



Optelecom 9000 Series Installation and Operation Manual

Model 9241DT Model 9241DR

Rack-Mounted Fiber Optic Video Duplex Data
Transmitter and Receiver Cards

For transport of one NTSC, PAL video signal, one duplex RS232, RS422, RS485, or Manchester data signal, and two duplex Option Module port signals over one optical fiber. Digital encoding and transmission techniques are utilized for the video (9-bit) and the data.

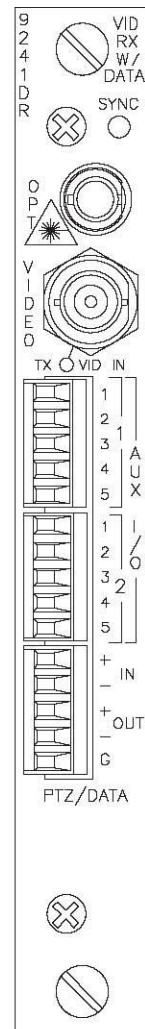
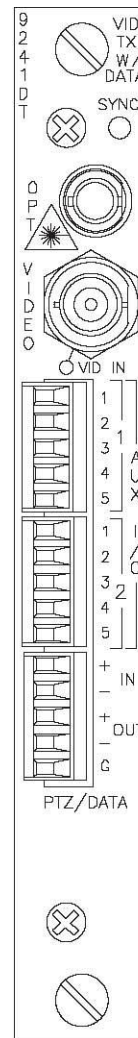
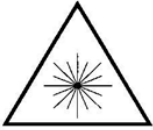


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Safety Instructions

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.

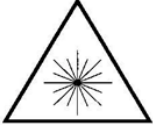


The chassis into which this unit is installed must be housed in a properly rated NEMA enclosure.



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.



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.

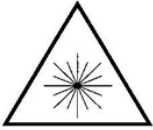


El chasis en el cual está instalada esta unidad debe estar dentro de un alojamiento debidamente calificado por NEMA.



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 Bedienungselemente 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 kan 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.



Schwarzer Rand und
gelber Hintergrund



Diese Baugruppe enthält Teile, die durch elektrostatische Entladungen (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.

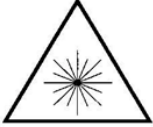


Wenn diese Einheit bei besonders hohen Temperaturen betrieben wird, können interne und externe Metallflächen extrem heiß werden. Es muss darauf geachtet werden, dass diese Einheit in einem Bereich mit eingeschränktem Zugang aufgestellt wird, damit nur geschultes Wartungspersonal Zugang zur Einheit hat.

Consignes de Sécurité

RM-1

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.

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.

Functional Description

The 9241DT transmitter accepts a composite video signal in NTSC or PAL format via the BNC video input port. This baseband video signal is sampled at a 16 KHz rate by an A-to-D converter operating with nine bits of precision. Data signals are combined into the bit stream and converted to an optical signal for transmission over the optical fiber. For the reverse direction, data comes into the transmitter via an optical receiver operating at a different wavelength than the transmitter. The received data stream is demultiplexed into data for output via the data port and the Option Module Ports.

The receiver accepts the optical signal and converts it back to a serial bit stream. The signal is deserialized and converted back into the video and data signals, which are output on the BNC and data connectors. For the reverse direction, outputs from the data port and the Option Module Ports are multiplexed together, converted to an optical signal for transmission to the transmitter on the second wavelength.

The built-in data port is dipswitch-programmable. The port may be configured for Manchester-encoded data, RS485 2-wire, RS485 4-wire, RS422, or RS232. The data port supports data at speeds up to 115.2kbps.

The 9241DT and 9241DR support two TKH Security USA Data/Audio Option Modules. The modules operate bidirectionally. The user may select from duplex audio (Option Module type A), duplex data (Option Module type B), duplex contact closure (Option Module type C) or Stereo Audio (Option Module type D (Stereo Input), and E (Stereo Output)).

