

UL, ULC Listed  
FM Approved\*

Fire Alarm Controls  
4120 Series 2500 NDU  
Network Display Unit

## STANDARD FEATURES:

- 4120 Network Interface
- Functions as a Primary Operator Workstation for Proprietary Systems or Remote Receiving Unit for Remote Station Protective Signaling Systems
- Performs 4120 Network Functions for up to 2500 Points Including:
  - Alphanumeric Annunciation
  - Alarm Silence, System Reset, Supervisory Service, and Trouble Acknowledge
  - Manual Point Enable/Disable
- Multiple 2500 NDUs per 4120 Network:
  - Duplicate Information at Other Locations
  - Vector Different Information to Separate Locations
- 80 Character Liquid Crystal Display
  - Super -Twist Type for Optimum Viewing
  - Back-Lit Alphanumeric Characters
- TrueAlarm® Sensor Operation\*\*
  - Investigate Status and History
  - Select Sensor Sensitivity
- Can be Packaged with:
  - NDU Status Command Center
  - Voice NDU Status Command Center

## SOFTWARE FEATURES:

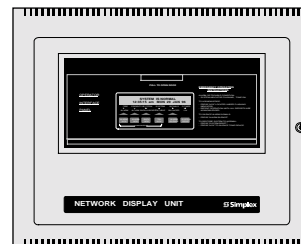
- 4 Operator Access Levels
- 1200 Event Historical Log
- Field Programmable
- Network Diagnostics
- Set-Host Function Accesses Remote Node Data

## OPTIONAL FEATURES:

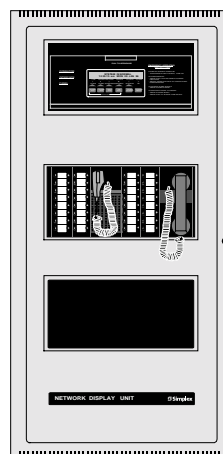
- Connection for Remote LCD Annunciators
- RS-232 Interface for Remote CRT/Keyboard and Local or Remote Printer Operation
- Internal DACT
- Dial-In Service Modem Interface

\* Applicable FM approval information is available on request.

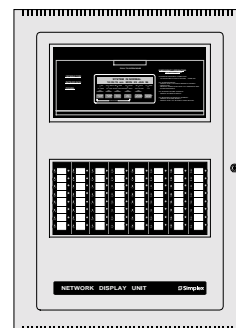
\*\* TrueAlarm analog detection is protected by U.S. Patents 5,155,468 and 5,173,683.



4120-8801, 2500 NDU (2 UNIT CABINET)



4120-8821 NDU WITH  
COMMAND CENTER (VOICE)  
(6 UNIT CABINET)



4120-8821 NDU WITH  
COMMAND CENTER  
(4 UNIT CABINET)

## 4120 NETWORK DISPLAY UNIT (NDU) PRODUCTS

NOTE: Refer to Simplex data sheet S4120-0001 for additional information on the 4120 Network. Refer to Glossary of 4120 Terms on page 7 for a summary of terminology.

## INTRODUCTION:

The 4120 Network Display Unit, 2500 NDU, is a network annunciator and manual system/point controller for a 4120 Network. It provides alphanumeric annunciation for up to 2500, 4120 Network points and/or point lists and can be programmed to function as the network master controller for Alarm Silence, Trouble Acknowledge, and System Reset.

When connected to other 4120 Series products as part of a 4120 Network, fire alarm control panels become components of a distributed intelligence system. Each panel that directly connects to the network is called a network “node” and is capable of performing individual supervision and control on its locally connected devices but has the network ability to inform the 2500 NDU (as well as other network control panels) of point status and panel condition. This allows system information to reach the proper location for appropriate system response.

Multiple 2500 NDUs (separately packaged) can be connected to a 4120 Network to duplicate common information at separate locations, or direct selected information by type such as troubles, alarms, control, etc.

## OPERATOR INTERACTION:

The 4120, 2500 NDU master controller operator's panel (shown in Figure 1) maximizes efficiency when performing primary fire alarm functions by displaying only the indication and interaction switches required for responding to 4120 Network emergency situations. A hinged access door exposes the section under the label “Function Keys” (refer to Figure) to provide this standard control panel focus.

