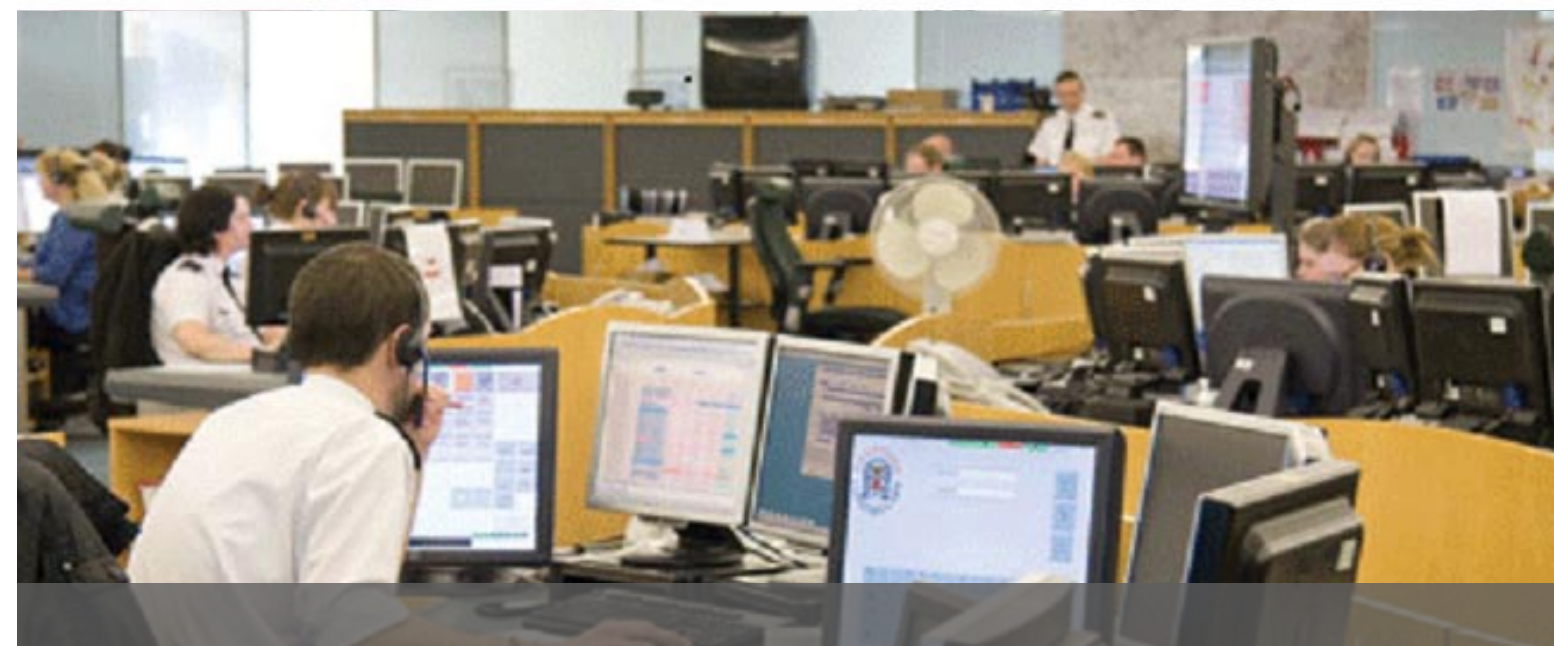




CORTEX – Software ICCS

Integrated Communications for Mission Critical Control Rooms



TETRA

CORTEX first interfaced with TETRA in 1999. Since then it been at the forefront of integration with new TETRA infrastructures and features, with deployed solutions directly connecting to CASSIDIAN (EADS) and Motorola TETRA networks and various options for connection via Fixed Mobile Radio terminals.

CORTEX enables major TETRA Dispatcher features, such as:

- ✓ Multi-Select Talkgroups
- ✓ Group Call
- ✓ Private / Individual Call
- ✓ Patch
- ✓ Stun / Un-stun
- ✓ Callback Requests
- ✓ SDS Messages
- ✓ Status Messages
- ✓ Emergency Alarms
- ✓ DGNA (inc. Inter-Customer)
- ✓ Ambience Listening
- ✓ Aliasing (static & dynamic)
- ✓ Priority Dispatch
- ✓ Talkgroup Affiliations
- ✓ Radio User Directories
- ✓ Eavesdrop
- ✓ Audio playback of recent calls
- ✓ Archive Recorder integration

Operators manage single or multiple talkgroups, patching, selecting and removing talkgroups according to need, using the aliasing facilities to connect rapidly to radio users in the field. Operators can event monitor and audio monitor talkgroups with colour codes highlighting the different states. Talkgroups can be automatically brought in to the required state upon *Role* and or *Scenario* selection, thereby reducing setup time.

