

# Switchcraft® CONXALL®



[www.switchcraft.com](http://www.switchcraft.com)



# Switchcraft®

## Your Source for Custom Connectivity Solutions

Established in 1946, Switchcraft is a leading manufacturer of connectors, jacks, plugs, molded cable assemblies, patchbays, and switches. In addition to our line of over 5000 standard products, with thousands of variations, we also specialize in quick-turn, low-volume, custom-engineered products. Our products are used in a wide variety of industries including medical, lighting, GPS, process control, transportation, communications, security, military / defense, broadcast and pro audio.

### *A Reputation Built on Quality*

At Switchcraft quality is of the utmost importance. We blend old-world craftsmanship and value, with high technology precision, through innovative manufacturing techniques.

Switchcraft builds and tests products to meet the demands of worldwide approval agencies including UL, CSA, VDE, Semko, Nemko, Mil-Spec and IEC IP66, IP67, IP68 NEMA 250 (6P)

### *The Design is the Difference*

Our designs are known for their durability, reliability and often become industry standards. Effective communication between our engineers and our customers throughout the design phase leads to a product that is customized to precisely fit your application. Innovation in design, creative use of materials, and CNC/EDM capabilities including prototype tooling, combine to make Switchcraft products unique.



Injection Molding

### *Engineering Excellence*

Advanced CAD capabilities enable Switchcraft engineers to create 3D solid models, as well as SLA and SLS prototypes. Once the design is approved, we can move directly from CAD to rapid prototypes made on site to manufacturing, shortening the production cycle and ensuring the integrity of the design.

Switchcraft is proud to be a U.S. manufacturer. We have over 185,000 sq. ft. in our Chicago facility which supports our electronic and electromechanical component operations. Nearby, our 35,000 sq. ft. Conxall facility specializes in custom cable assembly manufacturing. With an on-site tool room and 3D design capabilities, we provide the fastest, most efficient response to your project's custom needs.

### *On the Cutting Edge of Quality*

Switchcraft quality components begin with quality piece parts. As a vertically-integrated company, we produce most of the components we use in-house to control quality and delivery. We hold all of our suppliers to the same high standards we have set for ourselves, constantly evaluating and amending our select list of certified suppliers, based upon their ability to consistently deliver quality, value and service.



CNC

### *Consistently Excellent*

We monitor and maintain consistent manufacturing performance. The perfect blend of top notch equipment, streamlined production procedures, use of SPC standards and the dedication of our experienced, talented personnel are reflected in each and every product we manufacture... each and every time.



Vertical Machining

# Capabilities

Extensive in-house testing facilities provide quick, accurate results. Our environmental test lab is equipped to analyze and measure salt spray and humidity resistance, life cycle, compatibility with military and commercial parameters, tensile strength, hi-pot testing, shock and vibration. Our model shop boasts molding, CNC milling and drilling machines, grinders, saws and lathes for rapid prototyping.

## *Engineering Capabilities*

- Full staff of design engineers in Chicago and Villa Park, IL locations
- Full use of modeling and simulation software, for electronic and mechanical design
- Ability to provide rapid prototypes quickly after initial design concepts are completed
- Test lab and model shop on site for product development



## *Engineering Test Capabilities*

### Testing Capabilities for Electrical Properties

- Insulation resistance
- Breakdown voltage
- Contact resistance
- Return losses
- Frequency response measurement

### Mechanical Properties

- Force testing
- Life cycle testing
- Low level vibration

### Environmental Testing

- Thermo cycling
- Salt spray
- Humidity vs. temperature testing
- NEMA 250 (6P) - IP 66/ 67/ 68



On Site Tool Room- EDM



On Site Tool Room- Vertical Machining Center



Automated Assembly



Hand Assembly

## *Production Capabilities*

### Molding

- 12 to 140 ton presses
- Injection molding, insert molding and overmolding
- Multi-cavity or runner-less molding
- More than 70 engineered plastics
- Mold design, mold making and mold repair

### Stamping

- High speed Bruderers
- Minster and Havir presses
- In die monitoring ensures quality and die protection

