

BRAVO

COMMUNICATIONS, INC.

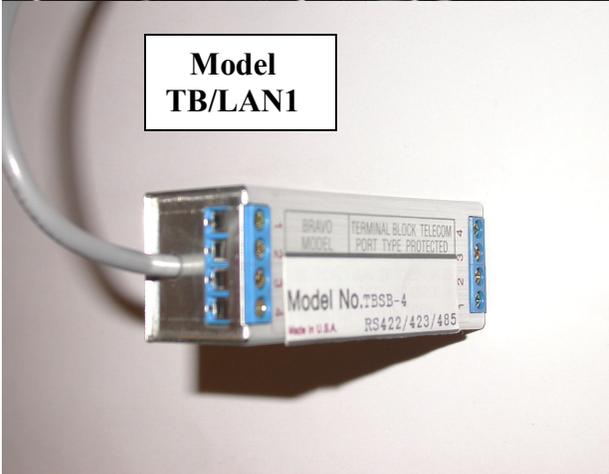
SURE/FIRE[®] LAN PROTECTORS
LAN TIMES

says...

"A sound choice and have the distinction of being the only protectors using tri-polar gas tube/avalanche diode design."



**Model
TB/LAN1**



Description

Bravo's Sure/Fire family of LAN Protectors stops all forms of LAN damaging voltage transients (spikes and surges) that are prevalent in the LAN cable environment. The mass

of cable segments exposed in a typical LAN environment act as antennae for attracting (inducing) damaging lightning and electrostatic discharge (ESD) energy waveforms.

The worldwide IEEE and ISO LAN Standards cite four electrical and safety hazards which LAN networks are susceptible to and recommend precautions from...

1. Direct contact between local network components and power or lighting circuits.
2. Static charge build-up on local network cables and components.
3. High-energy transients coupled onto the local network cabling system (those included by other cables which are installed in the general proximity of network cables).
4. Potential differences between safety grounds to which various network components are connected (such as the slight differences which may be found in safety grounds from one building to another).

Spikes can also be caused by fluctuating AC lines, blackouts, or brownouts. They can be passed onto the network by lack of proper AC spike and surge protection.

Features

- ◆ Unique 3-Stage Protection on all signal lines (the highest protection available).
- ◆ Stops all voltage transients greater than ± 8 Volts and up to 25K Amps per line in less than a pico-second.
- ◆ Shielded all-metal enclosures or shielded plastic fire-proof enclosures.
- ◆ Diamond-Shaped Protection Test Light.
- ◆ Meets or exceeds Level 5 network requirements.
- ◆ Automatic Self Recovery.
- ◆ High-Quality LAN Signal Design allows high speeds to 155 Mhz.
- ◆ 100% Complete Package includes LAN insertion cable and heavy-duty grounding wire.
- ◆ Every unit has passed a rigorous set of signal and functional tests.
- ◆ Fails Short if overstressed.

Benefits

- ◆ Stops spikes and surges covering a complete range of voltage, current, waveform speed and pulse duration transients. Saves thousands of dollars of equipment damage.
- ◆ Prevents degradation of LAN performance and LAN components and preserves data integrity. Helps prevent keyboard lock-ups, corrupted CRT screens and corrupted data files.
- ◆ Immunity to interference and safety hazards.
- ◆ Ensures foolproof grounding, indicates active protection and provides a valuable LAN monitoring tool.
- ◆ Protects LAN equipment repeatedly and then automatically resets itself.
- ◆ Negligible network loading effect with < 8 pf capacitance, and $<.5$ db insertion loss.
- ◆ Makes installation a snap and error free.
- ◆ Sacrifices itself due to an extreme transient effectively disconnecting your unprotected equipment.
- ◆ Powerful enough to use for both Interbuilding & Intrabuilding cable runs.

There are Bravo LAN Protectors to protect all major LAN networks including Ethernet, Token Ring and ARCNET. Inquire at Bravo if you need more information regarding your specific protection requirements.

Installation & Operation

- ◆ Bravo LAN Protectors simply plug into the LAN interface port of the equipment you want to protect and you fasten the isolated ground wire to your equipment's chassis ground. The built-in LAN protection test light assures you of proper grounding and active protection.

