



Lynxtester



GenerationRFID
EOL Test & Embedded Electronics



LYNXICT

**CAN controlled Solid State Relay Test
Board for functional EOL testers**

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LynxICT

CAN controlled Solid State Relay Test Board for functional EOL testers

1. GENERAL DESCRIPTION

The **LynxICT** is a solid-state relay-based test board designed for EOL testing of electronic products.

It provides **50 independent test channels** to connect DUT pins to both common lines (BK+ and BK-) and **external stimulus**. Each DUT pin is routed through two solid-state relays, enabling flexible switching as illustrated in Figure 1.

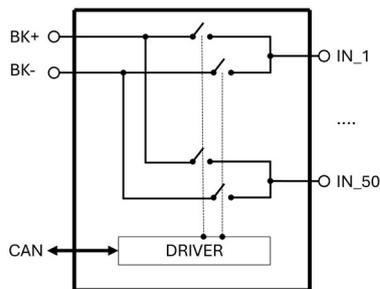


Figure 1. LynxICT functional Block Diagram

When connected to DMM measuring lines, the platform allows monitoring of multiple physical variables, such as voltages, resistances, capacitances, inductances, or frequencies, depending on the DMM capabilities. It is also designed to switch external stimulus into DUT pins.

The design ensures reliable and isolated distribution of signals and power rails, making it suitable for demanding testing and automation environments.

Each channel can be individually activated or deactivated, providing maximum flexibility for configuring test benches, switching external devices, or integrating into industrial processes.

The LynxICT is controlled via CAN bus, or via Ethernet when integrated within the Lynx Chassis

2. FEATURES

Board size: 293 × 100 mm (stackable board for 3U, 19" subracks).

Scalability: expandable when combined with Lynx backplanes

Compatibility: fully integrated with Lynx Tester Scheduler software

Number of channels: 50 independent test channels, each implemented with two solid-state relays.

Connector Type: female DB50.

Communications:

- CAN bus when used standalone.
- Ethernet when connected through a Lynx Chassis.

Status indicators (LEDs):

- **Blue:** General status (Power/OK).
- **Green:** CAN activity.
- **Red:** Error or fault indication red.

Power supply: 12 V DC.

Connectors:

- DB50 connector for the 50 relay outputs.
- DIN connector (Backplane) for power supply, CAN bus, and synchronization (SYNC).

Application highlights:

- Industrial automation – remote control and distribution of power or signals in manufacturing environments.
- Signal multiplexing – selective routing of digital or analog signals to measurement instruments.
- System integration – scalable control solution when combined with Lynx Chassis and LynxTester software.
- Remote device management – activation or deactivation of external circuits via CAN commands

