Revision

2.0

INSTALLATION & USER GUIDE

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CH1000 Installation & User Guide

Disclaimer

This manual has been validated and reviewed to be accurate for the CH1000 Series Communications System at the time of this manual's production. However, the information contained in this document is subject to change without notice. Support for various features listed herein, is subject to the software version(s) provided with the system.

CareHawk Inc makes no warranty of any kind with regard to this manual, and assumes no liability for damages incurred directly or indirectly from errors, omissions or discrepancies in relation to this manual.

FCC Information

All equipment parts of the CH1000 system comply with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) the equipment may not cause harmful interference. And (2) the equipment 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. 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 can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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/her own expense.

WARNING: Changes or modifications not expressly approved by CareHawk Inc. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.
(Cet appareil numerique de la classe A est conforme a la norme NMB-003 Canada)

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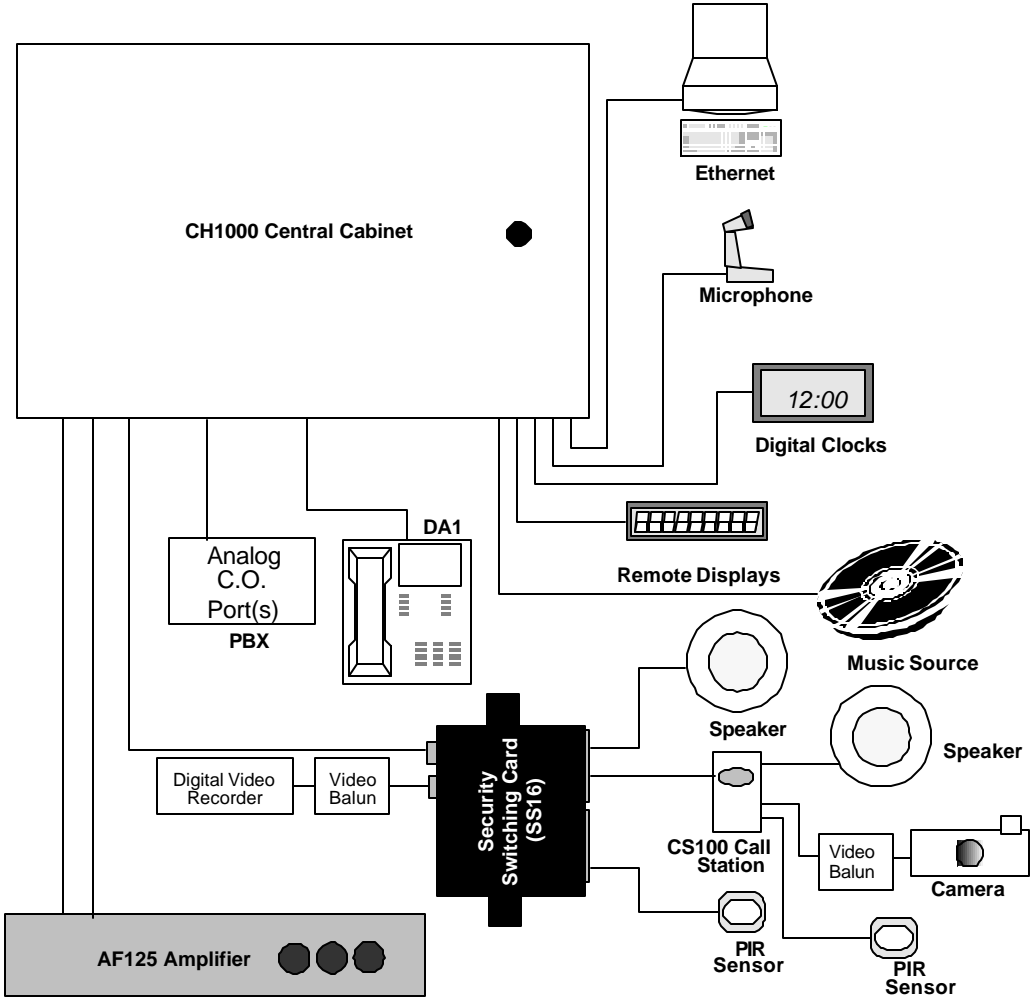
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Sensor**

**PIR
Sensor**

Figure 1

T he CareHawk CH1000 is a distributed, multi-channel, microprocessor-controlled security communication system. The system architecture allows for up to a maximum of eight Security Switching Cards (SS16), and eight display phones (DA1). Each SS16 contains 16 independent output audio/device ports, and is designed to be remoted from the central cabinet.

Each SS16 can be located close to the central cabinet if desired, however to take advantage of the reduced wiring requirements, it is typically remoted elsewhere in a facility. It can be anywhere from a few hundred or a few thousand feet away from the central cabinet[1]. The system contains two independent 25V audio channels which can be used for paging/program material distribution as well as intercom (when equipped with an IA1 intercom amplifier).

The system is controlled via a Display Administrative Console (DA1). A CH1000 system can have up to eight DA1s installed. Any # from 1 to a maximum of 8 of the phone ports are available for connection to a PBX system via standard analog CO ports[2]. It is recommended that at least one of the ports be left available for a DA1 when using multiple ports to interface with a PBX/KSU).

System Primary Component Overview

Central cabinet (CH1000)

The CH1000 is the central equipment cabinet for the security communication systems. Each CH1000 provides for up to 128 audio/I/O ports and up to eight DA1 Display Administrative Consoles, as well as the following connections on the MI100 Main Interface Card (See Figure 16 for location of all ports):

- Six input and 5 open collector output contacts (via keyed terminal strips). Open collector outputs are shared with two dry contact outputs (with N.O. and N.C. contacts available)

- Any combination of phones or analog C.O. PBX interface ports totaling 8

- One microphone port (terminal strip)

- Two Music source inputs (terminal strip)

- Ethernet connectivity (RJ-45 jack)

- RS-485 port for driving external digital clocks (RJ-45 or terminal strip)

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[1] Attainable distances of the SS16 from the central cabinet are dependent on audio loading, and the losses deemed acceptable over that distance.

The cabinet is made of 18 gauge steel with a durable powder coat finish. The cabinet can be wall or rack-mounted. The overall cabinet dimensions are 18 1/2" high x 17" wide x 5 3/8" deep. See Figure 13 for full mounting details.

Figure 2

Switching Security Card (SS16)

An SS16 adds 16 audio/device ports that provide annunciated call-in with half-duplex communications capabilities between the DA1. Security sensors, speakers, and call-in switches can all be used with any of the 16 ports. The SS16 is designed to be a distributed component, and as such can be wall- or ceiling- mounted. SS16's are housed in a metal cabinet similar to a network hub, and are easily used for retrofitted in existing installations (requires field wiring to be adapted to RJ45 terminated CAT5 cable). Up to eight SS16's can be added to each CH1000 system for a total of 128 ports. Each SS16 requires only one CAT5/RJ45 termination between each SS16 and the central cabinet for basic operation[2]. With the video option, a second CAT-5 cable in needed.

Figure 3

Display Administrative Console (DA1)

Each DA1 provides a control center for all paging, intercom, security, and telephone communications. The DA1 has a visual as well as an audible indicator for incoming calls. The built-in memory allows for 8 speed dials and 99 stored numbers in a visual directory. The screen is backlit and adjustable for the attendants convenience. Screen icons simplify identifying the current status of the DA1. Six soft keys are provided for use with the dynamic menu system. The easy to use menu system allows for distributing program sources and pages to zones or all speakers without the need to remember long complicated number sequences. Arrow keys are provided to allow for easy scrolling through the call queue, directory, and menus.

Figure 4

---

[2] Basic operation provides two independent audio channels, +12VDC power, and RS-485 data transmission to each SS16 over a single CAT5 cable.

120 watt Power Amplifier (AF125)

An AF125 is the external 120 Watt program/paging amplifier used with the system. This unit can be wall mounted or rack mounted. Output is 25V rms.

Telephone Communications Card (TC1)

The TC1 is a card that allows for the interconnection of a DA1 console to the CH1000 system, as well as connection of an analog PBX C.O. port the CH1000 system. The TC1 is installed as a plug in module on to the MI100 interface card. One TC1 is required for every DA1, and up to eight can be used with a system. When using it for PBX connectivity, a phone on the PBX system can gain access to paging and intercom functions on the CH1000 system just like a phone that is locally connected.
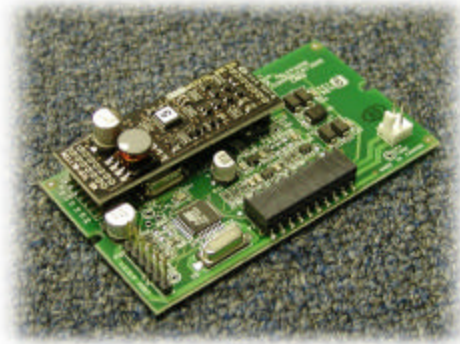

Figure 5

Intercom Amplifier Card (IA1)

An IA1 is a module that provides the talk/listen audio amplification for conversations between a DA1 and a remote room. The IA1 provides the means for a half duplex audio channel, as well as digital audio filtering of all talk and listen audio. The use of digital audio filtering means that typical room characteristics that make it difficult to listen to someone, are less of a factor, and the listen audio becomes more intelligible at the DA1 handset. One IA1 is required for systems requiring intercom functionality.
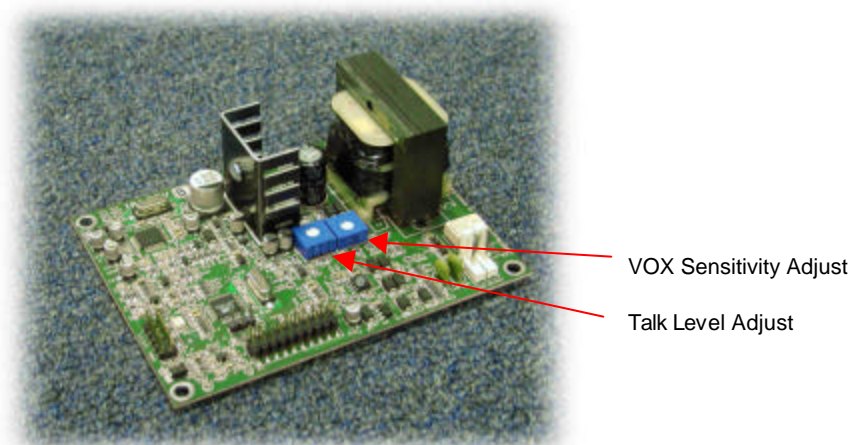

VOX Sensitivity Adjust

Talk Level Adjust

Figure 6

Camera Routing Card (CR16)

