This manual provides brief instructions for installing and connecting the CP9001 Comfort Controller. Please download the supplementary Installation Manual and programming guides from
http://www.cytech.biz/installation_and_programming.html

Differences – CM9001 and CM9000

- CM9001 and CM9000 Digital (CPU) and Analog (DSP) Sections are different but each part is fully interchangeable, eg CM9000 CPU with CM9001 DSP or CM9001 CPU with CM9000 DSP, provided the correct Transformer/ Power supply is used with the Analog/ DSP section.
- CM9001 does not have EOL shunts to determine if EOL resistors should be connected to the zone. The EOL setting is programmed in Comfigurator 3.11.13 and above. CM9000 has EOL shunts for each zone. **Important – UCM Minimum firmware is 7.098 to allow setting of EOL. Upgrade your UCM firmware**
- Universal Power Supply TU15A 90-260 VAC Input, 15VDC 1.8 A Output is supplied with CP9001
- **Local Phone control via Voice Menu is not supported in the base CM9001. DSI Submodule is needed.**
- Door Station Interface (DSI) Plug in submodule for Ringer and Local Phone Control is optional, ordered separately.
- LEM02B Local Expansion Module - 8 inputs 0 outputs can be plugged in and mounted to CM9001, not in CM9000. This does not obstruct any connectors LED, or Buttons
- OP03 output submodule is plugged in to provide 8 outputs, with Terminal Blocks. OP01 is used in to CM9000, without terminal blocks.
- The ETH03 submodule can be plugged into the ETH connector/header to act as a UCM/ETH03 without the need for a UCM/ETH03. This does not obstruct any connectors LED, or Buttons. UCMs can still be added.
- The X10 connector has been removed from CM9001. X10 is not supported.
- The CM9001 Tamper connector is 3-way terminal block with spare center pin for series connection of Tampers in series.

What is Included

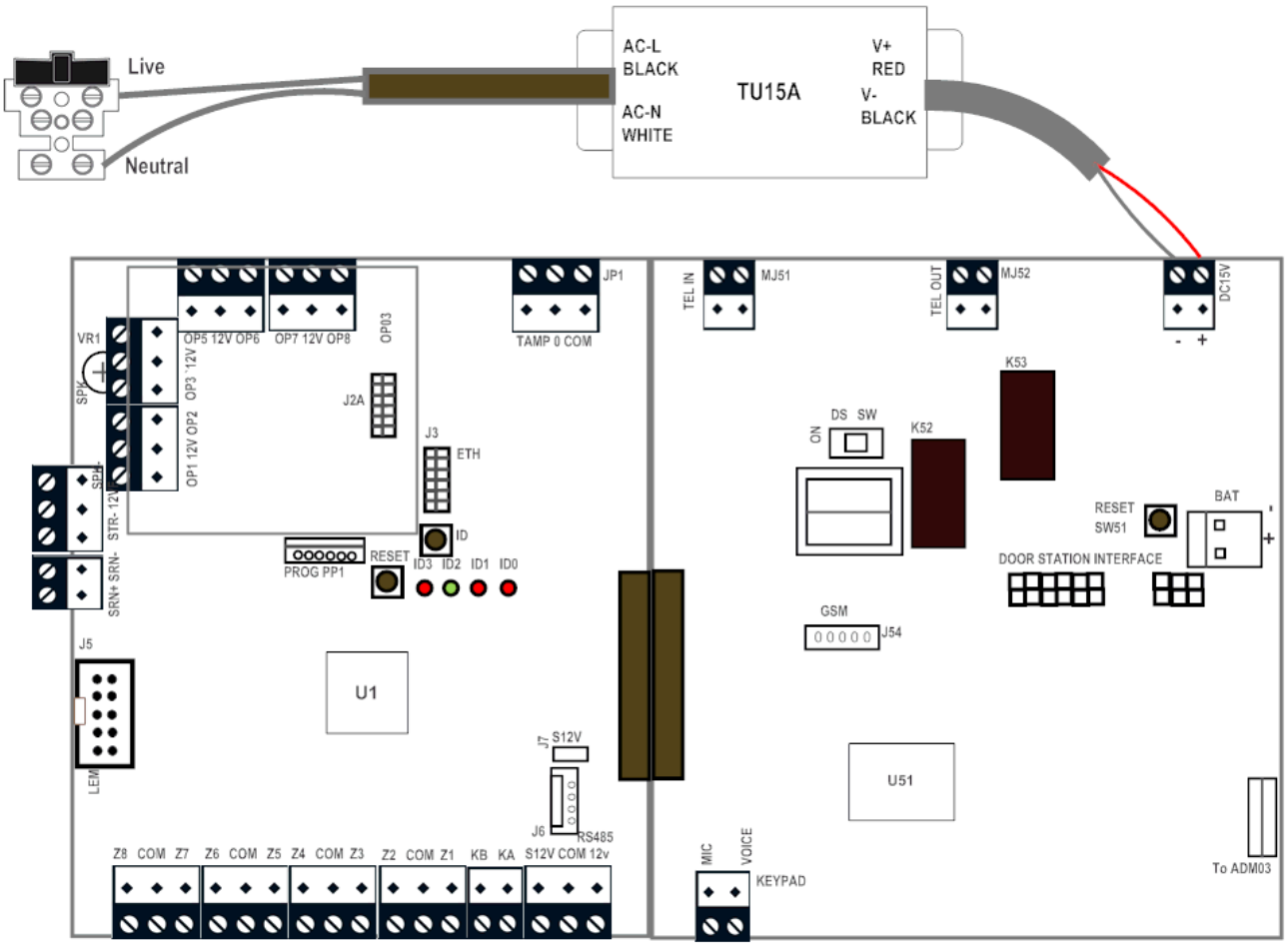
- OP03 output submodule is plugged in to provide 8 outputs, with Terminal Blocks.

Additional Options

- LEM02B Local Expansion Module - 8 inputs 0 outputs can be plugged in to CM9001 to provide 8 Inputs. This does not obstruct any connectors LED, or Buttons
- The ETH03 submodule can be plugged into the ETH connector/header to act as a UCM/ETH03 without the need for a UCM/ETH03. This does not obstruct any connectors LED, or Buttons. UCMs can still be added.
- EN01D Metal Enclosure with TT01-0022 Universal Power supply 90-260 VAC Input, 15VDC 1.8 A Output. CM9001 is PCB only without metal box or power supply.

