MICROSAR Network Management Interface

5155133

Authors	G
Status:	

Document Information

History

Author	Date	Version	Remarks
	5339-43-57	4133133	H FD 3334; ; 35=F D D 5141
	5339-45-54	4134133	1
	533: -34-3:	4135133	H FD 3334<438= 1 I 1
	533: -36-3<	4136133	H FD 3334<; <<=G 1
	533: -37-44	4137133	H FD 33353387= 1
	533: -3<-57	5133133	H FD 33355796= D D 6
	533; -35-34	5134133	D
	533; -36-45	5135133	H FD 33358639=F - 1
	533; -37-35	5135134	D
	533; -37-54	5136133	H FD 3335883 4=
	533; -38-35	5136134	F
	533; -38-63	5137133	D
	533; -3; -53	5137134	H FD 3335; <<3=D 2 - D 1
	533; -3; -55	5138133	H FD 3335; 8<; =D F D D 514
	533; -44-5;	5139133	H FD 333649<7=D F >F I G
	533<-36-64	513: 133	H FD 333675: ; =F >D 1
	533<-38-3;	513: 134	H FD 67<99= F H G
	533<-3: -63	513; 133	H FD 33369957=F H H FD 33369978=D F F H H FD 33369985=D H D
	533<-44-63	513<133	H FD 3336<494=D F

	5343-39-56	5143133	H FD 33373<66=D D H F H H FD 33376738=D F D H FD 33376739=D H F H FD 3337676<=D H H
	5343-3: -55	5144133	H FD 33376: 3; =D H
	5343-3; -5:	5145133	H FD 33376: ; 4=D F
	5343-3<-36	5146133	H FD 33376: : 9=D F H FD 33376: : ; =D G H FD 33376: <5=D

G	5345-44-55	514<133	H FD 33395: ; < D I F F H FD 33395<99 I H H FD 33395<9: D 61 H FD 33396564 D I + 51514, H FD 33396579 D 5 9
G	5346-36-38	5153133	H FD 33397549 D F I F E I F F
G	5346-37-48	5154133	H FD 33398: <5 D F + 61414, H FD 33399444 D 61414 H FD 3339997: D F /D 5/6/ : 6/ 7 8/ F D 7/
G	5346-43-34	5155133	H FD 3339<: 43 D F H H FD 333: 3; 47 H 81914

Reference Documents

No.	Source	Title	Version
4	D D	D D	61313
5	D D		41613
6	D D	FD	61713
7	D D	I	61613
8	D D	FD	61713
9	D D	F	51613
:	D D	G H	51515
;	D D	G H	61613
<	D D	E	41513
43		D - F-; -444; F D E F F	41313
44		F D I F E	4134133
45		F D I F F	4134133
46		F D HF	5145134

Caution

1

/

1

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6141518 G H G 4;
6141519 H G H 4;
614151: 4;
614151; 4;
614151< 2 - E 4;
61415143 H ..... 4<
61415144 F ..... 4<
61415145 F H ..... 4<
61415146 F F ..... 4<
61415147 F 514 ..... 4<
61415148 F F H ..... 4<
61415149 G F ..... 4<
6141514: H F ..... 4<
6141514; H H ..... 4<
6141514< H ..... 4<
61415153 F ..... 4<
61416 53
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61; H 5:
61; 14 D 5;
61; 15 F 5;
61; 16 ..... 5<
61; 17 F ..... 5<
61; 18 F ..... 5<
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6143 H 64
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6149 H 6:
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715 73
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816 77
817 F 78
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818 D I 79
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819 I 7;
81914 = ... 7;
81915 = D 83
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81917 - 85
819714 = ... 85
819715 = ... 86
8198 F F 87
819814 G F =G ... 87
819815 H F =H 88
8199 G 89
819914 G = G 89
819915 G = G 8:
819916 G = G 8;
8191 G ..... 8<
8191 14 = E .... 8<
8191 15 = ... 93

8191 16 = ... 94
8191 95
8191 14 F =F 95
8191< H 96
8191<14 = ... 96
8191<15 E = E 97
8191<16 F =F 98
8191<17 I = I 99
8191<18 I = I 9:
8191<19 = ... 9;
8191<1 G = G ... 9<
81 I ..... : 3
81 F I ..... : 6
81 14 = ... : 6
81 15 = ... : 7
81 16 E = E ..... : 7
81 17 E =E ..... : 8
81 18 = ... : 8
81 19 F = F ..... : 9
81 1 = ... : 9
81 1 = ... : :
81 1< F = F ..... : ;
81 143 H = H ..... : <
81 144 F =F - ..... : <
81 145 H ..... ; 3
81 14514 D F = D F E ..... ; 3
81 14515 = ... ; 4
81 14516 F = F ..... ; 5
81 14517 =H .. ; 6
81 14518 H F I ..... ; 6
81< F I ..... ; 8
81<14 F I ..... ; 8
81<15 F F I ..... ; 8
81<16 D F I ..... ; 9
81<1614 F ..... ; 9
81<1615 F G H ..... ; 9
81<1616 F H ..... ; 9

6 Configuration 87

914 F ....; :
915 F G E ....; :
916 F H ....; ;
91614 F F ....; <
91615 F F ....<6
91616 F ....<9
916164 I ....<9
916165 I F ....<9
916166 ....<9
9161614 F ....<:
916167 F ....<:
9167 H F ....<;
9168 H F ....<;
9169 G H F 433
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F 63
6-9 H H 64
6-: F 67
6-; G 6;
6-< GH H F 6;
7-4 I ..... 6<
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8-5 G 77
8-6 D G 78
8-7 F D G 78
8-8 G..... 78
8-9 ..... : 5
8-: H F I ..... ; 7
9-4 G D ..... ; :
9-5 F F ..... <6
9-6 F F ..... <8
9-7 F F ..... <9
9-8 F F ..... <:
9-9 F
F H ..... <;
9-: F G H 433
9-; F H 433
9-< F I F E 2I F F
..... 434
: -4 D 435
: -5 436

1 Component History

1

Component Version	New Features
4133133	F D D 514
4136133	D I
5133133	D D D 6
5134133	D F H + , I
5136133	D F -
513; 133	D D D 514 F
5147133	D G F I
5148133	D H F D H H
5149133	D H I
514: 133	D F I
514; 133	D F I D I
514<133	D I F E D F
5159133	D I F F
515: 133	D F I F E I F F
515<133	D H F

4-4 F

2 Introduction

/ / D
D D 1 D
+ , FD 1
I 1
D
/ 1 1 F F 1
/D I 1
I D D
G

2.1 Naming Conventions

/ FD I
1H1 1 Nm_ 1
F
ComM_Nm_ 1H1 1 ComM_Nm_
/ F
1

Naming conventions	
Nm_	+ ,1
CanNm_	FD F ,1
FrNm_	I I ,1
BusNm_	-
ComM_Nm_	F F F ,1
Det_	G H G ,1
Dem_	G H G ,1

5-4

- D D FD I
1

Bus Type	Additional supported bus-specific NM (Short name)
FD	H + ,
FD	I F E + I E,
FD	I F F + I F,