### Machining Centers- CNC and Swiss

### In-house Electroplating

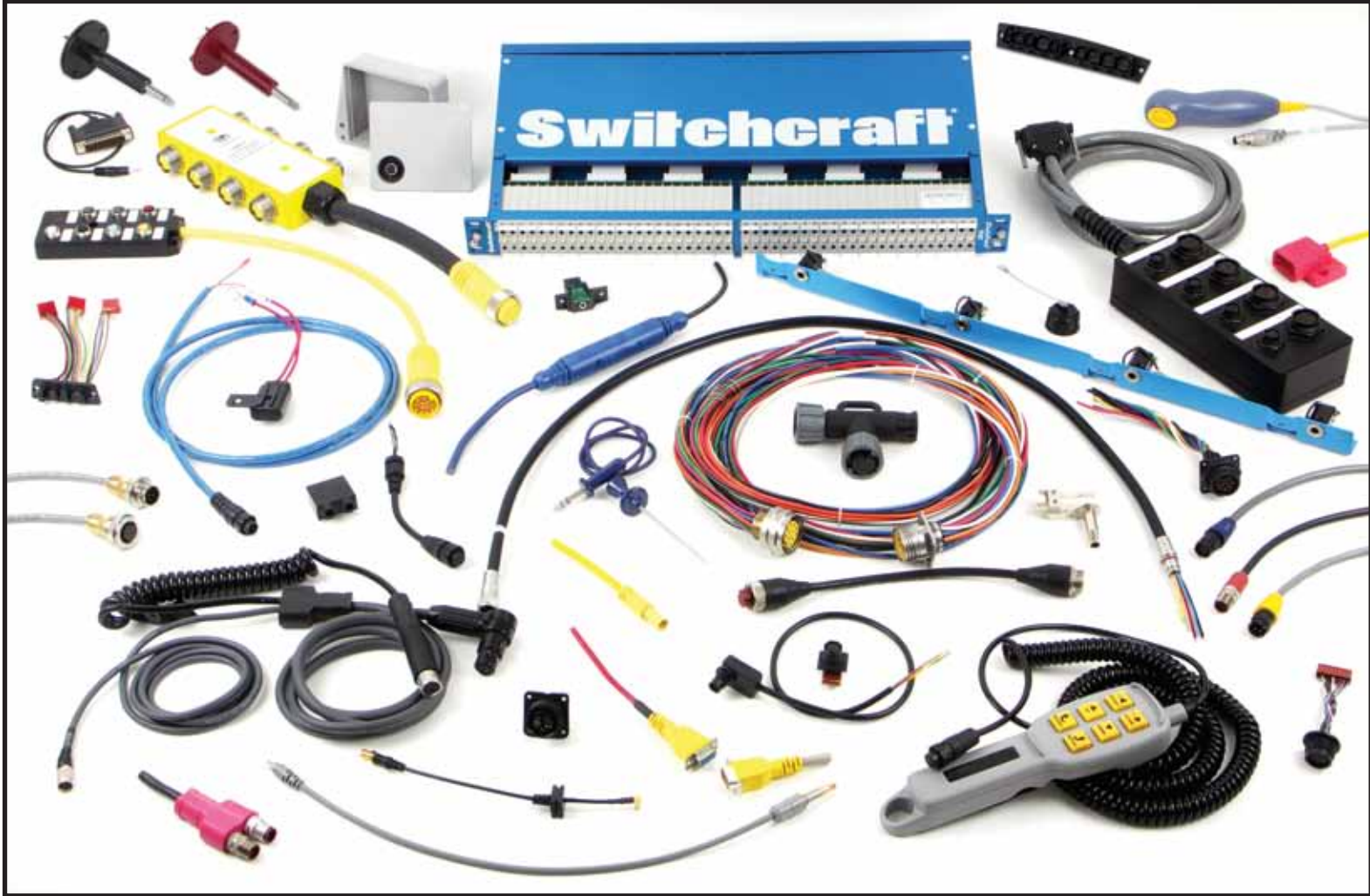
### Assembly

- Automated, semi-automated, and hand assembly
- Assembly fixtures built in house
- Full manufacturing engineering capabilities

### Quality Assurance Team

# Custom products

Can't find exactly what you are looking for in our standard product offering? Contact us to start creating your custom solution! A strong group of engineers and a vertically integrated manufacturing facility make Switchcraft and Conxall your logical choice for custom products. We can transform your product ideas into reality.



We manufacture many customized and fully custom products. Some examples are:

- Panel connectors with flex circuits
- Wave soldering to panel mount connectors
- Custom assembly and wiring
- Custom mounted and wired product assemblies
- Wide selection of mold compounds for molded color products
- Molded ends for non-Switchcraft and Conxall products
- Fully molded units with connectors encapsulated into the assembly

Please contact us and we will be happy to help you fulfill your customized product needs.

