Purpose

The NTRL02 Term nat on Un t (TU) prov des NR O02 Remote /O (R O) Modu es and f e d equ p ment w th a remote commun cat on nterface v a a 1 Megab t/second f ber opt c data nk The NTRL02 s des gned for po nt to po nt commun cat on and a ows for a max mum cab e d stance between a master and s ave RIO of 10,000 feet (3000 meters) Th s d stance can be doub ed by us ng two TUs w th JP1 jumpered for repeater mode, and a remote +24 V dc power supp y Th s TU a so supports commun ca t on to D g ta Contro and D g ta nd cator Stat on

Description

The NTRL02 Term nat on Un t, s shown n F gure 1 requ res +24 V dc /O power to dr ve ts c rcu try and has a max mum current consumpt on of 170 mA A 25 Amp fuse (F1) prov des nput protect on and a 5 Amp fuse (F1) prov des nput protect on and a 5 Amp fuse (F2) s fused to the D g ta Stat ons

The fo ow ng steps must be performed before the NTRL01 NTRL02, or NTRL03 Term nat on Un ts are put nto operat on

Handling

Special Handling

The NTRL01, NTRL02 and NTRL03 TUs use E ec trostat c Sens t ve (ESD) dev ces Fo ow these hand ng procedures

1 Keep the TU n the spec a ant stat c bag unt you are ready to nsta t n the system Save the bag for future use

2 Ground the ant stat c bag before open ng

3 Ver fy that a dev ces connected to the TU are proper y grounded before us ng t

4 Avo d touch ng the c rcu try when hand ng the TU

NOTE: Ground ng straps (f e d stat c k ts) must be used when nsta ng of remov ng the TU to conf gure or change jumper sett ngs

General Handling

1 Exam ne the TU mmed ate y to ver fy that no damage has occurred n trans t

TABLE 1 NTRL02 Application Summary

INTERFACES TO	CABLE	APPLICATION
Remote /O Modu e NR O02	NKLM01	Prov des commun cat on between NR O02s and the NTRL02
NTRL02	F ber Opt c	Prov des commun cat on between NR O02s
D g ta Contro Stat on NDCS03	NKDS01 NKDS02	Prov des commun cat on between NR O02 and NDCS03 w th or w thout bypass or ND S01
Contro er/Stat on Term n at on Un t NTCS02	NKSE01	Prov des commun cat on between NR O02s and NDCS03 w th or w thout bypass or ND S01

2 Not fy the nearest Ba ey Contro Sa es/Serv ce Off ce of any damage

3 F e a c a m for any damage w th the transpor tat on company that hand ed the sh pment

4 Use the or g na pack ng mater a and/or con ta ner to store the TU

5 Store the TU n an env ronment of good a r qua ty, and free from temperature and mo sture extremes

Installation

The NTRL02 TU can mount on a F e d Term nat on Pane w th n a Process Contro Un t (PCU), remote y The max mum d stance between the NTRL02 and NR O02 s 200 feet (60 meters) P ease refer to the Ter m nat on Un t and Cab e nsta at on sect on of th s manua for comp ete nsta at on nstruct ons or other nformat on as necessary

Cable Connection

An NKLM01 cab e connects between P1 on the TU and P3 on the R O F be· opt c cab e connects two TUs v a TX and RX

Exerc se caut on when connect ng f ber opt c cab es Pay str ct attent on to the bend rad us spec f cat on pu ng tens e strength dur ng nsta a t on and norma system operat on Term nat on of the f ber opt c cab e w th SMA type connectors must be performed by qua f ed personne

Fiber Optic Budget

The opt ca nk has a m n mum of 15 dec be s (dB) of power that can be expended n a system Th s s referred to as the Power Budget The 15 dB of power that can be expended n a system Th s s referred to as the Power Budget The 15 dB of power s guaranteed when 62 5 125 m crometer f ber s ze s used

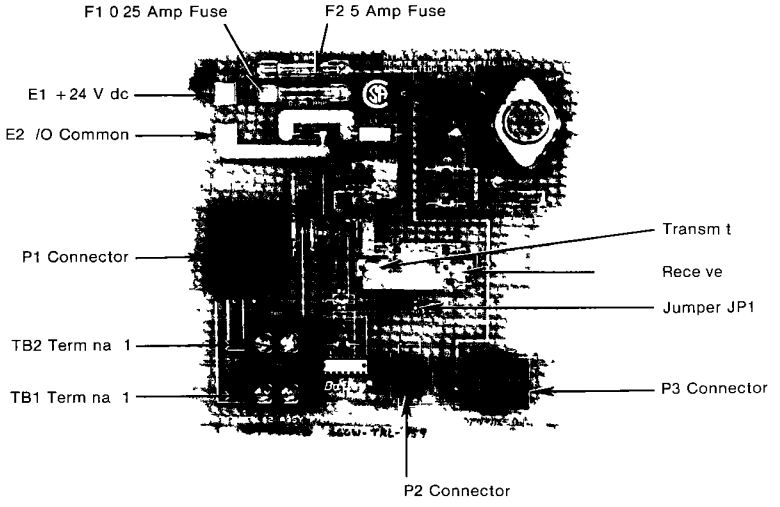


FIGURE 1 NTRL02 Termination Unit

The Power Budget determ nes the max mum d stance over wh ch the nk can operate The osses n a system measured n re at ve dec be s are due to f ber osses spec f ed n dB/km and osses due to connectors or sp ces n the system The 62 5/125 f ber s ava lable n 2 km max mum lengths w th the max mum oss rates at 3 3 dB/km

Examp e

f 3 km of cab e s used the nsert on oss due to the f ber s

3 3 dB/km x 3 km 9 9 dB

Connector osses, f nsta ed proper y amount to an average of 1 dB per connector

f one connect on s made n the cab e the tota oss due to connectors s 3 dB Th s nc udes 1 dB each as the rece ver and transm tter

The tota oss to the system s

9 9 dB 3 dB 12 9 dB

There wou d then be 2 1 dB eft n the Power Budget (15 dB 12 9 dB 2 1 dB) Th s s the safety marg n and shou d be at east 2 dB to a ow for com ponent degradat on

