



# APCO P25 Mobile Phase 1 and Phase 2 / TIA 902 Wideband Data

## Building an APCO P25 Mobile?

Etherstack's off-the-shelf APCO P25 products provide the fastest, lowest risk and most cost effective path to market.

Written in highly portable ANSI C/C++, our feature-rich APCO P25 software is designed to be integrated onto your platform with ease.

### APCO P25 Application + Protocol Stack

Our TIA APCO P25 compliant Application + Protocol Stack supports trunked and conventional operation, all mandatory call types, and advanced features such as SMDCP, OTAR and Supplementary Services. We even offer a red/black separated variant structured for Type 1 secure voice and data.

Our protocol software is constructed as a set of layered components (Layers 1, 2, 3 and Mobile Application Layer) for a cleaner, more adaptable architecture. These components can be supplied individually or together, and can be split across multiple processors if necessary.

We offer a complete APCO P25 Mobile software solution: a Human-Machine Interface (HMI), database, and configuration and testing tools are all available to accompany our protocol software. And naturally, all our standard products can be customized to suit your requirements.

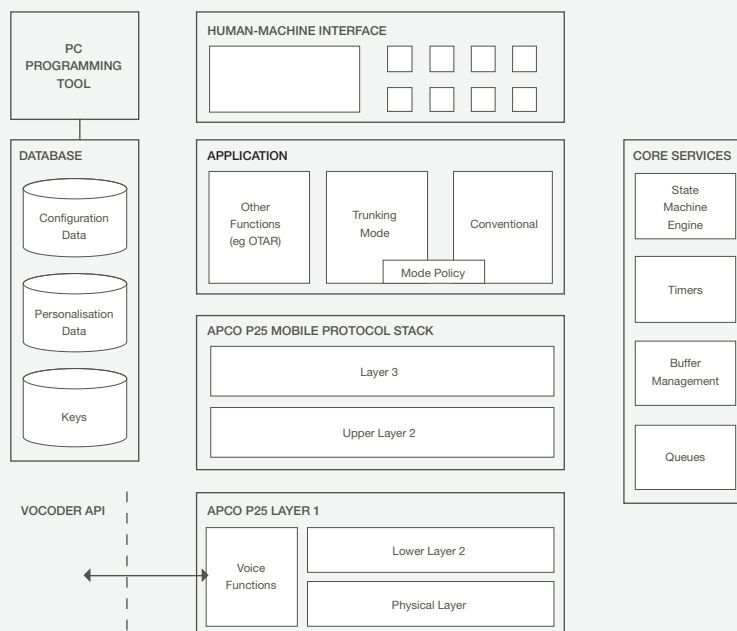
### Market Expertise

Etherstack has substantial APCO experience and intellectual property – our APCO engineers are market leaders in the timely delivery of APCO products to clients around the world. We are an active member of the TIA APCO P25 standards development process and systematically update our APCO-P25 products in accordance with the ongoing TIA standardization process.

As a result, our protocol software forms a benchmark for APCO P25 interoperability.

### Features

- Full APCO P25 Trunked and Conventional operation
- All APCO P25 Call Types
- All APCO P25 Supplementary Services
- OTAR
- SMDCP Packet Data
- Full Red/Black Separation
- Phase 2 Air Interface
- Full integration, testing, servicing and support from highly experienced APCO engineers.
- Comprehensive Test Tool suite for rigorous pre and post-integration testing.
- Product customization service.
- Shipped with source code, full design documentation and well-defined interfaces.
- TIA 902 SAM Wideband Data also available.



## APCO P25 Application + Protocol Stack Features

### Services

- Full APCO P25 Trunked and Conventional operation
- Analog operation (Optional)
- All Voice Call types (Unit to Unit, Unit to Group, Announcement Group Call, Broadcast Call, System Call)
- PSTN Calls (Unit to PSTN, PSTN to Unit/Group) including support for PSTN dialling types.
- All Data Call types (Unit to Unit, Unit to Group) - although these procedures are expected to be deprecated and replaced by SMDCP
- All APCO P25 Supplementary Services (Call Alert, Short Message, Status Update, Status Query, Emergency Alarm, Radio Unit Monitor)
- All APCO P25 Extended Functions (Radio Check, Radio Transmit Inhibit / Uninhibit, and Radio Detach)
- Multiple level priority call request for trunked calls (if required – otherwise simplified to “Normal” and “Emergency”)
- Talkaround (Conventional only) and Talkback Support
- Three Emergency modes (All outgoing calls flagged as emergency/Periodic transmission of an emergency alarm/Periodic establishment of an emergency call)
- SMDCP Packet Data (Optional)
- Low Speed Data over voice