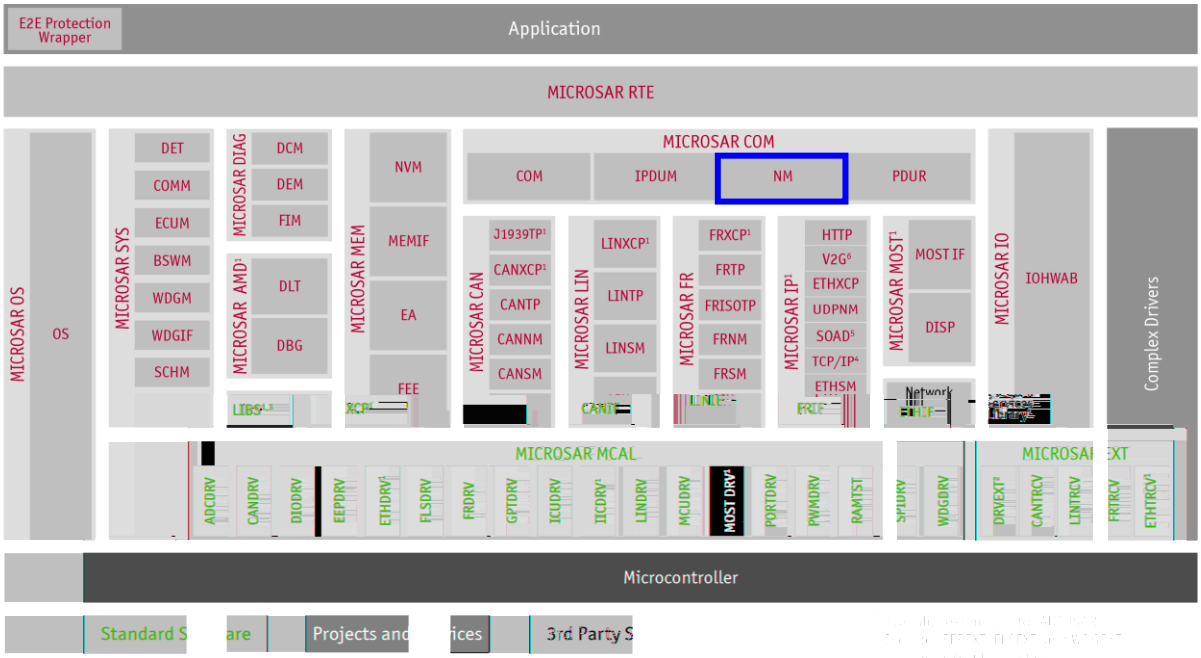
5-5 D

2.2 Architecture Overview

2.2.1 Architecture of AUTOSAR Software

D D

1



I 5-4 D D D

2.2.2 Architecture of AUTOSAR Network Management

D D =

>

> FD 1

> I 4

F F ,

/ 1 1 FD FD

1 F 1

1

-

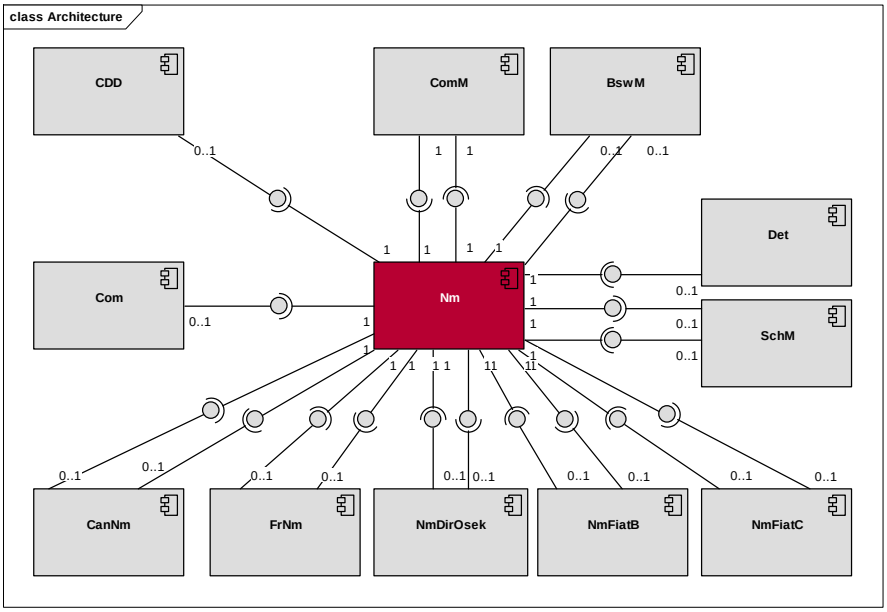
1 -

1

1

8 D G 1

[1] Not covered by this document.



I 5-5 D

D E 1
E H1
/ H 1

3 Functional Description

3.1 Features

1 1
HF /
1

1
D D 5 /

- 6-4 D D
D D 1

- 6-5 I D D

5 =

Supported AUTOSAR Standard Conform Features
F HF - 1
G
G
F I
F
H
G F
F -
G

6-4 D D

3.1.1 Deviations Against AUTOSAR 3.2 R 2

D
4 1 1
=

> I
=

- NM_COM_CONTROL_ENABLED OFF 1

- NM_NODE_DETECTION_ENABLED OFF 1

I / D D
5 1 81814 1

D F D D
5 1 81; 14514 1

F 5
F 1

Nm_ConfigType
; 1518 5 1

3.1.2 Additions/ Extensions

D D =

Features Provided Beyond The AUTOSAR Standard
F 514
H
HF
F
I F E
I F F

6-5 I D D

Info
D -D D
1

+5 ,
1 /
1

3.1.2.1 Filenames of NM Interface

H -
NmIf_Cfg Nm_Cfg
D D FD G H 1
I 714 I 1

3.1.2.2 Link-time Support

/ -
1 - 1
I 9 F 1

3.1.2.3 Link-time Support for Channels

5 - -
1 I -
1 -
1

- - / 1 1
- + -
, - 1

3.1.2.4 Configurable Service Callback Functions

D -

1

I 81<15 F F I 1

3.1.2.5 Development Error Detection

D 5
1

I 614914 G H G 1

3.1.2.6 Error Reporting to Diagnostic Event Manager

D D D G H
1 D D G H
1

NM_PROD_ERROR_DETECT 1

I 91614 F F 1

3.1.2.7 Memory Initialization

- FD
1 /
1
1

I 8191<14 = 1

3.1.2.8 Limp Home Indication

/ 1 1
1
H - 1 !
1

I 9 F 1

3.1.2.9 Synchronous Restart / Wake-up Behavior

H /

I 617516

3.1.2.10 OSEK NM Support

H F 1

3.1.2.11 Selective NM Channel

D D F HF 1
/
1 F
F 1

I 61714 F 1

3.1.2.12 Coordinator Extension

I
1

I 618 F H 1

3.1.2.13 Coordination of Multiple NMs on One Channel

F 1

I 61716 F
F 1

3.1.2.14 ComM 2.1 Support

D D 514 F 1

I 61< F 514 1

3.1.2.15 Communication Control Support for OSEK NM

H 1 61; 14
D H 1

3.1.2.16 NM User Data via Com

F D F 1
I FD I 1

3.1.2.17 OSEK NM State Change Notifications

F H 1
61; 18 F 1

3.1.2.18 OSEK NM Extended Initialization

H 1
61; 19 H 1

3.1.2.19 Gateway Extension

H - / G H
H 1 I 6143
H 1

3.1.2.20 Passive Coordinator

F F H
H 1

I 619 F 1

3.1.3 Limitations

3.1.3.1 Synchronized OSEK Channel

F H
+ 9 F ,1

3.1.3.2 Extended Coordination Algorithm

D
1
I 6187 D 1
F 5 1

D F 1
F E I E
1 / F F E I F E
1
1

3.2 Adaptation Layer

-
F - 1F
FD I 1D D 1
H
H + 61 H ,1D
I F E I F F + 6148 I
F E I F F ,1

3.3 Macro Layer Optimization

D
D D FD / D D I /
F D I F E F D I F F /
+ /
D F ,1D 9 F 1
-

+ 1 1F ,1

3.4 Network Management Coordination

HF

1
1
1

+ 9161 5 F

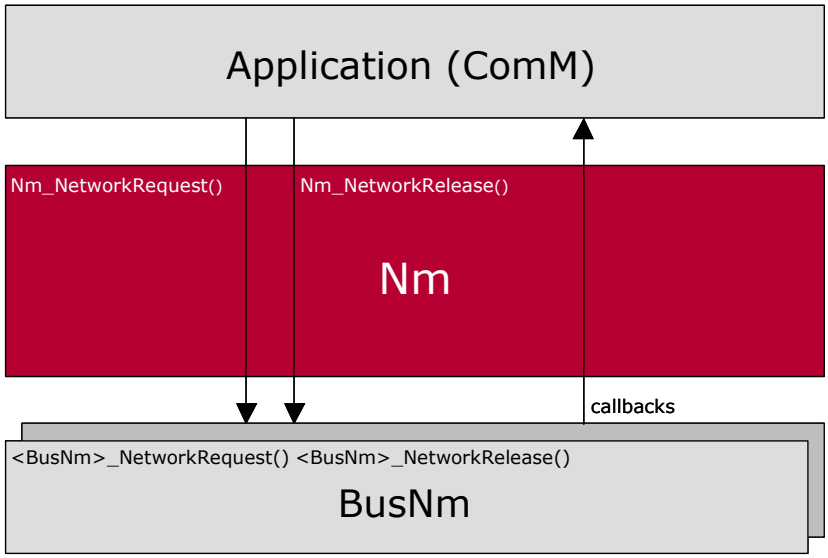
F ,1

3.4.1 Selective Channels

- 1 2

- 1

=



I 6-4 2 F

3.4.2 Synchronous Channels

1F 1

+ 718 I ,1

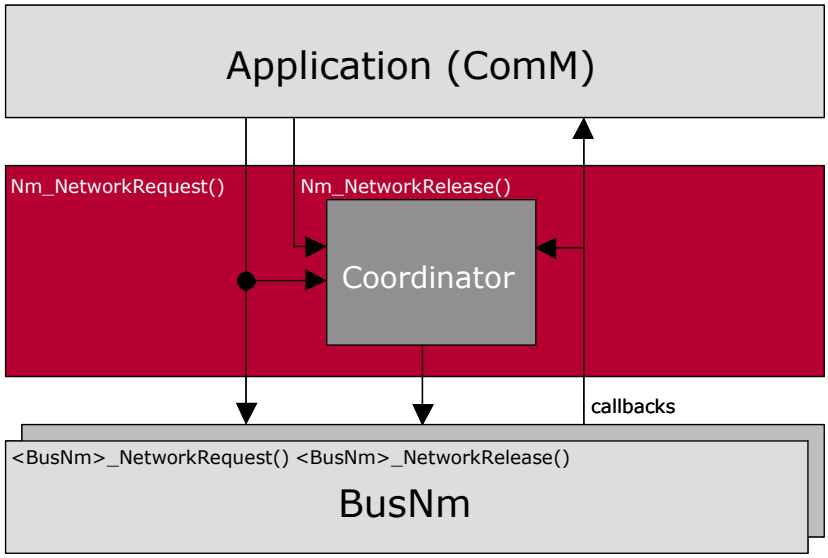
> D

>

>

2

=



I 6-5 2 F

3.4.2.1 Application Request Handler

1 D
1

D
1 1
D
1 1

3.4.2.2 Network Request Handler

-
1 1
/
1

1 1

3.4.2.3 State Machine for Shutdown

1
D
1
/ 1D -
1
1

Caution

1

H /
/ 1 1 1

Caution

H /
1 H 1
H
+ 61 17
F ,1

/ 1

```
void                              (
   const NetworkHandleType nmChannelHandle )
```

