

External I/O Expansion Unit

Just the Facts

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SunWIN Token# 498978



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Positioning

Sun External I/O Expansion Unit

Introduction

The Sun External I/O Expansion Unit was designed for Sun's midrange and high-end SPARC Enterprise Server family: The Sun External I/O Expansion Unit allows for significant I/O adapter expandability and connectivity to meet the most demanding I/O requirements. Each Sun External I/O Expansion Unit allows for up to 12 PCI-X or PCI Express I/O adapters to be connected to, and managed by, a host server. The Unit is a 4RU rack mountable chassis with optical fibre or copper connection links to the host server, and includes redundant and hot-pluggable cooling and power. Connection to the host achieved by installing this Copper or Optical Fibre Link Card into on of the internal system PCI Express slots, essentially converting one of the internal slots to 6 slots of either PCI-X or PCI Express in the External I/O Expansion Unit.

The Sun External I/O Expansion Unit is the first offering by Sun for large scale I/O expandability, providing unprecedented I/O scalability and performance for Sun SPARC Enterprise family of servers. Designed for the rigors of the enterprise, the External I/O Expansion Unit is an I/O expansion option for demanding I/O applications requiring large scalability, mission critical levels of availability, and seamless integration into the data center. Built from the ground up, the External I/O Expansion Unit takes maximum advantage of the high I/O bandwidth of the SPARC Enterprise M4000-9000 and T5120, T5140, T5220, T5240, and T5440 servers. Please refer to server configuration specifics below.



Product Family Placement

The Sun External I/O Expansion Unit is currently the only I/O expansion option offered by Sun that allows additional I/O cards/adapters to be connected remote, or external, to the system chassis. The Sun External I/O Expansion Unit is supported only on the SPARC Enterprise midrange and high end (M4000-M9000) servers and the Sun SPARC Enterprise T5120, T5140, T5220, T5240, and T5440 servers. The maximum number of units that can be attached to each server type is listed in the table below. Please note that the External I/O Expansion Unit is not supported on the SPARC Enterprise M3000 or T1000/T2000.



Supported Server	Maximum I/O Expandability	Maximum # of Additional External Slots
Sun SPARC Enterprise T1000 Server	Not supported	Not supported
Sun SPARC Enterprise T2000 Server	Not supported	Not supported
Sun SPARC Enterprise T5120 Server	1x External I/O Expansion Unit (1x I/O Boat, PCIe only)	6
Sun SPARC Enterprise T5140 Server	1x External I/O Expansion Unit (2x I/O Boats, PCIe only)	12
Sun SPARC Enterprise T5220 Server	1x External I/O Expansion Unit (2x I/O Boats, PCIe only)	12
Sun SPARC Enterprise T5240 Server	1x External I/O Expansion Unit (2x I/O Boats, PCIe only)	12
Sun SPARC Enterprise T5440 Server	2x External I/O Expansion Units (Max 2) (4x I/O Boats, one Boat per processor, PCIe only)	24
Sun SPARC Enterprise M3000 Server	Not supported	Not supported
Sun SPARC Enterprise M4000 Server (4 processors)	2x External I/O Expansion Units (4x I/O Boats)	24
Sun SPARC Enterprise M5000 Server (8 processors)	4x External I/O Expansion Units (8x I/O Boats)	48
Sun SPARC Enterprise M8000 Server (16 processors)	8x External I/O Expansion Units (16x I/O Boats)	96
Sun SPARC Enterprise M9000-32 Server (32 processors)	16x External I/O Expansion Units (32x I/O Boats)	192
Sun SPARC Enterprise M9000-64 Server (64 processors)	16x External I/O Expansion Units (32x I/O Boats)	192

Sun External I/O Expansion Unit Specifications

Feature	Value
External I/O Expansion Unit	4RUchassis with 2x Fan/Power Supply Units
Types of I/O Boats	PCI Express or PCI-X
Number of I/O Boats	Maximum of 2, Minimum of 1
Number of Expansion Slots	Maximum of 12 (with 2x I/O Boats installed) Minimum of 6 (with 1x I/O Boat installed)
Number of Card Carriers	7x per each I/O Boat. (1 for Link, 6 for Expansion)
Link Options with Host Server	PCI Express (x8) Card: Optical Fibre (10m or 25m) or Copper (4m)*
Number of Link Cards	1x Link card required per each I/O Boat
Hot Pluggable	at Fan/PSU, I/O Boat, individual I/O card levels ¹
Supported I/O Cards	PCI Express 1.0 (x8), PCI-X 1.0, PCI 2.3 (using PCI-X I/O Boat) Full Height Adapter Face Plate is required

* Copper Link Card is supported on M4000 and M5000 and Sun SPARC Enterprise T512, T5220, & T5440 servers only.

