# Rack-mounted Modem Shelf

# **USER'S MANUAL**

## **INFORMATION TO THE USER**

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device. Pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and if not installed and used in accordance with the instructions may cause harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This booklet is available from the US government Printing Office, Washington, DC 20402, Stock NO. 004-000-00345-4.

The shielded RS-232 cable is to be used in order to ensure compliance with FCC Part 15, and it is the responsibility of the user to provide and use shielded RS-232 cable from MODEM to personal computer.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

## **FCC REQUIREMENTS**

This equipment complies with Part 68 of the FCC Rules. On the base unit of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. IF REQUESTED, THIS INFORMATION MUST BE GIVEN TO THE TELEPHONE COMPANY.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the REN's of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN you should contact your local telephone company to determine the maximum REN to your calling area.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But the advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, please contact the following address and phone number for information on obtaining service or repairs.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

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## CONTENT

- 1.1 Modem Shelf and NMC
- **1.2 Rack-mounted Modem and NTU**

## **CHAPTER 1** Introduction

#### 1.1 Modem Shelf and NMC

The DCE rack-mounted modem shelf, as illustrated below, is desi gd nfor centralized networks which need a lot of modems.



Fig. 1-1 DCE Rack-Munt Modem

The modem shelf RM32MUI or RM16MUI employs the standard rack with 5RU (about 255 mm) which accommodates up to 16 concentrated modem cards. In addition, the Network Management Controller NMC16 used with RM32MUI or RM16MUI supports two levels of network management system (NMS). The users may choose either or both to work with in order to meet various requirements.

The first (basic) level network management only needs a rack. In this condition, the control unit is responsible for the operation of the network management system. It can setup, control, and test with any specific modem card in the same shelf. In addition, it continuously scans all the modem cards and reports any erroneous and abnormal conditions such as signal quality degradation which exceeds a predetermined threshold. You may observe this kind of condition by audible alarm and visible crystal display (LCD) by operating front panel keys. Consequently, troubleshooting procedure might be determined.

In the case that there are only a few modem cards, this level of network management will meet the requirements. Whereas, if there are a lot of modem cards or if the modems and the people being on duty are not collocated, the higher level network management system is required.

In the second level network management system, you may connect several modem racks to a network master controller which is composed of a computer and a control unit in "daisy chain" structure. By employing this structure, you may construct a larger network management system which may manage up to 130,000 modems in this system which will satisfy the needs of most large-size networks.

For more details about this level of NMS, please refer to the User's Manual of DCE MANAGER for Windows.

#### 1.2 Rack-mounted Modem and NTU

The modem shelf RM32MUI can accommodates up to 16 concentrated V3600UI-DUAL (two full-featured V.34 modems on a single card), DT-128N NTU and T-336NDx modem cards. Also, the modem shelf RM16MUI can accommodate up to 16 concentrated DCE-series modem cards

#### 1.2.1 The V3600UI-DUALRM Modem Front Panel

The shelf RM32MUI can accommodates up to 16 concentrated V.3600UI-DUAL modem cards (two full-featured V.34 modems on a single card). The front panel of the V.3600UI modem card is illustrated below:

- 1. Front Panel Switch : One touch switch VO/DA Voice and data switch, used in dial up applications. Whereas in the leased line applications, it functions as "reconnect".
- 2. **SEL** Indicators : One red LED indicates this modem card is being selected.
- 3. LED Indicators : 10 LEDs on front panel.
  - **DTR** DTR signal indicator .
  - **DSR** DSR signal indicator.
  - **RTS** RTS signal indicator.
  - **CTS** CTS signal indicator.
  - TXD Transmit data indicator.
  - **DCD** Receive carrier indicator.
  - **RXD** Receive data indicator.
  - **OH** Off-Hook indicator.
  - **TST** Test mode indicator.
  - SCAN Being scanned by control unit.



#### **1.2.2 The NTU Front Panel**

The shelf RM32MUI can accommodates up to 16 concentrated NTU cards. The front panel of the NTU card is illustrated below:

- 1. Front Panel Switch : One **RESET** touch switch.
- 2. **SEL** Indicators : One red LED indicates this NTU card is being selected.
- 3. LED Indicators : 10 LEDs on front panel.
  - **DTR** DTR signal indicator .
  - **DSR** DSR signal indicator.
  - **RTS** RTS signal indicator.
  - **CTS** CTS signal indicator.
  - TXD Transmit data indicator.
  - **DCD** Receive carrier indicator.
  - **RXD** Receive data indicator.
  - ACT Connection indicator.
  - **TST** Test mode indicator.
  - SCAN Being scanned by control unit.



