LTC 8770 Series

Security Systems

EN

Instruction Manual

Relay Units

BOSCH

Important Safeguards

1. **Read, Follow, and Retain Instructions** - All safety and operating instructions should be read and followed before operating the unit. Retain instructions for future reference.
2. **Heed Warnings** - Adhere to all warnings on the unit and in the operating instructions.
3. **Attachments** - Attachments not recommended by the product manufacturer should not be used, as they may cause hazards.
4. **Installation Cautions** - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to a person and serious damage to the unit. Use only manufacturer-recommended accessories, or those sold with the product. Mount the unit per the manufacturer's instructions. Appliance and cart combination should be moved with care. Quick stops, excessive force, or uneven surfaces may cause the appliance and cart combination to overturn.
5. **Cleaning** - Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a damp cloth for cleaning is sufficient. Do not use liquid cleaners or aerosol cleaners.
6. **Servicing** - Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
7. **Damage Requiring Service** - Unplug the unit from the main AC power source and refer servicing to qualified service personnel under the following conditions:
   - When the power supply cord or plug is damaged.
   - If liquid has been spilled or an object has fallen into the unit.
   - If the unit has been exposed to water and/or inclement weather (rain, snow, etc.).
   - If the unit does not operate normally, when following the operating instructions. Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may result in damage, and require extensive work by a qualified technician to restore the unit to normal operation.
   - If the unit has been dropped or the cabinet damaged.
   - If the unit exhibits a distinct change in performance, this indicates that service is needed.
8. **Replacement Parts** - When replacement parts are required, the service technician should use replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electrical shock or other hazards.
9. **Safety Check** - Upon completion of servicing or repairs to the unit, ask the service technician to perform safety checks to ensure proper operating condition.
10. **Power Sources** - Operate the unit only from the type of power source indicated on the label. If unsure of the type of power supply to use, contact your dealer or local power company.
    - For units intended to operate from battery power, refer to the operating instructions.
    - For units intended to operate **with External Power Supplies**, use only the recommended approved power supplies.
    - For units intended to operate with a limited power source, this power source must comply with EN60950. Substitutions may damage the unit or cause fire or shock.
    - For units intended to operate at 24VAC, normal input voltage is **24 VAC**. Voltage applied to the unit's power input should not exceed 30VAC. User-supplied wiring, from the 24VAC supply to unit, must be in compliance with electrical codes (Class 2 power levels). Do not ground the 24VAC supply at the terminals or at the unit's power supply terminals.
11. **Coax Grounding** - If an outside cable system is connected to the unit, ensure that the cable system is grounded. U.S.A. models only - Section 810 of the National Electrical Code, ANSI/NFPA No.70, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
12. **Grounding or Polarization** - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact an electrician to arrange replacement of the obsolete outlet. Do not defeat the safety purpose of the polarized plug.
    Alternately, this unit may be equipped with a 3-wire grounding plug (a plug with a third pin, for grounding). This safety feature allows the plug to fit into a grounding power outlet only. If unable to insert the plug into the outlet, contact an electrician to arrange replacement of the obsolete outlet. Do not defeat the safety purpose of the grounding plug.
13. **Lightning** - For added protection during a lightning storm, or when this unit is left unattended and unused for long periods of time, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power line surges.

For Indoor Product

1. **Water and Moisture** - Do not use this unit near water - for example, in a wet basement, in an unprotected outdoor installation or in any area classified as a wet location.
2. **Object and Liquid Entry** - Never push objects of any kind into this unit through openings, as they may touch dangerous voltage points or short out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the unit.
3. **Power Cord and Power Cord Protection** - For units intended to operate with 230VAC, 50Hz, the input and output power cord must comply with the latest versions of IEC Publication 227 or IEC Publication 245.
   Power supply cords should be routed so they are not likely to be walked on or pinched. Pay particular attention to location of cords and plugs, convenience receptacles, and the point of exit from the appliance.
4. **Overloading** - Do not overload outlets and extension cords; this can result in a risk of fire or electrical shock.

For Outdoor Product

Power Lines - An outdoor system should not be located in the vicinity of overhead power lines, electric lights or power circuits, or where it may contact such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching power lines or circuits, as this contact might be fatal. U.S.A. models only - refer to the National Electrical Code Article 820 regarding installation of CATV systems.

For Rack-mount Product

1. **Ventilation** - This unit should not be placed in a built-in installation or rack, unless proper ventilation is provided, or the manufacturer's instructions have been adhered to. The equipment must not exceed its maximum operating temperature requirements.
2. **Mechanical Loading** - Mounting of the equipment in a rack shall be such that a hazardous condition is not achieved due to uneven mechanical loading.

WARNING:
Electrostatic-sensitive device. Use proper CMOS/MOSFET handling precautions to avoid electrostatic discharge.

NOTE: Grounded wrist straps must be worn and proper ESD safety precautions observed when handling the electrostatic-sensitive printed circuit boards.

Cover Removal

WARNING: Removal of the cover should only be performed by qualified service personnel - not user serviceable. The unit should always be unplugged before removing the cover and remain unplugged while the cover is removed.

