Honeywell

Experion PKS
Startup and Shutdown

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Document	Release	Issue	Date
EPDOC-X137-en-431A	431	0	February 2015

Disclaimer

Contents

1 About this guide

The guide provides general procedure for starting up and shutting down Experion services and interacting with some control hardware. Refer to the individual documents provided for the Series C form-factor components for information specific to Series C control hardware.

Revision history

Version	Date	Description
A	February 2015	Initial release

2 Introduction

The intent of this guide is to provide concise procedures for operator tasks related to starting up an Experion system in response to one of the following general anomalies.

- Power interruption
- Application unexpectedly quits or 'crashes'
- Component failure and replacement

This guide also provides a recommended procedure for shutting down an Experion system.

Related topics

“Our assumptions about readers” on page 8
“About security/password protection” on page 9
“Process startup supplement” on page 10
“Getting Started” on page 11
“Conventions” on page 15

2.1 Our assumptions about readers

We assume that you have experience in navigating within a Windows environment and you are to some extent familiar with the Experion applications of Control Builder and Station. If you do not have this experience, we recommend that you read the Experion Operator's Guide.

2.2 About security/password protection

Be aware that security features can be an integration of a Windows user account and an Experion sytem operator definition. This means you have logon and user-access security based on standard Windows tools for system administration and control configuration functions as well as the ability to define operator access levels for Station displays and Control Builder.

Please refer to the *Network and Security Planning Guide* for more information about security considerations.

If applicable, ensure to contact your System Administrator to get your personal ID and password. If you intend to use the operator sign on security, you will need these to gain access to Station displays.

2.3 Process startup supplement

You may want to consider supplementing this guide with the unique startup and shutdown routines that have been developed for your process. These routines may involve initiating process actions through standard and/or custom displays in the Station application.

2.4 Getting Started

We assume that you have completed the initial startup and the Experion system is up and running. This means a configuration is loaded in the Control Processor Module (CPM) and you can monitor operation through the Monitoring tree in Control Builder (CB) or a display in Station.

For reference, “Initial Start Up of C200 Controller and I/O Chassis” on page 56 in *Appendix A* includes data about initially applying power to a C200 Controller and/or an I/O chassis. You may want to review this data before restarting a Controller or I/O chassis after a hardware component failure.

2.4.1 Reviewing Control Builder interaction considerations

Keep the following considerations in mind as you interact with the Experion Control Builder application.

- Only run 2 CB instances when you are connected to 2 different servers.
- Do not perform **multiple** loads/delete/upload/import/export/QVCS checkin or checkout functions from CBs on the same node.
- Open no more than five charts in Control Builder at a time.
- Only activate Input/Output Modules (IOMs), if they are present in a chassis.
- You cannot rename standalone blocks such as a CPM, or container blocks such as a Control Module (CM) after it has been loaded.
- You cannot delete a loaded standalone block, container block, or I/O component block from the Project tree until it is deleted from the Loaded/Monitoring tree.
- While a load operation is in progress, all other CB functionality is inhibited.
- You can only assign IOMs, CMs, SCMs, or devices to an Execution Environment when no charts are open.

2.4.2 Multiple User Considerations

The following table summarizes some operational limits relative to using Control Builder (CB) and Enterprise Model Builder (EMB) simultaneously on connected clients.

Consideration	Control Builder Limit	Enterprise Model Builder Limit
Maximum clients connected to single server	12 (for FTE systems) 4 (for ControlNet Systems)	4
	See **Cautions** below	
Remote Access Service (RAS) support	Not Supported	Not Supported
Dial-up Networking support	Not Supported	Not Supported
Windows Terminal Service access	Supported	Supported
Minimum continuously available Network Bandwidth required for each multiple-user CB Client.	128 KB	128 KB
Maximum instances running simultaneously on a single workstation	1 CB per Experion server, 1EMB	
	See **Constraints** on use below	

CAUTION

Using multiple CB clients to load to multiple controllers simultaneously actually increases the overall load time. Do not employ this technique as a way to save time in loading a controller with contents.

CAUTION

Database operations (load, delete, upload, update, etc.) initiated from a CB or EMB client will affect the performance of applications that run on the backup server. Remote CB clients will also be affected by these operations. For instance, a CB client will experience reduced performance if another CB client is also connected to the same server and has requested a large database operation.

CAUTION

The following large database operations should only be performed by one CB at a time on nodes where more than one CB instance is running.

- Load
- Delete
- Upload
- Import/Export
- QVCS checkin/checkout

Constraints on multi-user Control Builder/Enterprise Model Builder use

- Remote building operations may be slower than when configuring on an ERDB server.
- Remote loading (to/from controller) may be slower than when loading from a computer that has a ControlNet connection.
- A CB client may not be upgraded to a PS Process Server or Engineering Workstation, or a CB Direct Connect Client.
- Modem support is limited by the NT Workstation Remote Access Server functionality.
- The first instance of Control Builder operating on a system object will have exclusive read/write access to the object. Additional clients will have read access only to that object.
- It is possible to run more than one instance of Control Builder on a single workstation node. This should only be done when each Control Builder is connected to a different server's database (ERDB) in the system.

2.4.3 Control Builder license influence on EMB usage

The following table summarizes the interaction between licensed Control Builders (CB) and Enterprise Model Builder (EMB) usage.

Number of Control Builders Licensed	Maximum Number of Enterprise Model Builders Allowed
1	**1**
2	**2**
3	**3**
4	**4**
5	**4**
6	**4**
7	**4**
8	**4**
9	**4**
10	**4**
11	**4**
12	**4**

2.4.4 EMB capacity limits

The following table lists some capacity limits for the Enterprise Model Builder application.

Function	Limit
Maximum number of assets defined in a system	4000
Maximum number of assignable entities	1000
Maximum nesting depth for asset hierarchies	10
Maximum number of children per asset	No limit (up to the 4000 total assets)
Maximum number of alarm groups defined in a system	5000
Maximum number of children per alarm group	500
Maximum nesting depth for alarm group hierarchies	5

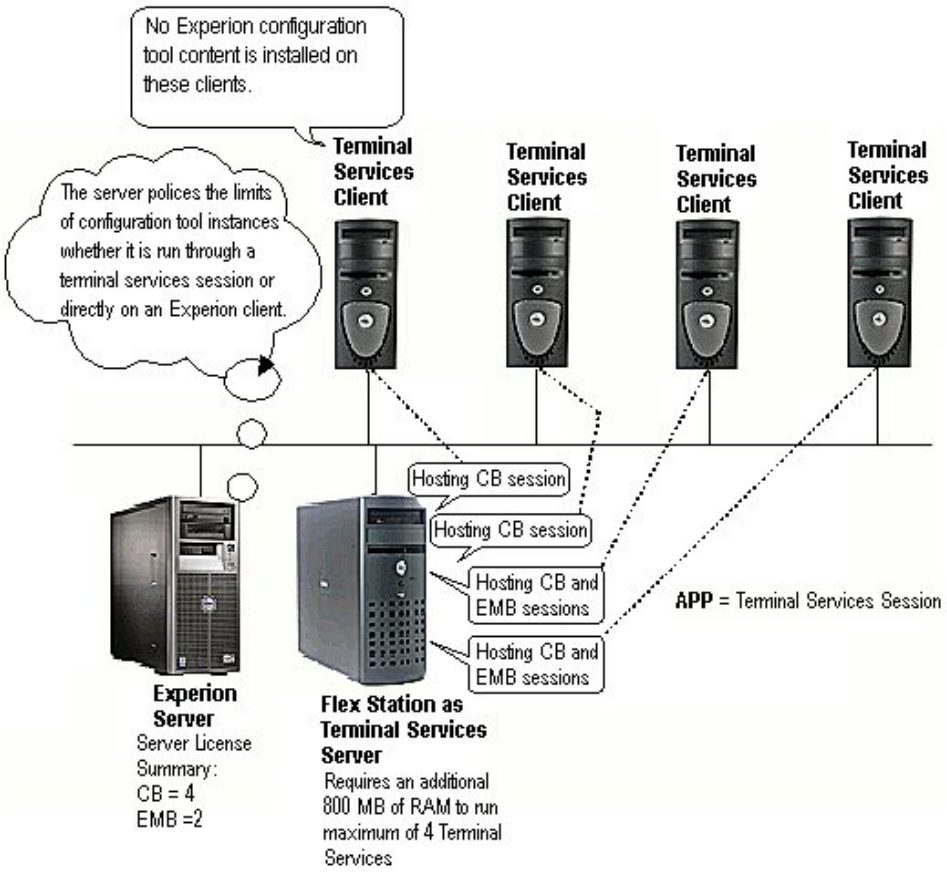
2.4.5 Terminal Services capability and configuration rules

You can use terminal services connections to an Experion client host to remotely configure or monitor an Experion system. Be aware that this places additional load on the node that hosts the sessions. You should use terminal services only if you understand the resource loading issues described in the example below. Observe the following configuration rules.

- Only host terminal services on nodes that are normally used to host configuration tools applications (Flex Station, Console Station).
- Be sure the host node memory can provide 200 MB of RAM for each terminal services session that is expected to run on that node.
- Any one client node can host a maximum of 4 terminal services sessions.
- Any single node can run a maximum of 4 Control Builder sessions through terminal services.
- Any single node can run a maximum of 2 Enterprise Model Builder sessions.
- Configuration tools running directly on the hosting client reduces the number of tools that can be run through the terminal services connection. For example, if a CB session is running on the host client, then only 3 additional CB instances could be initiated through terminal services sessions.

2.4.6 Terminal Services example

The following illustration shows a Flex Station as a terminal services server running a maximum of 4 terminal services sessions.



2.4.7 Terminal Services Restrictions when using multiple sessions per node

When you run multiple sessions on the same terminal server node, the applications used in each session may share a common resource on the node hosting the sessions. The following table identifies some configuration operations and the potential for resource conflicts:

Application / Operation	Potential Conflict
Qualification and Version Control System	A conflict will occur if dual checkin operations are attempted. This function is **not recommended** for use with Terminal Services.
Control Builder Import/Export	There is a potential conflict if the same target location is used by two simultaneous users exporting files. **Import/Export should only be performed by one terminal services user at a time**.
Control Builder Load/Upload	Server point building can fail if simultaneous loads are performed**. Loading/ Uploading should only be performed by one terminal services user at a time.**

2.4.8 Considering input/output (I/O) behavior

See “Input/Output Behavior Analysis” on page 62 in “Appendix B” on page 61 for an analysis of chassis I/O behavior for some operating scenarios that are unique to the Experion system's partitioned architecture. You may want to review this section to determine the possible impact, a given operator action may have on chassis I/O during a startup procedure.

2.5 Conventions

The following table summarizes the terms and type representation conventions used in this guide.

Term/Type Representation	Meaning	Example
click	Click left mouse button once. (Assumes cursor is positioned on object or selection.)	Click the Browse button.
double-click	Click left mouse button twice in quick succession. (Assumes cursor is positioned on object or selection.)	Double click the Station icon.
drag	Press and hold left mouse button while dragging cursor to new screen location and then release the button. (Assumes cursor is positioned on object or selection to be moved.)	Drag the PID function block onto the Control Drawing.
right-click	Click right mouse button once. (Assumes cursor is positioned on object or selection.)	Right-click the AND function block.
<Del>	Keys to be pressed are shown in angle brackets.	Press <F1> to view the online Help.
File->New	Shows menu selection as menu name followed by menu selection.	Click **File-** > **New** to start new drawing.
>D:\setup.exe<	Data to be keyed in at prompt or in an entry field.	Key in this path location >D: \setup.exe<.

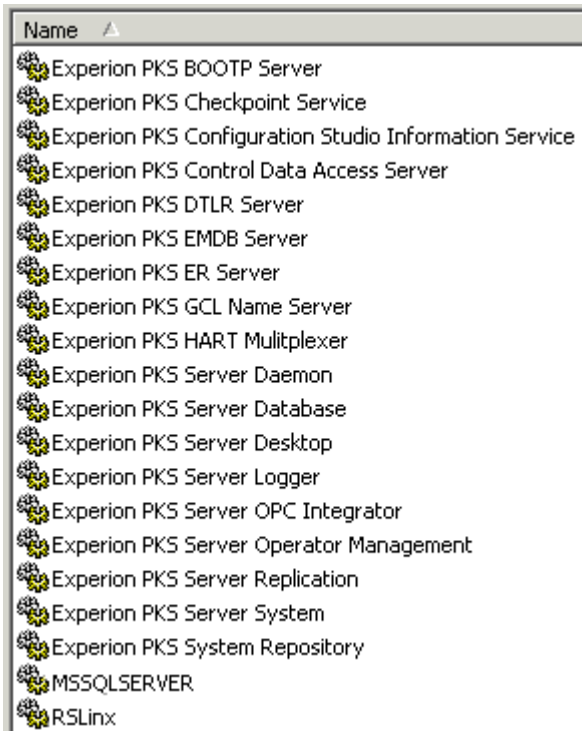
3 System Startup/Restart

Related topics

“Restarting an Experion Service or Application” on page 18
“Restarting the System after a Power Interruption or CPM Shutdown” on page 28
“Restarting System after a Component Failure” on page 37

3.1 Restarting an Experion Service or Application

For improved operating efficiency, the Experion system integrates the following functions into your computer as system services. The following list shows all possible services that may be included on your computer and many are automatically started when you reboot your computer.



The list above shows that both **BOOTP Server** and **RSLinx** services are included on the computer. The **BOOTP Server** supports a Fault Tolerant Ethernet supervisory network and **RSLinx** supports a ControlNet supervisory network. While these two networks **cannot** be used simultaneously on an Experion Server to communicate to C200 Controllers in a network, the services are compatible. The **RSLinx** service can run on a Server using the Fault Tolerant Ethernet supervisory network, but the **RSLinx** service is not required.

3.1.1 About Experion applications

The Experion R210 system or greater includes the Configuration Studio, which provides a central location from which you can configure your Experion system. The individual tools required to configure parts of your system are launched from Configuration Studio. These tools include the following applications.

- Control Builder
- Display Builder
- HMIWeb Display Builder
- Quick Builder
- Station

3.1.2 About crashes that halt the computer services or applications

We use the term 'crash ' to identify a computer service or application that has unexpectedly quit working. A common indication of a crash is a frozen cursor or no response from an initiated task. In most cases, you can recover from a crash by shutting down and restarting the application.

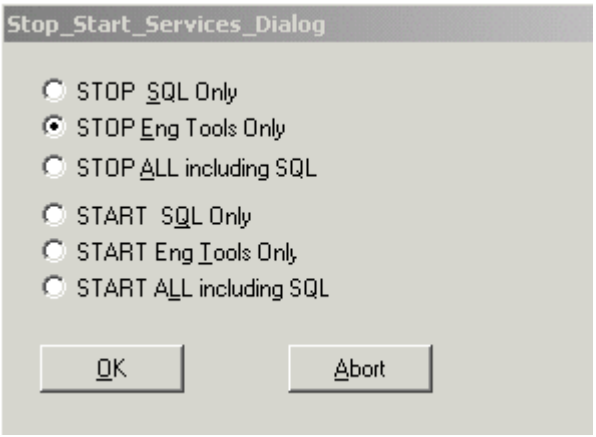
If the **RSLinx** service crashes, ensure that the **Control Data Access Server** service is also stopped. Then, restart the **Control Data Access Server** service, which automatically restarts the **RSLinx** service.

3.1.3 Using Engineering Tools control panel to start or stop services

In Experion R210 system or greater, you can use the Engineering Tools services control panel as outlined below to start or stop Experion services.

1 Click **Start** button in the task bar. Click **Programs** > **Honeywell Experion PKS** > **Engineering Tools** > **Experion PKS Start-Stop Services Control Panel.**

2 On the **Start_Stop_Services_Dialog**, select the start or stop action you want to initiate.



3 Click the **OK** button.

4 Depending upon which action you selected, a prompt dialog may appear asking if you want to also start or stop another service. Click the **Yes** or **No** button to acknowledge the prompt and initiate the selected action.

