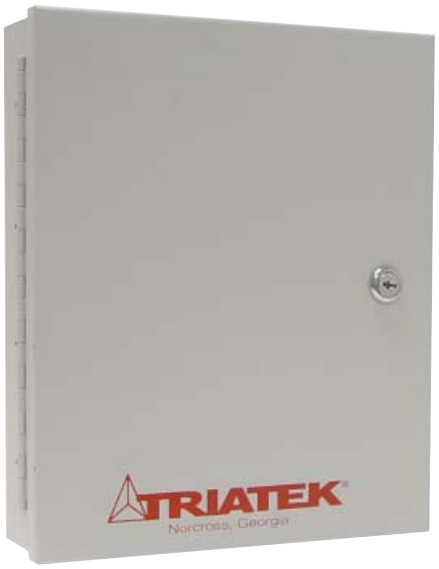
TRIATEK®

TRIGATE

N2 - LON INTEGRATOR



Installation Guide

Rev 1.3

06/02/2005

TRIATEK
Phone: 770-242-1922
Fax: 770-242-1944
http://www.triatek.com
sales@triatek.com

Table of Contents

General

Contents **Page**

Overview 3-4
Installation 5-6
Dimensions 7-8
Mounting 9

Wiring / Communications

Contents **Page**

N2 Network Wiring 10
LON Network Wiring 11-12
Power Wiring 13
Start-Up. 14
LON Commissioning (If Required) 15
LON Mapping Table Worksheet. 16-17

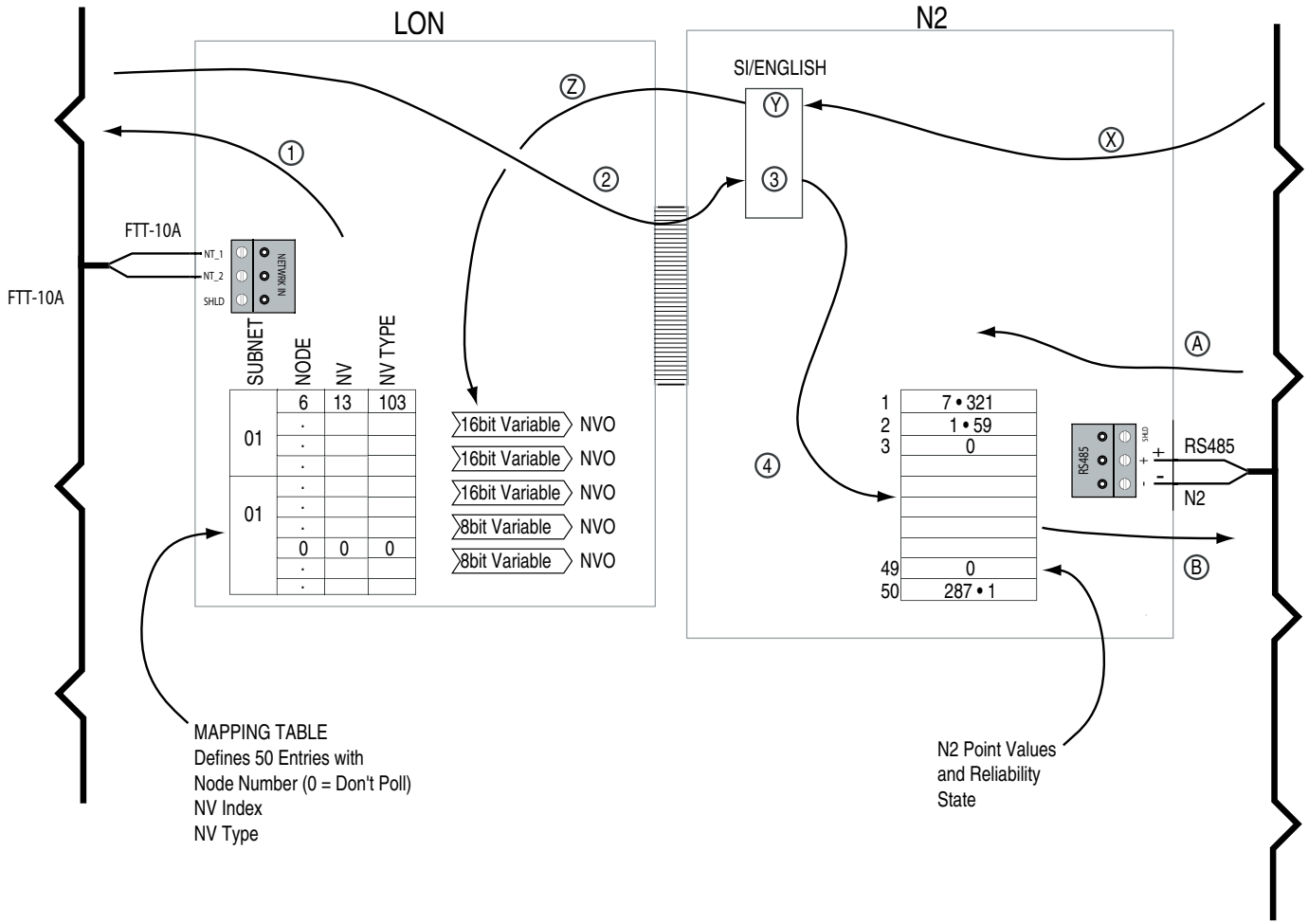
General

Overview

The TRIATEK TRIGATE Integrator is a protocol translator which enables networks using N2 protocols to communicate with FTT-10 LON devices. An example is a Triatek HMS-1600L Fume Hood Controller using LonWorks protocol providing alarm information to a N2 network. Another example is a Triatek FMS-1630 Room Monitor/ Controller using N2 protocol providing alarm information to a LON network. In a single, comprehensive package the TRIGATE Integrator provides the hardware necessary for this translation. TRIATEK offers a comprehensive line of integration gateways.

Information Flow Diagram:

- Ⓐ Receive Poll for ADF
- Ⓑ Respond with Point Value
- ① Use Mapping Table to Request NV Value
- ② When Value Returns Transfer to N2 Side
- ③ Convert to English Units from SI
- ④ Place in Table in Index Based on LON Table Position
- Ⓧ Receive Point Update
- Ⓨ Convert from English Units to SI
- Ⓩ Update Relevant NVO (Output NV)



General

Overview Capabilities

The gateway is capable of supporting up to 50 incoming (from the LON network) and 5 outgoing (to LON devices) points / NetworkVariables. The LON side of the gateway must be "installed" on the LON network just like any other LON node. This can be done with LonMaker or similar Network Management tool. The configuration of the point mapping is also done with LonMaker or other Network Management tool. The N2 side of the node is implicitly configured by the setup procedure on the LON side. The only parameter on the LON system that effects the N2 side is the UCPTUnitAddress. This is the address of the gateway on the N2 trunk. After setting this value the gateway will need to either be reset or have a Wink command issued. This transfers the information to the N2 side of the gateway.