**conxall**<sup>®</sup>

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# Switchcraft® & Conxall®

## HARSH ENVIRONMENT CONNECTORS

Con-X



Shielded Con-X



EN3® / EN2



Mil-E-Qual®



Applications

Medical, lighting, GPS, safety & security, marine and general industrial electronic applications

Medical, communications, lighting and general industrial electronic applications

Medical, food service, transportation, GPS, marine and general industrial electronic applications

Instrumentation, lighting fixtures, power transmission for alternative energy, outdoor waterproof applications and general industrial electronic applications

Features / Benefits

- IEC IP67 when mated\*
- Available in 5 connector sizes
- Available in cable mount, in-line and panel mount
- Available in solder, crimp or PC contact styles
- Gold plated contacts standard
- Caps available
- Available as field assembled or factory overmolded backshells
- Bayonet quick mate coupling nuts - round or winged available in all sizes

- IEC IP68 NEMA 250 (6P) when mated
- Available in 2 connector sizes
- Available in cable mount and panel mount
- Available in solder or PC contact styles
- Gold plated contacts standard
- Threaded coupling metal shells
- Available as field assembled or factory overmolded backshells
- EMI / RFI shielding

- IEC IP68 NEMA 250 (6P) when mated or covered
- Available in 2 connector sizes
- Available in cable mount, panel mount, right angle panel mount and in-line
- Available in solder, crimp or PC contact styles
- Gold plated contacts standard
- Caps available- rated IP68 NEMA 250 (6P)
- Available as field assembled or factory overmolded backshells
- Easy, no soldering connector wiring with crimp type contacts

- IEC IP67 when mated\*
- Available in shell sizes 10 thru 28 in 29 insert patterns. Custom patterns available
- Available in straight cable plugs and box mount receptacles
- In-line available in molded assemblies only
- Available in solder or crimp contact styles
- UV inhibitors in shell
- Available as field assembled or factory overmolded backshells
- Silver plated contacts. Gold available
- Plastic Mil-C-5015 equivalent and interchangeable

Characteristics

**Coupling Ring OD:**  
Five sizes between 0.532" OD-1.291" OD

**Number of Contacts:**  
2 thru 31

**Contact Sizes:**  
#12, #16, #20, #22 & #26

**Max Cable Diameter:**  
0.560"

**Electrical Rating:**  
Up to 23.0A, 600V AV / DC

Custom overmolded cable assemblies available

\* When using molded cable

**Coupling Ring OD:**  
Two sizes- 0.710" OD & 0.875" OD

**Number of Contacts:**  
2 thru 12

**Contact Sizes:**  
#16 & #20

**Max Cable Diameter:**  
0.400"

**Electrical Rating:**  
Up to 13.0A, 600V AC / DC

Custom overmolded cable assemblies available

**Coupling Ring OD:**  
Two sizes 0.532" OD & 0.700" OD

**Number of Contacts:**  
2 thru 18

**Contact Sizes:**  
#16, #20, #22 & #26

**Max Cable Diameter:**  
0.380"

**Electrical Rating:**  
Up to 13.0A, 600V AC / DC

Custom overmolded cable assemblies available

**Coupling Ring OD:**  
Nine sizes between 0.825" OD-2.1" OD

**Number of Contacts:**  
2 thru 37

**Contact Sizes:**  
#12 & #16

**Max Cable Diameter:**  
0.840"

**Electrical Rating:**  
Up to 23.0A, 600V AC / DC

Custom overmolded cable assemblies available

# AUDIO CONNECTORS

## XLR (Q-G®)



Audio & microphone cabling, test equipment, instrumentation, audio consoles, sound reinforcement and general industrial electronic applications

- Recognized as the industry standard
- Unsurpassed durability with a choice of finishes and contact plating
- Exclusive quick ground system allows additional grounding options for specific applications
- Rugged design and high quality material
- Female connectors have latch lock feature to hold connectors firmly together
- Cable mount, panel mount, right angle, wall mount and XLR jackfields available

**Number of Contacts:**  
3 thru 7

**Max Cable Diameter:**  
0.328"

**Electrical Rating:**  
Up to 15A, 125V AC

## Mini XLR ( Tini "QG"®)



Audio & microphone cabling, test equipment, instrumentation, audio consoles, sound reinforcement, medical and general industrial electronic applications

- Unsurpassed durability with a choice of finishes and contact plating
- Exclusive quick ground system allows additional grounding options for specific applications
- Rugged design and high quality material
- Female connectors have latch lock feature to hold connectors firmly together
- All metal Tini QG® available
- Cable mount, panel mount, right angle, wall mount and surface mount available
- Shielded Version with or without spring flex relief available

**Number of Contacts:**  
3 thru 8

**Max Cable Diameter:**  
0.240"

**Electrical Rating:**  
Up to 5A, 125V AC

Custom overmolded cable assemblies available

## Data Connectors (EH Series)



Safety & security, audio, broadcast, instrumentation and general industrial electronic applications

