Database Attributes

Technical Reference

GMLAN 3.1

Version 2.02.01

Authors	Frank Triem
Versions:	2.02.01
Status:	Released

1 Document Information

1.1 History

Author	Date	Version	Remarks
Frank Triem	2007-06-06	1.0	Creation of document based on “Database Attributes GMLAN V3.0”.
Frank Triem	2007-06-25	1.1	Database Attribute GenMsgMandatoryToSupervise corrected
Frank Triem	2008-01-23	2.0	Update for configuration tool GENy
Frank Triem	2008-02-06	2.1	Database attributes added - Baudrate - SamplePointMin - SamplePointMax - SyncJumpWidthMin - SyncJumpWidthMax
Frank Triem	2012-10-23	2.2	Database Attribute NodeSuprvStabilityTime added in chapter 3.2
Frank Triem	2013-01-28	2.02.01	ESCAN00064577: Update GMLAN version from GMLAN 3.0 to GMLAN 3.1

Table 1-1 History of the Document

Please note
We have configured the programs in accordance with your specifications in the questionnaire. Whereas the programs do support other configurations than the one specified in your questionnaire, Vector’s release of the programs delivered to your company is expressly restricted to the configuration you have specified in the questionnaire.

Contents

Tables

2 Introduction

This document describes the database attributes that are used by the configuration and generation tool GENy for the configuration of the GMLAN Handler. In chapter 3 all possible attributes are listed along with a description of how the attributes should be set for use with GMLAN.

A list of database base attributes that can be found in the GM databases, which are not used by GENy, can be found in chapter 6. Please note that this is not a complete list of all available database attributes.

Caution
This document is valid for GMLAN 3.1 and Nm_Gmlan_Gm version 4.02.00 and higher.

3 Attribute Definitions for GMLAN 3.1 Databases

3.1 Network Attributes

On the network level the following attributes are evaluated by GENy:

Name	Type	Description
Manufacturer	String	This is a fixed value and must be set to “**GM**” Default: “**GM**”
NmType	String	Must be set to “**GMLAN**” to define the GMLAN network management. Default: “**GMLAN**”
NmBaseAddress	Hexadecimal	Defines the base address for the VNMF. This value is usually set to 0x620 to declare a range of 0x620-0x63F in the CAN-identifier range for the VNMF.
NmMessageCount	Integer	This attribute defines the maximum number of nodes on the network. This attribute is used in combination with NmBaseAddress and spans a range of CAN-identifier within the 11-bit range for the VNMF. The value must be given as 2N (e.g. 16 or 32).
NetworkType	String	Defines the type of the CAN-network. The following Network Types are known: Possible values: “Powertrain”, “Bodybus”, “Infotainment” GENy uses this attribute in order to configure the baud rate.
VersionNumber	BCD-coded Integer	This attribute can be used for versioning purposes. The value shall be a BCD-coded format. Thus, the number 100 is treated as Version 1.00, or the value 245 is handled as V2.45. This attribute definition is stored in ROM in two 8-bit constant values that can be accessed globally. Mainly used to retrieve the DB-version number by diagnostics. The names of the global variables are: *kDataDictMainVersion*, *kDataDictSubVersion*.
BusOffRecoveryTime	Integer	Defines the node recovery time after a BusOff event.
BusWakeUpDelay	Integer	Defines the time between a High-Level Voltage Wakeup (HLVW) and the activation of Initially-Active VNs.

		This parameter is also used as a delay time between the Activation of shared-local input VNs and the actual activation inside the ECU.

Table 3-1 Network Attributes

3.1.1 Network Attributes for Node Communication Active Message

On the network level the following attributes are defined for the Node Communication Active (NCA) Message:

Name	Type	Description
NodeStatusMsgID	Hexadecimal	Declares the CAN-identifier for the Node-Communication-Active (NCA) message. This is a message transmitted by a node when using Parameter-IDs on the network. The node transmits the message with a pre-defined cycle time, whenever at least one Virtual Network gets active. Note that the last 8 bits of this parameter must be 0. See also: NodeStatusMsgCycleTime and NodeStatusMsgTimeoutTime, (Default: 0x13FFFE00)
NodeStatusMessageCycleTime	Integer	Defines the periodic rate for the NCA message. Default: 1200 Unit: ms
NodeStatusMsgTimeoutTime	Integer	Defines the minimum time a node must receive at least one message from a node for a specific source address. If at least one virtual network is active, but the node receives no messages (including NCAs) within this time; all NCA-supervised messages and signals are handled by supervision failure. Default: 3000 Unit: ms