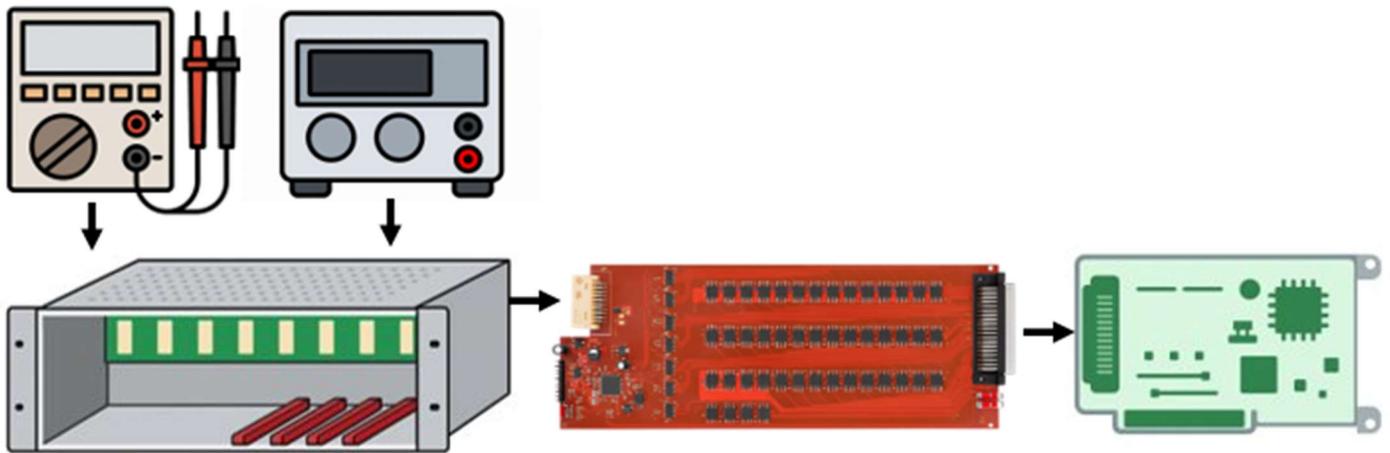
4. TERMINOLOGY

VSUPPLY – Supply rail for Lynx boards.
VDUT – DUT backline supply rail.
DMM – Digital Multimeter.
ICT – In-Circuit Test.
EOL – End-of-Line.
CAN – Controller Area Network.
RJ45 – Standard Ethernet connector.
Slot – Connector for Lynx daughter boards (×10).
Backline – Shared distribution bus for DUT supply and measurement.
Gateway – Internal converter between Ethernet (host) and CAN (test boards).
Scheduler – Lynx Tester software used to configure and execute test sequences.
SYNC – Synchronization line shared among boards.
BL1 / BL2 – Backline signal pairs distributed across the backplane.
Host – PC or controller that communicates with the chassis.

5. APPLICATION SETUPS

5.1. Low-Cost ICT

All control boards require a verification of the correct component soldered values. However, some projects do not justify high investment. LynxICT can measure physical variables of the DUT by connecting the Test Points to a DMM or any other test equipment. Therefore, variables such as Voltage drop, Resistance, Impedance, Capacitance or Frequency can be measured.



6. ELECTRICAL SPECIFICATIONS

6.1. Recommended operating conditions

PARAMETER	NOTES	SYMBOL	MIN	TYP	MAX	UNIT
Supply voltage (nominal)	Input via backplane or external	V_{IN}	8	12	24	V
Current consumption	All relays OFF, 12 V supplied	I_{IDLE}		380		mA
On-resistance (DC only)	$I_F = 10 \text{ mA}$, $I_L = 2 \text{ A}$	R_{ON}		0.05	0.07	Ω
Turn-on time	$I_F = 10 \text{ mA}$, $V_L = 5 \text{ V}$, $I_L = 1 \text{ A}$	t_{ON}	370		550	μs
Turn-off time	$I_F = 10 \text{ mA}$, $V_L = 5 \text{ V}$, $I_L = 1 \text{ A}$	t_{OFF}	18		50	μs
Relay activation latency (UDS → ON)	Command reception to actuation	t_{UDS}			750	μs
Operating temperature	Industrial grade	T_{AMB}	0		+70	$^{\circ}\text{C}$

Table 1. Electrical characteristics

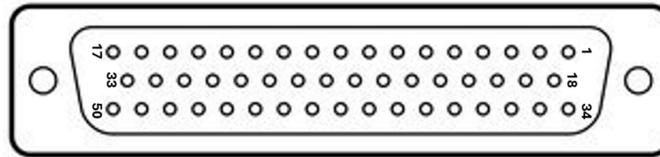
6.2. Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
DC or peak AC load voltage*	V_L	45	V
Load current (DC only)*	I_L	1000	mA

