



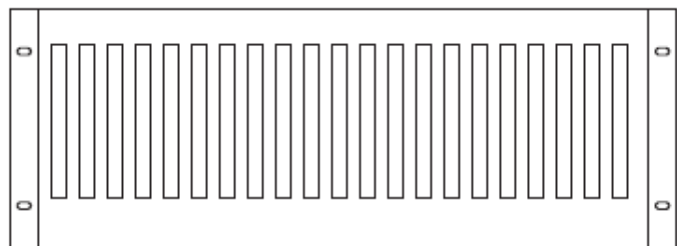
Optelecom 9000 Series Installation and Operation Manual

Model 9002 Chassis

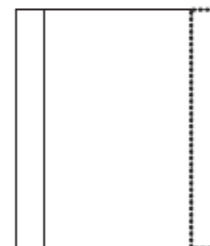
The 9002 chassis is the standard 19-inch, EIA/TIA rack-mount chassis for operation with any of the Series 9000 rack-mount cards.



Front View



Card Entry View



Side View

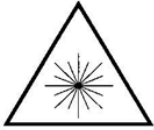
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Safety Instructions

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The safety information contained in this section, and on other pages of this manual, must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the unit. TKH Security Solutions USA assumes no liability for the customer's failure to comply with any of these safety requirements.



LASER RADIATION
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (MAGNIFIERS)
CLASS 1M LASER PRODUCT

CAUTION:
DISCONNECTED OPTICAL CONNECTORS MAY EMIT OPTICAL ENERGY.
DO NOT VIEW BEAM WITH OPTICAL INSTRUMENTS (MAGNIFIERS)

This product contains Class 1M lasers or LEDs.

- Class 1M laser product according to IEC60825-1:1993+A1+A2
- **CAUTION: Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.**
- Precautions should be taken to prevent exposure to optical radiation when the unit is removed from its enclosure or when fiber is disconnected from the unit.
- Laser radiation may be present on a fiber connection to this unit even when the power has been removed from the unit.
- This unit is intended for installation in locations where only trained service personnel have access to the fiber connections.
- The locations of all optical connections are listed in the Connection Locations and Function section of this manual.
- Optical outputs and wavelengths are listed in the Specifications section of this manual.

The optical devices used in this equipment are Hazard Level 1M. As required by IEC60825-1, the installer is responsible for insuring that the label depicted below is present in the restricted locations where this equipment is installed.

Hazard Level 1M

The border shall be black and
the background shall be yellow



This assembly contains parts sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies.

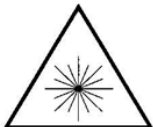


The chassis into which this unit is installed must be housed in a properly rated NEMA enclosure.



When this unit is operated in extremely elevated temperature conditions, it is possible for internal and external metal surfaces to become extremely hot. Care should be taken to insure this unit is installed in a restricted area where only properly trained service personnel have access to the unit.

Debe observarse la información de seguridad contenida en esta sección, y en otras páginas de este manual siempre que se opere, dé servicio o repare esta unidad. Si no se cumple con alguna precaución, advertencia o instrucción indicada en este manual se infringen los estándares de diseño, fabricación y el uso destinado a la unidad. TKH Security Solutions USA no asume ninguna responsabilidad si el cliente no cumple con alguno de estos requisitos de seguridad.



RADIACIÓN LÁSER
NO VER DIRECTAMENTE CON INSTRUMENTOS ÓPTICOS (DE AUMENTO)
PRODUCTO LÁSER CLASE 1M

PRECAUCIÓN:
LOS CONECTORES ÓPTICOS DESCONECTADOS PUEDEN AMITIR ENERGÍA ÓPTICA
NO VER EL HAZ CON INSTRUMENTOS ÓPTICOS (DE AUMENTO)

Este producto contiene rayos láser o diodos emisores de luz Clase 1M.

- Producto láser Clase 1M conforme a la norma IEC60825-1: 1993+A1+A2
- **PRECAUCIÓN:** El uso de los controles, ajustes o procedimientos, aparte de los aquí especificados, pueden ocasionar exposición peligrosa a la radiación.
- Deben tomarse precauciones para evitar la exposición a la radiación óptica cuando se saque la unidad de su alojamiento, o cuando se desconecte la fibra de la unidad
- Puede haber radiación laser en una conexión de fibra a esta unidad aun cuando se haya eliminado la corriente de la unidad.
- Este equipo está destinado a instalarse en lugares donde sólo el personal de servicio debidamente entrenado tenga acceso a las conexiones de fibra.
- La ubicación de todas las conexiones ópticas se enumeran en la sección Ubicación de los conectores y funciones de este manual.
- Las salidas ópticas y longitudes de onda aparecen en la sección Especificaciones de este manual.

Los dispositivos ópticos usados en este equipo son de Nivel de Riesgo 1M. Según lo exige la norma IEC60825-1, el instalador es responsable de asegurar que la etiqueta descrita a continuación esté presente en las áreas restringidas donde se instale este equipo.