81<14,

2 -

1

3.4.3 Coordination of Multiple NMs within one Channel

D D FD H
1E 1

H D D FD / 1 1 D
FD 1 H 1

Info

F / 1 1
1

3.5 Coordinator Extension

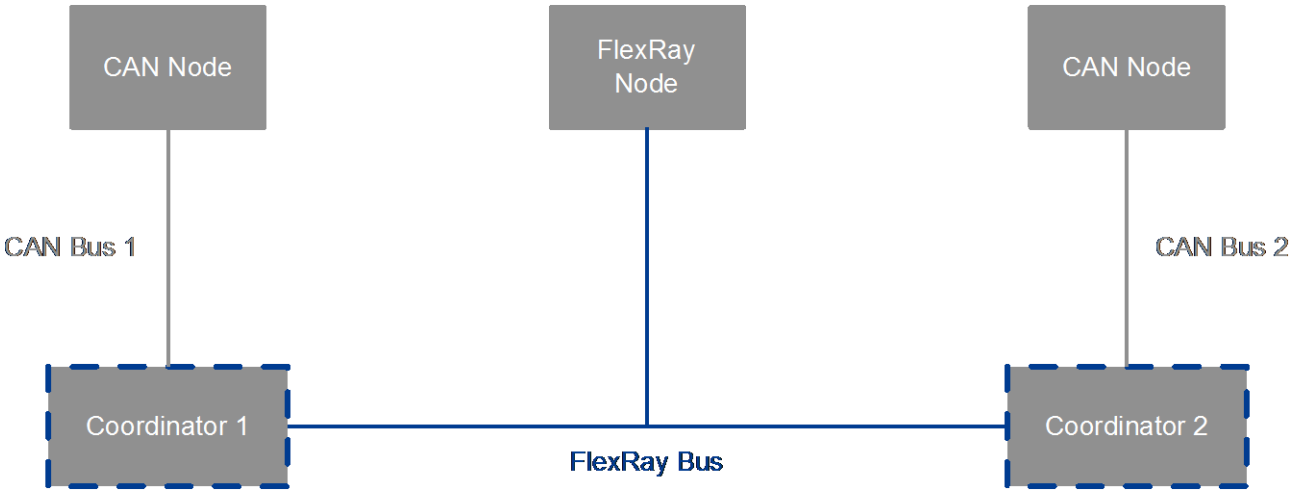
I

1

1D

1

=



I 6-6 F 5 F

3.5.1 Active Coordinator Detection

H F G 1I

G 9 1 6 1 4 F F 1

G

1 D

1

G1

Caution

D F E

6 1

3.5.2 Extended Shutdown Algorithm

F

1

D E 1

+ ,

1

D D

1

1

1D

1

F

+ 91614 F F ,
+ 9167 H F ,1

3.5.3 Coordinator Loss Detection

F

1
1

1 E
- 1

3.5.3.1 Loss Detection Before Shutdown

1
2
1

3.5.3.2 Loss Detection During Shutdown

1 3
1 +1 1
E ,1

1

3.5.4 Algorithm Restrictions

1 F
9167 H F
1

3.5.4.1 Not Covered Scenarios

-D D +1 1 H
,1

D E 1

1

D

/ 1 1 1

1

[2] Note that in case of FlexRay NM the data cycle time is taken as message cycle time due to the Control Bit Vector information is relevant for the loss detection.
[3] Note that in case of FlexRay data message is send in the static part NM message data is still transmitted in Ready Sleep. The loss detection mechanism in this case works also.

3.5.4.2 Synchronous Shutdown Delay

F

1

D E

1

F

H H

H F 1

3.6 Passive Coordinator

F - F H +

618 F H ,1D

/

1

1

1

-D D

+1 1 H , 1

Note

D D

1

D E

1 E

1

1

Caution

D E

1

3.6.1 Algorithm Restrictions

D E

/

1

3.7 Provision of the NM State

```
Nm_ReturnType
  ( const NetworkHandleType nmChannelHandle,
    Nm_StateType* const     nmStatePtr,
    Nm_ModeType* const      nmModePtr )
```

+81914,

F H 1 E

5 1

F

H + 6145 ,1

3.7.1 Determining the NM State Using Nm_GetState

+ 81914, /

- + 1 1F /I ,

nmChannelHandle 1

Nm_StateType 2Nm_ModeType 1 1

3.7.2 Using the ‘State Change Ind Enabled’ feature

F H

1 / F H

H + 91614 F

F ,1I /

F F

F 1

F F

+ , Nm_StateChangeNotification

+ 81 1< ,1

3.8 OSEK NM Support

H H

1 H

1

Note

H

1

3.8.1 API Mapping

I H D D D
H D 1 -
1

+ ,=

	H	
+;	+ HH G,	H
+;	+ HH G,	H
+;	+D ,	H
+;	+E ,	H
+;	+;[4]	H
Nm_CheckRemoteSleepIndication()	NmGetRemoteSleepInd()	H
Nm_DisableCommunication()	SilentNM()	H
Nm_EnableCommunication()	TalkNM()	H

6-6 D H F

3.8.2 Callback Mapping

F H 1
1
+ --- ,=

H	
ApplNmCanNormal ApplNmWaitBusSleepCancel	Nm_NetworkMode
ApplNmWaitBusSleep	Nm_PrepareBusSleepMode
ApplNmCanSleep	Nm_BusSleepMode
ApplNmBusStart	---
ApplNmCanBusSleep	---
ApplNmBusOff	---
ApplNmBusOffEnd	---

6-7 F H F

Caution
H 1

[4] OSEK NM state information is converted to AUTOSAR NM state information.

Caution

H 1
D D Nm_NetworkStartIndication() H
- ApplNmCanNormal()1

3.8.3 Limitations

H
=

> + 616,
> H
H
=
> G H
> H
>
> G H
> H
> F H

3.8.4 NM Coordination

F H
H
1
I H
1 + 91614
F F ,1

3.8.5 State Change Notifications

H 1
=

nmChannelHandle= F

nmPreviousState nmCurrentState= 6-7

nmPreviousState \ nmCurrentState	NM_STATE_BUS_SLEEP	NM_STATE_PREPARE_BUS_SLEEP	NM_STATE_READY_SLEEP	NM_STATE_NORMAL_OPERATION	NM_STATE_BUS_OFF
NM_STATE_BUS_SLEEP			■	■	
NM_STATE_PREPARE_BUS_SLEEP	■		■	■	
NM_STATE_READY_SLEEP		■		■	■
NM_STATE_NORMAL_OPERATION			■		■
NM_STATE_BUS_OFF			■	■	

6-8 H F D = F

E FD E NM_STATE_PREPARE_BUS_SLEEP NM_STATE_BUS_OFF 1

I / NM_STATE_NORMAL_OPERATION NM_STATE_READY_SLEEP1

Caution
FD FF 1

I 91614 F F 1

3.8.6 Extended Initialization

H 1 H 1 H 1

=

Initialization State	Description
FD HH	H E / 1 1
D	H 1

Initialization State	Description
HH G	H 1

6-9 H H

I H
H 1 I
91614 F F 1

Caution

1

3.9 ComM 2.1 Support

D D 514 F
D D 6 1 D
F 5141

F 5141 I
91614 F F 1

Caution

D D 514
1H FD H +
, D D 61

3.10 Gateway Extension

/ G
H H 1
G H
1
H
1

Info

;

1

3.10.1 Diagnostic Gateway Extension

G H

=

```
void                              (
   const NetworkHandleType nmChannelHandle,
   uint8 nmNodeId, uint8 nmReqId )
```

+81<1615,

E

1 7

1

=

```
Nm_ReturnType                ( uint8 nmReqId )
```

+8191<1 ,

1 FD 1

I G H 91614

F F 1

Info

FD

1

3.10.2 NM Gateway Extension

H

=

D

1

H

1

I H 91614 F

F 1

3.10.2.1 Shutdown Criteria

D =

1. D

2. +
,
3.
8
4. / 1 1 /
+
,
1
F 7 I 1
1
1
- I
=

```
void                          (
   const NetworkHandleType nmChannelHandle,
   uint8 nmFilterMask )                                  +8191<17,
```

3.10.2.2 Wakeup Handling

I 1
G 1
=

```
void                          (
   const NetworkHandleType nmChannelHandle,
   uint8 nmFilterMask )                                  +8191<18,
```

1
=

```
void                      (
   const NetworkHandleType nmChannelHandle )             +8191<19,
```

1

3.10.2.3 Coordination of Multiple NMs within One Channel

H D D FD H
1E 1
H D D FD / 1 1 D
FD 1 H 1

Info

1 + 618
F H , 1

3.11 Car Wakeup

F
1 F
FD I 1
FD I 1
I 91614 F F 1

3.12 Set Nm State in User Data

G -
F 1 +
,
1

Previous State	Current State	Signal Value
E [5]		4
E [6]		5
		7
		;
		49
		65

6-: F

1I
91615 F F 1
D D + 1 1FD I
,1

3.13 Multiple ECU Support

H D D HF 1
HF 1

[5] As FlexRay NM does not perform a transition directly from Bus Sleep Mode to Repeat Message State the value is set in the transition from Synchronize Mode to Repeat Message State.
[6] This transition is not available for FlexRay NM.

