

cannon

HDx™ Series

High-Density, Small Form  
Factor Connector Catalog



ITT

# Overview & Specifications

## HDx Series - High-Density, Small Form Factor



### Key Product Features

- Lightweight, compact design
- Ultra-high density layouts
- Support signal & power
- Support high speed data
  - USB® 3.2 Gen1 up to 5Gbit/s
  - Ethernet up to 10Gbit/s
  - HDMI® up to 8.16 Gbit/s
- Watertight to 20 meter depth
- High-durability - +5000 mating cycles
- Anti-glare, non-reflective plating
- Break-Away or Threaded Locking Options

ITT Cannon's HDx Series provides exceptional versatility in a lightweight, water resistant, small form factor (SFF) design. With standard and high density contact layouts for USB 3.1, high-speed Ethernet and HDMI data transmission, this ruggedized interconnect solution offers watertight sealing up to 20 meters submersion, 360° shielding, over 5,000 mating cycles and selective, anti-glare plating. This, combined with custom cabling capabilities provide our customers with a full end-to-end partnership ensuring secure, high-speed data transmission in a miniaturized, high-density interconnect.



Soldier-Worn Systems



First Responders



Medical Devices

# HDx Series Specifications & Test Standards

## Specifications

<b>Mechanical Shock</b>	No electrical discontinuity > 1 $\mu$ s from 50g Amplitude, 1/2 sine shock pulse of 6ms MIL-STD-810G Method 516.5 Procedure I, Figure 516.7-12 / EIA-364-27C	
<b>Sinusoidal Vibration</b>	10-2,000Hz, 15g, No electrical discontinuity > 1 $\mu$ s Sine Profile: EIA-364-28F Condition IV (15g) / MIL-STD-202, Method 204, Condition G	
<b>Reflectance</b>	Exposed Portions of connectors shall not expose shiny, reflective surfaces	
<b>Color</b>	Exposed portions of connector shall be dark gray	
<b>Chemical Safety</b>	Materials shall not create a toxic health hazard	
<b>Durability @ Ambient Temperature</b>	5000 Mating Cycles	
<b>Wire Accommodation</b>	#22 - #28 AWG, Layout dependent: Ø0.3mm Solder Contacts: 28 AWG and Ø0.7mm Solder Contacts: 22 AWG	
<b>Intermateability</b>	Tested to Intermate with competitor Plugs and Receptacles	
<b>Material</b>	Shells and Coupling Nut, - Brass, w/Ruthenium over Electroless Nickel Plating	Jam Nut - Aluminum Alloy, with Hard Black Anodizing
	Backshell (Locking Plug) - Brass, w/Ruthenium Plating	Backshell (Breakaway Plug) - Brass, w/Electroless Nickel Plating
	Insulators - Thermoplastic	O-Ring - Fluorosilicone
	Contacts - Copper Alloy, with Gold over Nickel Plating	Ground Pins- Copper Alloy, with Gold over Nickel Plating
	Crimp Sleeves - Copper Alloy, with Electroless Nickel Plating	Potting Material - Thermoset Epoxy

## Electrical Specifications

<b>Current Rating (MIL-STD-810G)</b>	Ø0.3mm Contacts: 1 Amp Max (Single Contact)	Ø0.7mm Contacts: 5 Amps (Single Contact)
<b>Operational Voltage</b>	250VDC	
<b>DWV, At Sea Level</b>	Leakage less than 2mA @ 1000 VDC. No Flashover	
<b>Insulation Resistance @ Ambient Temp</b>	> 100 MΩ, tested at 500 VDC +/- 10% @ 1 Amp	
<b>Low Level Contact Resistance (Mated, unwired contacts only)</b>	Ø0.3mm <5 mOhm	Ø0.7mm <4 mOhm
<b>Shell to Shell Conductivity</b>	<5 mOhms	

