TOA Electronics, Inc.

VS-900
SECURITY INTERCOM SYSTEMS

The TOA VS-900 SECURITY INTERCOM SYSTEM provides reliable and intelligible voice communication for critical security applications, including corporate security, correctional institutions, educational facilities, hospital access points, and parking structures. For over 35 years, TOA has developed a proven track record of innovative, reliable intercom products, including the groundbreaking EXES and IC-100 systems. The TOA VS-900 system is UL and CUL Listed and manufactured to ISO-9001 standards to ensure continuous operation for extended periods.

Ideal for applications with multiple "sub" stations calling in to one or more "master" stations, the VS-900 has a wide range of standard and software programmable features, including comprehensive Call-Forwarding to allow system operators freedom of movement and most importantly, to ensure that no calls go unanswered. The VS-900 integrates easily with access control and video surveillance equipment via a simple RS-232 communications protocol. Other features include telephone system integration, paging and external source distribution, event logging, and recording outputs.

The VS-900 scalable architecture allows the most cost effective configuration for each application with easy expansion as the size of the facility grows. Each exchange mainframe supports up to 4 master stations and 64 sub-stations. For large systems, exchanges can be expanded or "tie-lined" to provide up to 64 master stations and 1,024 sub-stations. The master stations can be either the TOA MS-900 or standard off-the-shelf single line telephones with support for Caller-ID signaling. Sub-stations include Economy, Indoor, Outdoor, and Panic models, each with heavy-duty plate, call switch and optional LED/relay control. Direct select interface cards provide relays, LED drivers and switch inputs for custom consoles and annunciator panels.

The VS-900 Security Intercom System is backed with a two-year warranty.

Features

- **Security Intercom Systems** for critical applications such as corporate, correctional, educational, government, military, parking structures, police, and others
- **"Sub-to-Master" and "Master-to-Master" Station Communication**
- **Proven TOA Quality and Reliability**
- **UL-Listed, Manufactured to ISO-9001 Standards**
- **User-Friendly Installation, Setup and Maintenance**
- **Modular Design** — Scalable for cost-effective system configurations with easy system expansion
- **Station Capacity**:
  Single Exchange Mainframe: 4 Master stations and 64 Sub-stations
  Up to 16 Tie-lined Exchange Mainframes: 64 Master stations and 1,024 Sub-stations
- **Flexible Programming and Control Software** — For setup and maintenance of multiple exchanges from one PC or remotely via modem
- **Security System Integration** — Communication protocol available for remote control and monitoring of intercom system functions from external devices
- **Comprehensive Call Forwarding Features** — Busy, No-Answer, C/O Line and Time-Based to prevent unanswered calls and allow attendant mobility
- **Recording Outputs** — For individual conversation recording of each master station, telephone master station and telephone line port with start/stop control activation
- **Event Logging** — All system events are date and time-stamped for PC archiving
- **Master Station Flexibility** — Supports TOA MS-900 or standard Caller-ID analog telephones
- **Console Master Interface** — Allows custom master station fabrication with headset, microphone, speaker, and key ports
- **Durable Sub-stations** — Choose from Economy, Indoor, Outdoor, and Panic models, each with heavy-duty plate, call-switch and optional LED/relay control
- **Simple "Star Configuration" Wiring** — Each station connects to exchange via shielded, twisted pair (sub) or two twisted pairs (master)
- **Extended Cable Runs** — Master Stations: 7,546 ft. , Sub-stations: 4,265 ft. and Tie-Lined Exchanges: 4,921 ft. (#20 AWG)
- **Site Connector Interface** — Allows remote exchange connections with fiber optic or other media converters
- **Telephone Interface** supports two outside C/O telephone lines or trunks
- **Paging Interface** — For external amplifier zone distribution with sixteen control ports
- **External Source Input** — For station and external amplifier zone distribution with four trigger inputs
- **Two Year Warranty**

Applications

- Access Control
- Corporate Security
- Correctional Institutions
- Educational Facilities
- Government
- Hospital Access Points
- Industrial
- Military
- Parking Garages
- Parking Structures
- Police
- Restricted Door Access

TOA

Scalable Architecture — The expandable, modular design allows you to specify the most cost-effective station configuration for each installation. A single VS-900MF exchange mainframe supports up to 4 master stations and 64 sub-stations. You can easily connect up to 16 exchanges for a maximum of 64 master stations and 1024 sub-stations.

Master Station Flexibility — Along with TOA MS-900 Master Stations, the VS-900 also supports standard analog Caller-ID telephones.*

Direct Select Interface — The Direct Select Interface cards provide external relays, Call-LED drivers and direct select switch inputs for applications requiring camera control, access control or custom annunciator panels. The interface can also be used for custom master stations with headset interface, microphone input, speaker output and key inputs.

System Integration Solution — VS-900 functions can be both remote controlled and monitored with a serial RS-232 data connection. A simple communications protocol allows integration with access control and video surveillance equipment such as camera controllers, PLC's, and touch-screens.

Flexible Programming and Control Software — System programming and maintenance is accomplished with flexible Microsoft Windows®-based software. Features include system configuration, remote dialing, event logging and communication monitoring. Systems can be set up at the office and uploaded to the VS-900 at the job-site. In multi-exchange systems, you can program and maintain up to sixteen exchanges from a single connection. Programming and event log data can be easily saved to disk or printed.

Remote System Management — The software accommodates a dial-up modem connection for off-site programming and maintenance of up to 16 exchanges.

Telephone System Integration — With the VS-900CO Telephone Interface card, you can connect up to two outside telephone lines or trunks to each exchange allowing the following convenient features.

Call Forwarding — Automatically route station calls to offsite locations.

Outside Line Access — Dialing a pre-assigned access number allows master stations to access an outside telephone line for outgoing calls.

