

# DCS-5020

## Digital Console System

### Features

- Digital communications console system
- IP connected dispatch positions
- Integrates telephone call handling and radio dispatch
- Resilient distributed architecture
- 30 definable ports for lines and operators to a maximum of 16 operators
- Supports and integrates analogue radio, MPT 1327, NEXEDGE®, FleetSync®, iDEN®, MOTOTRBO™, and TETRA voice and data
- Screen-based, configurable Graphical User Interface (GUI) with intelligently integrated call queuing feature and caller ID aliasing.
- Multilingual operator presentation
- Range of operator and audio interface options

### Introduction

The DCS-5020 Digital Console System is designed to meet the needs of the small to medium-sized operations control room. Combining telephony and both digital and analogue radio control to either direct wired or IP connected dispatch positions, the DCS-5020 meets a range of professional applications for public safety, transportation, utilities, oil, gas, mining and private industry. Offering many of the features of a traditional console system, the DCS-5020 is based on a distributed architecture which removes the requirement for a central switch, and also allows IP connected dispatch positions to be placed anywhere on an associated IP Network. This ensures a fully scalable solution down to a single operator position and provides a high level of system resilience for mission critical applications.

### Description

The DCS-5020 integrates telephony and radio, call handling, monitoring and logging functions into a single operator interface. The system supports up to 30 ports, with each assignable to either operator, telephone or radio circuits. There are up to 16 operator positions possible, each comprising a host PC and video monitor, with desktop speakers, connected to the main control equipment either direct wired or via an IP Network. Optional accessories include headset, gooseneck/desk microphone, PTT footswitch, and keyboard.

The host PC runs Zetron's Windows®-based IntegratorDCS™ software, providing a graphical user interface (GUI) presenting the telephone/radio channels and system functions available to the operator. The video monitor can be full-size, compact LCD or part of an inbuilt panel PC to fit control room requirements. Touchscreen and/or mouse/trackball control is available. The operator GUI is extensively configurable and screen operation can be provided in a range of languages.

The desktop speakers and headset can be used to minimize desktop space requirements. The speakers—each with a volume

