redialled a specific number of times defined by the system. This function unconditionally redials after a predefined time regardless of whether the called party is available or busy after redialling. Redialling ends either when the counter defined in the system is exceeded or when the user takes the phone off-hook.

One-Touch Dialling

This function allows the subscriber to use the Auto Dial function to access system functions or to dial calls. Numbers or function codes can be assigned to an Auto Dial function key.

Control Group Forward

When an extension is configured as a control group, this function forwards all calls sent to members of this group to this particular extension. This function is designed to forward all calls to a particular phone or duty desk after normal hours.

Hunt No Answer Redial

When a particular extension tries to make a call to a group and the called number does not answer, this function forwards the call to another group member. The calls are distributed according to the call distribution mode set for the group, and the No Answer timer value is selected in the system database.

Volume Key

The Volume key of the digital phone is used to adjust Speaker volume, Handset volume, Ring volume, and Ring Frequency.

Soft Key

There is a Scroll key and three soft keys on a digital phone. The Scroll key is used to display function menus; the soft keys under each menu select the required menu function.

No Ring

This function mutes the ring when a call is sent to a Multiline subscriber. It is normally used when a number is shared by an executive and a secretary to mute the ring signal on the executive's phone.

Station Group Service

When extensions are configured as a group and a call is sent to the group call number, this function distributes calls within the group using the call distribution mode selected.

ATC Transfer

This function transfers all incoming calls from a particular attendant console to an extension, extension group or another console.

VTN / PTN

The user can select VPN (Virtual Private Network) / PTN (Public Telephone Network) using the trunk call code, even within the same trunk group. If the trunk group call code is VPN, this function sends the area code of the trunk group information ahead of the digits dialled by the caller.

POLA

This is a signal that occurs when a called subscriber answers the call, and is used as a billing time point or a speech path connection time point.

Malicious Call Identification

This function displays the caller's phone number when the called extension requests it. This is often used for emergency calls such as 000.

Call Transfer

This function transfers a call while a trunk or extension call is in progress.

Direct In Line Group Service

This function sends an incoming trunk call to a particular extension. If the extension is busy or the call cannot be connected, and the extension is a member of a group, the call is forwarded to another member of the group.

PNA (Pre-defined Night Answer) Group Service

If the Direct In Line function is not used for trunk calls, the call is sent to the attendant console. If the console is in night mode, the call is sent to a specific extension ('PNA' station). The service differs depending on the group that the PNA station belongs to.

If the PNA station's line is busy or the call cannot be connected and the line is the general directory number of the station group, the corresponding group service will be performed. If the PNA station is the pilot number of the PNA group, all members of the group will be called simultaneously.

Incoming Call No Answer Service

If the called subscriber does not answer for a predefined time on an incoming trunk call, this function provides a service corresponding to the trunk options set.

Erred Incoming Number Service

If no telephone number exists for an incoming trunk call, this function provides a service corresponding to the trunk options set.

Incoming Function Code Service

If the incoming phone number is a function code for an incoming trunk call, this function provides a service corresponding to the trunk options set.

Incoming Incomplete Call Service

If the incoming trunk call does not have the complete called phone number, this function provides a service corresponding to the trunk options set.

Direct Inward System Access (DISA)

When an incoming call is received, this function detects a particular password and then dials the extension number to send the call or drive the system that is connected via a modem. In addition, trunk calls can be made if the password and trunk call code are received. It can also use the DISA function to connect a PSTN line to a private (leased line) network.

Automatic Network Dialling (AND)

If the DCS Gateway is configured as a network with tie trunks, users can call an extension in another node of the network by dialling only the node number and the extension number.

Trunk Tandem

This service allows a PSTN subscriber to use the organisation's leased lines to call a particular extension or PSTN subscriber. PSTN and leased line service requires the DISA or Tandem function.

Call Transfer to ATC Group

This function transfers a call to the attendant console group during a call in progress with an extension or a trunk.

Auto Parking

When an incoming/outgoing call is to be connected to an extension which is busy, this function can be used to automatically camp on to the extension by pressing the CONN key so that the call is connected when the extension finishes the current call.

Call Monitoring

When connecting a trunk call, this function can monitor the current status of the call (ringing, talking or released) if it is connected after the Monitoring function is enabled.

DND Set/Reset

This function sets/resets the DND (Do Not Disturb) function for a specific extension.

Forward Set/Reset

This function sets/resets the Forward function for a specific extension.

Howler Recall

If an extension's handset is not hung up correctly and howler tone is generated, the extension is recalled to the console after the 'Time to Recall When Howling' timer is exceeded to notify that the handset has not been hung up correctly.

Long Conv Recall

When a trunk call exceeds the 'HATC Recall Time for Long Trunk Call' timer, the call is recalled to the console to monitor if the call is still in progress.

Loop to Loop Connection (Attendant Console)
This function connects the call currently in progress with a call that is put on hold on another loop.

MMC Time Change
This function checks the system time and changes it.

MMC COS Change
This function checks the COS of an arbitrary extension and changes it.

MMC System Speed Dial Change
This function changes System Speed Dials for the console.

Wake-up Call Notification Call
When a wake-up call is registered by the operator, a call that signals the wake-up is sent to the console and is relayed to the corresponding extension at the defined time.

Night / Day Mode
This function controls the In Service state of the console. Operator service is provided in day mode but not in night mode.

Other Attendant Call Transfer During No Answer
This function transfers calls to another attendant console for the same Tenant if the normal operator does not answer the call.

Request / Nocall Set or Reset
This function sets/resets the Request / Nocall function for a specific extension.

Serial Call
When a trunk call is forwarded to an extension, this function recalls the call to the console, instead of disconnecting it, so that the trunk caller can be connected to another extension or service.

Wake-up No Answer Query
If an extension does not answer a wake-up call, the call is stored in the system and can be queried by the console.

Three-Party Service
This function connects a third party while a call is in progress.

Specifying Billing
With this function, the user can enter billing type and billing code for trunk-related calls forwarded.

Connecting Trunk Tandem
This function transfers incoming/outgoing trunk calls to other trunk calls.

VMS Connection After Answered Incoming Call
This function connects a trunk call to the Voice Mail system after answering the call to allow the caller to leave a VMS message.

Alarm Indicator
This function enables the console to acknowledge an alarm that has occurred in the PABX system and display what type of alarm it is.

Calling ATC When FAC Input Error
When a Forced Authorisation Code (FAC) is entered during a station or trunk DISA call, this function calls the console in accordance with system option settings.

MMC Emergency
This function toggles the Emergency mode at the corresponding console.

Security
Users can be prevented from using certain facilities and functions by requiring a password to be entered prior to using these functions. Function restriction is set in the user's COS.

POLA Billing
If the trunk is set to receive POLA in trunk port information, billing is applied only when the POLA is received.

Transfer Billing
During trunk or station calls, billing is applied according to the specification defined by the system when the call is transferred to the station or trunk subscriber.

Offsite Forward Billing
All incoming calls to the subscriber who has the Offsite Forward function set will be billed to the subscriber who set the Offsite Forward function instead of the caller.

DISA Billing
When leased lines are accessed and used from the PSTN, permission is determined by receiving a password. The billing is charged to the extension defined by the password.

Bulk Billing
If the trunk call subscriber is the bulk subscriber, the system stores the accumulated metering for each extension for a particular period and outputs it to identify each call type (local/toll/gateway).

FAC Billing

If the calling subscriber has an FAC code, this code can be entered from any phone with the subscriber's COS. The bill will be charged to the calling subscriber's own phone number.

Account Code Billing

The subscriber who uses an ACC code can enter the ACC code during a call. The called party's phone number and the duration of the call will be recorded.

Tandem Billing

This is the billing for incoming trunk calls or when outgoing calls are made by occupying another trunk.

DDI

This function analyses the digits input for incoming trunk calls. If the number is registered in the DDI table, it connects the call to the registered number in the DDI Translation table.

LED Dual Colour Handling

This function displays LEDs in red or green depending on their use in the DCS Gateway.

Displaying Forward Set/Reset in Idle State

This adds the Forward Set / Reset state in addition to displaying the other function set / reset in the idle state.

Off-Hook Flash Mode Name Display

This function displays the name of the primary user along with the phone number when a digital phone is off-hook. For example:

2676:DAVID

It displays the name of the user unconditionally if this is not a Multiline phone.

No Answer Forward Time Set

The No Ans Forward Time value can be set using the MAP. The extension can also set this value directly.

Displaying Soft Key Immediately

When accessing functions via the soft keys on digital phones, this function shows the function list immediately without needing to press the Scroll key. It checks if it can display the functions of the soft keys whenever the state is changed, and displays three functions at a time.

Outgoing Trunk Number Table Name Display

This function analyses the digits entered by the caller when making an outgoing trunk call and displays the corresponding name in the predefined name table on the caller's display on a digital phone. The incoming/outgoing trunk name table is set up using the MAP.

OPP Number Display

This checks the OPP number for incoming trunk calls and searches the incoming/outgoing trunk call name table for a corresponding name. It displays the name on the called party's display.

The incoming/outgoing trunk name table is set up using the MAP. The first '0' should be omitted when registering the OPP number.

Station Incoming / Outgoing Call Information Display

This function changes the display of the digital phone depending on the status of the extension during a call. For example:

Caller Number: 1234, Caller Name: K. Smith
Called Number: 5678, Called Name: J. Peters

The caller's LCD display is as shown below when the caller hears ringing tone:

5678: Ringing J. PETERS	Or	5678: Ringing CAMP MSG

The called party's LCD display is as shown below:

CALL FR 1234 K. SMITH

The LCD displays of the caller/called party are as shown below when the call is answered.

Caller:	5678: J.Peters	Called:	1234: K.Smith

Conditional Interception

This function transfers the incoming trunk call from a particular caller to a predefined number.

Ring Group Call Waiting

Keysets in station ring groups receive an indication that another call is waiting to be answered.

Ring Group Log In/Out

Extensions are able to log in and out of a ring group.

Additional Features

QSIG Protocol

The QSIG protocol provides signalling for Private Integrated-Services Network Exchange (PINX) devices. It is based on the ISDN Q.931 standard. Using QSIG PRI signalling, a multi-service concentrator can route incoming voice calls from a PINX across a WAN to a peer concentrator, which can then transport the signalling and voice packets to a second PINX.

Benefits

ISDN PRI QSIG voice signalling provides the following benefits:

- Enables connection of the multi-service concentrator with the DCS Gateway that uses the QSIG form of Common Channel Signalling.
- Provides transparent support for supplementary services so that the proprietary features of the DCS Gateway are not lost when connecting to networks.
- Provides QSIG support based on widely-used ISDN Q.931 standards. DCS Gateway's QSIG follows these ETSI implementation standards:
    - ECMA 143: Private Telecommunication Network (PTN) Inter-exchange Signalling Protocol Circuit Mode Basic Services. (This specification covers QSIG basic call services.)
    - ECMA 142: Specification, Functional Model and Information flows for Control Aspects of Circuit Mode Basic Services in Private Telecommunication Networks.
    - ECMA 141: Private Telecommunications Networks Inter-exchange Signalling Data Link Layer Protocol.
    - ECMA 165: Generic Functional Protocol for the Support of Supplementary Services.

Cards Required

- PRI4 card (with QSIG EPROM)

QSIG Features

The functions provided by the DCS Gateway based on the QSIG protocol are as follows.

Call Transfer

Allows a subscriber to transfer calls to other Private Integrated-Services Network Exchange (PINX) subscribers.

Call Offer

If a called party is busy, the called party is informed that there is an incoming call. The call in progress can be terminated to answer the incoming call.

Call Intrusion

If the party's line is busy on a call, another calling party can intrude and participate in the call.

Call Forward

- Off-site Forward: Call forwarding unconditional (CFU)
- Busy Forward: Call forwarding busy (CFB)
- No Answer Forward: Call forwarding no answer (CFN)

Do Not Disturb (DND) / Do Not Disturb Override (DNDO)

DND rejects all calls originated from the PINX. DNDO overrides DND at a called number; that is, to allow the call to proceed as if the called party had not activated DND.

Name Identification

Calling Name Identification Presentation (CNIP) displays the calling party's name to the called party. Connected Name Identification Presentation (CONP) displays all connected parties' names, the called party's name or the busy party's name to the calling party.

Path Replacement

Where it is no longer possible to continue the connection of the current call or it is necessary to establish a better call connection, this function is used to replace the old connection with a new one.

Call Completion

If a called party is busy, or there is network congestion, the CCBS function is used to forward the call to the called party as soon as they become free or the network congestion is overcome. (See CCBS and CCNR functions in *System / Telephone / Attendant Console Features*.)

Internet Gateway (Voice Over IP)

The DCS Gateway, functioning as an Internet gateway, provides a voice communication service via the Internet or any IP-based LAN or WAN.

Cards Required

- ITM card
- LAN ITM sub-card

Equipment Required

- MMC terminal (PC)
- LAN (10Base-T)
- Telephone (Web Video Phone, digital telephone, or SLT)
- MAP terminal (PC)

Configuration Tasks

The configuration tasks to be performed to use the functions of the Internet gateway are as follows.

