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Application Note ARINC825 CAN Usage within MOSES

Company Confidential
Commercial-in-Confidence



iMAR Navigation GmbH
Im Reihersbruch 3
D-66386 St. Ingbert
Germany

www.imar-navigation.de
sales@imar-navigation.de



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Scope

MOSES is a well-known solution by MeasX for efficient vehicle dynamics testing. Users are automotive companies .

<https://www.measx.com/en/products/software/moses.html>


Every iNAT and iTraceRT-MVT inertial measurement system can be operated by MeasX' MOSES system. To allow this, the CAN interface had been expanded by iMAR and the MOSES software has to be enabled accordingly by MeasX.

The following document shows the state diagrams for the three major operational use cases.

1.1 Applicable Documents

Table 2-1: Applicable documents

Ref.	Document Name	Description	Document No.
[1]	ICD_ARINC825_iNAT	ICD	DOC141106133
[2]	ICD_IXCOM_Communication	ICD	DOC141126064
[3]			
[3]			

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2 SETUP SEQUENCE FOR IMS CONFIGURATION VIA ARINC825 (CAN)


Three use cases have been identified to operate the iTraceRT-MVT or iNAT system (inertial measurement system, IMS) within the MOSES tool. They are mainly different regarding the starting condition, i.e. how to perform the initial alignment.

- a) Position obtained by GNSS, heading initialized by „Forced Heading” command
- b) Position obtained by GNSS, initial heading unknown
- c) No GNSS available during alignment, “Forced Heading” and “Forced Position” command

The three use cases are explained in the following chapters. In general, it is expected that GNSS is (or will become) available during the measurement. Also it is expected, that an odometer (like Correvit or wheel sensor) is applied to aid the system with velocity. If such sensor is not available, the usage of the odometer input for the data processing has to be deactivated on the IMS.

Use the dbc file to read the right messages from the CAN. The CAN is of protocol type ARINC825.

To generate the commands given in the state charts (e.g. SFC49161), see document [1] and here the Service Function Codes (SFC) in chapter 6. There you will find a reference to document [2] for more detailed information about the function.

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2.1 Initial Position by GNSS, initial known Heading by Command

The following state diagram shows how to initialize the IMS if the following condition is present:

➔ Position obtained by GNSS, heading initialized by „Forced Heading” command

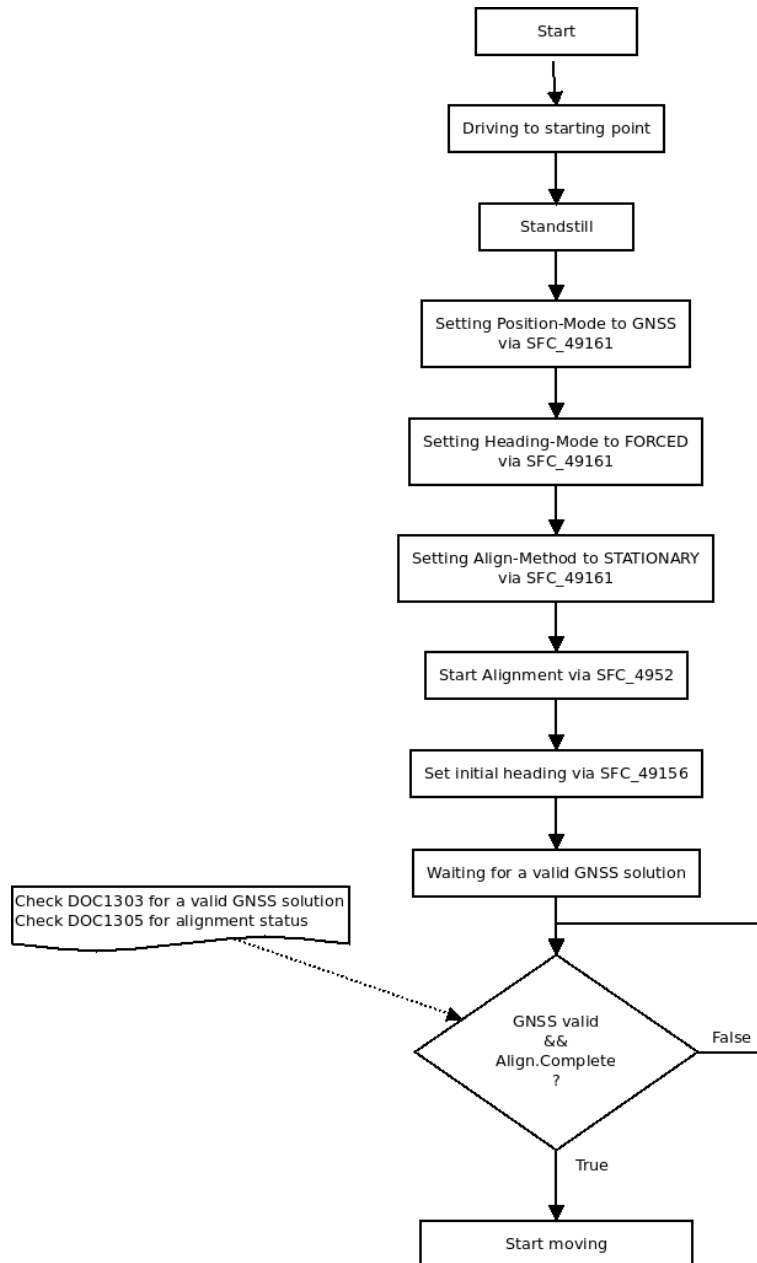



Figure 1: Initial position obtained by GNSS, heading initialized by „Forced Heading” command

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2.2 Initial Position by GNSS, initial Heading unknown

The following state diagram shows how to initialize the IMS if the following condition is present:

- ➔ Position obtained by GNSS, initial heading unknown, i.e. to be derived by executing some maneuvers like S-curves to make heading observable within the data fusion.

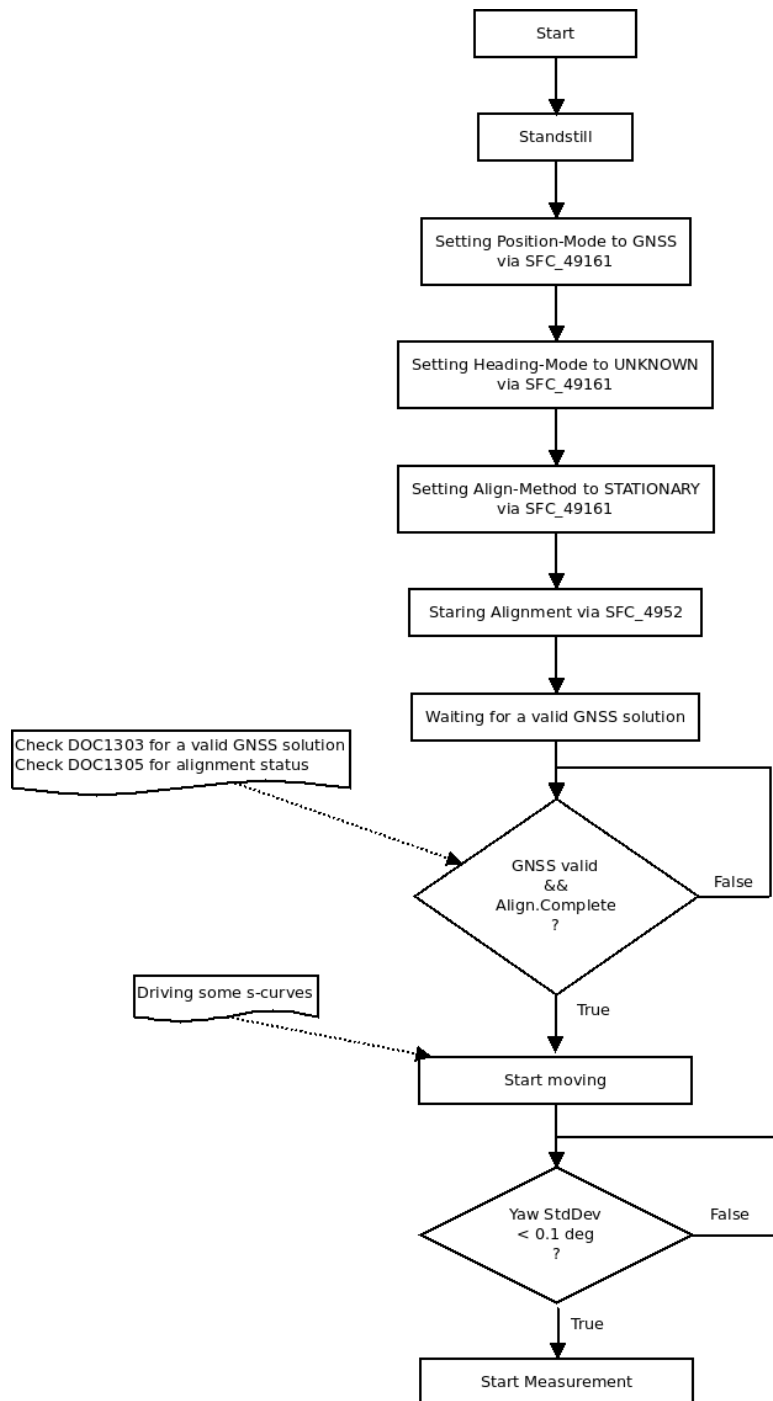



Figure 2: Initial position obtained by GNSS, initial heading unknown

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2.3 No GNSS available during alignment, Position & Heading by Command

The following state diagram shows how to initialize the IMS if the following condition is present:

- ➔ No GNSS available during alignment, “Forced Heading” and “Forced Position” command required.

