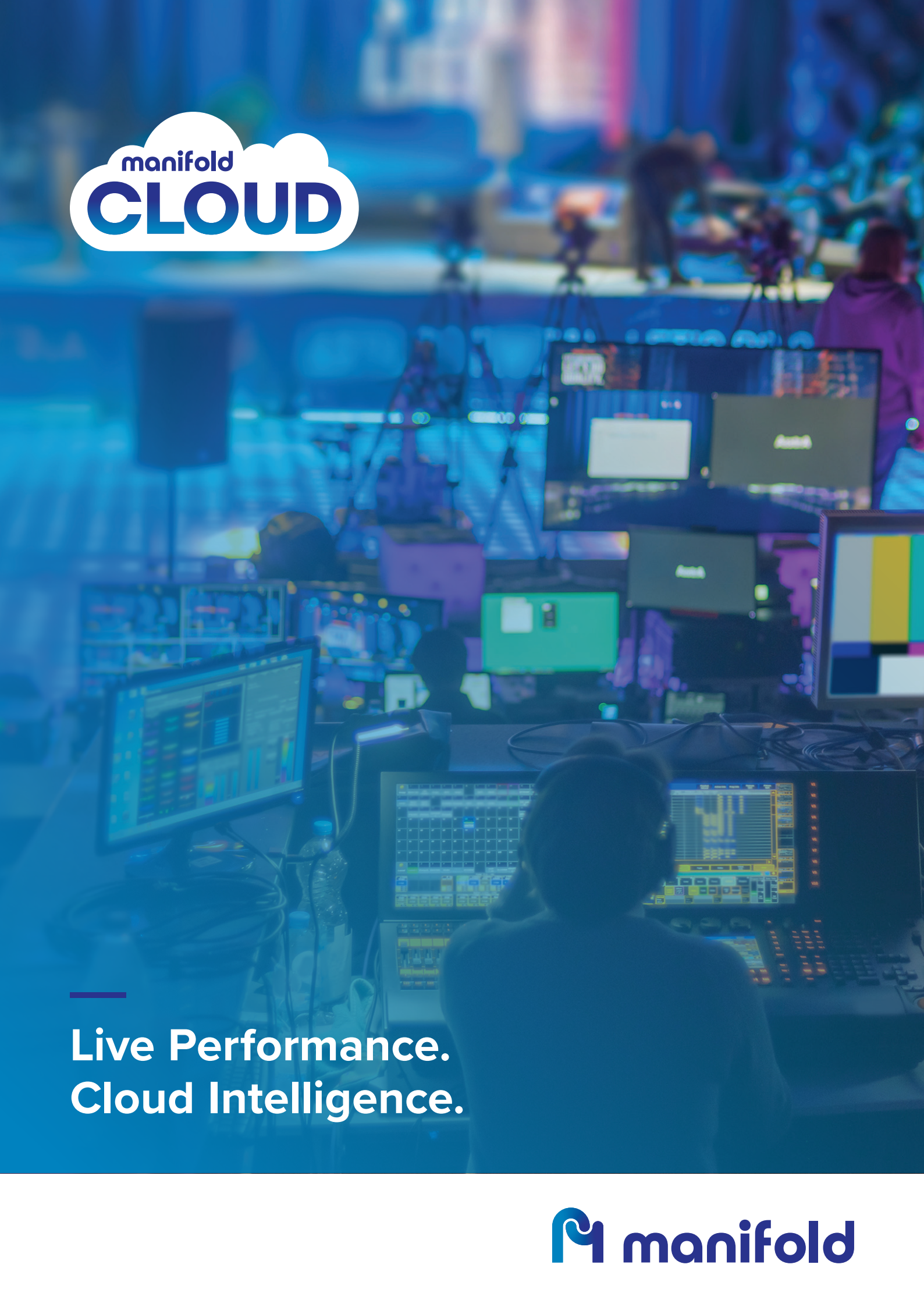
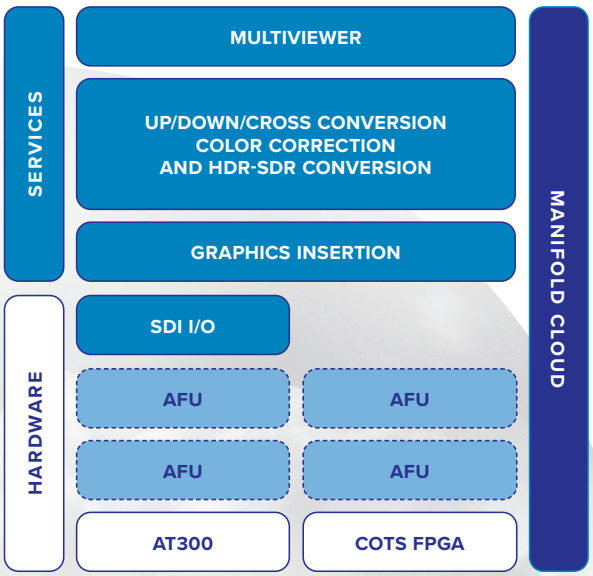

