

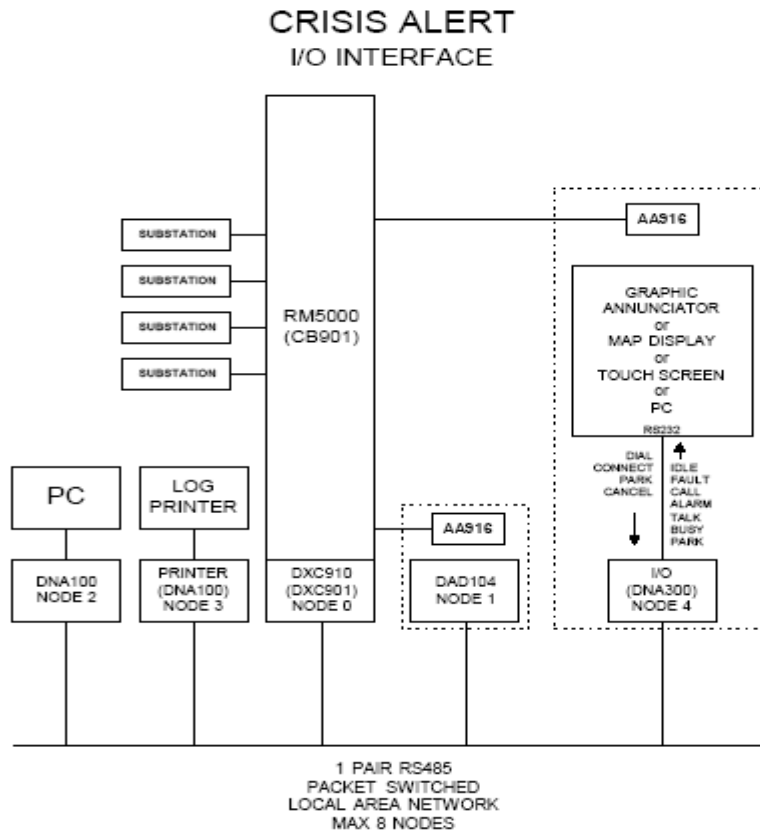
Ring Communications, Inc.
Crisis Alert System

I/O Interface

DNA300

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INTRODUCTION

A serial RS232 device can be interfaced to the Crisis Alert Network for the purpose of handling incoming and outgoing calls associated with one of the Crisis Alert master stations.

Examples of other display devices would be graphics annunciator panels, touch screen annunciators, or any other graphical user interfaces not made by *Ring Communications, Inc.*

One DNA300 is required to interface each external device to the network. Each DNA300 must be assigned to a master station in the exchange controller DXC901/DXC910 (the same way as when using DAD104).

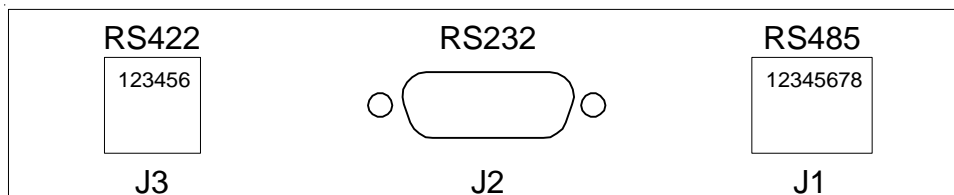
INSTALLATION

INTRODUCTION

The **D**igital **N**etwork **A**dapter (DNA300) interfaces one external RS232 or RS422 device to *Ring Communications'* Crisis Alert System.

The DNA300 operates on +24 VDC. It can be powered from the central exchange or can be powered locally by a separate 24 VDC regulated power supply.

The recommended cord is the BF640A to connect the DNA300 to the RJ45 network jack, KB171. Cords and jacks must be ordered separately.



Rear Panel Connectors

J1 - 8 pin (RJ45) Network connections :

Two modular jacks are provided at the rear of the DNA300. **Use modular cables with straight through pin configuration only!** An 8-pin (RJ45) modular jack (KB171) and cord (BF640A) are required for connection to the network.

PIN# - DESIGNATION

- 1 - No connection.
- 2 - +12 VDC power input
- 3 - Data + (positive)
- 4 - No connection.
- 5 - No connection.
- 6 - Data - (negative)
- 7 - -12 VDC power input
- 8 - External Alarm.