Table 2. Absolute Maximum Ratings

7. PINOUT

7.1. DUT connector Interface



PIN	NAME	TO BK+		TO BK-		PIN	NAME	TO BK+		TO BK-	
		Relay	Code	Relay	Code			Relay	Code	Relay	Code
1	IN_1	RL_1	0x01h	RL_51	0x33h	26	IN_26	RL_26	0x1Ah	RL_76	0x4Ch
2	IN_2	RL_2	0x02h	RL_52	0x34h	27	IN_27	RL_27	0x1Bh	RL_77	0x4Dh
3	IN_3	RL_3	0x03h	RL_53	0x35h	28	IN_28	RL_28	0x1Ch	RL_78	0x4Eh
4	IN_4	RL_4	0x04h	RL_54	0x36h	29	IN_29	RL_29	0x1Dh	RL_79	0x4Fh
5	IN_5	RL_5	0x05h	RL_55	0x37h	30	IN_30	RL_30	0x1Eh	RL_80	0x50h
6	IN_6	RL_6	0x06h	RL_56	0x38h	31	IN_31	RL_31	0x1Fh	RL_81	0x51h
7	IN_7	RL_7	0x07h	RL_57	0x39h	32	IN_32	RL_32	0x20h	RL_82	0x52h
8	IN_8	RL_8	0x08h	RL_58	0x3Ah	33	IN_33	RL_33	0x21h	RL_83	0x53h
9	IN_9	RL_9	0x09h	RL_59	0x3Bh	34	IN_34	RL_34	0x22h	RL_84	0x54h
10	IN_10	RL_10	0x0Ah	RL_60	0x3Ch	35	IN_35	RL_35	0x23h	RL_85	0x55h
11	IN_11	RL_11	0x0Bh	RL_61	0x3Dh	36	IN_36	RL_36	0x24h	RL_86	0x56h
12	IN_12	RL_12	0x0Ch	RL_62	0x3Eh	37	IN_37	RL_37	0x25h	RL_87	0x57h
13	IN_13	RL_13	0x0Dh	RL_63	0x3Fh	38	IN_38	RL_38	0x26h	RL_88	0x58h
14	IN_14	RL_14	0x0Eh	RL_64	0x40h	39	IN_39	RL_39	0x27h	RL_89	0x59h
15	IN_15	RL_15	0x0Fh	RL_65	0x41h	40	IN_40	RL_40	0x28h	RL_90	0x5Ah
16	IN_16	RL_16	0x10h	RL_66	0x42h	41	IN_41	RL_41	0x29h	RL_91	0x5Bh
17	IN_17	RL_17	0x11h	RL_67	0x43h	42	IN_42	RL_42	0x2Ah	RL_92	0x5Ch
18	IN_18	RL_18	0x12h	RL_68	0x44h	43	IN_43	RL_43	0x2Bh	RL_93	0x5Dh
19	IN_19	RL_19	0x13h	RL_69	0x45h	44	IN_44	RL_44	0x2Ch	RL_94	0x5Eh
20	IN_20	RL_20	0x14h	RL_70	0x46h	45	IN_45	RL_45	0x2Dh	RL_95	0x5Fh
21	IN_21	RL_21	0x15h	RL_71	0x47h	46	IN_46	RL_46	0x2Eh	RL_96	0x60h
22	IN_22	RL_22	0x16h	RL_72	0x48h	47	IN_47	RL_47	0x2Fh	RL_97	0x61h
23	IN_23	RL_23	0x17h	RL_73	0x49h	48	IN_48	RL_48	0x30h	RL_98	0x62h
24	IN_24	RL_24	0x18h	RL_74	0x4Ah	49	IN_49	RL_49	0x31h	RL_99	0x63h
25	IN_25	RL_25	0x19h	RL_75	0x4Bh	50	IN_50	RL_50	0x32h	RL_100	0x64h

7.2. Backplane Connector

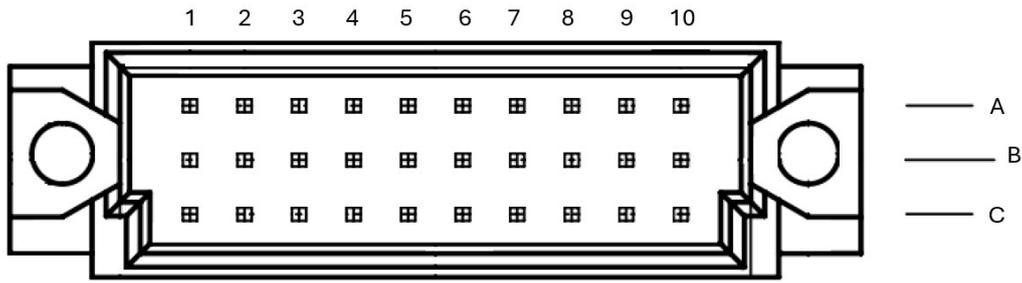


Figure 2. Backplane Connector Pinout

PINS	NAME	DESCRIPTION
A1	CAN_L	CAN Lo bus line
B1	CAN_H	CAN Hi bus line
C1, A2, B2, A9, B9, C9, A10, B10, C10	-	Not connected
C2	SYNC	Reserved for future use
A3, B3, C3	GND_control	Ground reference for the PS of the Lynx control boards
A4, B4, C4	PS_control	Power supply for the Lynx control boards
A5, B5, C5	GND_DUT	Ground reference for the PS of the DUT
A6, B6, C6	PS_DUT	Power supply for the DUT
A7, B7, C7	BK-	Connection to the measurement equipment, positive
A8, B8, C8	BK+	Connection to the measurement equipment, negative