¹ Hot swap of PCIe adapters is not available for the Sun SPARC Enterprise T5440 server



Key Features and Benefits

Features	Benefits
Each unit allows expansion to 6x or 12x industry standard PCI Express (up to x8 lane) and/or PCI-X adapter cards. Connection to the host is made by installing one Link Card in one host PCI Express slot. This Link Card then expands the single host slot to six slots in each I/O Boat in the External I/O Expansion Unit. (2 PCI Express slots are required if second optional I/O Boat is installed in the External I/O Expansion Unit)	Allows for future expansion outside the system chassis utilizing industry standard I/O adapter technology Leverage SPARC Enterprise systems' high I/O bandwidth for large scale I/O applications Allows customers to incrementally scale their I/O capacity
Allows various PCI Express and PCI-X card form factors using adjustable card carriers	Allows flexibly and greater customer choice in I/O adapter technology
Redundant power and cooling within the chassis	Supports higher availability of host servers
Full integration and control of unit by host server, via Fiber Optic or Copper link	Enables simplified setup, management and sharing of I/O resources by host server
Hot Pluggable at the I/O card, I/O boat, and PS/Fan unit levels.	High availability feature that allows card/component installation/replacement without bringing active cards down.
Small 4U form factor in 19" standard rackmount cabinets	Small and convenient modular package, allows for incremental expandability using available rackmount space.
I/O cards behave as though they are internal/local to the system (Link card/cable connection is invisible to the OS)	Easy to manage, external I/O cards behave like multi-function add-in cards.
Software control/monitoring built into the host system XCP software	Simplified management/monitoring to support high availability and diagnostics.

Key Messages for Customers

HIGHLY SCALABLE & EXPANDABLE

The Sun External I/O Expansion Unit allows for flexible and incremental I/O expansion/connectivity option for the SPARC Enterprise M4000-9000 servers and the Sun SPARC Enterprise T5120, T5140, T5220, T5240, and T5440 servers.

HIGHLY AVAILABLE²

Sun External I/O Expansion Unit offers hot-swappable I/O and redundant power/cooling, as well as host system monitoring, failure mode diagnostics, and Dynamic Reconfiguration support.

EASY TO INTEGRATE & MANAGE

Once the I/O Expansion Unit is installed, the I/O Expansion Unit slots are treated as though they are a multi-function I/O adapter installed locally within the host system.

² Hot swap of the I/O adapters and Dynamic Reconfiguration not available for the Sun SPARC Enterprise T5120, T5140, T5220, T5240, and T5440 servers.



Selling Highlights

Channels and Support

The Sun External I/O Expansion Unit will use the same selling channels as the Sun SPARC Enterprise server line: direct and indirect worldwide.

The principal support provider for warranty or for a SunSpectrumSM support contract is Sun Services. The Sun External I/O Expansion Unit warranty is Category 3 (next business day, Mon-Fri, 8am to 5pm). The system warranty is one year and is for hardware and software. In addition to the one-year warranty, customers are highly encouraged to obtain a SunSpectrum support program service contract.

SunSpectrum support goes beyond the warranty and provides for a flexible level of service that allows customers to choose the right amount of service based on their specific needs. Check the SUPPORT SERVICES section of this document for more details.

Note: The Sun External I/O Expansion Unit is not customer serviceable. Service contracts are required.

Target Customers

The most promising potential customers are:

Sun customers that are purchasing Sun SPARC Enterprise M4000 -M9000 or T5120, T5140, T5220, T5240, and T5440 servers that require additional I/O expandability/connectivity beyond the internal server capabilities.

System Architecture

Overview – Primary Hardware Components

The Sun External I/O Expansion Unit Chassis contains the following primary components:

External I/O Expansion Unit Chassis - The 4RU metal chassis is the external housing that contains all sub-components. The Chassis is rack-mountable in the Sun Rack 1000 series of rack mount cabinets and Sun Rack II series (1242 and 1042) rack mount cabinets.

PSU/Fan Units – 2 per External I/O Expansion unit. Integrated fan and power supply to provide power and cooling to installed I/O Cards. Separate AC connectors are provided for each power supply, allowing connection to two independent power grids. When both units are connected to AC power they serve as redundant power and cooling units for one or both I/O Boats.

I/O Boats – The External I/O Expansion Unit chassis can accept a maximum of 2 I/O Boats. The unit can operate with either 1 or 2 I/O Boats installed. Each boat may be PCI-X or PCI Express. Each I/O Boat contains 7 Card Carriers. The first slot, Slot 0, is reserved for the Link Card only.

Card Carriers – 7 per I/O Boat. Slot 0 is reserved for the link card only. Carriers support and align the PCI cards for proper insertion into the I/O Boat slots. Carriers are adjustable and can accept multiple sizes of I/O Cards (All PCI 2.3 and above, PCI-X 1.0, and PCI-Express 1.0 up to x8 lanes). A full height face plate is required for all cards, however. Sun I/O cards are shipped with both half height and full height faceplates included, and can be easily swapped. Card Carriers include a slot locating/restriction feature which can require that a carrier can only be installed back into the same slot of an I/O Boat.

Link Card Kit – The Link Card Kit provides the communication/management link to the host system. One link card kit is required for each I/O Boat. Each Link Card kit contains two Link Cards: one which mounts in slot 0 of the I/O Boat, and one which installs into one of the available PCI Express slots in the host server. (Slot 0 is reserved for the exclusive use of the Link Card, and the link card will not function in any of the other slots in the I/O Boat.) The kit comes in two types: Copper or Optical Fibre versions.