CORTEX provides search facilities to lookup radio users and produces activity logs. Supervisor's privileges enable radios to be stunned, un-stunned and the ambience listening facility to be utilised (remotely open radio terminal's microphone).

TETRA Gateway

CORTEX's TETRA Gateway server provides dynamic aliasing facilities that enable operators to seamlessly communicate voice and text exchanges with radio users. Operators view radio call signs, collar numbers, in addition to the radio ID/ISSI. Talkgroup affiliation accurately shows which radios are in use and the talkgroup to which they are assigned.

Other CORTEX Functionality

Analogue Radio gateways allow integration with legacy UHF/VHF radio systems

CCTV feeds provide operators with real-time video images; supporting both IP and analogue cameras and providing operators with snapshot, zoom, pan and save features.

Access Control enables automatic camera selection and image pop-up, remote monitoring of inputs (e.g. alarms, fire exits, munitions lockers) and activation of outputs (e.g. doors and barriers).

Archive Recording offers central audio and metadata recording facilities allowing telephony or radio calls to be saved, searched and replayed to assist call management.

Web Browser enables easy access to intranet / internet, allowing operators to easily initiate and transfer calls to numbers held within web pages.

Management Reporting provides customisable reports from logged events, i.e. TETRA, telephony, user activity, CCTV, Alarms, configuration changes and system health.

CORTEXremote portable workstations provide operators with full control room functionality, but with the flexibility to quickly connect the ultra slim, all-in-one touch screen PC from anywhere with an ADSL connection. Ideal for special event coverage, Mobile Command Vehicles and fallback / training control rooms.



Contact APD

- APD Communications Ltd, Head Office Newlands Centre, Inglemire Lane, Hull, HU6 7TQ, United Kingdom
- Sales and Marketing, Shenley Pavilions, Chalkdell Drive, Milton Keynes, MK5 6LB, United Kingdom
- UAE Office, Office 403, Al Niyadi Building, Airport Road, Abu Dhabi, UAE, P.O. Box 31954
- Tel: +44(0) 1482 808300 | Fax: +44 (0) 1482 803901 | UAE Tel : +971 (2) 443 9277 | Email: info@apdcomms.com | Web: www.apdcomms.com

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CORTEX is a TETRA-enabled Software Integrated Communications Control System (SICCS) used in over 80 mission-critical control rooms around the world. CORTEX seamlessly merges radio dispatch, telephone call handling, access control and video monitoring into a single user friendly touchscreen interface. With its integration to Command & Control (CAD) systems it enables control room operators to conduct their duties effortlessly in a stressful environment.

In 1996 APD delivered its first system to Grampian Police in Scotland and has earned its reputation for deploying feature rich and highly resilient solutions compatible with different telephony platforms, legacy analogue and TETRA digital radio infrastructures. CORTEX customers include Swedish Police, Abu Dhabi Police, Emirates Airlines, Dubai International Airport and around half the police forces in England and Wales. CORTEX won the showcase ICCS application for the UK Airwave TETRA network in 2000 and powered the first Multi-Agency Control Room worldwide at the Isle of Man.