Direct-In Line/Group Call — Routes incoming telephone calls to individual or multiple master stations simultaneously.

Direct-In Dial — Incoming telephone line callers can dial specific master or sub-stations directly.

Master Station Features — The TOA MS-900 Master Station includes a 12-digit alphanumeric LCD, clock, 8 programmable auto-dial keys and the following convenient functions.

Alphanumeric Station Numbering — For easily recognizable dialing and display, station numbering is fully programmable for both 2 to 6 digit and 8 alphanumeric characters.

Call-In Display Priority — Sub-stations can be assigned either Emergency or Normal display priority in the master station queue during multiple station call-in.

Call Queuing — Up to 64 incoming calls can be queued in order of pre-assigned priority and answered in any order. Once an existing call is terminated, the next call moves to the top of the queue.

Selective Response — The master station operator can scroll through a list of multiple incoming calls and select a specific station call to answer.

Redial — The master station operator can redial the last dialed key sequence with a single key operation.

Call Hold — The master station operator can place an answered call on hold.

Call Transfer — The master station operator can place an answered call on hold, dial a third party and then either transfer the original calling party or return to the original conversation.

Auto-Dial — Each master station operator can assign frequently dialed station numbers or dialing sequences to eight programmable keys to allow convenient one-touch operation.

Multiple Communication Modes — Depending on the type of station in use, users have the choice of Handset, Hands-free and Press-to-talk (Simplex) Communication.

Call Forwarding — Incoming calls to a master station can be forwarded internally, manually or automatically, to another master station or group of master stations or externally, to an outside telephone number or PBX extension.

Manual Forwarding — Each master station can manually dial a key sequence to route future sub-station calls to a new destination.

Remote Forwarding (Call Capture) — Sub-station calls to a master station can be forwarded to a new destination from a remote master station location.

Time-Based Forwarding (Automatic) — Sub-station calls to a master station can be automatically forwarded at a pre-programmed time to a new destination and then automatically reset to normal operation. Ideal for shift changes or off-hours security.

No Answer Forwarding — Sub-station calls to a master station can be automatically forwarded to other master stations, outside telephone or PBX extension after a specific number of unanswered rings.

Busy Forwarding — Sub-station calls to a master station can be automatically forwarded to a master station or outside telephone if the called master station is busy.

Off-Site Forwarding / Outside Line Call Forwarding — Station calls can also be routed via Call Forwarding to a preprogrammed outside telephone number.

Master Station Group Call — Routes incoming sub-station calls to multiple master stations simultaneously.

Conference / Emergency Conference — Any master station can initiate a conference with up to two other master stations. A pre-assigned four station emergency conference can also be initiated with a single key sequence.

Audio Monitoring — Real-time audio monitoring of pre-programmed sub-station groups with automatic scrolling and stop/forward/back control.

Event Logging — System events are stored with station numbers, date and time stamp for PC archiving.

Voice Recording — All master station, telephone master stations and telephone line ports have individual recording outputs for recording conversation audio. Each has an associated control port for start/stop control of an external recording device for the beginning and end of the conversation.

Paging — Master stations and telephone master stations can initiate paging to up to 19 sub-station zones, All-Zones and Emergency All-Stations/Zones. A separate Paging Output is also available for connection to an external paging amplifier along with 16 programmable control outputs for external relay activation.

Automatic Time-out — A preprogrammed time limit allows automatic termination of Incoming Station Calls, Conversations and Paging.

External Source Input — Line input for connecting an external music source or tone generator. Four programmable trigger inputs distribute the external source to pre-programmed zones.

*See VS-900 Operating Instructions for details on Telephone Master Station features.
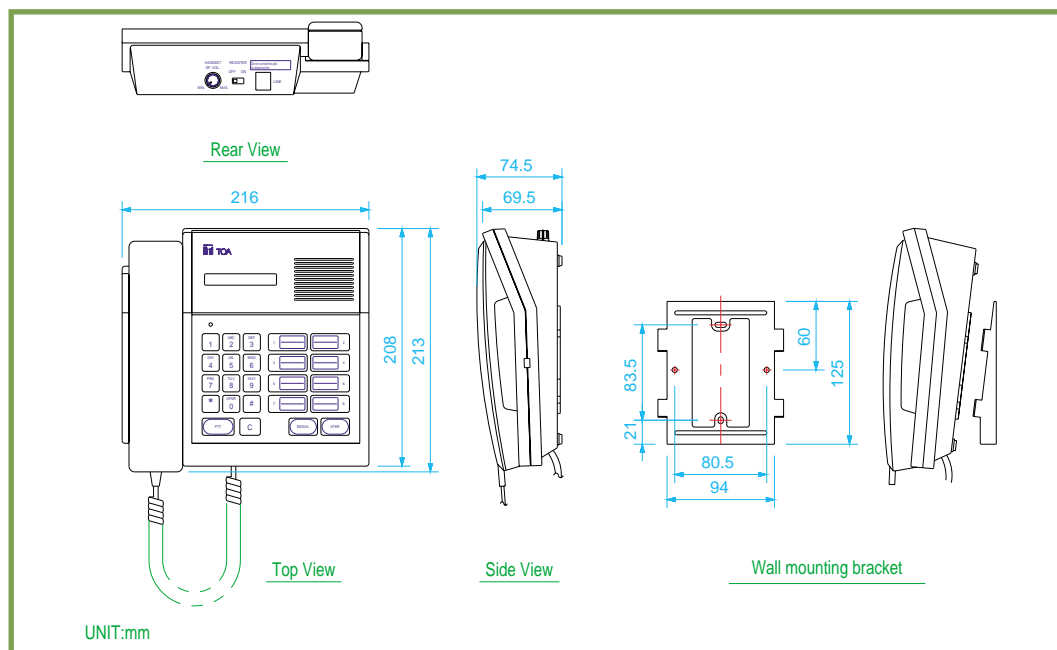
MS-900
Master Station

