



**Line card functions and off-premises control on one card**

The TELSTONE® M-487 combines standard line card functions with "A" lead control of an off-premises extension telephone, or an off-premises telephone in another key system.

**Off-premises control without adding a control pair**

No additional pair of wires is needed to provide the off-premises control. The M-487 provides an "A" lead ground into the key telephone system when an off-premises phone is off-hook or on hold, giving STEADY lamp indication at all telephone sets in the key system. When an off-premises phone picks up a call that has been put on hold from an on-premises phone, the hold condition is removed from that line.

Extremely flexible, the M-487 adapts to a variety of Central Office timing requirements with a simple change of switch settings.

**TWO MODELS**

- M-487-01 Provides on- and off-hook recognition times for the off-premises phone of less than 500 ms
- M-487-02 Provides 1 to 2-second off-hook recognition and 400 to 1500 ms on-hook recognition times for the off-premises phone

**APPLICATIONS**

- Can be used in place of any standard 4-inch, 18-contact line cards in 1A or 10A type key telephone systems
- Can be used with bridge and minibridge lifters

**STANDARD FEATURES**

- WECO 400 and AE 1400 line card functions
- Off-premises supervision control
- Music-on-hold

**STRAPPING OPTIONS**

- Steady or winking hold lamp
- Interrupted, steady, or common (ground) control to ringer
- Balanced or single ended music-on-hold input

**SWITCH-SELECTABLE OPTIONS**

- Dry circuit time-out (three settings)
- Ring time-out (seven settings)
- Direct ring
- High or low hold release detector sensitivity for varying loop lengths

**DIMENSIONS:** 3½ in. x 5¼ in. x 1⅞ in.

**FCC REGISTRATION:**

Federal Communications Commission (FCC) approved per Part 68, FCC Rules and Regulations.

**Registration Number: AHH9WA-69272-KX-N.**  
**Ringer Equivalence Number: 1.0 B**

## SPECIFICATIONS

### Input signal timing (key system phone)

Off-hook recognition	Less than 500 ms
On-hook recognition	Less than 500 ms
"A" lead ground recognition	50 ms ± 10 ms
"A" lead ground removal recognition*	50 ms ± 10 ms

### Input signal timing (off-premises phone)

Off-hook recognition	
M-487-01	Less than 500 ms
M-487-02	1 to 2 seconds
On-hook recognition	
M-487-01	Less than 500 ms
M-487-02	400 to 1500 ms

### Timing

Ring detect (greater than 40 Vrms Tip to Ring)	350 ms ± 100 ms
Ring time-out	3 to 30 seconds (selectable)
Hold survive time on dry circuits	21 to 470 ms (selectable)

### Power requirements

Central office voltage**	- 44 to - 56 VDC
Key system supply voltage	- 18 to - 28 VDC
Supply current	
idle	30 mA maximum
busy	80 mA maximum
hold or ring	80 mA maximum
- 15 V on card regulator	- 15.0 ± 0.75 VDC

DC input impedance	60 M ohms from Tip or Ring to ground, minimum
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Ringing voltage blocking	150 Vrms maximum, 15 to 70 Hz
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Allowable noise level (longitudinally induced 60 Hz voltage)	56 V p-p maximum unterminated, Tip and Ring to ground
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Inserted line resistance	3 ohms maximum
Forward loop current recognition	22 mA minimum
Reverse loop current recognition	22 mA minimum
Insertion loss	0.5 dB maximum
Common mode rejection	20 Vrms, 56 V p-p on Tip or Ring
Longitudinal balance	Hold > 60 dB; off hold > 75 dB

### Line card section

Music-on-hold	Balanced or single-ended input (selectable)
Interrupter start (relay loop closure)	AC and DC
Hold release	20, 140, or 470 ms (selectable)
Hold impedance	Line variable
Hold lamp	Steady or winking (selectable)
Ringing signal	Ground, interrupted, or steady
Direct ring	Bridged or single input (Pin 18 grounded)
Lamp load	20 lamps
Ringer load	5 ringers
Polarity reversal	Yes, on dry circuits (selectable)
Lightning protection	Standard
Bridge and minibridge lifters	Allow operation (1300 ohms maximum)
Loop length maximum	1400 ohms maximum
Operating environment	0° to 55°C, 0% to 85% relative humidity, noncondensing

\*When the "A" lead is not grounded by either the M-487 or the external equipment, it is pulled to - 15 VDC by the M-487.

\*\*Central Office ground must be within - 2/ + 1 V of M-487 ground for correct operation under longest loop conditions.

# TELONE®

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