

Bourns®

Outside Plant Products

Product Overview Guide

Revision 4



Telecom Protection

The worldwide telecommunications industry has come to rely on Bourns® surge protection, connection and demarcation devices to protect personnel and sensitive communications equipment from damaging electrical surges. With the addition of plug-in protectors and connection products through two acquisitions, we now offer a full, integrated line of surge protection and connection products for Telco central office, outside plant and customer premises.

Bourns has a very large selection of plug-in modules (protected or continuity only) to meet your every need. The protection modules are available in Solid State, Gas Discharge Tube and Hybrid technologies in overvoltage protection only or overvoltage with sneak-current protection.

The new connection products are compact units for 5-pin and 4-pin plug-in protection modules as well as terminal blocks. These products provide a wide variety of standard and custom solutions for current and legacy central office and remote terminals.

The Network Interface Devices (NIDs) which provide subscriber test point, station protection, coaxial protection and DSL POTS Splitters in various combinations, are available in counts from one to one-hundred lines. The units are modular so lines may be added as needed, eliminating investment in idle plant resources. All units are UL Listed and manufactured to RUS and Telcordia requirements.

The Bourns® line of protectors, connection products, NIDs and POTS splitters combine to provide the telecom industry with an integrated solution. In addition to unique products, quality is engineered into all aspects of the manufacturing process. The patented Multi-Stage Protector (MSP®) devices are available in 5-pins, station protector footprints, the

Bourns is unique in the industry in that we design and manufacture our own GDT, thyristor, PPTC and TBU™ components for use in our protection modules.

Integrated Protection Assembly (IPA) series and Insulation Displacement Connector (IDC) series of station protectors that make NID installation virtually tool-less. Recent innovations include a full offering of POTS splitters;. Bourns® 361xA2 series is optimized for video over ADSL2+ or VDSL2. We also offer a Balance/Unbalance adapter for “no new wires” coax to DSL conversion and 3617 series BalUn/Splitter combination units. These developments are part of our commitment to provide value to our customers with quality engineered surge protection and associated products. Responsiveness to the voice of our customers is the cornerstone of our business philosophy at Bourns. Our mission is to provide the best products to meet the requirements of your application.



The Bourns® MSP® Protector Advantage

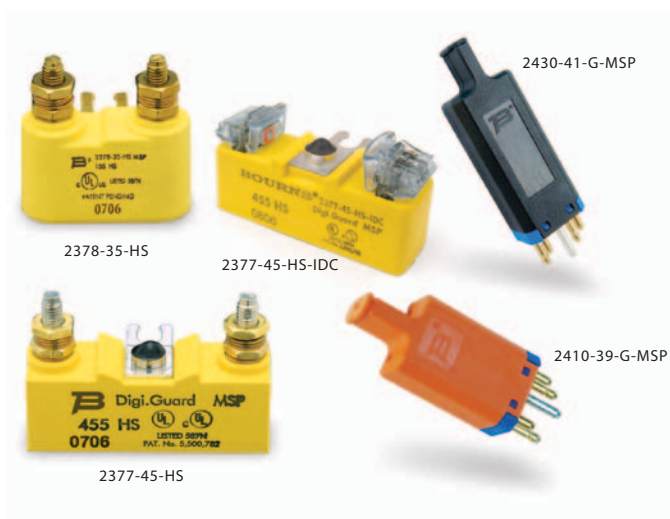
Multi-Stage Protection

The Best of Two Technologies - Bourns® MSP® 5-pins and station protectors provide superior protection by combining the high energy handling of a three-electrode Gas Discharge Tube with the quick response of solid-state Metal Oxide Varistors (MOVs).

Solid-state devices react quickly to electrical surges but generally cannot handle high energy surges. Multi-Stage Protectors limit the incoming surge with the MOVs as the GDT activates to handle the bulk of the energy by directing it safely to ground, away from personnel and equipment.

Low Capacitance - The low capacitance of Bourns® MSP® products makes them ideal for broadband applications such as ADSL2+ and VDSL2. Our new PPTCR-based 5-pins with overcurrent protection offer industry-leading performance with low resistance and capacitance.

No Air Back Up Gap - Bourns® MSP® devices do not have an air Back Up Gap (BUG), thereby eliminating BUG-related contamination within the protector as a potential cause of faults on the line.



Switch-Grade Fail-Short - Unlike technologies that require a solder pellet to melt or an insulating material to burn away, Bourns® MSP® units feature a Switch-Grade Fail-Short, which activates in response to an extended overvoltage to provide exceptional fire protection.

Proprietary Low Work Function GDT Coating - This feature ensures low heating and high efficiency in handling surges.

Long Life, Proven Reliability - Bourns® MSP® products have a proven record of reliability with millions of protectors deployed worldwide.

5-Pin and Station Protectors with Transient Blocking Unit (TBU™) Technology

Bourns® 2377 and 2470 MSP®/TBU™ series are a new generation of surge protector designed to be the best choice for protection of high-speed network data circuits. MSP®/TBU™ series protectors integrate four advanced technologies: Our proprietary advanced balanced TRIGARD® GDT, precision matched metal oxide varistors (MOV), a patented switch-grade Fail-Short mechanism, and our patented TBU™ device that protects the circuit by rapidly switching to a blocking state. These technologies are combined to provide robust

overvoltage and fast, resettable sneak-current protection with extremely low surge let-through and very low loss characteristics making it the ultimate choice for protection of sensitive, high speed communication lines.