Table 3-2 Network Attributes for Node Communication Active Message

3.1.2 Network Attributes for Virtual Networks

On the network level the following attributes are defined for the Virtual Networks:

Name	Type	Description
VN_<<vn-name>>	Integer Range: 0..55	Declares the Virtual Network with the name <<vn-name>> (placeholder-name). The integer value must be a contiguous and zero based number.
VNInitAct<<vn-name>>	Enum: No Yes	Defines whether a Virtual Network is declared as 'Initially Active'. Default: No

Table 3-3 Network Attributes for Virtual Networks

3.1.3 Network Attributes for Bit Timing Register setup

On the network level the following attributes are defined for Bit Timing Register (BTR) setup. All five database attributes have to be defined in conjunction for GENy.

Name	Type	Description
Baudrate	Integer	Defines the baud rate for the respective network.
SamplePointMin	Integer	Defines the minimum sample point in [%] for the respective network.
SamplePointMax	Integer	Defines the maximum sample point in [%] for the respective network.
SyncJumpWidthMin	Integer	Defines the minimum synchronous jump width for the respective network.
SyncJumpWidthMax	Integer	Defines the maximum synchronous jump width for the respective network.

Table 3-4 Network Attributes for Bit Timing Register setup

3.2 Node Attributes

On node level the following attributes are evaluated by GENy:

Name	Type	Description
ILUsed	Enum: No Yes	Defines whether the Interaction Layer of the GMLAN-Handler shall be used or not. If the attribute is not set, the IL-Option page will not appear in GENy. Default: “Yes”
NmNode	Enum: No Yes	Defines whether the Network Management of the GMLAN-Handler shall be used or not. If the attribute is not set, the GMLAN-Option page will not appear in GENy. Default: “Yes”
VNECU<<vn-name>>	Enum: None Activator Remoted Activator_Remoted Shared Local	Defines the VN-Type for a specific Node for the specific VN
NodeSuprvStabilityTime	Integer: 0..65535	This attribute defines a delay time in ms between activation of a VN and start of supervision of the corresponding signals. The supervision stability time is used to avoid 'Loss of Communication' DTCs due to transient conditions after VN activation. Default: “5000”

Table 3-5 Node Attributes

3.3 Message Attributes

On message level the following message attributes are evaluated by GENy:

Name	Type	Description
GenMsgSendType	Enum: spontanX cyclicX	Defines the send type of a message. It could either be defined as periodic or non-periodic. Periodic includes both strict periodic and periodic with event. Non-periodic is strictly event-based. cyclicX = periodic spontanX = non-periodic
GenMsgCycleTime	Integer	If the message is defined as periodic, this attribute defines the periodic time. Unit: ms
GenMsgDelayTime	Integer	Defines the minimum update time of a message. The value is given in units of ms. The minimum update time is mostly used for mixed send types, namely periodic and event send types. Unit: ms
GenMsgStartDelayTime	Integer	Defines the start time after VN Activation when processing of message events is started (i.e. the cyclic transmission of the messages is started). Unit: ms
GenMsgMandatoryToSupervision	Enum: No Yes	Defines the default setting after Power-up before the Source Learning procedure the functional messages with extended IDs has been started. The source address of a message is either initialized to FF (Yes) or FE (No). Different indications to the application are given if a timeout occur for non-learned messages.
GenMsgILSupport	Enum: No Yes	Defines whether a message shall be handled by the Interaction Layer. Default: “Yes”
Prio	Integer Range: 0..7	Defines the priority of the functional messages in an GM database. These are the first three bits of the Extended CAN ID. The priority is added to the CAN Identifier, which can be found in the database, within GENy in order to build the Transmit CAN-identifier as defined for GMLAN with Extended CAN-Ids.
NmMessage	Enum: No Yes	Declares a message as a Network Management message. The attribute must be set to ‘Yes’ for all Virtual Network Management Frames (VNMF messages).
TpTxIndex	Integer	Defines application TP messages.

