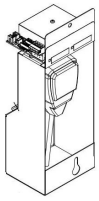
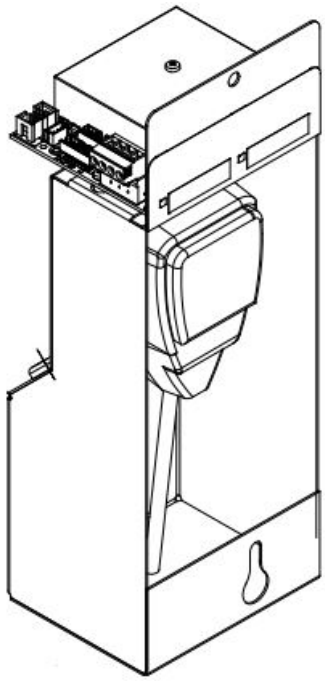


SIEMENS VTO2004-U2-U3 Option Module Instruction Manual

Contents

SIEMENS

SIEMENS VTO2004-U2-U3 Option Module



INSTALLATION INSTRUCTIONS
Model VTO2004-U2/U3
Option Module (Microphone)
The VTO2004-U2/U3 Option Module (Microphone) illustrated in Figure 1 is installed in the Fire System FS20 to enable firefighters and other safety personnel to make announcements and broadcast safety instructions during emergencies and drills. The VTO2001-U2/U3 can be installed in either or both the FV2025/FV2050 Fire Voice Control Panel or the VR2005-U1 Remote Microphone station.
NOTE: The VTO2001-U2/U3 is intended for use in dry, protected environments, only.

FEATURES

The principal features of the VTO2004-U2/U3 Option Module (Microphone) include:

- Push-to-talk voice operation with centralized contention resolution
- Internal microcontroller with remote firmware update capability
- Tune-down relay muting of local speakers to prevent audio feedback squeal
- Automatic microphone gain control
- Microphone supervision of short and open circuit conditions
- Continuous status monitoring with automatic fault reporting
- EMC compliant
- ROHS compliant and meets performance specifications within the temperature range
- Can be used in UL and ULC markets

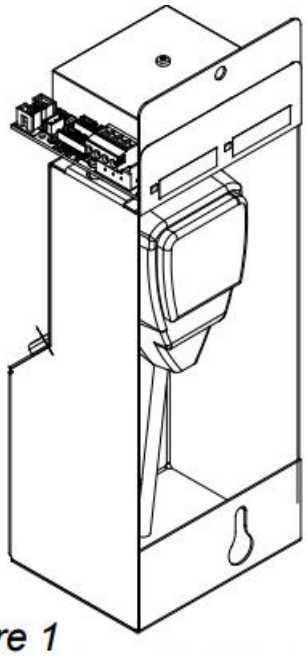


Figure 1
VTO2004-U2/U3 Option Module (Microphone)

PRE-INSTALLATION

The two-digit CAN Bus address for the VTO2004-U2/U3 Option Module (Microphone) is determined by the two rotary DIP switches located on the back of the module, as illustrated in Figure 2. The left switch sets the tens digit of the address while the right switch sets the ones digit of the address. The CAN bus address is selected by the installer and may be set either before or after mounting the module. To set the CAN Bus address use a small flat bladed screwdriver to rotate the center of each switch until the arrow points to the digit of the address which that switch represents.
Information relevant to assigning CAN bus addresses is provided in the following Siemens Industry, Inc., Building Technologies Division, documents:

- A6V10315013 FS20 Fire Detection and Voice Announcement System Planning Manual
- A6V10315023 FS20 Fire Detection and Voice Announcement System Configuration Manual

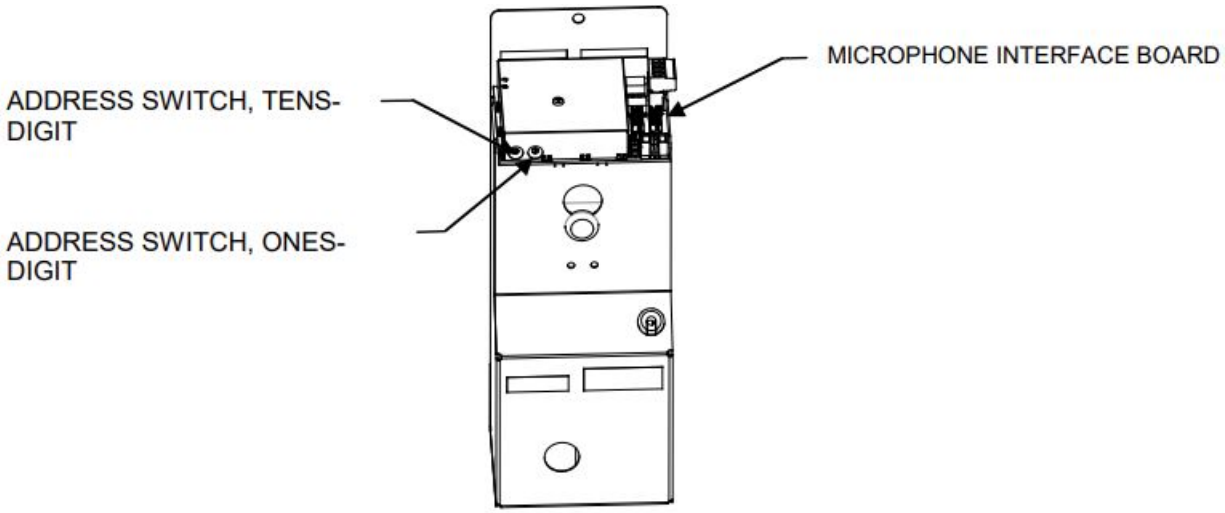


Figure 2
Rear view of the VTO2004-U2/U3 Option Module (Microphone)

OPERATION

Refer to Figure 3. The VTO2004-U2/U3 Option Module (Microphone) includes a hand-held microphone with a

push-to-talk button and a flexible cable, packaged together in a rectangular metal housing with a surface-mounted Microphone Interface Board (MIB pictured in Figure 2). To use the microphone, the operator depresses and holds the push-to-talk button until the control system enables the announcement to be transmitted. The operator continues to hold the button for the duration of the announcement. To prevent audio feedback “squeal” during announcements, the VTO2004-U2/U3 incorporates a tune-down relay to mute the nearest loudspeaker(s) while the push-to-talk button is depressed and the microphone is active.

