

**A Guide to Project 25
Subscriber and Infrastructure
Equipment Capabilities as
Standardized in the TIA-102 Series**

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Project 25 Technology Interest Group
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1. Document Overview

This document is intended as a guide that lists the capabilities of subscriber and infrastructure equipment enabled by the TIA-102 series of published standards. These standards are referred to as the “Project 25 Standard”.

The most common differentiator for both subscriber and infrastructure equipment is the air interfaces. This guide groups the listed equipment capabilities by the currently available standardized air interfaces:

- FDMA Conventional
- FDMA Trunking
- TDMA Trunking

For each air interface grouping, this guide provides both a summary of capabilities and a more detailed listing which expands on the capabilities identified in the summary. This approach is used for both subscriber and infrastructure equipment.

The TIA-102 series of standards, referred to as the “Project 25 Standard,” result from a sequential but iterative process:

- Project 25 publishes the “Project 25 Statement of Requirements (SOR)” for user desired features and capabilities.
- TIA publishes the TIA-102 series of technical documents as completed standards for specific features and capabilities.
- Project 25 adopts the completed TIA-102 standards and they become part of the “Project 25 Standard”.

Within the tables of this guide, detailed references to the TIA-102 series documents are included. The format of the guide includes space for detailed references to the Project 25 Statement of Requirements (SOR) when available into future editing.

Both the TIA-102 series and the Project 25 Statement of Requirements continue to evolve together as the needs of users and technology continue to evolve. Similarly, this document will also evolve over time. Subsequent versions will continue to aid the understanding of the standardized features and capabilities available to the Project 25 community of users and planners.

This first published release, version 1.0, included capabilities only for subscriber equipment. The second published release, version 1.4 included clarifications only. The third published release, version 1.x added capabilities for the Trunked ISSI/CSSI and the Conventional FSI.

1.1. VERSION HISTORY

Version Number	Change Overview
1.0	First published release covers Subscriber capabilities only
1.1 – 1.3	Offline working versions adding clarifications
1.4	Second published release containing various clarifications and updates associated with TIA-102 Standards publications occurring since version 1.0 publication
1.5	Offline working version adding clarifications and Trunked ISSI/CSSI section 9 & 10 and Conventional FSI section 11.
1.6	Approved by PTIG
1.7	Added P25 SoR references provided by P25 UNS Working Group and various editorial corrections

1.2. Introduction To This Document As A Guide To Project 25 Features And Capabilities:

The TIA-102 series and the Project 25 Statement of Requirements are complementary but they do not always match at a specific point in time. In most cases, this disparity exists because some of the capabilities identified in the SoR have not been developed into TIA-102 Standards and adopted by the Project 25 Steering Committee to be included in the P25 Suite of Standards.

This document has multiple purposes:

1. The listing of the services and features that have been defined in published TIA-102 Standard documents with a corresponding reference to the services and feature descriptions found in the P25 Statement of Requirements.
2. The listing of the P25/TIA-102 services and features broken out by subscriber and fixed infrastructure network.
3. The listing of the P25 /TIA-102 services and features broken out by conventional and trunked operation.
4. The linking of defined P25/TIA-102 services and features to one or more of the P25 Standard interfaces.
5. Public safety subscriber equipment supports conventional FM analog voice operation in the VHF, UHF and 700/800MHz bands. The FCC requires public safety subscriber equipment to support the FCC defined interoperability channels. Therefore, the FM analog interface, TIA-603, is also noted in the conventional FDMA voice section.
6. It should not be expected that ALL of the services and features contained in these tables will be included in a P25 subscriber unit. The P25/TIA-102 Standard defines many services and features. System operators and users will need to make choices as to which features and services are required for their particular situation.
7. It should not be expected that ALL of the services and features contained in these tables will be included in P25 Fixed Network Equipment. The P25/TIA-102 Standard defines many

services and features. System operators and users will need to make choices as to which features and services are required for their particular situation.

At a minimum, two types of tables are provided in each section. There will be a high level summary table titled “Feature Summary” for the services followed by a second table with details about the features under each service titled “Feature Detail.” The high level summary will also list the frequency bands.

Many of the P25/TIA-102 services and features are described in the TIA-102 Documentation Suite Overview document. These descriptions provide details without the technical detail found in the TIA-102 core technical standard documents.

In the case of “FDMA Conventional – Non-Voice Service” there will be two sections that correspond to different operational configurations. One section will apply to two types of conventional operations; (1) conventional operations where a single transmitting subscriber communicates directly (no repeater) to one or more subscribers typically using a single frequency; and, (2) conventional operation where a single transmitting subscriber communicates to a repeater and that repeater re-transmits the same message to one or more subscribers using a frequency different than the frequency used by the transmitting subscriber. The second section for “FDMA Conventional – Non-Voice Service” will be for fixed network equipment (FNE) systems. These are conventional systems where the transmitting subscriber communicates to a repeater that is linked via wireline to a fixed host computer or server. While the majority of the services and features for those different operational configurations are the same, important differences do exist. These differences will be seen in the Feature Detail tables.

Blank columns for the P25 subscriber Common Air Interface (CAI), analog FM standard (TIA-603), analog with signaling (examples include but are not limited to: CTCSS, DCS, MDC-1200, Type 99, GE-STAR), Mobile Data Terminal Interface (MDTI), and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

The P25 SoR reference column entries were blank in earlier versions of this guide. This version provides references to the P25 SoR for each row in each Detailed Table. The published standards contain significantly more detail than the P25 SoR. This sometimes results in multiple capabilities listed in this document all tracing to a single item in the P25 SoR. Note also that when a reference is made to a section heading in the P25 SoR, the reference is intended to include all the P25 SoR sub-items associated with the section heading.

Note that the TIA-102 column in each table does not intend to identify the latest document revisions or appendices; determination of the latest versions is left to the reader.

Note that DES Encryption is included in several tables. NIST has deprecated DES by withdrawing the following standard: “FIPS PUB 46-3 DES”. AES should be considered the preferred P25 encryption standard.

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1.3. Acronyms

AES	Advanced Encryption Standard
ARP	Address Resolution Protocol
CAI	Common Air Interface
CHAP	Challenge-Handshake Authentication Protocol
CTCSS	Continuous Tone Coded Squelch System
DCS	Digital Coded Squelch
DES	Data Encryption Standard
FDMA	Frequency Division Multiple Access
FNE	Fixed Network Equipment
GE-STAR	General Electric analog signaling method
IP	Internet Protocol
IPv4	Internet Protocol version 4
LRRP	Location Request and Response Protocol
MDC1200	Motorola Data Communications analog low speed data signaling using audio frequency shift keying
NMEA	National Marine Electronics Association
P25 SoR	Project 25 Statement of Requirements
PAP	Password Authentication Protocol
PPP	Point to Point Protocol
PTT	Push To Talk
RFC	Request For Comment
SCEP	Simple CAI Encapsulation Protocol
SNDCP	Sub-Network Dependent Convergence Protocol
SU	Subscriber Unit
TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
Type 99	General Electric Mobile Radio name for two-tone sequential signaling.
UDP	User Data Protocol
USB	Universal Serial Bus

2. **FDMA Conventional - Voice Service**

Table 1 lists the high level P25 FDMA conventional voice services defined in published TIA-102 Standard documents. A column for the P25 subscriber Common Air Interface (CAI) required to support those services is included. A column for the analog air interface based on the analog FM standard, TIA-603 Land Mobile FM Communications Equipment -Measurement and Performance Standards, that may support some of these services is included for conventional analog operation. The frequency bands that typically support public safety communications are listed at the bottom of the table.

Table 1 - FEATURE SUMMARY - FDMA Conventional Voice Services for Subscriber

FDMA Conventional Subscriber	P25 CAI	TIA 603
Voice Service (CAI)		
Voice Calls		
Supplementary Services		
Telephone Interconnect		
Voice Encryption		
Frequency Bands (single and multi-band units)		
VHF (136-174MHz)		
UHF (380-470MHz)		
UHF (450-512MHz)		
700/800 (764-870MHz)		


Grey table cells  indicate the interface is not related to that feature.

Table 2 details the features of the P25 FDMA conventional voice services shown in Table 1. Table 2 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is a column for listing the P25 Statement of Requirements section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), analog air interface based on analog FM standard (TIA-603) and analog with signaling (examples include but are not limited to: CTCSS, DCS, MDC-1200, Type 99, GE-STAR) are provided for the user to inventory the current features on their existing system or to note desired features for future systems.


While there is no published standard for many of the signaling methods that may be used with analog voice, several have been implemented by multiple manufacturers and enable many of the Voice Call and Supplementary Services on the analog air interface. The column labeled TIA 603 should be interpreted as the analog air interface without any analog signaling and the analog with signaling column should be interpreted as including analog voice so, analog air interface capabilities that depend on some method of analog signaling will shade the TIA 603 cell but not the analog with signaling cell (e.g., Group or Individual Voice Call). Suggested format is to enter "H" ("Have") for a service, feature or capability in the user's current system and a "W" ("Want") if it is needed in the new system.