Introduction to the CM9001 PCB

Please refer to the Hookup Diagram on the Lid of the Comfort Enclosure



CM9001 PCB with MC01-0022 transformer

LED Indicators

- ID1 (Red) LED - If Steady, system is armed. If Flashing, system is in Alert or Alarm state.
- ID2 Green) LED - If Steady, system is disarmed. If Flashing, system is in Trouble State.
- ID0, ID3 – No function

RED (ID1)	GREEN (ID2)	STATUS
Off	On	Disarmed, Normal
Off	Flash	Disarmed, Trouble
On	Off	Armed, Normal
On	Flash	Armed, Trouble
Flash	Off	Alarm, Armed
Flash	Flash	Alert/Alarm, Trouble
Flash	On	Alarm, Disarmed
Off	Off	Fault, No Power, UCM Programming cable is connected
On	On	U4 File System Mismatch

Connections - Analog Section (Right Side)

- 15VDC (JP51) - Connected to TU15A Universal Power Supply 15VDC 1.8 Amps
- BATT (JP52) - Connected to 12V 7AH Sealed Lead-Acid Battery via supplied Battery cable.

- TEL IN (MJ51) - Connection to Telephone Line
- TEL OUT (MJ52) - Connection to Local telephones
- KP MIC/VOICE (JP53) - connection to Keypads MIC/VOICE
- GSM (J54) - connection to UCM/GSM Module audio signals.
- J104 - Door Station Interface Plug in module for Ringer/Local Phone Control
- J53 - To ADM03 module

Connections - Digital Section (Left Side)

- TAMP/0/COM (JP1) - Connection to Tamper of Panel and Siren/Bell box. Short TAMP to COM with wire if tamper Input is not used. If open this will cause a Tamper Alarm. The centre (0) pin is a spare point for ease of connecting 2 tampers in series.
- Z1/COM/Z2: Zones 1-2 input connections
- Z3/COM/Z4: Zones 3-4 input connections
- Z5/COM/Z6: Zones 5-6 input connections
- Z7/COM/Z8: Zones 7-8 input connections
- KA/KB (JP8) - RS485 connection to keypads, UCMs and other modules (2 position terminal block). Use WA485 4 way cable and J6 for short distances.
- SRN+/SRN- (JP9) - Siren/Bell Connection (12V), SRN- terminal is the negative trigger, SRN+ is fixed 12V.
- STR/12VF/SPK (JP10) - Speaker and Strobe Connection for Speaker and 12V Strobe Light. Centre pin is at fixed 12V. STR and SPK go to 0V when triggered (negative trigger).
- OP1/12V/OP2 (JP11) - Output 1, 2, centre 12V common (On OP03)
- OP3/12V/OP4 (JP12) - Output 3, 4, centre 12V common (On OP03)
- OP5/12V/OP6 JP13) - Output 5, 6, centre 12V common (On OP03)
- OP7/12V/OP8 (JP14) - Output 7, 8 centre 12V common (On OP03)
- RS485 (J6) - 4 way connector for RS485 modules eg UCM, SEM, RIO for short distance only using 4 way cable (WA485)

Plug-in Submodule Headers

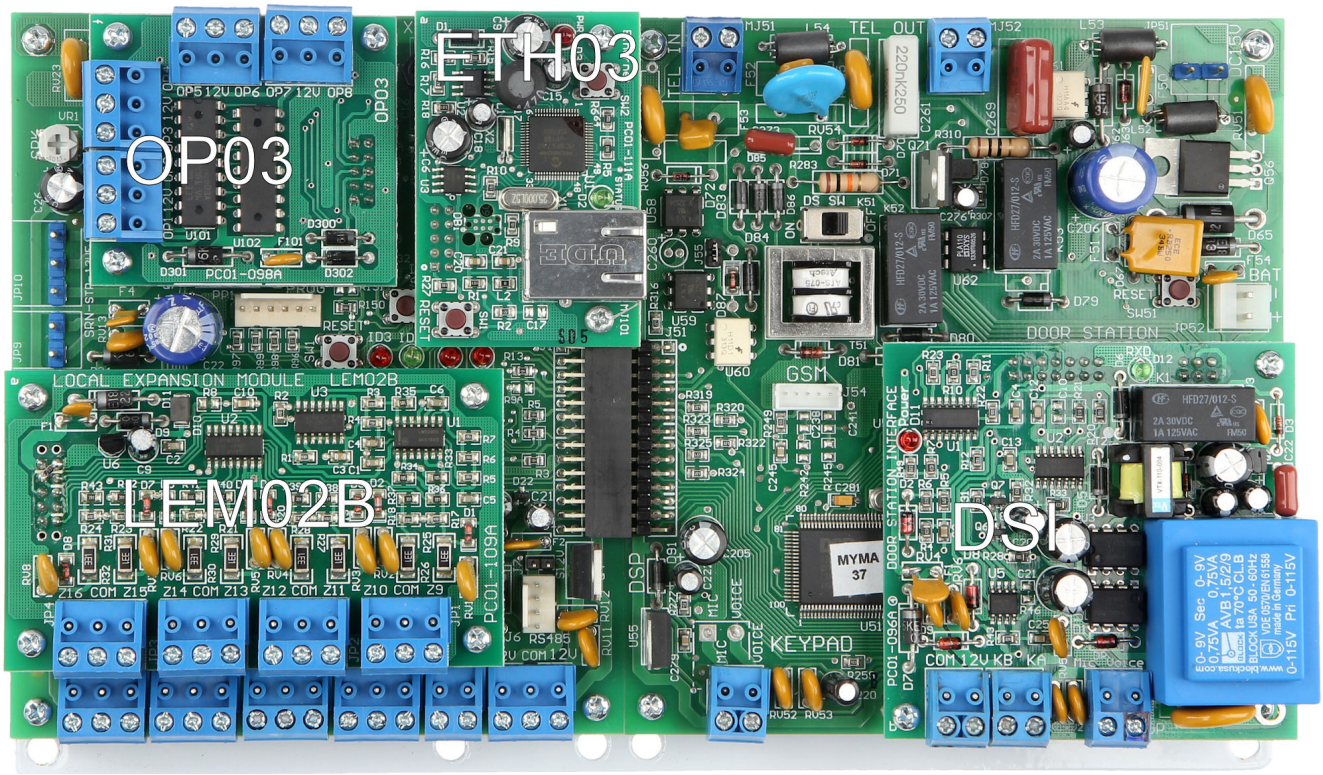


Figure 2 – Submodules Mounting Location

- OP03 (J2A): Connector/header OP03 plug in Output driver.
- LEM (J5): Connector for LEM02B Plug-in board or ribbon cable to LEM01/LEM02.
- ETH (J1): Connector/Header for ETH03 submodule.
- DSI: not required for CM9001