5 You can monitor the progress of the start or stop action through the **Start** or **Stop Services Application** dialog.

6 The action is completed when the dialog closes.

3.1.4 Restarting a service through Control Panel services

There is some interaction between services when starting or stopping them through the Windows Control Panel. The following table lists some possible interactions for reference.

If You . . .	Then . . .
Stop **System Repository**,	**Control Data Access Server** also stops.
Stop **ER Server**,	**Control Data Access Server** and **System Repository** also stop.
Stop **RSLinx**,	**Control Data Access Server** and **DTLR Server** also stop.
Stop **GCL Name Server**,	**Control Data Access Server**, **System Repository**, **ER Server**, **DTLR Server** and more also stop.
Start **Control Data Access Server**,	**System Repository** and **RSLinx** also start.

The **ER Server** must be started before you can start the **Control Data Access Server** and/or **System Repository**. The **Control Data Access Server** must be shutdown before you can stop the **RSLinx** service through its Service Control Panel.

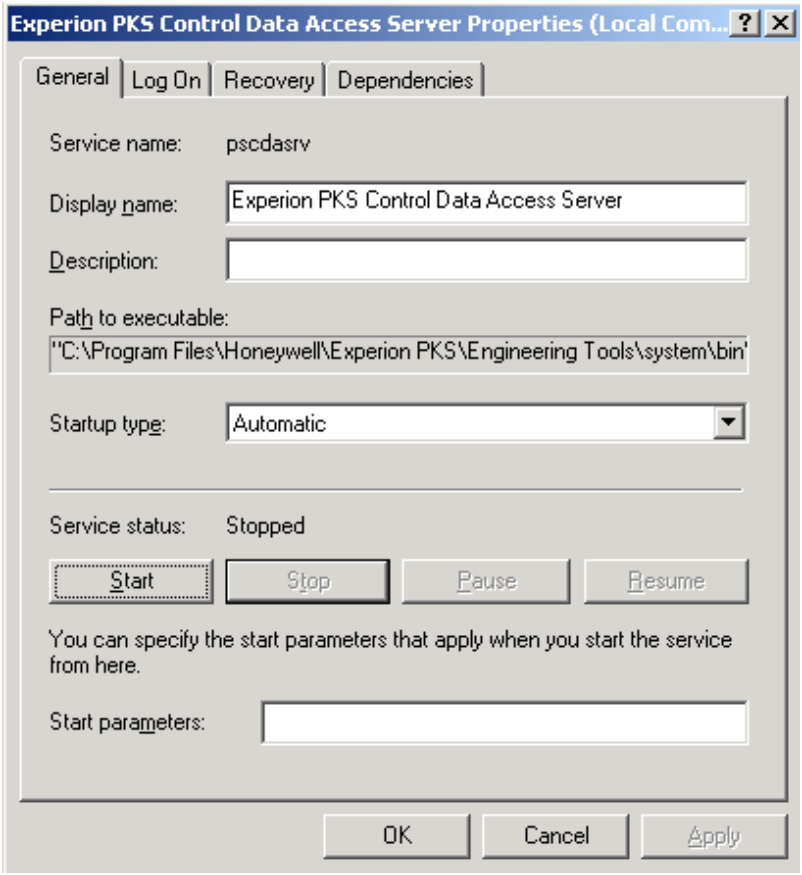
While the following procedure shows the specific steps for restarting the **Experion PKS Control Data Access Server**, it can easily be adapted to apply for any other service.

Tip
The easiest way to restart an Experion system after a crash or shutdown is to reboot the computer on which the crash occurred. If you cannot reboot the computer, refer to the appropriate procedure in this document to restart the given service or application.

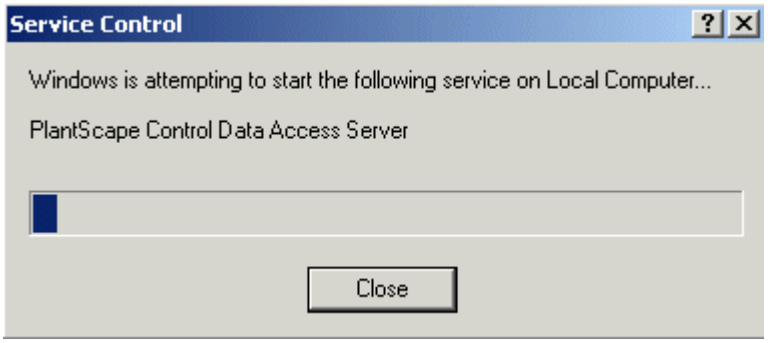
The following procedure is provided for optional reference only. Since, in the Experion R210 system or greater, you can use the Experion PKS Start-Stop Services Control Panel to stop all services, as noted in “Using Engineering Tools control panel to start or stop services” on page 19 above.

To restart a service through Control Panel services

1. Click the **Start** button in the task bar. Click **Settings-** > **Control Panel**.
   Calls up **Control Panel** dialog.
2. Double-click **Administrative Tools** icon.
   Calls up **Administrative Tools** dialog.
3. Double-click **Services** icon.
   Calls up **Services** dialog.
4. Scroll **Detail** pane to locate **Experion Control Data Access Server** service and double-click it.
   Calls up properties dialog for service.



5. Click **Start** button.
   Initiates restart and opens **Service Control** dialog to track progress.



6 After service starts, click **OK** button.
Closes properties dialog.

7 Confirm that the status of the **Experion System Repository**, **ER Server**, **DTLR Server**, **GCL Name Server**, and the **RSLinx** services is Started. For system with Fault Tolerant Ethernet supervisory network, be sure **BOOTP Server** service is started.
For each of these services that is not started, repeat Steps 4 to 6 to select and start it. Otherwise, go to Step 8.

8 Click the close button at top right corner of dialog.
Closes dialog.

9 Click **File-** > **Close**.
Closes **Administrative Tools** dialog.

10 Go to the **Alarm Summary** display in Station.
Acknowledge any CDA communication alarms.

11 This completes the procedure.

3.1.5 Restarting ER Replication that does not self recover

Prerequisites

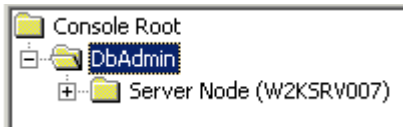
- You have launched the Configuration Studio and logged on with amble security level to manipulate control strategies.

Use the following procedure to attempt to restart **Experion ER Replication** service that fails to restart using the previous procedure.

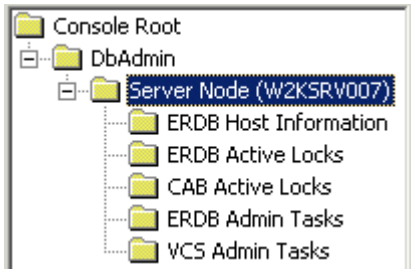
To restart ER replication that does not self recover

1 On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Administer the control strategy database**.
Calls up the **DB Admin** utility.

2 Click plus sign for node icon.



Expands directory.



3 Click **ERDB Active Locks** icon.
Any current locks appear in view pane.

4 On **Tools** menu, Click **Clear All Locks**.
Initiates action to clear all current locks.

5 Click **Start** button in the task bar. Click **Programs** > **Honeywell Experion PKS** > **Engineering Tools** > **Experion PKS Start-Stop Services Control Panel**.
Calls up **Start_Stop_Services_Dialog**.

6 Select **Stop SQL Only** function and click the **OK** button.
Shutdowns SQL Server services. This may take several seconds.

7 Repeat Step 7. Select **Start SQL Only** function and click the **OK** button.
Starts SQL Server services. This may take several seconds.

8 See the previous procedure to check if **ER Replication** service has started.
If ER Replication service has started, go to Step 13.

If ER Replication service has not started, go to Next Step.

9 In DB Admin utility, click **Admin Tasks** icon.
Opens Task pad for ERDB administration in view pane.

10 Click **Disable Replication** icon.
Prompt asks if you want to continue.

11 Click **Yes** button.
Stops replication jobs and deletes configured replicationsetup.

12 Wait for prompt to announce successful completion of action. Click **OK** button.
Acknowledges prompt.

13 Stop all Experion services through **Eng Tools Service Control Panel**. See previous procedure for access details.
Stops Engineering Tools Services.

14 Click the **Recover Secondary Database** icon.
Prompt asks if you want to continue.

15 Click the **Yes** button.
Initiates function to backup the Primary database and use it to restore the Secondary database.

16 Wait for prompt to announce the successful completion of the action. Click the **OK** button.
Acknowledges prompt.

17 Start all Experion services through **Eng Tools Service Control Panel**. See previous procedure for access details.
Starts Engineering Tools services.

18 Click the **Enable Replication** icon.
Initiates replication of the database from the Primary to the Secondary. It sets up and starts the SQL server jobs to do the replication.

19 Wait for prompt to announce the successful completion of this operation. Click the **OK** button.
Acknowledges prompt.

20 Click **Console-** > **Exit** to close dbadmin window and return to normal operation.
This completes the procedure.

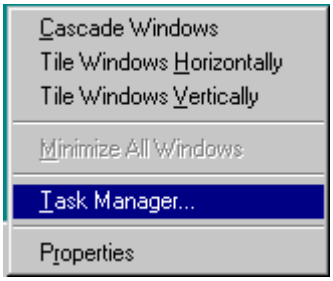
3.1.6 Restarting Control Builder

Prerequisites

- You have launched the Configuration Studio and logged on with amble security level to manipulate control strategies.

To start up the Control Builder application after a crash

1 If Control Builder is still open, right-click in the task bar to open the shortcut menu and click **Task Manager** to call up the **Windows Task Manager** dialog box.

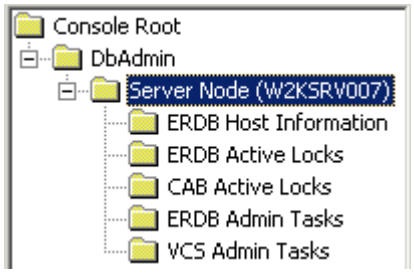


2 Click **Control Builder** in the **Task** list under the **Applications** tab.

3 Click the **End Task** button. If applicable, Click **End Task** button in popup dialog box to stop CB. Click **File-** > **Exit Task Manager** to close the Task Manager function.

4 On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Administer the control strategy database** to start the DbAdmin utility, which will allow you to clear any database locks that have been created.

5 Open the folders in the tree pane of the **DBADMIN** window.



6 Click the **ERDB Active Locks** folder to display locks in the view pane. On **Tools menu**, click **Refresh Locks** to update the view.

7 On **Tools**-menu, click **Clear All Locks** to clear all database locks.

8 On **Console** menu, click **Exit** to close the DbAdmin function.

9 On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Configure process control strategy** to start the Control Builder application.

10 Resume operation.

3.1.7 Restarting Station

Use the following procedure to start up Station after a crash.

1 Click the **Start** button in the task bar. Click **Programs-** > **Honeywell Experion PKS-** > **Station** to start the Station application.

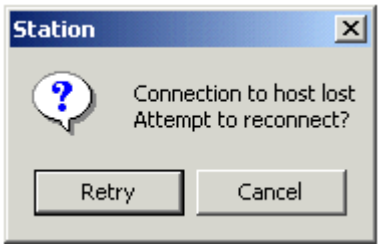
2 After the connection is restored, Station returns to the display that was active when it crashed.

3 Resume operation.

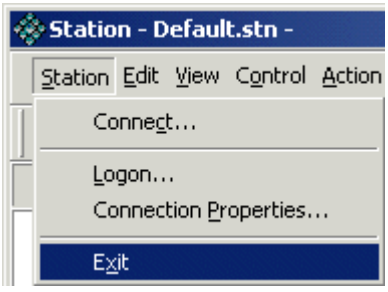
3.1.8 Restarting Experion Server

Use the following procedure to start up the Experion Server after a crash.

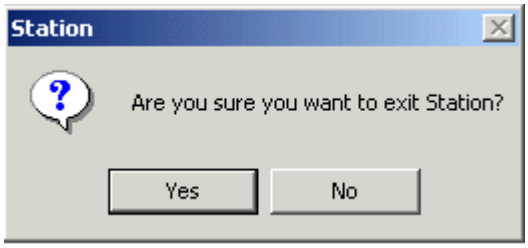
1 If the Experion Server stops running, a message in a dialog box tells you that Station has lost the connection to the host and asks if you want to try to reconnect. Click the Cancel button.



2 Click **Station-** > **Exit** to close Station.



Click the Yes button to confirm the exit request.



3 Click the Start button in the task bar. Click **Programs-** > **Honeywell Experion PKS-** > **Start-Stop Experion Server** to open the Experion Server dialog box.

4 Click the button for System Running or click the Start button. Click the Yes button to confirm the action. Wait for the Server to change state and click the close button ✕ to close the dialog box.

Non-Full Mode Option

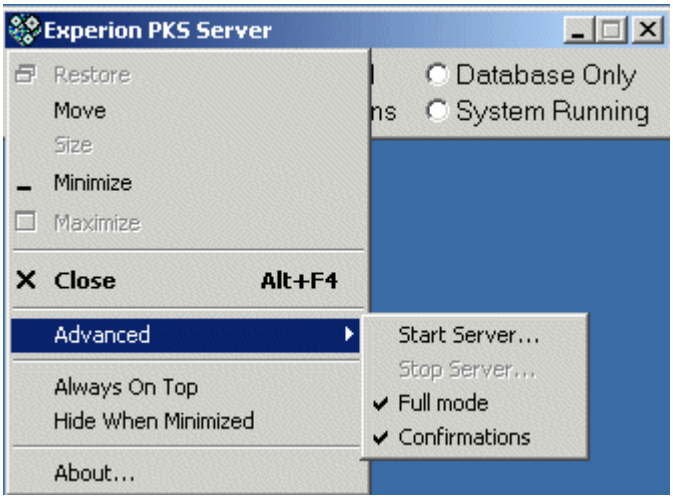
OR

Full Mode Option

Tip

- For redundant servers in System Running state, the server state (Primary or Backup) appears in parenthesis in the title bar of the dialog, as shown in the following illustration.

- You can select whether you want the Full Mode option or the Non-Full Mode option of the Start/Stop dialog box as follows.
  - At the left of Experion Server in the header of the dialog box, click the icon to open the shortcut menu.



  - Click **Advanced-** > **Full Mode** to select or unselect the Full Mode option. (A check mark means the Full Mode option is currently selected.)

5 Click the Start button in the task bar. Click **Programs-** > **Experion PKS Server-** > **Station** to start the Station application.

6 If this server is part of a redundant Server system and another Server is the primary, synchronize with the primary. From Station, click **View -** > **System Status -** > **Server Redundancy** to call up the Redundancy display. Click the Synchronize button to synch the server databases.

7 Resume operation. Confirm the status for the monitored CEE and its assigned blocks in Control Builder.

3.1.9 Restarting Console Station

Use the following procedure to start a Console Station after a crash.

1 Click the Start button in the task bar. Click **Programs-** > **Honeywell Experion PKS -** > **Console Station-** > **Start-Stop Experion Console Station.**

The Start-stop dialog box displays in either Simple or Full mode.

2 Click the button for System Running or click the Start button. Click the Yes button to confirm the action. Wait for the Server to change state and click the close button ☒ to close the dialog box.