The camera routing card is an optional add on card within the SS16 module. It facilitates the connection of UTP cameras on all SS16 device ports, and then feeds one video channel at a time to 3rd party video monitoring equipment. It can be factory installed onto an SS16, or added to an SS16 on site at a later date if required. The use of this optional card requires one additional CAT-5 cable to be run to the SS16 for taking the video feed back to the 3rd party monitoring equipment. Each CH1000 system can have up to 8 CR16's (assuming the system has 8 SS16's), for a total of 8 simultaneous video feeds per system. Through programming (via CareHawk Settings software), camera sequencing can be setup at selectable intervals, between a selectable group of cameras. Camera sequencing can then be enabled/disabled as desired by a DA1 phone by using the on-screen menus. Adding a CR16 to an SS16 requires no software upgrades or system configuration. As soon as the CR16 is present and the cabling is in place, the system is video ready.
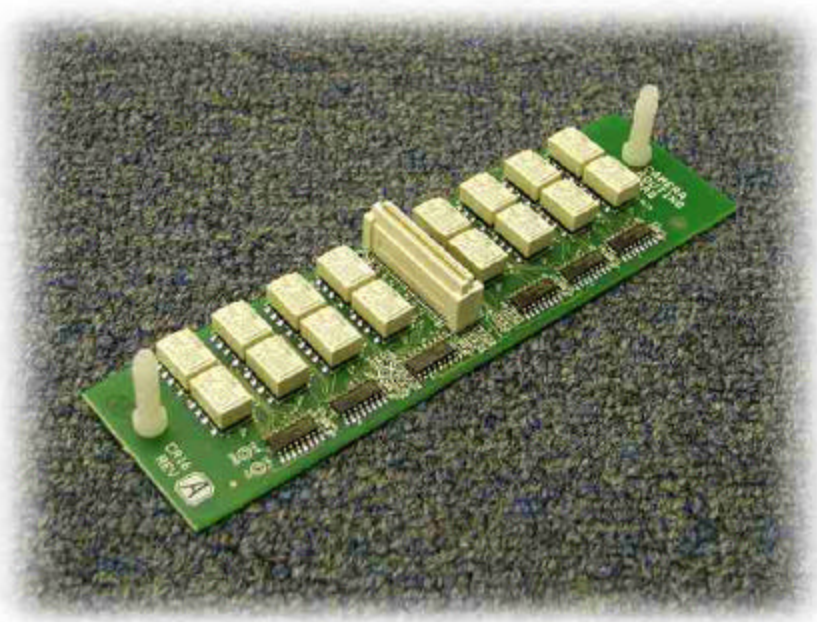

Figure 7

System Accessories

System Accessory Feature Summary

Station Feature	Station Model #				
	CS50	CS100	CS150	HS100	HS120
Single Gang Stainless Steel Wall Plate	?	?	?	?	
Dual Gang Stainless Steel Wall Plate					?
Can Originate Call	?	?	?		?
Silicon Call Button		?	?		
Silicon Privacy Button			?		
Visual Call Assurance			?		
Illuminated Privacy button			?		
Grounded Audio Xfmr Center tap Privacy	?				?
Audible Call Assurance			?		
Durable Audio Handset w/hookswitch				?	?
Rocker switch with Momentary Call & Maintained Privacy	?				?
Speaker connections	?	?	?	?	?
RJ-45 Connectivity	?	?	?		?
RJ-45 UTP Camera Connectivity		?	?		
Sensor/Device Input for N.O. & N.C., jumper			?		

Table 1

CS50 Call Station

A CS50 is a basic single gang stainless steel call station with a rocker switch. The switch provides for a momentary call and lockable privacy position. This station provides RJ-45 connectivity for connection to the SS16, and stripped wire ends facilitating crimp connection onto cable going to the associated speaker.
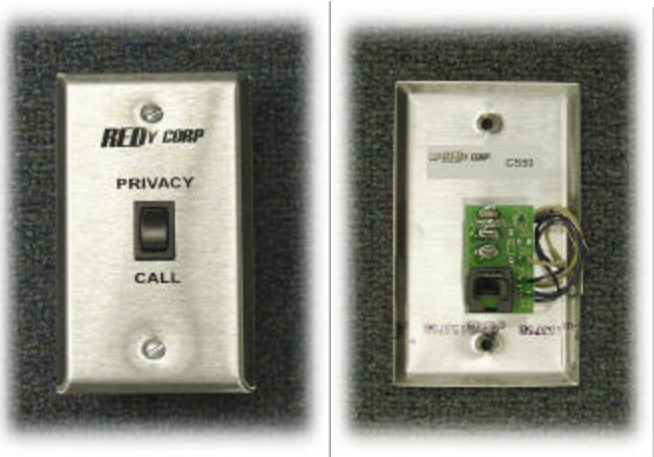

Figure 8

CS100 Call Station

A CS100 is a basic single gang stainless steel call station with an epoxy coated silicon call button. The switch provides a momentary contact closure for making a call. This station comes with RJ45 connections on the rear for the connection from the SS16 which are clearly labeled on the board. In addition there are also connections for a speaker, security sensors and optional camera. The CS100 station does not provide any power to the camera, so when connecting a camera a separate power source is required. This station acts as a cable concentrator for a location to allow a single CAT5 cable run back to the SS16.
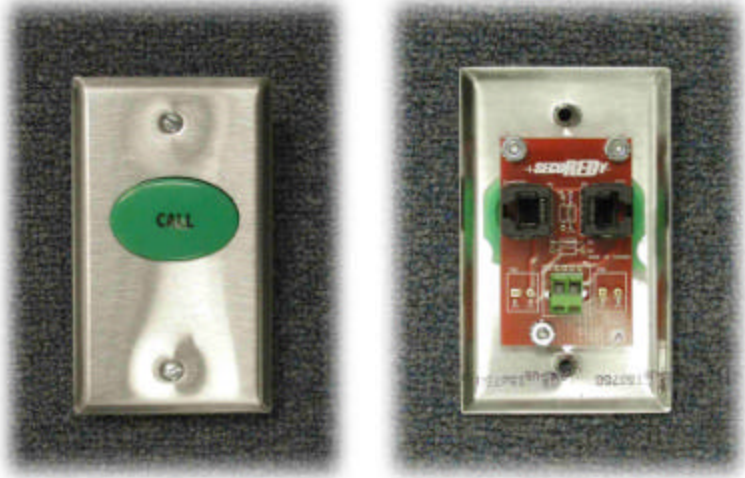

Figure 9

CS150 Call Station

A CS150 is an enhanced single gang stainless steel call station with an epoxy coated silicon call and privacy button, both of which can be illuminated when pressed. When placing a call, the call button will be illuminated only after the central equipment has received the call, so it acts as a true visual call assurance indicator. At the same time, an audible call assurance tone will be provided by a buzzer on the station[3]. The privacy button can be pressed at any time to mute the listen audio from a room during normal intercom conversations, and provides an orange illumination when activated. Both switches provide a momentary contact closure when pressed. This station comes with an RJ45 jack on the back for connection to the SS16 which is clearly labeled on the board. In addition, there are also connections for a speaker, security sensor, open collector driver, and optional camera (also RJ-45).
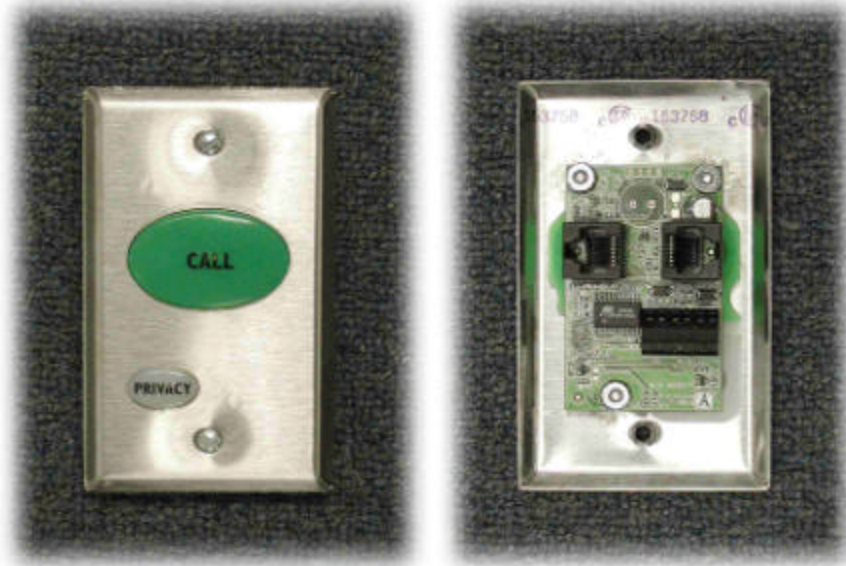
Figure 10

HS100 Handset

A HS100 is a basic single gang stainless steel handset station. The handset allows for a private conversation by automatically switching the intercom from the associated room speaker when taken off-hook. There is no call button on this station, so it is only capable of facilitating half duplex audio communications that is initiated from a phone.

Figure 11

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[3] Audible alert tone is a local jumper selectable function of each CS150 station. Each CS150 station is factory set to enable the audible alert tone. See figure 23 to determine how this tone can be defeated with the buzzer enable/disable jumper setting.

HS120 Handset/Call Station

A HS120 is a basic double gang stainless steel combination handset and call station. The rocker switch provides for a momentary call and lockable privacy position. The handset allows for a private conversation by automatically switching the intercom from the associated room speaker. Taking the handset off-hook with the call switch in the privacy position will not override the privacy function. The call button must be returned to the center position for the handset audio to be heard at the phone.

Figure 12

System Installation

CH1000 Cabinet Mounting

The CH1000 cabinet is designed for mounting on a wall. The diagram below shows the location of the four mounting holes. Holes are located on 16" centers to accommodate fastening to wall studs where possible, however the cabinet weight including power supply, 8 TC1's and one IA1 is only 27 lbs. The cabinet should be mounted to the wall using four #8x 2" screws appropriate to the wall type.
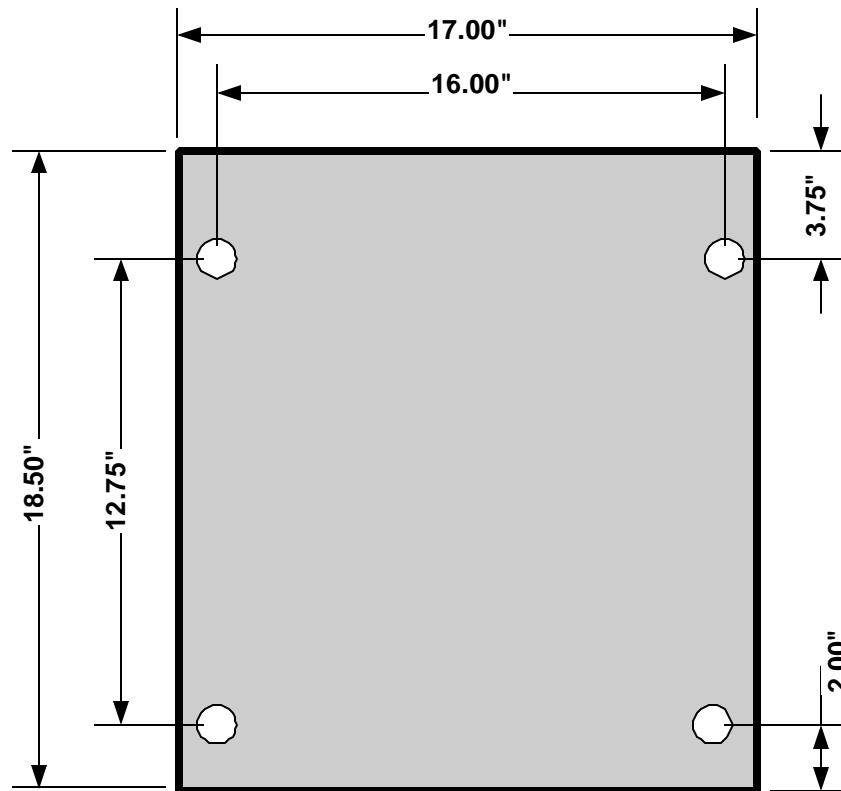

Figure 13

CH1000 Cabinet Features

Figure 14 below shows an internal picture of the CH1000 system. All field wiring enters the cabinet from the bottom via dual knockout holes (7/8" and 1 ¼"). A knockout has also been provided to bring AC power into the cabinet.