- Setting up the jumper for the ITM card (Note 1)
- Mounting the ITM card (Note 2)
- Connecting the ITM card to the monitoring port
- Connecting the Ethernet port
- Setting up the MAP
- Configuring network parameters

Related menu in the MAP:
Database MGMT → CO line database MGMT → SIGATE network parameter

Note
1. Refer to the *DCS Gateway Maintenance Guide* for details of setting the card jumper.
2. Refer to the *DCS Gateway Installation Guide* for details of installing the card and connecting various terminals.

MMC Commands

Internet Gateway MMC is the method for exchanging information between users and the system. The system operator can use MMC commands by operating the MMC client from the terminal (PC) connected to the server.

Internet Gateway MMC is built into the Gateway package as a task in the same way as H323 Main, DSP Manager, H.245 and Q.931. This allows users familiar with UNIX commands to use the task by establishing the environment for I/Q and File Executive (IFX) and Streams and TCP/IP Networking Executive (SNX) without any special IPC with other tasks.

There are a number of MMC commands.

alias:	Outputs the current alias list or a specific alias line.
cp:	Copies a file.
create:	Creates a new file.
date:	Outputs or modifies the current time and/or date of the system.
dir:	Outputs the directories and the files in the system.
help:	Provides details of MMC commands. Usage: > help or > help [command] (e.g. help [create])
history:	Outputs the history list of commands used.
md:	Outputs the contents of a specific memory location.
mm:	Modifies the contents of a specific memory location.
mv:	Moves a file.
pwd:	Outputs the current directory path.
rm:	Removes files or directories.
type:	Outputs the contents of a given file.
ver:	Outputs the operating system version of the target system.
dsptable:	Outputs the contents of the DSP channel table managed by the H323 main task or modifies the port property in the table. The status value of the port property is blocked so that the system operator may not alter it.
iptable:	Outputs, inserts, modifies or deletes the contents of the user profile table managed by the H323 main task.
cfg:	Outputs or modifies the Internet Gateway configuration data.

Note
The use of MMC commands is detailed in the *DCS Gateway Administration Guide*.

Remote MAP (RMAP)

This program allows users to monitor the DCS Gateway over the PSTN or a LAN on a Microsoft Windows PC.

PC Specifications

- CPU: Pentium 300MHz or higher
- Memory: Minimum 32MB (64 MB recommended)
- Hard Disk: Minimum 400MB
- Op. System: Windows 95 or 98

LAN Card

- 10Mbps Ethernet card

Portable Modem

- Speed: 9.6 kbps or higher

Multi-port Card

- Number of Ports: 4
- Drive: Win95/Win98 driver

Software Required

- The RMAP package works with the web component and report tool.
- Free Web Component: MS Personal Web Server 4.0, MS Internet Explorer 4.01 and above, Macromedia Flash ActiveX Control
- Commercial Report Tool : Seagate Crystal Report 7 Professional
- RMAP package: RMAP programs, HTML, Image files

RMAP Features Test

This function tests the system components for diagnostic purposes. Users can invoke immediate tests or scheduled tests.

All the test result data can be retrieved according to the user's needs.

1. Setting Diagnostic Test

Users can select multiple items to be tested. For the scheduled test, users have to set the designated time and duration (days). The Polling Scheduler will test the item at the scheduled time and duration.

2. Retrieving Test Results

The test results are saved in an MS Access database file. Users can access the test result data after specifying the required data range.

Alarm

This function notifies the system operator of alarm information raised from each site and stores it in an MS Access database file. The alarm history can be displayed on the screen or printed out as required.

1. Receiving Alarm

The RMAP package receives alarm information raised by a system through a modem or LAN, then stores the alarm information in an MS Access database file.

2. Retrieving Alarm

Alarm information from systems is stored in an MS Access database file so as to be readily available for retrieval.

Status Configuration

This function provides a graphical report of the system status.

1. Node Configuration

This function displays a graphical interface of the node configuration from information received from the system. Card hardware type and card status in the designated node will be displayed as a rack image.

2. Shelf Configuration

Users can display the port status configuration information received from the system. Port status in a designated shelf will be displayed in table form.

ACD (Automatic Call Distribution)

ACD distributes calls to agents equally, with calls waiting for the longest time being connected to agents first (First In First Out, or FIFO). Additionally, each call can have a priority, with the highest priority call being connected to an agent first. Priority takes precedence over FIFO order.

If a customer calls in when no agent is available, the customer will hear an announcement and then be held pending an agent becoming available, or be transferred to another group or extension.

ACD provides various features to enable ACD agents to transact customer calls efficiently.

- Log In/Log Out for the ACD call transaction
- Message sending/receiving feature to request help during the ACD call transaction
- Emergency feature to alert the supervisor of an emergency
- Recording feature to record the phone conversation
- Telephone State Change feature

Cards Required

- DLI4 card
- Trunk card (PSTN or ISDN)
- AVA2 card

Configuration Devices Required

Required configuration devices for using ACD features are:

- Digital telephone for agent/supervisor
- External announcement device such as Music On Hold (MOH).
- Recording device such as VMS.

Configuration Tasks for Using ACD Features

Configuration tasks for using ACD features are:

- **Agent/Supervisor Phone Connection**
  Connect digital phones used by agent/supervisor to DL14 card of the DCS Gateway.

- **MOH Connection**
  Connect external announcement devices such as MOH via an LIU and trunk port to provide background music. Announcement messages can be provided from the AVA2 card.

- **Recording Device (VMS) Connection**

Set the MAP by referring to 'VMS Feature' Description part, if the recording device is required.

- **MAP Setting**

1. **ACD Group Information Set and Inquiry**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ ACD Group Information

2. **ACD Group Configuration**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ ACD Group Configuration

3. **ACD Recording Device Configuration**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ Recording Device Set

4. **ACD Group Routing Index set by the hour during weekdays**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ Routing Index by the hour during weekdays

5. **ACD Announcement Group Set (Recorded AVA2 Channel Set)**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ Announcement Group Set

6. **LOG IN/ LOG OUT Time Set by the ACD Group**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ Log In/Out Time Set

7. **ACD Group Holiday Service Date Set**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ Holiday Service Date Set

8. **ACD Service Option Set**
   Related menu in the MAP:
   Data Base Management ➨ ACD&Infolink DB Management ➨ ACD Service Option Specification

9. ACD Routing Table Programming

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ Routing Table Programming

10. ACD Message Input

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ ACD Message Set

11. ACD Group Night time/Holiday Routing Index Set

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ Night-time/Holiday Routing Index Set

12. Agent Phone Log On/Off Set by the ACD Group

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ ACD Log On/Off

13. Statistics Port Assignment by the ACD Trunk

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ Statistics Port Assignment by the ACD Trunk

14. Statistics Port Assignment by the ACD agent

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management Statistics Port Assignment by the ACD Agent

15. Function Code Designation on the ACD Digital Phone

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ ACD digiphone programmable keys

16. Function Code Designation on the ACD DIGITAL Phone

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ ACD (DIGITAL) phone programmable key

17. ACD DB Information Inquiry and Change by Port Type

Related menu in the MAP:

Data Base Management ➨ ACD&Infolink DB Management ➨ Port Information (Synthesis)

Note

1. Refer to the the *DCS Gateway Installation Guide* for connecting ACD configuration devices.
2. Refer to the *DCS Gateway Administration Guide* for details of configuration tasks required after selecting a MAP menu.

ACD Features

Call Distribution and Grouping Features

A customer call will be connected to the first available agent promptly. If all agents are busy or unavailable, callers hear an announcement following ring tone.

The order of distribution of calls to the ACD group is primarily based on FIFO. Calls can also be assigned a priority order, which has precedence over FIFO. Thus, a call which has the higher priority number will be connected to an agent first. If calls have the same priority, they will be connected to agents in FIFO order.

Incoming ACD calls are divided into three categories according to priority:

- Priority ACD Call (priority order number 0, 1 and 2)
- Overflow ACD Call (calls transferred from another group, priority order number 3)
- General ACD Call (includes station calls, the lowest priority order).

Incoming ACD call distribution on FIFO order is done on the basis of available agents. If no agent is available, incoming calls are saved in a waiting queue. Either an announcement or music (as defined in the Routing Table) will be heard by callers.

Agent Features

Every agent must log in on arriving at the office and log out on leaving the office in order to get accurate data on agent Record Management through the Statistics Report.

The system can be set to change automatically into Night mode at a predefined time, even if agents do not log out. The path for incoming calls is designated in the Log In/Out Table.

ACD agent status is one of the following.

- Available (Available Status for answering customer calls)
- Unavailable (Reject Status for customer calls)
- Work (Holding Status, handling work for customer)
- Non ACD (if using local phone or external phone)
- ACD In (handling a customer's call)

An agent can change the status of their phone to Available, Unavailable or Work. When no agent is available to answer calls, incoming ACD calls are placed in 'waiting status' and the call-waiting key LEDs on agents' phones will flash. The call-waiting LED indicates as follows.

Off:	No waiting calls
Flashing or on steady:	There are calls waiting. The frequency with which the LED flashes (slow, medium, fast) depends on the number of calls waiting. The LED is on steady if there is a large number of calls. The number of calls indicated by the LED is defined using the MAP (Setting ACD Service Options).

A maximum of 1,998 agent IDs (1–1,998) can be assigned in this system and it is possible to collect data for individual performance analysis of each agent.

The agent ID can be fixed as one digit, two digits, three digits or four digits, by setting the number of digits in the MAP.

Available features for agents

- Agent State Change (Work, Available, Unavailable)
- Autowork feature
- Agent ID Input (option of one to four digits)
- Customer Call Transaction
- Message Transmission to Supervisor
- Emergency Message Transmission to Supervisor
- ACD Message Receipt from Supervisor (a maximum of 16 messages can be transferred from the supervisor to agents.)
- If external recording devices are connected, it is possible to record call conversations.

The Autowork feature is available for agents to allow them to automatically change to Work state rather than having to do so manually after taking a customer call.

Supervisor Features

Each ACD group allows one supervisor telephone.

Available features for supervisors are:

- Supervisor Status Change (Work, Available, Unavailable)
- Customer Call Transaction
- Executive Override
- Monitor
- ACD Message Transmission to agents
- Message Receipt from Agent (a maximum of 16 messages can be received from agents).

- Emergency Receipt from Agents

Each statistics PC can manage five ACD groups.

When using the statistics PC, the statistics group number (0–4) and statistics output port should be assigned separately in the MAP.

Announcement Features

If all agents are busy and not available for ACD call transactions, incoming ACD calls are connected to the announcement device.

The announcement source to be connected to incoming ACD calls is determined by the Routing Table that is set via the MAP. The duration of MOH for ACD calls is also defined in the Routing Table.

Announcement features are as follows.

- Each ACD group has an announcement group. Individual announcement groups can have 12 types of announcement sources and each announcement source is called the 1st, 2nd,…12th announcement source respectively. Where sources 7 to 12 are not used for ACD service, they are used for Nighttime or Holiday announcements.
- The AVA2 (Automatic Voice Announcement) card used as the announcement device has 15 recording ports available.
- Multiple ACD groups can share one announcement group, where they use the same announcement.
- The maximum announcement time is 32 seconds, but the announcement can be repeated as set by the Routing Table. If an announcement is longer than 32 seconds, it can be recorded in two parts and the Routing Table set to repeat them after inserting MOH between them.

When an incoming caller is listening to the announcement and an agent becomes available, the call will be immediately connected to the agent regardless of how much of the announcement has been played. The call will be distributed according to the order in which it came in or according to its priority.

Recording Features

Each agent can have their own exclusive recording device. If an agent has not registered a recording device, the common recording device for the group to which the agent belongs is used. To record a conversation using a recording device, the recording key on the agent's or supervisor's phone must be pressed.

When the recording device is in operation, the following will be displayed on the LCD of the agent's phone:

RECORDING 1234

ANI (Automatic Number Identification) Features

Calling Line Identification is available. On PSTN lines the R2CID daughterboard must be installed on the MCPU2.

Supervisor Statistics Report Features

Statistics reports are available on the statistics PC using the CallView program.

CallView provides the following types of statistics reports.

- Current Agent State Report
- Current Trunk State Report
- ACD System Summary Report
- Trunk Usage Report
- Trunk Usage Detailed Report
- ACD Position Performance Report
- ACD Agent Performance Report
- ACD Group Answered Call Profile by hours
- Trunk Answered Call Profile by hours
- Overflowed Call Profile by hours
- Abandoned Call Profile by hours
- Daily Agent Performance Report
- Daily Position Performance Report

The following items must be registered on the CallView PC.