The Copper Link Card kit includes one 4 meter long copper cable, and corresponding Link Cards that allow connection of the copper cable. The Copper Link Kit is only for use on the SPARC Enterprise M4000-5000 and T5120, T5220, and T5440 servers. When used in the T series servers the low profile bracket (included with link card kit) will need to be installed onto the card before installation.

The Fibre Link Card kit is available in two lengths: 10 meter or 25 meter versions. For each version, a pair of Optical Fibre cables are provided along with a pair of Optical Fibre Link cards. The Optical Link Kit is for use on the SPARC Enterprise M4000-8000 midrange and high end servers.

I/O Architecture

The Sun External I/O Expansion Unit includes several key technologies, including:

- Link card side-band communication technology along with I/O Mgr capabilities built into XCP system software allows seamless remote management by and integration with the host server

- Adjustable Card Carrier design allowing for multiple card form factors in every slot

- Redundancy/Hot-Pluggability of PSU/Fans, I/O Boats, and I/O Cards (include thermal monitoring, remote diagnostic capabilities)

The External I/O Expansion Unit consists of an advanced network of switches, bridges, and controllers to allow I/O data communication along with system control information via the PCI Express link card connection to the host server.

The X8 PCI Express connection from the host is forwarded over the link card cable to a switch in the I/O Boat.

- For the PCI Express Boat an additional set of switches connects the six x8 slots in the boat.

- For the PCI-X Boat three separate bridges convert the PCI Express to the six independent 133 MHz PCI-X slots.

The Bridge controller supports the side band management function of the link card and has the following features:

- Gather & communicate I2C diagnostic and environmental information to the host server's system controller.

- Execute system instructions to modify fan speeds or selectively power down components within the unit.

- Perform locate/warning information via the front panel LED's.

- I/O Link Cards can be used to connect a host system IOU in the base system cabinet to an I/O Boat in the External I/O Expansion Unit. Up to 4 I/O Link Cards can be placed in a host system IOU.

- Supports dynamic reconfiguration, which enables hot maintenance and replacement of PSU's, I/O Boats, or I/O cards during system operation, and supports addition and deletion of active I/O cards during system operation.

All of these features/functions allow I/O adapters that are mounted in the External I/O Expansion Unit to function as though they are mounted directly in the host system.

Installation Data

Hardware Dimensions & Weight

Feature	Specifications
External dimensions	444.5 x 711.2 x 170.3mm
Weight	Approx. 73.40lbs, 33.36Kgs

Ambient Environmental Requirements

Feature	Specifications
Temperature, Operating	2 to 35°C (x to y°F) at an installation altitude ranging from 0 to less than 3200 m (x ft.) above sea level
Temperature, Non-operating	0 to 68°C (32 to x°F) at an installation altitude ranging from 0 to less than 13000 m (x ft.) above sea level
Humidity, Operating	7% to 93% RH, 35C, 16 hour dwell
Humidity, Non-operating	93% RH, 40C, 5 days dwell

Vibration

Feature	Specifications
Operating [G]	0.15g (vertical); 0.10g (horiz), 5 to 500 Hz, swept-sine
Seismic wave [gal]	3.0mm pk-pk 0.5g (vertical); 0.25 (horiz), 5 to 500 Hz, swept-sine

Electrical Specifications

The External I/O Expansion Unit has two power supplies, mounted side-by-side in the chassis. The table below list the power requirements.

Single-Phase Power Supplies

System	Voltage (AC) (see Note 1)	Power Consumption (W)	Power Factor	Rush Current (A _{0-p})	Leak Current (mA)	Fuse Capacity (A)
Redundant Power Supply Units (2x)	100 to 240	600	0.95	30A decaying to normal in 150mS	1.5 mA	15 (each PS)

Notes:

- 1 Input power requires a frequency of 50/60 Hz (+/-3%) and voltage within +/-10%

Cooling Specifications

Fan Unit	Heat Dissipation (kJ/h)	Exhaust Airflow (m ³ /min.)	Cooling Method	Noise Level (dB(A))
2x - 120 mm Fan/PSU combined unit, Redundant & Hot-Pluggable	2100 kJ/h	2.5 m ³ /min	Forced air cooling (Front to Back)	<85 dBA

Agency and Regulatory Compliance Specifications

The External I/O Expansion Unit complies with the following specifications.

Category	Relevant Standards
Safety	UL/CSA60950-1, EN60950-1, IEC60950-1, IEC825 and CB Scheme with all national differences
Emissions and RFI/EM	FCC, EN55022/CISPR22 (All Class-A), VCCI class-A & EN61000-3-2, and -3-3
Immunity	EN55024, EN61000-4-2, -4-3, -4-5, -4-6, -4-8, -4-11, EN300-386
Regulatory markings - System level	CE, UL, FCC, VCCI, ICES, C-tick, GOST-R, MIC, and GS
Regulatory markings - Power Supply level	CE, UL, BSMI ¹ , GOST-R, MIC, CCC, S-mark
Radiated Emissions Report format	FCC, VCCI, and CISPR22
Environmental	RoHS

¹For Taiwan only, SENY8BE1Z-TWN and SENY8BX1Z-TWN versions are BSMI approved and allowed for sale.



System Management

System Management

All External I/O Expansion Unit System management is performed remotely via the host server. The External I/O Expansion Unit has no onboard SPARC based processors or system console.