#### 1.2.3 The V3600UI-RM Modem Front Panel

The shelf RM32MUI can accommodates up to 16 concentrated V3600UI-RM modem cards (two full-featured V.34 modems on a single card). The front panel of the V.3600UI=RM modem card is illustrated below:

- 1. Front Panel Switch : One touch switch VO/DA Voice and data switch, used in dial up applications. Whereas in the leased line applications, it functions as "reconnect".
- 2. **SEL** Indicators : One red LED indicates this NTU card is being selected.
- 3. LED Indicators : 10 LEDs on front panel.
  - **DTR** DTR signal indicator .
  - **DSR** DSR signal indicator.
  - **RTS** RTS signal indicator.
  - **CTS** CTS signal indicator.
  - TXD Transmit data indicator.
  - **DCD** Receive carrier indicator.
  - **RXD** Receive data indicator.
  - **OH** Off-Hook indicator.
  - **TST** Test mode indicator.
  - SCAN Being scanned by control unit.



Fig. 1-4 The V3600UI-RM Modem Front View

#### 1.2.4 The DCE-series Modem Front Panel

- 1. Front Panel Switch : One touch switch
  - **VO/DA** Voice and data switch, used in dial up applications. Whereas, it functions as "reconnect" in leased line applications.
- 2. SEL Indicators : One red LED indicates this modem card is being selected.
- 3. LED Indicators : 10 LEDs on front panel.

		1
DTR	-	DTR signal indicator.
DSR	-	DSR signal indicator.
RTS	-	RTS signal indicator.
CTS	-	CTS signal indicator.
TXD	-	Transmit data indicator.
DCD	-	Receive carrier indicator.
RXD	-	Receive data indicator.
OH	-	Off hook indicator.
TST	-	Test mode indicator.
SCAN	-	Being scanned by control unit.



Modem Front View

4. Auxiliary Jack : This function well be only equipping for the T-1496N and T-288NC, not provided by 3600UI-RM.

This is an 8-pin jack (RJ45 like). It provides you the ability to maintain lines from just front panel as described below.

Pin No.	Color	Function
1	Blue	2W/4W-Tx
2	Orange	2W/4W-Tx
3	Black	Not Used
4	Red	Tip (Dial Line)
5	Green	Ring (Dial Line)
6	Yellow	Not Used
7	Brown	4W-Rx
8	White	4W-Rx

Table 1-1 The Pin Arrangement of AUX Jack

For more details about the operation of the DCE-series modem, please refer to the User's Manual.

## 1.3 Ordering Information

For TRS16 Shelf				
Model	Description	Part No.		
RM16MUI	19" width rack for up to 16 modem cards (16ports)	000041-0012		
NMC N	MS Control unit used with TRS16 0	00012-0018		
PW-130AC	90 ~ 265 VAC power unit for rack	000012-0011		
PW-130DC	$-36 \sim -72$ VDC power unit for rack	000012-0012		
FAN - 12	Cooling fan set	000012-0015		
DCE Manager <sup>®</sup> for Windows	V.34/V.32 network management system	000042-0005		

For TRS32 Shelf				
Model	Description	Part No.		
RM32MUI	19" width rack for up to 16 modem cards (32ports)	000053-0004		
NMC N	MS Control unit used with TRS32 0	00055-0002		
PW-132A	90 ~ 265 VAC power unit for rack	000057-0001		
PW-132D	-36 ~ -72 VDC power unit for rack	000057-0002		
CA50	50 pin cable with standard centronic connector for TRS32	000053-0003		
TB32	The rear panel terminal block module board of the TRS32 for 2/4-wire Leased and Dial line connection	000053-0002		
DCE Manager <sup>®</sup> for Windows	V.34/V.32 network management system	000042-0005		

## CONTENT

- 2.1 RM32MUI Rear Panel
- 2.2 RM16MUI and RM16MUI-B Rear Panel
- 2.3 RM16MUI-A Rear Panel

## **CHAPTER 2** Installation

The t can be fit into a 19-

inch standard rack with 5RU (about 255 mm) high. You may start to connect wired after proper placing the racks. At the first, you should pay particular attention to the connection of the power core. The voltage  $90 \sim 265$ VAC or  $-36 \sim -72$ VDC even single or dual power can be selected in the different power supply cards.

