

CAN-XL Evaluation Board

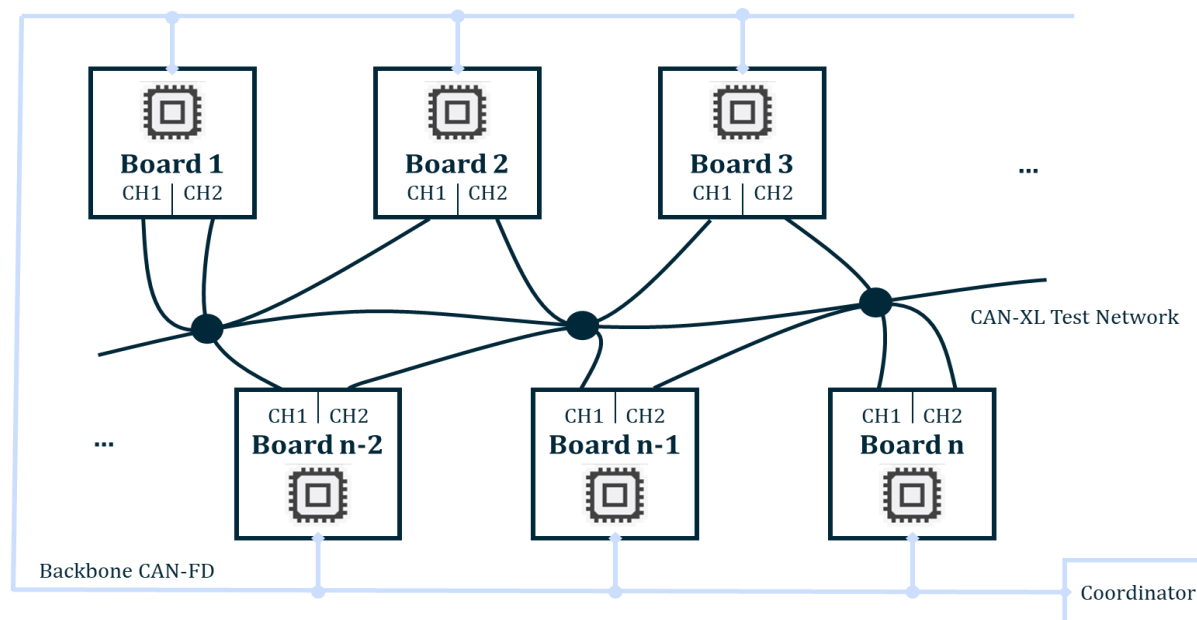
Bosch, NXP Semiconductors, Volkswagen AG, C&S group GmbH

Overview

CAN-XL Evaluation Boards

Overview and Scope

- DE1-SoC (Terasic) FPGA board includes the latest Bosch CAN-XL IP
- Every board includes two CAN-XL test interfaces and one CAN-FD interface for optional control and configuration via coordinator SW
- A total of 31 CAN-XL Evaluation Boards can be used in one network



Semiconductor
Manufacturers

Integrate and test your PMA device
in different environmental and
configuration conditions.



OEMs

Try out the CAN-XL technology
from ground up: create your
requirements for series car
integration up to series car network
approval.



Measurement Equipment
Manufacturers

Develop your products with the
help of the CAN-XL Evaluation
Board to fit CAN-XL analysis.



Universities and
Research Groups

Use our CAN-XL Evaluation
Board for research and
education.

CAN-XL Evaluation Boards

FPGA and Adapter Board

Transmitting CAN-XL messages according to free configurable scheduler or default setup after start-up

Fully configurable CAN-XL capabilities provided by BOSCH's CAN-XL IP

- bit timing
- frame length
- data rates
- MICI (if provided by used PMAs)

