TELEX

Radio Dispatch

Innovating the Future of Mission-Critical Communications

TELEX

More installations than any other IP-based dispatch system.

Table of Contents

Features:

Telex Radio Dispatch, part of the Bosch Group, manufactures and delivers thousands of mission-critical communication systems worldwide.

Telex Radio Dispatch is the leading manufacturer of IP control for two-way radio communications. Based on a distributive architecture, Telex dispatch console systems have flexibility, scalability, and redundant capability based on the network.

Telex converts audio and control functions from analog or digital communication devices to Ethernet. Once converted to IP, the signal can be transported via LAN, WAN, 802.11 wireless, satellite, and the Internet. With this many mediums to work with, systems can be precisely scaled according to application, whether confined to a single building or campus, or covering an entire country or the world. You can control a Telex IP-based system in Texas from New York, and all with parallel control in London, England.

C-Soft is the industry's most flexible and capable dispatch software – the perfect application for any dispatch environment. This software installs on a Telex Nexus position, a Telex laptop, or on your own computer position (when used with the ADHB-4 audio adaptor). With two to two hundred radio lines, C-Soft allows you to design your screen to your application. Standard features include an Instant Recall Recorder, paging, and intercom. Available features include Fleetsync, MDC-1200, and Advanced SIP. C-Soft is compatible and Windows 7 32- and 64-bit formats.

The newest addition to the list of radio interfaces is the connection that gives the C-Soft consoles control capability of MOTOTRBO™ Professional Digital Two-Way Radio Systems. All of the MOTOTRBO™ Conventional and Capacity Plus features are supported at this time, including GPS tracking. Add this capability to the most scalable and flexible IP-based dispatch control system, and you have the best dispatch solution offered today.

Another key component is technical support and services. Telex Technical Support team members have the right combination of extensive training and years of experience to assist you with any technical issues, ensuring your Telex equipment provides the right solution for you.

Read on to learn more about how a Telex dispatch solution can be right for you.

Portland State University Public Safety Dispatch:

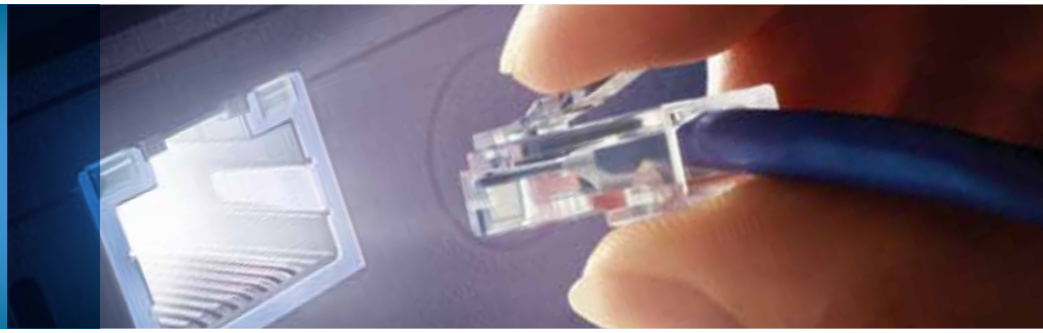
With a student body of nearly 30,000, Portland State University (PSU) is the largest university in Oregon. The campus is made up of 50 buildings, including ten student housing facilities, situated on 50 acres in central Portland. Policing at PSU is handled by the Campus Public Safety Office (CPSO), which is staffed for up to 16 officers and five dispatchers. "We provide most of the law enforcement services for the university," says lead dispatcher Tyler Roppe, "and act as the central contact point for the university."

CPSO uses three channels on the 800-MHz system – one for the city police's precinct channel, and two for on-campus CPSO activity. Two channels run on Motorola MCS 2000 systems, and another on a newer Motorola XLT. At the same time, CPSO needs to maintain easy communication with other campus departments that use a Motorola 450 radio system, including the parking and recreation staffs. The 450 system also serves as CPSO's backup in case the city system goes down.

"The idea of running radio over IP (RoIP) was a very attractive way to deal with the situation," Roppe continues, "because there was already Ethernet to our basement and also to the penthouse. In fact there is a fiber line that goes directly from us to that penthouse. And once we had decided on RoIP, it seemed like C-Soft was the system that everyone was talking about.

"Everyone is very happy with the C-Soft console," Roppe says. "We haven't had any significant issues at all. It's great to be able to interoperate with the 450s, and the system is very stable; once it was locked in, we didn't need to adjust it. And the IP-223s are very sound units; we've never had any issues with them. So overall the reliability on the system has been very good. We'd actually like to expand the Telex system and use it in some new ways, including interconnecting with our phones. This system was a good choice for us, and I don't see us using anything else."

IP-based FAQ



Can we use our existing computer network to create an IP-based dispatch system, or do we need to build a new one?

The answer to this question depends on the IP dispatch system application. In many cases we can use existing IP networks, but in other cases, like public safety applications, you may want to think about creating a secure, standalone communications network. Here are a few things to consider with regard to IP dispatch solutions:

- How much traffic is on my existing network and how much bandwidth is available to dedicate to a communications solution?
- Does your network support multicasting? Multicasting is an important element in making our dispatch solutions as effective as possible. We can work with non-multicasting networks, but there are some limitations.
- Do you want to connect and communicate between multiple locations or installations via an IP dispatch network? If so, that means you have to have a good network connection between them. Anywhere you have a network connection could be a potential location for communications equipment. If you have offices across the country that are all connected via a network, you could communicate between them using two-way radios because the network ties them together.

How much bandwidth will the dispatch system use on the network?

With a C-Soft low-bit vocoder, there can be a bandwidth savings of up to 30 percent. This depends on how many radios and dispatch positions you want on the system. The breakdown is simple: every device you connect to the system that operates in simplex mode requires 50 kBits of available bandwidth. Multiply that times the number of communication lines you have on the system — 8 base stations means 8 x 50 kBit or 400 kBit for effective simultaneous communications. Always make sure the network has the capacity to account for the maximum possible number of simultaneous transmissions.

How important are SIP capabilities in a dispatch system?

The Session Initiation Protocol (SIP) is a signaling protocol used for establishing sessions in an IP network. For a radio dispatcher, SIP is one way of bringing control of telephone onto the console, be it a simple two-way call or a collaborative conference session. This allows dispatch to control phone calls incoming and outgoing phone calls and use features such as hold/unhold, call forwarding, conferencing, voice mail, and call transfer. One of the most important features is the crosspatch capability of radio and phone. Now a police officer on a radio channel can be connected to a phone call to coordinate activities or assist dispatch with a critical situation. SIP can be configured to use existing switches, so a large number of lines are available if required. SIP is becoming an important part of dispatch consoles. Like the IP console, SIP is a powerful yet simple tool which is also very flexible and scalable.

I have two dispatch locations, but can only afford to update one console to IP. Will I be able to communicate with the old console?

In most cases, Telex will be able to interface an IP-223 or gateway to each channel at the location where the radios would be interfaced to the analog console, usually the Central Electronics Bank (CEB). The IP-223 is configured in console mode, and allows the channels configured this way to be put on the same IP network system as the new IP console. Through the network, the analog console can be monitored and operated like it was another IP console. The flexibility of this design provides a way for an end user to start a migration path to a complete IP changeover when replacing the dispatch consoles in multiple locations. When required, this concept also provides a very cost-effective backup console to existing analog consoles.

Nexus IP Console Position

Complete Communications Solution

To build your dispatch position:

Choose a PC platform, monitor, C-Soft, headset adapter, and accessories.

1. Choose your computer:
Either purchase our Nexus computer, or purchase a computer that meets the PC requirements listed on the next page under the C-Soft product.