## Environmental Specifications

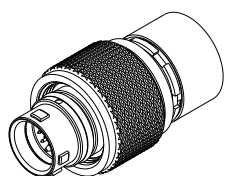
<b>Operating Temperature</b>	-51°C to +125°C
<b>Storage Temperature</b>	-51°C to +125°C
<b>Temperature Cycling / Thermal Shock</b>	-65°C to +125°C, 5 Cycles (EIA-364-32 / IEC 60068-2-14)
<b>Humidity</b>	85% up to 95 % relative humidity, 28 °C up to 71 °C (MIL-STD-810G Method 507.5)
<b>Icing</b>	Operational in Snow and Ice Conditions (MIL-STD-810G 521.4)
<b>Salt Spray, Static / Corrosion Resistance</b>	Connector shall operate in and when stored in a salt fog atmosphere without protective covers - 96 Hours Unmated. (EIA-364-26, Condition A / MIL-STD-810G Method 509.5)
<b>Solar Radiation+</b>	No damage from extended exposure to sunlight (IEC 60068-2-5)
<b>Sand &amp; Dust</b>	No damage detrimental to the operation of the connector from blowing sand & dust (MIL-STD-810G 510.6)
<b>Water Immersion-Mated</b>	20 meters / 28.5 psi for 120 minutes (Mil-STD-810G Method 512.5 Procedure 1 / 20 meter profile, IPX8)
<b>Water Tightness</b>	IPX9K, Resistant to high-pressure, high-temperature water jets. (IEC 60529)
<b>Chemical/Fluid Endurance+</b>	No damage detrimental to the operation of the connectors caused by unmated connectors immersed in various fuels and oils
<b>Mold Growth+</b>	Connector materials shall be fungus inert (IEC 60068-2-10 (European fungus)
<b>High Altitude, Operational</b>	30,000 ft., 60 minutes exposure after stabilization, 10 m/s (32.8 ft/s) max rate of altitude change. 3°C/min (5°F/min) max rate of temperature change (MIL-STD-810G Method 500.6)
<b>High Altitude, Storage</b>	40,000 ft., 60 minutes exposure after stabilization, 10 m/s (32.8 ft/s) max rate of altitude change. 3°C/min (5°F/min) max rate of temp change (MIL-STD-810G Method 500.6)
<b>Low Pressure, Rapid Decompression</b>	59.1 to 18.8 kPa (443 to 141 torr) < 15 sec (MIL-STD-810G Method 500.6)
<b>Low Pressure, Operational</b>	57.2 kPa, -55 °C (MIL-STD-810G Method 500.5)

# Ordering Guide - HDx Series

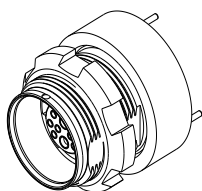
1- Product	2- Series	3- Type	4- Shell Style	5- Material	6- Arrangement	7- Contact Style	8- Contact Diameter	9- Polarization	10- Earth Tag	11- Mod Codes
HDX -	W	A	1	M	0-09	X	M	A		

1 - Product	
HDX -	High Density Small Form Factor
2 - Series	
W -	High Density
3- Type	
G -	Receptacle, Panel Mount
K -	Receptacle, In-Line
A -	Plug, Break-Away
C -	Plug, with Locknut
4 - Shell Style	
1 -	In-Line
K -	Rear Panel Mount, Low Profile Inside Device
5 - Material and Finish	
M -	Brass Alloy / Ruthenium over Electroless Ni (Series W)

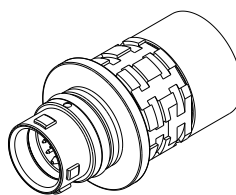
6- Arrangement	
	0-09
	0-12
	0-16
7 - Contact Style	
W -	Socket, Solder Cup (Receptacle Only)
X -	Pin, Solder Cup (Plug Only)
U -	Socket, PC-Tail (Receptacle Only)
8 - Contact Diameter	
B -	0.3mm
F -	0.7mm
M -	Combo / Mixed
9- Shell Polarization	
A -	Brown Color Code
B -	Red Color Code
C -	Blue Color Code
D -	Green Color Code
10- Receptacle Earth Tag	
L -	Applicable to GC, GK and G8 ONLY
OMIT -	All other styles and types
11- MOD Codes	
Leave Blank if None	



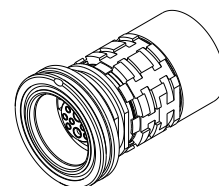
In-Line Breakaway  
Plug with Locknut- C1



