ANET3910-EN

STANAG3910 Electrical
Test & Simulation Module
for Standard Ethernet

**Data
Sheet**

www.aim-online.com

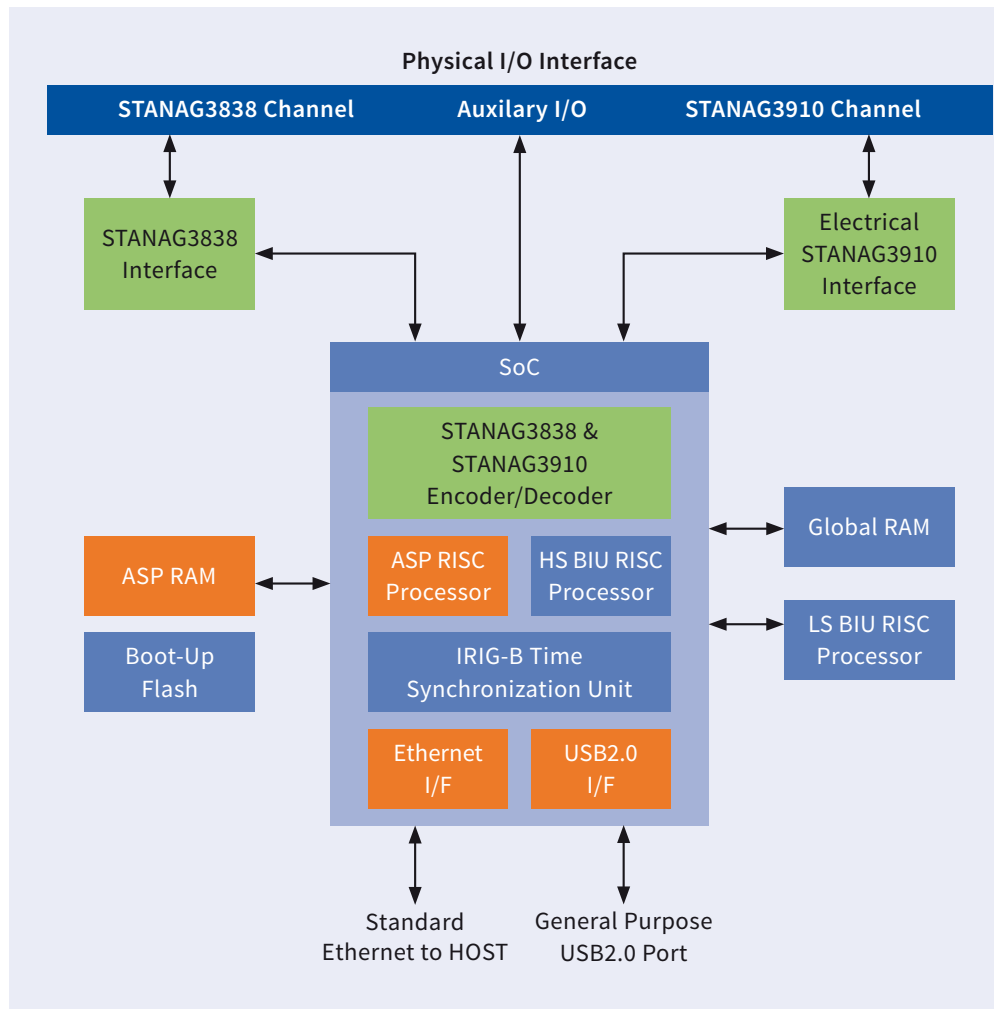# ANET3910-EN

General Features

The ▶ **ANET3910-EN** is a member of AIM's
new line of Ethernet based modules for
analysing, simulating, monitoring and
testing ▶ **STANAG3910** databuses.
The ANET3910-EN concurrently acts as Bus
Controller, Multiple Remote Terminals (31)
and Chronological/Mailbox Bus Monitor.

The ANET3910-EN provides one fully inde-
pendent STANAG3910 High Speed (HS) and
STANAG3838 Low Speed (LS) bus interface
with an Ethernet based host connection
and with all the Databus Electrical signals
accessible on a single front panel.
The ANET3910-EN can be used for Protocol
Testing and Simulation of STANAG3910
LS/HS Bus Controller, Multiple Remote
Terminals and Chronological Monitoring
at full bus loads.

The ANET3910-EN incorporates full protocol
error injection and detection and allows
the reconstruction and replay of previously
recorded electrical STANAG3910 bus traffic
to the LS/HS databus with excellent
timing accuracy.

All ANET3910-EN modules provide
8 General Purpose Discrete I/O (GPIO)
signals and also offer Trigger-I/O.