F
1

Note
D
1
1

3.14 Multiple Configuration Support

F H
D D HF 1
HF H /
1

=

```
void          (
      const Nm_ConfigType * nmConfigPtr )
```

+81814,
+ F ,
1

Note
1 F 1 1F
H 1 46
1

Note
F F
H 1
1

Caution
D -
- 1

3.15 Fiat Class B NM and Fiat Class C NM Support

I F E I F F
H D D HF 1

Note

F D I F E 2
F D I F F D D D + FD
, D D 1 44 2 45
F D I F E 2 F D I F F 1

3.15.1 API Mapping

D I F E 2I F
F FD I 1
I F E 2I F F 1D
/ 81 I
1

3.15.2 Callback Mapping

I F E 2I F F
=

> + 81 14,
> + 81 15,
> E + 81 16,
> E + 81 17,

D
I F E 2I F F + 44 2
45 ,1

3.15.3 Limitations

I F E 2
I F F =

> H + 6143,
> H

3.16 Error Handling

3.16.1 Development Error Detection

G GH Det_ReportError()
: / +1 1 -
NM_DEV_ERROR_DETECT==STD_ON,1

/
/
Det_ReportError()1
G 5<1
G 818/
819/ 81; 1 G =

Service ID	Service
3 33	
3 34	
3 35	
3 36	
3 37	G F
3 38	H F
3 39	G
3 3:	G
3 3;	G
3 3<	
3 3D	
3 3E	
3 3G	F
3 3H	
3 3I	
3 43	I
3 44	
3 45	
3 46	E
3 47	E
3 48	
3 49	F
3 4F	D F
3 4G	F
3 57	
3 58	F
3 5;	

Service ID	Service
3 5<	H
3 63	
3 64	F
3 66	
3 F3	E
3 G3	F
3 G4	I
3 G5	I
3 G6	
3 G7	G

6-; G

GH =

Error Code		Description
0x01	NM_E_NO_INIT	D 1
0x02	NM_E_INVALID_CHANNEL	D 1
0x13	NM_E_NULL_PTR	1
0x20	NM_E_PRIORITY_COLLISION	F
0x21	NM_E_SLEEPBIT_ERROR	E

6-< GH H F

3.16.2 Production Code Error Reporting

E / GH
Dem_ReportErrorStatus() ; /
+1 1 - NM_PROD_ERROR_DETECT==STD_ON,1
/
/
Dem_ReportErrorStatus()1
F 1

4 Integration

4.1 Files

=

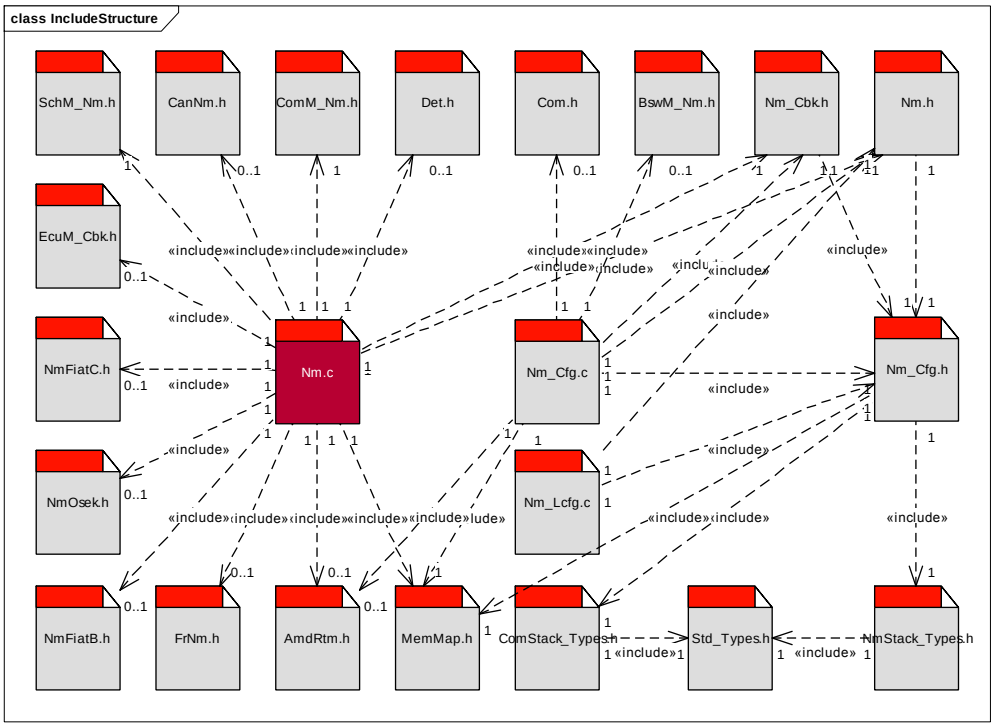
Files of NM Interface			
Nm.c		1	must not
Nm.h	D	1	must not
Nm_Cbk.h	D	1	must not
Nm_Cfg.c	-	F 1	must not
Nm_Cfg.h	F	1	must not
Nm_Lcfg.c	-	F 1	must not
Nm_Lcfg.h	-	F 1	must not
NmStack_Types.h		1	must not

7-4 I

Note

H -D D FD G
Nm_Cfg.h Nm_Cfg.c NmIf_Cfg.h NmIf_Cfg.c
H 1

4.2 Include Structure



I 7-4

Note

H /
H 1
I F E 2 I F F /
I F E 2I F F
1

4.3 Version Changes

F
1

4.4 Initialization

E 1
1 -
F 1
D 81814 = 1

Caution

-
F H 1
D -
- 1
614151 1

Note

D D HF /
HF 1 HF
1
F
1D
1
F
1
6147 F
1

4.5 Main Function

F
H 1 1
G 43 1

Note

E / E
1 E H
1
: E 1

4.6 Critical Sections

D D E + , E /
1

F E 1

=

```
void ( uint8 ExclusiveArea ) ;
```

=

```
void ( uint8 ExclusiveArea ) ;
```

+ ,
E 1
H E 1
1G
71914 F
F 1

I E : 1

Note

1

4.6.1 Critical Section Codes

E + 719 F
,
/ =

Critical Section Define	Interrupt Lock
NM_EXCLUSIVE_AREA_0	1 1
NM_EXCLUSIVE_AREA_1	- 1 + 1 1 - , 1

7-5 F F

Note

1

5 API Description

5.1 API Categories

D D - D 1

- D

+ 616 ,1

5.2 Data Types

D D

Std_Types.h

Platform_Types.h1

/ NmStack_Types.h11

=

Name	Type	Description
Nm_ReturnType	;	1
Nm_StateType		1
Nm_ModeType		1

8-4

I =

Name	Type	Description
Nm_ConfigType[7]		1
Nm_ChannelConfigType		1
Nm_BusNmType		H - 1
Nm_SyncNmType[8]		H

8-5 G

1

5.3 Global Variables

1

[7] These types are used for configuration purposes only.
[8] Only available if the NM Coordinator is enabled.

5.4 Global Constants

5.4.1 AUTOSAR Specification Version

D D
EF G =

Name	Type	Description
NM_AR_MAJOR_VERSION	EF G	F 1
NM_AR_MINOR_VERSION	EF G	F 1
NM_AR_PATCH_VERSION	EF G	F 1

8-6 D G

5.4.2 Component Versions

EF G =

Name	Type	Description
NM_SW_MAJOR_VERSION	EF G	F 1
NM_SW_MINOR_VERSION	EF G	F 1
NM_SW_PATCH_VERSION	EF G	F 1

8-7 F D G

5.4.3 Vendor and Module ID

=

Name	Type	Description
NM_VENDOR_ID	-	G 1
NM_MODULE_ID	-	G 1

8-8 G

5.5 Administrative Functions Provided by NM Interface

5.5.1 Nm_Init: Initialization of NM Interface

Nm_Init

Prototype	
`void ( const Nm_ConfigType * nmConfigPtr )`	
Parameter	
`nmConfigPtr`	F
Return code	
-	-
Service ID	
G	3 33
Functional Description	
1 H / 1	
Particularities and Limitations	
■ Nm_Init() 1 ■ F = ■ - ■ H 1 ■ H F 1 F 1 1 HF 1 46 E 1 D D HF 1 ■ D D 5 1 D D = `void (Nm_ConfigType* const nmConfigPtr)`	

5.5.2 Nm_MainFunction: Main Function of the NM Interface

Nm_MainFunction

Prototype	
void (void)	
Parameter	
nmConfigPtr	F
Return code	
-	-
Service ID	
G	3 43
Functional Description	
1 F 1	
Particularities and Limitations	
■ 1 ■ F = 1 ■ - 1 ■ E FF 1 ■ NM_COORDINATOR_SUPPORT_ENABLED STD_ON1	

5.6 Service Functions Provided by NM Interface

5.6.1 Nm_GetState: Get the State of the Network Management

Nm_GetState

Prototype	
Nm_ReturnType	(const NetworkHandleType nmChannelHandle, Nm_StateType* const nmStatePtr, Nm_ModeType* const nmModePtr)
Parameter	
nmChannelHandle nmStatePtr nmModePtr	
Return code	
NM_E_OK NM_E_NOT_OK	
Service ID	
G	3 3H

Functional Description

- 1

=

> NM_STATE_BUS_SLEEP +E ,
> NM_STATE_PREPARE_BUS_SLEEP + E ,[9]
> NM_STATE_READY_SLEEP + ,
> NM_STATE_NORMAL_OPERATION + ,
> NM_STATE_REPEAT_MESSAGE + ,[10]
> NM_STATE_SYNCHRONIZE + ,[11]
> NM_STATE_WAIT_CHECK_ACTIVATION + F D ,[12]
> NM_STATE_WAIT_NETWORK_STARTUP + ,[45]
> NM_STATE_BUS_OFF +E ,[13]