Safety Precautions

CAUTION
RISK OF ELECTRIC SHOCK. DO NOT OPEN!

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol indicates the presence of uninsulated "dangerous voltage" within the product's enclosure. This may constitute a risk of electric shock.

The user should consult the operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical Code or applicable local codes.

Power Disconnect. Units with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON-OFF switch is in the ON position. The power cord is the main power disconnect for all units.

FCC & ICES INFORMATION

(U.S.A. and Canadian Models Only)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and ICES-003 of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and radiates radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at his expense.

Intentional or unintentional changes or modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such changes or modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402,
Stock No. 004-000-00345-4.

WARNING: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

Sécurité

ATTENTION
RISQUE D'ÉLECTROCUTION.
NE PAS OUVRIR !

ATTENTION : POUR ÉVITER TOUT RISQUE D'ÉLECTROCUTION, N'ESSAYEZ PAS DE RETIRER LE CAPOT (OU LE PANNEAU ARRIÈRE). CET APPAREIL NE CONTIENT AUCUN COMPOSANT SUSCEPTIBLE D'ÊTRE RÉPARÉ PAR L'UTILISATEUR. CONFIEZ LA RÉPARATION DE L'APPAREIL À DU PERSONNEL QUALIFIÉ.

Ce symbole signale que le produit renferme une « tension potentiellement dangereuse » non isolée susceptible de provoquer une électrocution.

Ce symbole invite l'utilisateur à consulter les instructions d'utilisation et d'entretien (dépannage) reprises dans la documentation qui accompagne l'appareil.

Attention : l'installation doit exclusivement être réalisée par du personnel qualifié, conformément au code national d'électricité américain (NEC) ou au code d'électricité local en vigueur.

Coupure de l'alimentation. Qu'ils soient pourvus ou non d'un commutateur ON/OFF, tous les appareils reçoivent de l'énergie une fois le cordon branché sur la source d'alimentation. Toutefois, l'appareil ne fonctionne réellement que lorsque le commutateur est réglé sur ON. Le débranchement du cordon d'alimentation permet de couper l'alimentation des appareils.

Sicherheitshinweise

VORSICHT
ELEKTRISCHE SPANNUNG.
NICHT ÖFFNEN!

VORSICHT: UM EINEN ELEKTRISCHEN SCHLAG ZU VERMEIDEN, IST DIE ABDECKUNG (ODER RÜCKSEITE) NICHT ZU ENTFERNEN. ES BEFINDEN SICH KEINE TEILE IN DIESEM BEREICH, DIE VOM BENUTZER GEWARTET WERDEN KÖNNEN. LASSEN SIE WARTUNGSARBEITEN NUR VON QUALIFIZIERTEM WARTUNGSPERSONAL AUSFÜHREN.

Das Symbol macht auf nicht isolierte „gefährliche Spannung" im Gehäuse aufmerksam. Dies kann zu einem elektrischen Schlag führen.

Der Benutzer sollte sich ausführlich über Anweisungen für die Bedienung und Instandhaltung (Wartung) in den begleitenden Unterlagen informieren.

Achtung! Die Installation sollte nur von qualifiziertem Kundendienstpersonal gemäß jeweils zutreffender Elektrovorschriften ausgeführt werden.

Unterbrechung des Netzanschlusses. Geräte mit oder ohne Netzschalter haben Spannung am Gerät anliegen, sobald der Netzstecker in die Steckdose gesteckt wird. Das Gerät ist jedoch nur betriebsbereit, wenn der Netzschalter (EIN/AUS) auf EIN steht. Wenn das Netzkabel aus der Steckdose gezogen wird, ist die Spannungszuführung zum Gerät vollkommen unterbrochen.

Precauciones de Seguridad

ATTENZIONE
PERICOLO DI SCOSSA ELETTRICA.
NON APRIRE.

PRECAUCIÓN: PARA DISMINUIR EL RIESGO DE DESCARGA ELÉCTRICA, NO RETIRE LA CUBIERTA (NI LA PARTE POSTERIOR). NO EXISTEN PIEZAS DE RECAMBIO EN EL INTERIOR DEL EQUIPO. EL PERSONAL DE SERVICIO CUALIFICADO SE ENCARGA DE REALIZAR LAS REPARACIONES.

Este símbolo indica que existen puntos de tensión peligrosos sin aislamiento dentro de la cubierta de la unidad. Estos puntos pueden constituir un riesgo de descarga eléctrica.

El usuario debe consultar las instrucciones de funcionamiento y mantenimiento (reparación) en la documentación que se suministra con el aparato.

Atención: la instalación la debe realizar únicamente personal cualificado de conformidad con el National Electric Code o las normas aplicables en su país.

Desconexión de la alimentación. Las unidades con o sin interruptores de encendido/apagado reciben alimentación eléctrica siempre que el cable de alimentación esté conectado a la fuente de alimentación. Sin embargo, la unidad sólo funciona cuando el interruptor está en la posición de encendido. El cable de alimentación es la principal fuente de desconexión de todas las unidades.