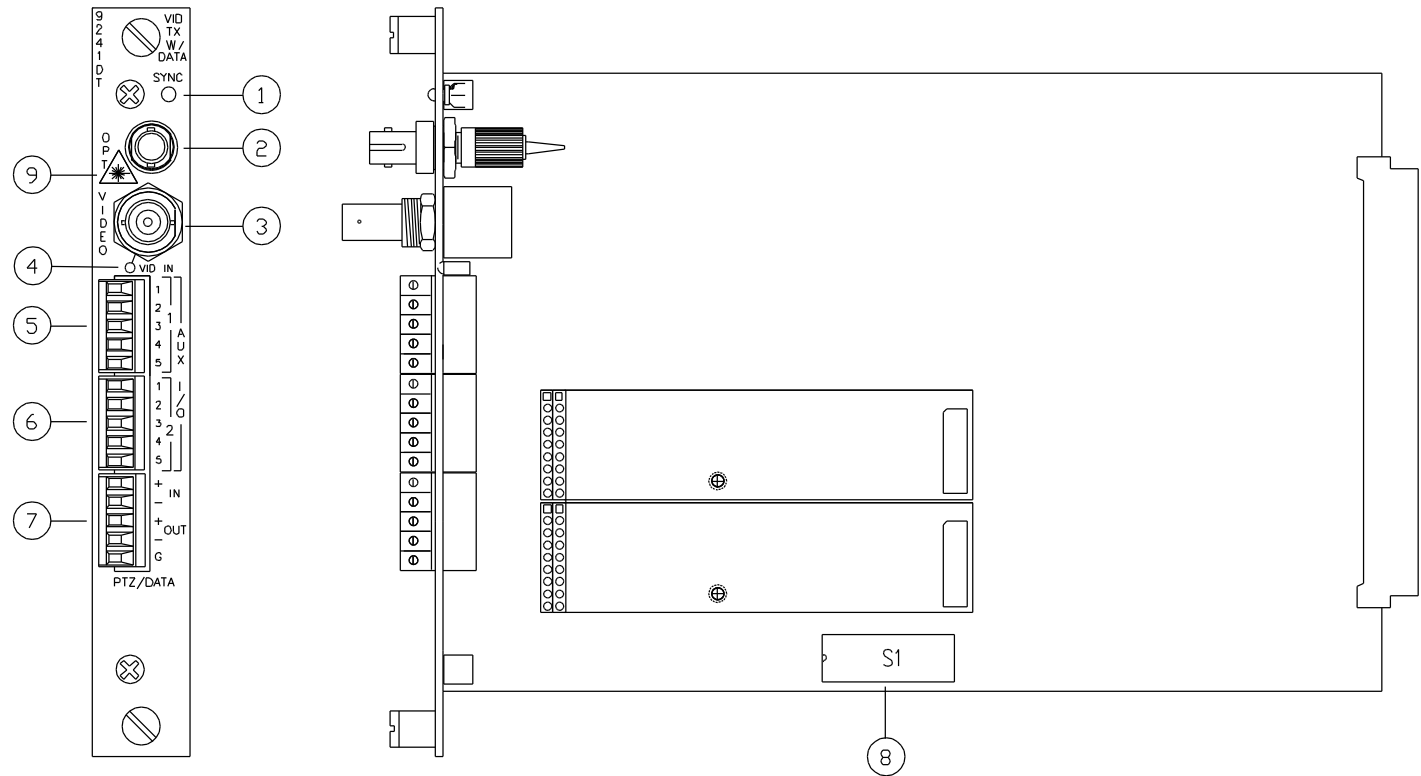
The Xs in the 9241DT(XX)-Y-ZZ and 9241DR(XX)-Y-ZZ model numbers should be replaced with the letter for the type of Option Module desired. The specific Option Modules installed are indicated by labels on the front panel and on the AUX I/O connectors.

The 9241DT and 9241DR are optically compatible with the 9245DT and 9245DR standalone models.

Both the 9241DT and 9241DR operate on 6VDC as supplied from the chassis in which they are.

9241DT Indicator and Connector Locations

FIGURE 1



1. SYNC INDICATOR

This multicolor LED provides status information about the link as follows:

- OFF indicates no power is applied to the card.
- **Red** (NO SYNC, NO LOOP) indicates the local unit is not receiving sufficient optical signal from the remote unit or the local demux circuitry is not able to synchronize to the incoming signal.
- **Yellow** (SYNC, NO LOOP) indicates the local unit has synchronized to the incoming signal, but the remote unit has not synchronized with the local unit.
- **Green** (SYNC, LOOP) indicates that both local and remote units are communicating correctly.

2. OPTICAL CONNECTOR

The optical fiber connection is made here.

3. VIDEO INPUT CONNECTOR

The video input signal cable is connected to this BNC connector.