Ordering Information

Sun External I/O Expansion Unit Configuration Rules

A customer is required to make specific ATO configuration selections when ordering a Sun External I/O Expansion unit. The base configuration of either PCI Express or PCI-X must first be selected. An optional 2nd I/O Boat may be selected. One link card kit is required per I/O Boat, and 2 power cables must be selected. The part numbers for these ATO configurations are listed in the tables below.

Special Note:

Two I/O Boats (contained within one I/O Box) can be connected to two different domains in the same server chassis. One I/O Box can NOT be split between two server chassis.

BASE ATO CONFIGURATIONS: <i>select one type (base External IO Expansion Unit comes with either one PCI-X or PCIe boat already installed.)</i>		
SENY8BE1Z		<p>A 4 Rack Unit tall External IO Expansion Unit for servers. It includes: A base chassis containing 2 High efficiency power supplies/fan units and status LEDs. 1 PCI-Express "boat" and 6 "smart adjust" Hot pluggable carriers for x8 or smaller PCI-Express cards Filler panels as needed. Sun "Getting Started Guide" (1) Sun Packaging (1) Sun Ship Kit (1) containing: Cable Management bracket (1) Rack mount kit (1)</p> <p>Note: This part number is not allowed for sale in Taiwan. Instead, use the SENY8BE1Z-TWN part number, which is to be used for Taiwan only.</p>
SENY8BX1Z		<p>A 4 Rack Unit tall External IO Expansion Unit for servers. It includes: A base chassis containing 2 High efficiency power supplies/fan units and status LEDs. 1 PCI-X version 1.0 "boat" and 6 "smart adjust" Hot pluggable carriers for PCI-X cards Filler panels as needed. Sun "Getting Started Guide" (1) Sun Packaging (1) Sun Ship Kit (1) containing: Cable Management bracket (1) Rack mount kit (1)</p> <p>Note: Note: This part number is not allowed for sale in Taiwan. Instead, use the SENY8BX1Z-TWN part number, which is to be used for Taiwan only.</p>

I/O Expansion Unit Ordered in Conjunction with a DC Server

Customers who order an I/O Expansion unit with their DC system can have the I/O Expansion Unit configured within the same rack as the DC system. To order this joint configuration use the part numbers for the Sun Rack II (a.k.a. Redwood) listed below. Note: These are for the Base ATO IO Box configurations: SENY8BE1Z and SENY8BX1Z



Sun Rack II (Redwood): SR-1042E-F Power Distribution Unit Options: SR-10K-L630-F SR-10K-IEC309-F	Sun Rack II (Redwood): SR-1242E-F Power Distribution Unit Options: SR-10K-L630-F SR-10K-IEC309-F
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OPTIONAL: 2nd IO Boat. Customer may pick one (maximum) additional IO boat per External I/O Expansion Unit.		
SENY8TE1Z		ATO - PCI-Express "boat" for the External I/O Expansion Unit. Includes 6 "smart adjust" Hot pluggable carriers for x8 or smaller PCI-Express cards and 6 PCI-E filler cards. (For Factory Integration)
SENY8TX1Z		ATO - PCI-X "boat" for the External I/O Expansion Unit. Includes and 6 "smart adjust" Hot pluggable carriers for PCI-X cards and 6 PCI-X filler cards. (For Factory Integration)
REQUIRED: Link Kits. Customer MUST select 1 kit per IO Boat, regardless if they have one or two IO Boats installed.		
SENY8LK2Z		ATO – Fibre optic connection kit from a server with a PCI-Express slot to a External I/O Expansion Unit PCI-E or PCI-X expansion "boat" Includes 2 cards and two 10m dual path Fibre optic cable (For Factory Integration)
SENY8LK3Z		ATO – Fibre optic connection kit from a server with a PCI-Express slot to a External I/O Expansion Unit PCI-E or PCI-X expansion "boat" Includes 2 cards and two 25m dual path Fibre optic cable (For Factory Integration)
SELY8LK1Z		ATO – Copper connection kit from a server (M4000/5000 and T-series ONLY, not supported on M8000/9000) with a PCI-Express slot to a External I/O Expansion Unit equipped PCI-E or PCI-X expansion "boat" Includes 2 cards and one 4m dual path copper cable (For Factory Integration)
REQUIRED: Power Cables Customer MUST select one cable type (quantity of 2 required), regardless if they have one or two IO Boats installed.		
X311L		AC Power Cord U.S./Asia AC Power Cord U.S./Asia
X312L		AC Power Cord Continental Europe
X312E		AC Power Cord China
X386L		AC Power Cord Australia
X312F		AC Power Cord Argentina
X317L		AC Power Cord U.K
X314L		AC Power Cord Switzerland
X384L		AC Power Cord Italy
X383L		AC Power Cord Denmark
X312G		AC Power Cord Korea
X332A		AC Power Cord Taiwan [PWR CORD,TAIWAN,10A,5-15P]
X9237-1-A		Pwr Jumper Cables, 1m, Rack (For use in a Sun Rack)
X9238-1-A		Pwr Jumper Cables, 2.5m, Rack (For use in a Sun Rack)
X320A		AC Power Cord, IEC 320 C13 to NEMA 6-15P - 15A/220V 2.5M Power Cord, Direct to wall, N. American, RoHS-6