Alarm, Supervisory, and Trouble conditions are indicated at the operator's panel by dedicated LEDs and a locate tone-alert. An 80 character (2 lines x 40 characters) alphanumeric, Super-Twist Liquid Crystal Display provides information concerning

point status (alarm, trouble, etc.), type of alarm (smoke detector, manual station, etc.), number of alarms in the system, node location, and a custom location label. Alarm supervisory and trouble conditions have dedicated acknowledge push-button switches. Operation of the appropriate acknowledge switch silences the tone-alert with the LED remaining illuminated until all conditions in that category are restored to normal.

For increased functionality, opening the access door exposes all of the operator keys shown in Figure 1. The depth of the operator's interaction is determined by four Security Access Levels (1 through 4). Level 1 allows routine actions while level 4 is reserved for sensitive operations requiring an authorized operator. Levels 2 through 4 are passcode protected to ensure proper authorization for that level's control access. Passcode log-ins are stored in the history log for access review.

The 4120, 2500 NDU can be programmed to perform a “global acknowledge” where a single push of the appropriate acknowledge switch will silence the tone-alert for all 4120 Network points in that condition. It can also be programmed for individual acknowledgment of each point in an abnormal condition, as well as their restoration. Both operations are in accordance with the requirements of NFPA 72, the *National Fire Alarm Code*.

Pressing the “ALARM SILENCE” switch silences audible notification appliances. Visible notification appliances can either be extinguished with the same switch, or be installed such that they stay on until pressing the “SYSTEM RESET” switch restores the system to the normal operation mode. To serve as a trouble reminder when a trouble condition remains in the system and the audible trouble signal has been silenced, the tone-alert can be programmed to “beep” at user specified time intervals.

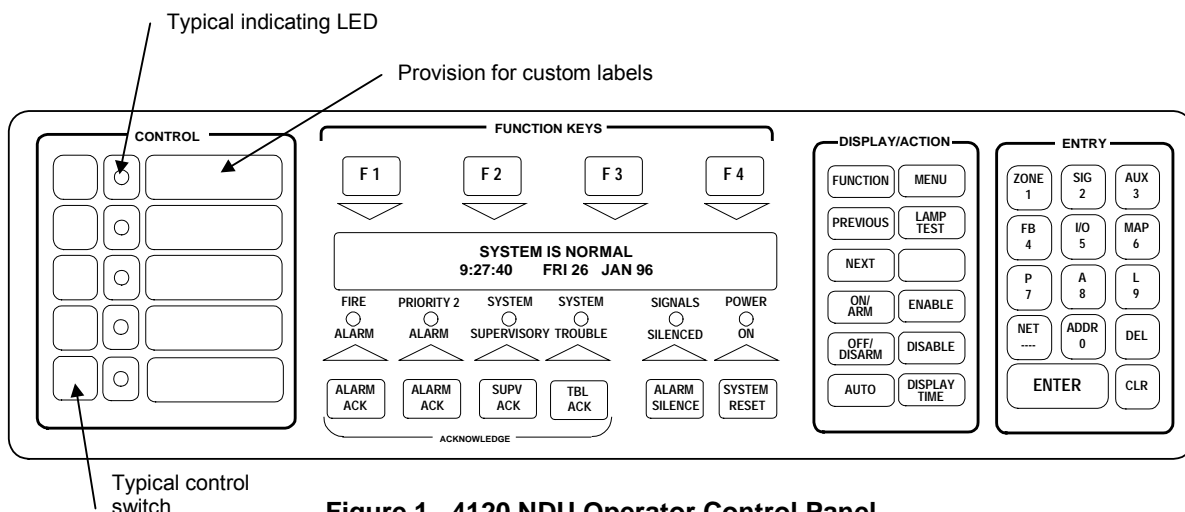


Figure 1. 4120 NDU Operator Control Panel

### **OPERATOR INTERACTION (CONTINUED):**

The “FUNCTION KEYS”, “DISPLAY/ACTION” keypad, and the “ENTRY” keypad are the operator interface sections which provide operations that are not essential in a fire emergency situation. These functions are presented in a self-directing, menu based manner and include: circuit/device “ENABLE” or “DISABLE”, control point turn “ON” or “OFF”, “DISPLAY HISTORICAL LOGS”, review TrueAlarm peak activity, etc.