Nivel de Riesgo 1M

El borde debe ser negro y
el fondo debe ser amarillo



Este ensamblaje contiene piezas sensibles al daño por descargas electrostáticas (ESD, por sus siglas en inglés). Use procedimientos para prevenir las descargas electrostáticas al tocar, desmontar o insertar piezas o ensamblajes.

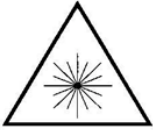


El chasis en el cual está instalada esta unidad debe estar dentro de un alojamiento debidamente calificado por NEMA.



Cuando se opera esta unidad en condiciones de temperatura sumamente elevada, es posible que las superficies internas y externas de metal se pongan extremadamente calientes. Debe tenerse cuidado para asegurar que esta unidad se instale en un área restringida donde sólo tenga acceso a la unidad el personal de servicio debidamente capacitado.

Die in diesem Abschnitt und auf anderen Seiten dieses Handbuchs enthaltenen Sicherheitsinformationen müssen befolgt werden, wenn diese Einheit betrieben, gewartet oder repariert wird. Falls Vorsichtsmassnahmen, Warnungen oder Anweisungen in diesem Handbuch nicht befolgt werden, verstösst dies gegen die Konstruktions- und Herstellungsstandards und erfolgt im Gegensatz zum vorgesehenen Verwendungszweck dieser Einheit. TKH Security Solutions USA übernimmt keine Haftung für das Verabsäumen des Kunden, diese Sicherheitsanforderungen einzuhalten.



LASER-STRAHLUNG
NICHT DIREKT MIT OPTISCHEN INSTRUMENTEN (LUPEN) ANSEHEN
LASER-PRODUKT DER KLASSE 1M

VORSICHT:
ABGEKLEMMTE OPTISCHE STECKVERBINDER KÖNNEN OPTISCHE ENERGIE FREI SETZEN
NICHT MIT OPTISCHEN INSTRUMENTEN (LUPEN) IN DEN STRAHL BLICKEN.

Dieses Produkt enthält Laser oder LEDs der Klasse 1M.

- Laserprodukt der Klasse 1M gemäß IEC60825-1:1993+a1+A2
- **VORSICHT: Wenn die Bedienelemente anders als hier beschrieben bzw. andere Einstellungen verwendet werden, kann es zu schädlicher Strahlenaussetzung kommen.**
- Es müssen Vorsichtsmaßnahmen getroffen werden, um Aussetzung an optischer Strahlung zu vermeiden, wenn die Einheit aus dem Gehäuse genommen oder die Faseroptik von der Einheit getrennt wird.
- In einer Faseroptik-Verbindung dieser Einheit kann auch dann Laserstrahlung vorhanden sein, wenn die Stromversorgung zur Einheit abgeschaltet wurde.
- Diese Einheit ist zum Einbau an Orten vorgesehen, an denen nur geschultes Personal Zugang zu den Faseroptik-Verbindungen hat.
- Die Lage aller optischen Verbindungen ist im Abschnitt über die Lage von Anschlüssen und Funktionsweise dieses Handbuchs zu finden.
- Optische Ausgänge und Wellenlängen sind im Abschnitt mit den technischen Daten dieses Handbuchs zu finden.

Die optischen Vorrichtungen in diesem Gerät haben Gefahrenstufe 1M. Wie vorgeschrieben durch IEC60825-1 ist der Installateur dafür verantwortlich, sicherzustellen, dass die unten abgebildeten Schilder an den Orten mit eingeschränktem Zugang, an denen dieses Gerät aufgestellt ist, vorhanden sind.

Gefahrenstufe 1M

Schwarzer Rand und
gelber Hintergrund



Diese Baugruppe enthält Teile, die durch elektrostatische Entladung (ESD) beschädigt werden können. Vorsichtsmaßnahmen zum Schutz vor elektrostatischer Entladung treffen, wenn Teile oder Baugruppen berührt, ausgebaut oder eingefügt werden.



Das Gestell, in dem diese Einheit eingebaut ist, muss in einem entsprechend klassifizierten NEMA-Schutzgehäuse untergebracht sein.

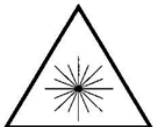


Wenn diese Einheit bei besonders hohen Temperaturen betrieben wird, können interne und externe Metallflächen extrem heiß werden. Es muss darauf geachtet werden, dass diese Einheit in einem Bereich mit eingeschränktem Zugang aufgestellt wird, damit nur geschultes Wartungspersonal Zugang zur Einheit hat.

Consignes de Sécurité

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Les consignes de sécurité contenues dans cette section et dans le reste de ce manuel doivent être respectées à chaque fois que cet appareil est utilisé ou fait l'objet d'une maintenance ou d'une réparation. Le non-respect d'une précaution, d'un avertissement ou d'une instruction figurant dans ce manuel est une violation des normes de conception, fabrication et indication d'usage de l'appareil. TKH Security Solutions USA n'est pas responsable du non-respect de ces consignes de sécurité par le client.



