comnet
Communication Networks

INSTALLATION AND OPERATION MANUAL

FDC24NL[SFP] Series

24-CHANNEL DUPLEX CONTACT CLOSURE TRANSCEIVER

This manual serves the following ComNet Model Numbers:

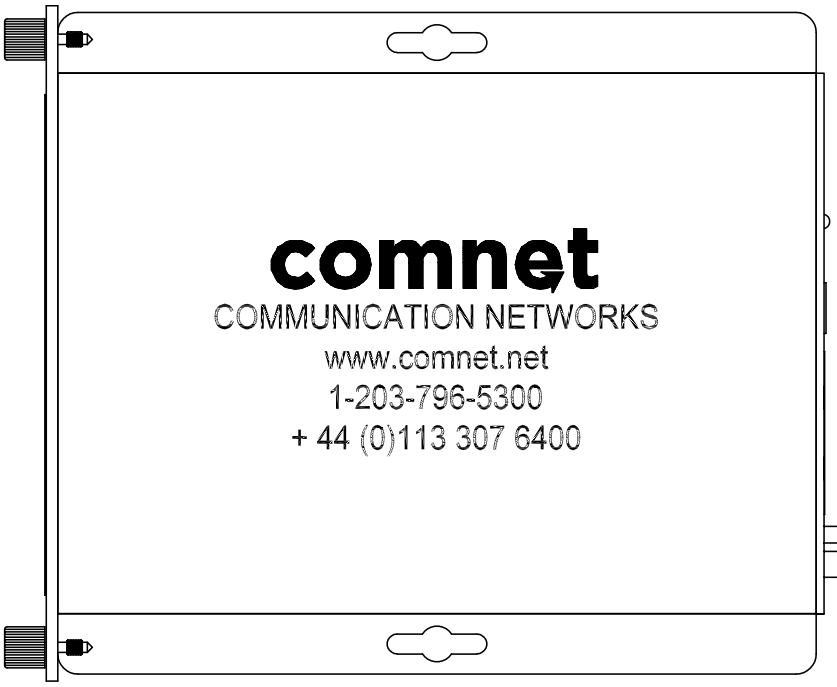
FDC24NL

FDC24NLSFP

The ComNet FDC24NL Series contact closure transceiver units provide transmission of up to twenty four independent duplex dry switch or relay contact closures using a single SFP optical port or any four-wire RS-422 copper circuit. The FDC24NL Series supports an integrated field expandable RS-422 data bus allowing up to 12 uniquely addressed units to be connected to the bus providing up to 288 unique duplex contact closures over a single SFP optical port or RS-422 copper circuit.

The contact closure information is sent in packets that are ordered and encoded, ensuring extremely robust transmission. Packets that are garbled, packets out of sequence, and transmission bit errors will not cause random changes of state on the contact relays. One relay can be optionally re-purposed as a summary fault alarm contact and is triggered in the event that the unit loses fiber or RS-422 bus communications. The FDC24NL series is offered with non-latching solid state relays. Each module incorporates link and individual status indicating LEDs for monitoring confirmation of contact closure input and output of each of the twenty four channels. Packaged in the exclusive ComNet ComFit housing, these units may be either wall or rack-mounted, or may be DIN-rail mounted by the addition of ComNet model DINBKT1 or DINBKT4 adaptor plate.

FIGURE 1 – FDC24NL RS-422 TRANSCEIVER



RS-422 4-Wire (B)

RS-422 4-Wire (A)