There are 5 configuration properties, which define the LON Network variables that will be monitored. Each of the 5 config properties contain 10 point definitions making a total of 50 points. UCPTN2A contains N2 points / objects 1 –10, UCPTN2B contains N2 points / objects 11-20 etc. The points on the N2 side are represented only as Internal Floats. To map the LON NVs to N2 Points, pick the N2 point to be used (ie 05 is entry 5 in the UCPT A property). Each entry has three values N, I and T, where N is the node address on the LON trunk. This can be found by right clicking on the node in LonMaker and getting the properties. The I is the Index of the NV that is to be monitored. This can be found by browsing the appropriate node and then right clicking in the browser on the NV to be monitored, and selecting Properties. The value will be in the NVIndex property. The T is the SNVT type of the NV. This can be obtained the same way as the NVIndex. Once these values are entered and the config property downloaded, the gateway will start polling for the value. Any entries where the Node address is set to 0, will not be polled. At the front of each of the 5 UCPTs is a S=0. Set this number to the Subnet of the system that the gateway is on (typically = 1).

The five output points are represented as Internal Floats and are only affected by writing to objects 51 – 55. When the node is reset or "Winked" the gateway will determine the SNVT type of the output NV and scale any commanded values accordingly before sending them to the LON side. The output NV will need to be bound to the appropriate nvi to allow it to control the input of any controller. Each of the outputs can have its output type changed to suit the matching input NV on a controller. If the type is changed, the node will need to be winked to allow it to transfer the information to the N2 side of the gateway. Note that type changes require that the new NV type (SNVT) be of the same size as the original type, hence three of the NVs are 2 bytes in size and the remaining two are one byte in size.

Receiving And Inspection

Carefully remove the TRIGATE from the shipping container and inspect for any damage. If any damage has occurred in transit, contact freight carrier.
Save the shipping container for possible future use in returning the TRIGATE to the factory. for repair.

Location

The standard version of the TRIGATE is a NEMA 1 enclosure suitable for most clean indoor locations. If additional protection is required, mount unit in an enclosure with adequate NEMA rating.

The ambient temperature of the selected mounting location must be between +40º to 120ºF. Consideration should be given to units exposed to direct sunlight.

The selected mounting location should be rigid and free of vibration.

General

Installation

This section will illustrate a typical method of installing the TRIGATE . Tools required include: drill, 3/8 drill bit, 1/8 drill bit, Phillips #2 screwdriver, and standard medium blade screwdriver.

1. Prepare mounting locations

2. See following pages for dimensions and mounting detials.

3. All wiring should conform to the Local Regulations and National Electrical Code. Take care not to run network wiring in the same conduit as line voltage or other conductors that supply highly inductive loads such as generators, motors, solenoids or contactors, etc.

4. Attach the N2 RS485 communications channel to the 3 pin RS485 connector on the N2 board. N2 + to the + and N2 – to the – terminal. Leave the shield unconnected. (See Page 10 for Wring Diagram.)

5. Connect the LON FTT-10A communications cable to the either of the two LON network in/out connectors on the LON board. Leave the shield unconnected and connect to the NT_1 and NT_2 terminals which are polarity independent. (See Page 12-13 for Wiring Diagram.)

6. Power supply connections - input voltage must be Class 2, 24 VAC or 24 VDC. An isolation stepdown transformer is supplied with the TRIGATE. Ensure that power is available, and connect the two 24VAC connectors, one to each board, if they are not already connected.

7. After installation is complete, apply power to the unit and observe for proper operation.

If there are already settings in the LON controller there will be an indication of operation on the 4 LEDs on the N2 board.

LED1 (nearer the edge of the board) flashes for each Network Variable response received into the LON card from the LON network.

LED2 flashes for each character received on the N2 network. This makes no assumption that the character is valid for the received message or is intended for this device.

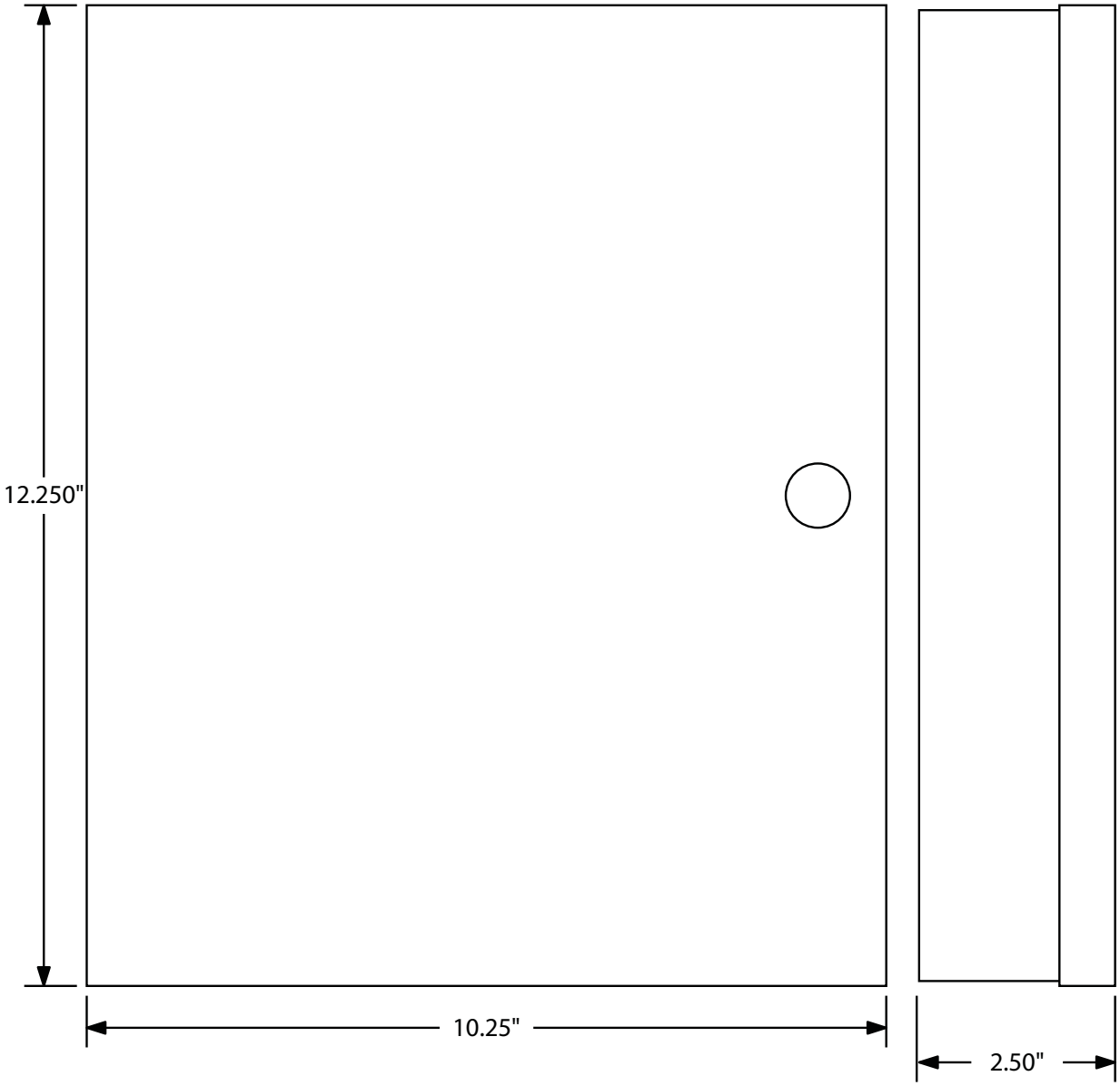
LED3 flashes for each packet sent back on the N2 network in response to a valid request message from the N2 master.