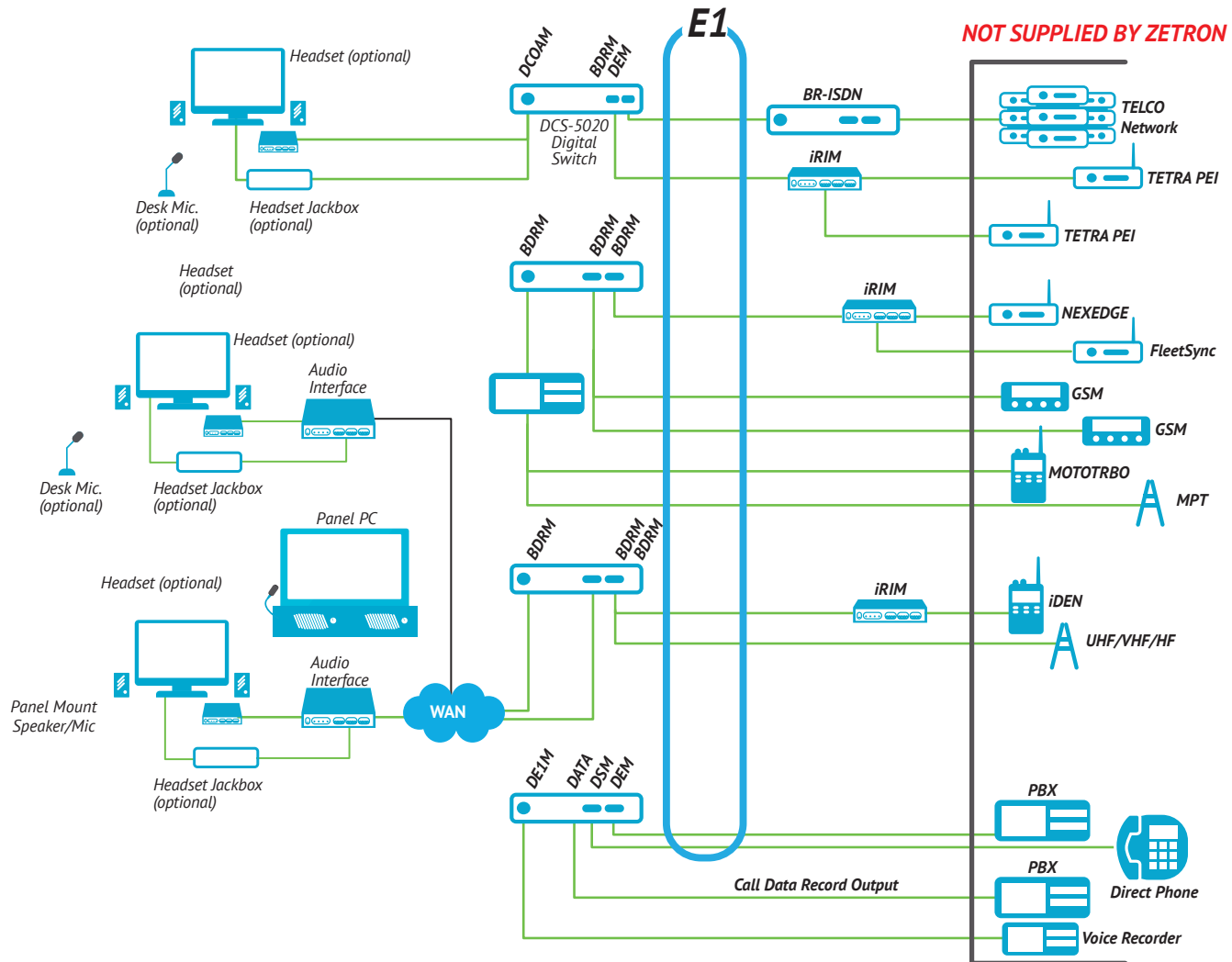


control—are for active conversation (select) audio and monitored (unselect) audio and come in either desktop or panel mount options. Optionally the DCS-5020 can include an integrated Instant Recall Recording (IRR) capability that allows operator audio to be logged on the console PC with playback controlled from the GUI.

The control interface to the telephone and radio channels is through the compact DCS-5020 Digital Switch. Each Digital Switch supports up to six interface ports with additional system ports provided by linking Digital Switches together using fibre, coaxial or twisted pair cable. The system architecture supports flexible system layout with operator positions and system resources being local to or remote from each other via traditional connection or IP Networks. Each interconnected Digital Switch and the interface ports on the switch are accessible from any other Digital Switch, meaning the radio and telephone resources on each switch may be shared in common with all positions in the system. In the unlikely event that a single Digital Switch fails, the only impact is on those operator, telephone and radio resources connected to that switch. All other shared resources continue to be available to the remaining positions. If a switch is isolated due to link failure it will still operate autonomously with any connected consoles and resources until its connection to the main system is re-established.

By networking the operator console PCs, operators may gain access to corporate phone directories, databases, and web-based services such as third party Call ID information or web based video feeds.

# SAMPLE SYSTEM ARCHITECTURE



## Digital Switch – Modular Design

The required interfaces determine the choice of plug-in modules in the Digital Switch. Modules are currently available for the following:

- Analogue subscriber line or PABX extension level (or GSM networks with suitable gateway)
- Direct telephone connection or hot line circuits
- Conventional radio via 2/4-wire direct or Tone Remote Control (TRC), 5/6 Tone or FleetSync
- MPT 1327 via MAP27 interface or direct connect to Zetron MPT infrastructure
- Digital trunked Radio - TETRA (compatible with Motorola, EADS/ Nokia, Sepura), iDEN, NEXEDGE and MOTOTRBO
- HF radio via an interface to Codan transceivers
- Analogue or E1 interface to long term voice logger
- Serial or NTP interfacing to Real Time Clock

System installation and configuration is through the Digital Console Management System (DCMS) software. DCMS is used to set levels, download new firmware, and monitor the health of the system. Full time connection is required only if continuous monitoring is desired.