- Connects to VS-900MS card using two-twisted pair wiring
- Handset and hands-free speaker/microphone
- Alpha-numeric, 12 character display
- Digital clock display
- In-use indicator
- Eight programmable auto-dial keys
- Press-to-talk, redial and transfer keys
- Station number directory
- Adjustable speaker volume and microphone sensitivity
- Speaker High/Low volume selector switch
- Standard RJ-11 telephone jack
- External speaker terminals for high ambient noise areas
- Wall-mount bracket included

Power Source	24 VDC (supplied from the VS-900MS)
Communication Modes	Duplex, half-duplex and PTT
Frequency Response (Speech)	300 – 3,400 Hz
Handset Microphone/ Speaker	Dynamic type, 150 ohms
Handsfree Microphone	Electret condenser microphone
Station Speaker	Dynamic type, 8 ohms, 2.24" (57 mm), 0.6 W
Key Pad	Membrane switches
Display	12 digit LCD
Auto-Dialing	8 keys (programmable)
Station Speaker Volume Control	2-step selection slide switch
Handset Speaker Volume Control	Volume, 0 to +12 dB
Installation Method	Desk/Wall-mount
Wiring	Two twisted pair cables
Connectors	Modular jack (RJ-11 type) External speaker output: screw terminal (8 ohms, 0.6 W)
Operating Temperature	32° - 104° F (0° - 40° C)
Finish	ABS resin, pale white
Dimensions (W x H x D)	8.50" x 2.93" x 8.39" (216 mm x 74.5 mm x 213 mm)
Weight	2.07 lbs. (940 g)
Maximum Service Distance*	24 AWG 2,953 ft./0.56 mile (0.9 km) 22 AWG 4,921 ft./0.93 mile (1.5 km) 20 AWG 7,546 ft./1.43 mile (2.3 km)

*Distance may be limited by job site conditions.

Rear View

216

74.5
69.5

208
213

83.5
21
80.5
94
60
125

Top View

Side View

Wall mounting bracket

UNIT:mm

RS-150
Economy Indoor Sub-station

RS-160
Indoor Vandal Sub-station

RS-170
**Outdoor Vandal Sub-station**

RS-180
Outdoor Panic Sub-station

- Heavy-duty brushed stainless steel faceplate, #11 GA (RS-150: #14 GA)
- Vandal-resistant call button (except RS-150)
- Weather-resistant models (RS-170 and RS-180)
- Connects to VS-900RS card using shielded, twisted pair wiring*
- Mounts in two-gang deep electrical box with adapter ring (supplied by others)
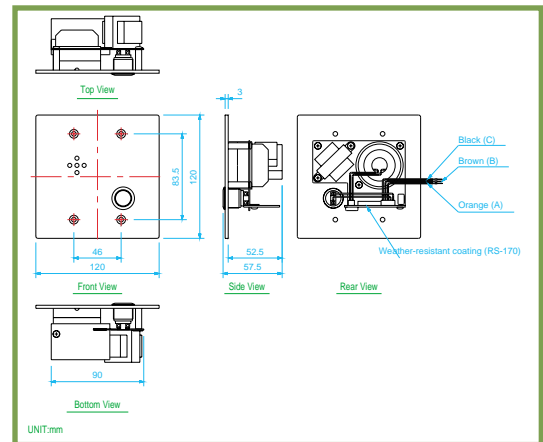
RS-180

- Red vandal-resistant call button
- Red Call Assurance LED for ADA-compliance
- Control output – open collector-type for external relay control
- Labeling area for ADA-compliant message

|	
Input Power	1 W
Impedance	625 ohms (1 W @ 25 V line)
Output SPL (1 W/1 m)	82 dB SPL
Frequency Response	300 to 4k Hz
Internal Speaker	1.57" (4 cm) Mylar cone
Sensitivity as Microphone	-40 dB (0 dB = 1 V/Pa)
Faceplate	Brushed stainless steel RS-150: #14 gauge (2 mm) RS-160/170/180: #11 gauge (3 mm)
Weather-Resistant Coating	Synthetic rubber sealant (RS-170/180)
Call Button (Momentary-action)	RS-150: Resin, black RS-160/170: Stainless steel, silver RS-180: Aluminum, red
Call LED (RS-180)	Red LED
Control Output (RS-180)	Open-collector type, 30 mA, 24 VDC
Ambient Temperature	RS-150: $+14^{o}$ – $+122^{o}$ F ($^{-}10^{o}$ – $+50^{o}$ C) RS-160/170/180: $+14^{o}$ – $+131^{o}$ F ($^{-}10^{o}$ – $+55^{o}$ C)
Dimensions	Faceplate: 4.72" x 4.72" (120 mm x 120 mm) Maximum depth: 2.1" (52.5 mm) Mounting hole spacing: 1.81" x 3.28" (46 mm x 83.5 mm)
Weight	RS-150: 0.90 lbs (410 g) RS-160/170: 1.19 lbs (540 g) RS-180: 1.26 lbs (570 g)
Accessories	Nickel-plated steel, slotted, oval head screw No. 6 - 32 (4 pcs.)
Maximum Service Distance**	24 AWG 1,640 ft./0.31 miles (0.5 km) 22 AWG 2,625 ft./0.5 miles (0.8 km) 20 AWG 4,265 ft./0.81 miles (1.3 km)
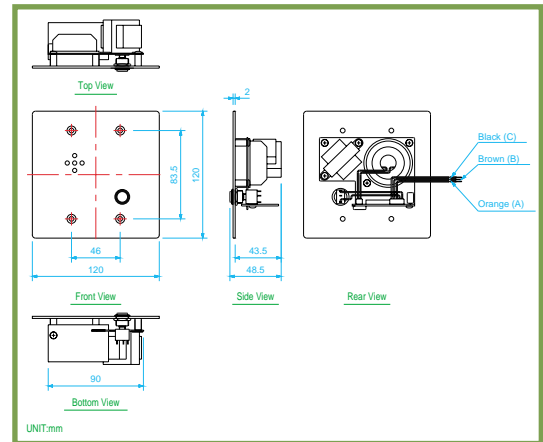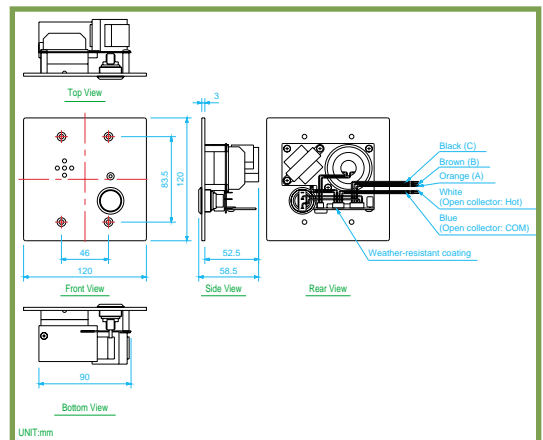
*Note: Fiber optic interfaces available from others.
**Distance may be limited by job site conditions.