LED4 (nearer the processor chip) flashes when the N2 and LON boards resync the inter-board messaging system. This normally occurs when the boards first powerup or if the LON board is issued a reset command.

In addition to this the LON board has a “service” button and a “service” led. These are used in the commissioning of the LON side of the gate way. A tool like LonMaker is used to commission the LON side of the gateway. The N2 address is set with the commissioning tool from the LON side of the gateway. Point mapping of the LON Network Variables and the N2 points is done from the LON side of the gateway. See separate guide sheet for information on this.

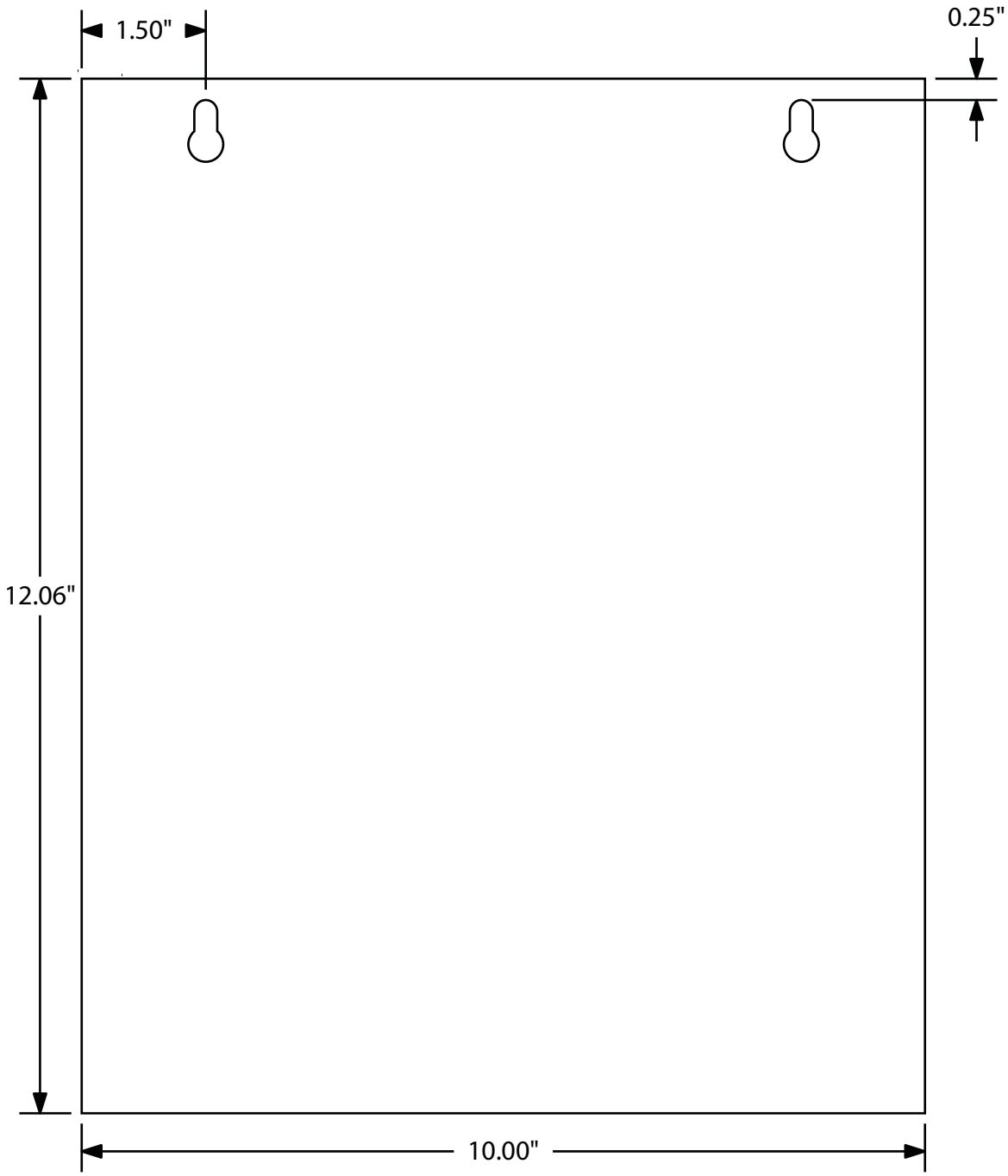
Dimensions

TRIGATE



Dimensions

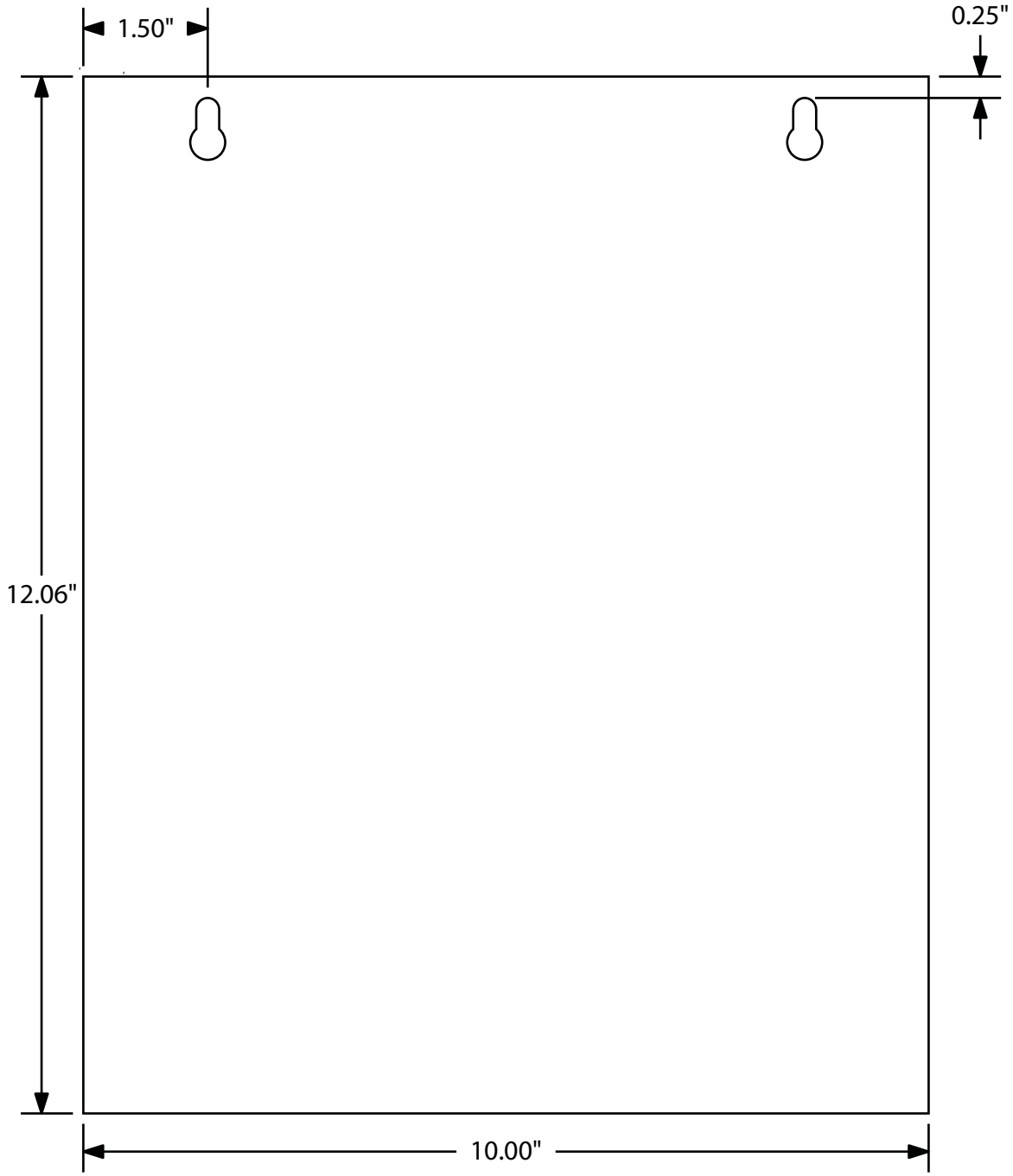
TRIGATE



Mounting