Veiligheidsmaatregelen

VOORZICHTIG

GEVAAR VOOR ELEKTRISCHE SCHOK. NIET OPENEN!

VOORZICHTIG: OPEN DE BEHUIZING OF DE ACHTERKANT VAN HET APPARAAT NIET. ZO VERMINDERT U HET RISICO OP ELEKTRISCHE SCHOKKEN. IN HET APPARAAT BEVINDEN ZICH GEEN ONDERDELEN DIE U ZELF KUNT REPAREREN. LAAT SERVICE EN ONDERHOUD UITVOEREN DOOR GEKWALIFICEERD PERSONEEL.

Dit symbool geeft aan dat er binnen in het apparaat ongeïsoleerde, gevaarlijke spanning aanwezig is die mogelijk elektrische schokken kan veroorzaken.

De gebruiker dient de bedienings- en onderhoudsvoorschriften te raadplegen in de documentatie die werd meegeleverd met het apparaat.

Attentie: het apparaat mag alleen door gekwalificeerd personeel worden geïnstalleerd. De installatie dient in overeenstemming met de nationale elektrische richtlijnen of de van toepassing zijnde lokale richtlijnen te worden uitgevoerd.

Spanning uitschakelen. Apparatuur met of zonder aan-uitschakelaar staat onder spanning zolang de stekker is aangesloten op de wandcontactdoos. De apparatuur is uitsluitend in werking als de aan-uitschakelaar aan staat. Het netsnoer is de "hoofdschakelaar" voor alle apparatuur.

Medidas de Segurança

CUIDADO

RISCO DE CHOQUE ELÉCTRICO. NÃO ABRIR!

CUIDADO: PARA REDUZIR O RISCO DE CHOQUE ELÉCTRICO, NÃO RETIRE A TAMPA (OU A PARTE POSTERIOR). NO INTERIOR, NÃO EXISTEM PEÇAS QUE POSSAM SER REPARADAS PELO UTILIZADOR. REMETA A ASSISTÊNCIA PARA OS TÉCNICOS QUALIFICADOS.

Este símbolo indica a presença de "tensão perigosa" não isolada dentro da estrutura do produto, o que pode constituir risco de choque eléctrico.

O utilizador deve consultar as instruções de funcionamento e manutenção (assistência) nos documentos que acompanham o aparelho.

Atenção: a instalação deve ser executada apenas por técnicos qualificados da assistência, de acordo com o código eléctrico nacional ou os códigos locais aplicáveis.

Corte de corrente. As unidades com ou sem interruptores ON-OFF (ligar/desligar) recebem corrente sempre que o fio de alimentação está introduzido na fonte de alimentação; contudo, a unidade apenas está operacional quando o interruptor ON-OFF está na posição ON. O fio de alimentação destina-se a desligar a corrente em todas as unidades.

Sicurezza

ATTENZIONE

PERICOLO DI SCOSSA ELETTRICA. NON APRIRE.

ATTENZIONE: PER RIDURRE IL RISCHIO DI SCOSSE ELETTRICHE NON RIMUOVERE LA COPERTURA (O IL PANNELLO POSTERIORE). L'UNITÀ NON CONTIENE COMPONENTI INTERNI RIPARABILI DALL'UTENTE. PER QUALSIASI INTERVENTO, RIVOLGERSI A PERSONALE TECNICO QUALIFICATO.

Questo simbolo indica la presenza di "tensione pericolosa" non isolata all'interno del contenitore del prodotto. Ciò comporta un potenziale rischio di scosse elettriche.

Si consiglia di consultare le istruzioni operative e di manutenzione (interventi tecnici) contenute nella documentazione fornita con il dispositivo.

Attenzione: l'installazione deve essere effettuata esclusivamente da personale tecnico qualificato in conformità con il National Electrical Code o con le normative locali vigenti.

Scollegamento dell'alimentazione. Le unità dotate o sprovviste di interruttori ON-OFF vengono alimentate quando si inserisce il cavo nella presa dell'alimentazione. L'unità è tuttavia in funzione solo quando l'interruttore ON-OFF si trova nella posizione ON. Il cavo di alimentazione costituisce il dispositivo di scollegamento dell'alimentazione principale per tutte le unità.

Zasady Bezpieczeństwa

UWAGA

NIEBEZPIECZEŃSTWO PORAŻENIA PRĄDEM ELEKTRYCZNYM. NIE OTWIERAĆ!

PRZESTROGA: ABY ZMNIEJSZYĆ RYZYKO PORAŻENIA ELEKTRYCZNEGO, NIE NALEŻY ZDEJMOWAĆ POKRYWY GÓRNEJ (ani tylnej). WEWNĄTRZ URZĄDZENIA NIE MA ŻADNYCH ELEMENTÓW, KTÓRE MOGĄ BYĆ NAPRAWIANE SAMODZIELNIE PRZEZ UŻYTKOWNIKA. SERWIS NALEŻY ZLECAĆ WYKWALIFIKOWANYM PRACOWNIKOM OBSŁUGI.

Ten symbol wskazuje na obecność nieizolowanego „niebezpiecznego napięcia" we wnętrzu urządzenia. Napięcie to grozi porażeniem elektrycznym.

