Infinova®

FIBER OPTIC TRANSMISSION SYSTEM

N3776 & N3576 SERIES

Aiphone È Audio Intercom System

User Manual

Infinova

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The installation of this product should be made by qualified personnel. Do not attempt to service this product yourself. Refer all servicing to qualified personnel.

If you require information during installation of this product or if service seems necessary, contact the local suppliers or Infinova at 1-732-355-9100 in 51 Stouts Lane, Monmouth Junction, NJ 08852 U.S.A. You must obtain a Return Authorization Number and shipping instructions before returning any product for service.

Our obligation under this warranty is limited only to the repair or replacement of any of our products, provided that products are used within the specified ratings and applications, and that products are applied in accordance with good engineering practices, and that products are proved by our examination to be defective.

This warranty does not extend to any Infinova products which have been subject to acts of accident, misuse, abuse, neglect, improper application or installation, improper operation or maintenance, connection to an improper voltage supply or to materials which have been altered or repaired outside an authorized Infinova factory repair center.

Information provided by Infinova is accurate and reliable. However, no responsibility is assumed by Infinova for its use; nor for any infringements of other rights of third parties which may result from its use. No license is granted by implications or otherwise under any patent or patent rights of Infinova.

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

DO NOT LOOK INTO OPTICAL PORTS WITH POWER ON.

Description

The N3776 and N3576 series provide high quality reliable transmission of digitally encoded Aiphone® Intercom Audio and protocols over one or two optical fibers. N3776/N3576 is compatible with Aiphone® Intercom NEM / LEF / LEM Protocols and the three Protocols are factory selectable. Sub-board for RS485, RS422 or RS232 data transmission can be added as required. The transmission distance of 25km, 50km or 75km varies with the product model. Plug-and-play design ensures ease of installation, requiring no electrical or optical adjustments. Each transmitter or receiver incorporates status indicators for monitoring of proper system operation. The modules are available in either stand-alone or card unit transmitter versions.

Stand-alone module

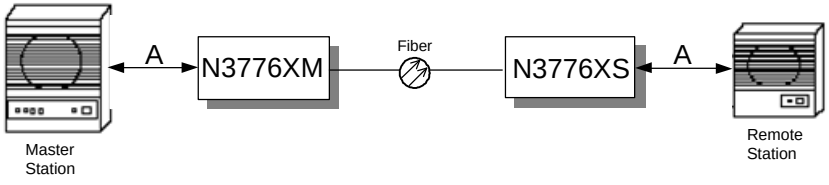
Card unit

The N3776 series are compatible with 9/125 micron single-mode fibers; the N3576 series are compatible with 50/125 or 62.5/125 micron multimode fibers.

Accessories (optional)

N3910-000 19″ 1U fan assembly unit
N3951 Fiber optical transmission repeater

System Diagram



Aiphone® Intercom

Model	Description
N35/776XM-4-N/L	4-ch NEM/LEF, LEM Aiphone® master transceiver, 1 fiber, 1-slot
N35/776XS-4-N/L	4-ch NEM/LEF, LEM Aiphone® slave transceiver, 1 fiber, 1-slot
N35/776XM-8-N/L	8-ch NEM/LEF, LEM Aiphone® master transceiver, 1 fiber, 2-slot
N35/776XS-8-N/L	8-ch NEM/LEF, LEM Aiphone® slave transceiver, 1 fiber, 2-slot

Aiphone® Intercom with Data

Model	Description
N35/776XM-4AI-4D-N/L	4-ch NEM/LEF, LEM Aiphone® master transceiver with 4-ch two-way data, 4-ch intercom + 4D<>, 1 fiber, 2-slot
N35/776XS-4AI-4D-N/L	4-ch NEM/LEF, LEM Aiphone® slave transceiver with 4-ch two-way data, 4-ch intercom + 4D<>, 1 fiber, 2-slot
N35/776XM-8AI-4D-N/L	8-ch NEM/LEF, LEM Aiphone® master transceiver with 4-ch two-way data, 8-ch intercom + 4D<>, 1 fiber, 3-slot
N35/776XS-8AI-4D-N/L	8-ch NEM/LEF, LEM Aiphone® slave transceiver with 4-ch two-way data, 8-ch intercom + 4D<>, 1 fiber, 3-slot

Fiber Type	Optical Budget(dB)	Wavelength(nm)	Range(km)
Multi-mode	12	1310/1310	4.4
Single-mode	20	1310/1550	25
	*Higher output lasers available for range over 25km		

Note:

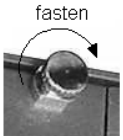
1. 4D/4B/2D2B are optional for “4D”, “B” represents two-way RS232 data, and “D” represents RS485/RS422 data.
2. For N35/776, the suffix “–N” added represents the system is compatible with NEM intercom, and “-L” added represents the system is compatible with LEF/LEM intercom.
3. "-M" added after the model represents “Module type”; “-R” added after the model: represents “Card type”.
4. Transmission distance for multi-mode models is 4.4km.

Installation of Aiphone® Intercom Interface

To install the apparatus, it is necessary to allow enough space to accommodate the bend radius of the optical cable connected to it.

Installation of Card Unit

Push the card unit along the guide rails (not in spaces between the rails). There is an Infinova logo on the front panel indicating the proper orientation. Press hard to make good connection to motherboard - loud snap indicates firm connection. There are two captive screws on the front panel that can fasten the card unit to the subrack. They must be locked by hand in a clockwise manner (do not over tighten), see figure right below.



