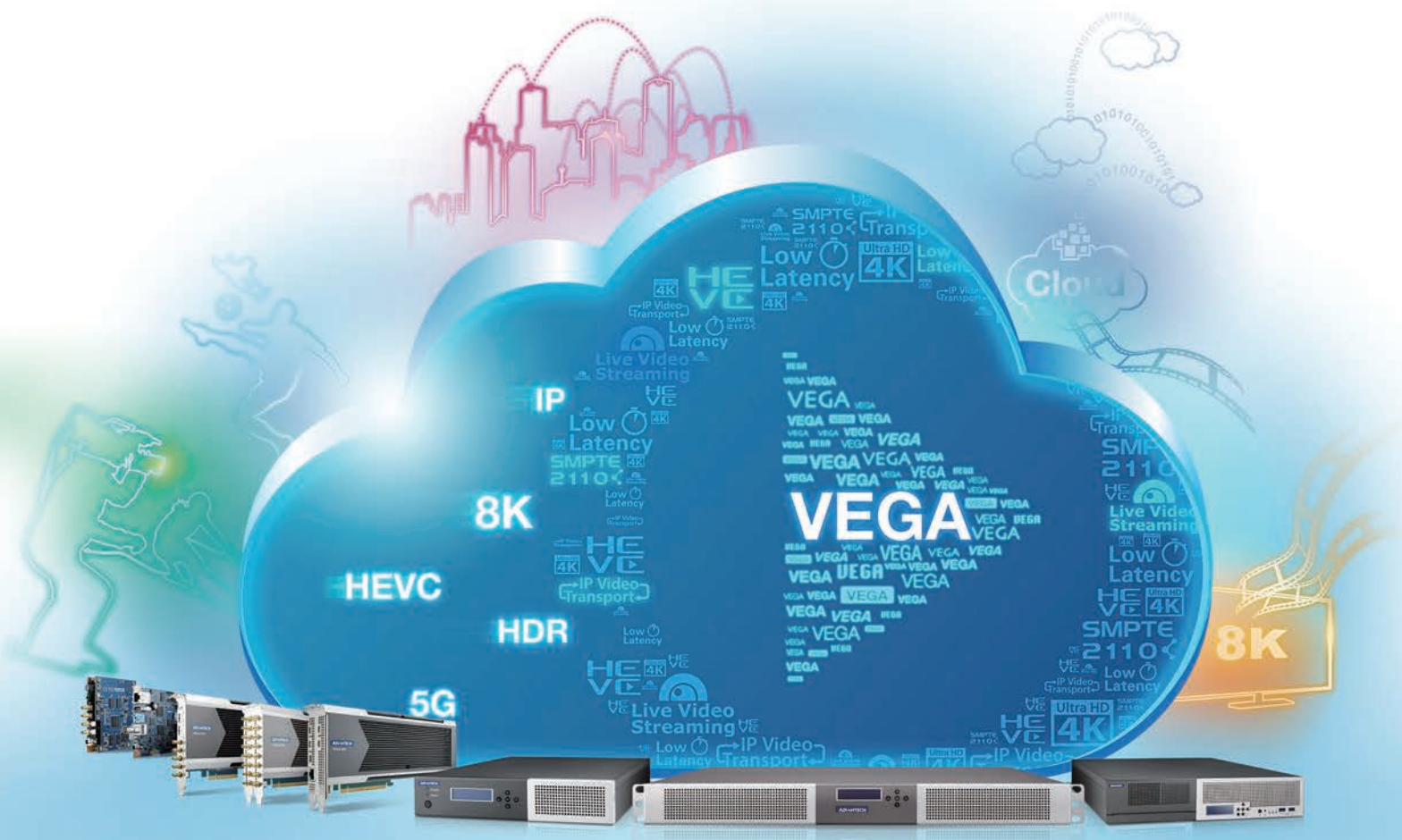# Advantech VEGA Video Infrastructure Solutions

Accelerating UHD Workflow Transformation

- 4K/8K UHD Broadcast Encoding & OTT Transcoding Accelerators
- Virtual Reality & 360° Video Streaming Accelerators
- Ultra-High-Density Cloud Media Processing Accelerators & Platforms
- Interoperable IP Media Adapters and Encoding Platforms for UHD Live Production
- Small Encoding Modules for HD/UHD Live Streaming & Self Broadcasting
- Integration, Customization & Design Services