manifold
CLOUD
Live Performance.
Cloud Intelligence.
manifold

manifold CLOUD

manifold CLOUD is a software solution that provides multi-viewing, up/down/cross conversion, color correction, color space conversion and other live production functionality as services through a single-sign-on web UI.

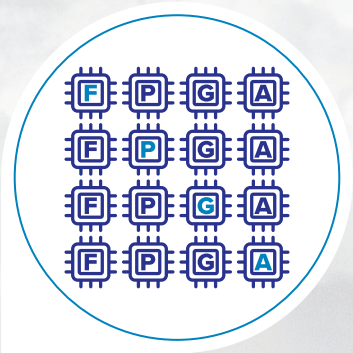


Built on a state-of-the-art service-based architecture, manifold CLOUD was designed to offer all the benefits of cloud and virtualization while retaining the strict performance requirements of Tier-1 live broadcast production.

Specifically, manifold CLOUD provides the scalability, resiliency, automatic provisioning and cost efficiency of commodity hardware while supporting large, live uncompressed workflows with subframe latency.

SOFTWARE DEFINED PRODUCTIONS

manifold CLOUD was designed with virtualization at the core of a service based architecture. Production workflows are created by cascading services together which can be saved, reused and altered as required. A complete production can be turned up in seconds by simply loading a configuration.



COTS FPGA

Based on off-the-shelf FPGA accelerators from multiple vendors, manifold CLOUD takes advantage of the cost & development speed of COTS compute while still retaining the performance requirements of live broadcast productions, truly providing the best in class of both performance and cost.

DENSITY AND ENERGY EFFICIENCY

manifold CLOUD packs Terabit processing speeds per rack-unit, easily outperforming CPU and GPU based solutions in both performance, density and power utilization - packing over 10 times the performance as opposed to competing solutions while offering over 90% energy savings.

100% SOFTWARE

- Runs on COTS FPGA accelerators from multiple vendors

LIVE PERFORMANCE

- Provides millisecond latency, just as live productions require
- Chain multiple manifold CLOUD services together while still staying within 1 frame delay end-to-end

SIMPLE WEB UI

- User-friendly web UI for control & management of all sources and services

SERVICE FOCUS

- Simple configuration
- Focus on the what not the how

4K AND BEYOND

- The architecture handles uncompressed HD/3G/UHD and is prepared for even larger resolutions with current generation accelerators providing Terabits of processing per RU

AUTOMATIC PROVISIONING

- Acts as a hypervisor and orchestrator that automatically assigns services to hardware accelerators as required
- Easily save and recall productions (Infrastructure as Code)

RESILIENCY

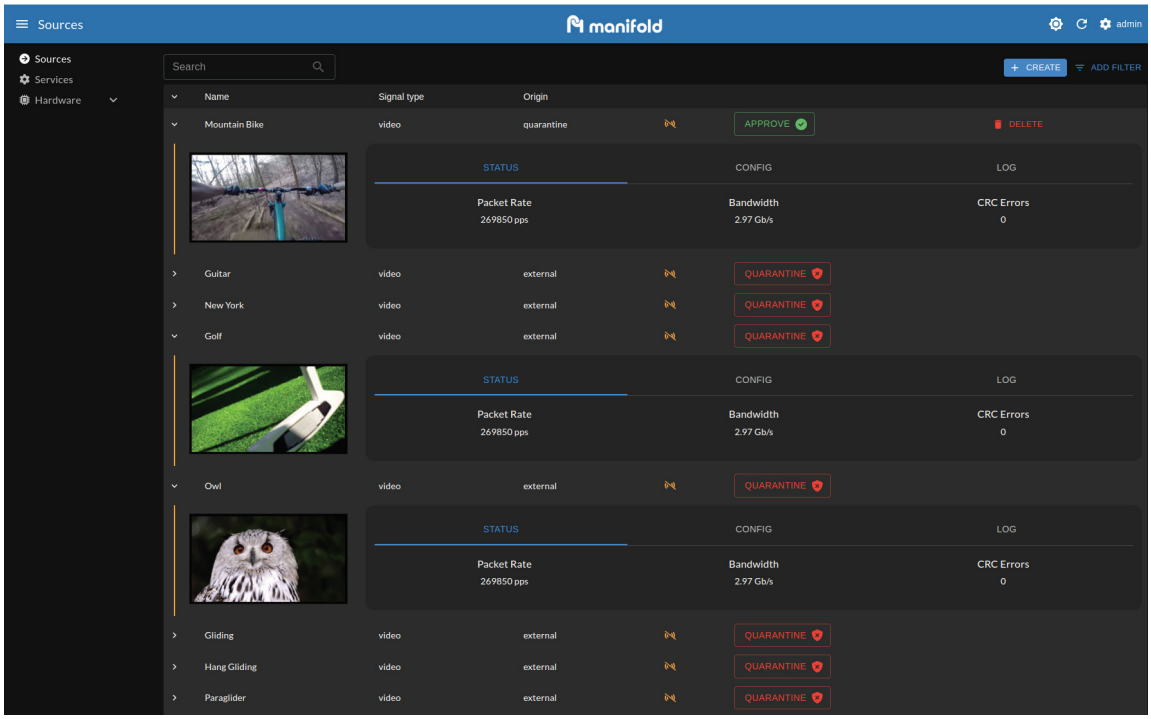
- manifold CLOUD is inherently self-healing and will automatically recover from processing failure

