



MARKET BRIEFS

**Executive summaries of market trends and opportunities
in key market segments and regions worldwide**

Next Generation Video Networks

Highlights

- Globally, IP video traffic will be 82 percent of all consumer Internet traffic by 2020, up from 70 percent in 2015. Global IP video traffic will grow threefold from 2015 to 2020, a CAGR of 26 percent. Internet video traffic will grow fourfold from 2015 to 2020, a CAGR of 31 percent.
- Consumer VoD traffic will nearly double by 2020. Ultra-high-definition (UHD) will be 20.7 percent of IP video-on-demand (VoD) traffic in 2020, up from 1.6 percent in 2015.
- Content delivery network (CDN) traffic will carry nearly two-thirds of all internet video traffic by 2020, according to CISCO.

by Virgil Labrador, *Editor-in-Chief*
Satellite Markets and Research

Tremendous changes, driven by technological innovations and market forces, have been sweeping the video broadcast market. People no longer view their favorite shows just on TV but also on their different devices, mostly through streaming video. Viewing habits have been changing. Today, 87% of subscription video comes from binge viewing or marathon viewing or subscription video. Thematic channels, binge viewing, and the use of cloud for viewing are prompting technology enablers to change how videos are provided to customers. Most of these “disruptive” technologies are altering business models and the dynamics of providing broadcast services. This was the consensus during the EUsatcom conference held during IBC 2015.

Despite all these changes, traditional broadcasting elements—satellite, cable, terrestrial—remain as vital enablers, though satellite could sometimes be lost in view, says Pryor. But because there is now video everywhere, satellite broadcasting is still a vital component. Satellite’s relative market share is decreasing as there is cloud, mobile data, and other technologies but its

absolute share of the market continues to grow.

The broadcast and media service provider industry continues to march towards efficiency, more innovative, spot beam architectures, higher performance and higher efficiency. What is driving the change are the enablers who drive these business opportunities. Broadcast market is changing and the impact of all these technological changes are changing the old order. Pryor said satellite remains in good shape but hidden from view, but continues to enjoy higher revenues.

Although satellite stays dominant in the broadcast industry, it is partially hidden, Pryor said. While technological advancements in video broadcasting are changing, satellite broadcast continues to grow as it adapts to changes.



Orchestrating Satellite Services

Steven Soenens, Product Marketing Director of Skyline, a supplier of end-to-end multi-vendor network management and OSS solutions for the broadcast, satellite, cable, telco and mobile industry, said looking at where current investments in the industry are pouring in, it is becoming more and more attractive to deliver video over broadband connections in homes. He said telcos, cable, and satellite companies competing for the same customers are now using cloud technology

to change their business models resulting in changes in value chain and resulting in huge pressure on operational costs.

Soenens said the satellite industry is responding by leveraging in niche markets with new technology from new vendors and migrating as well to cloud and IP technology while preserving satellite "quality of service" and "uptime." He said satellite operators who want to stick to what their services better than anybody should focus on uptime as this remains central.

"Even all the transition is happening, uptime will remain important," says Soenens, and adds it is imperative for satellites companies to use resources more efficiently through effective booking of bandwidth and automating the operational processes. He said it is also important to adapt flexible business models.

Customers are more demanding than ever before, technology is evolving at a rapid pace and there is increasing pressure to run businesses far more efficiently. An efficient network is a network that supports end-to-end unified media workflows, regardless of which network technology is used and regardless of the brand of equipment. He concluded that end-to-end service orchestration is now the key, emphasizing the efficient use of space segment utilization.

"The demand for bandwidth is ever-growing: Higher video resolutions, more internet users and usage, more communication. With the step to Q/V band in the future the space for this communication is available, but the technology still offers potential: coping with the higher frequencies and the amount of data as such, then there is the sensibility to rain fade, new infrastructures like high throughput satellites, and so on. Offering easy-to-use solutions for the higher complexity of the application is equally a big challenge and a big opportunity for the satcom industry including equipment manufacturers like Work Microwave," said Thomas Frölich, CEO of Work Microwave.