- ACD Agent Group Name
- Agent ID
- Agent Name
- ACD TRK Group Name
- The maximum numbers of Trunk by Group

Program Key Function Registration of the agent/Supervisor telephone

There are 24 programmable keys available on the agent's/supervisor's phone. Frequently-used function codes or phone numbers can be assigned to these keys. Recommended function keys for agent's phones are:

ACD LINE	NON ACD	SUPMSG	SUPMSG CLEAR	AUTOWORK
SUPMSG1	SUPMSG2	SUPMSG3	SUPMSG4	
SUPMSG5	SUPMSG6	SUPMSG7	SUPMSG8	
BAD LINE	RECORD	ACK	ENTER ID	
AVAIL	UNAVAIL	WORK	EMERGENCY	

Recommended function keys for Supervisor's phones are:

ACD LINE	NON ACD	AGTMSG	AGTMSG CLEAR
EOV	INTERNAL PAGE	PLAY AVA	MONITOR
HEADSET	EMERGENCY	BAD LINE	RECORD
ACK AVAIL	UNAVAIL	WORK	ENTER ID

Using the Agent Telephone

Agent features are:

- Log In

Agents register their ID prior to starting work. The agent has to log in to begin answering calls. When using CallView, the log-in time of each agent is stored on the PC and is used to monitor availability of the agent along with the log-out time.

- Log Out

An agent has to log out before leaving the telephone, so that calls are not forwarded to unattended phones. CallView can monitor log-out time for each agent.

- Available Status Display

Available Status means the agent is ready to handle customer call transactions.

- Work State

Work state prevents calls being sent to agents' phones temporarily whilst they finalise work for the previous call transaction after hanging up the phone (e.g. completing tasks such as order entry and database update). When these duties are completed, the agent presses the Work key again to indicate they are again available to take calls. In the Work state, internal calls can still be received.

If they have an Autowork key they can be automatically put in Work state after receiving a customer call, and after a preset time are returned to Available state.

- Unavailable State

When agents do not wish to receive calls, the phone is placed in Unavailable state. In this state, incoming ACD calls will not be received by this agent, but internal calls can still be received.

Note
Where the current state is Available or Work, it is possible to change to the Unavailable state.

- Report of Trunk Line Abnormality

When the speech quality on a trunk line is poor the call can be recorded and the supervisor informed so that action can be taken to rectify the problem. The trunk number, agent number and current time are reported on CallView.

- Message Transmission

Whilst talking to a caller, an agent can transfer a predefined message to the supervisor. Messages are predefined in the MAP. The caller is not aware of the transmission of the message.

- Message Receipt

The supervisor can also transfer messages to the agent.

- Emergency Message Transmission

When an important customer call is received, the agent can notify the supervisor by pressing the EMEG key. A beep is sounded and the message is displayed on the supervisor's phone for attention.

- Recording Phone Conversations

Agents can record phone conversations for incoming or internal calls.

Note
'Hook off' means to pick up the handset. 'Hook on' is to put down the handset. You can also hook on/off by using the Speaker key.

Using the Supervisor Telephone Features

The supervisor's phone has the same agent features described above, plus seven additional features.

- Message Simulcast Transmission

The supervisor phone can transfer the same message to a maximum of 20 agents at the same time. This feature is called Message Simulcast Transmission.

- Speech Monitoring

The supervisor can monitor the conversation between an agent and the customer, if required. The LCD on the agent's phone displays 'MONITOR' so the agent is aware that the call is being monitored. The supervisor cannot participate in the conversation, only monitor it. If the supervisor wishes to participate in the conversation, he/she presses the CONF key as described below.

- Interrupt During Conversation Monitoring

The supervisor can interrupt the conversation between the agent and the customer whilst monitoring by pressing the CONF key.

- Paging

The supervisor can page an agent if required. The paging device is connected to a spare trunk port that is programmed to provide this paging feature.

- Forced Interrupt (Executive Override, EOV)

This feature allows the supervisor to forcibly interrupt the conversation between an agent and the caller and establish a three-way conversation.

- Play Automatic Voice Announcement (AVA)

This feature plays the AVA message when the caller is put on hold during the transaction.

- Record AVA

This feature records the AVA message to be played when callers are put on hold.

CTI (Computer Telephony Integration)

Computer telephony integration (CTI) is the technique of coordinating the actions of telephone and computer systems. There are many kinds of CTI interface protocols. The Samsung DCS Gateway utilises Microsoft's TAPI 2.1 Compatible Service Provider.

TAPI is an open industry standard, defined with considerable, and ongoing, input from the worldwide telephony and computing community. As TAPI is switch vendor independent, TAPI-compatible applications can run on a wide variety of PC and telephony hardware and can support a variety of network services.

TAPI 2.1 addresses the client-server need for call control. A telephony client application can integrate with the phone system via a link between the server and phone system, or via a link between the PC and telephone. This flexibility allows deployment of computer telephony solutions on the most appropriate scale to suit the required application.

TAPI 2.1 Compatible PBX Driver (Service Provider)

The Service Provider:

- Supports most of the initialisation, call control and monitor functions defined in the Microsoft TAPI specification
- Can be configured by the user/system administrator using a Graphical User Interface (GUI)
- Maps all the TAPI calls to the current set of Command/Event formats defined in the InfoLink Specification, which is the Samsung proprietary CTI interface protocol.

Features Supported

- Make Calls
- Answer Calls
- Release Calls
- Hold/Retrieve Calls
- Blind Transfer
- Consultation Call

- Conference Call
- Redirect Call
- Park/Unpark Call
- Pickup Call
- Page
- Set/Reset Call Forwarding
- Set/Reset DND
- Monitor calls, devices and more under development

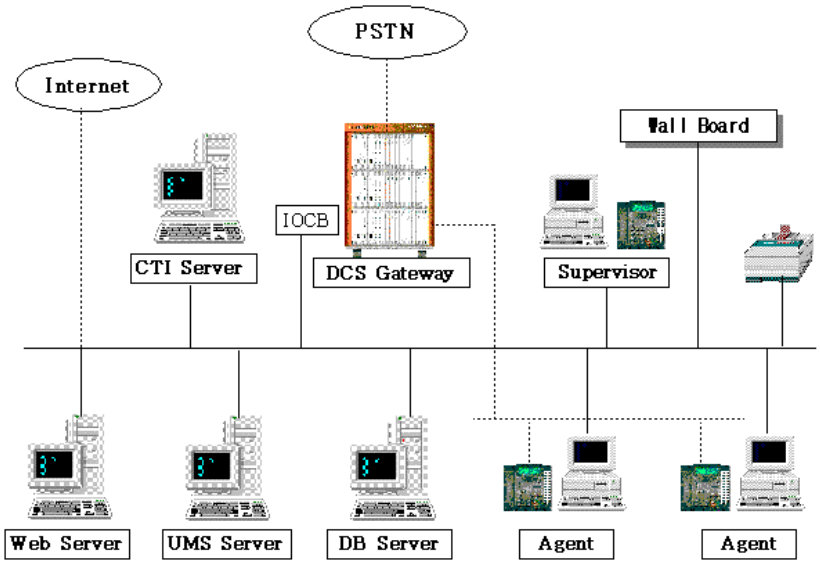
DCS Gateway Requirements

- MCPU2 card
- IOCB3 card

CTI Server Requirements

- Operating System: Windows NT 4.0 or higher with SP4
- CPU: 233MHz or higher processor
- Memory: 128 MB RAM
- Storage: 250 MB of available hard disk space

Call Centre Using a DCS Gateway (Example)



Announcement

The announcement function on the DCS Gateway is used mainly for ACD calls.

Announcement Function on ACD Call

The ACD function distributes many incoming calls from many trunks and extension lines equally to agent phones to process large numbers of calls efficiently.
If a new call is received while agents are busy and can't process incoming calls, an announcement is broadcast to the caller whilst they are on hold.

Announcement Types

- External Announcement

An external announcement device such as MOH can be used for background music or announcements and is accessed via a trunk port.

Note
MOH refers to external devices such as a radio, CD player, or cassette tape which provide music.

- Melody IC

If no external announcement source is installed, a melody is provided by a chip on the MCPU2.

- Announcement Using AVA2 Card

The AVA2 card is a voice recording device used to provide an announcement service. Where the AVA2 card is installed, announcements are recorded on it and replayed to callers on hold.

Major Features

The following summarises features of the announcement function for ACD calls.

- Each ACD group has an announcement group. An announcement group can have 12 announcement types (1st…12th). The 7th to 12th types are used only for night or holiday announcements.
- An AVA2 card has eight recording ports (or 15 ports). If it uses four ports per announcement type, it can broadcast two types of announcement.
- Multiple ACD groups can share an announcement message.
- The maximum announcement time is 16 (or 32) seconds, but an announcement may be repeated depending on the content of the Routing Table. If an announcement is longer than 32 seconds, the Routing Table should be set in such a way that the announcement is divided into two announcements with MOH in between.

- If an agent becomes available while a call is listening to an announcement, the call is connected to the agent immediately. The call distribution sequence is not related to the size of the announcement, and calls are distributed on the basis of FIFO.

Cards Required

- AVA2 card

Devices Required

- Announcement device

Configuration Tasks for Using Announcement Features

Configuration tasks for using announcement features are as follows:

- Installing the AVA2 card
- Connecting an announcement device (e.g. radio or CD player)
- Setting up the MAP

    1. Setting up announcement group (setting up recorded AVA2 channel)
       Related menu in the MAP**:**
       Data Base Management ➨ ACD&Infolink DB Management ➨ Announcement Group Setup

    2. Programming ACD Routing Table
       Related menu in the MAP**:**
       Data Base Management ➨ ACD&Infolink DB Management ➨ Routing Table Programming

---

Note

1. Refer to the *DCS Gateway Installation Guide* for how to install the AVA2 card and connect a device.
2. Refer to the *DCS Gateway Administration Guide* for details of configuration tasks required after selecting a MAP menu.

External Music

The DCS Gateway offers the Music On Hold (MOH) function that repeats a specific melody to subscribers while calls are on hold. Tone types for this are the system melody (internal) tone and external music.

There is a tone chip on the MCPU card, which provides the system melody (internal) tone. In addition to this basic system tone, a cassette or radio can be connected for external music. Alternatively, a low-cost Music-On-Hold SIM (MSIM) which does not require an analogue trunk can be used. The MSIM also acts as a door-phone interface module. (*MSIMs are to be available in the second quarter of 2001*.)

In the DCS Gateway, external music is used mostly as hold tone or background music and may also be used in processing ACD calls.

Cards Required

- GLOOP2 card

The music source can be connected to a port on the GLOOP2 card via an approved Line Isolation Unit (LIU)

Devices Required

- Radio or CD player or cassette tape recorder.

Note
Radios, CD players and cassette tape recorders are designed with an output impedance of 8Ω or 16Ω. The input impedance of external music is fixed at 600Ω.

Configuration Tasks for Using External Music Features

Configuration tasks for using external music features are as follows:

- Connecting the external music device to the DCS Gateway trunk port via an LIU
- Setting up the MAP

    1. Setting subscriber port information
       Related menu in the MAP**:**
       Data Base Management ➨ Subscriber DB Management ➨ Port Information (Comprehensive)

    2. Setting the tone option (tone type, port number)
       Related menu in the MAP**:**
       Data Base Management ➨ System DB Management I ➨ Tone Option

Note
1. Refer to the *DCS Gateway General Description Guide* for specifications of the GLOOP2 card.
2. Refer to the *DCS Gateway Installation Guide* for how to install the card and connect external music devices.
3. Refer to the *DCS Gateway Administration Guide* for configuration tasks required after selecting the MAP menu.

Statistics

The Statistics function provided by the DCS Gateway is used to collect, arrange and display data, either at the request of the system manager or periodically.

Data output by the Statistics function can be used for diagnosis of system operation, analysis of traffic distribution and improvement of call quality and service.

The complete process is divided mainly into data collection, storage and processing, and data display.

About the Statistics Function

The Statistics function is divided into random (occasional or on-demand) statistics reports and periodic (cyclic) statistics reports.

Random Statistics Report

Random statistics reports collect, analyse and process data as requested by the system manager, and display the results.

The random statistics report collects statistics data in a cycle of 15, 20, 30 and 60 minutes as set by the system manager (refer to *Setting the Cycle of Random Statistics Reports*, below.)

The data collection cycle can be set for up to 16 times a week. The data collection results are saved on the hard disk and may be output to a printer.

Random statistics are divided into the following types.

Type	Function
Trunk Group Statistics	Provides statistics information such as trunk-specific equipment status, the total seizure time and the average seizure time.
Extension Group Statistics	Provides statistics information such as the equipment status, the originating/terminating seizure count, the originating/terminating seizure time and the average seizure time for each extension group (Distribution, Hunt, Equality group).
Function Code Use Statistics	Measures the usage of each function (feature). The count is for the number of attempts to use a feature and not the number of successful attempts.
Signalling Device Statistics	Provides statistics information such as the equipment status, seizure count, seizure time and the average seizure time for the common resources of each node.
ISDN Subscriber Statistics	Provides statistics information such as the equipment status and the originating/terminating seizure count, the originating/terminating seizure time and the average seizure time for each ISDN subscriber group.
Inter-node (INI) Statistics	Provides statistics information such as the connection status of interconnected nodes, the maximum number of seized channels, the average seizure count, and the count of call failures because all channels are busy.