Table 3-6 Message Attributes

3.3.1 Attribute Definitions for Diagnostics

The following message attributes need to be defined to assign CAN-messages for the Diagnostic communication:

Name	Type	Description
DiagState	Enum: No Yes	Defines the AllNodeMessage request message wit the CAN-ID 0x101 as the functional diagnostic request message. This attribute causes the GENy to reduce the DLC check to a 1-byte value in order to let messages shorter than 8 bytes also pass the DLC-check. It also forces the Generation Tool to generate a specific function call inside the GMLAN-handler.
DiagRequest	Enum: No Yes	Defines the physical request message from the tester to the node for the diagnostic communication. Together with the definition of DiagResponse, GENy assigns a connection within the Transport Layer. **Note** that GENy can only manage one pair of diagnostic connection. Thus, only one message can be defined for DiagRequest for one node.
DiagResponse	Enum: No Yes	Defines the physical response message from the node to the tester for the diagnostic communication. Together with the definition of DiagRequest, GENy assigns a connection within the Transport Layer. **Note** that GENy can only manage one pair of connection. Thus, only one message can be defined for DiagRequest for one node.
TpApplType	String	Defines the UUDT message of a node. It has to be set to “DiagUUDTResponse” for all diagnostic UUDT response messages. This attribute causes GENy to generate separate naming independent macros used by CANdesc. It will also generate tables that can potentially used by Multiple Identity Modules (MIMs).

Table 3-7 Attribute Definitions for Diagnostics

3.4 Signal Attributes

On Signal level there are four concepts that need to be defined:

- Assignments of signals to VNs
- Definition of signal transmit models
- Definition of signal supervision methods
- Define default values for signal attributes (valid-failed, supervision failed, VDA/Mask signal failed, start-up default value)

3.4.1 VN-Assignment of Signals

VN assignments of signals are signal-dependent and therefore defined at signal level. Every signal can be assigned to any or all VNs. Signal VN assignments are defined through the use of VN-specific attributes one per VN per signal.

Name	Type	Description
VNSig<VnName>	Enum: No Yes	Declares if a signal is assigned to a VN or not

Table 3-8 VN-Assignment of Signals

3.4.2 Signal Transmit Model Attributes

Event-based signal transmit criteria are defined at the signal level. Periodic transmit criteria are defined at the message level and do not appear here. Refer to chapter 4.1.1 “Message Attributes”.

Name	Type	Description
GenSigSendOnInit	Enum: NotInitialized Application Handler	Defines whether a signal (and the message) should be transmitted upon: - Reception or transmission of an I-VNMF that initializes at least one VN that is associated to the VN - Start of a Shared Local VN, which the message is associated to - All Initial Messages that are associated to any Initially Active VN are transmitted upon reception of a HLVW. .

3.4.3 Signal Supervision Attributes

Signal supervision attributes are node-dependent and therefore defined at the Node-Rx-Signal relation instead on the signal itself. A signal can have different supervision criteria in different messages and different nodes.

Name	Attribute Class	Attribute Type	Description
GenSigTimeoutTime	Signal	Integer	The attribute defines the timeout time for self-supervision or supervised-by-presence. If the corresponding message doesn't come in within this time, supervision failure indication is done on this message.
GenSigTimeoutMsg	Signal	Hex	This value defines the CAN-identifier that is used for supervision. For self-supervised messages, this is the CAN-identifier of the same message. This attribute directs to the message used for supervision-by-presence.
GenSigSuprvResp	Node-Mapped Rx Signal	Enum: None Notify Substitute NotifySubstitute	Defines the strategy concerning substitution and notification in case the signal supervision has failed. > Notify: A timeout flag is automatically configured for the signal. > Substitute: The timeout default value defined by 'GenSigSuprvRespSubValue' is automatically configured for the signal. > NotifySubstitute: Both a timeout flag and timeout default value are configured automatically for the signal.
GenSigSuprvRespSubValue	Node-Mapped Rx Signal	Integer	Timeout substitution value for failsoft mechanism. It is automatically set in case 'GenSigSuprvResp' is defined as 'Substitute' or 'NotifySubstitute'.

Table 3-9 Signal Supervision Attributes

Info

Note: Validity signals are identified by the Capital-V at the end of its signal short name. The Validity signal must have the same base name as the signal it is assigned to.