Użytkownik powinien zapoznać się z instrukcjami obsługi i konserwacji (serwisu), zamieszczonymi w dokumentacji towarzyszącej urządzeniu.

Uwaga: Instalacja może być wykonywana wyłącznie przez wykwalifikowanych pracowników obsługi, zgodnie z zasadami kodeksu National Electrical Code lub innych obowiązujących norm.

Odłączanie zasilania Niezależnie od wyposażenia w wyłącznik zasilania, prąd do urządzenia jest doprowadzany zawsze, gdy przewód zasilania jest podłączony do źródła zasilania; jednak urządzenie działa tylko wtedy, gdy wyłącznik zasilania jest włączony. Przewód zasilania jest głównym wyłącznikiem zasilania we wszystkich urządzeniach.

Table of Contents

1 UNPACKING

Unpack carefully. This electronic equipment should be handled with care.

Check for the following items:

- Verify the Relay Unit model number, LTC 8770/60 or LTC 8770/50
- Four 12-pin relay screw terminal connectors
- One 3-pin biphase screw terminal connector

If the item appears to have been damaged in shipment, replace it properly in its carton and notify the shipper. If any items are missing, notify your Bosch Security Systems, Inc. Representative or Customer Service Representative.

The shipping carton is the safest container in which the unit may be transported. Save it for possible future use.

2 SERVICE

If the unit ever needs repair service, the customer should contact the nearest Bosch Security Systems Inc. Service Center for authorization to return and shipping instructions.

Service Centers

USA
Phone: 800-366-2283 or 717-735-6638
fax: 800-366-1329 or 717-735-6639
CCTV Spare Parts
Phone: 800-894-5215 or 408-956-3853 or 3854
fax: 408-957-3198
e-mail: BoschCCTVparts@ca.slr.com
Canada
Phone: 514-738-2434
Europe, Middle East & Asia Pacific Region
Phone: 32-1-440-0711
For additional information, see www.boschsecuritysystems.com.

3 DESCRIPTION

The LTC 8770 Series are relay units that are designed to operate with devices that generate Allegiant® biphase control code. These devices include the Allegiant Series of video matrix switcher/controllers, System4® Series of multiplexers, LTC 5136 Controller Series, Phoneline Video Transmission Systems, Code Merger Series Units, and various Data Converter Series Units. The LTC 8770 receives biphase control signals and opens or closes relays, depending upon the desired operating mode. There are 24 individually isolated relays in which to connect to various devices and six functional operating modes and one user test mode to aid installation.

Model versions:

Model No.	Rated Voltage	Voltage Range	Power
LTC 8770/50	230VAC 50/60Hz	198-264VAC	8W
LTC 8770/60	120VAC 50/60Hz	105-132VAC	8W

4 INSTALLATION

4.1 Power

The LTC 8770/60 model operates from 120VAC, 50/60Hz power. The LTC 8770/50 model operates from 220–240VAC, 50/60Hz power. The model number and operating voltage are shown on the label located on the bottom of the unit. These units are supplied with grounded power cords, and grounding should not be defeated.

4.2 Mounting

The LTC 8770 Series are supplied as desktop units. For rack-mounting, the optional LTC 9101MK rack-mount kit is available. The LTC 8770 Series are half-rack units.

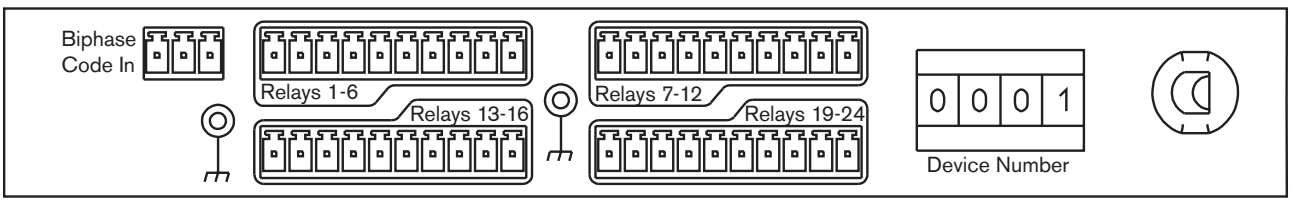
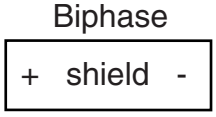


Figure 1 LTC 8770 Relay Unit Rear Connection Panel

4.3 Biphase Control Code Input

The biphase control code input connection is made to the 3-pin screw terminal connector located on the rear of the unit. This is the communications port where commands are received using the proprietary biphase protocol. The CODE_IN +, SHIELD, and CODE_IN – wires are connected to the device generating the biphase code (such as the output from an LTC 8568 Series Signal Distribution unit). The connector pin out is detailed in the following illustration. Polarity is critical in this installation and must be observed for proper operation.



The biphase control lines are internally terminated in a 100W resistor between the biphase + and biphase – signals. This termination can be removed by cutting or removing internal jumper wire W204 in order to *daisy chain* the biphase into several units. However, the termination should be used in the last unit in the chain.