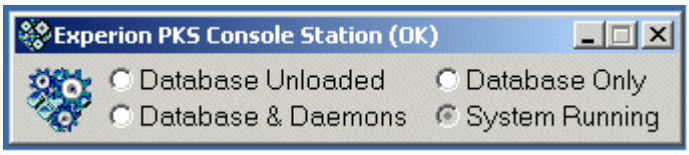
Non-Full Mode Option

OR

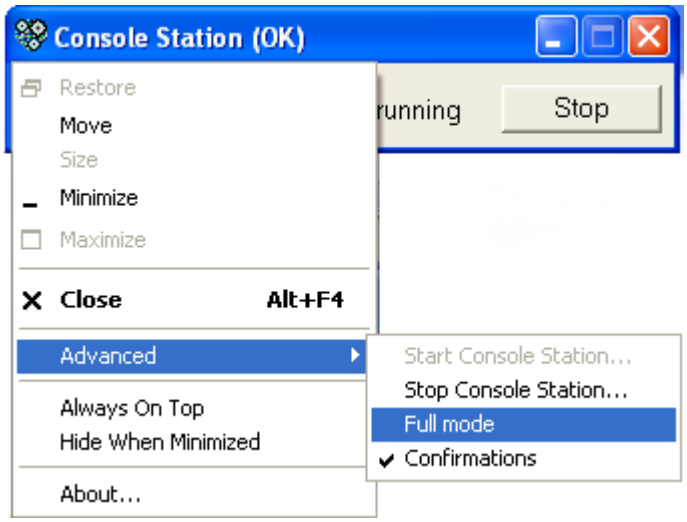
Full Mode Option

Tip

- In a System Running state, the node status of the Console Station appears in parenthesis in the title bar of the dialog, as shown in the following illustration.



- You can select whether you want the Full Mode option or the Non-Full Mode option of the Start/Stop dialog box as follows.
  - At the left of Experion Server in the header of the dialog box, click the icon to open the shortcut menu.



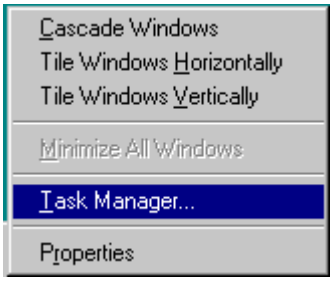
  - Click **Advanced** > **Full Mode** to select or unselect the Full Mode option. (A check mark means the Full Mode option is currently selected.)

3 Click the Start button in the task bar. Click **Programs** > **Experion PKS Console Station** > **Station** to start the Station application.

3.1.10 Restarting Display Builder or HMIWeb Display Builder

Use the following procedure to start up the Display or HMIWeb Display Builder application after a crash.

1 If Display or HMIWeb Display Builder is still open, right-click in the task bar to open the popup menu and click Task Manager to call up the Windows Task Manager dialog box.



2 Click Display or HMIWeb Display Builder in the Task list under the Applications tab.

3 Click the End Task button. If applicable, click the End Task button in the popup dialog box to stop Display or HMIWeb Display Builder. Click **File-** > **Exit** Task Manager to close the Task Manager function.

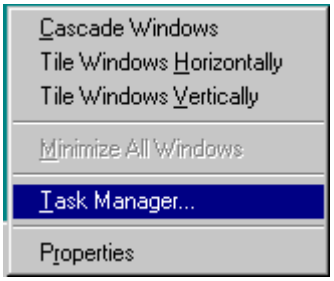
4 Click the Start button in the task bar. Click **Programs-** > **Honeywell Experion PKS-** > **Display or HMIWeb Display Builder** to start the Display or HMIWeb Display Builder application.

5 Resume operation.

3.1.11 Restarting Quick Builder

Use the following procedure to start up the Quick Builder application after a crash.

1 If Quick Builder is still open, right-click in the task bar to open the popup menu, click Task Manager to call up the Windows Task Manager dialog box.



2 Click Quick Builder in the Task list under the Applications tab.

3 Click the End Task button. If applicable, click the End Task button in the dialog box to stop Quick Builder. Click **File-** > **Exit** Task Manager to close the Task Manager function.

4 Return to Configuration Studio and restart the task you were working on when Quick Builder crashed.

5 Resume operation.

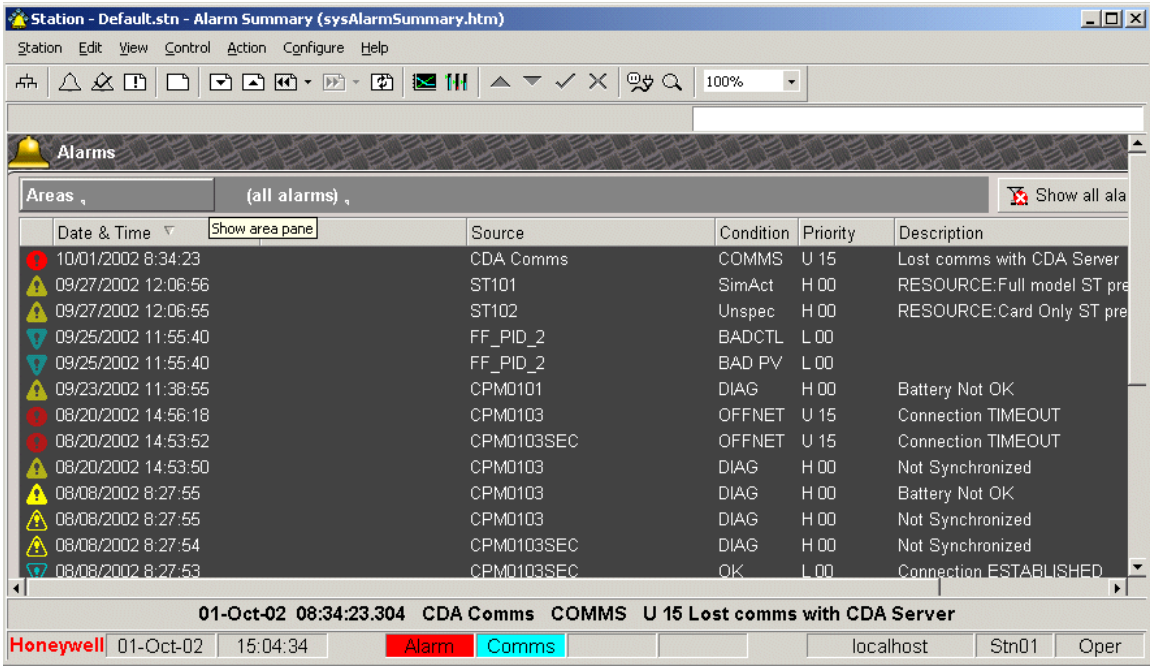
3.2 Restarting the System after a Power Interruption or CPM Shutdown

3.2.1 Starting up Experion Server after a power interruption

Attention

In systems with a redundant Experion Server scheme, a power interruption to the Primary Server (SERVERA node) initiates an automatic switchover to the Secondary Server (SERVERB node). Once power is restored to the Primary Server and it is restarted, you must manually switch over to restore this Server as the Primary one. The following procedure is generic to both non-redundant and redundant Server schemes, but it does not include redundant specific switchover and database replication actions.

1. Be sure power switches on monitor and server are turned ON. Computer reboots to Windows environment. Press <**Ctrl**>+<**Alt**>+<**Delete**> to call up the logon dialog box. Key in your password to start the Windows session.
2. All Experion services plus the **MSSQLSERVER** service start automatically when you reboot your computer.
3. Click the **Start** button in task bar. Click **Programs-** > **Honeywell Experion PKS Configuration Studio** to open this function.
4. Complete the Login with amble security level to manipulate control strategies.
5. Select server and click the **Connect** button.
6. On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Administer the control strategy database** to call up the DbAdmin utility.
7. Open the folders in the tree pane of the **DBADMIN** window.
8. Click the **ERDB Active Locks** folder to display locks in the view pane. On Tools menu, click **Refresh Locks** to update the view.
9. On **Tools** menu, click **Clear All Locks** to clear all database locks.
10. On **Console** menu, click **Exit** to close the DbAdmin function.
11. If required, use the Windows Date/Time Control Panel function to set the 'wall clock ' time.
12. On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Configure process control strategy** to start the Control Builder application.
13. Click the **Start** button in the task bar. Click **Programs** > **Honeywell Experion PKS** > **Server** > **Station** to start the Station application.
14. Acknowledge 'Lost comms with CDA Server ' alarm and any other alarms as required.



15 Repeat any operation that was in progress when the power failed.

3.2.2 Starting up CPM after a power interruption

This procedure assumes that the CPM was in RUN when the power was interrupted.

Attention

If the CPM is located in a Redundant Chassis Pair (RCP), a power interruption to C200 Controller chassis A with the redundancy state of Primary could initiate a switchover of control to C200 Controller Chassis B, depending on its current Secondary readiness state as shown in Table 1.

While the graphics in the following procedure are specific to a non-redundant C200 CPM, they still represent the general indications for a C200 CPM in an RCP. You may also need to add a Step to manually initiate the synchronization of the Secondary after power is restored and initiate switchover to transition Secondary to Primary after a redundant CPM is restarted, if required.

CAUTION

We assume that you are using separate power sources for the Controllers in the Redundant Chassis Pair (RCP). You must always turn OFF power to the Secondary chassis first and then the Primary chassis to avoid a switchover when powering down a RCP. In addition, when restarting an RCP, always turn ON the Primary chassis first and then the Secondary chassis to ensure that the database is maintained in the Primary CPM.

Table 1: Summary of switchover action for RCP power interruption

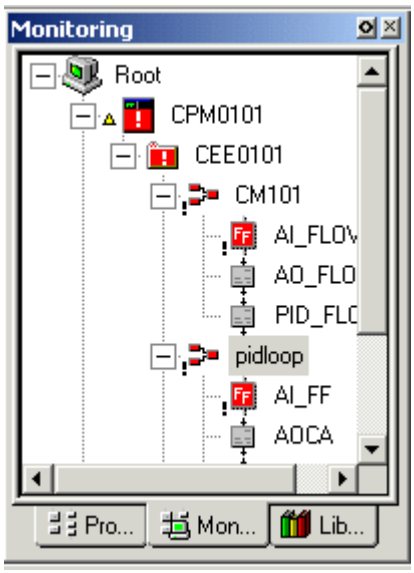
Chassis A -> Chassis B ->	Primary Secondary/ Synchronized	Primary Secondary/ Disqualified	Primary Secondary/ Synchronizing	Primary Secondary/ Standby*
Power removed from Chassis A	Switchover A Failed B Primary	No Switchover A Failed B Disqualified	No Switchover A Failed B Disqualified (Synchronizing Stops)	Switchover A Failed B Primary

Chassis A -> Chassis B ->	Primary Secondary/ Synchronized	Primary Secondary/ Disqualified	Primary Secondary/ Synchronizing	Primary Secondary/ Standby*
Power removed from Chassis B	No Switchover A Primary B Failed	No Switchover A Primary B Failed	No Switchover A Primary B Failed (Synchronizing Stops)	No Switchover A Primary B Failed

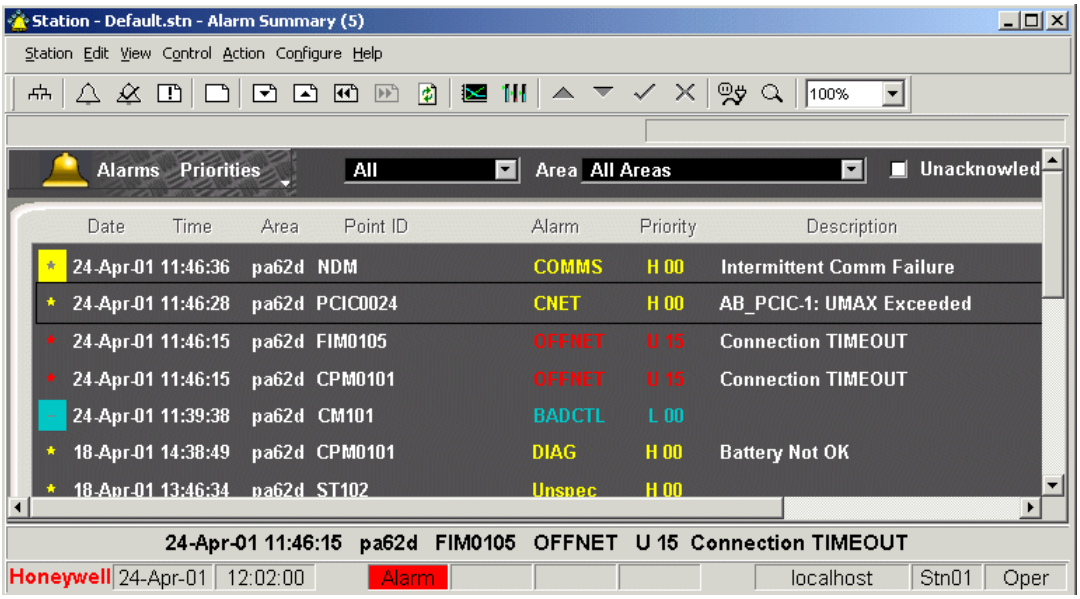
To start a CPM after a power interruption

1 *The Standby mode is not supported at this time.

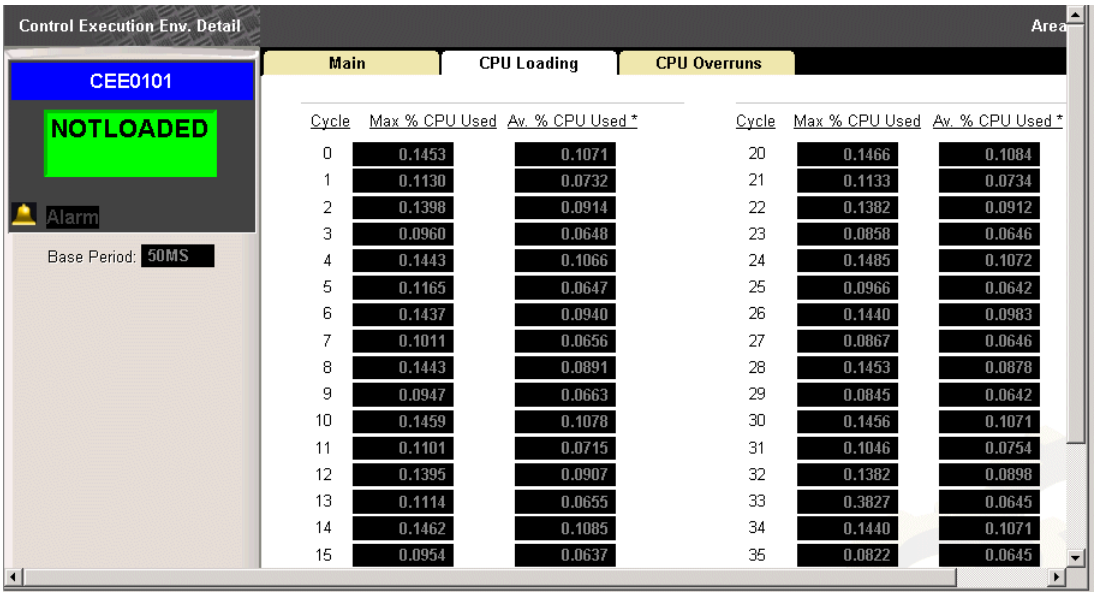
2 Typical indications of CPM power OFF condition include,
CPM icons in CB Monitoring turn Red to show communication error condition.



Station Alarm Summary displays 'OFFNET connection timeout ' alarm.



Data fields in CPU Loading view of CEE display in Station are darkened.



3 Upon restoration of power, the CPM runs its diagnostics and returns to either the IDLE, NODB, or BKUP state. Confirm these conditions through Control Builder and Station displays.
CEE returns in its Idle state - CEE icon is Blue in CB Monitoring tree.