Periodic (Cyclic) Statistics Report

The periodic statistics report collects, analyses and processes data automatically every hour. The data collection results are saved on the hard disk and may be output to a printer.

Periodic statistics are divided into the following types.

Type	Function
Extension Group Statistics	Provides statistics information on the call progress status related to extension subscribers. Collects events occurring in groups (Distribution, Hunt, Equality group). Provides statistics information such as off-hook count, extension subscriber call count, and trunk seizure count for each extension group.
Trunk Group Statistics	Provides statistics information on the progress status of trunk terminating calls. Provides statistics information such as call termination count, count of extensions originating to trunks, and the tandem call count.
Attendant Console (ATC) Statistics	Provides the following information by classifying calls terminating at the attendant console. Total termination count Call termination count from other extensions Call termination count from trunk subscribers Count of call failure due to all loops seized
System Status Statistics	Provides statistics information such as the count of diagnosis for each item on the system status, count of fault block generation, recovery count, or count of diagnosis stopped.
System Load Statistics	Provides statistics information such as the average load rate and the maximum load rate of the processor in each node.
Trunk Originating Call Statistics	Provides statistics information such as trunk port allocation count, trunk call origination count, tandem call origination count, and call count for each trunk originating call
ISDN Supplementary Service Statistics	Provides statistics information such as attempt count of ISDN function service, success count, failure count for each ISDN group.

Major Statistics Features

- The random statistics report starts and ends depending on what is set in the system database, and can be generated up to 16 times per item for a week. Also, it can be repeated weekly.
- The periodic statistics report specifies its own start and end time.
- All statistics data is stored on the hard disk, and all information on the hard disk can be output via the MAP or the system printer.
- Collected statistics data is stored on the hard disk for a week. After a week, the data is replaced by new data.
- Statistics data generated on a trunk port without a trunk group are not collected.
- Start and end of the random report statistics is set to 15, 20, 30 and 60 minutes, while the periodic report statistics can only be set to 60 minutes or its multiples.

- Statistics can be processed on up to 62 groups for extension and trunk data groups, and 64 subscribers for the attendant console.
- Only one MAP can request statistics data to be printed.
- When the MAP is using the printer, periodic report statistics may not be printed even if the print option is set. Also, if MAP requests a print of statistics while periodic report statistics are being printed, an error message may appear on the MAP PC.
- Even though the database has been set for collection of operator statistics, no statistics can be processed if there is operator activity within the statistics period.
- If any one of the nodes does not answer while statistics data from each node is being output to the MAP or the printer, it is processed as an error. Only when there are answers from all nodes can the data be output to the MAP or the printer. The statistics data collected is stored on the hard disk.

Output Devices Required

- Printer or MAP PC

Print statistics results or view them on the MAP PC.

Configuration Tasks for Using Statistics Features

Configuration tasks for using statistics features are as follows.

- Connecting the printer
  The printer is connected via the RS232C or LAN port of the IOCB3 card located on the basic shelf.

- Connecting the MAP PC
  The MAP is installed on a PC connected to the DCS Gateway to perform system tasks. The PC transmits and receives data through the RS232C or LAN port of the IOCB3 card located on the basic shelf.

- Setting up the MAP

  1. Setting up I/O devices for each node
     Related menu in the MAP**:**
     Data Base Management ➨ System DB Management ➨ System I/O Device Management ➨ Change Devices For Each Node

  2. Controlling I/O device service reservation
     Related menu in the MAP**:**
     Data Base Management ➨ System DB Management ➨ System I/O Device Management ➨ I/O Device Holding Control

3. **Setting Async Port**
   Related menu in the MAP**:**
   Data Base Management ➨ System DB Management ➨ System I/O Device Management ➨ Setting Async Port

Collecting Statistics

The method of collecting statistics data can be defined in the Installation Tool (IT) when the DCS Gateway is installed , or in the MAP (refer to the *DCS Gateway Administration Guide*).

If the collection method is not selected, statistics data is not stored on the hard disk nor printed online.

Collecting Periodic (Cyclic) Report Statistics Data

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Collecting Random Report Statistics Data

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Measuring Extension Group Statistics

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Measuring Data Group Statistics

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Measuring Statistics on the Node Attendant Console

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Requesting to Initialise Bulk Statistics Items

Bulk statistics data is not saved on the hard disk, but starts accumulating when the system power is turned on, and is cleared when the system restarts or initialisation is requested. Statistics items and nodes must be designated.

Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Setting the Cycle of Random Statistics Reports

The random statistics report cycle is set to 15, 20, 30 and 60 minutes.
Select a menu in the MAP MMC main screen using the sequence:
Data Base Management ➨ PMS/VMS Statistics Management ➨ Statistics Cycle Report

Display or Print Statistics Results

Statistics information collected for each node is stored on the hard disk of the statistics PC for that node and can be displayed on the MAP screen or printed by the system printer.

In the case of multiple node configurations, both the statistics PC for each node and the links between nodes should be operating properly when display or printout is requested. In addition, statistics information collected at every time period requested by the MAP should be stored on all the hard disks of every node.

Querying On-demand Report Statistics

On-demand report statistics comprise the categories shown below.

- Statistics by extension group
- Statistics by CO line group
- Statistics on functions/features
- Statistics on signalling equipment
- Statistics on attendant consoles
- Statistics on ISDN subscribers
- Statistics on INI (nodes)

On the MAP MMC main screen, select menus using the sequence:
Statistics Billing Management → On-demand Report Query

When selecting the query period required, the PC for MAP collects statistics data generated during that period, per on-demand report interval, and displays them.

On the On-demand Report Query screen, select On-demand Report Query by CO Line Group, Extension Group, Function Code Use, Signalling Equipment, Attendants, ISDN Subscribers or INI menu.

Querying Periodic Report Statistics

Periodic report statistics comprise the categories shown below.

- Statistics by extension group
- Statistics by CO line group
- Statistics on attendant consoles
- Statistics on system status
- Statistics on system load rate
- Statistics on distribution of CO line calls
- Statistics on CO line outgoing calls
- Statistics on ISDN supplementary services

On the MAP MMC main screen, select menus using the following sequence:
Statistics Billing Management ➨ Periodical Report Query

After selecting the query period required, the PC for MAP collects statistics data generated during that period, per hour, and displays them.

On the Periodical Report Query screen, select Periodical Report Query by Extension Group, CO Line Group, System Status, System Load, Attendants, Distribution of CO Line Calls, Statistics on CO Line Originating Calls, or Statistics on ISDN Supplementary Services menu.

How to Print On-demand Report Statistics

On the MAP MMC main screen, select menus using the sequence:
Statistics Billing Management ➨ On-demand Report Query ➨ Printing Request by On-demand Report Item

After selecting the query period required, the PC for MAP prints statistics data generated during that period.

On the Printing Request by On-demand Report Item screen, select CO Line Group Statistics, Extension Groups Statistics, Function Code Use Statistics, Signalling Equipment Statistics, Attendants Statistics, ISDN Subscribers Statistics, or INI Statistics item.

How to Print Periodic Report Statistics

Select menus using the following sequence:
Statistics Billing Management ➨ Periodical Report Query➨ Request for the printing of periodical report by each menu

After selecting the query period, the PC for MAP prints the statistics data generated during that period.

On the Request for the Printing of Each Periodical Report Item screen, select the Extension Group Statistics, CO Line Group, Attendant, System Status, System Load, CO Line Call Distribution, CO Line Originating Call, or ISDN Supplementary Service menu.

Diagnosis

To ensure the DCS Gateway operates in a stable manner, the LPM3 card constantly monitors program commands performed by the system such as call tasks, diagnostic tasks, and data tasks. Therefore, the user is immediately informed of any system abnormalities.

The main processor (MCPU2) performs the most critical functions within the system. To minimise disruption in the event of a failure, a second MCPU2 can be installed in the system to provide redundancy.

Hardware Fault Diagnosis

- The system can monitor the operational state of system hardware for more stable system operation.
- The system is equipped with a test function for on-line diagnosis and an indication function for showing alarms.
- In the event of system faults, the system performs functions to minimise disruption to users and activates an alarm to alert users that the system requires service.
- The system has various LEDs that indicate the operational status of cards to assist maintenance personnel in diagnosing problems.

Software Fault Diagnosis

The processor continuously performs on-line fault diagnosis while the system is online. As a result, if malfunctions occur, the system stores the information in memory and then activates the alarm LED on the attendant console.

Viewing the Diagnosis Function

The DCS Gateway provides the following types of diagnosis function.

Built-in Test
This test allows the system manager to detect malfunctions using hardware in specific system devices .

Pre-scheduled Test

This test allows the system manager to detect malfunctions by performing tests continuously or periodically during system operation. The diagnosis cycle can be changed using the MAP.
Test items are classified further as follows:

- Control Unit Test
- Switch Unit Test
- Common Equipment Unit Test
- Inter-Processor Communication Test
- Input/Output Device Unit Test
- Subscriber Interface Unit Test
- Inter-Node Link Test
- Supplementary Device Interface Test
- Audit Test

On-demand Test

The system manager can use the MAP in order to test each system component whenever required.

Fault Analysis and Localisation

This function allows the system manager to analyse the results of error detection in order to search fault locations, with the goal of minimising the effect on system services.

Fault Isolation and Reconfiguration

Using a fault analysis function, the system determines the location of faulty units and then puts faulty units into the 'fault blocking' state in order to maintain services. Where duplicated processor hardware is installed and there is a processor fault, processing will continue on the duplicate unit. Malfunctioning units that are blocked and excluded from service can be tested continuously by a pre-scheduled test or an on-demand test. Where the previously faulty units test OK, these units are put back into service.

Fault Report

This function is used to output detected malfunctions to the printer, the MAP PC or the PC running RMAP instantaneously, or by the request of MMC based on their classes.

Fault Recovery and Reintegration

The system tests the malfunctioning units classified as faulty periodically or using on-demand diagnosis. When the system detects the malfunctioning units as no longer faulty, it releases the system block.

System Alarm and Status Output

When the system detects fault conditions, the system classifies malfunctions generated and prints information on generation time and generation locations.

Devices Required

The following peripheral devices are required.

- Printer
- PC running MAP
- PC running RMAP

Configuration Tasks for Using Diagnosis Features

The following set-up tasks should be performed in order to use a diagnosis function in the DCS Gateway.

- Connecting peripheral devices
- Setting up the MAP

Selecting the Fault Information Output Device

Related menu in the MAP:
Diagnosing & Control Database MGMT➨ Control ➨ Setting the Fault Information Output Unit

Diagnosis Features

System Diagnosis and Control Using the MAP

For more details, refer to *Diagnosis and Control Management of the MAP Operation* in the *DCS Gateway Administration Guide.*

Error Types Using Alarms and Status Output Messages

Details on system malfunctions are output to the printer as follows

```
Type (***) Contents, Year, Month, Day HH:MM:SS
LOC    :
INFO   :
```

- **Type**: details the severity of the alarm.

An alarm is activated if there is a system malfunction which may have a serious affect on system operation.

Alarm indications are CRI (critical), MAJ (major), or MIN (minor) depending on the degree of severity.

- **LOC**: is used to indicate fault locations.

Fault locations are indicated by nodes, shelves, slots and ports according to their locations.

- **INFO**: shows detailed information on malfunctions.

Note
1. Refer to the *DCS Gateway Installation Guide* for connection of printer or MAP PC.
2. Refer to the Diagnosis, Control, and Management section of the *DCS Gateway Administration Guide* for detailed descriptions of message types.

ISDN

ISDN (Integrated Services Digital Network) is a digital network for public communication. It is an integrated information network over which you can use voice communication, visual communication and data communication at the same time. ISDN can perform high-speed data communication at the rate of 64kbps per channel.

ISDN BRI consists of three digital channels, represented as 2B+D, comprising two B channels and one D channel. The B channel transfers data at a line speed of 64kbps while the D channel transfers signalling messages for control and management. High-speed data communication and voice conversations can occur simultaneously through the B channels.

The DCS Gateway also provides PRI cards (consisting of 30B+D), which can be connected to the ISDN network, and BRI cards which can be connected to the ISDN network or to ISDN terminals.

The BRI card operates in two modes:

- BRI-T mode: The BRI port is used to connect the ISDN network to the DCS Gateway.
- BRI-S mode: The BRI port is used to connect the ISDN terminal to the DCS Gateway.

Eight ports on the BRI card can be used by setting the card as either BRI-T or BRI-S for each port.

Main Features

- It is possible to perform voice and data communication between ISDN terminals.
- It is possible to make voice conversations between ISDN telephones and digital / analogue telephones.
- If a separate ISDN multiplexer is installed, multimedia communication services such as videoconference between ISDN videophones can be provided.
- With the high-speed data transmission rate of 64kbps, data downloading time and communication expenses can be reduced.
- It is easy to build up a strategic information network using ISDN PCs.
- When connection is made to the ISDN network using PRI, the system can be used as a trunk so that a maximum of 30 subscribers can make calls at the same time.
- When connection is made to the ISDN network using BRI, the system can be used as a trunk so that a maximum of two subscribers can make calls at the same time.

