

ONEAC PBX Extension Line Protection: Many businesses face persistent PBX system problems, despite their use of conventional communication line protectors. Others face performance expectations that demand zero tolerance for communication downtime. ONEAC's PBX extension protectors (for analog, digital, or off-premise extensions) are specifically engineered to satisfy these demanding applications.

Ultimate assurance of system reliability

Leading telecommunications companies employ ONEAC ONEAC communication line protectors in their installations for good reason: because ONEAC protectors provide greater assurance of system uptime and lower service costs than conventional protectors.

Patented SwitchedFilter™ technology

System lockups, dropped calls, mis-dials, system memory loss, "no trouble found" service calls, service outages, shortened component life — these problems result from high frequency interference.

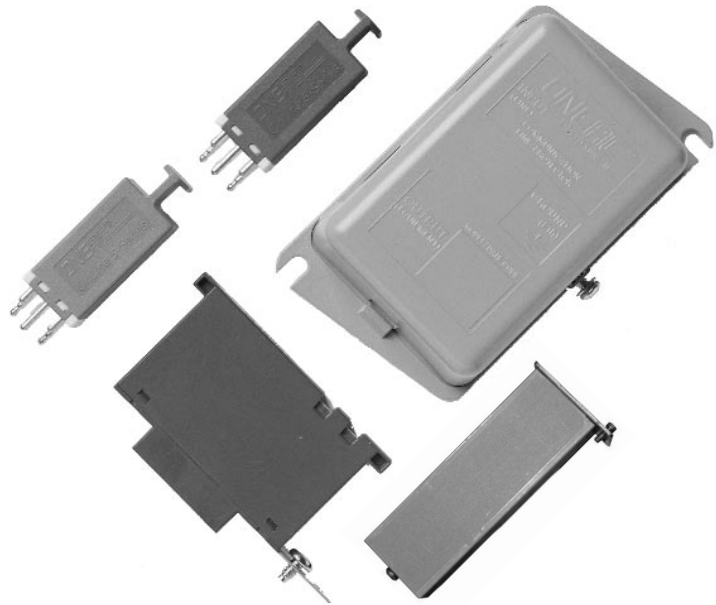
ONEAC protectors with SwitchedFilter technology have the unique ability to discriminate between harmful and desired signals. This allows ONEAC protectors to prevent fast-edged transients from entering your system, yet allow lower frequency ring voltages and lower voltage voice and data signals to pass through unobstructed.

Last longer on the job

ONEAC communication line protectors feature a more robust design than others so they are better able to withstand current and voltage surges. They also include self-resetting sneak current protection — to eliminate the cost and downtime of replacement due to nuisance failures.

Proven to reduce service costs

By removing electrical transients, ONEAC improves system reliability. Look at actual evidence — installers switching over to a protection scheme using ONEAC protectors with ONEAC power conditioners report an over 50% reduction in total trouble calls; 83% fewer service calls due to hardware problems; 70% fewer system resets; and 43% fewer calls in which no trouble was found.



- **Simple installation:** plug-in models for popular interconnect blocks, rackmount and wallmount styles for flexible installation
- **Robust/solid-state overvoltage protection:** last longer in the field
- **Models available for analog and digital lines**
- **Patented SwitchedFilter technology:** allows exceptionally low let-through performance for optimum protection of electronic systems
- **Convenient test points:** for faster, easier line testing
- **Self-resetting sneak current protection:** eliminates overcurrent problems without creating unnecessary fuse replacements
- **100 A surge impulse design:** provides longer lasting protection
- **Safety approvals:** UL, cUL Primary and Secondary
- **5-year warranty:** the best assurance of product quality and performance in the industry

ONEAC PBX Extension Line Protection

Analog PBX extension lines

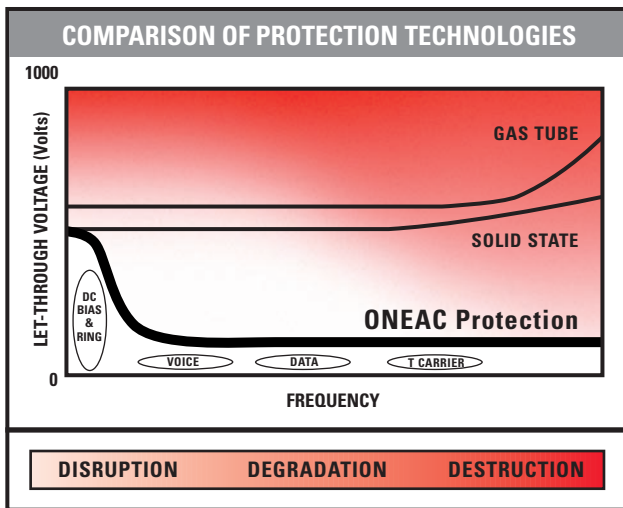
Analog PBX extension lines operate with an interface similar to carrier provided Plain Old Telephone Service (POTS), so a plain old telephone can be used as an extension. Analog extension lines typically operate with lower voltage ring signals and lower voltage DC biases because they are not intended to pass signals over long distances. The high-voltage breakdown characteristics of protectors for POTS lines may not be adequate for PBX extension lines that are designed to operate at somewhat lower voltage and power levels.