Rear Panel Mount  
Receptacle - GK

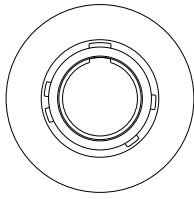


In-Line Breakaway  
Plug - A1

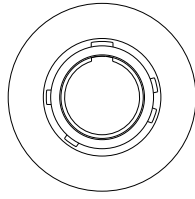


In-Line Breakaway  
Receptacle - K1

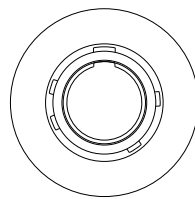
# Clocking- Plug Key Polarization



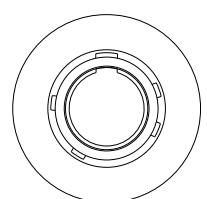
A- Brown



B- Red

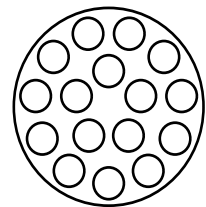
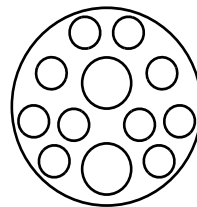
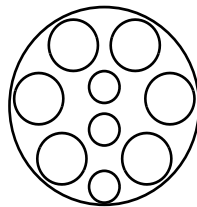


C- Blue



D- Green

## Configurations - High Density Contact Layouts

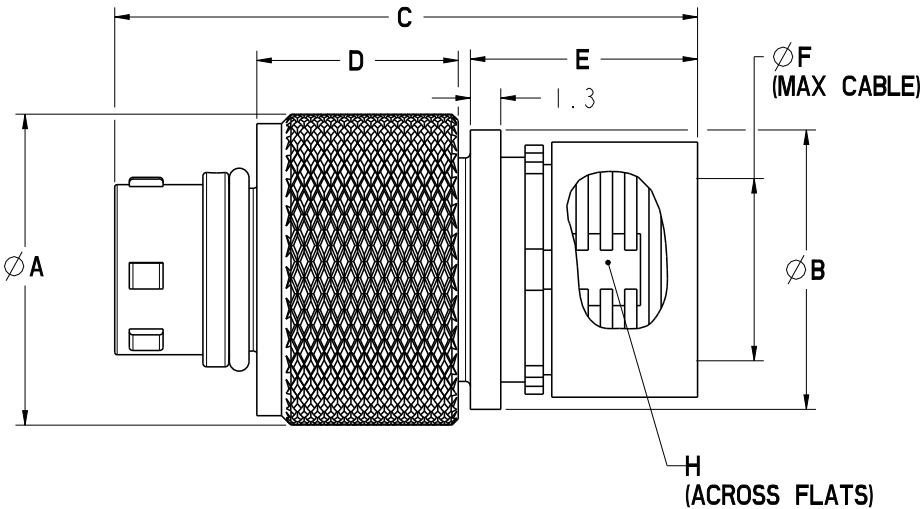
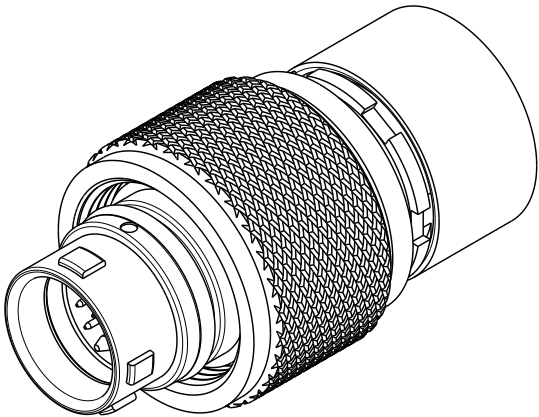


Configuration	0-09	0-12	0-16
Shell Size	0	0	0
Suitable For	USB	USB	Standard
Number of Contacts	9	12	16

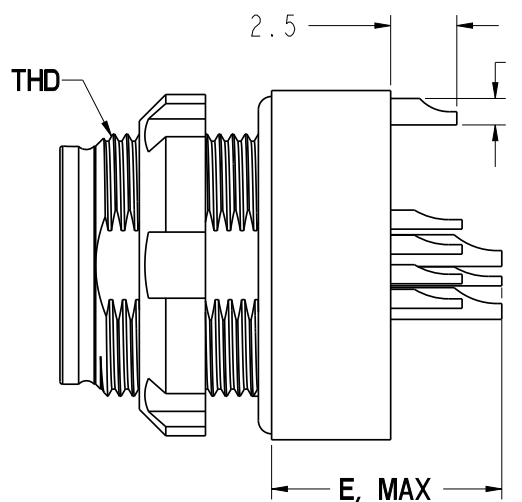
Contact Specification						
Configuration	Contact Count	Contact Diameter (mm)	Wire Size (AWG)	Max Current	Voltage VDC	Application
0-09	3	0.3	28 AWG	1A	250	USB 2.0 + Power
	6	0.7	22 AWG	5A		
0-12	10	0.3	28 AWG	1A	250	USB 3.2 Gen 1 + Power
	2	0.7	22 AWG	5A		
0-16	16	0.3	28 AWG	1A	250	Signal