2. Choose your C-Soft

A. Select C-Soft by number of Lines
   a. DFSI-P25
   b. SIP Telephone

3. Choose your monitor:

- 19" LCD monitor
- 19" TS LCD monitor

4. Choose your headset adapter:

- ADHB-4 with PC position
- RHB-1 for remote headset

5. Choose any of the applicable accessories:

- Microphone
- Speakers, up to 6 or 3 pairs
- Headset
- Footswitch

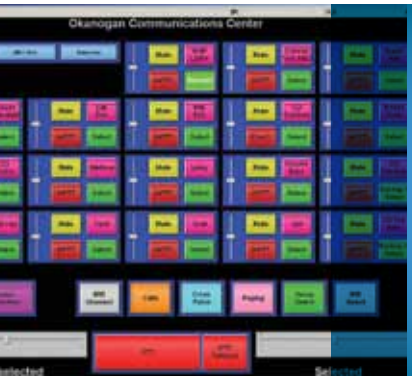
The Nexus IP console position delivers everything for dispatch communications—stability, performance, and world-class dispatch capability. The IP platform makes it simple to install, easy to expand, and flexible enough to use in any dispatch setting.

Service and Support

By standardizing around a single dispatch position platform, we have been able to optimize both the operating system and dispatch software for maximum stability and performance. We are able to deliver a total solution that is significantly enhanced and much easier to support by removing the variables associated with software installation on an end-user provided PC.

Flexibility and Scalability

The Nexus IP console position can be ordered in configurations from 2 to 200 lines. It is our most capable and highest-capacity dispatch solution. The user interface is completely customizable, meaning you can control the button layout – the size, shape, color, and even the labeling. Change the background color, create simple or advanced dispatch interfaces — the options are nearly limitless with the Nexus console position. You can even store multiple dispatch configurations on a single station for different applications or usage scenarios.



C-Soft

Software-based Radio Dispatch Console

PC requirements:

- Operating system: Windows XP and Windows 7 32- and 64-bit formats
- Network connection: 10 Mbps or 100 Mbps TCP/IP connection
- Processor speed: Intel Pentium dual CPU 1.8 GHz
- Memory: minimum of 2 GB of RAM recommended
- Parallel applications: not recommended to run other applications on PCs running C-Soft, especially those with high demands.

NOTE: These are minimum requirements and users should bear in mind that when handling a large number of lines - 50 or more per PC – it is strongly recommended that more powerful computers and more robust network resources be deployed. Please consult your integrator for specific system recommendations.

Features:

Available configurations – available in configurations from 2 to 200 lines.

User interface – user-controlled configurations for any dispatch application.

Signaling capabilities – MDC-1200 encode and decode, NEXEDGE, FleetSync encode and decode, DTMF, serial and OTA FleetSync, 5/6 tone—supports emergency, group, individual, and status calls.

Instant recall recorder:
- Tracks the last ten minutes of both select and unselect speaker audio.
- Buttons can be set up to start playback at various points in the buffer, or played call-by-call from the call buffer.

Information windows – per-line call history, active emergency, emergency history, manual call list, and status window.

Intercom capabilities – intercom communications between dispatch positions can be set up on all consoles on the system.

DTMF keys – a full 16-key keyboard is supported.

Paging:
- Multiple paging formats are built into the C-Soft console software.
- Quickcall in both the 100 and 1000 group formats, as well as DTMF, Knox paging tone, and 5/6 tone paging.
- Manual frequency entry mode is also supported.

Alert tones:
- Three alert-tone types are supported, including steady tone, pulsed tone, and high-low warble.
- All frequencies and durations are programmable.

Programmed group & mute buttons – for both functions, lines can be selectively included within these programmed buttons, allowing for instant access to particular lines of interest.

Status indicators – 24-hour clock, VU meter, PTT indication, and Instant Recall Recorder progress are displayed on the upper status bar.

Flexible audio interface options – using Telex's new ADHB-4 and RHB, C-Soft can interface with all common dispatch communication audio sources, including headsets, desktop microphones, external speakers (up to six), and footswitches.

SIP Telephony:
- Crosspatch, DTMF hold, call history, phone directory, stun, and proxy server.
- Provides audio adjustment with silence detection and jitter buffering.
- Able to specify IP interface for SIP connections.
- Per-line configuration for each SIP account. SIP is only available with 24 lines of C-Soft dongle or above.

Multiple vocoders – per-line vocoder type ability to select lower bandwidth vocoder.

Special interfaces – MOTOTRBO™ Systems with Mapping, Motorola Smartnet/ Smartzone, Kenwood NEXEDGE, iDEN, and DFSI-P25

DFSI-P25

The Telex conventional P25 offering complies with Telecommunications Industry Association (TIA) standards for the Digital Fixed Station Interface (DFSI). This interface provides the connection between the C-Soft console and conventional P25 networks operating with the common air interface.

Working with Tait and Daniels, Telex is providing a DFSI for digital conventional radio systems. This interface will connect directly to the base station radio and will not require an IP-223 or IP-224 to convert audio and control signals to Ethernet. This design does not require dedicated servers in the system, so, in a multi-position console system, one position takes the role of control server and another position backs-up the control in case of failure. Any of the positions can be configured to be the server and backup, thus maintaining scalability and flexibility in the console system design. All C-Soft features are still available with this design, including Crosspatch, which allows the analog systems to be connected to the P25 systems. The following list outlines the companies and functions offered in this DFSI interface.

Supported DFSI Repeaters:

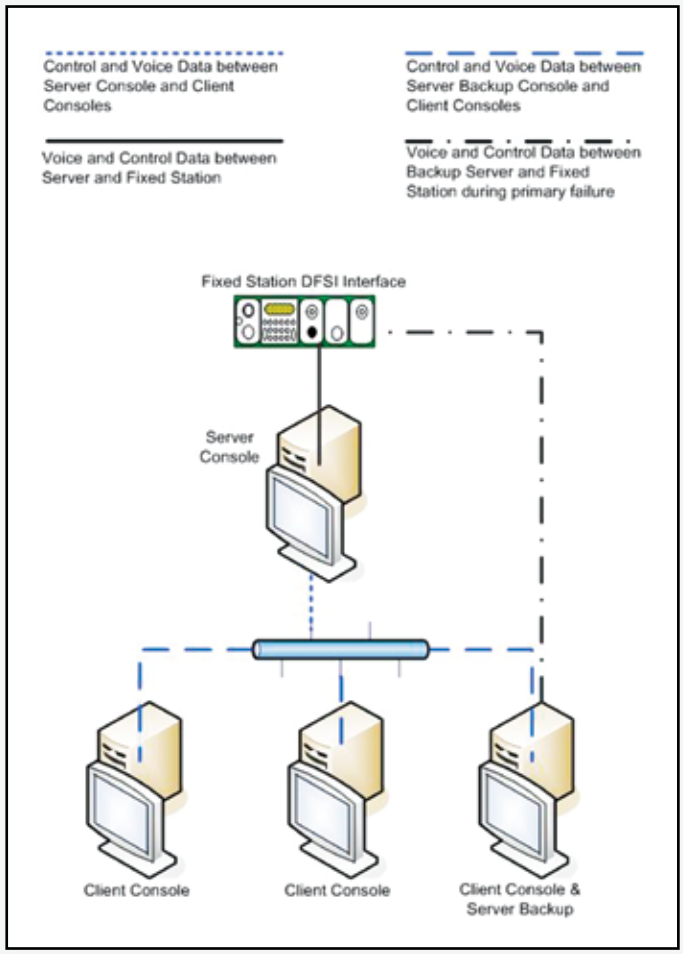
- Tait
- Daniels

Supported DFSI Repeater Functions:

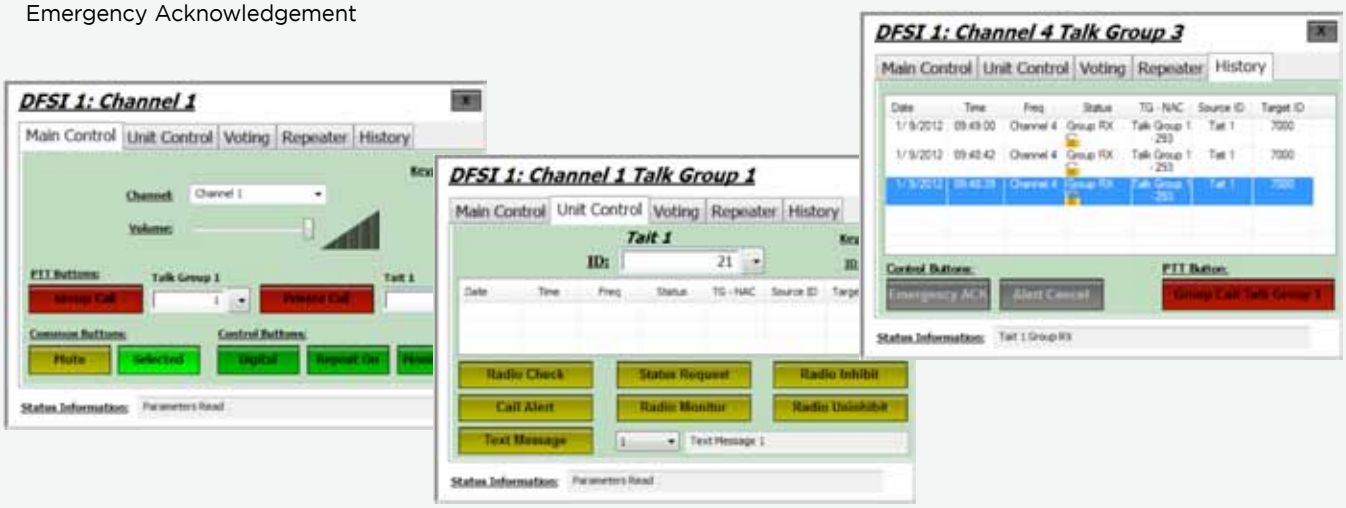
- Channel Change
- Repeat Mode
- Monitor
- Voting

Supported DFSI Radio Functions

- Digital/Analog/Mixed Mode
- Radio Check
- Radio Inhibit
- Radio Un-inhibit
- Status Request
- Call Alert
- Radio Monitor
- Private Call
- Group Call
- Pre-Programmed Text Message
- Emergency Acknowledgement



When multiple operating positions are required, one position will be the primary controller of the fixed stations in a server/client model. One console acts as a server, one acts as a backup server, and the other positions act as clients. It is important to note that there is no special software build between consoles. Any C-Soft position can be configured as a server, backup server, or client console position by using C-Soft designer.



Advanced SIP

Session Initiation Protocol (SIP)

Features:

Call hold – places the current call on hold and returns to the previous call.

Call waiting – sends an audible indicator when a third party calls in.

Blind call transfer – two parties are in a call and one transfers the call to a third party without first contacting the third party.

Call transfer with consultation – two parties are in a call, then the third party is contacted to announce the transfer before it happens.

Call-forwarding feature:

- Unconditional – routes all incoming calls to voicemail or another number for any reason.
- Busy – sends a call to another phone number or voicemail in the event the line is busy.
- No answer – sends the call to another phone number or voicemail in the event that there is no answer (after a pre-defined time).

Three-way call conferencing – allows up to three calls via conference bridge.

Crosspatching radio PTT users with SIP calls – allows dispatchers to interface radios via SIP, to be included in the interoperable conferences.

Call conference up to five users – allows for multiple calls out to others, putting all calls on hold then bridging the conference call.

Do not disturb – allows all calls to be routed to voicemail.

All SIP call sessions are recorded on the Network Recorder – C-Soft records via echo packets, so the user will have to configure packets in C-Soft Designer.

We are excited to launch a full industry-standard SIP solution as a part of the C-Soft software-based console. Users can opt for a two-line or six-line HW security key or SW option for the ADHB-4. Adding our new Advanced SIP solution to the Telex IP dispatch console allows for a complete console solution.

Our new application provides a great alternative method of telephone line installation into a dispatch console solution. With the Advanced SIP features, users can implement and configure many telephone lines into a C-Soft console position without having to connect external hardware.

Our application is easy to install and easy to use! The icons are intuitive and they indicate various calling features (i.e. call is on hold, etc).

Telex ROIP for Cobalt Equipment's mobile ECC

Cobalt Equipment and TelePath chose the Telex IP-223 RoIP/C-Soft dispatch system because it is the best solution for a mobile response unit. "Telex is very user-friendly, it can be changed quickly, and it's very flexible. We looked at several other systems, but we kept on coming back to Telex. A lot of states and state fire agencies also use Telex, so we figured that it would be a good fit with anyone with whom we would ever work."

— Rob Knabe
President, Cobalt Equipment

BEACON

Beacon Series

ADHB-4 & RHB

Advanced Digital Headset Box

Remote Headset Box

Features:	
Ethernet communication	LED power and PTT indicator
Six audio channels	12 VDC operation
One dual-channel 1/4" headset jack	Two remote headset box connections
One XLR connector to low-impedance microphone	Volume control knob
One desk mic jack	LED for power/PTT indication
One telephone handset jack	Programmable gain control
One NENA I/O jack with offhook detection	Footswitch inputs for PTT and monitor
Separate headset volume knobs	Two relays with form-C contacts
Supports three pairs of speakers	AUX inputs are DC isolated
Use with any standard amplified speaker	Color LCD-type display

The all-new Advanced Digital Headset Box (ADHB-4), an enhancement to the HB-3+, is our next-generation radio dispatch headset adaptor. The ADHB-4 works exclusively with the Telex C-Soft console version 5.000 or later. It processes audio internally and communicates with C-Soft to transfer the signal via USB, which eliminates dependence on the PC sound card. This allows users to purchase their own computer. While the current HB3+ works with two speakers, the ADHB-4 supports up to six speakers per position.

The ADHB-4 is the heart of the C-Soft console dispatch position. It removes the barrier between users of different PC audio platforms and enables them to relay vital, life-saving information. To further enhance the flexibility of the system, the ADHB-4 works with most desktop systems running the latest Microsoft Windows 7. It is also backwards-compatible with Windows XP. In addition, the ADHB-4 includes all connections necessary for full integration into the most common radio dispatch configurations.

One of the most striking features of the ADHB-4 is its full-color LCD screen. This display hosts a rich interface which provides the user with at-a-glance system status updates. With its web capability, the ADHB-4 can also be managed via web interface. These advanced configuration options will bring peace of mind to dispatch operators, enabling them to focus on the critical task at hand. Our new Remote Headset Box (RHB) allows up to two optional RHBs to connect to the ADHB-4. This allows other users to listen to the dispatch position (ie: supervisor, second dispatcher).

St. Lawrence Seaway

The Seaway's primary communications center is at St. Lambert, QC – one of the seven main locks that connect the Seaway's system of canals. The St. Lambert location is equipped with two primary Telex C-Soft positions (interfaced with IP-223 RoIP adapters), one of which is a supervisory position for controlling communications over the length of the Seaway – about 200 km. Three more C-Soft positions are dedicated to controlling the locks. All of the above are backed up by two identical C-Soft positions at a smaller center at lock two in Sainte-Catherine, QC.

Eight Telex IP-1616 consoles are distributed at the seven locks along the Seaway, allowing the main St. Lambert center to communicate locally with other communications colleagues, maintenance staff, ships, etc. In addition, 12 IP-2002 consoles were specified for specific management locations to access different channels.