Controls and Indicators

The “Preannouncement Active” LED and the “Ready to Page” LED are located on the front panel of the VTO2004-U2/U3 Option Module (Microphone). The “Preannouncement Active” LED illuminates when the operator presses the “push-to-talk” button on the microphone to request an audio connection to the FV2025/2050 Fire Voice Control Panel. When the audio connection is made, the “Preannouncement Active” LED extinguishes and the “Ready to Page” LED is illuminated. At that point the operator can talk over the microphone. The LED remains illuminated until the operator releases the push-to-talk button or is overridden by a higher priority audio message.

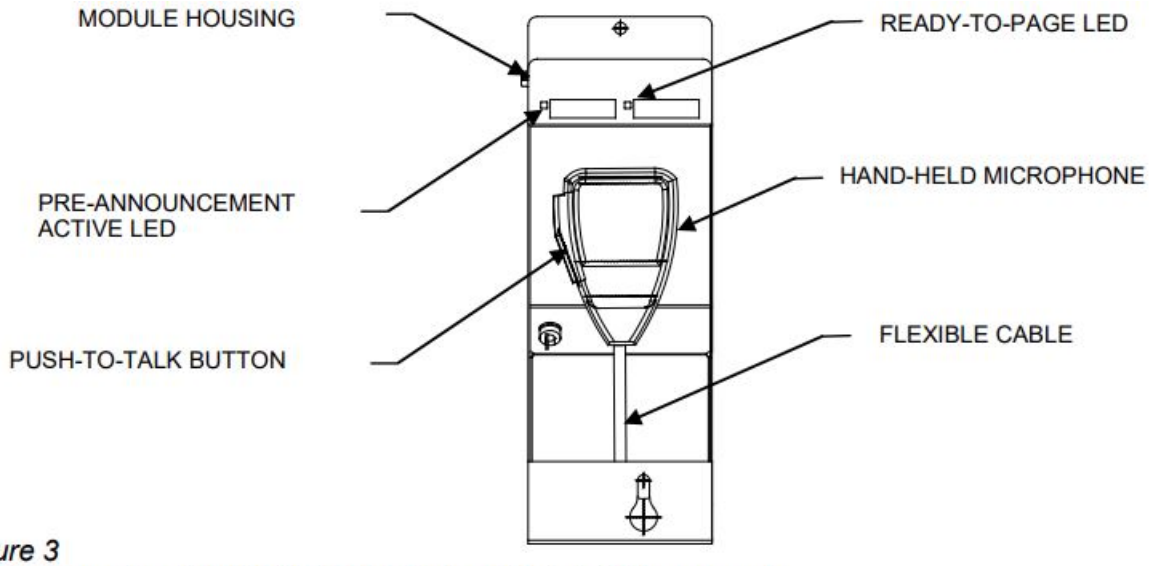


Figure 3
Front view of the VTO2004-U2/U3 Option Module (Microphone)

MOUNTING

Mounting the VTO2004 in the FV2025/2050 Fire Voice Control Panel

To avoid mechanical interference with the VCA2002-A1 Card Cage, the VTO2004-U2/U3 module must always be mounted at the farthest right position of the middle window of the inner door, as illustrated in Figure 4.