=

> NM_MODE_BUS_SLEEP +E ,
> NM_MODE_PREPARE_BUS_SLEEP + E ,
> NM_MODE_NETWORK + ,

I E + 1 1 6 / 7 / 44 / 45 ,1

D H /

> NM_STATE_BUS_SLEEP / E +NM_ACTION_BUS_SLEEP,/
> NM_STATE_PREPARE_BUS_SLEEP / +NM_ACTION_GO_BUSSLEEP,/
> NM_STATE_READY_SLEEP / E / GotoMode(BusSleep) E F /
> NM_STATE_NORMAL_OPERATION / E / GotoMode(Awake) E F /1
> NM_STATE_BUS_OFF / E / E

F 1

Particularities and Limitations

- F =
-

[9] Not used by FrNm
[10] Only used by CanNm and FrNm
[11] Only used by FrNm
[12] Only used by NmFiatB and NmFiatC
[13] Only used by OSEK NM

5.6.2 Nm_GetVersionInfo: Version Information API

Nm_GetVersionInfo

Prototype	
void (Std_VersionInfoType* NmVerInfoPtr)	
Parameter	
NmVerInfoPtr	
Return code	
–	-
Service ID	
G	3 3I
Functional Description	
1 / +E 3373: ,1	
Particularities and Limitations	
■ F =	
■ -	
■ NM_VERSION_INFO_API is STD_ON	

5.6.3 Nm_PassiveStartUp: Wake-up Network Management

Nm_PassiveStartUp

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	
`NM_E_NOT_EXECUTED`	

Service ID	
G	3 34

Functional Description
1 - 1

Particularities and Limitations
■ F = ■ - ■ - F 1

5.6.4 Wake-up Registration

5.6.4.1 Nm_NetworkRequest: Request the Network

Nm_NetworkRequest

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	

Service ID	
G	3 35

Functional Description
HF - 1

Particularities and Limitations
■ F = ■ - ■ F 1 ■ +NM_PASSIVE_MODE_ENABLED STD_ON,

5.6.4.2 Nm_NetworkRelease: Release the Network

Nm_NetworkRelease

Prototype	
Nm_ReturnType (const NetworkHandleType nmChannelHandle)	
Parameter	
nmChannelHandle	
Return code	
NM_E_OK NM_E_NOT_OK NM_E_NOT_EXECUTED	
Service ID	
G	3 36
Functional Description	
HF - 1	
Particularities and Limitations	
■ F = ■ - ■ F 1 ■ +NM_PASSIVE_MODE_ENABLED STD_ON,	

5.6.5 Communication Control Service

5.6.5.1 Nm_DisableCommunication: Disable NM Message Transmission

Nm_DisableCommunication

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	G
`NM_E_NOT_EXECUTED`	G

Service ID	
G	3 37

Functional Description
G - 1 I I H H HF HG1

Particularities and Limitations
■ F = ■ - ■ NM_COM_CONTROL_ENABLED STD_ON

5.6.5.2 Nm_EnableCommunication: Enable NM Message Transmission

Nm_EnableCommunication

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	H
`NM_E_NOT_EXECUTED`	H

Service ID	
G	3 38

Functional Description
H - 1 I H 1

Particularities and Limitations
■ F = ■ - ■ NM_COM_CONTROL_ENABLED STD_ON

5.6.6 User Data Handling

5.6.6.1 Nm_SetUserData: Set User Data

Nm_SetUserData

Prototype

```
Nm_ReturnType                  (
          const NetworkHandleType nmChannelHandle,
          const uint8 * const nmUserDataPtr )
```

Parameter

nmChannelHandle	
nmUserDataPtr	

Return code

NM_E_OK	
NM_E_NOT_OK	

Service ID

G	3 39

Functional Description

G

- 1

Particularities and Limitations

- F =
- -
- NM_USER_DATA_ENABLED is STD_ON
- +NM_PASSIVE_MODE_ENABLED STD_ON,

NM_COM_USER_DATA_ENABLED STD_ON

5.6.6.2 Nm_GetUserData: Get User Data

Nm_GetUserData

Prototype
Nm_ReturnType (const NetworkHandleType nmChannelHandle, uint8* const nmUserDataPtr)

Parameter	
nmChannelHandle	
nmUserDataPtr	

Return code	
NM_E_OK	
NM_E_NOT_OK	

Service ID	
G	3 3:

Functional Description

G

- 1

Particularities and Limitations

- F =
- -
- NM_USER_DATA_ENABLED STD_ON

5.6.6.3 Nm_GetPduData: Get NM Pdu Data

Nm_GetPduData

Prototype	
Nm_ReturnType (const NetworkHandleType nmChannelHandle, uint8* const nmPduData)	
Parameter	
nmChannelHandle	
nmPduData	G
Return code	
NM_E_OK	
NM_E_NOT_OK	G
Service ID	
G	3 3;
Functional Description	
G - 1	G
Particularities and Limitations	
■ F = ■ - ■ NM_NODE_ID_ENABLED STD_ON NM_USER_DATA_ENABLED STD_ON	

5.6.7 Node Detection

5.6.7.1 Nm_RepeatMessageRequest: Set Repeat Message Request Bit

Nm_RepeatMessageRequest

Prototype
Nm_ReturnType (const NetworkHandleType nmChannelHandle)

Parameter	
nmChannelHandle	

Return code	
NM_E_OK NM_E_NOT_OK NM_E_NOT_EXECUTED	

Service ID	
G	3 3<

Functional Description
E - 1

Particularities and Limitations
■ F = ■ - ■ NM_NODE_DETECTION_ENABLED STD_ON NM_PASSIVE_MODE_ENABLED STD_OFF1

5.6.7.2 Nm_GetNodeIdentifier: Get Source Node Identifier

Nm_GetNodeIdentifier

Prototype
Nm_ReturnType (const NetworkHandleType nmChannelHandle, uint8* const nmNodeIdPtr)

Parameter	
nmChannelHandle	
nmNodeIdPtr	

Return code	
NM_E_OK	
NM_E_NOT_OK	

Service ID	
G	3 3D

Functional Description
- 1

Particularities and Limitations
■ F =
■ -
■ NM_NODE_ID_ENABLED STD_ON

5.6.7.3 Nm_GetLocalNodeIdentifier: Get Local Source Node Identifier

Nm_GetLocalNodeIdentifier

Prototype
Nm_ReturnType (const NetworkHandleType nmChannelHandle, uint8* const nmNodeIdPtr)

Parameter	
nmChannelHandle	
nmNodeIdPtr	

Return code	
NM_E_OK	
NM_E_NOT_OK	

Service ID	
G	3 3E

Functional Description
- 1

Particularities and Limitations
■ F =
■ -
■ NM_NODE_ID_ENABLED STD_ON

5.6.8 Remote Sleep Indication

5.6.8.1 Nm_CheckRemoteSleepIndication: Check for Remote Sleep Indication

Nm_CheckRemoteSleepIndication

Prototype
Nm_ReturnType (const NetworkHandleType nmChannelHandle, boolean* const nmRemoteSleepIndPtr)

Parameter	
nmChannelHandle	
nmRemoteSleepIndPtr	

Return code	
NM_E_OK	
NM_E_NOT_OK	F

Service ID	
G	3 3G

Functional Description
F F - 1

Particularities and Limitations
■ F =   ■ -   ■ NM_REMOTE_SLEEP_INDICATION_ENABLED STD_ON NM_PASSIVE_MODE_ENABLED STD_OFF1

5.6.9 Vector Extensions

5.6.9.1 Nm_InitMemory: Memory Initialization

Nm_InitMemory

Prototype	
void (void)	
Parameter	
-	-
Return code	
-	-
Service ID	
G	-
Functional Description	
D - / - + 1 1 , 1	
Particularities and Limitations	
> Nm_InitMemory() 1	
> F = 1	
> - 1	
> NM_COORDINATOR_SUPPORT_ENABLED STD_ON1	

5.6.9.2 Nm_RequestBusSynchronization: Request Bus Synchronization[14]

Nm_RequestBusSynchr

5.6.9.3 Nm_CheckLimpHomeIndication: Check the Limp Home Status

Nm_CheckLimpHomeIndication

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle, boolean* const nmLimpHomeIndPtr )`

Parameter	
`nmChannelHandle`	
`nmLimpHomeIndPtr`	

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	F

Service ID	
G	3 G3

Functional Description
F - 1 FD H 1I FD H + , / 1

Particularities and Limitations
■ F =
■ -
■ NM_LIMP_HOME_INDICATION defined

5.6.9.4 Nm_SetGwRemoteSleepFilter: Set Remote Sleep Filter

Nm_SetGwRemoteSleepFilter

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle, uint8 nmFilterMask )`

Parameter	
`nmChannelHandle`	
`nmFilterMask`	I 1 1 1

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	I

Service ID	
G	3 G4

Functional Description
D 1 1

Particularities and Limitations
■ F =
■ -
■ H

5.6.9.5 Nm_SetGwRemoteWakeupFilter: Set Remote Wakeup Filter

Nm_SetGwRemoteWakeupFilter

Prototype
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle, uint8 nmFilterMask )`

Parameter	
`nmChannelHandle`	
`nmFilterMask`	I 1 1 + -, 1

Return code	
`NM_E_OK`	
`NM_E_NOT_OK`	I

Service ID	
G	3 G5

Functional Description
D 1 1

Particularities and Limitations
■ F =
■ -
■ H

5.6.9.6 Nm_WakeupNotification: Wakeup Notification

Nm_WakeupNotification

Prototype	
`Nm_ReturnType ( const NetworkHandleType nmChannelHandle )`	
Parameter	
`nmChannelHandle`	
Return code	