#### 2.1 RM32MUI Rear Panel

The shelf is designed for centralized networks which accommodates up to sixteen (16) concentrated modem cards. The connections located on the rear panel are illustrated as below:



Fig. 2-1 RM32MUI Rear Panel

- 1. **115/230 VAC**:AC Input 115/230 ± 10% VAC.
- 2. -48V & 0V:DC Input -36 ~ -72 VDC.
- 3. GND & -12: Provide DC Source -12 VDC for cooling fan model FAN-12.
- 4. Ext. Alarm: A relay connection in conjunction with external alarm system.
- 5. NMS RS-485:RS-485 connector for NMS.
- 6. NMS RS-232:RS-232 connector for NMS.
- 7. NORMAL/TERMINATION: Terminator Switch for NMS RS-485 interface.
- 8. PG & SG:Protective Ground and Signal Ground.
- 9. DTE 1 ~ DTE 32:RS-232 Interface for PC or Terminal connection.
- 10. CON 1 ~ CON 4:50-pin centronic connector for telephone line connection.
- 11. **NMS Jacks:**Two RJ11 Jacks in conjunction with NMS RS-485 PREV terminals, the pin arrangement is illustrated as Figure 2-5.

#### 2.2 RM16MUI and RM16MUI-B Rear Panel

The RM16MUI shelf is designed for centralized networks which accommodates up to sixteen (16) concentrated modem cards. The differences between RM16MUI and RM16MUI-B are NMS jack and GND & -12V connectors. The connections located on the rear panels are illustrated as below:



Fig. 2-2 RM16MUI Rear Panel



Fig. 2-3 RM16MUI-B Rear Panel

- 1. 115/230 VAC AUTO RANGE: AC Input 90 ~ 265 VAC.
- 2. **-48V & 0V:** DC Input -36 ~ -72 VDC.
- 3. GND & -12V: Provide DC Source -12 VDC for cooling fan model FAN-12.
- 4. Ext. Alarm: A relay connection in conjunction with external alarm system.
- 5. NMS RS-485: RS-485 connector for NMS.
- 6. **NMS RS-232:** RS-232 connector for NMS.
- 7. NORMAL/TERMINATION: Terminator Switch for NMS RS-485 interface.
- 8. **PG & SG:** Protective Ground and Signal Ground.
- 9. **DTE 1 ~ DTE 16:** RS-232 Interface for PC or Terminal connection.
- 10. CH 1 ~ CH 16: 8-position terminal block for telephone line connection.
- 11. **NMS Jacks:** Two RJ11 Jacks in conjunction with NMS RS-485 PREV terminals, the pin arrangement is illustrated as Figure 2-5.

## 2.3 RM16MUI-A Rear Panel

The RM16MUI-A shelf is also designed for centralized networks which accommodates up to sixteen (16) concentrated modem cards. There (3) 50-pin Centronic Connectors instead of 16 pcs of 8-position Terminal Block are used to connect to the dial-line and 2-wire/4-wire leased-line. Please refer to Fig. 2-7 and Fig 2-8 for the pin arrangement of 50-pin Centronic Connectors.

Except that, three optional daughter boards TB-16, PJ-16, and TBPJ-16 which can be directly connectted to the there (3) 50-pin Centronic Connectors. Please refer to Fig. 2-9, Fig. 2-10, and Fig. 2-11. These daughter boards are specially designed for user easily to connect to the dial-line and 2-wire/4-wire leased-line.

The remaining connections located on the RM16MUI-A rear panel are illustrated as below:



Fig. 2-4 RM16MUI-A Rear Panel

- 1. 115/230 VAC AUTO RANGE: AC Input 90~265 VAC.
- 2. **-48V & 0V:** DC Input -36~ -72 VDC.
- 3. GND & -12V: Provide DC Source -12 VDC for cooliny fan model FAN-12.
- 4. Ext. Alarm: A relay connection in conjunction with external alarm system.
- 5. NMS RS-485: RS-485 connector for NMS.
- 6. NMS RS-232: RS-232 connector for NMS.
- 7. NORMAL/TERMINATION: Terminator Switch for NMS RS-485 interface.
- 8. PG & SG: Protective Ground and Signal Ground.
- 9. DTE 1 ~ DTE 16: RS-232 Interface for PC or Terminal connection.
- 10. CON 1 ~ CON 3: 50-pin centronic connector for telephone line connection.
- 11. **NMS Jacks:** Two RJ11 Jacks in conjunction with NMS RS-485 PREV terminals, the pin arrangement is illustrated as Figure 2-5.