All audio traffic is recorded on Telex Network Recorders with RDR (Remote Data Reviewer) capability from remote locations. This recorder logs all audio traffic and events from each console and makes that information available to the various RDR locations for viewing.

The Telex system's IP capability provides the ideal combination of flexibility and user-friendliness needed over the length of the Seaway.

C-Soft is the industry's most flexible and capable software dispatch console — the perfect application for any dispatch environment. C-Soft delivers all of the dispatch capabilities you expect, while also giving you the flexibility that only an IP-based software console can provide: simple and quick deployment in the field, easy back-up of communications assets, and the ability to save multiple configurations on a single computer. This proven application has been deployed in communication centers around the world, in applications from 911 dispatch to mobile command centers and transportation management.

Telex C-Soft: A Proven Life-Saver for Okanogan County 911 Center

How does a small city handle a big crowd without huge problems? That's a key question facing authorities in the Gulf Coast hot-spot of Galveston, Texas, where popular events such as Mardi Gras, Spring Break, and the Lone Star Motorcycle Rally can draw nearly a half-million people to a city of under 60,000. The answer, of course, involves a broad array of effective public safety practices, many of which depend on the availability of reliable, high-performance emergency communications both within the city and beyond. To handle the job, Galveston built its special event communications system around the C-Soft RoIP platform from Telex.

"During special events we don't like to use assets that might be needed for the day-to-day operation of the rest of the city," says Robert Simmons, Galveston's Risk Manager. "So we set up a mobile command post in the field with dispatchers. The big challenge for these dispatchers used to be trying to use radios to monitor the number of channels in play at a given event."

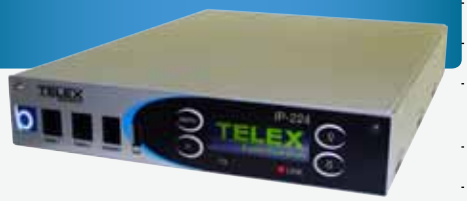
Simmons says his first taste of a possible solution to the problem came when he visited the County of Galveston's emergency operations center and saw their Telex C-Soft system in action. "I saw the benefits of being able to look at 12 or 24 channels at one time on one screen," he says. "It allows a much more effective use of radio assets, because the dispatchers are able to monitor visually. That takes the burden off of the people in the field, who can now just talk to a dispatcher on their regular channels without worrying about switching over."

"The C-Soft system worked out very well for us," Simmons continues. "It did everything that was promised, and we were very happy with it. In particular, it gave our dispatchers the ability to monitor multiple channels in a way that they simply couldn't handle efficiently before. And it gave us the ability to access all the radio assets we might need from surrounding areas. Those are two big advantages right there."

Simmons adds that he "saw the benefits enough that I'm going to expand the system as much as I possibly can. We currently have a 12-position license on each of our C-Soft consoles, and we're going to upgrade both of those to 24-positions. And we're going to tie IP-223s into every radio asset that we have in our main dispatch center, so that if we ever do need to call in outside help — for a hurricane, for example — we'll have access to the radio channels of all the various departments that are coming down here even before they get here. With the Telex system, we're now able to take the greatest possible advantage of all of our radio resources."

IP-224

IP-224 Ethernet Adapter Panel



The IP-224 is the next generation of IP adaptor to form the heart of the Telex Radio Dispatch System. This redesigned Telex IP adaptor does not require any jumper settings or setting of internal pots. Configuration is made simple by the use of a computer for IP settings and communication device settings. Below are more details about the features and options of Telex's newest offering.

Available Options:

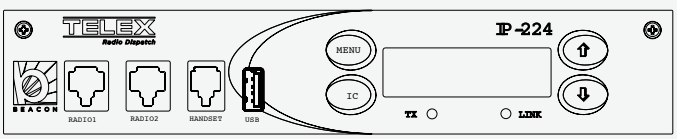
- Fleetsync encode and decode
- MDC-1200 encode and decode
- iDen Interface
- E.F. Johnson RS5300 P25 radio Interface

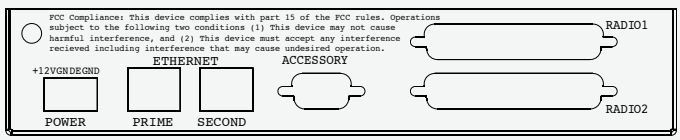
Available Accessories:

- Single or dual rack mounts
- AHS-1 handset

Features:

- PTT (Push-to Talk), monitor, and F1 and F2 relays (programmable to any function tone or revert to F1)
- Four PTT modes and three monitor modes
- Nine selectable PTT frequencies
- Eight digital outputs for channel selection, completely programmable per function tone
- CTCSS (Continuous Tone Coded Squelch System) generation (64 frequencies)
- Software gain control
- Local handset port for monitoring activity and transmission back to base or to radio, uses optional AHS-1 alignment handset
- RX AGC (Automatic Gain Control)
- RX (Receive) audio squelch
- ANI (Automatic Number Identification) over-the-air-protocol decode and display
- Kenwood radio interface
- SoIP (Serial-over-Internet-Protocol)
- Supports USB, RS485, CAN-bus, RS232, and TTL
- Radio communication
- Backwards compatible with Telex Radio Dispatch equipment
- Secure remote web-browser-based programming and configuration
- Single- or dual-function tone generation
- Guard tone user-selectable for 2100 Hz, 2175 Hz, 2300 Hz, 2325 Hz, 2400 Hz, 2600 Hz, 2800 Hz, 2850 Hz, or 2900 Hz
- Menu-driven front panel controls for TX, RX, spare audio, IP addressing, and CTCSS
- Number of channels or talk groups up to 1000
- Interface for MOTOTRBO™





Based upon the Linux operating system, the IP-224 provides an extremely reliable means of remote-controlling two audio devices. The IP-224 can be easily configured to work with both digital and analog consoles, and it performs a wide variety of other tasks related to using radios on a digital network, including state-of-the-art system diagnostics.

The IP-224's sleek new design combines form with function, allowing easy installation, operation, and servicing. The unit may be rack-mounted or placed directly on a desktop, and it is equipped with an LCD display to clearly provide user feedback when programming. VU meters are also provided via the display for alignment purposes. All other configurations are completed in the web browser configuration windows.

The IP-224 is backward compatible, allowing the use of IP-224 and IP-223 adaptors in the same system. This will allow a migration to the new products when desired.

IP-223

Dual IP Network Remote Adapter Panel

IP-223 also offers seven functional modes:

- **Local –** direct connection to any radio, bridging it onto the IP network.
- **Tone –** generate standard control tones via conventional connections to radio.
- **Console –** bridge analog consoles into an IP dispatch network.
- **Crosspatch/repeater –** directly patch communications devices on the network without a console. It can also be used to extend coverage.
- **Phone –** connects a standard POTS telephone line to the dispatch network via the TDI.
- **iDEN –** puts iDEN phones onto the dispatch network and provides advanced access and control.
- **TETRA –** provides access to advanced features of the TETRA system via an interface with Sepura radios.

The Telex IP-223 Network Remote Adapter is the center of IP radio control solutions for Telex. The IP-223 bridges two-way radios and other communications devices onto the IP network. Each IP-223 allows you to connect and control up to two communications devices from any dispatch location on the network.

Features:

Radio telephony operation – allowing local consoles to change to a remote radio channel via POTS (Plain Old Telephone Service) line.