## Operator Functions

Operator screen layouts can be configured to individual requirements, with on-screen graphics presenting line, function and status keys.

1. **Line** keys are assigned to individual ports—telephone, PABX, radio, intercom or pre-programmed working groups. Examples are:
  - Analogue telephone line
  - Telephone hunt group
  - Conventional radio
  - MPT 1327 radio/Zetron MPT 1327 infrastructure
  - iRIM radio (TETRA, NEXEDGE, FleetSync, iDEN or MOTOTRBO)
  - Direct Intercom line

2. **Function** keys allow the operator to select the specific operation, and include:

- Dial and Memory dial
- Answer next
- Clear
- Hold
- Multiline call
- Call transfer
- Radio/Radio and Radio/Telephone patch
- Monitor/unselect
- Volume control
- Radio selcall 5/6 tone, FleetSync
- Radio priority/busy channel marker
- Radio self repeat
- Individual/group call
- Emergency call
- Trunked mode (TMO)/Direct mode (DMO)
- Send/receive status messages
- Encryption calls (TETRA)
- Scan (TETRA, MOTOTRBO)
- Stun, revive (MOTOTRBO, NEXEDGE)
- Kill (NEXEDGE, FleetSync)
- Radio check (MOTOTRBO)
- IRR playback
- Monitor digital inputs (e.g. external alarms)
- Control digital outputs (e.g. door latches)

3. The **status** area displays information about the console such as:

- Communications with the Digital Switch
- Audio mode—speakers/headset
- Date and Time

4. The **Call Stack** area displays lists of calls in various formats. One or more call lists can be setup for display and include various data fields including time, date, call direction, call type, caller ID, unit status and call priority. Features include:

- Call Log list, showing a history of past calls.
- Unit Status list, showing the last transmission from each field unit.
- Call Queue list, showing field units who are requesting dispatcher attention.
- Optional buttons may be used to scroll through, remove calls from, and answer calls from the list.
- Field headers at the top of the list may be clicked to change the list sorting.
- List sorting by simply clicking on the desired field headers at the top of the stack.
- Configurable highlighting and text colour coding to simplify and enhance usability.

Call History							Prev	Next
Name	Priority	Dir	Date	Time	Console	Mis...		
Sapura	Emer...	Incoming	02/20/09	02:10:59 PM	System	Yes		
Sapura	Emer...	Incoming	02/20/09	02:09:21 PM	Console 2	Yes	CALL BACK	
Radio	Normal	Outgoing	02/20/09	02:08:58 PM	Console 2	No		
Sapura	Normal	Incoming	02/20/09	02:08:28 PM	Console 2	Yes	CALL DEL	
Phone 1	Normal	Incoming	02/20/09	02:08:13 PM	Console 2	No	DEL ALL	

5. The **HTML** browser is a powerful feature which allows access to additional operator services and third party information such as:

- AVL application and Geographic Information Systems (GIS)
- Network files, e.g. procedures, directories and training
- Video streams, e.g. door access or CCTV
- Audio streams, e.g. voice logger
- Web or HTML based services, e.g. HAZMAT, weather
- MDC1200 ANI decode

All of the above can incorporate HTML dial tags to quick dialing from the HTML page.

## Flexible User Interface

Key to the DCS-5020's operational benefits is the flexibility of the GUI.

The Console Design tool allows the GUI to be designed to provide the required functionality and presentation format to meet the clients unique operational needs.

The GUI can be designed based on button, graphical and/or HTML presentation or a combination thereof. For example:



Button

Graphic



HTML

Thumb TABs allow multiple pages to be provided. More frequently used buttons/information can be placed on the main screen/front page while lesser used resources can be placed behind. This and other GUI design resources allow the DCS-5020 GUI to be customised to provide the most effective and efficient GUI possible.