“CONTROL” identifies five programmable control switches with associated LEDs. Possible applications are: city disconnect, door holder bypass, manual evacuation, elevator capture bypass, etc. Note: the 2500 NDU is a 4120 Network Display Unit and the hardware required for implementing these control examples is located at fire alarm control panels that are nodes on the 4120 Network.

“CONTROL” switches can be individually passcode protected such that only certain Access Level operators can perform that function. (See Figure 1).

“DISPLAY ACTION: and “ENTRY” keypads allow operators (with proper access levels) to perform

controlling functions to system zones, notification appliances or auxiliary control relays, or to gain access for system information.

“DISABLE” allows a specific 4120 Network point to be disconnected from the system, typically as a service operation. A “TROUBLE” condition will occur as a reminder of the action taken.

“ENABLE” and “ENTER” restores the circuit or device to active status in 60 seconds. The display will count down the remaining time and will warn the operator if the device or the circuit to be enabled will cause an alarm.

“FUNCTION KEYS” identifies the “soft” keys F1 through F4 whose functions vary within each Main Menu Option. Each key’s function is described on the top line of the display. For example, when setting time and date, F1 and F2 control the placement of the cursor and F3 and F4 either increase or decrease the indication above the cursor. (See Figure 1). The standard display is “SYSTEM IS NORMAL” on line 1 and line 2 will display the network time and the date.

## **4120-8801 2500 NDU NETWORK DISPLAY UNIT FEATURES**

### **4120,2500 NDU MASTER CONTROLLER ASSEMBLY:**

The Master Controller assembly supports the Operator’s Panel, provides local and remote module communications and supervision, and controls the system memory and custom programming interface. Feature highlights are:

- 4120 Network Interface with style 4 or style 7 communications. Performs automatic node or wire isolation in the event of a wire-to wire short, open, or communication failure.
- 2500 NDU point capacity can include both actual points and point lists.
- One SPDT Auxiliary Trouble Relay Contact Rated at 2 amps @ 24 VDC, resistive.
- City Circuit operation 24 VDC Remote Station (reverse polarity), local energy, shunt master box, or a form “C” contact output.
- Internal dual line DACT module provides automatic 24 hour test and programmable power fail report delay.
- Port for connecting the 4120 System Programming Unit.
- Can be packaged in a stand-alone 2 unit box or can be placed in the top module location of a 4 or 6 unit cabinet that contains a Status Command Center or Voice Status Command Center, each being a separate node on the 4120 Network.
- Power is sourced from an internally packaged power supply/battery charger.

### **OPTIONAL MODULES:**

#### **REMOTE UNIT INTERFACE (RUI) (4120-0304)**

- Provides supervised serial annunciator communications for up to 31 remote 4603 Series LCD annunciators.

#### **MODULAR NETWORK INTERFACE**

- Multiple communications media are available on the 4120-6014 Modular Interface Card with selectable Media Cards. Media cards include fiber optics, wired, and modem communications and may be mixed on one interface card. Refer to Simplex data sheet S4210-0003 for further details.
- For interconnections purposes, physical bridge modules may be installed for increased network connections flexibility. Refer to Simplex data sheet S4120-0005 for further details.

#### **DIAL-IN SERVICE MODEM INTERFACE (4120-0139)**

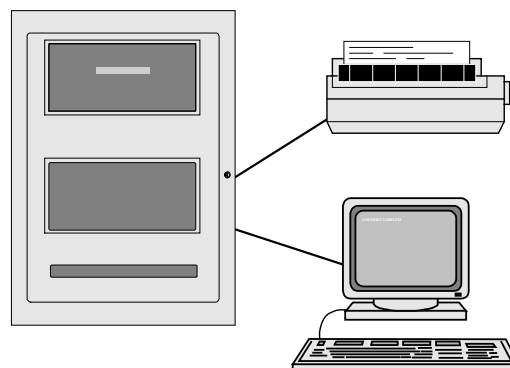
- Provides remote data access for a computer equipped with a modem and terminal emulation software.

