BridgeWay® M8100 Radio/Intercom VoIP Gateway System Overview

System Overview

The BridgeWay M8100 system provides SIP and H.323 voice over IP (VoIP) communications between mobile radio, SATCOM terminals, telephone systems, user headsets and VoIP networked communication terminals. The environmentally sealed M8100 meets MIL-STD-810 standards for operation in extreme ground and surface platform environments.

BridgeWay supports multiple simultaneous radio repeater, cross-patch, conference and intercom network connections. An embedded TDM switch provides dial access to combat radio and intercom nets from IP phones, PC's and legacy telephones.

The BridgeWay system provides next generation radio and intercom communications capabilities while dramatically reducing size, weight and power requirements over previous generation technology. BridgeWay systems may be networked and console operators may log into any networked terminal.

BridgeWay integrates 4 (M4100) or 8 (M8100) radio ports, VoIP Gateway, client server, communications switch and call manager into a single compact, light weight and low power vehicle based system.

A plug in option card for the M8100 supports quad FXO telephone lines and a single Primary Rate ISDN T1/E1 span.

Voiceboard offers a BridgeWay compatible line of rugged mobile PC operator terminals, intercom stations and headset boxes. BridgeWay systems are configurable via a network connected operation, administration and maintenance PC.

Radio Ports

Bridgeway analog radio/audio ports feature transformer isolated 4-wire audio, Carrier Operated relay (COR) inputs and relay operated PTT transmit control.

VoIP Gateway

Depending upon the installed DSP capacity, the BridgeWay embedded H.323 or SIP Gateway supports from 16-128 VoIP terminal devices, such as IP telephones, PC laptops and operator workstations.

Dual 10/100bT Ethernet LAN connections are provided for VoIP communications and a 1G fiber or copper LAN port is optional.

BridgeWay M8100

Remote Radio Configuration and Data Communications

BridgeWay may also be equipped to remotely configure radio base stations from a PC operator console GUI, including frequency, squelch disable, vehicle ID capture and more.

BridgeWay's radio configuration messaging protocols are programmable for compatibility to all radios with RS-232, RS-422/RS-485 or Ethernet radio interface ports.

BridgeWay may also transmit and receive data between IP networked operator terminals and RS-232, RS-422/RS-485 or Ethernet radio data ports.

BridgeWay Power

The M8100 BridgeWay systems operate from 9-36 VDC vehicle power, or from 110/220 VAC power with an auto-switching external power pack. A MIL-STD-2175B power supply is optional.

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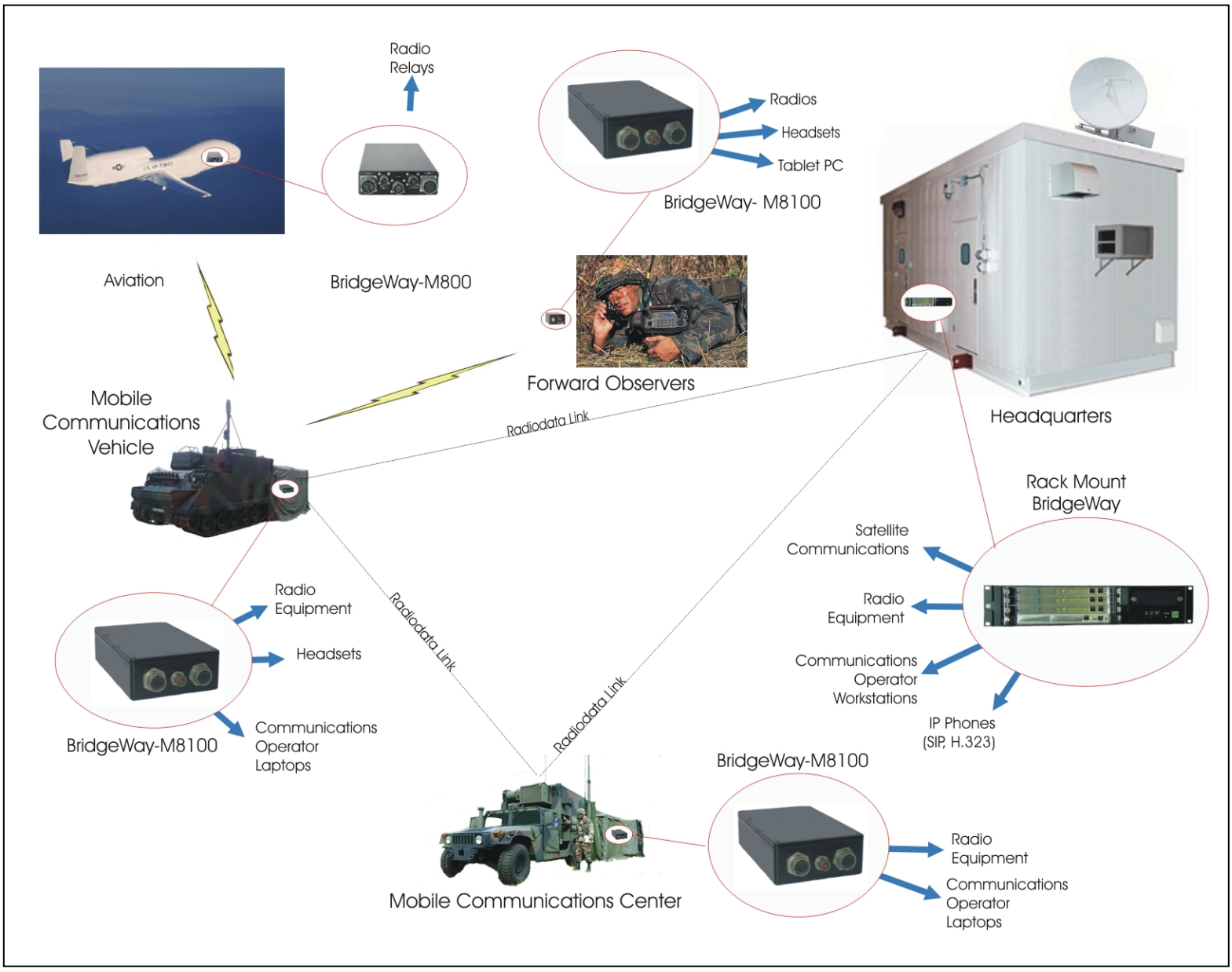