Table 2 - FEATURE DETAIL - FDMA Conventional Voice Features for Subscriber

FDMA Conventional Subscriber (voice)	TIA-102	P25 SoR ¹	P25 CAI	TIA 603	Analog with signaling
Voice Service (CAI)					
-- Voice Calls					
Unaddressed (Analog) Voice Call ²	AABF, BAAD	5.1.1.3, 5.1.2.1, 5.3.1.1			
Group Voice Call		2.1.2.1			
Emergency Group Voice Call		2.1.2.25.1			
Individual Voice Call		2.1.2.3			
All Call		2.1.2.32			
-- Supplementary Services					
Call Alert	AABF, AABG, BAAD	3.3.5.13			
Discreet Listening		3.3.5.11			
Emergency Alarm		2.1.2.17			
Radio Check		2.1.2.26			
Radio Unit Inhibit/Uninhibit		3.3.5.10			
Radio Unit Monitoring		3.3.5.12			
Short Message		2.1.2.11			
Status Query		2.1.2.11			
Status Update		2.1.2.11			
Transport of Talking Party ID		2.1.2.19			
Normal Squelch	BAAD	2.1.2.29			
Monitor Squelch		2.1.2.30			
Selective Squelch		2.1.2.1			
Busy Channel Lockout		2.1.2.28			
-- Telephone Interconnect					
Landline to group call	AABF, AABG, BAAD, BADA	2.1.2.1, 2.1.2.5			
Landline to unit call		2.1.2.3, 2.1.2.5			
Unit to landline call		2.1.2.3, 2.1.2.5			
Dialing side tone		2.1.2.5, 5.1.4.11			
34 digit dialed number		2.1.2.5, 5.1.4.11			
Generate hook flash		2.1.2.5			
Conventional disconnect code		2.1.2.5			
Overdial		2.1.2.5, 5.1.4.11			
-- Voice Encryption					
AES encryption	AAAD	2.1.2.9, 4.1.1.1			
DES encryption		2.1.2.9, 4.1.1.2			

¹P25 Statement of Requirements; version "12131211_Aproved_P25_SoR_12-11-13"

²Note that in P25 Unaddressed Voice Call is accomplished by using the Normal Squelch mode

Grey table cells  indicate the interface is not related to that feature.

3. FDMA Conventional – Non-Voice Service; SU-to-SU & SU-Repeater-SU (No FNE)

Table 3 lists the high level P25 FDMA conventional non-voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table.

Table 3 - FEATURE SUMMARY - FDMA Conventional Non-Voice Services for Subscriber – NO FNE SU-TO-SU & SU-REPEATER-SU DATA TOPOLOGIES

FDMA Conventional Subscriber	CAI	MDTI	KFDI
>> Direct & Repeated Data System Topology <<			
Data Bearer Services			
-- Block Encryption Service			
-- CAI Data Bearer Service			
-- IP Data Bearer Service			
CAI Data Bearer Service Applications			
-- Tier 1 Unit Location - NMEA 0183 Sentences			
IP Data Bearer Service Applications			
-- Tier 2 Unit Location - LRRP Services			
Data Terminal Services			
-- SU to Terminal IP Connectivity			
-- SU to Terminal Management			
Encryption Key Management			
-- Key Fill Device Services			

Grey table cells indicate the interface is not related to that feature.

Table 4 details the features of the P25 FDMA conventional non-voice services shown in Table 3. Table 4 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

Table 4 - FEATURE DETAIL - FDMA Conventional Non-Voice Features for Subscriber – NO FNE SU-TO-SU & SU-REPEATER-SU DATA TOPOLOGIES

FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> Direct & Repeated Data System Topology <<					
Data Bearer Services					
-- Block Encryption Service					
AES Encryption	AAAD	4.1.1.1			
DES Encryption		4.1.1.2			
-- CAI Data Bearer Service					
Confirmed Data Packet Delivery	BAEA	2.2.1.2			
Unconfirmed Data Packet Delivery		2.2.1.2			
-- IP Data Bearer Service					
---- IPv4 and SCEP					
Static IP Address Binding	BAEA, BAEB	2.2.1.2			
Dynamic IP Address Binding via ARP		2.2.1.2			
Confirmed IPv4 Datagram Conveyance		2.2.1.2			

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FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> Direct & Repeated Data System Topology <<					
Unconfirmed IPv4 Datagram Conveyance	BAEA, BAEB	2.2.1.2			
CAI Data Bearer Service Applications					
-- Tier 1 Unit Location - NMEA 0183 Sentences					
Global Positioning System Fix Data	BAJB	2.2.1.2, 3.3.6.2			
Geographic position - Latitude and Longitude		2.2.1.2, 3.3.6.2			
GPS dilution of precision and active satellites		2.2.1.2, 3.3.6.2			
Satellites in view		2.2.1.2, 3.3.6.2			
Recommend Min. Specific Loran-C Data		2.2.1.2, 3.3.6.2			
Recommended Min. Specific GPS/TRANSIT Data		2.2.1.2, 3.3.6.2			
Track made good and speed over ground		2.2.1.2, 3.3.6.2			
IP Data Bearer Service Applications					
-- Tier 2 Unit Location - LRRP Services					
Immediate location service	BAJC	2.2.1.2, 3.3.6.2			
Unsolicited location report service		2.2.1.2, 3.3.6.2			
Location Protocol Version Service		2.2.1.2, 3.3.6.2			
Triggered location service		2.2.1.2, 3.3.6.2			
- PTT		2.2.1.2, 3.3.6.2, 3.3.6.4			
- Periodic		2.2.1.2, 3.3.6.2, 3.3.6.5			
- Emergency		2.2.1.2, 3.3.6.2, 3.3.6.3			
- Power On/Off		2.2.1.2, 3.3.6.2			
- Distance Change		2.2.1.2, 3.3.6.2			
Data Terminal Services					
-- SU to Terminal IP Connectivity					
IPv4 over PPP/USB	BAEA, BAEB, BAEE	2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/USB		2.2.1.1, 5.1.1.4.1			
IPv4 over PPP/TIA-232		2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/TIA-232		2.2.1.1, 5.1.1.4.1			
-- SU to Terminal Management					
---- Management Protocol					
Radio Control Protocol (RCP)	BAEE	5.1.1.4.1			
Simple Network Management Protocol (SNMP)		5.1.1.4.1			
---- Management Services					
Get Information	BAEE	5.1.1.4.1			
Get Configuration		5.1.1.4.1			
Restore Default Configuration		5.1.1.4.1			
Set Configuration		5.1.1.4.1			
Reset Operations Statistics		5.1.1.4.1			
Get Operations Statistics		5.1.1.4.1			
Radio Power Up Report		5.1.1.4.1			
Data Service Availability		5.1.1.4.1			
Encryption Key Management					

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FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> Direct & Repeated Data System Topology <<					
-- Key Fill Device Services					
Key Load	AACD	4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14, 4.3.4.3.17, 4.3.4.3.25			
Key Erase		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14, 4.3.4.3.17, 4.3.4.3.25			
Erase All Keys		4.2.1, 4.2.1.1, 4.3.4.3.29, 4.3.4.3.30			
View Key Info		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
View Individual RSI (Radio Set ID)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load Individual RSI		4.2.1, 4.2.1.1, 4.3.4.3.3, 4.3.4.3.4, 4.3.4.3.13, 4.3.4.3.14			
View KMF RSI		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load KMF RSI		4.2.1, 4.2.1.1			
View MNP (Message Number Period)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load MNP		4.2.1, 4.2.1.1			
View Keypad Info		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Activate Keypad		4.2.1, 4.2.1.1, 4.3.4.3.5, 4.3.4.3.6			
Inventory (list active SUID)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Inventory (list SUID items)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			

¹P25 Statement of Requirements; version "12131211_Approved_P25_SoR_12-11-13"

Grey table cells indicate the interface is not related to that feature.

4. FDMA Conventional – Non-Voice Service; SU-Fixed Network Equipment (FNE)

Table 5 lists the high level P25 FDMA conventional non-voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table.

**Table 5 - FEATURE SUMMARY - FDMA Conventional Non-Voice Services for Subscriber - FNE
FIXED NETWORK EQUIPMENT (FNE) DATA TOPOLOGY**

FDMA Conventional Subscriber	CAI	MDTI	KFDI
>> FNE Data System Topology <<			
Data Bearer Services			
-- Block Encryption Service			
-- CAI Data Bearer Service			
-- IP Data Bearer Service			
CAI Data Bearer Service Applications			
-- CAI Layer OTAR			
IP Data Bearer Service Applications			
-- IP Layer OTAR			
-- Tier 2 Unit Location - LRRP Services			
Data Terminal Services			
-- SU to Terminal IP Connectivity			
-- SU to Terminal Management			
Encryption Key Management			
-- Key Fill Device Services			
-- Over The Air Rekeying (OTAR) Services			
-- OTAR Response Types			


Grey table cells  indicate the interface is not related to that feature.