Bandwidth on the Move

Drew Klein, Director of International Business Development of C-COM Satellite Systems, observes that most customers are now looking for hardware that has the ability to have both Ku- and Ka-; those

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that have multiband solutions. When compared to Ka, he says, Ku has been shown to be cheaper, its hardware comparatively lower-priced, and the bandwidth availability a little bit better. He reveals that some studies have shown that some 30% decrease in the total cost of ownership for a Ka band vs. a Ku-band broadcaster. He admits, though, that there are pros and cons to the use of either bands.

He said C-COM has developed its iNetVu 98 cm Ka-band vehicle mount and flyaway antenna systems that have received type approval from Hughes Network Systems. He said the antenna's ability to operate with Jupiter—a leading platform for high-throughput satellite networks—significantly expands C-Coms addressable market for transportable antenna systems, bringing very high data throughputs to mobile users.

These driveaway and flyaway systems, Klein said, offer an attractive solution to customers interested in taking advantage of the availability of higher speed and lower cost Ka-band service offerings. The new antennas operate in Ka-band but are field upgradable to Ku-band, and are ideal for broadcasters, oil and gas exploration companies, telemedicine, first responders, as well as governments and military.

Klein also announced the release of its Ka-band flat panel antenna, which leverages the broadband speeds offered by High Throughput Satellites (HTS) in Ka band to provide low cost always-on connectivity into a moving vehicle. With over 7,000 Comm-on-the-Pause (COTP) units deployed on vehicles and in transportable

cases worldwide, the next logical step for C-Com, he said, was to design and manufacture an antenna that works while in motion.

The iNetVu inMotion antenna opens up land-based COTM (communications-on-the-move) markets such as buses, trains, military vehicles and many others which require Broadband Internet via satellite while on the move. He said a Ku- version is also being developed.

But he believes that what people now want is the availability of bandwidth at all times while in motion. In cell phones, signal remains even when people are in moving cars so the problem has been sorted out on the cellular side, he said. But the problem persists on the satcom side.

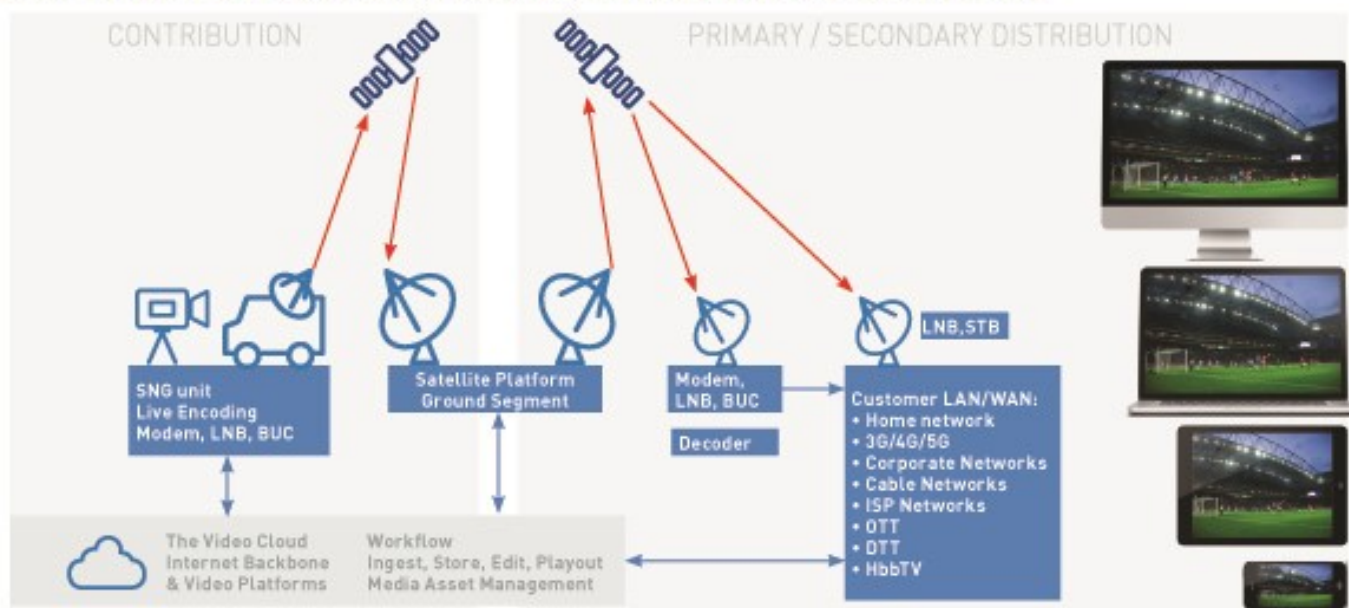
Klein believes that the 'communications on the move or satcom on the move' segment of the market is the future of the hardware business. He revealed they are developing an even more advanced super thin antenna that he hopes will change the face of the hardware business forever. He said it would be available for every type of vehicle -- land, sea, air-- and will be affordable to produce and to sell to consumer markets. He hopes that it will be as ubiquitous as a cell phone, it will be as big as a computer mouse, and it will be mounted on the roof of every vehicle. This hardware, he hopes, will provide bandwidth at all times everywhere, for whatever reason. Although he admits why anyone would need bandwidth any time, he still doesn't know, but says someone in the future may be able to figure out why. He said it is just like Steve