Example

Signal name: SysPwrMode

Validity signal: SysPwrModeV

3.4.4 Signal Attributes

The following signal attribute is used in order to define the default/initial behavior of signals. These values are defined on signal level and are the same for all nodes that transmit the signal.

Name	Type	Description
GenSigStartValue	Integer	Default value for a signal used by the GMLAN-Handler to initialize the transmit value during Power-Up initialization.

Table 3-10 Signal Attributes

4 Attribute Settings in Terms of GM Concepts

Understanding the attributes and how they affect GENy and the configuration of GMLAN can lead to a simple mapping of attribute values to GM-specific concepts on transmit models and signal supervision.
Below is an outline of how GM transmit model and signal supervision concepts can drive the settings for the attributes involved.

4.1 Signal Transmit Model

4.1.1 Message Attributes

As signals can only be transmitted as part of a message, all signals in a message will share the same transmission behavior. The message transmit model must therefore be set correctly to ensure all signals contained in the message can be transmitted according to their signal-specific requirements. Signal attributes define event-based transmit criteria, but not periodic transmit criteria. Periodic transmit criteria must be defined at the message level. Any message containing a signal that must be transmitted periodically, regardless of value, must be marked as periodic. Signal attributes do not contain this information. Signal transmission requirements must be considered by the serial data engineer and used to determine if a message must be transmitted periodically. Periodic messages allow for event-based transmission in addition to the regularly scheduled cyclic transmissions.

For periodic messages, a cycle time must be defined. The cycle time must be equal to the shortest transmit cycle time of all signals contained in the message. For signals with both slow and fast cycle times, only the slow cycle time should be considered.

For periodic messages, a minimum update (or delay) time must be defined. The minimum update time is the least amount of time that must elapse between transmissions of the message. The minimum update time must be equal to the longest minimum update time of all signals contained in the message.

Name	Value for Transmit Model		
	Strictly Event Driven	Periodic	Periodic w/Event
GenMsgSendType	spontanX	cyclicX	cyclicX
GenMsgCycleTime	N/A	cycle time in ms	cycle time in ms
GenMsgDelayTime	minimum delay time in ms	N/A	minimum delay time in ms

Table 4-1 Message Attributes of Transmit Model

4.1.2 Signal Attributes

Event-based transmit criteria are defined at the signal level. Every signal has its own event-based transmit criteria. The signal type determines the valid and possible event-based transmit criteria. Signal type is defined by the SignalType attribute.

Attributes displayed in *italic* font aren't used any more. They are listed for documentation purpose only.

Name	**Value for Transmit Model (by Signal Type)**				
SignalType = ENM					
	Any		None		
GenSigSendType	OnAnyChange		NoSigSendType		
SignalType = BLN					
	Send on 0-1	Send on 1-0	Send on Any Change	None	
GenSigSendType	OnChangeIfActive	OnChangeIfActive	OnAnyChange	NoSigSendType	
GenSigInactiveValue	0	1	N/A	N/A	
SignalType = UNM					
	Send on Delta	On Delta & Top	On Delta & Bottom	On Delta, Top & Bottom	None
GenSigSendType	OnDelta	OnDelta	OnDelta	OnDelta	NoSigSend Type
GenSigDeltaValue	delta value	delta value	delta value	delta value	N/A
GenSigSendTopBottom	None	SendOnTop	SendOnBottom	SendOnTopBotto m	N/A

Table 4-2 Signal Attributes of Transmit Model

4.2 Signal Supervision

4.2.1 Signal Attributes

Signal supervision is defined at the signal level. Every signal has its own supervision criteria. There are two concepts that define signal supervision criteria. One concept is the signal supervision method and the other is the response triggered by a supervision failure.

