VIKING©

Telecommunication Peripheral Products

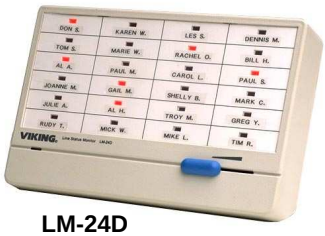
Technical Practice

LM-24S
Line Status Monitor System

July 5, 2000

See at a Glance when Lines are Ringing or In-Use

LM-24M



LM-24D

The **LM-24S** Line Status Monitor System provides a visual status of up to 24 lines or stations. If a line or station is in use, the corresponding LED will light steady, a ringing line or station will show a flashing LED.

Even if a ringing phone is out of hearing range, a common audible tone calls the operator's attention to the visible display. The tone is adjustable for convenient operation.

The **LM-24S** Line Status Monitor System is designed for professional and efficient call processing at department answering positions, message centers and back-up attendant stations. Each **LM-24S** Line Status Monitor System includes one **LM-24D** Display and one **LM-24M** Scanner.

http://www.VikingElectronics.com

E-mail...Sales@VikingElectronics.com

Features

- Non-volatile memory (no batteries required)
- Visual status for up to 24 analog lines or stations (idle, in-use, ringing)
- Programmable ring indication on a per-line basis
- Adjustable display viewing angle for desk or wall mounting
- Displays require only a single pair of wires
- Powers up to (3) **LM-24D** or **LM-12W** displays
- User printable extension identification cards
- Adjustable audio volume
- Quick installation
- Includes both the display and the scanner
- One year limited warranty

Applications

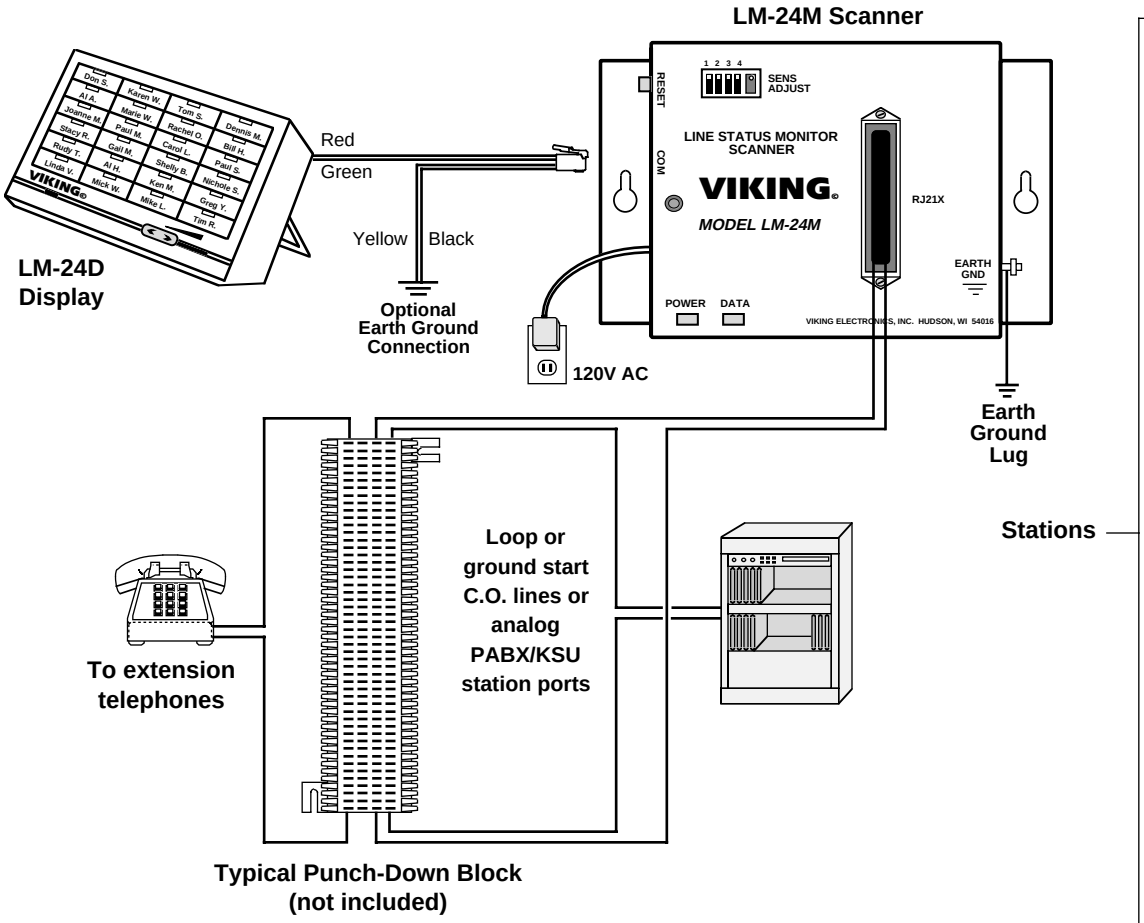
- Ideal for areas where personal attention must be given to every call
- Eliminates the additional cost of adding a PABX console or key system
- Allows for full utilization of all call pickup features
- Monitors the status of lines or stations