Table 6 details the features of the P25 FDMA conventional non-voice services shown in Table 5. Table 6 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement feature item (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

**Table 6 - FEATURE DETAIL - FDMA Conventional Non-Voice Features for Subscriber - FNE
FIXED NETWORK EQUIPMENT (FNE) DATA TOPOLOGY**

FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Data Bearer Services					
-- Block Encryption Service					
AES Encryption	AAAD	4.1.1.1			
DES Encryption		4.1.1.2			
Unable To Decrypt PDU	BAAD	2.2.1.3, 4.1.1.1, 4.1.1.2			
-- Conventional Management Services					
Static Registration	BAAD	2.1.2.13			
Dynamic Registration		2.1.2.13			
Mobility Tracking		2.1.2.13			

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FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Data Scan	BAAD	5.1.1.6			
-- CAI Data Bearer Service					
Confirmed Data Packet Delivery	BAEA	2.2.1.3, 2.2.2.2			
Unconfirmed Data Packet Delivery		2.2.1.3, 2.2.2.2			
-- IP Data Bearer Service					
---- IPv4 and SCEP					
Static FNE and SU IP Address Binding	BAEA, BAEB	2.2.1.3, 2.2.2.2			
Confirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
Unconfirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
---- IPv4 and SNDCP					
Context Management	BAEA, BAEB	2.2.1.3, 2.2.2.2			
Confirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
Unconfirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
----SNDCP Header Compression					
RFC-1144 TCP/IP Compression	BAEA, BAEB	2.2.1.3, 2.2.2.2			
RFC-2507 UDP/IP Compression		2.2.1.3, 2.2.2.2			
----SNDCP Data User Authentication					
CHAP (Challenge Handshake Authentication Protocol)	BAEA, BAEB	2.2.1.3, 2.2.2.2			
----SNDCP Data Host Network Selection					
FNE Controlled	BAEA, BAEB	2.2.1.3, 2.2.2.2			
SU Controlled		2.2.1.3, 2.2.2.2			
CAI Data Bearer Service Applications					
-- CAI Layer OTAR	AACA	4.3.3, 4.3.4.3			
IP Data Bearer Service Applications					
-- IP Layer OTAR	AACA	4.3.3, 4.3.4.3			
-- Tier 2 Unit Location - LRRP Services					
Immediate location service	BAJC	2.2.1.3, 2.2.2.2, 3.3.6.2			
Unsolicited location report service		2.2.1.3, 2.2.2.2, 3.3.6.2			
Location Protocol Version Service		2.2.1.3, 2.2.2.2, 3.3.6.2			
Triggered location service		2.2.1.3, 2.2.2.2, 3.3.6.2			
- PTT		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.4			
- Periodic		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.5			
- Emergency		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.3			
- Power On/Off		2.2.1.3, 2.2.2.2, 3.3.6.2			
- Distance Change		2.2.1.3, 2.2.2.2, 3.3.6.2			
Data Terminal Services					
-- SU to Terminal IP Connectivity					
IPv4 over PPP/USB	BAEA, BAEB, BAEE	2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/USB		2.2.1.1, 5.1.1.4.1			
IPv4 over PPP/TIA-232		2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/TIA-232		2.2.1.1, 5.1.1.4.1			
-- SU to Terminal Management					
---- Management Protocol					
Radio Control Protocol (RCP)	BAEE	5.1.1.4.1			
Simple Network Management Protocol (SNMP)		5.1.1.4.1			
---- Management Services					
Get Information	BAEE	5.1.1.4.1			
Get Configuration		5.1.1.4.1			
Restore Default Configuration		5.1.1.4.1			

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FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Set Configuration	BAEE	5.1.1.4.1			
Reset Operations Statistics		5.1.1.4.1			
Get Operations Statistics		5.1.1.4.1			
Radio Power Up Report		5.1.1.4.1			
Radio Registration		5.1.1.4.1			
Data Service Availability		5.1.1.4.1			
Encryption Key Management					
-- Key Fill Device Services					
Key load	AACD	4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14, 4.3.4.3.17, 4.3.4.3.25			
Key Erase		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14, 4.3.4.3.17, 4.3.4.3.25			
Erase All Keys		4.2.1, 4.2.1.1, 4.3.4.3.29, 4.3.4.3.30			
View Key Info		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
View Individual RSI (Radio Set ID)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load Individual RSI		4.2.1, 4.2.1.1, 4.3.4.3.3, 4.3.4.3.4, 4.3.4.3.13, 4.3.4.3.14,			
View KMF RSI		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load KMF RSI		4.2.1, 4.2.1.1			
View MNP (Message Number Period)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Load MNP		4.2.1, 4.2.1.1			
View Keypad Info		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Activate Keypad		4.2.1, 4.2.1.1, 4.3.4.3.5, 4.3.4.3.6			
Load Authentication Key		4.2.1, 4.2.1.1			
Inventory (list active SUID)		4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14			
Delete Authentication Key		4.2.1, 4.2.1.1			
Inventory (list SUID items)	4.2.1, 4.2.1.1, 4.3.4.3.13, 4.3.4.3.14				
-- Over The Air Rekeying (OTAR) Services					
Change Radio Set ID	AACD	4.3.3.1, 4.3.4.3.3, 4.3.4.3.4			
Changeover		4.3.3.2, 4.3.4.3.5, 4.3.4.3.6			
Delete Key		4.3.3.3, 4.3.4.3.8, 4.3.4.3.9			
Modify Key		4.3.3.5, 4.3.4.3.17, 4.3.4.3.25			
Hello		4.3.3.4, 4.3.4.3.12			
Rekey		4.3.3.7, 4.3.4.3.24, 4.3.4.3.25			
Warm-Start		4.3.3.8, 4.3.4.3.28, 4.3.4.3.25			
Zeroize		4.3.3.9, 4.3.4.3.29, 4.3.4.3.30			
Registration		4.3.3.6, 4.3.4.3.22, 4.3.4.3.23			

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FDMA Conventional Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Deregistration	AACA	4.3.3.12, 4.3.4.3.10, 4.3.4.3.11			
Capabilities		4.3.3.10, 4.3.4.3.1, 4.3.4.3.2			
Delete Keypad		4.3.3.11			
Inventory		4.3.3.13, 4.3.4.3.13, 4.3.4.3.14			
Key Assignment		4.3.3.14, 4.3.4.3.15, 4.3.4.3.16			
Modify Keypad Attributes		4.3.3.15, 4.3.4.3.18, 4.3.4.3.19			
Set Date and Time		4.3.3.16, 4.3.4.3.26,			
-- OTAR Response Types					
Delayed	AACA	4.3.4.3.7			
Negative		4.3.4.3.20			
No Service		4.3.4.3.21			
Unable to Decrypt ²		4.3.4.3.27			

¹P25 Statement of Requirements; version "12131211_Approved_P25_SoR_12-11-13"

²The 'Unable to decrypt' feature is only available with 'IP Layer Data' service.

Grey table cells indicate the interface is not related to that feature.

5. FDMA Trunked - Voice Service

Table 7 lists the high level P25 FDMA trunked voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table. The frequency bands that typically support public safety communications are listed at the bottom of the table.

Table 7 - FEATURE SUMMARY - FDMA Trunked Voice Services for Subscriber

FDMA Trunked Subscriber	CAI	MDTI	KFDI
Voice Service (CAI)			
Voice Calls			
Supplementary Services			
Mobility and Registration Services			
Telephone Interconnect			
Voice Encryption			
Frequency Bands (single and multi-band units)			
VHF (136-174MHz)			
UHF (380-470MHz)			
UHF (450-512MHz)			
700/800 (764-870MHz)			

Grey table cells  indicate the interface is not related to that feature.

Table 8 details the features of the P25 FDMA trunked voice services shown in Table 7. Table 8 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

Table 8 - FEATURE DETAIL - FDMA Trunked Voice Features for Subscriber

FDMA Trunked Subscriber (voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Voice Service (CAI)					
-- Voice Calls					
Broadcast Call	AABC, AABD, AABF	2.1.2.22			
Announcement Group Call		2.1.2.24			
Group Voice Call		2.1.2.2			
Emergency Group Voice Call		2.1.2.25.2			
Individual Call with Availability Check		2.1.2.4			
Individual Voice Call without Availability Check		2.1.2.4			
System Call		2.1.2.31			
Message Trunking		2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.25.2, 2.1.2.31			
Transmission Trunking		2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.22, 2.1.2.24, 2.1.2.25.2, 2.1.2.31			
Conventional Fallback		AABD, AABF	3.2.1.7.4		
-- Supplementary Services					
Call Alert	AABC, AABD, AABF	3.3.5.13			
Discreet Listening		3.3.5.11			