- A personal ISDN network may be operated using ISDN PRI.
- For the BRI-S interface, Point-to-Point connections and Point-to-Multipoint connections are supported:

Point-to-Point connections:
Connects a terminal to a port on the BRI card.

Point-to-Multipoint connections:
Connects multiple ISDN terminals to one BRI-S port on the BRI card.

Cards Required

The DCS Gateway cards which can be connected to the ISDN network are:

- BRI card
- PRI4 card

Terminals Required

ISDN terminals that can be connected to the BRI card are:

- ISDN telephone
- ISDN videophone
- G4 Fax
- ISDN PC

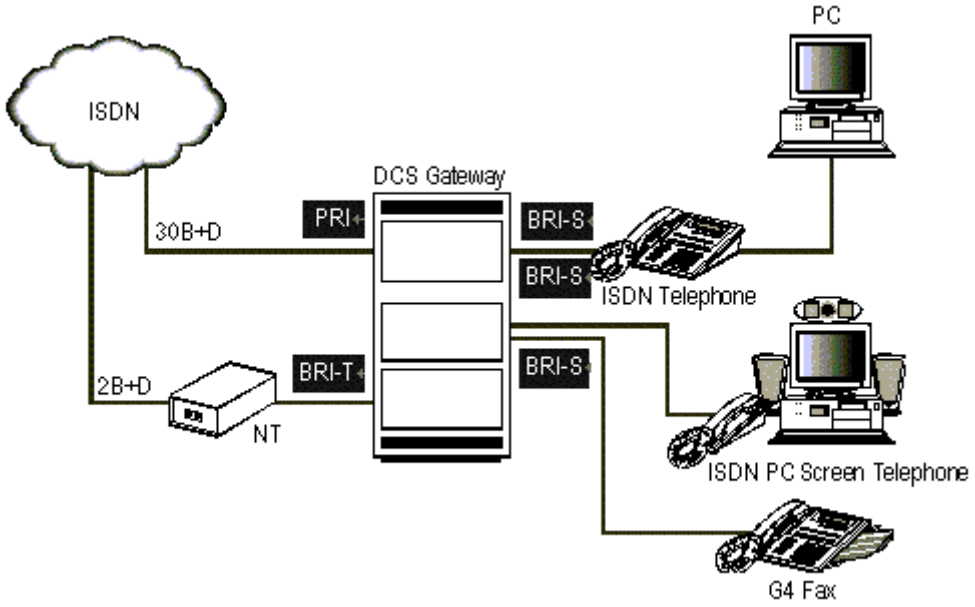
System Configuration Tasks for Using ISDN Features

System configuration tasks to be done prior to using ISDN features are as follows.

- Setting jumpers for the BRI and PR14 cards.
- Connecting the ISDN terminals

An Example System Configuration

The following diagram shows a possible system configuration.



Note
1. See the *DCS Gateway Maintenance Guide* for how to set the jumpers for cards.
2. See the *DCS Gateway Installation Guide* for how to connect terminals.

ISDN Telephone Features

This section describes the ISDN telephone features which the DCS Gateway provides, and the menu which you should choose from the MAP.

Note
1. See the *DCS Gateway Administration Guide* for details of configuration requirements after you have selected the MAP menu.
2. Refer to the user manual that came with the ISDN telephone for details of how to use it.

Direct Dialling Inwards (DDI or DID)

This function enables incoming calls from outside lines to be connected with internal extensions directly without the need to be connected by an operator.

Register Multiple Subscriber Number (MSN)

In Point-to-Point or Point-to-Multipoint connections, a common phone number can be designated for the various ISDN telephones connected to the BRI card. If you dial the common number, all ISDN phones with that number will ring. However, when it is necessary to call a specific phone in the group you may allocate an additional number for that phone.

A maximum of eight MSN numbers for a common phone number may be assigned and these numbers should be compatible with the system's Numbering Plan.

To use this function, the two following steps should be completed.

- Assign the MSN number to the ISDN phone.
- Enter the MSN number into the automatically-created index when the BRI-S port is configured in the DCS Gateway's MAP.

Related Menu in the MAP:

Data Base Management ➨ Subscriber DB Management ➨ ISDN Telephone Info.

Note
The number of MSN numbers supported, as well as the method for assigning MSN numbers, can be different depending on the type of ISDN phones used.

Calling Line Identification Presentation (CLIP)

This function displays the line number of calling parties on the LCD display of ISDN phones receiving a call. The function is set up in the MAP.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Calling Line Identification Restriction (CLIR)

This function prevents calling details being forwarded to called parties.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Connected Line Identification Presentation (COLP)

This function presents connected line details on the LCD display of the calling phone when connected with other parties. If this function isn't registered, the phone numbers will not be displayed.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Connected Line Identification Restriction (COLR)

This function prevents call details of the calling party being displayed on the LCD display of the called party when the call is answered.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Sub-Addressing

Using this function, you can extend the phone numbers of ISDN phones that are linked by Point-to-Multipoint connections.

Also, a particular terminal may be specified using a sub-address after designating the common number for several ISDN terminals that are linked by Point-to-Multipoint connections. Each ISDN phone can set up its own sub-address. The DCS Gateway does not store sub-address details. For information on how to specify the sub-address of an ISDN phone, please refer to the user manual for the ISDN phone.

Call Transfer

This function transfers a received call to another subscriber. When a call is transferred, the following activities will be performed.

- If the phone to whom the call is to be transferred is busy, the transferring phone will be recalled automatically
- If the call is disconnected during transfer, the transferring phone will be recalled automatically.
- If the subscriber to whom the caller wants to be transferred doesn't answer or hangs up the phone by choosing "back", the RETRIEVE message will be indicated and the transferring phone will be recalled

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Call Forwarding Unconditional

If the telephone numbers of other subscribers for call forwarding have already been registered, this function enables all incoming calls to be forwarded unconditionally to them.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Call Forwarding Busy

If an extension line is busy, this function enables the call to be forwarded to another extension. Calls will be transferred only when both ISDN B channels are occupied.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Call Forwarding No Reply

If an extension does not answer, this function enables the call to be transferred to other extensions automatically after a delay.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Call Deflection

This function enables a call to be forwarded whilst still ringing. The function is available for ALCATEL ISDN phones only.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Line Hunting

This function is used for forwarding a call or to call the common number of an ISDN internal group, whose lines are not busy. There are two hunt types:

- Sequential Hunting

This function enables the call to be forwarded to members of an ISDN group who are not busy. The calls are distributed to the first free member of the group according to a predetermined order. Under this group method, calls are always directed to group member number 1 first; if this member is busy the calls are forwarded to member number 2, and so on.

- Uniform Distribution

This function is used to forward calls to members of an ISDN group whose lines are not busy, starting with the group member following the group member who received the previous incoming call. Under this group method, calls are distributed in a uniform manner so that all members receive the same number of calls.

Related menu in the MAP:
Data Base Management ➨ Subscriber DB Management ➨ Subscriber Group Info.

Add-On Conference

The DCS Gateway provides a conference facility that allows multiple subscribers to be connected simultaneously for a conference. New members can be admitted to the conference using function keys or function codes.

If a subscriber with an acceptable COS presses the Conference function key while engaged in conversation, they can include a new member into a conference call along with the current caller. The subscriber invoking this function is known as the "conference caller".

- The conference caller brings another member into a conference by pressing the Conference function key and, on receiving dial tone, dialling the member's number. The caller already in conversation will be placed on hold. When the new member answers, the conference call is set up.
- If the subscriber who is required to join the conference is busy, or if the conference caller dials a wrong number, an error tone is heard.

The conference caller can continue to add other members into the conference using the Conference function key as described.

The Conference feature is provided by default and therefore does not have to be specifically set up in the MAP

Three-Party Service

This function enables the subscriber to hold a conversation and dial another subscriber, making a three-party conversation possible. This is different to the Add-on Conference service (described above) in that only three subscribers can be on the phone together.

Note
For a conference with more than three subscribers, you can release the Three-Party Service function to use the Add-on Conference function.

A subscriber using the Three-Party Service function can use the following functions during the three-party call.

- Disconnecting a subscriber

If one of the subscribers (except the conference caller) is selected to be disconnected from the call, the Three-Party Service function will be ended and the selected subscriber will be disconnected**.** However, the conference caller can continue to talk with the remaining subscriber.

- Ending Three-Party Service

When the conference caller hangs up, the Three-Party Service function will be ended and the remaining two subscribers will be disconnected.

- Confidential communication with one subscriber

If the conference caller selects one subscriber to communicate confidentially with, the Three-Party Service function will be ended. The conference caller can talk with the selected subscriber while the other subscriber is put on hold.

If one of the subscribers (except the conference caller) hangs up, the Three-Party Service function will be ended, but the remaining two parties can continue to talk.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Displaying the ISDN Network ID and the Calling Party's Phone Number

This function indicates the ISDN network ID and the calling party's phone number on the LCD of the called party's phone.

The called party can request the service for ISDN ID and the calling party's phone number:

- before answering an incoming call;
- during a phone call;
- after the calling party hangs up.

For an incoming call from the ISDN network, the network ID and the calling party's number are transferred to the DCS Gateway. The system will provide this information on request from the called party depending on the class of service set up. This function is not available unless the network ID and the calling number can be transferred to the system.

However, for calls from the PSTN network to the ISDN subscriber, this function is available if the DCS Gateway has details of the calling party's number and the network ID.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

Restricting Communication Between Groups

This function enables communications only between subscribers in the same group, by grouping subscribers. It restricts communications with other groups.

Related Menu in the MAP
Data Base Management ➨ Subscriber DB Management ➨ ISDN Cug/Com Grp Configuration

Restricting Incoming Calls Between Groups

For example, this function specifies that a subscriber in a group with COS grade 3 may prevent any incoming call from a subscriber in a group with COS grade 1.

In such a case, the subscriber in the group with COS grade 1 may set up so that calls cannot be made to group members with COS grade 2.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Restricting Outgoing Calls Between Groups

For example, this function specifies that a subscriber in a group with COS grade 3 may not dial a subscriber in a group with COS 1.

In such a case, the subscriber in the group with COS grade 3 may set up so that calls cannot be made to group members with COS grade 1.

Then, if the called subscriber's line is busy, or if an error is caused by dialling a wrong number, error tone is heard. When the conference caller hangs up, the RECALL will ring.

When the called subscriber answers the call, the Three-Party Service along with the subscriber on hold will be available immediately.

The function for adding others to a conference is available only for conference calls. The conference caller can continue to call and add other subscribers by using the Conference function key on the ISDN telephone**.**

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Restricting Incoming / Outgoing Calls Between Groups

For example, this function specifies no incoming calls/outgoing calls between a subscriber in the COS grade 1 group and a subscriber in the COS grade 3 group.

A subscriber in the COS grade 3 group may set up not to make outgoing calls to a subscriber in the COS grade 1 group, while the latter may set up not to make outgoing calls to the former.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Allowing Incoming / Outgoing Calls Between Groups

For example, this function can specify to allow incoming calls/outgoing calls between a subscriber in the COS grade 3 group and the subscriber in the COS grade 1.

A subscriber in the COS grade 3 group may set up to make outgoing calls to those in the COS 1 group, while the subscriber in the COS grade 1 group may set up to make outgoing calls to those in the COS grade 3 group.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Restricting Incoming Calls Within the Group

For example, this function restricts calls between subscribers in the COS grade 3 group.

Related Menu in the MAP:
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Restricting Outgoing Calls Within the Group

For example, this function restricts outgoing calls between subscribers in the COS grade 3 group.

Restricting outgoing calls occurring within the group is identical to restricting incoming calls.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Allowing Incoming/Outgoing Calls Within the Group

For example, this function allows calls in/calls out occurring between subscribers in the COS grade 3 group.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Service Holds By Relative Grades

Advice of Charging (AOC)

This function checks whether any charging information exists within messages received from the CO line. If it does, details are passed to the internal subscriber after checking that the subscriber uses an ISDN phone. Charging information is sent to the ISDN phone in the Connect/Information messages which are delivered from the CO line. This information is displayed on the LCD of the ISDN phone

For each call in or out, the AOC service will be provided only if the subscriber has applied for it.

There are three types of AOC.

- AOC-S (charging information at call set-up time)

This is an additional service providing information for charging rates on each call forwarding to the ISDN subscriber. If charging information is included in CONNECT messages transferred from the CO line, the messages will be transferred to the ISDN phone and shown on the LCD.

- AOC-D (charging information during a call)

This service provides up to date information on call charges applicable during the call. If charging information is included in the Information or Facility messages transferred from the CO line, the information will be transferred to the ISDN phone and shown on the LCD.

- AOC-E (charging information at the end of a call)

This service provides information on call charges at the end of the call. If charging information is included in the Disconnect or Release messages transferred from the station line, it will be transferred to the ISDN phone and shown on the LCD.

User-to-User Signalling (UUS)

This service allows you to transfer/receive a limited volume of information to/from ISDN subscribers on other networks.

The following methods are suggested.