Sales...(715) 386 - 8861

Specifications

Power: 120V AC/13.8V AC 1.25A UL listed adapter provided
Dimensions: LM-24M - 187mm x 127mm x 45mm (7.37" x 5" x 1.75"), **LM-24D -** 184mm x 119mm x 38mm (7.25" x 4.7" x 1.5")
Shipping Weight: **LM-24M -** .68 Kg (1.5 lbs), **LM-24D -** .59 Kg (1.3 lbs)
Environmental: 0°C to 32°C (32°F to 90°F) with 5% to 95% non-condensing humidity
Connections: (1) RJ21X connector, (1) RJ11 jack
Maximum Display Runs: (1) display: 244m (500 ft), (2) display: 122m (400 ft), (3) displays: 61m (200 ft)

Installation



Line	Pins	Color
1T 1R	26 1	W/BL BL/W
2T 2R	27 2	W/O O/W
3T 3R	28 3	W/G G/W
4T 4R	29 4	W/BN BN/W
5T 5R	30 5	W/S S/W
6T 6R	31 6	R/BL BL/R
7T 7R	32 7	R/O O/R
8T 8R	33 8	R/G G/R
9T 9R	34 9	R/BN BN/R
10T 10R	35 10	R/S S/R
11T 11R	36 11	BK/BL BL/BK
12T 12R	37 12	BK/O O/BK
13T 13R	38 13	BK/G G/BK
14T 14R	39 14	BK/BN BN/BK
15T 15R	40 15	BK/S S/BK
16T 16R	41 16	Y/BL BL/Y
17T 17R	42 17	Y/O O/Y
18T 18R	43 18	Y/GN GN/Y
19T 19R	44 19	Y/BN BN/Y
20T 20R	45 20	Y/S S/Y
21T 21R	46 21	V/BL BL/V
22T 22R	47 22	V/O O/V
23T 23R	48 23	V/GN GN/V
24T 24R	49 24	V/BN BN/V

25T 25R	50 25	V/S S/V

Receptionist's Phone

A. Ground Connections

The earth grounding lug or yellow/black pair on the modular RJ14 jack of the **LM-24M** scanner must be connected to the positive of the talk battery for proper reference. Normally this is the earth ground on most C.O. lines or analog PABX/KSU stations. To test, use a voltmeter with the positive probe connected to the earth ground and the negative probe to the ring side of a phone line. Measurements should be about 50 volts on-hook and 30 volts off-hook.

B. Phone Line Connections

All connections to the RJ-21X are in parallel with the C.O. lines or analog PABX/KSU stations. Use the table (above right) to make the connections to the RJ-21X connector on the **LM-24M** scanner.

Note: *The **LM-24M** scanner is factory set to 48 volts for C.O. lines or analog PABX/KSU stations. **The LM-24M** is not sensitive to the polarity of the C.O. lines connected to the RJ-21X.*

C. Display Connections

Communication from the **LM-24S** scanner is accomplished over a single pair to the **LM-24D** display. The **LM-24D** display receives data through pins 3 (red) and 4 (green) of a modular 6-wire jack or pins 2 (red) and 3 (green) of a modular 4-wire jack.

