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SYSTEM X

Alarmbox 128

I121DX

Installation

Manual

213,4

426

483

88,5
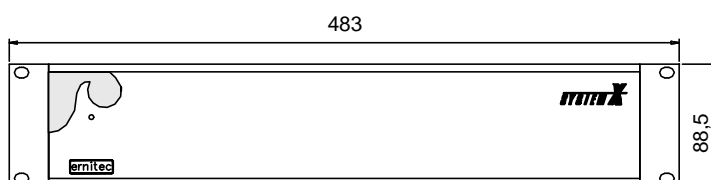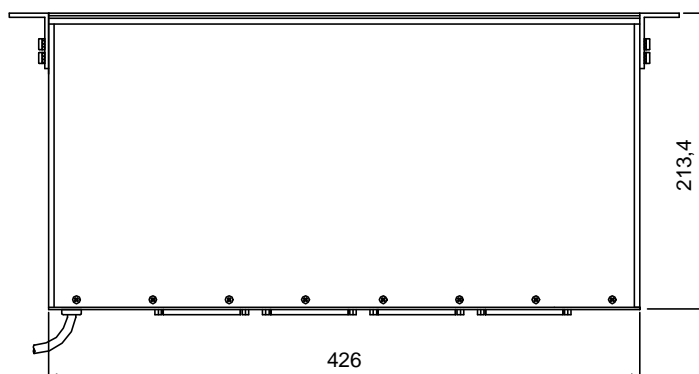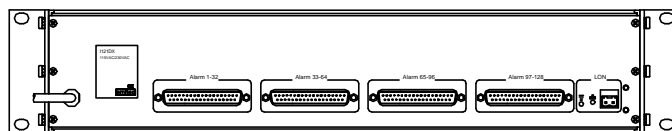
Introduction

The *I121DX Alarmbox 128* is an interface unit for connection of up to 128 alarm sensors. The setup of the I121DX will allow for several physical inputs to be combined into one alarm only using logical operators (AND, OR, NOT etc).

Four relay outputs and four open collector transistor outputs are available.

The alarm inputs are equally distributed onto four 37-pin DSUB connectors. Pin layout is identical to the SYSTEM 500M and SYSTEM 1000M alarm interface.

Alarms are presented on the LONWORKS® network and are then noticed by other System X units which react upon the alarms in accordance with the setup of the respective units. All settings are selected remotely using the *S111SX Node Manager* - no settings are possible on the unit itself, except selection of mains voltage; either 230 VAC (factory default) or 115 VAC.

Validity

This manual cover the *I121DX Alarmbox 128* unit only.

Compatibility

The I121DX is compatible with any System X component.

The S111SX NodeManager must be Version 1.7 or higher.

Alarm sensors must have voltage free contacts or TTL-level active outputs.

Approvals

All electronic equipment can emit, or be sensitive to, induced electromagnetic noise, which can be conducted via the connected wires or transmitted as electromagnetic fields.

Electromagnetic noise can cause malfunction or damage to the equipment.

The I121DX is CE -certified and approved in accordance with the EU-directives regarding Electromagnetic Compatibility, the EMC-directive, and Low Voltage safety, the LVD-directive with respect to the EN 50081-1 (EMC, emission), the EN 50130-4 (EMC, immunity) and the EN 60950 (LVD, safety) standards.

WARNING: To fulfil the above regulations make sure to carefully follow the installation instructions in this manual.

Trademarks

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Installation

Carefully follow the instructions in order not to cause mal-function or damage to the equipment or humans. Damages caused by incorrect installation will void the warranty and repairs will consequently be invoiced according to current scale charges.

All connections are shown on the figures at the fold-out page at the back of this manual.

After all connections have been made installation is completed by switching on the mains supply. Finally should the *Service Pin* be activated, however, prior to pressing the *Service Pin* make sure the *S111SX Node Manager* is running and connected to the LON® network. Please note, that it is of outmost importance to keep track of the order in which the various *System X* units are activated e.g. by carefully noting the exact time the *Service Pin* is activated. This information is crucial when identification and configuration of each unit is carried out later using the *S111SX Node Manager*.