`NM_E_OK`
`NM_E_NOT_OK`
`NM_E_NOT_EXECUTED`
	1

Service ID	
G	3 G6
Functional Description	
D	1
Particularities and Limitations	
■ F = ■ - ■ H	

5.6.9.7 Nm_SetDiagGwReqId: Set Requested Diagnostic Node Identifier

Nm_SetDiagGwReqId

Prototype	
Nm_ReturnType (uint8 nmReqId)	
Parameter	
nmReqId	G
Return code	
NM_E_OK NM_E_NOT_OK	
Service ID	
G	3 G7
Functional Description	
D FD 1	
Particularities and Limitations	
■ F = ■ - ■ G H	

5.7 Service Functions Used by NM Interface

/

1I

1

Component	API
GH	G H
	H H
F	F F F F F G F G F G F F F F F F G F F H F F E
I	I I I I I G I G I G I I I I F I G F I H F I E

Component	API
	F E E E
I E	I E I E I E I E I E G I E G I E I E I E I E G I E F I E H F I E G F
I F	I F I F I F I F I F G I F G I F I F I F I F G I F F I F H F I F G F

Component	API
F +F F ,	F F F E F E F F F F F G

8-9

5.8 Callback Functions Provided by NM Interface

FD /I /I F E I F F1

5.8.1 Nm_NetworkStartIndication: Network Start Indication

Nm_NetworkStartIndication

Prototype	
void (const NetworkHandleType nmChannelHandle)	
Parameter	
nmChannelHandle	
Return code	
–	-
Service ID	
G	3 53
Functional Description	
- E - 1	
Particularities and Limitations	
■ F =	
■ -	
■ FD /I /I F E I F F	

5.8.2 Nm_NetworkMode: Network Mode Indication

Nm_NetworkMode

Prototype	
void (const NetworkHandleType nmChannelHandle)	
Parameter	
nmChannelHandle	
Return code	
–	-
Service ID	
G	3 54
Functional Description	
1	
Particularities and Limitations	
■ F =	
■ -	
■ FD /I /I F E I F F	

5.8.3 Nm_PrepareBusSleepMode: Prepare Bus Sleep Mode Indication

Nm_PrepareBusSleepMode

Prototype	
void (const NetworkHandleType nmChannelHandle)	
Parameter	
nmChannelHandle	
Return code	
–	-
Service ID	
G	3 55
Functional Description	
E 1	
Particularities and Limitations	
■ F =	
■ -	
■ FD /I F E I F F	

5.8.4 Nm_BusSleepMode: Bus Sleep Mode Indication

Nm_BusSleepMode

Prototype
void (const NetworkHandleType nmChannelHandle)

Parameter	
nmChannelHandle	

Return code	
–	-

Service ID	
G	3 56

Functional Description
E 1

Particularities and Limitations
■ F =
■ -
■ FD /I /I F E I F F

5.8.5 Nm_RemoteSleepIndication: Remote Sleep Indication

Nm_RemoteSleepIndication

Prototype
void (const NetworkHandleType nmChannelHandle)

Parameter	
nmChannelHandle	

Return code	
–	-

Service ID	
G	3 57

Functional Description
1

Particularities and Limitations
■ F =
■ -
■ FD /I /I F E I F F
■ NM_REMOTE_SLEEP_IND_ENABLED STD_ON

5.8.6 Nm_RemoteSleepCancellation: NM Remote Sleep Cancellation

Nm_RemoteSleepCancellation

Prototype
void (const NetworkHandleType nmChannelHandle)

Parameter	
nmChannelHandle	

Return code	
–	-

Service ID	
G	3 58

Functional Description
1

Particularities and Limitations
■ F =
■ -
■ FD /I /I F E I F F
■ NM_REMOTE_SLEEP_IND_ENABLED STD_ON

5.8.7 Nm_PduRxIndication: NM Message Reception Indication

Nm_PduRxIndication

Prototype
void (const NetworkHandleType nmChannelHandle)

Parameter	
nmChannelHandle	

Return code	
–	-

Service ID	
G	3 59

Functional Description
1

Particularities and Limitations
■ F =
■ -
■ FD I
■ NM_PDU_RX_INDICATION_ENABLED STD_ON

5.8.8 Nm_RepeatMessageIndication: Repeat Message Request Indication

Nm_RepeatMessageIndication

Prototype
`void ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
–	-

Service ID	
G	3 5;

Functional Description
E 1

Particularities and Limitations
■ F =
■ -
■ FD I
■ NM_NODE_DETECTION_ENABLED STD_ON

5.8.9 Nm_StateChangeNotification: State Change Notification

Nm_StateChangeNotification

Prototype
void (const NetworkHandleType nmChannelHandle, const Nm_StateType nmPreviousState, const Nm_StateType nmCurrentState)

Parameter	
nmChannelHandle	
nmPreviousState	
nmCurrentState	F

Return code	
–	-

Service ID	
G	3 5:

Functional Description
1

Particularities and Limitations
■ F =
■ -
■ FD /I /I F E I F F
■ NM_STATE_CHANGE_IND_ENABLED STD_ON

5.8.10 Nm_TxTimeoutException: Transmission Timeout Exception

Nm_TxTimeoutException

Prototype
void (const NetworkHandleType nmChannelHandle)
Parameter
nmChannelHandle
Return code
– -
Service ID
G 3 5<
Functional Description
1
Particularities and Limitations
■ F =
■ -
■ FD I
■ NM_PASSIVE_MODE_ENABLED STD_ON

5.8.11 Nm_CarWakeUpIndication: Car Wake-up Indication

Nm_CarWakeUpIndication

Prototype
void (const NetworkHandleType nmChannelHandle)
Parameter
nmChannelHandle
Return code
– -
Service ID
G 3 5D
Functional Description
- 1
Particularities and Limitations
■ F =
■ -
■ FD I
■ NM_CAR_WAKE_UP_RX_ENABLED STD_ON

5.8.12 Vector Extensions

5.8.12.1 Nm_ActiveCoordIndication: Indication of an Active Coordinator Bit

Nm_ActiveCoordIndication

Prototype
`void ( const NetworkHandleType nmChannelHandle, const uint8 nmCoordPrio const uint8 nmSleepInd )`

Parameter	
`nmChannelHandle`	
`nmCoordPrio`	F
`nmSleepInd`	E

Return code	
–	-

Service ID	
G	3 65

Functional Description
1 1

Particularities and Limitations
■ F =
■ -
■ FD I
■ F H `NM_ENABLE_COORD_SYNC_SUPPORT`

5.8.12.2 Nm_LimpHomeIndication: Limp Home Indication

Nm_LimpHomeIndication

Prototype
`void ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
–	-

Service ID	
G	3 63

Functional Description
1

Particularities and Limitations
■ F =
■ -
■ FD
■ `NM_LIMP_HOME_INDICATION`

5.8.12.3 Nm_LimpHomeCancelation: NM Remote Sleep Cancellation

Nm_LimpHomeCancelation

Prototype
`void ( const NetworkHandleType nmChannelHandle )`

Parameter	
`nmChannelHandle`	

Return code	
–	-

Service ID	
G	3 64

Functional Description
`Nm_LimpHomeIndication` 1

Particularities and Limitations
■ F = ■ - ■ FD ■ `NM_LIMP_HOME_INDICATION`

5.8.12.4 Nm_GwPduRxIndication: Extended Gateway Message Indication

Nm_GwPduRxIndication

Prototype
void (const NetworkHandleType nmChannelHandle, uint8 nmNodeId, uint8 nmReqId, uint8 nmReqCh)

Parameter	
nmChannelHandle	
nmNodeId	G
nmReqId	G G + 7,
nmReqCh	G + 8,

Return code	
–	-

Service ID	
G	3 66

Functional Description
1 1

Particularities and Limitations
■ F =
■ -
■ FD
■ H

5.8.12.5 OSEK NM Callback Functions

H

1 I

H 1

OSEK NM Callback Function	Description
D F	H * *
D E	H E
D E	H * E *
D E F	H * E *
D F E	H *E *
D F	H *E *
D E	H E
D E H	H E

OSEK NM Callback Function	Description
D	H

8-: H F I

5.9 Callback Functions Used by NM Interface

81 F I
1

5.9.1 Service Callback Functions of NM Interface

F 1
F
=

```
void                                ( const NetworkHandleType
nmChannelHandle )
void                        ( const NetworkHandleType nmChannelHandle
)
void                               ( const NetworkHandleType
nmChannelHandle )
void                         ( const NetworkHandleType
nmChannelHandle )
void                             ( const NetworkHandleType
nmChannelHandle )[15]
```

1

5.9.2 Configurable Service Callback Functions

I
\+ 91614 F
F ,=

```
void                                  ( const NetworkHandleType
nmChannelHandle )
void                                ( const NetworkHandleType
nmChannelHandle )
void                                  ( const NetworkHandleType
nmChannelHandle )
void                           ( const NetworkHandleType
nmChannelHandle )
void                                  (const NetworkHandleType nmChannelHandle
  const Nm_StateType nmPreviousState,
  const Nm_StateType nmCurrentState )
void                           ( const NetworkHandleType
nmChannelHandle )
```

1

Ul_Nm_PduRxIndication/
1

[15] This callback function will only be called if the Coordination Feature is enabled.