RAYONNEMENT LASER
NE PAS REGARDER DIRECTEMENT AVEC DES INSTRUMENTS OPTIQUES (LOUPES)
PRODUIT LASER DE CLASSE 1M

ATTENTION:
LES CONNECTEURS OPTIQUES DEBRANCHES PEUVENT EMETTRE UNE ENERGIE OPTIQUE.
NE PAS REGARDER LE FAISCEAU AVEC DES INSTRUMENTS OPTIQUES (LOUPES)

Ce produit contient des lasers ou diodes électroluminescentes de classe 1M.

- Produit laser de classe 1M conformément à IEC60825-1:1993+A1+A2
- **ATTENTION: L' utilisation de commandes ou réglages, ou de procédures différentes de celles indiquées ici risque de provoquer une exposition dangereuse au rayonnement.**
- Prendre des précautions pour empêcher une exposition au rayonnement optique lorsque l' appareil est retiré de son boîtier ou lorsque la câble optique fibre est débranché de l' appareil.
- Un rayonnement laser pourra être présent dans un câble optique branché sur cet appareil, même une fois l'alimentation coupée.
- Cet appareil est prévu pour une installation à des endroits où seul un personnel de maintenance formé accès aux câbles optiques.
- Les points de branchement de tous les câbles optiques sont indiqués à la section Points de branchement et fonction de ce manuel.
- Les sorties et longueurs d' onde optiques figurant à la section Caractéristiques techniques de ce manuel.

Les appareils optiques utilisés dans cet équipement correspondent à un niveau de danger 1M. Comme exigé par la norme IEC60825-1, il incombe à l'installateur de s'assurer que l'étiquette ci-dessous est présente aux endroits d'accès limité où cet équipement est installé.

Niveau de danger 1M

La bordure doit être noire et
le fond jaune



Cet ensemble contient des pièces sensibles aux décharges électrostatiques (ESD). Prendre les précautions relatives aux ESD avant de toucher, retirer ou insérer des pièces ou des ensembles.



Le châssis dans lequel est installé cet appareil doit être placé dans une enceinte NEMA conforme aux spécifications nominales.



Lorsque cet appareil fonctionne à une température ambiante extrêmement élevée, il est possible que les surfaces métalliques internes et externes deviennent extrêmement chaudes. S'assurer que cet appareil est installé dans une zone dont l'accès est limité à un personnel de maintenance correctement formé.

Additional Chassis Safety Information



1. When all covers are closed and fastened, there are no accessible hazardous live parts. The 9002 chassis provides the enclosure required to prevent access to hazardous live parts, comply with all spacing requirements, and provide ample wiring space with a minimum flame rating of 94V-0.



2. This symbol is used to call attention to the fact that AC power must be removed from the chassis to remove high voltage from that chassis.



3. The installation of this equipment must be done in accordance with all local and national electric codes and requirements.



4. The equipment must be located within three meters of the easily accessible AC socket-outlet.

Fiber Information

This unit was manufactured with attention to fiber cleanliness by TKH Security Solutions USA. Beyond the optical safety information contained in this manual, the following guidelines should be observed when working with optical fibers.

The biggest problem is **dirt!**

It takes very little contamination to cause problems with optical fiber connections; cleanliness is extremely important to proper operation of optical equipment.

1. Protect optical connectors by leaving the connector covers in place on unused fiber connections and on the fiber tips themselves.
2. Personnel who remove and replace fibers should be equipped with a fiber cleaning kit. These are inexpensive and can be obtained from any fiber equipment supply house. If you choose to, you can use propanol and lint-free tissue to clean fibers.
 - a. Do not use isopropanol alcohol (typically called rubbing alcohol) mixed with water. This can cause additional spots. (**Caution: *Pure isopropanol is very flammable!***)
 - b. Use lintless tissues to clean fibers.
 - c. Clean the fiber with a folded tissue moistened with the propanol, pulling the connector tip across the tissue, then turn the connector 90 degrees and repeat in a different spot on the tissue.
 - d. Don't pull the fiber across and then push it back. This will put the dirt that was cleaned off back on again.
 - e. Repeat the process on a dry, folded tissue.
3. When removing fibers, ***always*** clean them when replacing them no matter how long you had them off.
4. When connecting fibers, pay attention to the bend radius of the fibers. A general rule is to have a 3-inch (8 cm) bend radius. A bend radius less than 3 inches is an attenuator and can cause optical signal loss.
5. Installers of fiber equipment should be equipped with the equipment manuals and an optical power meter to measure the optical inputs and outputs in a system. An optical power meter is an inexpensive tool that can save much time and effort in getting optical communications links up and running. Properly equipped and trained installers can quickly determine the source of any problems that occur.