Enhanced crosspatch capabilities:

- Line-to-line crosspatch – enable and disable via DTMF strings.
- Start/stop function tone line-to-line crosspatch – designated function tones have the ability to automatically set up and knock down line-to-line crosspatches within the device.
- Dial – remote user with portable radio can key a DTMF string, causing IP-223 to take the TDI off-hook, dial a pre-programmed phone number and establish a patch between the devices via DTMF strings.
- Dial VoIP – remote user with portable radio can key DTMF string, causing an IP-223 to join different multicast group and port-mapping the IP to a different channel.
- Phone patch – remote user with portable radio can key a DTMF string, causing IP-223 to take the TDI off-hook. The user can then manually dial a phone number.
- Multiple vocoders (per line vocoder type) – ability to select lower bandwidth vocoder.

Kenwood P25 TK5710/5810 serial control – supports encode and decode of FleetSync ID and P25 ID, channel change, scan ON/OFF, and monitor. Also capable of direct serial control of Kenwood 80, 90, and 150 series radios.

Generate FleetSync MSK signal at the IP-223 – DMR (Digital Mobile Radio) radio: NexEdge does not require specific Kenwood base station.

Advanced compatibility with multiple radio manufacturers – Motorola, Kenwood, EF Johnson, iDEN, and Sepura.

Five-tone detection – decodes five-tone messages received from remote radios and sends console information to the display.

COR click dialing – while using COR (Carrier Operated Relay), the remote user can key click a portable radio, causing IP-223 to take TDI off-hook and dial a pre-programmed phone number to establish a telephone connection between remote user and a designated dispatch console.

Improved web-based programming interface – redesigned web page displays important information on start screen and simplifies navigation to critical programming areas.

Encode iDEN emergency – able to receive and decode ID and information related to incoming iDEN emergency signals.

Sepura status messaging – able to decode and display status messages generated via TETRA (Sepura SRM200/3500) radios.

Telex System Manager (TSM) – easily detects Telex device on the network for easy firmware upgrade and configuration.

Denver Public Schools use Telex for stability and effectiveness

"I have been working with two-way radios for DPS going on 25 years now, and RoIP is the neatest technology I have seen in communications yet. The ability to multicast over Ethernet is a powerful tool. RoIP has created endless possibilities for our two-way applications. We can design and add on to the Telex IP-223/C-6200 system in many different ways. It's a great platform to grow with."

— Jim Bailey,
Denver Public Schools Radio Room

MTRBi

Radio Interface for C-Soft

Features:

Radio check/status – allows dispatchers to check the status of portables in the field.

Radio enable/disable (stun/revive) – allows dispatchers to enable and disable radios out in the field.

Remote monitor – dispatchers can monitor the audio of a radio in the field.

Zone & channel change – allows dispatchers to change zones and channels configured in the MOTOTRBO™ professional digital two-way radio system.

Scan control

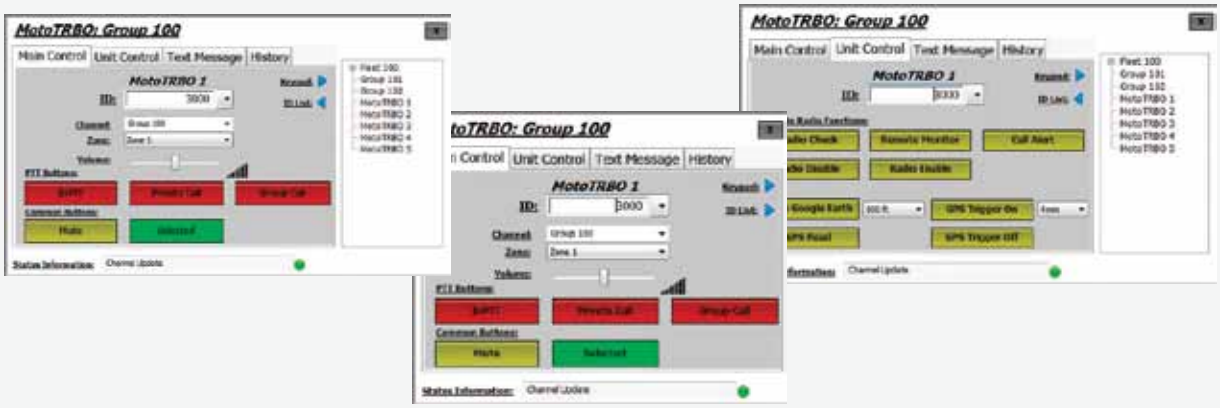
ANI with alias table – provides dispatchers with a call history.

Call alert – notifies dispatchers of calls.

Emergency alert – alerts dispatchers and supervisors in an emergency situation and can provide GPS coordinates of the location.

Outgoing text messaging – allows for communication between dispatcher and radio.

Supports GPS/GIS – location tracking services integrated into C-Soft solution.



Our newest addition to the Telex product family is the MTRBi interface. This interface allows a C-Soft software based console to control the Motorola MOTOTRBO™ radio. Adding the Telex IP dispatch console allows one to have a complete MOTOTRBO™ solution.

The main advantages of our MTRBi are its ease of use, scalability, and reliability. It has a high level of performance, productivity, and value!

Different types of organizations, including public safety, government, commercial, health care, utilities, and transportation, can now get the features of Motorola's MOTOTRBO™ with full console capability. Telex's MTRBi solution is a very cost-effective and efficient solution. We support the features listed on the side, and are very excited about the text messaging and location tracking services (GPS location tracking).

Accessories

TDI

Telephone Dispatch Interface

This innovative technology allows dispatchers to place and receive calls from their console. A single analog phone line can now be a shared resource among several IP-based dispatch consoles in a facility.

NI223 +

iDEN Interface to the IP-223

Users are able to change groups, initiate/terminate calls, crosspatch iDEN calls to other radio channels on the network, communicate directly with the phone user, power the iDEN phone, and pass caller ID information back to the console.

IP-25300

EFJ 25300 Interface to the IP-223

Users have the flexibility to crosspatch the radio with any other communication platform, including iDEN and a range of other two-way radios. The EFJohnson 5300 mobile radio is available in bands from VHF to 700/800 MHz and is used around the world.

NEO-10

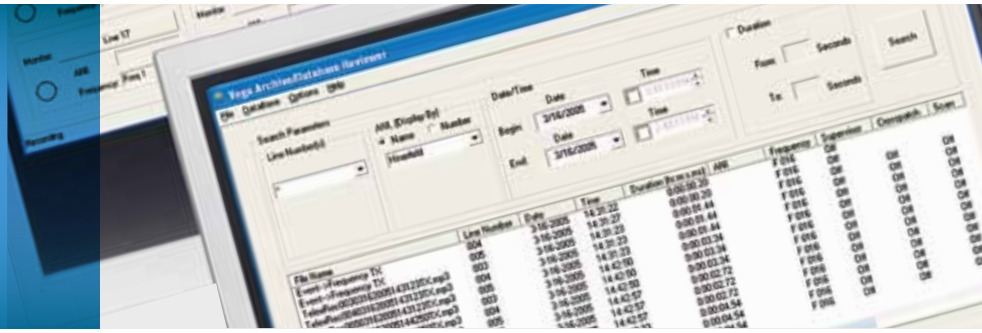
Network Input/Output Control Device

The NEO-10 is a network-based input/output device that has 10 DPDT relays and 10 inputs for monitoring external events. Anytime a relay or input changes, the NEO-10 sends a message across the network, allowing all console users on the system to see status updates in real time. Actual control of the NEO-10 is accomplished by a TCP/IP socket connection from the controlling console.

HB-3 +

Headset Adapter Panel

Microphone and headset input circuits allow end-users to choose between electret and dynamic element microphones. The HB-3+ contains its own microprocessor and software, giving it the intelligence and ability to control multiple inputs and outputs. Sold with legacy hardware consoles.