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FDMA Trunked Subscriber (voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Emergency Alarm	AABC, AABD, AABF	2.1.2.18			
Emergency Alarm Cancellation		2.1.2.18, 3.3.2.2.7			
Group Emergency Cancellation		2.1.2.25.2, 3.3.2.2.7			
Priority Call		3.1.1.6			
Pre-emptive Priority Call		3.3.4.9			
Call Interrupt (Wireline Console outbound audio takeover)		3.3.5.1			
Radio Check		2.1.2.26			
Radio Unit Inhibit/Uninhibit		3.3.5.10			
Radio Unit Monitoring		3.3.5.12			
Short Message		2.1.2.12			
Status Query		2.1.2.12			
Status Update		2.1.2.12			
Transport of Talking Party ID		2.1.2.20			
Radio Detach		2.1.2.27			
-- Mobility and Registration Services					
Unit Registration; Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AABF	2.1.2.14, 3.1.3.2, 3.1.3.7			
Unit Registration; Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 3.1.3.3, 3.1.3.7			
Unit Registration; Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 3.1.3.3, 3.1.3.7			
Secure Unit Registration (Radio Authentication); Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AACE, AABF	2.1.2.14, 2.1.2.23, 3.1.3.2, 3.1.3.7			
Secure Unit Registration; (Radio Authentication); Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 2.1.2.23, 3.1.3.3, 3.1.3.7			
Secure Unit Registration (Radio Authentication); Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 2.1.2.23, 3.1.3.3, 3.1.3.7			
Location Registration	AABC, AABD, AABF	2.1.2.14, 3.1.1.2, 3.1.3.1, 3.1.3.6, 3.1.3.7, 3.1.3.9			
Unit Deregistration		2.1.2.14, 3.1.3.8			
Affiliation; Home TGs (TG WACN & Sys ID match FNE)		2.1.2.143.1.3.6, 3.3.4.8			
Affiliation; Inter System TGs (TG Sys ID does not match FNE Sys ID)		2.1.2.14, 3.1.3.6			
Affiliation; Inter WACN TGs (TG WACN ID does not match FNE WACN ID)		2.1.2.14, 3.1.3.6			
Call Restriction (Authorization)		2.1.2.14, 2.1.2.23, 2.1.2.33, 3.1.3.4, 3.1.3.6, 3.3.4.8			
-- Telephone Interconnect					
Landline to group call	AABC, AABD, AABF, BADA	2.1.2.2, 2.1.2.6			
Landline to unit call		2.1.2.4, 2.1.2.6			
Unit to landline call		2.1.2.4, 2.1.2.6			
Trunked interconnect availability check		2.1.2.4, 2.1.2.6			
Dialing side tone		2.1.2.6, 5.1.4.11			
34 digit dialed number		2.1.2.6, 5.1.4.11			
Generate hook flash		2.1.2.6			
Overdial		2.1.2.6, 5.1.4.11			
-- Voice Encryption					
AES Encryption	AAAD	2.1.2.10, 4.1.1.1			

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FDMA Trunked Subscriber (voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
DES Encryption	AAAD	2.1.2.10, 4.1.1.2			

¹P25 Statement of Requirements; version "12131211_Aproved_P25_SoR_12-11-13"

Grey table cells  indicate the interface is not related to that feature.

6. ***FDMA Trunked – Non-Voice Service***

Table 9 lists the high level P25 FDMA trunked non-voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table.

Table 9 - FEATURE SUMMARY - FDMA Trunked Non-Voice Services for Subscriber

FDMA Trunked Subscriber	CAI	MDTI	KFDI
>> FNE Data System Topology <<			
Data Bearer Services			
-- Block Encryption Service			
-- IP Data Bearer Service			
IP Data Bearer Service Applications			
-- IP Layer OTAR			
-- Tier 2 Unit Location - LRRP Services			
Data Terminal Services			
-- SU to Terminal IP Connectivity			
-- SU to Terminal Management			
Encryption Key Management			
-- Key Fill Device Services			
-- Over The Air Rekeying (OTAR) Services			
-- OTAR Response Types			


Grey table cells  indicate the interface is not related to that feature.

Table 10 details the features of the P25 FDMA trunked non-voice services shown in Table 9. Table 10 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

Table 10 - FEATURE DETAIL - FDMA Trunked Non-Voice Features for Subscriber

FDMA Trunked Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Data Bearer Services					
-- Block Encryption Service					
AES Encryption	AAAD	4.1.1.1			
DES Encryption		4.1.1.2			
-- IP Data Bearer Service					
---- Management Services					
SNDCP Data Channel Allocation	AABC, BAEA, BAEB	2.2.1, 2.2.2			
---- IPv4 and SNDCP					
Context Management	BAEA, BAEB	2.2.1.3, 2.2.2.2			
Confirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
Unconfirmed IPv4 Datagram Conveyance		2.2.1.3, 2.2.2.2			
----SNDCP Header Compression					
RFC-1144 TCP/IP compression	BAEA, BAEB	2.2.1.3, 2.2.2.2			
RFC-2507 UDP/IP compression		2.2.1.3, 2.2.2.2			
----SNDCP Data User Authentication					

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FDMA Trunked Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
CHAP (Challenge Handshake Authentication Protocol)	BAEA, BAEB	2.2.1.3, 2.2.2.2			
----SNDP Data Host Network Selection					
FNE controlled	BAEA, BEAB	2.2.1.3, 2.2.2.2			
SU controlled		2.2.1.3, 2.2.2.2			
IP Data Bearer Service Applications					
-- IP Layer OTAR	AACA	4.3.3, 4.3.4.3			
-- Tier 2 Unit Location - LRRP Services					
Immediate location service	BAJC	2.2.1.3, 2.2.2.2, 3.3.6.2			
Unsolicited location report service		2.2.1.3, 2.2.2.2, 3.3.6.2			
Location Protocol Version Service		2.2.1.3, 2.2.2.2, 3.3.6.2			
Triggered location service		2.2.1.3, 2.2.2.2, 3.3.6.2			
- Periodic		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.4			
- Emergency		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.5			
- Power On/Off		2.2.1.3, 2.2.2.2, 3.3.6.2, 3.3.6.3			
- Distance Change		2.2.1.3, 2.2.2.2, 3.3.6.2			
Data Terminal Services					
-- SU to Terminal IP Connectivity					
IPv4 over PPP/USB	BAEA, BAEB, BAEE	2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/USB		2.2.1.1, 5.1.1.4.1			
IPv4 over PPP/TIA-232		2.2.1.1, 5.1.1.4.1			
IPv4 over SLIP/TIA-232		2.2.1.1, 5.1.1.4.1			
-- SU to Terminal Management					
---- Management Protocol					
Radio Control Protocol (RCP)	BAEE	5.1.1.4.1			
Simple Network Management Protocol (SNMP)		5.1.1.4.1			
---- Management Services					
Get Information	BAEE	5.1.1.4.1			
Get Configuration		5.1.1.4.1			
Restore Default Configuration		5.1.1.4.1			
Set Configuration		5.1.1.4.1			
Reset Operations Statistics		5.1.1.4.1			
Get Operations Statistics		5.1.1.4.1			
Radio Power Up Report		5.1.1.4.1			
Radio Registration		5.1.1.4.1			
Data Service Availability		5.1.1.4.1			

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FDMA Trunked Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Encryption Key Management					
-- Key Fill Device Services					
Key Load	AACD	4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14, 4.3.4.17, 4.3.4.25			
Key Erase		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14, 4.3.4.17, 4.3.4.25			
Erase All Keys		4.2.1, 4.2.1.1, 4.3.4.29, 4.3.4.30			
View Key Info		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
View Individual RSI (Radio Set ID)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load Individual RSI		4.2.1, 4.2.1.1, 4.3.4.3, 4.3.4.4, 4.3.4.13, 4.3.4.14			
View KMF RSI		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load KMF RSI		4.2.1, 4.2.1.1			
View MNP (Message Number Period)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load MNP		4.2.1, 4.2.1.1			
View Keypad Info		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Activate Keypad		4.2.1, 4.2.1.1, 4.3.4.3.5, 4.3.4.3.6			
Load Authentication Key		4.2.1, 4.2.1.1			
Inventory (list active SUID)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Delete Authentication Key		4.2.1, 4.2.1.1			
Inventory (list SUID items)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
-- Over The Air Rekeying (OTAR) Services					
Change Radio Set ID	AACA	4.3.3.1, 4.3.4.3.3, 4.3.4.3.4			
Changeover		4.3.3.2, 4.3.4.3.5, 4.3.4.3.6			
Delete Key		4.3.3.3, 4.3.4.3.8, 4.3.4.3.9			
Modify Key		4.3.3.5, 4.3.4.3.17, 4.3.4.3.25			
Hello		4.3.3.4, 4.3.4.3.12			
Rekey		4.3.3.7, 4.3.4.3.24, 4.3.4.3.25			
Warm-Start		4.3.3.8, 4.3.4.3.28, 4.3.4.3.25			
Zeroize		4.3.3.9, 4.3.4.3.29, 4.3.4.3.30			
Registration		4.3.3.6, 4.3.4.3.22, 4.3.4.3.23			
Deregistration		4.3.3.12, 4.3.4.3.10, 4.3.4.3.11			
Capabilities		4.3.3.10, 4.3.4.3.1, 4.3.4.3.2			
Delete Keypad		4.3.3.11			
Inventory		4.3.3.13, 4.3.4.3.13, 4.3.4.3.14			
Key Assignment		4.3.3.14, 4.3.4.3.15, 4.3.4.3.16			

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FDMA Trunked Subscriber	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
>> FNE Data System Topology <<					
Modify Keypad Attributes	AACA	4.3.3.15, 4.3.4.3.18, 4.3.4.3.19			
Set Date and Time		4.3.3.16, 4.3.4.3.26			
-- OTAR Response Types					
Delayed	AACA	4.3.4.3.7			
Negative		4.3.4.3.20			
No Service		4.3.4.3.21			
Unable to Decrypt		4.3.4.3.27			

¹P25 Statement of Requirements; version "12131211_Approved_P25_SoR_12-11-13"

Grey table cells indicate the interface is not related to that feature.