This use case applies e.g. if the vehicle is aligned within a building without GNSS. Then the vehicles moves outside and adjusts with GNSS as soon as available.

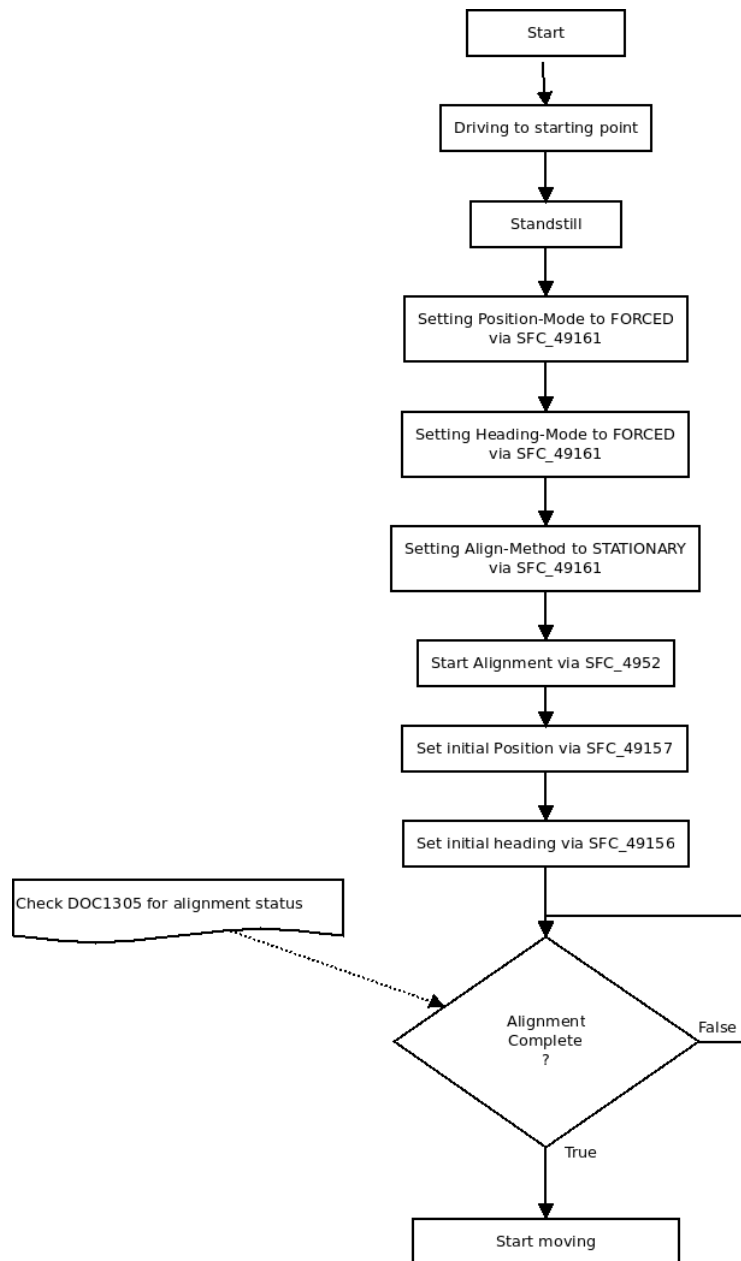




Figure 3: Initial position and initial heading provided by command


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3 CONTACT / SUPPORT

You can find general information about our products, used technologies and about inertial navigation and GNSS based navigation at www.imar-navigation.de.

You can reach iMAR Customer Support as follows:

 support@imar-navigation.de

 +49-6894-9657-0



 **iMAR** Navigation GmbH

Customer Support

Im Reihersbruch 3

D-66386 St. Ingbert

Germany

Type: iNAT-M200-MLI	
Proj.No.: KFP-I000718.001	
P/N 00190-00003-0201	
S/N: 00001 -- A B C D	
Power: 9-34 V DC / 10W	
MFD: 05.2017	
Nato CageCode DN401	

For our support management system, we need to know the project number (Proj.No.) and part number (P/N) and serial number (S/N) as well as revision character of the system you are speaking about.

These numbers are for example provided on the type plate (example shown in the Fig. on the right side).