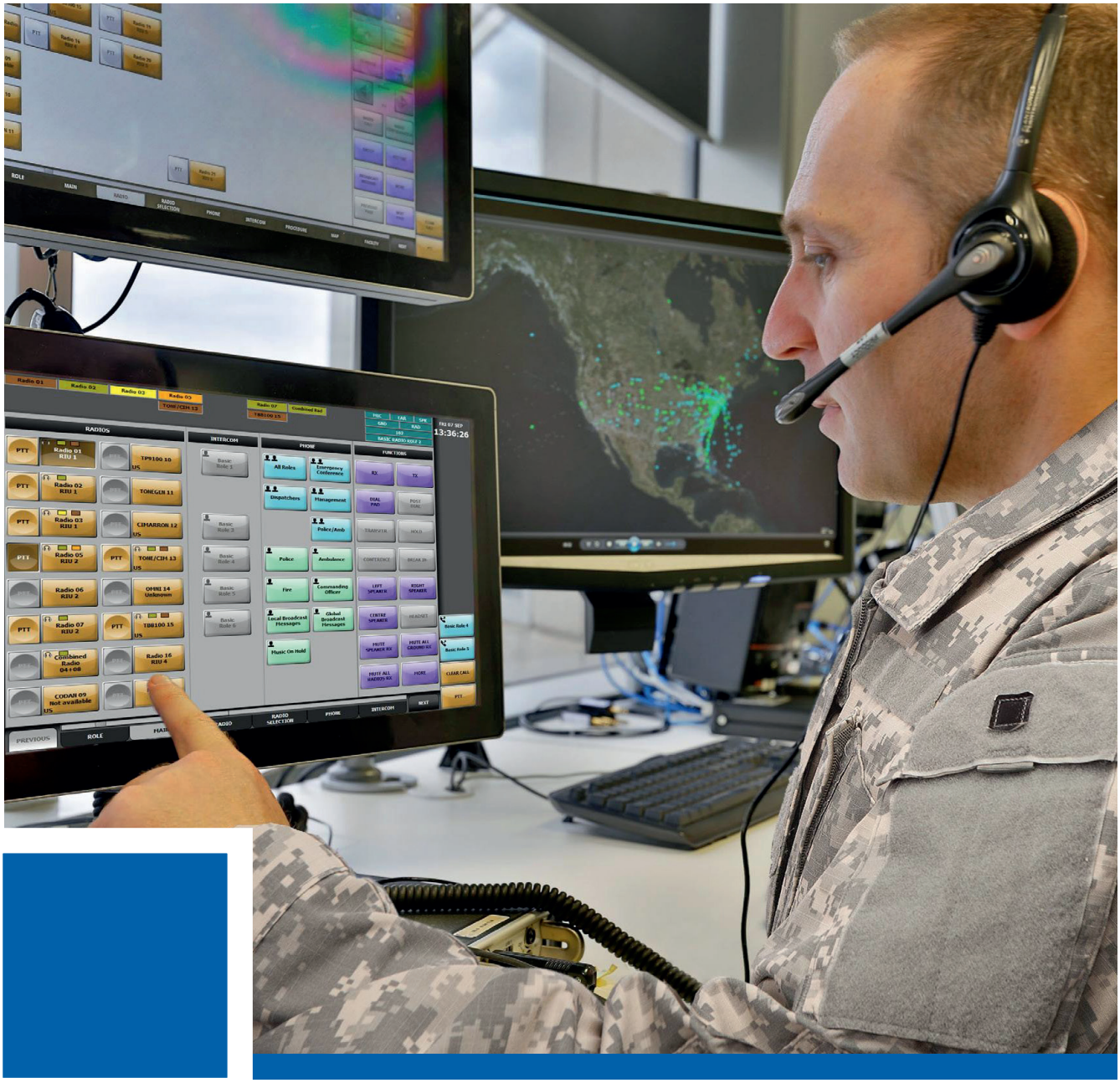


Voice Over Internet Protocol Communications

Enterprise (VOICE)

Command and Control (C2)

FREQUENTIS

FOR A SAFER WORLD

Interoperable communications solutions for your critical missions

C4i, a leader in IP-based communications, has built leading-edge solutions serving the C2 market for more than three decades. VOICE C2 is an advanced IP communications system based on simplified hardware and software components that, when combined, deliver a sophisticated communications platform.
The system provides users with the ability to access and control radio, telephony, intercoms and paging systems using a single intuitive GUI.

