

RN00389

PROFINET (A/B) Protocol Software Stack for IO Device

Rev. 3.1 — 13 January 2026

Release notes

Document information

Information	Content
Keywords	RN00389, PROFINET, PROFINET (A/B), protocol software stack, MIMXRT1180-EVK
Abstract	This document is the release notes for the PROFINET (A/B) protocol software stack for IO device. Supports: MIMXRT1180-EVK.



1 Features

[Table 1](#) lists the supported features.

Table 1. Features

Feature	Unit	NXP Stack	Comment
Conformity class		A/B	Mandatory support of Discovery and basic Configuration Protocol (DCP), Link Layer Discovery Protocol (LLDP), and Simple Network Management Protocol (SNMP), certified with example application
Maximum number of total cyclic input data, including IOPS and IOCS	Bytes	1440	Verified on MIMXRT1180-EVK
Maximum number of total cyclic output data, incl. IOPS, and IOCS	Bytes	1440	Verified on MIMXRT1180-EVK
Maximum number of submodules		Not defined	Not limited by SW stack, but may be limited by System resources depending on the cyclic and acyclic data requirements
Supported AR		Controller AR, Supervisor AR, Data Access AR, Implicit AR	Mandatory
Acyclic communication (record objects)	kBytes	Not defined	Carrier aggregation (CA) 1200 bytes real and fragmented
Alarm types		Yes	Process, diagnosis, user specific (for example, maintenance)
Diagnostic entries	records	Yes	20 (adjustable with prio - queue)
Identification and maintenance (I & M)	I & M	Yes	Mandatory (I & M 1 – 4 by default)
Topology recognition		Yes	Mandatory
Physical device record objects		Yes	Mandatory
Minimum cycle time, RT_CLASS_1		Down to 1 ms, depends on target and application	Verified on MIMXRT1180-EVK
Baud rate	Mbit/s	100 Mbit/FD	Although Software Stack supports both FD and HD, PROFINET natively operates at a standard baud rate of 100 Mbit/FD
Data transport layer		IEEE802.3	Verified on MIMXRT1180-EVK
PROFINET specification		V2.4	Supported
Application IP stack API, max. number of sockets		lwIP	Verified on MIMXRT1180-EVK
Maximum number of device instances		1	

Note: The demo version of the software libraries has no feature restrictions, but are limited to a runtime of five hours.

2 Known restrictions

The following table lists the known restrictions.

Table 2. Known restrictions

Feature:	Comment
Minimum cycle time, RT_CLASS_3	RT_CLASS_3, Isochronous Real Time Protocol (IRT) is not supported
Net load Class II and III	Not tested
IRT support	Not supported
Media Redundancy with Planned Duplication of frames (MRPD)	Not supported
Shared device	Not supported
Shared input	Not supported
System redundancy	Not supported, works as S1
Configuration in Run (CiR)	Not supported
Fast startup (depending on hardware)	Not supported
Asset management	Not supported
Sending and receiving raw Ethernet frames	Should be supported by the user application
RT over User Datagram Protocol (UDP)	Not supported
Multicast Relation Support (MCR)	Not supported
Multiple ARs	Not supported
Media Redundancy Protocol (MRP)	Fixed ring port configuration (Port 1 - Ring Port 1, Port 2 - Ring Port 2)
Dynamic Host Configuration Protocol (DHCP)	Not supported

3 Changelog and open issues

The following is the list of the changelog and open issues.

• Changelog

– Incorrect behavior when `OAL_getBufferById()` cannot provide a buffer

- In `GOAL_LP_PROFINET/protos/pnio/pnio/source/pn_crtdata.c` (version 2_20_1), the function `CD_openEP()` calls `OAL_getBufferById()`.
- If no buffers exist, only `retVal` updates.
- `GOAL_MEMSET()` writes to an unwanted memory area because of a null pointer.

– Missing error when submodules exceed the configured maximum

- Functions `goal_pnioCfgSlotMaxCntSet(...)` and `goal_pnioCfgSubslotMaxCntSet(...)` set maximum allowed slots/subslots.
- During creation, these values were not checked, causing issues at connection attempts.