The maximum total network length is 7000 feet. A unshielded twisted pair cable should be used for the data pair (24 or 22 AWG).

Connect the DATA pair from the network to pins 3 and 6 of the RJ45 wall jack maintaining polarity of the pair. If a remote power source is being used, the negative side of the supply must be referenced to Earth Ground, as well as, the CB901 power supply.

J2 - 9 pin (DB9) RS232 signals :

The DNA300 has a RS232 serial port interface, J2, that can connect to a terminal, printer, or video switcher. Check your terminal, printer or video switcher manual for the correct RS232 connector type, input, output and handshaking signal connections.

The maximum length for a RS232 cable connecting the DNA300 and other equipment is 50 feet.

A null-modem (LapLink) cable can be used to connect a DNA300 and a laptop or computer together if they are close enough to each other.

If you are going to make your own cable the following is a description of the pinout of the DB9 connector on the DNA300.

<u>J2</u>	<u>SIGNAL</u>	<u>DIRECTION/</u>
<u>PIN#</u>	<u>NAME</u>	<u>DESIGNATION</u>
1	DCD	Data Carrier Detect, input.
2	RXD	Receive Data, input.
3	TXD	Transmit Data, output.
4	DTR	Data Terminal Ready, output.
5	GND	Signal Ground.
6	DSR	Not used.
7	RTS	Request to Send, output.
8	CTS	Clear to Send, input.
9	RI	Not used.

J3 - 6 pin (RJ11) RS422 signals :

A two twisted pair installation utilizing RS422 signals can be used to connect two devices up to 7000 feet apart.

Use a six wire RJ11 cord with straight through wiring from J3 to another RJ11 jack on both sides of the installation, and then use two twisted pairs between the two RJ11 jacks.

A strap **MUST** be installed between RTS and CTS of J2 (DB9), in order to disable flow control for the RS422. To do this, simply place a strap between pin 7 and pin 8 of J2. You could also solder this strap to a female DB9 connector with solder lugs on the rear, then insert it into the J2 connector. illustrates the strapping of J2.

Setting Baud Rate / Selecting Device Type

DIP switches SW3-1 through SW3-6 are used to set the desired baud rate for the RS232 device. SW3-7 and SW3-8 are used to select the RS232 device the DNA300 is driving (see chart below).

Baud Rate	SW3						0=off 1=on	DEVICE	7 8	
	1	2	3	4	5	6				
19200	1	0	0	0	0	1	I/O Module	0	0	
9600	1	0	0	0	1	0	Not used	0	1	
4800	0	1	0	0	0	1	Not used	1	0	
2400	0	1	0	0	1	0	Not used	1	1	
1200	1	0	0	0	1	1				

Communication Protocols

Hardware flow control is used (RTS/CTS). The DNA300 will send data only if CTS is high from the connected device. Parity, Data Bits and Stop Bits are programmable (see configuration section).

Defaulting Configuration Memory

Set DIP switch SW2 1-8 to off . Push RESET. Master light will start to flash, indicating that memory is default. Set Network and Node Address. Push Reset. The DNA300 is now ready to be configured.

Setting Network and Node Address

DIP switch SW2 is used to set the address of the DNA300. See SETTING NETWORK ADDRESS of Chapter A - NETWORK for a full description for setting addresses, as well as, an addressing chart.

FRONT PANEL SWITCHES AND INDICATORS -

SWITCHES

- SW1 - Reset. Creates a local reset for this node only.
- SW2 - Node & Network Address
- SW3 - RS232 Baud Rate, Device selection

L.E.D.'s (left side, network)

RUN - Indicates the local processor in the DNA300 is running. Will illuminate after power up or reset.

MASTER - Will light steady if this node is the master on the network. There can only be one master on each network. On power up, each device waits for a response from a master. If no response is received, then this device will take over as a master. Therefore, the first device powered up will be the master.

TX - Transmit data to the Network. Will flash when the DNA300 sends data out on the Network. If the Master LED is on, the TX LED will flash constantly. When the Master LED is off, TX will only flash when transmitting to other devices.

RX - Receive data from the Network. Will flash when data is transmitted from another device to the network. If the Master LED is on, the RX LED will flash when other devices respond to scanning from the Master. When the Master LED is off, the RX LED will flash constantly.