CAN-XL Channel 2
incl. loop through

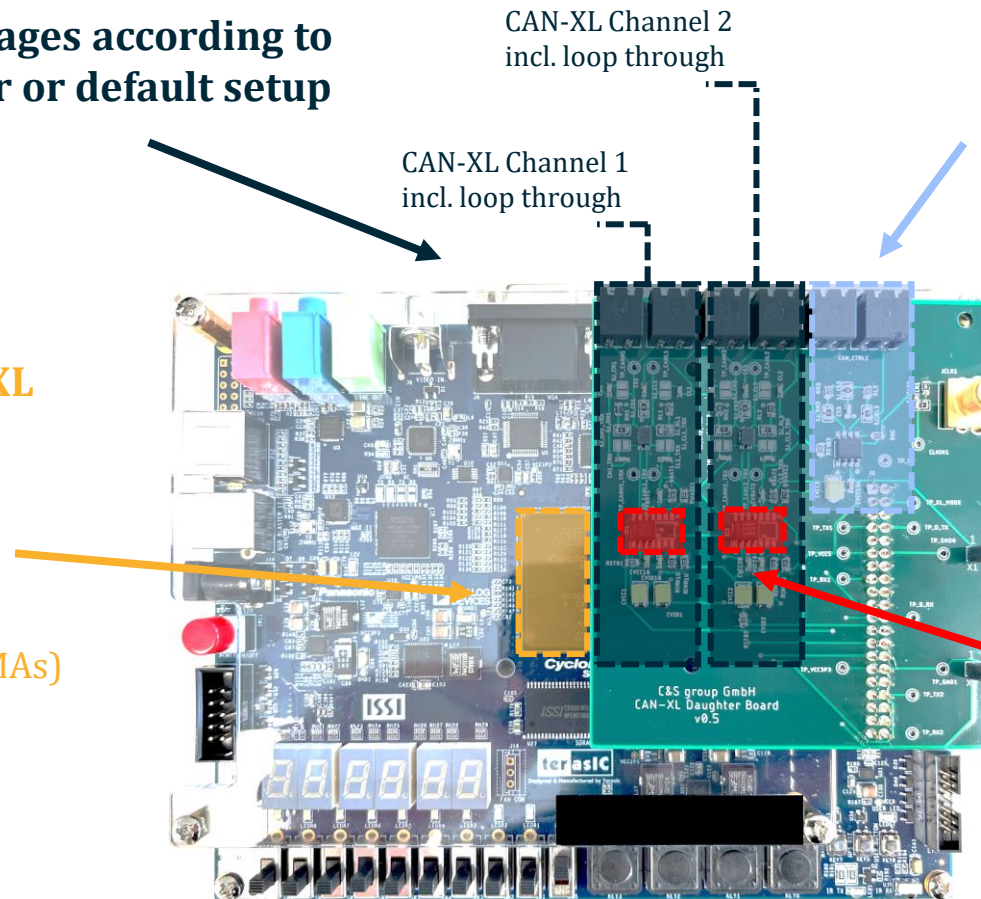
CAN-XL Channel 1
incl. loop through

Coordinator is connected via CAN-FD interfaces from Vector or Peak

Changeable PMA adapter

- PMA implementation with up to 14 pin footprint
- CAN-XL hardware interface (e.g., CMC, termination, ESD)