- UUS1

Using this method, the subscriber can transfer/receive information at the time of calling out. If the service is activated, the subscriber can send UUI when any user accepts or rejects the service, or when the call is cleared. The calling party may hang up before the call is connected, but after sending UUI.

Using the UUS1 method, you can send set-up messages including greetings.

- UUS2

This method provides the capability to transfer/receive information during a call, but doesn't support ISDN phones.

- UUS3

Using this method, information will be transferred separately from call controlling messages during the call. Any user can send UUI after the service is activated. The UUS3 service will, as an explicit service, be activated on request.

Related Menu in the MAP
Data Base Management ➨ System DB Management ➨ Class Of Service (COS)

PMS

The PMS (Property Management System) handles reservations, registration and room management for hotels and motels. The PMS receives room information and call charge details from the DCS Gateway. It can alter the COS of the room phone through the PMS and compute call charges.

Overview of Features

- Fast Room Check In/Out

The user can enter customer information or room status information through the PMS at the time of checking in or out. If changing rooms or exchanging one room with another, information on customers in each room can be simply moved or exchanged.

- Efficient Room Management

In the past, hotel management has been performed by memorising or recording information in writing. The PMS is more efficient as hotel staff can use the room phone to speedily enter the status of the room after it has been cleaned, repaired, and so on.

- Direct Service

The PMS calculates call charges based on details of telephone usage supplied by the DCS Gateway. Customers can make calls directly without the need for operator assistance.

Cards Required

- IOCB3 card

The PMS is connected via the IOCB3 card using RS232 or LAN connections.

Note
For details of the IOCB3 card, see the *DCS Gateway General Description Guide*.

Configuration Tasks for Using PMS Features

This section describes configuration tasks required for using PMS features, as follows.

- Connecting PMS PCs to IOCB3 cards.
- Setting up the MAP.

    1. Environmental set-up for using PMS
       Related menu in the MAP:

Data Base Management ➨ System DB Management ➨ System I/O Device Management ➨ I/O Device Change By Nodes

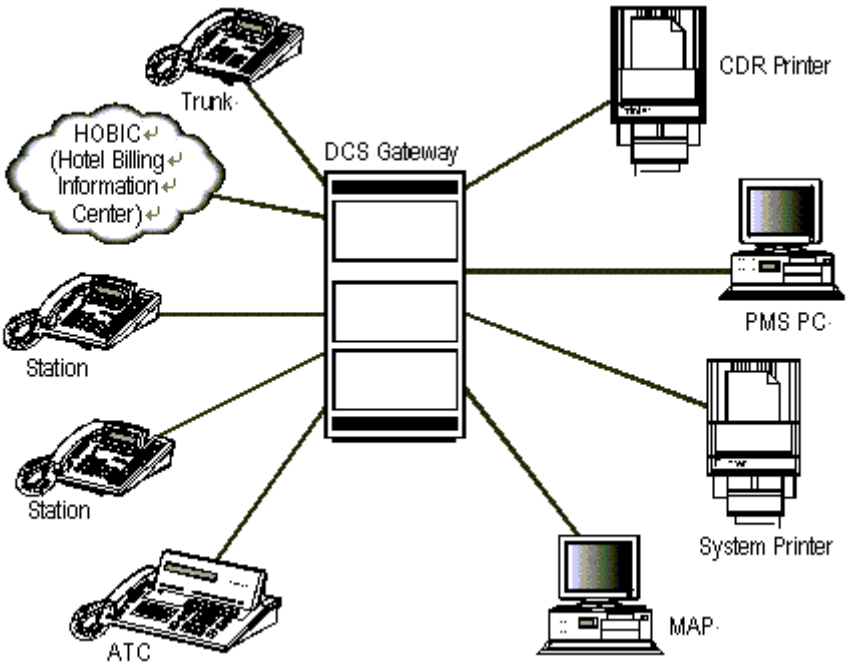
2. Room maid's ID set-up
   Related menu in the MAP:
   Data Base Management ➨ PMS, VMS, Statistics DB Management ➨ Maid ID Figures

3. Specifying the class of telephone subscriber by room classes
   Related menu in the MAP:
   Data Base Management➨PMS, VMS, Statistics DB Management ➨ Class Of Tel. Subscriber By Room Class

4. Registering how to use PMS features
   Related menu in the MAP:
   Data Base Management ➨ PMS, VMS, Statistics DB Management ➨ PMS Feature Usage Register

5. Specifying option related to accounting
   Related menu in the MAP:
   Statistics Accounting DB Management ➨ Accounting Management ➨ Accounting Output Entry Specifying

An Example System Configuration



Note
For details of configuration tasks after selecting the MAP menu, see the *DCS Gateway Administration Guide*.

Main Features

This section describes PMS features and how to use them.

Room Check In/Out

For room check in/out, hotel reception can use the PMS to input customer information. When a customer is checked in, the data contained in the DCS Gateway will be updated automatically. At room check in, the following customer information should be entered.

- Room phone number
- Customer's nationality
- VIP guest or not
- Wake-up time
- Customer name

The customer is classified according to the class of the room. There are 16 classes.

DCS Gateway Operations for Room Check In

If the receptionist enters check-in details for the customer via the PMS, the DCS Gateway will perform the following processes automatically.

1. Release the telephone restriction.
2. Delete the information on call charges.
3. If the LED of the message key is lit, turn it off by deleting all messages.
4. Remove the DND (Do Not Disturb) function.
5. Enter the customer's name.
6. Enter the customer's nationality.
7. Enter whether VIP or not.
8. Enter the wake-up time.
9. Enter the arrival time.
10. Register check-in for that room

If the receptionist mistakenly specifies a room already occupied, check-in cannot be registered because the information contained in the PMS and that saved in the DCS Gateway are inconsistent.

Where such inconsistencies arise, it must be determined which information is correct (PMS or DCS Gateway) and amendments made as required, using the Image Data Transfer Feature (see below).

DCS Gateway Operations for Partial Check In

Where a second party checks into a room where a guest is already registered, registration information can be revised/complemented by the following process.

- Overwrite the existing customer's name with the new customer's name.
- Add any additional wake-up times to the existing information.
- Do not change the remaining information.

DCS Gateway Operations for Room Check Out

When the receptionist checks out a guest; the DCS Gateway will perform the following processes automatically.

1. Change the class of that telephone subscriber.
2. Delete the information on call charges after printing it.
3. Turn the message key LED off.
4. Remove the DND feature.
5. Delete the customer's name.
6. Delete the customer's nationality.
7. Delete whether VIP or not.
8. Delete the wake-up time.
9. Register the room as empty.

If check-out is registered for an empty room, the PMS information and the DCS Gateway information will be inconsistent. Where such inconsistencies arise, it must be determined which information is correct (PMS or DCS Gateway) and amendments made as required using the Image Data Transfer Feature (see below).

For a partial check-out, where a guest who is registered with another for a specific room checks out before the other guest, the DCS Gateway will perform the process described above automatically.

Room Status Change

The room maid can change the room status by entering the Room Status Code through the phone in the room or using the service phone (the staff phone dedicated to servicing guests, usually in Reception). The DCS Gateway immediately transfers the room status information entered to the PMS.

The Room Status Code entered has already been designated and stored in the PMS by the system manager according to the hotel specification.

When entering the room status using the room phone, the Function Access Code, the Room Status Code, and the Maid Authority Code must be entered. Entering the room status using the service phone requires entering the room phone number in addition to the above. The number of digits used for the phone number and the Maid Authority Code are designated in the MAP.

Entering Room Status Using the Room Phone

The following explains the procedure for entering the room status. The Room Status Code should be entered within the time allotted between digits.

1. Lift the handset and wait for dial tone.
2. Enter the Function Access Code required for entering the room status.
3. Enter the 1-digit Room Status Code (0–7). Entering 8 or 9 will result in error tone.
4. Wait for transfer tone and enter the Maid Authority Code (usually 4-digits).
5. When the room status information is received by the PMS, verification tone will be heard. If the information is not received by the PMS, error tone will sound.
6. Finish by replacing the handset.

Entering Room Status Using the Service Phone

The room status can be entered by someone other than the room manager using the service phone. Multiple room status can also be entered from one location using the service phone.

1. Lift the handset and wait for dial tone.
2. Enter the Function Access Code required for entering the room status.
3. Enter the 1-digit Room Status Code (0–7); entering 8 or 9 will result in error tone.
4. Wait for transfer tone and enter the phone number of the room.
5. When the room status information is received by the PMS, verification tone will be heard. If the information is not received by the PMS, error tone will sound.
6. Finish by replacing the handset.

Message Waiting

If you leave a message-waiting indication for a guest who is busy on the phone or who does not answer your call, the Message Waiting LED on the phone flashes to inform the guest that there is a message waiting.

The PMS transmits the information that there is a message for the phone number to the DCS Gateway. When the guest presses the Message key, the system automatically connects to the phone number predesignated in the MAP.

The phone number connected at this point is the phone number designated in:
Data Base Management -> PMS, VMS, Statistics DB Management-> Guest Room Member Level menu (Call-ID field).

The pre-designated number can be:

- a special message centre;
- the Front Desk (Reception);
- the operator.

If the message was left by a guest in another room, that guest-room phone will ring when the guest presses the Message key.

If the guest-room phone is a standard phone which does not have the Message key feature, a different dial tone will be heard on the phone to inform the guest that a message is waiting. They will need to dial the message-waiting feature code to connect to the caller leaving the message.

Note
Hotels with VMS (a Voice Mailing system) installed can have the voice message stored and accessed by the guest-room phone.

The message feature works as follows.

1. A phone call is received by the hotel operator.
2. The operator attempts to connect the caller to the guest-room phone requested.
3. If the guest is not in the room or is using the phone, the message left by the caller is registered to the room phone number through the PMS terminal.
4. The Message Waiting LED starts flashing on the guest's phone (or special dial tone is generated if this is a standard phone).
5. When the guest returns to the room or ends the current call and presses the Message Waiting key (or dials the message waiting code), the call is automatically connected to the message centre, the operator, or another guest-room (whichever is designated to be called back).
6. When the message is received, the operator removes the message registration on the PMS terminal.
7. The message-waiting LED stops flashing on the guest's phone (or the dial tone returns to normal dial tone).

Call Limiting

Limitations can be placed on guest-room phones for incoming and outgoing calls from/to particular phone numbers. This can be done by changing the room class setting for each room on the DCS Gateway MAP.

If the guest does not wish to receive any phone calls, the room can be registered so that no incoming calls will be received. This will block all phone calls, both external and internal. For blocking incoming calls, the registration status is "DND".

Blocking and allowing incoming and outgoing calls can be done simultaneously. Room phone settings can be set according to service levels. Access limitation on outgoing phone lines is set according to the room class and subscriber class set in the MAP. The system is designed so that outgoing calls are possible even when incoming calls are blocked, and vice versa.

Room phones can be set to prevent the guest from accidentally calling an office phone number. Access control is set according to the subscriber's class assigned to the room phone.

Room Change/Exchange

If a guest changes to a different room, information for the guest does not have to be changed. The DCS Gateway can be automatically updated by the PMS.

The information exchanged between rooms is:

- Detailed calling and billing information
- Message waiting status
- Call limitation status
- Guest name
- Guest nationality
- Wake-up registration time
- VIP or not

Change of guest room is entered in the PMS. The PMS then transmits the new information to the DCS Gateway. The DCS Gateway inspects the room status and exchanges the status information between the two rooms. If an error occurs while this is happening, an error message is generated.

A maximum of 10 messages can be transferred; additional messages will not be transferred. It is common practice to register the Front Desk number or the operator number for each room when using the Message feature; therefore, the number of messages left during the transfer is 1.

Changing Rooms

When a guest changes to a different room, the guest information, phone bill, message and access settings are all transferred to the new room. The room that the guest previously occupied is changed to 'vacant' status and the new room to 'occupied' status. For this transfer to be valid, the new room must be in 'vacant' status when the transfer occurs.

Interchanging Rooms

Room information is interchanged between the two rooms, and both rooms have 'occupied' status. Therefore, both rooms must be 'occupied' to execute this feature.

Detailed Call Billing

This convenient feature allows the DCS Gateway to transmit line usage information to the PMS to automatically calculate the phone bill. The DCS Gateway itself does not have the phone bill calculation capability; therefore, the billing information is processed by the PMS. If a printer is connected to the PMS, billing information is printed simultaneously while the transfer is taking place. Call information is transmitted immediately after the call is terminated.

When an outside call is made, the DCS Gateway transmits the following information to the PMS. The type of call information being transmitted can be set in the MAP.

- Room number the call originated from.
- Telephone number of the recipient.
- Time the call began.
- Call duration.

Visual Alarm and Wake-Up Call

The Wake-Up feature is used to have the phone ring at a predetermined time requested by the guest. The time can be viewed on the MAP. Wake-up / reminder / alarm calls can be entered by the guest, by the operator, or using the service phone.

If a digital phone is installed in a guest-room, a message indicating the wake-up call can be displayed on the LCD.