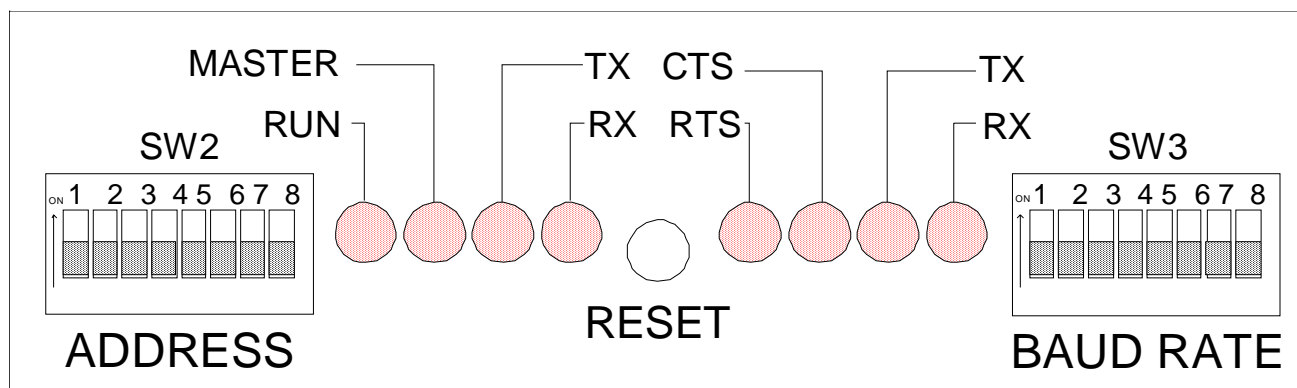
L.E.D.'s (right side, RS232)

RTS - Request to send. Output, indicates the DNA300 is ready to receive data from the RS232 device.

CTS - Clear to send. Input, illuminated when the RS232 device is ready to receive data from the DNA300.

TX - Transmit data. Output to RS232 device.

RX - Receive data. Input from RS232 device.



Front panel indicators

INPUT OUTPUT INTERFACE

Set the DIP switches so that **SW3-7 is OFF and SW3-8 is OFF** to activate the I/O software .

COMMUNICATION PROTOCOL

The device receiving from the DNA300 must be setup in the following matter:

The interface is using RS232 between the baud rates of 1200-19200 bps (see SETTING BAUD RATE/DEVICE TYPE SELECT earlier in this chapter).
 Hardware flow control (RTS/CTS).
 Configurable Parity, Data and Stop bits.

MESSAGE FORMATS

STX	hex 02	CTRL-B Start of Text
RS	hex 1E	CTRL-^ Record Separator
ETX	hex 03	CTRL-C End of Text
BCC	hex 00-7F	XOR Checksum of all characters including STX and ETX
EVENT		One character
BUTTONADDRESS		Four character (0000-FFFF hex).
PRIORITY		One character (0-9 decimal).
CALL NUMBER		Four character (0000-9999 decimal).
ACK	hex 06	CTRL-F Message acknowledge is expected back after each message is sent.

The DNA300 will retransmit the message if not acknowledged within 1 second. Maximum two retransmits.
 The DNA300 will send ACK after receiving a valid message from the external device.

The message format is in the following format for output messages from the DNA300:

| STX | EVENT | RS | BUTTON ADDRESS | RS | PRIORITY |RS| CALL NUMBER | ETX | BCC |

Events:

I (hex 49) = INITIALIZE (hex string: 02 49 03 48)
 F (hex 46) = FAULT
 E (hex 45) = ALARM
 C (hex 43) = CALL
 T (hex 54) = TALK
 B (hex 42) = BUSY
 P (hex 50) = PARK
 R (hex 52) = CLEAR

The message format is in the following format for input messages to the DNA300:
| STX | EVENT | RS | BUTTON ADDRESS | ETX | BCC |

Events:

I (hex 49) = INITIALIZE (hex string: 02 49 03 48)
D (hex 44) = DIAL (accept call in que or dial a station)
O (hex 4F) = OUTPUT (remote control)
P (hex 50) = PARK
X (hex 58) = CANCEL

A (hex 41) = ACCEPT (same as DIAL)

Note:

Only the DIAL event needs **RS | BUTTON ADDRESS** in the message.
The I, O, P and X events will ignore button address if included.

CONFIGURATION

One DNA100 is used as a programming interface to the DNA300. The DNA100 has one RS232 port for connection to a PC running PROCOM+.