PMA implementation provided by NXP



CAN-XL Evaluation Boards

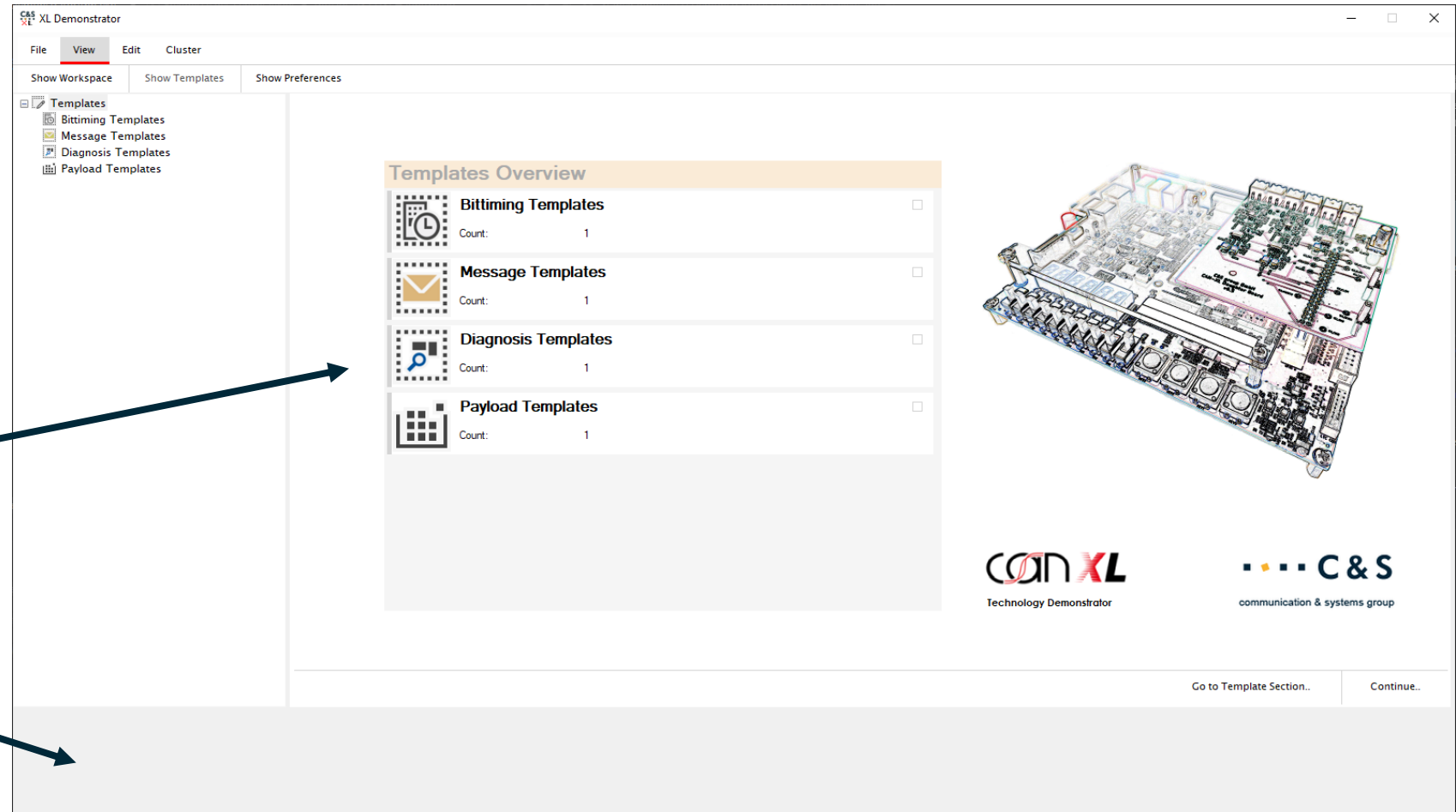
Coordinator Software - General

Easy to use GUI with full control over attached interfaces

CAN-XL raw system diagnosis

- Evaluation Board
- PMA diagnosis

Software Log



CAN-XL Evaluation Boards

Coordinator Software – Status and Statistics

Exchange of workspaces

- topology setups
- CAN-XL configurations

Communication statistics

- protocol events
- error counter
- bus load
- transmitted/received messages

The screenshot shows the 'CAN-XL Demonstrator' application window. The left sidebar contains a tree view of the workspace configuration, including 'Test Board Channels', 'Bit Timing Generators', 'Message Generators', and 'Register Access Generators'. The main area is titled 'Workspace Cluster Statistics' and contains two sections: 'Test Execution - Per Node Channel Statistics' and 'Test Execution - Summary'.

Node	Node ID	Channel	Node State	CAN XL IP	Firmware	Frames Sent	Frames Received	TEC	REC
Node 01 - Channel 0	1	0	Online (error-active)	Release 0.4.0, Date 202...	2021-09-15	74503	475685	0	0
Node 01 - Channel 1	1	1	Online (error-active)	Release 0.4.0, Date 202...	2021-09-15	74503	475685	0	0
Node 02 - Channel 0	2	0	Online (error-active)	Release 0.4.0, Date 202...	2021-09-15	200576	349600	0	0
Node 02 - Channel 1	2	1	Online (error-active)	Release 0.4.0, Date 202...	2021-09-15	200590	349600	0	0

Test Execution - Summary	
Overall Test Run Time	03:11:01
Testsystem Synchronisation State	Cluster connected
Overall RX Error Counter	0
Overall TX Confirmations	550172
Overall TX Error Counter	0
Overall RX Indications	1650570
CAN Bus Load (average value for 1000 ms)	17.6 %

At the bottom, there is an event log with the following entries:

Event	Timestamp	Message
Information	11/24/2021 11:37:50	Application is ready.
Information	11/24/2021 11:38:13	Preferences saved.
Information	11/24/2021 11:39:01	Cluster started.
Information	11/24/2021 14:49:41	Cluster stopped.
Information	11/24/2021 14:56:19	Cluster started.

