System i

Hardware installation and use Control panel

Version 5 Release 4

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Note

Before using this information and the product it supports, read the information in "Notices," on page 35 and the manual *IBM eServer Safety Information*,, G229-9054.

Third Edition (February 2006)

This edition applies to version 5, release 4, modification 0 of IBM i5/OS (product number 5722-SS1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

Contents

Control panel

You can process system functions using the control panel.

The control panel is the initial interface to your system. From the control panel, you can process the following system functions:

- Turn on or turn off the system.
- Perform an initial program load (IPL).
- Display and get attributes of error codes to analyze problems.
- Determine processor activity.

Attention:

- If you have a partitioned system, only the primary partition can access the control panel. All secondary partitions use the remote control panel through the primary partition.
- The information in this topic pertains only to IBM® iSeries™ 270 and 8*xx* models. If you have a different model, see the IBM Systems Hardware Information Center for more information.

The following topics provide information for you to set up the virtual control panel or the remote control panel, access control panel functions, and use APIs to operate your remote control panel with a user-written program.

Related information

IBM Systems Hardware Information Center

Printable PDFs

Use this to view and print a PDF of this information.

To view or download the PDF version of this document, select Control panel (about 600 KB).

You can view or download these related topics:

- Basic systems operations (about 600 KB) contains the following topics:
  - Basic system operations
  - Starting and stopping the system
  - i5/OS® concepts
  - Analyzing and reporting system problems

Saving PDF files

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1. Right-click the PDF in your browser (right-click the link above).
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Control panel concepts

This information explains the differences between the control panel options: the virtual control panel, the remote control panel, and the physical control panel. It also provides details about the functions that the control panel can perform.

Types of control panels

Control panels include the virtual control panel, the remote control panel, and the physical control panel. You can use these panels to perform almost all of the same functions. The remote control panel and virtual control panel provide a way to perform control panel functions from a PC.

Physical control panel

The physical control panel is your initial interface with the system. You can use the physical control panel to perform functions such as initial program load (IPL), turn on, and turn off. Control panel functions range in complexity from functions that display status (such as IPL speed) to low-level service functions that only service representatives can access.

Note: If the system has multiple partitions, some secondary partitions might not start if they have been configured to a status of hold.

Related concepts

"Control panel buttons, lights, and indicators" on page 7
These figures illustrate the interface for each of the control panels, including the buttons, lights, and indicators. The interface for the virtual control panel and remote control panel are identical.

Related tasks

Restarting and powering down a system with logical partitions

"Accessing control panel functions" on page 11
To access the control panel functions, follow these instructions, which apply to all three kinds of control panels.

Remote control panel

The remote control panel provides a way to use control panel functions through a PC. The graphical user interface of the remote control panel looks similar to the physical control panel.

The characteristics of the remote control panel are as follows:

- The remote control panel is installed through Operations Console.
- A directly attached remote control panel is not supported, but you can use the remote control panel with a LAN-connected console. The use of virtual control panel is supported.
- You can use the interface for the remote control panel to restart and turn off the system. However, a LAN-connected remote control panel or the virtual control panel cannot turn on the system unless it is connected to a primary partition of an iSeries 270 or 8*xx* model and the primary partition is still active. You can use the remote control panel to perform most of the same functions as the physical control panel.
- You can use remote control panel APIs to automate control of the remote control panel through a user-created program.
- If your system uses a keystick, the **Mode** button works with the same functions as the physical control panel, depending on whether the keystick is inserted.

Related concepts

"Setting up your control panel" on page 10
Both the remote control panel and the virtual control panel are set up through an Operations Console configuration. You need to install Operations Console and configure a remote control panel or a virtual control panel to use control panel functions.

"Control panel buttons, lights, and indicators" on page 7
These figures illustrate the interface for each of the control panels, including the buttons, lights, and indicators. The interface for the virtual control panel and remote control panel are identical.

Related tasks

"Accessing control panel functions" on page 11
To access the control panel functions, follow these instructions, which apply to all three kinds of control panels.

Virtual control panel

The virtual control panel is an alternative to the remote control panel for parallel cable. With the virtual control panel, you can use control panel functions through a PC.

The graphical user interface for the virtual control panel is identical to the user interface of the remote control panel. Also, the virtual control panel can perform most of the same functions as the remote control panel. If your system uses a keystick, the **Mode** button works with the same functions as the physical control panel, depending on whether the keystick is inserted.

The most significant functional difference between the remote control panel and the virtual control panel is that the virtual control panel cannot turn on the system. As an alternative, if you need to turn on the system at a later time, you can use the IPL scheduling function in Operational Assistant by pressing the **Attention** key. You can also use the GO POWER command and select option 2 (Change turn on and off schedule).

Considerations for the virtual control panel

If you use the virtual control panel, you should be aware of the following considerations:

- The virtual control panel must have a direct connection to the system from Operations Console using the serial console cable.
- The virtual control panel is only available while the Operations Console is connected.
- You cannot use the virtual control panel remotely through a dial-up connection.
- There are prerequisites when installing the virtual control panel such as a program temporary fix (PTF) for the server and service packs for the client.
- If the PC has a parallel cable connection for a remote control panel, you must remove it before you can install and use your virtual control panel.
- A unique service tools device profile must exist for each virtual control panel connection.
- You cannot use an existing network name.
- More than one virtual control panel and remote control panel can be active at the same time.
- The service tools user ID that is used to authenticate the connection must have the partition remote panel key privilege in order to use the mode function provided by the virtual control panel. To verify that your service tools user ID has this privilege, see Changing the functional privileges for a service tools user ID using SST.

How to choose between the virtual control panel and remote control panel

The following table shows which server models are recommended for the virtual control panel and which models are recommended for the remote control panel.

Virtual control panel	Remote control panel
270 800 810 820 825 830 840 870 890	170 250 6*xx* 7*xx* S*xx*

Related concepts

"Control panel buttons, lights, and indicators" on page 7
These figures illustrate the interface for each of the control panels, including the buttons, lights, and indicators. The interface for the virtual control panel and remote control panel are identical.

Related tasks

"Accessing control panel functions" on page 11
To access the control panel functions, follow these instructions, which apply to all three kinds of control panels.

Related information

iSeries Operations Console

Control panel functions

This table lists the codes and descriptions for each of the control panel functions and whether each type of the control panel supports these functions.