ADVANTECH

Enabling an Intelligent Planet

HEVC High Effeciency Video Coding

4K/8K UltraHD

VR 360°

iabm

www.video-acceleration.com

Leading Innovation for the New IP Video Infrastructure

Advantech VEGA Video Platforms and PCI Express Accelerators are designed to boost video infrastructure performance from acquisition to distribution at the lowest power budget while fully complying with the media industry needs. By providing access to the latest 4K/8K video processing and IP media technologies on commercial-off-the-shelf IT platforms we accelerate the deployment of next-generation, open and more efficient solutions across a wide range of media applications from broadcast encoding and OTT transcoding to cloud, mobile and 360° video. Advantech's proven expertise in networking and computing enables us to lead innovation in the IP transition of the industry and get our customers ahead of the curve.

Here are the principal issues confronting the industry and how we can help.
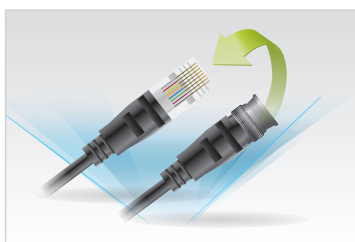
The Move to IP

One of the major disruptors in the industry is the migration to IP that improves flexibility, reduces costs, and allows more use of commercial computing and networking gear. Advantech accelerates this transition by working together with key industry partners through industry alliances such as AIMS on standard and interoperable solutions that unlock the full potential of the new IP media infrastructure.

UltraHD and HEVC

The advent of 4K/8K and H.265 are a double whammy for the industry, together significantly outstripping the processing capability of many infrastructure elements. Advantech provides a wide range of easy-to-integrate, ultra-low-power video acceleration cards and application-ready platforms that efficiently scale throughput of high-density video infrastructure solutions to enable next-generation UHD services.

The Media Cloud

As the need for video ingest, processing and storage skyrockets, media companies are considering moving to cloud-based architectures. However, some aspects of video processing are less than optimal in a generic IT cloud environment. Advantech acceleration technology offloads heavy-lifting video processing tasks and enables higher density, server based solutions that bring data center efficiencies to cloud media deployments.

Simpliflying the Customization Process

Advantech has invested heavily in dedicated resources to develop the essential building blocks that enable the deployment of innovative and integrative video infrastructure solutions, including video acquisition, video transport, video processing and video distribution. With Advantech, you are not limited to a standard products offering alone. Our flexible design approach allows OEMs to easily partner with Advantech on customized versions of commercial-off-the-shelf products, a framework we call Customized COTS. The advantage of Customized COTS is its "best of both worlds" approach enabling OEMs to differentiate with unique premium solutions that leverage the cost benefits of full custom ODM designs and offer a significantly faster time to market. In addition, we are open to engage on full custom designs supported by our world-class team of video architects and engineers.

Commercial-off-the-Shelf (COTS)	Customized COTS	Joint Development Model	Original Design Manufacturing (ODM)

Standard   **Full Custom**

- Based on Advantech standard product & technology roadmap with optional minor changes

- Strategic partnership
- Co-architected design based on common IP from converging product & technology roadmaps