EFFICIENCY

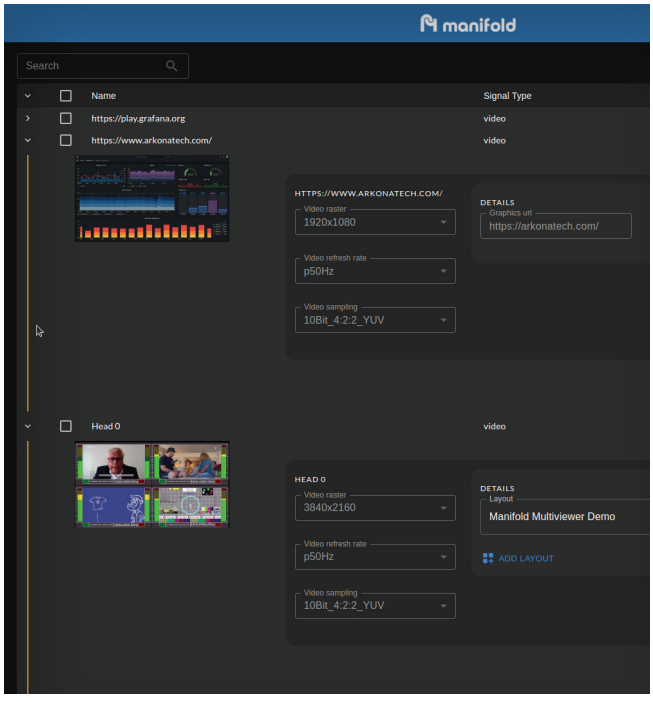
- Power consumption is 90% less than equivalent CPU/ GPU-based systems

SIMPLE WORKFLOW

Designed with operator simplicity in mind, manifold CLOUD offers a workflow focused on the basic concept of **sources** and **services**. Audio, Video and Metadata sources are displayed in a simple list view which can be easily searched and filtered. Sources can be inspected directly from the UI and display key information as well as a real-time video thumbnail or audio PPMs.



The services section is at the core of manifold CLOUD. This is where media processing functions such as multiviewers, up/down/cross converters, color correctors, delays, etc. are quickly created and configured on demand. Services take sources as inputs and generate new sources as outputs. Sources generated by services are displayed in the sources section and can be used as inputs for other services or consumed by other devices.