Fig. 2-5 The Pin Arrangement of NMS Jack



Pin	COLOR	Pin	COLOR
No.	(Body/Dot)	No.	(Body/Dot)
1	Blue/White	26	White/Blue
2	Orange/White	27	White/Orange
3	Green/White	28	White/Green
4	Brown/White	29	White/Brown
5	Gray/White	30	White/Gray
6	Blue/Red	31	Red/Blue
7	Orange/Red	32	Red/Orange
8	Green/Red	33	Red/Green
9	Brown/Red	34	Red/Brown
10	Gray/Red	35	Red/Gray
11	Blue/Black	36	Black/Blue
12	Orange/Black	37	Black/Orange
13	Green/Black	38	Black/Green
14	Brown/Black	39	Black/Brown
15	Gray/Black	40	Black/Gray
16	Blue/Yellow	41	Yellow//Blue
17	Orange/Yellow	42	Yellow/Orange
18	Green/Yellow	43	Yellow/Green
19	Brown/Yellow	44	Yellow/Brown
20	Gray/Yellow	45	Yellow/Gray
21	Blue/Purple	46	Purple/Blue
22	Orange/Purple	47	Purple/Orange
23	Green/Purple	48	Purple/Green
24	Brown/Purple	49	Purple/Brown

Fig. 2-6 The color assignment of 50-pin Centronic Cable

## CON 1

Dial A1	1	26	Dial B1
Tx A1	2	27	Tx B1
Rx A1	3	28	Rx B1
Dial A17	4	29	Dial B17
Tx A17	5	30	Tx B17
Rx A17	6	31	Rx B17
Dial A2	7	32	Dial B2
Tx A2	8	33	Tx B2
Rx A2	9	34	Rx B2
Dial A18	10	35	Dial B18
Tx A18	11	36	Tx B18
Rx A18	12	37	Rx B18
Dial A3	13	38	Dial B3
Tx A3	14	39	Tx B3
Rx A3	15	40	Rx B3
Dial A19	16	41	Dial B19
Tx A19	17	42	Tx B19
Rx A19	18	43	Rx B19
Dial A4	19	44	Dial B4
Tx A4	20	45	Tx B4
Rx A4	21	46	Rx B4
Dial A20	22	47	Dial B20
Tx A20	23	48	Tx B20
Rx A20	24	49	Rx B20
not used	25	50	not used

## CON 2

Dial A5	1	26	Dial B5
Tx A5	2	27	Tx B5
Rx A5	3	28	Rx B5
Dial A21	4	29	Dial B21
Tx A21	5	30	Tx B21
Rx A21	6	31	Rx B21
Dial A6	7	32	Dial B6
Tx A6	8	33	Tx B6
Rx A6	9	34	Rx B6
Dial A22	10	35	Dial B22
Tx A22	11	36	Tx B22
Rx A22	12	37	Rx B22
Dial A7	13	38	Dial B7
Tx A7	14	39	Tx B7
Rx A7	15	40	Rx B7
Dial A23	16	41	Dial B23
Tx A23	17	42	Tx B23
Rx A23	18	43	Rx B23
Dial A8	19	44	Dial B8
Tx A8	20	45	Tx B8
Rx A8	21	46	Rx B8
Dial A24	22	47	Dial B24
Tx A24	23	48	Tx B24
Rx A24	24	49	Rx B24
not used	25	50	not used

## CON 3

## CON 4

	-						
Dial A9	1	26	Dial B9	Dial A13	1	26	Dial B13
Tx A9	2	27	Tx B9	Tx A13	2	27	Tx B13
Rx A9	3	28	Rx B9	Rx A13	3	28	Rx B13
Dial A25	4	29	Dial B25	Dial A29	4	29	Dial B29
Tx A25	5	30	Tx B25	Tx A29	5	30	Tx B29
Rx A25	6	31	Rx B25	Rx A29	6	31	Rx B29
Dial A10	7	32	Dial B10	Dial A14	7	32	Dial B14
Tx A10	8	33	Tx B10	Tx A14	8	33	Tx B14
Rx A10	9	34	Rx B10	Rx A14	9	34	Rx B14
Dial A26	10	35	Dial B26	Dial A30	10	35	Dial B30
Tx A26	11	36	Tx B26	Tx A30	11	36	Tx B30
Rx A26	12	37	Rx B26	Rx A30	12	37	Rx B30
Dial A11	13	38	Dial B11	Dial A15	13	38	Dial B15
Tx A11	14	39	Tx B11	Tx A15	14	39	Tx B15
Rx A11	15	40	Rx B11	Rx A15	15	40	Rx B15
Dial A27	16	41	Dial B27	Dial A31	16	41	Dial B31
Tx A27	17	42	Tx B27	Tx A31	17	42	Tx B31
Rx A27	18	43	Rx B27	Rx A31	18	43	Rx B31
Dial A12	19	44	Dial B12	Dial A16	19	44	Dial B16
Tx A12	20	45	Tx B12	Tx A16	20	45	Tx B16
Rx A12	21	46	Rx B12	Rx A16	21	46	Rx B16
Dial A28	22	47	Dial B28	Dial A32	22	47	Dial B32
Tx A28	23	48	Tx B28	Tx A32	23	48	Tx B32
Rx A28	24	49	Rx B28	Rx A32	24	49	Rx B32
not used	25	50	not used	not used	25	50	not used