### RS232-C INTERFACE CARD (4120-0113)

- Two isolated ports per card.
- Supports CRT/Keyboard or printer.
- CRT/Keyboard operation connects to the Simplex model 4190-9006 remote computer terminal and provides both full screen annunciation and keyboard control. (Reference Simplex data sheet S4190-0006).
- Printer operation can be field programmed to print all activity displayed on the local LCD or to be selective by event types (alarms or troubles). The 2500 NDU keyboard can be used to request a printed report from the historical log including alarms, troubles, and TrueAlarm Status and Service Reports for all available points on the 4120 Network. (See Figure 3 and 4 for printer report samples).
- Applicable printers are model 4190-9008, for 120 VAC desk top operation, 4120-0451 for 24 VDC panel mount, or model 2190-9039 for 24 VDC desk top operation. (Reference Simplex data sheets S4190-0008, S4100-0021, and S2190-0014).

### NDU OPERATING SPECIFICATIONS:

Temperature.....31° F to 120° F (0° C to 49° C)  
Humidity .....85% Non-condensing  
@ 86° F, 30° C  
Input Power Requirements.....4 A @ 120 VAC, 60 Hz  
2 A @ 240 VAC, 50/60 Hz  
for each power supply



TYPICAL NDU RS-232 CONNECTIONS

#### Event Printouts

##### Alarm Condition:

12:42:44 pm MON 03 NOV 97 CAFETERIA STORAGE ROOM  
FIRE MONITOR ZONE ALARM

##### Supervisory Service:

12:43:08 PM MON 03 NOV 97 OFFICE AREA BUILDING 23  
SPRINKLER MONITOR ABNORMAL

##### Trouble Condition:

12:43:41 PM MON 03 NOV 97 NURSES STATION EXAMINING ROOM  
FIRE MONITOR ZONE DISABLE TROUBLE

#### History Log Reports

SIMPLEX 4100 FIRE ALARM SYSTEM  
Report 1 : Alarm Historical Log

Page 1  
11:42:48 pm MON 03 NOV 97

Entry 1 12:14:49 am WED 05 NOV 97 PRESS ROOM INK STORAGE BUILDING 24  
FLAME DETECTOR ALARM

ENTRY 2 12:15:20 AM WED 05 NOV 97 ALARMS ACKNOWLEDGED AT MAIN PANEL

ENTRY 3 12:20:09 AM WED 05 NOV 97 ALARM SILENCE REQUESTED

ENTRY 4 12:27:57 AM WED 05 NOV 97 SYSTEM RESET REQUESTED AT MAIN PANEL

ALARM HISTORICAL LOG REPORT COMPLETED

SIMPLEX 4100 FIRE ALARM SYSTEM  
Report 2 : Trouble Historical Log

Page 1  
9:14:16 am MON 03 NOV 97

ENTRY 1 3:14:26 PM TUE 16 NOV 97 BLDG 24-2 PCA SOUTH EAST  
PEAK=80 / 7% OF ALARM / 0.1% SMOKE

ENTRY 2 8:13:26 PM WED 17 NOV 97 BLDG 24-2 PCA BREAKROOM WEST  
PEAK=70 / 6% OF ALARM / 0.2% SMOKE

ENTRY 3 5:36:00 PM TUE 18 NOV 97 BLDG 26-2 CARPENTER SHOP ATTIC  
PEAK=83 / 4% OF ALARM / 0.1% SMOKE

FIGURE 3. EVENT, ALARM, AND TROUBLE LOG SAMPLE REPORT

| Channel 1 (M1)    |      |      |                |       | Sensi   |        | Device Status |  | Almost |  |
|-------------------|------|------|----------------|-------|---------|--------|---------------|--|--------|--|
| Zone              |      |      |                |       | -tivity |        |               |  | Dirty  |  |
| Name Custom Label |      |      |                |       |         |        |               |  |        |  |
| M1-1              | BLDG | 24-2 | LOADING DOCK   | 1     | 2.5     | NORMAL |               |  |        |  |