BLACK
BLACK WITH WHITE STRIPE

Power Supply:
Surface Mount: 8-15 VDC @ 5 W Max
Rack Mount: From Rack

NOTE: Remove Electrical Connector for Rack Mount Units

FIGURE 2 – FDC24NL FRONT PANEL

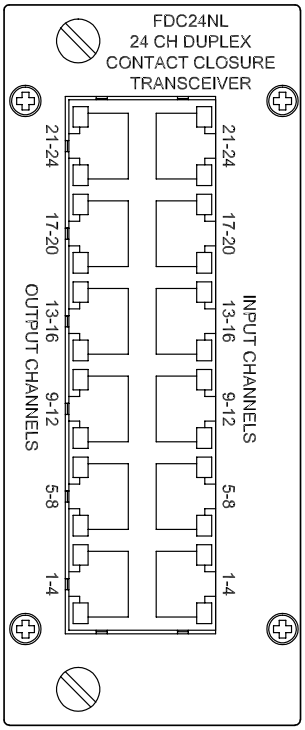


FIGURE 3 – FDC24NL REAR PANEL

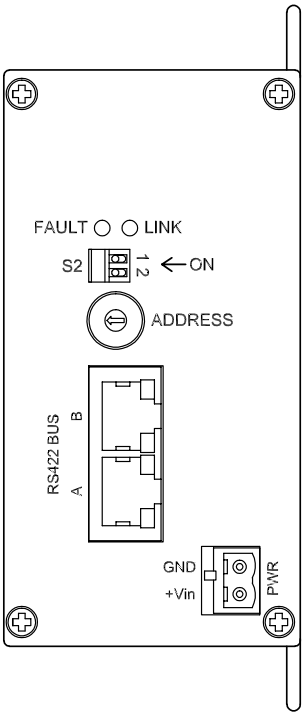


FIGURE 4 – FDC24NLSFP RS-422 & SFP TRANSCEIVER

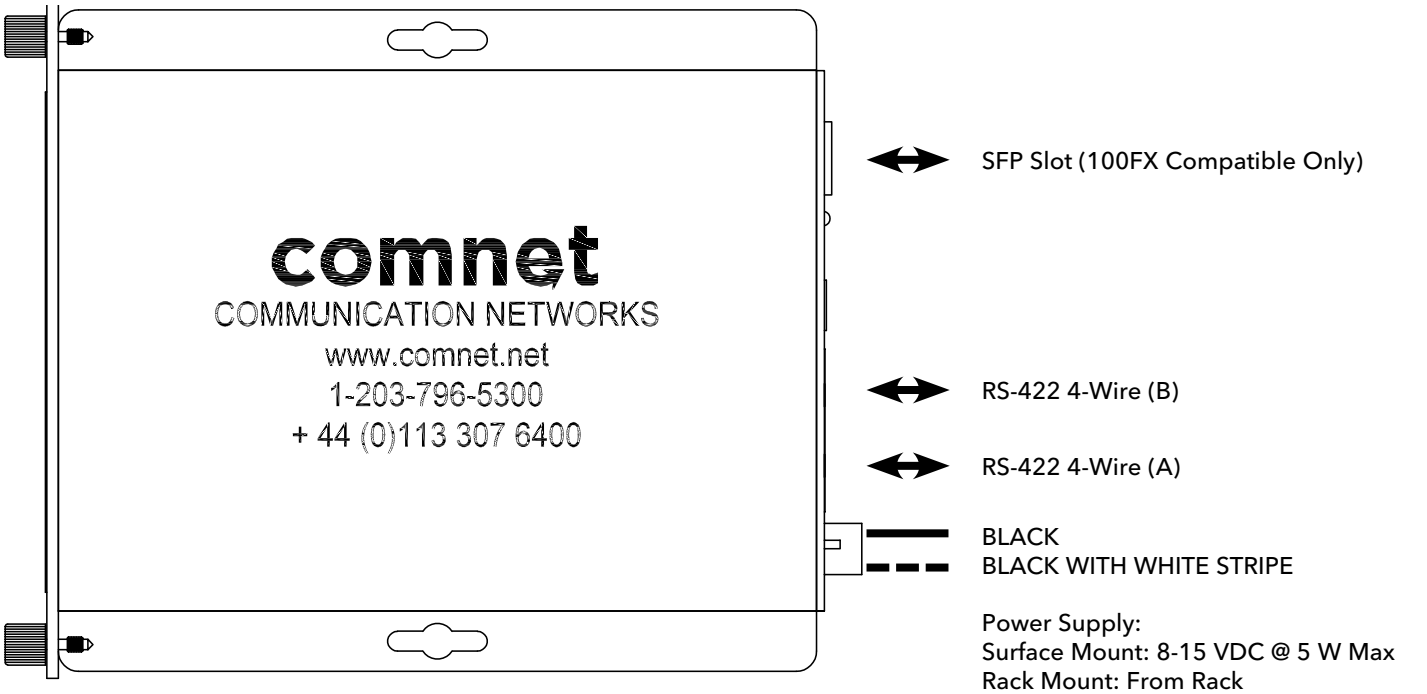


FIGURE 5 – FDC24NLSFP FRONT PANEL

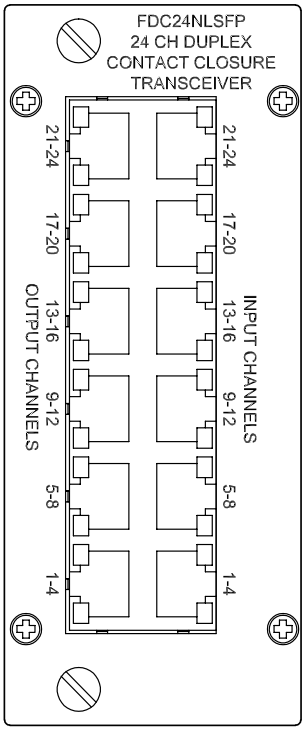


FIGURE 6 – FDC24NLSFP REAR PANEL

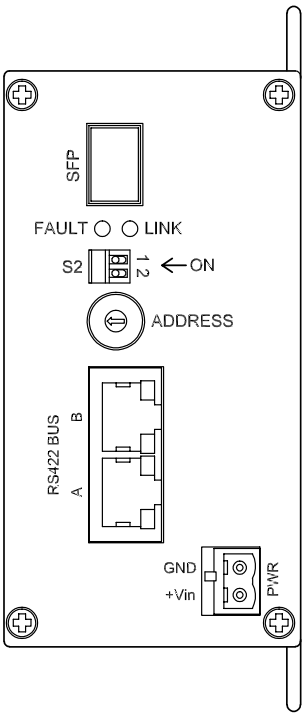
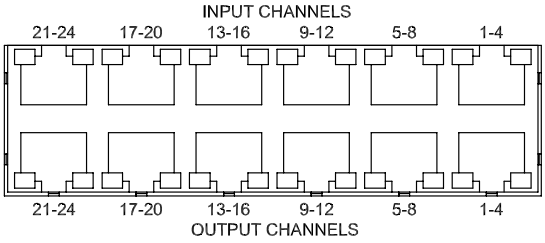


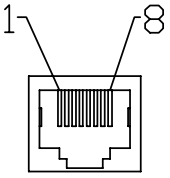
FIGURE 7 – CONTACT CLOSURE PIN-OUT

RJ-45 PORTS

The ports are located on the front panel of each unit

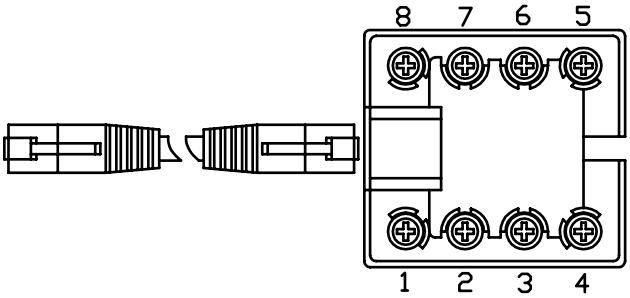


VIEW INSIDE RJ-45 PORT



RJ-45 BREAK-OUT KIT (SOLD SEPARATELY)

Screw Number Corresponds to RJ-45 Port Pin Number