Station and Central Office Protectors

 *UL Listed per 497*

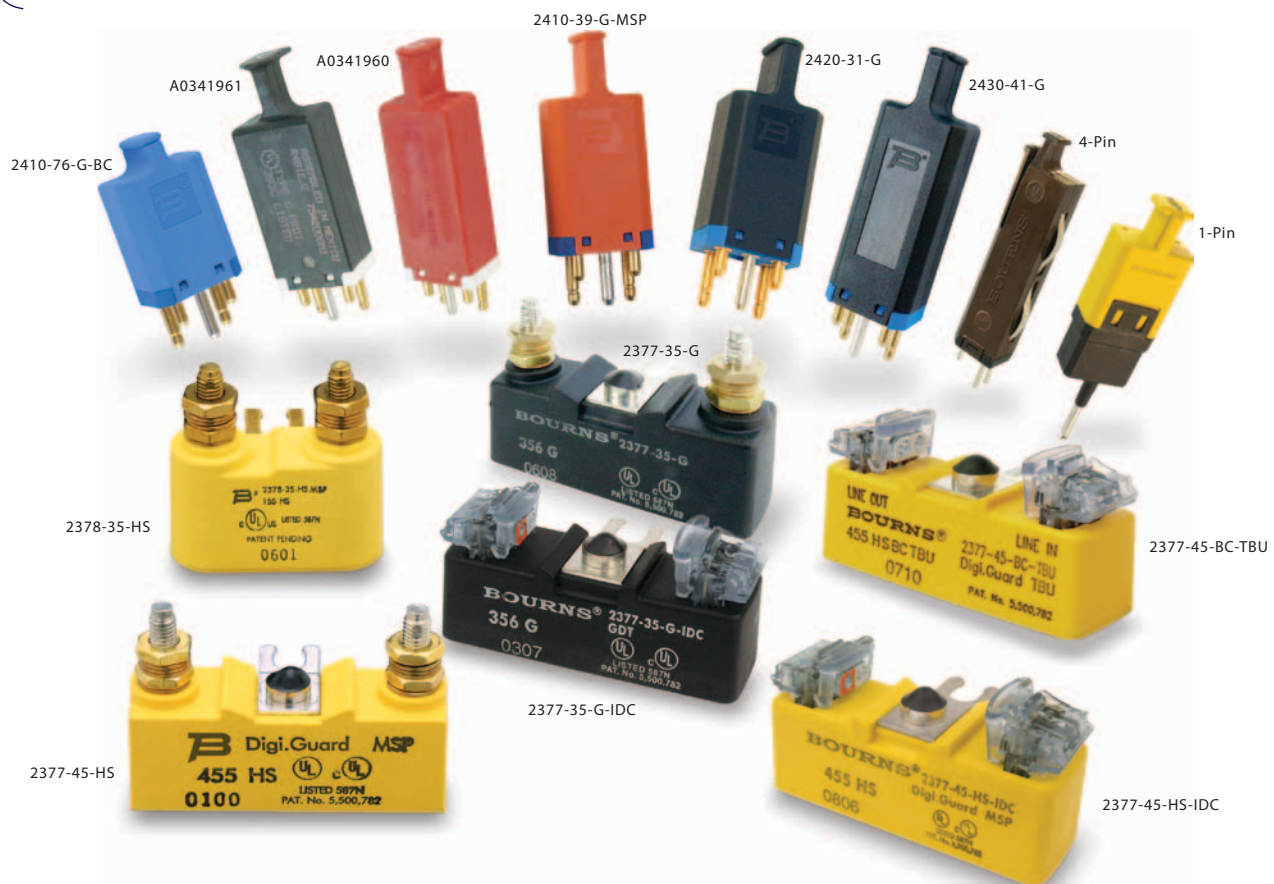
Bourns® station and central office protectors are designed to provide primary surge protection of copper-twisted pair POTS and broadband circuits. They utilize industry standard footprints and meet or exceed industry performance requirements.

All station protectors feature sealed bodies of UL approved material. The broad product offering ranges from the economical units to the maximum duty DigiGuard® protectors.

5-pin surge protectors are used in Telco central offices and remote terminals. Bourns produces a full range of GDT, solid state and hybrid technologies, with models for both overvoltage and overvoltage / overcurrent (sneak-current) protection. Bourns® MSP® 5-pin surge protectors combine solid-state MOVs and gas discharge tubes to provide Multi-Stage Protection. Special balanced capacitance versions are available

for VDSL2 and other balance-sensitive high-speed systems. Bourns® 2410 and 2420 series are analyzed to the latest requirements of GR-974-CORE and SBC SR-5165, "Generic Requirements for Broadband Surge Protectors" (Telcordia Test Report DA-1547). The new 2440 and 2430 series of 5-pin protectors offer this same superior protection with sneak-current protection utilizing PPTCR technology for greater reliability than heat coil type of protection.

The two recent acquisitions of plug-protectors expands our offering to include a complete line of solid state (SS) 5-pin, 4-pin and 1-pin plug-in protectors. Versions for overvoltage (3-type) and overvoltage/overcurrent (4-type) protector units are available. These units provide a rapid response to surge events and limit voltage overshoot. 4-type models are available with heat-coil and PTC elements for sneak-current protection.



Special Application Modules

 *UL Listed per 1893*

Bourns offers a variety of special purpose plug-in modules for continuity, grounding and dummy plugs. We also offer S-50, 300, and 6-pin type

overvoltage protectors as well as S-76A heat coils to provide sneak-current protection for C-50 and C-52 mainframe connectors.