| M1-2              | BLDG | 24-2 | LOADING DOCK   | 2     | 2.5     | NORMAL |               |  |        |  |
| M1-3              | BLDG | 24-2 | LOADING DOCK   | 3     | 2.5     | NORMAL |               |  |        |  |
| M1-4              | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5     | NORMAL |               |  |        |  |
| M1-5              | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5     | NORMAL |               |  |        |  |
| M1-6              | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5     | NORMAL |               |  |        |  |

| Channel 1 (M1)       |      |      |                |       | Alarm   |    | Avg Current/ |    | Peak/   |     | State |  |
|----------------------|------|------|----------------|-------|---------|----|--------------|----|---------|-----|-------|--|
| DEV Num Custom Label |      |      |                |       | at:     |    | val % alarm  |    | % alarm |     |       |  |
| 1                    | BLDG | 24-2 | LOADING DOCK   | 1     | 2.5/139 | 71 | 71/          | 0% | 81/     | 14% | NOR   |  |
| 2                    | BLDG | 24-2 | LOADING DOCK   | 2     | 2.5/139 | 71 | 72/          | 1% | 76/     | 7%  | NOR   |  |
| 3                    | BLDG | 24-2 | LOADING DOCK   | 3     | 2.5/132 | 64 | 64/          | 0% | 75/     | 15% | NOR   |  |
| 4                    | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5/144 | 76 | 77/          | 1% | 82/     | 8%  | NOR   |  |
| 5                    | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5/158 | 90 | 90/          | 0% | 99/     | 13% | NOR   |  |
| 6                    | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5/148 | 80 | 81/          | 1% | 83/     | 4%  | NOR   |  |
| 7                    | BLDG | 26-2 | CARPENTER SHOP | ATTIC | 2.5/146 | 78 | 79/          | 1% | 86/     | 11% | NOR   |  |

FIGURE 4. TrueAlarm STATUS AND SERVICE REPORT SAMPLE PRINTOUT

## 4120 NDU STATUS COMMAND CENTER (4120-8821)

### DESCRIPTION:

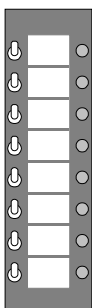
The 4120-8821 NDU Status Command Center combines the 2500 NDU with a custom selection of modular LED and/or LED and control switch assemblies that provide a dedicated monitor and control interface. These modules comprise a system control that allows operation of the required functions with minimal system familiarity.

### 4120-0301, 64/64 LED/SWITCH CONTROLLER

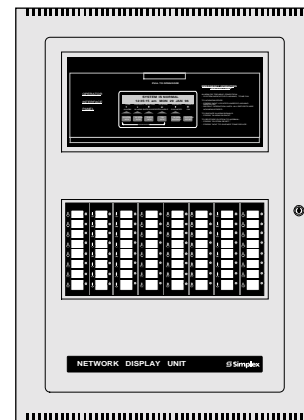
- Supports up to 64 LEDs and 64 switches
- Monitors switches for status changes
- Supervises and controls LEDs
- Supervises LED/switch module placement

### 4120-0302, 24 POINT I/O GRAPHIC INTERFACE

- Individually configurable as a switch input or lamp output.
- Inputs can monitor supervised or unsupervised, 2 or 3 position switches and toggle type switches.
- Outputs can be slow pulse, fast pulse or steady.
- 150 mA lamp driver output (+24 VDC) common)
- Supervised monitoring and/or control