TRIGATE

Tools Required: Electric drill; #25 (0.1495”) bit; screwdriver or nutdriver; and #10 self-tapping screws.
The TRIGATE should be mounted at eye level.
Reasonable consideration should be given to clearances for network and electrical connections.
Once a suitable location is found, use the unit as a template to mark the centers of the mounting holes.
Drill pilot holes at the marked locations. With the unit in position, install the #10 screws.

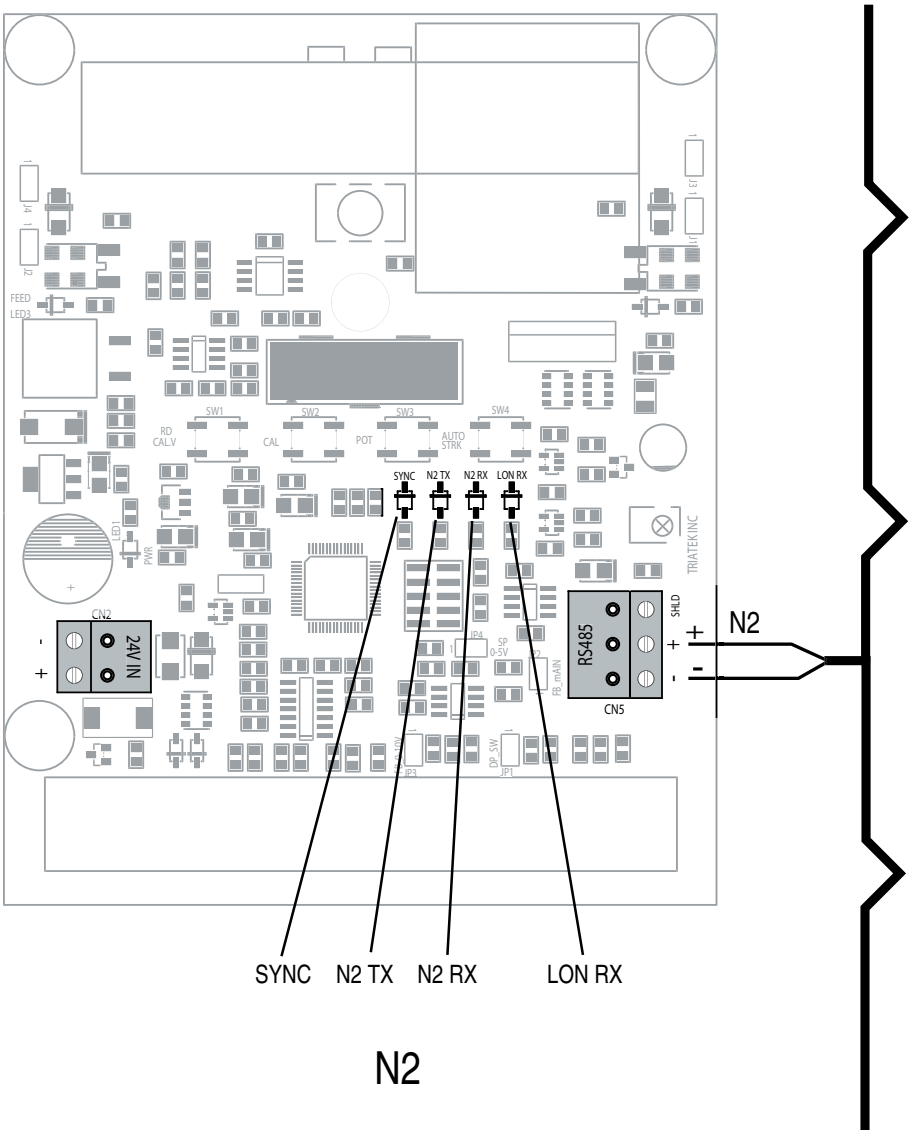


Communications

TRIGATE Network N2 Wiring

1. All wiring should conform to the Local Regulations and National Electrical Code. Take care not to run network wiring in the same conduit as line voltage or other conductors that supply highly inductive loads such as generators, motors, solenoids or contactors, etc.