7. TDMA Trunked - Voice Service

Table 11 lists the high level P25 TDMA trunked voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table. The frequency bands that typically support public safety communications are listed at the bottom of the table.

Table 11 - FEATURE SUMMARY - TDMA Trunked Voice Services for Subscriber

TDMA Trunked Subscriber	CAI	MDTI	KFDI
Voice Service (CAI)			
Voice Calls			
Supplementary Services			
Mobility and Registration Services			
Telephone Interconnect			
Voice Encryption			
Frequency Bands (single and multi-band units)			
VHF (136-174MHz)			
UHF (380-470MHz)			
UHF (450-512MHz)			
700/800 (764-870MHz)			


Grey table cells  indicate the interface is not related to that feature.

Table 12 details the features of the P25 TDMA trunked voice services shown in Table 11. Table 12 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.


Table 12 – FEATURE DETAIL - TDMA Trunked Voice Features for Subscriber

TDMA Trunked Subscriber (voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Voice Service (CAI)					
-- Voice Calls					
Broadcast Call	AABC, AABD, AABF, BBAC	2.1.2.22			
Announcement Group Call		2.1.2.24			
Group Voice Call		2.1.2.2			
Emergency Group Voice Call		2.1.2.25.2			
Individual Voice Call with Availability Check		2.1.2.4			
Individual Voice Call without Availability Check		2.1.2.4			
System Call		2.1.2.31			
Message Trunking		2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.25.2, 2.1.2.31			
Transmission Trunking		2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.22, 2.1.2.24, 2.1.2.25.2, 2.1.2.31			
Conventional Fallback		AABD, AABF	3.2.1.7.4		
-- Supplementary Services					
Call Alert	AABC, AABD, AABF, BBAC	3.3.5.13			
Discreet Listening		3.3.5.11			

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TDMA Trunked Subscriber (voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Emergency Alarm	AABC, AABD, AABF, BBAC	2.1.2.18			
Emergency Alarm Cancellation		2.1.2.18, 3.3.2.2.7			
Group Emergency Cancellation		2.1.2.25.2, 3.3.2.2.7			
Priority Call		3.1.1.6			
Pre-emptive Priority Call		3.3.4.9			
Call Interrupt (Wireline Console outbound audio takeover)		3.3.5.1			
Transmitting Subscriber Forced Preemption		3.1.1.6, 3.3.4.9, 3.3.5.8			
Radio Check		2.1.2.26			
Radio Unit Inhibit/Uninhibit		3.3.5.10			
Radio Unit Monitoring		3.3.5.12			
Short Message		2.1.2.12			
Status Query		2.1.2.12			
Status Update		2.1.2.12			
Transport of Talking Party ID		2.1.2.20			
Radio Detach		2.1.2.27			
-- Mobility and Registration Services					
Unit Registration; Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AABF	2.1.2.14, 3.1.3.2, 3.1.3.7			
Unit Registration; Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 3.1.3.3, 3.1.3.7			
Unit Registration; Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 3.1.3.3, 3.1.3.7			
Secure Unit Registration (Radio Authentication); Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AACE, AABF	2.1.2.14, 2.1.2.23, 3.1.3.2, 3.1.3.2, 3.1.3.7			
Secure Unit Registration; (Radio Authentication); Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 2.1.2.23, 3.1.3.3, 3.1.3.7			
Secure Unit Registration (Radio Authentication); Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 2.1.2.23, 2.1.2.23, 3.1.3.3, 3.1.3.7			
Location Registration	AABC, AABD, AABF	2.1.2.14, 3.1.1.2, 3.1.3.1, 3.1.3.6, 3.1.3.7, 3.1.3.9			
Unit Deregistration		2.1.2.14, 3.1.3.8			
Affiliation; Home TGs (TG WACN & Sys ID match FNE)		2.1.2.14, 3.1.3.6, 3.3.4.8			
Affiliation; Inter System TGs (TG Sys ID does not match FNE Sys ID)		2.1.2.14, 3.1.3.6			
Affiliation; Inter WACN TGs (TG WACN ID does not match FNE WACN ID)		2.1.2.14, 3.1.3.6			
-- Telephone Interconnect					
Landline to group call	AABC, AABD, AABF, BADA	2.1.2.2, 2.1.2.6			
Landline to unit call		2.1.2.4, 2.1.2.6			
Unit to landline call		2.1.2.4, 2.1.2.6			
Trunked interconnect availability check		2.1.2.4, 2.1.2.6			
Dialing side tone		2.1.2.6, 5.1.4.11			
34 digit dialed number		2.1.2.6, 5.1.4.11			
Generate hook flash		2.1.2.6			
Overdial		2.1.2.6, 5.1.4.11			
-- Voice Encryption					
AES Encryption	AAAD	2.1.2.10, 4.1.1.1			
DES Encryption		2.1.2.10, 4.1.1.1			

¹P25 Statement of Requirements; version "12131211_Aproved_P25_SoR_12-11-13"

Grey table cells  indicate the interface is not related to that feature.

8. TDMA Trunked – Non-Voice Service

Table 13 lists the high level P25 TDMA trunked non-voice services defined in published TIA-102 Standard documents. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) note when each interface is required to support those services listed in the table.

Table 13 - FEATURE SUMMARY - TDMA Trunked Non-Voice Services for Subscriber

TDMA Trunked Subscriber	CAI	MDTI	KFDI
Encryption Key Management			
Key Fill Device Services			

Grey table cells  indicate the interface is not related to that feature.

Table 14 details the features of the P25 FDMA trunked non-voice services shown in Table 13. Table 14 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 subscriber Common Air Interface (CAI), the Mobile Data Terminal Interface (MDTI) and the Key Fill Device Interface (KFDI) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

Table 14 - FEATURE DETAILS - TDMA Trunked Non-Voice Features for Subscriber

TDMA Trunked Subscriber (non-voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Encryption Key Management					
-- Key Fill Device Service					
Key Load	AACD	4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14, 4.3.4.17, 4.3.4.25			
Key Erase		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14, 4.3.4.17, 4.3.4.25			
Erase All Keys		4.2.1, 4.2.1.1, 4.3.4.29, 4.3.4.30			
View Key Info		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
View Individual RSI (Radio Set ID)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load Individual RSI		4.2.1, 4.2.1.1, 4.3.4.3, 4.3.4.4, 4.3.4.13, 4.3.4.14			
View KMF RSI		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load KMF RSI		4.2.1, 4.2.1.1			
View MNP (Message Number Period)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Load MNP		4.2.1, 4.2.1.1			
View Keypad Info		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Activate Keypad		4.2.1, 4.2.1.1, 4.3.4.3.5, 4.3.4.3.6			
Load Authentication Key		4.2.1, 4.2.1.1			
Inventory (list active SUID)		4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			
Delete Authentication Key		4.2.1, 4.2.1.1			

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TDMA Trunked Subscriber (non-voice)	TIA-102	P25 SoR ¹	CAI	MDTI	KFDI
Inventory (list SUID items)	AACD	4.2.1, 4.2.1.1, 4.3.4.13, 4.3.4.14			

¹P25 Statement of Requirements; version "12131211_Approved_P25_SoR_12-11-13"

Grey table cells indicate the interface is not related to that feature.

9. Fixed Network Equipment - Trunked ISSI/CSSI Voice Services

Table 15 lists the high level P25 trunked voice services for Fixed Network Equipment (FNE) defined in published TIA-102 Standard documents. Columns for the P25 FNE Common Air Interface (CAI) and the Inter Sub System Interface/Console Sub System Interface (ISSI/CSSI) note when each interface supports those services listed in the table. The frequency bands that typically support public safety communications are listed at the bottom of the table.

Table 15 - FEATURE SUMMARY - Trunked Voice Services for the FNE

Trunked FNE (voice)	CAI	ISSI/CSSI
Voice Service (CAI)		
Voice Calls		
Supplementary Services		
RFSS Roles and Capabilities		
Mobility and Registration Services		
Telephone Interconnect		
Voice Encryption		
Frequency Bands (single and multi-band units)		
VHF (136-174MHz)		
UHF (380-470MHz)		
UHF (450-512MHz)		
700/800 (764-870MHz)		

Grey table cells  indicate the interface is not related to that feature.

Table 16 details the features of the P25 FDMA trunked voice services shown in Table 15. Table 16 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 FNE Common Air Interface (CAI) and the ISSI/CSSI are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system. It should be noted that a single set of protocols (SIP & RTP) are used for both a Trunked ISSI and/or a Trunked CSSI application and the majority of features in the table apply to both applications. The capabilities of the RF Sub System with Console equipment dictates whether a particular interface is acting as a Trunked ISSI or a Trunked CSSI. Based on these points, the RFSS Roles and Capabilities section can be used to differentiate a Trunked ISSI or Trunked CSSI application and a single column is used in the table for the ISSI/CSSI features.

