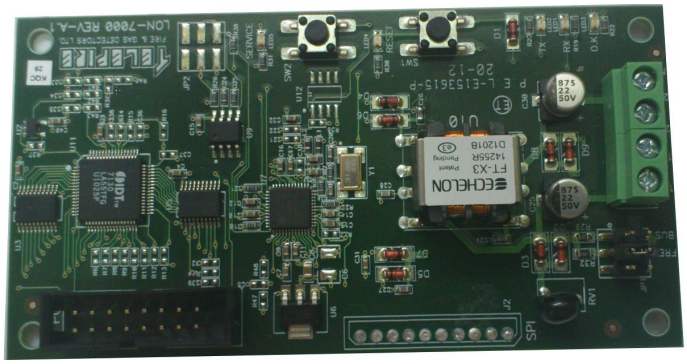
LON-7000 / LON-3000

TELEFIRE

LON-7000 / LON-3000

Network Communication Module

Technical Manual



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LON-X000En115.pdf

Revision 1.17
August 2023

Compatibility

This manual refers to equipment with the following prerequisites:
ADR-7000/3000 Software revision ..... 3.02Q or higher

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Note

The terms “**Trouble**” as used in NFPA 72 guideline and UL standards and “**Fault**” as used in EN 54 standards are used interchangeably throughout this manual.

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Note

Do not install, operate, and maintain this product before fully reading this manual.

 August 2023 Revision 1.1

1 Introduction

The LON-7000 / LON-3000 (LON-X000) allow the networking of several addressable control panels. The network can consist of between 2 and 32 control panels connected via LON-X000 modules and a twisted pair cable. Each control panel on the network requires its own LON-X000 module.

The use of LON-X000 enables expanding the capacity of the addressable control panel beyond 508 addresses. The control panels may be configured in a peer-to-peer or master /slave connection. All the control panels in a network operate as a single integrated system that is able to monitor' display, and control the entire system, including conditional activation matrices amongst all devices in the network. The rights can be configured through the programming menu.

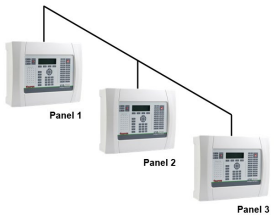

Figure 1 Three node network

Additionally, it is possible to connect up to 10 LON-X000 modules in a fiber-optic redundant ring topology.

Please refer to the control panel's technical manual for additional details about system programming and configuration.

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Note

Ensure that all ADR-7000/3000 control panels and all LON-X000 modules have the latest software versions.

2 Topology

The network can be wired in either of two topologies:

2.1 Bus Topology

A connection in which the control panels are connected along the length of a single bus.

When implementing this topology, set jumper (JP1) on the LON-X000 modules at both ends of the bus to BUS Mode.

The JP1 jumper on all the other control panels should be removed.

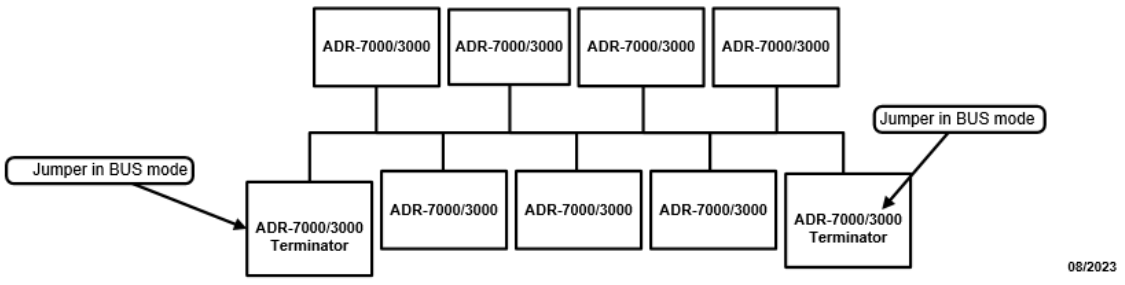

Figure 2 Bus Topology

2.2 Star Topology

When implementing this topology, install one control panel in a central location and set the termination JP1 jumper on the LON-X000 to FREE mode. The JP1 jumpers on the remaining control panels should be removed.