There are few functional differences among these control panels. The main difference is that the physical control panel and the remote control panel, when cabled directly to the system, can turn on the system. The virtual control panel and the remote control panel, if connected through a LAN, cannot turn on the system.

Notes:

1. Some control panel functions might not be available on all system types.
2. The *x* can be any number 0 through 9, any letter A through F, or a blank.
3. If you have selected a function, find the selected function in the table and verify that you have completed the correct function.
4. If you cannot change the Function/Data display or complete the selected function, contact your service provider.

Control panel (32-character) function codes

Function code	Remote control panel code	Virtual control panel function?	Function description
01	01	Yes	1. Display the currently selected initial program load (IPL) type (and logical key mode on some system types). 2. Display the currently selected IPL speed override for the next IPL.

Function code	Remote control panel code	Virtual control panel function?	Function description
02	02	Yes	Select the IPL type, logical key mode, and IPL speed.
03	03	Yes	Start an IPL to load the system. The IPL uses the selected IPL options.
04	04	Yes	Lamp test all displays and indicators are switched on.
05	05	No	System power control network (SPCN) system reference code (SRC). Display an SRC on the control panel.
07	Not applicable	Not applicable	Allow you to perform SPCN service functions.
08	08	Yes	Fast turn off. To perform a fast turn off, see Stopping the system in the Basic system operations topic collection.
09 through 10	Not applicable	Not applicable	Reserved.
11 through 19	11 through 19	Yes	System reference code (SRC) displays an SRC on the control panel.
20	20	Yes	Display the machine type, model, processor feature code, processor class indicator, and IPL path description.
21	21	Yes	Cause the Use Dedicated Service Tool (DST) display to appear on the system console. To exit DST, select the Resume operating system display option.
22	22	Yes	Force system main storage dump.
23	Not applicable	Not applicable	Reserved.
24	Not applicable	Not applicable	Reserved.
25	25	Yes	Use Service switches 1 and 2 to enable or disable functions 50 through 70.
26	26	Yes	Use Service switches 1 and 2 to enable or disable functions 50 through 70.
27 through 32	Not applicable	Not applicable	Reserved.
33	33	Yes	Reorder SPCN addressing.
34	34	Yes	Retry main storage dump (MSD) IPL.
35 through 49	Not applicable	Not applicable	Reserved.

Function code	Remote control panel code	Virtual control panel function?	Function description
50	Not applicable	Not applicable	System processing unit stop.
51	Not applicable	Not applicable	System processing unit status displays the following values: B0 register contents, Next Instruction Address (NIA), and current Task Dispatching Element (TDE) contents
52	Not applicable	Not applicable	System processing unit start.
53	53	No	Unconfigure an intermittently failing processor (Repeat GARD function)
54 through 56	Not applicable	Not applicable	Reserved.
57	Not applicable	Not applicable	Display area addresses for system data.
58	Not applicable	Not applicable	Set the first character of the base address for the function 62 display.
59	Not applicable	Not applicable	Set the second character of the base address for the function 62 display.
60	Not applicable	Not applicable	Set the third character of base address for function 62 display.
61	Not applicable	Not applicable	Set the fourth character of base address for function 62 display.
62	Not applicable	Not applicable	Display service processor storage.
63	Not applicable	Not applicable	System status SRC trace.
64	Not applicable	Not applicable	Service processor diagnostic status SRC trace.
65	65	Yes	Deactivate remote service.
66	66	Yes	Activate remote service.
67	67	Yes	Disk unit IOP reset/reload is enabled only by specific disk unit SRCs.
68	68	Yes	Concurrent maintenance power domain Power Off.
69	69	Yes	Concurrent maintenance power domain Power On.
70	70	No	Dump service processor control storage.

Function code	Remote control panel code	Virtual control panel function?	Function description
Power button	Power button in graphical interface -- for powering on and off the system. (LAN-connected remote control panels cannot turn on the system.)	Power button in graphical interface -- for powering off the system only.	OFF = Delayed turn off. ON = Immediate power on (can be timed turn on).
Keystick	See note.	See note.	IPL keylock - Manual, Auto, Normal, Secure.
Attention light	Graphical attention light	Yes	Attention state LED.
Power indicator	Power indicator in graphical interface	Power indicator in graphical interface	Lit when power is fully operational.
Note: The remote control panel and virtual control panel recognize the presence of a keystick. If your system uses a keystick, the **Mode** button works with the same functions as the physical control panel, depending on whether the keystick is inserted. LAN-connected remote control panels need special authority to use the **Mode** button.			

If you cannot find the function code in the previous table, the support for added features or devices might not have been available when this information was produced. Look for any supplemental unit function code information for the function code you displayed on the control panel.

Related concepts

"Instructions and descriptions for control panel functions" on page 12
Control panel functions can be classified into three categories: normal functions, extended functions, and low-level debug functions. The remote control panel and virtual control panel can perform most of these functions. The physical control panel can perform all of them.

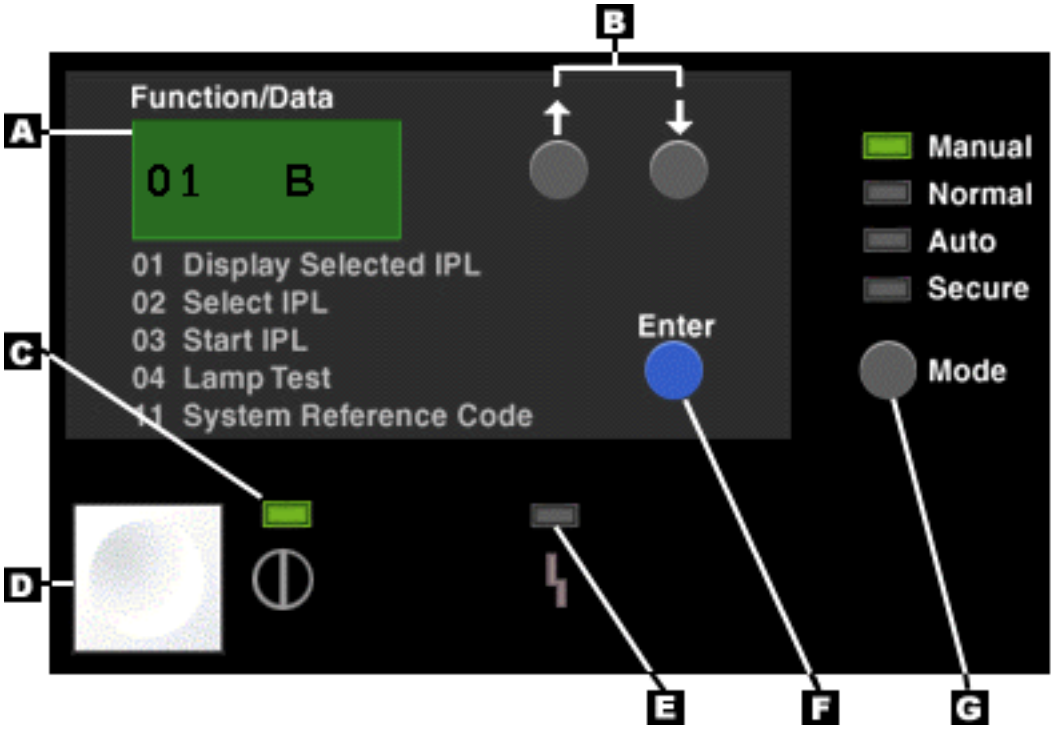
Control panel buttons, lights, and indicators