The DNA100 sets up a link between the PC and the DNA300. The Configuration is done from the PC and the information is stored in battery RAM in the DNA300. When the system is first installed the RAM must be reset before the system is configured (described earlier in this section). After configuring the system the DNA100 may be removed.

SYNTAX

TYPE FONTS

boldface type_{cr} indicates user input
Courier font indicates output

COMMAND

The command consists of a command word plus one or more parameters.

The command may be entered on one line with the parameters separated by spaces.

>**command par1 par2 par3**_{cr}

The command may be entered in prompt mode with parameters separated by carriage return. The prompt will indicate what type of parameter value is required.

```
>commandcr  
Prompt>par1cr  
Prompt>par2cr  
Prompt>par3cr  
>
```

PROMPT

< > Angle brackets enclose input parameters.
\$ Hexadecimal value (default is decimal).
- Range of values may be entered.
.. Periods indicate that only ONE value is required from the range of values.
* Wild card means all values in a range of values.
/ Optional input selection separator.

ERROR HANDLING

Misspelled command input will give the following error message:

Unknown Command

Parameter errors will print ERROR: and then prompt for the parameter again.

HELP

HELP COMMANDS

Help lists all help commands in the Configuration program. Type HELP, H or ?.

>**HELP**_{cr}

DNA300 Command Summary:

=====

H	Help
?	Help
LCN	List Call Numbers
LTTY	List Serial Port Characteristics
STTY	Set Serial Port Characteristics
SBA	Set Pushbutton Address
BAK	Backup

>

SERIAL PORT

Set Parity, Data bits, Stop bits for serial port.

PROGRAMMING

The following commands are used for this feature.

STTY Set Serial Port Characteristics

LTTY List Serial Port Characteristics

Example: Set No Parity, 8 Data bits, 1 Stop bit

```
>STTYcr
Mode 0 = Even, 7 Data, 2 Stop
Mode 1 = Odd, 7 Data, 2 Stop
Mode 2 = Even, 7 Data, 1 Stop (default)
Mode 3 = Odd, 7 Data, 1 Stop
Mode 4 = None, 8 Data, 2 Stop
Mode 5 = None, 8 Data, 1 Stop
Mode 6 = Even, 8 Data, 1 Stop
Mode 7 = Odd, 8 Data, 1 Stop
Serial Port Mode <0..7> : 5cr
>LTTYcr
Mode 5 = None, 8 Data, 1 Stop
>
```

CALL NUMBERS

All intercom stations are assigned call numbers in the Ring intercom central exchange.

The DNA300 interface assigns a Push Button Address to each of the intercom call number for the external device. This assignment is stored in the DNA300 and may be listed with the command **LCN** from the PC connected to the DNA100.

The call number may be 2,3 or 4 digit decimal.

The Push Button address may be 1,2 3 or 4 digit HEX.

The Button may be removed from a a call number by entering 0 as the address.

>**LCN**_{cr}

Call Number <10-9999/*> : **100-110**_{cr}

Intercom Call Number	Button Address	NetSub Address
101	A1	801
103	A3	803
104	A4	804

>

Note! The NetSub is the Network Address and Line Equipment Number of the intercom station. This information is updated when a call is received from the intercom-station.

BUTTON ADDRESS

Assign a Push-Button to an intercom station.

PROGRAMMING

The following commands are used for this feature.

SBA Set Button Address
LCN List Call Number

Example: Set Button address for intercom call number 101 to address A1.

>**SBA**_{cr}

Call Number <10..9999> : **101**_{cr}

Button Address <0..FFFF> : **A1**_{cr}

>**LCN**_{cr}

Call Number <10-9999/*> : **101**_{cr}

Intercom Call Number	Button Address	NetSub Address
=====	=====	=====
101	A1	

>

BACKUP

Backup generates all programming commands required to restore the configuration of the DNA300. These commands may be downloaded and stored in a file on the PC. This file can then be uploaded to restore the configuration of the DNA300

PROGRAMMING

The following commands are used for this feature.

BAK Backup

Example:

```
>BAKcr
Call Number <10..9999> : *cr
!
!   BACKUP START: 2006/05/22
!
! DNA300 VERSION: 2006/05/17
!
SBA 101  A1
SBA 103  A3
SBA 104  A4
STTY 5
!
! END OF TRANSFER
```