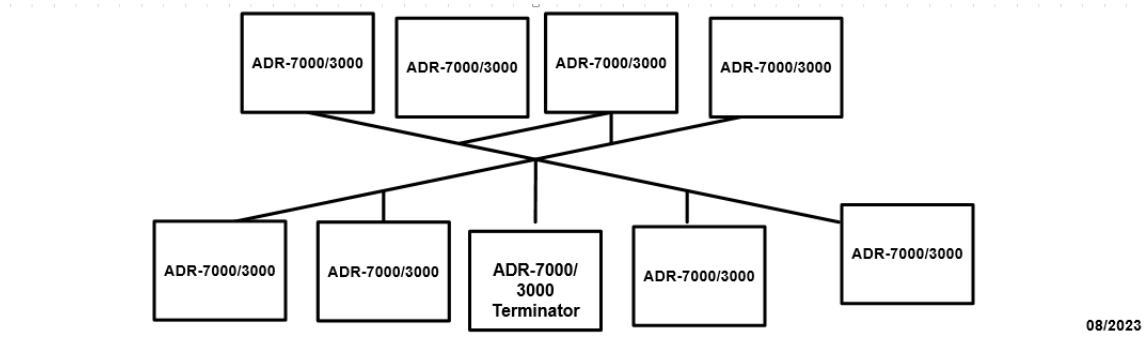

Figure 3 Star Topology

2.3 Ring Topology

When implementing this topology, set the termination on one control panel to FREE mode. The JP1 jumpers on the remaining control panels should be removed.

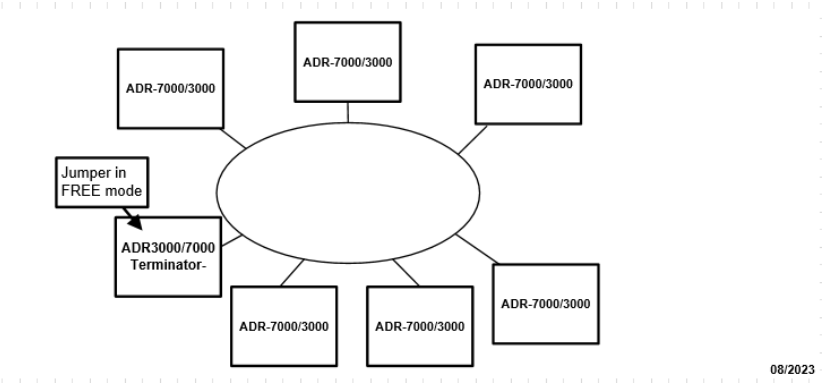

Figure 4 Ring Topology

2.4 Mixed Topology

When implementing this topology, install one control panel in a central location and set the termination JP1 jumper on the LON-X000 to FREE mode. The JP1 jumpers on the remaining control panels should be removed.