Fig. 2-7 The Pin Arrangement of the CON 1  $\sim$  CON 4 for TRS32

CON 3				C	CON 2					CON 1		
Tip 13	1	26	Rina 13	Tip 7	1	26	Rina 7	Tip 1	1	26	Rina 1	
Phone A 13	2	27			2	27	Phone B 7		2	27		
TX A 13	3	28			3	28			3	28		
RX A 13	4	29	RX B 13	RX A 7	4	29	RX B /	RX A T	4	29	RXBI	
Tip 14	5	30	Ring 14	Tip 8	5	30	Ring 8	Tip 2	5	30	Ring 2	
Phone A 14	6	31	Phone B 14	Phone A 8	6	31	Phone B 8	Phone A 2	6	31	Phone B 2	
Tx A 14	7	32	Tx B 14	Tx A 8	7	32	Tx B 8	Tx A 2	7	32	Tx B 2	
Rx A 14	8	33	Rx B 14	Rx A 8	8	33	Rx B 8	Rx A 2	8	33	Rx B 2	
Tip 15	9	34	Ring 15	Tip 9	9	34	Ring 9	Tip 3	9	34	Ring 3	
Phone A 15	10	35	Phone B 15	Phone A 9	10	35	Phone B 9	Phone A 3	10	35	Phone B 3	
Tx A 15	11	36	Tx B 15	Tx A 9	11	36	Tx B 9	Tx A 3	11	36	Tx B 3	
Rx A 15	12	37	Rx B 15	Rx A 9	12	37	Rx B 9	Rx A 3	12	37	Rx B 3	
Tip 16	13	38	Ring 16	Tip 10	13	38	Ring 10	Tip 4	13	38	Ring 4	
Phone A 16	14	39	Phone B 16	Phone A 10	14	39	Phone B 10	Phone A 4	14	39	Phone B 4	
Tx A 16	15	40	Tx B 16	Tx A 10	15	40	Tx B 10	Tx A 4	15	40	Tx B 4	
Rx A 16	16	41	Rx B 16	Rx A 10	16	41	Rx B 10	Rx A 4	16	41	Rx B 4	
not used	17	42	not used	Tip 11	17	42	Ring 11	Tip 5	17	42	Ring 5	
not used	18	43	not used	Phone A 11	18	43	Phone B 11	Phone A 5	18	43	Phone B 5	
not used	19	44	not used	Tx A 11	19	44	Tx B 11	Tx A 5	19	44	Tx B 5	
not used	20	45	not used	Rx A 11	20	45	Rx B 11	Rx A 5	20	45	Rx B 5	
not used	21	46	not used	Tip 12	21	46	Ring 12	Tip 6	21	46	Ring 6	
not used	22	47	not used	Phone A 12	22	47	Phone B 12	Phone A 6	22	47	Phone B 6	
not used	23	48	not used	Tx A 12	23	48	Tx B 12	Tx A 6	23	48	Tx B 6	
not used	24	49	not used	Rx A 12	24	49	Rx B 12	Rx A 6	24	49	Rx B 6	
not used	25	50	not used	not used	25	50	not used	not used	25	50	not used	

Fig. 2-8 The Pin Arrangement of CON 1 ~ CON 3 for TRS16



Fig. 2-9 The Pin Arrangement of TBPJ-16 and PJ-16 Daughter Board.

For users easily connect to the dial-line and 2W/4W leased-line, one optional daughter board TB-32 are provided. The TB-32 can be directly connected to the four (4) 50-pin Centronic Connectors, as illustrated below.



Fig. 2-10 The RM32MUIRear Panel + TB-32 Daughter Board

The CH1  $\sim$  32 are dial-line and 2W/4W leased-line connector for the modem 1  $\sim$  32. The pin arrangements of the connector CH1  $\sim$  32 are illustrated below.