These figures illustrate the interface for each of the control panels, including the buttons, lights, and indicators. The interface for the virtual control panel and remote control panel are identical.

The figures show the following kinds of control panels:

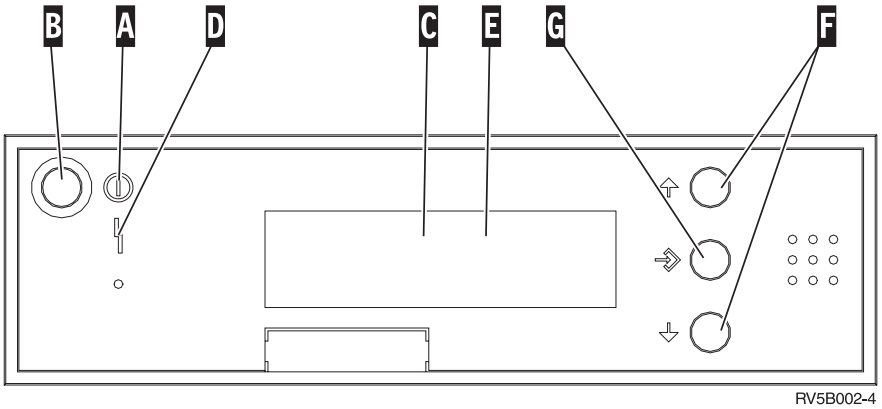
- The remote control panel or virtual control panel.
- A physical control panel without a keystick.
- A physical control panel with a keystick.

Remote control panel and virtual control panel



(A)	Function/Data display
(B)	Increment and Decrement buttons
(C)	Turn on indicator
(D)	Power button
(E)	System Attention light
(F)	Enter button
(G)	Mode button

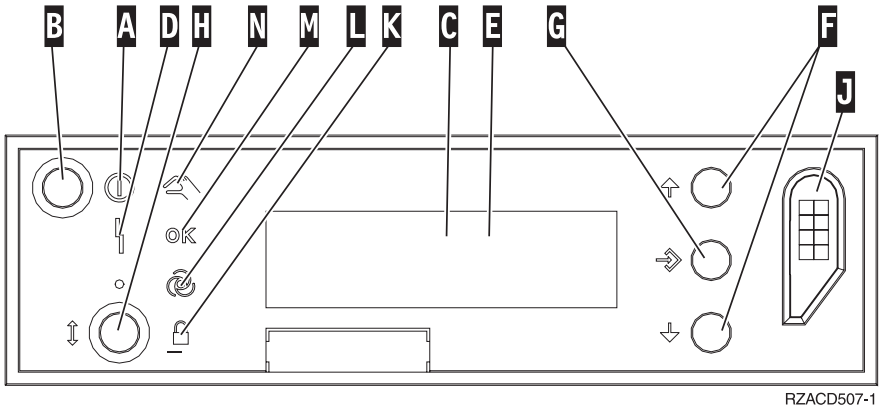
Physical control panel without a keystick



(A)	Power On Light • A blinking light indicates power to the unit. • A constant light indicates that the unit is up and is working.
(B)	Power button
(C)	Processor Activity
(D)	System Attention
(E)	Function/Data Display
(F)	Increment and Decrement buttons
(G)	Enter button

Physical control panel with a keystick

A keystick gives the operator security control over the control panel functions and control over data that is accessible from the control panel. The keystick for the electronic keylock activates the **Mode** button.



(A)	Power On Light • A blinking light indicates power to the unit. • A constant light indicates that the unit is up and is working.
(B)	Power button
(C)	Processor Activity
(D)	System Attention
(E)	Function/Data Display
(F)	Increment and Decrement buttons
(G)	Enter button
(H)	Mode button
(J)	Electronic Keystick Slot
(K)	Secure
(L)	Auto
(M)	Normal
(N)	Manual

Related concepts

"Physical control panel" on page 2
The physical control panel is your initial interface with the system. You can use the physical control panel to perform functions such as initial program load (IPL), turn on, and turn off. Control panel functions range in complexity from functions that display status (such as IPL speed) to low-level service functions that only service representatives can access.

"Remote control panel" on page 2
The remote control panel provides a way to use control panel functions through a PC. The graphical user interface of the remote control panel looks similar to the physical control panel.

"Virtual control panel" on page 3
The virtual control panel is an alternative to the remote control panel for parallel cable. With the virtual control panel, you can use control panel functions through a PC.

Related tasks

"Accessing control panel functions" on page 11
To access the control panel functions, follow these instructions, which apply to all three kinds of control panels.

Setting up your control panel

Both the remote control panel and the virtual control panel are set up through an Operations Console configuration. You need to install Operations Console and configure a remote control panel or a virtual control panel to use control panel functions.

Setting up your remote control panel

To set up the remote control panel, you need to install Operations Console. Use the configuration wizard to select the remote control panel functions.

Considerations for configuring a remote control panel are as follows:

- A special remote control panel cable is required to support your configuration. Refer to Operations Console cable requirements.
- A local console through dial-up support does not support the remote control panel functions. A remote console through dial-up support only supports the remote control panel functions if the local console it connects to has the cable installed and configured.

Setting up your virtual control panel

The iSeries Access Web site has specific instructions for setting up your virtual control panel. You must have a local console directly attached to the system configured in order for the virtual control panel to function. To set up a local console directly attached to the system configuration, you need to follow the instructions in Operations Console. Be aware of those limitations and restrictions to the use of virtual control panel functions in the installation instructions.