- ◆ Normal LAN network interface signals are allowed to flow passively through the protector without interruption. If an abnormal voltage level is sensed, the Bravo LAN Protector will instantly activate and clamp the damaging voltage transient and divert it through its isolated ground wire to earth ground, thereby safeguarding your valuable LAN installation. Afterwards, the Protector safely resets itself and assumes its normal guardian/watchdog operation.
- ◆ A LAN Protector is recommended for every LAN node/port you want to protect. Because damaging voltage transients can originate anywhere on a cable conductor or be induced through the cable jacket anywhere along the cable run path, only LAN equipment ports having properly installed Protectors will be safeguarded.
- ◆ LAN adaptor cards, repeaters, hubs, MAUs, concentrators, multiplexers, transceivers, fanouts and related equipment can all be protected.

Transient Protection

- ◆ Tripolar Gas Tube Crowbar protection on all lines with a nominal DC breakdown voltage of ± 90 Volts. Maximum impulse discharge current (8/20 μ s) is 25K Amps. Impulse life (10/1000 μ s) @ 500 Amps is 100 times.
- ◆ 1500 Watt Avalanche Diode Fine protection per line for pico-second clamping nominally @ ± 8.2 Volts.
- ◆ Proprietary intermediate stage circuitry acts as a buffer and performs in harmony with other protection stages.

Physical

- ◆ Size: All models are within these maximum dimensions (excludes cables). 1.2" H x 1.3" W x 3.5" D; 3.0 cm H x 3.3 cm W x 8.9 cm D. (except Model IDC/LAN is 5.0" D; 12.7 cm D).
- ◆ Weight: All models are 2 oz. (.06 kg.) except models 9/LAN and TWINAX are 4 oz. (.12 kg.) (includes cables).

Environment

- ◆ Operating Temperature: 0° - 50° C; 32° - 122° F.
- ◆ Relative Humidity: 0 - 90% (non-condensing).

Certifications

- ◆ Meets or exceeds all applicable CCITT, R.E.A. and worldwide standards.
- ◆ UL 94 V-0 transient voltage suppressors.

Warranty

- ◆ 5-year limited warranty.
- ◆ Extended warranty option.

③ Stages of LAN Protection Stops Lightning, ESD & All Damaging Voltages.

Model #	Description & Equipment Protected
BNC/LAN	BNC Male/Female LAN Port Protector. Protects Ethernet/ThinNet, ARCNET & Token Ring ports. May also be used to protect other BNC coaxial cable equipment such as in IBM 3270 networks and video applications. Protects center pin & shield.
BNC/LANT	BNC "Protected T" LAN Port Protector. Model BNC/LANT is a "T" connector version of Model BNC/LAN.
N/LAN	N Series Male/Female LAN Port Protector. Protects Ethernet/ThickNet ports. Protects center pin & shield.
RJ45/LAN1	RJ45 Plug/RJ45 Socket LAN Port Protector. Protects Twisted-Pair Ethernet, 10-Base T & Fast Ethernet ports at speeds up to 155 Mhz. Protects pins 1, 2, 3, & 6.
RJ45/LAN2	RJ11 Plug/RJ45 Socket LAN Port Protector. Protects Twisted-Pair Token Ring & ARCNET ports. May also be used to protect other twisted-pair wired networks at speeds up to 155 Mhz. Protects pins 3, 4, 5, & 6.
9/LAN	9-Pin Male/Female LAN Port Protector. Protects all IBM® or Compatible shielded Type 1 Token Ring ports. May also be used to protect other 9-pin networks. Protects pins 1, 5, 6, & 9.
TB/LAN1	4-Position Terminal Block LAN Port Protector. Protects up to 4-wires for Ethernet, RS-422/423/485 Serial and audio/video circuits.
TWINAX	Twinax Male/Female Port Protector. Protects all IBM® or Compatible Twinax equipment ports (System/3X, AS/400, twinax workstations, etc.).
F/LAN	F Series Male/Female CATV / CCTV Port Protector. Protects cable T.V., closed circuit T.V. and security system ports. Protects center pin & shield.
TNC/LAN	TNC Male/Female LAN Port Protector. Protects TNC coax based LAN/Network ports. Protects center pin & shield.

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