Full load of N3910-18S

There are 18 slots on N3910-18S. Besides N3910-18S, there are N3910-1S, N3910-2S, N3910-3S, N3910-4S and N3910-15R optional, with 1 slot, 2 slots, 3 slots, 4 slots and 15 slots on these chassis respectively.

N3910-1S

N3910-2S

N3910-4S

N3910-15R (Redundant power supply)

WARNING:

A FULL LOAD OF N3910-15R AND N3910-18S SUBRACK REQUIRES FORCED AIR COOLING IN THE RACK. TO AVOID OVER HEATING OF CARD UNITS, WHENEVER POSSIBLE, INSTALL IN EVERY OTHER SUBRACK.

Forced air cooling

Power Supply for Card Unit

The unit is powered by a plug-in power supply that is provided with the appropriate desk chassis or EIA 19″ subrack.

Power Supply for Stand-alone Module

The card unit can be converted into a stand-alone module when installing into N3910-1S/N3910-2S/N3910-3S chassis.

The 1-slot/2-slot chassis is powered by a plug-in 24VAC@1A (N3921-24A-1 for 110V; N3921-24A-2 for 220V) power supply, and the 3-slot chassis is powered by a plug-in 24VAC@1.5A (N3921-24A-1-15 for 110V; N3921-24A-2-15 for 220V) power supply. Plug the wires into the connectors, fasten the screws to make a firm connection, see figures below.

	
N3921 external power supply	Connection between stand-alone module and power supply

Note: When the series is powered together with other devices (cameras and etc.) by a single 24VAC power source, please make sure that the related device has a full-wave (bridge) rectifier circuit.