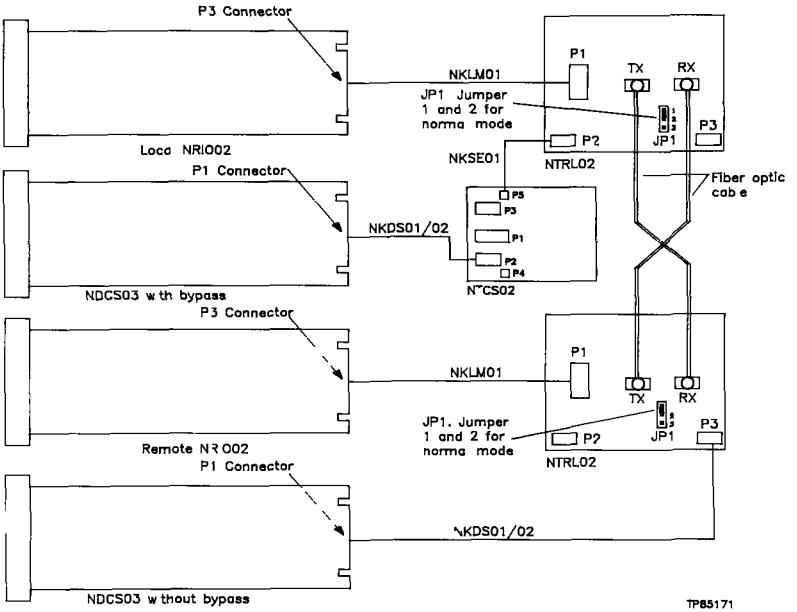


FIGURE 2 Cable Connections for NTRL02 Normal Mode

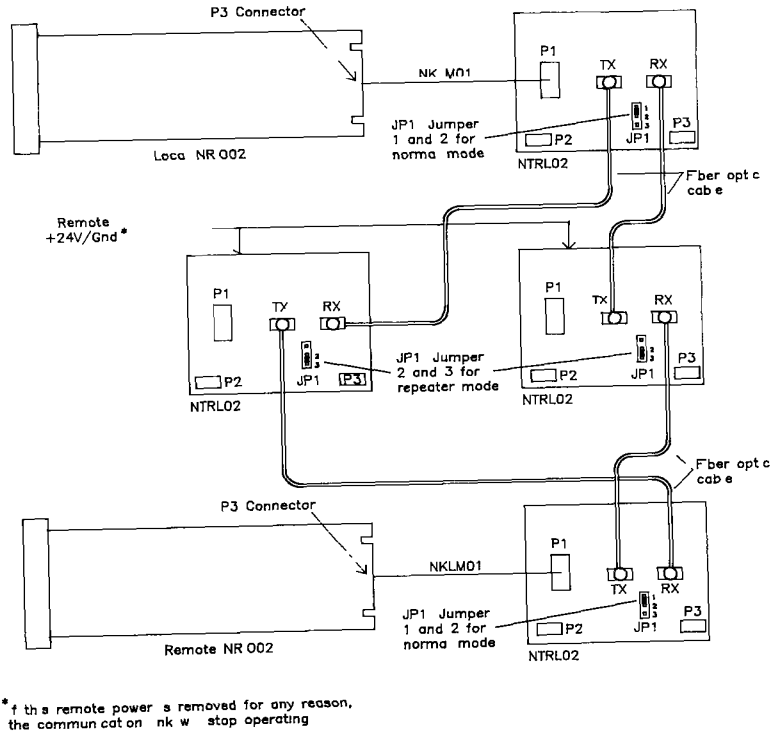


FIGURE 3 Cable Connections for NTRL02 Repeater Mode

Purpose

Th s Terminat on Un t serves as an nterface between the D gita S ave Modu e (NDSM05) and f e d w r ng from AC or DC oads The TU prov des so d state re ays for oad sw tch ng

Description

The NTDO01 Term nat on Un t s shown n F gure 1

Installation

P ease refer to the Term naton Un t and Cab e nsta at on section of th s manua for comp ete instruct ons on nsta ng the Term nation Un t

Additional Cable Installation Procedures

n add t on to the standard Term nat on Un t Cabl ng procedures (see the Term nation Un t and Cab e Insta at on sect on of th s manua), the Term nat on Un t can be connected to other Term nation Un ts and so d state re ays This s done us ng a Da sy Cha n Cab e (NKDO01) connected to the P2 p ug of the Ter m nat on Un t F gure 2 depicts the cab e connect ons between th s Term nat on Un t and the NDSM05 D gita S ave Module The f gure a so shows connec t on between two NTDO01 Term nat on Un ts, s nce the NDSM05 hand es 16 outputs and each TU hand es on y eight

TABLE 1 NTDO01 Application Summary

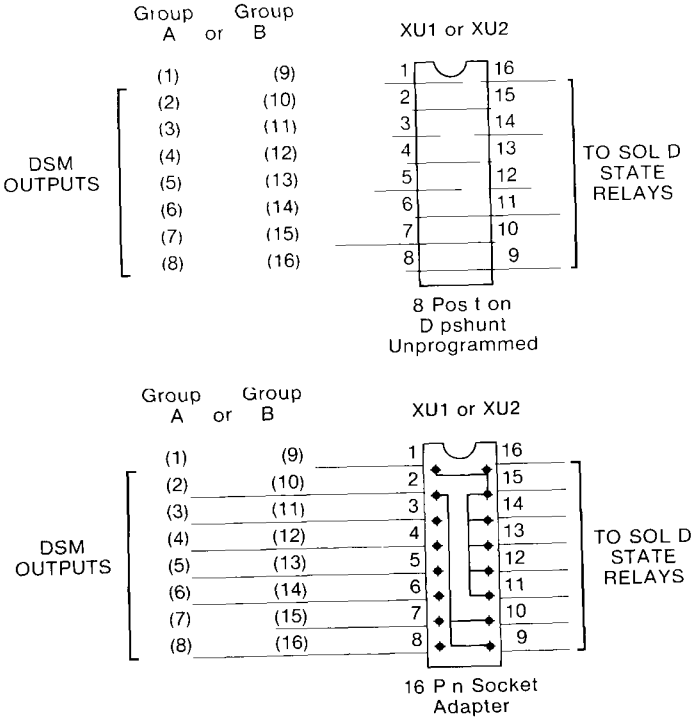
INTERFACES TO	APPLICATION/SIGNAL TYPE	CONNECTING CABLE	NUMBER OF OUTPUTS
DIG TAL SLAVE MODULE NDSM05	120 V ac or 24 V dc	NKTU01	8
TERM NAT ON UN T NTDO01	Enables user to da sy cha n D g ta Slave Modu es together to ncrease the number of outputs	NKDO01	