2. Attach the N2 RS485 communications channel to the 3 pin RS485 connector on the N2 board. N2 + to the + and N2 – to the – terminal. Leave the shield unconnected.



N2

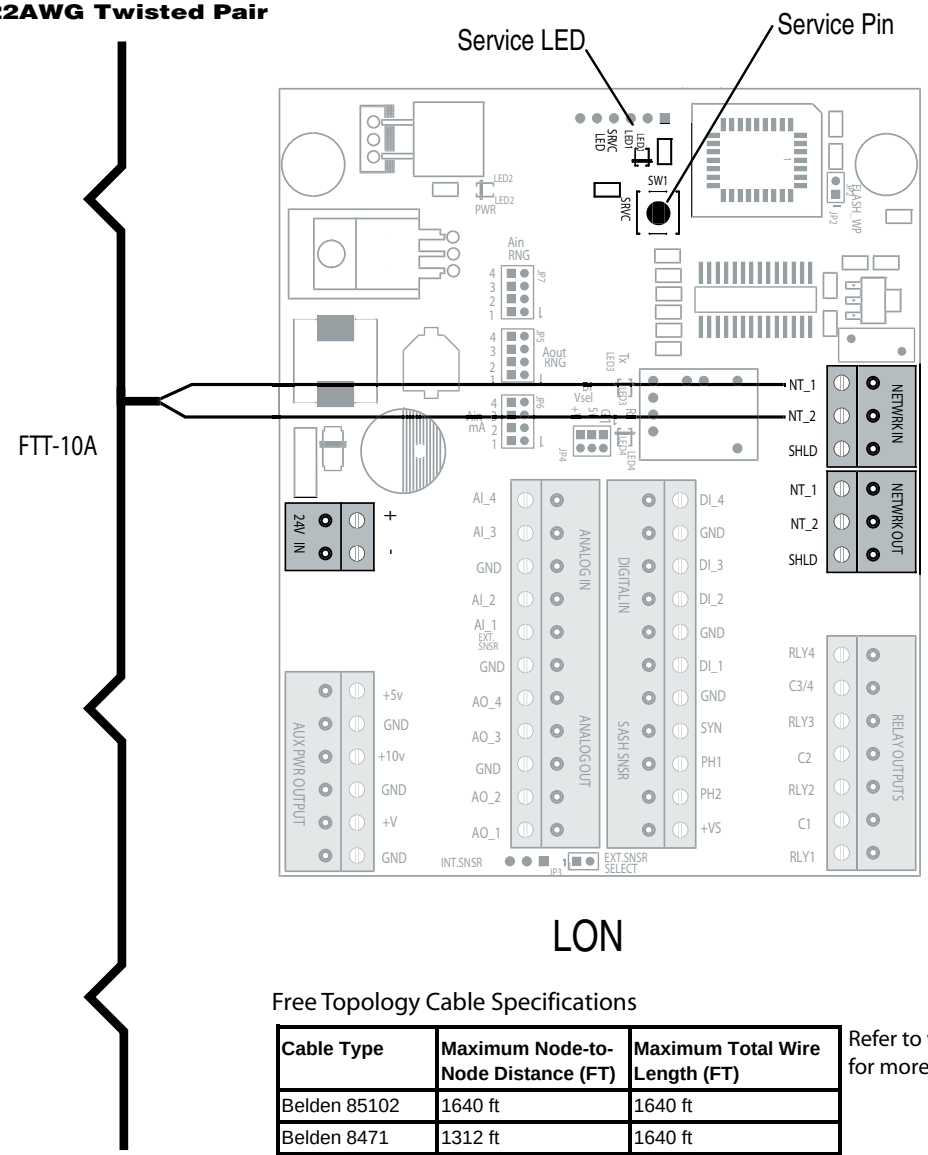
Communications

Wiring LON

1. All wiring should conform to the Local Regulations and National Electrical Code. Take care not to run network wiring in the same conduit as line voltage or other conductors that supply highly inductive loads such as generators, motors, solenoids or contactors, etc.

2. Connect the LON FTT-10A communications cable to the either of the two LON network in/out connectors on the LON board. Leave the shield unconnected and connect to the NT_1 and NT_2 terminals which are polarity independent.

LON FTT-10 Free Topology Communications Network 18-22AWG Twisted Pair



LON

Free Topology Cable Specifications

Cable Type	Maximum Node-to-Node Distance (FT)	Maximum Total Wire Length (FT)
Belden 85102	1640 ft	1640 ft
Belden 8471	1312 ft	1640 ft
Level IV, 22AWG	1312 ft	1640 ft
JY (St) Y x2x0.8	1049 ft	1640 ft
TIA Category 5	820 ft	1476 ft

Refer to www.lonmark.org for more details.

Communications

General, Wiring

LON WIRING INSTRUCTIONS

Communications connections require that the Trigate units be connected with twisted pair communication cable to each unit in the network. The unique network address of each Trigate unit is set by a network management tool like LONMAKER.

All wiring must be done in accordance with the NEC as well as regulations of all authorities having jurisdiction, and must conform to applicable codes. When required by code, communications wiring may be installed in conduit of a type designed specifically for this purpose.

WIRE TERMINATIONS

The Trigate is provided with a removable connector block with convenient screw terminals. Make the LON FTT-10 communications connections as follows:

1 Connect a cable lead to the “NT_1 -” terminal (#1).

2 Connect a cable lead to the “NT_2” terminal (#1)

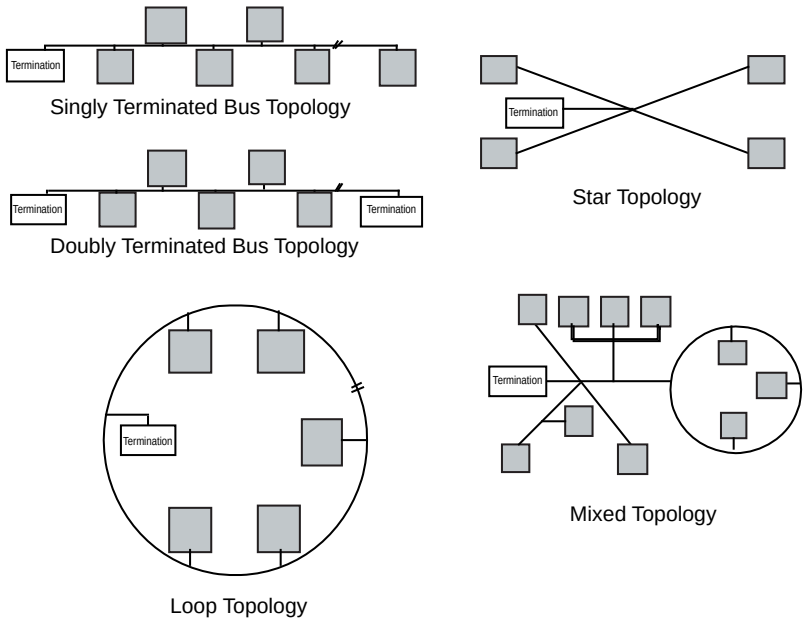
GUIDELINES FOR WIRING

Following these guidelines will help to keep wiring-related communications problems to a minimum:

1. Do not splice communications cable or wire at any point.
2. Avoid “T-tap” technique of routing/connecting communications cable. Conductor discontinuities produced by such connections may generate RFI or other electromagnetic interference on the communications circuit.
3. Do not use wire nut devices for connecting communications cable.
4. Do not route any part of the communications cable through conduit, junction boxes or other devices containing AC electrical wiring.
5. Do not strap communications cable to any conduit or other device containing AC electrical wiring, or run communications cable parallel to (or against) such devices.

