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# INVISIO V60

Advanced Tactical Communication and Hearing Protection System

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# The Modern Soldier Faces Many Challenges

## Increasing Mission Success

### Efficient communication

On today's military battlefield, efficient communication is essential for reducing risk for the soldier and ensuring mission success. INVISIO V60 supports full radio functionality for different mission scenarios, for both the mounted and dismounted soldier. Radio communication and hear-thru are separate with continuous

and unimpeded hear-thru in both ears, even when transmitting. Transmission using the radio's internal push-to-talk or wireless remote push-to-talk is possible as well as radio sidetone, radio warning tones, full duplex and dual net functionality.

## Preventing Hearing Damage

### Intelligent hearing protection

For soldiers, the ability to communicate clearly in high noise environments while protecting their hearing and still retaining situational awareness, is a tactical advantage and can be a life saver. Soldiers in the field often experience very high noise levels that can impede mission critical communication and damage the soldier's hearing. Hearing impairment is the most common injury

of soldiers returning from active duty. Combine this with the risk of short term hearing damage due to explosions and the risk of mission failure increases. The INVISIO V60 provides certified hearing protection solution rated at SNR 32 dB and NRR 29 dB to meet the needs of demanding users in high noise environments and is available with both universal fit and custom fit headsets.

## Reducing the Burden

### Size, weight and power

The modern soldier is faced with a significant burden - both cognitively and physically. The soldier's mobility, sustainability and ability to communicate are adversely affected by this burden. The INVISIO V60 addresses today's soldier systems challenges of size/weight reduction, integration, power optimization and battlefield situational awareness by simplifying the system down to what

the soldier needs and only what he needs. The user interface is reduced to face the real issue of mission critical communication and supplying state-of-the-art hearing protection to the soldier. As a consequence of this simplification, size and weight are significantly reduced, and the power supply is centralized. Soldier efficiency, safety and mobility increases.



# The INVISIO Solution Is Unique

## Improving Safety and Efficiency

### INVISIO comfort and fit

Soldier safety and efficiency is severely reduced by inadequate fit and uncomfortable equipment. INVISIO headsets offer unsurpassed performance, comfort and fit to professional users and are available in universal fit or custom fit versions. INVISIO Universal Fit headsets utilize a form factor that has been researched and refined over the past decade. The patented Soft Spring™ adapts perfectly to the contours of any ear offering maximum comfort and a

secure fit. INVISIO Custom Fit headsets are the ultimate headsets for fit and comfort. Made to fit the ear of the individual user and manufactured from an actual impression of the user's ear. All INVISIO headsets are compatible with helmets, eyewear, breathing apparatus and ear muffs. The INVISIO V60 is the ultimate tactical communication system for performance, versatility, comfort and fit.



## Enabling Crystal Clear Communication

### INVISIO Bone Conduction Technology

Clear communication in the heat of battle can mean the difference between life and death. The INVISIO V60 utilizes the patented INVISIO Bone Conduction Technology. Instead of traditional sound wave technology, a small, comfortable in-ear microphone picks up

vibrations from the user's jawbone. The vibrations are converted into sound, delivering crystal clear communication under extreme and noisy conditions, even when whispering.

## Enhancing Situational Awareness

### INVISIO 360° hear-thru

Full situational awareness with the ability to communicate and hear the surroundings at all times is critical. Soldiers need to maintain natural hearing and still have protection from potentially damaging impulse noises, such as gunshots or explosions, as well as continuous noise from vehicles and aircraft. The INVISIO V60 uses advanced digital signal processing, miniaturized audio components and ergonomic headset design to provide the most natural hearing possible - even in extreme conditions.

The INVISIO hear-thru microphone is positioned within the external

contours of the outer ear, utilizing the outer ear capability of detecting the origin of sounds and providing full 360 degree situational awareness. Advanced miniaturized speakers and microphones reproduce the sound naturally. Digital signal processing not only improves hear-thru quality by compensating for the inherent loss of ear canal resonance to improve situational awareness, but also protects the user with instantaneous compression of audio signals that exceed a dangerous threshold.







# INVISIO V60

## Advanced Tactical Communication and Hearing Protection System



# INVISIO V60

## At a Glance

### World's Smallest

Lightest multi-com control unit, 20 meter submersible.

### Quad-Com

Listen and talk simultaneously on 4 com sources, mounted or dismounted.

### Connect Anything

The ultimate soldier hub for headsets, radios, remote PTTs and computers.

### Plug & Go

No training needed, fully functional from when radio is turned on.