Configuring the XU1 and XU2 Dipshunts

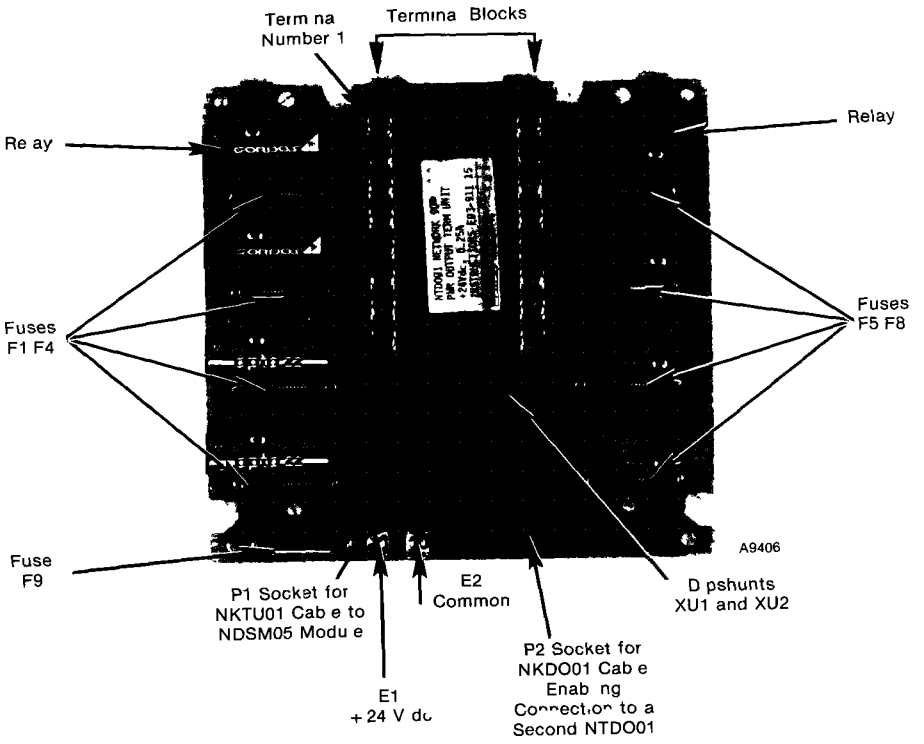
The XU1 and XU2 d pshunts are used to a ow any D g ta S ave Modu e (DSM) output to contro any so d state re ay(s) w th a max mum of n ne per output Th s means that a max mum of 18 Term nat on Un ts can be da sy cha ned together by NKDO01 cab es and contro ed by one DSM

f an unprogrammed d pshunt s p aced nto the XU1 or XU2 socket, each output from group A or group B on the DSM contro s one so d state re ay on the Term nat on Un t If group A s outputs (1 through 8) are a ready contro ng one re ay and group B s out puts (9 through 16) are needed then another NTDO01 Term nat on Un t must be used

f one output from the DSM has to contro more than one re ay a socket adapter s nserted nto the XU1 or XU2 sockets An examp e of both cases s shown be ow For the socket adapter app cat on, the f rst output of e ther group A or B s set to contro s x re ays The second output from e ther qroup A or B s set to contro up to two re ays f more re ays are des red, then another Term nat on Un t(s) must be added



Typical Example Output 1 Driving 6 Relays, Output 2 Driving 2 Relays



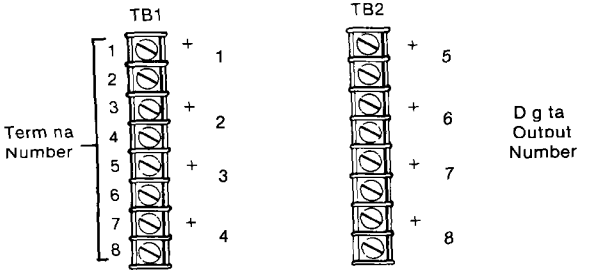


FIGURE 1 NTDO01 Termination Unit and Terminal Assignments

NTDO01

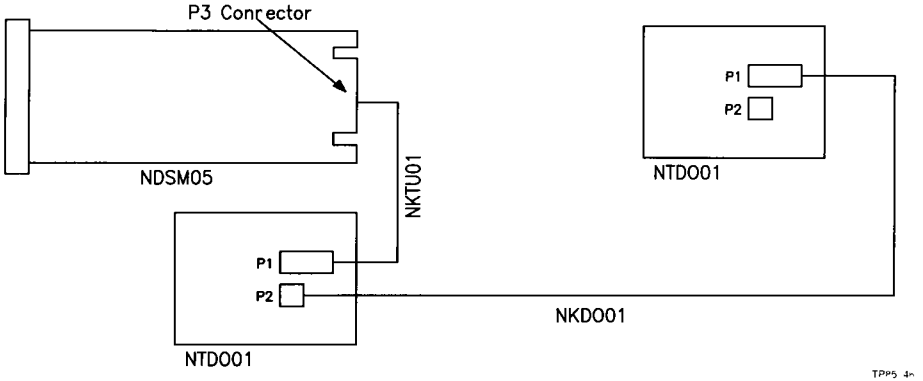


FIGURE 2 Cable Connections for the NTDO01

Purpose

Th s Term nat on Un t prov des the nterface for

- f e d w r ng when a NC S01/02 S ave Modu e s used to supp y analog and d g ta f eld /O
- D g ta Contro Stat ons and D g ta nd cator Stat ons
- Contro er Modu es (NCOM02/03/04), Qu ck Response Contro lers (NQRC01), Mu t Funct on Contro ers and Ba ey PC 90™ Processors

Description

The NTCS02 Term nat on Unit s shown n F gure 1 I/O options are se ected by means of d pshunt con f gurat ons See Tab e 1

Installation

P ease refer to the Term nat on Un t and Cab e nstal at on section of th s manua for comp ete instruct ons on nsta ng th s Term nat on Un t

Cable Installation Procedure

The Ser a Extens on Cab e (NKSE01) enab es the NTCS02 Term nat on Un t to be connected to the NTMF01 Term nat on Un t, a so a ows NTCS02 Ter m nat on Un ts to be da sy cha ned for Mu ti Funct on Contro er to Stat on commun cat on The NKSE01 cab e connects to the P2 connector on the NTMF01 Term nat on Un t and to the P4 or P5 connector on the NTCS02 Term nation Un t

The Ser a L nk Cab e (NKSL01) connects the Mu t Funct on Contro er to the NTCS02 Terminat on Un t Th s cab e s connected to the P1 or P2 connec tor of the Term nat on Un t and the P3 connector of the Mu t Funct on Contro ler on the CPU Board