External Wiring Information

Cable assemblies with lengths external to the unit not exceeding 3.05 meters, coiled or uncoiled, may be constructed of jacketed appliance wiring material suitable for the maximum voltage current and temperature, rated VW-1 or FT-1 or better. Cable assemblies with lengths external to the unit not exceeding 3.05 meters, coiled or uncoiled, and supplied by a limited power source or NEC Class 2 source of supply as defined in the National Electric Code, ANSI/NFPA 70, may be constructed of materials rated VW-1 or FT-1 or better with no additional requirements.

Optical Output Power Information

Many of the I/O cards used in this chassis have optical emitters. The table below illustrates the wavelengths and maximum output power of the optical devices that may be present on installed I/O cards.

Note: Most I/O cards have a continuous optical output, however some low speed, data only I/O cards have outputs that are only active during data transmission. Some low speed transmitters switch the lasers off and on at the data rate. Lasers may be continuous wave or emit a pulse width. Pulses may be as short as 5 nanoseconds up to being continuous. Table 1 below provides information relating to the maximum power that can be output by these cards. For details on specific cards, refer to the manual for that card.

TABLE 1 — MAXIMUM OPTICAL EMITTER OUTPUTS

Wavelength (nm)	Maximum Optical Output (dB)	Maximum Optical Output (mW)
850	−3	+0.5
1270	+1	+1.26
1290	+1	+1.26
1310	+1	+1.26
1330	+1	+1.26
1350	+1	+1.26
1370	+1	+1.26
1390	+1	+1.26
1410	+1	+1.26
1430	+1	+1.26
1450	+1	+1.26
1470	+1	+1.26
1490	+1	+1.26
1510	+1	+1.26
1530	+1	+1.26
1550	+1	+1.26
1570	+1	+1.26
1590	+1	+1.26
1610	+1	+1.26

Functional Description

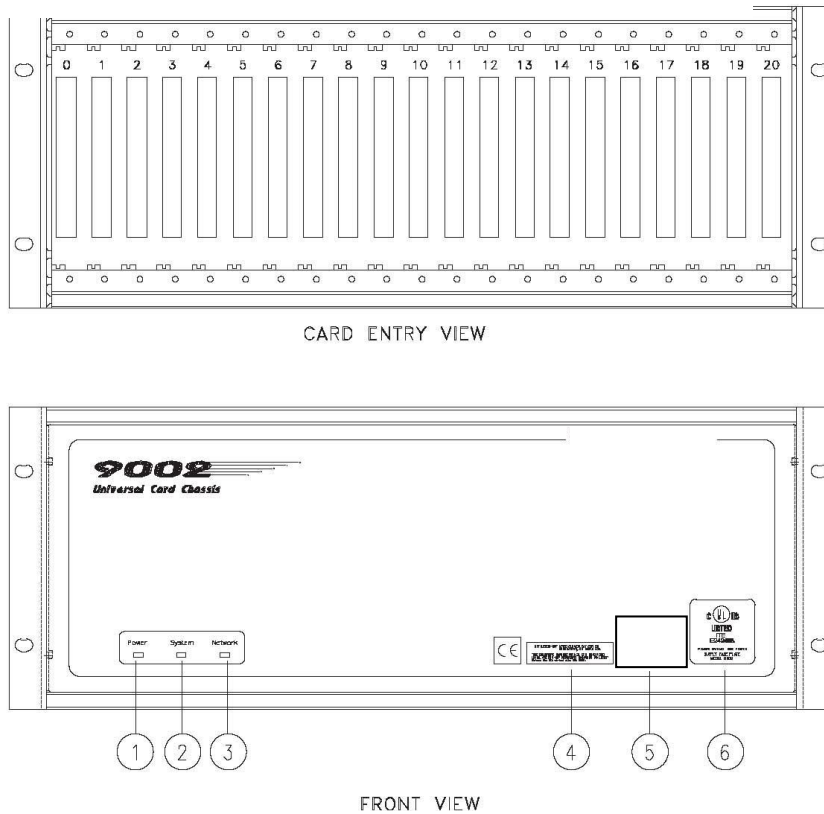
The 9002 chassis is designed to provide mechanical and electrical support for TKH Security USA Series 9000 rack-mount cards. Mechanically, the chassis is designed to fit in a standard 19-inch NEMA/EIA rack and is 4RU (rack units) in height.

It is designed to operate with the recommended 9030B and 9050BF series of power supplies. For details and specifications of those supplies, refer to their respective manuals. The 9002 chassis has a total of 21 slots, or card positions, and can accommodate up to 18 single slot cards after the installation of one 9030B or 9050BF power supply.

Up to two supplies may be installed when additional power is required or when redundant supply operations are desirable. The power supplies may be installed in any of the slots of the chassis, with care taken as to the dissipation of heat and airflow. Refer to the Installation section of this manual for details on power supply installation.

9002 Indicator Locations and Functions

FIGURE 1



1. POWER INDICATOR

This **green** LED illuminates when 6VDC power is applied to the backplane power bus in the chassis.

2. SYSTEM INDICATOR

This **red/green** LED, illuminates **green** when no cards in the chassis are reporting faults. It illuminates **red** when one or more cards in the chassis are reporting a problem. For details on the specific conditions that cause this indicator to illuminate **red**, refer to the instruction manuals for each of the cards installed in the chassis.