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POTS Splitters

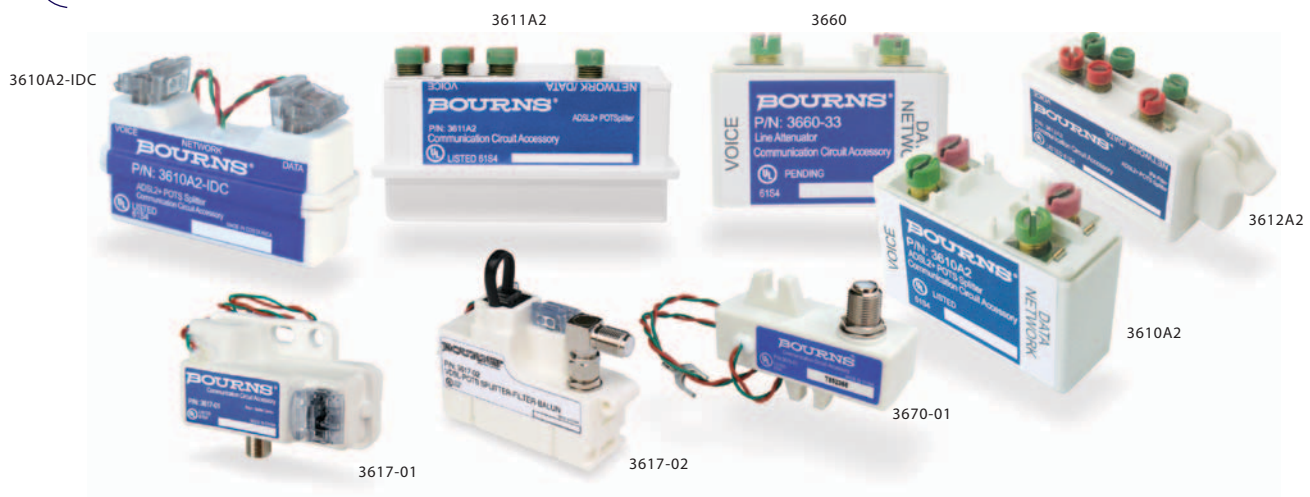
 *UL Listed per 1893*

Bourns® POTS splitters/filters simplify the deployment of DSL service at the subscriber premises. Compliant to applicable ANSI and ITU-T standards, the units accept the incoming DSL service, filter off the voice (POTS) channel and provide a connection for the data service (modem). Our **new ADSL2+ / VDSL2 models** are optimized for **video over ADSL2+ and VDSL2** applications and tolerate high ring trip currents. The 361xA2 series POTS splitters meet requirements for ADSL, ADSL2+, VDSL and VDSL2 services.

Models are available for ADSL, ADSL2+ and VDSL/VDSL2 systems, which fit Bourns' and other manufacturers' NIDs. The Bourns® POTS splitters 3610A2, and 3610A2-IDC are manufactured in the traditional binding post mounting style. Also available in a convenient snap-in footprint is the model 3611A2.

It is compatible with the Bourns® 7043 series and other manufacturers' 7600 style enclosures. In addition, the 3612A2 IPA mounting style splitter is available for mounting in other manufacturers' 2003/2006 style NIDs. The Bourns® 366x series of binder equalization modules is also available in all three industry-standard footprints. The modules, also called attenuators, reduce crosstalk issues on lines where the customer is located in close proximity to the central office.

The 3670-01 BalUn (Balanced-Unbalanced) impedance matching module is optimized to extend the reach of high speed services with high efficiency conversion of twisted pair to coaxial transmission for HPNA and Triple Play applications. Our new 3670-01 BalUn is designed to adapt twisted pair to coax for xDSL systems. The 3617-01 and 3617-02 combine the circuitry of the 3610A2 and the 3670-01.



