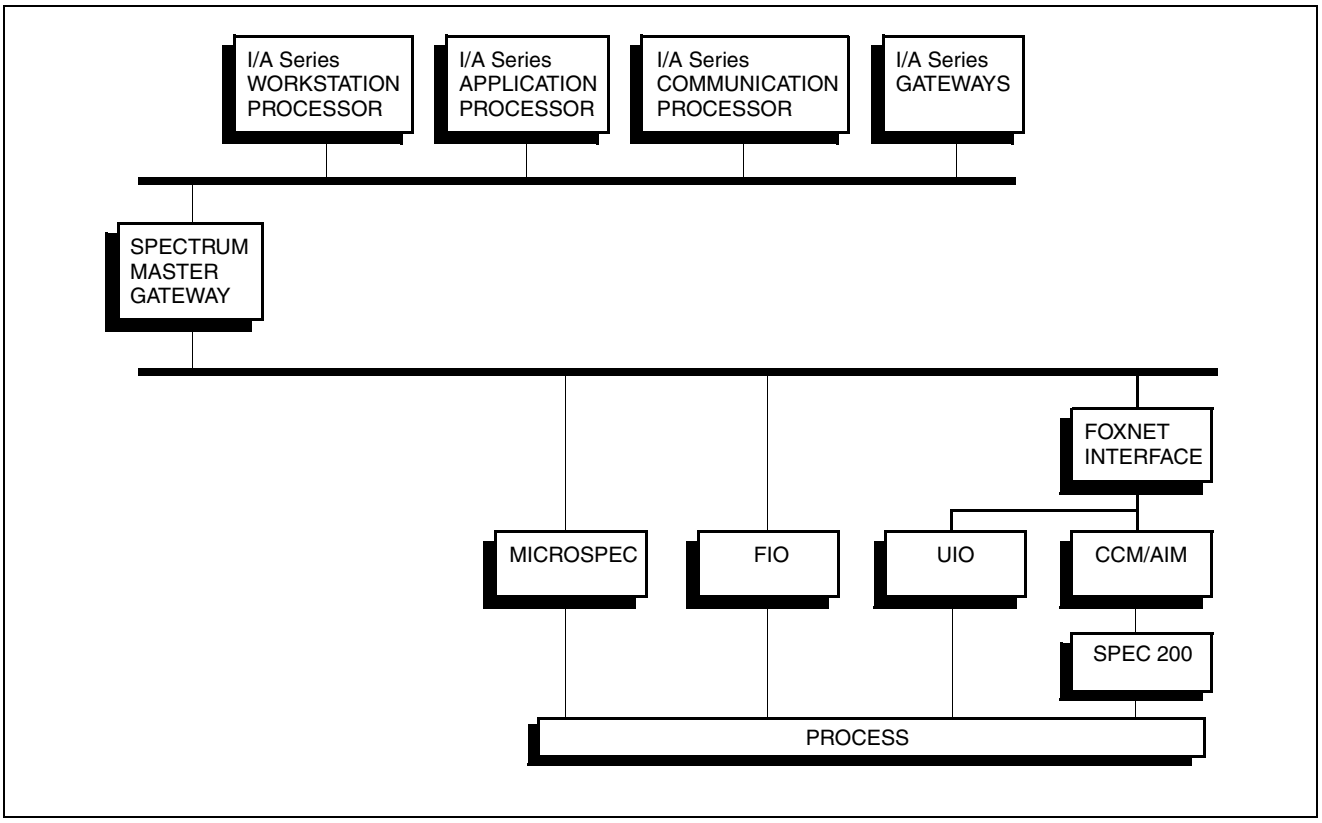
I/A Series® Hardware
SPECTRUM Master Gateway



Use Gateway for Information Management only. User must adhere to Product Specifications.

SPECTRUM MASTER GATEWAY (SMG) CAPACITY AND PERFORMANCE SPECIFICATIONS

Capacity

The SPECTRUM Database Processor (SDP) has the capacity to scan up to 2000 SPECTRUM blocks in a 2 Mb configuration and up to 4000 SPECTRUM blocks in a 4 Mb configuration. Each SPECTRUM Interface Processor (SIP) can be configured to support 1000 block equivalents. Table 1 defines the block sizes and block equivalents associated with each block type in the SIP.

Table 1.

BLOCK TYPE	BLOCK EQUIVALENTS
SAIN	1.0
SAIO	2.0
SDIN	1.0
SDIO	1.0
SCTLR	2.0
SBIAS	2.0
SRATIO	2.0
STOT	1.0
Note: Add 1.0 Block per Compound	

Standard I/A Series rules for control processors govern the number of input and output device connections supported. Table 2 summarizes the SIPs required for an SDP.

Table 2.