Related concepts

"Remote control panel" on page 2
The remote control panel provides a way to use control panel functions through a PC. The graphical user interface of the remote control panel looks similar to the physical control panel.

Operations Console

Related information

iSeries Operations Console

Operations Console connection troubleshooting

Accessing control panel functions

To access the control panel functions, follow these instructions, which apply to all three kinds of control panels.

If you are using the virtual control panel or remote control panel, click the button where the instructions say press. To use the control panel, perform the following steps:

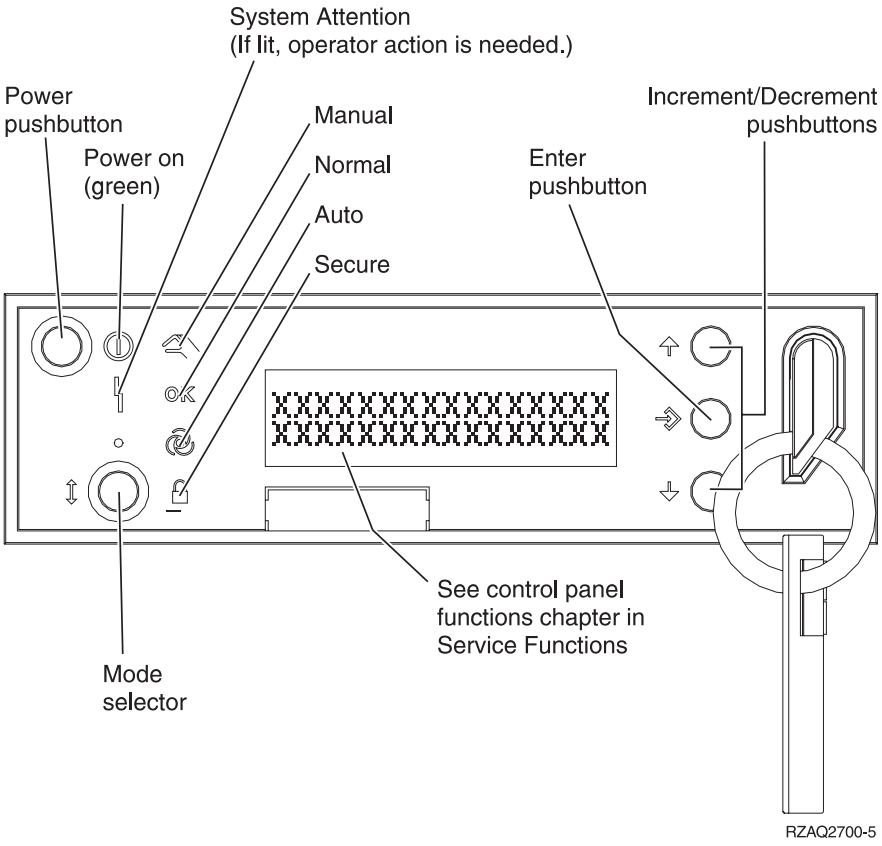
1. If your physical control panel has a keystick, insert the keystick and press the **Mode** button to select **Manual** mode. You must do this step even if you are using the remote control panel or virtual control panel.
2. To select a function number, press the **Increment** or **Decrement** button on the control panel until the function number you want is in the display.
3. Press Enter.

Control panel with a keystick

This figure shows how a control panel with a keystick looks like.

The items on the control panel include:

- Power On indicator
- Power pushbutton
- System Attention light
- Function/Data display
- Increment and Decrement buttons
- Enter pushbutton
- Mode selector
- Electronic keystick slot



Related concepts

"Physical control panel" on page 2
The physical control panel is your initial interface with the system. You can use the physical control panel to perform functions such as initial program load (IPL), turn on, and turn off. Control panel functions range in complexity from functions that display status (such as IPL speed) to low-level service functions that only service representatives can access.

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"Control panel buttons, lights, and indicators" on page 7
These figures illustrate the interface for each of the control panels, including the buttons, lights, and indicators. The interface for the virtual control panel and remote control panel are identical.

Instructions and descriptions for control panel functions

Control panel functions can be classified into three categories: normal functions, extended functions, and low-level debug functions. The remote control panel and virtual control panel can perform most of these functions. The physical control panel can perform all of them.

Normal control panel functions

Normal control panel functions are the most often performed functions, such as displaying IPL speed and forcing the system to perform an IPL. They also include functions such as forcing DST and forcing a main storage dump. These functions are 01 through 49.

Extended control panel functions
Extended control panel functions are performed less often. Only service representatives can perform these functions. Extended functions are 50 through 70.

Low-level debug panel functions
These are functions 57 through 70. They are performed only by service representatives.

Note: The examples in the following topics show control panels with a 4-word (32 character) display. Control panels with a 1-word (8 character) display only show the first word (8 characters) of each function.

Related tasks

"Control panel functions" on page 4
This table lists the codes and descriptions for each of the control panel functions and whether each type of the control panel supports these functions.

Normal control panel functions

These instructions show how to use normal control panel functions 01 through 49. Functions 21 through 49 are available when you select the **Manual** mode.

The instructions you follow for function 01 or 02 depend on whether your system uses a keystick. Also, the following instructions for functions 01 and 02 alternate between systems with a keystick and systems without a keystick.

To determine how to activate functions 01 and 02 on a control panel, complete the following steps:

1. **Does the control panel have an electronic keylock (a keystick)?**

Yes	Go to the next step.
No	The system displays the IPL key mode (For Manual or Normal modes only). The Auto mode and Secure mode are not supported. Follow the procedures for functions 01 and 02 for systems without a keystick.

2. Insert the keystick.
   Press the **Mode** button to select the IPL mode. Follow function 01 and 02 procedures for systems with a keystick.

Note: The function that is displayed is not activated until you press Enter on the control panel.

To select a function number, press the **Increment** or **Decrement** button on the control panel. To activate the function, press Enter on the control panel while the system displays the required function number.

Function 01 - Display Selected IPL Type and IPL Speed (on Systems with a Keystick)

This function allows you to display the selected type and speed for the next IPL.

1. Display IPL types (A, B, C, or D).
2. Display IPL speed (F, S, SE, V=F, or V=S).

When selected, function 01 displays the currently selected IPL type and IPL speed values (where each _ represents 1 character).

The following table shows a function 01 example with a keystick.