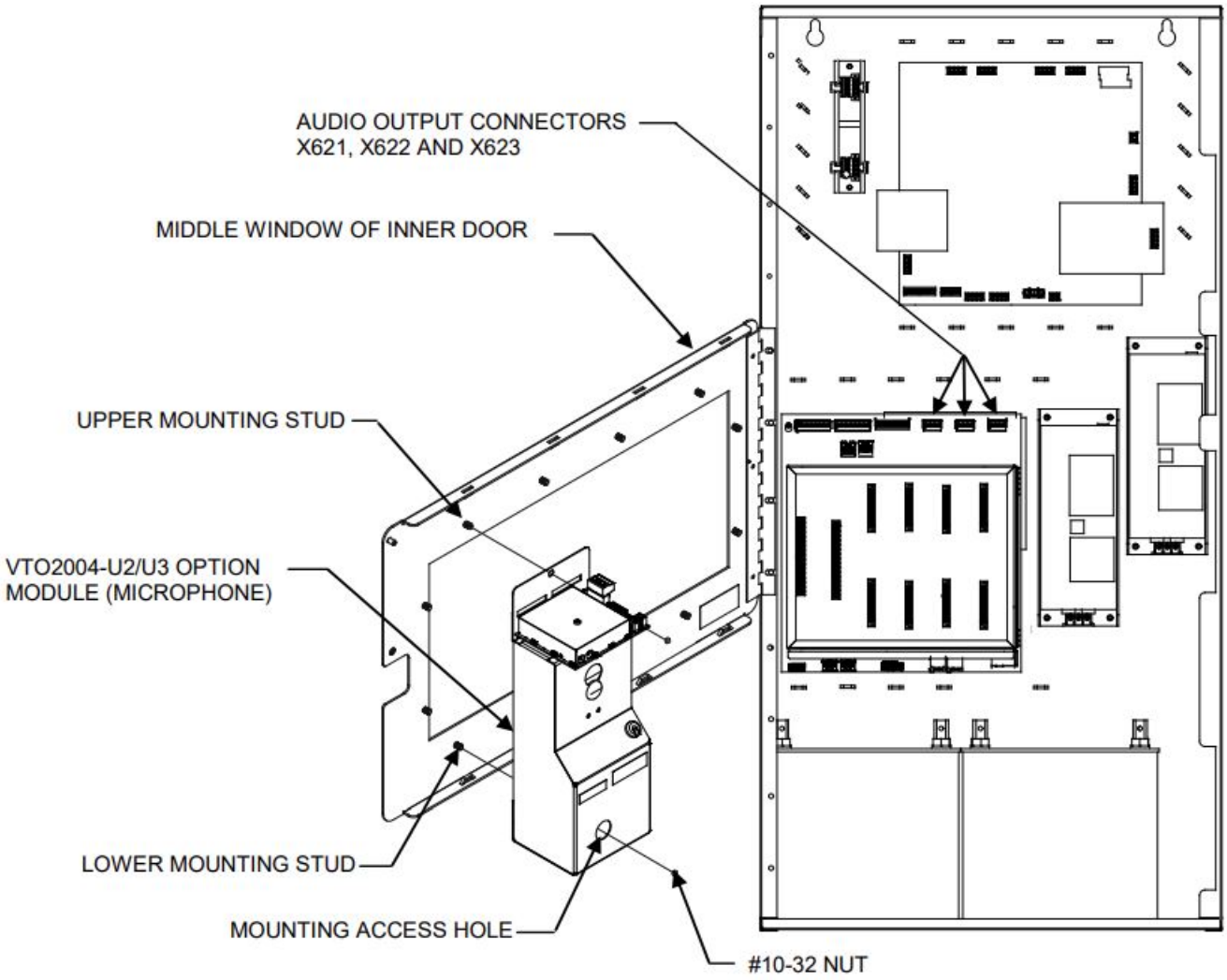


Figure 4
Mounting the VTO2004 in the FV22025/2050

Mounting Procdures

1. Refer to Figure 4. Mount the VTO2004-U2/U3 module by sliding its top and bottom mounting holes over the upper and lower mounting studs in the outside mounting position of the inner door.
2. Remove the mircrophone from the VTO2004-U2/U3.
3. Place a #10-32 nut into a 3/8 inch nut-driver and insert the nut-driver through the mounting access hole in the rear of the VTO2004-U2/U3 Module. Fasten that nut to the lower mounting stud.
4. Fasten a second #10-32 nut to the upper mounting stud to secure the VTO2004-U2/U3 module into position.
5. Return the microphone to the VTO2004-U2/U3 Module.

Mounting the VTO2004-U2//U3 Option Module (Microphone) in the VR2005-U1 Remote Microphone Station
Figure 5 illustrates the mounting position for the VTO2004-U2/U3 Option Module (Microphone) on the inner door of the VR2005-U1 Remote Microphone station.

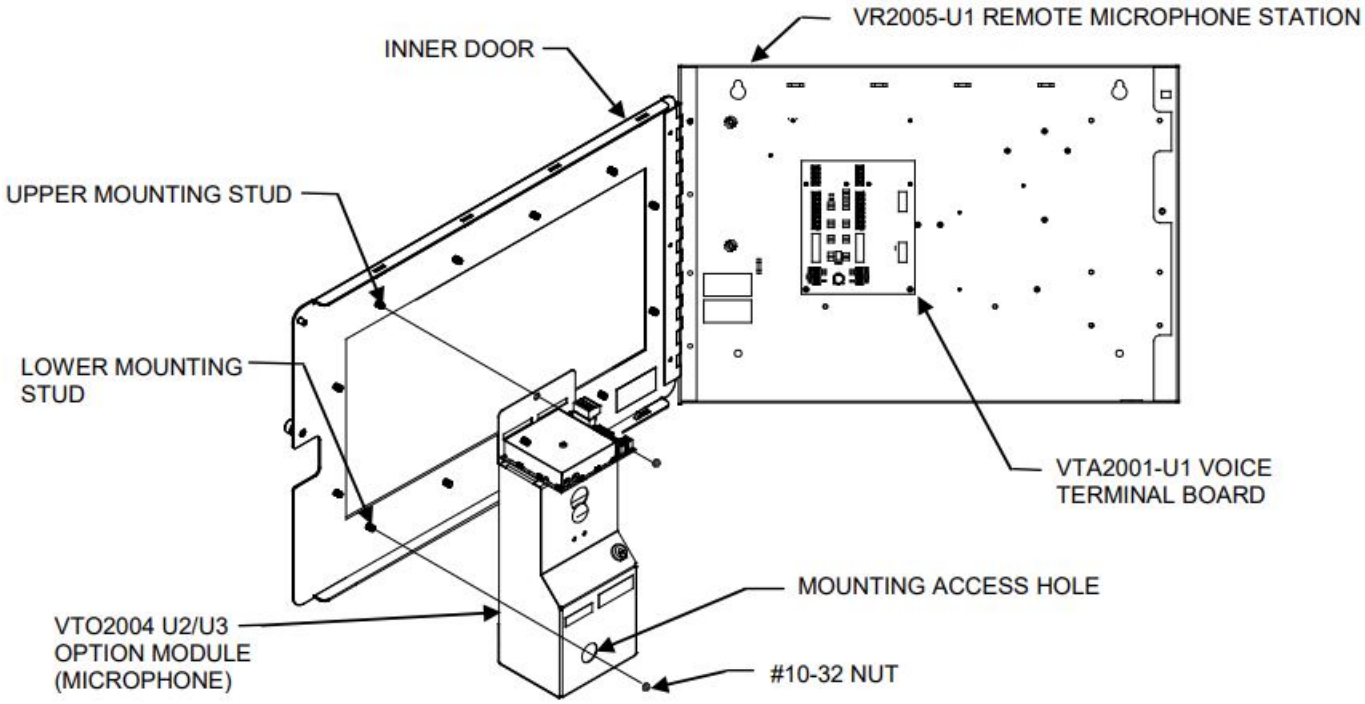


Figure 5
Mounting the VTO2004-U2/U3 in the VR2005-U1 Remote Microphone Station

Mounting Procdures
The procedure for mouting the VTO2004-U2/U3 in the VR2005-U1 Remote Microphone station is identical to the procedure for mounting the VTO2004-U2/U3 in the FV2025/2050 Fire Voice Control Panel, presented above.

WIRING

Wiring the VTO2004-U2/U3 Option Module (Microphone) both in the FV2025/2050 Fire Voice Control Panel and in the VR2005-U1 Remote Microphone station consists of two parts.

1. Wiring the VTO2004-U2/U3 Option Module (Microphone) to the nearest VTO2001-U2/U3 Option Module (24 Switches) using the supplied ribbon cable
2. Wiring the tune-down relay on the VTO2004-U2/U3 Option Module (Microphone) to the audio amplifier and the muted speaker(s)

Part I. Wiring the VTO2004-U2/U3 Option Module (Microphone)
The wiring used to connect the VTO2004-U2/U3 Option Module (Microphone) varies according to whether the module is mounted in a FV2025/2050 Panel or in a VR2004-U1 Remote Microphone station.