# HDx Series High Density In-Line Breakaway Plug with Locknut- C1



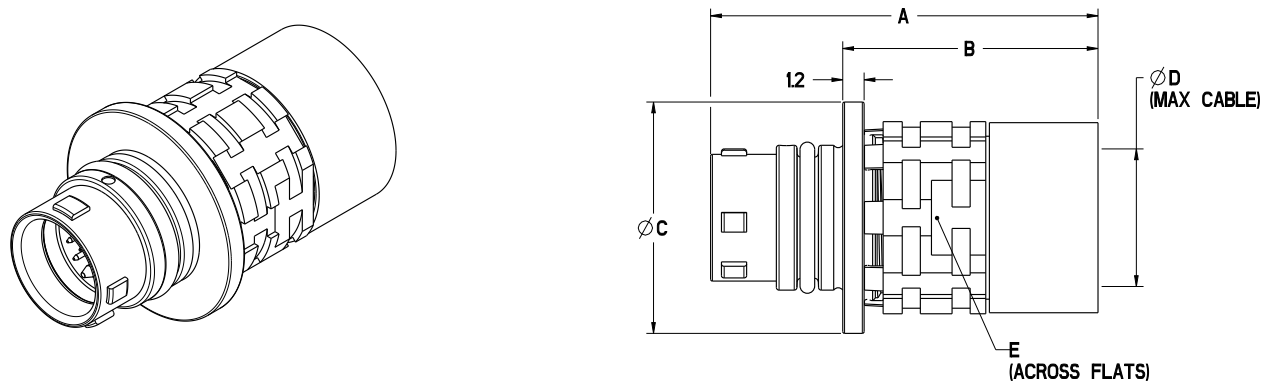
Size	ØA	ØB	C	D	E	ØF, MAX	H	THD
0	12,8	11,5	24	8,3	9,4	6,5	9,5	M10 X 0,5

[illegible]

Size	ØA	B	ØC	D	E	F	ØH	THD
0	13,2	8	13	4*	8,7	9,1	10,1	M10x 0,5

7

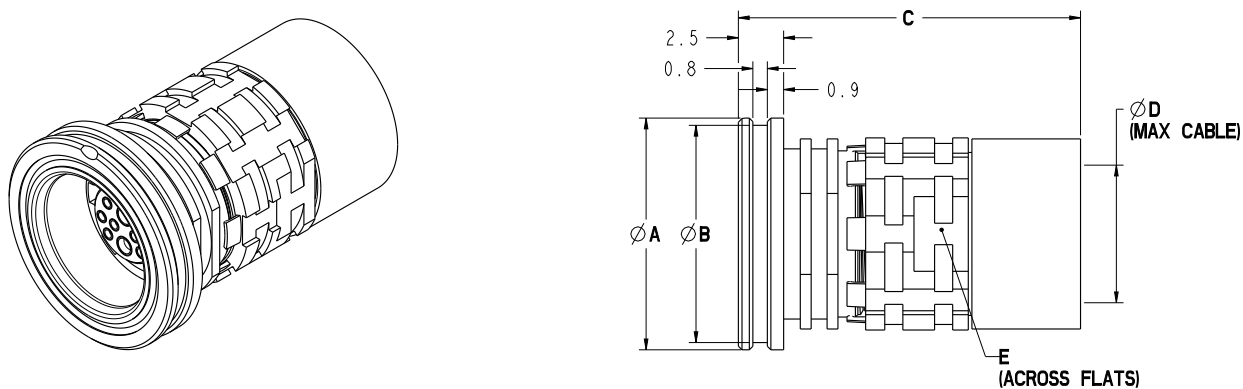
# HDx Series - High Density In-Line Breakaway Plug - A1