Unpacking the unit

Check that the carton box contains the following items:

- A 121DX unit.

- A connector/mounting kit.

- Installation manual (this manual).

Carefully check for any sign of damage. Any such damage or parts missing should be reported to your supplier prior to installation.

Mains installation

The I121DX must be used with a 3-wire mains connection (2W+PE @ min. 0,75 mm^2, PE=yellow/green).

> **WARNING: Make sure correct mains voltage 230/115 VAC is selected the voltage selector prior to connecting the mains supply. If permanently connected to mains, a readily accessible disconnect device (mains switch) shall be incorporated in the building installation wiring.**
> **If pluggable connection to mains has been made, the socket-outlet shall be present near the equipment and shall be easily accessible.**
> **Mains connection and mains voltage selection requires installation by an instructed person.**
> **The unit is designed for continous operation.**

Mains voltage selector

Prior to connecting mains voltage make sure the correct nominal mains voltage 230VAC (factory default position) or 115 VAC is selected with the voltage selector located on the main board inside the unit. Refer to the drawings at the fold-out page.

> Note: The unit is equipped with two PTC-fuses with automatic reset function. In case of malfunction <u>always</u> return the unit for repair. The references below are intended for information only.
> **F1:** (BC Components, type 2322 660 66393)
> I_{hold} = 63mA, I_{trip} = 95mA, Initial resistance = 120R
> **F2:** (BOURNS, type MF-R110)
> I_{hold} = 1.1A, I_{trip} = 2.2A, Initial resistance = 0R18

LON® connection

Refer to the drawings at the fold-out page at the end of this manual. Connection is polarity insensitive. A detailed description of cabling, network topology, temination etc is included in the *LON® Installation* section located later in this instruction.

> Note: If you have no previous experience with LON® , study the *LON® Installation* section carefully!

Alarm connections

Refer to the drawings at the fold-out page at the end of this manual.

Inputs

The alarm inputs accept voltage free contacts or active outputs using 5 VDC TTL-drivers or equivalent. When using active outputs the Ground/Common signals must be connected to the GND pin 19 on the I121DX alarm connectors.

> Note: In countries where the CE approval is mandatory, cables with an overall screen must be used in order to comply with EMC/EMI standard EN 50130-4. The cable screen should be connected to the D-SUB metal housing using the cable clamp inside.

Outputs

The relay output may be loaded with up to 30 V / 1 A. All three contacts; Common, Normally Open and Normally Closed contact, are available.

The open collector transistor output may be loaded with up to 24 VDC/100 mA. The output is able to drive standard low voltage relays directly.

Note, that Ground from the external power supply must be connected to the GND pin 19.

First time start

Make sure the *S111SX Node Manager* software is running and the PC-interface is connected to the LON® network.

Activate the *Service Pin* using a small screw-driver or equivalent, refer to the fold-out page drawing for exact location of the *Service Pin*.

Please note, that it is of **_outmost importance_** to keep track of the order in which the various *System X* units are activated e.g. by carefully noting the exact time the *Service Pin* is activated. This information is crucial when identification and configuration of each unit is carried out later using the *S111SX Node Manager*.

> Note: Strictly follow the above instructions to avoid possible configuration problems.

The *Service Pin* may be activated later also if reconfiguration of the network is needed, however, always make sure the S111SX Node Manager software is on-line prior to pressing the Service Pin.

LED indicators

Front panel indicator

The green LED is a power indicator.

Rear panel indicator

The yellow LED indicates the LON® network status:

- Off indicates normal operation; the unit is configured and running.
- Flashing and on indicates that the unit isn't configured; run the S111SX Node Manager and press the Service Pin.

Note: The LON® LED flashes shortly when the Service Pin is activated - this is not a fault condition.