RS-150

RS-160/RS-170

RS-180

VS-900MF
Exchange Mainframe

- ■ Mainframe for system cards
- ■ Supports up to 4 master stations and 64 sub-stations
- ■ Requires one PU-200 Power Supply for 32 sub-stations and 2 PU-200 for 33-64 sub-stations
- ■ 24 VDC input for backup power supply
- ■ ON/OFF Switch
- ■ LED's for Status Indication
- ■ Microsoft Windows®-based PC required for system programming
- ■ All programming stored in non-volatile EEPROM
- ■ 2 RS-232 ports (programming / logging)
- ■ Rack-mount brackets included (10 RU)
- ■ Optional wall-mount bracket, model YC-303

Slot	Card Type
1	**VS-900MS** Master Station Line Card (2 ports) or **VS-900AL** Telephone Master Station Line Card (2 ports)
2	**VS-900MS** Master Station Line Card (2 ports) or **VS-900AL** Telephone Master Station Line Card (2 ports)
3	**VS-900RS** Sub-station Line Card (16 ports)
4	**VS-900RS** Sub-station Line Card (16 ports)
5	**VS-900RS** Sub-station Line Card (16 ports)*
6	**VS-900RS** Sub-station Line Card (16 ports)*
7	**VS-900CO** C/O Telephone Line Card (2 ports)
8	**VS-900AF** Audio Function Card (paging/input/conference)
9	**VS-900TI** Tie-Line Interface Card (multi-exchange)

*Add second PU-200 Power Supply for 3 or more VS-900RS.

Power Source	20 VAC, 24 VDC
Current Consumption	7 A
Speech Path Configuration	Time sharing digital switch
Internal Sound Source	12 types
Serial Ports	Complies with the RS-232C Standard, D-sub connector (9-pin, female), 2 ports
Installation Method	Rack-mount or wall-mountable with YC-303
Other	Real time clock for time control Unit presence/non-presence detection System programming Power switch
Connectors	Bus connector: DIN connector (64-pin, female) x 9 (2) PU-200 connection terminal: 4-pin x 2 24 VDC input terminal: 4-pin (with grounding terminal)
Operating Temperature	32° - 104° F (0° - 40° C)
Finish	Pre-coated steel plate, black, 30% gloss
Dimensions (W x H x D)	16.54" x 17.47" x 11.35" (420 x 443.7 x 288.3 mm)
Weight	28 lbs. (12.7 kg)
Accessories (included)	Rack-mount bracket (2) and screws (8) Mounting screw (M4 x 10) (6) Cable clip (20) 4-pin removable terminal block (3) Lithium battery (CR2032) Floppy disk (Microsoft Windows®-based software) (2) Operating/Installation/Software manuals (1 set)

Top View

Front view without front panel

Front View

Side View

UNIT:mm
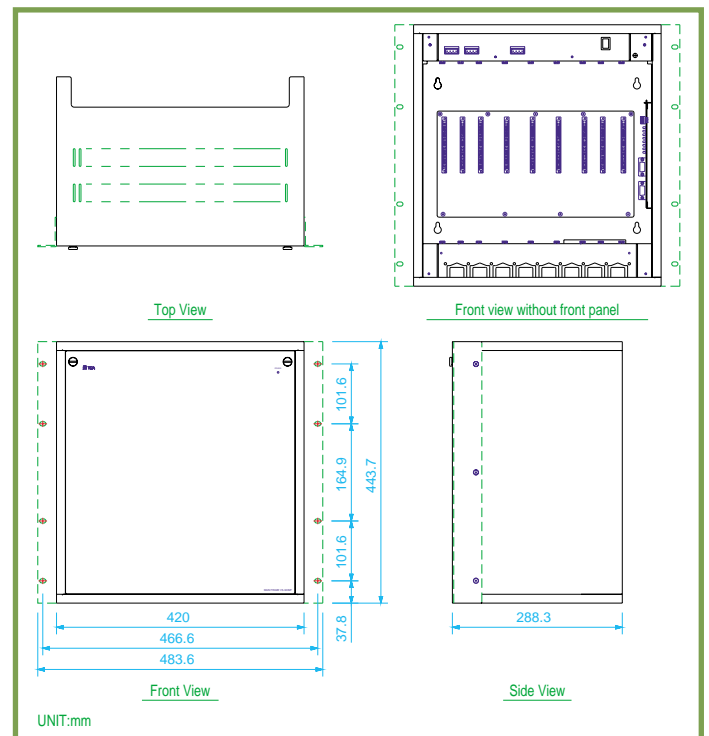
PU-200
Power Supply for VS-900MF