NOTE: AC electrical devices such as transformers, disconnects, fluorescent lighting, motor-controllers, variable frequency drives or other high voltage power sources may generate RF interference which could cause intermittent problems in the communications network.

Typical Network Topologies



Wire the LON network in accordance with LON network standards.

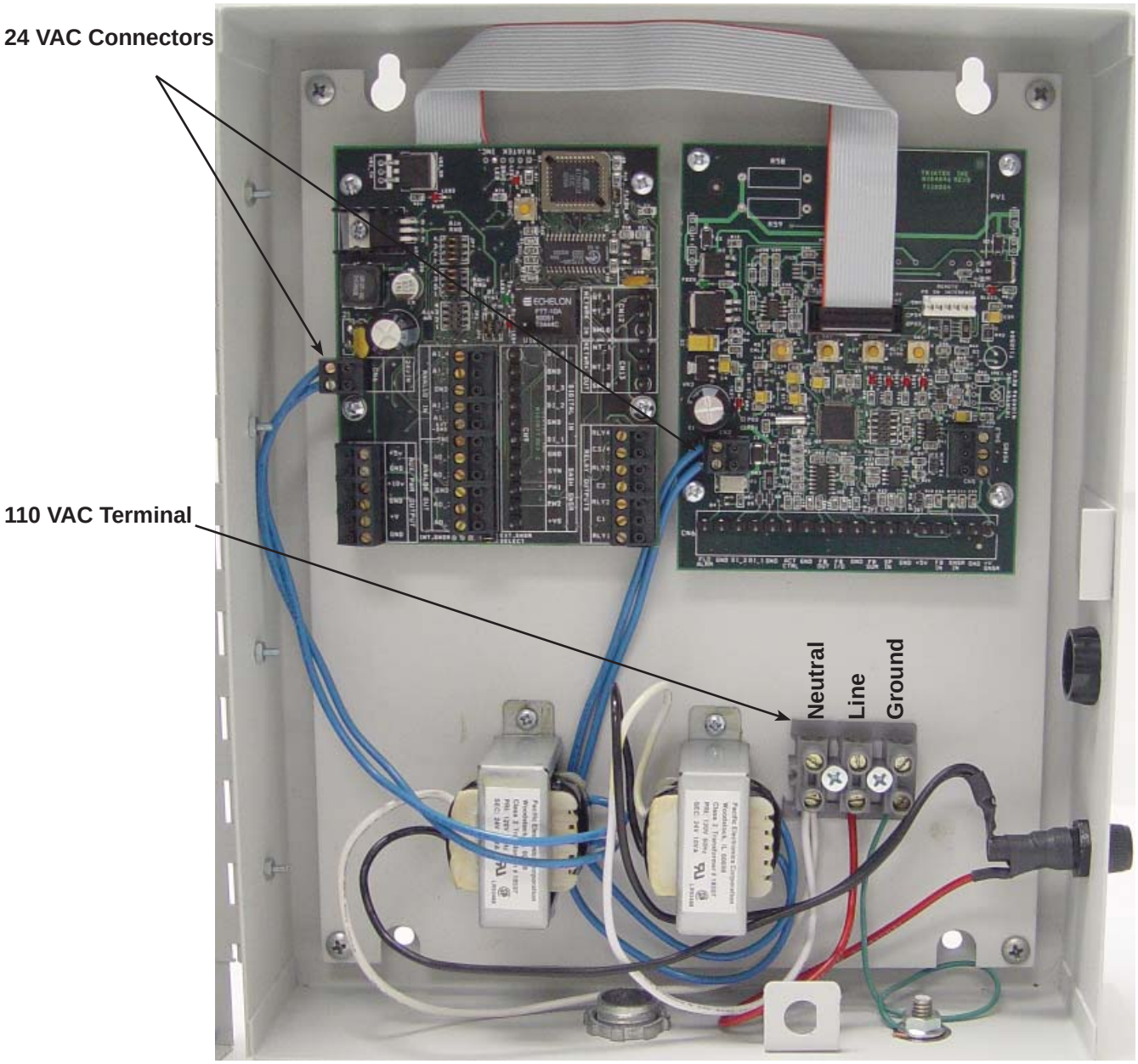
NOTE: Be sure to observe installation instructions regarding possible need for a termination load or other device that may have to be attached on the end of a run.

Power Wiring

TRIGATE

1. All wiring should conform to the Local Regulations and National Electrical Code. Take care not to run network wiring in the same conduit as line voltage or other conductors that supply highly inductive loads such as generators, motors, solenoids or contactors, etc.

2. Power supply connections - input voltage must be Class 2, 24 VAC or 24 VDC. An isolation stepdown transformer is supplied with the TRIGATE. Ensure that power is available, and connect the two 24VAC connectors, one to each board, if they are not already connected. Connect 110 VAC wiring to the terminal block shown below.



Start-Up

TRIGATE

1. After installation is complete, apply power to the unit and observe for proper operation. If there are already settings in the LON controller there will be an indication of operation on the 4 LEDs on the N2 board.

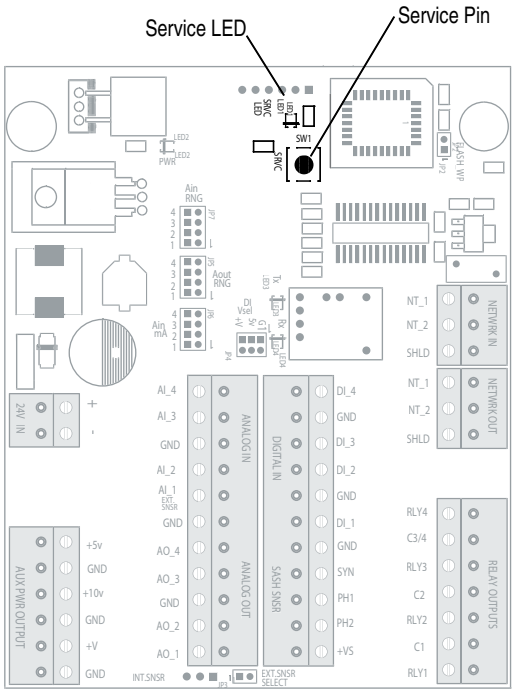
LED1 (nearer the edge of the board) flashes for each Network Variable response received into the LON card from the LON network.