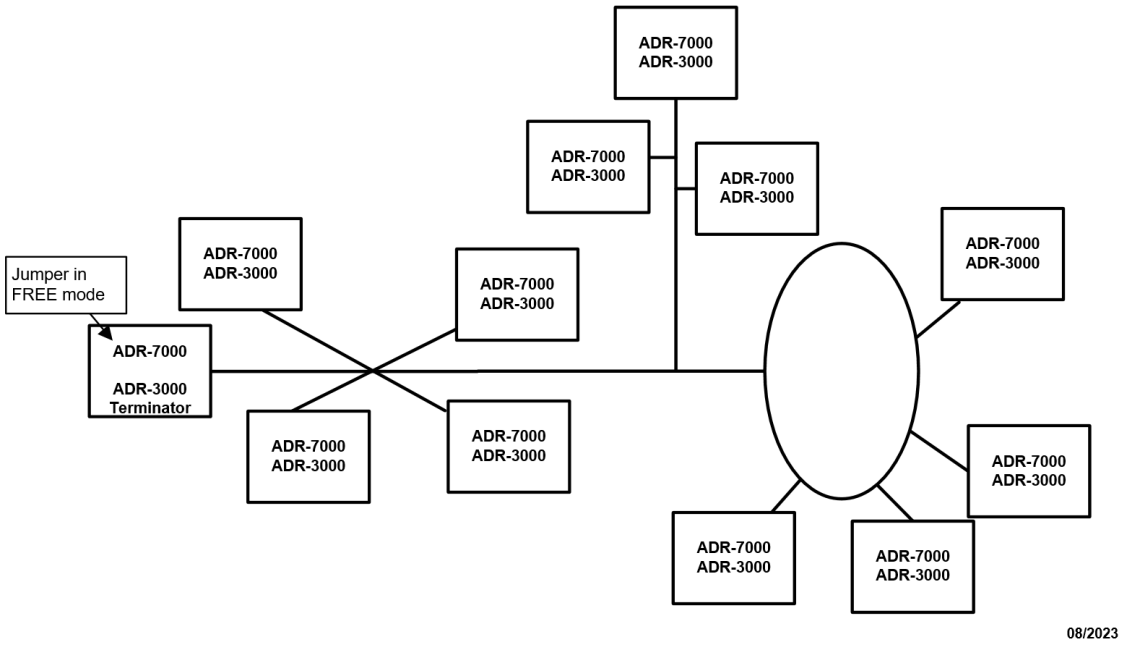

Figure 5 Mixed Topology

3 Installation

3.1 Board Location and Features

Set termination jumpers according to Table 2. Connect the LON wires to other control panels to J2 on the LON-3000 module. The LonWorks network cabling is polarity insignificant.

Please refer to the ADR-7000/3000 technical manual for further information on configuring ADR-7000/3000 control panels.

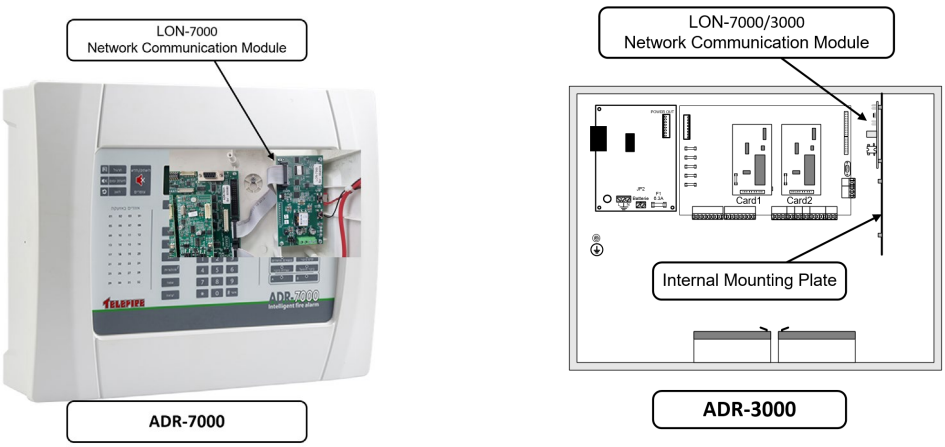

Figure 6 LON-x000 Network Communication Module

3.1.1 On Board LEDs:

LON-3000	LON-7000	
D1 Service	Service	Constantly on during a malfunction
D2 Send	TX	Flashes when a signal is sent from the hub

LON-3000	LON-7000	
D14 Receive	RX	Flashes when it receives a signal hub
–	OK	Flashes when the assembly LON-7000 is connected to the main card

Table 1 LON-7000 / LON-3000 LED lights

3.1.2 Connectors and jumpers

LON-3000	LON-7000	
J1	J1	A flat cable connection LON-COM connector on the main card hub
J2	TB1 (1A-1B) or (2A, 2b)	Connects the other network hubs. Polarity is unimportant.
JP1	JP1	Network style