- Connects to the VS-900MF and provides two 20 VAC outputs
- One PU-200 supports 1 or 2 VS-900RS, two PU-200 support 3 or 4 VS-900RS
- Wall-mount brackets included
- Optional rack-mount panel, model PN-100B

Power Requirements	110/120 VAC, 50/60 Hz
Output Voltage	20 VAC x 2
Output Current	2.5 A x 2
Finish	Color steel plate, ivory
Dimensions (W x H x D)	6.30" x 2.68" x 7.01" (160 x 68 x 178 mm)
Weight	6.17 lbs. (2.8 kg)
Accessories (included)	Round head wood screw (3.5 x 25) (4) Fuse (125 V, 4 A) (2) Fuse (250 V, 2 A) (1) Wall-mount brackets (2)

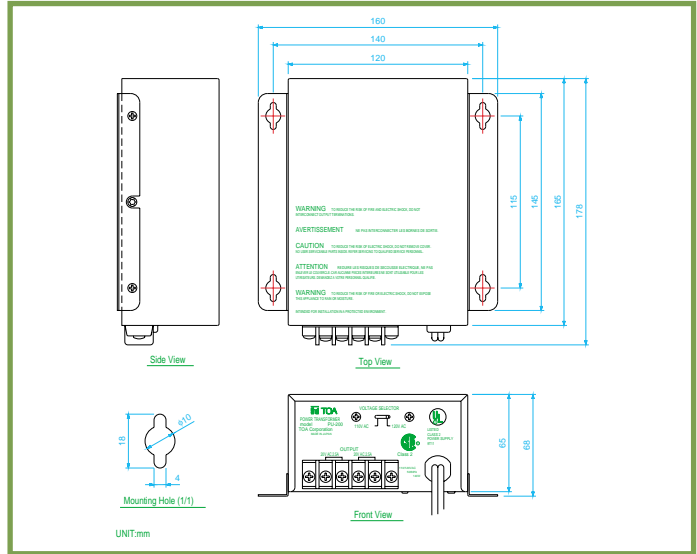## PN-100B
Rack-Mount Panel for (2) PU-200 (4 RU)

YC-303
Wall-Mount Bracket for VS-900MF

Finish	Steel, black, electrode position paint
Dimensions (W x H x D)	15.41" x 17.32" x 2.28" (391.4 x 440 x 58 mm)
Weight	4.63 lbs. (2.1 kg)
Accessories (included)	Wood screw (5.1 x 38) (4) Tapping screw (4 x 12) (4)

PU-200

Side View
Top View
Mounting Hole (1/1)
Front View
UNIT:mm

PN-100B

Top View
4-7φ10.5
466
483
101.6
177
37.7
10
Side View
Front View
UNIT:mm

YC-303

99
200
440
290
338
391.4
58
Front View
Side View
Mainframe VS-900MF
36.2   66   78   78   78
Bottom View
UNIT:mm

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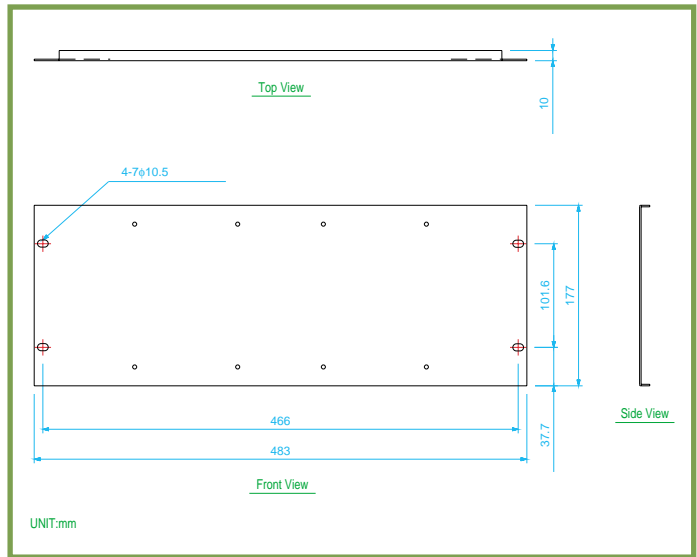
VS-900MS
Master Station Line Card

- Two MS-900 Master Station ports
- Two Recording Line outputs
- Two Recording Control outputs (open collector)
- Removable terminal blocks

VS-900AL
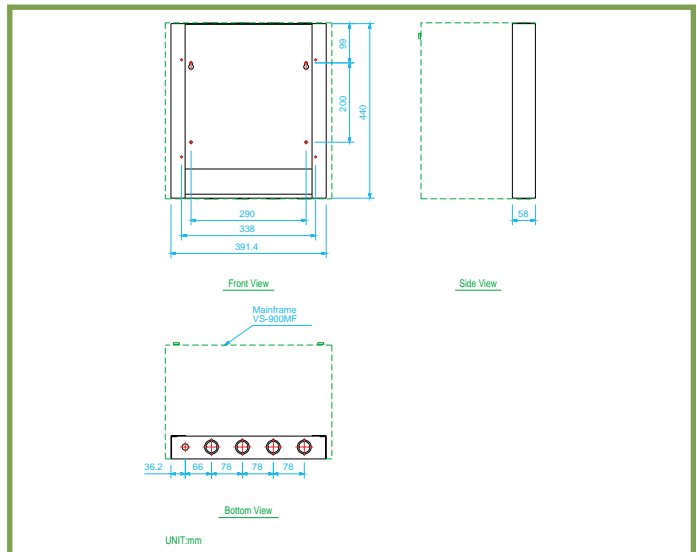**Telephone Master Station Line Card**