Buttons/ Jumpers - Digital Section (Left Side)

- ETH (J1): Connector/Header for ETH03 submodule.
- Reset: This resets the CM9001 but doesnot affect programmed setings.
- ID Pushbutton - Not Used for CM9001
- S12V – shunt if S12V output is not to be switched. This means S12V is continuous 12V output and cannot be switched off
- SPK (VR1) trimmer - adjusts volume of the speaker on SPK/COM output (not BELL)

Shunts/Settings - Analog Section (Right Side)

- **K51 Switch - set to ON position if DSI submodule is NOT connected. Set to OFF if DSI is connected.**
- BATT (SW51)- Press to connect backup battery if connected without the DC Input voltage at 15VDC turned on. If the DC Input voltage is off and a backup battery is connected, the battery voltage is not applied to the system until the BATT switch is pressed. Use a non-conducting tool, eg a pen to press this as it is not easily accessible

Installation

Location and Mounting of Panel

The system should be mounted in a dry area, with access to an AC Mains power source and incoming telephone line.



Note that other modules like UCM should be mounted in the enclosure first as they require metal standoffs which need access to the back of the enclosure

Mount the enclosure securely to a brick wall using Number 8 - 25 mm long screws to the 3 mounting holes as shown in the diagram above. Do not switch on or connect the backup battery until all other wiring is complete. Take precautions against damage by static discharge by using an antistatic wrist strap tied to a suitable earth point

Transformer

For Australia and New Zealand, the transformer is in the form of an approved 3 pin plug pack . The plug pack should be connected to a socket with a protective earthing connection

Warning Notice (Australia/New Zealand Installations)

This equipment must only be installed and maintained by qualified Service Personnel. Connect the Protective Earth (Plug Pack) before the telephone line cord. Disconnect the telephone line cord before the protective Earth (Plug Pack). The protective Earth wire should be connected to the earth stud on the metal case.

- ➔ **The mains installation should be carried out by a qualified electrician in accordance with Electrical Wiring Regulations (BS 7671). As this is a permanently connected equipment, the fixed wiring must have a readily accessible disconnect device, e.g. isolation switch.**

Backup Battery (JP2)

Connect a 12V 7 AH sealed lead-acid battery to the BATT (JP2) terminals using the supplied Battery Cable. This will give more than 24 hours of standby power to the system if 200 mA or less of auxiliary current is used. Do not connect the battery until all wiring is completed.

➔ **The system may not operate correctly without a backup battery.**

Cable Routing / Requirements

The minimum cable type to be used for detection devices, siren or sounders should be 6-core alarm cable (7/0.2mm). This has a resistance of approximately 8 ohms per 100 meters. Shielded Twisted pair (STP) CAT 5 cables are recommended for Keypads and Door Stations. Each cable runs from the panel separately, in a star or home-run configuration. Use of untwisted/unshielded cables may cause noise interference to be heard on the Keypad/Door station.

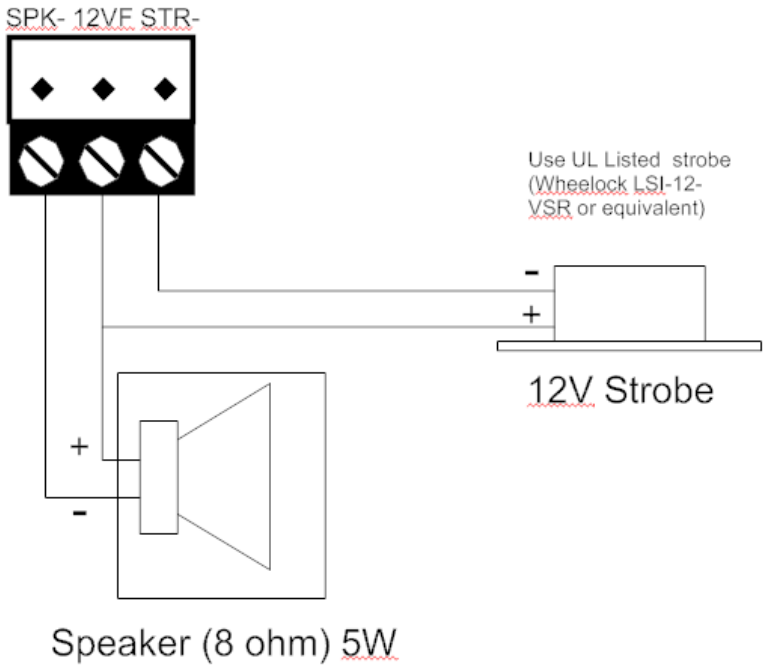
Where spare conductors are available in multicore cable runs, they should be used to double-up the 12V power supply cables to the each control station to reduce circuit resistance and further improve current performance. **Ensure that all RS485 communication lines and detection circuit cables are kept away from mains supply cables.**

Speaker and Strobe

Connect a 12V strobe to the 12VF and STR- outputs if needed. Observe the polarity. In the event of an alarm, the strobe is turned on until the system is disarmed. The Strobe and speaker terminals have a combined current limit of 1 A, protected by a resettable fuse (F3)

➔ **The backup battery must be connected for the Siren to work properly.**

An 8 ohm 5W (minimum) speaker may be connected to the SPK- and 12VF terminals. Polarity is not important for a speaker.



Speaker and Strobe connection

The speaker may be used as an internal siren, but is not meant to be the primary audible alarm indicating device.