- Customer-driven design
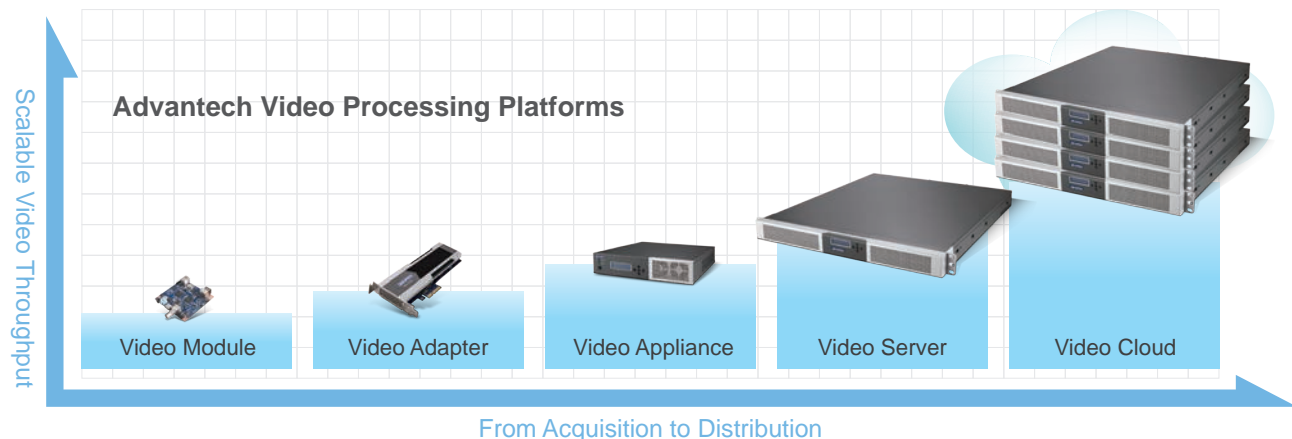- Based on customer's product and technology roadmaps

About Advantech Video Solutions

Advantech's Video Solutions Division has been developing broadcast-quality video solutions for some of the top OEMs in the industry. Customers can leverage our strong video expertise and leading-edge computing and networking design skills to accelerate the deployment of their next-generation media solutions:

	Contribution & Live Production	Media Processing & Distribution
Video Acceleration	▪ Support for a variety of mezzanine compression implementations such as Sony LLVC and intoPIX TICO for 4K video transport over 10GbE	▪ Efficient HD/UHD H.264/H.265 encoder, decoder and transcoder PCIe acceleration for higher density, lower TCO deployments
Networking	▪ IP media transport supporting different industry standards such as SMPTE 2022 and SMPTE 2110	▪ Low latency media-over-IP interfacing & switching ▪ Software-defined networking & ToR switching
Computing	▪ Ethernet, SDI/ASI, HDMI/DVI, USB, and analog interface flexibility ▪ Embedded computing solutions for field applications	▪ Application-ready x86 platforms optimized to run compute-intensive video processing applications ▪ FPGA expertise for innovative IP integration

We apply our solid media technology knowledge to engineer innovative solutions for our customers. From design through quality assurance and production to global logistics, our teams integrate with our customers' teams to create a highly collaborative environment that minimizes the risk of developing complex solutions.

Advantech scalable video platforms are designed with modularity in mind to meet a wide range of application scenarios. From ultra-light modules that can be embedded into live streaming devices to high-density architectures for live cloud media services, our video processing platforms provide a user space software framework supported by our software engineering team that simplifies their integration into your new IP workflow solutions.

Advantech Video Processing Platforms

Scalable Video Throughput

Video Module — Video Adapter — Video Appliance — Video Server — Video Cloud

From Acquisition to Distribution

The media industry is undergoing a profound transformation driven by the fundamental change in video consumers' behaviour that disrupts the traditional business model. Broadcasters and service providers are looking to optimize their operations and monetize the big opportunities that the online media era brings. Advantech helps video equipment manufacturers lead the media workflow transformation with products that address its current upheaval, the processing impact of UHD, the widescale move to IP and the convergence of broadcast and IT technologies.
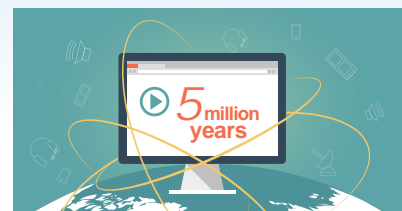
The Online Video Era - In 2020

There will be 26.3 billion networked devices (3.4 per capita), 41% of which will be video enabled consumer devices.

Internet traffic will grow 3-fold from 2015. Video will be 82% of all Internet traffic.

It would take an individual over 5 million years to watch the amount of video that will cross the Internet each month.

Change the Game

Contribution Encoding & Live Streaming

Live is an important driving force of today's video-centric networks. Reduced power and size, or easiness of deployment are some of the features that differentiate field solutions from those in central studios. Advantech efficient encoding technology perfectly matches these requirements without jeopardizing video quality.

