

Installation Instructions

Model ZAC-40

Zone Amplifier Card 40W (500-035400 / S24235-B1-A2 (70V))



Installation Instructions for North America.

INTRODUCTION

The Model ZAC-40 from Siemens Industry, Inc. is a CAN data bus card that contains two speaker zones and one 40 Watt audio amplifier, capable of operating at 25 VRMS or 70 VRMS.

The two speaker zones can be wired and operate as either a single Class A zone or a single Class B zone or as two Class B zones independently protected to provide split zone or interleaved speaker zones.

The ZAC-40 can also be used as a backup amplifier to serve as a backup for other ZAC-40 amplifiers in a 1 to 1 backup or 1 to many backup.

The ZAC-40 also contains a local external audio input circuit (0 dB) and a dry contact input to switch on the amplifier and activate the two zones as configured via the Zeus tool. The ZAC-40 is capable of amplifying any one of the 8 audio channels that are transmitted from the DAC-NET (Digital Audio Card-NETWORK) via the internal digital Audio bus ASI (Audio Serial Interface)

Features

ZAC-40 features are as follows:

- Class D audio power amplifier with 40W RMS output power
- Over all efficiency is about 80% under full load
- Amplifier is supervised for functionality
- Amplifier is protected against open, short circuit, over current and over modulation
- Speaker lines are supervised for open, short circuit and ground fault
- The ZAC-40 is micro controller controlled
- A FPGA controls the digital audio data stream (ASI Bus) transmitted by the DAC-NET
- Software update via PMI/PMI-2/PMI-3

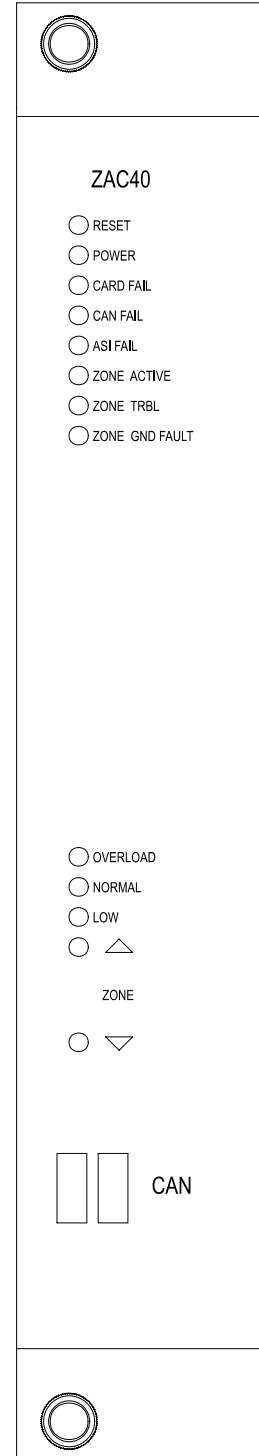


Figure 1
ZAC-40 Front Panel

OPERATION

The ZAC-40 receives its control and communication data from the DAC-NET and sends its status data to the DAC-NET via CAN Bus. Therefore it takes 1 sub-address of the DAC-NET.

The transmission of compressed or uncompressed audio data from the DAC-NET to the ZAC-40 is realized via ASI (Audio Serial Interface). Transmission on the ASI is executed with a timeslot method and is synchronized with Frame and Bit Synchronize Signals. Via control data on the CAN Bus, the timeslots are allocated to each ZAC-40. Each ZAC-40 is configured to listen to its corresponding timeslot.

A local audio input is provided to connect an external audio source. The audio input is isolated on the ZAC-40 to prevent ground loops. The local audio input is activated/deactivated via CAN-Bus. A switch input is provided to connect an external contact. If this contact is opened or closed a CAN-Bus message is sent to the DAC.

It is possible to configure the switch input via ZEUS tool to activate the local audio input.

The speaker lines are individually supervised for open and short circuit.

Ground fault is detected in common for both speaker lines on each ZAC-40.