8. DID LIST

8.1. Configuration

For all the frames, these parameters must be considered:

- **CAN Baudrate** = 500 Kbps
- **CAN-ID**
 - TX Frame = 1000 + (SERIAL % 100)
 - RX Frame = 1100 + (SERIAL % 100)
- **CAN FRAME LENGTH** = 0x08

8.2. Read Data Diagnostic List

DID	Name
0xF702	Get Relays State
0xF195	Read Software Version
0xF193	Read Hardware Version
0xF182	Read Product ID
0xF181	Read Product Name
0xF18C	Read Serial Number

8.3. GET RELAYS STATE

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F7	02	-	-	-	-

- **LENGTH** (1 byte): 0x03 = 3 bytes frame length
- **SERVICE** (1 byte): 0x22 = Read Data Service
- **DID** (2 bytes): 0xF702 = Get Relays State

RECEIVED FRAME

SF INDEX	LENGTH	SERVICE	DID		BUFOUT		
10	1C	62	F7	02	RS (0-3)	RS (4-7)	RS (8-11)
SF INDEX	BUFOUT						
21	RS (12-15)	RS (16-19)	RS (20-23)	RS (24-27)	RS (28-31)	RS (32-35)	RS (36-39)
SF INDEX	BUFOUT						
22	RS (40-43)	RS (44-47)	RS (48-51)	RS (52-55)	RS (56-59)	RS (60-63)	RS (64-67)
SF INDEX	BUFOUT						
23	RS (68-71)	RS (72-75)	RS (76-79)	RS (80-83)	RS (84-87)	RS (88-91)	RS (92-95)
SF INDEX	BUFOUT						
24	RS (96-99)	-	-	-	-	-	-

- SF INDEX (4 bytes): Sequential Frames Index
 - 0x10 = First frame index
 - 0x21 = Second frame index
 - 0x22 = Third frame index
 - 0x23 = Fourth frame index
 - 0x24 = Fifth frame index
- LENGTH (1 byte): 0x1C = 28 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF702 = Get Relays State
- BUFOUT (25 bytes): Relay State (RS, 2 bits per relay)
 - 0b11 = OFF
 - 0b10 = ON

8.3.1. Read Software Version
SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F1	95	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x22 = Read Data Service
- DID (2 bytes): 0xF195 = Read Software Version

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
07	62	F1	95	SwVer [0]	SwVer [1]	SwVer [2]	SwVer [3]

- LENGTH (1 byte): 0x07 = 7 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF195 = Read Software Version
- 0 (4 bytes): Software Version

8.3.2. Read Hardware Version
SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F1	93	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length

- SERVICE (1 byte): 0x22 = Read Data Service
- DID (2 bytes): 0xF193 = Read Hardware Version

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
07	62	F1	93	HwVer [0]	HwVer [1]	HwVer [2]	HwVer [3]

- LENGTH (1 byte): 0x07 = 7 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF193 = Read Hardware Version
- BUFOUT (4 bytes): Hardware Version

8.3.3. Read Product Id

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F1	82	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x22 = Read Data Service
- DID (2 bytes): 0xF182 = Read Product ID

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
07	62	F1	82	ProdID[0]	ProdID[1]	ProdID[2]	ProdID[3]

- LENGTH (1 byte): 0x07 = 7 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF182 = Read Product ID
- BUFOUT (4 bytes): Product ID

8.3.4. Read Product Name

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F1	81	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x22 = Read Data Service
- DID (2 bytes): 0xF181 = Read Product Name