The INVISIO V60 is an in-ear hearing protection and communication system with electronic hear-thru and impulse noise protection. The INVISIO V60 control unit

can interface with different headsets types along with up to four com sources simultaneously, including radios, intercoms, mobile phones and computers.



**INVISIO V60**  
Top view



**INVISIO V60**  
Bottom view



# Small, Lightweight and Tough

Prepared for any challenge

## Reduced Size and Weight

Reducing the burden on the soldier

The INVISIO V60 is the world's smallest and lightest multi-com control unit, with its volume and weight reduced by more than half compared to most other multi-com control units on the market. The control unit measures 70 x 63 x 25 mm and weighs 145 grams.



## Submersible to 20 Meters

Resistant to water, dirt and sand

The INVISIO V60 is submersible to 20 meters, even with unmated plugs. The control unit can be cleaned in fresh water to remove dust, dirt and sand. The INVISIO V60 is so light it even floats.

## MIL Tested and Proven

Compliance and safety

The INVISIO V60 has been tested extensively to meet MIL-standards and has total EMC shielding from the metalised housing and connectors.

The INVISIO V60 uses breakaway connectors to improve safety especially for the dismounting soldier or in case of entanglement.



# Intuitive and Intelligent

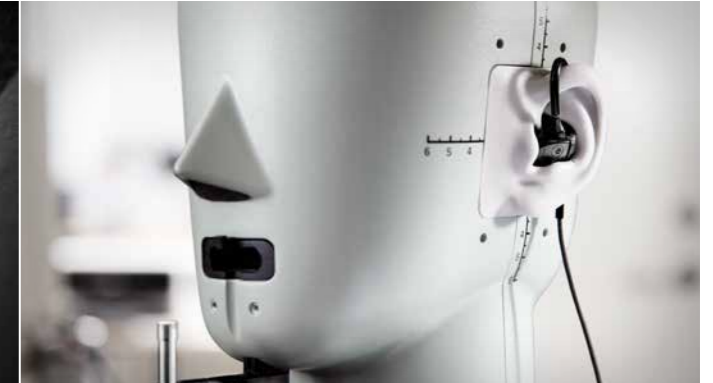
Advanced comms made simple



## Open Microphone

In-ear headset with hot-mic

The INVISIO V60 can operate with all radio communication microphone lines open at all times – even to multiple com sources. This makes it possible to maintain full radio functionality like full-duplex communication, radio sidetone, priority voice, VOX and keying the radios onboard PTT buttons.



## Split Ear Audio

Dynamic assignment to both ears

The INVISIO V60 features split ear received audio so that different talk groups can be assigned between left and right ear to improve intelligibility and battlefield situational awareness. Received audio is automatically and dynamically assigned when connecting or disconnecting a radio.



## Independent Audio Streams

Four separate audio streams

The INVISIO V60 has four separate and independent input audio (Rx) streams that can be directed to either ear with different audio amplification. The three output audio streams (Tx) are also separate and independent with different audio amplification for each device connected.