The speaker lines are supervised in both, the inactive and active states. The speakers must be AC-coupled.

Controls and Indicators

The front panel of the ZAC-40 contains the Reset button, seven diagnostic LEDs, level adaptation of the local external audio input and the CAN address switches.

The LEDs functions are defined as follows:

LED	COLOR	NORMAL STATE	DEVIANT STATE	ACTION IN DEVIANT STATE
POWER	green	ON	OFF – external voltages fail	Check for failure on PSC-12, CC-5, wiring
CARD FAIL	yellow	OFF	ON – general trouble at ZAC-40	failure on ZAC-40, ZAC-40 needs to be replaced
CAN FAIL	yellow	OFF	ON – CAN interface trouble	failure on AIC, DAC-NET, CC-5 back plane or other CAN cards / modules
ASI FAIL	yellow	OFF	ON – ASI interface trouble	failure on „ASI OUT“ and / or „ASI IN“ at ZAC-40
ZONE ACTIVE	green	OFF	ON – ZAC-40 is activated	indicates normal operation
ZONE TRBL	yellow	OFF	ON – Speaker zone trouble, open circuit or short circuit	check wires to the speakers, EOL resistor(s) and de-coupling capacitors at every speaker
ZONE GND FAULT	yellow	OFF	ON – unwanted earth ground connection on a speaker line	check wires to the speakers for earth ground connections
OVERLOAD	Yellow	OFF	ON	Refers to Local Audio input only: Press “DOWN” push button until “OVERLOAD” LED turns off and “NORMAL” LED turns on
NORMAL	Green	ON	OFF	Refers to Local Audio input only: no audio signal or audio signal too high/low
LOW	yellow	OFF	ON	Refers to Local Audio input only: Press “UP” push button until “LOW” LED turns off and “NORMAL” LED turns on

PRE-INSTALLATION

The ZAC-40 takes one sub-address on the DAC-NET. To configure the CAN-address use the two rotary-switches on the front panel (refer to Figure 1)

For setting the speaker line voltage and the low frequency cutoff see Figure 2.

