



# The MFA Shared PLMN-ID – The Ideal Solution for Your Private Network Deployment



# INTRODUCTION

The MFA Private Network Identifier Package in combination with our own MFA shared PLMN-ID is the answer for industry verticals asking how to deploy their own private LTE and 5G networks.

MFA has eliminated one of the key barriers you may encounter when deploying your own private LTE or 5G network—getting a PLMN-ID. We have been assigned a PLMN-ID by the International Telecommunication Union (ITU) that we will share with you, making your private network deployment surprisingly easy.

The MFA shared PLMN-ID offers an ideal, efficient solution for large multinational companies, verticals, small businesses, and all private wireless network enterprises that do not have their own unique PLMN-ID. With access to our shared PLMN-ID, you can deploy your own LTE or 5G private network in locally licensed or unlicensed spectrum. You also get your own private network identifier (PN-ID) that uniquely identifies your 5G network when using the MFA shared PLMN-ID.

The MFA Private Network Identifier Package is easy, hassle free, and meets all your private network deployment needs.

### MFA Mission

“To make it as easy as possible for enterprises to quickly deploy their own private networks and realize the benefits of greater control over their networks, enhanced on-premise data security, and predictable performance. We are creating this new program to ensure all industry verticals have ready access to a PLMN-ID that will support their digitalization journey.”

Mazen Chmaytelli, President at MFA

# WHAT IS A PLMN-ID

A Public Land Mobile Network (PLMN) provides voice and data services over a large area to mobile users, typically subscribers identified by the SIM card installed in their devices. The PLMN-Identifier (PLMN-ID) is a series of numbers that identifies a specific network. Devices, such as cell phones, iPads, and any other mobile device that connects to your network, use the PLMN-ID to select a network that they are authorized to use.

A PLMN-ID is made up of a Mobile Country Code (MCC) and a Mobile Network Code (MNC). MCCs have three digits and MNCs can have either two or three digits.

PLMN-ID	
MCC	MNC
3 digits	2 to 3 digits

This combination of numbers is how your mobile device knows to connect to your carrier’s network and not to a competitors’ network.

# GETTING A PLMN-ID

Obtaining a PLMN-ID is no small task. Applying for a PLMN-ID is a long, difficult process that can take years. Applicants are typically public network operators who already have their own regional spectrum license—something that is uncommon for the average private network operator. These applicants apply for a country-specific PLMN-ID that is assigned by their local governing authority. Globally usable PLMN-IDs, however, are assigned directly by the ITU to global operators, such as satellite operators, and now to MFA.

Our shared PLMN-ID is intended for use in private MFA networks. Furthermore, it can be used in both locally licensed and unlicensed bands where the private network will operate. The MFA’s shared PLMN-ID is especially easy for you: you don’t need to apply for your own PLMN-ID, you don’t need your own regional spectrum license, and you don’t have to wait. All you have to do is subscribe.

## PLMN-ID for Private Networks

The need for a PLMN-ID for private networks has already been recognized in Germany and the United States. Germany has allocated a specific PLMN-ID for private networks, but this ID works only in Germany. A United States-specific band, CBRS—an LTE “lightly licensed” band—has been allocated but may not be available in some areas. Neither are global identifiers.

For private networks that need their own PLMN-ID, ITU has designated the generic 999 MCC. With only three free digits for the MNC, the number of possible MNCs is limited to 1000. To complicate issues further, assignment of the MNC across different private networks is not coordinated by any organization; therefore, there is the probability that more than one network will use the same PLMN-ID. When networks that use the same PLMN-ID assign the same values to other identifiers that are generated from the PLMN-ID, such as the cell or tracking area identifiers, significant issues and failures occur. When two identifiers that should be unique are the same, it is called an identifier collision.

## Identifier Collisions

A typical identifier collision problem occurs when a user from one private network moves into a neighboring network to which they are not a subscriber but that has the same PLMN-ID.

The user’s device will either not detect that it has moved to a different network or will try to connect to the unfamiliar network and will be rejected. Consequently, the device will store the information from the network that it is not authorized to use, and when the subscriber returns to their home network, their device will have problems connecting and must be reset. This can take a significant amount of time and create disruption in productivity and performance—something no successful business wants to encounter.