The door is hinged on the left side as illustrated below, and equipped with a keyed lock to prevent un-authorized access to the system hardware.

Since the cabinet contains a total of 6 knockout holes, there is plenty of cable entry space for bringing field wiring into the cabinet. When bringing field wiring into the cabinet, it is recommended that DA1/phone cabling enter in a different knockout hole then SS16 wiring. It is also recommended that the wiring to/from the external audio amplifier be routed through a knockout hole on its own in an effort to prevent coupling between cables.

Figure 14

System Power Requirements

The CH1000 system requires 120VAC at 1.0 amp maximum (excluding power requirements of the AF125 – 115 VAC, 3.0 amps at rated power output). The system fuse is 1.0 amp slow blow, and is located on the PDB1 (just above transformer show in Figure 15)

System Power Wiring

Each CH1000 system is provided with a standard 6 ft line cord which mates with the 120 VAC socket on the bottom edge of the central cabinet as shown below. Plug the receptacle end of the line cord firmly into the socket on the bottom of the cabinet, and plug the other end into a 120 VAC outlet. If power will be entering the cabinet through conduit instead, then the following steps need to be followed:

1. Inside the CH1000 cabinet, disconnect the black and white wires connecting the AC socket to power distribution board (PDB1) terminal strip TS1. Disconnect the green ground wire connecting the AC socket to the ground stud on the bottom of the cabinet.

2. Install appropriate wires through conduit and into the cabinet.

3. Attach the ground wire entering the cabinet to the ground stud located on the bottom of the cabinet (labeled with a green ground symbol) using a #6 ring lug. Ensure that the ground stud at the bottom of the cabinet is still wired to the appropriate pin in terminal strip TS1 located on the PDB1.

4. Using a slot screw driver, loosen the two screws which fasten the terminal strip onto the PDB1.

5. Using the same slot screw driver, connect the black (Hot), and white (Neutral) wires entering the cabinet into the appropriate pins in terminal strip TS1 on the PDB1. Observe the markings on the PDB1 to determine the correct position, as well as using the picture below to determine correct wire colors.

Figure 15

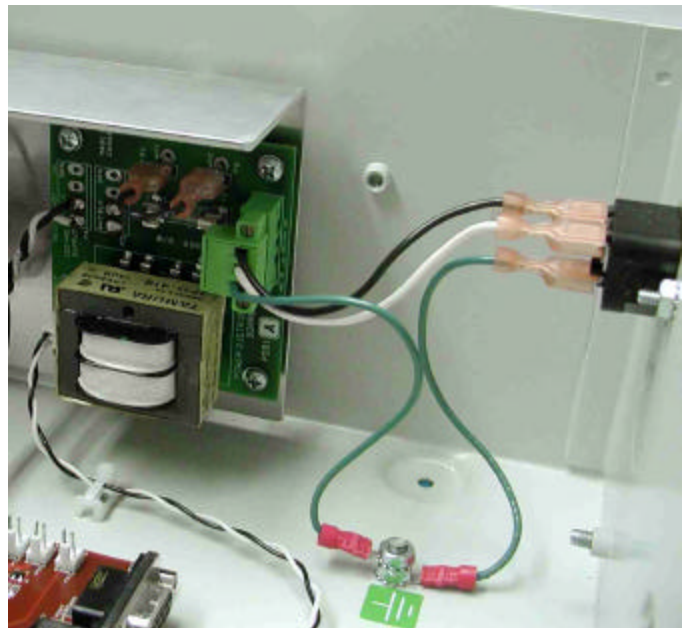# CH1000 Connections

The figure below shows all of the connections required to the MI100 Main Interface board found inside the CH1000 cabinet.

TC1 Slot #8

TC1 Slot #1

DA1/Phone Ports (8)

PBX C.O. Ports (2)

SS16 Ports (8)

Music Source Inputs (2)

Microphone Input

General Purpose Outputs (Top)
General Purpose Inputs (Bottom)
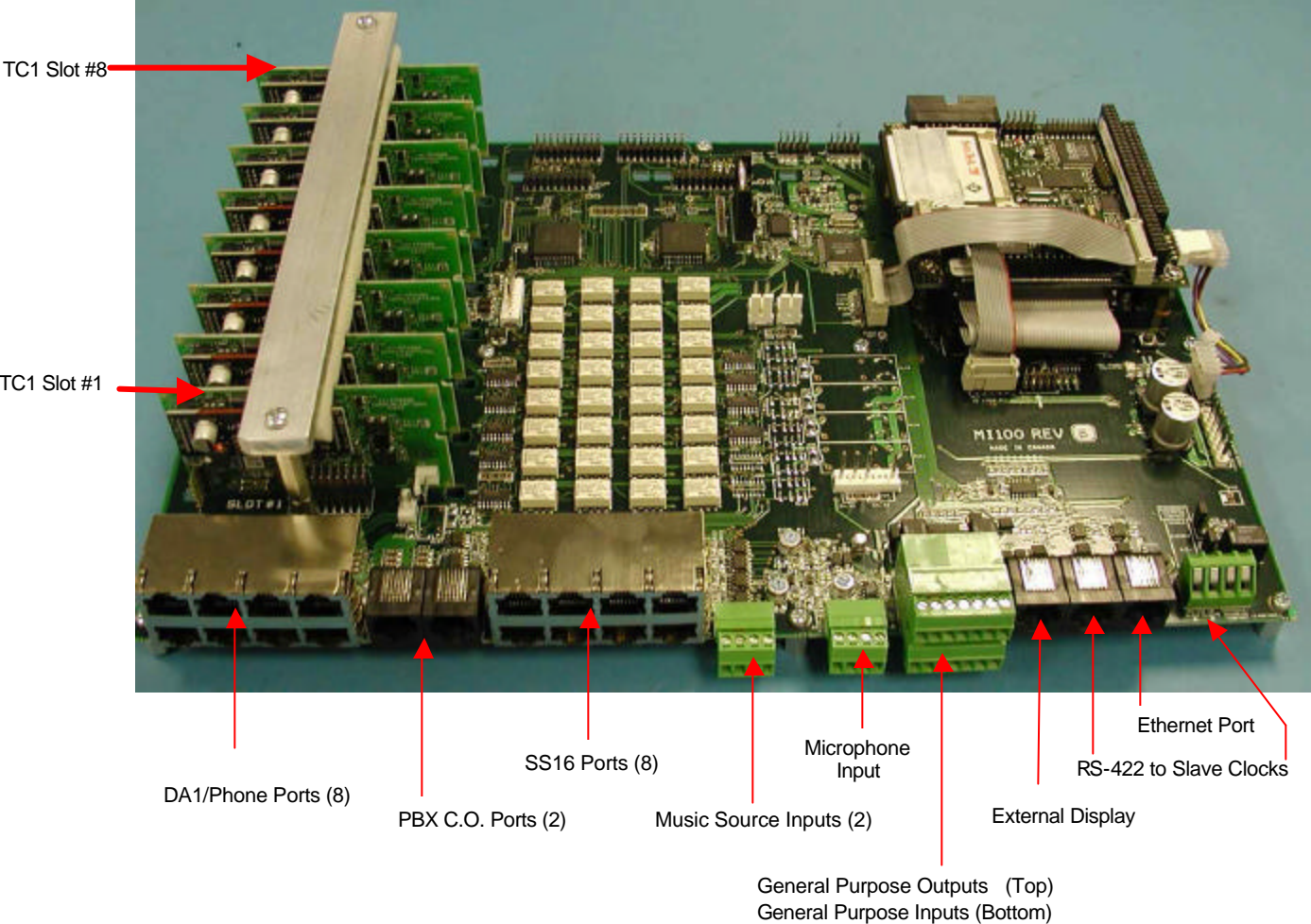
External Display

RS-422 to Slave Clocks

Ethernet Port

Figure 16

SS16 Mounting

The SS16 is designed to be located in a hallway or corridor of a building in a location near devices that will connect to it. The cabinet should be located away from any machinery as well as florescent lighting, and if necessary SS16 cabling should cross power cabling at right angles (avoid long parallel runs). The SS16 cabinet can be installed on a wall or above the ceiling tile in the air plenum.

The SS16 can be located at a distance from the central cabinet. Wiring losses need to be taken into consideration to determine the maximum distance an SS16 can be located away from the central cabinet. Powering remote devices such as motion sensors, etc from the SS16 is possible. When it's required to source > 150 mA DC at 12V to remote devices, a local class II rated +12VDC power source can be connected to the 2.1mm DC power jack located on the side of the chassis as shown in figure 19.