Name	Value for Supervision Method				
	Unsupervised	Source Learning	Self Supervised (direct)	Supervised By Presence (indirect)	Supervised By Value
NodeStatusMsgTimeoutTime	0	> 0	N/A	N/A	N/A
GenSigTimeoutTime	0	0	time in ms	time in ms	N/A
GenSigTimeoutMsg	0	0	hex CAN-ID of message containing this signal	hex CAN-ID of message that shall be used for supervision	N/A

Table 4-3 Signal Attributes for Supervision

Name	Value for Supervision Failure Response Type			
	None	Notify Application	Substitute Value	Notify & Substitute
GenSigSuprvResp	None	Notify	Substitute	NotifySubstitute
GenSigSuprvRespSubValue	N/A	N/A	raw bus value	raw bus value

Table 4-4 Signal Attributes for Failsoft Mechanism

5 Database Attributes for CANoe Models

The following database attributes are used for the configuration of CANoe models. They are not used by the configuration tools for the GMLAN Handler:

Attribute Name	Attribute Class	Attribute Type	Description
NodeLayerModules[1]	Node	String	This attribute is used by CANoe to load NodeLayer DLLs. These DLLs are used to provide an advanced interface to CAPL and extended functionality of a specific node. Typically, the value “GMLAN02.DLL” is provided. This DLL extends CANoe to provide GMLAN-specific functionalities. Another attribute value is “osek_tp.dll”. This DLL provides

Table 5-1 Database Attributes for CANoe Models

[1] This attribute is not used for the configuration of the GMLAN-Handler.

6 Database Attributes not evaluated by GENy

This chapter contains database attributes, which are defined in GM's network databases but are not evaluated by the configuration and generation tool GENy for configuration of the GMLAN-Handler.

Attribute Name	Attribute Class	Attribute Type	Description
UseGMParameterIDs	Network	Integer	Defines if the network uses the GMLAN parameter ID's in the 29-bit architecture. 1: Network uses Parameter-Ids (29-Bit) 0: Network uses no parameter-ID's (11-Bit)
SourceID	Node	Hexadecimal	The Source address of a node is given as an attribute inside the database. There are two possibilities to use this attribute: > Instead of initialization of the Source Address by the application, the handler could do this in the function IlInit(). This would imply, that the value is always fixed (MIM-modules will be handled correctly depending on the pre-selection of the application, which instant should run). > The transmit messages inside the handler will already be pre-set with the Source Address given in this attribute. This would avoid the runtime effort of the driver to add the source address every time a message must be transmitted. The dynamic setting will only be required for MIM's.
GenSigVBitResp	Node-Mapped Rx Signal	Enum: No Yes	Identifies that a validity signal is used for signal integrity.
GenSigVDAFailResp	Node-	Enum:	Identifies that a VDA signal is

	Mapped Rx Signal	No Yes	used for signal integrity.

Table 6-1 Network attributes not evaluated by GENy

6.1 Signal Transmit Model Attributes

Name	Type	Description
SignalType	String	Defines the type of the signal: “ENM” : Enumeration “BLN” : Boolean “UNM” : Unsigned Numeric
GenSigSendType	Enum: 0 not used 1 not used 2 not used 3 not used 4 not used 5 not used 6 not used 7 NoSigSendType 8 not used 9 not used 10 OnAnyChange 11 OnChangeIfActive 12 OnDelta	Defines the transmit criteria for a signal ENM: NoSigSendType or OnAnyChange UNM: NoSigSendType or OnDelta BLN: NoSigSendType or OnChangeIfActive or OnANyChange
GenSigInactiveValue	Integer	Defines if a signal shall be transmitted if changed (SigSendType = OnChangeIfActive). It is not send if it reaches the inactive value. Used to define the send type 0-to-1 OR 1-to-0. GenSigInactiveValue is defined as a raw value (for signals of type Boolean only raw values are used at all).
GenSigSendTopBottom	Enum: None SendOnTop SendOnBottom SendOnTopBottom	Defines whether a signal of type UNM needs to be sent if the physical value reaches one or all of its limits. The limits for Top and Bottom are defined in the Min and Max values of the database.
GenSigDeltaValue	Integer	This is used with SigSendType “OnDelta”. If the most recent value exceeds the value of Delta compared to the last value sent via CAN, the signal is transmitted again.

Table 6-2 Signal Transmit Model attributes not evaluated by GENy

6.1.1 Node Mapped Rx-Signal Default Value Attributes

Name	Type	Description
GenSigRxStartValue	String	Value receivers set signal to at power up. Used for documentation and UEF-Export.

Table 6-3 Rx-Signal Default attributes not evaluated by GENy

7 Contact

Visit our website for more information on

- News
- Products
- Demo software
- Support
- Training data
- Addresses

www.vector-informatik.com