The Term nat on Un t Cab e (NKTU01) connects the Term nat on Un t to the Control /O S ave Modu e (NCIS01)

The NKDS01 D g ta Station Cab e or NKDS02 (w th a Ser es Connector for da sy cha n ng), nks the Term nat on Un t. v a the P1 connector to a D g ta Contro Stat on (us ng the P2 or P3 connectors) F gure 2 shows samp e cab ng conf gurat ons us ng the NTCS02 Terminat on Un t

TABLE 1 NTCS02 Application Summary

MODULE (CABLE)	APPLICATION/ SIGNAL TYPE	D PSHUNT CONFIGURATION*
CONTROLLER /O SLAVE MODULE NC S01/02 (NKTU01)	ANALOG NPUT VAR AT ONS system powered 4 20 mA	D PSHUNTS XU1 XU4 1 2 3 4 5 6 7 8 1 0 1 0 0 1 1 1
CONTROLLER MODULE NCOM02/03/04 (NKTU01)	externa y powered 4 20 mA	1 2 3 4 5 6 7 8 0 1 0 1 0 1 0 1
MULT FUNCT ON CONTROLLER MODULE NMFC01/02/03/04 (NKSL01, NKTU01)	s ng e ended vo tage	1 2 3 4 5 6 7 8 0 1 0 1 0 0 1 1
	d fferent a vo tage	1 2 3 4 5 6 7 8 0 1 0 1 1 0 0 0
BA LEY PC 90™ PROCESSOR MODULE NMPC01 (NKTU01)	D G TAL NPUT VAR AT ONS ana og +24 V dc /O supp y n ser es	D PSHUNTS XU5 XU7 1 2 3 4 5 6 7 8 0 0 0 0 1 0 1 0
QU CK RESPONSE CONTROLLER NQRC01 (NKTU01)	separate (+24/125 V dc) /O supp y n ser es	1 2 3 4 5 6 7 8 1 0 1 0 0 0 0 0
QUICK RESPONSE SLAVE NQRS01/02 (NKTU01)	no supp y n series	1 2 3 4 5 6 7 8 0 0 0 0 0 0 0 1

** 8 represent strap numbers for d pshunts XU1 through XU9, where 0 represents a cut strap and 1 represents an uncut strap

NOTE The NTCS02 Term nat on Un t hand es 4 Ana og nputs 2 Ana og Outputs, 3 D g ta nputs and 4 D g ta Outputs

TABLE 1 NTCS02 Application Summary (cont.)

MODULE (CABLE)	APPLICATION/ SIGNAL TYPE	DIPSHUNT CONFIGURATION
CONTROLLER MODULE NCOM02/03/04 (NKTU01) D G TAL CONTROL STAT ON NDCS02/03 (NKDS02)	ANALOG NPUT FEEDBACK VAR ATIONS ana og nputs 3 and 4 routed to stat ons 1 and 2 (socket P2 or P3 respect ve y)	D PSHUNT XU8 1 2 3 4 5 6 7 8 1 1 0 1 1 1 0 0 0
D G TAL IND CATOR STAT ON ND S01 (NKDS02)	ana og nput 3 routed to stat on 1 ONLY (socket P2)	1 2 3 4 5 6 7 8 1 1 0 0 0 1 0 0
MULT FUNCT ON CONTROLLER MODULE NMFC01/02/03/04 (NKSL01 NKTU01)	ana og nput 4 routed to stat on 2 ONLY (socket P3)	1 2 3 4 5 6 7 8 0 0 1 1 1 1 0 0 0
BA LEY PC 90™ PROCESSOR MODULE NMPC01 (NKTU01) QUICK RESPONSE CONTROLLER NQRC01 (NKTU01)	NO ana og nput routed to e ther stat on	1 2 3 4 5 6 7 8 0 0 1 0 0 1 0 0

TABLE 1 NTCS02 Application Summary (cont.)

MODULE (CABLE)	APPLICATION/ SIGNAL TYPE	DIPSHUNT CONFIGURATION
CONTROLLER I/O SLAVE MODULE NIS01/02 (NKTU01) CONTROLLER MODULE NCOM02/03/04 (NKTU01) MULTIFUNCTION CONTROLLER NMFC01/02/03/04 (NKSL01, NKTU01) BAILEY PC 90™ PROCESSOR MODULE NMPC01 (NKTU01) QUICK RESPONSE CONTROLLER NQRC01 (NKTJ01) QUICK RESPONSE SLAVE NQRS01/02 (NKTU01)	ANALOG OUTPUT VARIATIONS	DIPSHUNT XU9
	both outputs are in voltage mode	1 2 3 4 5 6 7 8 1 1 0 0 0 0 1 1
	analog output 1 is in voltage mode, analog output 2 is in current mode	1 2 3 4 5 6 7 8 1 1 0 0 0 0 0 0
	analog output 1 is in current mode, analog output 2 is in voltage mode	1 2 3 4 5 6 7 8 0 0 0 0 0 0 1 1
	both outputs are in current mode	1 2 3 4 5 6 7 8 0 0 0 0 0 0 0 0