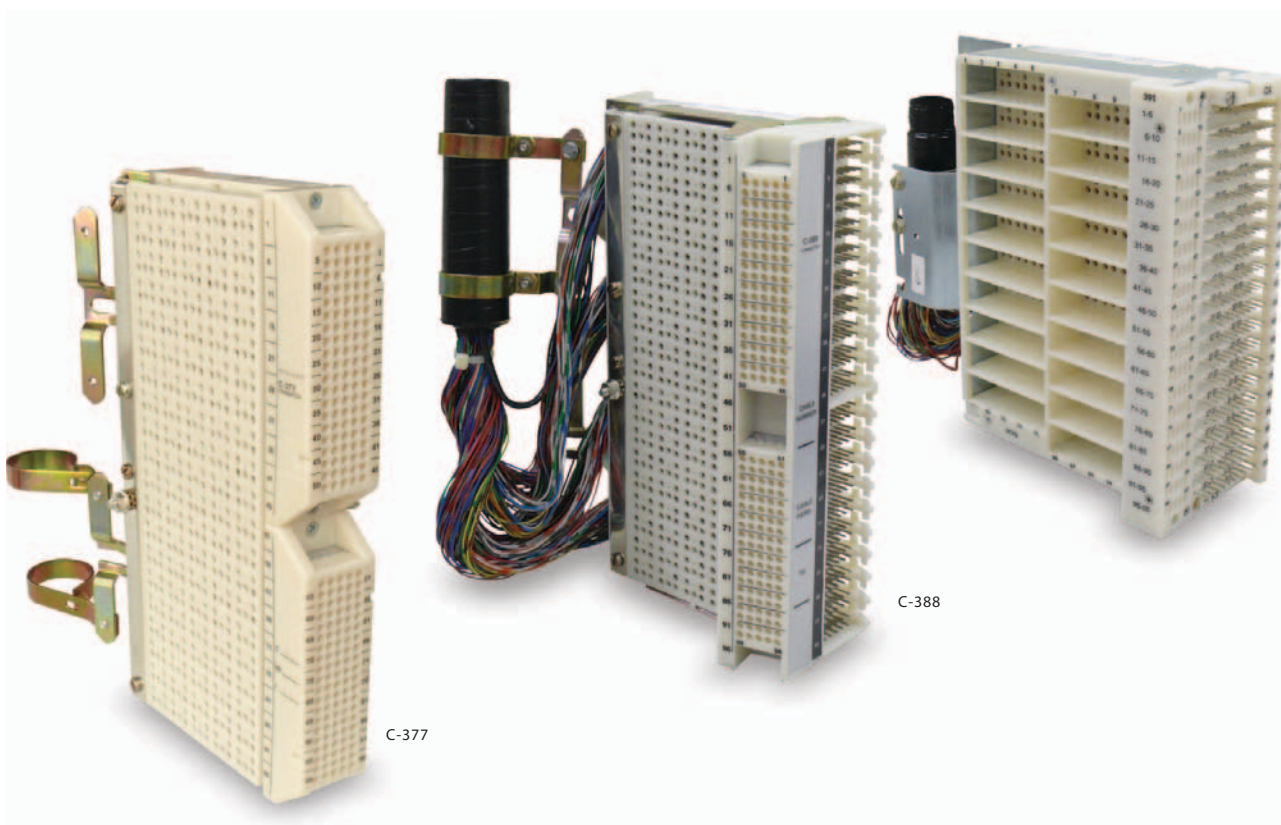
Connection

 *UL Listed per 497*

Bourns now manufactures a complete line of connector blocks to be used with industry-standard 5-pin protectors. These compact units provided generous working space between connectors and are available in 100 pair counts. Models can be ordered with tin or gold plated fields to match the 5-pin module plating. Bourns offers stubless and stubbed units with standard stub lengths of 30, 50,

80 and 100 feet in 22 or 24 AWG. Grounding options include frame or isolated ground. There are six connector block families, starting with the 303 style to the most compact 391 family, including the 310, 377, 388 and 390 connector blocks.

Many accessories are available for the 5-pin connector block families.



Protected Connector Comparison

Connector Family	Accepts Module [†]	Dimensions in inches (stubless, H x W x D)	Mounting	Grounding	Termination - Wire Wrap / IDC	Contact Material	UL	Telcordia Audit	Data Sheet
CG 391	5-Pin	9.5 x 5 x 9.5	Right* / Left*	Frame / Isolated	W W	Gold	Y	Yes	CG-391 Series
C 391	5-Pin	9.5 x 5 x 9.5	Right* / Left*	Frame / Isolated	W W	Tin	Y	-	CG-391 Series
CG 390	5-Pin	11 x 5 x 9	Left	Frame / Independent / Isolated	W W	Gold	Y	Yes	CG-390 Series
C 390	5-Pin	11 x 5 x 9	Left	Frame / Independent / Isolated	W W	Tin	Y	-	CG-390 Series
C 388	5-Pin	11 x 3.6 x 6.6	Left	Frame / Independent / Isolated	W W	Tin	Y	-	C-388 Series
C 377	5-Pin	11 x 3.6 x 6.6	Left	Frame / Independent / Isolated	W W	Tin	Y	-	C-377 Series
CG 310	5-Pin	15 x 5.5 x 5	Left	Independent / Isolated	W W	Gold	Y	Yes	CG-310 Series
C 310	5-Pin	15 x 5.5 x 5	Left	Independent / Isolated	W W	Tin	Y	-	CG-310 Series
CG 303	5-Pin	19.2 x 5.5 x 5	Left	Independent	W W	Gold	Y	Yes	CG-303 Series
C 303	5-Pin	19.2 x 5.5 x 5	Left	Independent	W W	Tin	Y	-	CG-303 Series
MPC	4-Pin	8.5 x 4.2 x 8.5	Left	Frame	IDC, W W	Tin	Y	-	MPC Series

*Available in Straight or Angle mount.

[†]All models available with protectors factory installed. Contact Bourns for ordering information.

All models are available stubless or stubbed with either 22 or 24 gauge cable.

Cable stubs can be directed up or down.

Standard stub lengths are 30', 50', 80' & 100'.

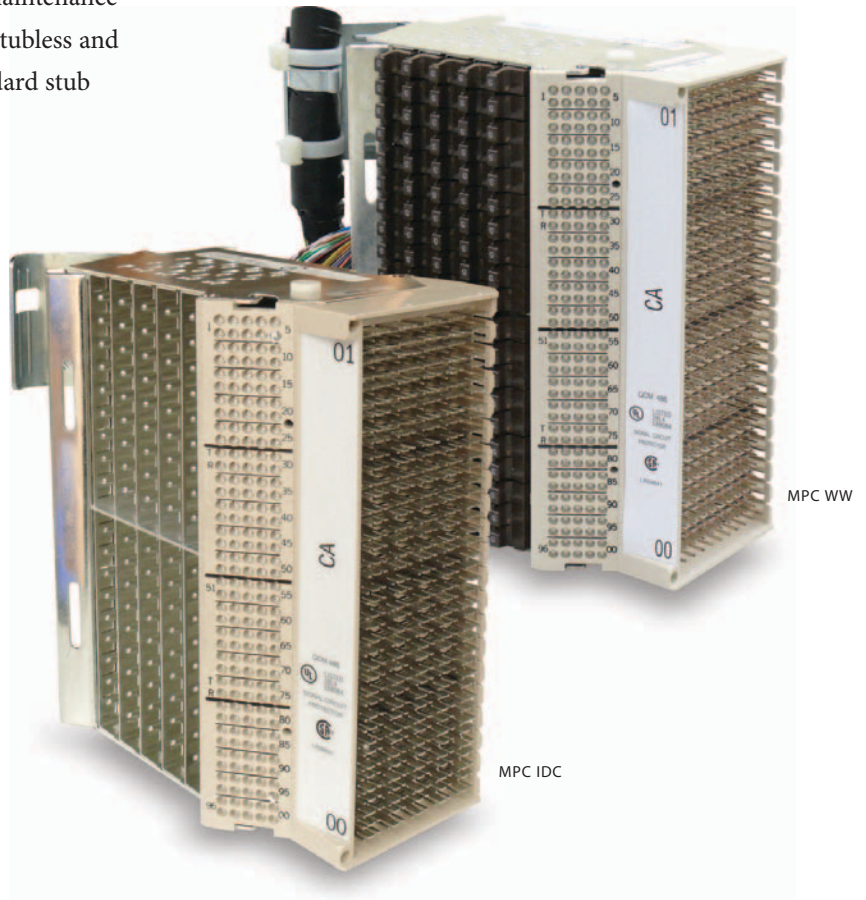
Other lengths are available as custom models.