Entering Wake-Up/Alarm Calls At the Guest Phone

1. Lift the handset.
2. Enter the function code for a wake-up call or visual alarm feature and listen for verification tone.
3. Enter the time you want the alarm to ring and listen for verification tone.
4. If you want the alarm to be repeated each day for the next few days, enter the number of repetitions (days) and listen for verification tone.
5. Replace the handset.

At the designated time the phone will ring. Details are sent only to the printer and not the PMS.

Entering Wake-Up/Alarm Calls At the Attendant Console

1. Press the WAKE key on the console.
2. Enter the alarm time using the dial keys.
3. Enter the internal phone number to be called at the designated time.
   When the alarm time is registered, the information will be displayed on the LCD panel.
4. If the internal phone is digital, enter the message number to be displayed on the guest's phone and the repeat number (days).

Note
There are 32 possible messages set up in the system from which to select.

5. Store the information by pressing the CON/ANS key.

Entering Wake-Up/Alarm Calls Via the PMS

1. Select the room number.
2. Select Alarm Type.
3. Enter the date and time the alarm is to ring.
4. Set repetition time.
5. Transmit message to the DCS Gateway.

Registering the Phone Number to be Identical to the Room Number

This is a convenient feature which allows you to register the room phone number with the same number as the room number. In addition, this feature allows you to call other guest-rooms by entering the guest-room phone number and the room number.

Providing Caller Information

With this feature, when a call is made from a guest-room to Reception, the room phone number is transmitted to the PMS PC, thus identifying the room from which the call originates.

If the PMS has Directory Information entered, such as the guest's nationality, it is also possible to transmit this information to the digital phone's LCD display.

Even if the caller does not identify him/herself, Reception will be able to see which guest is calling and tailor services to that particular guest's needs.

If a guest is designated for special treatment, this information is also displayed on the LCD display allowing the guest to receive VIP treatment.

1. A call is made to Reception.
2. The room number, nationality, VIP status and name of the guest making the call are displayed on the LCD display.
3. Simultaneously, the room phone number is transmitted to the PMS. The PMS can then display more detailed information on the particular guest. The information displayed can be set according to the room class.

Service Station Call

This feature reduces the number of digits required to call services frequently used by guests, thus making it convenient for guests to call. The call can be made from both guest-rooms and offices.

Suite Room Secretary Phone Feature

The digital phone feature provided by the DCS Gateway is combined with the Multiline feature to provide a secretary phone service to a room suite. A secondary line is connected to the suite while the primary line is connected to the secretary's phone. Incoming phone calls are directed to the secretary's phone, where calls can be screened.

House Phone

Phones can be preset to directly connect to designated services as soon as the handset is lifted; for example, to ring Reception or Room Service.

Service Phone

The service phone is used by Reception and is dedicated to servicing guests. The main function of the service phone is to facilitate handling of multiple calls for service. The service phone can also change or modify guest-room information.

In addition, the room number and information for the guest is displayed, thus allowing for better and more efficient service.

Optionally-Defined Data Transfer Feature

If there is a need to increase the amount of information for guest-rooms, this feature can be invoked. For example, to manage room furnishings, where many different types of information are required, a code can be defined to synchronize with the PMS.

1. Lift the handset and wait for dial tone.
2. Enter the function access code for Optional Data Transfer.
3. Enter the guest-room status. The room status is pre-designated with a number less than 9.
4. Wait for transfer tone.
5. Enter first data value. The data field length can be preset using the MAP.
6. Wait for transfer tone.
7. Enter second data value.
8. If the PMS has received both sets of data, verification tone will sound, or else error tone will sound.
9. Hang up the phone.

If an error occurs, repeat the process. If the error repeatedly occurs, contact the system manager.

Image Data Transfer Feature

Where communication between the DCS Gateway and the PMS is lost, differences between the information stored in the two might arise.

When communication between the two systems is recovered, the information stored in the DCS Gateway System is then requested by the PMS. The data received from the DCS Gateway System is compared with the data stored in the PMS before data update is executed. The information transmitted to the PMS from the DCS Gateway System is called Image Data.

The information exchanged between the PMS and the DCS Gateway for each room is as follows.

- Wake-up time

- Nationality
- VIP status
- Guest name
- Room class
- Member class
- Message registration status
- DND/Call Lock registration status
- Room occupation status

Transferring Incoming Calls to VMS

In cases where incoming calls are preset to be automatically transferred to the VMS (Voice Mail system), the transfer status and the password (if transfer is successful) are sent to the PMS.

The VMS transfer status information is transmitted to the DCS Gateway where the database is modified.

Locator/External Call Lock/No Call Registration

This is one of the more simple functions used in hotels in which the DCS Gateway and the PMS can lock out incoming and outgoing calls for a certain group of guests, designate DND, and monitor KEY LOCK status.

Fax Number Designation

If a guest staying in a particular room wants to use the Fax facility from the room, a phone number is designated to a Fax machine. Fax number designation is controlled and monitored by the PMS and when the Fax number is sent to the DCS Gateway, the phone number is matched with the TEL. TRANSACTION.

Group Registration

For group guests, a special group number can be assigned to the rooms the group is staying in. A maximum of 256 group numbers can be assigned and managed by the PMS.

Group Function Registration

To make management of groups more convenient, common functions for the group can be assigned. Examples of such functions are Wake Up, Lock on outgoing calls, and denial of phone use. Group functions exist as a separate database and have higher priority than individual guest-rooms.

Examples of Using VMS Features

This section provides examples of using VMS features.

- **VMS Voice Mail Box Service**

The Voice Mail Box service configuration is as follows.

- **Paging The VMS From Internal/Outside Line**

When a call is received from a non-member (outside) or member (internal line user)

- **Leaving a Message**

If a message indication is left on a phone which is registered with the VMS for call transfer, the Message Waiting LED flashes and message-waiting tone is generated.

These message-waiting indications remain until the message is checked by the user.

- **Calling the VMS From An Outside Line**

A call from an outside line to an internal user will be transferred to the VMS if the user is not able to answer the phone or the phone has been pre-set to transfer incoming calls to the VMS.

- **Replying to a Message**

The user can check the message received by pressing the Message key with the flashing LED or by dialling the message-waiting function code.

Each internal user is allocated a certain amount of space for storing messages in a message box. Message box numbers and passwords must be designated for the management of such boxes.

To reply to the message, the appropriate password must be entered.

SMDR

The SMDR feature (System Monitor Detailed Recording) is used to manage local / toll / international / tandem call information and internal call information for subscribers connected to the DCS Gateway. Call information is provided by the DCS Gateway.

Call information provided by the SMDR is the following.

- Date of call
- Time of call
- Duration of call
- Classification of call
- Type of call
- Dial type
- Trunk group number
- Tenant number
- Phone number of the internal line caller
- Phone number of the call recipient (internal/local)
- Number dialled
- Account code, Forced Authorisation Code

The above information is usually generated as output on the SMDR printer connected to the DCS Gateway. In this case, billing information cannot be determined from the printer output. In order to get billing information, the PC running SMDR for the PMS should be connected separately to the DCS Gateway so that information transmitted from the DCS Gateway can be converted to billing data in a format the user wants.

Cards Required

- IOCB3 card

Terminals Required

- SMDR Printer

The SMDR printer can be connected to the DCS Gateway and used to print various call information details.

Printer requirements are that it can be connected to an IBM compatible PC and that the printer supports KS and KSSM printer modes.

- SMDR PC

A PC can be connected to the DCS Gateway to create billing data from the information transmitted from the DCS Gateway.

The information received from the DCS Gateway can be converted into billing data through the use of TIMs software.

- PMS PC

PMS is a special-purpose computer program used mainly in hotels/motels. The PMS receives guest status and phone usage information from the DCS Gateway. PMS converts this information to billing data, and commands can be sent to the DCS Gateway to change phone COS.

Configuration Tasks for Using SMDR Features

The following must be configured to use SMDR features

- Connect SMDR printer
- Connect SMDR/PMS PC
- Set details in the MAP

1. Assigning output device
   Related menu in the MAP:
   Data Base Management-> System DG Management->System I/O Device Management-> Change Node I/O device

2. Using multi-node DCS Gateway
   Related menu in the MAP:
   Data Base Management-> System DG Management->System I/O Device Management-> Change Node I/O Device

3. I/D device service hold control
   Related menu in the MAP:
   Data Base Management-> System DG Management->System I/O Device Management-> Change Node I/O Device Service Hold

4. Asynchronous port assignment
   Related menu in the MAP:
   Data Base Management-> System DG Management->System I/O Device Management-> Assign Asynchronous Port

5. Assign/Check/Change Forced Authorisation Code (FAC)
   Related menu in the MAP:
   Data Base Management-> System DG Management->FAC Management

6. Selecting SMDR phone billing /FAC output option
   Related menu in the MAP:
   Statistics Billing Data Base Management-> Billing Management-> Billing Related Option Select

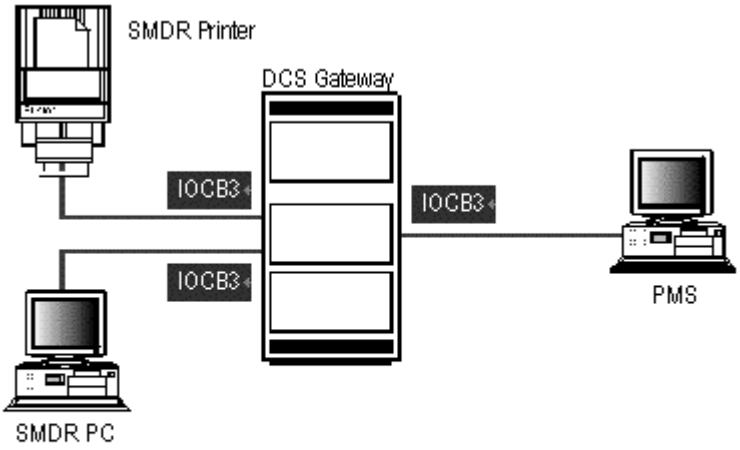
7. Select output device for SMDR call information output
   Related menu in the MAP:
   Statistics Billing Data Base Management-> Billing Management->Select Billing Category

8. Designating user to bill
   Related menu in the MAP:
   Statistics Billing Data Base Management->Billing Management->Select User To Be Billed

9. Generating internal line SMDR information
   Related menu in the MAP:
   Statistics Billing Data Base Management->Billing Management->Set Billing Between Tenants

Note
For details of MAP configuration procedures, see the *DCS Gateway Administration Guide*.

An Example System Configuration



SMDR Output Formats

This section explains the various output formats of the SMDR printout and methods of interpreting the data.

SMDR information is printed in the following format.

```
          BLUK       CID-NAME
                     ??????????????
          (13)       (14)
```

(1) Date of call

(2) Time of call

(3) Duration of call

(4) Classification of call

(5) Type of call

(6) Dial type

(7) Trunk group number

(8) Tenant number

(9) Phone number of the extension caller

(10) Phone number of the call recipient (internal/local)

(11) Number dialled

(12) Account code, Forced Authorisation Code

The SMDR printout and methods of distinguishing between local / toll / international / tandem calls are described in detail in the following sections.

Classification of Call

Call classification information is generated in 16-bit format and provides important information for determining phone bills.

The call classification printout is different for each type of call. The call classification is indicated in the 15th and 16th bits as follows:

- Incoming (I): A call received from a CO trunk line
- Outgoing (O): A call forwarded to an outside line
- Tandem (T): Transfer of an incoming call on a CO trunk to another outgoing CO trunk number. An example would be where incoming calls are transferred to a mobile phone when the user is away from the office.

Outgoing or Tandem Call

Information per bit

FE	D	C	B	A	9	8	7	6	5	4	3	2	1	0
O/T	ACC	FAC	PRS	HCD	ICL	VAN	FRE	TIE	INF	CAR	PAG	LOC	DDD	ISD

Meaning of each bit

ISD	International Subscriber Dialling (international call)
DDD	Direct Distant Dialling (toll call)
LOC	Local call
PAG	Pager call
CAR	Car phone call
INF	Information call
TIE	Tie call
FRE	Toll Free
VAN	VAN service
ICL	International Clover (international collect call)
HCD	Home Country Dial (native language service)
PRS	Polarity Signal

FAC	Forced Authorisation Code
ACC	Account Code
O/T	Outgoing / Tandem call

If the phone is using a particular bit, the bit is set to "1", otherwise the bit is set to "0". The printout details the types of call made by the user.

- For free international calls, both the ISD and FRE bits are set to "1".
- For free domestic calls, both the DDD and FRE bits are set to "1".

Each call type can be set with the TIE bit.

Incoming calls

Information per bit

FE	D	C	B	A	9	8	7	6	5	4	3	2	1	0
I	ACC	FAC					TIE	CLV	PNA	DIS	DID	DIL	OAS	

Meaning of each bit

OAS	Operator Assistance (connecting call from outside to transfer centre)
DIL	Direct In Line (using high-level service by using FAC)
DID	Direct Inward Dialling (verification of call reception)
DIS	DISA (communication using DISA line)
PNA	Private Night Answer
CLV	Clover service (toll free)
TIE	Tie call (dedicated line call)
FAC	Forced Authorisation Code
ACC	Account Code
I	Incoming call

If the phone is using a particular bit, the bit is set to "1", otherwise it is set to "0". The printout details the types of calls made by the user.

