AN3744

LAN937x AUTOSAR Driver

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INTRODUCTION

The LAN937x AUTOSAR driver is a software library developed by Microchip. This software library is designed to be integrated into an AUTOSAR ecosystem. The AUTOSAR or Automotive Open System Architecture is used by many components in the automotive industry. Microchip provides an Ethernet switch driver that conforms to the Communication Abstraction layer utilizing the communication and IO drivers.

The LAN937x switch does not have an internal switch management processor, giving users some flexibility to select the right size of processor and operating system for every application.

This document covers a step-by-step procedure for integrating the Microchip AUTOSAR into large AUTOSAR systems.

REFERENCES

The following documents should be referenced when using this application note:

- *LAN937x Data Sheet*
- AUTOSAR Software Documentation

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AUTOSAR DRIVER INTEGRATION FOR THE LAN937X DRIVER

The Microchip software is not a complete AUTOSAR solution. It is only a piece of the larger AUTOSAR ecosystem. To evaluate and test the Microchip LAN937x switch, it needs to be integrated into an AUTOSAR system. Below are the steps for integrating the LAN937x switch into larger AUTOSAR systems.

1. **Step 1: Choose an AUTOSAR vendor.**

   There are many AUTOSAR systems offered by solution vendors. Select the right vendor and solution that fit application needs. The following is a list of known AUTOSAR vendors:

   - Elektrobit
   - Vector
   - Mentor Graphics®

2. **Step 2: Choose the processor and operating system supported by the AUTOSAR vendor.**

   Once the system is selected with the proper development environment, users need to select the appropriate processor that can run the AUTOSAR code. Microchip provides evaluation boards with SPI, MIIM, and RMII™ interface connections to the switch for system prototyping. The AUTOSAR driver code was written specifically for SPI management of the switch.

3. **Step 3: Secure the Microchip Switch Driver code.**

   Microchip issues the source code for the AUTOSAR driver through the local Sales and Support team. It also provides support for AUTOSAR v4.3.1 and 19-11 versions. (See Note.) The source code needs to be integrated into the final AUTOSAR system.

Note:	PTP API calls are only supported on versions 19-11.

4. **Step 4: Integrate the code into the AUTOSAR system.** Table 1 details the API call functions provided.

TABLE 1: API FUNCTIONS

Function Call Group	API Function Call
Switch Functional API Calls	EthSwt_Init
	EthSwt_SwitchInit
	EthSwt_GetSwitchReg
	EthSwt_SetSwitchReg
	EthSwt_GetArlTable
	EthSwt_SetMacLearningMode
	EthSwt_GetMacLearningMode
	EthSwt_GetSwitchIdentifier
	EthSwt_SetForwardingMode
	EthSwt_EnableVlan
	EthSwt_GetVersionInfo
	EthSwt_GetPortMacAddr
	EthSwt_SetPortMirrorState
	EthSwt_GetPortMirrorState
	EthSwt_ReadPortMirrorConfiguration
	EthSwt_WritePortMirrorConfiguration
	EthSwt_GetBufferLevel

Note 1: For versions 19-11 only.

2: gPTP functionality is supported at the timestamp level only. The higher-level implementation will need to come from the AUTOSAR application selected.

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TABLE 1: API FUNCTIONS (CONTINUED)

Function Call Group	API Function Call
PHY Config API Calls	EthSwt_ReadTrcvRegister
	EthSwt_WriteTrcvRegister
	EthSwt_SetSwitchPortMode
	EthSwt_GetSwitchPortMode
	EthSwt_StartSwitchPortAutoNegotiation
	EthSwt_GetLinkState
	EthSwt_GetBaudRate
	EthSwt_GetDuplexMode
	EthSwt_GetPortIdentifier
Stats API Calls	EthSwt_GetCounterValues
	EthSwt_GetRxStats
	EthSwt_GetTxStats
	EthSwt_GetTxErrorCounterValues
Diagnostic API Calls	EthSwt_SetPortTxMode
	EthSwt_SetPortLoopbackMode
	EthSwt_GetPortCableDiagnosticsResult
	EthSwt_GetPortSignalQuality
Configuration API Calls	EthSwt_GetCfgDataInfo
	EthSwt_GetCfgDataRaw
	EthSwt_StoreConfiguration
	EthSwt_ResetConfiguration
	EthSwt_NvmSingleBlockCallback
	EthSwt_VerifyConfig
Management API Calls (**Note 1**)	EthSwt_EthRxProcessFrame
	EthSwt_EthRxFinishedIndication
	EthSwt_EthTxPrepareFrame
	EthSwt_EthTxAdaptBufferLength
	EthSwt_SetMgmtInfo
	EthSwt_EthTxProcessFrame
	EthSwt_EthTxFinishedIndication
	EthSwt_PortEnableTimeStamp (**Note 2**)
	EthSwt_GetTxMgmtObject
	EthSwt_GetRxMgmtObject
PTP Utility API Calls	EthSwt_AdjustPtpTime
	EthSwt_SetPtpDrift
	EthSwt_SetPTPPortLinkDelay
	EthSwt_SetPtpMsgCfg1
	EthSwt_GetPtpMsgCfg1
	EthSwt_SetPtpMsgCfg2
	EthSwt_GetPtpMsgCfg2
	EthSwt_UnsyntonizeClk

Note 1: For versions 19-11 only.

2: gPTP functionality is supported at the timestamp level only. The higher-level implementation will need to come from the AUTOSAR application selected.

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APPENDIX A: APPLICATION NOTE REVISION HISTORY

TABLE A-1: REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS00003744A (12-10-20)	Initial release	

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