Connectors with 4-pin Module Protectors

 *UL Listed per 1893*

The MPC series of Mainframe Connector utilizes the QMP 4-pin plug-in protectors. The front-facing jumper and test fields provide convenient working space for these compact units. 4-inch inter-vertical spacing and a slide access protector field reduce maintenance time. All models are 100 pair count with stubless and stubbed units in 22 or 24 AWG with standard stub lengths of 30, 50, 80 and 100 feet.

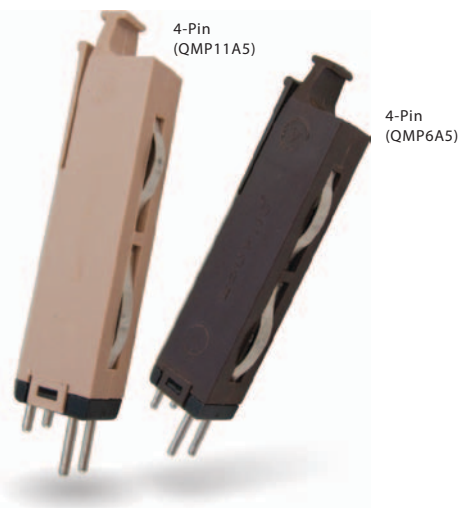
MPC accessories are available.



4-Pin Surge Protectors

 *UL Listed per 1893*

The compact QMP 4-pin modules are available in overvoltage and overcurrent (sneak-current) protection for the MPC connectors. Gas Discharge Tube (GDT) 4-pins are offered with and without heat coil. Solid state (SS) versions are available with and without PTTC.



Terminal Blocks

 *UL Listed per 1893*

Bourns offers three terminal block families: the 139, 130 and QBB that can be provided for field termination or pre-connectorized for quicker overall installation.

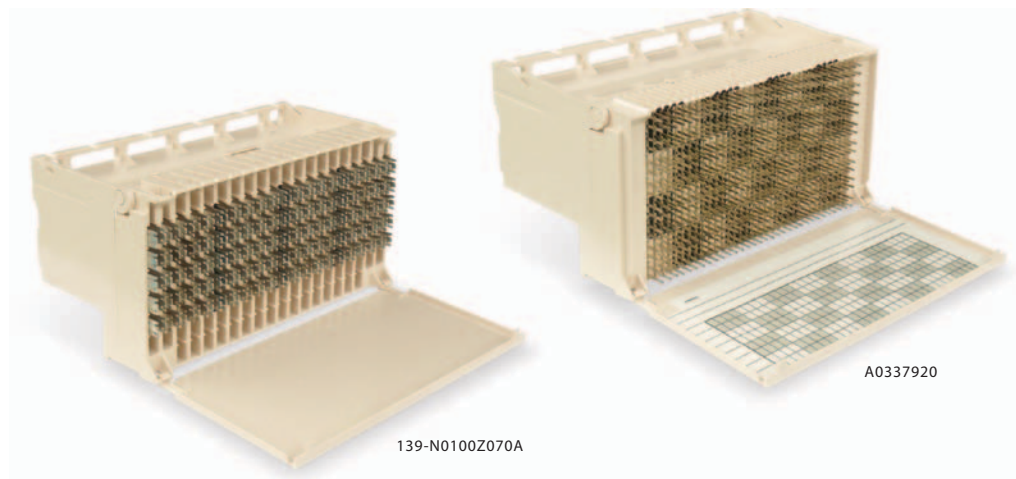
139 Terminal Blocks

The Versablock® Rotating Terminal Block Series 139 is a versatile connection point for trunk modules, tie pairs, transmission channels banks and other applications. The terminal field rotates 180° and locks into place for convenient access to equipment terminations. It features equipment side terminations with optional connectors, multiple pin patterns and wiring configurations. Bifurcated, and single wire wrap and quick-clip

insulation displacement connectors (IDC) are available. The terminals can be installed vertically or horizontally. Block density is up to 256 pairs.

130 and QBB Terminal Blocks

The Versablock® Rotating Terminal Block Series 130 and QBB are families of rotating terminal blocks that offer termination configurations for decimal and octal pair-count applications. Can be used for CO and PABX frames or any application where a compact terminal block is required. The terminal field rotates 180° and locks into place for convenient access to equipment terminations. Maximum pair count is 128. The Series 130 utilizes bifurcated quick-clip IDCs.



OSP Connection

Protector Panels

Bourns offers 5-pin protector module connector blocks of various pair count sizes. The blocks can be ordered as standalone components or as part of a custom design that is mounted on a wall or rack within a cabinet or building. The custom designs can also be pre-wired to the blocks and terminated with a connector of your choice. These custom designs are referred to as protector panels. These panels are designed to

provide connection and protection for cabinets and multi-dwelling unit (MDU) applications. The modular protector panels are Cat 5 compatible and can be easily sized to a variety of port counts for broadband applications. A variety of 5-pin protection modules are available. A large variety of module capacities are available by combining various standard 10, 20, 25 50 and 100 pair 5-pin protector module connector blocks.