Event Summary in Station may list these entries:

RCVBGN: EE recovery begin

POWRON: Database Retained (Database restored through RAM Retention Start Up function) or Database NOT Retained

IDLE: EE Alarming Disabled (CEE in IDLE state or NOTLDD for Not Loaded state)

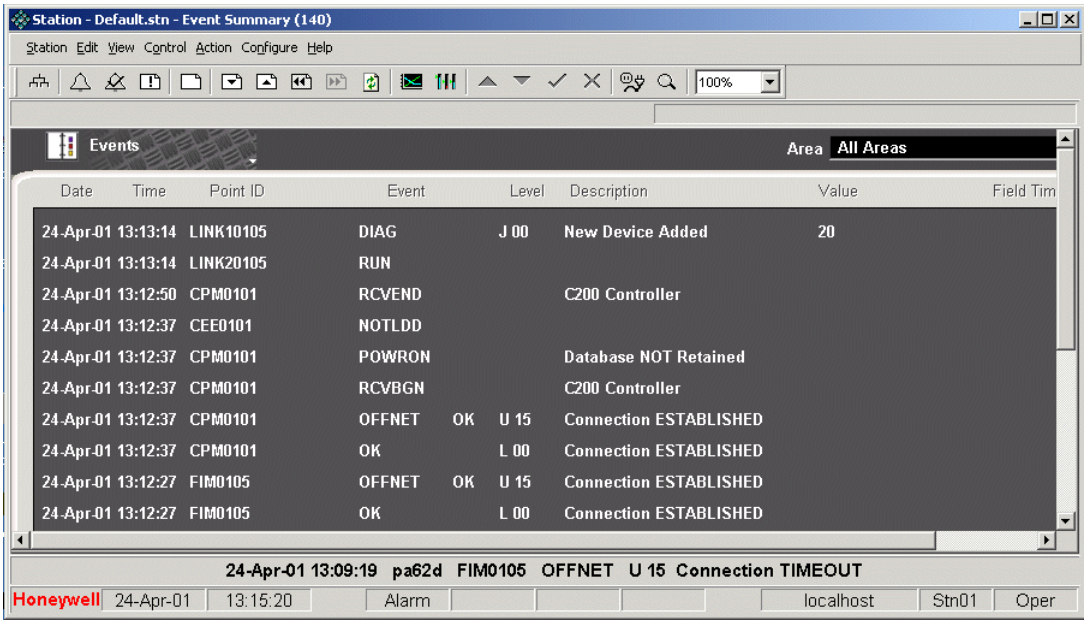
DIAG: Battery Not OK (CPM backup battery not connected or discharged)

DIAG: Not Synchronized (redundant controllers)

INFO: Primary chassis ID (redundant controllers)

RCVEND: EE Recovery End

Main view in CEE detail display in Station shows CEE in IDLE and CPU Loading view includes value in Data fields.

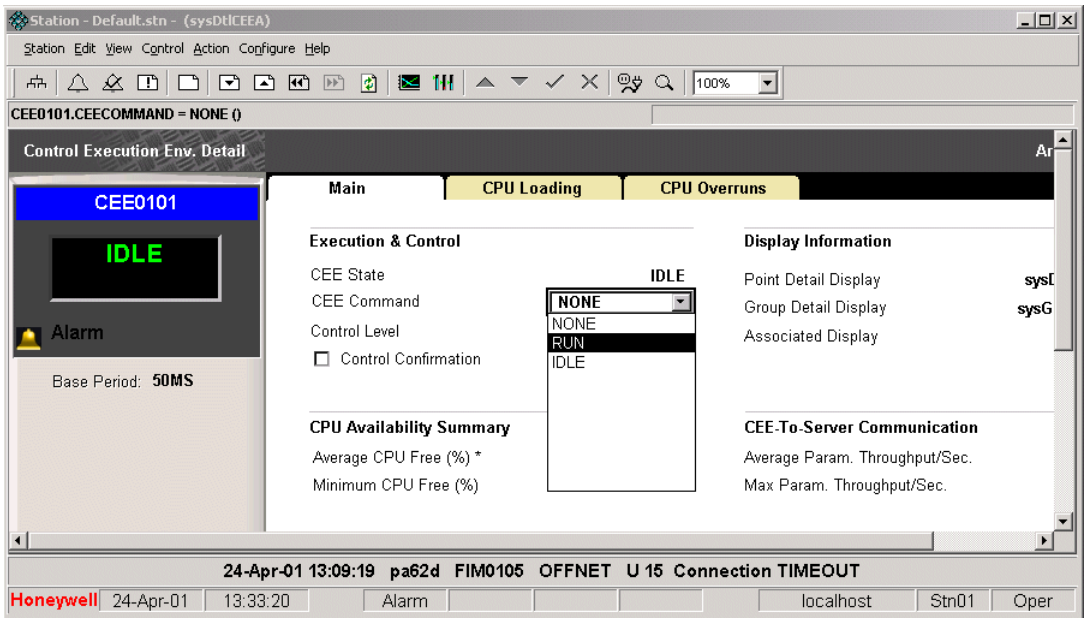


4 If the CPM did not retain its database, its front panel display will indicate NODB or BKUP if CPM is in a redundant controller. In the case of NODB, you can restore the database in the CPM using a valid database checkpoint file.

5 From Control Builder Monitoring Tab, select the CPM to be restored. Select **Controller -** > **Checkpoint -** > **Restore** from Checkpoint.

6 Select the node and checkpoint file to be restored and click the Restore button.

7 Put CEE in RUN state through CPM function block Parameter [Monitoring] form in CB Monitoring tree or through Main view for CEE detail display in Station. This is not applicable for a CPM in a Secondary Controller in a Redundant Chassis Pair.



8 Resume operation.

3.2.3 Initiating CPM shutdown and Restarting CPM after shutdown

Use the following procedure to issue a shutdown command to the CPM and then, restart the CPM.

Attention

If the CPM is located in a Redundant Chassis Pair (RCP), ensure the readiness state of the Secondary is 'Disqualified ' before you begin the following procedure; or, turn off the Secondary Controller chassis.

In Control Builder Monitoring Tree, double-click the RM icon to call up RCP configuration forms, select the Summary tab, and click the Disqualify Secondary button to initiate the command. This prevents a Controller switchover in response to the CPM Shutdown command.

The graphics in the following procedure are specific to a non-redundant C200 CPM. They still represent the general indications for Primary and Secondary CPMs in an RCP.

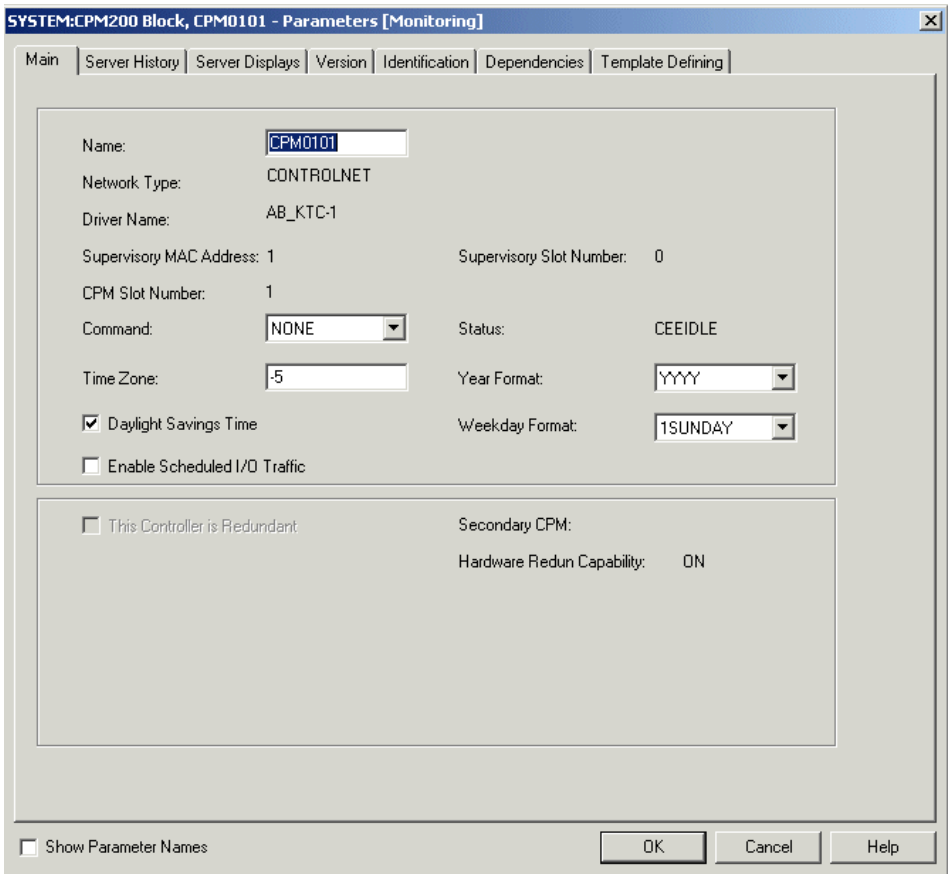
Also, after restarting the redundant CPM, you may find that the Primary and Secondary are not synchronized and that transitioning from Secondary to Primary did not occur. In this case, you may need to add Steps to manually initiate the synchronization of the Secondary and initiate switchover from Secondary to Primary.

To initiate a CPM shutdown and restart the CPM after shutdown

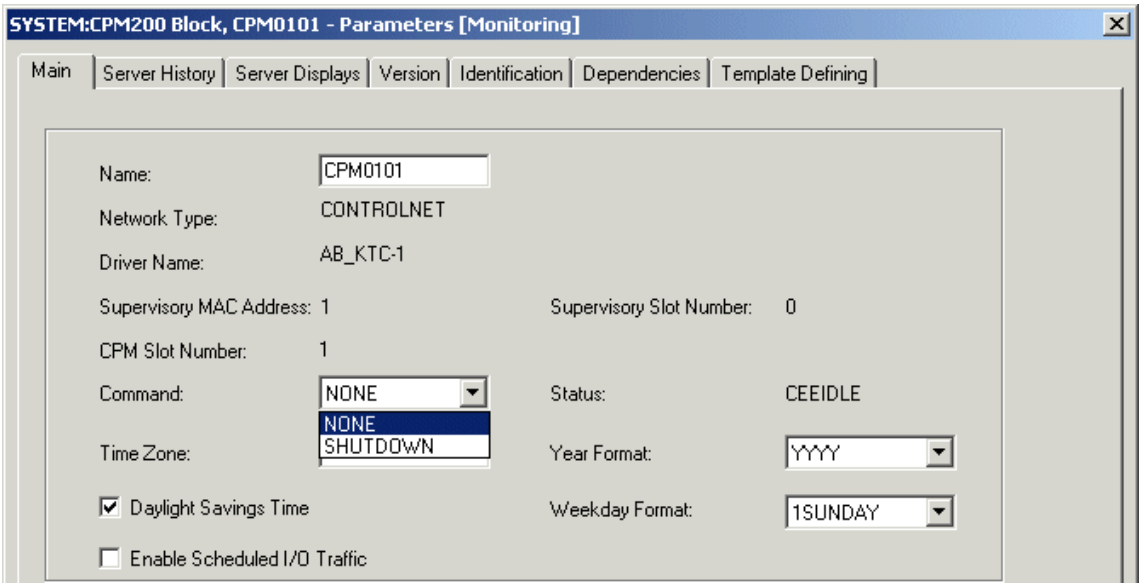
1 Click the plus sign (+) in the tree root path to the CPM icon in the Monitoring tree to expand it. Click the plus sign (+) for the CEE folder to view its contents.

2 Click the CEE folder to select it. Click **Controller-** > **Inactivate-** > **Selected CEE(s)**, IOMs, CMs, and Applicable Function Blocks to inactivate the CEE and all assigned IOMs and CMs. Click the Yes button in the dialog box to confirm the action.

3 Double-click the CPM icon to call up the Parameters [Monitoring] form in Control Builder Monitoring tree.



4 Click button in CPM Command field and click Shutdown selection. Click Yes button to confirm action.



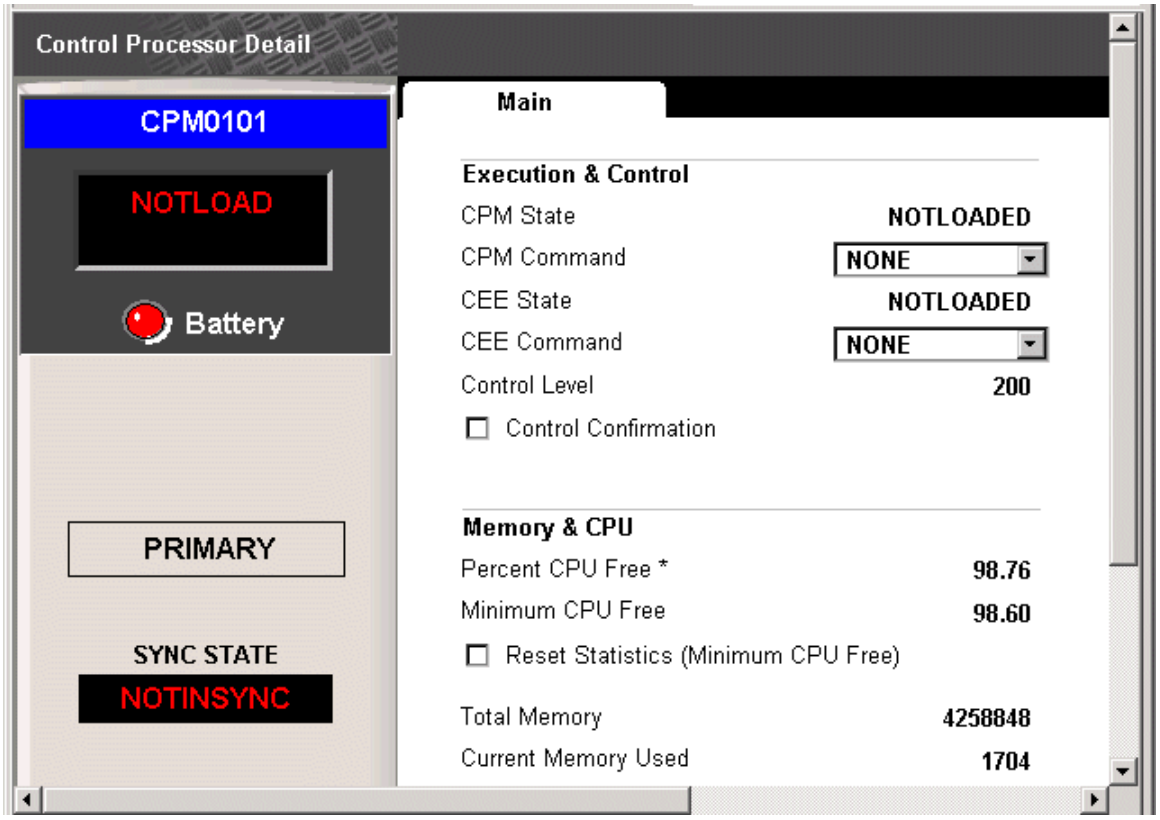
5 CPM runs diagnostics and returns to Ready state. Check that LEDs on the CPM indicate RDY. If monitoring CM, the title bar will indicate diagnostic error Err7007, and icons in Monitoring tree will turn Red. Station display goes into Connection Timeout alarm.

6 Flip toggle switch on chassis power supply to OFF, and then back to ON to cycle power.

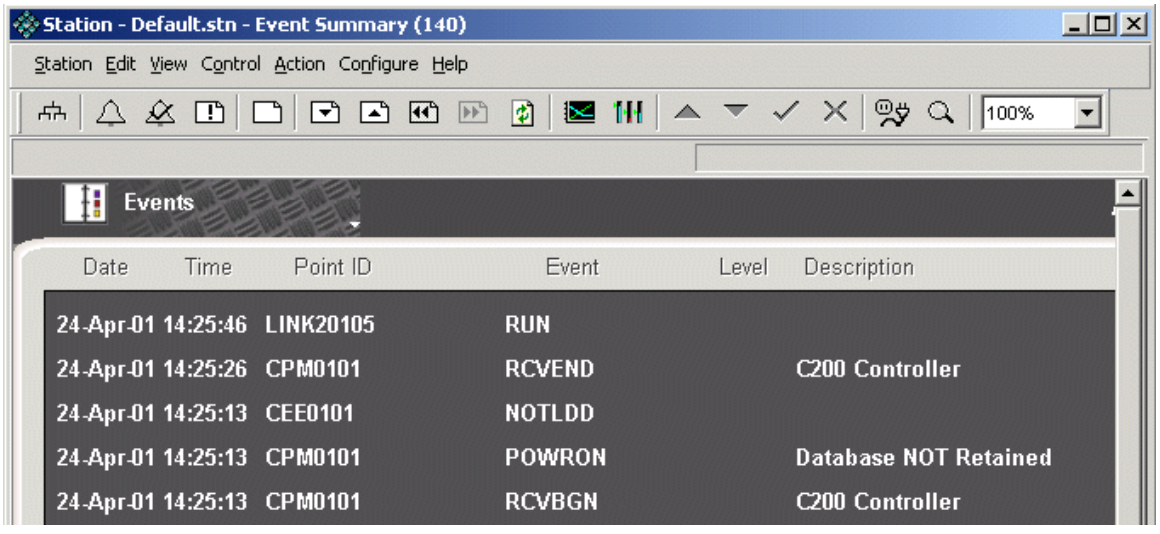
7 CPM runs diagnostics and returns to NODB state as indicated in LEDs on the CPM.