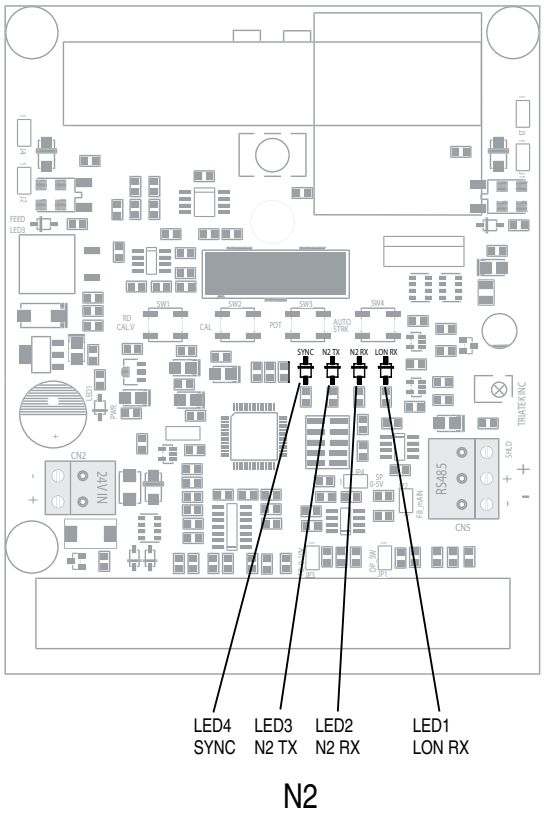
LED2 flashes for each character received on the N2 network. This makes no assumption that the character is valid for the received message or is intended for this device.

LED3 flashes for each packet sent back on the N2 network in response to a valid request message from the N2 master.

LED4 (nearer the processor chip) flashes when the N2 and LON boards resync the inter-board messaging system. This normally occurs when the boards first powerup or if the LON board is issued a reset command.

In addition to this the LON board has a “service” button and a “service” led. These are used in the commissioning of the LON side of the gate way. A tool like LonMaker is used to commission the LON side of the gateway. The N2 address is set with the commissioning tool from the LON side of the gateway. Point mapping of the LON Network Variables and the N2 points is done from the LON side of the gateway. See separate guide sheet for information on this.





Start-Up

TRIGATE LON Commissioning (If Required)

With reference to the LonMaker Browser screen capture, the following items are required to be commissioned.UCPTN2A, UCPTN2B, UCPTN2C,UCPTN2D and UCPTN2E, UCPTPollInterval and UCPTUnitAddress.

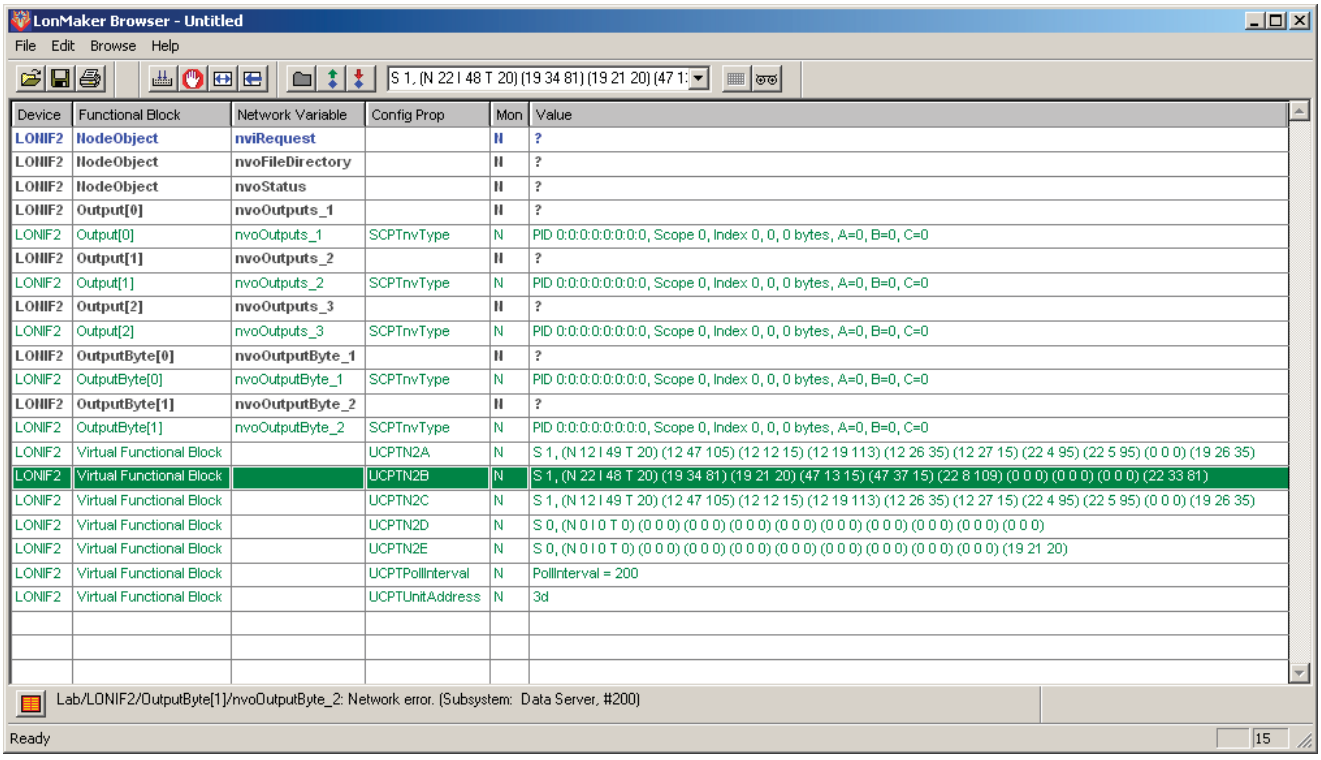
UCPTUnitAddress sets the address that the N2 aspect of the unit will occupy on the N2 network. The address is represented in hexadecimal. If the entry is changed in the LON entry field, the N2 address will not change on the N2 side of the unit until the LON device is either "Winked" or reset.

UCPTPollInterval sets the LON polling rate. This defaults to 1000mS (1 sec). This should not be set to a value less than 200mS.