## Advanced Mode Settings

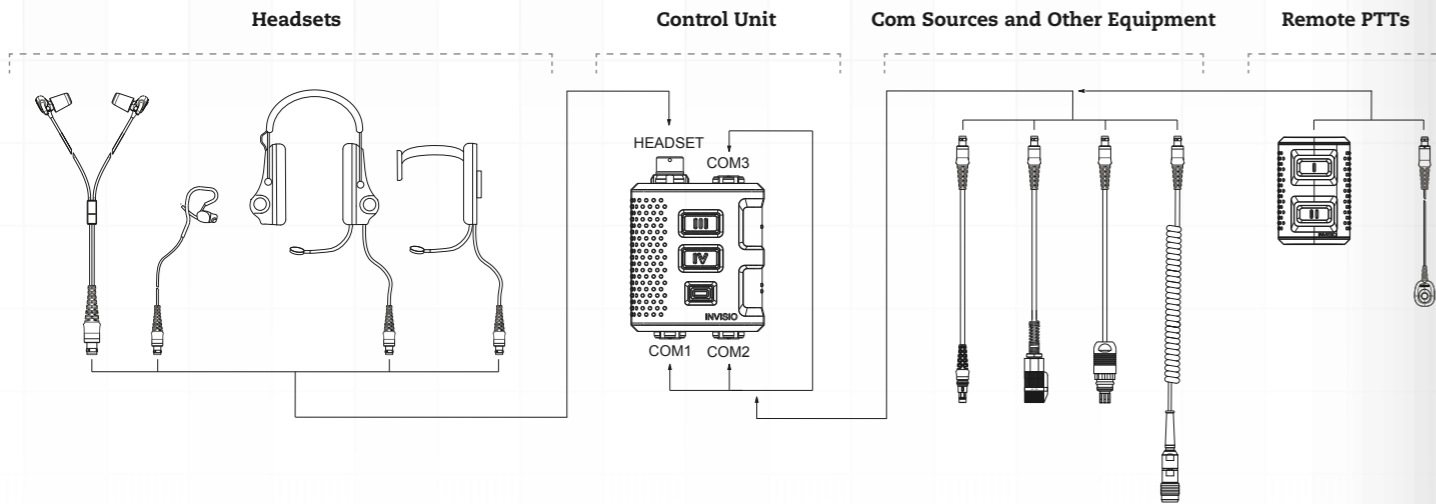
User configurable

The INVISIO V60 can be configured to meet different operational requirements through preset key combinations, enabling users to set up the system as required for their mission.



# Complete Interfacing Solution

Connected today and tomorrow



# Simplified User Interface

Plug & go



## Multi-Headset Interface

Adapts to legacy and future headsets

The V60 System has the ability to operate multiple types of headsets including dual in-ear, submersible in-ear, ear-cups with boom mics, lightweight and throat mics. An adapter cable is also available so an existing installed base of headsets can be utilized.

## Data Connection

Direct connectivity to devices

The INVISIO V60 has a data connection on all com ports, enabling data communication between the control unit and another device. This enables software upgrades and control of other devices.

## Cable Detection

Automated exchange

The INVISIO V60 enables automatic detection of hot-swap devices such as radios, intercom systems, mobile phones, computers and remote PTTs and sets the audio and system parameters instantaneously. A key benefit is being able to deploy new equipment (headsets and radios) without having to reprogram the INVISIO V60.

## Multi-Com Interface Unit

Quad com

Connect either a radio, intercom system, mobile phone, computer, remote PTT or power supply to any of INVISIO V60 com ports and the system will automatically sense it and change the settings. All of the com ports feature dual audio input (stereo) as well as dual PTT to enable the use of the latest software-defined personal radios and platform intercom systems. For the mounted soldier using a platform intercom there is a microphone latching function for turning the microphone on and off, as well as a PTT for the platform radio.

## Centralized Power

Simplified with no internal battery

The INVISIO V60 has no internal battery and powers directly from an attached radio or other central power supply. This not only reduces the size/weight of the system, it also reduces the system's complexity, the number of batteries to be changed during or after missions as well as life cycle and operational costs.

The system turns on and off automatically with the radio and removing a radio does not interfere with operation, as long as power remains from another source. The system can also be powered from the platform intercom system, enabling the mounted soldier to have all man worn radios turned off.

## Four PTT Buttons

4 dynamically assigned PTTs

Four PTT buttons are assigned dynamically depending on the attached radios and user configuration. The two side buttons are designated as primary use and the two front buttons are designated as secondary use.

### A normal use scenario could be:

PTT	Single net	Dual net
PTT 1	COM 1	COM 1/NET 1
PTT 2	COM 2	COM 1/NET 2
PTT 3	COM 3	COM 2
PTT 4		COM 3

## Hear-Thru Control

Simplified volume control

The INVISIO V60 uses a single button volume control for hear-thru that reduces the number of buttons required and makes it simpler to get the amplification required for a situation. The hear-thru starts automatically when the radio is turned on and can be turned off by pressing and holding the hear-thru controller. A short press of the hear-thru controller then scrolls between different hear-thru levels.

## Automatic Start-Up

Starts with radio - no calibration

The INVISIO V60 starts automatically when the first connected radio is turned on and then shuts down again when the last connected radio is turned off. Once the system is turned on, the communications and hear-thru are fully functional and there is no need for any calibration of the system (it even works without the foam plugs on).



# Headsets

## INVISIO X5

### Hear-Thru Microphone

Paired microphones for natural situational awareness and impulse noise protection.

### INVISIO Bone Conduction Microphone

Vibration sensing Bone Conduction Microphone for clear speech and total elimination of ambient noise.



### Cable Retainer

Securing the Kevlar reinforced cable comfortably behind the ear.

### Soft Spring™

Allows in-ear wearing style securing a discreet and secure fit.

### Hearing Protection Plug

Six sizes of foam plugs for optimal fit and performance.

### Speaker

High performance balanced armature loudspeaker with low distortion.

## Dual in-ear

headset with a market leading level of hearing protection - SNR 32 dB.

## Crystal clear

communication even in extremely noisy environments.