CONTACT INPUT PORT

PIN #	Wire Color	Connections	Polarity
1	Blue	IN 1,5,9,13,17,21	+
2	Orange	IN 1,5,9,13,17,21	–
3	Black	IN 2,6,10,14,18,22	+
4	Red	IN 2,6,10,14,18,22	–
5	Green	IN 3,7,11,15,19,23	+
6	Yellow	IN 3,7,11,15,19,23	–
7	Brown	IN 4,8,12,16,20,24	+
8	White	IN 4,8,12,16,20,24	–

CONTACT OUTPUT PORT

PIN #	Wire Color	Connections	Polarity
1	Blue	OUT 1,5,9,13,17,21	+
2	Orange	OUT 1,5,9,13,17,21	–
3	Black	OUT 2,6,10,14,18,22	+
4	Red	OUT 2,6,10,14,18,22	–
5	Green	OUT 3,7,11,15,19,23	+
6	Yellow	OUT 3,7,11,15,19,23	–
7	Brown	OUT 4,8,12,16,20,24	+
8	White	OUT 4,8,12,16,20,24	–

Link Loss: The alarm inputs on one end are transferred to the outputs on the receiving end of the link. A closed contact on the input causes a closed circuit on the opposing output (i.e., relay turned on). If the RS-422 serial data link is broken or corrupt the outputs will remain in their last known good state.