Network Recorder

Features:	
Faster CPU speed, more RAM	Separate OS drive
Dual 500-GB hardware RAID control hard drives	250-GB SATA removable hard drive for archive
Easy to recover the system in case of failure	Additional archive hard drive available
Exportable	

Network Recorder Software
The new network recorder is sold in combinations of 12, 24, 50, and 100 licenses.

The Telex Network Recorder allows you to monitor and record audio for any channel in real time, and stores detailed information for each call and event in an SQL database for quick and easy retrieval. This includes source IP addresses, channel changes, crosspatch creation and tear down, supervisor mode start and end, ANI, date/time/call duration, line number, scan status, and NEO-10 relay input while supporting Windows 7 and DFSI-P25.

The recorder monitors the radio network for audio packets and records specific criteria. These are stored as raw PCM audio and are then compressed into MP3 files. A 32-bit digital signature is added to the file to guarantee its authenticity. Both RX and TX audio are stored and separated for search purposes.

Network Recorder monitor features:

- **Check for heartbeat, warning, and errors**
- **Established reporting messages –**
  - MP3 compression problems
  - Database connection/reconnect problems
  - Protect key (dongle) not found
  - Sound card problems
  - Hard drive full
  - Database rebuilding
  - A line has been recording over 30 min.
  - Accumulation of error files
  - Less than 20 GB left on hard drive recorder

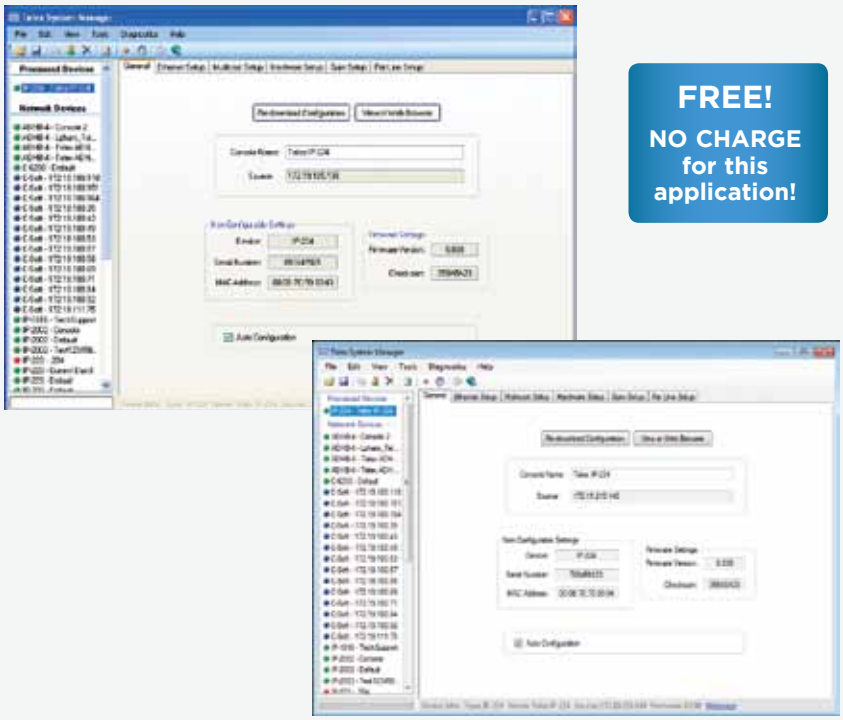
The Remote Database Reviewer and Network Recorder's relationship is as client and server. The Remote Database Reviewer (client) connects to Network Recorder (server), and a session is created. While the session is active, the Remote Database Reviewer is able to perform database queries and request audio from the Network Recorder server. As long as the session is active, the session's user account is also considered active. When the Remote Database Reviewer is closed, the session ends and the user becomes inactive. The Network Recorder allows for six sessions at a time.

The Telex Remote Database Reviewer software is a state-of-the-art tool that enables users to remotely access the Telex Network Recorder's database of audio files for playback and data export, to generate a report for portable viewing. The Remote Database Reviewer is able to stream and copy audio files and data from the Network Recorder's archive of recorded audio.

Recorder Search Engine:

The network search engine can search the recorder computer using these parameters: ANI, line number, date, time, and call duration. Unrelated calls can be removed from the search screen, and calls of interest can be copied for playback on another computer or an MP3 player. Large groups of calls can be archived for permanent storage and to clear disk space. Archived calls can then be brought back into the database for later review.

Telex System Manager



FREE!
NO CHARGE for this application!

Features:

- Option to save the configuration to a file
- Selectively copy device parameters from one configuration to another
- Import or export to XML or CSV file, ID directory, crosspatch table
- Save device configuration files to local disk for backup, archiving, or duplication
- Record configuration files back to a Telex device

Requirements:

- Windows XP SP2 or higher
- NET Framework 2.0 or higher
- Windows Installer 3.1

Telex System Manager (TSM) software allows users to easily configure Telex devices. TSM allows a user to view and manipulate configuration parameters for the IP-223, IP-2002, and the IP-1616. In addition, TSM includes the ability to update firmware on the IP-223, IP-2002, IP-1616, C-6200, and the NEO-10. Telex System Manager replaces and improves upon the existing FTP Telex and Configuration Saver programs.

V.I.P.E.R.

IP-based Radio Control System

All V.I.P.E.R. packages include:
four Telex IP-223 radio controllers, external connection for up to eight different portable radios, external Cat-5 network connection, internal network router, and a rugged weather resistant mil-spec case.

V.I.P.E.R. MCU also includes:	V.I.P.E.R. 8 also includes:
Nexus IP laptop computer	110–240 V @ 100 W max power supply
12-line C-Soft dispatch console software and network recorder software	Closed dimensions: 28” W x 27.25” D x 15.5” H
Built-in storage drawers for laptop computer and accessories	
110–240 V @ 320 W max power supply	
Closed dimensions: 28” W x 29.5” D x 22.5” H	

Use the V.I.P.E.R. to create completely self-contained dispatch networks that are easy to deploy in emergency situations, providing effective communications interoperability solutions. V.I.P.E.R. is based on a modular architecture, and it provides the flexibility to create an exact solution for any application. Any authorized Telex Radio Dispatch dealer or integrator can help design a system that fits your needs. Our V.I.P.E.R. MCU and V.I.P.E.R. 8 can be connected together to achieve expanded capabilities.

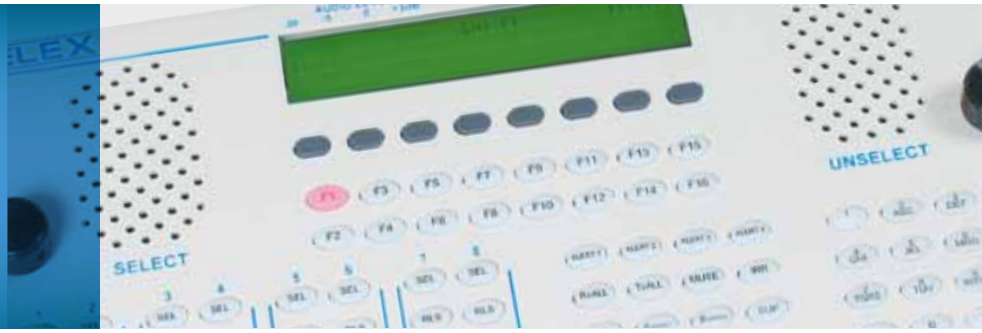
Number of radios needed for control

Each Network Remote Adapter (IP-223) supports up to two radios. The number of different radio systems you need to control will determine the number of IP-223s to include.

Number of pre-configured radios for installation

When building a V.I.P.E.R., agencies and integrators often choose to have their most commonly used radios built right into the unit.