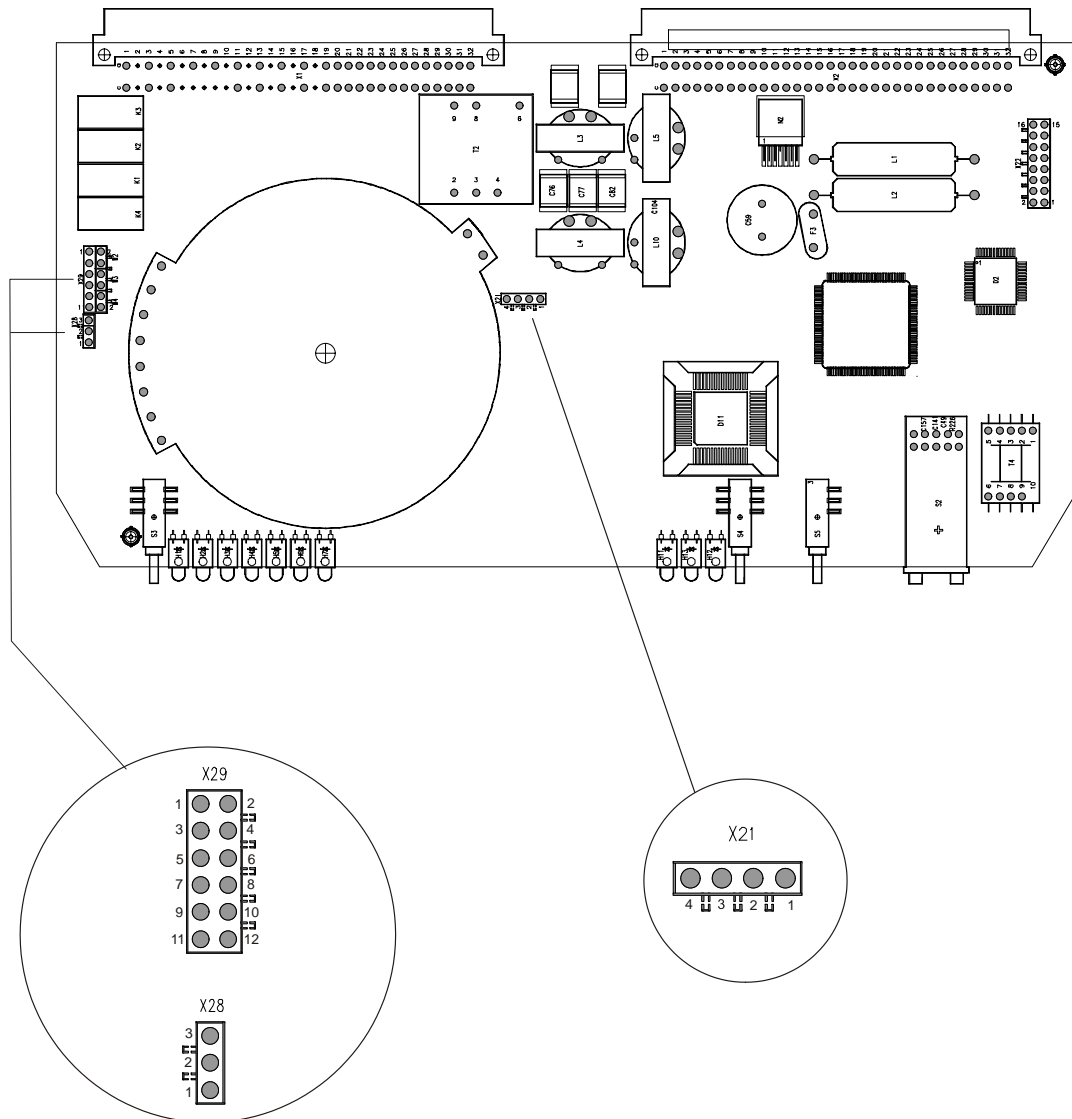


Figure 2 Position of Jumpers X21, X28 and X29

Setting the Speaker Line Voltage

The speaker line voltage is set with jumpers on header X29. The amplifier supervision has to be configured for the appropriate line voltage, too. Amplifier supervision is configured with jumpers on header X28

Speaker Line Voltage 70V

Set Jumper on X29 positions 3-4, 6-8, 10-12 and X28 position 2-3.

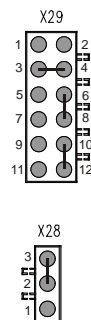


Figure 3 Jumper Position 70V

Speaker Line Voltage 25V

Set Jumper on X29 positions 1-2, 3-4, 5-6, 7-8, 9-10, 11-12 and no jumper on X28.

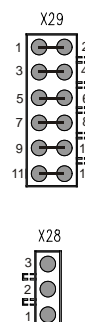


Figure 4 Jumper Position 25V

Setting the low frequency cutoff

Low frequency cutoff can be set for 240Hz or 85Hz. This setting acts on both: local audio input and on all digital channels.

Setting for 240 Hz protects small speakers from being overload with bass impulses. Speech intelligibility may be improved. This setting is not recommended for higher quality music reproduction.

85Hz: Set no jumper on X21

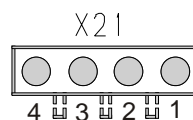


Figure 5 Jumper Position 85 Hz

240Hz: For 240Hz low frequency cut-off two jumpers have to be set.



Never set only one jumper !!!

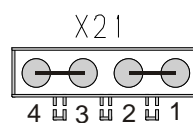


Figure 6 Jumper Position 240 Hz

INSTALLATION

The ZAC-40 plugs perpendicularly into one slot in the CC-5 card-cage via two 96-pin DIN connectors and can occupy any slot in the card cage.