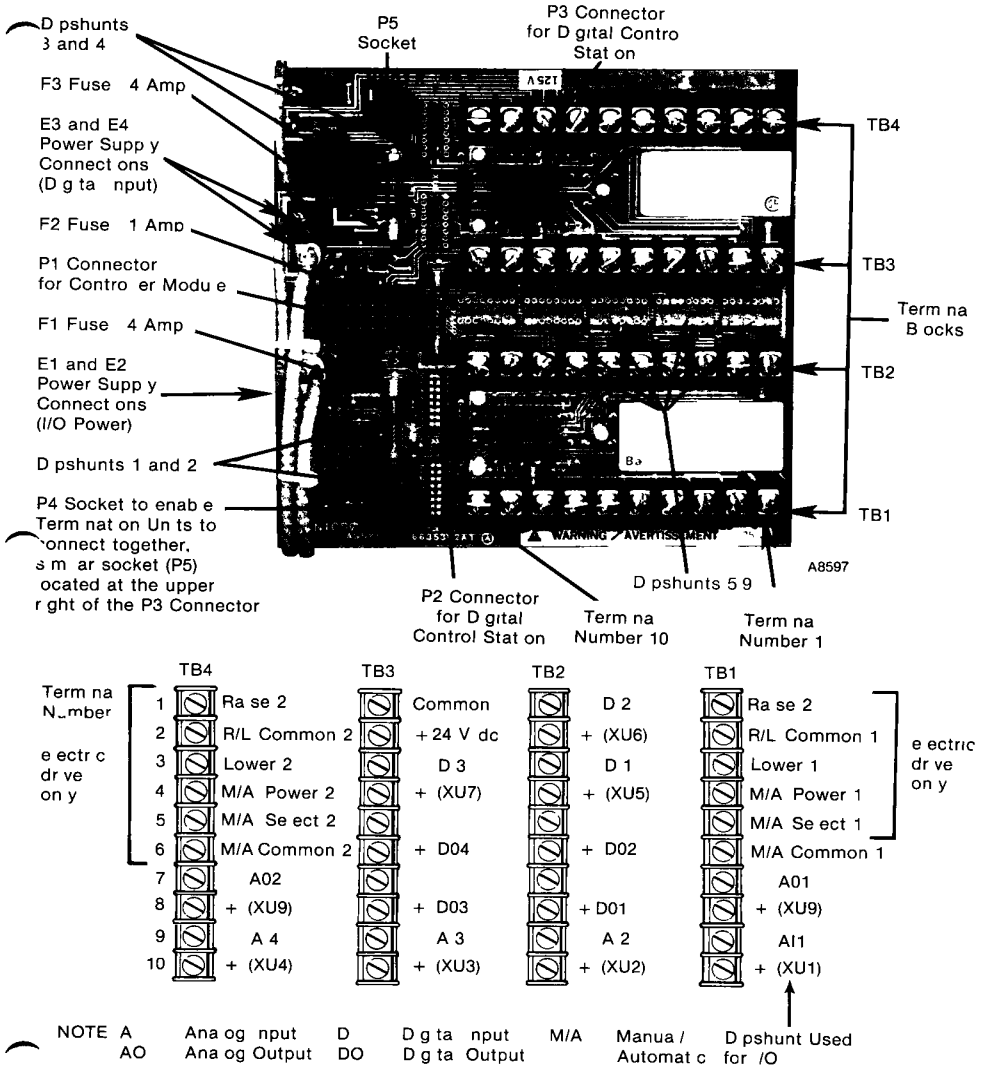


FIGURE 1 NTCS02 Termination Unit and Terminal Assignments

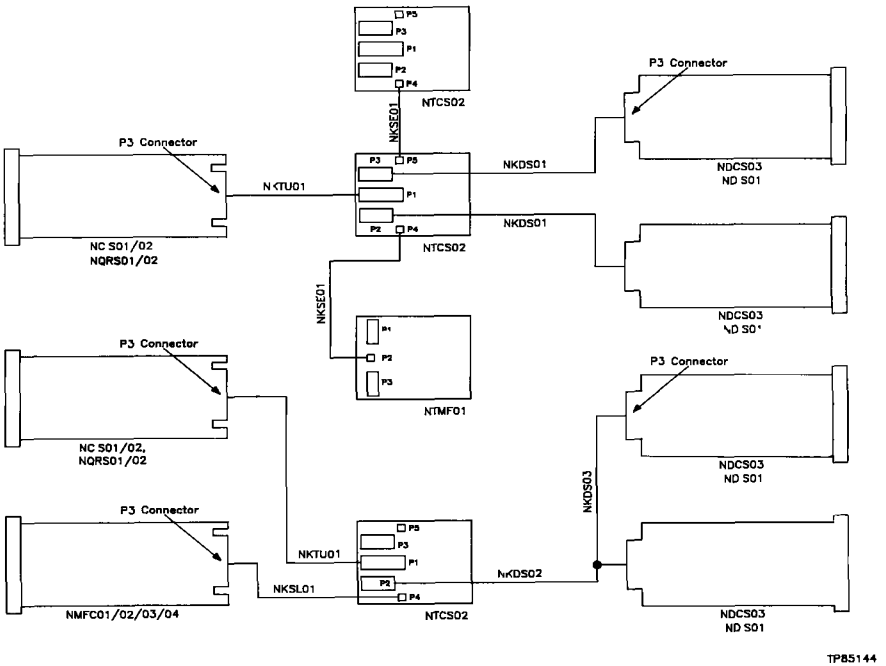


FIGURE 2 Cable Connections for the NTCS02

Purpose

Th s Term nat on Un t is the nterface between the f e d w r ng from RTD sensors and one or two Ana og S ave Modu es (NASM03)

Description

The NTA 03 Term nat on Un t s shown n F gure 1

Installation

P ease refer to the Term nat on Un t and Cab e nsta at on sect on of th s manua for comp ete instruct ons for nsta ng th s Term nat on Un t

Additional Cable Installation Procedures

n addition to the standard Term nat on Un t Cab ng procedures (see the Term nat on Un t and Cab e nsta at on sect on of this manua), the P2 socket con nects the Term nat on Un t to a second Ana og S ave Modu e if so des red F gure 2 shows the cab e con nect on between the NTAI03 Term nat on Un t and the NASM03 Analog S ave Modu e

Th s TU provides a socket for ca brat ng a s ave module by the master See the **Analog Master Module — NAMM02 — Calibration Guide (Product Instruction Supplement — IS-E93-912-2)** for deta s

TABLE 1 NTAI03 Application Summary

INTERFACES TO	CONNECTING CABLE	APPLICATION/SIGNAL TYPE	NUMBER OF INPUTS
ANALOG SLAVE MODULE NASM03 and RTD nputs	NKTU01	100 Ohm P at num RTD	16