A. Wiring the VTO2004-U2/U3 Option Module (Microphone) when it is mounted in the FV2025/2050 Fire Voice Control Panel

1. Please refer to Figure 6. Install an A5Q00055918D end-of-line (EoL) terminator on connector X205 on top of the VTO2004-U2/U3 module.
2. Install a 16-conductor ribbon cable between connector X204 on top of the VTO2004-U2/U3 module and connector X204 on the nearest VTO2001 Option Module (24 Switches).
   NOTE: Instructions for interconnecting the VTO2001 Option Module (24 Switches) to each other and to the VCA2002-A1 Card Cage are provided in Siemens Industry, Inc., Building Technologies Division, document number A6V10370342 Installation Instructions for the VTO2001-U2/U3 Option Module (24 Switches).

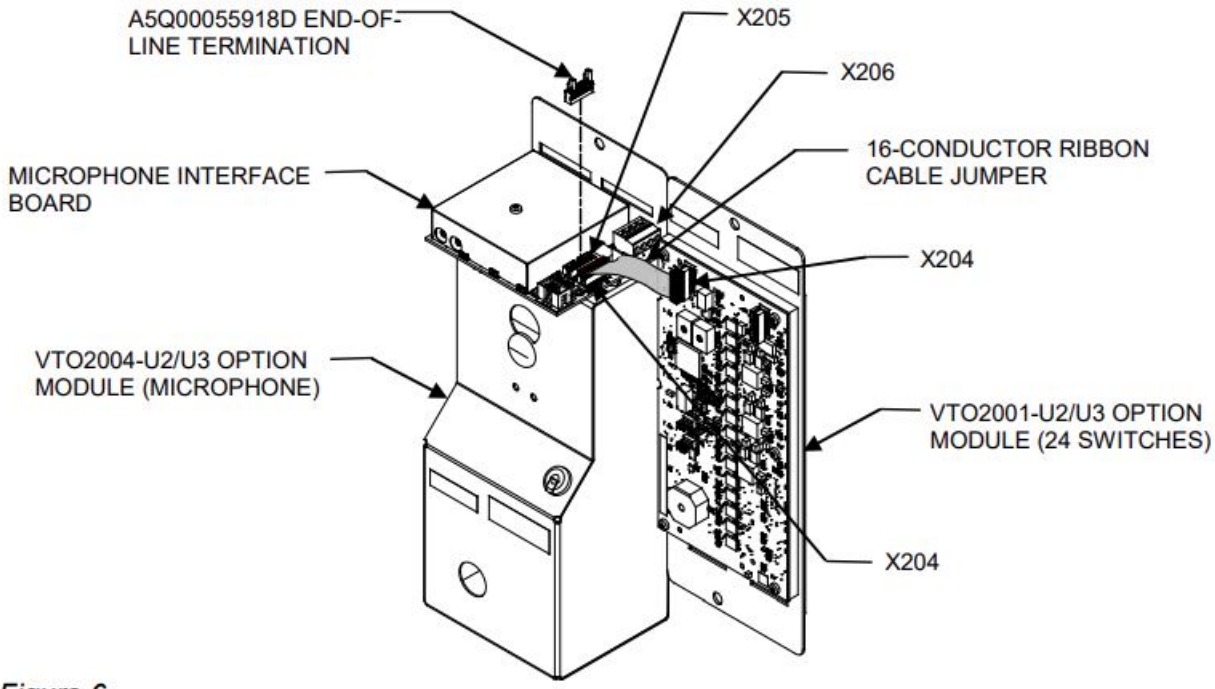


Figure 6
Connecting the VTO2004-U2/U3 Option Module (Microphone) to the Nearest VTO2001-U2/U3 Option Module (24 Switches)

B. Wiring the VTO2004-U2/U3 Option Module (Microphone) when it is mounted in the VR2005-U1 Remote Microphone station

1. Install a 16-conductor ribbon cable between connector X204 on top of the VTO2004-U2/U3 module and connector X204 on the nearest VTO2001 Option Module (24 Switches).
2. If this is an intermediate microphone station in a system with several remote microphone stations, install a 16 conductor ribbon cable between connector X205 on top of the VTO2004-U2/U3 module and connector X9 of the VTA2001-A1 Voice Terminal Board. Otherwise, if this is either a system with only one remote microphone station or this is the end remote microphone station in a system with several remote microphone stations, install an A5Q00055918D end-of-line (EoL) terminator on connector X205 on top of the VTO2004-U2/U3 module.

   NOTE: Instructions for connecting a VTO2004-U2/U3 module and the VTA2001-A1 Voice Terminal Board are provided in Siemens Industry, Inc., Building Technologies Division, document number A6V10405564 Installation Instructions for the VTA2001-A1 Voice Terminal Board – Class B.

Part II. Wiring the Tune-Down Relay

The tune-down relay is a component of the Microphone Interface Board (MIB), which is mounted on the VTO2004-U2/U3 Option Module (Microphone) and is used to mute nearby speaker(s) during announcements. The wiring configuration for the tune-down relay varies according to whether the host VTO2004-U2/U3 microphone module is mounted in a FV2025/2050 Panel or in a VR2004-U1 Remote Microphone station. The relay wiring also varies according to the wiring class of the speaker line. The relay wiring is the same for both Class A and Class B speaker lines, but differs for the Dual Interleaved Class B speaker line wiring configuration. Wiring instructions are presented as follows.

A. Wiring the tune-down relay when the VTO2004-U2/U3 Option Module (Microphone) is mounted in the FV2025/2050 Fire Voice Control Panel

1. Class A and Class B Speaker Line Wiring
2. Dual-interleaved Class B Speaker Line Wiring

B. Wiring the tune-down relay when the VTO2004-U2/U3 Option Module (Microphone) is mounted in the VR2005-U1 Remote Microphone station

1. Class A and Class B Speaker Line Wiring
2. Dual-interleaved Class B Speaker Line Wiring

A. Wiring the tune-down relay when the VTO2004-U2/U3 Option Module (Microphone) is mounted in the FV2025/2050 Fire Voice Control Panel

CAUTION: Remove electrical power from FV2025/2050 Fire Voice Control Panel before working on equipment.

NOTE
Instructions for connecting speaker lines are presented in Siemens Industry, Inc., Building Technologies Division, document number A6V10370410 Installation Instructions for the Model VCI2001-U1 Voice Amplifier Card.