Function 01 on systems with a keystick

Function/data	Action or description
0 1 _	Use the **Increment** or **Decrement** buttons to scroll to function 01.
0 1 _ _ A _ _ _ _ _ V = F _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Valid IPL types are A, B, C, or D. Valid IPL speed displays are F, S, SE, V=F, or V=S.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

Function 01 - Display Selected IPL Type, Logical Key Mode, and IPL Speed (on Systems without a Keystick)

This function allows you to display the selected IPL type, logical key mode, and speed for the next IPL.

1. Display IPL types (A, B, C, or D).
2. Display the valid logical key modes (M or N).
3. Display IPL speed (F, S, SE, V=F, or V=S).

The following table shows a function 01 example on systems without a keystick.

Function 01 on systems without a keystick

Function/data	Action or description
0 1 _	Use the **Increment** or **Decrement** buttons to scroll to function 01.
0 1 _ _ A _ _ M _ _ V = F _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Valid IPL types are A, B, C, and D. Valid logical key modes are **Manual** and **Normal**. Valid IPL speed displays are F, S, SE, V=F, or V=S.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

Function 02 with a keystick - Select IPL Type and IPL Speed Override (on Systems with a Keystick)

Before you can use function 02, you must have the system in **Manual** mode. You can change the IPL types with the system turned on or off. However, to select the IPL speed override, you must turn off the system.

The following table shows the sequence used to select the IPL type on systems that are turned on.

Function 02 - Select IPL type on turned-on systems with a keystick

Function/data	Action or description
0 2 _	Use the **Increment** or **Decrement** buttons to scroll to function 02.
0 2 _ _ A < _	Press Enter to start function 02. The current IPL type is displayed with a pointer.
0 2 _ _ B < _	Use the **Increment** or **Decrement** buttons to scroll through the IPL types.

Function/data	Action or description
0 2 _	Press Enter to select the IPL type and exit function 02.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

The following table shows the sequence used to select the IPL type and IPL speed on systems that are turned off.

Function 02 - Select IPL type and IPL speed on turned-off systems with a keystick

Function/Data	Action or Description
0 2 _	Use **Increment** or **Decrement** buttons to scroll to function 02.
0 2 _ _ A < _ _ _ _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Press Enter to start function 02: • The current IPL type is displayed with a pointer. • The current IPL speed is displayed.
0 2 _ _ B < _ _ _ _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Use the **Increment** or **Decrement** buttons to scroll through the IPL types and speeds.
0 2 _ _ B _ _ _ _ _ _ _ V _ < _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Press Enter to select the IPL type. • The current IPL type is displayed. • The current IPL speed is displayed with a pointer.
0 2 _ _ B _ _ _ _ _ _ _ S _ < _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Use the **Increment** or **Decrement** buttons to scroll through the IPL speeds.
0 2 _	Press Enter to select the IPL speed and exit function 02.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

Function 02 without a keystick - Select IPL type, IPL speed override, and Logical key mode (on Systems without a Keystick)

You can use function 02 in either normal mode or manual mode. With the system either turned on or off, this function allows you to select the IPL type and logical key mode. Before you can select the IPL speed override, you must turn off the system.

Turned-on systems

For turned-on systems without a keystick, function 02 is used to select the IPL mode and logical key mode. The following table shows an example of the function 02 IPL type and logical key mode selection sequence for a turned-on system that does not have a keystick.

Function 02 - Select IPL type and logical key mode on turned-on systems without a keystick

Function/data	Action or description
0 2 _	Use the **Increment** or **Decrement** buttons to scroll to function 02.

Function/data	Action or description
0 2 _ _ A < _ M _	Press Enter to start function 02. • The current IPL type is displayed with a pointer. • The current logical key mode is displayed.
0 2 _ _ B < _ M _	Use the **Increment** or **Decrement** buttons to scroll through the IPL types.
0 2 _ _ B _ _ M < _	Press Enter to select the IPL type.
0 2 _ _ B _ _ N < _	Use the **Increment** or **Decrement** buttons to scroll through the logical key modes.
0 2 _	Press Enter to select the logical key mode and exit function 02.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

Turned-off systems

For turned-off systems without a keystick, function 02 is used to select the IPL type, logical key mode, and IPL speed indicators. The following table shows an example of the function 02 IPL type, logical key mode, and IPL speed selection sequence for a turned-off system that does not have a keystick.

Function 02 - Select IPL type, logical key mode, and IPL speed on turned-off systems without a keystick

Function/data	Action or description
0 2 _	Use the **Increment** or **Decrement** buttons to scroll to function 02.
0 2 _ _ A < _ M _ _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Press Enter to start function 02. • The current IPL type is displayed with a pointer. • The current logical key mode is displayed. • The current IPL speed is displayed.
0 2 _ _ B < _ M _ _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Use the **Increment** or **Decrement** buttons to scroll through the IPL types.
0 2 _ _ B _ _ M < _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Press Enter to select the IPL type. • The current IPL type is displayed. • The current logical key mode is displayed with a pointer. • The current IPL speed is displayed.
0 2 _ _ B _ _ N < _ _ _ V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Use the **Increment** or **Decrement** buttons to scroll through the logical key modes.
0 2 _ _ B _ _ N _ _ _ _ V _ < _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Press Enter to select the logical key mode. • The current IPL type is displayed. • The current logical key mode is displayed. • The current IPL speed is displayed with a pointer.
0 2 _ _ B _ _ N _ _ _ _ S _ < _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Use the **Increment** or **Decrement** buttons to scroll through the IPL speeds.

Function/data	Action or description
0 2 _	Press Enter to select the IPL speed and exit function 02.
0 1 _	Use the **Increment** or **Decrement** buttons to scroll through the control panel functions.

Function 03 - Start IPL

The system enables function 03 only when the key mode is Manual and the system is turned on.

This function starts an IPL of the selected IPL type when you press the Enter button. The system will load all the Licensed Internal Code.

Attention: No system shutdown is performed before the initial program load (IPL). The use of this function can cause data loss.

Function 04 - Lamp Test

This function shows whether any control panel indicators are burned out and whether characters that are displayed on the control panel Function/Data display are valid. When you activate this test, all the control panel lights and indicators flash on and off.

The lamp test continues on the system control panel until you perform another control panel function or a power procedure. The lamp test for the expansion unit control panel is active for 25 seconds and does not flash.

Use this procedure to verify that the lights on the system control panel are working correctly. If you cannot complete these steps, contact your service provider.