Fig. 2-11 The Pin Arrangements of the CH1 ~ CH32



Fig. 2-12 RM16MUI-A Rear Panel + TB-16 Daughter Board



Fig. 2-13 RM16UI-A Rear Panel + PJ-16 Daughter Board



Fig. 2-14 RM16MUI-A Rear Panel + TBPJ-16 Daughter Board

# CHAPTER 3 OPERATING THE NMC

CONTENT

- 3.1 The NMC Front Panel
- 3.2 Running the NMC Front Panel

## CHAPTER 3 Operating The NMC

#### 3.1 The NMC16/32 Front Panel

The NMC is a Network Management Control Unit used with the shelf RM16/32MUI providing network management function allowing user to setup, control, and test with any specific modem card in the shelf. The front panel of the NMC is illustrated below:



Fig. 3-1 NMC Front Panel



Fig. 3-2 NMC Front Panel

1. **Panel Switches :** 6 key switches.

HOME	It can be used to go back to the top menu screen.
CARD#	Modem card select key, used to select a modem card.
◀	Left shift key, used to select the left next column.
	Right shift key, used to select the right next column.
ENTER	Use it to get into a deeper level menu or to validate the selected function.
EXIT	Use it to escape from the selected function or to go back to the upper level menu.

2. **LED Indicators :** Four LED indicators.

ALARM	Red LED illuminated when an alarm event occurred.
SCAN	Green LED illuminated when this control unit is scanned by NMS.
PW1	Green LED illuminated when the Power Unit #1 is operating O.K.
PW2	Green LED illuminated when the Power Unit #2 is operating O.K.

3. Alarm Switch : There are two positions (ON/OFF) for the alarm switch. Push down the Alarm Switch to set "ALARM OFF". The audio alarm will be disabled, however the LED indicator will still be lightened when an event occurs. Push up (release) the Alarm Switch to set "ALARM ON". There will be audible and visible alarms when an event occurs. Push down the Alarm Switch and immediately release it to set "ALARM CUT OFF" (ACO), in case alarm event occurred, it providing temporary alarm-cut-off.

#### 4. LCD Display:

A  $2 \times 16$  characters backlighted LCD display located at the front panel, provides the functions as follow. The backlighted LCD will automatically turn off its backlight if the NMC detects no operation from the front panel more than 5 min.

#### 3.2 Running the NMC Front Panel

#### 3.2.1 Main menu

NMC Vn.nn-nn ID=xxx

#### **Description:**

- NMC = Network Management Controller Vn.nn-nn = The current software version of the NMC xxx = NMC ID (address code)
- 2. The main menu is the top-level of the NMC control setting. Press [ENTER] key allowing you to log on access to the lower-level control setting.

#### 3.2.2 NMC Setting and Modem Control menu



#### **Description:**

Press [ENTER] key allowing you to log on access to the modem selection menu from the main menu.

- 1. The "nn" represents the address of modem card. Press "CARD #" key allowing you to access to the next modem card. The "SEL" indicator of the selected modem card will light.
- 2. By pressing [ENTER] key to log on access to the control menu of the selected modem.

#### 3.2.3 Modem Control menu



#### **Description:**

- The "nn" represents the address of the selected modem card allowing you to change it by pressing "▶" or "◀" key. The "SEL" indicator of the selected modem card will light.
- 2. After logging on the selected modem control menu, please refer to the DCE Network Series Modem User's Manual for detailed operation.

0	Not install	5	Continue polling fail 1 times
1	1 Normal initial		Continue polling fail 2 times
2	Poor initial	7	Continue polling fail 3 times
3	Normal operation	8	Continue polling fail 4 times
4	Poor operation	9	Modem fail

Where the "X" =  $0 \sim 9$ , represents as follows:

#### 3.2.4 NMC urrent Alarm menu



#### **Description:**

The NMC current alarm menu displays the current alarm message of the selected modem card.