- Complete line of audio, video, & data connectors built into universal panel mount XLR housings
- Custom combinations of EH Series connectors can be quickly loaded into any of our 1 RU (1x16), 1.5 RU (1x16) or 2 RU (2x16) Q-G® Series panels
- Available individually bagged with mounting screws
- Assembly of a custom panel is fast & easy

**Connector Options:**

3.5mm (1/8")  
S-Video  
PS/2 (6 pin din)  
Firewire 400 / 800  
Phono  
BNC  
USB  
9 or 15 pin DSUB  
LC, SC, and ST Fiber Optic  
TOSLINK  
RJ45- CAT5e and CAT6  
XLR ( E Series)  
1/4" Locking Jack  
F Type Connector  
Toggle Switch  
Push Button Switch  
Rocker Switch  
HDMI

## Additional Connectors



Professional audio, instrumentation and general industrial electronic applications

**Available Connectors**

DIN  
Mini DIN  
Slim Line  
CB Style  
AC Receptacles (IEC Series)  
Multi-function High Current Connectors (HPC Series)  
HP75BNC Series Cable Mount Audio Adapters  
Microphone Adapters

Patchbays also available

**Number of Contacts:**  
3-8 contacts

**Max Cable Diameter:**  
0.56" max.

**Electrical Rating:**  
Up to 50A, 1500V AC

Custom overmolded cable assemblies available

# JACKS & PLUGS

## Power Jacks & Plugs



Medical, portable devices and general industrial electronic applications

## 1/4" Jacks & Plugs



Guitar plugs, military, aviation and communications applications

## 2.5mm & 3.5mm Jacks & Plugs



Audio, medical, instrumentation and general industrial electronic applications

## Phono Jacks & Plugs



Semi-permanent connection in audio, video and general industrial electronic applications

## Additional Sizes



Communications, instrumentation, medical, audio, and general industrial electronic applications

### Jacks

- Wide range of DC power jacks including straight and right angle, PC mount, plastic or metal housings, & solder terminals

- Variety of center pin size options available

- Sealed power jacks available with an IP 68/ NEMA 250 (6P) rating, caps also available

### Plugs

- Wide range of DC power plugs including red or black plastic handles & solder terminals

- Variety of center pin size options available

- Sealed power Plugs available with an IP 68/ NEMA 250 (6P) rating

### Jacks

- Available in open frame, enclosed frame, straight & right angle, PC terminals, solder lug & fastons

- Available with 2 or 3 conductors

### Plugs

- Plugs feature single piece finger / tip construction

- Available in straight and right angle

- Choose between a metal or plastic handle

- Available with 2 or 3 conductors

Please visit our website for mating jack / plug pins  
[www.switchcraft.com](http://www.switchcraft.com)

### Jacks

- Available in straight & right angle, PC mount, and a variety of circuit options

- Available with 2 or 3 conductors

### Plugs

- Plugs feature single piece finger / tip construction

- Available in straight, right angle & locking

- Plugs are 1/8" stereo, 3-conductor

### Jacks

- 1 to 8 position jack sets are offered in a variety of color combinations with numerous plating, grounding, shielding, mounting, and justification options

- Feedthru and PC mounted RCA jacks available

### Plugs

- Available in straight & right angle

- Available in nickel or gold-plated plug bodies with nickel or black finish handles

- Right-angle RCA plugs feature an easy-to-assemble three piece construction

### Available Jacks & Plugs

- 0.101" Micro Jacks & Plugs
- 0.141" Jacks & Plugs
- 0.206" Jacks & Plugs
- 0.176" Bantam TT Jacks & Plugs
- 2 & 3 Conductor Specialty High Temperature Jacks & Plugs

Audio and video patchbays also available

### Life:

5,000 insertion / withdrawal cycles, minimum.

### Insertion Force:

3 lb. max \*\*

### Withdrawal Force:

4 ounce min \*\*

### Dielectric Withstanding Voltage:

Up to 500V AC

### Contact Rating:

Up to 5A, 30V DC

\*\* Dependent on mating parts

### Life:

*Commercial*- 10,000 insertion / withdrawal cycles, minimum.

*Military*- 20,000 insertion / withdrawal cycles, minimum.

### Insertion Force:

8 lb. max \*\*

### Withdrawal Force:

1 lb. min \*\*

### Dielectric Withstanding Voltage:

Up to 1,000V AC (rms) max

### Contact Rating:

Up to 3A, 125V AC

### Life:

5,000 insertion / withdrawal cycles, minimum.