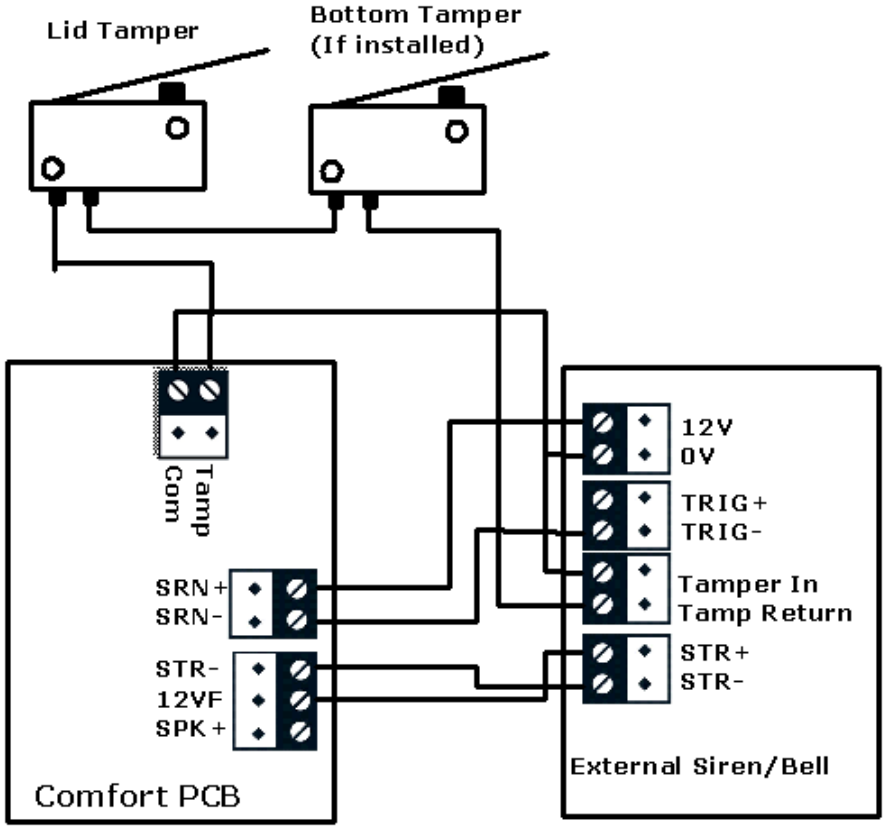
The speaker gives 2 levels of sound volume: For alarms, the full volume is produced. For trouble and information tones, as when arming, a lower, adjustable level of sound is produced. This volume may be adjusted by trimmer VR1 near the SPK terminals.

Siren (JP9)

SRN+ Siren (+) output has constant 12 volts to be connected to the Siren box

SRN- Siren (-) output is normally floating, but pulled to ground to activate siren.

The Tamper terminals of the Siren/Bellbox can be connected in series with the Case tamper switches. Alternately the Siren/Bellbox tamper terminals can be connected to a spare zone input on Comfort which is programmed as a Tamper Zone Type.



Siren Connections

If the siren/bellbox sounds softly as soon as it is connected connect a pull-up resistor (1K-ohm) placing between the SRN+and the SRN- 'terminal. If you wish to work on the siren/bellbox connections or open the control panel, you can prevent the system from causing a tamper alarm by entering Engineer Test Mode via Eng. Menu 8,6, 1 for on. Upon deselecting this option 8,6 ,0 for Off, the system will enter Security Check Mode and will report any faults through the keypad. Tamper Alarm means the Panel Tamper or Bellbox Tamper switch or Connections are open or incorrect.

Telephone Connections

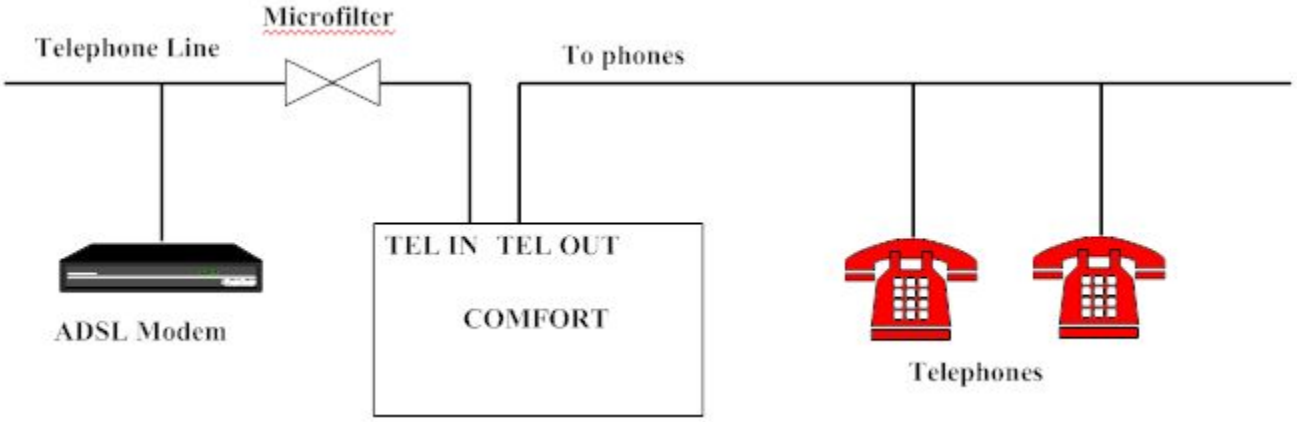
Connect the incoming telephone line to the TEL IN Terminal Block. Connect the telephone wires going to the house phone(s) to the TEL OUT Terminal Block. The system will work with any tone-dialling telephone.

Telephones, facsimile machines and other telecommunications equipment may be connected to the Telephone OUT socket.

➔ **Do not connect any other equipment between the incoming telephone line and the control panel. Also, do not connect any other telephone equipment including fax machines and PABX in parallel with the control panel. Violating the above rules may prevent the control panel from seizing the telephone line to dial out during an alarm condition.**

ADSL Connection

An ADSL modem on the same telephone line as Comfort should be connected before Comfort on the TEL IN connection as shown in the figure



Single Line Telephone Connection with ADSL

A micro filter must be connected between the ADSL modem and Comfort. Comfort is connected to the "Telephone" end of the micro filter. It will not necessary to use micro filters for the other telephones in the house. The telephones should be connected to Comfort TEL OUT, and NOT to the ADSL modem. This will ensure that Comfort can still dial to the programmed telephones in case of an alarm

Parallel Phone Connections

Equipment should **not be connected in parallel to the TEL IN connector** except for an ADSL modem.