TYPICAL LED/SWITCH  
CONTROL MODULE WITH  
CUSTOM LABEL POCKETS

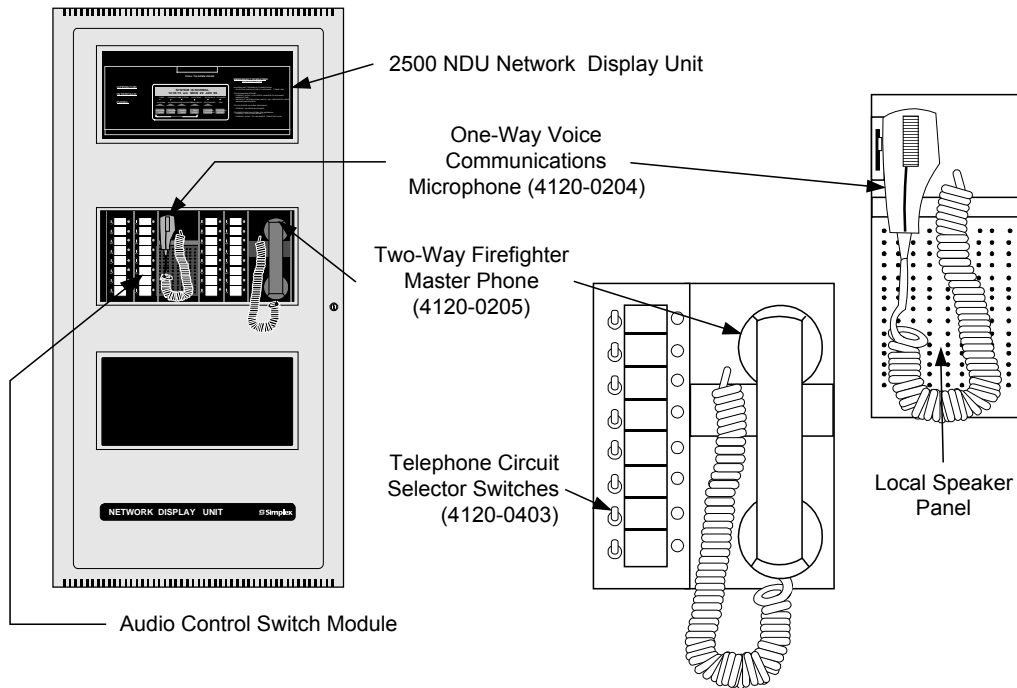


4120-8801 NDU NETWORK  
STATUS COMMAND CENTER

### LED AND LED/SWITCH MODULES

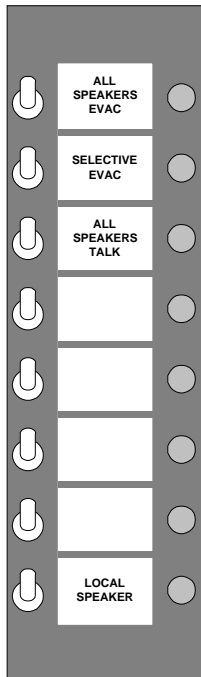
- 4120-0401: 8 Red LEDs
- 4120-0402: 8 Red LEDs and 8 Yellow LEDs
- 4120-0403: 8 Red LEDs and 8 Momentary Switches
- 4120-0404: 8 Red LEDs, 8 Green LEDs, & 8, 3 Position Maintained Switches
- 4120-0405: 8 Red LEDs, 8 Yellow LEDs, & 8 Momentary Switches
- 4120-0501: LEDs Only, 8 Red
- 4120-0502: LEDs Only, 8 Green
- 4120-0513: LEDs Only, 8 Yellow

## 4120 NDU VOICE STATUS COMMAND CENTER (4120-8821)



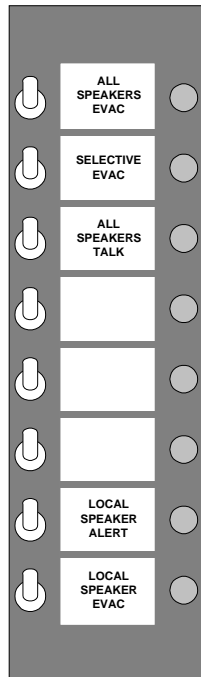
### SAMPLE AUDIO CONTROL SWITCH MODULES:

#### SINGLE CHANNEL



4120-0412

#### DUAL CHANNEL



4120-0413

#### DESCRIPTION:

The 4120-8821 NDU Voice Status Command Center (SCC) combines the 2500 NDU with a full featured voice control panel that can be equipped to provide audio tones and voice messages as well as firefighter's telephone control. The Voice SCC provides one-way voice communication, alarm tones, and/or digitally recorded voice messages to alert occupants of a fire or other emergency situation throughout the network. Evacuation signaling may be automatically generated via alarm initiated event programs in the 4120 Network, or by firefighting personnel using the system microphone. The system may also be equipped with a Firefighter's Master Telephone module to provide two-way communications throughout the 4120 Network.