RECEIVED FRAME

SF INDEX	LENGTH	SERVICE	DID		BUFOUT		
10	17	62	F1	81	char1	char2	char3
SF INDEX	BUFOUT						
21	char4	char5	char6	char7	char8	char9	char10
SF INDEX	BUFOUT						
22	char11	char12	char13	char14	char15	char16	char17
SF INDEX	BUFOUT						
23	char18	char19	char20	-	-	-	-

- SF INDEX (4 bytes): Sequential Frames Index
 - 0x10 = First frame index
 - 0x21 = Second frame index

- 0x22 = Third frame index
- 0x23 = Fourth frame index
- LENGTH (1 byte): 0x17 = 23 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF181 = Read Product Name
- BUFOUT (25 bytes): Product Name

8.3.5. Read Serial Number

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	22	F1	8C	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x22 = Read Data Service
- DID (2 bytes): 0xF18C = Read Serial Number

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
07	62	F1	8C	SerNum[0]	SerNum[1]	SerNum[2]	SerNum[3]

- LENGTH (1 byte): 0x07 = 7 bytes frame length
- SERVICE (1 byte): 0x62 = Read Data Service OK
- DID (2 bytes): 0xF18C = Read Serial Number
- BUFOUT (4 bytes): Serial Number

8.4. Write Data Diagnostic List

DID	NAME
0xF701	Enable Relay
0xF700	Disable Relay
0xF703	Disable All Relays
0xF709	Enable / Disable Watchdog
0xF70A	Refresh Watchdog
0xF705	Set Serial Number
0xF606	Set Product Name
0xF704	Set Hardware Version
0xF601	CAN enable configuration of the serial
0xF603	CAN configuration of the serial

Table 3. Write Data DID List

8.4.1. Enable Relay

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
04	2E	F7	01	RelayIndex	-	-	-

- LENGTH (1 byte): 0x04 = 4 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- Did (2 BYTES): 0xF701 = Enable Relay
- BUFIN (1 bytes): 0xF18C = RelayIndex in Hex Format (from 0x01-0x64)

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	01	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length

- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF701 = Enable Relay

8.4.2. Disable Relay

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
04	2E	F7	00	RelayIndex	-	-	-

- LENGTH (1 byte): 0x04 = 4 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF700 = Disable Relay
- BUFIN (1 byte): RelayIndex in Hex Format (from 0x01-0x64)

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	00	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF700 = Disable Relay

8.4.3. Disable All Relays

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	2E	F7	03	RelayIndex	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF703 = Disable All Relays

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	03	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF703 = Disable All Relays

8.4.4. Enable/Disable Watchdog

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
04	2E	F7	09	En/Dis	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF709 = Enable/Disable Watchdog
- BUFIN (1 byte):
 - 0x00 = Disable Watchdog
 - 0x01 = Enable Watchdog

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	09	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF709 = Enable/Disable Watchdog

8.4.5. Refresh Watchdog
SENT FRAME

LENGTH	SERVICE	DID		BUFIN		
04	2E	F7	0A	AA	-	-

- LENGTH (1 byte): 0x04 = 4 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF70A = Refresh Watchdog
- BUFIN (1 byte): 0xAA = Key

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	0A	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF70A = Refresh Watchdog

8.4.6. Set Serial Number
SENT FRAME

SF INDEX	LENGTH	SERVICE	DID		BUFIN		
10	0B	2E	F7	05	Pw[31:24]	Pw[23:16]	Pw[15:8]
SF INDEX	BUFIN						
21	Pw[7:0]	Ser[31:24]	Ser[23:16]	Ser[15:8]	Ser[7:0]	-	-

- SF INDEX (2 bytes): Sequential Frames Index
 - 0x10 = First frame index
 - 0x21 = Second frame index
- LENGTH (1 byte): 0x0B = 11 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF705 = Set Serial Number
- BUFIN (8 bytes):
 - Password (4 bytes) (always 0xAA 0x55 0x99 0x66)
 - Serial Number (4 bytes)

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	05	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF705 = Set Serial Number