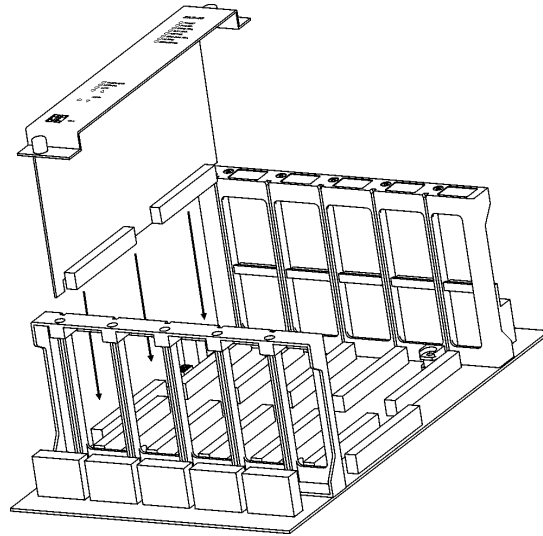


Figure 7 Installing the ZAC-40

Insert the ZAC-40 card into the card guides right side up (lettering on the front panel is legible)

Slide the card in until the card edge connectors contact the receptacles on the motherboard.

Verify that the DIN connectors of the card and the card-cage aligned properly. The card can only plug in one direction to the card cage, if it does not align, DO NOT FORCE the card.

Place thumbs on the front panel adjacent to the captive screws and gently apply even pressure on the card until the connectors seat in the receptacles on the motherboard.

Secure with the captive screws.

Power up the system and verify that the ZAC-40 power LED turns ON.

WIRING



Remove ELECTRICAL POWER prior to working on equipment.

All field wiring of the ZAC-40 is connected to the terminal blocks of the CC-5/CC-2 cardcage slot in which it is installed.

The configuration of the speaker lines is selectable between Class A, Class B or 2 x Class B.

NOTE: For U.S. installation only, reference to Power Limited is deemed Class 2 and reference to Power Limited 70V speaker circuits is deemed Class 3. Class 2 and Class 3 designations do not apply to Canadian installations. Please refer to the appropriate product installation instructions for further details.

To connect external wiring

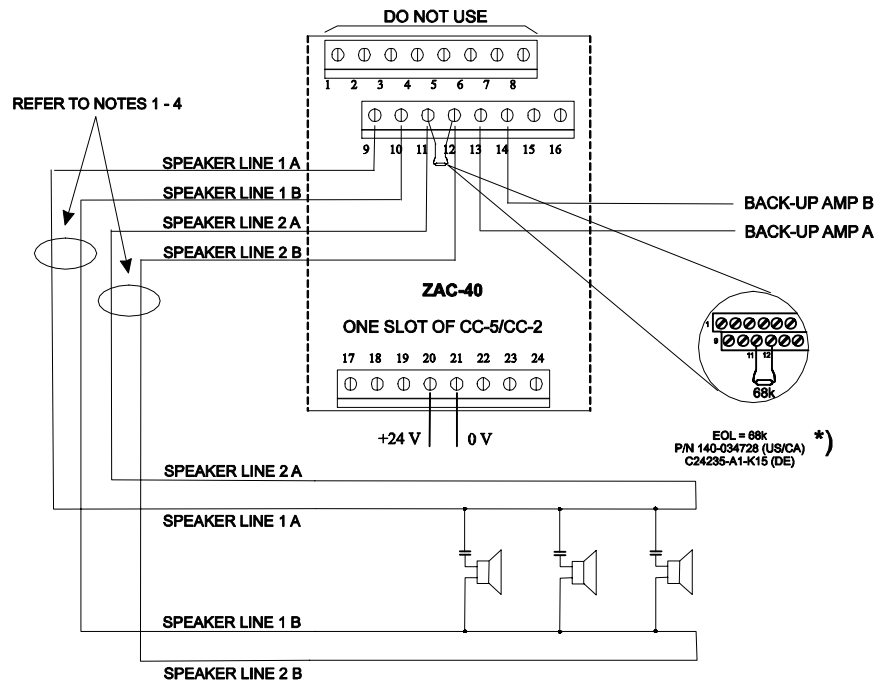
Loosen the screw of the terminal by turning it counterclockwise.
 Insert the wire into the side of the terminal block.
 Tighten the screw of the terminal block by turning it clockwise.