- Two standard analog telephone ports*
- Caller-ID Signalling
- Two Recording Line outputs
- Two Recording Control outputs (open collector)
- Removable terminal blocks

VS-900RS
Sub-station Line Card

- Sixteen RS Sub-station ports
- Two talk paths/speech links (one speech, one speech/paging)
- Paging input and output for external paging amplifier connection
- Removable terminal blocks

* Telephone equipment supplied by others

VS-900MS

Number of Lines	2 lines
Conversation Recording Output	Audio signal: 0 dBV, unbalanced Control signal: Open collector output, 24 VDC max. Control current: 20 mA
Connectors	Mainframe: DIN connector (64-pin, male) Line output: 4-pin x 2 Recording audio/control output: 4-pin x 2

VS-900AL

Number of Lines	2 lines
Conversation Recording Output	Audio signal: 0 dBV, unbalanced Control signal: Open collector output, 24 VDC max. Control current: 20 mA
Selectable Signal Type	DTMF
Monitoring Function	Line loop detection function
Applicable Terminal	Telephone sets to comply with FCC Part 68
Control Function	Call signal transmission, audible signal transmission, caller identification signal transmission (Caller ID Function)
Connectors	Mainframe: DIN connector (64-pin, male) Line output: 2-pin x 2 Recording audio/control output: 4-pin x 2
Maximum Service Distance	Loop resistance less than 500 ohms (including telephone)

VS-900RS

Number of Lines	16 Sub-station lines
Number of Links	2 links (1 Speech, 1 Speech/Paging)
Paging Output	Unbalanced, -20 dBV, 2k Ω
Paging Input	Balanced, 25 V line amplifier, 16 W min.
Conversation Method	Half-duplex conversation by voice-operated switch or simplex conversation by PTT switch
Power Output	1 W @ 25 V line per speech link
Other	Call button detection function and speech link control function
Connectors	Mainframe: DIN connector (64-pin, male) Sub-station: Two-core shielded cable (3-pin) x 16

VS-900 Interface Cards

VS-900CO
C/O Telephone Interface Card

- Two Outside Telephone (C/O) Line ports
- Two Recording Line outputs
- Two Recording Control outputs (open collector)
- Removable terminal blocks

VS-900CO

Number of Lines	2 lines
Conversation Recording Output	Audio signal: 0 dBV, unbalanced Control signal: Open collector output, 24 VDC max. Control current: 20 mA
Selectable Signal Type	DTMF
Signal Format	Loop start and Ground start compatible
Main Functions	DTMF dial signal transmission function, DTMF signal detection function Call signal (receiving) detection
Connectors	Mainframe: DIN connector (64-pin, male) C/O line: 4-pin x 2 Recording audio/control output: 4-pin x 2

VS-900AF
Audio Function Card

- Paging Line output
- Sixteen Paging Control outputs (open collector)
- External Source Line input
- Four External Source Trigger inputs for zone distribution
- Link for Conference and Emergency Conference features
- Removable terminal blocks

VS-900AF

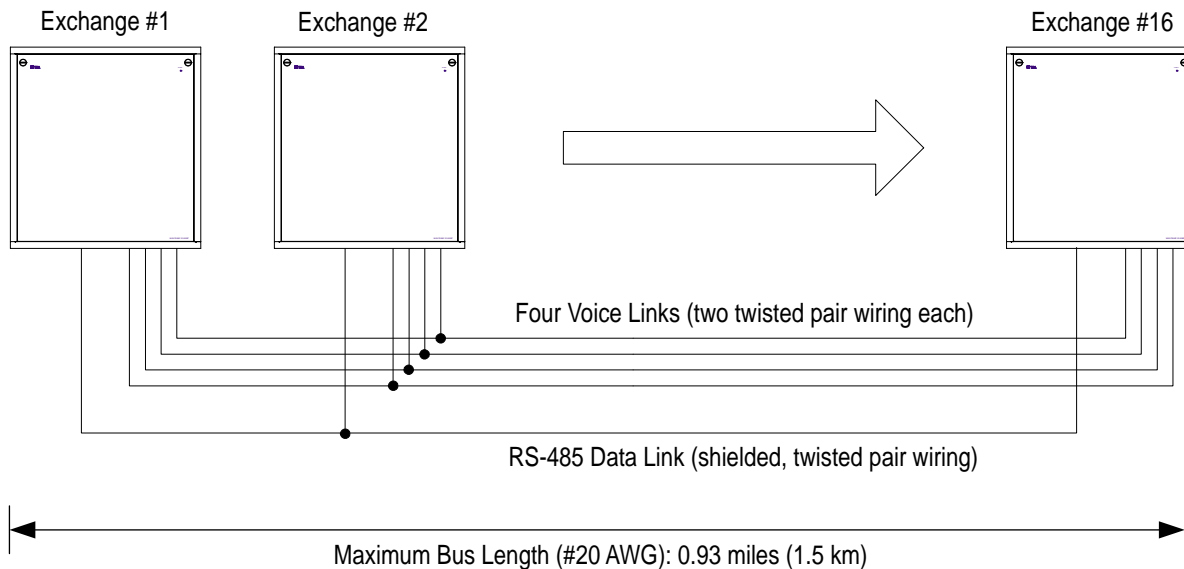|	
Paging Output	Audio output: 1 output, 0 dBV, unbalanced, 1k Ω Control output: Open collector output, 24 VDC max. Control current: 20 mA
External Source Distribution	Audio input: 1 input, 0 dBV, unbalanced, 22k Ω Control input: 4 inputs, no-voltage make contact Open voltage: 24 VDC, short circuit current: 20 mA
Conference Link	1 link (up to 4-party conference)
Connectors	Mainframe: DIN connector (64-pin, male) External interface side: Voice output 2-pin Control output 2-pin x 16 Voice input 2-pin Control input 2-pin x 4