3. NETWORK INDICATOR

This **green** LED illuminates when the NMS software or other applications are communicating with the installed management card in this chassis. This indicator will not illuminate under other conditions.

4. REGULATORY COMPLIANCE LABEL LOCATION

5. MANUFACTURER'S INFORMATION LABEL LOCATION

6. UL LISTING LABEL LOCATION

Installation and Operation of the 9002 Chassis

Installation

The 9002 is designed to be installed in a standard NEMA 19" rack and requires 4RU (7.0 in., 4x1.75 in.) in height. The following design criteria must be observed when installing the 9002 chassis in EIA 9-inch rack systems.

1. The 9002 chassis mounting ears may be installed on either the card insertion side or the indicator panel side.
2. The 9002 chassis is designed for use in an EIA 19" rack environment and is not designed for operation in conditions where airflow through the top and bottom of the chassis are blocked by solid surfaces. Refer to the System Layout and Design Criteria section below for mounting and ventilation requirements.
3. The 9002 chassis will support its own weight when fully configured with cards and power supplies, but may not be used to act as a mechanical attachment location or support for other rack-mounted equipment above or below it. In a large multi-chassis systems place heavier, fully loaded chassis at the bottom of chassis stacks and lighter chassis at the top.
4. The chassis earth connection is maintained through the power supply power cord. It is the user's responsibility to insure the power supply has the proper, grounded power supply cord connected for operation. Refer to the safety pages in the front of the manual and the power supply manuals for details on earthing and system grounds.

Unused slots in the chassis should be covered with the available 9996 single blank and/or 9998 triple blank slot covers to meet airflow, signal immunity, and fire enclosure safety design criteria.

System Layout and Design Criteria

When configuring TKH Security USA Series 9000 chassis and cards into a system, there are several important design criteria that should be followed to insure trouble free operations and regulatory compliance. These fall into three major categories.

1. Power Supply Criteria
2. Cooling and Airflow Criteria
3. Wiring Criteria

Power Supply Criteria

Power supply selection is based on the number of cards and the current requirement for each card. When laying out the system configuration, calculate the total current requirement for the cards to be installed in the chassis and select the power supply accordingly. TKH Security USA offers the 9030B power supply and the higher current, fan-cooled 9050BF power supply.

It may be necessary to install more than one supply in the chassis to provide sufficient current in some applications. When two power supplies are installed in the same chassis, the power supplies can be adjusted to be redundant or to share the load. When operating in redundant mode, either of the power supplies may have to power the entire chassis to make sure the selected supply can handle the entire load. If you intend to share the load in order to supply more current than is available from a single supply, balance the load by adjusting the output voltage as directed in the power supply manual.

Cooling and Airflow Criteria

The 9002 chassis design requires natural convection cooling air to enter the bottom and exit the top of the chassis. The chassis should be mounted in a manner that does not block natural convection airflow.

Single chassis systems should be mounted in such a way as to insure that the equipment above, below, and to the sides of the chassis do not interfere with the airflow through and around the chassis. In cases where adjacent equipment may block airflow, provide a minimum of 1RU (1.75 in.) of open space above and below the chassis and at least 1 inch to the sides of the chassis to facilitate natural convection cooling. In extremely hot locations or locations where there is poor natural ventilation, install an external UL listed fan tray above or below the chassis to provide additional airflow in order to keep the operating temperatures in an acceptable range. Use of the 9050BF power supply is also recommended in extremely hot or poorly ventilated racks. The 9050BF has a built-in fan for cooling the power supply. Refer to Figure 2, Single chassis installation.

Multiple chassis systems may be stacked up to two chassis high without open space in between. Insure that a 1RU space is left above and below the two chassis stack to provide sufficient natural convection airflow for cooling. As with single chassis systems, a minimum of 1 inch should be left open on the sides as well. In systems with more than two chassis, leave a 1RU space between each stack of two chassis. In extremely hot locations or locations where there is poor natural ventilation, install an external UL listed fan tray above or below the chassis stacks. This must provide the bottom to top airflow required to maintain the system within acceptable operating temperatures. Install the power supplies in positions that are not directly over or under the power supplies in the chassis directly above or below. This insures no hot spots are created. The 9050BF power supply is recommended in multiple chassis installations, as it contains a built-in fan that provides additional cooling for the power supply. In systems with three or more chassis, in addition to a UL listed fan tray at the top or bottom of the stack, leave a 1RU space between each two adjacent chassis.