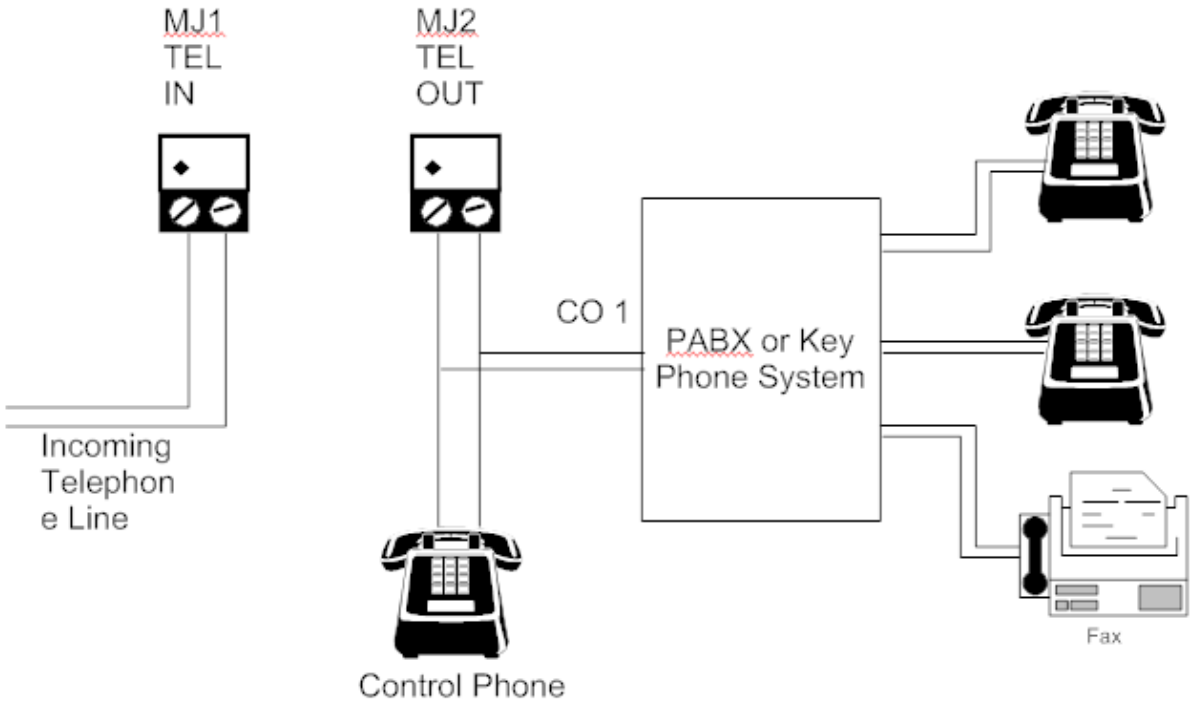
Connection to Keyphone and PABX systems

A key telephone system may be to the TEL OUT socket. To access the system with a key telephone, press the button which selects the incoming line to which the system is connected, and press *, sign-in code and # in the usual way. The system cannot be connected as an extension of a key telephone system. Remote telephone access can be achieved by dialing into the exchange line to which the system is connected.

A PABX may be connected to the TEL OUT socket. A telephone may be connected in parallel to the PABX, to be used for local system access. Remote telephone access can be achieved by dialing into the exchange line to which the system is connected. See Figure 2.8 for connection

➔ **With this method of connection, the extension phone will not be able to access the system if the CO line for Comfort is in use. Also,**

for remote access, the user must dial the actual number and not the hunting line to ensure that Comfort can receive the call.



Connection before PABX/Keyphone System

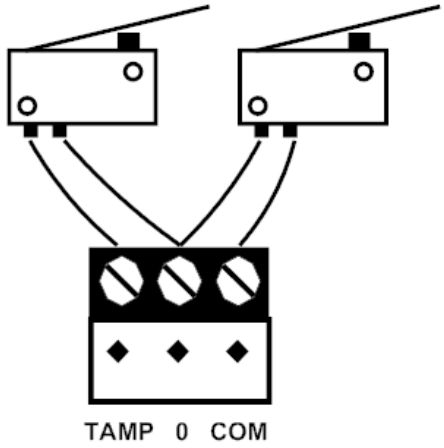
Connection to extension of PABX

It is also possible to connect the system as an (analogue) extension of a PABX, for non-monitored systems. A normal telephone may be connected to the TEL OUT socket for system access and for use as a normal extension phone. In this connection method, Comfort can take messages from any of the incoming CO lines if the extension is programmed to ring on all incoming calls. Other extension phones can access the system by dialing the extension to which Comfort is connected.

The programmed telephone numbers for dialing out must include the access digit usually "9" or "0" to obtain an outside line.

Tamper Input (JP1)

A tamper switch may be connected to the TAMPER input (3 pin TAMP). If not used, short the TAMP to COM terminal block with a wire. This terminal may be connected to an external tamper switch of a bell box as well as to the tamper switch of the control panel enclosure as in the figure below. The tamper switches may be connected in series as shown below. The Alarm type activated when the circuit is broken is Tamper (Alarm type 11).