BRIDGEWAY TACTICAL COMMUNICATIONS NETWORK

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FEATURES AND BENEFITS LISTING

- 2/4 wire transformer isolated audio interfaces with software programmable I/O gain adapt to all radio types.
- Programmable PTT + COR signal lines provide universal compatibility with radio base station and repeater equipment.
- Software programmable remote radio configuration option adapts to all types of radios equipped with RS232/RS485 serial digital or IP ports.
- Programmable remote radio configuration features include: PTT, frequency selection, squelch bypass, caller ID capture and more.
- VoIP Gateway interoperates radio and telephone systems with industry standard SIP or H.323 PC's, communication terminals, IP phones and call manager systems
- Automated call routing feature allows networked user dial access to multiple combat net radios, intercom nets and meet me conferences
- Configurable Voice detect and IP packet detect VOX transmit control modes
- MC^2 operator terminal GUI features simultaneous monitoring/mixing of multiple channels with individual gain control, multi-channel intercom, soft phone, simulcast, personalized operator screen configurations, remote radio control and more.
- Optional T1/E1 ISDN and quad FXO ports network BridgeWay with PBX, PSTN, cellular, legacy POTS or SATCOM equipment
- Operator may simulcast transmissions to all users, or a selected group of users, efficiently handling group and emergency communications.
- SIP and H.323 Gateway includes standard G.7xx vocoders, jitter buffering, AGC and echo cancellation for universal VoIP terminal compatibility
- Remote software and configuration updates to on board flash
- Dual 10/100bT LAN ports with optional 1G copper or fiber LAN port allows operation with redundant LAN networks
- Built in test (BIT) and remotely activated self-test facilitates high availability operation.
- Optional "Tiger" software supports multiple operator radio dispatch operations. The Tiger configuration requires a separate networked computer for running Tiger server software.

BRIDGEWAY SOFTWARE

BridgeWay includes Voiceboard's MC^2 embedded call manager application software. The MC^2 call manager application supports compatible BridgeWay client GUI or third party GUI software products.

MC^2 call manager software networks multiple BridgeWay system nodes, allowing operators to access all BridgeWay connected radios or to log in via any LAN-connected VoIP terminal.

The embedded MC^2 call manager and web server eliminates the external server and call manager equipment typically required when using third party software GUI's, or when BridgeWay is connected to external telephone systems.

The BridgeWay JAVA programmed client GUI may be easily configured to meet unique requirements.

MC^2 CLIENT GUI

The MC^2 Client GUI allows operators to communicate via VoIP with multiple radios and telephones, setup radio-telephone patches and intercom nets. The MC^2 Client GUI will run on any laptop, computer or workstation supporting standard JAVA scripts.

Voiceboard offers BridgeWay MC^2 client GUI software customized to specific project requirements. Alternatively, the BridgeWay MC^2 client GUI source code and API may be licensed to users interested in

developing customized client workstation and administrative GUI's.

BCC VoIP Communications Console

BCC-1 Console

The BridgeWay Communications Console (BCC) is a rugged VoIP networked radio, telephone and intercom communications console designed for operation in mobile vehicle and shelter environments.