Figure 17 below shows the mounting brackets for the SS16. #8 screws should be used when attaching the SS16. Choose the appropriate type of screws for the wall type being fastened to. The top mounting hole is masked off so that a ring lug and 16 AWG wire can be used for connecting the chassis to a solid earth or electrical ground. This connection is necessary, as it provides a means of diverting high level transient voltages entering the SS16 on the audio lines to a solid earth ground.
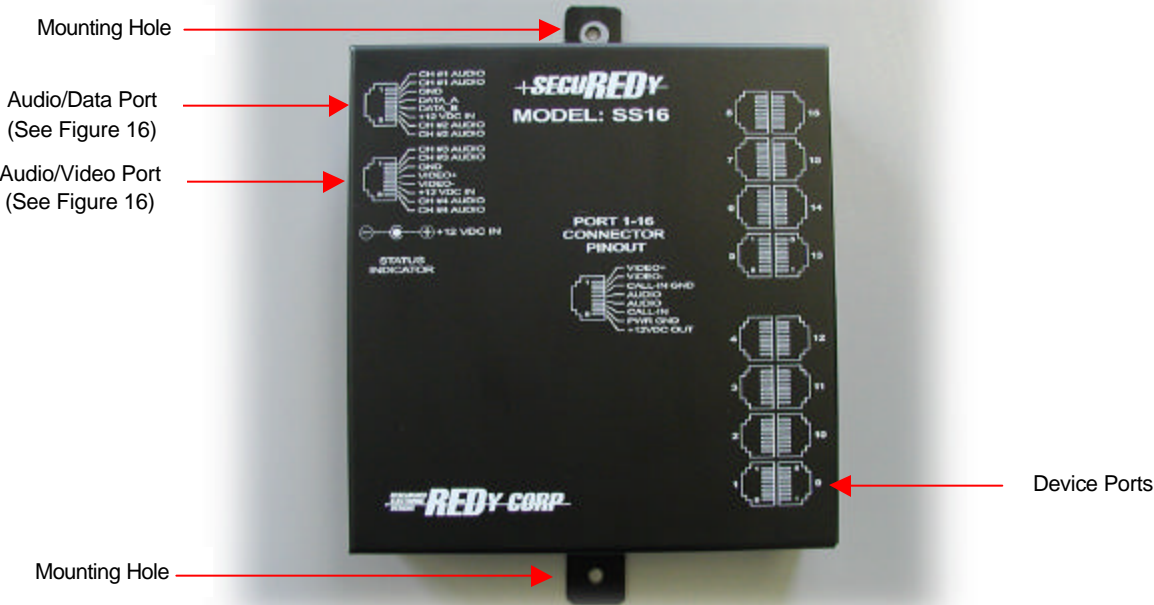

Figure 17

CH1000 to SS16 Wiring

The wire required for connection from the CH1000 cabinet to all SS16's is standard CAT3,5, or 5e 24 AWG cable. All RJ45 connections to the SS16 and central cabinet must follow the Electronics Industry Association (EIA) 568A or 568B standard[4], since all RJ45 connectors coming from the SS16 and central cabinet conform to this. It does not matter which standard is used, as long as the same one is used consistently throughout the entire system installation. The pin out for the two RJ45 SS16 ports is shown here as well as directly on the top cover of the SS16:

SS16 AUDIO/DATA PORT　　　　**SS16 AUDIO/VIDEO PORT**

RJ-45 JACK PIN #

(4)	DATA_A	DATA_B	(5)
(3)	GND	+12VDC IN	(6)
(2)	CH #1 AUDIO	CH #2 AUDIO	(7)
(1)	CH #1 AUDIO	CH #2 AUDIO	(8)

RJ45 JACK

RJ-45 JACK PIN #

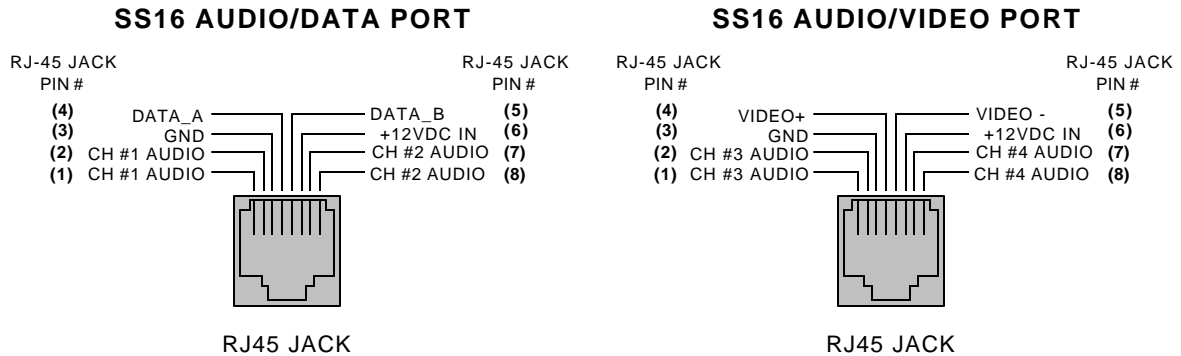| (4) | VIDEO+ | VIDEO - | (5) |
(3)	GND	+12VDC IN	(6)
(2)	CH #3 AUDIO	CH #4 AUDIO	(7)
(1)	CH #3 AUDIO	CH #4 AUDIO	(8)

RJ45 JACK

Figure 18

Within the central cabinet eight SS16 ports are found. Figure 16 shows the interconnection ports. The SS16 ports should be used in the numerical order shown. A +12 VDC jack is also provided on this module to allow for it to be locally powered. This jack should be used in either of the following two situations:

- SS16 needs to be located farther from the central cabinet than the maximum recommended distance of 1400 feet (this distance is based purely power consumption of the SS16, and does not take into account the audio loads connected to the SS16).

- SS16 needs to source +12VDC power to a significant number of end devices (such as motion sensors etc). The more devices requiring power, the greater the power losses in the cable feeding the SS16 from the central cabinet, which in turn reduces the distance the SS16 can be located from the central cabinet. When powering numerous devices from the SS16 audio/device ports, it is recommended that it be locally powered from a class II +12VDC power source. Since the maximum distance the SS16 can be located from the central cabinet is directly related to the power being consumed by the SS16 and the end devices drawing power from the device ports. By locally powering the SS16, the distance limitation based on power consumption goes away. The only distance limitation left relates to the audio power being drawn by the SS16 speaker ports.

---

[4] EIA568A/568B is a common standard used for computer network wiring. See appendix A for further details about how to wire to this standard.

SS16 to End Devices

The SS16 allows for connection of up to 16 devices. The devices can be any of the REDy Corp standard stations listed in table 1. They can also be direct connection of 25V audio transformer/speaker, or UTP camera (utilizing a video balun). Typical installations will connect these types of devices to one of the standard room stations prior to connecting to the SS16, however it is not mandatory. When connecting speakers the following limits must be followed. No more than 25 watts per port and no more than 35 watts peak per SS16 can be connected. The required wire to go from the SS16 to the end devices is CAT5. The wire is terminated at the SS16 with an RJ45 plug of the appropriate type for the CAT5 cabling being used. The device end of the wire can be left as a pig tail or terminated with a RJ45 connector depending on the application. Figure 19 below shows where the devices are connected to the SS16. The diagram found on the cover of the SS16 lists the port numbers as well as the function of each pin within each connector.

For installations needing to deploy motion sensors etc, requires wiring them into a CS150 call station before connecting back to an SS16 (See Figure 22). The SS16 also provides +12 VDC power at each device port for powering some sensor devices, with the combined current consumption of all 16 ports limited at 150 mA. It is recommended that if more than a few sensors per SS16 are required, that the SS16 be provided with local power via the 2.1 mm DC jack on the side of the SS16. If this is not practical, or the +12 VDC supply is not appropriate for the devices being used, then a completely separate power source must be used.

When power is applied to an SS16, the green status LED (shown on the right side of figure 19 beside the DC input jack), will flash at a steady rate, indicating the unit is operating properly.

Sensors can be connected directly to an SS16 device port, as long as the following specific limitations are understood.

- Sensor/device must provide a normally open contact during idle going closed during activation. Normally closed contacts are not supported unless going through a CS150 call station.

- Contact closure provided by the sensor will be treated like a normal call-in to the system, and will not have sensor input status.

- Sensor/device activation time must be a minimum of 50 milliseconds to be recognized.

Device Port(s)

2.1mm 12 VDC INPUT JACK From class II Source ONLY.
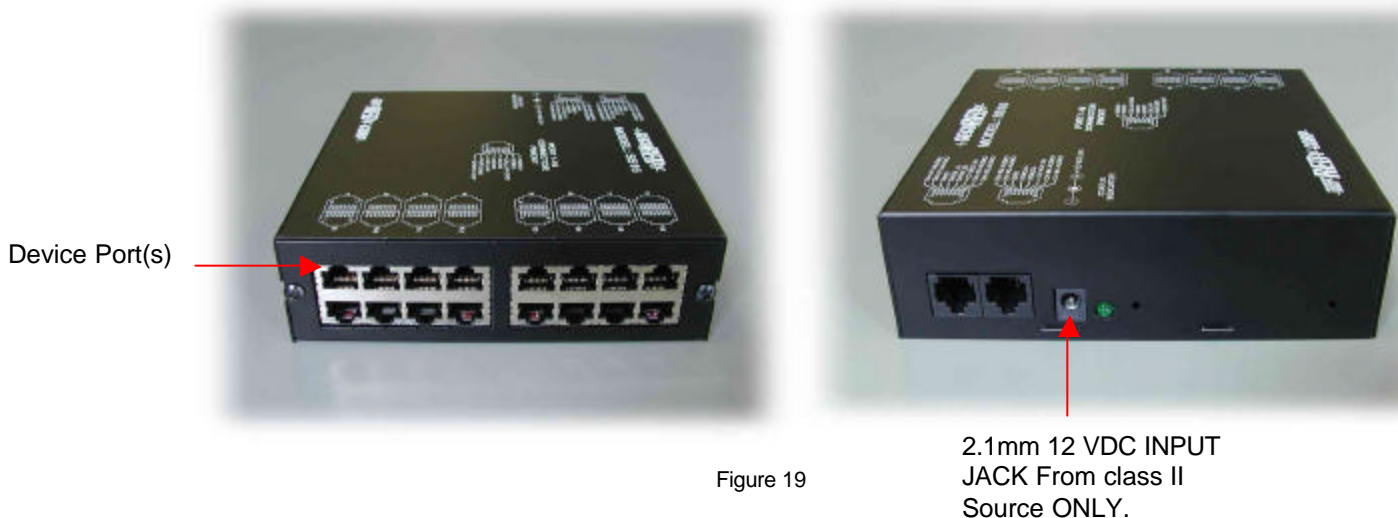
Figure 19

CS50 Wiring

Figure 20

Connection to this station from an SS16 port can be done through an RJ-45 terminated CAT-5 cable (straight through, not cross-over cable). Connections to the audio transformer requires installer provided crimped connections onto the blue pair of wires coming off of the station. The yellow wire coming from the station must be wired as shown above for the privacy position of the toggle switch on the front of the station to be functional.