The ANET3910-EN module is based on AIM's
latest ▶ **'Common Core'** hardware design
which provides Ethernet and USB interfaces.
The onboard ASP (Application Support
Processor) is running under Linux OS.
This offers a scalable and flexible platform
for hosting various onboard applications.
Per default, the ASP executes the AIM
Network Sever (ANS) for use by customer
applications via the Standard AIM Applica-
tion Programming Interface.

ANET3910-EN Block Diagram

ASP Application Software development
is supported via the standard Ethernet
interface. A cross tool chain for ASP can be
provided and also standard Linux debug-
ging features like GDB are available.

The use of onboard processing and large
memory enables autonomous operation
with minimal interaction with the host PC.

A general purpose USB 2.0 port is available
e.g. for USB memory devices, used by the
onboard OS and onboard applications like
customer specific programs.

An onboard IRIG-B time Encoder/Decoder
is included with sinusoidal output
and 'free-wheeling' mode for time tag
synchronization via the dedicated IRIG-B
Inputs/Outputs.

The physical bus interface provides
programmable bus coupling modes
and variable output amplitude for the
STANAG3838 bus output voltage.
Full function software support for applica-
tion development on Windows and Linux
hosts is delivered with the ANET3910-EN
modules in comprehensive Board Software
Packages (BSP's). The execution of customer
written Python scripts on the Application
Support Processor of the ANET3910-EN is
supported per default. For the development
and execution of onboard customer appli-
cations (written in C/C++), an optional
S/W tool set (ANET-ADK) is available.

The standard PBA.pro™ Databus Test and
Analysis tool for Windows or Linux based
hosts can also be optionally purchased for
use with ANET3910-EN modules.

Bus Controller

The ▶ **ANET3910-EN** provides real time Bus Controller (BC) functions for the dual redundant STANAG3910 LS/HS databus system including data buffer queues for generation of dynamic data functions such as EFAbus Dynamic Tags for LS/HS messages. Key Features of the Bus Controller Mode include:

- Autonomous operation including sequencing of LS Minor/Major Frames
- Acyclic Message Insertion/Deletion
- Programmable BC Retry without host interaction
- Programmable HS Transmitter Initialize Time and HS Receiver Timeout
- Full LS/HS Error Injection down to word and bit level
- Supports EFAbus Message Multiplexing
- Multi-Buffering with Real Time Data Buffer Updates
- Synchronization of BC operation to external Trigger inputs
- LS Bus 4µs Inter Message Gaps

Multiple Remote Terminal

The ANET3910-EN can simulate up to 31 LS/HS Remote Terminals with all sub-addresses each providing individually programmable Response Time. Each HS RT simulates all 128 Message Identifiers (MID). LS/HS RT's can be programmed in 'Mailbox Monitor Mode' for non-simulated RT's. The interface provides data buffer queues allowing the generation of dynamic data functions such as EFAbus Dynamic Tags for LS/HS messages. Key features of the Remote Terminal Simulation Mode include:

- Programmable Response Time for each RT with fast RT Response at 4µs
- Multi-Buffering for each simulated RT, Sub-Address and MID
- Full LS/HS Error Injection for each simulated RT, Sub-Address and MID down to word and bit level
- Programmable and Intelligent Response to Mode Codes
- Multi-Buffering with Real Time Data Buffer Updates
- Multi-Buffering with Real Time Data Buffer

Physical Bus Replay

The ANET3910-EN module can reconstruct previously recorded STANAG3910 data bus traffic to both the LS and HS databus simultaneously with excellent timing accuracy. Recorded data files can be selected for Physical Bus Replay.

The additional capability to disable any or all RT responses from the STANAG3910 replay enables smart systems integration and test to be performed.

Physical Bus Interface

The Physical Bus Interface, which includes the STANAG3838 Transceiver and coupling Network for the LS-Bus, is implemented completely onboard. Both Interfaces are implemented for Dual Redundant operation. The ANET3910-EN also supports both High Speed (HS) and STANAG3838 Low Speed (LS) bus connections including a resistive terminated bus network as well as I/O connections for Triggering and IRIG-B signals. The coupling to an external data bus system is software programmable and provides isolated, transformer, direct or Network coupling, where the last one can be used for the direct connection of a single Terminal (BC/RT). Furthermore, the LS interface provides software programmable, variable output amplitude.

IRIG-B Time Encoder/Decoder

ANET3910-EN modules include an onboard IRIG-B time Encoder/Decoder with a sinusoidal output and 'free-wheeling' mode for time tag synchronization. This allows synchronization over the dedicated IRIG-B Inputs and Outputs of multiple ANET3910-EN cards to one common IRIG-B time input source or to the onboard time code generator of one ANET3910-EN card as the reference for the correlation of data across multiple STANAG3910 streams.