VEGA-2000 Series   Small HD/UHD Live Encode & Streaming Modules

The Advantech VEGA-2000 Series extends HEVC benefits to portable video solutions such as wireless broadcast cameras and self streaming devices by creating an embedded module that makes best use of limited 3G/4G or Wi-Fi uplinks bandwidth and local storage capacity. Their rich I/O comes in an ultra-compact format that can be integrated into lightweight acquisition and encoding solutions for anywhere live broadcasting.

VEGA-2000M

- 1-ch 1080p60 real-time HEVC or AVC encode
- 1-ch 3G-SDI or 1-ch HDMI 1.4 video inputs
- 1x GbE & 1x USB 2.0 ports
- Input video monitoring
- Web-based CGI interface
- Compact size 100 x 110mm
- Less than 7W power consumption

VEGA-2001

- 1-ch 4Kp60 AVC or 4Kp30 HEVC real-time encode
- 1-ch 12G-SDI, 4-ch 3G-SDI or 1-ch HDMI 2.0 video inputs
- 1x GbE & 1x USB 2.0 ports
- Web-based CGI interface
- Compact size 90 x 100mm
- Less than 15W power consumption

VEGA-6000 Series   Compact UHD Contribution Encode & Decode Appliances

Advantech's VEGA-6000 Series of all-in-one encode appliances are compact and efficient platforms that enable 4K live video contribution in space and power constrained applications. The family supports the latest HEVC codec to optimize high-resolution video transmission over satellite or mobile networks. The VEGA-6301 & VEGA-6311 appliances can be deployed as part of a flexible, 4K IP-based field production requiring up to four times less cabling than a traditional SDI-based deployment. They are both 1U high, less than 290mm deep, and two can fit side by side in a standard 19″ rack.

VEGA-6301

- 1-ch 4Kp60 or 4-ch 1080p60 real-time HEVC 4:2:2 10-bit encode
- 1-ch 12G-SDI, 4-ch 3G-SDI or HDMI 2.0 video inputs
- SMPTE 2022-5/-6/-7, SMPTE 2059
- 2x 10GbE, 2x GbE & 2x USB 3.0 ports
- Linux & Windows SDK with FFmpeg plug-in

VEGA-6311

- 1-ch 4Kp60 or 4-ch 1080p60 real-time 4:2:2 10-bit HEVC, AVC & MPEG-2 encode & decode
- 1-ch 12G-SDI, 4-ch 3G-SDI or DVB-ASI video inputs
- SMPTE 2110, SMPTE 2022, SMPTE 2059
- 2x 10GbE, 2x GbE & 2x USB 3.0 ports
- Linux & Windows SDK with FFmpeg plug-in

2018 China Broadcasting and Television Technology Innovation Award!!

Accelerating the Video Innovations

IP Media Transport and Video Intelligence

Advantech accompanies customers on their migration to IP based media by offering a wide range of products that can be used in the construction of the new IP video infrastructure. Advantech supports industry standards through ecosystem alliances such as AIMS or IP Live to help solve the technical and interoperability challenges of 4K IP media.

VEGA-4000 Series   Reconfigurable Video Accelerators

VEGA-4000 series are Xilinx FPGA-based PCI Express cards which is ideal for accelerating machine learning, video and data analytics, and live video processing both in appliances and in scale-out data center servers. The latest generation of Field Programmable Gate Arrays (FPGAs) from Xilinx offers the processing acceleration while retaining future-proof reconfigurable capability and flexibility, and Advantech VEGA-4000 series can provide access to this technology.

VEGA-4000 **NEW**

- Xilinx Virtex® UltraScale⁺ XCVU9P FPGA
- 4-ch of 4GB DDR4-2400 64b w/ ECC

- PCIe Gen-3 x16 Low-Profile form-factor
- Up to 75W power consumption with fanless or fan-assisted heatsink

VEGA-4001 **NEW**

- 2 x Xilinx Virtex® UltraScale⁺ XCVU9P FPGA
- 4-ch of 4GB DDR4-2400 64b w/ ECC per device
- PCIe Gen-3 x16 full height, 10.5" length form-factor

- Up to 225W power consumption with fanless or fan-assisted heatsink
- Ideal for machine learning application

VEGA-4002 **NEW**

- 2 x Xilinx Virtex® UltraScale⁺ XCVU9P FPGA
- 4-ch of 4GB DDR4-2400 64b w/ ECC per device
- PCIe Gen-3 x16 full height, 10.5" length form-factor

- Up to 150W power consumption with fanless or fan-assisted heatsink
- Ideal for video processing application

VEGA-500 Series   Video Intelligence Accelerations

32-channel FHD HEVC/AVC video transcoding with video analytics capabilities in a small power envelop under 150W. Utilizing Xilinx MPSoC solution embedded, video preprocessing can be run on the ARM cores, while customers can utilize the programmable logic and integrated video codec unit(VCU) for the hardware acceleration on video analytics applications to make it as a right solution for Video Intelligence Accelerator.