LON® Installation

Note: If you have no previous experience with LON® installation, study this section carefully!

All SYSTEM X components (nodes) are connected together in a common LONWORKS® communication network.

The network is polarity insensitive and therefore either of the two twisted pair wires can be connected to either of the LON® connectors on the SYSTEM X components.

Due to the risk of cross-talk/interference, it is recommended not to run LON® Network cables close to high voltage cable, or cables carrying video signals.

Note: In countries where the CE approval is mandatory, LON® cables with an overall screen must be used in order to comply with EMC/EMI standard EN 50130-4. The cable screen should be connected to the cable clamp next to the LON® connector.

Selection of network Topology

In a **free topology network**, there are no demands as to how the cables are routed between the nodes. It can be point-to-point, bus, star, tree, or a mixture.
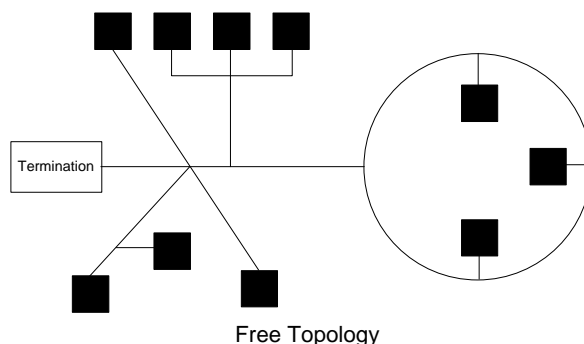

Free Topology

When using free topology, the maximum cable length in one segment is approx. 500 meters, and is calculated adding together all cables used. The maximum number of nodes in one segment is 64. If more that 500 meters, or more than 64 nodes, is required, two or more network segments can be made, using a repeater between each segment.

Bus Topology

In a bus topology network, all nodes are connected on a bus. Cable stubs can be used to connect the individual nodes to the bus, as long as the length of the stub is maximum 3 meters.

The advantage of bus topology, is that the cable length can be longer than when using free topology. This can be useful e.g. when making network connection to remote PTZ cameras.

Bus Topology
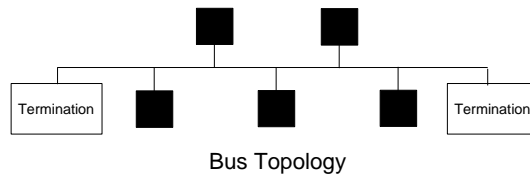
The maximum number of nodes on one bus is 64. Maximum length of the network bus depends on the type of cable used. If more nodes, and/or longer cable length, is required, two or more network segments can be made, using a repeater between each segment.

Termination

Each network segment require termination for proper data transmission performance. The type of termination varies depending on whether Free topology or Bus topology is used.

In a free topology network segment, only one termination is required and may be placed anywhere on the network. The termination resistor should be a 52 Ω, 1/4W type.

In a bus topology networksegment, two terminations are required, one at each end of the bus. The termination resistors should each be a 105 Ω, 1/4W type.

Termination resistors, which are included with the SYSTEM X keyboard, are easily fitted using the LON® connectors on the SYSTEM X units as shown on the figure.

Termination resistor

LON® cable
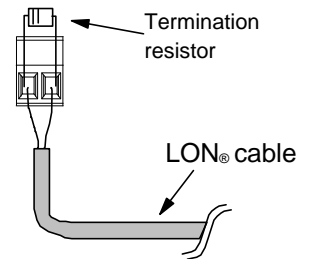
Repeater

If the maximum numbers of nodes (max. 64) or total cable distance are exceeded, a repeater can be added to interconnect two or more network segments.