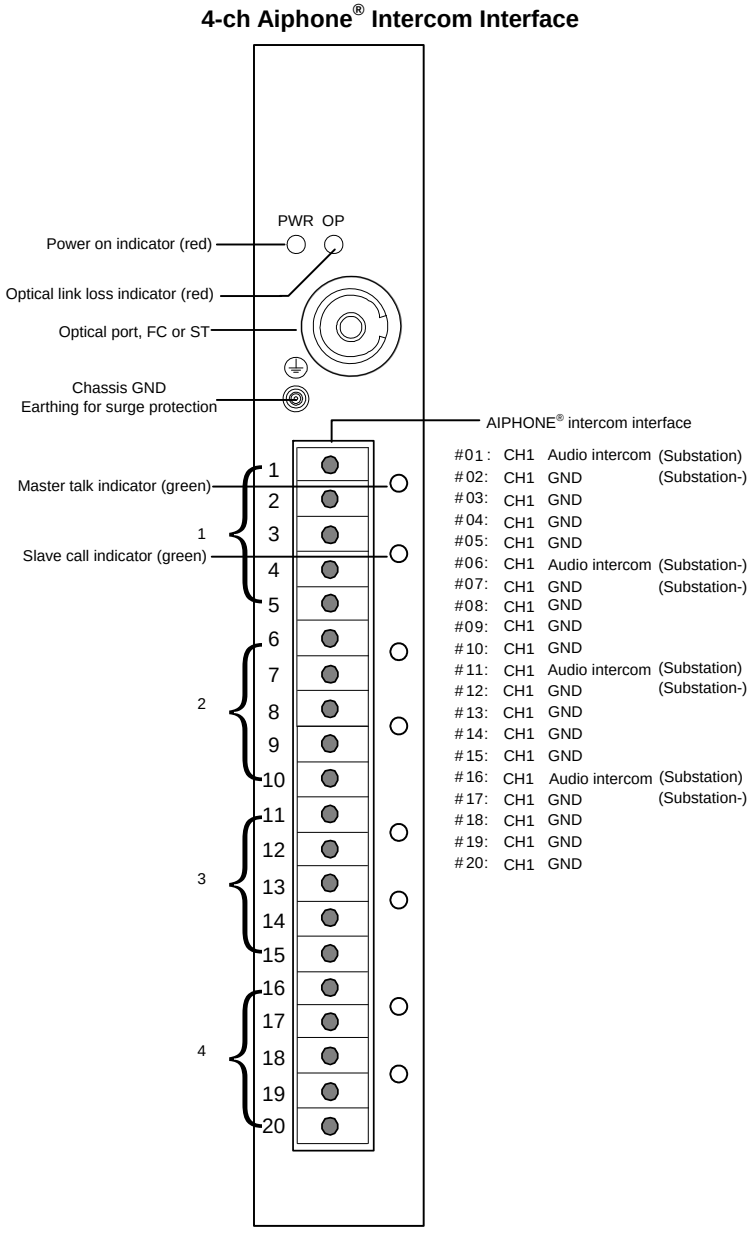


Figure 1. N3776XS-4-N/L & N3576XS-4-N/L

4-ch Aiphone® Intercom + 4-ch Data Interface

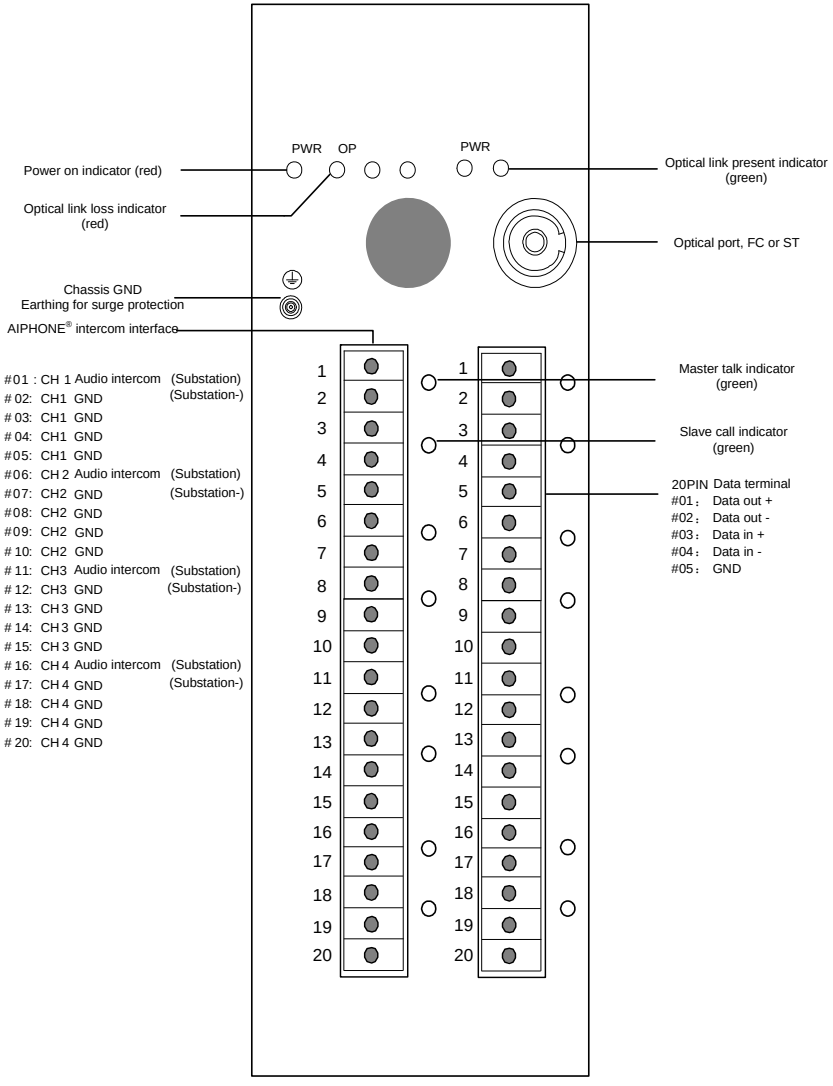


Figure 2. N3776XS-4AI-4D-N/L & N3576XS-4AI-4D-N/L