- Now validated during creation.
- **MCTC: Input modules not pulled due to API typo**
 - Misspelling in `goal_pnioSubmodPull(...)` prevented input modules from being pulled during module configuration reset on multicore platforms.
- **SNMP: Writable SNMP entries must be empty after ResetToFactory**
 - Following PROFINET specification, SNMP entries `sysLocation`, `sysName`, and `sysContact` must be empty after factory reset.
 - Release candidates of PROFINET automated tester (> V2.44.1) check this issue.
- **Device ID not changeable**
 - RSI: Updated stack with findings from Plugfest RSI/SecClass1 (June 12–13, 2024).
 - SecClass1: Initial implementation of SNMP and DCP records.
 - GSDML: Added SecClass1.
 - RSI: Fixed usage of new LLDP API.
 - RSI: Corrected VLAN ID data copy.
 - LLDP: The maximum-allowed Port ID is 999; implemented was 1000.
 - SNMP: Missing indexes 8–12 in `lldpRemTable`:
 - `lldpRemPortDesc`
 - `lldpRemSysName`
 - `lldpRemSysDesc`
 - `lldpRemSysCapSupported`
 - `lldpRemSysCapEnabled`
- **Autoneg is always enabled in LLDP frames**
 - In hardware test 4, LLDP frames incorrectly show autoneg enabled after setting MAU type to `BASE_100TXFD`.
 - Bug in `pn_lldp.c` `PN_lldpPortStateCb()`: wrong define used.
 - Solution: Replace `GOAL_ETH_AUTONEG_ON` with `PN_LLDP_PHY_IF_AUTONEG_SUPPORT_FLAG` in `goal_lldp.c`.
- **DiffAccessWays TC fails without SupportedSubstitutionModes="0 1 2"**
 - Test case fails for 1-Port DUT without SupportedSubstitutionModes in GSDML.
- **Separate PROFINET-specific MIBs from goal_lldp/snmp**
 - Move PROFINET-specific MIBs to PROFINET module.
- **Data Mapper not reset for input modules only**
 - When DUT configured with input modules only, Data Mapper does not reset when pulling modules/submodules.
- **peerMacAddress field in PdPortDataReal incorrect**
 - LLDP reports port MAC address as chassis MAC instead of device MAC of neighbor.
- **Profinet: Flexible DAP**
 - Added flexible DAP so port subslots can be freely chosen for each port.
 - Added two new example projects.
- **PNIO MRP: Added diagnosis "Mismatch Peer MRP domain UUID"**
- **MCTC: Application ready request sent before IOXS good**
 - The device sent AR request even when submodules had bad IOXS.
 - Fixed by setting good values initially.
- **Accessing IOXS is not properly locked**
 - IOXS setting lacked locking, allowing simultaneous access by low-priority loops and HIGH-priority tasks.
- **Add Sec Class 1 to standard applications and GSDML**
 - Added Security Class 1 configuration to `Appl_13_pnio_snmp` and `24_snmp_mrp`.

- Created new GSDML.
- **Missing evaluation of the return value caused NULL-pointer access at MCTC targets**
 - If `PN_new(...)` failed, instance pointer freed but result overwritten by `GOAL_OK`, leading to null-pointer access.
- **New GSDML**
 - Added MRP for 3-port and 4-port devices.
 - Added Security Class 1 to all CC-B devices.
- **Open Issues**
 - **Missing answer to R/W-Request using busy records**
 - In GOAL V2.25.1, multiple read/write requests fail if more records exist than configured by `goal_pnioCfgRecDataBusyBufsizeSet` (default = 2).
 - Expected behavior:
 - The first two records return actual status.
 - Remaining records return Resource Busy.
 - **Missing alarm when IOXS returns to good for data mapper subslots**
 - Submodules mapped to Data Mapper copy directly into the cyclic buffer without evaluating IOXS changes, causing missing alarms.

4 Revision history

[Table 3](#) summarizes the revisions to this document.

Table 3. Revision history

Document ID	Release date	Description
RN00389 v.3.1	13 January 2026	Removed irrelevant information from the changelog.
RN00389 v.3.0	12 December 2025	Initial public release

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