Table 16 - FEATURE DETAIL - Trunked Voice Features for the FNE

Trunked FNE (voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Voice Services				
-- Voice Calls				
Broadcast Call	AABC, AABD, AABF, BACA	2.1.2.22, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1		
Announcement Group Call		2.1.2.24, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1		
Group Voice Call		2.1.2.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.2, 2.6.6.3, 2.6.6.4,		

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Trunked FNE (voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Confirmed Group Call	BACA	2.1.2.2, 2.1.2.22, 2.1.2.24, 2.1.2.25.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.2, 2.6.6.3		
Unconfirmed Group Call		2.1.2.2, 2.1.2.22, 2.1.2.24, 2.1.2.25.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.2, 2.6.6.3		
Emergency Group Voice Call	AABC, AABD, AABF, BACA	2.1.2.25.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.8		
Individual Voice Call with Availability Check		2.1.2.4, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.5		
Individual Voice Call without Availability Check		2.1.2.4, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1, 2.6.6.5		
System Call	AABC, AABD, AABF	2.1.2.31		
Full Rate Vocoder ²	BABA, BACA	3.3.5.2.2, 7.3.2.2		
Half Rate Vocoder ³		3.3.5.2.2, 7.3.2.2		
Native Mode	BACA	3.3.5.2.2, 7.3.2.2		
Message Trunking	AABD, BACA	2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.25.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1		
Transmission Trunking		2.1.2.2, 2.1.2.4, 2.1.2.6, 2.1.2.22, 2.1.2.24, 2.1.2.25.2, 2.4.5.1, 2.4.7.3, 2.4.8.1, 2.6.4.1		
Conventional Fallback ²	AABD, AABF	3.2.1.7.4		
-- Supplementary Services				
Call Alert	AABC, AABD, AABF, BACD	2.4.5.1, 2.6.2.6, 3.3.5.13		
Discreet Listening	AABC, AABD, AABF	2.4.5.1, 2.6.2.6, 3.3.5.11		
Emergency Alarm	AABC, AABD, AABF, BACD	2.1.2.18, 2.4.5.1, 2.6.2.6, 2.6.4.1, 2.6.6.7		
Emergency Alarm Cancellation	AABC, AABD, BACA	2.1.2.18, 2.6.2.6, 2.4.5.1, 2.6.4.1, 2.6.6.7, 3.3.2.2.7		
Group Emergency Cancellation		2.1.2.25.2, 2.4.5.1, 2.6.2.6, 2.6.4.1, 3.3.2.2.7		
Priority Call	AABC, AABD, AABF, BACD	2.4.5.1, 2.6.2.6, 3.1.1.6		
Pre-emptive Priority Call		2.4.5.1, 2.6.2.6, 3.3.4.9		
Call Interrupt (Wireline Console outbound audio takeover)	BACA	2.4.5.1, 2.6.2.6, 3.3.5.1		
Wireline Console Audio Takeover By Another Wireline Console		2.6.6.10, 2.6.6.11		
Wireline Console Acoustic Crossmute		2.6.6.10, 2.6.6.11		
Radio Check	AABC, AABD, AABF, BACD	2.1.2.26, 2.4.5.1, 2.6.2.6, 2.6.4.1		
Radio Unit Inhibit/Uninhibit		2.4.5.1, 2.6.2.6, 3.3.5.10		
Radio Unit Monitoring		2.4.5.1, 2.6.2.6, 3.3.5.12		
Short Message		2.1.2.12, 2.4.5.1, 2.6.2.6, 2.6.4.1		
Status Query		2.1.2.12, 2.4.5.1, 2.6.2.6, 2.6.4.1		
Status Update		2.1.2.12, 2.4.5.1, 2.6.2.6, 2.6.4.1		
Transport of Talking Party ID		2.1.2.20, 2.4.5.1, 2.6.2.6, 2.6.4.1, 2.6.6.1, 2.6.6.4		

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Trunked FNE (voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Radio Detach	AABC, AABD	2.1.2.27, 2.4.5.1, 2.6.2.6, 2.6.4.1		
Tx Source Type Identification	BACD	2.4.7.3, 2.6.6.11		
Voice Source Type Identification		2.4.7.3, 2.6.6.11		
-- RFSS Roles and Capabilities				
RFSS with RF sites Only	BACA	2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
RFSS with Consoles Only		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
RFSS with RF sites and Consoles		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Group Home RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Group Serving RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Ind Calling Home RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Ind Called Home RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Ind Calling Serving RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
Ind Called Serving RFSS		2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1		
-- Mobility and Registration Services				
Unit Registration; Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AABF, BACA	2.1.2.14, 3.1.3.2, 3.1.3.7		(Applies to Intrasystem ISSI/CSSI only)
Unit Registration; Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3 3.1.3.3, 3.1.3.7		
Unit Registration; Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 2.4.1.3, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3 3.1.3.3, 3.1.3.7		
Secure Unit Registration (Radio Authentication); Home SUs (SU WACN & Sys IDs match FNE)	AABC, AABD, AACE, AABF, BACA	2.1.2.14, 2.1.2.23, 3.1.3.2, 3.1.3.7		(Applies to Intrasystem ISSI/CSSI only)
Secure Unit Registration; (Radio Authentication); Inter System SUs (SU Sys ID does not match FNE Sys ID)		2.1.2.14, 2.1.2.23, 2.4.1.3, 2.4.7.1, 2.4.7.2, 2.4.7.3, 2.4.10.1, 2.4.10.3 3.1.3.3, 3.1.3.7		
Secure Unit Registration (Radio Authentication); Inter WACN SUs (SU WACN ID does not match FNE WACN ID)		2.1.2.14, 2.1.2.23, 2.4.1.3, 2.4.7.1, 2.4.7.2, 2.4.7.3, 2.4.10.1, 2.4.10.3 3.1.3.3, 3.1.3.7,		
Transport of Authentication Credential	BACA	2.4.7.2		
Location Registration	AABC, AABD, AABF, BACA	2.1.2.14, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3, 3.1.1.2, 3.1.3.1, 3.1.3.6, 3.1.3.7, 3.1.3.9		(Applies to Intrasystem ISSI/CSSI only)
Unit Deregistration		2.1.2.14, 2.4.7.1, 2.4.7.3, 2.4.10.1, 3.1.3.8		

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Trunked FNE (voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Affiliation; Home TGs (TG WACN & Sys ID match FNE)	AABC, AABD, AABF, BACA	2.1.2.14, 3.1.3.6, 3.3.4.8		(Applies to Intrasystem ISSI/CSSI only)
Affiliation; Inter System TGs (TG Sys ID does not match FNE Sys ID)		2.1.2.14, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3, 3.1.3.6		
Affiliation; Inter WACN TGs (TG WACN ID does not match FNE WACN ID)		2.1.2.14, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3, 3.1.3.6,		
Call Restriction (Authorization)	AABC, AABD	2.1.2.14, 2.1.2.23, 2.4.7.1, 2.4.7.3, 2.4.10.1, 2.4.10.3, 2.4.10.5, 3.1.3.4, 3.1.3.6, 3.3.4.8		
RFSS Polling Request (without Capabilities)	BACA	2.4.10.10		
RFSS Polling Request (with Capabilities)		2.4.10.10		
RFSS Polling Response (without Capabilities)		2.4.10.10		
RFSS Polling Response (with Capabilities)		2.4.10.10		
RFSS Polling; RFSS Functional Capability		2.4.10.10		
RFSS Polling; RFSS Adjacent Site Status		2.4.10.10		
RFSS Polling; RFSS Unit/Group Roaming Capability		2.4.10.10		
RFSS Polling; Known Status		2.4.10.10		
RFSS Polling; RFSS Vocoder Mode Conveyance		2.4.10.10		
-- Telephone Interconnect				
Landline to group call	AABC, AABD, AABF, BADA	2.1.2.2, 2.1.2.6		
Landline to unit call		2.1.2.4, 2.1.2.6		
Unit to landline call		2.1.2.4, 2.1.2.6		
Trunked interconnect availability check		2.1.2.4, 2.1.2.6		
Dialing side tone		2.1.2.6, 5.1.4.11		
34 digit dialed number		2.1.2.6, 5.1.4.11		
Generate hook flash		2.1.2.6		
Overdial		2.1.2.6, 5.1.4.11		
-- Voice Encryption				
AES Encryption	AAAD	2.1.2.10, 2.4.8.1, 2.6.6.12, 4.1.1.1,		
DES Encryption		2.1.2.10, 2.4.8.1, 2.6.6.12, 4.1.1.2,		

¹P25 Statement of Requirements; version "12131211_Aproved_P25_SoR_12-11-13"

²Applies to FDMA only

³Applies to TDMA only

Grey table cells indicate the interface is not related to that feature.

10.Fixed Network Equipment - Trunked ISSI/CSSI Non-Voice Services

Table 17 lists the high level P25 trunked non-voice services for Fixed Network Equipment (FNE) defined in published TIA-102 Standard documents. Columns for the P25 FNE Common Air Interface (CAI) and the Inter Sub System Interface/Console Sub System Interface (ISSI/CSSI) note when each interface is required to support those services listed in the table.