VOICE C2 building blocks

- Operator control unit (OCU)
- Operator interface unit (OIU)
- Comms server unit (CSU)
- Radio interface unit (RIU)
- Secure operator interface unit (SOIU)

A versatile communications platform customized to meet any operational requirement

VOICE C2 is designed around a "building block" architecture that provides expanded capabilities and capacities with simple, readily available components. All C4i VOICE C2 communications systems are built from the same advanced, modular footprint building blocks, packaged and adapted to suit mission requirements in any environment. The system scales from small, transportable, and vehicle-mounted solutions, to large complex operations center systems.

Operator Console Unit

Flexible software application

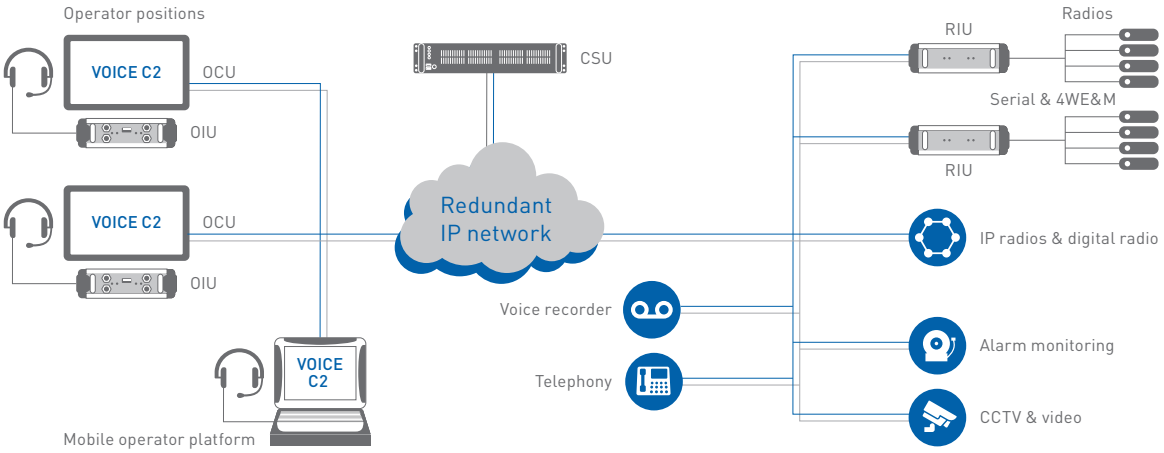
Simplifying operator control

The VOICE C2 OCU provides an integrated voice communications human machine interface (HMI) that interconnects operators, radios and telephony. With advanced audio and control interfaces, system users can communicate or conference with any available internal or external resources. Operator position hardware comprises of an OCU, a touchscreen panel computer, and an optional OIU. OIU associated accessories include speakers, handset, wired or wireless headsets and microphones. For positions requiring less capability, the operator position hardware can be streamlined to simply a headset and touch-panel computer or laptop. The GUI that runs on the OCU permits the selection and control of all the communications resources connected to the system.

Simplifying configuration

The VOICE C2 OCU provides each user with complete control of their communications environment via an intuitive, highly configurable touchscreen interface. The interface provides:

- Patching of radios and radio to telephone
- Multiple audio stream conferencing
- Alarm monitoring and facilities control
- Access to wide range of functionality including: role logon, telephony and radio calls, radio control



Benefits

Unparalleled operational flexibility gives operators the ability to control any radio, anywhere, at any time

The intuitive graphical user interface (GUI) provides operational access to both local and remote systems for quicker response times

Progressive internet protocol (IP) at the core technology allows authorities to take advantage of modern communication enhancements

Features

Role-based free seating

Radio-to-telephone and telephone-to-group conferencing

Extended reach via networked systems and add on nodes

Radio interoperability:
- remote radio control
- land mobile radio (LMR) and tactical radios
- radio paging
- unit ID, alias, status, messaging
- unlimited patching/ crossbanding