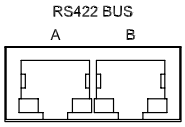
Power-On State: At power-on all alarm outputs will be open (i.e. off), they will remain in this state until a valid link is established, after which they will then track the inputs from units with the same address.

FIGURE 8 – RS-422 DATA PORTS RJ-45 PIN-OUT

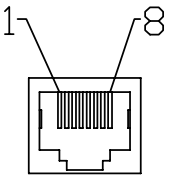
The RS-422 RJ-45 data ports are designed to provide simple connection between units using a standard straight-through patch cable. Connections should be made B to A. The units should always connect to a fiber device or FDC24NLSFP model using Port B.

RJ-45 PORTS

The ports are located on the rear panel of each unit

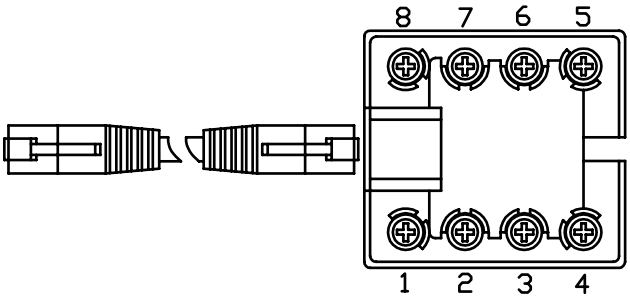


VIEW INSIDE RJ-45 PORT



RJ-45 BREAK-OUT KIT (SOLD SEPARATELY)

Screw Number Corresponds to RJ-45 Port Pin Number



RS-422 A PORT

PIN #	Wire Color	Connections	Polarity
1	Blue	DATA OUT	–
2	Orange	DATA OUT	+
3	Black	DATA IN	+
4	Red	NC	
5	Green	NC	
6	Yellow	DATA IN	–
7	Brown	NC	
8	White	NC	

NC = No Connection

RS-422 B PORT

PIN #	Wire Color	Connections	Polarity
1	Blue	DATA IN	–
2	Orange	DATA IN	+
3	Black	DATA OUT	+
4	Red	NC	
5	Green	NC	
6	Yellow	DATA OUT	–
7	Brown	NC	
8	White	NC	

NC = No Connection

FIGURE 9 – ADDRESS SWITCH SETTINGS

The switch is located on the rear panel of each unit

SW #	Address
0	Reserved
1	UNIT 1
2	UNIT 2
3	UNIT 3
4	UNIT 4
5	UNIT 5
6	UNIT 6
7	UNIT 7

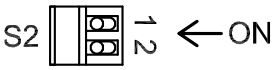
SW #	Address
8	UNIT 8
9	UNIT 9
A	UNIT 10
B	UNIT 11
C	UNIT 12
D	Not Used
E	Not Used
F	Not Used

Up to 12 unique addresses are possible within a single system. Only contact information from units with the same address is exchanged. Multiple units can exist with the same unit address in which case the contacts behave in an OR function so that an input from any unit with the same address will trigger its corresponding output on as many units that have a matching address.

Please refer to Figure 12 for example system topologies.

FIGURE 10 – SWITCH SETTINGS

The switch is located on the rear panel of each unit.



S2-1 - Relay 24 Fault Summary Enable
S2-2 - Fault Summary Relay Operation

The switch S2 is used to configure the summary fault alarm relay operation. The operation is outlined below:

S2-1-ON: Relay Output 24 will function as a summary fault alarm which will trigger on loss of RS-422 or SFP link

S2-1-OFF: Relay Output 24 will function as a normal relay and will be triggered based on the input of contact 24 on a unit with the same address.

S2-2-ON: The summary fault alarm relay will be normally closed and will go open circuit during an alarm condition.

S2-2-OFF: The summary fault alarm relay will be normally open and will close during an alarm condition.