VS-900TI
Tie-Line Interface Card

- Required in each VS-900MF exchange in a multi-exchange tie-lined system (16 maximum)

- Multi-drop (bussed) configuration simplifies wiring

- Up to four Voice Links (4x Send/4x Receive), two twisted pair wiring each*

- One Data Link, RS-485, shielded twisted pair wiring

- Removable terminal blocks

Number of Audio Links	4 links
Connection Format	Multi-drop (bussed)
Transmitting System	Data: RS-485 Voice: Base band
Input/Output Level	Voice: 0 dBu, balanced Data: In compliance with RS-485 Standard
Other	Exchange number setting function
Connectors	Mainframe: DIN connector (64-pin, male) Tie-line interface side: 4-pin x 4 (Voice line) 4-pin x 1 (Data line)
Maximum Bus Length (All Exchanges)*	24 AWG 1,969 ft./0.37 mile (0.6 km) 22 AWG 3,281 ft./0.62 mile (1 km) 20 AWG 4,921 ft./0.93 mile (1.5 km)

*Distance may be limited by job site conditions. To connect exchanges using fiber optic hardware, use the VS-900SC Site Connector, page 10. Fiber optic interfaces available from others.

Tie-Line Up to Sixteen VS-900MF Exchange Mainframes

Exchange #1   Exchange #2   Exchange #16

Four Voice Links (two twisted pair wiring each)

RS-485 Data Link (shielded, twisted pair wiring)

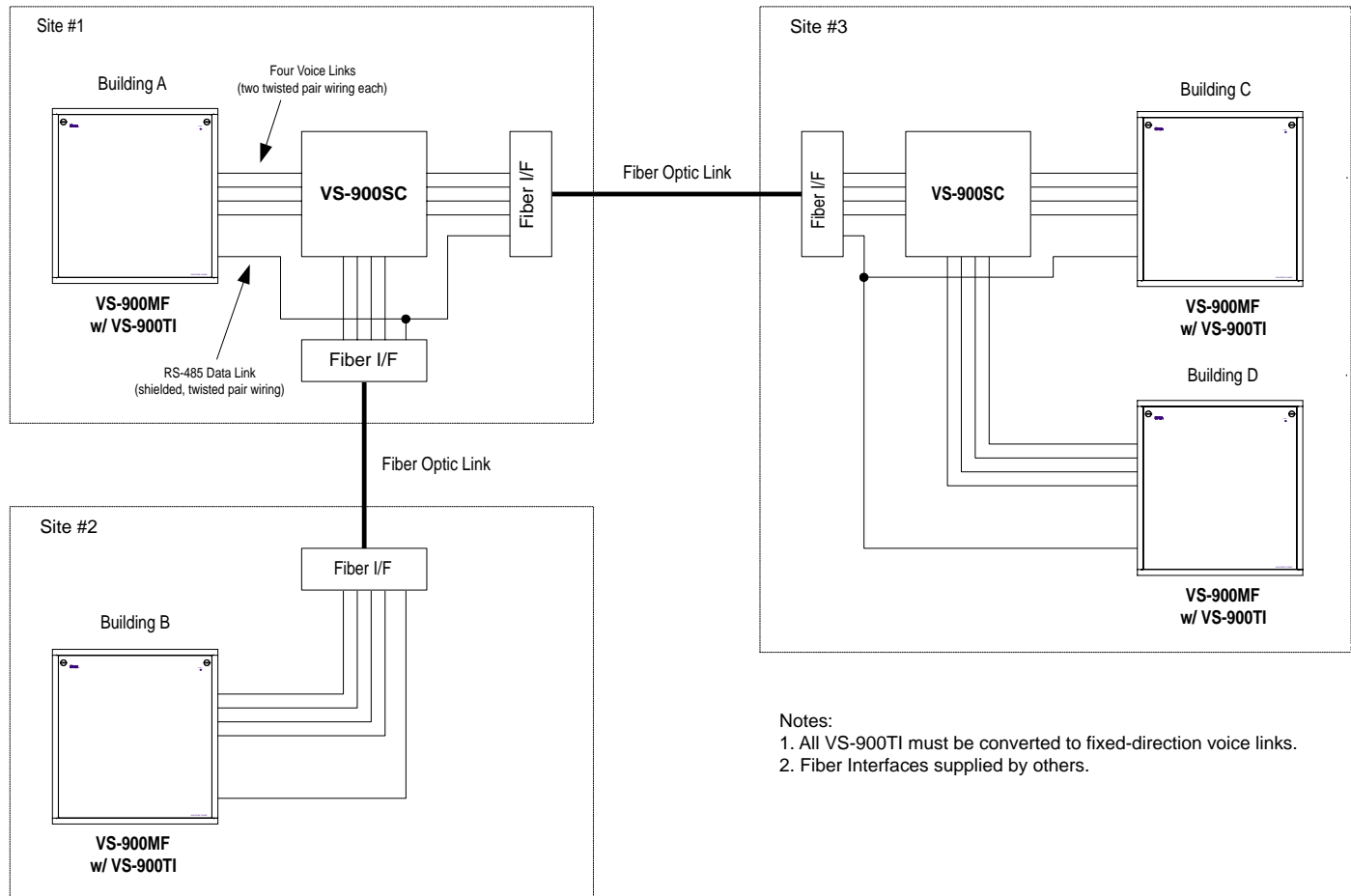Maximum Bus Length (#20 AWG): 0.93 miles (1.5 km)

VS-900SC
Site Connector Tie-Line Interface

- Allows you to connect exchanges using standard audio fiber interfaces or other media converters (supplied by others)

- Combines up to four voice links from two exchanges

- Two exchange systems requiring fiber or other media connection do not require the VS-900SC

- Requires external power supply, model PU-200

- To determine the number of VS-900SC, subtract "two" from the total number of VS-900MF Exchange Mainframes. For example, a system with ten VS-900MF will require eight VS-900SC.