ONEAC's unique solutions for analog extension lines

ONEAC's analog PBX extension line protectors are designed for PBXs that limit the peak operating voltage to 180V. ONEAC's analog extension line protectors utilize conventional balanced overvoltage devices, the fast reaction time of solid-state crowbar-type protection, tight control of the breakdown voltage, self resetting and non-resetting overcurrent protection, and the low let-through voltage performance only ONEAC's patented SwitchedFilter technology can provide.

ONEAC breaks the "Ring and DC bias barrier"

Conventional protectors (gas tube or solid state) are designed to activate above the operating DC bias and signal voltage level. The ONEAC protector's ability to differentiate high frequency transients from lower voltage or lower frequency signals permit the desired signals to pass while preventing transients from damaging sensitive electronic circuits.



Digital PBX extension lines

Digital extension lines operate similarly to network provided digital communications services. The digital PBX feeds a DC voltage onto the extension line to power the digital extensions and to act as a carrier for the digital logic and voice signal.

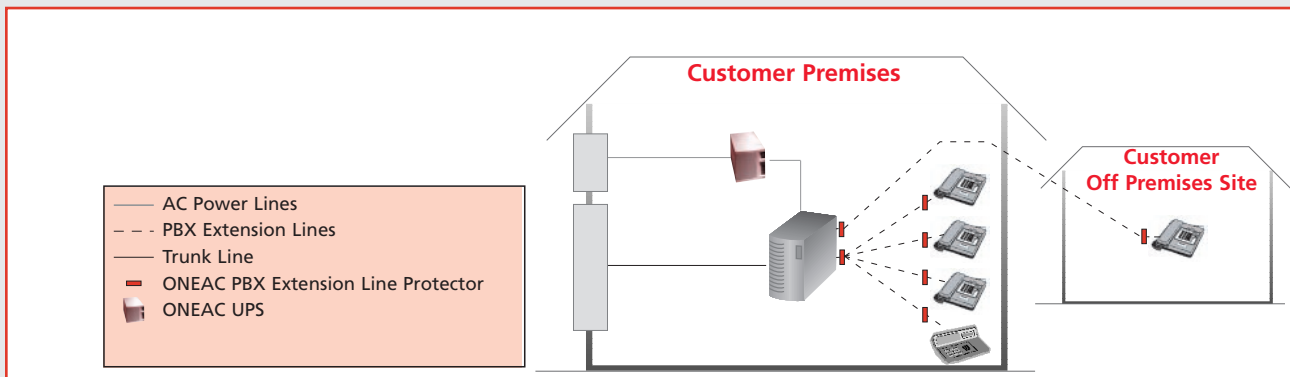
Depending upon the manufacturer and the PBX model, the DC feed voltage is usually 12 V, 24 V, or 48 V (some manufacturers of 24 V systems split the DC feed voltage so that 12 V appears on each of two separate pairs of wires). Digital logic signals are usually limited to 5 V, though some systems use 12 V logic signals. Digital PBX systems typically feed signals using balanced drivers via twisted pair cables that are usually shielded. And, depending upon the PBX manufacturer, each extension may use 1, 2, or 4 pairs of wires.

Digital extensions, however, typically require more power to operate than analog extensions. In order to provide this extra power, the resistance of the circuit feeding the DC bias voltage is reduced. If a crowbar-type protector is used, excessive currents can flow through the protector from the DC bias circuit once the protector is active. If the current flow is greater than the holding current rating of the protector, the protector may not release, which could stress the DC source circuit beyond its limits.

Digital extension lines also cannot tolerate as much series resistance in the telephone loop as analog extension lines. As a result, protectors with series resistance can considerably shorten the distance at which digital PBX extensions will operate.