1. Turn on the system.
2. Press the **Increment** or **Decrement** buttons on the control panel to display function 04.
   Press Enter on the control panel.
3. Do all of the lights and indicators on the system control panel flash on and off?

Yes	Proceed to the next step.
No	Need to exchange the control panel or the replaceable unit that contains the control panel function (system unit backplane (MB1) or tower card (CB1)). Contact your service provider.

4. Do all the control panel lights on the expansion unit come on?

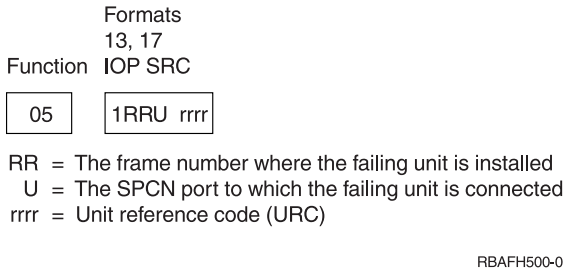
Yes	End.
No	Exchange the control panel on the expansion unit.

The lights on the system control panel are working correctly.

Function 05 - SPCN SRC

Function 05 displays information about power faults and provides informational reference codes during disk-unit concurrent maintenance procedures. The format for this function is as follows:

SPCN SRC formats



Function 07

Function 07 is only used during service by authorized IBM service representatives.

Function 08 - Fast Turn Off

Function 08 is enabled only when the key mode is Manual and the system is turned on.

Use this function when the system is suspended and you cannot perform a turn-off operation.

The first time that you select function 08 and press Enter, the system displays an attention SRC, 11 A1*xx* 8008. This SRC indicates that you selected Function 08. The second time that you select function 08 and press Enter, you confirm the request to turn off. To perform a fast turn off, see Stopping the system.

Attention: No system shutdown is performed before the initial program load (IPL). The use of this function can cause loss of data.

Attention: If the system password was changed at the most recent IPL, performing a fast turn off might cause that new password information to be lost.

Functions 09 to 10 - Reserved

These functions are reserved for future control panel operations.

Functions 11 to 19 - System Reference Code (SRC)

Functions 11 though 19, if enabled, represent the words of the SRC.

You must record SRC information for error reporting and contact your service provider.

Function 20 - System type, model, feature code, hardware level, and IPL path description

This function displays the machine type, model, processor feature code, hardware level, and IPL path description in the following format:

```
t m m m c c c c _ _ _ _ _ _ _ _

h h h h _ _ _ _ i i i i i i i i
```

Values for *t* indicate the machine type:

1	9401
2	9402
4	9404

6	9406

Values for *m* indicate the model:

mmm	Model number (for example, 820)

Values for *c* indicate the system processor feature code:

cccc	Processor feature code (for example, 23A4)

Values for *hhhh* indicate the system processor hardware level:

hhhh	Processor hardware level (for example, 1025)

Values for *iiiiiiii* indicate the description of the system turn on or restart path:

iiiiiiii	The restart path description (for example, 00 000 001 indicates that the system was turned on by using the white button on the control panel).

You should record this information with the SRC.

Function 21 - Make DST Available

This function makes DST available on the system console display. The Use Dedicated Service Tools (DST) display appears on the primary or alternative console.

To exit DST and return to the operating system, select the Resume operating system display option on the Use Dedicated Service Tools (DST) display.

Function 22 - Dump Main Storage

This function dumps main storage and processor data to the disk.

Note: Before to pressing function 22, determine whether function 34 is available (`00` shows in the panel after you select function 34). If it is available, then the system is attempting to run a main storage dump IPL. Using function 34 attempts to try the IPL again, such that the original dump is not lost. If function 34 is not enabled, (`>FF` shows in the panel after you select function 34), go back and start function 22.

The first time that you select function 22 and press Enter, the system displays attention SRC 11 A1*xx* 3022. This indicates that you selected function 22. To dump main storage and system processor data to the disk, you must select function 22 again and press Enter.

Use this function only when a main storage dump is necessary, for example, after a suspended (system hang) condition or after an operating system failure.

Attention: No system shutdown is performed before the main storage dump. The use of this function can cause data loss.

Functions 25 and 26 - Service Switches 1 and 2

In function 25, the service representative switch 1 is set. Function 25 is the first step necessary to set the service function range (50 to 99).

In function 26, the service representative switch 2 is set. Function 26 is the second step necessary to set the service function range (50 to 99).

Function 33 - Reorder SPCN Addressing

This function puts the rack addresses in the correct order to show their position in the system power control network (SPCN). Use it when you have added racks to or removed them from the system.

Function 34 - Retry MSD IPL

Function 34 is enabled only for main storage dump (MSD) IPLs. You can use it when the system is hung during the MSD IPL to try the IPL again without losing the original dump information.

Related reference

Stopping the system

Extended control panel functions

The system enables service functions 50 through 70 when you select manual mode and enter function 25 (service switch 1), then function 26 (service switch 2). You use **subfunctions** with Functions 51 and 57 through 64.

Notes:

1. When a function has no data to display, `FF` is shown.
2. Some upper functions, 50 through 70, are not supported using the remote control panel and virtual control panel, depending on connectivity.
3. Nonsupported functions for the remote control panel and virtual control panel display `FF`.

To enable functions 50 through 70, follow these steps:

1. Select function 25 and press Enter. The display reads `25 00`.
2. Use the **Increment** button to select function 26 and press Enter. The display briefly reads `26 00`. Then it typically displays `01 B` when the upper functions have activated.

Functions 50 through 70 are now available.

You can disable the service functions by selecting and entering either function 25 (service switch 1) or function 26 (service switch 2).

To disable functions 50 through 70, select function 25 and press Enter. Functions 50 through 70 are then no longer available.

Using Subfunctions

To work with subfunctions, complete the following steps:

1. Use the **Increment** or **Decrement** button to select the appropriate function and press Enter. The function number is displayed with asterisks (**); for example, `57**`. The two asterisks indicate that subfunctions are available.
2. Press the **Increment** button. The first subfunction number is displayed; for example, `5700`.
3. As the subfunction number is displayed, press Enter. The system displays data associated with the subfunction number.
4. Press the **Increment** button. The next subfunction number is displayed; for example, `5701`.

5. As the subfunction number is displayed, press Enter. The system displays the data associated with the new subfunction number.
6. Repeat these steps to gather all the data that is associated with the subfunction.
7. Use the **Increment** or **Decrement** button to return to the function display with asterisks; for example 57**.
8. Press Enter to exit the subfunctions.