FIGURE 2 — SINGLE CHASSIS INSTALLATION

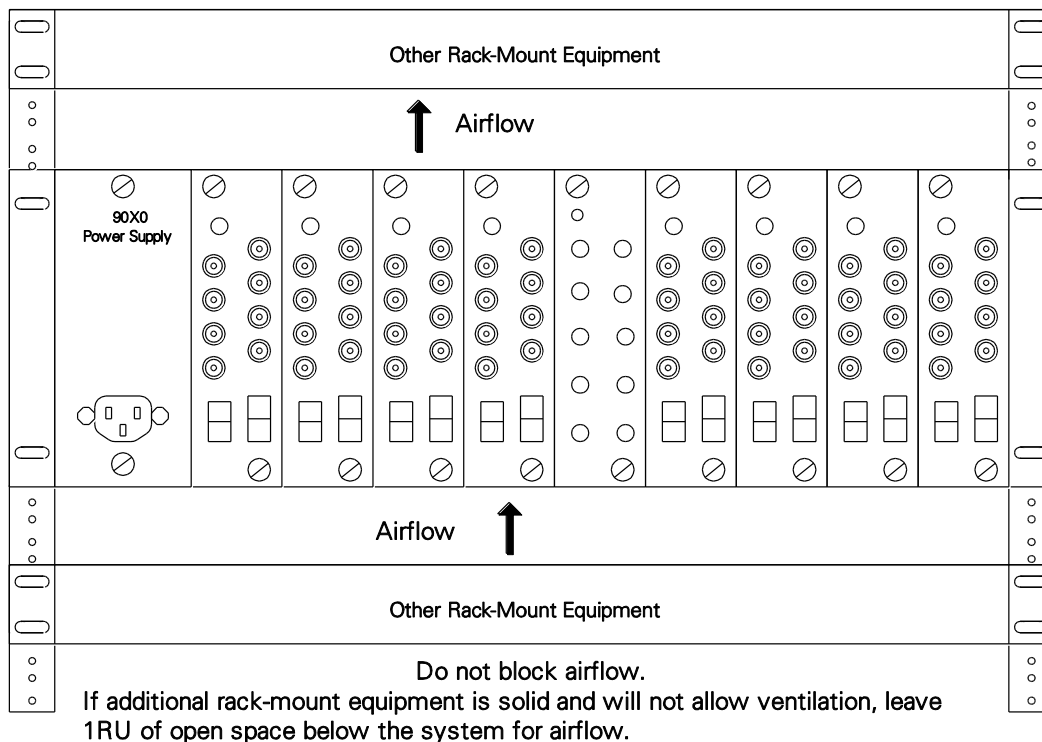
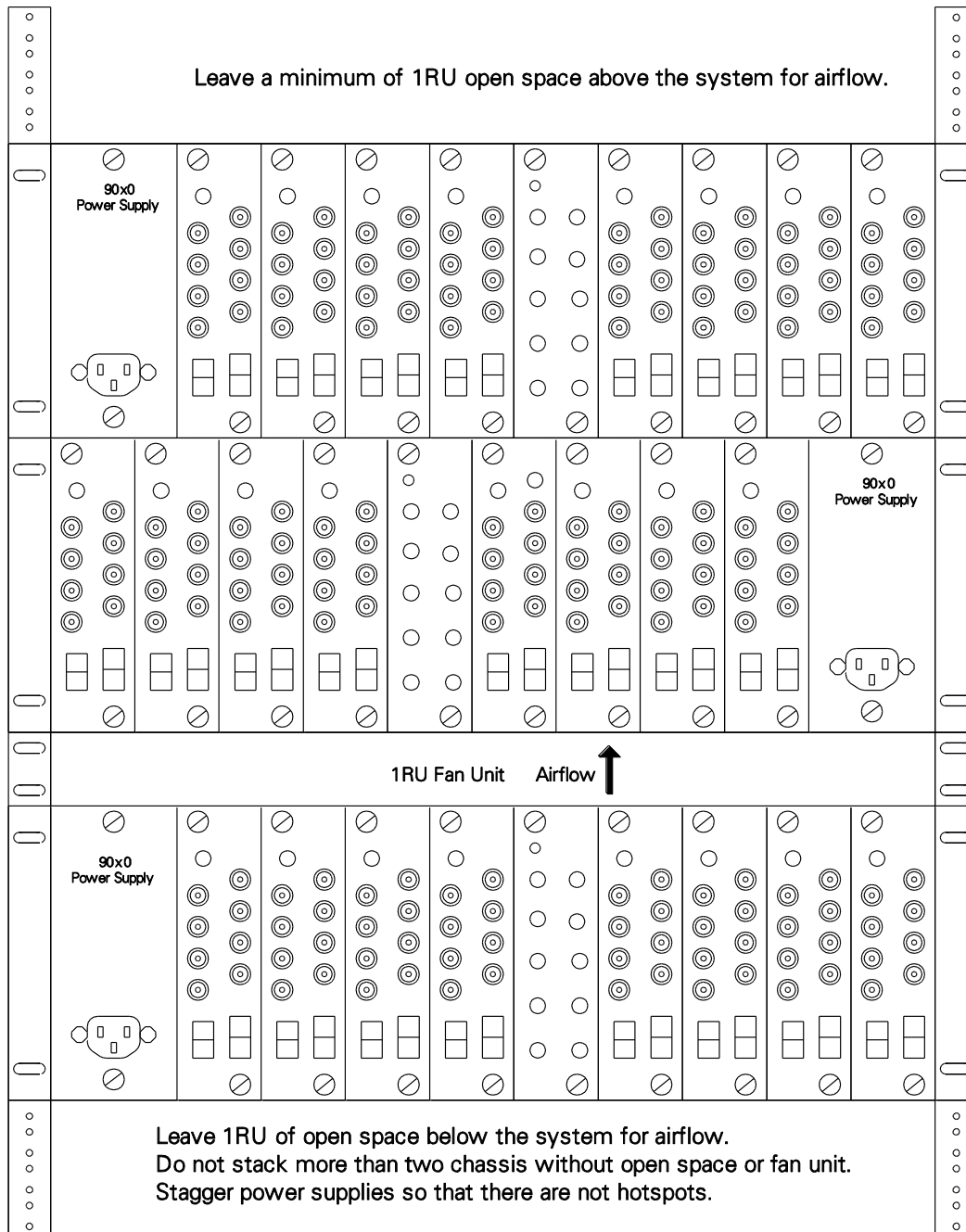