Chronological Bus Monitor

The ANET3910-EN includes a powerful LS/HS Chronological Bus Monitor and analysis function with multiple trigger and programmable capture capabilities. Accurate time tagging of both LS and HS messages, inter message gaps, response time and transmitter initialize time is supported. LS/HS messages are time tagged with a 1µs resolution. LS response time and inter message gaps as well as HS transmitter initialize time are measured down to 0.25µs. Key features of the Chronological Bus Monitor include:

- Multi-Level Complex Sequence Trigger on LS/HS Error, LS/HS Words and LS/HS Data Word in Limits
- Monitor and Bus Traffic Capture with 16MB of Onboard Memory for LS/HS Messages
- Trigger on Start, Centre and End
- LS/HS Message Counters

Trigger-/General Purpose Discrete I/O Signals

The Auxiliary I/O connector provides BC and BM Trigger Inputs and BC and BM Trigger Outputs. Additionally up to 8 user programmable General Purpose Discrete I/O signals are available on this I/O connector. Voltage levels of all trigger signals and General Purpose Discrete I/O's are TTL compatible whereby the General Purpose Discrete I/O's are designed to handle avionics level as well.

Software Support

Comprehensive Driver Software is supplied with the ANET3910-EN module. A full function Application Programming Interface (API) is provided compatible with Windows and Linux. Host applications can be written in C and C++. A LabView VI application interface is also provided (Windows only).

The configuration of the ANET3910-EN is supported via a built-in Web based configuration application, accessible via any standard Web browser. The ANET3910-EN Linux OS on the ASP is pre-configured for the support of Mass Data storage devices at the USB Port and with a Python installation for the execution of Python scripts.

Technical Data

System Interface
10/100/1000Mbit/s IEEE802.3 standard Ethernet interface

Processors
Dual Core RISC Processor @800MHz for HS-BIU and ASP, 400MHz RISC Processor for LS-BIU

Memory
16MB Global RAM, 1GB ASP-RAM and 512MB Flash Memory for ASP

Encoder/Decoder
STANAG3910/STANAG3838 with full error injection and detection capability

Time Tagging
Sinusoidal 46-bit absolute IRIG-B time stamping with 1µs resolution

Trigger I/O
BC/BM Trigger Input and Output lines, TTL compatible on Auxiliary connector

General Purpose Discretes
8 bi-directional Discrete I/O signals on Auxiliary connector

Physical Bus Interface
Dual Redundant Electrical Front End and STANAG3838 Front End with variable output amplitude and programmable bus coupling modes

Ethernet
RJ-45 female standard Ethernet connector

Auxiliary I/O
15-pin High-Density D-Sub connector for Discrete I/O, IRIG-B and Trigger signals

DC Power
DC low voltage power jack connector

USB Port
USB 2.0 Type A connector

Power Supply
9-12VDC input (external power adaptor included 110V-240VAC, 50-60Hz)

Dimensions
120mm x 180mm x 26mm

Power Consumption
Typical 9W @12VDC (@50% Busload)

Operating Temp. Range
Standard Temperature Range:
0°C to 50°C
Extended Temperature Range:
-15°C to +60°C

Storage Temperature
-40°C to +85°C

Humidity
0 to 95% non-condensing

Ordering Information

ANET3910-EN
Single Stream, Standard Ethernet to STANAG3910 Interface: BC, Multi RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Encoder/Decoder, 8 General Purpose Discrete I/O's, BC/BM Trigger-I/O, 16MB Global RAM, 1GB ASP RAM, 1x USB 2.0 General Purpose Port

ANET-ADK
ANET onboard Software Development Kit including documentation, samples and tool chain; requires Linux based development platform

ACB-HD15-1
Ready Made Adapter Cable (2.0m): From 15-pin HD-Sub to 2 Twinax Connectors PL-75 for all variants of ANET3910-EN cards

---

▶ **AIM Office Contacts:**

AIM GmbH
Sasbacher Str. 2
D-79111 Freiburg / Germany
Phone +49 (0)761 4 52 29-0
Fax   +49 (0)761 4 52 29-33
sales@aim-online.com

AIM GmbH – Munich Sales Office
Terofalstr. 23a
D-80689 München / Germany
Phone +49 (0)89 70 92 92-92
Fax   +49 (0)89 70 92 92-94
salesgermany@aim-online.com

AIM UK Office
Cressex Enterprise Centre, Lincoln Rd.
High Wycombe, Bucks. HP12 3RB / UK
Phone +44 (0)1494-446844
Fax   +44 (0)1494-449324
salesuk@aim-online.com

AIM USA LLC
Seven Neshaminy Interplex
Suite 211 Trevose, PA 19053
Phone 267-982-2600
Fax   215-645-1580
sales@aim-online.us