A repeater can also be used to convert from a free topology network to a bus topology network. This can be useful when e.g. making network connection to remote PTZ cameras. Information on suppliers of suitable repeaters and converters can be obtained from your supplier. *Note that only one Repeater should be placed in series between any two nodes in a segment.*
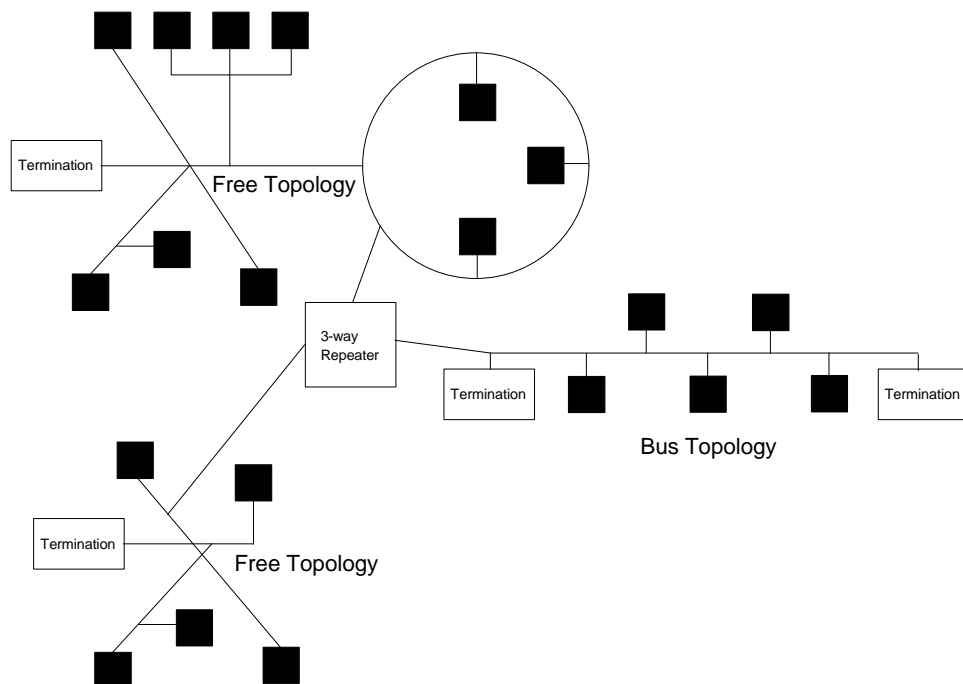
LON® Network Cables

The following five cables/cable types have been validated by Echelon®, but other cables may be used provided they have specifications similar to the ones listed below:

Validated Cables and Cable Types	AWG	Diameter	Shield[4]	Examples
TIA/EIA 568A[1] Category 5 cable	24AWG	0,5mm	Available	Belden 1624[5] Belden 1633A[5] Belden 1668A[5]
Belden 8471 (PVC jacket) or equivalent	16AWG	1,3mm	No	-
Belden 85102 (Tefzel jacket) or equivalent	16AWG	1,3mm	No	-
Level IV[2] cable	22AWG	0,65mm	Available	Anixter 9F220154[5]
J-Y(St)Y[3] 2x2x0.8	20,4AWG	0,8mm	Yes	Anixter 4QJB2[5] Coferro J-Y(St)Y[5] Waschek 240208[5] Eupen J-Y(St)Y Lg[5]

[1] Any cable that meets the TIA/EIA 568A standard, is suitable for LON® Networks.
[2] Standard originally specified by the National Electrical Manufacturers Association (NEMA).
[3] The J-Y(St)Y cable is normally only available in Europe.
[4] In order to comply with EMC/EMI standard EN 50130-4, shielded cable must be used.
[5] With shield.

A list of cable suppliers can be found in e.g. the *K111DX Keyboard X* manual.

LON® Network Cable Lengths

| Cable type	Free Topology Max. Node-to-Node/Total Length	Bus Topology Max. Total Length
TIA/EIA 568A Category 5	250/450 meters	900 meters
Belden 8471	400/500 meters	2700 meters
Belden 85102	500/500 meters	2700 meters
Level IV	400/500 meters	1400 meters
J-Y(St)Y 2x2x0,8	320/500 meters	900 meters

Junction Boxes

When splicing/terminating cables in the LON® Network installation, the following methods are normally used:

A ***Pass-Thru Junction Box*** is used to splice two cables. No SYSTEM X nodes or connectors are provided at a pass-thru junction box.