Table 2 LON-7000 / LON-3000 connections and jumpers

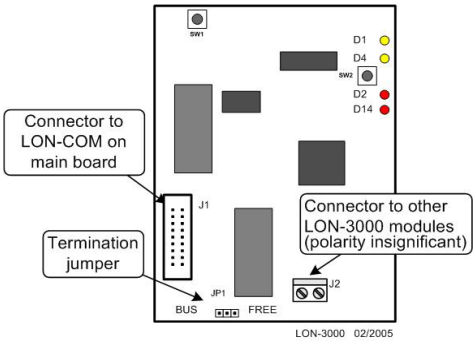

Figure 7 LON-3000

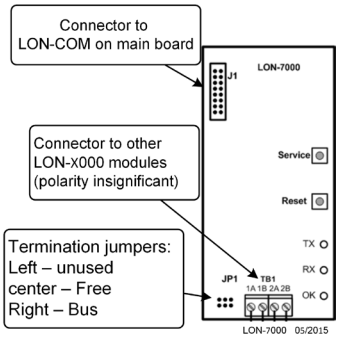

Figure 8 LON-7000

3.1.3 Jumper Setting

Topology	Panel	Jumper
Bus topology	Two end control panels	BUS ○ ○ ○ FREE
Bus topology	All other panels	BUS ○ ○ ○ FREE
Star topology	Central control panel	BUS ○ ○ ○ FREE
Star topology	All other panels	BUS ○ ○ ○ FREE
Ring topology	One control panel	BUS ○ ○ ○ FREE
Ring topology	All other panels	BUS ○ ○ ○ FREE
Free (mixed) topology	Central control panel	BUS ○ ○ ○ FREE
Free (mixed) topology	All other panels	BUS ○ ○ ○ FREE

Table 3 Termination jumper settings

3.2 Network Connections – Galvanic (Copper) Wiring

Wire Type	Belden 85102	Belden 8471	Level IV 22 AWG	JY (St) Y 2*2*0.8
Bus topology: Maximum bus length (meters)	2,700	2,700	1,400	900
Free topology Max. node-to-node distance (meters)	500	400	400	320
Free topology Maximum wire length (meters)	500	500	500	500
Resistance (Ω/km)	15	28	55	73
Capacitance (nF/km)	56	72	56 (@ 1 MHz)	98

Table 4 Network Wire Characteristics

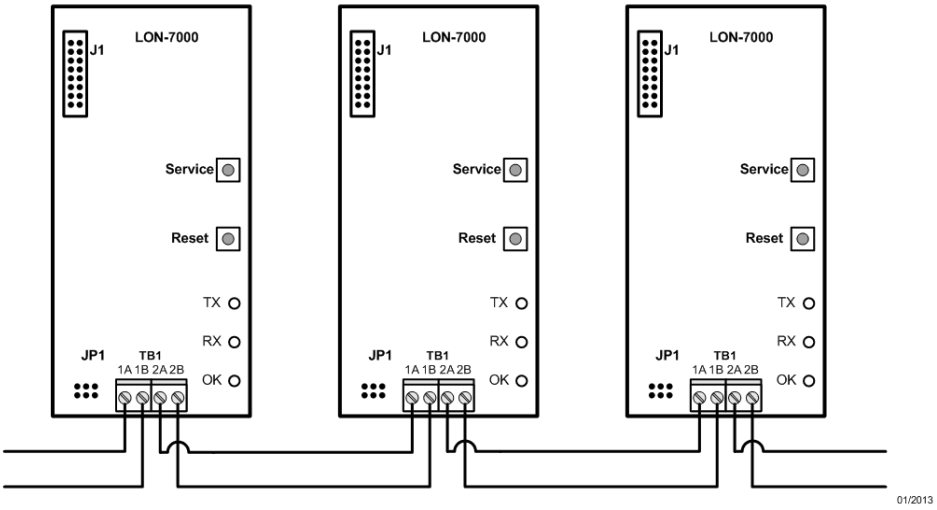

Figure 9 LonWorks Cable Connection

These limits are galvanic connection of different topologies. Increasing the distance between the hubs is made possible by the use of line amplifiers (repeaters) galvanic or optical fibers in accordance with the requirements of the application.

3.3 Network Connection – Fiber Optic Wiring

Cable distance limitations, galvanic isolation requirements or environmental electromagnetic interference may require connection via fiber optic cable. Use the LRW-702 or LR-01 Fiber Optic Repeater for this purpose.

The LRW-702 or LR-01 offers an easy way to extend the distance between LonWorks nodes by using a fiber optic link. The LRW-702 or LR-01 is completely transparent to the protocol therefore installation is simple, as no new network addresses are needed. The LRW-702 or LR-01 is equipped with either one or two pairs of fiber optic receivers and transmitters. This allows the user to build either point to point-, bus- or redundant ring topology fiber links. In a fiber ring, one of the LRW-702 OR LR-01 units will be ringmaster and will have the responsibility to stop messages from looping around the

ring. The LRW-702 OR LR-01 has a built-in redundancy system that provides for fault tolerance in the fiber rings.