4. VIDEO PRESENT INDICATOR

This **green** LED illuminates when a video signal is present on the input BNC connector.

5. AUX I/O 1 CONNECTOR

This is the connector for Option Module position 1. Refer to the separate Option Module Manual included with your shipment for details on connections to the Option Modules.

6. AUX I/O 2 CONNECTOR

This is the connector for Option Module position 2. Refer to the separate Option Module Manual included with your shipment for details on connections to the Option Modules.

7. PTZ/DATA CHANNEL CONNECTOR

This is the data I/O connector.

8. PTZ/DATA CHANNEL DIPSWITCH

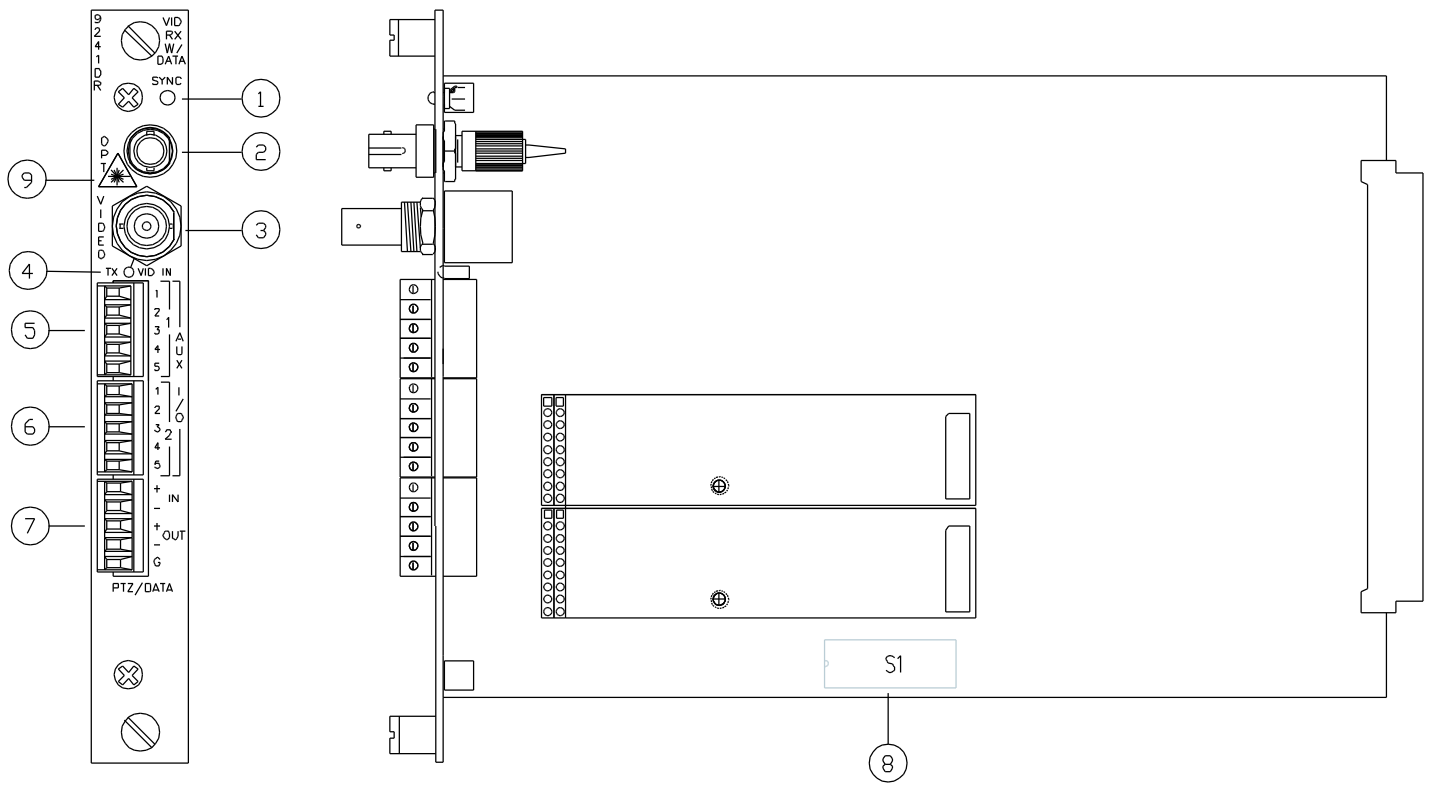
This switch is used to set the data parameters for the PTZ/Data Channel.