NOTE: W204 should be cut or removed when the LTC 8770 Series System is unplugged and the power is OFF.

NOTE: The generation of the Allegiant's biphase control code (crosspoint data), which is necessary for operating the LTC 8770 is user selectable. To ensure proper operation, both the camera-to-monitor crosspoint options and the alarm crosspoint options must be enabled in the Allegiant system.

There are several ways to enable generation of the Allegiant's crosspoint data:

1. **If using an Allegiant system keyboard:**
   Using a keyboard asssigned to a level 1 priority operator, press **User-36-ENTER**. If the keyboard beeps and *Error 15* appears, this indicates that the function is not available in your system version. Once you enter the mode, the on-screen text will display the current status of the various crosspoint options (Either **NoXpt xx-yy** or **Send Xpt xx-yy**). Operate the keyboard's *down* joystick function to view the various crosspoint (and other system) options. Operate the keyboard's right joystick function to ensure that the data is being generated (**Send Xpt xx-yy**) for all of the crosspoint options (ignore other system options) that are displayed.
2. **If using the PC-based TC8x59 Master Control Software:**
   Set applicable crosspoint and alarm crosspoint options in the *Parameters - System - Options* screen to *Y*.
3. **If using the PC-based LTC 8059 Master Control Software or the LTC 8850 GUI Software:**
   From the Allegiant Server program, check applicable boxes listing Monitor and Alarm Activations to Biphase Port in the Parameter - Options screen.

4.4 Dip Switches

Prior to connecting power to the unit, the internal DIP switches should be set for the desired operation as described in a later section. The LTC 8770 unit contains electrostatic sensitive devices. Grounded wrist straps MUST be worn and proper ESD safety precautions should be observed when adjusting the DIP switches.

NOTE: The DIP switches are read by the unit on power-up only and must only be changed when the LTC 8770 Series system is unplugged and the power is OFF. Restoring the power after DIP switch changes have been made will effect the new settings.

Remove the cover following the directions below, later paragraphs describe in detail each DIP switch function. Locate all DIP switch positions on the circuit board using FIGURE 1. Set the DIP switches to obtain the desired operation, then re-install the cover.

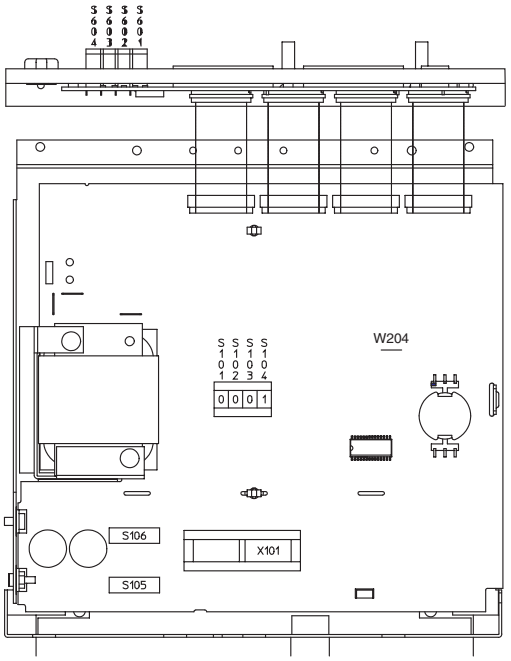


Figure 2 DIP Switch Location

4.4.1 Cover Removal

Cover Removal

WARNING: Removal of the cover should only be performed by qualified service personnel - not user serviceable. The unit should always be unplugged before removing the cover and remain unplugged while the cover is removed.

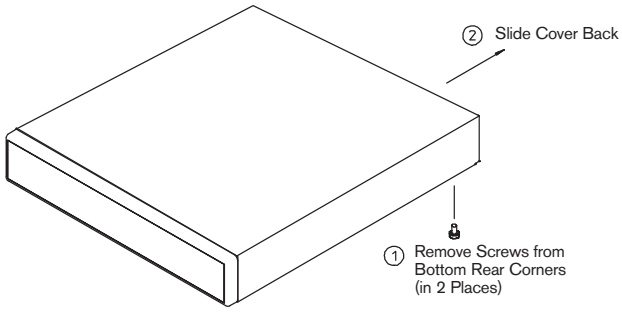


Figure 3 Cover Removal

The cover is fastened to the chassis by two screws on the bottom near the rear of the unit. Disassembly is as shown in FIGURE 2.

4.5 Selecting Modes of Operation

Switches S105-1 through S105-3 determine the mode of operation for the unit. There are seven modes of operation. The following table indicates the DIP switch settings and their corresponding modes of operation.

Switch Settings			Modes of Operation
1	2	3	
OFF	OFF	OFF	Mode 1
ON	OFF	OFF	Mode 2
OFF	ON	OFF	Mode 3
ON	ON	OFF	Mode 4
OFF	OFF	ON	Mode 5
ON	OFF	ON	Mode 6
OFF	ON	ON	Mode 7
ON	ON	ON	Reserved

Switches S105-4 through S105-8 are reserved switches for future use.