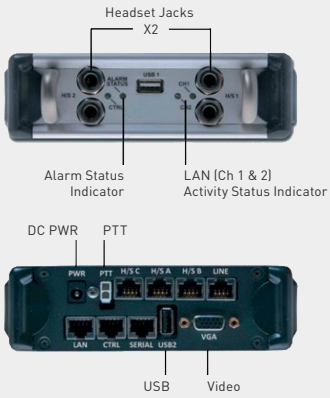
Variants

Single domain or multi-domain (Red/Black) variant for secure and non-secure communications

Reduced footprint variants – Communications on the Move or compact Blade

Secure: Joint Interoperability Test Command (JITC)-certified system with additional assured services

OIU



Specifications	
Physical	
Dimensions (w x h x d)	148 x 44 x 370 mm / 5.75 x 1.75 x 14.5 in
Weight	2.1 kg / 4.6 lbs
Mounting type	Rack or shelf mountable; 1U high Proprietary mounting kit available
Power input (configuration dependant)	
PoE	Power over Ethernet
DC	48 VDC, 500 mA (standard) or 24–60 VDC (extended DC range)
AC	110–240 VAC Requires use of AC–DC power adapter
Connection interfaces	
DC power	Circular socket DC10B
Headset/handset (non-isolated)	2 x stereo/mono headset/handset (connectors provided on front and rear panels for flexibility of system integration) 1 x mono headset/handset or microphone on rear panel (RJ45)
Auxiliary audio (isolated)	1 x mono audio for use with analog voice recorder
PTT switch	1 x Molex 2-pin connector; dry closure
Ethernet (to system LAN)	2 x IEEE 802.3 10/100 Base-T 1 x RJ45 socket (2 x Ethernet connections)
Ethernet (to operator PC)	1 x IEEE 802.3 10/100 Base-T 1 x RJ45 socket
USB	2 x USB 2.0; USB A profile
Serial	RS232 @ standard rates up to 9.2 kbaud (via RJ45 connector)
Video	RGB VGA
Software protocols	SIP, VoIP, RTP
Environmental	
Operating temperature	-20°C to +60°C / -4°F to 140°F
Storage temperature	-40°C to +75°C / -40°F to 167°F

Powerful, dedicated audio processing

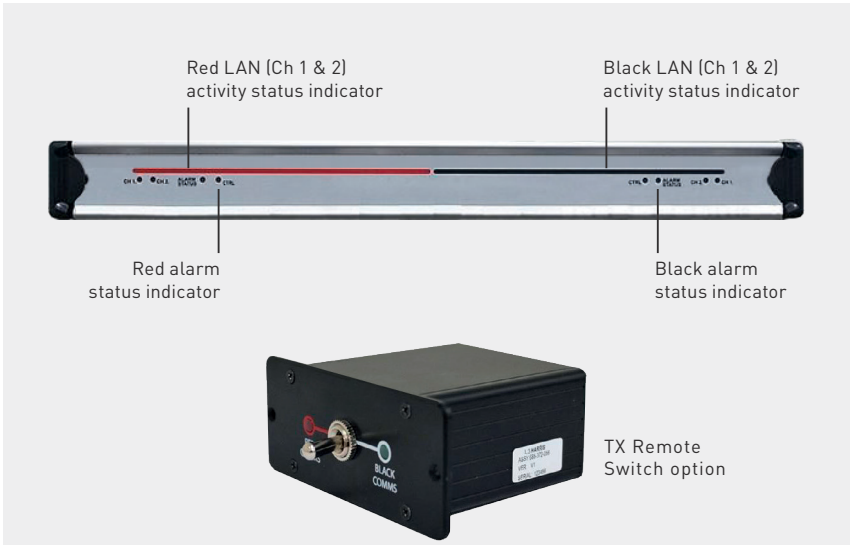
Simplifying operator audio

The VOICE C2 OIU is an optional building block that, when selected, acts as a communications hub for the operator position. It provides operators with dedicated digital signal processor (DSP) audio processing resources that enable efficient support for a diverse range of audio equipment including mono and stereo headsets, handsets with push to talk (PTT), microphones and speakers. The OIU efficiently converts audio from these devices to standards-based Voice Over IP (VoIP) which can be streamed to any compatible device via the local area network (LAN). It supports dual redundant LAN interfaces for mission-critical audio.