UCPTN2A(B, C, D and E) defines the points that will be monitored on the LON controllers. In the example shown, line UCPTN2A has the entry;
S 1, (N 12 I 49 T 20) (12 47 105) (12 12 15) (12 19 113) (12 26 35) (12 27 15) (22 4 95) (22 5 95) (0 0 0) (19 26 35)
As the "A" entry it represents N2 ADF points 1 –10, and as such ADF point 1 will be data from LON controller on Subnet 1 (S 1), Node 12 (N 12) Network Variable Index 49 (I 49), of SNVT type 20 (T 20), and ADF point 2 will be data from LON controller on Subnet 1 (S 1), Node 12, NV Index 47, of SNVT type 105 (12 47 105) etc. UCPTN2B represents ADF points 11 – 20, and in the example, UCPTN2B contains;
S 1, (N 22 I 48 T 20) (19 34 81) (19 21 20) (47 13 15) (47 37 15) (22 8 109) (0 0 0) (0 0 0) (0 0 0) (22 33 81)
Consequently ADF point 11 will be data from the LON controller on Subnet 1 (S 1), Node 22 (N 22), NV Index 48 (I 48) with SNVT type 20 (T 20). Note ADF points 17, 18, and 19 will not exist as the Node number entries are 0, (0 0 0) (0 0 0) (0 0 0).

As there are five UCPTN2x entries with ten points each, the user has the ability to monitor NVs in up to five different subnets. Each subnet is relevant to the ten points with that UCPT only.

There are five Output Network Variables that can be controlled by the N2 system. These occupy ADF points 51 – 55 in the 'write' mode. The points are configured to be of "Changeable Type" on the LON side. This allows the point type to be matched to the NV to be controlled. If, for example, the temperature setpoint needs to be controlled, then one of the first three output NVs need to have its type changed to SNVT_temp_p. Only NVs of the same type can be bound together. The first three Output NVs are 2 bytes in size and the remaining two are 1 byte in size. The 1 byte NVs would typically be used for state control like Occupancy. nvoOutputs_1 is ADF point 51, nvoOutputs_2 is 52, nvoOutputs3 is 53, nvoOutputByte_1 is ADF point 54 and nvoOutputByte_2 is ADF point 55, all in write mode only. These NVs should be bound to the appropriate controller point to be controlled, and will update only when a value is sent from the N2 side.



Start-Up

LON Mapping Table Worksheet

Read						LON MAPPING TABLE ENTIRES					
NPT	NPA	UNITS	POINT DESC.	RANGE/ VALUE	NOTES	UCPT	ENTRY	SUBNET	NODE #	NV INDEX	NV TYPE INDEX
ADF	1					UCPTN2A	1				
ADF	2					UCPTN2A	2				
ADF	3					UCPTN2A	3				
ADF	4					UCPTN2A	4				
ADF	5					UCPTN2A	5				
ADF	6					UCPTN2A	6				
ADF	7					UCPTN2A	7				
ADF	8					UCPTN2A	8				
ADF	9					UCPTN2A	9				
ADF	10					UCPTN2A	10				
ADF	11					UCPTN2B	1				
ADF	12					UCPTN2B	2				
ADF	13					UCPTN2B	3				
ADF	14					UCPTN2B	4				
ADF	15					UCPTN2B	5				
ADF	16					UCPTN2B	6				
ADF	17					UCPTN2B	7				
ADF	18					UCPTN2B	8				
ADF	19					UCPTN2B	9				
ADF	20					UCPTN2B	10				
ADF	21					UCPTN2C	1				
ADF	22					UCPTN2C	2				
ADF	23					UCPTN2C	3				
ADF	24					UCPTN2C	4				
ADF	25					UCPTN2C	5				
ADF	26					UCPTN2C	6				
ADF	27					UCPTN2C	7				
ADF	28					UCPTN2C	8				
ADF	29					UCPTN2C	9				
ADF	30					UCPTN2C	10				

LON Mapping Table Worksheet

Read						LON MAPPING TABLE ENTIRES					
NPT	NPA	UNITS	POINT DESC.	RANGE/ VALUE	NOTES	UCPT	ENTRY	SUBNET	NODE #	NV INDEX	NV TYPE INDEX
ADF	31					UCPTN2D	1				
ADF	32					UCPTN2D	2				
ADF	33					UCPTN2D	3				
ADF	34					UCPTN2D	4				
ADF	35					UCPTN2D	5				
ADF	36					UCPTN2D	6				
ADF	37					UCPTN2D	7				
ADF	38					UCPTN2D	8				
ADF	39					UCPTN2D	9				
ADF	40					UCPTN2D	10				
ADF	41					UCPTN2E	1				
ADF	42					UCPTN2E	2				
ADF	43					UCPTN2E	3				
ADF	44					UCPTN2E	4				
ADF	45					UCPTN2E	5				
ADF	46					UCPTN2E	6				
ADF	47					UCPTN2E	7				
ADF	48					UCPTN2E	8				
ADF	49					UCPTN2E	9				
ADF	50					UCPTN2E	10				

WRITE						LON MAPPING TABLE ENTIRES					
NPT	NPA	UNITS	POINT DESC.	RANGE/ VALUE	NOTES	NV					NV TYPE
ADF	51										
ADF	52										
ADF	53										
ADF	54										
ADF	55										

Field Calibration

Field Calibration Parameters are:
1) LoValu is the reading obtain when there is no air and the sensor is activated.
2) HiValu is the obtained to calibrate the system at a the known max pressure of the sensor with air running at a constant velocity.

These values have been set at the factory and should only be changed if instructed by customer support.

The Setup menu item “Field Calib” allows the user to calibrate the FMS-1400 to a specific flow probe.

1) From the Main display screen, simultaneously press both the **INC** and the **DEC** touchpads to display the Setup menu.
2) Press the **INC** touchpad until “Field Calib” is marked, then press the **Alarm Silence touchpad**.
3) Press the **INC** touchpad to select “**LoValu**”, then press the **Alarm Silence touchpad**.
4) Use the **INC or DEC** touchpad to set the “**LoValu**” to a value between **0 - 9999**. Then press the **Alarm Silence** touchpad to accept this selection.
3) Press the **INC** touchpad to select “**HiValu**”, then press the **Alarm Silence touchpad**.
4) Use the **INC or DEC** touchpad to set the “**HiValu**” to a value between **0 - 9999**. Then press the **Alarm Silence** touchpad to accept this selection.
8) Press the **Test touchpad** to exit *to the “Field Calib” Setup menu.*
9) Use **INC** or **DEC** to select “Exit” and press the **Alarm Silence touchpad** to *exit Setup.*

Programming/User Guide

Notes

TRIATEK
Phone: 770-242-1922
Fax: 770-242-1944
http://www.triatek.com
sales@triatek.com