Switch S105-7 is a factory test mode. This switch must remain OFF for proper operation of the unit.

4.6 Normal Condition Polarity

Switches S106-1 through S106-8 determine relay polarity under normal conditions. Each switch controls the polarity for three relays. If the DIP switch is ON, the three relays effected are set to normally-closed condition. This means under a non-activated condition, the relay contacts are closed (shorted). When the DIP switch is OFF, the relays are set to a normally-open condition. This means under a non-activated condition, the relay contacts are open (not shorted).

The following table indicates which relays are effected with each DIP switch.

Switch	Effected Relays	Switch	Effected Relays
S106-1	1, 2, 3	S106-5	13, 14, 15
S106-2	4, 5, 6	S106-6	16, 17, 18
S106-3	7, 8, 9	S106-7	19, 20, 21
S106-4	10, 11, 12	S106-8	22, 23, 24

4.7 Monitor Number

Thumb-wheel switches S101, S102, S103, and S104 collectively make up and determine the monitor number selection. The number dialed on these switches indicates the monitor number to respond to when commands are sent with monitor information. The monitor number is read once on power-up and the value of the number is read conventionally. For example, a number dialed onto the thumb-wheel switches as follows: S101=3, S102=4, S103=7, S104=1, indicated by: 3471, has the value of 3,471 as the responding monitor number.

4.8 Device Number

The 4-position thumb-wheel switches located on the rear panel collectively make up and determine the device number or starting logical relay number selection. The number dialed on these switches indicates either the box's logical address or the relay number to respond to (or starting range) when commands are sent with camera information. Normally, the device number or starting logical relay number (SLRN) logically maps the first physical relay to that number.

As with the monitor number, the value of the number is read conventionally (see the MONITOR NUMBER SECTION) for an example of how the value of the thumb-wheel switches are determined.

Some devices, like the Allegiant Series matrix switchers, support the use of camera input channel re-numbering. Under default conditions, video input 1 of the switcher would be identified as camera 1 on the switcher's on-screen text generator or keyboard. However, using the PC-based Allegiant software, it is possible to re-designate the presented number as another number. This re-designated number will be incorporated into the biphase data output generated by the switcher and sent to the LTC 8770 unit. In this case, the 4-position thumb-wheel setting should be set to follow the desired logical camera numbers.

Additionally, the Allegiant switcher supports an option to generate physical camera numbers in its biphase data output, regardless of the number displayed by the on-screen text generator. In this case, the 4-position thumb-wheel setting should be set to follow the corresponding physical range of camera numbers.

4.9 Relay Connections

The relay connections are made to the 4-screw terminal connectors located on the rear of the unit. The relay contacts are completely isolated from each other and from any internal connections. The + and - indications are only for distinction between the two separate contacts of the relay. Here, they do not indicate any polarity or other connection to the Relay Unit. The connector pin out is detailed in FIGURE 4.

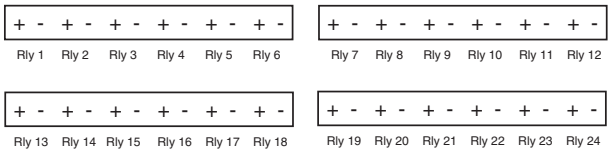


Figure 4

4.9.1 Relay Contacts

The relay contacts can handle up to 0.5Amp at 20VAC/DC (36 peak volts from either pin of the relay to ground), and a maximum resistive load of 10VA.

4.10 Cable

Shielded cable must be used when installing this unit.

4.10.1 Relay Cable

Connection between the relay contacts and any device should be made using 1mm^2 (18AWG) which provides 6.4Ω per 300m (1000ft), or 0.35mm^2 (22AWG) which provides 16.1Ω per 300m (1000ft) shielded cable. The shield must be grounded to the provided grounding screws located on the rear of the unit.

4.10.2 Biphase Code In Cable

Connection between the biphase code input and any biphase code generating device should be made using (Belden 8760 or equivalent 1mm^2/18AWG) shielded-twisted pair cable up to a maximum of 1500m (5000ft) in length (see connector pin out for shield connection).

5 OPERATION

Once the application has been determined, the operational setup of the LTC 8770 must be implemented via DIP switches. BEFORE connecting power to the unit, the internal DIP switches should be set for the desired operation. The DIP switches are read by the unit on power-up and should be only changed when the system is unplugged and the power is OFF.

The Relay Unit has two main operating modes, and several sub-modes. In the first main operating mode, biphase commands will be sent to the Relay Unit to activate or de-activate individual relays. The second main operating mode is the switcher follower mode, where the Relay Unit activates relays based upon cameras or alarms that are called up upon a specific Allegiant monitor, or activates relays based upon which Allegiant monitors are under alarm. In this second mode, the Relay Unit is just responding to biphase commands that are being sent out *following* the operation of the switcher.

5.1 Mode 1: Independent Relay Control

Mode 1 is an independent relay control mode. In this mode, any relay can be opened or closed regardless of polarity settings on the polarity DIP switches. This mode is not a switcher/follower mode and does not follow the camera that is being displayed on a monitor in a video switcher. This mode responds to commands to directly control relay activations only, using the LTC 4100 WorldView™ Series, and other devices transmitting this message structure.

