SWITCHplusIP®
INTEROPERABLE COMMUNICATIONS SOLUTIONS

Now JITC Certified

HARRIS® TECHNOLOGY TO CONNECT, INFORM AND PROTECT™

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As a leader in Internet Protocol (IP) based communications, Harris has built leading-edge solutions serving the command and control market for decades. SwitchplusIP is an advanced IP communications system based upon simplified hardware and software components to create a complex communications platform. The Harris SwitchplusIP communications system provides users with the ability to access and control radio, telephony, intercoms and paging systems—both local and remote—using a single intuitive graphical user interface (GUI).

**SwitchplusIP® BUILDING BLOCKS**

SwitchplusIP is designed around a “building block” architecture to provide expanded capabilities and capacities with simple, readily available components. All Harris SwitchplusIP communication systems are built from the same advanced, modular-footprint building blocks, packaged and qualified to suit the mission requirements and physical environment. This allows the system to scale from small, transportable and vehicle mounted solutions to large, complex dispatch center systems.

SwitchplusIP is “IP at the core” to maximize the advantages of today’s communications technology.

**SWITCHplusIP IS NOW AVAILABLE IN A JITC CERTIFIED CONFIGURATION AS A RADIO GATEWAY WITH AS-SIP AND MLPP SUPPORT**
SIMPLIFYING RADIO OVER IP TECHNOLOGY

The RIU is one of the SwitchplusIP core building blocks and provides a seamless interface between radios and telephony assets open-standards VoIP technology. Within its super 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 from these devices to standards-based VoIP which can be streamed to any compatible device via the LAN. It also supports dual LAN interfaces for ensured mission-critical audio.

SIMPLIFYING CONFIGURATION

The RIU can be used standalone as a SIP-based Radio Over IP (ROIP) gateway, integrated with other open-standards solutions like RTP (WAVE), or as part of a larger total Harris communications solution. It is ideally suited for Vehicle Interoperability Solutions, Mobile Fly Away Kits, or 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.

SPECIFICATIONS

- **Dimensions (W x H x D)**
  - 148 x 44 x 380 mm
  - 5.75 x 1.75 x 14 in
- **Weight**
  - 2.5 kg / 5.5 lbs
- **Mounting type**
  - Rack or shelf mountable; 1U high

**Power Input (config. dependent)**

- **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

**Environmental**

- **Protection**
  - IP65 rated enclosure & connectors (when connectors covered or mated)
- **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
- **Altitude**
  - 22,000 ft (operative)
COMMS SERVER UNIT (CSU)

INTEROPERABILITY BETWEEN 2-WAY RADIO AND ENTERPRISE TELEPHONY VIA OPEN-STANDARDS BASED PROTOCOLS

SIMPLIFYING RADIO OVER IP TECHNOLOGY

The SwitchplusIP Communications Server Unit (CSU) is one of the SwitchplusIP primary building blocks and provides the powerful core of the SwitchplusIP system. The CSU is responsible for system-wide functions including overall SIP registry, event logging and central configuration version management. It also provides telephony gateway services for the remainder of SwitchplusIP components. The CSU allows the SwitchplusIP system to seamlessly integrate telephone services including both Public Switched Telephone Networks (PSTN) and Private Branch Exchanges (PBX). It provides flexible call handling and call distribution (conferencing, transfer and hold) and a range of physical telephony interfaces (PRI ISDN (E1, T1), FXO, FXS) and IP via SIP trunks. For small transportable applications, the CSU functionality can be optionally embedded within the RIU.

SIMPLIFYING RADIO AND TELEPHONY INTEGRATION

The CSU is flexible and configurable by the addition of telephony cards, which are available in either analog or digital versions with various combinations and quantities supported. For high availability applications, the SwitchplusIP architecture supports dual-redundant CSUs with each unit supporting dual LAN interfaces. The CSU can either function alone as a fully functional soft PBX integrated with other open-standards solutions, or as part of a larger total Harris communications solution.