If the OAS bit is set to "1" and an incoming call has been connected to the Attendant Console, the phone bill calculation method is determined by the settings selected in the MAP menu using Statistics Billing Management -> Billing Management -> Assign User To Bill.

- If the user is set to FIRST, the call cost is charged to the Attendant Console.
- If the user is set to LAST, the phone bill is charged to the extension that receives the call.

Type of Call

Call type information is listed in 8 bit and 4 bit, 2-digit binary numbers.

Outgoing Calls

Information per bit

7	6	5	4	3	2	1	0
FAX				XFER		B/R	F/L

Meaning of each bit

F/L (FIRST/LAST)	When a call from an outside line is connected to an extension, billing is allocated depending on the billing option (FIRST/LAST) selected. • FIRST : the extension which initiated the call is billed • LAST : the extension which finished the call is billed • EACH : both first and last user are billed the amount of the call • FIRST : first bit is set to “0” • LAST : first bit is set to “1”
B/R (BUSINESS /ROOM)	Divides extensions between BUSINESS type and ROOM type. This information is frequently used in hotels. • BUSINESS type: second bit is set to “0” • ROOM type : second bit is set to “1”
XFER	Set to “1” when an outgoing call has been received by an internal phone.
FAX	Determines whether the call is a FAX or regular call. • Regular call : eighth bit is set to “0” • FAX transmission : eighth bit is set to “1”

Call type information is listed in 8-bit or 4-bit?, 2-digit binary numbers. As an example, consider the case where an outgoing call has been received by an internal phone: in other words, when the 4th bit (XFER) is set to "1". In this case, the 8-bit value is set to "00001000". The top 4 bits (0000) and the bottom 4 bits (1000) are each displayed as a decimal value, which results in the output "08".

Using the same principle, FAX transmissions from the guest room will have the 2nd and the 8th bits set to "1" (10000010), resulting in output "82".

Incoming or Tandem calls

Information per bit

7	6	5	4	3	2	1	0
				XFER	ANI	T/C	F/L

	Meaning of each bit
F/L (FIRST/LAST)	When a call from an outside line is connected to an extension, the charge is set depending on the billing option (FIRST/LAST) selected. • FIRST : the internal line user who initiated the call is billed • LAST : the internal line user who finished the call is billed • EACH : both first and last user are billed the amount of the call • FIRST : first bit is set to "0" • LAST : first bit is set to "1"
T/C (TRUNK/CALLING NUMBER IDENTIFICATION)	• T : Caller information was not received from the telephone company • C : Caller information was received
ANI	If the internal line user has requested the phone number of the caller to the telephone company, this bit is set to "1".
XFER	If an outside call has been transferred to an extension or to Tandem, this bit is set to "1". If an incoming call has been transferred to an extension it is listed as "received"; if the call is forwarded to an external phone the call is listed as "TANDEM"

Incoming or Tandem calls are listed in the same 2-digit format as Outgoing calls.

The following chart is summary information for each type of call.

Dial Type

This information indicates whether the call was made through the Attendant Console, or using the low cost line or the DISA line.

Outgoing or Tandem Calls

- **For the DCS Gateway V208**

Information per bit

7	6	5	4	3	2	1	0
OFWD		DIS	ASP	LCR	ODI	OAS	DIR

Meaning of each bit

DIR	DIRECT (call has been made without going through the Attendant Console)
OAS	OPERATOR ASSISTANCE (call made through the Attendant Console)
ODI	OPERATOR DIRECT (call made from the Attendant Console)
LCR	LOW COST ROUTING (call using low cost line)
ASP	ANSWER SUPERVISION
DIS	DIRECT INWARD SYSTEM ACCESS (DISA)
OFWD	OFFICE FORWARD (Tandem: incoming CO trunk call is forwarded to another external phone number)

- **DCS Gateway Hotel System**

Information per bit

7	6	5	4	3	2	1	0
ECS	ECP	EGS	EGP	LCR	OFWR	OAS	DIR

Meaning of each bit

DIR	DIRECT (call has been made without going through the Attendant Console)
OAS	OPERATOR ASSISTANCE (call made through the Attendant Console)
OFWR	OFFSITE FORWARD
LCR	LEAST COST ROUTING (call using low cost line)
EGP	Outside OPERATOR ASSIST - standard PERSON TO PERSON call. Calls using outside exchange or international calls. The caller is billed once contact is made with the person.
EGS	Outside OPERATOR ASSIST - standard STATION TO STATION call. Calls using outside exchange or international calls. The caller is billed once the call is made to the phone number.
ECP	Outside OPERATOR ASSIST - standard COLLECT PERSON TO PERSON. Calls using outside exchange or international calls. The recipient of the call is billed once contact is made with the person.
ECS	Outside OPERATOR ASSIST - standard COLLECT STATION TO STATION. Calls using outside exchange or international calls. The recipient of the call is billed once contact is made with the phone number.

Incoming Calls

Information per bit

7	6	5	4	3	2	1	0
	FRE	TSS	TPP	TCC	ISS	IPP	ICC

Meaning of each bit

ICC	INTERNATIONAL COLLECT CALL (recipient of the call pays for the call)
IPP	INTERNATIONAL COLLECT PERSON TO PERSON (phone bill is transferred to person receiving the call)
ISS	INTERNATIONAL COLLECT STATION TO STATION CALL (Phone bill is charged to a phone number receiving the call)
TCC	TOLL COLLECT CALL (toll call charge is billed to the recipient of the call)
TPP	TOLL PERSON TO PERSON CALL (toll call charge is transferred to the person receiving the call)
TSS	TOLL STATION TO STATION CALL (toll call charge is transferred to the phone number receiving the call)
FRE	TOLL FREE

For collect calls, the value set by the respective bit varies according to the billing method employed at the Attendant Console.

After pressing the billing (BILL) key on the console, the billing method can be selected from the following.

1: S-S: STATION TO STATION CALL
This option starts billing once the phone call is transferred to the phone number.

2: P-P: PERSON TO PERSON
This option starts billing once the call is transferred to the person

3: CSS: COLLECT STATION TO STATION CALL
This option starts billing once the call is transferred to the phone number receiving the call.

4: CPP: COLLECT PERSON TO PERSON CALL
This option starts billing once the call is transferred to the person receiving the call.

The bit status listed above is set to "1" depending on the options selected.

If COLLECT PERSON TO PERSON CALL, the IPP is set to "1"
If COLLECT STATION TO STATION CALL, the ISS is set to "1"

Trunk Group Number

Trunk group number indicates the number of groups to which the corresponding port belongs and has a value between 0 and 511. If the port is not part of the Trunk group port, the bit is set to FFFFh.

Tenant Number

Indicates the tenant number the recipient is part of, and has a value between 0 and 63.

Phone Number of the Extension Caller

Outgoing Calls

For cases such as tandem calls where an incoming call is forwarded to another external number, the phone number listed is the user's extension number.

Incoming or Tandem Calls

The external line used for the call is printed listing the DCS Gateway node and the party the line is connected to.

Caller information can be requested from the telephone company for calls made from domestic lines. If caller information is not requested from the telephone company (T/C bit is set to "0"), the DCS Gateway node and port number is listed.

If caller information is requested from the telephone company (T/C bit is set to "1"), the external caller's phone number is listed (up to 16 digits in NIBBLE format).

For tandem calls, depending on the billing method, the call initiator number or internal line number is listed.

Outgoing or Tandem Calls

For the pre-selected option, the company number is entered in the last byte. (The phone number of the extension user who made the call is eight bytes in length. Therefore, the company number is entered in the last byte. For the not pre-select option, 0xFF is entered)

Phone Number of the Call Recipient (Internal/Local)

Outgoing or Tandem Calls

The DCS Gateway node number and port number of the outside line used for the call are listed.

The port number has a value between 0 and 2047.

The last two bytes of the TIE ACCESS CODE are listed between the brackets.

Incoming Calls

The extension number receiving the call is printed in NIBBLE format

Number Dialled

The number dialled by the extension user is listed, up to a maximum of 20 digits.

Account Code, Forced Authorisation Code

In cases where the Account Code (ACC) or the Forced Authorisation Code (FAC) has been used, the code is listed (up to 12 digits). If the code was not used, a "-" symbol is printed.

Specification of the SMDR/PMS Interface

- Asynchronous RS232C type (the DCS Gateway operates as DCE)
- 9600 bps, No parity, 1 Stop bit (changeable)
- Number 2, 3, 7, 20 pin connection (power check by DTR)
- 25-pin RS232C Male connector

Multi-Node

The DCS Gateway adopts a multi-node dispersion structure, which connects multiple systems together. Since the multi-node dispersion structure distributes calls to different nodes, as required to prevent subscriber call concentration in a specific node, the DCS Gateway can provide a non-blocking service and virtual non-blocking service for calls between nodes. Such a structure improves the reliability of the system, and provides for future expansion and services that are not restricted by node location or distance.

Cards Required

- INI3 card

Configuration Tasks for Using Multi-Node Features

The system configuration process for using the Multi-node feature is as follows.

- **Deciding the total number of nodes to connect**

Decide the number of nodes to configure (maximum of 3) according to the total number of subscribers and call quantity.

- **Master node**

In a multi-node installation, one node performs the role of master node and other nodes are slave nodes. The master node provides the clock to the slave node to perform synchronization.

- **Registering the system configuration database using the Installation Tool (IT)**

After planning the multi-node configuration, IT should be installed and the system configuration database registered. The IT menu related to the Multi-node feature is included in the process.

Path configuration between nodes

Network synchronization database configuration

INI MAPPING database registration

INI/PRI parameter designation

Port general (INI Line)

- **Configuring the MAP**

After registering the database (DB) of the various systems using IT, power up the system. Once the DCS Gateway is ready to use, the multi-node configuration cannot be changed or adjusted. However, the INI/PRI parameters in the MAP can be designated to perform tasks related to multi-node configuration.

1. Designating Parameters for Each INI/PRI Card
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ INI/PRI Parameter Retrieval

2. Retrieval of Path Configuration Between Nodes
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization configuration ➨ Retrieval of path configuration between nodes

3. Inquiry of INI Configuration of Each Node
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ Inquiry of INI configuration of each node

4. Inquiry of INI Signalling Channel
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ Inquiry of INI signalling channel

5. Inquiry of INI Status
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ Inquiry of INI status

6. INI MAPPING DB Inquiry
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ INI Mapping DB inquiry

7. Network Synchronization Configuration DB Management
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization Configuration ➨ Inquiry of network synchronization configuration DB

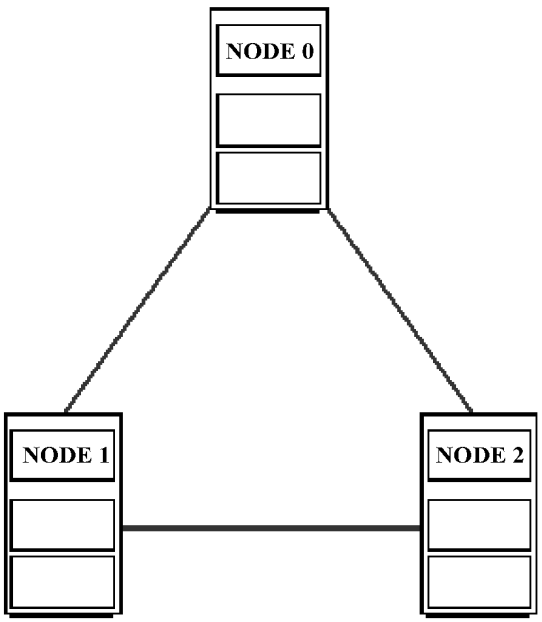
8. Inquiry of Network Synchronization Status
   Related menu in the MAP:
   Data Base Management ➨ System DB Management ➨ INI and Network Synchronization configuration ➨ Inquiry of network synchronization status

9. Designating the Caller to Charge
   Related menu in the MAP:
   Statistics charging DB Management ➨ Charging management ➨ Designating the caller to charge

10. Displaying SMDR Information Between Tenants
    Related menu in the MAP:
    Statistics charging DB Management ➨ Charging management ➨ Registration of whether to bill between Tenant

An Example Multi-Node Configuration

This section describes an example of multi-node connection of the DCS Gateway. Node 0 is the master node of three nodes.



The master node is connected directly to Nodes 1 and 2.

On Node 1, the primary and secondary paths are as follows:

- Node 1 is connected directly to Node 0 => Primary path
- Node 1 can be connected to Node 0 through Node 2 => Secondary path
- Node 1 is connected directly to Node 2 => Primary path
- Node 1 is connected to Node 2 through Node 0 => Secondary path

The same applies to other nodes for configuring primary and secondary paths.

Note

1. Details on configuration tasks after selecting the MAP menu are given in the *DCS Gateway Administration Guide.*
2. Using IT is described in the *DCS Gateway Administration Guide.*
3. Installing the INI3 card and connecting multi-nodes is described in the *DCS Gateway Installation Guide.*

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