### Channel Acquisition

- Inter and Intra-System Roaming, including Roaming Restriction and Site Lock
- Several scanning algorithms for optimized channel capture (Normal Channel scanning, Priority Channel Scanning, Frequency Scanning, Combined Group Monitor and Channel Scanning, Mixed Conventional and Trunked Scanning, and Background Scanning. Conventional fallback is available in Trunked operation).
- Dual Mode scanning and monitoring between Analog and APCO P25 Conventional channels.
- Multiple Network Support (Able to operate on multiple different networks by switching between operating parameter sets)

- Inter Network Service Support (Able to request services across network boundaries)

### Security

- Over-The-Air-Rekeying (OTAR) (Includes mandatory procedures and all optional procedures except Public Key) (Optional)
- OTAR over SMDCP
- Type 3 DES Encryption Support
- Type 3 Voice and Data Protection
- Type 3 Control Channel Protection
- Static Key Security Parameter Determinations (Talkgroup/ LLID/ Channel/Channel Selector switch position to OTAR SLN key mappings)
- Red/Black separated variant available for Type 1 Voice and Data Protection.

### Lower Layers

- Voice, Confirmed/Unconfirmed Data, TBSK/MBTP
- CTCSS/DCS Detection and Generation
- APCO P25 and Analog IQ sample streams
- DVSI Vocoder API (Can be customized for other vocoders)

### Human-Machine Interface

Etherstack can provide a standard HMI with keypad and switch input support, Liquid Crystal Display and indicator output support, and menu-based operation.

As many clients wish to develop their own HMI for consistent look and feel with a product range, we have added an HMI engine to our protocol stack that provides isolation from the underlying protocol services.

### Database and Configuration

Etherstack can develop a protocol stack database for your target platform on request. We can also customize our database interface for clients who wish to develop their own database.

Regardless of the database solution, Etherstack's PC Programming Tool makes it simple to configure Etherstack's APCO P25 Mobiles from a PC.

Designed with Network Operators in mind, it features an intuitive Graphical User Interface and substantial APCO P25 intelligence to allow the correct programming of default values and to prevent illegal settings.

### Integration and Test Services

Short on software engineers? Why not have our specialist protocol engineers deliver and integrate the product onto your platform at your site? You will be amazed at our package price for stack and services.

You choose the hardware - Etherstack is expert in providing software that can be ported to a range of target platforms and operating systems.

Also, Etherstack prides itself on its pre-delivery and post-delivery support. We can see you through from concept to release.

Our protocol software is abstracted from the underlying hardware and operating system by a “Core Services” module responsible for managing timing, memory and other services. This module is ported to your target without alteration to the protocol software. Our engineers are expert at this and can do the job for you on site.

All protocol products are shipped with test plans, custom automated test tools, and test scripts. The protocol product and tests are deployed within a unique simulation environment that allows software development to be completed in isolation from the hardware platform.

We also have a range of products for testing integrated APCO P25 Mobiles. Our Off-Air Monitor can snoop inbound and outbound frequencies of an APCO P25 channel simultaneously, and move channels to shadow a mobile in and out of calls. Traffic in both directions is dynamically displayed in raw binary and interpreted form on a Graphical User Interface. We have also developed reference APCO P25 Mobile and Base Station Applications to simulate inbound and outbound traffic on the air interface.

When used in conjunction with our PIP test script library, these tools allow easy categorization of a mobile's PIP compliance.

### Turnkey Development

Etherstack is skilled at developing third-party products from scratch, and places high emphasis on the quality of its requirements appraisal, support and documentation.

Contact us if you require customization or development of a wireless protocol product.

### Warranty and Support

Etherstack offers a comprehensive warranty and support package for our software range. Our package keeps you up to date with the latest innovations in the APCO P25 standard.

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