5.9.3 Additional Service Callback Functions of NM Interface

1 1

5.9.3.1 Callbacks for Limp Home Indication

2

=

```
void                          ( const NetworkHandleType
nmChannelHandle )
void                           ( const NetworkHandleType
nmChannelHandle )
```

1

5.9.3.2 Callback for Diagnostic Gateway Extension

=

```
void                             ( const NetworkHandleType
nmChannelHandle,
  uint8 nmNodeId, uint8 nmReqId )
```

/ 1 1

1

5.9.3.3 Generator Compatibility Error

HF F

F F F =

```
   void                              (
      uint16 ModuleId,
      uint8 InstanceId )
```

/ 1 1 /

F F F F 1

43 1

6 Configuration

D D -
- 1 -
1 -
/ 1 1 1
H -
- 1
2 2 =

> F G / 915
> F H 916

6.1 Configuration Variants

> VARIANT-PRE-COMPILE
> VARIANT-LINK-TIME

1I 1 1

6.2 Configuration in Data Base

GEF
1

Attribute	Object	Type	Values	Default	Description
NmType			D / H A- H		1I H - H - 1
NmAsrNode[16]		H	/		D D + , + ,1

9-4 G D

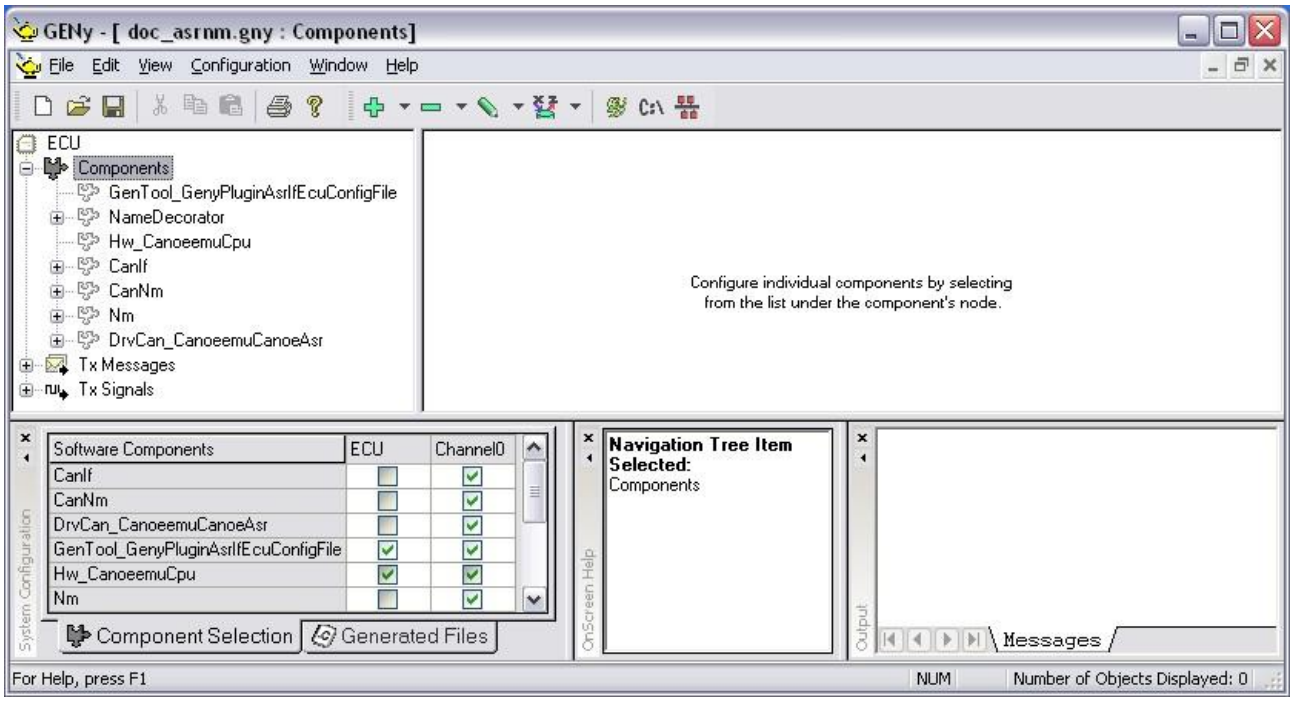
[16] Database attribute is required if GENy is used for the configuration.

6.3 Configuration with GENy

D D
H 1

915 F
G E 1 1

1



I 9-4 F H

D D /
1

1 -
1

HF
1

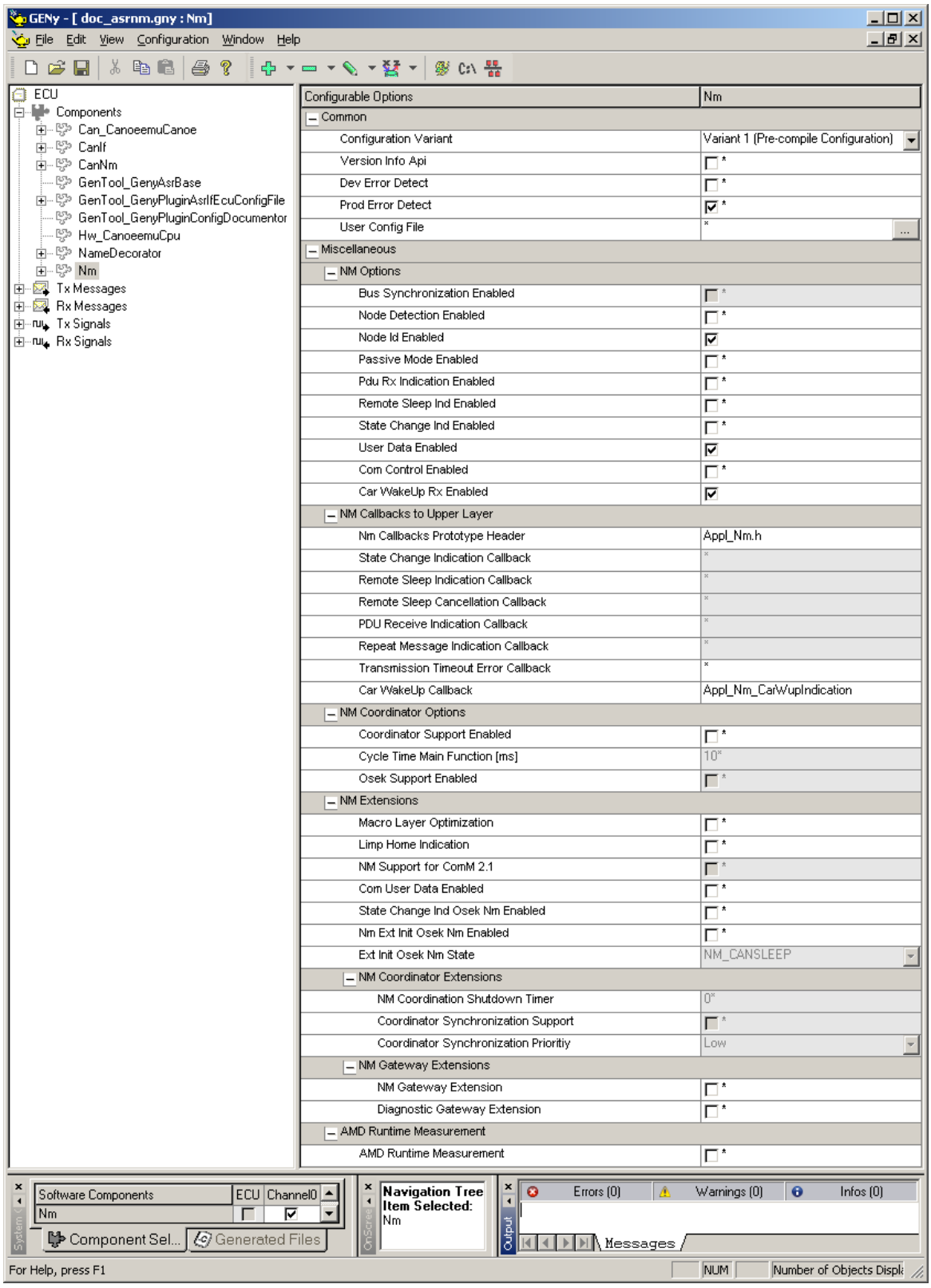
G -
1

D H + 61 H ,
H 1

- / -
1

6.3.1 Component Configuration

=



I 9-5 F F

Configuration options	Value	Description
F		
F	> 4 > 5	D D F + 4= - > 5= - ,1
D [17]	> H > G	D 2G 1
G H G [4]	> H > G	D 2G 1 1 1
H G [4]	> H > G	D 2G
F I		H 1 1 1
E H [4]	> H > G	D 2G + ,1 F 1
G H [4]	> H > G	D 2G 1 1
H [4]	> H > G	D 2G 1
H [4]	> H > G	D 2G 1
G H [4]	> H > G	D 2G G 1
H [4]	> H > G	D 2G + ,1 1
F H [4]	> H > G	D 2G 1

[17] Pre-compile parameter which is read-only in post-compile configurations.