Simplifying connection of operator audio equipment

The VOICE C2 OIU provides advanced, dedicated, DSP audio processing at each operator position. The unit has dual-network LAN interfaces and provides six audio outputs and four audio inputs. These support two headsets, microphone, speakers, line out, mono and stereo headsets for separate left- and right-ear audio programs. The dual operator headset jacks at each position support trainer PTT override.

SOIU



Specifications	
Physical	
Dimensions (w x h x d)	435 x 44 x 422 mm / 17.13 x 1.73 x 16.61 in
Weight	5.9 kg / 13 lbs
Power input (configuration dependent)	
PoE	48 VDC from ethernet switch Class 3 powered device (<13W each for red and black side)
Connection interfaces	
Headset/handset (non-isolated)	2 x stereo headsets Connection via D-Sub 9 connectors on rear of enclosure One D-Sub 9-pin connector per headset
Black auxiliary audio (isolated)	1 x audio output for use with speaker or voice recorder 1 x audio input
Red auxiliary audio (isolated)	1 x audio output for use with voice recorder
PTT switch	1 x D-sub 9-pin connector for 2 separate footswitch inputs: dry closure
Ethernet (to red system LAN)	2 x IEEE 802.3 10/100 Base-T 1 x D-Sub 9-pin socket (2 x Ethernet connections)
Ethernet (to black system LAN)	2 x IEEE 802.3 10/100 Base-T 1 x D-Sub 9-pin socket (2 x Ethernet connections)
Ethernet (to black control port)	1 x IEEE 802.3 10 Base-T 1 x D-Sub 9-pin socket (1 x Ethernet port)
Software protocols	VoIP, SIP & RTP
Environmental	
Operating temperature	0°C to +40°C / 32°F to 104°F
Storage temperature	-10°C to +63°C / 14°F to 145°F

Powerful, dedicated audio processing for advanced operators in multi-level security enclave environments

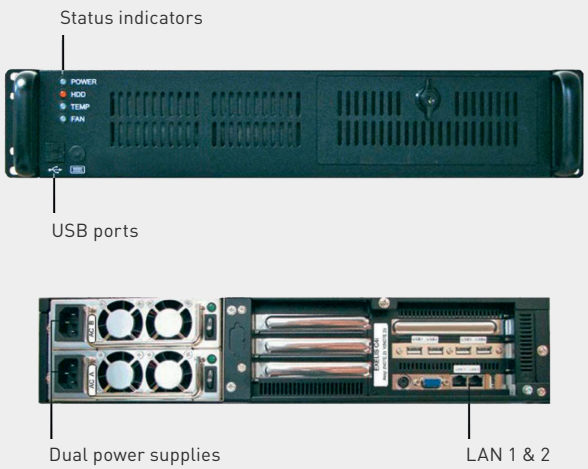
Simplifying secure operator audio

The SOIU is the communications hub of the VOICE C2 secure operator position. It provides users with a single access point into multi-security level domain environments where strict isolation requirements are essential. It provides the operator with dedicated, advanced DSP audio processing resources that enable efficient support for a range of audio equipment. It efficiently converts the audio from these devices to standards-based VoIP which can be streamed to any enabled compatible device via either security domain. Within each domain, it also supports dual LAN interfaces ensuring that mission-critical secure (red) or clear audio (black) always gets through. The SOIU is used as part of a larger total C4i secure communications solution.

Simplifying connection of operator audio equipment

The VOICE C2 SOIU greatly simplifies the operator's task when operating in environments requiring simultaneous access to multiple security domains. It allows operators to listen to audio from multiple domains in a single headset and, using a single touchscreen, to control communications in both domains.