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Coordinator Software – Bit Timing and Messages

Message Generator Instance Configuration

Message Structure		Message Transmission	
Frame Format	CAN XL	Enable Transmit	Yes
Message Base ID [hex]	200	Cycle Time [ms]	1000
Message ID Offset <small>(incremental per attached Node)</small>	1	Number of Burst Repetitions <small>(set to zero if no burst requested)</small>	0
Identifier Extension (IDE)	No	Individual Message IDs (combined from Base ID and Offset)	
Bit Rate Switch (BRS)	Yes	Node	Node State
Data Length Code (DLC)	2047	Node 01 - Channel 0	Message ID
SDU Type (SDT)	0	Node 01 - Channel 1	200h
Virtual CAN Network ID (VCID)	0		201h
Acceptance Field (AF)	0		
Simple Extended Content (SEC)	No		

Payload Data	
Length resulting from DLC [bytes]	2048
Bit Pattern in Data Field	All Bits 0
Custom Byte Pattern Placement	Begin of Data
Custom Byte Pattern [hex] <small>(could be 0 up to 32 bytes)</small>	

Message Configuration

Bit Timing Configuration

Bit Timing Configuration / Read Overview

Target Configuration to set

Global

Frame Format	CAN XL
CAN Clock Source	Internal Clock 100 MHz
External Clock [MHz]	40
Retransmissions	unlimited
BRP	1
Enable TDC	Yes

Arbitration Phase

Prop Segment [TQ]	119	Bit Rate [Mbit/s]	0.5
Phase Segment 1 [TQ]	40	Bit Time [ns]	2000
Phase Segment 2 [TQ]	40	NTQ	200
SJW [TQ]	40	TQ [ns]	10
Sampling Point [%]		80	

CAN FD Data Phase

Prop Segment [TQ]	25	Bit Rate [Mbit/s]	2
Phase Segment 1 [TQ]	12	Bit Time [ns]	500
Phase Segment 2 [TQ]	12	NTQ	50
SJW [TQ]	12	TQ [ns]	10
Sampling Point [%]		76	
TDC Offset [mTQ]	38		

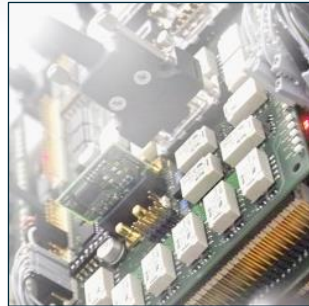
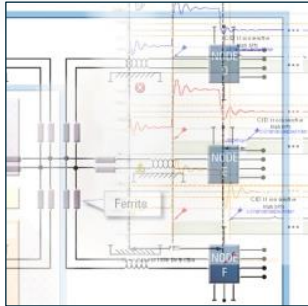
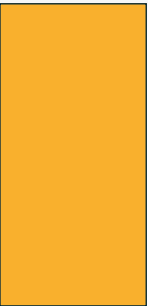
CAN XL Data Phase

Prop Segment [TQ]	5	Bit Rate [Mbit/s]	10
Phase Segment 1 [TQ]	2	Bit Time [ns]	100
Phase Segment 2 [TQ]	2	NTQ	10
SJW [TQ]	1	TQ [ns]	10
Sampling Point [%]		80	
TDC Offset [mTQ]	0		
TRX Mode Switching	Yes	Error Signaling	No
PWME Offset [mTQ]	0	PWME Short Phase [TQ]	3
PWME Long Phase [TQ]		7	

CAN-XL Evaluation Boards

Pricing and Shipment

- Boards in stock needs 1 week + shipment and customs for the delivery
- Boards out of stock needs further up to 4 weeks
- List price can be requested via support@cs-group.de



Our Tests, your Safety!

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