### Insertion Force:

8 lb. max \*\*

### Withdrawal Force:

0.5 In. min \*\*

### Dielectric Withstanding Voltage:

Up to 500V AC

### Contact Rating:

Up to 2.5A, 34V DC / AC

### Life:

5,000 insertion / withdrawal cycles, minimum.

### Insertion Force:

6.6 lb. max \*\*

### Withdrawal Force:

0.22 lb. min \*\*

### Dielectric Withstanding Voltage:

Up to 500V AC

### Contact Rating:

Up to 2A, 48V DC

### Life:

*Commercial*- Up to 10,000 insertion / withdrawal cycles, minimum.

*Military*- Up to 20,000 insertion / withdrawal cycles, minimum.

### Insertion Force:

7 lb. max \*\*

### Withdrawal Force:

0.5 lb. min \*\*

### Dielectric Withstanding Voltage:

Up to 250V AC

### Contact Rating:

Up to 1A, 25V DC

## MOLDED CABLE ASSEMBLIES

### Custom Molded Harsh Environment Cables



Lighting, medical, GPS data, alternative energy, instrumentation, safety & security and general industrial electronic applications

- Permanent and service free termination without the risk of cable pull out
- Weathertight reliability
- Available sealed or non-sealed- IEC IP67 or IP68 NEMA 250 (6P)
- Custom made to customer specifications
- EMI / RFI Shielded versions available
- Right angle and straight overmolds
- Ability to terminate non-Switchcraft and Conxall ends
- Quick disconnect option available in-line or panel mount
- Custom molded ends available

**Coupling Ring OD:**  
0.532" OD-1.98" OD

**Contact Sizes:**  
#12, #16, #20, #22 & #26

**Number of Contacts:**  
2 thru 37

**Connector Electrical Rating:**  
Up to 23.0A, 600V AC / DC

**Overmolded Cable Diameter:**  
Con-X- 0.545" OD MAX  
Shielded- 0.380" OD MAX  
EN3- 0.380" OD MAX

### Sensor Cables (Sensor Link)



Lighting, GPS data, alternative energy, sensor connections, instrumentation, safety & security and general industrial electronic applications

- IEC IP67 or IP68 NEMA 250 (6P)
- Available in five different overmolded cable assembly varieties
- Meets or exceeds the requirements of UL, CSA, NEMA, ANSI and IEC
- The overmolding process provides strain relief for flexing operations
- EMI / RFI Shielded versions available
- Right angle and straight overmolds
- Threaded coupling
- Plastic and metal shells
- Die blocks and multi-port boxes available

**Number of Contacts:**  
2 thru 19

**Contact Sizes:**  
#10, #14, #20 & #22

**Electrical Rating:**  
Up to 30A, 600V AC / DC

**Cable Length:**  
3-12 Ft.  
(Custom lengths available)

**Operating Ambient:**  
-20° to 105°

**Thread Sizes:**  
8mm, 12mm, 1/2"- 20, 7/8"-16,  
1"- 16, 1 1/8"- 16 & 1 3/8" - 16

### Standard End Molded Cable Assemblies



Instrumentation, medical, aviation, GPS data, communications and general industrial electronic applications

- Multiple overmold options
  - Custom made to customer specifications
  - Integrated flex relief
  - Ability to terminate non-Switchcraft and Conxall ends
- Audio and video patchcords also available

**Available Ends:**  
0.097" plugs  
0.141"  
1/4"  
3.5mm  
Y junction / splitter  
DC power jacks & plugs  
DIN  
Phono  
Shielded mini XLR  
Male & female 3-8 conductor mini XLR  
MOD plugs  
.281 plugs

### Pendant Switch Cables



Medical & remote equipment handling

- Available with or without flex relief
- Available sealed or non-sealed
- Available with different circuits, various colors and a wide variety of opposite cable ends
- We will build assemblies on cable furnished by you or on cable we purchase to your specifications. Jacket must have temperature of 60° C minimum
- Max cable diameter of 0.270" with out flex relief & 0.170" with flex relief

**Cable Specifications:**  
Standard Unshielded- Type W-1230, other options available

**Termination options**  
Wire stripped and tinned  
Wire blunt cut  
2 conductor 1/4" plug  
3 conductor 1/4" plug  
2 conductor Phono Receptacle  
2 conductor tini-plug  
Tini "QG"® male / female  
DIN 3-8 pin male  
Locking power plug  
Locking 1/4" plug assembly  
RCA plug  
USB  
RJ45

Applications

Features / Benefits

Characteristics