(For detailed operation and module information, refer to Simplex data sheet S4100-0013).

## GLOSSARY OF 4120 NETWORK TERMS:

- **ACCESS LEVEL**  
Network access is allowed when local panel access is allowed. Designated point control on a node panel can be achieved whether the point is local or external.
- **CONTROLLER NODE PRIMARY OPERATOR WORKSTATION**  
A node programmed to handle all silence and reset functions for network nodes. This node will be responsible for all network timing functions and will perform network historical logging. Equipment at this node would typically include a 2500 NDU, printer and a CRT/keyboard as a network status terminal.
- **CUSTOM CONTROL**  
Local and external points can both be used for custom control. If a point status is not available due to a network problem, that condition can be considered for writing custom control.
- **EXTERNAL**  
When a node is programmed to monitor or control a public point, that point is considered as external to that node.
- **GLOBAL**  
Silence or reset that is sent to all panels of the network requiring each panel to perform that operation and log the information.
- **LIST**  
If a group of points is assigned to a LIST at a node, the list may be controlled and monitored as a single point. When troubles or alarms occur, the quantity of each is identified as well as the list name, but the details are available only to the owner node.
- **LOCAL**  
Activity that only affects operation at the node with no impact to the network.
- **OWNER**  
The node where a specific point is physically connected.
- **NODE**  
An intelligent device that directly communicates with the network.
- **PEER-TO-PEER**  
This is the network communication scheme among panels.
- **PSEUDO POINT**  
This is a "point-like" function that is monitored and controlled like a physical point, but is actually a feature such as the turning "on" of a timer.
- **PUBLIC**  
A monitor or control point, or point list, that has been made available to the network by its owner.
- **REPLICA**  
When a public point is programmed into a node as an external point, a REPLICA of that point information is maintained at that node. The network updates all replicas whenever a status change occurs. This allows a control panel other than the owner to investigate and respond to specific point information.
- **SET-HOST FUNCTION**  
Authorized users can access remote node information by logging into the remote node data base. This function enables programming of the entire network from one node.
- **STYLE 7**  
When communications are capable of operating in the event of a single line-to-line short, single open circuit, or single short to earth. This is normally accomplished by using redundant, isolated wiring that is monitored for status on both the primary path and the redundant path.
- **TIMEKEEPING**  
To synchronize the network time, one node is designated to be the Network Timekeeper. This node will notify the network of authorized time and date changes (with seconds accuracy) and once a day for proper network synchronization. Each node will continue to update its local clock in the event of loss of communications with the network timekeeper.
- **TOKEN RING**  
The 4120 network communication protocol handles a network message in the form of the token ring process. The message is sent sequentially to each node and modified or retransmitted intact depending on the status update required of that node.
- **WALK TEST**  
Walk test service operations are local to the node and will not disturb the network. The network is informed that this node is "Walk Test Active" and the event is logged into the network controller.
- **WIRED 4120 COMMUNICATIONS**  
A proprietary communications format using differential mode low impedance drivers to provide high data rates over long distances. The electrical characteristics are those of RS-485.