A1. Class A and Class B speaker line wiring

- Consult the site-specific shop drawings to:
  - Identify the speaker line that will be installed in the vicinity of the FV2025/2050 Fire Voice Control Panel.
  - Determine which amplifier output block (X621, X622 or X623) will drive the speaker line.
  - Determine which of the loudspeakers connected to that speaker line are to be muted.

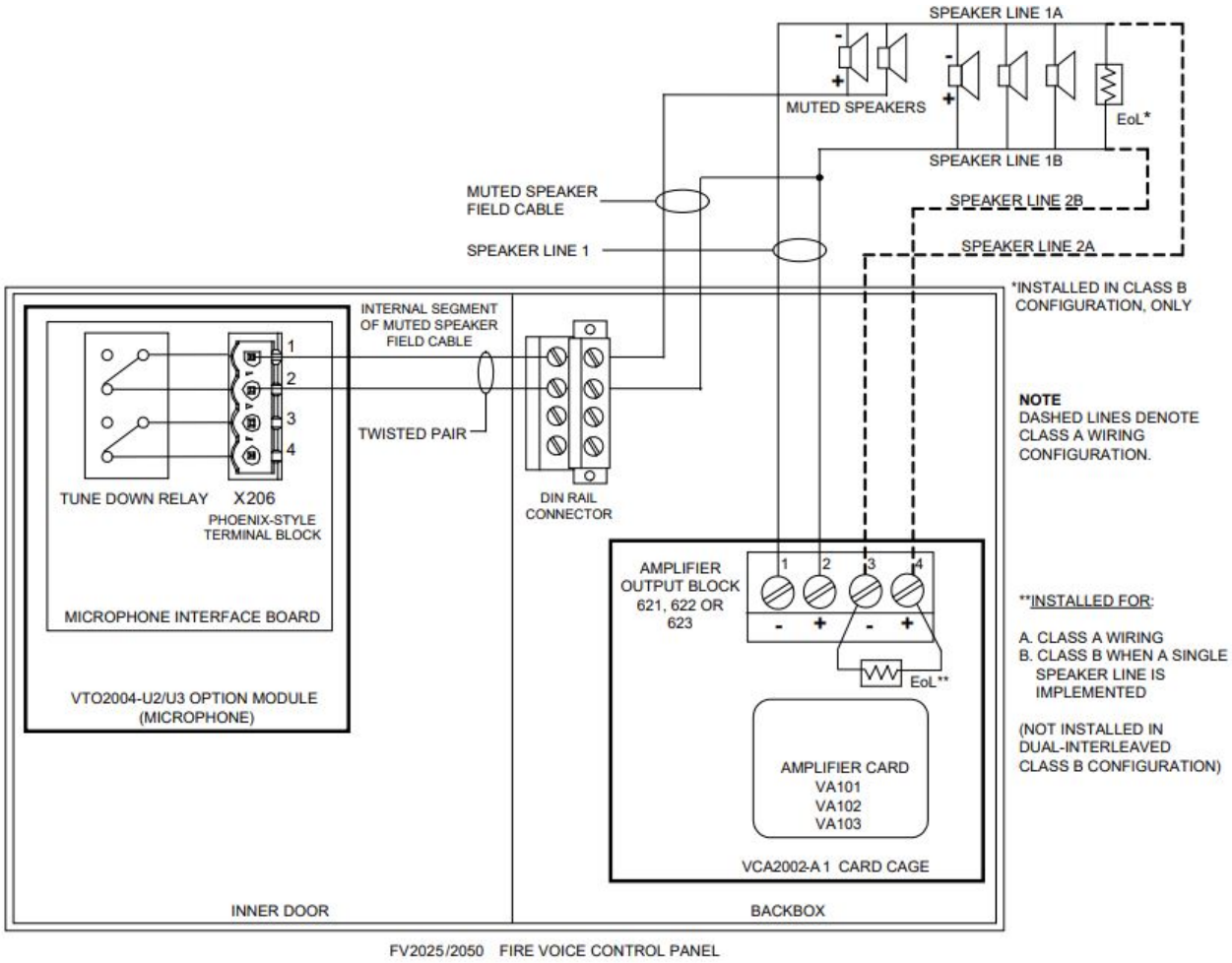


Figure 7
VTO2004-U2/U3 Option Module (Microphone) in the FV2025/2050 Fire Voice Control Panel: Class A and Class B Speaker Line Wiring

  - After the “non-muted” speakers have been installed and interconnected with a 68K EoL termination (P/N

C24235-A1-K15) across terminals of the last speaker, run Speaker Line 1 from the nearest non-muted speaker to the FV2025/2050 Fire Voice Control Panel. Refer to Siemens Industry, Inc, Building Technologies Division; document “A6V10370410 Installation Instructions for the Model VCI2001-U1 Voice Amplifier Card” for speaker line wiring specifications and instructions.

- After the muted speakers have been installed and interconnected, run a muted speaker field cable from the nearest muted speaker which has been connected between the speaker terminal and the amplifier return terminal to the DIN rail mounted terminal block on the FV2025/2050 Panel backbox. Terminate the field cable at terminals 1 and 2 of the DIN rail terminal block.
  Specifications and instructions for the muted speaker field cable are the same as those for the non-muted speaker lines discussed in the previous step.
- Run a twisted pair cable from terminals 1 and 2 of the DIN rail terminal block to the Microphone Interface Board, located on top of the VTO2004-U2/U3 Microphone Module) on the Inner Door.
- Terminate the twisted pair at the Microphone Interface Board using a 4-position, Phoenix-style terminal block at pins 1 and 2. Refer to Figure 7 for the terminal block pin-out arrangement.
- Connect the Phoenix-style terminal block to X206 on the Microphone Interface Board.
- At the VCA2002-A1 Card Cage, connect Speaker Line 1 to terminals 1 and 2 of the amplifier output block (X621, X622, or X623) identified in step A1, a, above.

  NOTE
  Take care to observe speaker line polarity conventions when connecting the speaker line to the amplifier output block.
  The following three steps apply to Class A speaker line wiring, only.