Hardware Consoles



IP-1616

Eight-line IP-based Radio Dispatch Console

Features:

- Simplex/full-duplex operation (field programmable)
- Crossmute (Ethernet-based)
- Parallel console update
- Instant Recall Recorder (IRR)
- Telex System Manager (TSM) easily detects Telex device on the network for easy firmware upgrade and configuration.
- 16-channel control
- Crosspatching of two to eight lines
- Communications with crosspatch groups while operating on unused channels
- Line select call with alarm

Controls:

- Monitor, intercom, and PTT button
- Up to four alert tones
- Crosspatch
- Group select, two pre-determined groups
- Supervisory control
- 16-digit DTMF keypad
- Volume controls
- Parallel TX LED detect
- Channel selection
- Instant PTT
- Four programmable buttons
- Paging (two-tone, DTMF, manual)
- A- and B-menu buttons

The IP-1616 is a workhorse console that offers all the dispatch features and control that you would expect from a larger, more expensive solution. Multiple IP-1616s can be used to control larger operations. Its smaller desktop footprint takes up less room at the workstation, but still offers all the dispatch capabilities and controls you need.

The IP-1616 requires no CEB or additional CPU equipment for operation. All processing and control capabilities are completely self-contained within the unit. Requires a gooseneck desktop microphone or dispatch headset for operation—all sold separately.

IP-1616 also offers:

- **Call history –** up to last 50 incoming calls displayed.
- **Autodial –** dials from history list and phone list.
- **Caller ID –** displays phone, iDEN, MDC, FleetSync, TETRA, and 5-tone.
- **NEO-10 support –** two NEO-10 relays from the console.
- **iDEN support –** full support of NI-223 features, including ID, Go-ahead beeps, signals, and manual dial.
- **Scan features –** scans for supported radios.
- **Emergency –** decodes incoming emergency signals from supported ANI formats.
- **Clear/coded transmit –** transmits to EFJ RS5300 mobile radio.
- **Radio telephony operation –** allows local console to change channel of the remote radio via POTS line. Also gives operators the ability to designate certain lines to automatically fail-over to a standard POTS line if the IP connection fails.
- **Phone line interface –** allows interfacing to a phone line.
- **Kenwood P25 TK5710/5810 serial control –** supports encode and decode of FleetSync ID and P25 ID, channel change, scan on/off, and monitor. Also capable of direct serial control of Kenwood 80, 90, and 150 series radios.
- **Generate FleetSync MSK signal at the IP-223 –** does not require specific Kenwood base station.

C-6200

18-line IP/Analog Radio Dispatch Console

Features:

- Simplex/full-duplex operation (field programmable)
- Crossmute (hardwire)
- Parallel console update
- Instant Recall Recorder (IRR)
- Telex System Manager (TSM) easily detects Telex device on the network for easy firmware upgrade and configuration
- Programmable single- or dual-function tones
- 16-frequency control
- Two- or four-wire (field programmable with optional line cards), local, and E&M
- Programmable squelch control
- Paging (multiple formats)
- Supports NEO-10 controls

Controls:

- Monitor, intercom, and PTT button
- Up to four alert tones
- Crosspatch
- Group select, three pre-determined groups
- Supervisory control
- 16-digit DTMF keypad
- Volume controls
- Parallel TX LED detect
- Channel selection
- Instant PTT
- Four programmable buttons
- Paging (two-tone, DTMF, manual)
- Auxiliary, up to four buttons

The C-6200 is a unique platform in the dispatch industry that can function as either an IP-based or an analog console, giving you the flexibility to deploy it in numerous settings. Perfect for any small- to mid-sized operation, the C-6200 offers world-class dispatch capability and can even be configured to bridge analog and IP assets within a single unit. It's also the perfect hardware console back-up to the Nexus IP dispatch position. The C-6200 requires no CEB or additional CPU equipment for operation. All the processing and control capabilities are completely self-contained within the unit. Requires a gooseneck microphone, desktop microphone, or dispatch headset for operation—all sold separately.

IP-2002

Two-line IP-Based Radio Dispatch Console

Features:

- Simplex/full-duplex operation (field programmable)
- Crossmute (hardwire)
- Parallel console update
- Instant Recall Recorder (IRR)
- Telex System Manager (TSM) easily detects Telex device on the network for easy firmware upgrade and configuration
- 100 talkgroup/frequency control
- Call history with autodial
- Caller ID (phone, iDEN, MDC, FleetSync, TETRA, and 5-tone)
- Scan feature for supported radios
- Emergency – decodes incoming emergency signals from supported ANI formats

Controls:

- Monitor, intercom, and PTT button
- Up to two alert tones
- Crosspatch
- Supervisory control
- 16-digit DTMF keypad
- Volume controls
- Parallel TX LED detect
- Frequency selection
- Menu button for direct menu access
- Paging (two-tone, DTMF, manual)

The perfect footprint for smaller operations or supervisory monitoring situations, the IP-2002 is an IP-based dispatch console in a familiar desktop telephone form factor. Dispatchers using the IP-2002 can initiate a crosspatch between the two lines, as well as inject audio into the crosspatch. A simple Ethernet connection places the IP-2002 on the network. The IP-2002 requires no CEB or additional CPU equipment for operation—all the processing and control capabilities are completely self-contained within the unit. The console comes with a handset and panel mic. Other microphone options are sold separately.

C-1616

Six-line Analog Tone Remote Control Console

Features:

- Two- or four-wire per line (field programmable)
- Simplex/full-duplex per line (field programmable)
- Programmable squelch control per line
- TX monitor
- Supervisory control
- 16-channel control
- Two alert tone cadencing (keypad programmable)
- Crossmute per line (hardwire)
- TX notch filter
- Wildcard groupings (function tones)

Controls:

- Select/Unselect status for each line
- Selective call indication
- 16-function tone button selection
- TX all button
- RX all button
- Mute button
- Alert button
- AUX relay button
- Intercom
- PTT button
- 16-digit DTMF keypad
- Supervisory button
- TX detect LED for selected audio
- Line activity monitor LED for each line

The C-1616 is designed for easy field programmability. Its modular design offers selection and control of up to six base stations and 16 frequencies. The C-1616 comes standard with two channels. Additional channels may be added by installing another two-line module (sold separately). Its unique vacuum-fluorescent display provides channel alpha/numeric indication, and features a clock and audio-level meter. Multiple consoles can be easily programmed by using the serial port located on the back of each console. Unlike other manufacturers' equipment, the C-1616 requires no additional programming. Optional: handset/headset, gooseneck mic, desk mic, and footswitch.

Telex brings flexibility to University of Phoenix Stadium

"The 24-hour stadium security team covers a multitude of responsibilities during its rotating shifts, including video surveillance, fire alarms, door/gate monitoring, and answering after-hour incoming phone calls. An easy-to-use dispatch system was essential, especially in terms of training new staff and ensuring seamless operator turnover at the primary dispatch position."

Creative Communications recommended a Telex C-Soft 12-line basic dispatch console, using an IP-223 to interface remotely with CDM base radios.

— Nick Spiro, Creative Communications

C-2002

Two-line Radio Control Console

Features:

- Selective call indication
- Parallel console update
- Alert tone
- Time duration of the PTT
- Audio delay
- Function tones (programmable)
- Two- or four-wire (field programmable), local and E&M
- Simplex/full-duplex (field programmable)
- Programmable squelch control
- Crossmute (hardwire)
- TX monitor
- Supervisory control
- TX and RX notch filter
- Programmable TX delay

Controls:

- Monitor, intercom, and PTT button
- Alert tone
- ALT button
- Mute, release, and select (per line)
- Supervisory control
- 16-digit DTMF keypad
- Volume controls
- Parallel TX LED detect
- Frequency selection
- Three simultaneous microphones

Compact, but still loaded with features, the reliable C-2002 offers crossmute and supervisory capability and programmable squelch control, which eliminates the unwanted noise generally associated with line monitoring. The C-2002 can control two base stations and select up to 99 frequencies. This DSP-designed console can be programmed by using the DTMF keypad on the front of the console. Used with our mating DSP-223 series adapter panels, the C-2002 meets all the needs and requirements for controlling remote base stations. The console comes with a handset and panel mic. Optional: headset, desk mic, footswitch, and wall-mount kit.