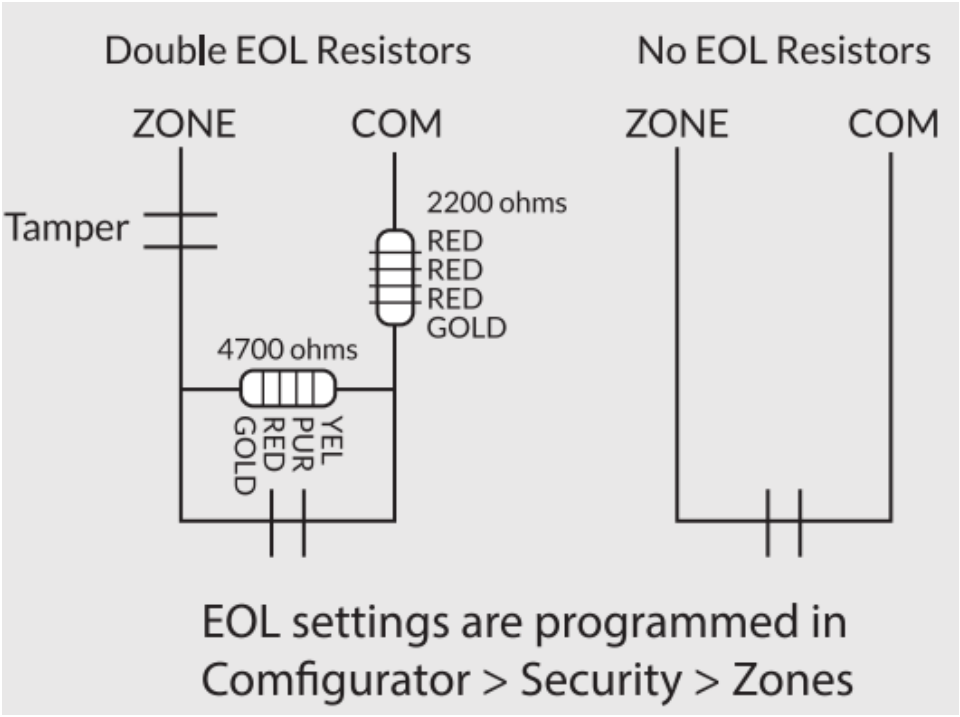


Tamper connections

Alternatively, any zone may be programmed as a Tamper zone type.

Zone Input Terminals Z1-Z8

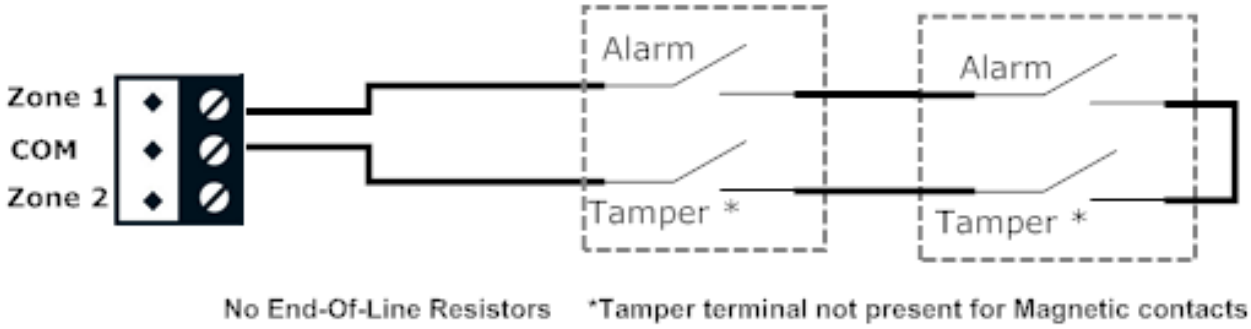
Important: UCM Minimum Firmware is 7.098 to select EOL configuration



Each zone may be wired as Normally Closed (NC) or Normally Open (NO). Any unused zones should be programmed as Zone Type 0

➔ **Normally Open and Normally Closed contacts cannot be connected to the same zone.**

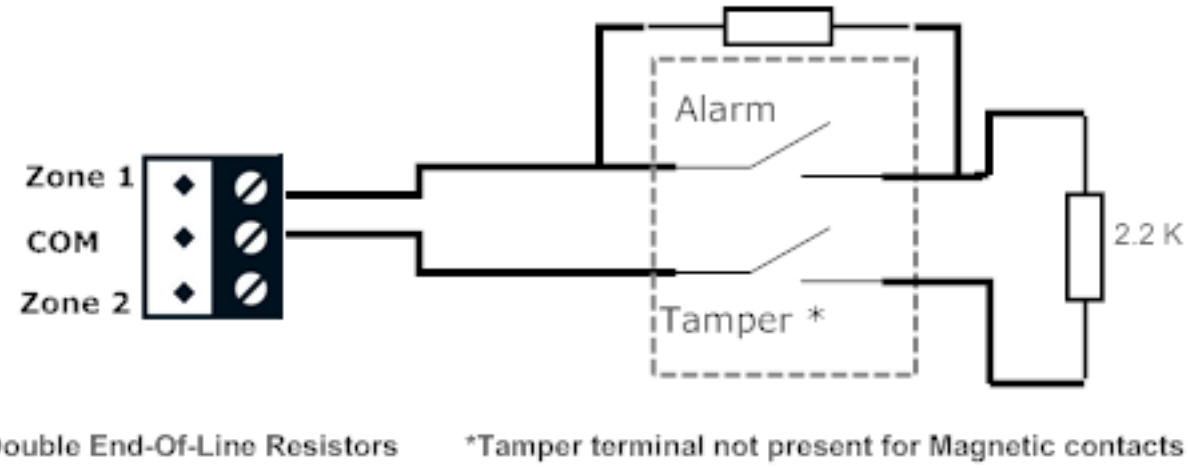
Circuits without EOL Resistor



Normally Closed Contacts without EOL Resistor

Circuits with 2 EOL Resistors

Wire zones according to the figure below. The Zone Settings in the Engineer menu determine if the contact is Normally Closed (N.C.) or Normally Open (N.O).



Alarm Contact with 2 EOL Resistors.

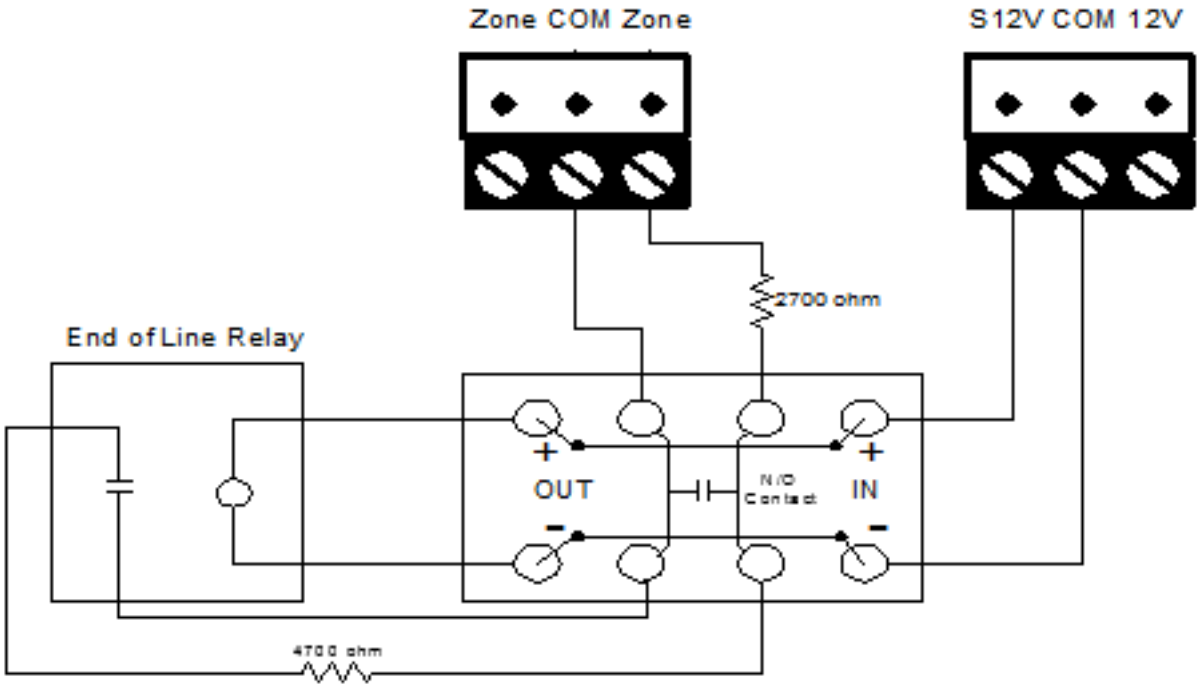
The 2 EOL resistors should be connected at the contact and not at the control panel. With 2 EOL resistors connected in this way, the system is able to distinguish open and closed contacts from open circuit and short circuit wiring for supervision of the zone contacts. Any short or open circuit fault will trigger a Zone Trouble Alarm which can be reported to the programmed phone numbers. The table below shows the expected values of circuit resistance for open and close conditions.