Breakaway Plug

Size	A	B	ØC	ØD MAX	E
0	21,5	14,2	12,8	7	10

# HDx Series - High Density In-Line Breakaway Receptacle - K1



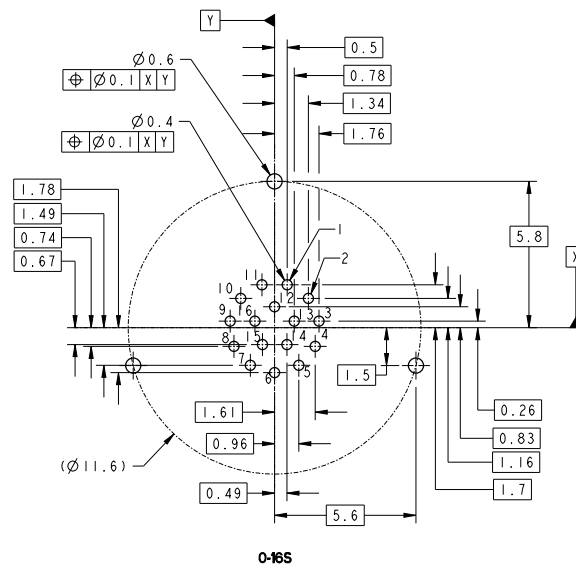
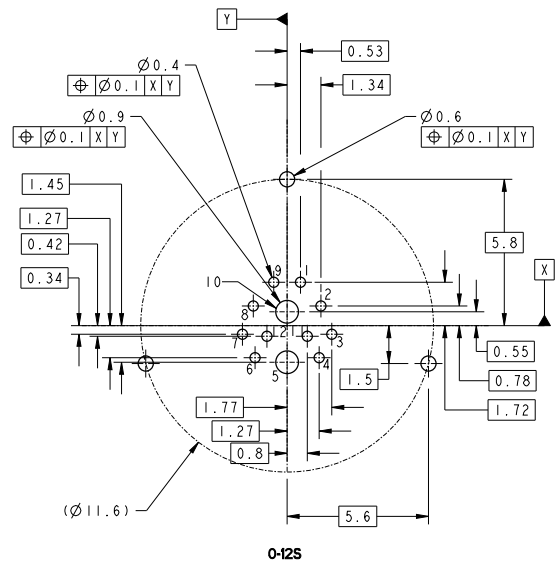
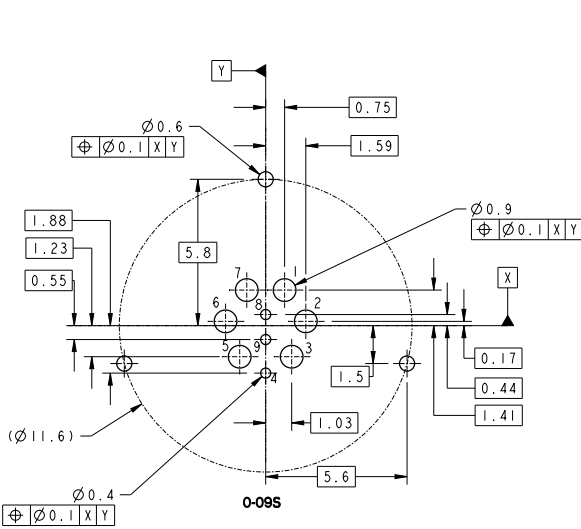
In-Line Receptacle