Sun External I/O Expansion Unit X-Options

X-Options: for the External I/O Expansion Unit		
SENX8TE1Z		PCI-Ex IO-Boat for External I/O Expansion Unit
SENX8TX1Z		PCI-X IO-Boat for External I/O Expansion Unit
SELX8LK1Z		1x Copper Link card Kit (2 boards + 4m metal cable) for I/O Expansion Unit
SENX8LK2Z		1x Optical Link card Kit (2 boards + 2 10M optical cables) for External I/O Expansion Unit
SENX8LK3Z		1x Optical Link card Kit (2 boards + 2 25M optical cables) for External I/O Expansion Unit
SENX8FC1Z		1x Optical Link Cable (25m optical cable) for External I/O Expansion Unit
SENX8FC2Z		1x Optical Link Cable (25m optical cable) for External I/O Expansion Unit

Refer to SPARC Enterprise M4000-M9000 I/O support matrix (SunWin Token # 501277) for specific I/O adapters that are supported for use with the External I/O Expansion Unit.

Configuration Specifics for Sun SPARC Enterprise T5440 Server

Only PCIe options are supported; PCI-X options are not supported.

Hot plug of PCIe slots is not supported

Only two I/O boats are currently supported. It is expected that this limit will be expanded shortly after the release of the server

Only one link card, and consequently, only one I/O boat per processor

Link cards must be installed into PCIe slots that are local to a processor

Processor failure may result in inaccessibility to the External I/O Expansion Unit

The **only** options available for the Sun SPARC Enterprise T5440 server are:

SENY8BE1Z - External I/O Expansion Unit - PCIe Base (or SENY8BE1Z-TWN for Taiwan)

SENY8TE1Z - PCI-Express boat

SELY8LK1Z - Copper connection kit from a server to a External I/O Expansion Unit. The optical/fibre link card is not supported. Note: The low profile bracket (included with link card kit) will need to be installed onto the card before installation into T5440 server.

Power cords as specified in the table above

Orders for the Sun SPARC Enterprise T5440 server and Sun External I/O Expansion Unit are shipped separately. Integration with the server is not currently possible, except through CRS. Please refer to www.sun.com/crs for details.

Please refer to *Sun SPARC Enterprise T5440 Server, Just the Facts*, SunWin Token 526118 for server specific details and configuration information



Configuration Specifics for Sun SPARC Enterprise T5120 & T5220

The Sun External I/O Expansion Unit provides additional PCIe connectivity by multiplexing one adapter, installed in the Sun SPARC Enterprise T5120 or T5220 server, to many adapters through the external I/O Box and the I/O boats therein. This technique provides additional bus connectivity, not additional throughput or bandwidth.

Only PCIe options are supported with the I/O Box; PCI-X options are not supported

The Sun SPARC Enterprise T5120 supports one I/O boat per system and the Sun SPARC Enterprise T5220 supports two I/O boats per system.

A link to an I/O boat consists of a pair of link cards and connecting cable. One link card is installed in a PCI-Express I/O slot in the T5120 or T5220. The other link card is installed in the LINK slot of the I/O boat. Use: SELY8LK1Z Copper kit.

The x8 slots only should be used for the attachment of link cards:

The Sun SPARC Enterprise T5120 has (1) x8 slot which can only support (1) link card

The Sun SPARC Enterprise T5220 has (2) x8 slots which can support (2) link cards.

The x4 slots should NOT be used for the link cards

The Fault Management Architecture (FMA) is not able to isolate to a component in the External I/O Expansion Module. The diagnosis will fault the I/O slot in the Sun SPARC Enterprise T5120 and T5220 server to which the External I/O Expansion Module is attached rather than the component in the External I/O Expansion Module itself.

Customers must select two power cords per I/O Box, not per I/O Boat

Configuration Specifics for Sun SPARC Enterprise T5140 & T5240

The Sun External I/O Expansion Unit provides additional PCIe connectivity by multiplexing one adapter, installed in Sun SPARC Enterprise T5140 and T5240 server, to many adapters through the external I/O Box and the I/O boats therein. This technique provides additional bus connectivity, not additional throughput or bandwidth.

Only PCIe options are supported with the I/O Box; PCI-X options are not supported

One I/O boat per processor is supported on the Sun SPARC Enterprise T5140 or T5240 server.

A link to an I/O boat consists of a pair of link cards and connecting cable. One link card is installed in a PCI-Express I/O slot in the T5140 or T5240. The other link card is installed in the LINK slot of the I/O boat. Use: SELY8LK1Z Copper kit.

Link cards must be installed into PCIe slots that are local to a processor.

Processor failure may result in remapping of the PCIe slots. The remapping may cause a link card (and attached I/O boat) to no longer be local to a processor. The increased probe depth could exceed OBP limits so adaptors installed in the I/O boat slots are not discovered. The recommended solutions are to replace the failed processor or to move the link card to another PCIe slot that is local to the processor.

The Fault Management Architecture (FMA) is not able to isolate to a component in the External I/O Expansion Module. The diagnosis will fault the I/O slot in the Sun SPARC Enterprise T5140 and T5240 server to which the External I/O Expansion Module is attached to rather than the component in the External I/O Expansion Module itself.