Operator screens can be set up to support local language display such that functions, controls and UI messages may be displayed in the native language of the installation location.

## Applications

The combination of telephony, conventional radio, MPT, and Digital Radio supports a range of console applications.

### Small Control Rooms

The DCS-5020 is an economic solution for small control rooms for public safety, oil and gas, mining, events, industry, ports and harbours. It brings many of the features of a large control centre into the smaller control room environment. The integrated radio and telephone functionality allows the operator to perform both call taking and dispatch functions. It can be employed as an incident control room without impacting on the role of the primary control centre.

### Mobile Command Centre

Mobile command centres can be established for special events, accidents or other major incidents by deploying the DCS-5020 as a transportable package. The operator can have access to multiple radio working groups, conventional radio channels or telephone circuits to manage incident personnel. For truly transportable applications, the telephone ports may be fitted with GSM terminals for mobile telephony service. Digital radio connectivity is done through a number of fixed digital radios rather than direct to the infrastructure, providing a quick deployable solution.

### Fallback Control Centres

The DCS-5020 has a specific application for digital radio operators to ensure basic communications are maintained in the event of failure of key elements of the infrastructure. Failures of the network controller, links to repeater sites, or the primary control room are addressed by the DCS-5020 fallback solution which maintains critical communications between control room and field personnel via wireless interfacing to the network. A wireless console is preferred in these situations where connection to the infrastructure is not suitable for application, too expensive or not possible due to the location of the control room.

### Command and Control Centres with Mixed Technologies - Patching

For operators migrating from conventional to digital radio, the DCS-5020 provides a bridge enabling operators to manage both networks from a single position. Additionally, the operator can set up an interconnection or "patch" between the two networks so field personnel on one network can speak directly with the other. The patch can also be set permanently using the maintenance terminal.

## Specifications

### PHYSICAL

Digital Switch: 45 mm (1.75") High (excluding 13 mm rubber feet)  
430 mm (17") Wide (excluding 19" rackmount brackets)  
240 mm (9.5") Deep (excluding cable exits)

### ENVIRONMENTAL

Operating Temp.: 0 to 50 degrees C  
Storage Temp.: -10 to 60 degrees C  
Humidity: 95% RH at 45 degrees C, non-condensing  
Power: 85 to 260 Vac, 47 to 63 Hz. 96 VA max per device  
12/24 VDC and 48VDC versions available

### HOST PC REQUIREMENTS FOR INTEGRATOR DCS AND DCMS

Processor: Intel Pentium® IV or equivalent x86-class CPU, 2GHz  
Operating system: Microsoft Windows XP Professional Service Pack 2  
Microsoft Windows 7 Professional  
Memory: 512 MB  
Video: 1024 x 768 resolution with a 16-bit colour depth (65,536 colours)  
Input Device: Keyboard, 2-button mouse  
CD Drive: Required for installation  
Network: 10/100 Ethernet Connection  
(TCP/IP network protocol must be enabled)  
Only required for application features that support network operations  
.NET Framework: Microsoft .NET Framework (included on installation media)  
DirectX: Microsoft DirectX 9.0c or later  
PDF Reader: Adobe Acrobat Reader 8.0 or better (included on installation media) required for accessing electronic documentation

### NETWORK REQUIREMENTS

Device Payload: 1 Kbps idle, 104 Kbps active (136Kbps Ethernet) using G.711 per channel.  
Network Loading: < 40% (< 30% mission critical). Bandwidth Ratio of IP bearer should be 2 to 3 times actual payload to ensure optimum voice quality  
Packet Loss: < 0.1%  
Packet Error: < 0.01%  
Packet Delay: < 400 ms (< 40 ms mission critical)  
Packet Jitter: < 50 ms (< 20 ms mission critical)  
Network Type: Fully switched Ethernet, full-duplex, capable of passing unicast UDP. Sharing the network with other IP traffic may negatively impact voice quality and therefore should not be considered for mission-critical applications.

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