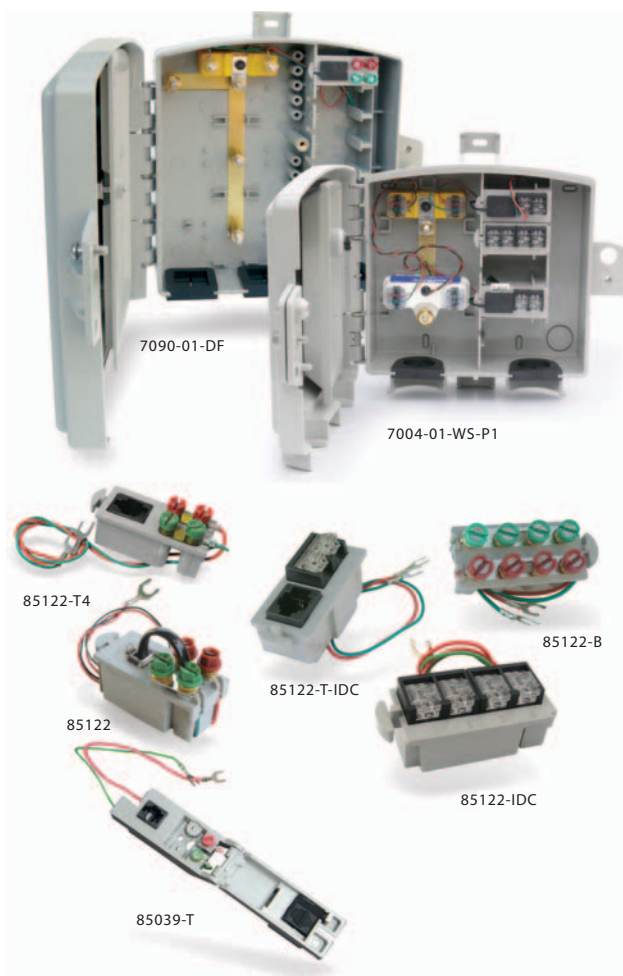
7004 and 7090 Series NIDs

 **UL Listed per 497 | RUS Approved**

The 7004 joins the Bourns® 7090 series industry-leading NID products. The four line 7004 series features convenient customer side working space, added wire management features, an extra subscriber bridge location and improved cosmetics. The 7004 and 7090 series are very versatile, rugged and are ideal for single or multi-line residential / commercial installations. Sealed switching subscriber jacks which simplify the test point are available with four lugs for inside wire connections. Your company's logo can be embossed on the cover. Please contact Bourns' sales department for more information.

Dimensions in inches

Model	Pair	Height	Width	Depth
7004	4	7.5	7.7	2.7
7090	6	9	8.5	2.7



How To Order

Model Number Designator → **7004 / 7090 - 0X - X X - XX - XX**

Number of Twisted Pair Lines →

1 - One 3 - Three 5 - Five (7090)
2 - Two 4 - Four 6 - Six (7090)

Station Protector Options →

D¹ - 455HS-MSP (2377-45-HS) Voice / DSL / Data (UL, cUL)
U³ - 455HS-MSP (2377-45-HS-IDC) Voice/DSL/Data (UL,cUL)
Z¹ - 455HS-BC* (2377-45-BC) Balance-sensitive DSL (UL, cUL)
W³ - 455BC-MSP* (2377-45-BC-IDC) Balance-Sensitive DSL (UL,cUL)
E² - 155HS-MSP (2378-35-HS) Voice / DSL / Data (UL, cUL)
Y² - 155HS-BC* (2378-35-BC) Balance-sensitive DSL (UL, cUL)
K - 356G (2377-35-G) Balanced GDT, no Back-Up-Gap (UL,cUL)
R³ - 356G (2377-35-G-IDC) Balanced GDT, no Back-Up-Gap (UL,cUL)
B - 125EW (2374-01) Dual Gas Tube (UL, cUL, Telcordia analyzed)
C - 125EW-R (2375-01) Dual Gas Tube (UL, cUL, RUS)
0 - No Station Protectors (Not available with DSL Configurations)

*For DSL systems requiring capacitive balance within 1 pF

Note 1 = Digi.Guard® - 356 size, RUS Max Duty

Note 2 = Digi.Guard® II - 125 size, RUS Heavy Duty

Note 3 = Insulation Displacement Connectors (IDCs)

Special Options →

G - Security Screw in Telco Cover (not available on 7004)
H - Security Screw in Security Plate
S - Sealed Switching Jack w/ IDC (85122-T-IDC)
F - Sealed Switching Jack 4-post (85122-T4) Supplied with DSL
B - Expansion Bridge w/ Binding Posts (85122-B)
I - IDC Type Expansion Bridge - 4 Jacks (85122-IDC)
5 - Expansion Bridge Slot (7004)
0 - No Options (ships w/standard 85122 Switch Jack)