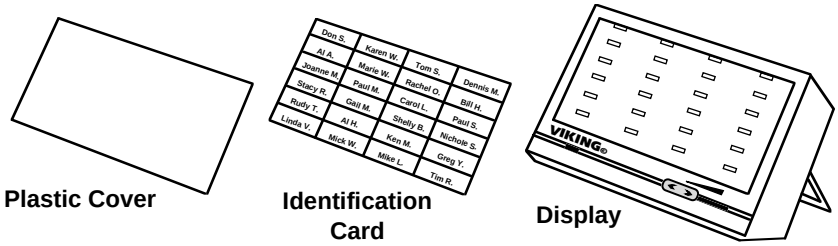
Note: *The **LM-24D** is sensitive to the polarity of this communication pair. The **LM-24D** will not be damaged by reversed polarity on this pair but it will not function properly!*

D. Multiple Displays

The **LM-24M** can power up to (3) displays. If you need to power more than (3) displays or for long runs between the scanner and display, an optional **PS-2** power supply must be used with each **LM-24D** display. Adding **PS-2** power supplies will efficiently double maximum run distances.

E. Station Identification Cards

After filling out the station identification card, insert in onto the display, followed by the plastic cover, as shown in the diagram to the right.



Programming

A. Accessing the Programming Mode

In order to program, you must first connect a C.O. line or analog PABX/KSU station port in parallel to the attendant port (pins 25 and 50 - V/S and S/V). A telephone or test set must also be connected to the same pair. The following programming must be done from this Touch Tone phone.

B. Programming the LM-24M

To begin programming, pick up the attendant's phone (pins 25 and 50 - V/S and S/V). Enter ✶✶ or ## depending on which character is accepted by your phone system. The display will flash twice and remain off, to indicate the programming mode has been entered. The programming mode is exited when a valid or invalid program is entered, or when the phone is returned to the on-hook position.

	Line Number	Delimiter	Line Number	Ring Delay
To disable display for one line only.....	Line number			**0**
To disable displays for multiple lines.....	Line number	✶ or #	Line number	**0**
To set a ring delay for one line only.....	Line number			**(1 - 7)**
To set a ring delay for for multiple lines.....	Line number	✶ or #	Line number	**(1 - 7)**

Note: *The **LM-24D** will flash the corresponding ring delay and then remain on. Programming is exited at this point and the unit returns to the run mode. If an invalid program is entered, the **LM-24D** will sound an audible alert tone and the current programming sequence will be canceled. On first time power up, all lines are enabled with a ring delay of one. Once programmed, the ring delays are set from non-volatile memory.*

C. Programming Examples

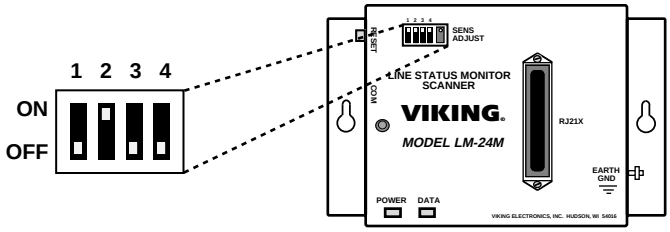
1. Pick up the attendant's phone (pins 25 and 50 - V/S and S/V) and enter ✶✶ or ## to enter programming mode.
2. Complete the following examples...

Programming the LM-24M to....	Enter ...
...disable line 5	**05 0**
...disable lines 2 through 10	**02 ✶ or # 10 0**
...set a ring delay of 6 for line 8	**08 6**
...set a ring delay of 3 for lines 12 through 20	**12 ✶ or # 20 3**

Note: *Setting a ring delay to "0" disables a line. To enable a line, set the ring delay to 1 - 7.*

D. Resetting the Ring Delays

1. Set dip switches as shown to the right.
2. Press the **RESET** button.
3. Turn switch 2 OFF.
4. Press the **RESET** button.
5. All ring delays will be set to one.