NTAI03

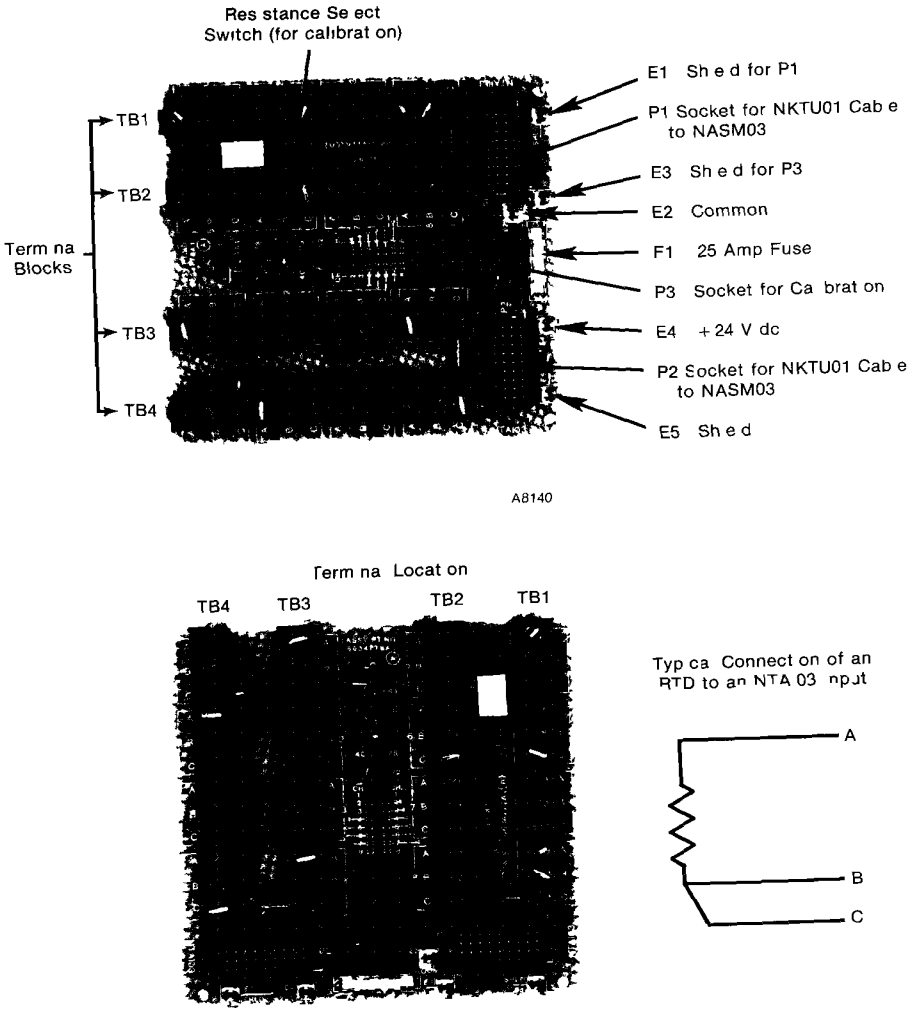
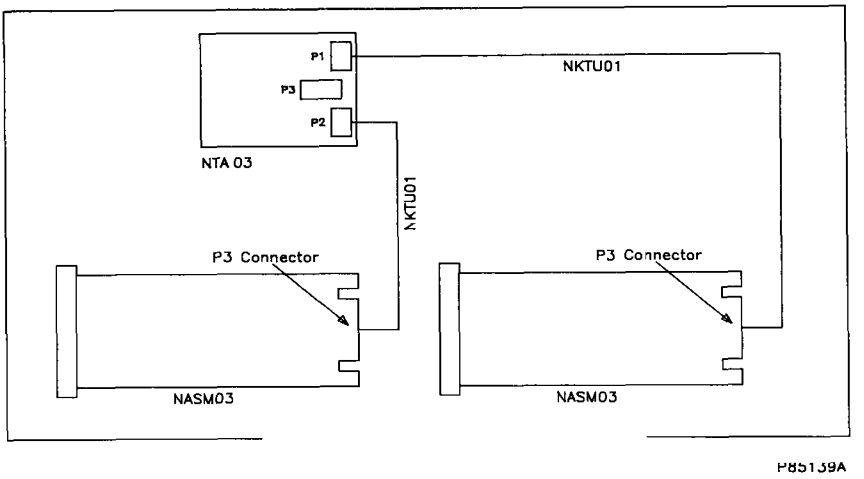


FIGURE 1 NTAI03 Termination Unit and Terminal Assignments



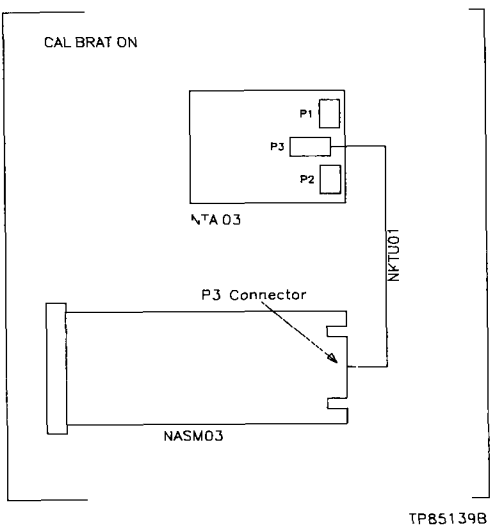


FIGURE 2 Cable Connections for the NTAI03

Purpose

Th s Term nat on Un t serves as an nterface between the fie d w r ng of the p ant process and either an Analog Master Modu e (NAMM01) or an Ana og S ave Modu e (NASM01) It a so accom modates (v a an e ght posit on d pshunt in a socket) analog inputs of d fferent types, spec fica y system powered or external y powered 4 to 20 mA current oops, and sing e ended or different al vo tage nputs on an nd v dua basis

Description

The NTA 01 Terminat on Un t is shown n F gure 1 The P1 socket nks th s Term nat on Un t to ts respect ve module via the Term nat on Un t Cable (NKTU01) Ana og nput opt ons are se ected by means of d pshunt conf guration (see Table 1)

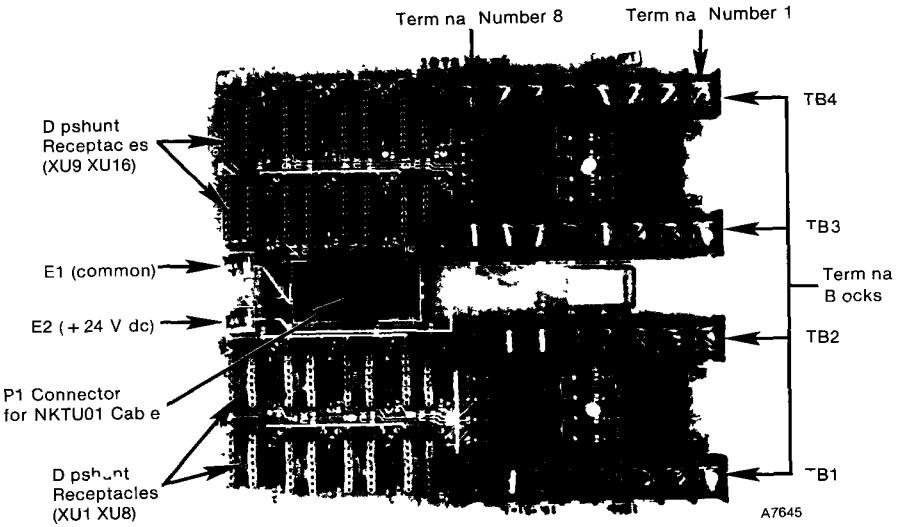
Installation

Please refer to the Term nat on Un t and Cable Insta at on section of th s manual for comp ete nsta lat on nstruct ons F gure 2 shows the cab e connect on between this Term nat on Unit and the NAMM01 Ana og Master Modu e