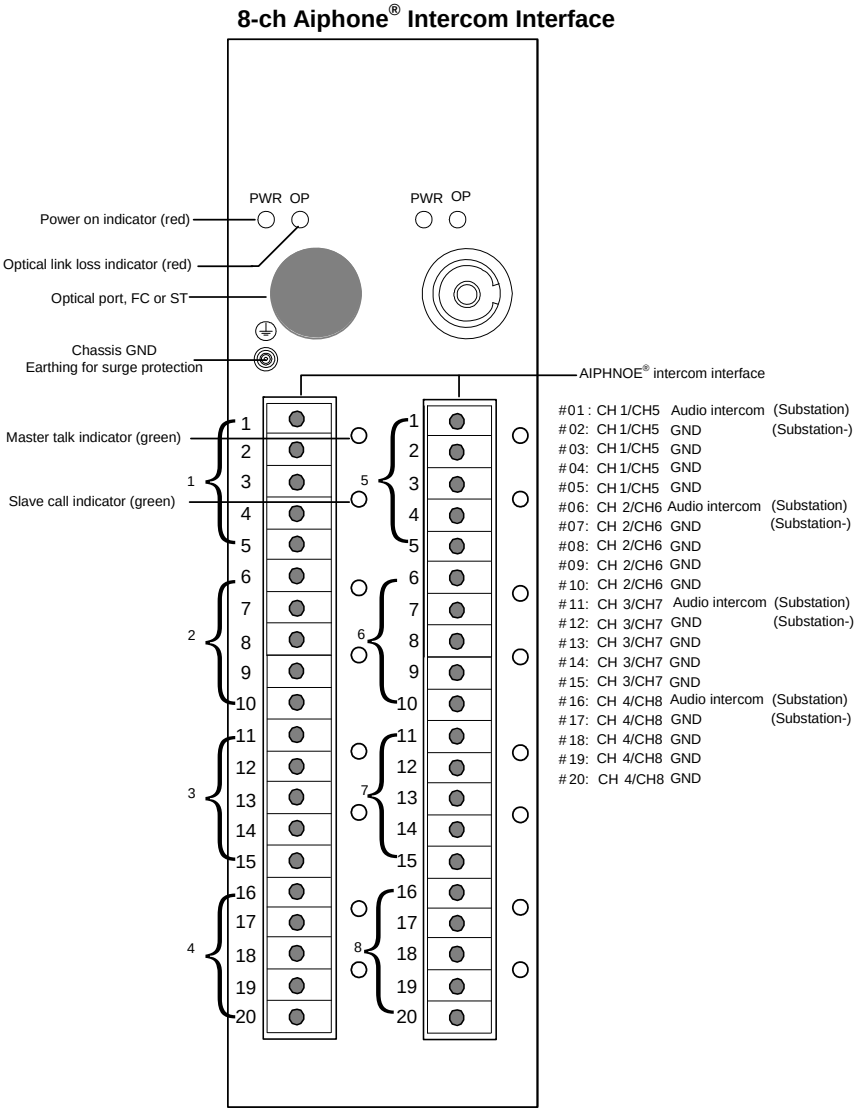


Figure 3. N3776XS-8-N/L & N3576XS-8-N/L

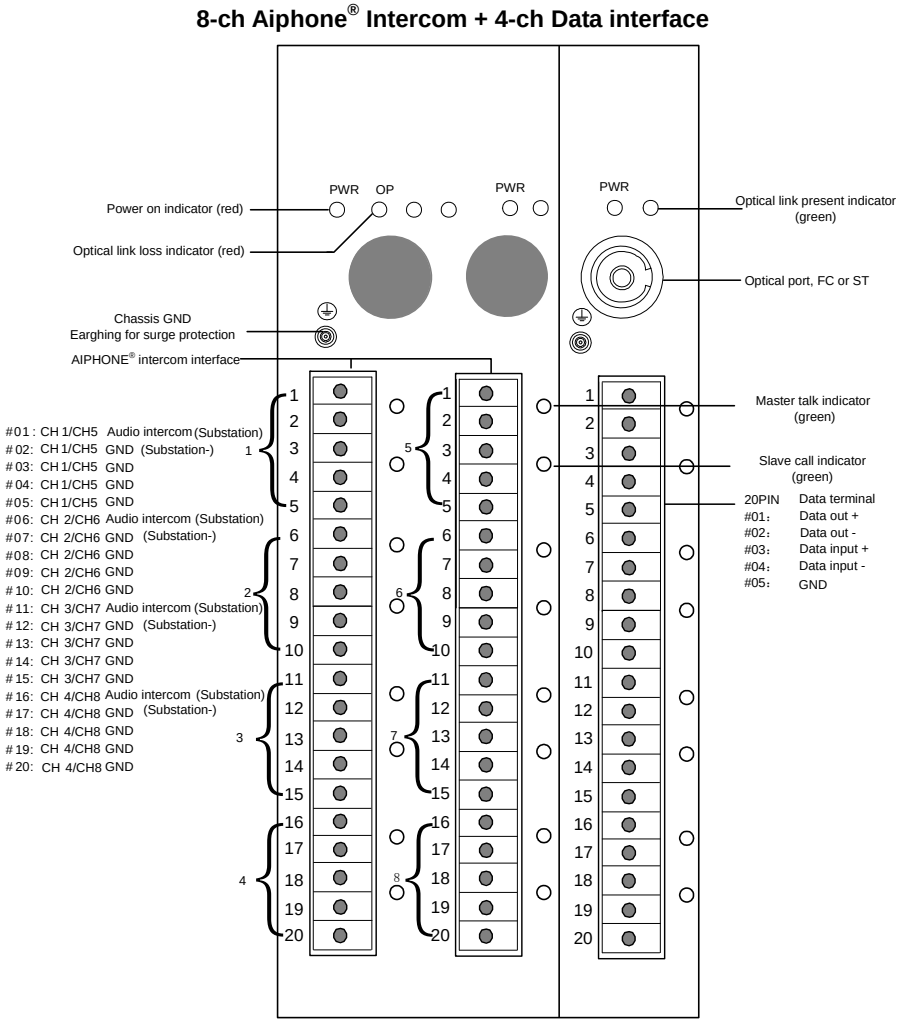


Figure 4. N3776XS-8AI-4D-N/L & N3576XS-8AI-4D-N/L

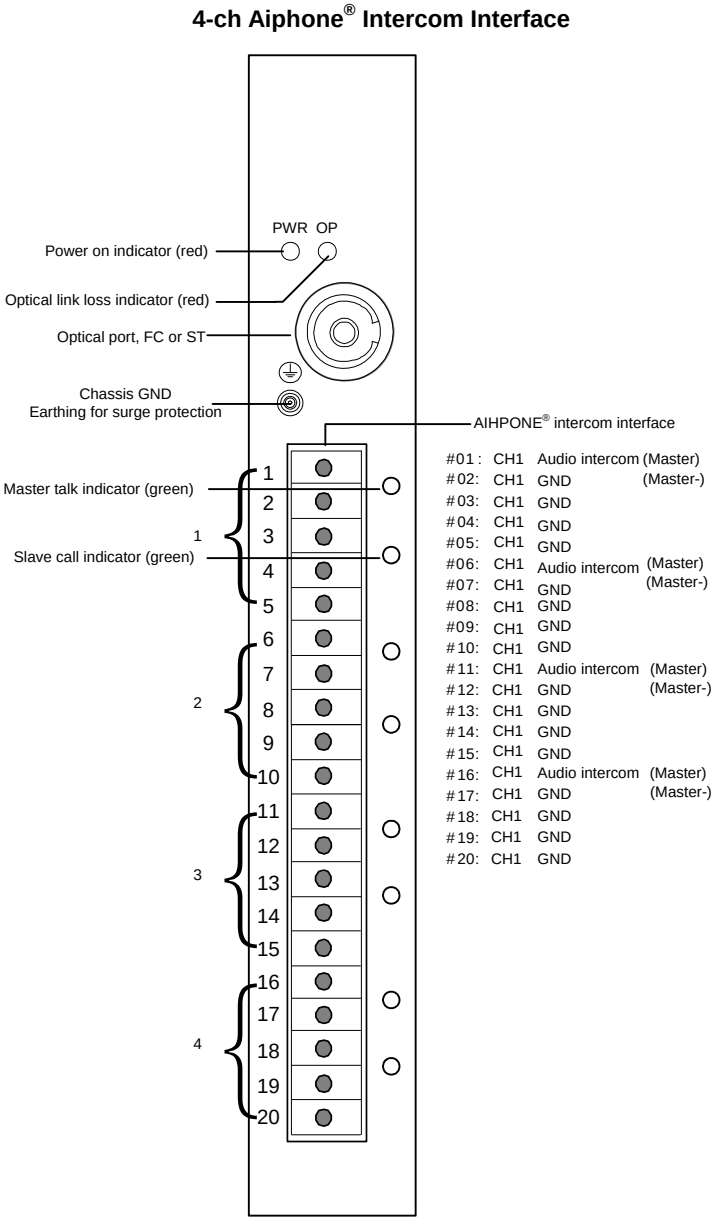