Function 50 - System Processor Stop

This function stops the system processor.

Attention: This function might cause the system to end abnormally. Use it only when directed by your next level of support.

Function 51 - System Processor Status

This function displays the following values:
- Next instruction address (NIA).
- Current task dispatching element (TDE) address.

The data can be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to 0F.

The following table is an example of a subfunction data display that shows NIA and TDE information.

Subfunction data display example

Function	Subfunction	Data Display
51	**	Subfunction mode entered
51	00, 01	NIA (8 bytes)
51	02, 03	Current TDE (8 bytes)

Function 52 - System Processor Start

This function starts the system processor (after it has stopped).

Function 53 - Repeat GARD

This function displays the following values:
- Clear memory, processor, L3 Repeat GARD.
- Enable memory, processor, L3 Repeat GARD.
- Disable memory, processor, L3 Repeat GARD.
- View enable/disable status.

This function permanently unconfigures an intermittently failing processor, during the IPL following the failure. This is performed in case the IPL diagnostics cannot detect the failure and automatically unconfigure it. The failing processor must be replaced or the Repeat GARD function must be cleared before that processor can be used again.

Attention: This function can cause an operating processor to be permanently unconfigured following a power failure. Use it only when directed by your next level of support.

The following table is an example of a subfunction data display that shows Repeat GARD information.

Subfunction data display example

Function	Subfunction	Data Display
53	**	Subfunction mode entered
53	00	Clear memory, processor, L3 Repeat GARD
53	01	Enable memory, processor, L3 Repeat GARD
53	02	Disable memory, processor, L3 Repeat GARD
53	03	View enable/disable status (E=Enabled, D=Disabled)

Low-level debug panel functions 57 through 70

You can enable these functions by selecting Manual mode and selecting functions 25 and 26.

Here is a list of all the low-level debug panel functions and a description of each:

Function 57 - Display Service Processor Diagnostic Data Area Addresses
These addresses can be used to display debug data in function 62.

Function 58 - Setting First Character of the Base Address for the Function 62 Display

Function 59 - Setting Second Character of the Base Address for the Function 62 Display

Function 60 - Setting Third Character of Base Address for the Function 62 Display

Function 61 - Setting Fourth Character of Base Address for the Function 62 Display

Function 62 - Display Service Processor Storage
This function displays service processor storage starting at the address that has been set with functions 58 through 61.

Function 63 - System Status SRC Trace
The system status SRC trace is a copy of the last 25 status SRCs (those that are typically associated with the IPL sequence or the turn-off sequence). Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequential order. The most recent SRC (the last status SRC) is displayed at subfunction hexadecimal 18.

Function 64 - Diagnostic Status SRC Trace
The diagnostic status SRC trace is a copy of the last 25 status SRCs (those that are typically associated with the service processor function of problem analysis and main storage dump). Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequence. You can see the most recent SRC (the last status SRC) at subfunction hexadecimal 18 and the extended SRC words for this SRC at subfunctions 19 through 1A.

Function 65 - Deactivate Remote Service
Use this function to deactivate a remote service session or Operations Console. This function releases the communications port that was in use for a remote service session or Operations Console.

Function 66 - Activate Remote Service
Use this function to activate a remote service session or Operations Console. This function activates the communications port that is used by a remote service session or Operations Console.

Function 67 - Disk Unit IOP Reset/Reload
Function 67 is not available for all system types. Use this function to initiate an IOP dump and a

disk unit IOP reset/reload. The function is enabled only when specific SRCs are displayed on the control panel and the associated IOP supports a reset/reload function.

Function 68 - Turn off Disk Unit IOP/IOA Power Domain
Function 68 is enabled only by specific disk-unit system reference codes (SRCs) such as disk-unit attention SRCs.

Function 69 - Turn on Disk Unit IOP/IOA Power Domain
Function 69 is enabled when the power domain is turned off.

Function 70 - Dump Service Processor Control Storage
This function saves the contents of the service processor control storage into nonvolatile storage for potential use from an error log.

Using remote control panel APIs

You can use these APIs to write a program that can access the control panel remotely. With the APIs, your program can access many commands and queries.

The remote control panel function of Operations Console provides a set of APIs that system administrators can use to control the system through programs. The APIs allow custom programs to interact with the system control panel and perform many common system control panel functions.

You can use these APIs only if you are using the remote control panel that is connected with the serial console cable. You cannot use these APIs with the virtual control panel or remote control panel connected with a parallel cable.

The interface to the remote control panel APIs is established through a standard TCP/IP socket connection. The socket connection can be implemented in any programming language that supports sockets on the Windows® platform (Java™ , C/C++, Visual Basic to name a few).

To use the remote control panel APIs, you need to follow these steps:

1. Start Operations Console with the remote control panel function.
2. From a custom program, open a socket connection to port 2150 on the same PC.
3. Send a supported command from the set of commands that are described below.
4. Receive the byte stream that is sent back on the same socket connection.
5. Repeat steps 3 and 4 as necessary on the same socket connection.
6. Close the socket connection when done.

Your program needs to interpret the byte stream that is sent back from the system. The returned byte stream consists of a predefined format, which is the same for all commands. The byte stream is at least 4 bytes long. Some commands return additional bytes.

The first 2 bytes (0 and 1) will return the command status, typically successful or unsuccessful. The next 2 bytes (2 and 3) will be a 16-bit number N, which tells how many additional bytes will follow these first 4 bytes. If N is nonzero, then there will be additional information in bytes 4 through 4 + N. This information will be additional data related to the command, such as TRUE or FALSE.

Note: If the command sent is not one of the command strings defined below, then the return code in bytes 0 and 1 of the return value will be 32 (0x20). This means `Command not Supported`.

Your programs can perform the following control panel functions by using the following APIs.

System power and test APIs

You can use these APIs to turn on and off the system and to perform and clear panel lamp tests.

Turning on the system

To turn on the system, you can use the PowerOn API (use the uppercase and lowercase characters as shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N = 0	Not applicable

Performing panel lamp test

To perform the panel lamp test, you can use the DoLampTest API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N = 0	Not applicable

Clearing panel lamp test

To clear the panel lamp test results, you can use the ClearLampTest API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+ N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N = 0	Not applicable

Powering off the system

To turn off the system, you can use the PowerOff API (use the uppercase and lowercase shown).