TABLE 1 NTAI01 Application Summary

INTERFACES TO	CONNECTING CABLE	NUMBER OF INPUTS	APPLICATION/ SIGNAL TYPE	DIPSWITCH CONFIGURATION
			ANALOG INPUT VARIATIONS	DIPSHUNTS XU1-XU16
ANALOG MASTER MODULE NAMM01 or ANALOG SLAVE MODULE NASM01	NKTU01	8 (master) 16 (s ave)	system powered 4 20 mA	1 2 3 4 5 6 7 8 1 0 1 0 0 1 1 1
			externa y powered 4 20 mA	1 2 3 4 5 6 7 8 0 1 0 1 0 1 0 1
			s ngle ended vo tage	1 2 3 4 5 6 7 8 0 1 0 1 0 0 1 1
			d fferent a vo tage	1 2 3 4 5 6 7 8 0 1 0 1 1 0 0 0

*1 8 represent strap numbers on dipshunts XU1 through XU16, where 0 represents a cut strap and 1 repre sents a strap eft ntact Strap one connects p n one to p n 16 strap two connects pin two to p n 15, etc



NOTE The d pshunt number corresponds numer ca y to the ana og nput number

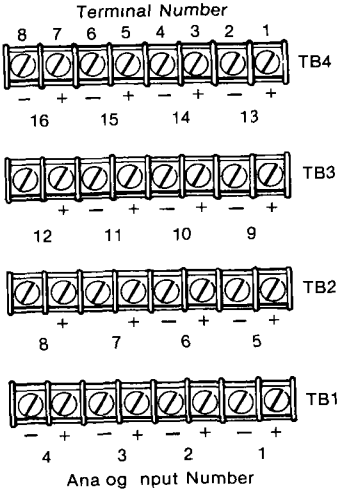


FIGURE 1 NTAI01 Termination Unit and Terminal Assignments

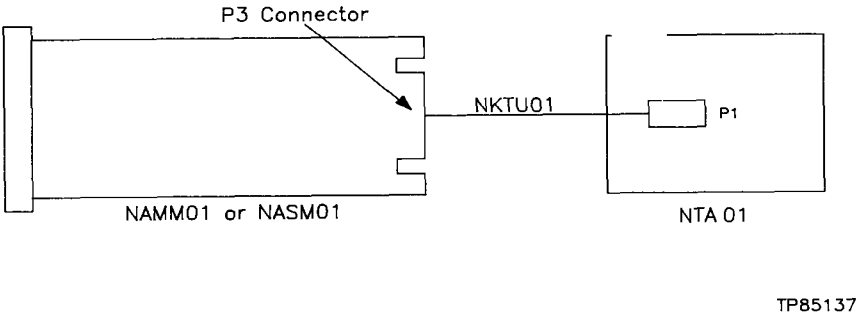


FIGURE 2 Cable Connections for the NTAI01

Terminat on Modu e, Plant Loop

Purpose

Th s Term nat on Modu e prov des two way access between the Loop Interface Modu e and the P ant Commun cat on Loop t a so prov des e ectr ca so at on surge protect on and bypass capab ty

Description

Th s Term nat on Modu e s shown n F gure 1

Installation

P ease refer to the Term nat on Modu e and Cab e nsta at on sect on of th s manua for comp ete nstruct ons on nsta ng th s Term nation Modu e

Cable Installation Procedure

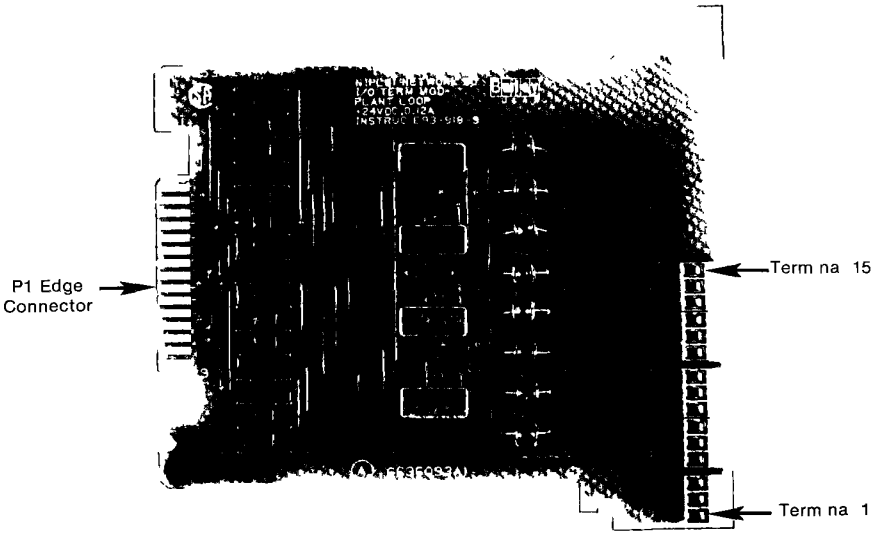
The Term nat on Modu e Cab e (NKTM01) a 30 con ductor r bbon cab e connects the Term nat on Modu e to the Loop nterface Mod.e Connect the cab e to the P1 connector on the Term r at on Modu e and the Loop nter face Modu e s ot on the back of the Modu e Mount ng Un t nsta th s cab e on the Modu e Mount ng Un t BEFORE nsert ng the Loop nterface Modu e

TABLE 1 NIPL01 Application Summary

INTERFACES TO	CONNECTING CABLE	APPLICATION
Loop nterface Modu e NL M02	NKTM01[1]	Term nat on po nt for messages to/from the P ant Loop
P ant Loop	NKPL01	Connects Node to P ant Loop

[1] **WARNING:** Rep ac ng the NIPL01 w th the NICL01 requ res rep ac ng the NKTM01 cab e w th the NKLS04 cab e Fa ure to rep ace the cab e w resu t n damage to the NL M02 Use caut on when mak ng a connect on w th the NKLS04 The cab e end marked J1 connects to the N CL01 and the cab e end marked J2 connects to the NL M02 Fa ure to correct y connect the NKLS04 cab e can damage the NL M02 or N CL01

AVERTISSEMENT: Lorsqu on remp ace e N PL01 par e NICL01 on do t ega ement remp acer e câb e NKTM01 par e câb e NKLS04 S on neg ge de remp acer e câb e e NL M02 pourra t être endommage Au moment de brancher e NKLS04 ass_rez vo_s de raccorder extrem te d_ câb e dent f ee par J1 au NICL01 et extrém té dent f ée par J2 au NL M02 S e câb e n est pas branche correctement e NLIM02 ou e N CL01 pourra t être endommage