There are no specific distance limitations between the CS50 and the SS16. The only distance limitation involves the acceptable cable losses for the audio over CAT-5 cable from the CH1000 central cabinet, and the speakers involved.
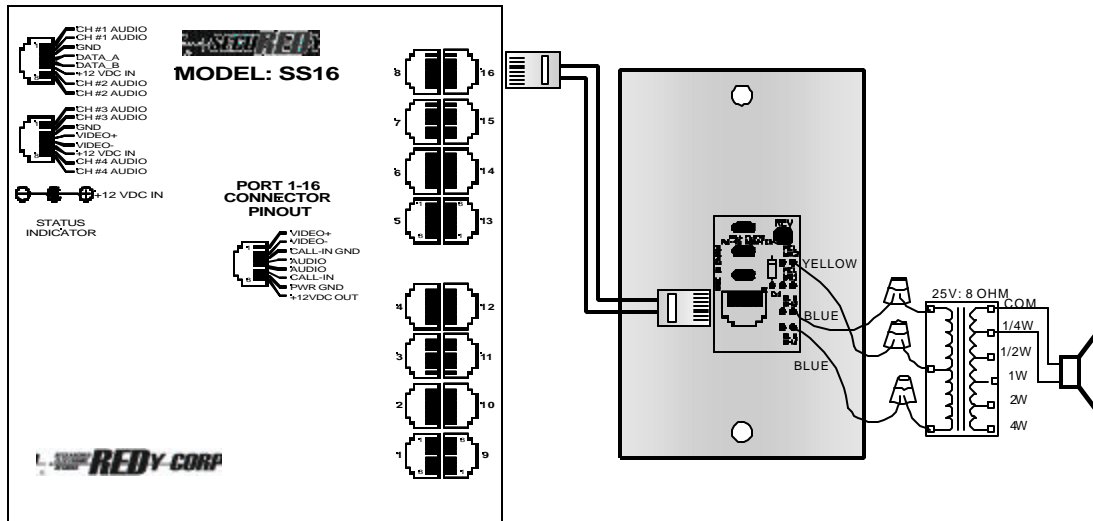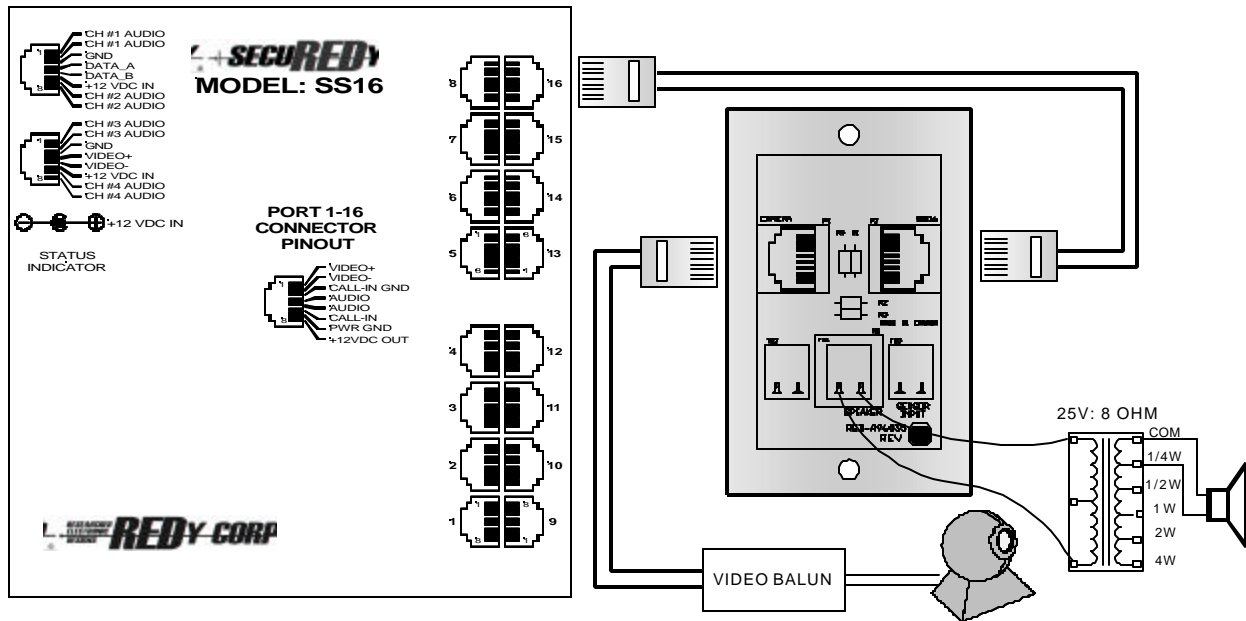
CS100 Wiring

Figure 21

Connection to this station from an SS16 port can be done through an RJ-45 terminated CAT-5 cable (straight through, not cross-over cable). Connections to the audio transformer may be wired directly into a terminal strip labeled TS1 provided on the back of the station as illustrated above. Privacy functionality is not supported directly from this station. If required, another model of REDy Corp. call station such as the CS50, CS150, or HS120 should be chosen. See table 1 for a complete listing of station models vs features.

When installing cameras, standard composite video security cameras may be used. For proper transmission of the video signal over UTP requires the use of a video balun as shown in the illustration above. The balun should be located as close to the camera as possible, however the balun/camera assembly may be located a significant distance away from the CS100 if required[5]. When using UTP cameras, the video balun is often integrated within the camera, so an external balun module is not required. Connection of the video signal to the CS100 station is done via standard RJ-45 terminated CAT-5 cable. The CS100 simply acts as a cable concentrator, and facilitates the ability to combine the video and audio signals onto a single CAT-5 cable going to the SS16 device ports. No video processing takes place on the CS100, or SS16. The video pair is connected to pins 1 & 2 on CS100 port P1 labeled **CAMERA**.

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[5] Distance limitation is dependent on the overall distance from the camera to the head end equipment (ex: DVR), and the type/quality of the video balun chosen for the application. There is no direct limitation on the distance from camera to CS100.
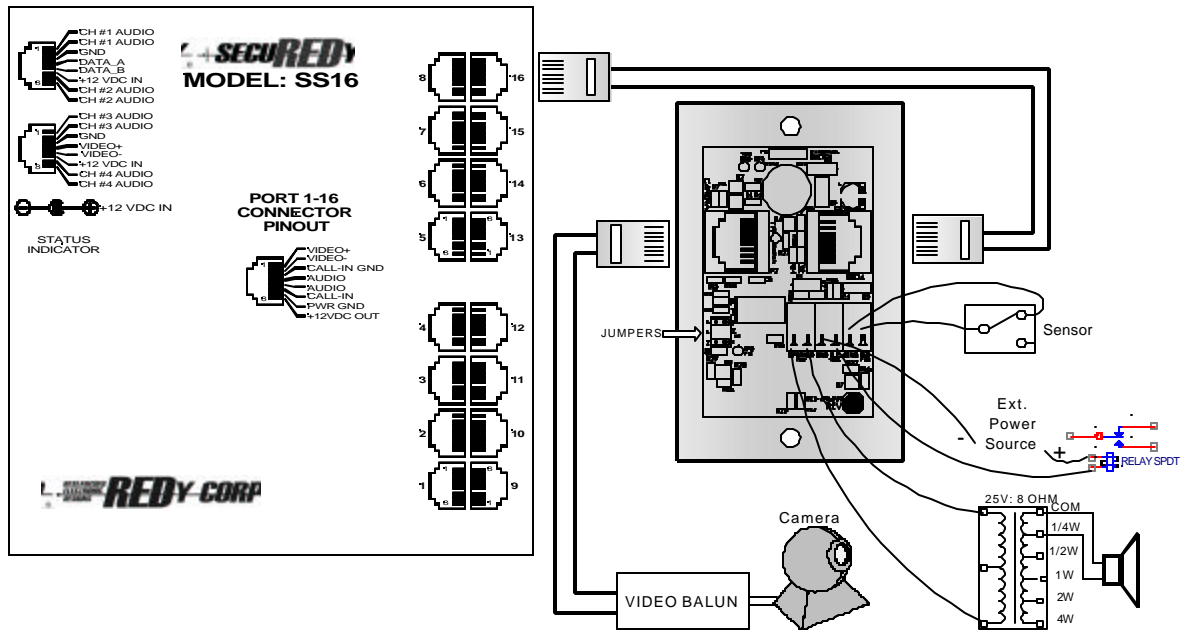
CS150 Wiring

Figure 22

Connection to this station from an SS16 port can be done through an RJ-45 terminated CAT-5 cable (straight through, not cross-over cable). Connections to the audio transformer may be wired directly into a terminal strip labeled TS2 provided on the back of the station as illustrated above. This station fully supports privacy functionality, but unlike the CS50, CS100, and HS120, does not require a center tap connection to the audio transformer.

When installing cameras, standard composite video security cameras may be used. For proper transmission of the video signal over UTP requires the use of a video balun as shown in the illustration above. The balun should be located as close to the camera as possible, however the balun/camera assembly may be located a significant distance away from the CS100 if required[6]. When using UTP cameras, the video balun is often integrated within the camera, so an external balun module shown above is not required. Connection of the video signal to the CS100 station is done via standard RJ-45 terminated CAT-5 cable. The CS100 simply acts as a cable concentrator, and facilitates the ability to combine the video and audio signals onto a single CAT-5 cable going to the SS16 device ports. No video processing takes place on the CS100, or SS16. The video pair is connected to pins 1 & 2 on CS150 port P2 labeled *CAMERA*..

The CS150 also allows for connection of a sensor into terminal strip TS1 (pins labeled *SENS* and *GND*). This can be a motion sensor, a door contact, etc. The CS150 comes shipped from the factory configured to accept a normally closed contact during idle, and going open when activated. If a normally open contact arrangement is required, a jumper can be moved on P1 to accommodate this (see illustration below for appropriate jumper position). See location marked JUMPERS indicated above in figure 22 to locate P1. When a sensor input is activated, the CS150 provides no visual or audible indication of the sensor being active, thereby providing a silent alarm. The systems response to the sensor activation is configured on a port by port basis in the REDySet configuration software.

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[6] Distance limitation is dependent on the overall distance from the camera to the head end equipment (ex: DVR), and the type/quality of the video balun chosen for the application. There is no direct limitation on the distance from camera to CS150.
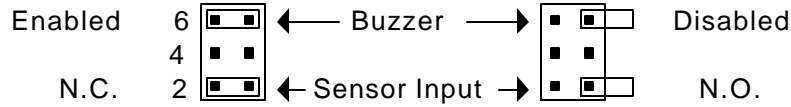
P1 on CS150

Enabled   6   ← Buzzer →   Disabled

4

N.C.   2   ← Sensor Input →   N.O.