Table 17 - FEATURE SUMMARY - Trunked Non-Voice Services for the FNE

Trunked FNE (non voice)	CAI	ISSI/CSSI
>> FNE Data System Topology <<		
Data Bearer Services		
-- Block Encryption Service		
-- IP Data Bearer Service		
IP Data Bearer Service Applications		
-- IP Layer OTAR		
-- Tier 2 Unit Location - LRRP Services		
Encryption Key Management		
-- Over The Air Rekeying (OTAR) Services		
-- OTAR Response Types		

Grey table cells indicate the interface is not related to that feature.

Table 18 details the features of the P25 trunked non-voice services shown in Table 17. Table 18 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is also a column for listing the P25 Statement of Requirement section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 FNE Common Air Interface (CAI) and the ISSI/CSSI are provided for the user to inventory the current features on their existing system or to note desired features for future systems. Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system. It should be noted that a single set of protocols (SIP & RTP) are used for both a Trunked ISSI and/or a Trunked CSSI application and the majority of features in the table apply to both applications. The capabilities of the RF Sub System with Console equipment dictates whether a particular interface is acting as a Trunked ISSI or a Trunked CSSI. Based on these points, the RFSS Roles and Capabilities section can be used to differentiate a Trunked ISSI or Trunked CSSI application and a single column is used in the table for the ISSI/CSSI features.

Table 18 - FEATURE DETAIL - Trunked Non-Voice Features for the FNE

Trunked FNE (non voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Data Bearer Services				
-- Block Encryption Service				
AES Encryption	AAAD	2.4.8.1, 2.6.6.12, 4.1.1.1		
DES Encryption		2.4.8.1, 2.6.6.12, 4.1.1.2		
-- IP Data Bearer Service				
---- Management Services				
SNDCP Data Channel Allocation	AABC, BAEA, BAEB	2.2.1, 2.2.2		
---- IPv4 and SNDCP				
Context Management	BAEA, BAEB, BACF	2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.7.1, 2.4.7.2, 2.4.7.3, 2.4.8.1, 2.6.2.1		
Confirmed IPv4 Datagram Conveyance	BAEA, BAEB	2.2.1.3, 2.2.2.2		

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Trunked FNE (non voice)	TIA-102	P25 SoR¹	CAI	ISSI/CSSI
Unconfirmed IPv4 Datagram Conveyance	BAEA, BAEB	2.2.1.3, 2.2.2.2		
IPv4 Datagram Conveyance over ISSI	BACF	2.4.2.1, 2.4.6.1, 2.4.7.3, 2.4.8.1, 2.6.2.1		
----SNDP Header Compression				
RFC-1144 TCP/IP compression	BAEA, BAEB	2.2.1.3, 2.2.2.2		
RFC-2507 UDP/IP compression		2.2.1.3, 2.2.2.2		
----SNDP Data User Authentication				
CHAP (Challenge Handshake Authentication Protocol)	BAEA, BAEB, BACF	2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.7.2, 2.4.8.1, 2.6.2.1		
----SNDP Data Host Network Selection				
FNE controlled	BAEA, BAEB, BACF	2.2.1.3, 2.2.2.2		
SU controlled		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1		
IP Data Bearer Service Applications				
-- IP Layer OTAR	AACA	2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3, 4.3.4.3		2
-- Tier 2 Unit Location - LRRP Services				
Immediate location service	BAJC	2.2.1.3, 2.2.2.2, , 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
Unsolicited location report service		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
Location Protocol Version Service		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
Triggered location service		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
- Periodic		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2, 3.3.6.5		2
- Emergency		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2, 3.3.6.3		2
- Power On/Off		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
- Distance Change		2.2.1.3, 2.2.2.2, 2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 2.6.7.3, 2.6.7.4, 3.3.6.2		2
Encryption Key Management				
-- Over The Air Rekeying (OTAR) Services				
Change Radio Set ID	AACA	2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.1, 4.3.4.3.3, 4.3.4.3.4		2
Changeover		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.2, 4.3.4.3.5, 4.3.4.3.6		2
Delete Key		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.3, 4.3.4.3.8, 4.3.4.3.9		2

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Trunked FNE (non voice)	TIA-102	P25 SoR ¹	CAI	ISSI/CSSI
Modify Key	AACA	2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.5, 4.3.4.3.17, 4.3.4.3.25		2
Hello		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.4, 4.3.4.3.12		2
Rekey		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.7, 4.3.4.3.24, 4.3.4.3.25		2
Warm-Start		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.8, 4.3.4.3.25, 4.3.4.3.28		2
Zeroize		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.9, 4.3.4.3.29, 4.3.4.3.30		2
Registration		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.6, 4.3.4.3.22, 4.3.4.3.23		2
Deregistration		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.12, 4.3.4.3.10, 4.3.4.3.11		2
Capabilities		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.10, 4.3.4.3.1, 4.3.4.3.2		2
Delete Keypad		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.11		2
Inventory		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.13, 4.3.4.3.13, 4.3.4.3.14		2
Key Assignment		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.14, 4.3.4.3.15, 4.3.4.3.16		2
Modify Keypad Attributes		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.15, 4.3.4.3.18, 4.3.4.3.19,		2
Set Date and Time		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.3.16, 4.3.4.3.26		2
-- OTAR Response Types				
Delayed	AACA	2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.4.3.7		2
Negative		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.4.3.20		2
No Service		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.4.3.21		2
Unable to Decrypt		2.4.2.1, 2.4.6.1, 2.4.8.1, 2.6.2.1, 4.3.4.3.27		2

¹P25 Statement of Requirements; version "12131211_Aproved_P25_SoR_12-11-13"

²Uses IPv4 Datagram Conveyance

Grey table cells indicate the interface is not related to that feature.

11.Fixed Network Equipment - FDMA Conventional – Fixed Station Control & Voice Service

The Project 25 Conventional Fixed Station Interface may use analog transport (AFSI – Analog Fixed Station Interface) or digital transport (DFSI – Digital Fixed Station Interface). Either form allows a Conventional Fixed Station Host device (such as a Console Subsystem) to control a Conventional Fixed Station and to communicate with wireless subscriber units (SU) via the P25 Common Air Interface (CAI) or an analog air interface such as that defined by TIA 603. Note that the analog air interface may also use a common method of analog signaling (examples include but are not limited to: CTCSS, DCS, MDC-1200, Type 99, GE-STAR) to enable additional capabilities. When the Host device is communicating with SUs, the Conventional Fixed Station acts as a bridge between either type of wireline interface and either type of air interface.

The following tables identify capabilities as they pertain to both types of wire line and air interfaces. There are several cases where a particular capability may be achieved by the wire line and air interfaces working together (e.g. DFSI+P25 CAI or AFSI + analog air interface). Footnotes in the table are used to note constraints and assumptions associated with these combinations. Footnotes in the tables are also used to note assumptions about the bridging expectations of the Fixed Station since these may be commonly available but may not be covered by published standards. In addition, the Host device may control the Conventional Fixed Station purely over the wire line interface without involving the air interface.

Table 19 lists the high level P25 FDMA conventional Fixed Station control and voice services defined in published TIA-102 Standard documents. A column for the P25 Analog Fixed Station Interface (AFSI) and Digital Fixed Station Interface (DFSI) required to support those services is included. A column for the P25 subscriber Common Air Interface (CAI) required to support those services is included. A column for the analog air interface based on the analog FM standard, TIA-603 Land Mobile FM Communications Equipment -Measurement and Performance Standards that may support some of these services is included for conventional analog operation. The frequency bands that typically support public safety communications are listed at the bottom of the table.

Table 19 - FEATURE SUMMARY - FDMA Conventional Voice Services for the FNE

FDMA Conventional Fixed Station	DFSI	AFSI	P25 CAI	TIA 603
Fixed Station Control				
Analog E&M				
Analog Tone Remote Control (TRC)				
Digital Ethernet IP				
Voice Service				
Voice Calls				
Supplementary Services				
Telephone Interconnect				
Voice Encryption		1		
Frequency Bands (single and multi-band units)				
VHF (136-174MHz)				
UHF (380-470MHz)				
UHF (450-512MHz)				
700/800 (764-870MHz)				

Grey table cells  indicate the interface is not related to the service.

Notes:

1. The AFSI can be used with P25 CAI voice encryption depending on the capabilities of the fixed station (e.g. vocoder and encryption technology must reside within the fixed station). The AFSI cannot support wire line transport of P25 encrypted audio.