## Unimpeded

and natural situational awareness.

## Comfortable

and discreet design with secure fit.

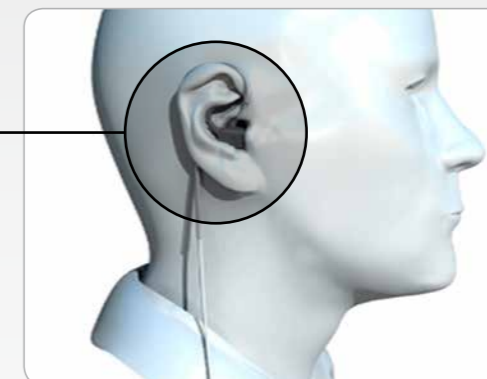
### INVISIO X5

Designed specifically for use with the INVISIO V60, the INVISIO X5 headset is a dual sided in-ear hearing protection headset that utilizes the patented INVISIO Bone Conduction Microphone Technology.

The INVISIO X5 headset has industry leading hearing protection, audio quality and situational awareness in a small and comfortable in-ear wearing style.

# INVISIO Bone Conduction Microphone

Instead of traditional sound wave technology, the patented INVISIO Bone Conduction Technology uses a small and comfortable in-ear microphone that picks up vibrations from the user's jawbone. The vibrations are converted into sound, delivering crystal clear communication under extreme conditions, even when whispering.



## Other Headsets



### X6 Custom Fit

Dual sided custom fit headset with hear-thru and hearing protection of SNR 29 dB.



### M3s Submersible

Single sided lightweight headset waterproof to 60 meters (no hearing protection).



### EC60 Ear Cup

Over-the-ear style hearing protection. Adapter cable available for legacy headsets.



### EG50 Single Sided Ear Cup

Lightweight single side headsets.

The INVISIO V60 is able to operate a wide range of headset types including dual sided in-ear, single sided in-ear, ear cups, lightweight single sided and even throat microphones. Using the submersible INVISIO M3s

headset, the entire system becomes fully submersible down to 20 meters. An adapter cable is also available so an existing installed base of headsets can be utilized.



# Accessories & Remote PTT Options



## M15 Chest Mounted PTT

Remote PTT for mounting on chest. Tactile and easy to actuate button.



## M30 Finger Mounted PTT

Remote PTT for finger mounting. Submersible down to 2 meters.



## M80 Remote Wireless PTT

Remote wireless PTT for rifle mounting. Submersible to 2 meters.



## PS30 Power Supply

Power supply for mounting on radio cable or direct connection. Uses AA battery.

# Attachment of Control Unit to Equipment



## Malice Clip

A standard malice clip that can be used with the universal clip or screwed directly to the control unit.



## Alligator Clip

The alligator clip is used for rapid attachment to or detachment from a belt or webbing.



## MOLLE Clip

The MOLLE clip has a low profile designed specifically for attachment to MOLLE webbing.



## Universal Clip

The universal clip makes it possible to use flexible fasteners like velcro, zip-ties or elastic straps.

The photos above show the different attachment methods for the control unit using the INVISIO 4-point attachment, which is a 4-screw system that is modular and interchangeable.

No matter which solution is chosen, quality, size/weight and usability have all been optimized. Examples include MOLLE clip, alligator clip and universal bracket.

# User Scenarios



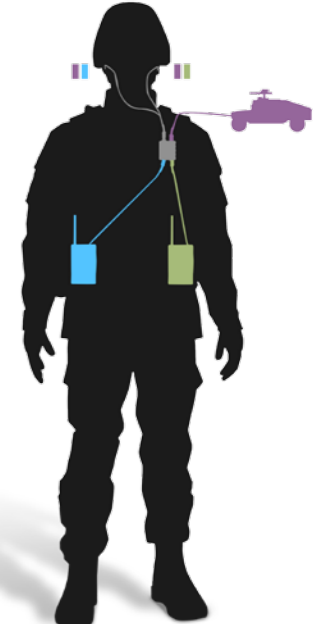
## Soldier

A soldier using a single net radio has audio from this radio in both ears. If the soldier uses a dual net radio the two nets will be split between left and right ears.



## Commander

A commander using two single net radios has audio from the primary radio in the left ear and audio from the secondary radio in the right ear.



## Mounted Commander

A mounted commander has the same audio split for the two radios, with the intercom being received in both ears.

# Connectivity Options



## Radio

Connect to any radio, including full-duplex and multiple networks simultaneously.



## Mine Sweeper

The mine sweeper audio response is heard in the headset and not transmitted to the surroundings.