SPECIFICATIONS

- 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

- Dual AC inputs
  - 110–240 VAC, 50/60Hz, 6/3 Amps
- DC
  - DC power available
  - Dual Power supplies (optional)

Connection Interfaces

- DC Power
  - IEC
- Ethernet
  - 2 x IEEE 802.3 10/100 Base-T
  - 2 x RJ45 sockets
- Telephony
  - SIP, E1/T1, FXO, FXS
- CODECS
  - G.729, G.711 A-law, G.711 μ-law
- Software protocols
  - SIP, VoIP, RTP
The Switch plusIP Operator Control Unit (OCU) provides an integrated voice communications human-machine interface connecting operators, radios and telephony. It provides advanced audio and control interfaces that allow users to achieve internal and external communication and conferencing with any available resource. The operator position hardware consists of an Operator Console Unit (OCU), which is typically a touch-screen PC, as well as an optional Operator Interface Unit (OIU) with associated accessories—including 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 PC or laptop. The GUI for the OCU permits the selection and control of all the communications resources connected to the system.

SIMPLIFYING CONFIGURATION
The OCU provides each user with complete control of their communications environment via an intuitive, highly configurable touch screen interface. This user interface provides access to all of the facilities required to perform their allotted tasks including: role logon, telephony and radio calls, radio control, telephone-to-radio patching, multiple audio stream conferencing, alarm monitoring, standard operating procedures, facilities control, and more. SwitchplusIP can be fully customized to meet any operational requirement.

ADDITIONAL CAPABILITIES
- Role-based free seating
- Operator-to-operator intercoms
- Telephone group conferencing
- Radio-to-telephone conferencing
- Radio interoperability
  - Any radio, anywhere, anytime
  - LMR and tactical radios
  - Radio paging
  - Unit ID, alias, status, messaging
  - Unlimited patching/crossbanding
  - Radio remote control
- Facility management
- Lights, doors, sirens
- Integrated phone books
- Short term record/play
- Extensive radio control/configuration library
- Integrated procedures/checklists
- Video camera support
- Public address (PA) capable
- Giant voice (GV) capable
- Fixed command post
- Comms on-the-move
  - Mobile command post
  - SUV
  - Transportable
  - Vehicle mounted
SIMPLIFYING OPERATOR AUDIO

The OIU is one of the SwitchplusIP optional building blocks. When used, it is the communications hub of the SwitchplusIP operator position. It provides the operator with dedicated Digital Signal Processor (DSP) audio processing resources that enable efficient support for a diverse range of equipment, including mono and stereo headsets, handsets with Push-to-Talk (PTT), boom mics and monitor speakers. The OIU efficiently converts the 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 also supports dual-redundant LAN interfaces, ensuring that mission-critical audio always gets through to its destination.

SIMPLIFYING CONNECTION OF OPERATOR AUDIO EQUIPMENT

The OIU provides advanced, dedicated, DSP based 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, boom microphone, monitor 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.

SPECIFICATIONS

- **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 (config. dependent)**

- **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 (P/N: 685-888-040)

**Connection Interfaces**

- **Power Input**
  - 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 boom 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 (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
SIMPLIFYING SECURE OPERATOR AUDIO

The SOIU Switch\textit{plusIP} building block is the communications hub of the Switch\textit{plusIP} secure operator position. It provides users with a single access point into multiple 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 that ensure secure (RED) or clear (BLACK) mission-critical audio. The SOIU is used as part of a larger total Harris secure communications solution.

SIMPLIFYING CONNECTION OF OPERATOR AUDIO EQUIPMENT

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

POWERFUL AUDIO FOR ADVANCED OPERATORS IN MULTI-LEVEL SECURITY ENCLAVE ENVIRONMENTS

SPECIFICATIONS

- 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
- Mounting type
  - 1U high
  - Rack, shelf or proprietary mountable (installation specific)
  - A proprietary mounting kit is available for full-width 19 inch rack
- Isolation
  - NSTISSAM TEMPEST/2-95

Power Input (config. dependent)

- PoE
  - 48 VDC from Ethernet switch
  - RED and BLACK sides powered individually from respective IP switches, with audio mixer powered from RED side
  - 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 aux. audio (isolated)
  - 1 x audio output for use with speaker or voice recorder
  - 1 x audio input
- Red aux. 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
  - SIP, VoIP, RTP

Environmental

- 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))

For more information, email interopcom@harris.com.
About Harris Corporation
Harris Corporation is a leading technology innovator, solving customers’ toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports government and commercial customers in more than 100 countries and has approximately $6 billion in annual revenue. The company is organized into three business segments: Communication Systems, Space and Intelligence Systems and Electronic Systems.