ONEAC's unique solutions for digital extension lines

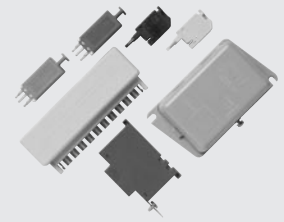
ONEAC's digital extension line protectors are tailored for systems that use 12 V, 24 V, and 48 V per extension line wire pair. All ONEAC digital extension line protectors use a StarBalanced™ solid-state clamping-type overvoltage protection. Featuring fast reaction time, low let-through voltage in all modes, low capacitance, and minimal series resistance — ONEAC protectors ensure that digital extension lines perform reliably and trouble-free.



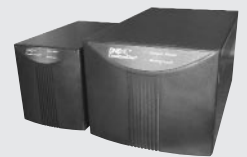
ONEAC PBX Extension Line Protection: Specifications

ONEAC analog PBX extension line protector:

	AP	AP195
Impulse Voltage Performance 10/1000µS, 1500V, 100A Impulses:		
Let-through voltage - line to line (typical/max.)	150 V/250 V	75 V/100 V
Let-through voltage - line to earth (typical/max.)	320 V/370 V	195 V/210 V
DC Breakdown Voltage:		
Line to line (typical/range)	640 V/540-740 V	195 V/180 V-210 V
Line to earth (typical/range)	320 V/270-370 V	410 V/360 V-420 V
Line Resistance at 25°C - each leg balanced within +/- 0.5 Ω (typical/max.)	15 Ω/18 Ω	15 Ω/18 Ω
Resetting Overcurrent Protection at 25°C	300 mA	300 mA
Non-resetting Overcurrent Protection (time delay fuse*)	1 A	1 A
Response Time	<1 ns	<1ns
DC Holdover at 25°C	>150 mA	>150 mA
On State Voltage at 1A	<5 V	<5 V
Capacitance at 50 VDC, 1 VAC, 10 kHz - 1MHz	<200 pf	<200 pf
Insulation Resistance	>100 M Ω (6AP >7.5 M Ω)	>100 M Ω
Service Life with 10/1000µS, 100 A Impulses	Unlimited	Unlimited
Storage Temperature/Operating Temperature	-40°C to +85°C/-40°C - +65°C	-40°C to +85°C/-40°C - +65°C





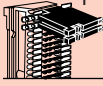




Communication Line Protectors



Power Conditioners

ONEAC analog PBX extension line protectors are available in stock models for the following connection types:

Connection Type	66 BLOCK (1 pr)	5 Series (1 pr)	RJ (1 pr)	Rackmount (2 pr)
Approvals	UL Primary, Secondary	UL Primary, Secondary	UL Primary, Secondary	UL primary, Secondary
Standard Analog Extension**	6-AP	5S-AP	RJ-AP11 & RJ-AP14	RM-AP11 & RM-AP14
Toshiba** (breakdown voltage <370 V)	6-AP195	5S-AP195		
Dimensions [▷] - HxWxL - in. (mm)	1.58 x 0.39 x 3.5 (40.1 x 9.9 x 88.9)	1.96 x 0.5 x 0.75 (49.8 x 12.7 x 19)	1.43 x 2.5 x 4.5 (36.3 x 63.5 x 114.3)	1.25 x 0.75 x 4 (32 x 19 x 102)
Protector				
Installation			Wallmount	*** 



Uninterruptible Power Supplies (UPS)

ONEAC's Total Protection Solutions protect all paths by which power disturbances can enter a system. Providing protection for communication lines (analog, digital or high-speed data) and power protection, with or without battery backup. An ONEAC Total Protection Solution assures increased system reliability with far fewer interruptions or outages.

* 5-pin models 5S-AP contains a balanced fail-safe shorting mechanism in place of fuses.

** The analog communications line protectors are designed to work with the analog extensions of most PBXs. In some cases, where the breakdown voltage is less than 370 V, a 5S-AP195 or 6-AP195 may prove more satisfactory. Call ONEAC for assistance.

***Rackmount protector must be mounted in a rack. ONEAC parts available: RM-5 and RM-10 (surface mount only) and RM-16 (fits in standard 19" rack using brackets which are provided).

† 66 Block protector installation requires one ground bar, ONEAC part #350-032 for each 25-position block.

▷ See the final page of this document for dimensions diagram.