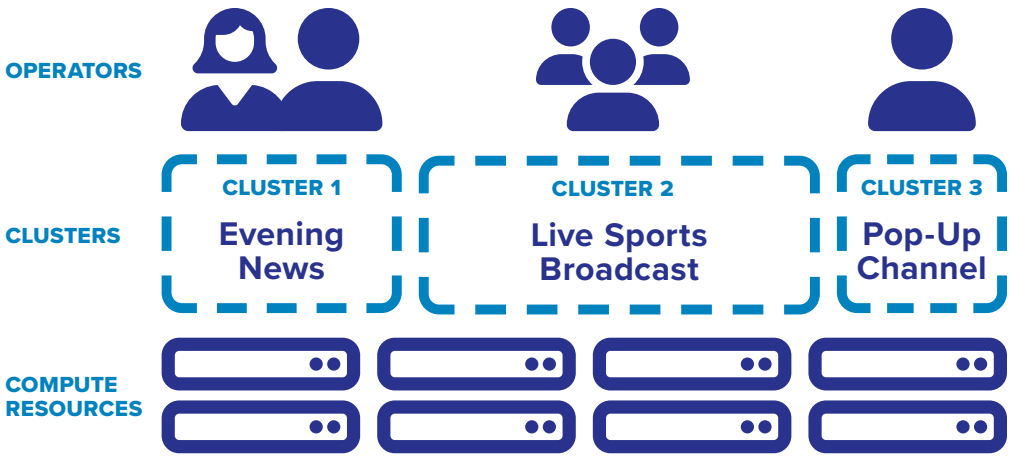


When a service is created, manifold CLOUD's orchestration function assigns the new service to an accelerator card and automatically handles all IP addressing and networking under the hood. This greatly simplifies the work for operators and allows them to focus solely on the workflow.

In the event of hardware or network failure, services are automatically restored on an alternate accelerator card for maximum resiliency. For even higher redundancy, it's possible to create the same service multiple times and have them run on different accelerator cards.

PRODUCTION CLUSTERS

manifold CLOUD natively supports multiple productions running at the same time. Productions are grouped in clusters that can operate simultaneously and independently from each other. Each production cluster contains an assignment of sources and services that can be spun up or down on demand. When a production is completed and spun down, the system will remember the last configuration so it can easily be spun up again with a simple click. A comprehensive user management system provides access to clusters on a per-user basis where an operator only sees what is relevant to the production he is currently working on.



SERVICES

manifold CLOUD provides a variety of live production audio and video processing and monitoring functionality.

manifold MULTIVIEWER

Live production multiviewer service using our unique Distributed MultiViewer (DMV) allowing for up to 512 PIPs per head from any source with no more than 2 frames/fields of delay from end to end. This service also generates high-quality (uncompressed) sub-resolution proxies of all input sources which are streamed back to the cluster as ST2110/RFC4175 encapsulated video.

manifold UDX

A broadcast quality Up/Down/Cross converter, this service takes a ST2110-20 video source and performs video format conversion between HD(720p/1080i)/Full HD(1080p)/UHD(2160p) with high quality deinterlacing. The output is a ST2110-20 video of the chosen format which then is available as a new source in the cluster.

manifold GFX

The manifold GFX inserter service overlays HTML5 graphics from a user selectable URL on-top of a manifold CLOUD video source to create a new composited video which then becomes available as a source in the manifold CLOUD system. As an alternative to compositing it is also possible to use the manifold GFX service to create ST2110 streams of any HTML5 website, in essence using it as a scan converter.

manifold CLOUD

Designed to run in a private cloud environment on COTS Intel FPGA acceleration cards from multiple manufacturers, manifold CLOUD takes advantage of the fast development cycles of COTS chip and server manufacturers while at the same time lowering the capex and power costs by up to 90% compared to CPU-based solutions.

PAC TECHNOLOGY PARTNERS

arkona BittWare a molex company prodesign FALCON-NEST

NAME	MANUFACTURER	ETHERNET I/O	SDI I/O	PROCESSING PER RU
AT300	arkona	2 x 100GE	16x16 mini BNC	600Gbps
520N-MX	BittWare	4 x 100GE	N/A	1.6Tbps
Falcon 1SM21	Pro Design	4 x 100GE	N/A	1.6Tbps
IA-860m	BittWare	2 x 400GE	N/A	3.2Tbps
Falcon AgileX 7M	Pro Design	2 x 400GE	N/A	3.2Tbps

Example of manifold CLOUD service density.

	BittWare				ProDesign		arkona		
	520N-MX		IA-860m		Falcon 1SM21		AT300		
	Per Accelerator	Per 1RU	Per Accelerator	Per 1RU	Per Accelerator	Per 1RU	Per Accelerator	Per 1RU	Per 3RU
MULTIVIEWER SERVICE INPUT	**UP TO**								
1.5G	256	1024	512	2048	256	1024	128	256	1024
3G	128	512	256	1024	128	512	64	128	512
12G	32	128	64	256	32	128	16	32	128
MULTIVIEWER SERVICE OUTPUT	**UP TO**								
3G	64	256	128	512	64	256	32	64	256
12G	16	64	32	128	16	64	8	16	64
UDX SERVICE OUTPUT	**UP TO**								
1.5G	128	512	256	1024	128	512	64	128	512
3G	64	256	128	512	64	256	32	64	256
12G	16	64	32	128	16	64	8	16	64

manifoldtech.tv

04/2024

Im Leuschnerpark 4,
64347 Griesheim, Germany
contact@manifoldtech.tv

manifold