E. Non-Connected Lines

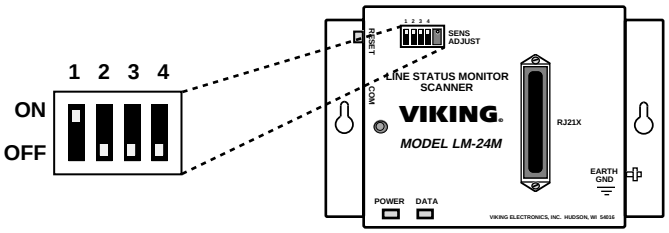
All open or non-connected positions (lines) on the **LM-24M** must be disabled through user programming or they will cause steady indication on the **LM-24D** display for their respective positions at all times.

The **LM-24M** scanner is shipped with all lines enabled. To disable (or not light) any of the 24 lines, some programming is necessary as explained in section **B** above.

F. Trouble Shooting

Note: *In order to attempt diagnostics tests 1 or 3, a C.O. line or analog station port must be connected to the attendant port (pins 25 and 50 - V/S and S/V), as described above to access programming. Diagnostic test 2 does not require any connections to the RJ-21X.*

1. Touch Tone Diagnostics



a. Set dip switches as shown to the right.

b. Press the **RESET** button.

c. From the attendant's phone, dial a Touch Tone **1**.

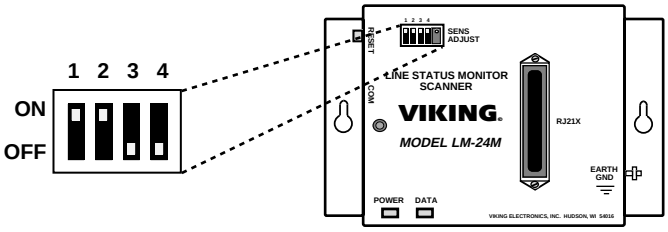
d. The first LED on the **LM-24D** display should light.

e. From the attendant's phone, dial a Touch Tone **2**.

f. The second LED on the **LM-24D** display should light, etc.

Note: *A ✶ on the attendant's phone is LED 11 on the LM-24D and # on the attendant's phone is LED 12.*

2. LED, Ring, and Communication Diagnostics



a. Set dip switches as shown at the right.

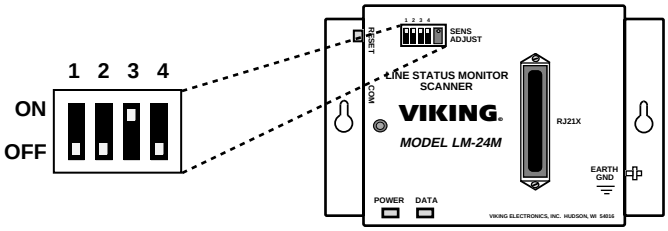
b. Press the **RESET** button.

c. The display should begin lighting each LED on the display in consecutive order.

d. Once all LED's are on, the display will turn each LED off in consecutive order. Ringing should also be heard.

Note: *The volume is adjustable.*

3. Checking the Sensitivity of the LM-24M



a. Set dip switches as shown at the right.

b. Press the **RESET** button.

c. Go off-hook on the attendant's phone.

d. The "Data" LED on the scanner should produce a steady light while off-hook and go off completely when hung-up.

Operation

The **LM-24S** system consists of two modules: the **LM-24D** display which is located at the answering position and the **LM-24M** scanner which is located in the telephone equipment room. Up to three **LM-24D** displays may be connected to one **LM-24M** scanner without optional **PS-2** power supplies. The communications link between the display and the scanner is a single pair of telephone wires. The scanner connects to all station ports that are to be monitored.

The **LM-24S** provides a visual "idle and "in-use" LED as well as visual and audible ring indication for up to 24 C.O. lines or analog PABX/KSU station ports. The system helps to eliminate confusion by providing a programmable ring indication on a per-line basis. The **LM-24S** is designed to be used at department answering positions, message centers or any system with directed call pickup, call forward on busy/no answer and for back up attendants.

The **LM-24S** scans all station circuits providing real time updated information for the attendants.

Product Support Line...(715) 386-8666 ***Fax Back Line...(715) 386-4345***

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