Figure 5. N3776XM-4-N/L & N3576XM-4-N/L

4-ch Aiphone® Intercom + 4-ch Data Interface

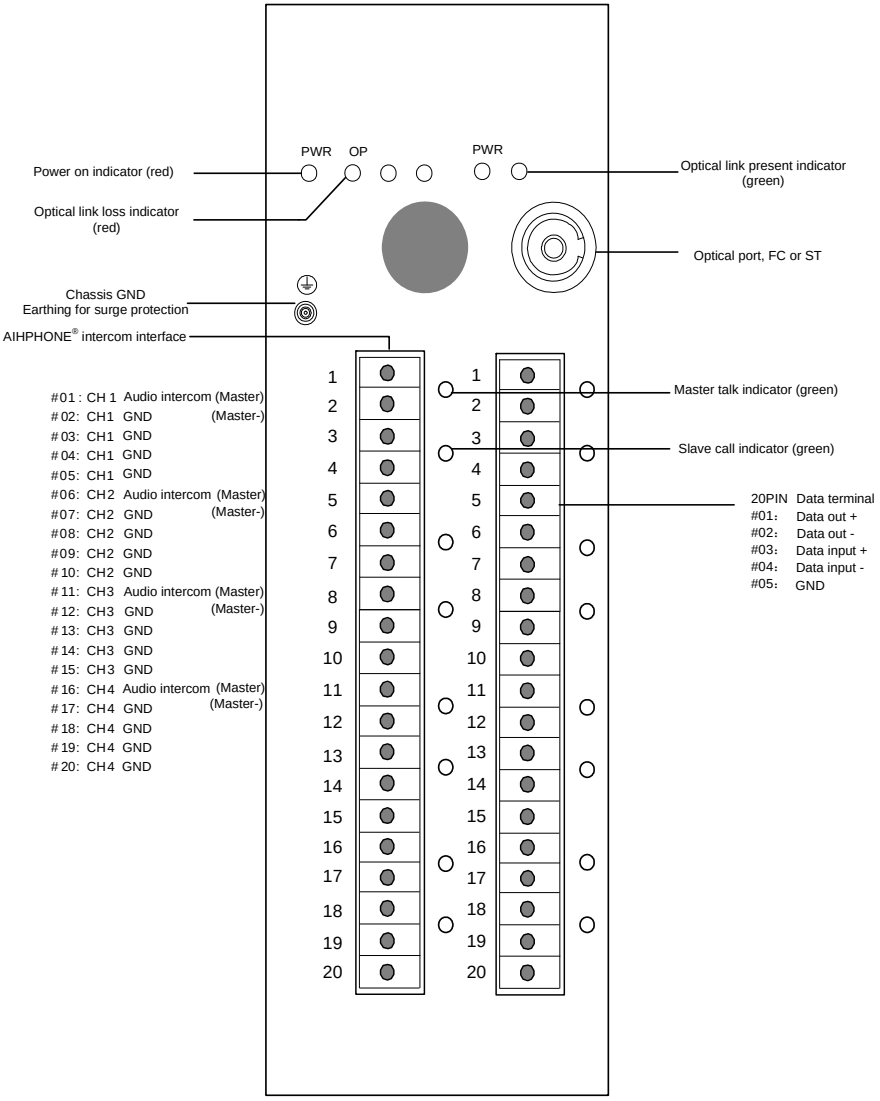


Figure 6. N3776XM-4AI-4D-N/L & N3576XM-4AI-4D-N/L

8-ch Aiphone® Intercom Interface