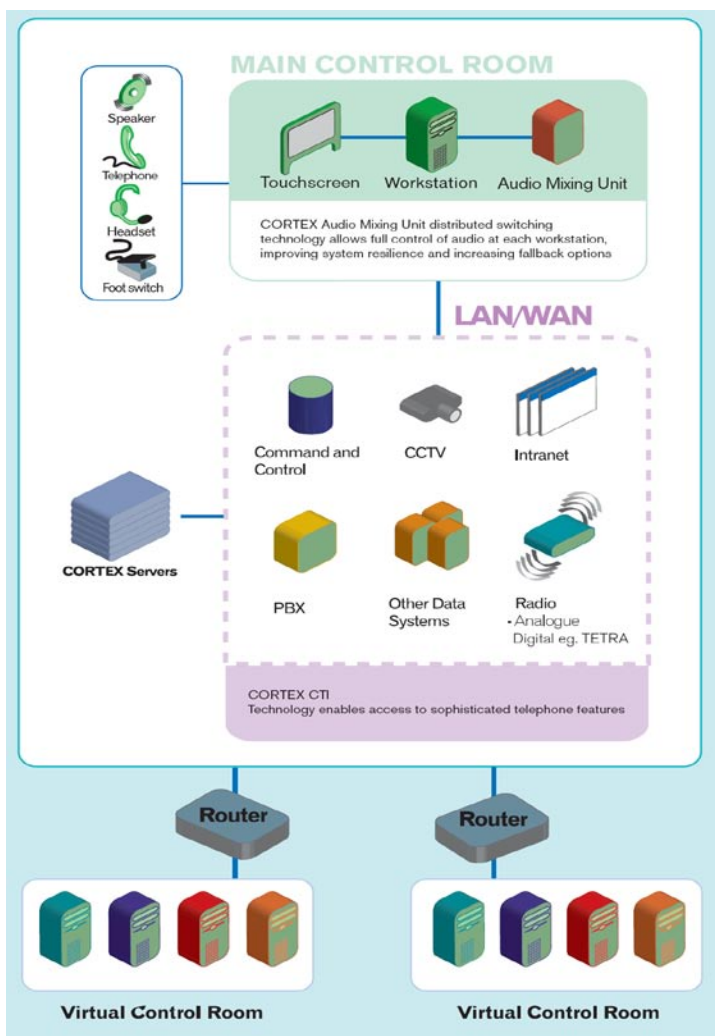


Key Features

- **Intuitive** – the touchscreen user interface has been designed by users for users, is fully featured whilst simple to operate and requires very little training.
- **Cost effective** – no centralised proprietary hardware required with all software running on standard Commercial of the Shelf (COTS) servers and PCs.
- **Resilient** – distributed architecture with intelligent clients, capable of remaining operational even when primary server, secondary server and the network fails.
- **Scalable** – very easy to add additional workstations. Capable of supporting very large control rooms (500+ seats) yet also viable for smaller control rooms with only 3 seats.
- **Flexible Free-Seating** – any operator can sit at any workstation, in any control room and automatically be presented with the resources needed to fulfil their role.
- **WAN Connectivity** – intelligent VoIP routing allows workstations to be placed anywhere there is a WAN connection back to the servers (e.g. ADSL, satellite)
- **TETRA integration** – support for a mixture of direct connections to leading TETRA infrastructures and via Fixed Mobile Radio terminals.
- **Telephony Integration** – compatible with a wide variety of telephony switches (PBXs) and Automatic Call Distribution (ACD) solutions from providers such as Avaya Nortel, Alcatel, Cisco, Mitel, Aastra Ericsson and Siemens. CORTEX supports TDM, IP and softphone telephony.
- **Command & Control / Computer Aided Dispatch** – interfaces allow C&C/CAD systems to automatically display caller's details (name, address, GPS location) for emergency calls as well as being able to send and receive SDS / Status messages and initiate telephone and TETRA calls from the C&C/CAD application.
- **Multilingual** – allows operators to dynamically switch to display their preferred language.

Data Sheet

CORTEX – Software ICCS



System Architecture

CORTEX is a modular system comprising high availability physical or virtual servers networked with operator workstations. CORTEX's distributed architecture naturally lends itself to allow systems to be regionally 'hosted' with workstations in various control rooms remotely connecting over a WAN

An AMU (Audio Mixing Unit) is located at each desk. The AMU intelligently mixes, balances and routes telephony, radio and intercom audio to a headset, speaker and other workstations.

TETRA connections terminate at selected workstations, for resilience, but are advertised to all other workstations, for flexibility, with the audio being VoIP encoded and streamed.

System Administration

CORTEX provides centralised administration, where changes made by System Administrators (e.g. adding and deleting operators, changing access levels) and changes made by individual operators (e.g. passwords, volume levels, audio routing preferences) will automatically propagate around all workstations and servers. System Administrators need only add / change user's credentials for one control room and these will be automatically propagated to all other control rooms – i.e. every operator can login to any workstation in any control room, even in a fallback situation (loss of servers / network).