- 1. The "nn" represents the address of modem card. Press "CARD #" key allowing you to access to the next modem card. Press "▶" or "◀" key allowing you to review all alarm messages.
- 2. The available alarm messages are listed as below:

Alarm Message	Scanning	<b>Description</b>
RXL low (xx)	Local Modem	$\overline{\text{Rx Level}=xx} \text{ dB}$ (Lower than alarm setting)
Rmt RXL low (xx)	Remote Modem	Rx Level=xx dB (Lower than alarm setting)
RXL high (xx)	Local Modem	Rx Level=xx dB (Higher than alarm setting)
Rmt RXL high (xx)	Remote Modem	Rx Level=xx dB (High than alarm setting)
SNR bad (xx)	Local Modem	S/N Ratio=xx dB (Lower than alarm setting)
Rmt SNR bad (xx)	Remote Modem	S/N Ratio=xx dB (Lower than alarm setting)
N-Echo high (xx)	Local Modem	N-Echo=xx dB (Higher than alarm setting)
Rmt N-Echo high (xx)	Remote Modem	N-Echo=xx dB (Higher than alarm setting)
DTR off	Local Modem	
Rmt DTR off	Remote Modem	
TXD inactive	Local Modem	
RXD inactive	Local Modem	
Connect fail	Local Modem	
No Dial tone	Local Modem	
Ring no ANS	Local Modem	
Card fail	Local Modem	

#### 3.2.5 Alarm Config menu



#### **Description:**

The Group Setup menu displays all alarm configuration setting (16 items) of the selected modem card in one list. The "nn" represents the address of modem card. Press "CARD #" key allowing you to access to the next modem card. Press "▶" or "◄" key allowing you to log on access to each item of alarm configuration setting.

The current status of each alarm item shown on the Group Setup menu are represented by "+", "-", "0", "x", illustrated as below:

X	The alarm setting is disable and no alarm occurred.
0	The alarm setting is enable and no alarm occurred.
-	The alarm setting is disable and an alarm is occurring.
+	The alarm setting is enable and an alarm is occurring.

2. The Alarm Config menu is to set the thresholds of various alarm parameters. Once the line condition is worse than a predetermined value, even still work, the NMC will announce an alarm to prevent catastrophe.

Alarm Configuration Item	Threshold Setting Values			
RXL low (Local&Remote)	-20 ~ -50 dBm			
RXL high (Local&Remote)	-1 ~ -19 dBm			
SNR bad (Local&Remote)	10 ~ 50 dB			
N-Echo high (Local&Remote)	0 ~ -63 dB			
Chk Dial line (Local)	$2 \sim 255$ minutes			
Ring no ANS (Local)	$2 \sim 30$ Times			
TD/RD inactive (Local)	$2 \sim 255$ seconds			
DTR off (Local)	$2 \sim 255$ seconds			

#### **Default Alarm Threshold Values:**

1	RXL high =	-6 dBm
2	RXL low =	-30 dBm
3	SNR bad =	21 dB
4	Chk Dial line =	13 minutes
5	Ring no ANS =	10 times
6	DTR off =	10 seconds
7	TD/RD inactive =	20 seconds
8	N-Echo high =	-8 dB

#### 3.2.6 NMC ID menu



#### **Description:**

- 1. The "xxx" represents the NMC ID number, which ranges from 001 to 253.
- 2. The NMC ID number is used for network management identification.

## 3.2.7 NMS Speed menu



#### **Description:**

- 1. The NMS transmission speed ranges is from 57600 bps to 2400 bps. The default setting is 9600 bps.
- 2. The speed setting is not necessary for operating the single rack-mount modem.

#### 3.2.8 NMS Interface menu



#### **Description:**

- 1. The "xxx" represents the NMC transmission path, NMC communicates with DCE MANAGER Network Management System through RS-485 or RS-232.
- 2. The path setting is not necessary for the single rack-mount modem.

#### 3.2.9 NMS Protocol menu



#### **Description:**

1. The "yyyy\_xxxx" represents the communication protocol used to link Network Management System (NMS) and NMC.

The available protocols are listed as below:

Async\_HDX HDLC\_NRZI\_HDX HDLC\_NRZ\_HDX

2. HDX = Half Duplex

#### 3.2.10 NMS Diagnostic menu



#### **Description:**

The NMS Diagnostic Menu is used for NMS diagnostic application.

- 1. The "nn" represents the address of the selected modem card allowing you to change it by pressing "CARD#" key.
- By pressing [ENTER] key to log on access to the following sub-menu of the selected modem. You can switch between these sub-menu by pressing "▶" or "◄" key.
  - [NAK count] The grant total of Negative Acknowledge (NAK) detected by the NMC after the selected modem card had been installed. The normal condition, NAK count = 0.
  - [BCC count] The grant total of Checksum Error (BCC) detected by the NMC after the selected modem card had been installed. The normal condition, BCC count = 0.
  - [Pending block] The total amount of Data Blocks (1 Block = 64 bytes) pending on the NMC that are going to transmit to the selected modem card. The normal condition, Pending block = 0. During modem card initiation, the count of pending block may be up to  $1 \sim 2$  blocks, however, in no circumstances, over 5 blocks.
- 3. By pressing [ENTER] key to log on access to the selected sub-menu.
  - The "XXXXX" represents the sum total of polling times after power\_on, where  $XXXX = 00000 \sim 65535$ . It will re-circle to zero (0) after the sum total is over 65535.
  - *<sup>ce</sup>* the "00...0" represents the count number of the selected item.