ONEAC PBX Extension Line Protection: Specifications

ONEAC digital PBX extension line protector specifications:

	12 V	24 V	48 V
Impulse Voltage Performance 10/1000 μS, 1500 V, 50 A Impulses:			
Let-through voltage - line to line (typical/max.)	35 V/45 V	50 V/60 V	85 V/95 V
Let-through voltage - line to earth (typical/max.)	35 V/45 V	50 V/60 V	85 V/95 V
DC Breakdown Voltage:			
Line to line (typical/range)	20 V/18V-23 V	36 V/33 V-40 V	68 V/64 V-74 V
Line to earth (typical/range)	20 V/18V-23 V	36 V/33 V-40 V	68 V/64 V-74 V
Loop Resistance	<1 Ω	<1 Ω	<1 Ω
Response Time	<5 nS	<5 nS	<5 nS
Capacitance at 12 VDC, 24 VDC, or 48 VDC and 1 VAC, 1 kHz	<75 pF	<75 pF	<75 pF
Non-Resetting Overcurrent Protection (time delay fuse)	1 A	1 A	1 A
Insulation Resistance	>1 M Ω	>1 M Ω	>1 M Ω
Service Life with 10/1000 μS, 100 A Impulses	unlimited	unlimited	unlimited
Storage Temperature/Operating Temperature	-40°C to +85°C/-40°C to +65°C	-40°C to +85°C/-40°C to +65°C	-40°C to +85°C/-40°C to +65°C

OnLine and Convergent Series™ Digital PBX extension line protectors are available in stock models to fit the following connection types:

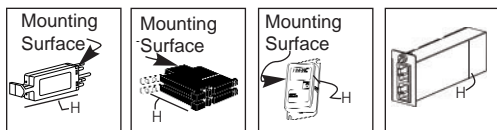
Connection Type	66 BLOCK (1 pr)	5 Series (1 pr)	RJ Series* (2 pr)	Rackmount Series* (1 pr)
Approvals	UL Primary Secondary	UL Primary Secondary	UL Primary Secondary	UL Primary Secondary
Toshiba 24 V (1 pr)	6-DSP36	5S-DSP36	RJ-DSP36	RM-DSP36
Toshiba 24 V (2 pr)**	6-DSP36	5S-DSP36	RJ-DSP36	RM-DSP36
Samsung 24 V (1 pr)	6-DSP36	5S-DSP36	RJ-DSP36	RM-DSP36
Samsung 24 V (2 pr, 12 V/pr)**	6-DSP20	5S-DSP20	RJ-DSP20	RM-DSP20
Executone 24 V (2 pr, 12 V/pr)**	6-DSP20	5S-DSP20	RJ-DSP20	RM-DSP20
Nortel 24 V (1 pr)	6-DSP36	5S-DSP36	RJ-DSP36	RM-DSP36
ROLM/Siemens 24 V (1 pr)	6-DSP36	5S-DSP36	RJ-DSP36	RM-DSP36
NEC 48 V (1 pr)	6-DSP68	5S-DSP68	RJ-DSP68	RM-DSP68
Fuji 48 V (1 pr)	6-DSP68	5S-DSP68	RJ-DSP68	RM-DSP68
AT&T 24 V (4 pr)**	6-DSP36	5S-DSP36		
AT&T 48 V (4 pr)**	6-DSP68	5S-DSP68		
Mitel 48 V (1 pr)	6-DSP68	5S-DSP68	RJ-DSP68	RM-DSP68
Color	Yellow	Yellow	Gray	Black/Yellow
Dimensions ^D - HxWxL - in. (mm)	1.58 x 0.39 x 3.5 (40.1 x 9.9 x 88.9)	1.96 x 0.5 x 0.75 (49.8 x 12.7 x 19)	1.43 x 2.5 x 4.5 (36.3 x 63.5 x 114.3)	1.25 x 0.75 x 4 (32 x 19 x 102)
Protector				
Installation			Wallmount	

* All RJ and Rackmount series protectors are provided with 2 pair RJ14 connections that can also be used with single pair RJ11 applications.

** 5-Series and 6-Series require one protector per pair

† 66 Block protector installation requires one ground bar, ONEAC part #350-032 for each 25-position block.

▷ Height dimension is measured from the mounting surface, out except Convergent Series which mounts into a rack.



ONEAC and OnLine are registered trademarks and StarBalanced, SwitchedFilter and Convergent Series are trademarks of ONEAC Corporation. All other trademarks are the property of their respective companies.

A CHLORIDE POWER PROTECTION COMPANY

ONEAC is a UL/BSI registered corporation — Certification No. A2900



(800) 327 8801 OPT. 2 in USA AND CANADA

+44 (0) 2380 610311 in UK AND EUROPE

27944 N. Bradley Road, Libertyville, IL 60048 Phone 847 816-6000 FAX 847 680-5124

George Curl Way, Southampton, Hampshire SO18 2RY, UK FAX +44 0 2380 612039