8 CPM icon in CB Monitoring tree turns Yellow to indicate that the CPM is in its NODB state. CEE icon turns Red to show that the database was not retained when CPM was restarted after shutdown. The shutdown action purges the database from the CPM.

In the Station, the CEE detail display shows NOT LOADED.



The Event Summary display includes a 'Database NOT Retained ' event.



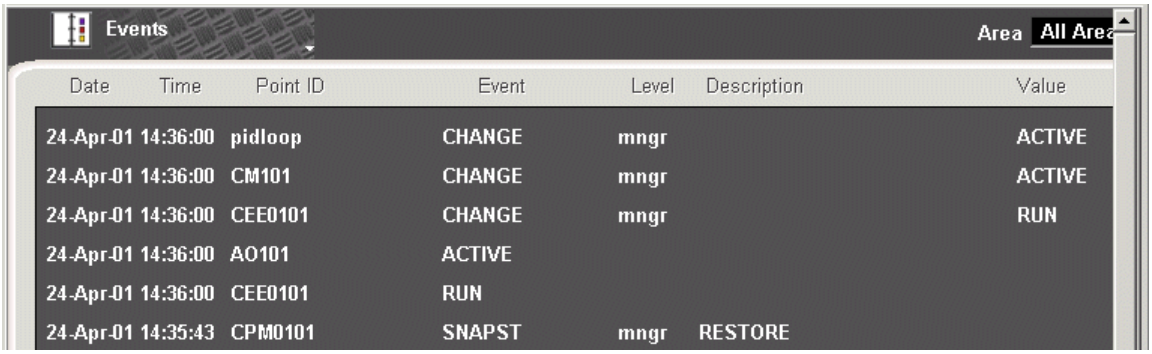
9 Click the CPM icon in the Monitoring tree, and restore the CPM database from snapshot, as described in the previous section, **'Starting up CPM after a power interruption '.**

10 Ensure to close any charts opened in CB.

11 Click the CEE folder to select it. Click **Controller-** > **Activate-** > **Selected CEE(s) IOMs**, CMs and Applicable Function Blocks to activate the CEE and all assigned IOMs and CMs. Click the Yes button in the dialog box to confirm the action.

12 Resume CB monitoring operation.

13 Go to Station. Acknowledge all alarms and check journal of startup events in the Event Summary display.



14 Resume Station operation.

3.3 Restarting System after a Component Failure

3.3.1 Starting up after a component replacement

The following procedure outlines the general actions associated with recovering from any one of these component failures.

- PCIC card
- ControlNet Interface module
- ControlNet cable
- Ethernet Interface module
- Ethernet cable
- IOM module
- Redundancy cable
- Redundancy Module

Attention

A failed PCIC card, ControlNet Interface module, ControlNet cable, Redundancy cable, or Redundancy Module may initiate a switchover, if Primary and Secondary states are as noted in Table 1. The same is true for the removal and/or insertion under power (RIUP) of a module in the Primary chassis. The RIUP of a module in a Secondary chassis results in a Disqualified state. We recommend that you only RIUP a module in the Disqualified Secondary of an RCP.

Please review the Removal and Insertion Under Power (RIUP) Function Guidelines in the *Control Hardware Installation Guide* before you RIUP any module.

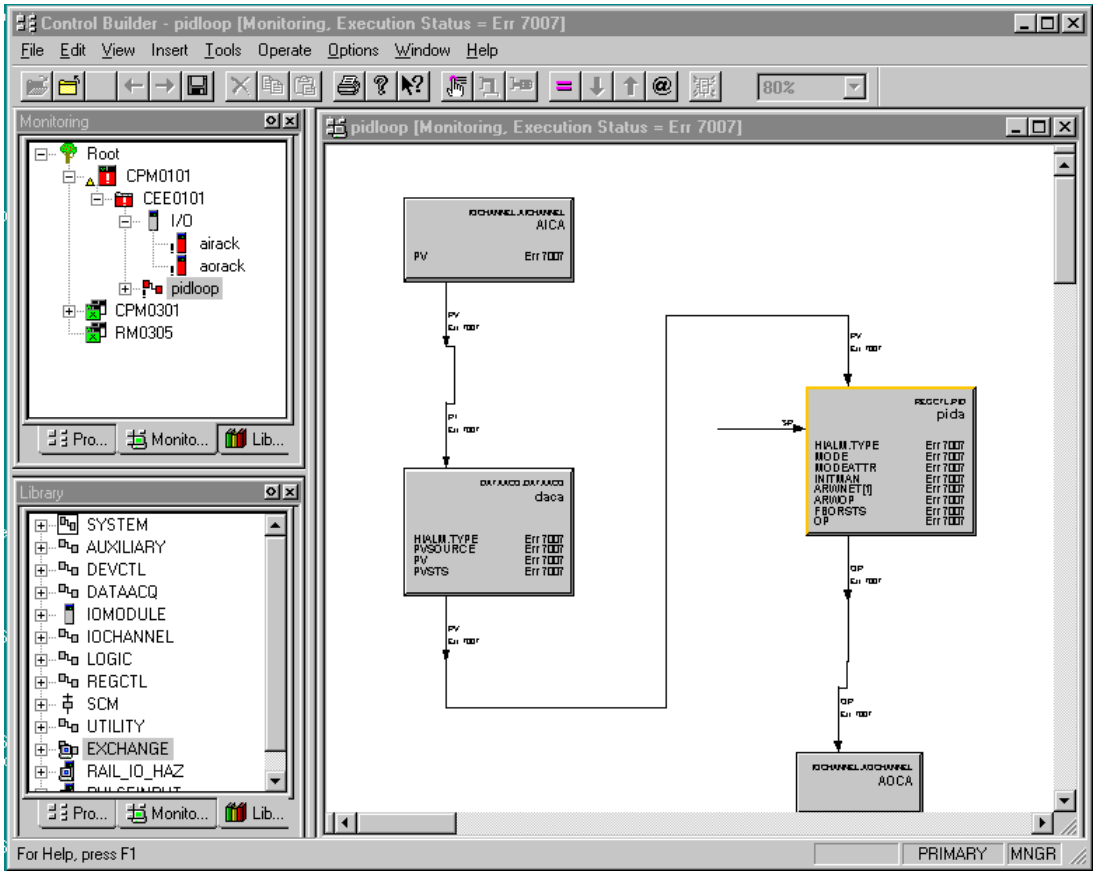
To restart a system after a component replacement

1 This procedure assumes that the failed component is removed and replaced.

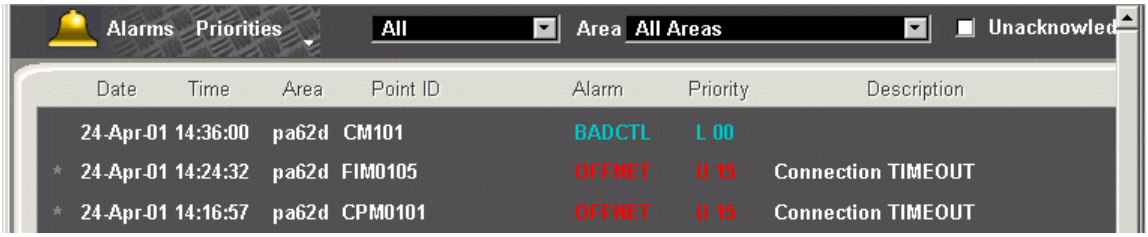
2 Check for these general indications of a failed component.

All icons in Monitoring tree turn Red for general communications failure or only given IOM icon turns Red for failed IOM.

CB and any open chart include diagnostic 'Execution Status = Err 7007 ' in title bar.



Initiates Connection Timeout alarm for general communications failure or Communications Error alarm for given IOM failure. Condition also generates corresponding event entry in the Event Summary display.



Front panel LEDs on C200 Controller modules provide general indication of their 'health '.

3 Once component is replaced and/or fault is repaired, confirm that CB Monitoring and Station display indications return to normal.

4 Acknowledge alarm conditions and check Event Summary display for journal of failure and recovery events.

5 Resume operation.

3.3.2 Checking the version of the installed CPM and loading the personality image

If you replace a Control Processor module, use the following procedure to check the version of the installed CPM and load the personality image, if required. Normally, the factory only loads the boot code into the CPM and the CPM will go into its ALIVE state upon power up. This means you must load the personality image to the CPM before you can load or restore a configuration to the CPM. If the CPM LED display shows ALIV, go to Step 23 in the following procedure to start the personality image load.

WARNING

Ensure your process is 'Off Control ' before you begin the following procedure.

Attention

If you are updating CPMs in an RCP, we recommend you turn OFF power to one of the Controller chassis in the RCP, so you can update the firmware in the CPM in the powered Controller chassis while it is in a Primary-with-no-partner state.

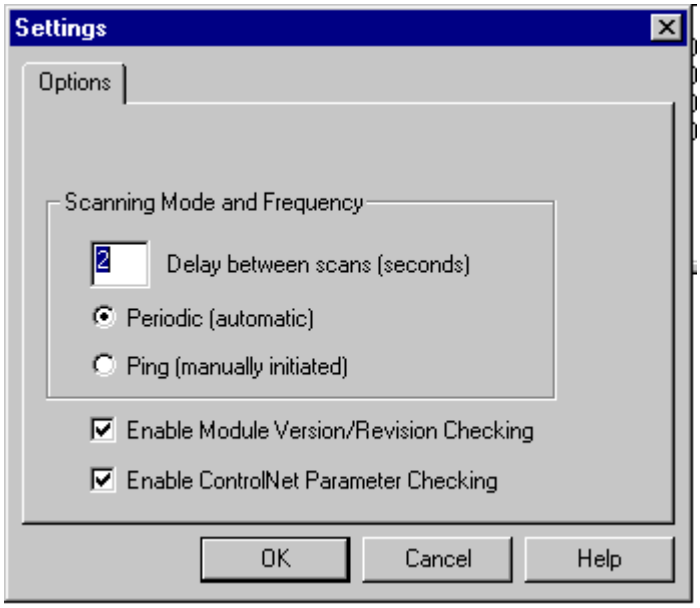
Once the CPM is updated in the powered chassis, turn OFF power to this chassis and turn ON power to the other Controller chassis to repeat the firmware update for the other CPM in the RCP. This avoids possible confusion caused by logical change in MAC IDs in response to a Controller switchover.

Prerequisites

- You have launched the Configuration Studio and logged on with amble security level to manipulate control strategies.

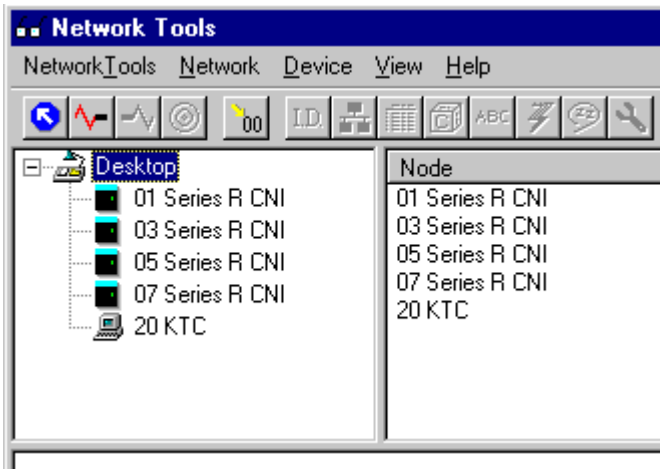
To check the version of the installed CPM and load the personality image

1. On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Set options for maintaining control system firmware** to open Select options for Network Tools dialog.
2. Ensure all check boxes on the dialog are checked and click the **OK** button.
3. On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Maintain control system firmware** to launch the Network Tools application.
4. Click the OK button to acknowledge the information message.
5. Click the Resume button  in the toolbar to initiate network scan.
6. Is this the first time you have used the Network Tools application?
   If the answer is **Yes**, complete Steps 5 through 12 to make the initial settings for your Experion network.
   If the answer is **NO**, go to Step 13.
7. With the Desktop icon selected, press the Settings button  to call up the Settings dialog box.
8. Make these settings in the Options tab.
   a. Key in >2< in entry field for Delay between scans (seconds).
   b. Click Periodic (automatic) selection to select it, if it is **not** already selected. This means automatic scans are made periodically with the specified delay between scans.
   c. Click Enable Module Version/Revision Checking to select it, if it is **not** already checked. This turns ON the automatic firmware version/revision detection function. This means NetworkTools automatically detects any incompatible firmware in a given module and shows the module's firmware indication in Red instead of Green on the module's graphic representation.
   d. Click Enable ControlNet Parameter Checking to select it, if it is **not** already checked. This turns on the function for checking ControlNet parameter settings.

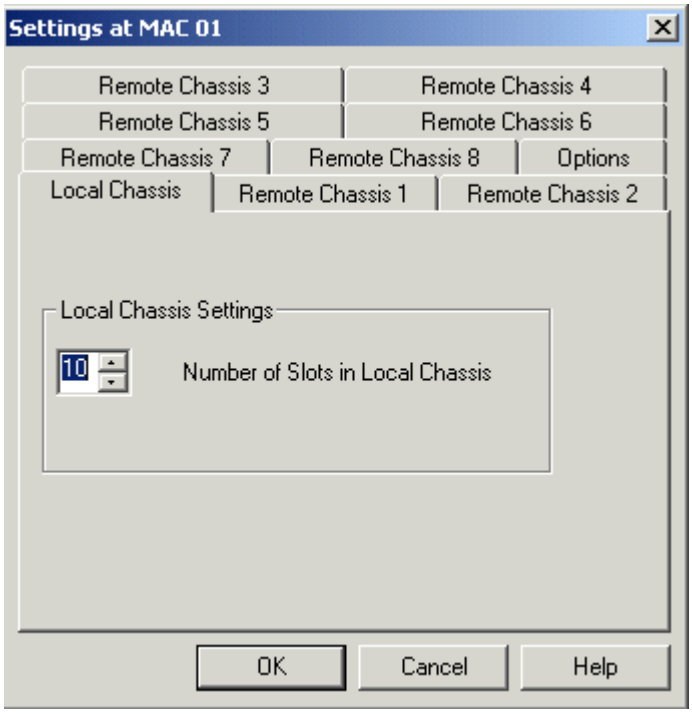


9 Click the OK button to close the dialog box.

10 When network nodes appear under the Desktop tree icon, click the first CNI icon to call up the settings dialog box. (Note that you only have to make these settings on the initial scan of the system.)



a In the Local Chassis tab, adjust the number in the scroll box to match the number of slots in your local chassis.