To use this command, you must insert the keystick in the electronic keystick slot (on systems with a keystick).

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+ N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted	16-bit additional data length N = 0	Not applicable

IPL-related APIs

You can use these APIs to set initial program load (IPL) modes, types, and speed, and to start an IPL.

Setting IPL mode to Manual

To set the system initial program load (IPL) mode to Manual, you can use the SetIPLModeManual API (use the uppercase and lowercase characters as shown).

You must insert a key to use this command (on systems with a keystick).

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+ N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted	16-bit additional data length N = 0	Not applicable

Setting IPL mode to Normal

To set the system initial program load (IPL) mode to Normal, you can use the SetIPLModeNormal API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick).

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted	16-bit additional data length N = 0	Not applicable

Setting IPL mode to Auto

To set the system initial program load (IPL) mode to Auto, you can use the SetIPLModeAuto API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick).

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted	16-bit additional data length N = 0	Not applicable

Setting IPL mode to Secure

To set the system initial program load (IPL) mode to Secure, you can use the SetIPLModeSecure API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick).

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted	16-bit additional data length N = 0	Not applicable

Setting IPL type to A

To set the system initial program load (IPL) type to A, you can use the SetIPLTypeA API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick). The system must be in **Manual** mode.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode	16-bit additional data length N = 0	Not applicable

Setting IPL type to B

To set the system initial program load (IPL) type to B, you can use the SetIPLTypeB API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick). The system must be in **Manual** mode.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode	16-bit additional data length N = 0	Not applicable

Setting IPL type to C

To set the system initial program load (IPL) type to C, you can use the SetIPLTypeC API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick). The system must be in **Manual** mode.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+ N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode	16-bit additional data length N = 0	Not applicable

Setting IPL type to D

To set the system initial program load (IPL) type to D, you can use the SetIPLTypeD API (use the uppercase and lowercase shown).

You must insert a key to use this command (on systems with a keystick). The system must be in **Manual** mode.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode	16-bit additional data length N = 0	Not applicable

Starting an IPL

To start a system initial program load (IPL), you can use the StartIPL API (use the uppercase and lowercase shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn on the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 16 = System turned Off	16-bit additional data length N = 0	Not applicable

Setting IPL speed to Fast

To set the system initial program load (IPL) speed to Fast, you can use the SetIPLSpeedFast API (use the uppercase and lowercase characters as shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn off the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 8 = System turned On	16-bit additional data length N = 0	Not applicable

Setting IPL speed to Slow

To set the system initial program load (IPL) speed to Slow, you can use the SetIPLSpeedSlow API (use the uppercase and lowercase characters as shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn off the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 8 = System turned On	16-bit additional data length N = 0	Not applicable

Setting IPL speed to system default

To set the system initial program load (IPL) speed to the default value, you can use the SetIPLSpeedDefault API (use the uppercase and lowercase characters as shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn off the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 8 = System turned On	16-bit additional data length N = 0	Not applicable

Other system function APIs

You can use these APIs to start dedicated service tools (DST), to start a main storage dump (MSD), and to disable continuously powered main storage.

Starting dedicated service tools on the primary or alternate console

You can use the StartDST API to start the dedicated service tools (DST) on the primary or alternative console (use the uppercase and lowercase characters as shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn on the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 16 = System turned Off	16-bit additional data length N = 0	Not applicable

Starting a main storage dump

To start a main storage dump (MSD), you can use the StartMSD API (use the uppercase and lowercase shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn on the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 16 = System turned Off	16-bit additional data length N = 0	Not applicable

Disabling continuously powered main storage

To disable the continuously powered main storage (CPM) on the system, you can use the DisableCPM API (use the uppercase and lowercase characters as shown).

To use this command, follow these instructions:

- You must insert a key to use this command (on systems with a keystick).
- The system must be in **Manual** mode.
- You must turn off the system.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful 2 = Key not inserted 4 = Not in **Manual** mode 8 = System turned On	16-bit additional data length N = 0	Not applicable

APIs that check the system status

You can use these APIs to check the system status.

Is CPM present?

You can use the GetCPMPresent API to find out if the continuously powered main storage (CPM) is present on the system (use the uppercase and lowercase characters as shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Is CPM enabled?

You can use the GetCPMEnabled API (use the uppercase and lowercase characters as shown) to find out if the system has continuously powered main storage (CPM) enabled.

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Is the key inserted?

To find out if the system has a keystick inserted, you can use the GetKeyInserted API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Is the system turned on?

To find out whether you have the system powered on, you can use the GetPowerOn API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Is the attention light lit?

To find out if the attention light is on, you can use the GetAttentionLight API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Is SPCN present?

You can use the GetSPCNPresent API (use the uppercase and lowercase characters as shown) to find out if the system powered control network (SPCN) is present on the system.

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	True or False

Getting the IPL mode

To find out the system initial program load (IPL) mode, you can use the GetIPLMode API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	Manual, Normal, Auto, or Secure

Getting the IPL type

To find out the system IPL type, you can use the GetIPLType API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	A or B or C or D

Getting the IPL speed

To find out the system initial program load (IPL) speed, you can use the GetIPLSpeed API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	Slow/Fast or V=Slow/V=Fast **Note:** The responses with `V=Slow/V=Fast` indicate the default IPL speed.

Getting type and model information

To find out the system type and model numbers, you can use the GetType&Model API (use the uppercase and lowercase shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of ASCII return value (does not count end of string NULL)	ZZZZZZZZ (ASCII string with type and model information.)

Getting the SPCN system reference code

To return the system powered control network (SPCN) system reference code (SRC), if available, you can use the GetSPCNSRC API (use the uppercase and lowercase characters as shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of hexadecimal return value (does not count end of string NULL)	0x'XXXXXXXX' **Note:** Hexadecimal return data will be 4 bytes available by SRC.

Getting all system reference codes 1 - 9

To return all the system reference codes (SRCs) 1 through 9, if available, you can use the GetSRCs API (use the uppercase and lowercase characters as shown).

There are no restrictions to the use of this command.

This API returns the following information:

Bytes 0 and 1	Bytes 2 and 3	Bytes 4 through 4+N
16-bit return code 0 = Command successful 1 = Command unsuccessful	16-bit additional data length N N = size of hexadecimal return value (does not count end of string NULL)	0x'XXXXXXXX' **Note:** Hexadecimal return data will be 4 bytes available by SRC.

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