Term na Number	
1	Ground
2	Common
3	+ 24 V dc
4	Loop 2 Sh e d
5	Loop 2 Out,
6	Loop 2 Out, +
7	Loop 2, Sh e d
8	Loop 2 n
9	Loop 2 n, +
10	Loop 1, Sh e d
11	Loop 1 Out
12	Loop 1 Out, +
13	Loop 1 Sh e d
14	Loop 1 n
15	Loop 1 n +

FIGURE 1 NIPL01 Termination Module and Terminal Assignments

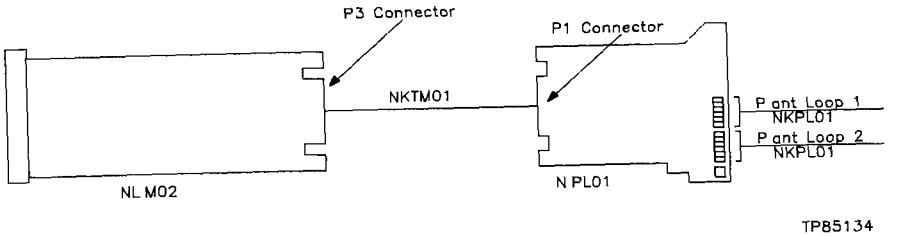


FIGURE 2 Cable Connections for the NIPL01

Purpose

This Termination Module serves as an interface between the Analog Slave Module (NASM01) and equipment such as two-wire transmitters. It also accommodates (via eight position dipswitches) analog inputs of different types: system powered or externally powered 4 to 20 mA current loops, and single ended or differential voltage inputs on an individual basis.

Description

The NIAI01 Termination Module is shown in Figure 1. An NKTM01 or NKTU02 cable connects between the P1 connector of the TM and the P3 connector of the Analog Slave Module. Analog input options are selected by means of dipswitch configurations (see Table 1).

Installation

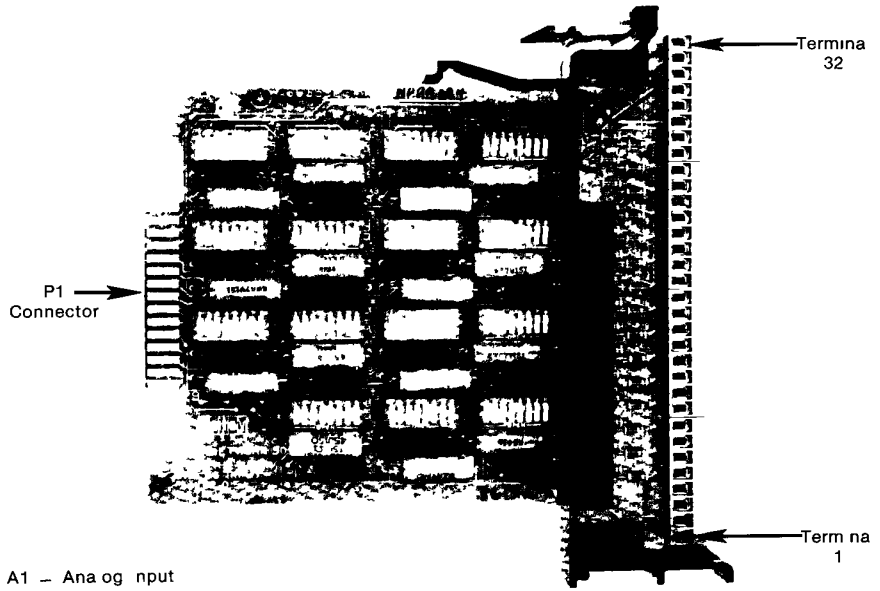
Please refer to the Termination Module and Cable Installation section of this manual for complete instruction on installing this Termination Module and its cable. Figure 2 shows the cable connection between this Termination Module and the NASM01 Analog Slave Module.

TABLE 1 NIAI01 Application Summary

INTERFACES TO	CONNECTING CABLE	NUMBER OF INPUTS	APPLICATION/SIGNAL TYPE	DIPSWITCH CONFIGURATION*
ANALOG SLAVE MODULE NASM01	NKTM01 or NKTU02	15	ANALOG INPUT VARIATIONS	DIPSWITCHES S1 S15
			system powered 4 20 mA dc	1 2 3 4 5 6 7 8 1 1 1 1 1 1 0 0
			external y powered 4 20 mA dc	1 2 3 4 5 6 7 8 0 0 0 0 1 1 1 1
			differential voltage	1 2 3 4 5 6 7 8 0 0 0 0 0 0 1 1
			single ended voltage	1 2 3 4 5 6 7 8 0 0 0 1 0 1 1 1

*1 8 represent switch positions on dipswitches S1 through S15, where 0 is open and 1 is closed

NIAI01



NOTE The dipsw tch number corresponds numer ca y to the ana og nput number

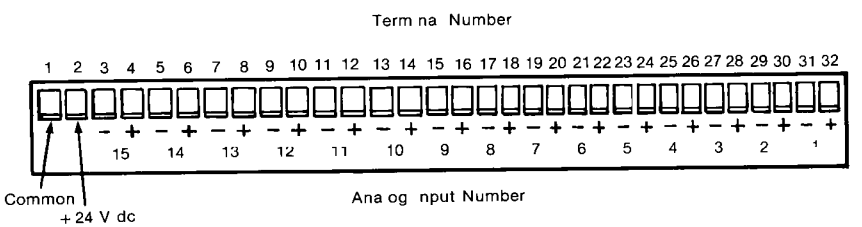


FIGURE 1 NIAI01 Termination Module and Terminal Assignments

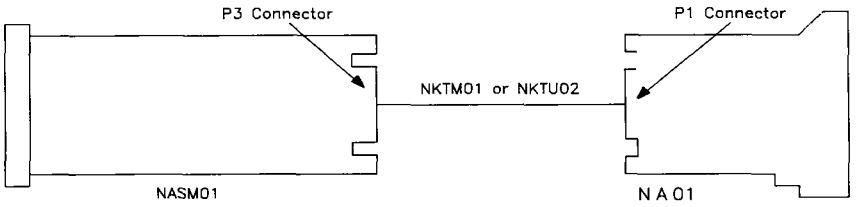


FIGURE 2 Cable Connections for the NIAI01