SDP CONFIGURED BLOCK EQUIVALENTS	NO. OF SIPs
0 < X < = 1000	1
1000 < X < = 2000	2
2000 < X < = 3000	3
3000 < X < = 4000	4

Processing Rate

The number of blocks scanned per second depends on the SDP configuration (whether one or two CPUs are implemented). Many application dependent factors contribute to the load of the SDP. The SDP is designed to handle a baseload activity with 20% spare capacity to handle peak load situations (i.e., load upset).

The SDP scan blocks can be scanned at a maximum rate of 500 blocks per second (250 blocks per second for a single CPU). Table 3 shows the SDP processing capability for both single and dual CPU configurations based on 20% of the scanned blocks having exceptions. The SDP can send up to 100 block exceptions per second (50 for a single CPU) to the SIP(s). The 100 block exceptions can be distributed to up to four SIPs.

Table 3.

SDP WITH A SINGLE CPU, 80% LOAD:	
	250 BLOCKS SCANNED/SEC
20% EXCEPTIONS 100% OPEN CONNECTIONS	-> 50 EXCEPTIONS/SEC -> 50 UPDATES/SEC TO I/A Series 1 READ FILE (1KBYTE/SEC) 5 OPERATOR CHANGES/SEC UP TO 4 PEER-TO-PEER CHANGES/SEC
SDP WITH A DUAL CPU, 80% LOAD:	
	500 BLOCKS SCANNED/SEC
20% EXCEPTIONS 100% OPEN CONNECTIONS	-> 100 EXCEPTIONS/SEC -> 100 UPDATES/SEC TO I/A Series 1 READ FILE (1KBYTE/SEC) 10 OPERATOR CHANGES/SEC UP TO 8 PEER-TO-PEER CHANGES/SEC

FOXNET Load

The FOXNET loading associated with a fully implemented SDP is a function of many factors, including:

- types of SPECTRUM stations scanned
- number of SPECTRUM stations scanned per second
- number of blocks or variables scanned per station per second

SDP configuration options support a user-initiated report on the off-line PC containing:

- profile of number of blocks configured for each scan period frequency
- estimates of SDP CPU loading information
- estimates of FOXNET loading attributed to the SDP

FOXNET loading for fully implemented SDPs can range from approximately 20 to 50%, depending on the application.

File Transfer Rate

One read/write file (1K bytes per second via message block).

Run Task Request

The single CPU SDP supports five requests per second and the dual CPU configuration supports ten requests per second.

Peer-to-Peer Connections

The SMG supports peer-to-peer connections for loosely coupled set point control functions {set point control changes may also be made via Inter Process Communications (IPC) Setval commands which do not require peer-to-peer connections}. In a dual CPU configuration, the SIP limits the number of requests for set point control to no more than two actions per second (eight actions per second total for four SIPs) to ensure that the normal SPECTRUM data processing at the SMG is not impacted (in a single CPU configuration, the SIP supports one action per second, four total for four SIPs). Standard I/A Series rules for control processors govern the number of SIP points that can be connected for peer-to-peer functions.

Nodebus Loading

A fully implemented SMG (four SIPs per SDP) looks like four Control Processors on the nodebus, each processing one-quarter of the scan update messages per second.

SMG Processing Time

Many factors contribute to the loading calculations for the SMG. Following are approximations of SMG processing times for various functions assuming a 1 second SDP scan block (I/A Series application and Nodebus processing for specific applications are additive to these times for estimating total application functional timing):

Process Changes

Approximately 2 to 3 seconds elapsed time are required for a value resulting from a process change on the input to a MICROSPEC Unit Control Module (UCM) to be available as an output from the SMG for processing on the Nodebus.

Operator Actions

Approximately 2 to 3 seconds elapsed time are required for processing an operator action through the SMG to a UCM and returning confirmation to the Nodebus.

Peer-to-Peer Control

The following formula provides an approximation of elapsed time in seconds required for the SMG supporting peer-to-peer control connections to an I/A Series Control Processor 10 (CP10) (including UCM and FOXNET processing times):

Elapsed Time (average) = 1.5 + .5 * SDP scan block period

Elapsed Time (worst case) = 2.2 + SDP scan block period

Control Processor and nodebus processing timing for specific applications are additive to these times for total loop timing.

Initialization

Following are approximate initialization times:

SDP Powerup

During powerup, the operating system and the database are loaded into memory from the Winchester disk and initialized automatically. Approximately 90 seconds are required for initialization from powerup.

SIP Powerup

The SIP software is resident on an I/A Series file server. Standard I/A Series software processing downloads the operating system to each SIP. The SIP requires approximately 200 seconds to initialize and become fully operational.

Redundant SMG

In a redundant SMG configuration, if a failure occurs in a redundant SDP and SIP combination, a switchover procedure to the tracking set occurs. This switchover is not transparent to the user. The initial scan of the new control unit lasts up to 30 seconds (dependent on the size of the database). The I/A Series connected points must then be updated with freshly scanned values. The duration of these updates depends on the number of connected points. Operator actions to the SMG during the switchover are discarded.

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