# MFA PLMN-ID

The MFA PLMN-ID is a globally valid PLMN-ID, and the identifiers generated using the MFA PLMN-ID are guaranteed to be unique, with no other network using the same identifier values anywhere in the world. We are sharing our PLMN-ID with MFA members, private network subscribers, and non-members. We have eliminated the dangers of identifier collisions by managing identifiers that use the PLMN-ID to ensure uniqueness. The MFA PLMN-ID can be used anywhere in the world without the risk of identifier collisions.

## MFA International Mobile Subscriber Identity

The International Mobile Subscriber Identity (IMSI) is used to identify subscribers to a network and is typically stored on the Universal Subscriber Identity Module (USIM) card. It includes the PLMN-ID to ensure uniqueness in addition to another 10 digits, allowing for up to 10 billion IMSIs per PLMN-ID. To facilitate efficient sharing of the MFA PLMN-ID resource, the MFA identifier package includes a 6-digit IMSI block number and a 4-digit User Identification Number (UIN). These 10 digits allow the issuing of up to 10 billion MFA IMSIs, with each block number allowing for up to 10,000 unique IMSIs. By using IMSI Block Numbers, you don’t have to worry about IMSI collisions, and don’t have to come to us for each IMSI you may need.

MFA IMSI			
MFA PLMN-ID		IMSI Block Number	UIN
MCC	MNC		
3 digits (902)	2 digits (01)	6 digits	4 digits

“With access to the global PLMN-ID from MFA, network suppliers or operators will have the necessary identifiers to create unique and distinguishable private networks, streamlining the deployment process for their enterprise customers – anywhere in the world they are located.”

Asimakis Kokkos, Chair of MFA Technical Specification Group



# Benefits of the MFA Shared PLMN-ID

With access to the MFA shared PLMN-ID, industry verticals can now deploy their own LTE and 5G private network in locally licensed and unlicensed spectrum.

- Globally unique, controlled number and subscriber ID that will not get confused with an ID in a neighboring network
- International number—can be used in any country
- You don't need your own licensed spectrum
- Can be used on all bands—4G, 5G, licensed, and unlicensed—and is not restricted by frequency or technology
- Allocation for private networks for their own users
- Two networks can work next to each other without risk of identifier collision
- Users will not be locked out of their own network
- Enables networks to run more smoothly
- Financial benefit by mitigating problems that affect productivity due to ID collision

## MFA PRIVATE NETWORK ID PACKAGE

We help you simplify your LTE and 5G private network deployment when you use the MFA shared PLMN-ID with the MFA Private Network ID Package, which includes all the identifiers you need to deploy an MFA network. Subscribing is all you need to do because we've done everything else for you. Additionally, you don't have to be an MFA member to subscribe.

Member companies and private network subscribers can receive complementary Private Network ID packages. Non-members can purchase a Private Network ID package for a one-time fee, followed by a renewal fee every two years. This renewal fee ensures that the limited number of identifiers are in use. In addition to the bundled package, you will have the option to purchase add-on identifiers as needed for your deployment.

### LTE Identifiers

For LTE networks using the shared MFA PLMN-ID, the MFA Private Network ID package includes the following identifiers:

- **MFA Private Network Identifier (PN-ID).** This uniquely identifies your network when using the shared MFA PLMN-ID.
- **Mobility Management Entity Group Identifier (MMEGI).** This identifies the Mobility Management Entity (MME) in an LTE network, which handles mobility and traffic routing. Most private network deployments will only need one MMEGI.
- **eNodeB Identifiers (eNB IDs).** These identify a given base station in your network – you need one per base station.
- **Tracking Area Codes (TACs).** These identify areas of your network, allowing the network to know where a device is as it moves around the network.
- **IMSI Block Numbers (IBNs).** Each IBN allows you to issue IMSIs for up to 10,000 devices.

Note: The same IMSIs (allocated within IBN[s]) can be used in both LTE and 5G deployments.