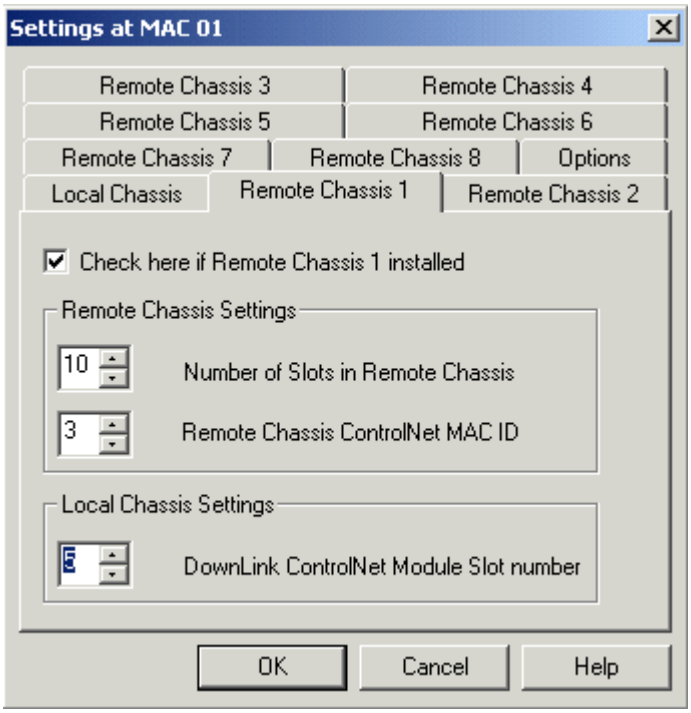
b If your system includes a remote chassis, go to Step 10. Otherwise, go to Step 11.

c Click the Remote Chassis 1 tab. Click the 'Check here . . . installed ' selection to select it. Adjust the numbers in the appropriate scroll box to match the following data about your remote chassis.

Number of slots in your remote chassis.

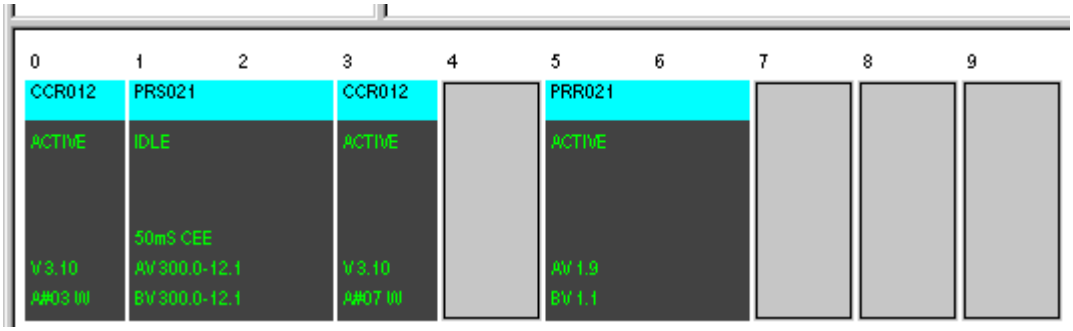
MAC ID of CNI in your remote chassis. (Note that the assigned MAC ID is repeatedly shown in the LED display on the CNI module in the format A#NN. Where NN is the MAC ID. For example, a display of A#03 means the CNI MAC ID is 3.)

Slot number where downlink CNI is installed in your local chassis. (This is the CNI that is cable connected to the uplink CNI in your remote chassis.)



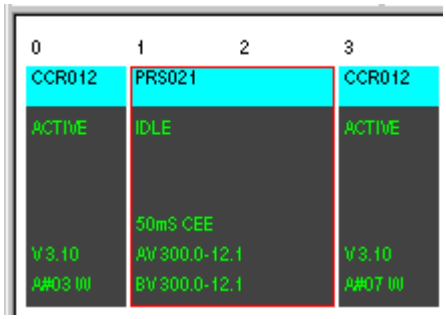
d Repeat this Step for other remote chassis by selecting the next numbered tab, as required.

11 When settings are complete, click OK. Look for the graphic of the chassis for given CNI to appear in the Detail pane. The graphic will also show remote chassis, if applicable.



12 Repeat Steps 8 to 11 for next CNI icon, as required.

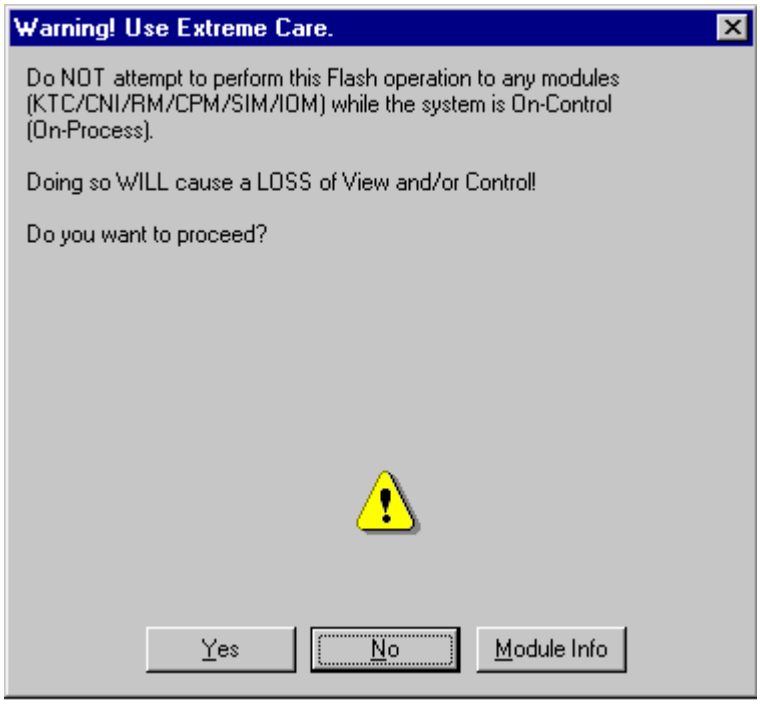
13 Click the CPM model in the graphic representation of your chassis configuration in the lower half of the window. If required, select another CNI icon to find the chassis that contains a CPM. This illustration is for example purposes only and does not represent current data.



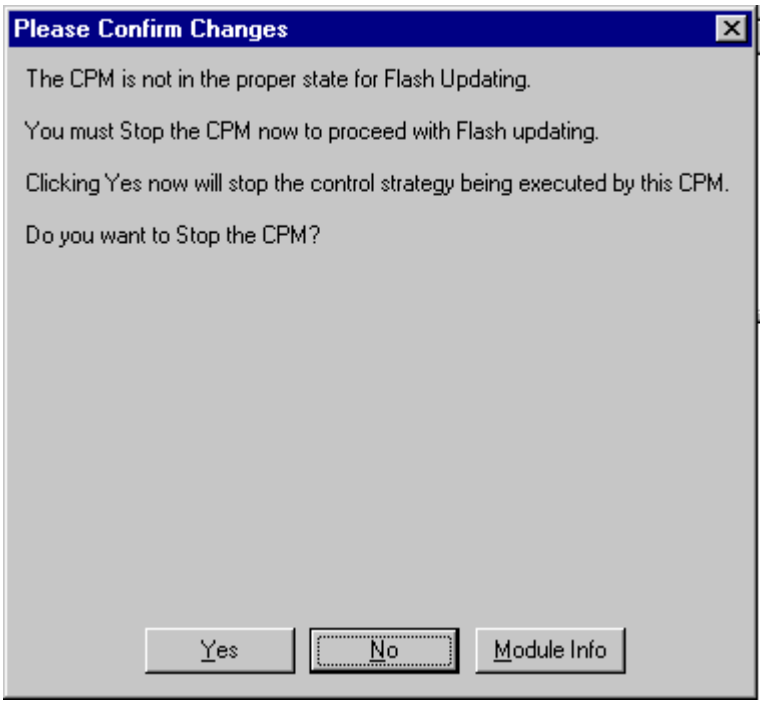
14 If the numbers listed for the AV and BV data on the selected CPM graphic match you current release software and are colored green, the CPM is loaded with the personality image and boot code versions for your release and you can skip to Step 31. Otherwise, go to the next Step.

15 With the CPM graphic still selected, click the flash button to initiate the firmware update function.

16 Click the Yes button to acknowledge the Warning prompt.

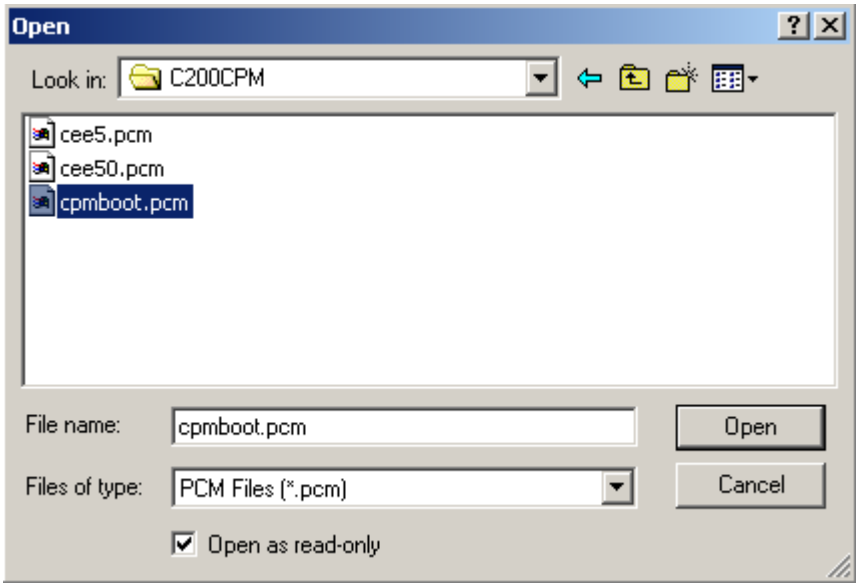


17 Click the Yes button to issue a Stop (Shutdown) command to the CPM.



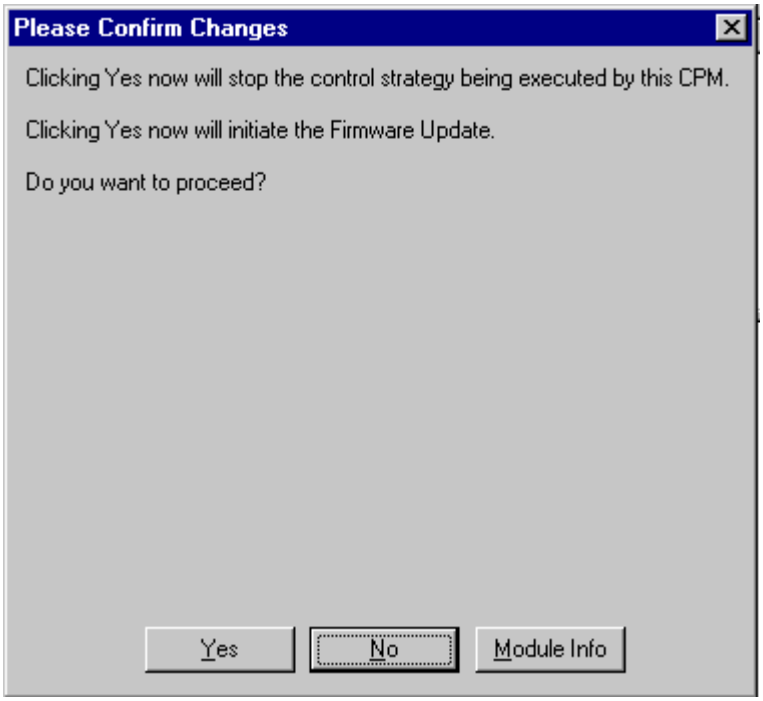
18 Wait for the CPM to reboot to its RDY state as shown in the CPM's LED display.

19 To load the boot image to a **CPM**, locate the cpmboot.pcm file in this directory location c:\Program Files \Honeywell\Experion\Engineering Tools\system\FIRMWARE\Controllers\C200CPM.

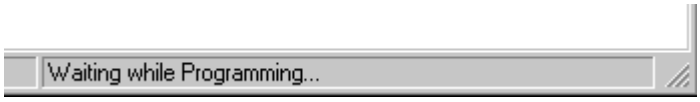


20 When cpmboot.pcm file appears in the list box, click it to select it, so it appears in the File Name entry field.

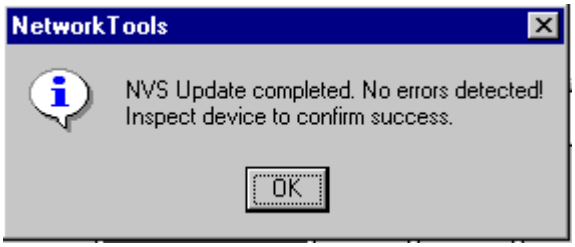
21 Click the Open button to start the firmware load and click the Yes button to confirm the action.



22 Wait for the load to complete and the CPM to reboot to its ALIV status as shown in the CPM's LED display. The Status field at the bottom of the Network Tools display tracks the load progress.



23 Click the OK button to acknowledge the load completion with no errors.

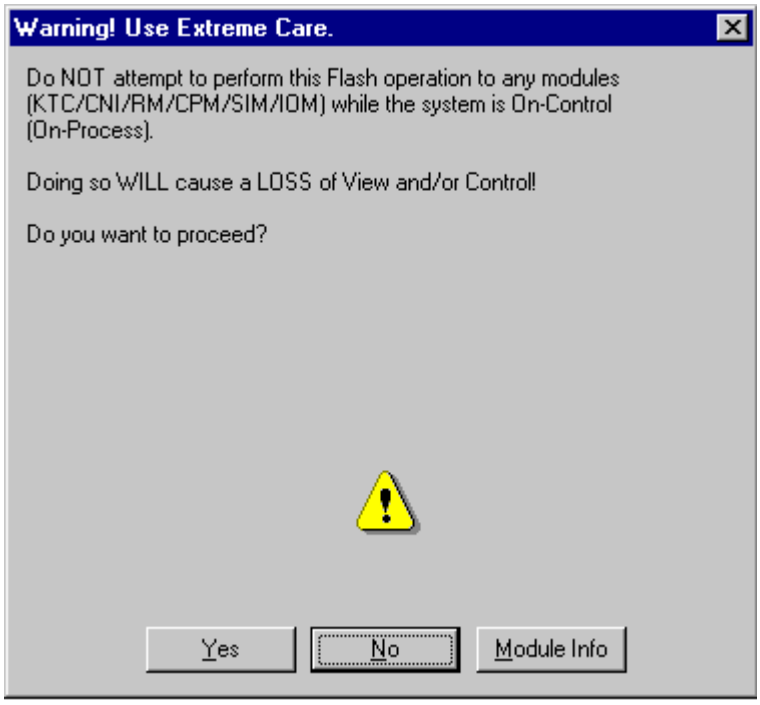


24 Confirm that the LED display on the CPM shows ALIV.

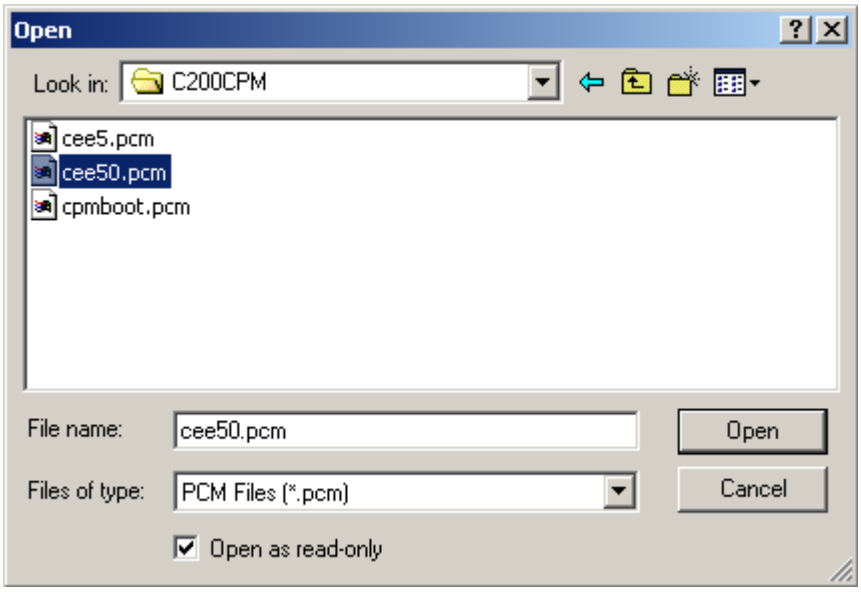
25 Wait for the CPM module to reappear in the graphic representation of the chassis in the lower half of the Network Tools window and click it.