Size	ØA	ØB	C	ØD MAX	E
0	12,8	12	19,5	7	10

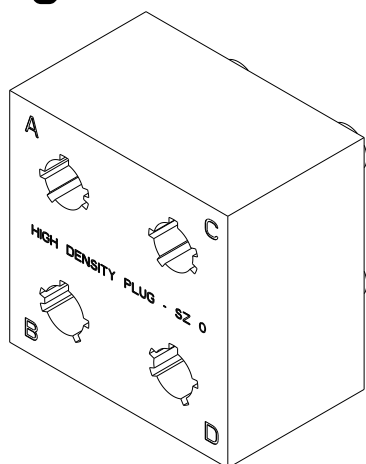


# PCB Layout

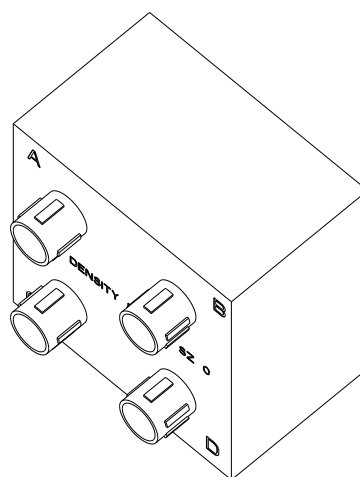
## HDx Series High Density PCB Layouts



# Tooling

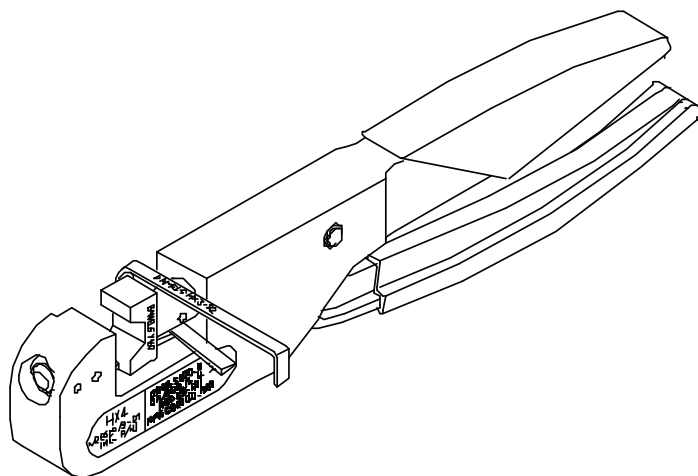


Plug Side View

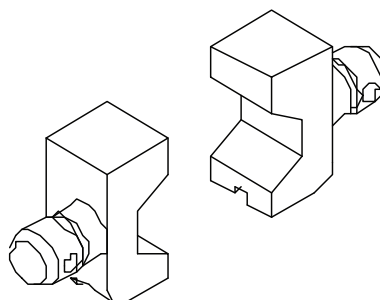


Receptacle Side View

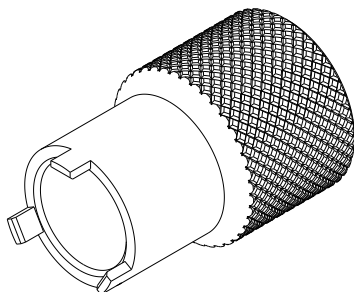
Part Number: 980-9500-387  
Backshell Assembly Block for Plug and Receptacle



Hand Crimp Tool -  
995-0001-761



Die Crimp Rail Insert for Hand Crimp Tool  
995-0001-790



Spanner Nut Socket  
317-2187-050

# Cables to Outfit Your Connector

## Value-Added Cabling Solutions from ITT Cannon

Let ITT Cannon complete your solution with our custom cable products. A complement to the reduction in size of the connectors is the reduction in weight and thickness in cabling. Choose from several available options to help customize your application. Improving on our high reliability connectors, we offer over molds that are suitable for military requirements in harsh environments.



### Braiding

- EMI shielded metal to light weight, textile braiding for abrasion protection

### Overmolding

- Injection molding with poly ureaurethane, Santoprene, and polyimide
- Transfer molding with Cannon's Super Jacketing System (SJS Series), Viton, Neoprene, EPDM, and alternative molding compounds
- Low pressure and prototype molding including M24041, poly ureaurethane, Polyimide, and custom compounds

### Shrink Boots

- Customized solution for all connector-to-cable transition type including straight, 90 and 45 degree.

### Backshells

- Integration of commercial and MIL-Spec backshell and molding adapters

### Cable Jacket

- Blown-on jacketing for multi leg cables using SJS jacket, Viton Neoprene, EPDM, and various other tubing jackets
- RONDENT proof extruded jackets using SJS jacket, poly ureaurethane, Santoprene and Neoprene.
- Textile braids and heat shrink jackets

### Integrated Assembly

- Integrated connector and cabling into box system
- Ribbon cable assembly
- Cable/Wire harnesses in boxes or as an LRU
- Machined & integrated high volume Die Cast housing



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## Connect with the experts.

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**CHINA—Shanghai**  
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**FRANCE**  
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**GERMANY—Weinstadt**  
+49.7151.699.0

**HONG KONG**  
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**ITALY—Lainate**  
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**JAPAN—Kanagawa**  
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**KOREA**  
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**MEXICO—Nogales**  
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**SINGAPORE**  
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**UK—Basingstoke**  
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[HDX-WK1M0-12WMC](#) [HDX-WK1M0-16WBA](#) [HDX-WK1M0-16WBB](#) [HDX-WK1M0-16WBC](#)