Status	Zone Resistance (Ohms)
Closed	2 K 2
Open	7 K 4

4-wire Smoke Detectors

Smoke Detectors are connected as Normally Open (NO) or Normally Closed (N.C) zones with 2 EOL resistors. Follow the wiring diagram in Figure 2.12. The 4700 ohm resistor should be connected in parallel with the last contact. The 2700 ohm resistor should be connected in series with the detector in order to be able to distinguish a ground fault (short-circuit) condition from a contact closed condition. The corresponding Header JZ1 to JZ8 should have a shunt inserted in the position away from the terminal block (1-2). Smoke and Heat Detector zones are programmed as Fire Zone Types. A Pulsed On/off siren

pattern indicating Fire Evacuation is produced when this zone type is activated (by default). If the zone wiring is cut or open-circuit or shorted, a Zone Trouble alarm is generated.



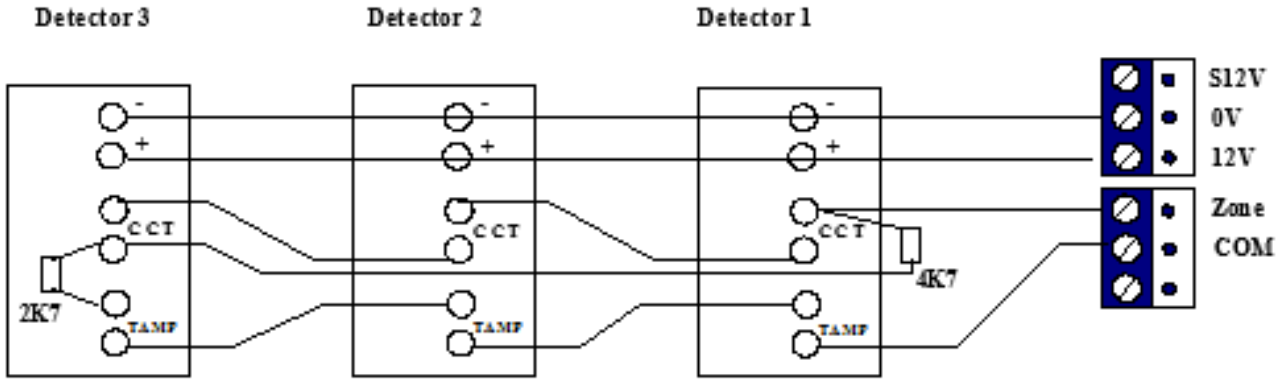
4 Wire Smoke Detectors

2-wire Smoke Detectors

Two-wire smoke detectors cannot be used with Comfort.

Connection of Multiple Detectors to a zone

The system has the ability to announce the type of the activated zone during Security Check (during arming), alarm history, alarm tracking, and event log. So if more than one detector is connected to a zone input, it should ideally be of the same type and in the same location, for example, magnetic contacts for several windows in the same room.



Multiple Contacts on one zone with EOL Resistors

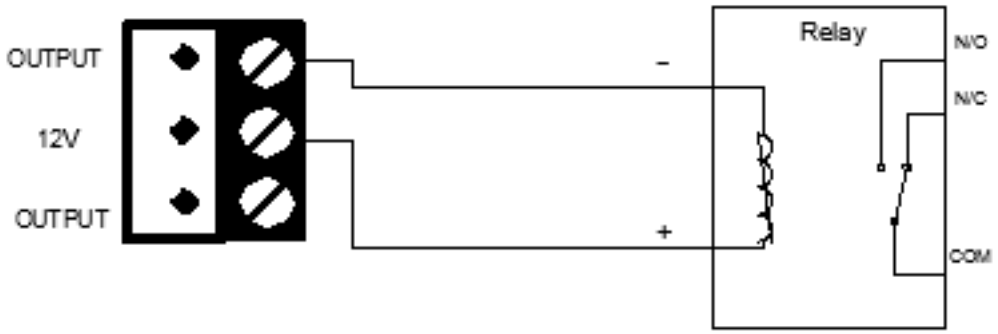
Some shock detectors can latch their LED on following an alarm for identification. To make the Do not mix Fire Detectors with Burglary Detectors under the same zone

Output Terminals OP1 - OP8

Each of the 8 outputs may be connected to infrared LEDs, indicator LEDs or external relays. Each output is an open-collector transistor output (pull to ground) capable of supplying 200 mA, but total current from these outputs together with the switched (S12V) and unswitched auxiliary power (12V) terminals should not exceed 500 mA, and protected by a resettable fuse (F2). If higher current is required, an external supply may be used instead of the 12V terminals.

Connection to Relays

Connect 12V relays to outputs according to the figure below Relays should be connected between the 12V terminal and the output terminal. They should be located near to the enclosure. The RLY01 has 4 x 12V relays which can be used for this purpose.