- LonWorks®, TP/FT-10, 78 Kbit/s
- Distances up to 25 km
- Multi-/single mode fiber
- ST-connectors
- SC-connectors (820 nm)
- Point to point (LR-01PP)
- Bus or redundant ring
- Transparent repeater function
- Optical signal regenerated
- Alarm output indicating failure
- AC-/DC-supply
- Easy to install
- 35 mm DIN-rail housing

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Note

Realization of network connection with fiber optics is carried out with optical transceivers LRW-702 or LR-01 (the LR-01 is not for future use).

See technical instructions LRW-702 / LR-01.

Make sure that the type of optical fiber (single mode or multi mode) fits the model transceiver.

The maximum number of optical transceivers network is 10 units.

3.3.1 Fiber Optic Connection

There are three possible topologies for connecting LonWorks optical fiber through the LRW-702 / LR-01: point to point, wired, and ring (see drawings).

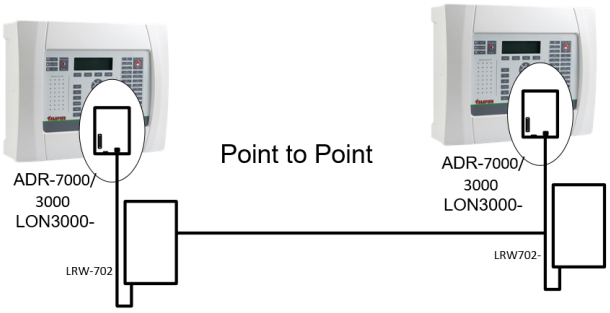

Figure 10 Fiber Optic connection: Point to Point

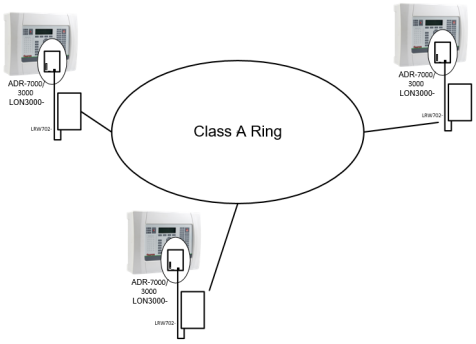

Figure 11 Fiber Optic connection: Redundant Ring

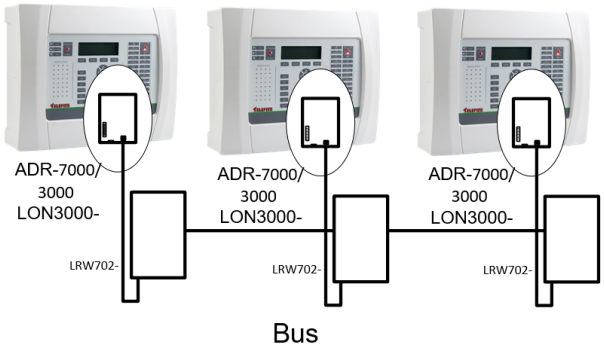

Figure 12 Fiber Optic connection: Bus

All optical line between the two hubs include fiber when the transmission origin TX unit is connected to the preamble reception unit RX of the next. Introduction reception RX unit is connected to the broadcast starting next unit's TX.

3.3.2 Fiber Optic Models

Reference the table below to select the specific transceiver model depending on the type of work and the optical fiber connector:

Model	P/N	Fiber Type	Connector	Max Distance
LRW-702-MM-LC2	3650-1101	MultiMode	LC	Up to 5 Km
LRW-702-SM-LC15	3650-1110	Single Mode	LC	Up to 15 Km
LRW-702PP-MM-LC2	3650-1001	MultiMode	LC	Up to 5 Km
LRW-702PP-SM-LC15	3650-1010	Single Mode	LC	Up to 15 km

Table 5 Optical transceiver models

3.3.3 Installation

Refer to the LRW-702 / LR-01 installation manual for detailed explanations, including calculations, cable type, and switch setting.