Customer must select two power cords per I/O Box, not per I/O Boat

Both I/O Boats must be connected to the same host system.



Service and Support

SunSpectrumSM Program Support

Sun System Service Plans for Solaris

World-class, integrated hardware and operating system support

SunSpectrum Support is a portfolio of service plans for systems, storage, and software that focuses on delivering proven expertise and responsive, consistent service quality to help you achieve high availability within your IT infrastructure. Years ago, with the introduction of SunSpectrum Support, Sun set the standard for fully integrated hardware and operating system service coverage. Today, the single-price, total-system approach provided by a Sun System Service Plan remains the best option if you're running the SolarisTM Operating System on your Sun hardware.

More choice. Greater confidence

Sun System Service Plans extend far beyond traditional break-fix services by delivering the proactive services and responsive, consistent service quality you need to help you achieve high availability within your IT infrastructure. With the benefit of integrated hardware and Solaris OS support - and four levels of service to best match your unique requirements - you can choose from different coverage hours and response times for hardware service coverage and technical support, up to 24/7. With our worldwide network of experienced support personnel and our commitment to quality of support², Sun is uniquely qualified to provide the level of availability and stable, responsive service you demand.

The result? You can help reduce system management costs and complexity while improving performance.

Don't get caught in the middle

We understand the components of your IT infrastructure don't run in isolation, they interoperate. Sun System Service Plan features such as the Sun Vendor Integration Program (SunVIPSM) help you gain confidence in your business infrastructure knowing that seamless cooperative support is available to help diagnose and drive resolution if interoperability issues arise. When support engineers from Sun and SunVIP vendors work together, you benefit from synergies that go beyond each company's individual capabilities—without the typical finger-pointing.

Highlights

The value and ease of integrated hardware and Solaris Operating System (OS) support

The specialized services you need to support your Sun systems—for one price per product per year

Resources for proactive system management so you can keep your environment—and your business—running efficiently

Flexibility to choose a level of service that matches the criticality of each system



SunSpectrum Service Plans for Solaris OS at a Glance

Features	SunSpectrum Platinum Service Plan	SunSpectrum Gold Service Plan	SunSpectrum Silver Service Plan	SunSpectrum Bronze Service Plan
Hardware Service Coverage	24x7 On-site within 2 hours	8-8, M-F On-site within 4 hours	8-5, M-F On-site within 4 hours	Replacement parts Within 2 business days
Telephone and Online Technical Support	24x7 Live transfer	24x7 Live transfer	8-8, M-F Live transfer	8-5, M-F Four hour response
SunVIP Interop Support	Yes	Yes	No	No
Knowledgebase Access	Yes	Yes	Yes	Yes
Solaris Releases	Yes	Yes	Yes	Yes
On-Demand Solaris Updates	Yes	Yes	Yes	Yes
Sun Alerts and Notifications	Yes	Yes	Yes	Yes
SunSpectrum eLearning Library	Yes	Yes	Yes	Yes
System Health Check Subscription	Yes	No	No	No
Additional Services for Qualifying Sites	Customer sites meeting qualification criteria may receive additional services including credits toward learning services			

Availability of specific features, coverage hours, and response times may vary by location, product, or service level. Other limitations might apply.

Response times are determined by customer-defined priority. The response times shown are for service requests designated by the customer as "Priority 1."

SunSpectrum(sm) Instant Upgrade (SIU) Part Numbers for Sun External I/O Expansion Unit:

SIU Number	Description
W9D-EXTIO-1G	Sun External I/O Expansion Unit Upgrade to 1 Year of Gold Support.
W9D-EXTIO-1P	Sun External I/O Expansion Unit Upgrade to 1 Year of Platinum Support.
W9D-EXTIO-1S	Sun External I/O Expansion Unit Upgrade to 1 Year of Silver Support.
W9D-EXTIO-24-1G	Sun External I/O Expansion Unit Upgrade to Gold Support + 7X24 On-Site Support for 1 Year
W9D-EXTIO-24-2G	Sun External I/O Expansion Unit Upgrade to Gold Support + 7X24 On-Site Support for 2 years
W9D-EXTIO-24-3G	Sun External I/O Expansion Unit Upgrade to Gold Support + 7X24 On-Site Support for 3 years
W9D-EXTIO-2G	Sun External I/O Expansion Unit Upgrade to 2 years of Gold Support.
W9D-EXTIO-2P	Sun External I/O Expansion Unit Upgrade to 2 years of Platinum Support.
W9D-EXTIO-2S	Sun External I/O Expansion Unit Upgrade to 2 years of Silver Support.
W9D-EXTIO-3G	Sun External I/O Expansion Unit Upgrade to 3 years of Gold Support.
W9D-EXTIO-3P	Sun External I/O Expansion Unit Upgrade to 3 years of Platinum Support.
W9D-EXTIO-3S	Sun External I/O Expansion Unit Upgrade to 3 years of Silver Support.
Note:	

Sun System Service Plans for Solaris OS Details

Feature: Hardware Service Coverage

How it Works: Hardware service coverage features on-site service (Silver, Gold, and Platinum) or parts replacement coverage (Bronze). You receive prompt, dependable service or parts based on the coverage hours and response time commitments defined in the Sun System Service Plan you choose. To help enable a first-time fix, all replacement parts are Sun certified. For on-site service, Sun dispatches experienced field engineers who can also provide proactive part replacement in accordance with any Sun field change orders (FCOs).