FIGURE 3 — MULTIPLE CHASSIS INSTALLATION



Wiring Criteria

In designing systems, care should be taken to insure that wire feeds are long and flexible enough to allow for maintenance and removal of the slide-in cards. Readily available miniature 75 ohm coax cable for video inputs is easier to bundle and manage. By employing a wire management system that does not block airflow in the 1RU space between chassis, the designer can accomplish good wire management and provide the spacing for cooling and airflow criteria (refer to previous section). Chassis and signal ground are at the same potential, so care must be taken to insure effective signal grounding techniques. Refer to the manuals for the specific cards installed in the system for signal grounding and connection guidelines. The power supply connector cord provides the earth ground for the chassis. Insure that the power cord is not damaged or modified in any way and is connected to a power source with a proper earth ground.

Some cards may require the use of special cables, which are provided with the card. Refer to the user manual for that card for details and part numbers of those cables.

Installing the Cards

Install the I/O cards first, followed by the power supply(ies). The cards will slide in right side up and a slight resistance will indicate the card connector has begun to engage. Push the cards in until the faceplate is against the chassis rails and tighten the attachment screws on the face of each card hand tight. Make the additional wiring connections. All the I/O connections to the cards chassis have removable connectors for the signal input and outputs. Remove the connectors to make the necessary wiring connections, then reinstall the connectors to the card.

As noted above, blank slots must be covered with blank cover plates (TKH Security USA Models 9996 and 9998, available separately) to meet airflow, signal immunity, and fire enclosure safety design criteria.

The chassis is now ready for operation.

Operation

After the installation procedures are complete, the chassis may be powered up. There are three indicators on the non-card insertion side of the chassis. They serve the following purposes:

Power Indicator

This LED illuminates **green** when 6VDC power is applied to any installed cards via the backplane. That power will be from the installed power supplies in the chassis. If this indicator does not illuminate, check the power supply or supplies and power supply input power.

System Indicator

This **red/green** LED illuminates **green** when no cards in the chassis are reporting faults and **red** when a card in the chassis is reporting selected faults. The faults that cause an alarm indication vary from card type to card type and are listed in the manuals for the installed cards. This indicator may only be accurate for cards that have been set up to indicate alarms via the Network System Software (available separately).

Network Indicator

This LED illuminates **green** when the NMS Software or other applications are communicating with the installed management card in this chassis. This indicator will not illuminate under other conditions.

Maintenance During Operation

Removal of Cards

Follow the procedure below to change cards once the system has been installed and is in operation.



If you have a system that cannot have power removed for maintenance, only properly trained personnel may eliminate steps 3, 15 and 16, performing a hot swap of the replacement card without endangering the system.

- Step 1) Insure that you are grounded and that you are taking the necessary steps to prevent electrostatic damage to the equipment.
- Step 2) If the chassis is equipped with a Network Management System card it may be a good idea to note any alarm parameters that may have been configured for the card to be replaced before shutting down the power to the chassis.
- Step 3) Insure that the power has been switched off and that the inlet cable to the power supply has been removed. If there is more than one supply in the chassis insure that the second supply has been turned off and that the inlet cable to that power supply has also been removed.
- Step 4) Remove the fiber(s) and/or electrical cables connected to the card to be replaced, tagging them as required for easy replacement later. Cover the fiber ends if you have fiber end covers.
- Step 5) Using a slotted screwdriver, loosen the top and bottom thumb screws from the card to be replaced. These are captive screws and cannot be removed completely from the card.
- Step 6) Using the captive screws, gently pull on the card with just enough force to break it free from the backplane connector.
- Step 7) Slide the card out along the card guides removing it from the chassis.
- Step 8) Place it in an antistatic bag or container.
- Step 9) Remove the replacement card from the antistatic bag.
- Step 10) Set any configuration switches (if the replacement card requires setting) either as the removed card was set, assuming the removed card worked at one time, or as described in the card's User Manual as required for your application.
- Step 11) Insert the card into the card guides where the old card was removed and slide it into the chassis.
- Step 12) A little stronger push when the card is within a quarter of an inch of being installed may be required to seat the card in the backplane connector.
- Step 13) Reinstall the thumbscrews at the top and bottom of the card.
- Step 14) Reconnect the electrical cable(s), clean and reconnect the fiber connector(s) to the card.
- Step 15) Reconnect the cable(s) to the Power Supply(ies).
- Step 16) Return the power supply switch(es) to the ON position.
- Step 17) If a Network Management Card was installed in the chassis, reconfigure any alarm settings for the replacement card.