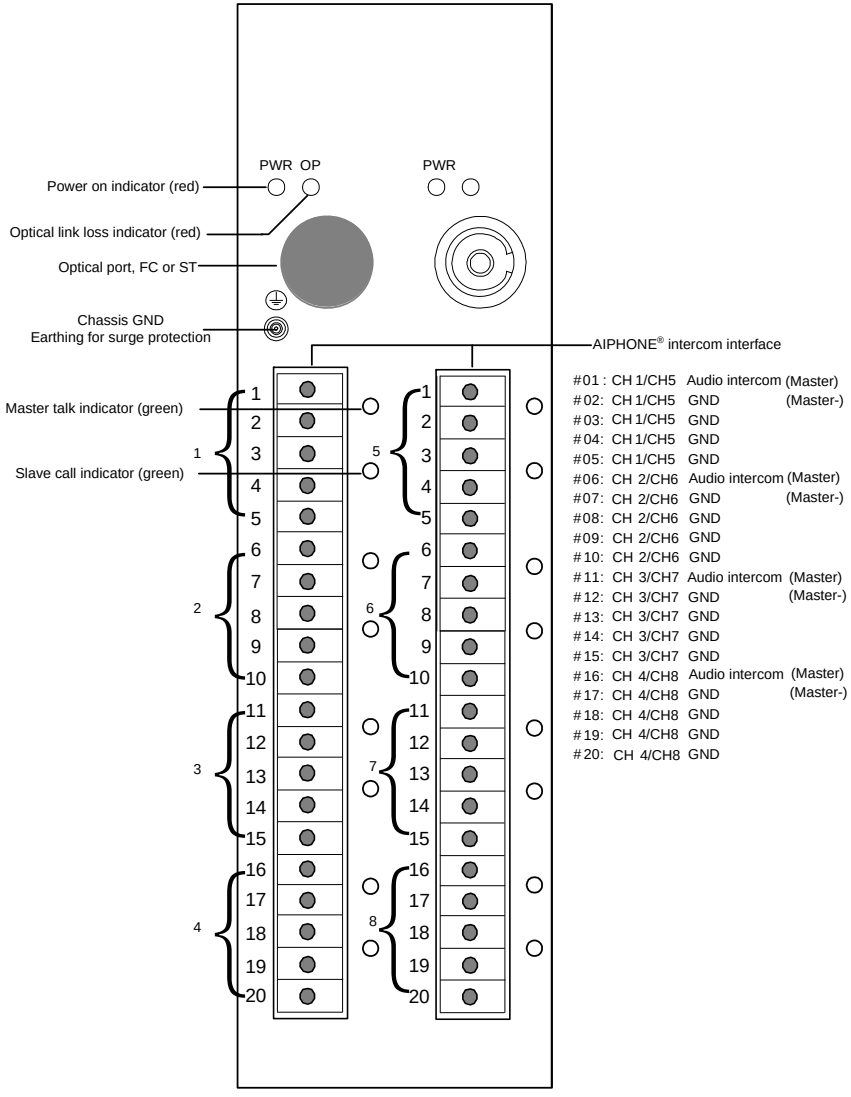


Figure 7. N3776XM-8-N/L & N3576XM-8-N/L

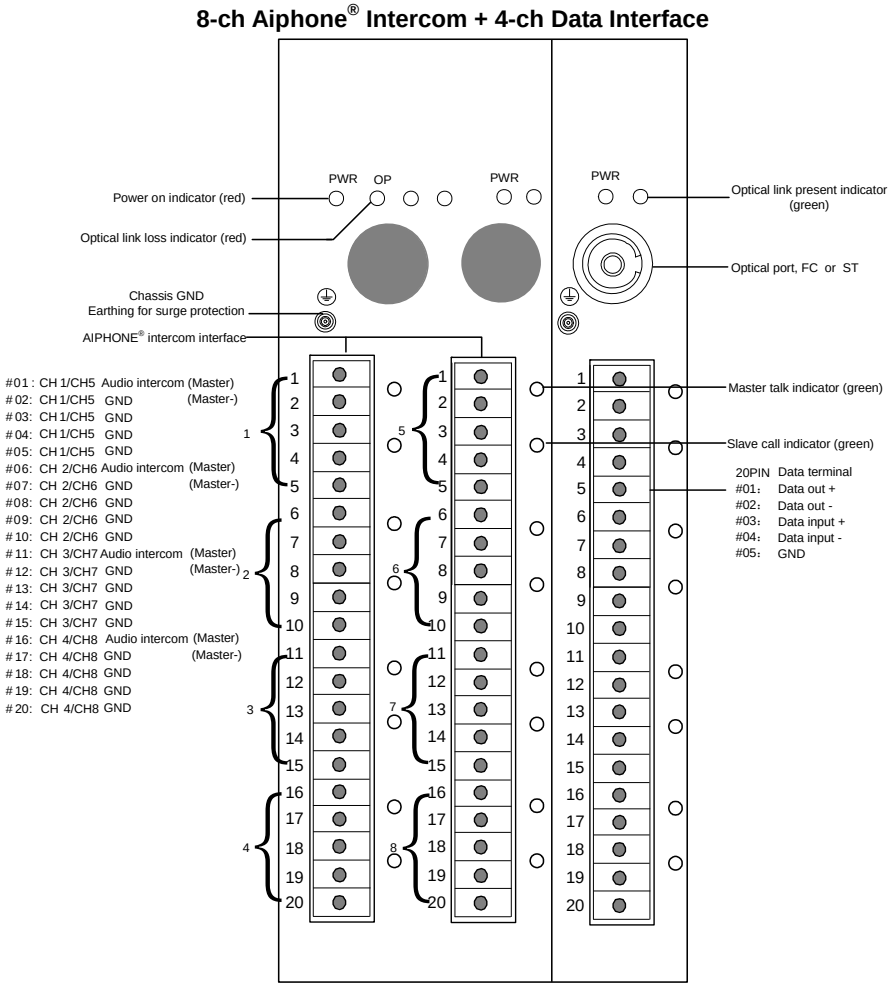


Figure 8. N3776XM-8AI-4D-N/L & N3576XM-8AI-4D-N/L

4ch Aiphone® Intercom Interface (without data)