G H 4:	> H > G	D 2G 1
F F H 4:	> H > G	D 2G 1 1
F H 4:	> H > G	D 2G F 1 I 6144 F 1
F		
F		H +1 1 ,1 D + 81 ,1 1
F F		H 1 1
F		H 1 1
F F		H 1 1
G F		H 1 1
F		H 1 1
H F		H 1 1
F F		H

		1 1
F		
F H 4:	> H > G	D 2G F 1
F	31198868	1 F 1 91616 F 1
F I	411	1 431 91616 F 1
H H 4:		D 2G H 1 H 1
H 4:	311588	H F 1 H 1 1
H		
4:	> H > G	1 616 1
18	> H > G	D 2G 1 1
F 514	> H > G	D 2G D D 6 D D 514 F 1
G F	> H > G	D 2G G F 1 1
F H	> H > G	D 2G H 1
H	> H	D 2G H

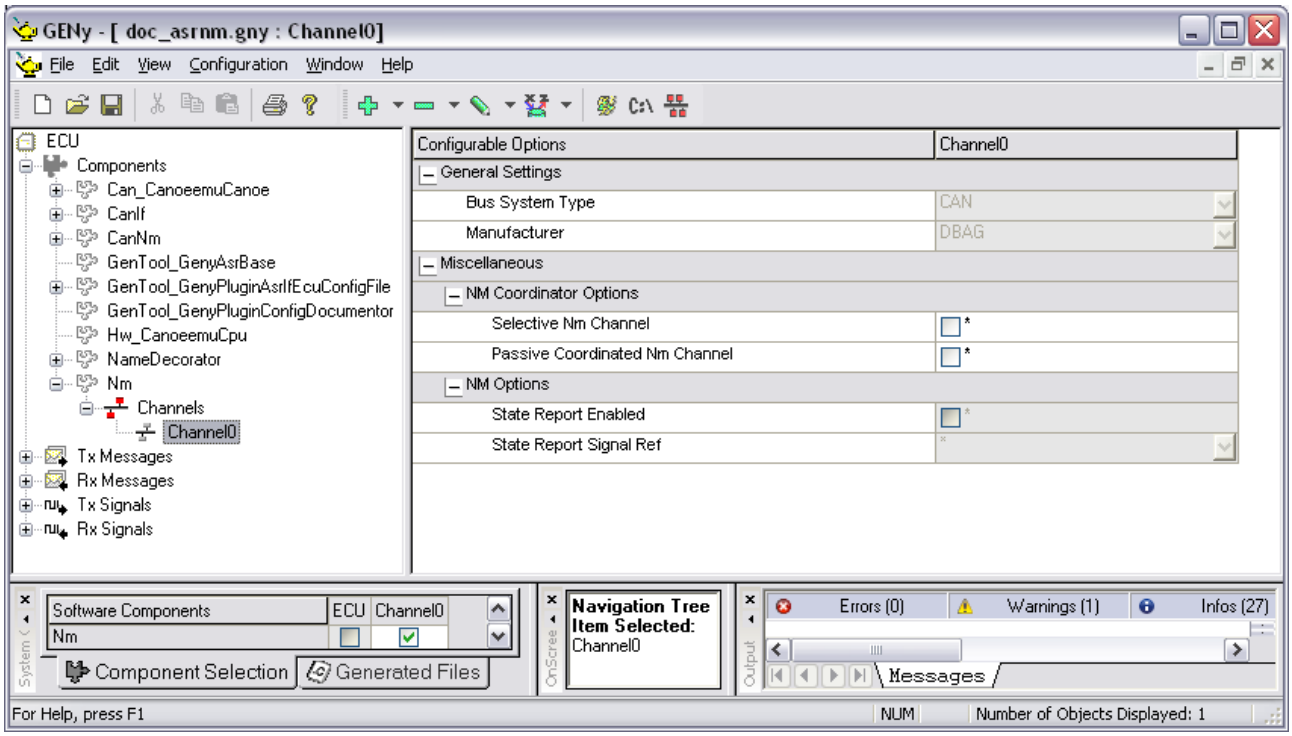
[18] This configuration item is only relevant if the Limp Home Indication feature is available.

H	> G	H 1
H	> FD HH > D > HH G	H 1 61 19 H 1
F H		
F 4:	> H > G	D 2G F 1
F	> > >	1
H		
H 4:	> H > G	D 2G H 1 614315 H 1 9161 H F 1
G H 4:	> H > G	D 2G G H 1 614314 G H 1 9161 9 G H F 1
D G		
D G 4:	> H > G	D G + , 1

9-5 F F

6.3.2 Channel Configuration

=



I 9-6 F F

Configuration options	Value	Description
E		E 1
		I 1 1
F		
F	> H > G	1 F 1 61714 F 1
F F	> H > G	1 619 F 1

H	> H > G	D 2G G 1 6145 G 1
		1 H 1 6145 G 1

9-6 F F

6.3.3 NM Coordination Restrictions

6.3.3.1 Needed NM Features

I F
1
=

Component	Required Configuration Item
2FD 2I	H
2FD 2I	E H
I 2FD	H
H	
H	
H	H F
H	
H	F
I F E	
I F F	

9-7 F F

I
1

6.3.3.2 NM Main Function Cycle Time

1
-
=

> I F FD I
F

> I F H
I F

> I F I
F [19]

D -
1

6.3.3.3 Shutdown Timing

I 1
F +
9 1 6 1 4 F F ,1 3/ H
D D 1
D 1

[19] FlexRay NM Repetition Cycle Time: (Repetition Cycle) * (FlexRay Cycle Time)

H F
H E 1
3/ H 1

Info
D H
F /
1

- 1

6.3.3.3.1 Shutdown Time Calculation

1
+ H / FD / I / I F E I F F,1
1

NM Type	Shutdown Timing
FD	F E [20]. F [53]. F I [53]
I	+H F [21]. 5, - I F [22] - I F [23],
H	E [53]. + [24] - [25],
I F E	I E [26]
I F F	I F E [27]

9-8 F F

6.3.3.4 Synchronized Channels

I 1
/
+ 6171 6 F
F ,1
1

[20] Timing value given in ms
[21] Ready Sleep Counter is given in number of Repetition Cycles
[22] Repetition Cycle is given in number of FlexRay Cycles
[23] FlexRay Cycle Time (duration of one FlexRay cycle) given in ms
[24] Time interval between two ring messages (TTyp) given in ms
[25] (Maximum) Number of OSEK NM Nodes in the network
[26] Silent Time value given in s
[27] Wait Bus Sleep Timeout Time given in s

6.3.4 NM Extended Coordination Restrictions

F H =

Component	Required Configuration Item
2FD 2I	F [28]
FD	F
I	F E H

9-9 F F H

D =

> I =+ ,[29] A5 - + F ,

> I + , F
+
3, 1 91616
F 1

> FD I E
F
F
1I E
I 6 FD 1

6.3.5 OSEK NM Configuration

I H H
+ 91614 F F ,1I H
91616 F
1

Caution

I H D D H
H F + ,1

H
H
F =

[28] When GENy is used for configuration this is automatically handled by GENy for CAN NM and FlexRay NM.
[29] CAN: NM Timeout Time; FlexRay: (Ready Sleep Counter + 1) * (Repetition Cycle) * (FlexRay Cycle Time)

Configurable Options	Nm_DirOsek
General Settings	
Indexed Component	☑
User Config File	$(ProjectDir)\Nm_DirOsek.cfg ...
Extended Callback	☑ *
Node Monitoring	☑
Number of Nodes	64
Extended Specification	
Immediate Alive	☐
Fast Bus Off Recovery	☑
NM Extensions	
AUTOSAR Environment Usage	☑ *
Remote Sleep Indication	☑
Nm Type	derived
BusOff Notification	☑

I 9-7 H F

6.3.6 Diagnostic Gateway Extension Configuration Restrictions

I

1

=

Component	Required Configuration Item
2FD	H
FD	G H
H	
H	F

9-: F G H

D G FD 8
1 I FD H
1

Caution
G H I /I F E I
F F 1

6.3.7 NM Gateway Extension Configuration Restrictions

I

1
+ 9161 9 G H F
,1D =

Component	Required Configuration Item
2FD 2 H	H
2FD	E H
FD	H
FD	H
H	
H	
H	H F
H	G D

9-; F H

D
F 1 916161 5
I F 1

6.3.8 Fiat Class B NM / Fiat Class C NM Configuration Restrictions

I I F E 2 I F F
1
1

Feature	Required Setting
H	G
F H	H
F	E 1
F F	E F

9-< F I F E 2I F F

3W1R

7 Glossary and Abbreviations

7.1 Abbreviations

Abbreviations	Complete expression
API	**A P I**
AUTOSAR	**Aut O S Ar**
BSW	**B S w**
BSWM	**B S w M**
CAN	**C A N**
CBV	**C B V**
CCL	**C C L**
ComM	**C M**
DEM	**D E M**
DET	**D E T**
DLC	**D L C** + FD ,
DLL	**D I I**
EAD	**E A D** + F D ,
ECU	**E C U**
FIBEX	**Fi B Ex**
ID	**Id** + FD ,
IL	**I L**
ISR	**I S R**
KL15	**K 15**
KL30	**K 30**
KL31	**K 31**
MICROSAR	**Micr O S Ar** + D D ,
MISRA	**M I S R A**
NID	**N Id**
NM	**N M**
PDU	**P D U**
RAM	**R A M**
RI	**R I** + FD -G ,
ROM	**R O M**
SRS	**S R S**
SWS	**S w S**

: -4 D

7.2 Glossary

Glossary	Description
Confirmation	FD 1
Identifier	1
Indication	1
Message	1
NM Channel	1
NM Cluster	1
Signal	1 / 1 FD / / / / 1

: -5

8 Contact

A
A
A G
A
A
A D

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