9. IEC LASER WARNING LABEL

Refer to the Safety Instructions at the beginning of this manual.

9241DR Indicator and Connector Locations

FIGURE 2



1. SYNC INDICATOR

This multicolor LED provides status information about the link as follows:

- OFF indicates no power is applied to the card.
- **Red** (NO SYNC, NO LOOP) indicates the local unit is not receiving sufficient optical signal from the remote unit or the local demux circuitry is not able to synchronize to the incoming signal.
- **Yellow** (SYNC, NO LOOP) indicates the local unit has synchronized to the incoming signal, but the remote unit has not synchronized with the local unit.
- **Green** (SYNC, LOOP) indicates that both local and remote units are communicating correctly.

2. OPTICAL CONNECTOR

The optical fiber connection is made here.

3. VIDEO OUTPUT CONNECTOR

The video output signal cable is connected to this BNC connector.

4. Tx VIDEO PRESENT INDICATOR

This **green** LED illuminates when a video signal is present on the *transmitter* input BNC connector.

5. AUX I/O 1 CONNECTOR

This is the connector for Option Module position 1. Refer to the separate Option Module Manual included with your shipment for details on connections to the Option Modules.

6. AUX I/O 2 CONNECTOR

This is the connector for Option Module position 2. Refer to the separate Option Module Manual included with your shipment for details on connections to the Option Modules.

7. PTZ/DATA CHANNEL CONNECTOR

This is the data I/O connector.

8. PTZ/DATA CHANNEL DIPSWITCH

This switch is used to set the data parameters for the PTZ/Data Channel.

9. IEC LASER WARNING LABEL

Refer to the Safety Instructions at the beginning of this manual.

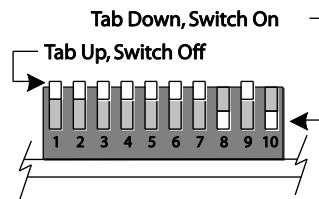
Set Up and Operation of the 9241D

Operation of the 9241DT and 9241DR units consists of setting the data parameter switches as required, installing the card in a compatible Series 9000 chassis, connecting the optical cables, the video input, and the data signals.

BUILT-IN PTZ/DATA CHANNELS SWITCH SETTINGS AND CONNECTIONS

The PTZ data channel switch sets the data input and output formats. Refer to Table 1 and the input/output connection diagrams below to set and connect data signals.

FIGURE 3



Type/Switch Position	1	2	3	4	5	6	7	8	9	10
RS232	ON	OFF	OFF	OFF	OFF	N/A	N/A	OFF	ON	OFF
RS422	OFF	OFF	ON	ON	ON	T	T	ON	OFF	ON
RS485 2-Wire	ON	ON	OFF	ON	ON	T	T	ON	OFF	ON
RS485 4-Wire	OFF	ON	OFF	ON	ON	T	T	ON	OFF	ON
Manchester	ON	ON	ON	OFF	OFF	ON	T	X	OFF	ON
Disabled	OFF	OFF	OFF	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes
¹ N/A Switch position does not affect setting.
² T = Input Termination Setting, ON = Termination On, OFF = Termination Off.
 Terminations should be on for the last RS422 and RS485 input where five or fewer inputs are connected in parallel.

Input connections are made in the following manner.

