

# Digital Mobile Radio (DMR) Mobile Station Protocol Stack

## Upgrading to digital?

Use Etherstack's off-the-shelf DMR MS protocol stack to introduce this modern standard to your radio equipment swiftly.

DMR is positioned as an ideal digital upgrade technology for analogue two-way radio. It offers increased capacity and advanced digital features within existing channel plans and network footprints.

Etherstack now offers DMR alongside our field-proven APCO 25, TETRA and MPT1327 protocol stacks. We know the ETSI DMR standards inside-out and have off-the-shelf mobile and base station stacks available.

### Simple to Integrate

Etherstack's ETSI DMR Mobile Station Protocol Stack is constructed as a set of highly portable, well documented and operating system independent ANSI C components that can be split across multiple processors.

It is available in isolation or deployed on our baseband digital board, Etherstack's DMR Mobile Signaling Module (MSM). The MSM upgrades your existing analogue radio equipment to DMR – so you can avoid complex digital design and make the most of your existing analogue assets.

### High Performance

Competing with analogue coverage and equipment cost is critical for DMR. Our FEC solution achieves excellent (better than analogue) coverage and has been optimised for efficient deployment, allowing the use of lower specification processors.

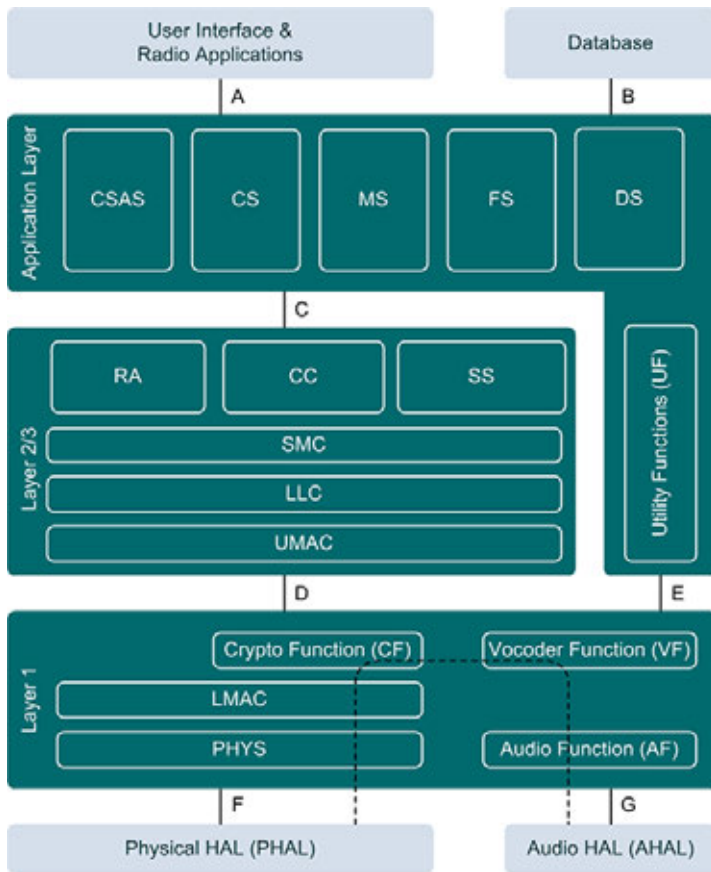
### Feature Rich

We offer DMR Tier 2 (Direct Mode + Repeater) and DMR Tier 3 Trunking starter packages. We also offer analogue and MPT1327 options for graceful migration to digital, and a full suite of advanced features including data and encryption. You can purchase these immediately or upgrade later as your requirements evolve.

Layer 1 exposes a 96 kS/s I/Q P-HAL interface and stubs to either the DVSI AMBE+2 vocoder (recommended by the DMR Association) or an alternate vocoder of your choice. Processor optimized code is also available.

### Technology Package

- ANSI C90 DMR Software
- Software Specifications
- Interface Specifications
- High Level Design
- Software Test Plan
- Software Test Description (traceable to specifications)
- DMR Test Script Library (traceable to specifications)
- ELITE and ESTV
- Integration Services
- 12 Month Warranty (with option to renew)



Etherstack DMR MS Protocol Stack Architecture

- ### Features
- Tier 2 (Repeater and Direct Mode)
  - Tier 3 (Trunking)
  - Short Data Service
  - Packet Data (TS 102 361 4)
  - Analog FM (CTCSS and DCS)
  - MPT1327
  - Encryption (unstandardized)
  - Duplex Call
  - Authentication (Normal/Mass)
  - Stun, Revive, Kill
  - Composite Control Channel Operation
  - Asynchronous Control Channel Activation
  - Closed Loop Power Control
  - Pre-emption
  - Powersave

### Full Package, Fixed Price

Etherstack offers a highly competitive fixed price for a full technology package that includes technical documentation, our pioneering automated protocol stack test system (ELITE), Etherstack TraceViewer and a comprehensive test script library that provides traceability to the requirements.

### Software Reuse

Protocol software represents a key investment. It is important you can update it and reuse it on future platforms to save money, reduce risk, hasten time-to-market and respond quickly to changing requirements. Code portability, reuse and maintenance are our priorities.

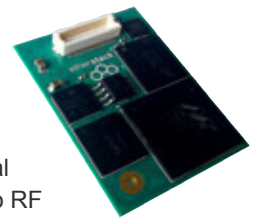
### Risk-Free 12 Month Warranty

After delivery, Etherstack provides a 12-month warranty against any defects. If an issue is found we fix it immediately at no extra cost.

Potential customers are welcome to appraise our DMR technology in our labs in Yokohama, London, Sydney or New York.

### DMR MSM Key Specifications

- Dimensions: 35 x 24 x 6mm
- High performance 32-bit processor
- Audio and Baseband Codecs
- 32 MB RAM (8M x 16b x 4 banks)
- 128 MB Flash (8M x 16b x 4 banks)
- 3.3V operation
- Analog or digital I&Q interface to RF



## About Etherstack

Etherstack engineers specialise in radio communications software.

With two decades experience and an international client base, Etherstack combines wireless protocol software design with all-IP soft switching expertise derived across professional mobile radio, military and cellular communications.

We work closely with our customers to achieve technical excellence, successful delivery at fixed price, ongoing support and software that can be reused.

## Related Products

- DMR Mobile Signaling Module (MSM)
- FIPS 140-2 Crypto Module
- DMR Base Station Protocol Stack
- DMR All-IP Network and Test Systems