FIGURE 11 – LED INDICATORS

	FAULT	LINK	RS-422 BUS A	RS-422 BUS B	CONTACT CLOSURE
YELLOW	–	–	–	Flashing: Waiting for Link	The yellow LED blinks in a repetitive pattern to indicate the status of each of the four contact inputs or outputs for that port. 1 Blink: Contact 1,5,9,13,17,21 2 Blinks: Contact 2,6,10,14,18,22 3 Blinks: Contact 3,7,11,15,19,23 4 Blinks: Contact 4,8,12,16,20,24
GREEN	Valid Address Selected	Data Link Established	RS-422 Link Established OFF: No Link	RS-422 Link Established OFF: No Link	Following each blink pattern of the yellow LED, the green LED will be on if that contact is closed or off if that contact is currently open. ON: Contact Closed OFF: Contact Open
RED	Invalid Address Selected	No Fiber Connection or No Mating FDC24 Connected	–	–	–
OFF	Unit Powered Down	Unit Powered Down	–	–	–

FIGURE 12 – TYPICAL APPLICATIONS

Cat5 Straight Patch Cable
Fiber Optic Cable

Point-to-Point SFP Fiber Link

RS422 Bus With SFP Fiber Link

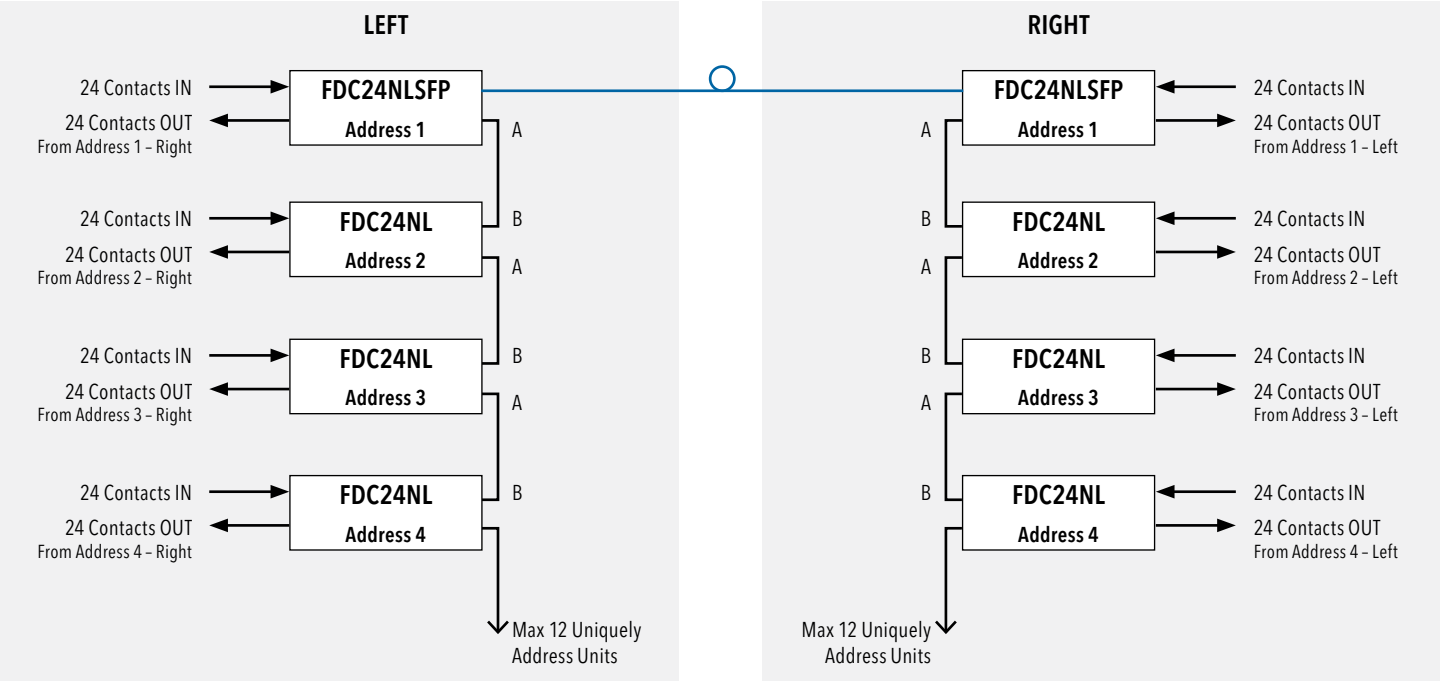
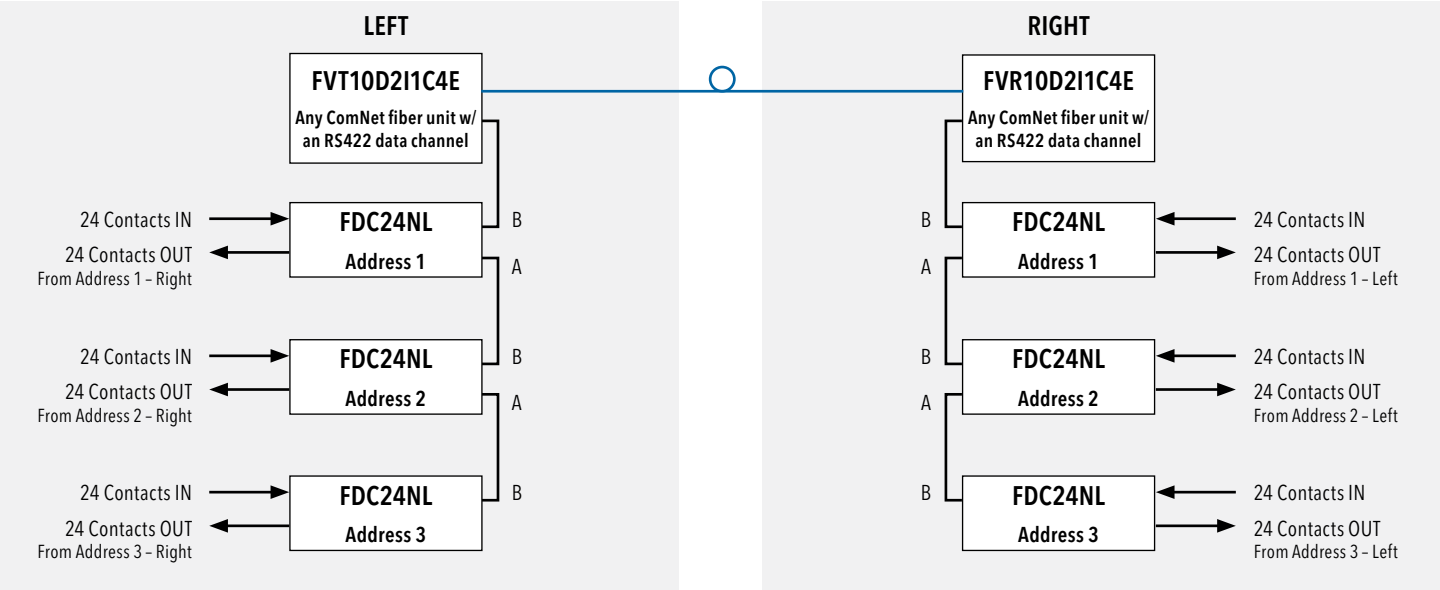


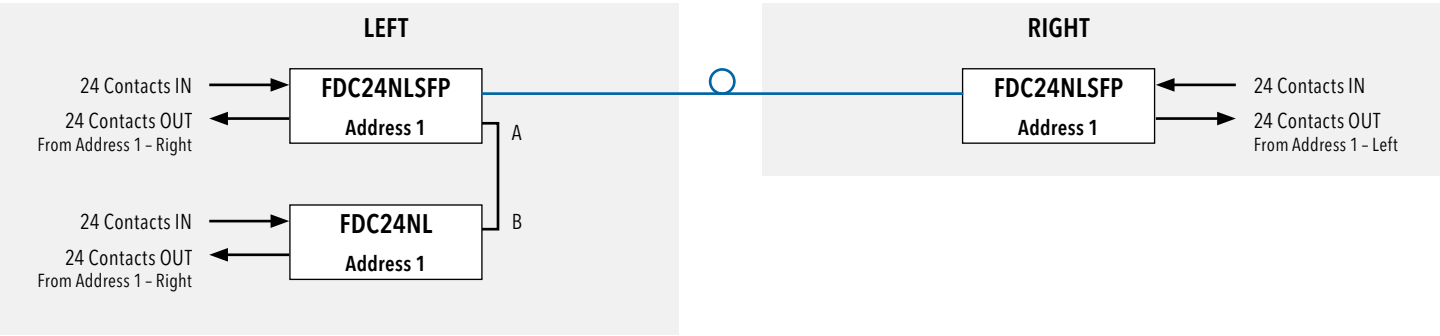
FIGURE 12 – TYPICAL APPLICATIONS (CONT'D)