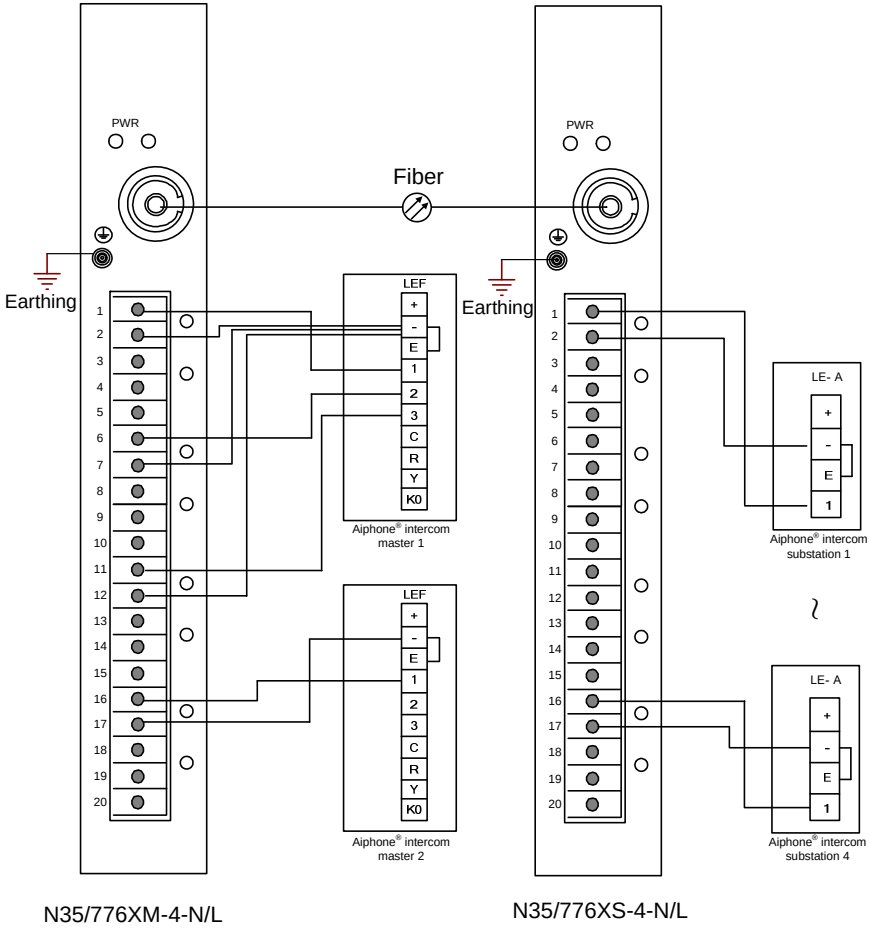


Figure 9. N35/776XM-4-N/L & N35/776XS-4-N/L

8-ch Aiphone® Intercom Interface (without data)

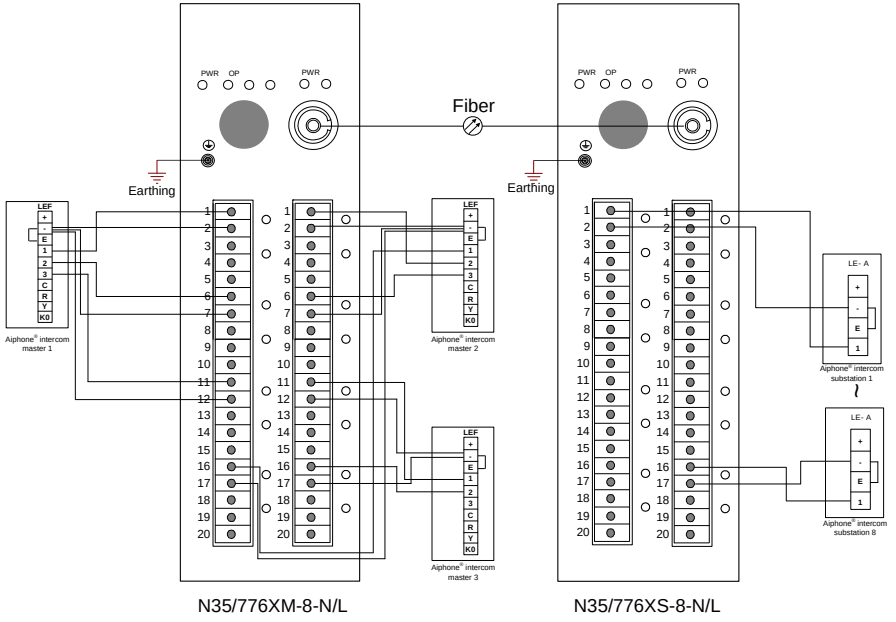


Figure 10. N35/776XM-8-N/L & N35/776XS-8-N/L

The N3951 series is used between transmitter and receiver to extend the transmission distance of fiber optical system. It magnifies the optical signal received from transmitter, and sends it to receiver. By using a N3951, the transmission distance of the system is doubled.