5.2 Mode 2: Auxiliary Command Control

In this mode, the user can activate or deactivate a relay using any device that supports ON-Site Receiver/Driver (OSRD) Auxiliary ON, and OFF commands, such as the Allegiant, or System4 Multiplexer keyboard, and the LTC 4150 WorldView Remote Site Monitor. The Logical Relay that corresponds to the Logical Camera Number that the keyboard or Remote Site Monitor is controlling will be controlled. For the Allegiant keyboard, this number is displayed on the keyboard, and for the Remote Site Monitor, this is the camera displayed in the viewing window that has focus.

5.2.1 User Interface: Allegiant Keyboard or GUI

- To turn a relay ON from an Allegiant keyboard, or the Allegiant GUI:

1. Select the appropriate camera.
   The relay whose Logical Relay Number is equal to the Camera's Logical Camera Number will be controlled. If the Relay Unit Device Number thumb wheel switch is set to 0001, select **Logical Camera 1** on the keyboard or GUI to control logical and physical relay 1, then **Logical Camera 2** to control logical and physical relay 2, and **Logical Camera 24** to control logical and physical relay 24, etc.

   If the Relay Unit Device Number is 0025, select **Logical Camera 25** to control logical relay 25 (physical relay 1), and **Logical Camera 26** to control logical relay 26 (physical relay 2), and **Logical Camera 48** to control logical relay 48 (physical relay 24), etc.
2. Press the **ON** button.
   Polarity is determined by the appropriate polarity setting in the Relay Unit. If the polarity for this logical relay is set to Normally Open, the relay will close. If the polarity for this logical relay is set to Normally Closed, the relay will open.
3. Enter the number **90**, and Press **ENTER**.

- To turn a relay OFF from an Allegiant keyboard, or the Allegiant GUI:

  Follow the procedure above to turn ON a relay, but press **OFF** on the Allegiant keyboard, instead.

- To TOGGLE a relay from ON to OFF, or from OFF to ON, select **TOGGLE** on the Allegiant GUI (this function is not available from the Allegiant keyboard).

It is also possible to control the relays of a LTC 8770 unit when it is connected to an Allegiant Series matrix switcher, by using Allegiant Command Console Language (CCL) commands. Refer to the Allegiant CCL Manual (available for download from www.boschsecuritysystems.com) for complete details on controlling an Allegiant switcher using ASCII-based commands from an external device. The following CCL command format is used:

Activate relay: **Aux-on <logical relay number> <auxiliary 90>**

Deactivate relay: **Aux-off <logical relay number> <auxiliary 90>**

For example, to control relay number 5 when the LTC 8770's SLRN is set to 0001, use:

Activate relay: **Aux-on *5* 90**
Deactivate relay: **Aux-off *5* 90**

5.2.2 User Interface: LTC 4150 Remote Site Monitor

- To turn a relay ON or OFF from the LTC 4150 Remote Site Monitor (RSM) using a camera number (another way to control individual relays, regardless of cameras being displayed in the RSM, is using *Mode 1*):

1. Select the appropriate camera.
   The relay whose Logical Relay Number is equal to the Camera's Logical Camera Number will be controlled, when being displayed in the RSM viewing window that currently has focus.
2. Press **ON** to turn the relay on, or **OFF** to turn the relay OFF.
   Polarity is determined by the appropriate polarity setting in the Relay Unit. If the polarity for this logical relay is set to Normally Open, then the relay will close if ON is selected, and will open if OFF is selected. If the polarity for this logical relay is set to Normally Closed, then the relay will open if ON is selected, and close if OFF is selected.
3. Enter the number **90**, and then press **OK**.

5.3 Mode 3: Automatically Follow the Non-alarm Camera Called up on a Monitor

In this Allegiant camera follower mode, the user selects the monitor number to respond to using the 4-digit Monitor Number (MN) inside the Relay Unit enclosure. The Relay Unit will respond to commands pertaining only to this monitor number. To select the corresponding starting camera the series of relays will respond to, the user enters the device number or starting logical relay number (SLRN) on the rear of the unit.

This mode responds only to cameras not in an alarm condition (non-alarm cameras). The physical relay whose Logical Relay Number corresponds to the non-alarm camera being displayed on this selected monitor will activate indefinitely. If the monitor displays a camera in an alarm condition (alarm camera), no relay is activated.

For example, the unit is set where MN = 0001, Device Number (SLRN) = 0005, and an Allegiant keyboard is displaying monitor #1 with camera 5 selected. For this particular mode, none of these cameras are in an alarm condition (other modes may require the camera to be in an alarm condition). This setup should activate physical relay 1 in the Relay Unit. This is because the starting range of the relays is set to 5 (SLRN = 0005), making the effective range from camera 5 through 28. If the viewed camera on the Allegiant was changed to camera 10, then physical relay 5 would activate. If the viewed camera was changed to camera number 1, no physical relays would be activated because camera 1 is out of the Relay Unit logical relay number range.