26 Click the flash button to initiate the firmware update function.

27 Click the Yes button to acknowledge the Warning prompt.

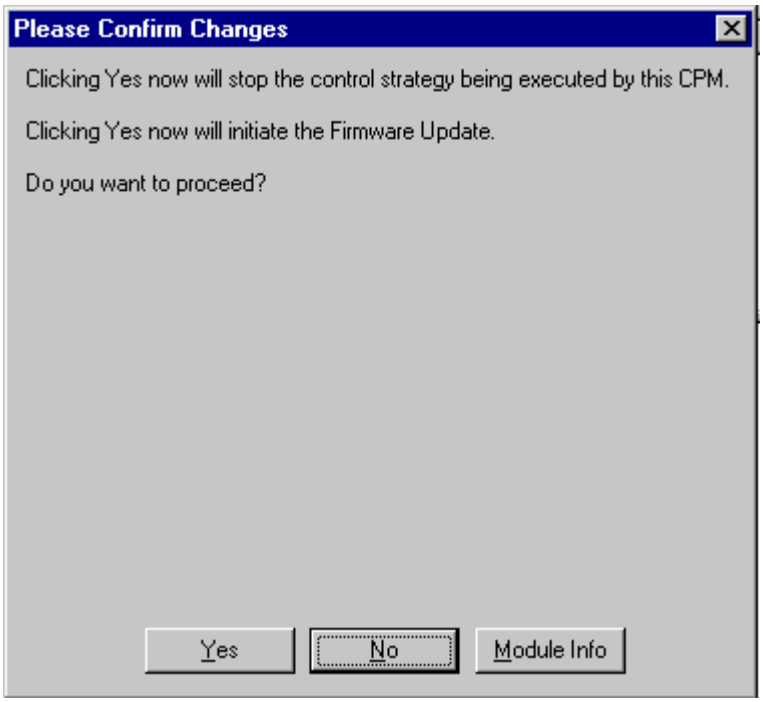


28 To load the personality image to a **CPM**, locate the cee50.pcm (or cee5.pcm for pulse output) file in this directory location c:\Program Files\Honeywell\Experion\Engineering Tools\system\FIRMWARE\Controllers \C200CPM.

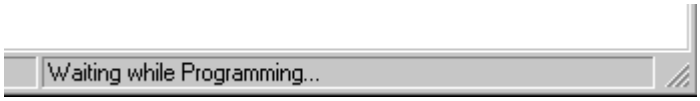


29 When the cee50.pcm (or cee5.pcm) file appears in the list box, click it to select it, so it appears in the File Name entry field.

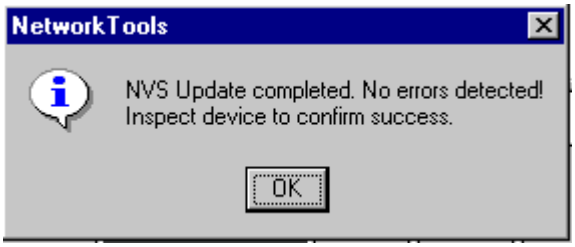
30 Click the Open button to start the firmware load and click the Yes button to confirm the action.



31 Wait for the load to complete and the CPM to reboot to its NODB status as shown in the CPM's LED display. The Status field in the lower right-hand corner of the Network Tools window tracks the load progress.



32 Click the OK button to acknowledge the load completion with no errors.



33 Repeat Steps 13 to 30 for other CPMs in your network, as required. Ensure to update the partner CPM in an RCP system configuration.

34 Click **NetworkTools-** > **Exit** to close the application.

3.3.3 Loading SIM personality image - Optional

If you replace a Serial Interface module, use the previous procedure for loading CPM personality image to load the SIM personality image. In this case, use the simboot.pcm and simrex.pcm files (located in the c:\Program Files\Honeywell\Experion\Engineering Tools\system\FIRMWARE\IOM\Serial directory) as the boot and personality image files, respectively.

3.3.4 Loading IOLIM personality image - Optional

If you replace an I/O Link Interface module, use the previous procedure for loading CPM personality image to load the IOLIM personality image. In this case, use the iolimboot.nvs and iolimapp.nvs files as the boot and personality image files, respectively.

3.3.5 Resetting a Diagnostic Output Module after short/thermal overload fault

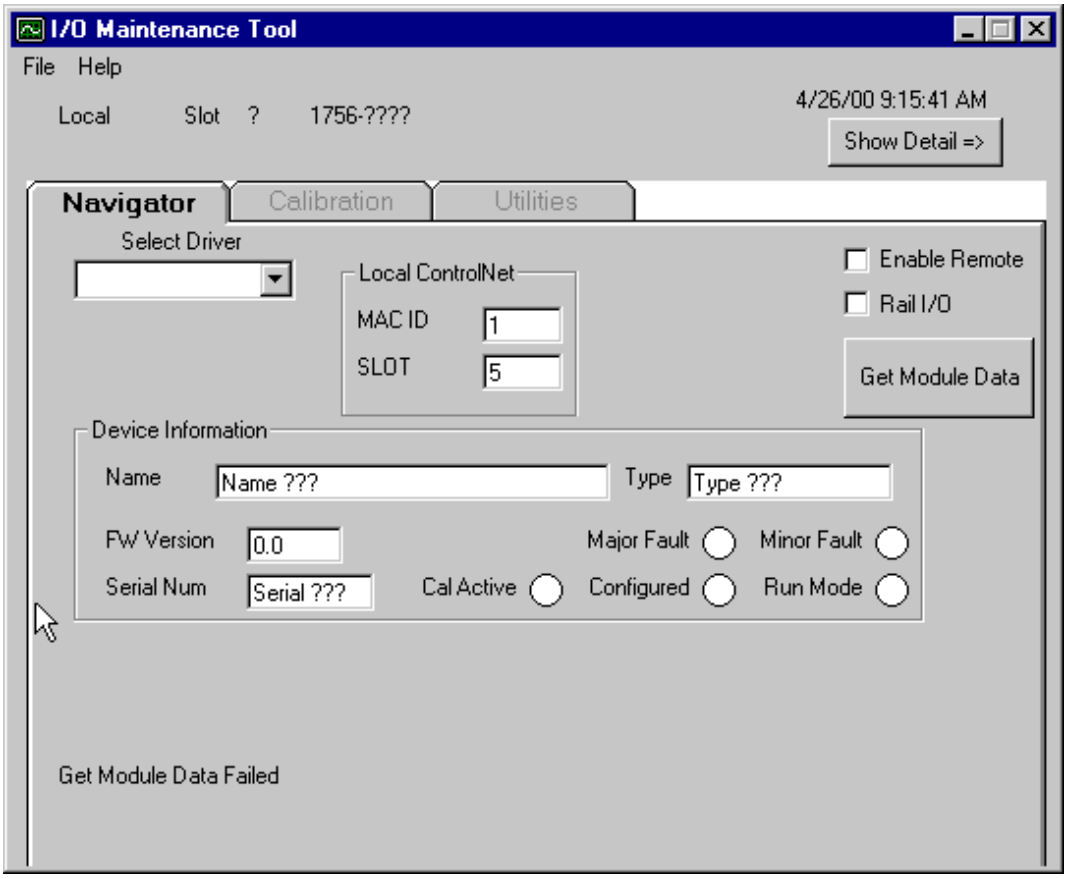
Prerequisites

- You have launched the Configuration Studio and logged on with amble security level to manipulate control strategies.

Use the following procedure to reset the channel on a diagnostic digital output module model TC-ODX081 or TC-ODX161 that detects a short or thermal overload fault condition. This procedure assumes that the condition that caused the fault has been corrected.

To reset a diagnostic output module after a short/thermal overload fault

1 On the **Configuration Explorer** tab in Configuration Studio, click **Control Strategy** > **Maintain I/O modules** to launch the tool.



2 In the Navigator tab, open the drop-down selection box in the Select Driver field, and select the applicable supervisory network driver.

3 Key in the MAC ID and SLOT number for the diagnostic output module in the local chassis with a faulty channel output in the corresponding entry fields. If output module is located in a remote chassis, click the check box for In Remote Rack, and key in appropriate MAC ID and SLOT number in corresponding Remote Rack entry fields.

4 Click the Get Module Data button. Confirm the data in the Device Information entry fields.

5 Click the Utilities tab to select it. Note that this tab is only active when you navigate to a diagnostic output module.

6 Click the check box or boxes for channel or channels in a fault condition.

WARNING
If you reset a channel that is not in a fault condition, the channel's output may transition to the unpowered (OFF) state.

7 Click the Reset Command button. Click the Yes button to acknowledge the warning prompt and send the reset command to clear the fault condition.

8 Click File->Exit to close the application.

9 Check the appropriate Detail display in Station, IOCHANNEL Function Block in Control Builder, or the status LED on the front of the diagnostic output module to confirm that the detected fault condition has been reset.

3.3.6 Restarting a failed Primary Server in a redundant Server system

Use the following procedure to restart a failed Primary Server (SERVERA) node in a redundant Server system. This procedure assumes that the Primary Server has been shut down.

1. Turn ON power to the Primary Server (SERVERA) node, complete the Windows logon, and wait for SERVERA to return to its fully operational state.
2. Click the Start button in the taskbar. Click **Programs-** > **Experion Server-** > **Station** to launch the Station application.
3. In Station, click **View-** > **System Status-** > **Server Redundancy** to call up the redundant Server display.
4. Click the Synchronize button to initiate synchronization with the Secondary Server (SERVERB) node.
5. When SERVERA and SERVERB are synchronized, click the Manual Failover button to switch to SERVERA as the Primary.
6. If Control Builder isn't running, click **Start-** > **Programs-** > **Experion Engineering Tools-** > **Control Builder** to launch the application and logon as applicable.
7. Click the Monitoring tab, check that the components in the Root directory Monitoring tree view reflect the newly restored Experion SERVERA Engineering Repository Database (ERDB).
8. Resume operation.

4 System Backup and Restore

The Experion system includes several backup utilities for saving and restoring various categories of system information. This means you can save critical Experion data to tape or other compatible storage device to protect against data loss, and you can restore saved data to aid in transferring data as part of a system upgrade or hardware migration.

Please refer to the Experion *Backup and Restore Guide* for more information.

5 System Shutdown

The following procedure outlines the steps for shutting down an Experion system under normal conditions. In most cases, shutting down the system using the Start key and Shut Down menu item will cause an orderly shut down of Experion services as part of shutting down your computer. The following steps detail how to stop Experion applications and services prior to shutting down your entire computer.

WARNING
Ensure all process components are in their Idle or Safe state before initiating a system shutdown.

To shutdown an Experion system

1. Close all open charts in CB.
2. Click **File -** > **Exit** in the Control Builder main menu to exit CB.
3. Click **Station-** > **Exit** in Station application window. Click OK to acknowledge the confirmation prompt and exit Station.
4. Click the Start button in the task bar. Select **Programs-** > **Honeywell Experion Server-** > **Start-Stop Experion Server** and click to open the server dialog box.
5. Click the radio button for Database Unloaded or the Stop button, as applicable. Click the Yes button to acknowledge the confirmation prompt. Wait for the server to change state and minimize the dialog box.
6. Click the Start button in task bar. Select **Honeywell Experion-** > **Engineering Tools-** > **Experion PKS Start-Stop Services Control Panel.**
7. Select Stop All including SQL, and click the OK button.
8. Wait for the Stop services action to complete.
9. Click **Start button-Programs-** > **Rockwell Software-** > **RSLinx-** > **RSLinx Launch Control Panel** to callup the function.
10. Click Stop button. (Note that the Experion CDA server service must be stopped before you can stop RSLinx through its control panel.)
11. Wait for message RSLinx Service is not running to appear. Click the close button to close the panel.
12. Close any other open applications as required. Click the Start button in the task bar. Click Shutdown, select Shutdown computer, and click the Yes button in Shut Down Windows dialog box to shutdown the computer.
13. If you have a redundant server, close all open applications and shutdown the computer as described in Step 10. Turn OFF power to Experion Server(s).

    Attention
    You must always turn OFF power to the Secondary chassis first, and then the Primary chassis to avoid a switchover when powering down an RCP. In addition, when restarting an RCP, always turn ON the Primary chassis first, and then the Secondary chassis to ensure that the database is maintained in the Primary CPM.

14. Open the cover on the C200 Controller power supply and flip the power switch to its OFF position.

6 Appendix A

Related topics

“Initial Start Up of C200 Controller and I/O Chassis” on page 56

6.1 Initial Start Up of C200 Controller and I/O Chassis

6.1.1 Hardware installation and wiring assumptions

We assume that you have installed and wired your C200 Controller and remote I/O chassis in accordance with instructions in the Control Hardware Installation Guide, and applicable I/O component Implementation Guide, as well as local codes and ordinances.

CAUTION

Before you apply power to your Controller and/or I/O Chassis for the first time, verify that the wiring is 100 percent correct. If you have any doubt, do not apply power until an electrician verifies that wiring is correct.

6.1.2 Powering up for the first time

You only have to open the door on the Controller and/or I/O Chassis power supply and flip its toggle switch to the ON position to power up the C200 Controller and/or I/O Chassis. Table 2 summarizes the LED indications to look for after powering up.

Attention

Since, the front face of all plug-in modules is clearly labeled, you may want to take a few minutes to confirm which modules are installed in your given C200 Controller and/or I/O Chassis for reference.

Figure 1: Front face of all modules is clearly labeled for easy identification.

Table 2: Table Normal LED indications for modules after powerup.

Module	Indication/Description
Power Supply	Power LED lights
Control Processor Module (CPM)	Four-character alphanumeric display shows: • **NODB,** • **IDLE** (if previously loaded database is retained), or • **BKUP** (if CPM is in a secondary chassis in a Redundant Chassis Pair (RCP) configuration.) BAT LED lights. OK LED lights.
Redundancy Module (RM)	Four-character alphanumeric display shows: • **PRIM** (Identifies the Controller chassis as the Primary one in an RCP configuration. This means the chassis is implementing the assigned system control functions.) • **SYNC** (Identifies the Controller chassis as the synchronized Secondary one in an RCP configuration. This means the chassis can assume the control functions for the Primary chassis if a switchover occurs.) • **DISQ** (Identifies the Controller chassis as the disqualified Secondary one in an RCP configuration. This means, the chassis is not ready to assume the control functions for the Primary chassis if a switchover occurs.) • **STBY** (This function is not supported at this time.) • Alternately, displays current RM state using the same abbreviations listed in the next row for the ControlNet Interface Module. For example, a primary RM may alternately display **PwNS**, **PwDS**, **PwQg**, or **PwQS** depending on the current state of the secondary RM. Likewise, the secondary RM may alternately display **DSNP**, **DSwP**, **Qfng**, or **QS** depending on its current state as well as percent complete indication of synchronization progress. PRI LED: • Steady Green (Redundancy state is Primary.) • Off (Redundancy state is Secondary or Failed.) COM LED: • Flashing Green (The redundancy communication link is not yet active, or the partner chassis is turned OFF.) • Steady Green (Communications is taking place.) • Steady Red (Critical communications failure as result of communications link breakdown or sudden partner RM failure.) OK LED: • Steady Green (RM is Okay.) • Flashing Green (RM is Okay, but it is not communicating with the other modules.) • Flashing Red (RM is configured improperly.)