Figure 23

HS100 Wiring

MODEL: SS16

CH #1 AUDIO
CH #1 AUDIO
GND
DATA_A
DATA_B
+12 VDC IN
CH #2 AUDIO
CH #2 AUDIO

CH #3 AUDIO
CH #3 AUDIO
GND
VIDEO+
VIDEO-
+12 VDC IN
CH #4 AUDIO
CH #4 AUDIO

+12 VDC IN

STATUS INDICATOR

PORT 1-16 CONNECTOR PINOUT

VIDEO+
VIDEO-
CALL-IN GND
AUDIO
AUDIO
CALL-IN
PWR GND
+12VDC OUT

REDy CORP

25V: 8 OHM
COM
1/4W
1/2W
1W
2W
4W

BLUE

BLUE

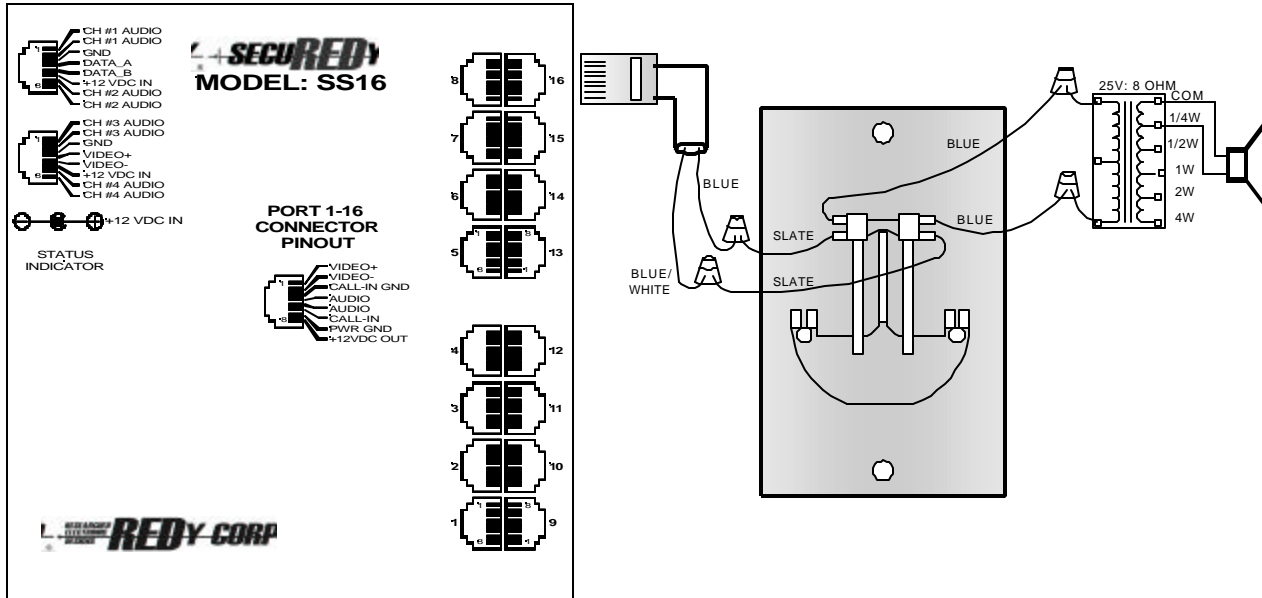BLUE

SLATE

BLUE/WHITE

SLATE

Figure 24

Connection to this station is done with installer provided crimp terminals onto the wires provided on the back of the station as shown above. Privacy functionality is not directly supported by this station. When intercom is done to this station, the audio is fed directly to the speaker as long as the handset is on-hook. As soon as the handset is taken off hook, the audio is immediately transferred to the ear piece on the handset. There is no call button provided with this station, so an intercom conversation must be initiated by a phone.
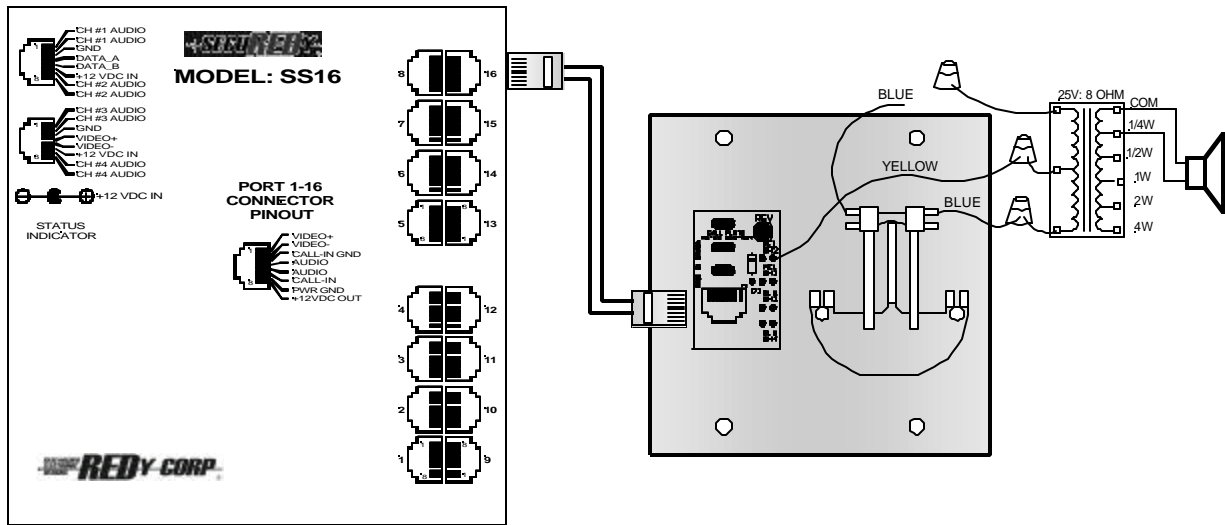
HS120 Wiring

Figure 25

Connection to this station from the SS16 is done via RJ-45 plug. Connections to the audio transformer are done by crimping onto the blue pig tail wires extending from the station. Privacy functionality is supported by connecting the center tap of the 25V audio transformer to the yellow pig tail wire extending from the station. When intercom is done to this station, the audio is fed directly to the speaker as long as the handset is on-hook. As soon as the handset is taken off hook, the audio is immediately transferred to the ear piece on the handset. The toggle switch on the front of the station provides a momentary call position, and a maintained privacy position to mute the listen audio at the telephone.

CR16 Installation

The CR16 is intended to be installed within the SS16 chassis. When ordering an SS16, it is possible to have it shipped from the factory pre-installed, however if required, it can be installed on site as well. The steps required to install it are as follows:

- Unplug all cabling entering the SS16 from the left side of the chassis (closest side in the photo below). If power is being provided locally, the power will also need to be removed. All device port cabling does NOT need to be removed.
- Using a Philips screwdriver, remove the two screws found on the device port side of the SS16 chassis (area highlighted with RED circles in picture below).
- Gently grasp the top and bottom edges of the cover close to the device ports and tip upward slightly.
- Now gently tap the entire cover to the left (opposite the device ports) until the two mounting tabs holding the left edge of the cover are free from the base.
- Take the CR16, and place it component side down, and align with connector P14 on the SS16 (right behind the large device port connectors). The plastic mounting posts located on each end of the CR16 should line up directly with mounting holes found on the SS16 board. Snap the each mounting post into the SS16, and then press the center of the CR16 to fully seat the connector.
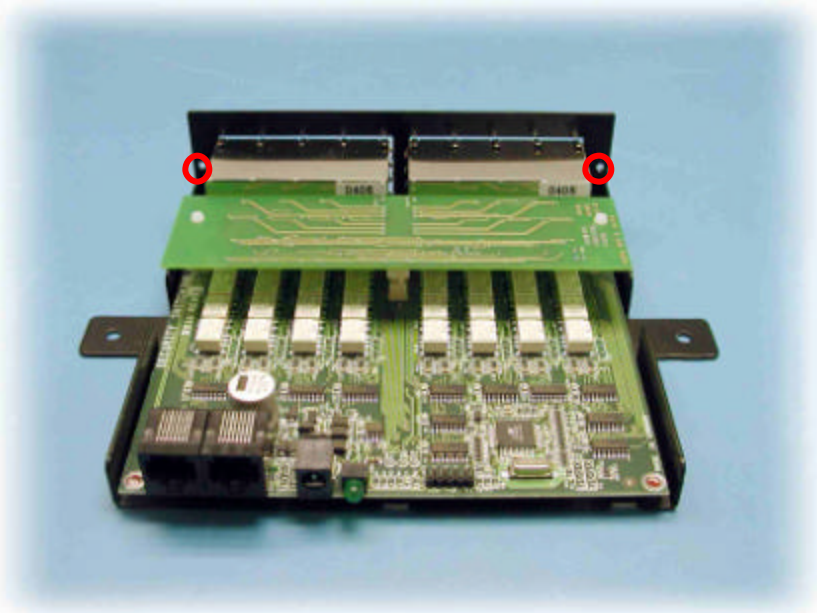- Re-install the cover, and mounting screws.

Figure 26

Camera wiring

Composite video cameras of the customers choosing can be used with this system. All that is required is the use of a video balun module local to the camera, as well as at the head end monitoring equipment. The balun modules simply convert the ground referenced composite video to a balanced video signal suitable for transmission over UTP, and then back again just before going into the central 3rd party monitoring equipment (ie: Digital Video Recorder). If the system is configured appropriately, the end user can select directly on the DA1 which camera is to be routed to the central monitoring equipment. Only one video signal per SS16 can be active at any one time.

DA1 Wiring

The DA1 ports are found in the lower left corner within the CH1000 Cabinet (See Figure 16 for exact location). Up to eight DA1's can be connected to the CH1000, and each port requires a TC1 card to be installed in the appropriate slot position (see figure 16 for TC1 slot locations). The slot # corresponds directly with the physical DA1 port number as shown on the DA1 port connector label. The DA1 consoles require power for the display, so a CH1000 system is designed to supply only the first DA1 with power (corresponding to DA1 port 1). This is done as a method of providing console functions in the case of a power failure when a UPS is used. Subsequent ports making use of DA1 phones will require the use of the AC adapter provided with the phone. All DA1's are wired with CAT-5 cable and terminated with RJ45 plugs. Figure 27 below shows the connections. Any DA1's connected to ports 2-8 must utilize the power adapter provided with each DA1. If preferred, ports 2-8 can be connected to standard DTMF phones also, but it is recommended that the adapter shown in figure 28 be used directly at the phone. This will allow the installer to use RJ-45 plugs throughout the installation, and provide a convenient means of converting this connection to the standard RJ-11 required by the phone. The DC power plug can be left un-connected, since no power is being provided on it when being used with DA1 ports 2-8.

CAUTION: The CH1000 system does not provide the appropriate protection for field wiring extending from the central cabinet to a DA1 phone or any other phone intended for use in exposed plant applications. Attempts to do so must follow the requirements of sections of the CEC and NEC (section 800.44, 800.90) depending on jurisdiction. Failure to provide adequate protection will void the system warranty.