VEGA-550 **NEW**

- 4 x Xilinx Zynq® UltraScale⁺ ZU7EV MPSoC FPGA
- 8GB DDR-4 2400 (PS side) and 8GB DDR4-2666 (PL side) per ZU7EV

- PCIe Gen-3 x16 full-height, 10.5" length double width form-factor
- Up to 150W power consumption with fanless heatsink

Unleash the WOW Experience

UHD Encoding, Decoding & Transcoding

The new High Efficiency Video Coding (HEVC) significantly reduces bit rates when compared to AVC. It is particularly relevant for live UHD services which require much higher capacity. But these improvements come at high computational cost with up to 48 server-class cores typically required to perform 1-ch real-time software-based 4K HEVC broadcast encoding.

VEGA-3300 Series Ultra-Low Power UHD Video Accelerators

Advantech VEGA-33xx encoding, decoding & transcoding accelerators enable real-time HEVC video processing at up to 20x less power consumption than a software-only solution. Traditional server hardware is not well suited to video processing, especially when multiple high bit rate channels require manipulation. Advantech's compact plug-in PCI Express accelerators provide video equipment manufacturers with the technology to accelerate this part of the workflow without otherwise losing capacity or adding more servers, helping them successfully address the challenges of real-time UHD media processing in a cost-effective manner. These low power add-on cards can deliver unrivaled video processing capability to IT-based infrastructure platforms, allowing servers to do more of what they are good at, and significantly improving density, scalability and costs of live UHD video solutions.

A key requirement for the transition to IP media is a way to connect existing SDI-based equipment to the new IP infrastructure. The VEGA-3300 series adapter implements the SMPTE 2022-5/6 standards to create up to three "virtual SDI" channels within a 10GbE link and bridge each channel either to a physical SDI connection or to a logical server port across the PCIe bus.

4K HEVC Encode in <15W

VEGA-3310

- 2-ch 4Kp60 or 8-ch 1080p60 real-time 4:2:2 10-bit HEVC, AVC & encode, transcode & decode
- Ultra-low latency encode mode (<10ms)
- Less than 21W power consumption
- Half-length PCIe card

VEGA-3311

- 1-ch 4Kp60 or 4-ch 1080p60 real-time 4:2:2 10-bit HEVC, AVC & encode & decode
- Ultra-low latency encode mode (<10ms)
- 1-ch 12G-SDI or 4-ch 3G-SDI w/ tri-sync
- SMPTE 2022 -5/6, SMPTE 2059
- Less than 21W power consumption
- Half-length PCIe card

The VEGA-3300 Series comes with a user-space Linux or Windows SDK package supported by Advantech software engineering team that features a RESTful API and includes an FFmpeg plug-in to streamline new product development and the integration into existing applications.

8K, Virtual Reality & 360° Video

Live UHD services are outstripping the processing capability of many infrastructure elements, being the load of 8K HEVC encoding more than 40X that of Full HD AVC. But, it is not only about resolution. New formats such as VR or 360 degree video multiply the amount of video data that needs to be processed at any given time. VEGA 8K series is for these new requirements being capable of performing 8Kp60 acquisition and real-time HEVC encoding in one single PCIe card that accelerates next-generation viewing experiences.