#### 3.2.11 Copy Profile menu



## **Description:**

The Copy Profile Menu is used to copy the current setting of the selected modem card to multiple modem cards.

- 1. The "nn" represents the address of the selected profile resource modem card. The "nn" allows you to change it by pressing "CARD#" key. The "SEL" indicator of the selected modem card will light.
- 2. Pressing [ENTER] key to log on access to the Copy Profile Menu, you can find 16 characters "x" ("+" or "-") shown on the LCD display. The "x" represents the setting condition, where "+" = marked and "-" = unmarked.
  - The "mm" represents the address of the destination modem card where the selected profile resource ("nn") will download.
- 3. Move the cursor to your desired modem card by pressing "▶" or "◄" key and then press [ENTER] key allowing you to mark or unmark it.
- 4. Pressing "▶" and "◄" keys simultaneously to enable the following action.
  The currently working profile (including S-register and Alarm Configuration) of the selected modem card will be download to the user profile #0 of all modem cards marked with "+".
  - If a modem card marked with "+" has been installed, the NMC will reset and initiate the modem card by the user profile #0.
  - If a modem card marked with "+" is not installed or failed (an error occurred), the NMC will automatically download the profile after modem card installation or error correction.
  - ☞ NMC will automatically reset mark "+" to "-" after the above action.

## CONTENT

- 4.1 Instruments
- 4.2 Install and Verify Power Supply
- 4.3 Troubleshooting
- 4.4 Return Procedure

## **CHAPTER 4 Maintenance**

This chapter tells you how to perform power supply installation, periodic maintenanc, troubleshooting, and return procedures.

#### 4.1 Instruments

The only instrument you need is a digital multimeter (DMM).

#### 4.2 Install and Verify Power Supply

Caution:

Verify the modem number of you need. The rack-mounted modem shelf of RM16MUI and the rack-mounted modem shelf of RM32MUI use different power unit. Don't mix up the power model with different shelf.

#### **For details please refer to Section 1.3.**

4.2.1 Verify the model number of your power unit. Make sure the input voltage and frequency is as follows.

PW132A : 90 ~ 265 Vac, 47 ~ 63 Hz, 132 W PW132D : -36 ~ -72 Vdc (Generally used -48 Vdc), 132 W

- 4.2.2. Make sure the power switch of your power unit is OFF.
- 4.2.3 Open the front panel cover of the NMC to an angle of 90 degree.
- 4.2.4 Insert your power unit into the rack-mounted modem shelf .
- 4.2.5 Turn ON your power unit, then the two LEDs (+24V, -12V) located on the front end of the power unit should be ON.
- 4.2.6 Measure the DC voltage between +24V Test Point and Ground with a DMM. The output voltage is within +20 Vdc~+28Vdc, otherwise, you should return your power unit for repairment.

*Note:* If the modem shelf installed dual power units, you shall turn OFF the other power unit before performing voltage measurement.

#### 4.3 Troubleshooting

Once the DCE rack-mount modem malfunctions, please check and record the indicators at the moment then turn the power off. Consequently, make sure all ICs on printed circuit board are firmly sited. Try to turn the power on again, if the trouble still exists, please follow the procedures below.

- 1) Power Unit
  - Make sure you get a proper power source. If no indicator is lighted, probably the problem is the power unit.
  - Check the power fuse; if it is broken, replace it.
- 2) NMC Unit
  - First, you should make sure LCD Display and Panel Switches is operating properly, and then check if the NMC working parameter can be changed. Once the NMC malfuction, you can directly pull out your NMC unit for repairment. A malfunctioned NMC unit should not interfered with all of the rack-mouned modems installed in the same modem shelf. To keep your modems work properly, please don't turn off the power supply.
  - The working parameters of the modem shelf including NMC unit and all of rack-mounted modems are saved in a battery backup RAM (model no: DALLAS DS123). You can install the original RAM into your spare NMC unit to quickly setup your modem shelf.

#### 4.4 Return Procedures

We suggest the individuals who hold a malfunctioned would contact with your local representative or distributor, or just directly access our customer service department in our MD Office as soon as possible in order not to cause catastrophe.