DA1 PORT 1

RJ-45 JACK
PIN #

(4) RING	TIP	**(5)**
(3) No Connect	No Connect	**(6)**
(2) 16 VAC	No Connect	**(7)**
(1) 16 VAC	No Connect	**(8)**

RJ-45 JACK

DA1 PORT(s) 2-8

RJ-45 JACK
PIN #

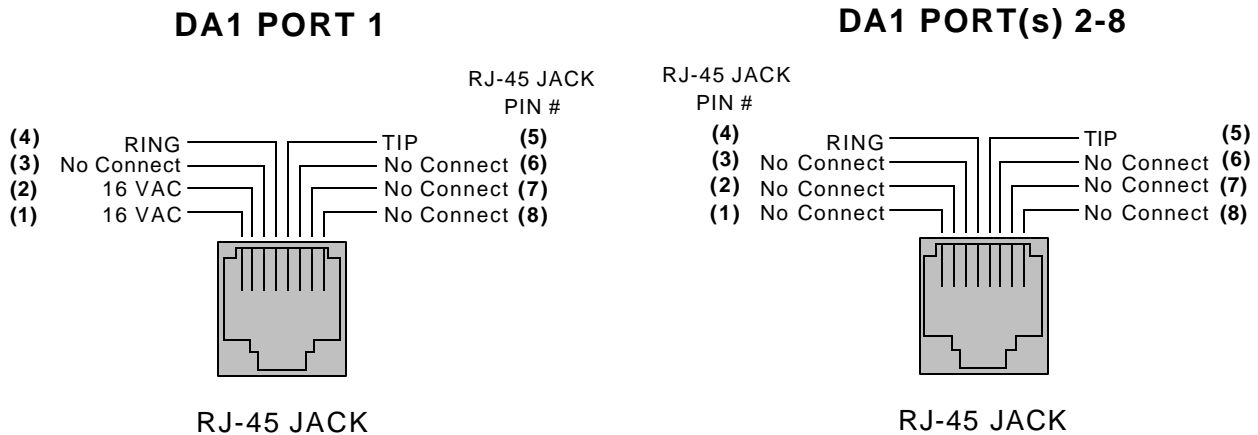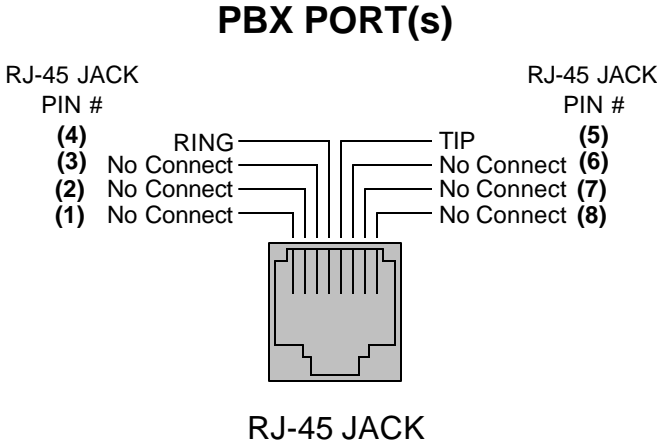|		
(4) RING	TIP	**(5)**
(3) No Connect	No Connect	**(6)**
(2) No Connect	No Connect	**(7)**
(1) No Connect	No Connect	**(8)**

RJ-45 JACK

Figure 27

The DA1 is provided with the adapter shown below in figure 28 (model # ADA1). This adapter provides the conversion from RJ45 to RJ11 for connection to the back of the DA1 console. This adapter also breaks out the power connection to supply the first DA1[7].

Figure 28

PBX Connections

The PBX ports are identical to the DA1 ports (See Figure 16 for exact location). For each PBX port that is used, one less DA1 port is available. For example if two PBX ports are to be used, only six DA1 ports are available. A maximum of eight ports are available on the CH1000 system, which are designed to be connected to analog C.O. ports on the PBX, since the TC1's provide the necessary loop current (-48VDC). If the PBX being connected is capable of recognizing caller ID information, then the corresponding CH1000 DA1 port should be configured as a "Caller ID" phone. This will ensure that all caller ID information from the CH1000 can be passed along to the PBX phones that are caller ID capable.

PBX PORT(s)

RJ-45 JACK
PIN #

RJ-45 JACK
PIN #

(4)	RING	TIP	(5)
(3)	No Connect	No Connect	(6)
(2)	No Connect	No Connect	(7)
(1)	No Connect	No Connect	(8)

RJ-45 JACK

WARNING: This system is NOT designed for direct connection to the public switched telephone network (PSTN). Any attempts to do so would be in direct violation of FCC part 68 and Industry Canada CS-03 regulations (depending on jurisdiction), and will void the system warranty.

---

[7] Power is provided out to only the first DA1 port. All other DA1 phones must make use of the AC adapter provided with the phone.

General Purpose I/O Connections

The general purpose I/O connections are found inside the CH1000 cabinet (See Figure 16 for exact location). The figure below shows the pin outs of the double row terminal strip. There are 6 general purpose inputs, and 6 open collector outputs/2 dry contact outputs (dry output contact rating of 1 amp). See next page for further details. Configuration of these ports is done through CareHawk Decisions software.
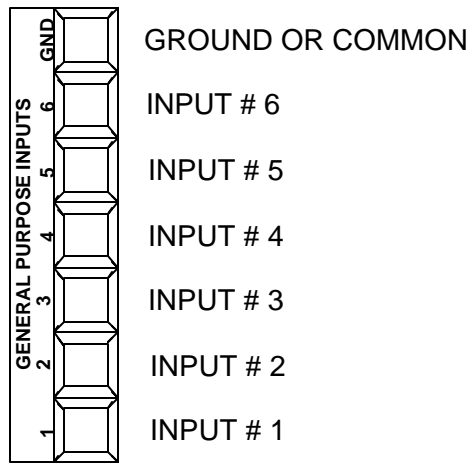
Input Terminal Strip (Lower terminal strip)

GROUND OR COMMON

INPUT # 6

INPUT # 5

INPUT # 4

INPUT # 3

INPUT # 2

INPUT # 1

Figure 29

Output Terminal Strip (Upper terminal strip)

GROUND OR COMMON

DRY CONTACT #2 N.C.

OPEN COLLECTOR #5/DRY CONTACT #2 N.O.

OPEN COLLECTOR #4/DRY CONTACT #2 COM

OPEN COLLECTOR #3/DRY CONTACT #1 N.C.

OPEN COLLECTOR #2/DRY CONTACT #1 N.O.
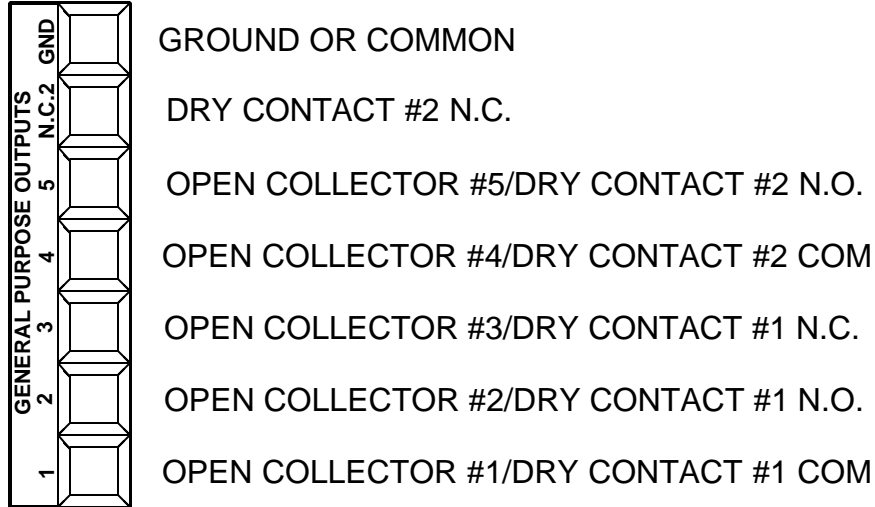
OPEN COLLECTOR #1/DRY CONTACT #1 COM

Figure 30

The chart below describes the jumper settings for the ports. The jumpers are found on the MI100 interface board directly behind the I/O terminal strip.

General Purpose Output Port Configuration

TERMINAL STRIP PIN #	JP13	JP14	JP15	JP16	JP17	OUTPUT FUNCTION
1	A	-	-	-	-	Open Collector #1
	B			-	-	COM: Dry Contact #1
2	-	A	-	-	-	Open Collector #2
		B		-	-	N.C. Dry Contact #1
3	-	-	A	-	-	Open Collector #3
			B	-	-	N.O. Dry Contact #1
4	-	-	-	A	-	Open Collector #4
				B	B	COM: Dry Contact #2
5	-	-	-	-	A	Open Collector #5
				B	B	N.O. Dry Contact #2
6	-	-	-	-	-	N.C. Dry Contact #2
7	-	-	-	-	-	Ground

	When a combination of open collector and dry contacts is required, JP13, JP14, and JP15 should be in position A (farthest from terminal strip), and JP16, JP17 should be in position B (closest to terminal strip). This will provide 3 open collector outputs on terminal strip pins 1-3, and one normally open dry contact on pins 4 & 5. Please note that the dry contact is rated for 1A Max switching, 2A carrying for simple resistive loads up to 60VDC. Rated at 0.5A for 120VAC.

Table 2

The schematic below is provided for illustration purposes only.
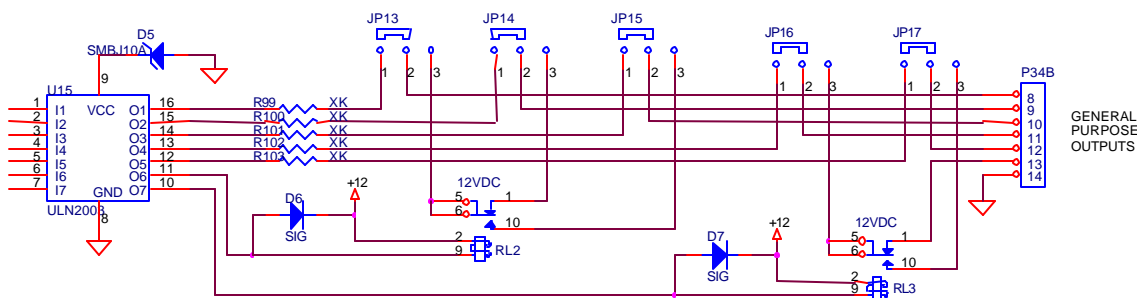
Program Inputs

The program inputs are located inside the CH1000 cabinet (See Figure 16 for exact location). Below is the pin outs for the removable terminal strip. The inputs are designed for 1V RMS with a 10KO input impedance. Program sources that produce signal levels in excess of this need to be attenuated prior to connecting to the CH1000 system. Program sources can be anything from a 3rd party AM/FM tape/tuner to a CD player or mixer. The minimum wire type recommended from the program source to the CH1000 is 24 awg shielded cable. The shield for the cable MUST be terminated at one end only, and not both.
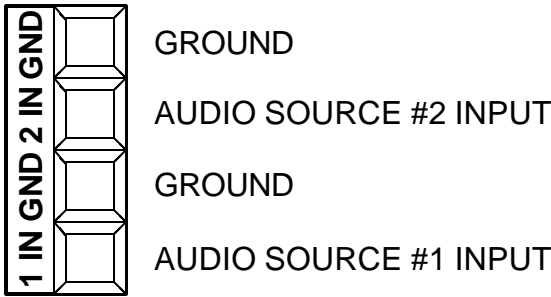
```
1 IN   GND   2 IN   GND

GROUND

AUDIO SOURCE #2 INPUT

GROUND

AUDIO SOURCE #1 INPUT
```