Output Connection to a Relay

Connection to Infrared LEDs

There are 3 types of IR transmitter modules which can be connected to the outputs; IRM01 for longer distances (up to 8 meters range), IR01W or IR03W for short range transmissions (up to 1 meter range) The manuals for IR transmitters can be downloaded from http://www.cytech.biz/infrared_transmitter_manual.html

12V Auxiliary Supply Outputs (12V and S12V)

12V and GND supply 12V to devices which require power e.g.. motion detectors. The S12V terminal provides 12V to external devices which require resetting when activated, e.g.. smoke detectors.

Comfort can be programmed to turn off S12V when needed, either when the system is disarmed or when the system is being armed. Latched Smoke detectors and Shock detectors need to be reset when the system is being armed.

Total continuous current from these and the Output 12V terminals should not exceed 1 A. These terminals are current limited by resettable fuses.

➔ **Do not connect PIRs set as 24 hour zones to the S12V supply.**

Local Expansion Module

LEM02B can be plugged directly into the LEM connector of the CM9001 without needing a ribbon cable. LEM01 or LEM03 is connected using the 10 way ribbon cable to the LEM connector (J5).Refer to the LEM Installation Manual which can be downloaded from http://www.cytech.biz/expansion_module_manuals.html

Modules on the Comfort RS485 Bus

Slave Expansion Modules(SEP01)

Slave Expansion Modules allow expansion beyond 16 Inputs and Outputs. Connect Slaves to CP9000 using the supplied 4 way white cable or by CAT5 cable to terminal blocks (12V, COM, KA, KB) for longer distances. Set Each Slave to a unique ID (from 1 to 3) via the ID shunts. Each SEP01 should have their own transfomer and battery. Refer to the SEM Manual which can be downloaded from http://www.cytech.biz/expansion_module_manuals.html

Keypad (KP04/KP05A/KP06A)

Up to 15 keypads can be installed in a system. Connect Keypads to CM9001 using by CAT5 cable to terminal blocks (12V, COM, KA, KB, MIC, Voice) at both ends. Set each keypad to a unique ID (from 1 to 15). Refer to the Keypad Installation Manuals which can be downloaded from http://www.cytech.biz/keypad_manuals.html

UCM (Universal Communications Module)

There are many types of UCMs which allow Comfort to be connected by USB or Ethernet for programming, or to other systems like Cbus, KNX or RS232/RS485 to 3rd party systems. Up to 8 UCMs can be installed. Connect UCMs to CP9000 using the supplied white 4 way cable or by CAT5 cable to terminal blocks (12V, COM, KA, KB) for longer distances. Set Each UCM to a unique ID (from 1 to 8) via the SW7 ID shunts. **Mount UCMs in the EN01D enclosure by using the standoffs BEFORE mounting the enclosure to the wall as it needs access to the bottom.** The UCM Manuals can be downloaded from http://www.cytech.biz/ucm_manuals.html

Quick Start Power-On Checklist

1 Connect one keypad with ID = 1, which is the default Keypad ID. 12V/COM, KA/KB, Mic/Voice from Keypad to CM9001 Terminal Blocks using Data cable 4 pair twisted cable.

2 Mount the LEM02B Local Expansion Module and ETH03 Submodule (if required) on the CM9001 PCB See Figure 2 for mounting position of CM9001.

3 Connect the telephone line to TEL IN terminal block. If the telephone line is not available, expect a "Phone Trouble" alarm at the keypad.

4 Connect a wire between the terminals TAMP and COM of the Tamper terminal block to prevent a tamper alarm.

5 Mount UCM (eg UCM/GSM4, UCM/KNX2 UCM/Cbus etc) to the Enclosure before mounting the enclosure to the wall. Connect to CM9001 using the white 4 way cable between JP2/JP2A on the UCM to "RS485" connnector on CM9001.

6 Mount the CM9001 PCB to the EN01 metal enclosure by 8 screws on the standoffs

7 Connect an electrical mains cable between the power supply terminal blocks and a mains plug.

8 Turn on the mains power. The keypad should beep briefly. Observe the ID1 (red) and ID2 (green) LEDs on the PCB during the self-testing cycle. Both LEDs should turn on when power is first applied. After a second, the red ID1

led should turn off, then the green ID2 LED which should blink off and on again.

9 The Green ID2 LED on the CM9001 board should be on steady, and may start blinking if there is a phone trouble. The RED ID1 led should be off indicating the system is not armed.

10 After a few seconds, the keypad should say "Security Off"

11 Enter 1234# on the keypad. The Voice menu should be announced. Press F to exit from the menu. There may be a "Phone Trouble" announcement and beeps if the telephone line is not connected.

12 Terminate all zone wiring into the respective Zone Terminal Blocks on the Main board or Local Expansion Module (LEM) and label accordingly.

13 The system is ready for programming, This can be done by the ETH03 submodule (if installed on CM9001), or by external UCM/USB or UCM/ETH03 via the 4 way cable to the white RS485 4 pin header on CM9001. The **UCM 6 wires multicoloured Programming cable should NOT** be connected. The UCM red (D9) and green (D10) LEDs on the UCM should both be blinking rapidly, showing that there is communication with CM9001.

14 To program using Comfigurator software, refer to "Programming with Comfigurator". **Remember to set Date and Time**

15 Connect the 12V 7 AH battery to the BATT terninals of CM9001 using the supplied battery cable.

16 Press the Night Mode button on the keypad. You should hear the announcement "Front Door" due to Zone 1 preprogrammed as the front door being open. Short the zone 1 with a wire to close it to arm the system. Alternatively, press # on the keypad to Force arm the system with the zone remaining open. The system should announce Night Mode. Enter the user code 1234# on the keypad to disarm it. You have now armed and disarmed the system for the first time.

17 You can now start to connect other keypads, door station and modules and security wiring, taking care to set a unique ID on each module.

Document Revision History

- 1.0.0 – 17 October 2017 Initial Release
- 1.0.1 – 20 July 2018 Amended

Important Note

The printed manual may not always be the most current version. Please check and download the latest version from http://www.cytech.biz/manuals.html

.

web site: http://www.cytech.biz
Email: info@cytech.biz
Forum:: http://www.comfortforums.com

Title: Comfort II Quick Installation Guide
Filename quickinst CM9001
Version: 1.0.1
Date Last 20 July 2018

Copyright Cytech Technology Pte Ltd.
RCB 199506853M