8.4.7. Set Product Name

SENT FRAME

SF INDEX	LENGTH	SERVICE	DID		BUFIN		
10	17	2E	F6	06	PN1	PN2	PN3
SF INDEX	BUFIN						
21	PN4	PN5	PN6	PN7	PN8	PN9	PN10
SF INDEX	BUFIN						
22	PN11	PN12	PN13	PN14	PN15	PN16	PN17
SF INDEX	BUFIN						
23	PN18	PN19	PN20	-	-	-	-

- SF INDEX (2 bytes): Sequential Frames Index
 - 0x10 = First frame index
 - 0x21 = Second frame index
 - 0x22 = Third frame index
 - 0x23 = Fourth frame index
- LENGTH (1 byte): 0x17 = 23 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF606 = Set Product Name
- BUFIN (20 bytes): Product Name (20 characters)

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F6	06	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF606 = Set Product Name

8.4.8. Set Hardware Version

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
04	2E	F7	04	Hw[31:24]	Hw[23:16]	Hw[15:8]	Hw[7:0]

- LENGTH (1 byte): 0x07 = 7 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF704 = Set Hardware Version
- BUFIN (4 byte): Hardware Version

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F7	04	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF704 = Set Hardware Version

8.4.9. Can Enable Configuration Of The Serial

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	2E	F6	01	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF601 = CAN enable configuration of the serial

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F6	01	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF601 = CAN enable configuration of the serial

8.4.10. Can Configuration Of The Serial

SENT FRAME

LENGTH	SERVICE	DID		BUFIN			
03	2E	F6	03	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x2E = Write Data Service
- DID (2 bytes): 0xF603 = CAN configuration of the serial

RECEIVED FRAME

LENGTH	SERVICE	DID		BUFOUT			
03	6E	F6	03	-	-	-	-

- LENGTH (1 byte): 0x03 = 3 bytes frame length
- SERVICE (1 byte): 0x6E = Write Data Service OK
- DID (2 bytes): 0xF603 = CAN enable of the serial

9. OTHER RELEVANT CHARACTERISTICS

9.1. Watchdog functionality

The LynxICT includes a configurable watchdog mechanism to ensure safe operation. When enabled, the watchdog requires the user to send refresh frames within the configured timeout period.

9.1.1. Fall-safe behavior

- If no refresh frame is received within 10 seconds, all relays are automatically deactivated.
- The blue status LED turns off, and the red error LED turns on.
- A diagnostic flag (Timeout Expired) is raised.

9.2. Control via CAN (UDS service 0x2E)

DID (hex)	COMMAND	DESCRIPTION	EXAMPLE
0xF709	Enable / Disable Watchdog	Activates or deactivates the watchdog function.	04 2E F7 09 01 → Enable 04 2E F7 09 00 → Disable
0xF70A	Refresh Watchdog	Must be sent periodically (≤ 10 s).	04 2E F7 0A AA

9.2.1. Operation summary

- **Enable** the watchdog (DID 0xF709).
- Send **refresh frames** (DID 0xF70A) at intervals shorter than 10 seconds.
- If refresh is not received within the timeout, the system enters the fail-safe state.

This mechanism prevents uncontrolled relay activation in case of communication loss, software malfunction, or operator inaction.

9.3. LEDs Manage

LynxICT includes three status LEDs that provide quick visual feedback on system operation:

COLOR	INDICATES
Blue	Power ON (board ready)
Green	Reception of CAN frames (blinks 3 times per frame)
Red	Watchdog timeout (fail-safe state)

9.4. Relay Command Behavior

After receiving relay control commands, the board executes the following sequence:

1. Load commands
 - The requested relay switching operations are performed.
2. Reset watchdog
 - The watchdog timer is refreshed to avoid timeout.
3. Update LEDs
 - Current status is indicated via LEDs:
 - Red OFF
 - Blue ON

9.5. Can Identifier Configuration

Each LynxICT device generates its communication identifiers (CAN IDs) based on the assigned Serial Number.

ID generation rule:

- **Transmit ID (Tx):** $1000 + (\text{Serial Number} \% 100)$
- **Receive ID (Rx):** $1000 + (\text{Serial Number} \% 100)$

This mechanism guarantees that each device has a unique CAN identifier set, avoiding collisions when multiple boards are used in the same system.

Whenever the **Serial Number** is changed, the CAN ID configuration must be updated accordingly and stored in non-volatile memory (NVM).

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