FIGURE 4

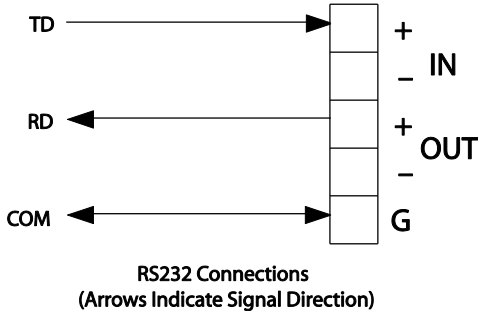


FIGURE 5

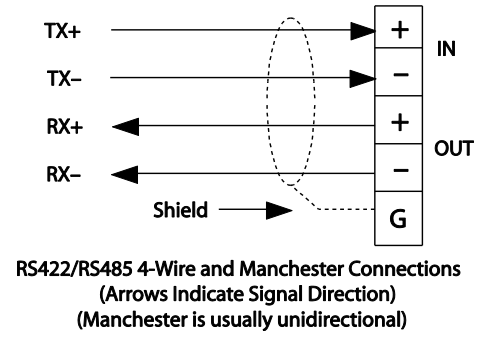


FIGURE 6

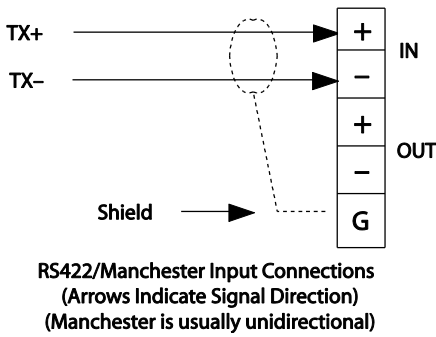


FIGURE 7

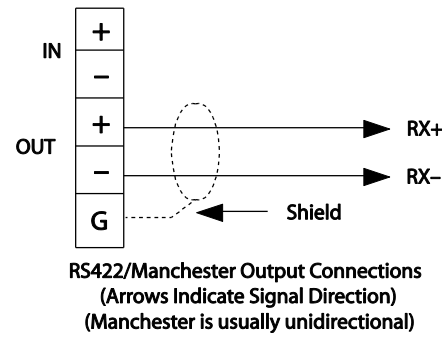
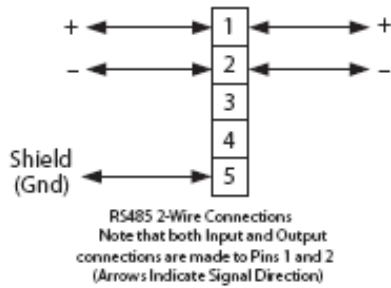


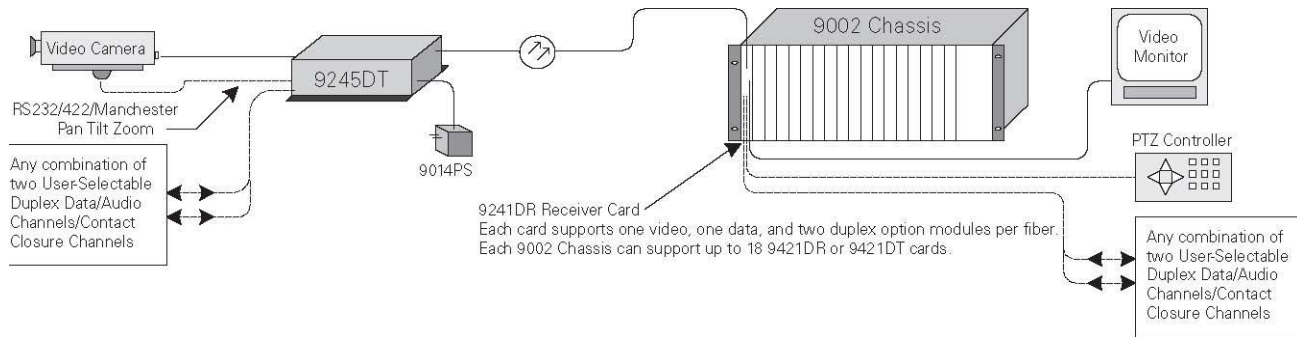
FIGURE 8



BUILT-IN PTZ/DATA CHANNELS SWITCH SETTINGS AND CONNECTIONS

Refer to the Option Module manuals provided in your shipment to set the Option Modules.

Typical Application of the 9241D



Troubleshooting 9241D Links

The Sync indicator LED on the transmitter and receiver provides information as to the optical and electrical status of the units. Troubleshooting normally starts at the transmitting end.

The SYNC LED serves multiple functions:

- OFF indicates no power is applied to the card. The receiver and/or chassis into which the card is installed have no power or the card is not seated into the chassis correctly.
- **Red** (NO SYNC, NO LOOP) indicates the local unit is not receiving sufficient optical signal from the remote unit or the local demux circuitry is not able to synchronize to the incoming signal. Check the fiber for poor connections or optical losses greater than the unit specifications.
- **Yellow** (SYNC, NO LOOP) indicates the local unit has synchronized to the incoming signal, but the remote unit has not synchronized with the local unit. Check the fiber for poor connections or optical losses greater than the unit specifications.
- **Green** (SYNC, LOOP) indicates that both local and remote units are communicating correctly.