CSU



Note: Representative only, multiple models are supported including option to use virtual machines (VMs)

Specifications	
Physical	
Dimensions (w x h x d)	483 x 89 x 450 mm / 19 x 3.5 x 17.72 in
Weight	14.4 kg / 31.7 lbs
Mounting type	Rack; 2U high
Power input (configuration dependant)	
Dual AC inputs	110–240 VAC, 50/60Hz, 6/3 Amps
DC	DC power available Dual power supplies (optional)
Interfaces	
DC power	IEC
Ethernet	2 x IEEE 802.3 10/100 Base-T 2 x RJ45 sockets
Telephony	SIP trunks Legacy EI/TI, FXO/FXS available when coupled with Telephony Interface Unit (TIU)
Codecs	G.711 A–law, G.711 μ–law
Software protocols	SIP, VoIP, real-time transport protocol (RTP)

Interoperability between 2-way radio and enterprise telephony via open standards-based protocols

Simplifying radio-over-IP technology

The VOICE C2 CSU allows the system to integrate telephone services including both public switched networks (PSTN) and private branch exchanges (PBX). It provides flexible call handling and call distribution including conferencing, transfer and hold. The CSU supports IP SIP trunks, or a range of other physical telephony interfaces when coupled with a Telephony Interface Unit (TIU).

Simplifying radio and telephony integration

The VOICE C2 CSU is flexible and configurable with the addition of telephony cards. Telephony cards are available in either analog or digital versions with various combinations and quantities supported. For high availability applications, the VOICE C2 architecture supports dual redundant CSUs with each unit supporting dual LAN interfaces, ensuring that mission-critical audio always gets through. The CSU can also be deployed as a standalone as a fully functional soft PBX; integrated with other open standards type solutions or as part of a larger total C4i communications solution.

RIU

Specifications	
Physical	
Dimensions	148 x 44 x 380 mm / 5.75 x 1.75 x 14 in (1 RU high)
Weight	2.5 kg / 5.5 lbs
Power input (configuration dependant)	
DC	48 VDC, 500 mA (standard) 24–60 VDC, 24W (extended range)
AC	110–240 VAC Requires use of AC–DC power adapter (P/N: 685-335-040)
Connection interfaces	
DC power	Circular push/pull lock/release socket Fischer 3-pin circular DBPC 102 A052–130
Ethernet	2 x IEEE 802.3 10/100 Base-T 1 x RJ45 socket (2 ethernet connections)
Radio devices	4 x 26-pin high density D-sub connector, 1 per radio connection
Audio	4-wire analog, transformer coupled DC blocked, 0 dBm/600Ω input/output
PTT switch	Normally open contact 150 mA/200V max
Codan	5–25 VDC optically isolated
Serial	RS232 at standard rates up to 115.2 kbaud (1 per radio port) RS422/RS485 available with appropriate interconnection cabling
Codecs	G.711 A–law, G.711 μ–law
Environmental	
Protection	IP65 rated enclosure & connectors
Operating temperature	-20°C to +60°C / -4°F to 140°F (MIL-STD 810G – 501.4 & 502.4 [Op. Tablet])
Storage temperature	-40°C to +75°C / -40°F to 167°F (MIL-STD 810G – 501.4 & 502.4 [non-op])
Vibration (vehicle/ integrity)	MIL-STD 810G – 514.5-C3 MIL-STD 810G – 514.6-C17
Transit shock	MIL-STD 810G – 516.5
EMI/EMC	MIL-STD 461

Interoperability between resources via open standards Voice Over IP

Simplifying radio-over-IP technology

The VOICE C2 RIU is a core building block that provides a seamless interface between radios and telephony assets using open standards VoIP technology. Within its compact, ruggedized footprint, the RIU provides support for four programmable audio devices, each with its own serial port for configuration or data transmission. It uses dedicated DSP audio processing resources to efficiently convert the audio to standards-based VoIP which can be streamed to any compatible device via the LAN. It also supports dual LAN interfaces ensuring that mission-critical audio always gets through.

Simplifying configuration

The VOICE C2 RIU can be used standalone as a SIP-based radio gateway or integrated with other open-standards type solutions such as real-time transport protocol (RTP). It is ideally suited for vehicle interoperability solutions, mobile fly-away kits and anywhere you need extensive capability in a small, ruggedized footprint. The RIU is easy to configure and provides direct connection interfaces to a range of audio equipment including conventional and trunked radios, public address systems, monitor speakers and intercoms.

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