## Computer

Allows situational awareness information from soldier-worn computer.



## iPod/MP3 Player

Audio playback from audio devices for mission notes. Alternatively music playback for headset training.



## Smart Phone

Use mobile or smart phone simultaneously with tactical communication equipment.



## Medic Cable

Medic to soldier intercom mode for direct and unimpeded communication.



## Intercom System

Connect to any platform intercom, with full operation of the intercom's platform radio.



## Power Supply

Use a centralised power supply or an optional INVISIO power pack, connected to the V60.



# Technical Specifications

V60 Control Unit		X5 Headset	
<b>Color</b>	Black	<b>Color</b>	Black
<b>Material</b>	Plastic with soft overlay	<b>Material</b>	Plastic with foam tips
<b>Weight</b>	145 grams (incl. caps and clip)	<b>Weight</b>	30 grams (incl. cable and connector)
<b>Dimensions</b>	70 x 63 x 25 mm (excl. connectors)	<b>Dimensions</b>	13 x 11 x 24 mm

V60 Power Supply		X5 Headset Cable	
<b>Power Supply</b>	From centralised power source	<b>Length</b>	1150 mm
<b>Operating Voltage</b>	3.6 to 36 Volts	<b>Pull Strength</b>	Kevlar reinforced with 20 kg pull
<b>Internal Battery</b>	None	<b>Connector</b>	ODU AMC Quick Disconnect

Environmental			
<b>Ingress Protection</b>	IP68 (20 m for 2 hrs) MIL-STD-810G	<b>Humidity</b>	MIL-STD-810G
<b>Operating Temperature</b>	-31 to +63°C (MIL-STD-810G)	<b>Mechanical Drop</b>	MIL-STD-810G
<b>Storage Temperature</b>	-31 to +71°C (MIL-STD-810G)	<b>EMI</b>	MIL-STD-461F

## X5 Test Results (EN 352-2:2002)

L=27 dB, M=29 dB, H=34 dB & SNR=32 dB

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
<b>Mean Attenuation dB</b>	30	30	32	33	34.7	36.2	40.8	44.7
<b>Mean Attenuation dB</b>	5.4	7.3	6.1	6.6	5.9	3.5	3.6	5.4
<b>Assumed Protection in dB (APV)</b>	24	23	26	26	28.8	32.7	37.2	39.3

## X5 Test results (ANSI S12.6-1997)

NRR 29 (ANSI S3.19-1974)

Frequency (Hz)	125	250	500	1000	2000	4000	8000
<b>Average Attenuation (dB)</b>	32.1	34.2	35.9	36.7	38.7	43.5	45.9

These results were obtained and certified at a certified test institute ref. ANSI S3.19-1974. This is in compliance with MIL-STD-1474D Appendix B Hearing Protector Noise Attenuation.

CE Personal Protection Equipment.

## INVISIO V60

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The INVISIO V60 depicted in actual size

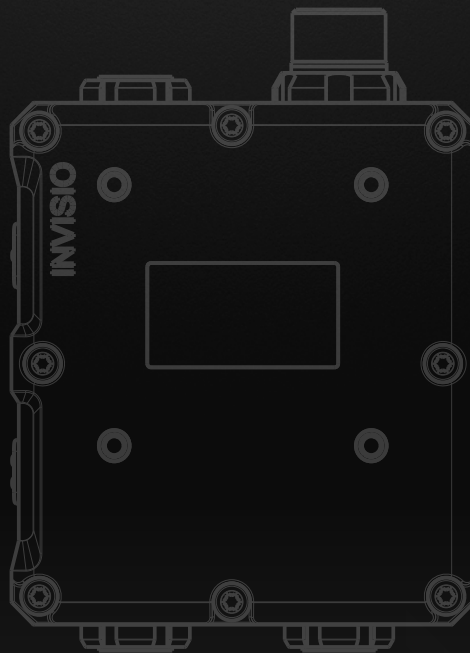




# INVISIO V60

Advanced Tactical Communication  
and Hearing Protection System

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*The INVISIO V60 depicted in actual size*

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## About INVISIO

INVISIO makes it possible for people to communicate in all environments, whether subject to loud noise, surrounded by extreme heat, or underwater. With our unique and world class expertise and technology, INVISIO offers professional users communication solutions such as advanced headsets, push-to-talks, control units and hearing protection systems for use with 2-way radios, intercom systems and mobile phones.

[www.invisio.com](http://www.invisio.com)

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**INVISIO**<sup>®</sup>  
NO NOISE. ONLY YOUR VOICE.

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