Operation of the 9002 Chassis with the Network Management System (NMS) Software

The 9002 chassis does not interact directly with any of the versions of the software. It only provides the signal paths for communications from the management card (optional, required for operation of the Network Management Software) and the power busses for the cards from the power supply. The indicators on the back of the chassis simply display power, alarm, and communications indications from the equipment installed in the chassis.

9002 Chassis Specifications

PHYSICAL*

Dimensions	(in inches)	7.0 H x 19.0 W x 8.0 D
	(in centimeters)	17.78 H x 48.26 W x 20.3 D
Weight	(in pounds)	6
	(in kilograms)	13.2

*Refer to the 9002 Chassis Dimensional Drawings page for detailed dimensions (see page 22).

SPECIFICATIONS

Construction	Painted aluminum sheet metal and extrusions
Card Capacities	
With one power supply	18 single width cards
With two power supplies	15 single width cards
Electrical Ratings	
Total chassis power capacity	500 Watts
Operating voltage	6.1 VDC Nominal

INDICATORS

ENVIRONMENTAL

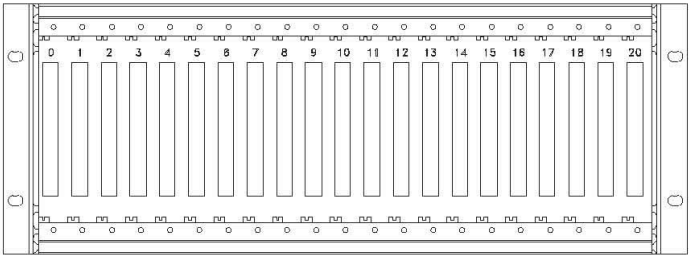
Operating Temperature	-40° C to +74° C
Storage Temperature	-55° C to +85° C
Relative Humidity	0 to 95% noncondensing

AGENCY COMPLIANCES

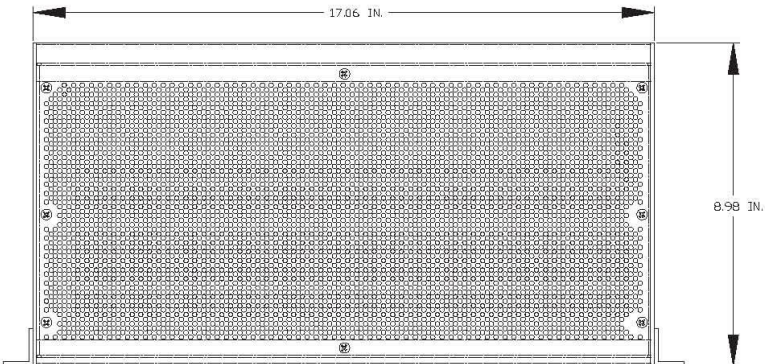
UL 60950-1 UL Listed E242498, CE

The safety information, installation, and operating instructions contained in this manual must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the unit. TKH Security USA assumes no liability for the customer's failure to comply with any of these safety requirements.

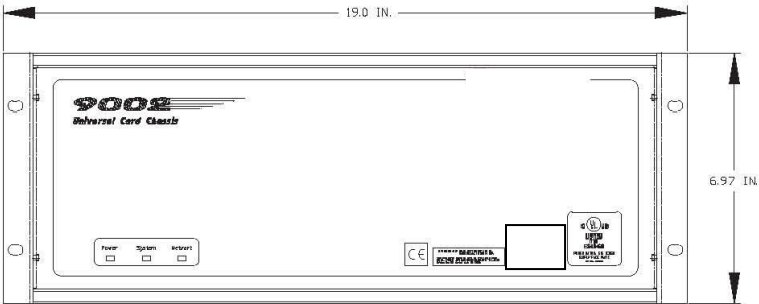
9002 Chassis Dimensions



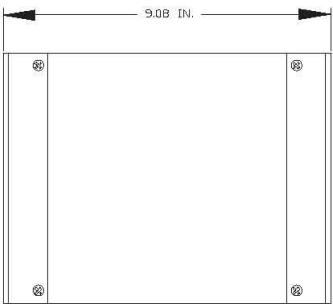
CARD ENTRY VIEW



TOP VIEW



FRONT VIEW



SIDE VIEW
MOUNTING EAR MAY ATTACH TO
THE FRONT OR REAR.

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