The BCC LCD/keyboard user interface is software programmable, including 5 function keys, radio and softphone control GUI's. The BCC console may be operated in LCD touch screen, mouse/keyboard or in key driven cursor interface modes.

The cursor driven mode uses the 5 BCC programmable function keys to allow the operator to select a desired radio or intercom channel. Both touch screen and key driven cursor mode interface options are designed for managing operator communications with combat networked multiple radio, telephone and intercom users.

The BCC operator may also conference, and patch radio and telephone users, make Public Address announcements and simultaneously broadcast to multiple radios and user terminals.

BCC consoles include a "softphone" that interoperates with industry standard SIP or H.323 computers, IP phones and IP network equipment.

The BCC console supports a variety of headset, microphone and speaker interfaces with "hot mic" or PTT operation.

The BCC console GUI configuration and user access privileges may be programmed remotely over the IP network by the System Administrator. Personalized GUI screens and access rights to specific conference nets, intercoms or radios are loaded to each BCC upon operator log-in.

Mission-specific GUI Screens, function keys and user access privileges are downloaded into each BCC.

BCC Features Listing

- Programmable GUI screens button and keys
- Selectable left-right binaural/monaural audio
- Multiple operator intercom channels
- SIP/H.323 interoperable "softphone"
- Push to talk (PTT) or "hot mic" operation
- Multi party "meet me" conferencing
- Radio and telephone call "patching"
- Simulcast "one-to-many" broadcast capability
- Power for ANR headsets and electret or condenser microphones
- Remote configuration and administration
- Personalized operator GUI screen
- 9-36 VDC @ 12W vehicle power or AC brick
- LCD display brightness control
- Internal microphone and speaker
- Water resistant IP65 (water stream) protection

OCS Communications Station

The BridgeWay LCD/keyboard Operator Communications Station (OCS) is an environmentally sealed MIL-STD-810 VoIP radio and intercom communications console.

The OCS panel is designed for field use with gloved hands. BridgeWay OCS supports military headsets, including ANR types. The LCD GUI may be customizable to specific program requirements.

OCS LCD/KEYBOARD OPERATOR COM STATION

OCS FEATURES LISTING:

- Programmable GUI screens
- Multiple intercom and conference nets
- Mix/monitor multiple radios and intercoms
- Select transmit channel, simulcast
- Low Power 9-32 VDC operation
- Environmentally sealed MIL-STD-810

ICS INTERCOM STATION

The ICS Intercom Station is a rugged VoIP SIP based intercom communications terminal designed for operation in harsh environments. ICS terminals may dial access combat net radios, telephones, conference and intercom nets, public address systems and other operators.

The ICS user programmable function keys allow the operator to select a desired radio or intercom channel via a single push button key.

Custom ICS configurations include programmable feature keys, optional LCD display, environmentally sealed enclosure, built in speaker/microphone and DC, AC or Power Over Ethernet (POE) operation.

The ICS terminal supports a variety of headset, microphone and speaker interfaces with hands free “hot mic” or PTT operation. ICS configurations include panel mount and desktop enclosures.

ICS access privileges to specific conference nets, intercoms or radios may be programmed remotely.

ICS programmable function keys allow the operator to select a desired radio or intercom channel via a single push button key. The optional LCD display allows dial by directory name operation.

The ICS terminal may be configured to compress audio to conserve network bandwidth. The high quality ICS compression maintains “toll quality” audio while achieving an 8-fold bandwidth reduction.

PANEL MOUNT ICS

ICS FEATURES LISTING

- Programmable push button keys
- Programmable speed dial
- Master volume control
- Multiple intercom channels
- Push to talk or hot mic operation
- Dial access to “meet me” conferencing
- Simulcast “one-to-many” broadcast capability
- Power for ANR headsets and electret or condenser microphones
- Dual headset jacks and optional speaker
- Remote configuration and administration
- Low power 9-32 VDC or POE operation
- LCD display brightness control
- AGC, echo cancellation
- Reduced bandwidth Voice compression
- Available in panel mount and environmentally sealed packaging