- Do not install the EoL terminating resistor across the last speaker terminals.
- Run a 2-conductor field cable between the last speaker in Speaker Line 1 and terminals 3 and 4 of the amplifier output block identified in step g.
- Connect a 68K EoL terminator (P/N C24235-A1-K15) across terminals 3 and 4 of the amplifier output block.

A2. Dual-Interleaved Class B speaker line wiring

Consult the site specific shop drawings to:

- Identify the speaker lines that will be installed in the vicinity of the FV2025/2050 Fire Voice Control Panel.
- Determine which amplifier output (X621, X622 or X623) will drive those speaker lines.
- Determine which of the loudspeakers connected to those speaker lines are to be muted.

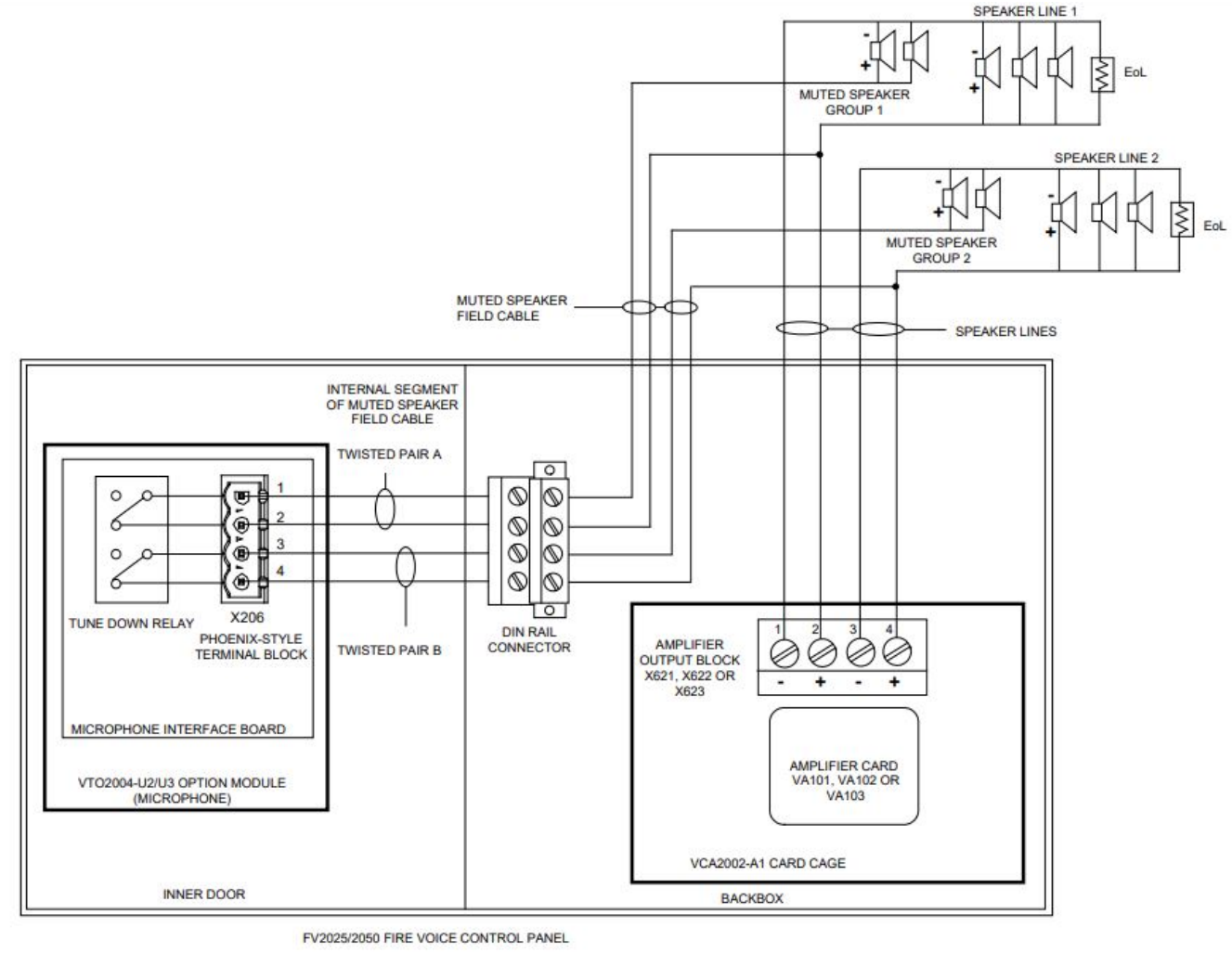


Figure 8
VTO2004-U2/U3 Option Module (Microphone) in the FV2024/2050 Fire Voice Control Panel: Dual Interleaved Class B Speaker Line Wiring

- After the “non-muted” speakers have been installed and interconnected, run Speaker Lines 1 and 2 from the nearest non-muted speaker to the FV2025/2050 Fire Voice Control Panel.
  Refer to Siemens Industry, Inc, Building Technologies Division, document “A6V10370410 Installation Instructions for the Model VCI2001-U1 Voice Amplifier Card” for speaker line wiring specifications and instructions.
- After both sets of muted speakers have been installed and interconnected, run a 2-wire muted speaker field cable from each set of muted speakers to the DIN rail mounted terminal block on the FV2025/2050 Panel backbox. Each cable connects between the speaker terminal and the amplifier return wire one of the sets of muted speakers. The Group 1 cable connects to terminal 1 and 2 of the terminal block while the Group 2 cable connects to terminals 3 and 4.
  Specifications and instructions for the muted speaker field cable are the same as those for the non-muted speaker lines discussed in the previous step.
- Run two twisted pair cables from the DIN rail terminal block to the Microphone Interface Board (located on top of the VTO2004-U2/U3 Microphone Module) on the Inner Door. One cable is connected to terminals 1 and 2. The other cable uses terminals 3 and 4.
- Terminate the two twisted pairs at the Microphone Interface Board using a 4-position, Phoenix-style terminal block. The first cable is connected to pins 1 and 2. The second cable is connected to pins 3 and 4. Refer to Figure 8 for the terminal block pin-out arrangement.
- Connect the Phoenix-style terminal block to X206 on the Microphone Interface Board.

- At the VCA2002-A1 Card Cage:
  - Connect Speaker Line 1 to terminals 1 and 2 of the amplifier output block (X621, X622 or X623) identified in step A1, a, above.
  - Connect Speaker Line 2 to terminals 3 and 4 of the identified amplifier output block.