NEW **CEATEC AWARD 2016**

VEGA-3304

World's First

- 1-ch 8Kp60, 4-ch 4Kp60 or 16-ch 1080p60 real-time 4:2:2 10-bit HEVC encode
- Up to 8K capture over built-in 16-ch 3G-SDI
- Less than 75W power consumption
- 3/4-length full-height PCIe card, compatible with GPU slots

NEW

VEGA-6304

- 1-ch 8Kp60 HEVC real-time encode compact encoder platform supporting I, P & B-frame, 4:2:2 sampling & 10-bit color
- 2SI format & slice-mode encoding support
- 4-ch SDI-12G inputs with 22.2-ch audio support
- Portable size with flexibility for rack-mount

High-Density Video Processing

With low-power PCIe offloading and standard IP technologies, here comes the potential of adopting more efficient cloud-based architectures within live video workflows. Advantech application-ready platforms combine best video and IT practices to create scalable and cost-efficient media solutions with better time-to-market.

VEGA-7000 Series High-Density Video Processing and IP Media Server

The VEGA-7000 is a highly-configurable, application-ready server with optimized density, power consumption, and functionality that integrates multiple PCI Express expansion slots within a 1U, off-the-shelf IT platform to efficiently offload heavy-lifting video processing tasks in live workflows. Compute-intensive media processing applications can leverage the density, open system architecture and time-to-market advantages of the VEGA-7000 to build more scalable and cost efficient cloud media solutions.

Video Source
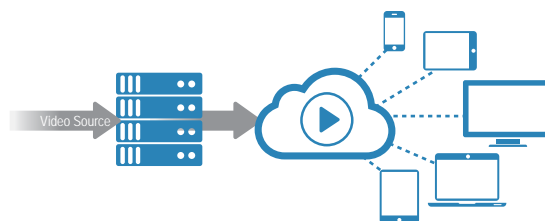
VEGA-7000/VEGA-7010

- 1U scalable & versatile accelerated video server
- Multi-channel UHD, HD & SD low-latency HEVC, AVC & MPEG-2 encode, decode & transcode
- Broadcast-quality video @ 60 fps including 10-bit profiles & 4:2:2 chroma sub-sampling
- Industry-standard Media-over-IP protocols including SMPTE 2110, SMPTE 2022 & Sony IP Live with optional TICO or LLVC lightweight compression
- Multiple redundant 10GbE & 1GbE ports
- Small OLED monitor for input monitoring

Cloud Media Processing

With the growing demand for OTT delivered content, service providers and media companies are looking to cloud-based architectures to optimize their operations. The new VEGA-3318 brings unprecedented density to large-scale cloud deployments being able to handle up to 32 real-time UHD transcodes per rack unit. It provides the acceleration required to efficiently scale media processing across a wide range of cloud applications from broadcast encoding and OTT transcoding to gaming and mobile video. The impressive performance of the new VEGA-3318 comes in a low power PCI Express format that can be integrated into standard IT servers and data center racks significantly improving efficiency and capability of live cloud media services.

VEGA-3318

32 Live UHD Transcodes per RU

- 8-ch 4Kp60 real-time 4:2:2 10-bit HEVC/AVC encode, decode & transcode
- Ultra-low latency encode mode (<10ms)
- Less than 75W power consumption
- 10.5" length full-height PCIe card, compatible with server GPU slots
- Linux SDK with FFmpeg plug-in

World's First

2018 China Broadcasting and Television Excellence Award!!

2018 BEST of SHOW TVTechnology

Global Access, Local Support

Legend:
- **D** Design Centers
- **M** Manufacturing Centers
- **C** Configure To Order Service Centers
- **L** Logistics Centers
- **O** Onsite Service
- **R** Repair Centers

Map locations: Milpitas (C L R), Irvine (D), Cincinnati (D), Monterrey (R), Mexico, Itajubá (C L R), Newcastle (D), Eindhoven (C L), Roosendaal, Reading, Paris, Milan, Munich, Düsseldorf, Warsaw (R), Moscow (R), St. Petersburg, Amberg (D), Bangkok (C), Bangalore (C R), Pune, Kuala Lumpur, Singapore (C L R), Kunshan (D M C L R), Beijing (D C L O R), Chengdu, Shanghai, Hong Kong, Shenzhen, Seoul (C L R), Tokyo (C L R), Osaka, Taipei (D M C L O R), Penang (C), Melbourne (C L R), Sydney

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Düsseldorf	49-2103-97-855-0

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Italy
Milano	39-02-9544-961

Benelux & Nordics
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London	44-0-870-493-1433

Poland
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St. Petersburg	8-800-555-81-20

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