Benefit: With Sun hardware service coverage, you receive prompt, dependable service and you aren't exposed to unpredictable repair costs or missed FCOs.

Feature: Telephone and Online Technical Support

How it Works: You can contact Sun for assistance within the coverage hours you choose (with no limit on the number of incidents). Through Sun's customer-defined priority process, you select Sun's response time and have access to live call transfer. As you move up to higher level plans, coverage hours broaden, response time commitments quicken, and issue escalation is accelerated. To receive the best support, Sun recommends that customers install Sun Net Connect software on SPARC-based systems. This software creates a secure, customer-controlled link to the Sun Solution Center that helps expedite Solaris OS troubleshooting, remote diagnostics, and a number of customer-enabled alerting and reporting functions.

Benefit: Your service requests are handled swiftly, helping enable faster resolution.

Feature: SunVIP Interop Support

How it Works: Sun System Service Plan customers can use SunVIP to initiate support when they are unsure where the problem lies. If you encounter an issue that you believe involves Sun product, but perhaps another vendor's product as well, you can call Sun. Sun will assist with multivendor collaborative troubleshooting by tapping into relationships with more than 100 top IT vendors and joint service centers.

Benefit: You don't get caught in the middle—SunVIP provides a customer-focused solution for expediting resolution of frustrating problems that cannot be readily attributed to a particular vendor.

Feature: Knowledgebase Access

How it Works: You have around-the-clock access to a variety of exclusive technical resources including Sun's online knowledgebase, collaborative remote diagnosis, and complete collections of technical articles, features, and security papers.

Benefit: Take advantage of faster problem resolution, troubleshooting, and remediation.



Feature: Sun Alerts and Notifications

How it Works: You receive Sun Alerts for covered products, including those for which Sun is still working on a fix, providing you with an early warning system so you can get a jump start on risk mitigation. In addition, Sun provides special content in the BigAdminSM newsletter to keep you up-to-date on Sun System Service Plan enhancements.

Benefit: Direct communication and alerts from Sun help you confidently run your operations, knowing that you are working from the most current information.

Feature: SunSpectrum eLearning Library

How it Works: Through collaboration with Sun Learning Services, Sun System Service Plan customers are entitled to web-based training modules at no additional charge.

Benefit: Courseware that complements your product(s) helps you keep pace with changing technology.

Feature: System Health Check Subscription

How it Works: With Platinum-level plan, you receive a subscription to Sun System Analysis. This powerful, on-demand configuration analysis service is a must for mission-critical systems. The recommendations you receive are prioritized in order of risk and are delivered via a secure, easy-to-use interface.

Benefit: Access to this unique feature enables you to take a more proactive approach to system management.

Feature: Additional Services for Qualifying Sites

How it Works: Sites that reach or exceed a Sun Service Plan contract value threshold, can receive additional services including credits toward Sun Learning Services.

Benefit: Sun helps coordinate support activities in large, complex environments while also providing additional value-added services.

Availability of specific features, coverage hours, and response times may vary by location, product, or service level. Other limitations may apply.

Which Sun System Service Plan is right for you?

With increasingly complex environments and interdependent systems, uptime and availability continue to become even more important. Understandably, you want the best IT product support available that you can obtain within your budget. Sun helps you evaluate your options with a range of Service Plans that are built to suit Sun's products and your need for flexibility. That means you can have one overarching SunSpectrum Support agreement, but still choose the precise level of service you need for individual system performance. This level of control is designed to help you manage cost while also providing you with the services your IT infrastructure requires.

Sun Spectrum Bronze Service Plan

The SunSpectrum Bronze Service Plan includes the fundamental components you need to maintain your systems, including replacement parts coverage, telephone and online technical support, Solaris OS releases and updates, and access to self-help tools and Sun notifications.

Sun Spectrum Silver Service Plan

The SunSpectrum Silver Service Plan provides the basic services you need to manage and resolve technical issues more quickly, including on-site hardware service coverage, telephone and online technical support, Solaris OS releases and updates, and access to self-help tools and Sun notifications.

Sun Spectrum Gold Service Plan

The SunSpectrum Gold Service Plan equips you with enhanced coverage to help you proactively maintain higher availability. Features include extended on-site hardware service coverage hours, 24x7 telephone and online technical support, Solaris OS releases and updates, access to self-help tools and Sun notifications, and additional specialized services, including SunVIP interoperability support.

Sun Spectrum Platinum Service Plan

The SunSpectrum Platinum Service Plan helps enable you to achieve maximum system availability when every minute counts. Designed with advanced tools and processes for your mission-critical systems, this robust level of service integrates specialized services, including SunVIP interoperability support, with the highest priority response available exclusively to SunSpectrum Platinum customers: 24x7 on-site hardware service coverage and 24x7 telephone and online technical support.

For more information, visit: <http://www.sun.com/service/serviceplans>.