C-2000 & C-2000HS

Single-line Radio Control Console

Features:

- Programmable single or dual-function tones
- Two- or four-wire (field programmable)
- Simplex/full-duplex (field programmable)
- Programmable squelch control
- TX monitor
- Supervisory control
- Crossmute (hardwire)
- TX notch filter
- Alert tone/warble
- 15 programmable DTMF addresses
- Parallel console update

Controls:

- Monitor button
- Intercom
- PTT button
- 16-digit DTMF keypad
- Volume controls
- Parallel TX LED detect
- Frequency selection

The C-2000 allows dispatchers to select and control a single base station and up to 100 frequencies. It's also designed for easy field programmability using the DTMF keypad. Used with Telex's DSP-223 series adapter panels, this console meets all dispatchers' needs and requirements for controlling remote base stations. Multiple consoles can be programmed by using the serial port located on the back of each console.

Unlike other manufacturers' equipment, the C-2000 requires no additional software. The C-2000 console comes with a built-in mic. Optional: headset and desk mic. The C-2000HS includes handset. Optional: desk mic and footswitch.

DSP-223

Tone Remote Adapter Panel

The Telex DSP-223 provides a reliable means of remotely controlling two-way radio base stations. The adapter can be used in conjunction with all radio dispatch consoles, or other manufacturers' (such as Motorola and GE) remote consoles that use the industry-standard sequential tone-keying format. The DSP-223 is interconnected to the distant remote control console(s) by any voice-grade transmission medium, such as a microwave link, leased telephone line, or a twisted-pair 600-ohm line. All DSP-223s are capable of decoding the PTT (push-to-talk/transmitter-on) tone sequence and the voice-plus-tone signals during transmission. All models are prepared for jumper plug conversion from two-wire line operation to four-wire line operation. In the four-wire mode, the panels are full-duplex capable.

TRA-223

Tone Remote Adapter Panel

The TRA-223 tone-adapter is a simple way to remotely control radio base stations. The TRA-223 can be used in conjunction with all Telex analog consoles, or other manufacturers' consoles that use the industry-standard sequential tone keying format.

Base stations can be connected to the distant remote control console(s) by any voice-grade transmission medium-microwave link, a leased telephone line, or a twisted pair 600 ohm line, and are capable of decoding the PTT and monitor function tone sequence. The TRA-223 also features a front panel dip switch that allows you to select various options, such as two- or four-wire line operation, along with full-duplex.

DH2000

Single-side Headset

DH2200

Dual-side Headset

Features:

- Weighs 3.2 ounces
- Mic-noise-canceling electret microphone
- Foam ear seals
- Three-year warranty

The DH2000 & DH2200 headsets leverage technology from the Telex Airman 750 headset, which is a best-in-class lightweight headset. A flexible boom allows microphone adjustment to preferred side, and the adjustable stainless steel headband makes it comfortable—even on the longest of shifts.

DH3000

Single-side Noise-Canceling Headset

DH3200

Dual-side Noise-Canceling Headset

Features:

- Weighs 4 ounces
- Total noise reduction 12 dBs
- Volume control
- Mic-noise-canceling electret microphone
- Plush foam ear seals
- Three-year warranty

DH3000 & DH3200 are our noise-canceling headset options, which are very light, with ear cups and cushions enlarged from previous models to enhance comfort. Other features include a set-and-forget volume control and fully flexible boom. This headset dramatically improves the clarity of communication and does not require batteries or panel be power-active noise reduction powered by microphone bias. All DH Headsets require a LC1500 lower cord unit when ordering.

MD-MS 0118022

Omnidirectional Electret Microphone

Specifications:

- Type: Dynamic
- Directivity: Omnidirectional
- Sensitivity: -14 ± 4 dB at 1 kHz (0 dB=1 Vmicrobar)
- Frequency Response: 200 Hz – 5 kHz
- Cable: 4 conductor, 2 shield, 1.5 m 3 5 cm
- Dimensions: H 1.43 mm, W 67.5 mm, L 12.9 mm

6513C 30190500

Noise-Canceling Dynamic Microphone

Specifications:	
Frequency Response: 125 Hz - 5000 Hz	Net weight: 822 g (1 lb 13 oz)
Polar Pattern: Cardioid, noise-canceling	Switch: Leaf, DPDT, switches external circuit and shorts/opens mike in off position
Impedance: 150 ohms	Finish: Black
Output Level: -57 dB (0 dB = 1 mW/10 dynes/cm²)	Cable: 2.13 m (7 ft.) long, 5-conductor, 2-shielded, vinyl jacket, black
Case Material: Pressure-cast zinc and Cycolac	Dimensions: H 246.1 mm, W 114.3 m, L 122.2 m

DT-GN-18

Desktop Gooseneck Microphone

Specifications:	**windscreen furnished
Frequency Response: 100 Hz - 15000 Hz	Color: Non-reflecting black
Generation Element: Condenser, back-electret	Power Requirements: 1.5 VDC to 9 VDC phantom supply
Sensitivity, open circuit voltage: 8.0 mV (-42 dB)/pascal @ 1 kHz	Output Impedance: Compatible with RTS keypanels
Power Level, 1 kHz (0 dB = 1 mW/ pascal): -44 dB	Current Consumption: <500 µA
Polar Pattern: Cardioid	Maximum Head Diameter: 14 mm
Dynamic Range: 102 dB	Gooseneck Diameter: 6.4 mm
Mounting: Male threaded TRS	Electronics Module Diameter: 20 mm

PC desktop-18RD

Polar Choice 18" Microphone

Specifications:	**windscreen furnished
Frequency Response: 50 Hz - 25000 Hz	Output Impedance, 1 kHz: 200 ohms
Generation Element: Dual condenser, back-electret	Equivalent Noise: <26 dB SPL "A" weighted (0 dB=20 micropascals)
Polar Patterns: Omni-directional, Cardioid, Super-cardioid and Hyper-cardioid	Polarity: Pin 2 positive, referenced to pin 3, with positive pressure on the diaphragm
Switches & Controls: Top mounted push-button configuration switches	Current Consumption: <8 mA with P12 supply
Sensitivity, open circuit voltage, 1 kHz: 5.6 mv/pascal	Cable: 10 ft, 5-conductor cable, terminated with 3-pin male XLR
Clipping Level (1% THD): >135 dB SPL	Power Requirements: 12-52 VDC
Dynamic Range: >109 dB	Base Dimensions: H 56 mm, W 117 mm, L 175 mm

System Diagram

Since Telex IP dispatch utilizes an Ethernet data network as its backbone for all the components, communications are possible to and from anywhere a user has access to an IP network. VoIP networks are easily expanded to grow with users' needs, and the number of end-users that can be added to the network is virtually unlimited. Get in touch with Telex and let us help you control your SP: communications with IP.

Network Recorder

IP-2002

NETW

IP-1616

IP-223

Radio base station

NEO-10
Door control, monitor power, temperatures, and other console functions

Nexus position
with ADHB-4

VORK

IP-224/control radio

Radio base station

Radio base station

Bosch Security Systems, Inc.
Telex Dispatch Products
8601 East Cornhusker Highway
Lincoln, NE 68507
(800) 752-7560

www.telex.com/radiodispatch

VOIProven

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MOTOROLA PROFESSIONAL RADIO APPLICATION provider

 LITDIS1012-4