Pass-Thru Junction Box

LON Network   LON Network
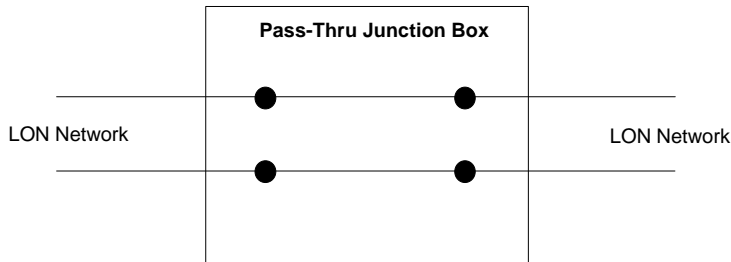
A ***Stub Junction Box*** is used to splice two cables and provide a stub for servicing a local SYSTEM X node.

Stub Junction Box

LON Network   LON Network

To local node
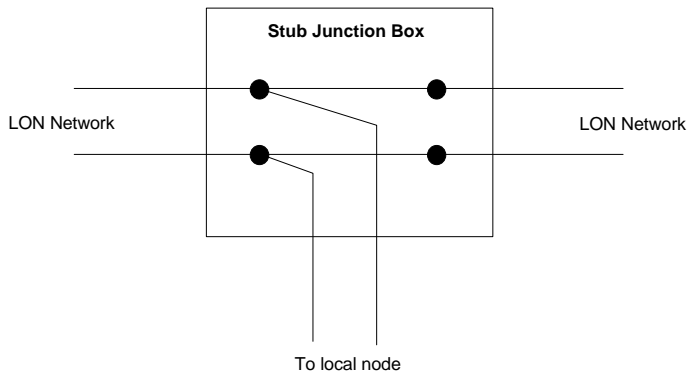
A local ***Loop Junction Box*** is used to terminate two cables, and provide a wiring loop for servicing one, or more, local SYSTEM X nodes.