The screw terminals can accommodate one 12-18 AWG, ($\approx 0,5\text{mm} - 2,5\text{mm}^2$) or two 16-18 AWG, ($\approx 0,5\text{mm} - 1,0\text{mm}^2$).

Class A: The speaker line is looped back to the system. The end of line resistor (EOL) is connected directly at the ZAC-40 (CC-5/CC-2). In this configuration the line works during the open circuit condition by feeding it from both sides. In the short circuit condition the speaker line is not functional.

- NOTES (Speaker Lines and Back-Up Amplifier)
1. Use twisted pair or twisted shielded pair.
 2. Terminate shields at one end only.
 3. Supervised and power limited
 4. Positive or negative ground fault detected at $<10\text{k Ohms}$ for terminals 9-12.



*) shipped with the ZAC-40

Figure 8 ZAC-40 - Wiring Class A

Class B: A configuration, where the end of line resistor (EOL) is at the end of the speaker line. The ZAC-40 is capable of single Class B wiring.



The unused speaker line also needs to be connected to an EOL.

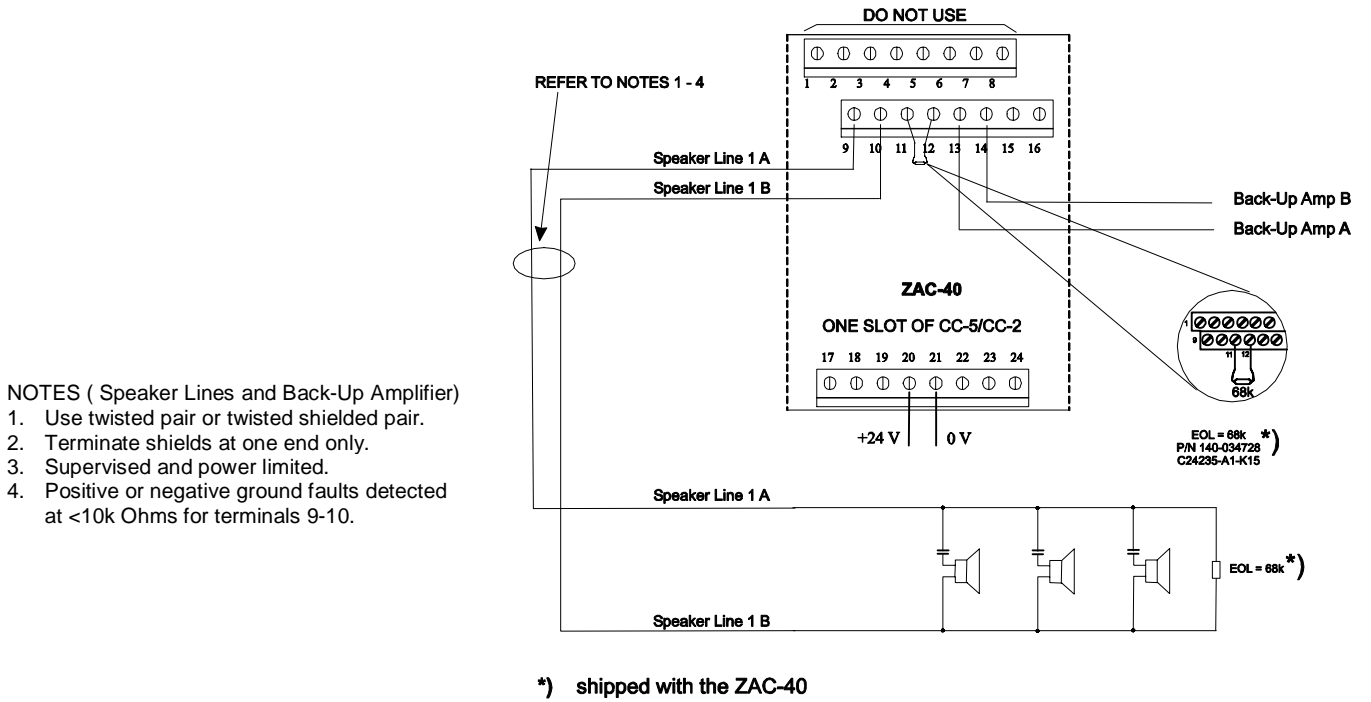


Figure 9 ZAC-40 - Wiring Class B

2x Class B: Both lines are used and have the end of line resistor (EOL) at the end of the speaker lines.