System Example

Site #1

Building A

Four Voice Links
(two twisted pair wiring each)

VS-900SC

Fiber I/F

VS-900MF
w/ VS-900TI

RS-485 Data Link
(shielded, twisted pair wiring)

Fiber I/F

Fiber Optic Link

Site #3

Building C

Fiber I/F

VS-900SC

VS-900MF
w/ VS-900TI

Building D

VS-900MF
w/ VS-900TI

Fiber Optic Link

Site #2

Fiber I/F

Building B

VS-900MF
w/ VS-900TI

Notes:
1. All VS-900TI must be converted to fixed-direction voice links.
2. Fiber Interfaces supplied by others.

VS-900DI
Direct Select/Master Station Interface Card

- Supports up to (32) VS-910DI Direct Select I/O cards
- Connects between MS-900 Master Station and VS-900MS port
- Use standalone without MS-900 to provide interface for custom master stations.
- Headset port
- Microphone input
- Speaker output (1 W, 8 Ohms)
- Key Input terminals (XFER, PTT, C)
- In-use Indication output
- Requires 24 VDC (1 A) power supply, model XPS-24VS
- Mountable in user-supplied console or enclosure

VS-900DI

Power Source	24 VDC ±10%/1 A
Maximum Number of Connectable VS-900DI Cards	4 per exchange, 64 per system (16 tie-lined exchanges)
Function Key Input	One each of [C], [PTT], [Xfer], and [Test] keys, dry contact, 5 VDC/0.5 mA Contact resistance: <50 ohms, 8-pole screwless terminal
Communication Line	1 line for VS-900 exchange (VS-900MS card) and 1 line for MS-900 master station, One 6-position/4-contact modular jack for each line
In-Use Indication Output	Open collector output, 24 VDC/approx. 100 mA, 2 pole screwless terminal
Electret Microphone Input	Microphone sensitivity: -75 to -65 dBV, 5 VDC phantom power supply, 2-pole screwless terminal
Speaker Output	Speaker impedance: 8 ohms, power output: 1 W maximum, 2-pole screwless terminal
Headset Connection	Microphone sensitivity: -75 to -65 dBV, speaker impedance: 200 to 400 ohms, detection jack contact input [Det.]: 5 VDC/10 mA, contact resistance: <10 ohms, 8-pole screwless terminal
PC Interface	RS-232C D-sub connector (9 poles, female type)
Maximum Service Distance* (including MS-900)	24 AWG 2,953 ft./0.56 mile (0.9km) 22 AWG 4,921 ft./0.93 mile (1.5 km) 20 AWG 7,546 ft./1.43 mile (2.3 km)

*Distance may be limited by job site conditions.

VS-910DI
Direct Select I/O Card

- Connects to VS-900DI (32 max.)
- 32 Programmable Relay outputs (24 VDC, 1 A)
- 32 Programmable Call-LED drivers (Open collector type)
- 32 Programmable Direct Select Switch inputs
- Relays Programmable to Activate at Call In or Call Answer
- Requires 24 VDC (1 A) power supply, model XPS-24VS
- Mountable in user-supplied console or enclosure

VS-910DI

Power Source	24 VDC ±10%/1 A
VS-910DI Ports	32 relay outputs (call- or response-activated relay output), 24 VDC/1 A, 50-pole "CHAMP" IDC (Amphenol) connector*
	32 open collector outputs (for LED indication of incoming and outgoing calls) 24 VDC/approx. 100 mA, 50-pole "CHAMP" IDC (Amphenol) connector*
	32 switch inputs (for calling and response switch operation), dry contact, 5 VDC/0.5 mA, contact resistance: <50 ohms, 50-pole "CHAMP" IDC (Amphenol) connector*
Maximum Number of VS-910DIs per VS-900DI	32
Maximum Number of Ports per Full VS-910DI-Mounted System	1,024 relay outputs (call- or response-activated relay output)
	1,024 open collector outputs (for LED indication of incoming and outgoing calls)
	1,024 switch inputs (for calling and response switch operation)

* Mating connectors supplied by others.

VS-900 SYSTEM CONFIGURATION

Master Stations[1]	Sub-stations[2]	VS-900MF	PU-200	VS-900MS/AL	VS-900RS	VS-900CO[3]	VS-900AF[3]	VS-900TI
4	64	1	2	2	4	1	1	0
8	128	2	4	4	8	2	2	2
12	192	3	6	6	12	3	3	3
16	256	4	8	8	16	4	4	4
20	320	5	10	10	20	5	5	5
24	384	6	12	12	24	6	6	6
28	448	7	14	14	28	7	7	7
32	512	8	16	16	32	8	8	8
36	576	9	18	18	36	9	9	9
40	640	10	20	20	40	10	10	10
44	704	11	22	22	44	11	11	11
48	768	12	24	24	48	12	12	12
52	832	13	26	26	52	13	13	13
56	896	14	28	28	56	14	14	14
60	960	15	30	30	60	15	15	15
64	1024	16	32	32	64	16	16	16

[1]TOA MS-900 Master Station or analog (DTMF) telephone (supplied by others)
[2]RS-150, RS-160, RS-170, RS-180
[3]Optional, see page 8 for details

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Installation and Operating Manuals
Estimate Worksheet
Architects and Engineering Specifications
Control Software
CAD Files
Application Notes

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