Figure 31

Microphone Input

The microphone input is located inside the CH1000 cabinet (See Figure 16 for exact location). Below is the pin outs for the removable terminal strip. The input is designed for a dynamic low impedance microphone. The microphone only becomes active for an all page, when the MIC SWITCH pin is connected to the GND pin. The microphone will continue to do an all call page until the switch opens again.
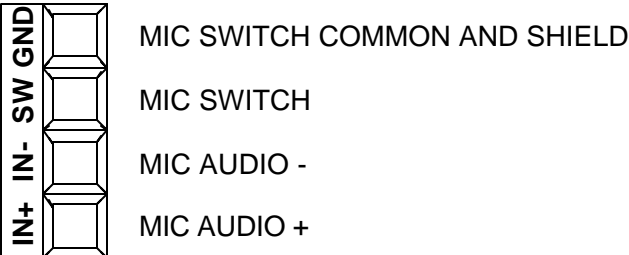
```
IN+   IN-   SW   GND

MIC SWITCH COMMON AND SHIELD

MIC SWITCH

MIC AUDIO -

MIC AUDIO +
```

Figure 32

AF125 Amplifier Connections

 The amplifier connections are made to terminal strips found on the top inside plate in the CH1000 cabinet. Connections are as follows. Both the input cable to the amplifier, and the output cable from the amplifier should make use of shielded cable.
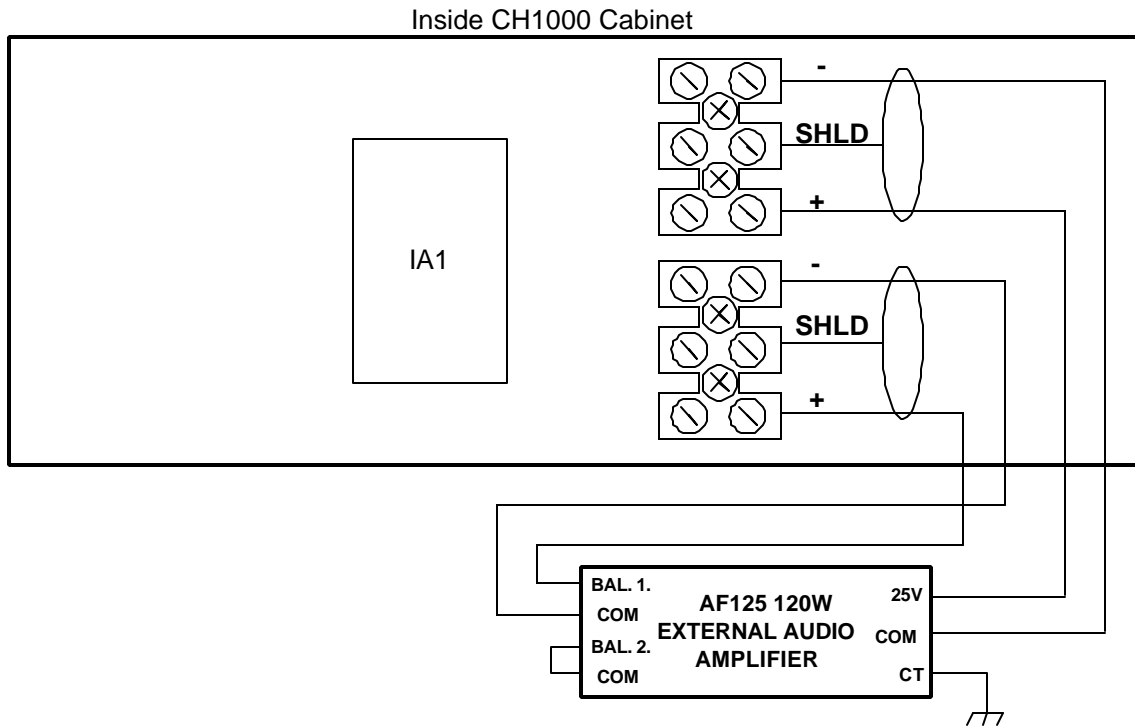
Inside CH1000 Cabinet

Figure 33

Master Clock Connections

The CH1000 is capable of acting as a master clock. As such it can be set up to synchronize Sapling RS-485 based slave clocks. The RS-485 port is located inside the CH1000 cabinet (See Figure 16). This port is wired as shown below. Pins 4 & 5 provide RS-422 communications to the Sapling clocks. (Feature not available at time of manual release. Contact factory to confirm when feature will be supported).
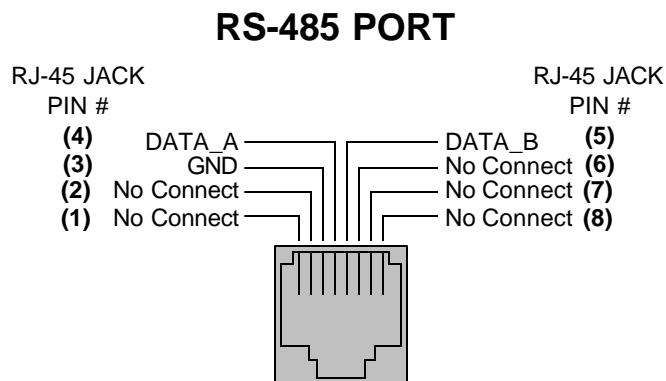
RS-485 PORT

Figure 34

APPENDIX A
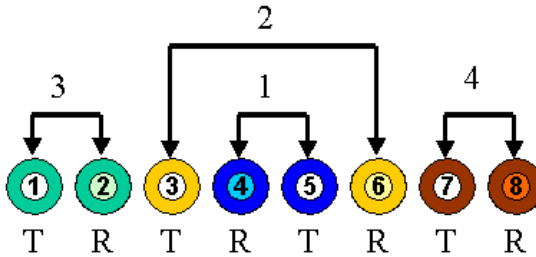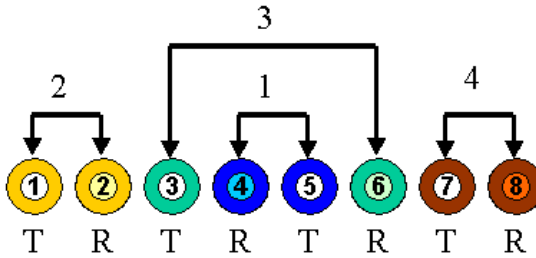
NOTE: Numbers 1-4 in the above illustration indicate the twisted pairs in the CAT5 cable.

Pin #	Wire Color for 568A	Wire color for 568B
1	Green/White	Orange/White
2	Green	Orange
3	Orange/White	Green/White
4	Blue	Blue
5	Blue/White	Blue/White
6	Orange	Green
7	Brown/White	Brown/White
8	Brown	Brown

USER's GUIDE

Basic Operation

The CareHawk CH1000 system is designed around keeping things simple. The DA1 phone shown below is the main device used for controlling all system functions on a day to day basis (standard DTMF telephones can also be used). The DA1 comes pre-programmed with numerous menus, which can be easily navigated with the 3 soft keys found on both sides of the large display. Each menu provides easy to use prompts that guide you through the steps needed to initiate system functions. Everything from all call paging, zone paging, intercom to a single room, manual time tones, music distribution, and video camera activation can be initiated from the DA1 with the press of a button.

System schedule programming can be done using a software tool called CareHawk Calendar. CareHawk Calendar allows all system events to be configured into a single calendar. When special schedules need to be employed, CareHawk Calendar offers the ability to program schedule templates, which can be made active at any time by following the schedule prompts on screen using the soft keys.

Figure 35

As calls from rooms within a facility come into the DA1, they will enter the call-in queue, and be displayed 4 calls at a time on the display. The calls will be listed in order of priority, with the highest priority call being at the top of the list. By lifting the handset, the highest priority call will automatically be connected.

Control Buttons:

A   Volume key: Adjusts the volume for the handset, headset, and handsfree speaker volume of the ringer tone. There are 8 ringer volume level settings. Default level is medium.

B   Handsfree key: Pressing this activates handsfree mode so you make and receive calls without lifting the handset.

C   Mute key: When activated, prevents the caller from hearing you through the handsfree, handset, or headset.

D   Hold keys: When doing an audio page, the talk audio is muted. When pressed during an intercom conversation, both the talk and listen audio is muted. Press again to restore the audio path.

E   Redial key: Displays the last 10 numbers dialed. When pressed, on screen menus guide you through the options.

F   Soft keys: Provides access to all on screen menu options. The menus change depending on which main menu is entered into.

G   Arrow keys: press to move the screen cursor when navigating through on screen options

Phone Commands

Dial Sequence	Command	Dial Sequence
00#	Emergency Page All	
001…#	Emergency Page Inclusive Zones	Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
002…#	Emergency Page Exclusive Zones	Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
01#	Page All	
011…#	Page Inclusive Zones	Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
012…#	Page Exclusive Zones	Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
013…#	Page Inclusive Speakers	Where … is the list of speakers
014…#	Page Exclusive Speakers	Where … is the list of speakers
020TT#	Tone All	Where TT is the tone number **(Tones: 00? 99 - Must be entered as 2 digits)**
021TT…#	Tone Inclusive Zones	Where TT is the tone number **(Tones: 00? 99 - Must be entered as 2 digits)** Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
022TT…#	Tone Exclusive Zones	Where TT is the tone number **(Tones: 00? 99 - Must be entered as 2 digits)** Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
023TT…#	Tone Inclusive Speakers	Where TT is the tone number **(Tones: 00? 99 - Must be entered as 2 digits)** Where … is the list of speakers
024TT…#	Tone Exclusive Speakers	Where TT is the tone number **(Tones: 00? 99 - Must be entered as 2 digits)** Where xxx is the list of speakers
025#	Play Emergency Tone Continuously	
026#	Stop Emergency Tone	
030P#	Program Source All	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)**
031P…#	Program Source Inclusive Zones	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)** Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**
032P…#	Program Source Exclusive Zones	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)** Where … is the list of zones **(Zones: 01? 64 - Must be entered as 2 digits)**

033P…#	Program Source Inclusive Speakers	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)** Where … is the list of speakers
034P…#	Program Source Exclusive Speakers	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)** Where … is the list of speakers
035P#	End Program Source	Where P is the program source **(Program Source : 1? 2 - Must be entered as 1 digit)**
050xxx#	Video Camera Off	Where xxx is the camera number
051xxx#	Video Camera On	Where xxx is the camera number
0520#	Video Camera Sequence Off	
0521#	Video Camera Sequence On	
060#	Call Forwarding Off	
061xxx#	Forward All Calls	Where xxx is the extension to forward call to
0700#	Cancel Main Alarm	
0701#	Clear Normal Call-Ins From Queue	
08#	Sync System Time	
0800xxx#	Turn Off Message Waiting Lamp	Where xxx is the extension
0801xxx#	Turn On Message Waiting Lamp	Where xxx is the extension
0810x#	Turn Off Output	Where x is the output number
0811x#	Turn On Output	Where x is the output number
0820#	Turn Schedules Off	
0821#	Turn Schedules On	
0822#	Read New Schedules	
083x#	Disable/Enable Schedule Templates	If x = 0, templates will be disabled and the system will use the standard schedule. If x is between 1and 5 inclusively, that template will be enabled until midnight when the system return to the standard schedule
084xxx#	Remote Extension Call Pickup	Where xxx is the remote extension