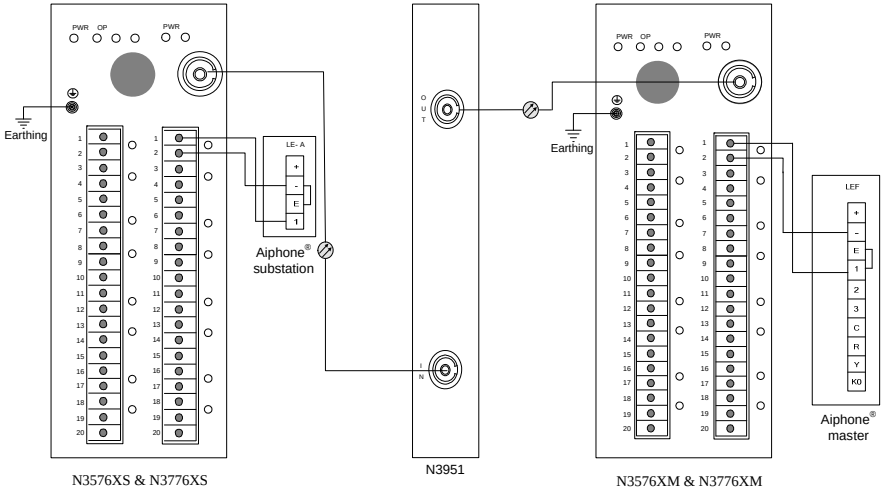


Figure 11. N3951 Transmission repeater

Relation between 24VAC Cable Diameter and Transmission Distance

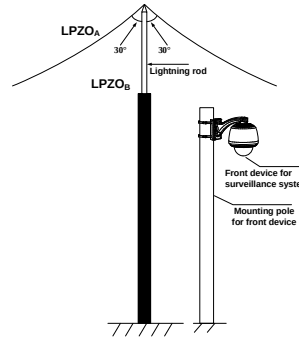
In general, the maximum allowable voltage loss rate is 10% for AC-powered devices. The table below shows the relationship between transmission power and maximum transmission distance under a certain specified cable diameter, on condition that the 24VAC voltage loss rate is below 10%. According to the table, if a device rated at 50W is installed 17-meter away from the transformer, the minimum cable diameter shall be 0.8000mm. A lower diameter value tends to cause voltage loss and even system instability.

Diameter (mm) / Distance (ft / m) / Power (W)	0.8000	1.000	1.250	2.000
10	283 (86)	451 (137)	716 (218)	1811 (551)
20	141 (42)	225 (68)	358 (109)	905 (275)
30	94 (28)	150 (45)	238 (72)	603 (183)
40	70 (21)	112 (34)	179 (54)	452 (137)
50	56 (17)	90 (27)	143 (43)	362 (110)
60	47 (14)	75 (22)	119 (36)	301 (91)
70	40 (12)	64 (19)	102 (31)	258 (78)
80	35 (10)	56 (17)	89 (27)	226 (68)
90	31 (9)	50 (15)	79 (24)	201 (61)
100	28 (8)	45 (13)	71 (21)	181 (55)
110	25 (7)	41 (12)	65 (19)	164 (49)
120	23 (7)	37 (11)	59 (17)	150 (45)
130	21 (6)	34 (10)	55 (16)	139 (42)
140	20 (6)	32 (9)	51 (15)	129 (39)
150	18 (5)	30 (9)	47 (14)	120 (36)
160	17 (5)	28 (8)	44 (13)	113 (34)
170	16 (4)	26 (7)	42 (12)	106 (32)
180	15 (4)	25 (7)	39 (11)	100 (30)
190	14 (4)	23 (7)	37 (11)	95 (28)
200	14 (4)	22 (6)	35 (10)	90 (27)

Lightning & Surge Protection

The product adopts multi-level anti-lightning and anti-surge technology integrated with gas discharge tube, power resistor and TVS tube. The powerful lightning and surge protection barrier effectively avoids product damage caused by various pulse signals with power below 4kV, including instantaneous lightning, surge and static. However, for complicated outdoor environment, refer to instruction below for lightning and surge protection:

- The product features with dedicated earth wire, which must be firmly grounded. As for surveillance sites beyond the effective protection scope, it's necessary to erect independent lightening rods to protect the security devices. It's recommended to separate the lightning rod from the mounting pole, placing the rod on an independent pole, as shown in the figure below. If the product has to be installed on the same pole or pedestal for lightning rod, there should be strict insulation between the video cable BNC terminal, power cable, control cable and the standing pole of the lightning rod.
- For suburb and rural areas, it's recommended to adopt direct burial for the transmission cables. Overhead wiring is prohibited, because it's more likely to encounter lightning strike. Use shielded cables or thread the cables through metal tubes for burial, thus to ensure the electric connection to the metal tube. In case it's difficult to thread the cable through the tube all the way, it's acceptable to use tube-threaded cables only at both ends of the transmission line, yet the length in burial should be no less than 15 meters. The cable sheath and the tube should be connected to the lightning -proof grounding device.
- Additional high-power lightning-proof equipment and lightning rods should be installed for strong thunderstorm or high induced voltage areas (such as high-voltage substation).
- The lightning protection and grounding for outdoor devices and wires should be designed in line with the actual protection requirement, national standards and industrial standards.
- The system should perform equipotential grounding by streaming, shielding, clamping and earthing. The grounding device must meet anti-interference and electric safety requirements. There should be no short-circuiting or hybrid junction between the device and the strong grid. Make sure there's a reliable grounding system, with grounding resistance below 4Ω (below 10Ω for high soil resistivity regions). The cross-sectional area of the earthing conductor should be no less than 25mm².



Separated layout for the lightning rod and the standing pole

Infinova®

51 Stouts Lane, Monmouth Junction, NJ 08852, U.S.A.

Tel: 1-888-685-2002(toll-free, USA)

1-732-355-9100

Fax:1-732-355-9101

E-mail: sales@infinova.com

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