PEER Protocol Connector

PEER protocol devices

- Name: **PEER**
- Version: 1.0.0.1
- Protocol: PEER (peer-to-peer, vital, session-based)
- Interface: Serial (RS-232 / RS-485)
- Runtime: .NET Standard 2.0 (Multiplatform)
- Configuration:
  - Devices / Channels / Nodes / Points

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Overview

The PEER connector implements the **PEER protocol** (ASTS USA, SM 9726), a peer-to-peer, session-based, vital serial signaling protocol used in railway and transit wayside applications. Unlike master/poll protocols, each pair of stations establishes a permanent communication session and exchanges the full operand interface of a station whenever a value changes; link integrity is maintained by periodic status/data messages paced by the heartbeat interval.

Compatible devices include the **Ansaldo STS Microlok II**. The protocol name is **PEER**; Microlok II is named only as a compatible device model.

Communication Driver Information	
Driver name	PEER
Assembly Name	T.ProtocolDriver.PEER
Assembly Version	1.0.0.1
Multiplatform	True
Devices supported	Ansaldo STS Microlok II and other PEER protocol compatible stations
Manufacturer	Ansaldo STS (ASTS USA)
Protocol	PEER
Interface	Point-to-point asynchronous serial (RS-232 / RS-485)

Channel Configuration

Protocol Options

Not used in this driver.

Serial Settings

PEER is a point-to-point asynchronous serial protocol. The serial port settings default to values appropriate for a PEER link:

- **Baud Rate**: 19200 (supported range 300..38400)
- **Data Bits**: 8
- **Stop Bits**: 1
- **Parity**: None (message integrity is provided by the CRC-31 security field, so parity is not required)

Node Configuration

Station Configuration

A PEER station is identified by its own station address and the partner (peer) address. Vitality is a property of the station: a station defines vital *or* non-vital operands, never both. The configurable station parameters are:

- **LocalAddress**: this unit's PEER station address (source). Integer 0–65535.
- **PeerAddress**: partner peer station address (destination). Integer 0–65535.
- **Vital**: when checked, the station is vital and uses the Vital CRC-31 init value. Uncheck for a non-vital station.
- **AckTimeout**: acknowledge timeout in milliseconds. Default: 1000.
- **HeartbeatInterval**: heartbeat interval in milliseconds (100). Default: 4000.

The station string is semicolon-separated: `LocalAddress;PeerAddress;Vital;AckTimeout;HeartbeatInterval` (for example, `10;20;true;1000;4000` for a vital station with local address 10 and peer address 20).

Point Configuration

Address

The PEER driver uses a concatenated address format: **`<ClassCode><Index>[.<Bits>]`**

- **ClassCode**: the operand class — `BO` (Boolean Output), `BI` (Boolean Input), `NO` (Numeric Output), `NI` (Numeric Input).
- **Index**: ordinal position of the operand within its class (0-based, 0–255).
- **.Bits**: numeric size in bits — 8, 16, 24 or 32. Required for numeric operands (NO/NI), omitted for boolean operands (BO/BI).

Vitality is inherited from the station and is **not** encoded in the point address. Numeric values are transmitted big-endian on the wire.

Example	Meaning
`BO0`	Boolean Output, index 0
`BI3`	Boolean Input, index 3
`NO0.8`	Numeric Output, index 0, 8-bit
`NI2.16`	Numeric Input, index 2, 16-bit

Write Group

Output operands (BO/NO) are transmitted as a single data message carrying the whole operand interface of the station's class group. Output points are therefore configured within a **WriteGroup** AccessType so that all values of the group are sent together.

Notes and Limitations

The current release implements operand read/write over an established PEER link using Header Format 1 (sync $F4, 2-byte addressing). Message types supported: 01 (Initialization), 02 (Vital Data), 03 (Non-Vital Data), 04 (Status) and 06 (Service Signal / ACK-NAK). Message security uses CRC-31 (ATCS Specification 200, Appendix Y), with the Vital CRC-31 init value applied to vital messages.

The following are not included in this release: ATCS WAN addressing (Header Format 2, sync $F5), HMAC headers ($FE), diagnostic message types (05/07/08/09/0A) and OSS message types (0B/0C).

Driver Revision History

PEER Revision History	
Version	**Notes**
1.0.0.1	Bidirectional PEER links no longer freeze: data messages are acknowledged and input tags keep updating while writes are in progress; writing one output no longer clears the partner's other outputs; numeric operands are mapped by index; read tags keep good quality on event-driven links; up to 255 boolean operands per message and operand indexes up to 65535; station settings available on Multi-Serial channels; Accept Unsolicited and serial fields are named in the channel settings; the address editor keeps the Bits value.
1.0.0.0	Initial release. Operand read/write over a PEER serial link (Header Format 1, 2-byte addressing); vital and non-vital stations; CRC-31 security.

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