### 5G Identifiers

If your 5G deployment supports Standalone Non-Public Networks (SNPN), which were added in 3GPP Release 16, you only need a PN-ID to use as the SNPN Network Identifier (NID). For Release 15 5G networks, or later releases that don't support SNPNs, you'll need the following set of identifiers:

- **Access and Mobility Management Function (AMF) Region + Set ID.** The AMF provides a function similar to the LTE MME, handling mobility and access control. Most networks will only need one AMF Region + Set ID.
- **gNodeB Identifiers (gNB IDs).** These identify a given base station in your network – as with LTE eNB IDs, you need one per base station.
- **Tracking Area Codes (TACs).** These identify areas of your network, like the LTE TACs.

MFA wants you to know that your information is kept confidential. We will not publish information about who has ordered what identifiers. We only publish summary information with the identifiers owner's permission.

## Package Options, Add-ons, and Fees

Private Network Package	Fee (Every 2 years)	Identifier Usage
<ul style="list-style-type: none"> <li>• 1 MFA PN-ID (can also be used as the SNPN NID)</li> <li>• 1 MMEGI and 1 AMF ID</li> <li>• 10 eNB IDs and 10 gNB IDs</li> <li>• 2 LTE TACs and 4 5G TACs</li> <li>• 1 IBN</li> </ul>	\$400	All you need to deploy a private network with up to 10 eNBs , 10 gNBs, and 10,000 IMSIs/SIMS
<b>Add-on Options</b>	Can purchase after getting initial package	
• MFA PN-ID	\$100	If your deployment needs more network identifiers
• MMEGI	\$200	If your deployment needs more MMEGI
• AMF Region+Set ID	\$200	If your deployment needs more AMF ID
• eNB ID	\$2	If your deployment has a lot of eNBs
• gNB ID	\$2	If your deployment has a lot of gNBs
• 2 LTE TACs	\$10	If your LTE deployment has isolated coverage areas
• 4 5G TACs	\$10	If your 5G deployment has isolated coverage areas
• 1 IBN	\$200	If your deployment needs more than 10,000 IMSIs

### Neutral Host Network

We also offer a Neutral Host Network (NHN) ID as well, for networks deploying an MFA NHN.

## CONCLUSION

MFA understands that getting a PLMN-ID can be difficult—if not impossible—for private LTE and 5G networks. We have solved that problem for you by getting our own shared PLMN-ID and making it available to any industry vertical deploying their own private network.

Purchasing an MFA Private Network ID Package with the MFA shared PLMN-ID will simplify your path to private networks and ensures that you avoid issues that can occur due to identifier collisions. You don't have to worry about a thing. Get your own globally unique identifiers from us, and you're done. We've simplified an otherwise difficult process and offer you these benefits:

- The MFA shared PLMN-ID is for you to use
- The MFA shared PLMN-ID is not related to spectrum and can be used in any band, including unlicensed bands
- The MFA shared PLMN-ID can work on all private networks, including 5G private networks and 4G MulteFire networks
- The MFA shared PLMN-ID can be used in any country around the world, a major win for multinational companies
- Management of identifiers to prevent identifier collisions and ensure reliable operation with minimal hassle
- Your information is kept confidential

#### Who will benefit from the MFA globally unique PLMN-ID

- **Industries**
  - Manufacturing floors
  - Shipping ports
  - Warehouses
  - Utilities
  - Oil & gas
  - Mining
  - Factories
- **Communities**
  - Campuses
  - Venues
  - Retail
- **Phone and Device makers**
- **End users**

Learn more about the program at <https://www.mfa-tech.org/network-identifier-program/>

# GLOSSARY OF TERMS

AMF ID	Access and Mobility Management Function Identifier
eNB ID	eNode-B Identifier
gNB ID	gNode-B Identifiers
IBN	IMSI Block Number
IMSI	International Mobile Subscriber Identity
ITU	International Telecommunication Union
MCC	Mobile Country Code
MMEGI	Mobility Management Entity Group Identifier
MNC	Mobile Network Code
NR	New Radio
PLMN-ID	Public Land Mobile Network Identifier
PN-ID	Private Network Identifier
SIM	Subscriber Identity Module
SNPN	Standalone Non-Public Networks
TAC	Tracking Area Code
UIN	User Identification Numbers
USIM	Universal Subscriber Identity Module



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