DSL Options →

P1 1) 3610A2 P2 2) 3610A2
P1-I 1) 3610A2-IDC P2-I 2) 3610A2-IDC
B1 1) 3670-01

DSL Equalization →

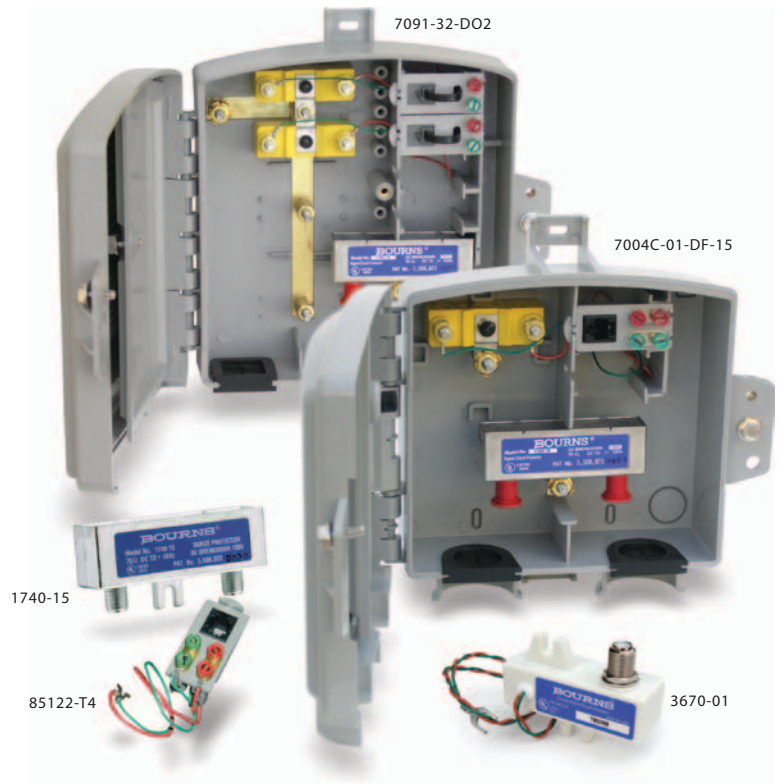
R1 - 1) 3660 Equalization Module

7004C and 7091 Series NIDs

 *UL Listed per 497*

The 7091 series of NIDs combines protection options for twisted pair and coaxial cable into one multi-purpose enclosure. Up to four twisted pair lines or two DSL and two twisted pairs can be combined with the 1740 series coax protectors. The 7004C series offers similar features with two less twisted pair connections. Sealed switching subscriber jacks and custom logos are optional.

Dimensions in inches				
Model	Pair	Height	Width	Depth
7004C	2	7.5	7.7	2.7
7091	4	9	8.5	2.7



Telecom Protection Application Guide

Name	Part Number	Technology	UL Listed per 497	Meets Telcordia 974	Meets Telcordia 1361	Meets RUS PE-80	Application Notes
DigiGuard®	2377-45-HS-IDC	3 Element GDT/SS Multi-Stage	Yes	Yes	Yes	Yes	Maximum Performance, Broadband
155HS	2378-35-HS	3 Element GDT/SS Multi-Stage	Yes	Yes	Yes	Yes	Heavy Duty, Broadband
IPA	2360-35 Series	3 Element GDT/SS Multi-Stage	Yes	Yes	Yes	Yes	Heavy Duty, Broadband
356M	2377-01	3 Element Gas Discharge Tube	Yes	N/A	N/A	Yes	Heavy Duty
125EW/EWR	2374-01 / 2375-01	Dual 2 Element Gas Discharge Tube	Yes	N/A	Yes	Yes	Heavy Duty
356G	2377-35-G	3 Element Gas Discharge Tube	Yes	Yes	Yes	Yes	Heavy Duty, Broadband
356G	2377-35-G-IDC	3 Element Gas Discharge Tube	Yes	Yes	Yes	Yes	Heavy Duty, Broadband
Well Type	2022-60-A / 2022-84-A	2 Element Gas Discharge Tube	Yes	N/A	Yes	Yes	Heavy Duty



Bourns® DSL/NID Products Application Guide

The charts below show the interoperability of Bourns® DSL products with our own NID line as well as other NID boxes.

The 3610A2 and 3660 models can fit into any NID that supports a 355/356 type station protector.

DSL Product	Description	Bourns® NID Product Line							
		7004	7032	7040	7043	7070	7090	7091	7101
	361X								
3610A2/3610A2-IDC	ADSL/ADSL2+/ VDSL2 POTS Splitter	X	X	X		X	X	X	X
3611A2						X			
3612A2/3612		Fits 2003/2006 style NIDs							
3617-01	BalUn / Splitter	X	X	X		X	X	X	X
3617-02	Combination Adapter	X	X	X		X	X	X	X
3670-01	BalUn Coax Adapter	X	X	X		X	X	X	X



Compact Network Interface Devices

 *UL Listed per 497 | RUS Approved*

The 708X NID series is a compact two-line unit. All industry standard station protectors fit these units. Measuring less than 7" x 4" x 2", the 708X series is designed to fit a variety of flush-mounted utility boxes. These products can be ordered without the exterior cover for use indoors.

Dimensions in inches				
Model	Pair	Height	Width	Depth
708x	2	6.6	3.5	2



Protection Assemblies

Bourns' surge protection assemblies for the premises provide binding post, ground point and surge protection using 1/2 x 20" Gas Discharge Tube (GDT) well protectors. Outdoor models offer secure and weather resistant enclosures for Telco service for residential or commercial installations. These units feature grommets for convenient cable access and generous working space for wire management. These mature products offer good maintainability, high insulation resistance, low moisture absorption and excellent transmission quality.



Higher Line Count NIDS

 *UL Listed per 497 | RUS Approved*

The 7032 NID series includes units with maximum counts from 6 to 100 lines. Termination, protection and demarcation are provided in five series of enclosures. Maximum counts of six, twelve, twenty-five, fifty and one-hundred twisted pair subscriber lines are available, and accommodate Bourns® 3610A ADSL and 3610A2 ADSL2+ POTS splitters. All enclosures are made from UL Listed materials.

Bourns® 7101 NIDs feature individual lockable modules for maximum security in locations such as apartment buildings. In addition to the standard closure, each module can be fitted with a padlock. They are available in maximum pair counts of six, twelve, twenty-five and fifty lines, sealed switching jacks are available for additional weather resistance and test point simplification. They also accept Bourns® 3610A and 3610A2 ADSL POTS splitters.