1. Set switches according to the fiber optic module installation manual.
2. Connect the fiber optic cables to the fiber optic module as per Figure 13.
3. Connect the LonWorks connector N1 and N2 to terminal block J2 on the LON-3000 module in the ADR-7000/3000 as per Figure 14.
4. Connect 24 Vdc power from the ADR-7000/3000 24 Vdc out or a TPS-74A/34A Auxiliary Power Supply.

3.3.4 LEDs

Please refer to the fiber-optic repeater's technical manual for further details.

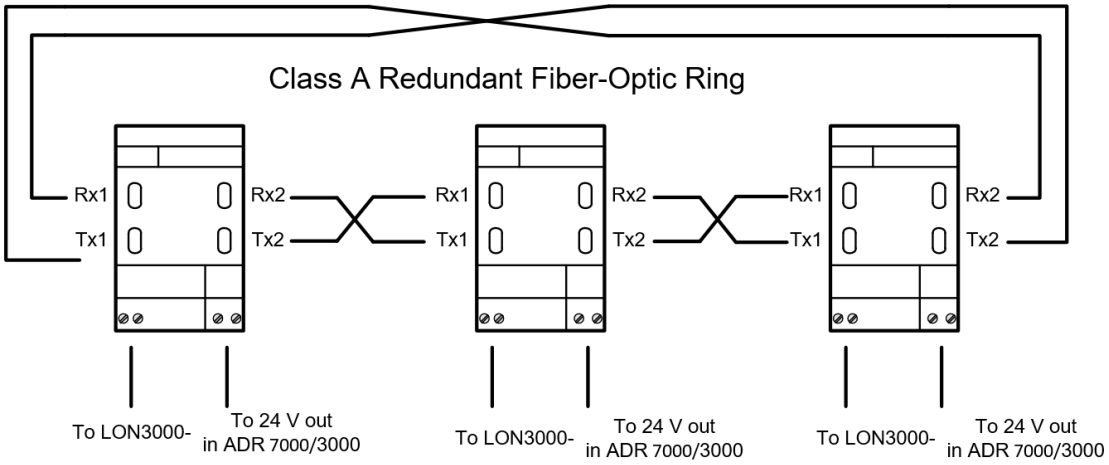

Figure 13 Fiber optic connection – Class A redundancy

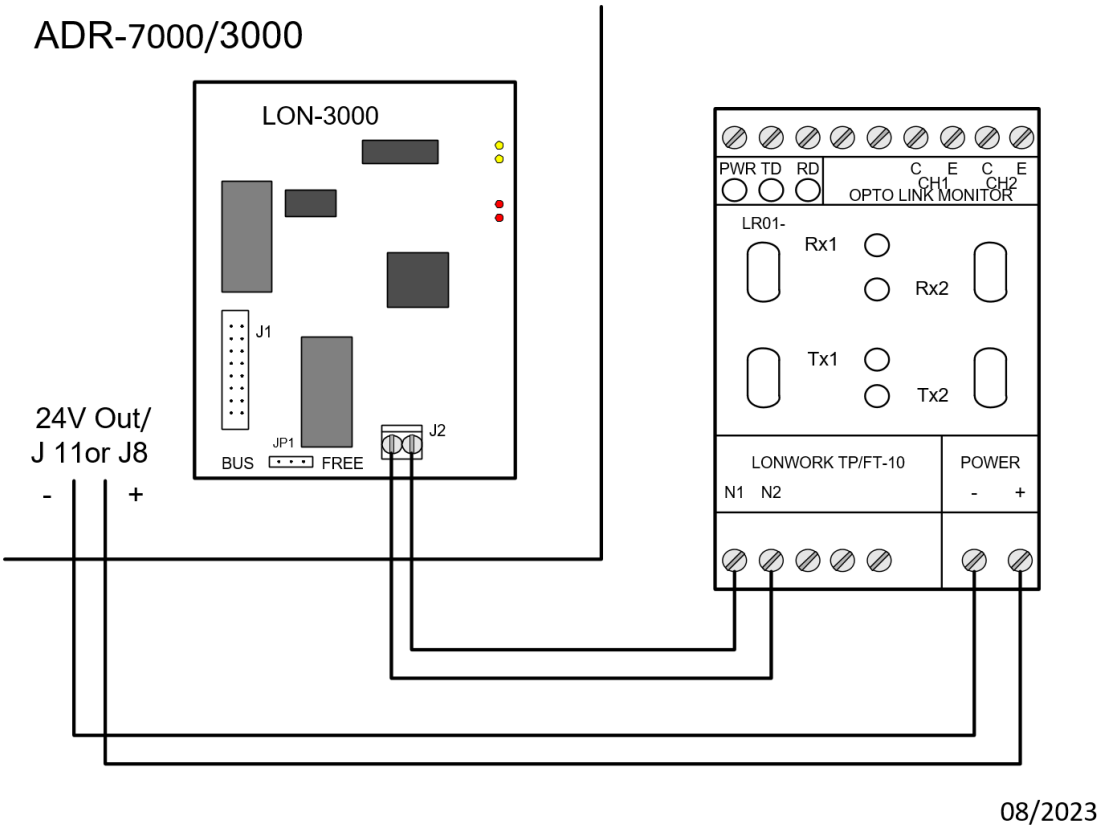

Figure 14 Connecting an LR-01 to the NET-X000

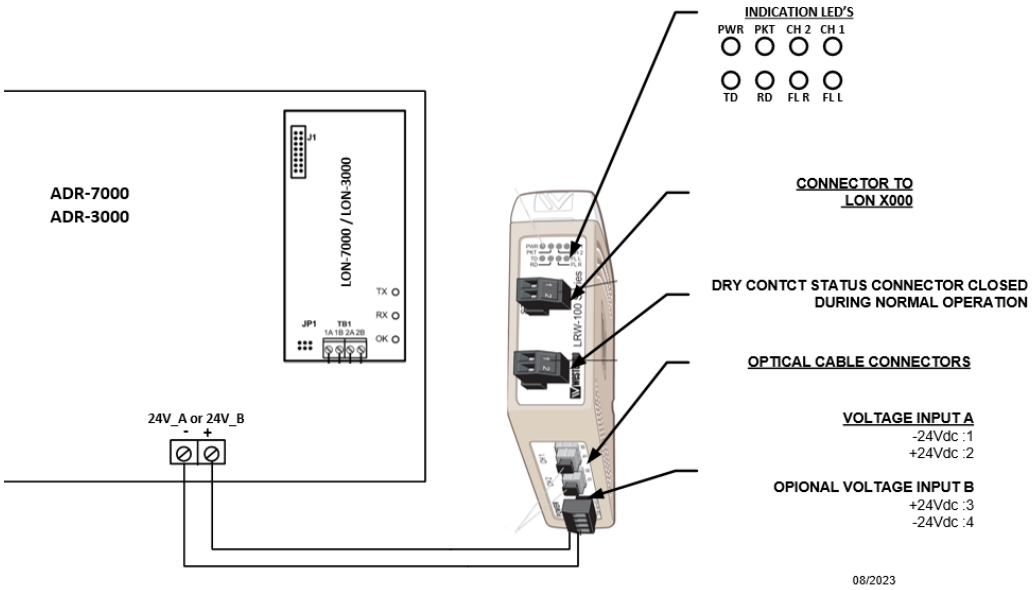

Figure 15 Connecting an LRW-702 to the NET-X000

3.4 Configuring the LRW-702 units

Please refer to the LRW-702 installation manual that is supplied with each unit for connection diagrams and switch setting.

3.5 Configuring the Control Panel

Configure the control panel for network communication and assign it with a panel number. Please refer to the ADR-7000/3000 technical manual for a detailed description of programming and configuration.

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4 Specification

4.1 LON-3000

Dimensions (W / H) ..... 62 / 105 mm
Weight 50g
Operating temperature range ..... -10°C – + 60°C
Relative humidity ..... 10% – 93% non-condensing
Maximum current consumption 31mA

4.2 LON-7000

Dimensions (W / H / D) ..... 56 / 116 mm
Weight 50g
Operating temperature range ..... -10°C – + 60°C
Relative humidity ..... 10% – 93% non-condensing
Maximum current consumption 40mA

All values are nominal. Specifications are subject to change without prior notice

5 Certification

Telefire's Product Analog Addressable Conventional Description has the following approvals:

- EN 54 Approved
- GOST Compliant
- IS 1220 Approved
- UL 864 Approved