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BRIDGEWAY M8100 I/O INTERFACE SPECIFICATIONS		
AUDIO SIGNAL	**DESIGNATION**	**SPECIFICATION**
Line Inputs	Line In	Up to 24V pk-pk, balanced 600 ohm transformer isolated and transient protected inputs. MIL-DTL-38999 connector.
Line Outputs	Line Out	18V pk-pk, 600/150 ohm balanced transformer isolated and transient protected outputs. MIL-DTL-38999 connector.
Audio Bandwidth	BW	Bandwidth 150Hz - 3.4Khz, +/- 1db
RADIO CONTROL	**DESIGNATION**	**SPECIFICATION**
COR Inputs	COR	Contact closure or voltage inputs. Inputs pulled up to +5VDC through a 51k resistor. Software programmable trigger voltage. MIL-DTL-38999 connector.
XMIT Control Outputs	XMIT	Normally Open relay contact closure. MIL-DTL-38999 connector.
Radio Control RS-232 Ports	Radio RS232 #1-8	1,200 – 112,000 bps RS232 serial ports. Rx, Tx, signal ground. MIL-DTL-38999 connector.
Radio Control RS-422/485 Ports	Radio RS485 #1-8	1,200 – 112,000 bps RS485 or RS422 2/4 wire serial port. MIL-DTL-38999 connector.
COM NETWORKS	**DESIGNATION**	**SPECIFICATION**
Dual 10/100bT Ethernet	10/100bT VoIP Port	IEEE STD 802.3 10/100bT Ethernet LAN. MIL-DTL-38999 connector.
1G-e Ethernet	1G-e Port	IEEE STD 802.3 1000b-T/X Copper or Optical Fiber Ethernet LAN. MIL-DTL-38999 connector.
RS-232 Maintenance Port	RS-232	1.2K - 112K bps RS-232 serial port. Rx, Tx, signal ground. MIL-DTL-38999 connector.
RADIO CONTROL	**DESIGNATION**	**SPECIFICATION**
Serial Digital	SDC	- Manual frequency entry - Scan/select channel presets - Mode selection - TX power level - Volume - Squelch - Run BIT - Caller ID

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GENERAL SPECIFICATIONS		
MODEL	**DIMENSIONS AND WEIGHT**	**POWER**
BridgeWay- BW-M8100	10.75” (273mm) L x 6.75” (171.4mm) W x 2.0” (51mm) H. 3.75lb (1.7Kg.)	9-36VDC @ 8 Watts. Optional MIL-STD-1275B.
BCC Operator Console	10.0” (255 mm) W x 6.3” (160 mm) H x 2.0” (51 mm) D. 3.25lb (1.5Kg.)	9-36VDC @ 12 Watts
OCS Operator Control Station	7.4” (188 mm) W x 5.0” (127 mm) H x 2.0” (51 mm) D. 3.25lb (1.5Kg.)	9-36VDC @ 5 Watts. Optional MIL-STD-1275B.
ICS Intercom Station	4” (102mm) W x 6” (152mm) H x 2” (51 mm) D. 1.75 lb (.8 Kg.)	9-32VDC @ .25 Watts

ORDERING INFORMATION	
BRIDGEWAY COMPONENTS	**MODEL**
4 Port MIL-STD-810 BridgeWay	BW-M4100
8 Port MIL-STD-810 BridgeWay	BW-M8100
Rugged LCD/Keyboard Communications Console	BCC-1
MIL-STD-810 Radio-Intercom Operator Communications Station	OCS-1
Rugged Intercom Communications Station	ICS-1
BRIDGEWAY- M8100 FEATURE OPTIONS	**MODEL**
MC^2 Radio-Intercom Client GUI license, xxx = seat capacity	GUI-xxx
Remote Radio Control Client GUI License, xxx = seat capacity	SDR-xxx
Quad FXO + PRI ISDN T1/E1 option card	FXO/4
1G-e copper LAN	1CG-e
1G-e fiber LAN	1FG-e

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STANDARDS SPECIFICATIONS		
SPECIFICATION	**PARAMETERS**	**STANDARD**
Storage Temperature	-55°C to 85°C	MIL-STD-810, Methods 501.4 and 502.4, Procedure I
Operating Temperature	-40°C to 70°C	MIL-STD-810, Methods 501.4 and 502.4, Procedure II
Vibration	Sine: 10 g peak; Random: 0.04 g^2/Hz; 15-2k Hz	MIL-STD-810, Method 514.5, Procedure I
Shock	Functional Test for Ground Equipment	MIL-STD-810, Figure 516.5-8, Table 516.5-I
Operating and non-operating (storage) humidity	0 to 100% non-condensing	MIL-STD-810 Method 507.4
Salt fog	48 hour exposure at 5% concentration and 35°C	MIL-STD-810 Method 509.4
Fine Blowing Sand	Up to 40 MPH	MIL-STD-810, Method 510.4, Procedures I and II
Rain	3” per hour rain, wind driven at up to 40 MPH	MIL-STD-810, Method 506.4, Procedure I
Water Immersion	30 minutes at a depth of 1 meter	IEC529 level 7
Altitude	-100 to 50,000 Feet	MIL-HDBK-5400 for Class 1A
EMI	CE102, CS101, CS114, CS115, CS116, RE102, RE103	MIL-STD-461E
Reliability	125,000 Hours	MIL-HDBK-217F
Safety	Sections 4.5.3.2 and 4.5.3.3	MIL-HDBK-454B

Specifications Subject to Change without Notice

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