7032 Dimensions in inches				
Enclosure	Pair	Height	Width	Depth
A	6	11	11	4
B	12	17.5	11	5
C	25	17	16	3
D	50	36	20	4.5
E	100	36	20	7
F	25	18.5	17.5	5.5

7101 Dimensions in inches				
Enclosure	Pair	Height	Width	Depth
A	6	10	11	3
B	12	18.5	11.5	3.5
C	25	19	19	4.5
D	50	32.5	17.5	3.5



7032-25-ECO



7032-25-DCF

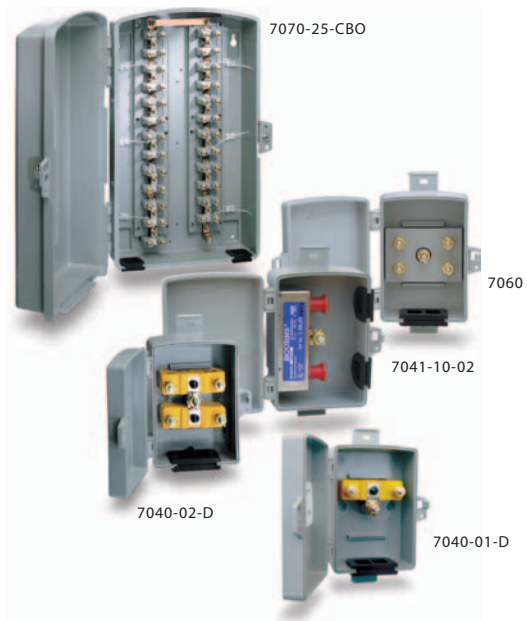


7101-25-ECO

Building Entrance Terminals

UL *UL Listed per 1863*

The compact Bourns® 7040 station protection enclosure can accommodate protectors for one or two twisted pair subscriber lines or one twisted pair with DSL. The 7041 is similar to the 7040 series, but is modified to accept a station protector and a 1740 model coaxial cable protector. Bourns® 7070 series of station protector enclosures are available in five sizes with maximum counts from twelve to one-hundred lines. For applications that do not require a subscriber test point, these units save space by fitting more pairs per enclosure. The Bourns® 7009 family of empty enclosures can be adapted to a variety of customer-specific applications.



Accessories

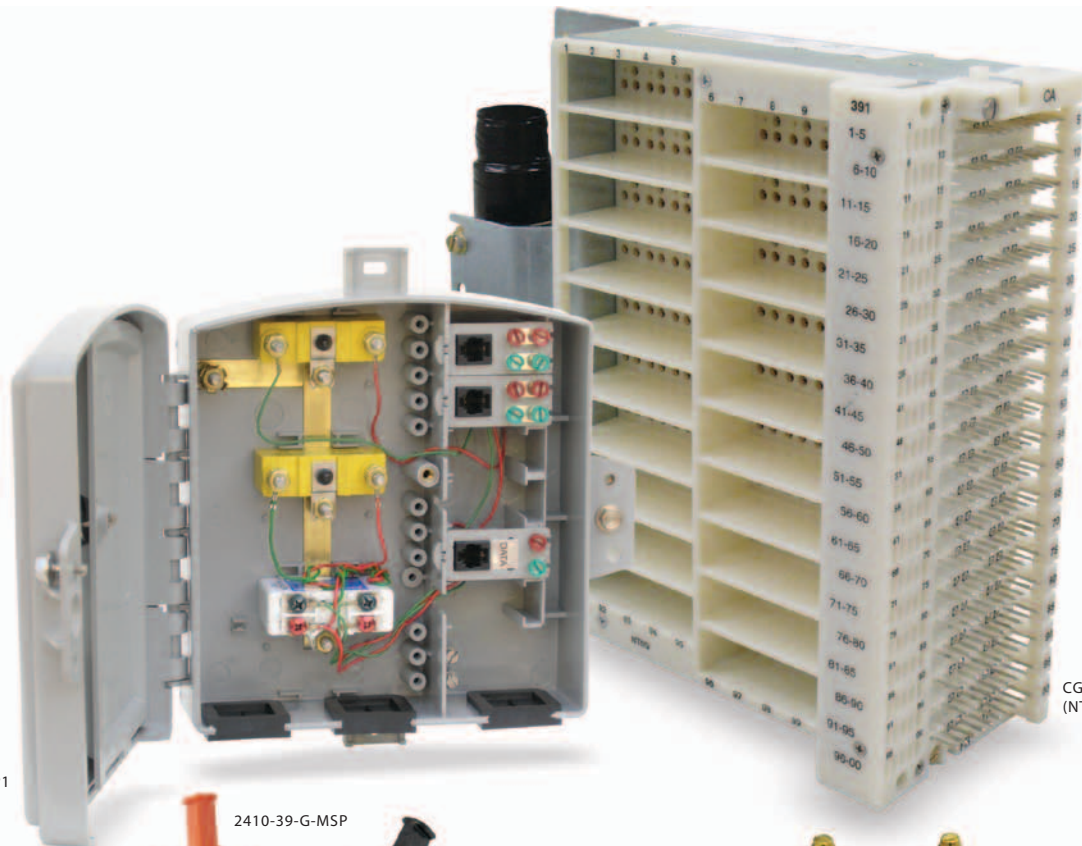
Bourns® 80545-A, 80545-C, 80535 and 80534 conduit adapters provide alternatives to the standard grommets supplied in the 7005 and 709X NIDs. The 85122-T-IDC and 85122-B are IDC and binding post expansion bridges for multiplying the home run terminations on Bourns® NIDs. The 85122-T4 and the 85039-T are modified subscriber test bridges. The standard RJ11 plug is eliminated and an internal switch within the jack disconnects the premises wiring during test. A rubber cover is supplied with the jacks to provide maximum resistance. Environmental sealant promotes longer life and fewer trouble reports. Bourns also offers binding post and IDC style expansion bridges for increased home run capability and wiring flexibility.



Surge Protector Test Sets

The 4010 general and 4020 station and 5-pin protector test sets are convenient hand-held units for testing the clamping and DC breakdown voltage of surge protectors. They feature true slow-rise circuitry for precise voltage measurements.





CG 391
(NT8G11EJ)

7090-02-DF-P1

2410-39-G-MSP

303M-11A1G0

2410-76-G-BC

2378-35-HS

2420-31-G

2377-45-HS

2377-35-G-IDC

2377-45-HS-IDC

3670-01

2360-35-MP

Bourns® Outside Plant Products

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