Operator Environment

Hardware

Operator desks have the following COTS items installed; a PC, touchscreen, desktop speaker, PTT footswitch (Push To Talk), headset and optional headset junction box. APD supplies the Audio Mixing Unit (AMU) which loads individual preferences for audio volume and routing when the operator logs in.

Touchscreen User Interface

Key functionality surrounds a central operating window with colour coding and tones differentiating traffic by priority. A VU meter indicates to the operator that their microphone is working and their voice is creating the correct modulation to be heard by the receiving radio or telephone.

Note: a keyboard and mouse driven interface is also available

Free-Seating

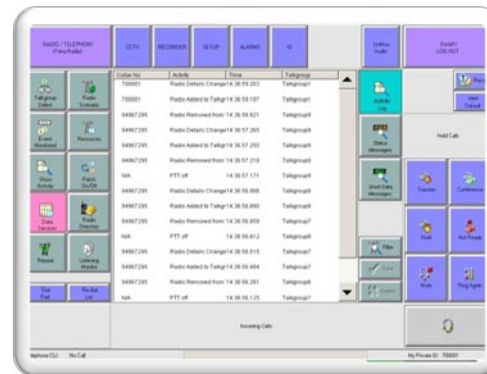
The free-seating concept is core to the design of the CORTEX architecture and software. All workstations are installed and configured identically and allow any operator to sit at any workstation, in any control room, and perform their specified *role*. From the operator perspective there is no difference, but to achieve this functionality requires highly evolved software with intelligent VoIP audio streaming capabilities.

Roles & Scenarios

Operators can choose different *Roles* when they login, e.g. Call Taker, Dispatcher or Supervisor. Roles listed are configurable by operator access levels. When a *Role* is selected those resources (e.g. TETRA talkgroups, emergency telephone calls) required for that role are presented. Scenarios can be configured for pre-defined situations, e.g. coverage of a geographical area, managing a special event, response to a major incident.

Supervisor Features

Supervisors have additional features, e.g. remotely reboot & calibrate workstations, disable operators, reset passwords, eavesdrop and take-over calls, monitor user activity.



Functionality

Command and Control / Computer Aided Dispatch

CORTEX can be configured to integrate with telephony provider databases (e.g. BT's EISEC) and upon receipt of an emergency telephone call automatically forward details of the caller to 3rd party systems.

Caller details supported by CORTEX:

- ✓ CLI (Phone Number)
- ✓ Name
- ✓ Address & Postcode
- ✓ Network Operator
- ✓ Time & Date
- ✓ Location (X,Y / Lat,Long)
- ✓ Vehicle Telematics:
 - ✓ Registration Number
 - ✓ Make, Model, Colour
 - ✓ Direction of Travel, Speed
 - ✓ Activation method: Airbag, crash, manual

This integration allows C&C/CAD applications to populate fields on their screen with caller details in advance of speaking to the caller, thereby vastly reducing incident response times. CORTEX also enables C&C/CAD applications to send and receive SDS / Status messages and initiate telephone and TETRA calls.

Telephony

CORTEX is not limited by use of a proprietary telephony switch, unlike many other ICCS solutions. Instead, being software based, CORTEX is able to integrate seamlessly with existing switches from leading manufacturers, thereby leveraging the advanced features available. CORTEX can work with Automatic Call Distribution (ACD) solutions and/or simultaneously present multiple calls to each workstation and to present the same calls across multiple workstations, presented in a variety of call queue presentations, e.g. stacking calls by priority of line group displaying longest calls at the front showing waiting time.

Supported telephony features include:

- ✓ CLI (Phone Number)
- ✓ Multiple call ringing
- ✓ Shared line presentation
- ✓ Priority Call queuing
- ✓ ACD
- ✓ Eavesdrop
- ✓ Intercom
- ✓ Public Address
- ✓ Redial List
- ✓ Unanswered call alarms
- ✓ Intrude, Take-Over, Barge-in
- ✓ Missed Calls, Ring-back
- ✓ Hold, Park, Mute
- ✓ Transfer (supervised / forced)
- ✓ Conference (inc. with TETRA)
- ✓ Hotkey dialling
- ✓ Audio playback of recent calls
- ✓ Archive Recorder integration
- ✓ Phone Directories
- ✓ Supervisor view of all calls

CORTEX can be configured to implement call handling to meet the customer's style of working, with different call management rules, colour coding and tones.