Warranty

Warranty Feature	Sun External I/O Expansion Unit
URL Site: URL Site: http://www.sun.com/service/warranty/product_warranty_chart.html	
Warranty Term	1 year
Phone Coverage	Business Hours
Phone Call Back Response Time	8 hours
On-Site Coverage	Business Hours
On-Site Response Time	Next Business Day

Sun Learning Services

The Learning Services portfolio which is comprised of thousands of courses and certifications can be viewed simply as the A, B, C of learning. A, before a project begins, we help the customer Analyze their organizational structure and their staff to determine what they need to know and identify their skills gaps. Then, B, we help the individuals and managers Build their skills through a variety of training modalities. And finally, C, we Certify the knowledge and skills acquired through formal training and on the job experience as a way to measure success, giving individuals and managers confidence in their newly developed skills.

Assuming that the company has their roles and skills gaps well defined, then the first thing we recommend is to look at our role-based Learning Paths (sun.com/training/learningpaths). These paths show a student which course they should take in sequence to achieve proficiency in their area. The learning paths also show all training modalities to help that student achieve their Certification. So, whether they want a traditional classroom environment, self-paced or instructor-led Web learning or CD-ROM learning, these Learning Paths show all their options. In particular, SPARC-based customers will find relevant courses in the Solaris learning paths.

Course Title	Course Number	Length	Delivery Method(s)
Sun SPARC Enterprise Product Line Features, Functions and Architecture Overview Pre-Work Course for Customers	WET-5408	6 hours	WBT
Sun SPARC Enterprise Product Line Features, Functions and Architecture Overview Pre-Work Assessment	WGS-PREX-5408	1 hour	Assessment
Sun SPARC Enterprise Product Line Installation and Optimization	ES-411	3 days	ILT with Remote Labs
Sun SPARC Enterprise Product Line Installation and Optimization	VC-ES-411	3 days	LVC with Remote Labs
Product Accreditation Program Assessment for Customers	TBD	TBD	Objectives-based Assessment

The other area of interest for SPARC-based customers is the set of Solaris Career Accelerator Packages that are found at (http://www.sun.com/training/catalog/accelerator_jump.htm). Many of our customers want to pursue certification, however, they know that Sun's certification is by no means easy to achieve. It's true that we set the bar high. So, to help our students increase their chances of passing the exam the first time we have packaged traditional classroom courses with companion Web courses, ePractice exams and the final certification exam. We find that students who purchase this package significantly increase their chance of passing the exam and shorten the time it takes to be fully prepared. It's a win for the student and a win for their company.



Sun Professional Services

Sun Enterprise Installation Services

Sun Enterprise Installation Services (EIS)

Sun Enterprise Installation Services (EIS) are designed to help with the physical installation and configuration of new systems, from high-end servers through storage to workstations and cluster software. EIS deliver a proven, standardized installation methodology that helps enable consistent, high quality and cost effective installations. To learn more, visit <http://www.sun.com/service/install.html>.

Glossary

Adapter	A host bus adapter or interface which plugs into a PCI slot to provide connectivity, e.g., to networks, storage, graphics or other I/O devices
ATO	Assemble-To-Order. Allows customers to configure options from the manufacturing plant. The External I/O Expansion Unit is available only as an ATO product.
Availability	A measurement of the percentage of time that a system is accessible by users and is providing service.
High availability	Capability of a system to mask many individual points of failure or to significantly compensate for them. This type of system is built upon standard components with limited hardware and/or software components to minimize the impact of failures. Generally, this type of system is less costly than a fault tolerant system.
Host-bus adapter	See Adapter.
Hot-plug	A component that can be electrically safe to remove or add while the system is still running.
I/O Boat	Modular chassis available in either PCI-X or PCI Express versions that accepts 7 Card Carriers (slots 0-6). Slot 0 is for the exclusive use of the External I/O Expansion Link Card (Fiber or Copper), and the remaining 6 slots are for expansion purposes. A maximum of two I/O Boats may be installed in an External I/O Expansion Unit.
Link Card	PCI Express adapter card that is installed in slot 0 of the I/O Boat and the host system to enable remote management/data communication between External I/O Expansion Unit and host server
PCI	Peripheral component interconnect. An industry-standard for connecting peripherals such as disk drives, tape drives and other external devices.
Pre-configured system	Pre-configured systems that offer discounted prices in comparison to assemble-to-order (ATO) or custom configurations. They are more convenient for both customers and sales as it assures that all necessary components for a functional system are included via a single line item on the order form.
PSU	Power Supply Unit.

PTO	See Pre-configured system.
RAS	Reliability, availability, and serviceability, Three aspects of the design of a system contributing to continuous operation and minimizing system downtime for services. Together reliability, availability, and serviceability provide for near continuous system operation.
Redundancy	Duplication for the purpose of achieving fault tolerance. Refers to duplication or addition of components.
Reliability	Ability of a system to operate continuously without failures and to maintain data integrity. Reliability influences MTBF.
Serviceability	A measurement of the time to restore a system to operation once a failure has occurred. Serviceability influences MTTR.

Materials Abstract

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Literature				
<i>Sun External I/O Expansion Unit, Just The Facts</i>	Reference Guide (this document)	Training Sales Tool	SunWIN	498978
<i>Sun External I/O Expansion Unit Data Sheet</i>	Data Sheet	Sales Tool	SunWIN	490802