    NOTE

    Take care to observe speaker line polarity conventions when connecting the speaker line to the amplifier output block.

Wiring the tune-down relay when the VTO2004-U2/U3 Option Module (Microphone) is mounted in the VR2005-U1 Remote Microphone station

CAUTION: Remove electrical power from the VR2005-U1 Remote Microphone station before working on equipment.

B1. Class A and Class B speaker line wiring

- Consult the site-specific shop drawings to:
  - Identify the speaker line that will be installed in the vicinity of the VR2005-U1 Remote Microphone station that houses the VTO2004-U2/U3 Option Module (Microphone).
  - Determine which of the loudspeakers connected to that speaker line are to be muted.

    NOTE

    Instructions for installing speaker lines are presented in Siemens Industry, Inc., Building Technologies Division, document number A6V10370410 Installation for the Model VCI2001-U1 Voice Amplifier Card.

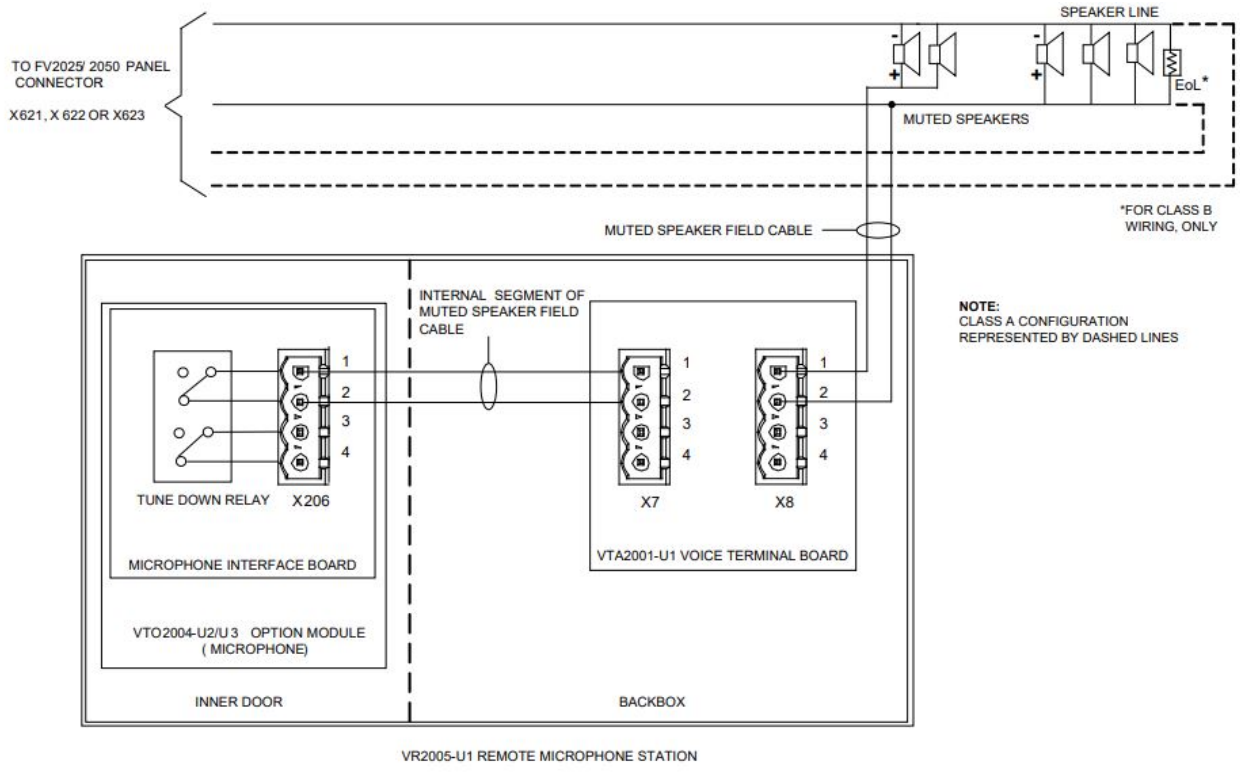


Figure 9
VTO2004-U2/U3 Option Module (Microphone) in the VR2005-U1 Remote Microphone Station: Class A and Class B Speaker Line Wiring

  - After the muted speaker(s) have been installed and interconnected, run a 2-wire muted speaker field cable between the VR2005-U1 Remote Microphone station and the nearest muted speaker.

- Connect the muted speaker field cable to the nearest muted speaker between the speaker terminal and the amplifier return wire.
- At the VR2005-U1 station, terminate the 2-wire muted speaker field cable with a 4-position Phoenix-style terminal block. Use pins 1 and 2 of the terminal block. See Figure 9 for the terminal block wiring arrangement.
- Connect the terminal block assembled in the previous step to X8 on the VTA2001-U1 Voice Terminal Board.
- Assemble the internal section of the muted speaker cabling by terminating both ends of a 3- foot-long, 2-wire section of twisted wire with 4-position Phoenix-style terminal blocks. Connect the wires to pins 1 and 2 of both terminal blocks. Refer to Figure 9 for the terminal block wiring arrangement.
- Connect the internal section of the muted speaker field cable between connector X7 of the VTA2001-U1 Voice Terminal Board and connector X206 located on top of the VTO2004-U2/U3 Option Module (Microphone) mounted on the inner door. (See Figure 6 for the location of connector X206).

B2. Dual-interleaved Class B speaker line wiring

- Consult the site-specific shop drawings to:
  - Identify the speaker lines that will be installed in the vicinity of the VR2005-U1 Remote Microphone station that houses the VTO2004-U2/U3 Option Module (Microphone).
  - Determine which of the loudspeakers on those speaker lines are to be muted.

    NOTE

    Instructions for installing speaker lines are presented in Siemens Industry, Inc., Building Technologies Division, document number A6V10370410 Installation for the Model VCI2001-U1 Voice Amplifier Card.
  - Refer to Figure 10. After the muted speaker(s) have been installed and interconnected, run a 2-wire muted speaker field cable from each set of muted speakers to the VTA2001-U1 Voice Terminal Board in the VR2005-U1 Remote Microphone station. (See Figure 5 for the location of the VR2005-U1).