Operation of the 9241D with the Network Management System

Operation of the 9241DT with the Network Management System consists of the following parameters:

1. Slot Number
2. Card Size (Number of Slots)
3. Serial Number
4. Time
5. Wavelength
6. Revision Number
7. Chronometer Value (Cumulative Hours of Operation)
8. Reset Cycles (Cumulative Number of Power Cycles)
9. Firmware Revision
10. Laser Drive Current
11. Temperature
12. Optical Output Power
13. Received Optical Power
14. Demux Sync
15. Remote Demux Sync
16. Video Input Present

Operation of the 9241DR with the Network Management System consists of the following parameters:

1. Card Location
2. Card Size (Number of Slots)
3. Serial Number
4. Time
5. Wavelength
6. Revision Number
7. Chronometer Value (Cumulative Hours of Operation)
8. Reset Cycles (Cumulative Number of Power Cycles)
9. Firmware Revision
10. Laser Drive Current
11. Temperature
12. Optical Output Power
13. Received Optical Power
14. Demux Sync
15. Remote Demux Sync
16. Tx Video Input Present

NMS users should set the Alarm Status and Alarm Limits for each parameter as required for the specific application when the NMS software is operated for the first time.

When the 9241D card is installed into an existing system already utilizing NMS system software, an upgrade of the software will be necessary to add the 9241D card to the software database in the NMS software. Consult the factory for guidance on how to download the latest version of the software from the TKH Security USA FTP download site.

Specifications for the Model 9241D

OPTICAL

Model Pair	MM	MM	MMH	MMH	SM
Fiber Size	50/125	62.5/125	50/125	62.5/125	09/125
Transmitter Optical Output Power (dBm)	-21	-17	-7	-7	-7
Transmitter Optical Output Wavelength (nm)	1310	1310	1310	1310	1310
Transmitter Optical Input Sensitivity (dBm)	-34	-34	-30	-30	-30
Maximum Transmitter Optical Input (dBm)	-10	-10	-5	-5	0
Receiver Optical Output Power (dBm)	-21	-17	-7	-7	-7
Receiver Optical Output Wavelength (nm)	850	850	1550	1550	1550
Receiver Optical Input Sensitivity (dBm)	-27	-27	-30	-29	-30
Maximum Receiver Optical Input (dBm)	-10	-10	0	0	0
Txmtr Opt Budget (Txmtr Out Pwr-Rcvr Input Sens) (dB)	6	10	23	22	23
Rcvr Opt Budget (Rcvr Out Pwr-Txmtr Input Sens) (dB)	13	17	23	23	23
Estimated Distance (km) 50 $\mu\text{m}^{1,2}$	3.0	N/A	19	N/A	N/A
Estimated Distance (km) 62.5 $\mu\text{m}^{1,2}$	N/A	4.6	N/A	19	N/A
Estimated Distance (km) 09 $\mu\text{m}^{1,2}$	N/A	N/A	N/A	N/A	57

¹Range estimates based on fiber losses of 3.0 dB/km @ 850 nm and 1.0 dB/km @ 1310 nm and 1550 nm on 62.5/125 fiber, 0.35 dB/km @ 1310 nm and 0.25 dB/km @ 1550 nm on 09/125 fiber, and include a 3 dB safety factor.

²Range estimates may be affected by chromatic dispersion, modal dispersion, and fiber bandwidth capabilities. Multimode range estimates are based on fiber specifications of 500 Mhz/km.

VIDEO

Video Sampling Rate/Resolution	16.0 Mhz., 9-bit
Video Input/Output Signal	NTSC or PAL, 1V p-p, 75 Ω
Video Input/Output Connector	BNC
Video Bandwidth	6.5 Mhz (-3.0 dB)
SNR	≥ 63 dB
Differential Phase	$\leq 1^\circ$
Differential Gain	$\leq 2\%$

DATA

RS232, RS422 2- and 4-wire, RS485 2- and 4-wire, Manchester (Bi-Phase, Burle, American Dynamics), switch selectable. Auto Baud, maximum data rate 115.2 Kbps

Refer to the Options Module manual for details on Option Module specifications.

POWER

Requirements	6VDC supplied from chassis
9241DT	700 mA
9241DR	700 mA

PHYSICAL

Dimensions (in inches)	6.15 H x 0.8 W x 8.6 D
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ENVIRONMENTAL

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

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