5.4 Mode 4: Automatically Follow the Alarm Camera Called up on a Monitor

In this Allegiant camera follower mode, the user selects the monitor number to respond to using the 4-digit Monitor Number (MN) inside the Relay Unit enclosure. The Relay Unit will respond to commands pertaining only to this monitor number. To select the corresponding starting camera the series of relays will respond to, the user enters the device number or starting logical relay number (SLRN) on the rear of the unit.

This mode responds only to cameras in an alarm condition (alarm cameras). The physical relay whose Logical Relay Number corresponds to the alarm camera being displayed on this selected monitor will activate indefinitely. If the monitor displays a camera not in an alarm condition (non-alarm camera), no relay is activated.

This mode is basically identical to *Mode 3*, except that it only responds to Cameras in Alarm.

In order to activate this command, read the example for *Mode 3* and change them to alarm-cameras.

5.5 Mode 5: Automatically Follow the Non-alarm or Alarm Camera Called up on a Monitor

In this Allegiant camera follower mode, the user selects the monitor number to respond to using the 4-digit Monitor Number (MN) inside the Relay Unit enclosure. The Relay Unit will respond to commands pertaining only to this monitor number. To select the corresponding starting camera the series of relays will respond to, the user enters the device number or starting logical relay number (SLRN) on the rear of the unit.

This mode responds to cameras both in an alarm condition (alarm cameras) and not in alarm condition (non-alarm cameras). The physical relay whose Logical Relay Number corresponds to the alarm or non-alarm camera being displayed on this selected monitor will activate indefinitely.

This mode is basically a combination of *Modes 3* and *4*, in that it responds to cameras whether or not they are under alarm.

In order to activate this command, read the example for *Mode 3* and apply it to both camera states.

5.6 Mode 6: Automatically Follow the Monitor under Alarm

In this Allegiant monitor follower mode, the user selects the monitor number to respond to using the 4-digit Monitor Number (MN) inside the Relay Unit enclosure. The MN maps the 24 physical relays 1-24 to 24 contiguous monitor numbers MN to MN+23. Physical Relay 1 corresponds to monitor number MN. Physical Relay 2 corresponds to monitor number MN+1. Physical Relay 24 corresponds to monitor number MN+23. These are physical monitors for all but the LTC 8900, where they may be logical monitor numbers, HOWEVER THERE MUST BE 24 CONTIGUOUS MONITOR NUMBERS, AND THE STARTING MONITOR NUMBER DEPENDS UPON THE MN, EITHER PHYSICAL OR LOGICAL.

If there is an alarm in one of the 24 relevant monitors, then the corresponding physical relay activates and remains activated until there is no alarm on that monitor.

5.7 Mode 7: Test Mode

In this user test mode, physical relay 1 is closed for one second and then opened, and physical relay 2 is closed for one second and then opened, and so on through the 24 relays. The test sequence will continue indefinately while in the *test* mode. This mode is used to check that the relay contacts are correctly connected to the other devices in your system, and that the Relay Unit is functioning. When in this mode, all command messages are ignored. This mode is only initiated by setting the mode DIP switch configuration or by setting the Device Number to 0000.

If Device Number is set to 0000, *Mode 7* will immediately start. This mode does not observe the polarity DIP switch settings and once the *test* mode has started, it will not end until it has gone through all 24 relay closures, even if the Device Number is changed prior to that time.

6 PIN OUTS

6.1 Biphase Code in Connector

Pin	Connection
1	Code In +
2	Shield
3	Code In -

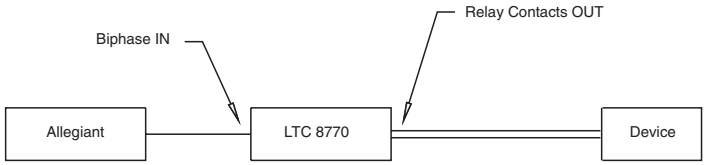


Figure 5 Configuration Example

6.2 Relay Connector

Pin	Relays 1-6	Relays 7-12	Relays 13-18	Relays 19-24
1	Relay 1 +	Relay 7 +	Relay 13 +	Relay 19 +
2	Relay 1 -	Relay 7 -	Relay 13 -	Relay 19 -
3	Relay 2 +	Relay 8 +	Relay 14 +	Relay 20 +
4	Relay 2 -	Relay 8 -	Relay 14 -	Relay 20 -
5	Relay 3 +	Relay 9 +	Relay 15 +	Relay 21 +
6	Relay 3 -	Relay 9 -	Relay 15 -	Relay 21 -
7	Relay 4 +	Relay 10 +	Relay 16 +	Relay 22 +
8	Relay 4 -	Relay 10 -	Relay 16 -	Relay 22 -
9	Relay 5 +	Relay 11 +	Relay 17 +	Relay 23 +
10	Relay 5 -	Relay 11 -	Relay 17 -	Relay 23 -
11	Relay 6 +	Relay 12 +	Relay 18 +	Relay 24 +
12	Relay 6 -	Relay 12 -	Relay 18 -	Relay 24 -

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