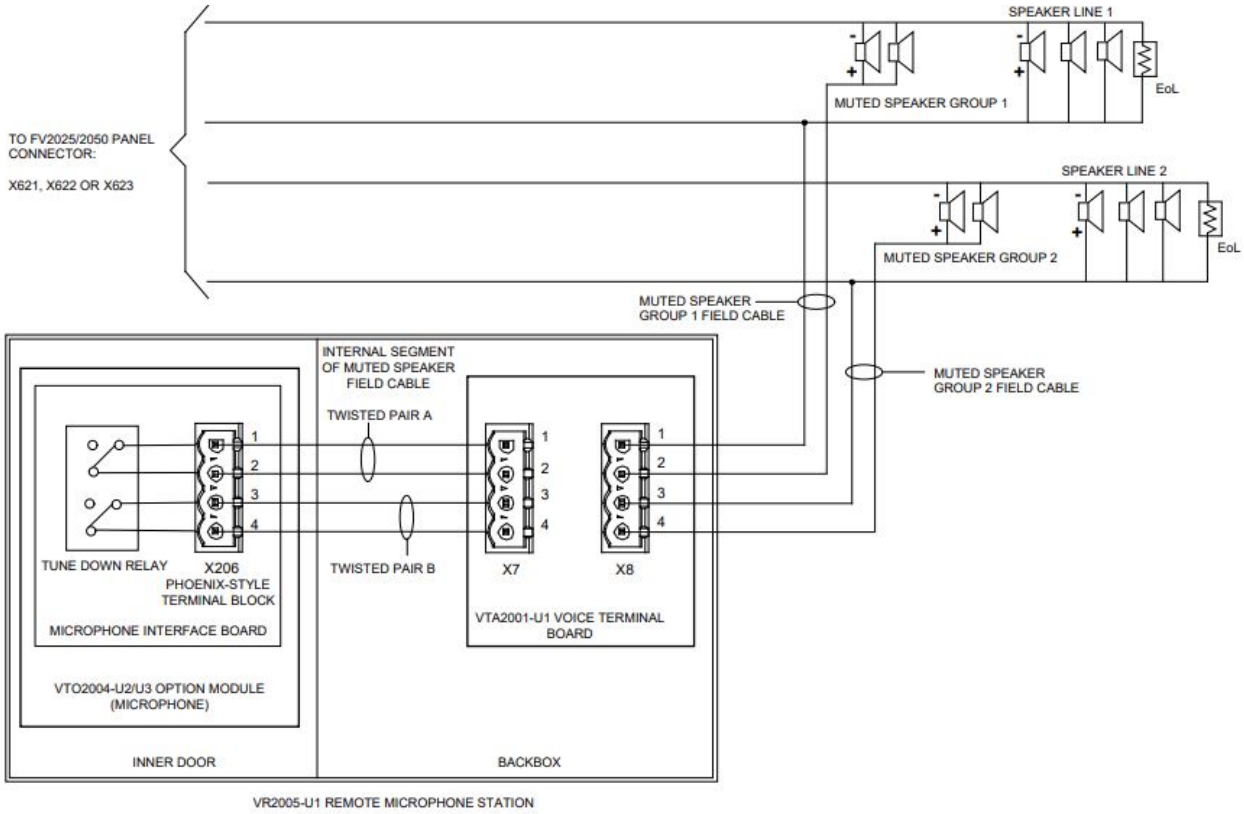


Figure 10
VTO2004-U2/U3 Option Module (Microphone) in the VR2005-U1 Remote Microphone Station: Dual Interleaved Class B Speaker Line Wiring

- Connect each muted speaker field cable to the nearest speaker of the associated muted speaker group between the speaker terminal and the amplifier return wire.
- At the VTA2001-U1 Voice Terminal Board, terminate the Group 1 and Group 2 muted speaker field cables using a single 4-position Phoenix-style terminal block. The Group 1 cable connects to terminals 1 and 2 while the Group 2 cable connects to pins 3 and 4. Refer to Figure 10 for the terminal block wiring arrangement.
- Connect the wired terminal block to X8 on the Voice Terminal Board.
- Refer to Figure 10 to assemble the internal segment of the muted speaker field cable. Terminate two 3-foot-long twisted pairs at both ends with 4-position Phoenix-style terminal blocks. One twisted pair uses pins 1 and 2. The other twisted pair uses pins 3 and 4.
- Connect the internal segment of the muted speaker field cable between connector X7 of the VTA2001-U1 Voice Terminal Board and connector X206 on the VTO2004-U2/U3 Option Module (Microphone) mounted on the inner door.

ELECTRICAL RATINGS

VTO2004-U2/U3 Option Module (Microphone)		
Input	Voltage	24VDC, nominal
	Current	Standby: 29mA Active: 54mA
CAN Bus	Voltage	3.3 VDC, max
Audio	Output	+6 dBu (4.4V p-p)
	Frequency	100 Hz – 15 kHz, ±3dB

Cyber security disclaimer

Siemens products and solutions provide security functions to ensure the secure operation of building comfort, fire safety, security management and physical security systems. The security functions on these products and solutions are important components of a comprehensive security concept.
It is, however, necessary to implement and maintain a comprehensive, state-of-the-art security concept that is customized to individual security needs. Such a security concept may result in additional site-specific preventive action to ensure that the building comfort, fire safety, security management or physical security system for your site are operated in a secure manner. These measures may include, but are not limited to, separating networks, physically protecting system components, user awareness programs, defense in depth, etc.
For additional information on building technology security and our offerings, contact your Siemens sales or project department. We strongly recommend customers to follow our security advisories, which provide information on the latest security threats, patches and other mitigation measures.
http://www.siemens.com/cert/en/cert-security-advisories.htm

Siemens Industry, Inc. Building Technologies Division Florham Park, NJ

Siemens Canada, Ltd.
1577 North Service Road East Oakville, Ontario
L6H 0H6 Canada

Document ID: P/N:

A6V10370377_en–_b A5Q00054008

firealarmresources.com

Documents / Resources

	**SIEMENS VTO2004-U2-U3 Option Module** [pdf] Instruction Manual VTO2004-U2-U3 Option Module, VTO2004-U2-U3, Option Module, Module

References

- **Fire Alarm Resources | Download fire alarm documents**
- **CERT Services | Services | Siemens Global**