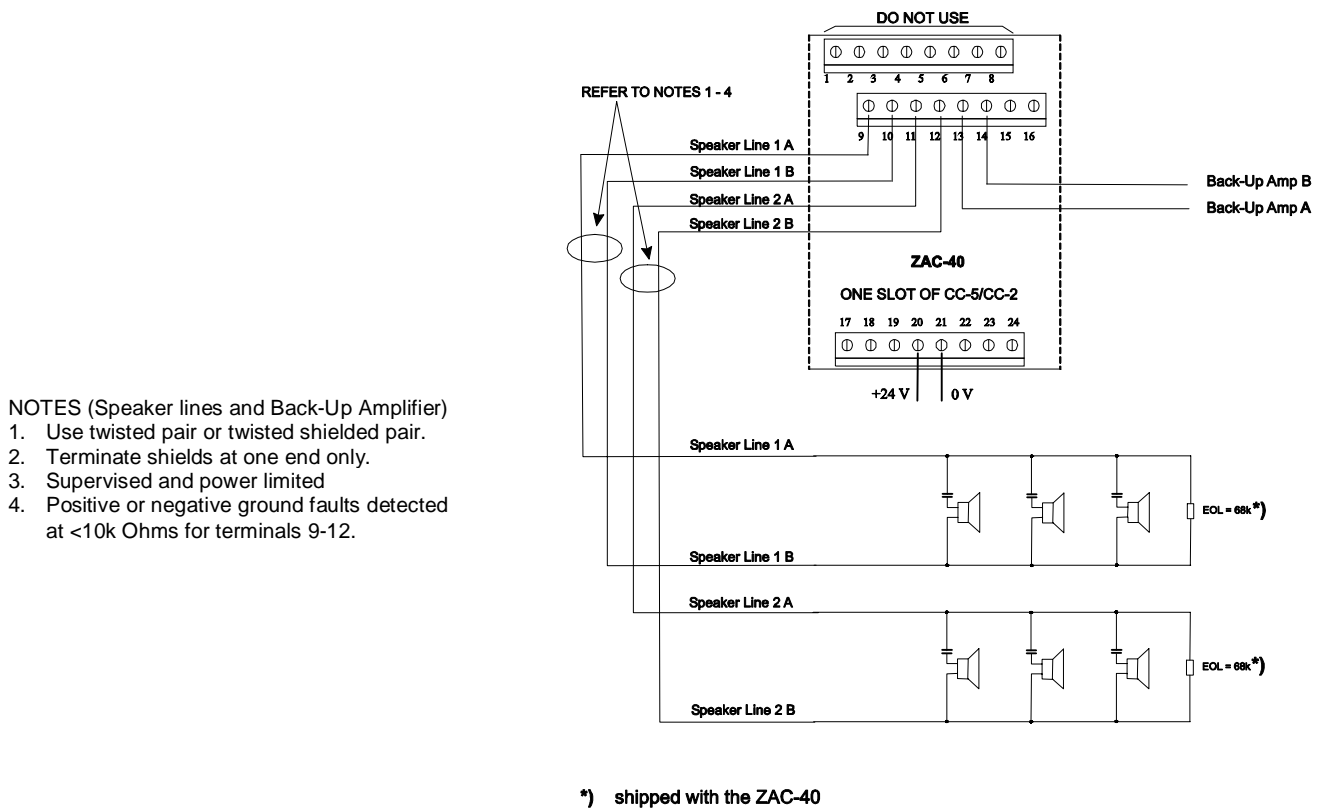
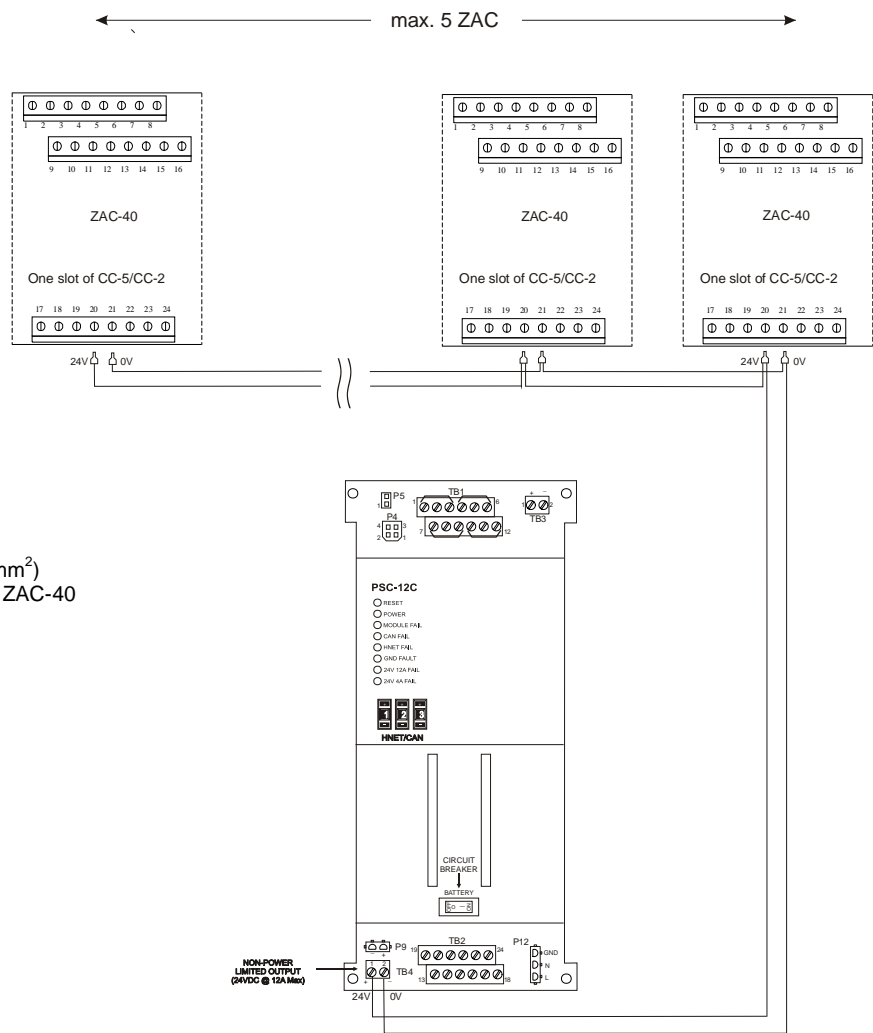


Figure 10 ZAC-40 - Wiring Class 2 x B



NOTES

1. 16-18 AWG ($\approx 1,0\text{mm}^2$)
2. 2.3A max. input current per ZAC-40
3. No EOL required.
4. Not power limited

Figure 11 ZAC-40 – Connection to PSC-12C

ELECTRICAL RATINGS

Input Power	
24V Back Plane Current	0mA
24V Screw Terminal Current	
@ 40W	2.3A
@ 20W	1.2A
@ 10W	0.7A
@ 0W	0.15A
6.2V Back Plane Current	0mA
24V Standby Current	150mA
Dry Contact Input	24V/10mA power limited

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