Loop Junction Box

LON Network   LON Network

Local loop
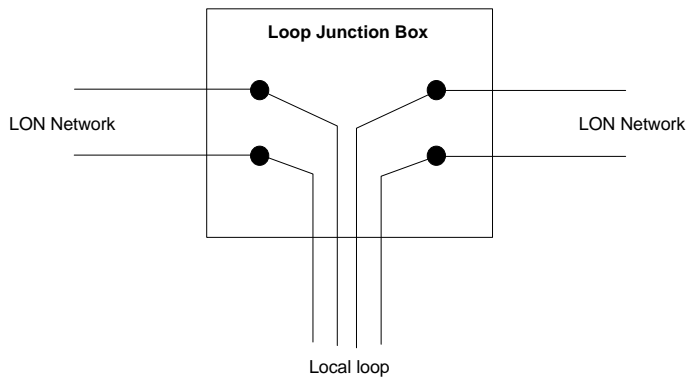
Specifications

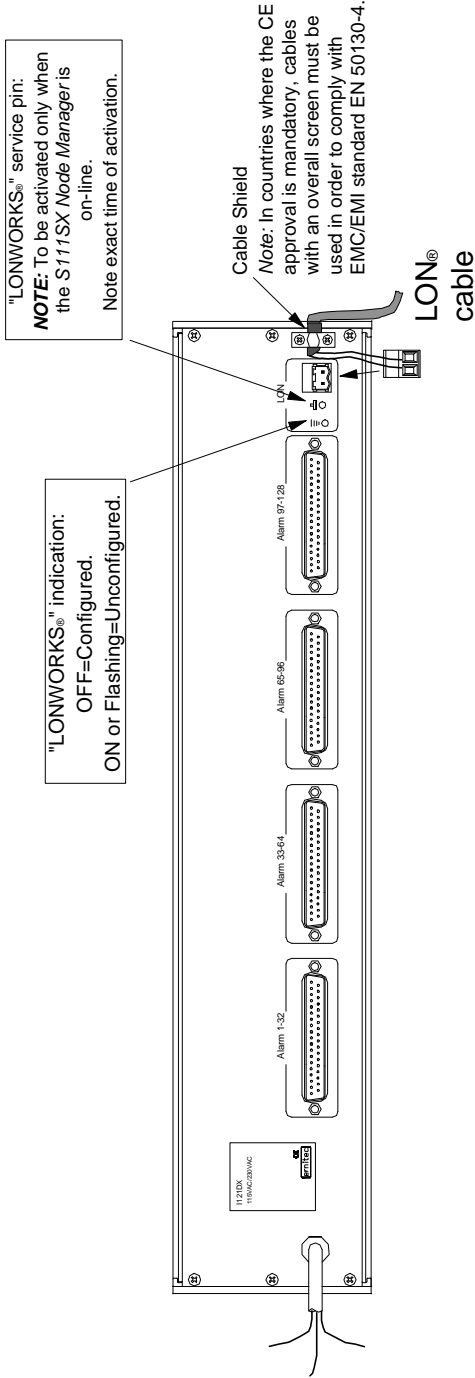|	**I121DX**
Alarm inputs	128 pcs. for voltage free contacts or active TTL-drivers
Relay outputs	4 pcs., max. load 30 V/1 A
Transistor outputs	4 pcs., max. load 24 VDC/100 mA
Comms interface	LONWORKS® TP/FT Free- or Bus-topology, 78 kbps FTT-10
Nominal mains voltage	230*/115 VAC ± 15%, 45-60 Hz, switch selectable (*factory default position)
Current consumption	35 mA @ 230 VAC, 70 mA @ 115 VAC
Dimensions H/W/D	88,5/426/214 mm (19″ -2HU) (D=excl. connectors, W=excl. "rack ears")
Approvals EMC/LVD	EN 50081-1, EN 50130-4 / EN 60950 C E

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Mains connection

Brown=Live

Blue=Neutral

Yellow/green=Ground

Mains connection requires installation by an instructed person.

"LONWORKS®" indication:

OFF=Configured.

ON or Flashing=Unconfigured.

"LONWORKS®" service pin:

NOTE: To be activated only when the *S111SX Node Manager* is on-line.

Note exact time of activation.

Cable Shield

Note: In countries where the CE approval is mandatory, cables with an overall screen must be used in order to comply with EMC/EMI standard EN 50130-4.

LON® cable

LON

Alarm 97-128

Alarm 65-96

Alarm 33-64

Alarm 1-32

I121DX
115VAC/230VAC

Mains Voltage Selector

Warning:

Make sure correct voltage 230/115 VAC is selected prior to connecting mains supply.

Factory default 230 VAC.

230

115

Max. load:
30 V / 1 A

AUX relay

Max. load:
24 VDC /
100 mA.

GND

AUX relay N/C

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 NO C GND 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 AUX relay N/C OC

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

LON

Alarm 97-128

Alarm 65-96

Alarm 33-64

Alarm 1-32

Alarm input 97-128
AUX Relay 4
OC Transistor output 4

Alarm input 65-96
AUX Relay 3
OC Transistor output 3

Alarm input 33-64
AUX Relay 2
OC Transistor output 2

Alarm input 1-32
AUX Relay 1
OC Transistor output 1

Note: In countries where the CE approval is mandatory, cables with an overall screen must be used in order to comply with EMC/EMI standard EN 50130-4. The cable screen should be connected to the D-SUB metal housing using the cable clamp inside.

I121DX
115VAC/230VAC

Pin numbers

1
3

20
22