Table 20 details the features of the P25 FDMA conventional voice services shown in Table 19. Table 20 has a column (TIA-102) for listing the TIA-102 Standard document (TIA-102.XXXX) in which the P25 feature is defined. There is a column for listing the P25 Statement of Requirements section (X.X.X.X) that corresponds to the TIA-102 feature. Columns for the P25 Analog Fixed Station Interface (AFSI), Digital Fixed Station Interface (DFSI), P25 Common Air Interface (CAI), analog air interface based on analog FM standard (TIA-603) and Analog with Signaling (examples include but are not limited to: CTCSS, DCS, MDC-1200, Type 99, GE-STAR) are provided for the user to inventory the current features on their existing system or to note desired features for future systems. While there is no published standard for many of the signaling methods that may be used with analog voice, they have been implemented by multiple manufacturers and enable many of the Voice Call and Supplementary Services on the analog air interface. The column labeled TIA 603 should be interpreted as the analog air interface without any analog signaling and the Analog with Signaling column should be interpreted as including analog voice so, analog air interface capabilities that depend on some type of analog signaling will shade the TIA 603 cell but not the analog with signaling cell (e.g., Group or Individual Voice Call). Suggested format is to enter “H” (“Have”) for a service, feature or capability in the user’s current system and a “W” (“Want”) if it is needed in the new system.

Table 20 - FEATURE DETAIL - FDMA Conventional Fixed Station Control & Voice Call Features for the FNE

FDMA Conventional Fixed Station	TIA-102	P25 SoR ¹	P25 DFSI	P25 AFSI	P25 CAI	TIA 603	Analog with Signaling
Wire line Physical Interface							
2-Wire Analog	BAHA	2.7.1			1	1	1
4-Wire Analog		2.7.1			1	1	1
Ethernet		2.7.2.14			1	1	
Fixed Station Control							
Using only Wire line Interfaces							
--Analog E & M							
FS Transmit	BAHA	2.7.1.2					
FS Receive Indication		2.7.1.2					
--Analog Tone Remote Control (TRC)							
FS Monitor	BAHA	2.7.1.3					
FS Transmit		2.7.1.3					
FS Channel Select		2.7.1.3					
FS Privacy Code Select		2.7.1.3					
FS RF Mode Select (analog/digital)		2.7.1.3, 2.7.1.5, 2.7.1.6					
FS Encryption Mode Select		2.7.1.3					
FS Repeat On/Off		2.7.1.3					
FS 2 nd Receiver On/Off		2.7.1.3					
FS Receiver Squelch Min/Max		2.7.1.3					
FS Wild Card On/Off		2.7.1.3					
--Digital Ethernet IP based control							

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FDMA Conventional Fixed Station	TIA-102	P25 SoR ¹	P25 DFSI	P25 AFSI	P25 CAI	TIA 603	Analog with Signaling
FS Monitor	BAHA	2.7.2.1					
FS Transmit		2.7.2.1					
FS Channel Select		2.7.2.1, 2.7.2.10					
FS Privacy Code Select		2.7.2.1, 2.7.2.12	2				
FS RF Mode Select (analog/digital)		2.7.2.1	3				
FS Encryption Mode Select		2.7.2.1	3				
FS Repeat On/Off		2.7.2.1, 2.7.2.11					
FS Voted Receiver Status & Control		2.7.2.1, 2.7.2.9					
Voice Service	Using both Wire line and Wireless Interfaces						
-- Voice Calls							
FS Intercom (not sent on wireless interface)	BAHA	2.7.1.4, 2.7.2.13					
Unaddressed (Analog) Voice Call ²	AABF, BAAD	2.7.1.1, 5.1.1.3, 5.1.2.1, 5.3.1.1					
Group Voice Call		2.1.2.1, 2.7.1.1, 2.7.2.1					4
Emergency Group Voice Call		2.2.2.25.1, 2.7.1.1, 2.7.2.1, 2.7.2.8					5
Individual Voice Call		2.1.2.3, 2.7.1.1, 2.7.2.1					4
All Call		2.1.2.32, 2.7.1.1, 2.7.2.1					4
Full Rate Vocoder Audio	BABA, BAHA	2.7.2.1					
PCM Audio	BAHA	2.7.2.1			6	6	
Analog Audio		2.7.1.1, 2.7.1.5			7		
-- Supplementary Services							
Call Alert	AABF, AABG, BAAD	2.7.1.6, 3.3.5.13					4
Discreet Listening		2.7.1.6, 3.3.5.11					4
Emergency Alarm		2.1.2.17, 2.7.1.6, 2.7.2.7, 2.7.2.8					4
Radio Check		2.1.2.26, 2.7.1.6					4
Radio Unit Inhibit/Uninhibit		2.7.1.6, 3.3.5.10					4
Radio Unit Monitoring		2.7.1.6, 3.3.5.12					4
Short Message		2.1.2.11, 2.7.1.6					4
Status Query		2.1.2.11, 2.7.1.6					4
Status Update		2.1.2.11, 2.7.1.6					4
Transport of Talking Party ID		2.1.2.19, 2.7.1.6, 2.7.2.3					4
Normal Squelch	BAAD	2.1.2.29, 2.7.1.1, 2.7.1.6, 2.7.2.12	8	9			
Monitor Squelch		2.1.2.30, 2.7.1.1, 2.7.1.3, 2.7.1.6, 2.7.2.12	8	9			
Selective Squelch		2.1.2.1, 2.7.1.1, 2.7.1.3, 2.7.1.6, 2.7.2.12	8	9			
Busy Channel Lockout		2.1.2.28, 2.7.1.6		10		10	
-- Telephone Interconnect							
Landline to group call	AABF, AABG, BAAD, BADA	2.1.2.1, 2.1.2.5, 2.7.1.5, 2.7.1.6, 2.7.2.4					4
Landline to unit call		2.1.2.3, 2.1.2.5, 2.7.1.5, 2.7.1.6, 2.7.2.3					4

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FDMA Conventional Fixed Station	TIA-102	P25 SoR ¹	P25 DFSI	P25 AFSI	P25 CAI	TIA 603	Analog with Signaling
Unit to landline call	AABF, AABG, BAAD, BADA	2.1.2.3, 2.1.2.5, 2.7.1.5, 2.7.1.6, 2.7.2.3		4		4	4
Dialing side tone		2.1.2.5, 2.7.1.5, 2.7.1.6, 5.1.4.11		4		4	4
34 digit dialed number		2.1.2.5, 2.7.1.5, 2.7.1.6, 5.1.4.11					
Generate hook flash		2.1.2.5, 2.7.1.5, 2.7.1.6	12	12	12	12	12
Conventional disconnect code		2.1.2.5, 2.7.1.5, 2.7.1.6	12	12	12	12	12
Over dial		2.1.2.5, 2.7.1.5, 2.7.1.6, 5.1.4.11					
-- Voice Encryption							
AES encryption	AAAD	2.1.2.9, 2.7.2.2, 4.1.1.1		11			
DES encryption		2.1.2.9, 2.7.2.2, 4.1.1.2		11			

¹P25 Statement of Requirements; version "12131211_Approved_P25_SoR_12-11-13"

²Note that in P25 Unaddressed Voice Call is accomplished by using the Normal Squelch mode

Grey table cells indicate the interface is not related to the service.

Notes:

1. The AFSI can be used with the P25 CAI (depending on fixed station capabilities) and TIA 603 (with or without analog signaling). The DFSI can be used with both P25 CAI and TIA 603 (depending on fixed station capabilities). End to end encryption is only available when the DFSI is used with the P25 CAI.
2. The DFSI has provisions to transport digital privacy code (NAC), but not analog privacy code (CTCSS/DCS). Thus only NAC privacy code may be selected by the FSI Host.
3. There are no explicit commands to control transmitted air mode or encryption mode via the DFSI, but there are implicit methods that may be used to control these modes depending on fixed station configuration.
4. These capabilities are supported when combining DFSI and P25 CAI or AFSI and analog air interface with analog signaling. Combinations of DFSI and analog air interface or AFSI and P25 CAI may be possible but are dependent on station capabilities and configuration not covered by published standards.
5. Emergency Group call is supported when DFSI and the P25 CAI are used together. When AFSI is used with the analog air interface with analog signaling, this is referred to as an "emergency PTT" (not a group call). Combinations of DFSI with analog air interface or AFSI with P25 CAI are also possible but are dependent on station capabilities and configurations not covered by published standards.
6. PCM audio only appears on the DFSI. The DFSI with PCM audio may be used with either the P25 CAI or the analog air interface (TIA603) depending on station capabilities and configurations not covered by published standards.
7. The AFSI can use analog audio over the wire line to communicate via P25 CAI depending on the fixed station capabilities (e.g. the fixed station must have an integral vocoder) and fixed station configuration not covered by published standards.
8. When using the DFSI the fixed station typically sends all over-the-air audio and signaling information to the DFSI host (e.g. console) and the host determines the method used to squelch the audio.
9. The squelch method used to control receive audio flow to the AFSI host (e.g. console) will depend on the fixed station configuration.
10. Busy Channel Lockout is explicitly supported by the DFSI and P25 CAI. For the Analog Air Interface, Busy channel lockout functionality may be implicitly supported at the subscriber or at the station transmitter by detection of analog air interface activity. This activity detection may be carried by the AFSI or DFSI.
11. The AFSI can be used with P25 CAI voice encryption depending on the capabilities of the fixed station (e.g. vocoder and encryption technology must reside within the fixed station). The AFSI cannot support wire line transport of P25 encrypted audio.

12. This function may be provided by a pre-programmed code or dialing digit sequence. This flexibility allows the function to be supported with a variety of wire line type and air interface type combinations.