Cat5 Straight Patch Cable
Fiber Optic Cable

RS422 Bus With Standard Fiber Units



Multiple Units With The Same Address



Contact inputs on the left side will be logic OR'ed together as both units have the same address. (e.g. closing input 1 on either unit will cause relay output 1 to close on the unit(s) with address 1 on the right side of the system.)

In addition, the relay outputs on both units on the left side will close when the corresponding input is closed on the unit(s) with address 1 on the right side of the system.

INSTALLATION CONSIDERATIONS
This fiber-optic link is supplied as a Standalone/Rack module. Units should be installed in dry locations protected from extremes of temperature and humidity.

C1-US, C1-EU, C1-AU OR C1-CH CARD CAGE RACKS

CAUTION: Although the units are hot-swappable and may be installed without turning power off to the rack, ComNet recommends that the power supply be turned off and that the rack power supply is disconnected from any power source.

1. Make sure that the card is oriented right side up, and slide it into the card guides in the rack until the edge connector at the back of the card seats in the corresponding slot in the rack's connector panel. Seating may require thumb pressure on the top and bottom of the card's front panel.

CAUTION: Take care not to press on any of the LEDs.

2. Tighten the two thumb screws on the card until the front panel of the card is seated against the front of the rack.

WARNING: Unit is to be used with a Listed Class 2 power supply.

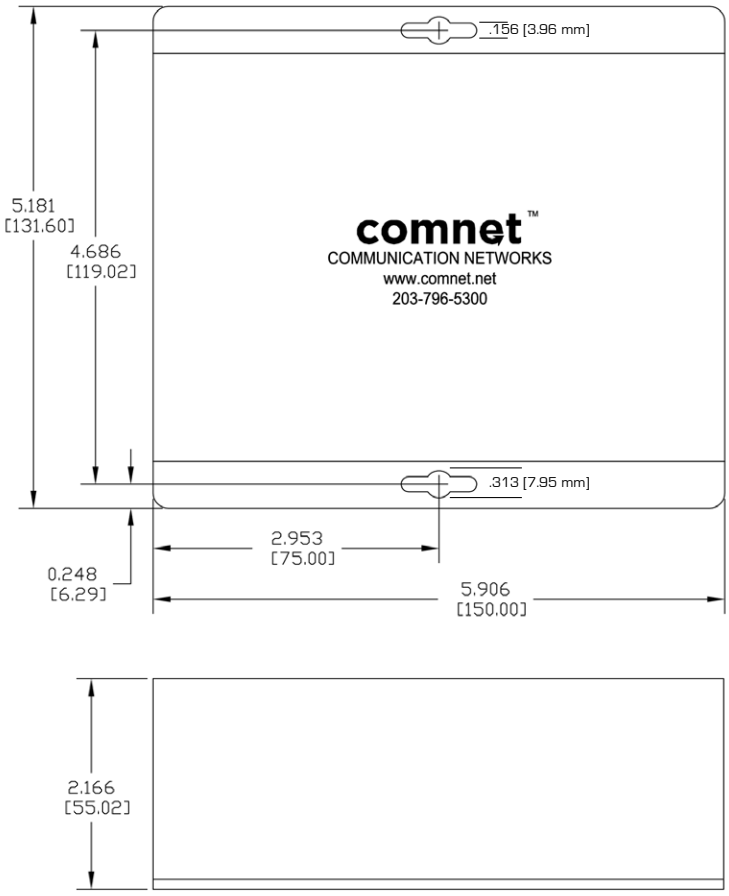
IMPORTANT SAFEGUARDS:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

FIGURE A

Dimensions are for a standard ComNet two-slot module



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