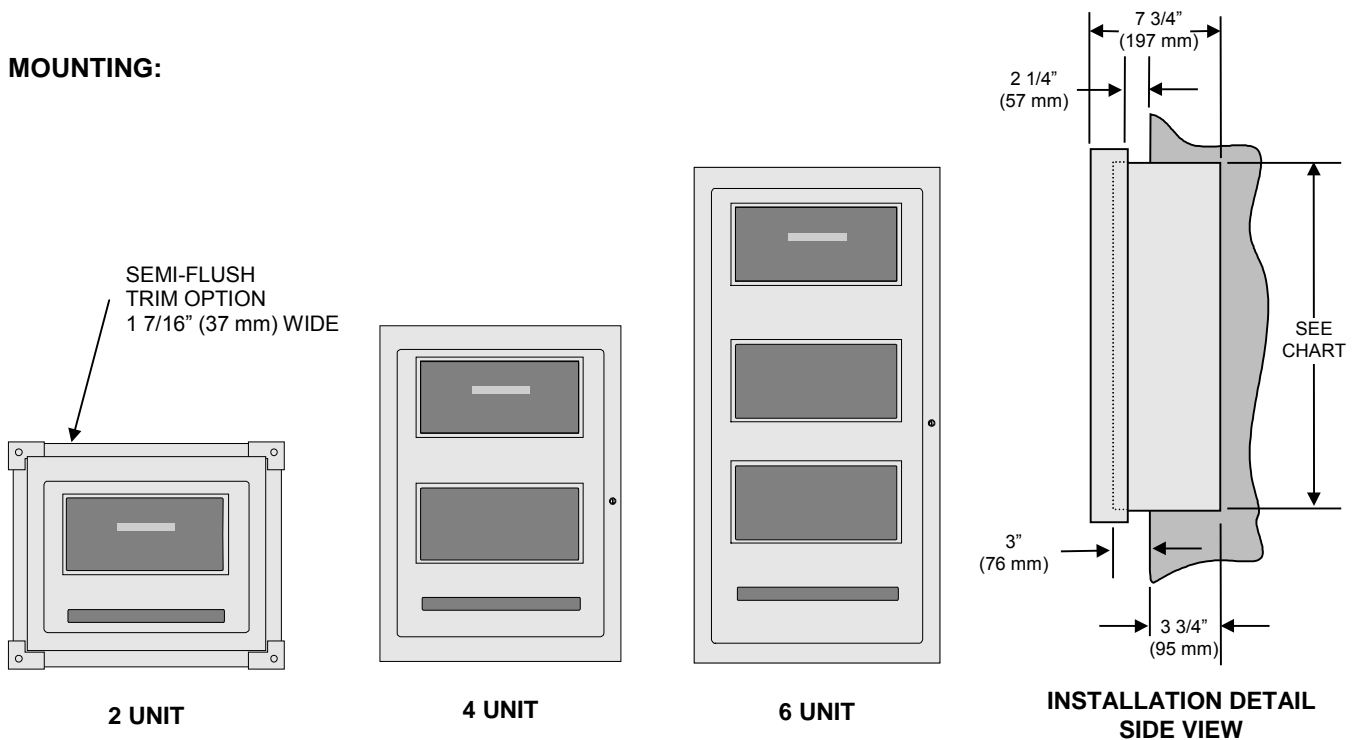
## PRODUCT STRUCTURE SUMMARY

| PRODUCT IDENTIFICATION | DESCRIPTION                         |
|------------------------|-------------------------------------|
| 4120-8801              | Basic 2500 NDU                      |
| 4120-8821              | 2500 NDU with Status Command Center |

## 4120 NDU CABINET DIMENSIONS

| MODEL NO.                          | SIZE   | HEIGHT               | CABINET WIDTH       | CABINET DEPTH      | DOOR WIDTH          |
|------------------------------------|--------|----------------------|---------------------|--------------------|---------------------|
| 2975-9190, Beige<br>2975-9191, Red | 2-UNIT | 20 3/4"<br>(527 mm)  | 25 3/4"<br>(654 mm) | 4 1/4"<br>(108 mm) | 26 3/8"<br>(670 mm) |
| 2975-9192, Beige<br>2975-9193, Red | 4-UNIT | 36 1/4"<br>(921 mm)  |                     |                    |                     |
| 2975-9194, Beige<br>2975-9195, Red | 6-UNIT | 52 1/8"<br>(1324 mm) |                     |                    |                     |

### MOUNTING:



**NOTE:** A system ground must be provided for Earth Detection and transient protection devices. This connection shall be made to an approved, dedicated Earth connection per NFPA 70, article 250, and NFPA 780.

S4120-0002-7 11-97



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