Module	Indication/Description
ControlNet Interface module (CNI)	Four-character alphanumeric display alternately flashes: • **OK** • **A#XX** (Where XX is the assigned MAC ID.) • **WAIT, RM** (Redundant-compliant CNI in RCP waiting for the Redundancy Module to power up.) • **PwDS** (CNI is in primary chassis with a disqualified secondary chassis.) • **PwQg** (CNI is in primary chassis with a qualifying secondary chassis.) • **PwQS** (CNI is in primary chassis with a qualified secondary chassis.) • **PwNS** (CNI is in primary chassis with no secondary chassis.) • **QUAL** (CNI in primary chassis is qualified with its partner in the secondary chassis.) • **CMPT/!Cpt** (CNI in secondary chassis is compatible with its partner in the primary chassis.) • **DISQ** (CNI is in disqualified secondary chassis.) • **Qfng** (CNI is in qualifying secondary chassis.) • **QS** (CNI is in qualified secondary chassis.) • **DSNP** (CNI is in disqualified secondary chassis with no partner.) • **DSwP** (CNI is in disqualified secondary chassis with partner.) OK LED lights. Channel A Green LED lights. Channel B Red LED flashes for single channel (A only) application, OR Channel B Green LED lights for dual channel (A and B) application.
I/O Modules (IOM)	OK LED flashes Green on Analog models, OR OK flashes Green in an alphanumeric display on Digital models.
Serial Interface Module (SIM)	Four-character alphanumeric display alternately flashes: • **OK** • **A ok** • **B ok** OK LED lights Green. A channel LED lights Green. B channel LED lights Green.

6.1.3 Interpreting other hardware LED indications

The following table lists some other possible LED indications that you may encounter at one time or another with a possible cause for a given indication.

If. . .	Then, cause could be. . .
the power LED on the power supply does not light and no module LEDs are lit.	power source is OFF or faulty power wiring.
the alphanumeric display on the ControlNet Interface module alternately flashes: • **NET** • **ERR** • **A#XX** Other indications that might appear in conjunction with ERR indication include: • **SW** • **CNFG** • **ADDR** • **RACK** • **DUPL** **NODE** • **CNIC** • **BPIC** • **BPRX** • **BPA#** Other indications that might appear include: • **BW** **>MAX** • **STOP** • **INIT** • **ROM** • **UPDT**	• Experion server is OFF. ControlNet communications cable is not connected or it is faulty. • MAC ID setting changed after powerup; or, in RCP, MAC ID of CNI in secondary chassis is not the same as its partner in the primary chassis. • ControlNet configuration error. • MAC ID of 1 used for two nodes or node set to 00 or 99, if redundant. • CNI cannot read backplane EPROM or rack/slot address. • There is another node in the network with the same MAC ID. • ControlNet ASIC error. • Backplane ASIC error. • Backplane receiver error. • Backplane address number (slot number error). • Bandwidth exceeded - Temporary CNET scheduling problem. • Non-redundant CNI located in secondary chassis of RCP has been commanded to stop by RM. • CNI is doing post powerup initialization. • Flash loading of firmware update is in progress.
the A, B, and OK LEDs on the ControlNet Interface module are alternately flashing Red /OFF.	Conflict in MAC ID assignments. Change the module's address assignment.
the alphanumeric display on the CPM shows: • **RDY** • **ALIV** • **TXXX** (Where XXX represents a self-test code.)	• CPM shutdown was commanded through CB. Cycle power to reboot CPM to NODB state. Or, use Network Tools to initiate boot code load. • Personality image has not been loaded. Use Network Tools application to load personality image. • A test has failed or hung. Cycle power to reboot the CPM.
the BAT LED on the CPM is not lit.	battery plug on CPM not connected. The battery has failed.
the alphanumeric display on the RM shows: • **????** • **THXX** (Where XX represents a self-test code.) • **EXXX** (Where XXX represents an error code.) • **BOOT**	• RM is resolving initial state. It enters either a primary or secondary state or a fault mode within a minute or so after powerup. • A test has failed or hung. Cycle power to reboot the RM. • Major fault condition has occurred. • Boot mode - awaiting further instructions.
the OK LED and OK display on I/O modules turn Red.	cycle power to reboot all modules. If indications persist, call our Technical Assistance Center.
the alphanumeric display on the SIM shows: • **RDY** • **ALIV** • **TXXX** (Where XXX represents a self test-code.) • **Aerr** • **Berr**	• SIM shutdown was commanded through NetworkTools. Cycle power to reboot SIM to OK state. Or, use NetworkTools to initiate boot code load. • Personality image has not been loaded. Use Network Tools application to load personality image. • A test has failed or hung. Cycle power to reboot the SIM. • Channel can not communicate with FTA. • Channel can not communicate with FTA.

If. . .	Then, cause could be. . .
• **A sf** • **B sf** • **Acfg** • **Bcfg** the A and/or B channel LED on SIM is: • OFF. • Flashing Green. • Brief Green flash every 0.5 sec. the OK LED on SIM is: • OFF. • Steady Red. • Flashing Red. • Flashing Green.	• FTA -A is reporting a soft failure. • FTA -B is reporting a soft failure. • Normally transient display means that channel is being configured. Permanent display means bad configuration. • Normally transient display means that channel is being configured. Permanent display means bad configuration. • No activity • Transmit or receive communication is in progress, but not normal continuous communications. • FTA is not present or not communicating. • No power or significant fault. • Cycle power to recover operation. • Fail state, running under software control. • No active I/O connection.

7 Appendix B

Related topics

“Input/Output Behavior Analysis” on page 62

7.1 Input/Output Behavior Analysis

The performance of a control system depends, in large part, on how well its Input/Output (I/O) system responds under various operating conditions. The Experion system is designed to provide reliable I/O behavior while offering the ultimate flexibility in process control design and operation.

This section provides an analysis of chassis I/O behavior for some operating scenarios that are unique to Experion's partitioned architecture.

7.1.1 Operating scenarios and I/O behavior

The following Tables summarize the analysis of chassis I/O behavior for a given general operation. Each Table identifies the Function Block (FB) of interest, the Configuration characteristics, the operating scenario, and the chassis I/O behavior. We assume that you are familiar with the Experion Control Builder application.

Table 3: Inactivate and activate IOM function blocks

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Module	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 50%.	• Inactivate AOM FB. This turns ON initialization Manual Mode for PID block.	• Holds last value (50%).
		• While AOM is inactive, manually change SP value for PID FB to 60%.	• Holds last value (50%).
		• Activate AOM FB. This turns OFF initialization Manual Mode for PID block.	• Changes in response to new SP.
Digital Output Module	Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate DOM FB. • Activate DOM FB.	• Holds last value (ON). • Holds last value (ON).
	Device Control FB pulsed output is connected to DOC ONPULSE input associated with DOM FB.	• Inactivate DOM FB.	
		• If DOC status output is ON.	• Changes to OFF.
		• If DOC status output is OFF.	• Remains OFF.
		• Activate DOM FB.	• Remains OFF.

Table 4: Delete IOM function blocks

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Module	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 50%.	• Inactivate AOM FB. This turns ON initialization Manual Mode for PID block. • Delete AOM FB from Loaded Tab. Acknowledge Warning about AOC connection. • With AOM inactive, reload it to the Control Processor and then activate the AOM.	• Holds last value (50%). • Holds last value (50%). Green LED on Module is blinking (in Idle). • Maintains previous value (50%) with no 'bump ' in output.

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Digital Output Module	Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate DOM FB. • Delete DOM FB from Loaded Tab. Acknowledge Warning about DOC connection. • With DOM inactive, reload it to the Control Processor and then activate the DOM.	• Holds last value (ON). • Holds last value (ON). Green LED on Module is blinking (in Idle). • Maintains previous value (ON) with no 'bump ' in output.

Table 5: Inactivate and activate IOC function block

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 60%.	• Inactivate Control Module (CM) containing AOC FB. This turns ON initialization Manual Mode for PID block.	• Holds last value (60%).
		• While CM is inactive, manually change SP value for PID FB to 70%.	• Holds last value (60%).
		• Activate CM. This turns OFF initialization Manual Mode for PID block.	• Changes in response to new SP.
Digital Output Channel	Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate CM containing DOC FB. • Activate CM.	• Holds last value (ON). • Holds last value (ON).
	Device Control FB pulsed output is connected to the DOC ONPULSE input that is associated with the DOM FB.	• Inactivate CM containing DOC FB.	
		• If DOC status output is ON.	• Remains ON for remainder of Pulse Width time.
		• If DOC status output is OFF.	• Remains OFF.
		• Activate CM after DOC status output goes OFF at end of Pulse Width time.	• Remains OFF.
		• Activate CM while DOC status output is still ON during Pulse Width.	• Goes OFF.

Table 6: Delete IOC function block

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 50%.	• Inactivate CM containing AOC FB. • Call up CM in Project Tab and delete AOC FB. Acknowledge Warning about uncontrolled output. • With CM inactive, reload it to the Control Processor, and then activate the CM. • From Project Tab, rebuild AOC FB. Connect it to PID FB and establish AOM FB association as before. With CM inactive, reload it to the Control Processor, and then activate the CM.	• Holds last value (50%). • Holds last value (50%). • Maintains previous value (50%) with no 'bump ' in output. • Returns to previous value (50%) and changes if PID output differs from SP to bring output equal to SP.
Digital Output Channel	Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate CM containing DOC FB. • Call up CM in Project Tab and delete DOC FB. Acknowledge Warning about uncontrolled output. • With CM inactive, reload it, and then activate the CM. • From Project Tab, rebuild DOC FB. Connect it to DIC FB, and establish DOM FB association as before. With CM inactive, reload it, and then activate the CM.	• Holds last value (ON). • Holds last value (ON). • Maintains previous value (ON) with no 'bump ' in output. • Returns to previous value (ON).
Analog Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 50%.	• Inactivate CM containing AOC FB. • Call up CM in Project Tab, and delete wire between AOC FB and PID FB. With CM inactive, reload it, and then activate the CM. • From Project Tab, rewire AOC FB to PID FB as before. With CM inactive, reload it, and then activate the CM.	• Holds last value (50%). • Maintains previous value (50%) with no 'bump ' in output. • Returns to previous value (50%) and changes if PID output differs from SP to bring output equal to SP.
Digital Output Module	Digital Input Channel (DIC) is connected to Digital Output Channel (DOC) associated with Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate CM containing DOC FB. • Call up CM in Project Tab and delete wire between DOC FB and DIC FB. With CM inactive, reload it, and then activate the CM. • From Project Tab, rewire DOC FB to DIC FB as before. With CM inactive, reload it, and then activate the CM.	• Holds last value (ON). • Maintains previous value (ON) with no 'bump ' in output. • Returns to previously held value (ON).

Table 7: Delete and reload CM function block containing analog and digital output channels

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Channel and Digital Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 70%. Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• Inactivate CM containing AOC and DOC FBs. Then, delete CM from Control Processor. Acknowledge Warning about all CM connections being broken.	• Analog output goes to unpowered and status output is OFF.
		• Reload CM to the Control Processor, and then activate the CM.	• Analog output changes if PID output differs from SP to bring output equal to SP and status output returns to ON.

Table 8: Change in CEE state

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Channel and Digital Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 70%.	• With CEE in its Run state, change state to Idle. • With CEE in its Idle state, manually change SP value for PID FB to 60%. • Change CEE back to its Run state.	• Holds last value (70%). • Holds last value (70%). • Changes in response to new SP with no 'bump ' in output.
Digital Output Channel	Digital Input Channel (DIC) is connected to the Digital Output Channel (DOC) that is associated with the Digital Output Module (DOM) FB. DOC status output is ON.	• With CEE in its Run state, change state to Idle. • Change CEE back to its Run state.	• Holds last value (ON). • Returns to held value (ON).
	Device Control FB pulsed output is connected to the DOC ONPULSE input that is associated with DOM FB.	• With CEE in its Run state, change state to Idle. – If DOC status output is ON. – If DOC status output is OFF. • Change CEE back to its Run state after DOC status output goes OFF at end of Pulse Width time. • Change CEE back to its Run state while DOC status output is still ON during Pulse Width.	• Remains ON for remainder of Pulse Width time. • Remains OFF. • Remains OFF. • Goes OFF.

Table 9: Shutdown and power cycle CPM

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
Analog Output Channel	PID FB output is connected to the Analog Output Channel (AOC) FB that is associated with the Analog Output Module (AOM) FB. Output value equals 70%. All I/O is located in a remote chassis. AOM is configured for Channel 0 to hold last value during communication loss. (Shed Mode is enabled). Channel 1 is configured to set output to 50% during communication loss. (Shed Mode is enabled and Shed Value equals 50.00).	• With all CMs loaded and controlling, remove power from CPM. • Restore power to CPM. Database should be recovered through RAM Retention StartUp function. Once CEE state returns to Run, Channels 0 and 1 outputs should back initialize.	• Channel 0 holds last value (70%). Channel 1 goes to 50%. • Channel 0 returns to initialized value (70%). Channel 1 returns to initialized value (50%).
Digital Output Channel	Digital Input Channel (DIC) 0 is connected to Digital Output Channel (DOC) 0 associated with Digital Output Module (DOM) FB channel 0. A standalone DOC 1 is associated with DOM Channel 1. Both DOC 0 and DOC 1 status outputs are ON. Shed mode configuration for DOM Channel 0 is for hold last state, Channel 1 is for Shed Value of OFF, and Channel 2 (no IOC associated) is for Shed Value of ON.	• With all CMs loaded and controlling, remove power from CPM. • Restore power to CPM. Database should be recovered through RAM Retention StartUp function. Once CEE state returns to Run, Channels 0 and 1 outputs should back initialize.	• Channel 0 holds last value (ON). Channel 1 goes to OFF. Channel 2 goes ON. • Channel 0 returns to initialized output value (ON). Channel 1 returns to initialized output value (OFF). Channel 2 remains ON.
All I/O FBs	Same as for previous AOC and DOC in this Table.	• From Monitoring Tab, issue commands through CPM FB to put CEE in Idle state and shutdown the CPM. CPM LED display shows 'RDY ' state, and CPM is not accessible from Control Builder or Server.	• Go to Fail state conditions: See previous AOC and DOC behavior in this Table.
		• Either load a new version of CPM personality image, or cycle power to CPM and restart current personality image. This purges the previous database. Reload the database from the server. Activate the CEE and all CMs and IOMs. This should restore normal control.	• Return to initialized values. See previous AOC and DOC behavior in this Table. Both track current control values, if necessary.

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
All IOM FBs	Same as for previous AOC and DOC in this Table.	• From Monitoring Tab, issue command through CPM FB to put CEE in Idle state. Reload the CM FB only. This purges database from CPM and losses connections to all IOMs.	• Hold last values.
		• Reload remaining control strategy (CEE, CMs, and IOMs) from the server. Activate the CEE and all CMs and IOMs. This should restore normal control.	• Return to initialized values and track current control values, if necessary.

Table 10: Failure of I/O communications

FB of Interest	Configuration Characteristics	Operating Scenario	I/O Behavior
All IOM FBs	Same as for AOC and DOC in Table 8.	• During normal control, disconnect the I/O ControlNet cable from the downlink ControlNet Bridge. This causes loss of communication to all remote I/O modules.	• Go to Fail state conditions: See previous AOC and DOC behavior in Table 8.
		• Reconnect the I/O ControlNet cable. This restores communication to all I/O modules.	• Return to initialized values and track current control values, if necessary.
		• With CEE in Idle state or IOMs inactive, disconnect the I/O ControlNet cable from the downlink ControlNet Bridge. This causes loss of communication to all remote I/O modules.	• Go to Fail state conditions: See previous AOC and DOC behavior in Table 8.
		• Reconnect the I/O ControlNet cable. This restores communication to all I/O modules.	• When CEE returns to Run state, return to initialized values and track current control values, if necessary.

8 Notices

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8.1 Documentation feedback

You can find the most up-to-date documents on the Honeywell Process Solutions support website at:

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8.2 How to report a security vulnerability

For the purpose of submission, a security vulnerability is defined as a software defect or weakness that can be exploited to reduce the operational or security capabilities of the software.

Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services.

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- Send an email to security@honeywell.com.

  or

- Contact your local Honeywell Process Solutions Customer Contact Center (CCC) or Honeywell Technical Assistance Center (TAC) listed in the “Support and other contacts” section of this document.

8.3 Support

For support, contact your local Honeywell Process Solutions Customer Contact Center (CCC). To find your local CCC visit the website, https://www.honeywellprocess.com/en-US/contact-us/customer-support-contacts/Pages/default.aspx.

8.4 Training classes

Honeywell holds technical training classes on Experion PKS. These classes are taught by experts in the field of process control systems. For more information about these classes, contact your Honeywell representative, or see http://www.automationcollege.com.