out at 40 megabits into ISPs. The content then reaches the company's Data Center in London via the Internet where the content is delivered over the Internet onto the broadcasters across Europe. So they will have satellite and they will take the feeds from satellite via satellite not as backup but as primary source. They can be taking those feeds, not 20 megabits but at 40 megabits, to contribute into their programming."

Some broadcasters that will be using the new system are the Sports Club in Serbia, IMC, and the Sky in the U.K.,

Group, a Belgian company that offers head-end technologies and digital TV accessories, said SAT IP allows satellite programs to be distributed not just on IP capable set-top-boxes but also on other modern IP capable devices: PCs, laptops, tablets, smartphones. This makes the technology ideal for families staying, for example in a hotel room. All that is required to enable the technology is a SAT IP software application to receive high quality satellite programming.

SAT IP was designed with several usage scenarios in mind: from consumer in-



Next Generation Video Network schematic from EUSatcom.

Holmes said. "So you know very large brands beginning to migrate away from satellite and fixed fiber using the Internet to contribute and gather signals."

He said he has seen side-by-side the satellite feed 20 megabits and the 40 megabits via Internet side-by-side on the same televisions in exactly the same screens and the difference in quality is noticeable. "It looks exceptionally good so we're really looking forward to this next season."

Broadcast Signal Distribution Over IP

Another innovative way of receiving and distributing satellite signals in homes is via SAT IP, which allows satellite programs to be distributed, like traditional IPTV, over any IP network.

home distribution to large professional distribution applications. But Dewitte believes SAT IP will allow all of today's satellite usage scenarios to be ported into the IP world as well as open up many new possibilities for advanced applications.

According to SES, which was one of the prime movers in developing the technology, SAT IP can work in single-home environments as well as in larger multi-dwelling unit (MDU) scenarios. Many network clients and existing Set-Top-Boxes today can be upgraded to SAT>IP reception simply through a software upgrade.

Support for SAT IP has been growing with six leading satellite operators and manufacturers forming a SAT IP Alliance, formalizing a coalition that was initiated last year to develop compatible hardware and software for the SAT IP technology. The SAT IP Alliance now consists of SES,

HISPASAT, Panasonic, NAGRA, ALi Corporation, MaxLinear and Eutelsat Communications.

The innovative SAT IP technology converts satellite signals into IP at the reception point using a small server, which may be located in the satellite dish or in the user's home, and distributing the signal to the different IP devices such as tablets, smartphones and laptops. This technology makes it possible to provide high-quality content via satellite more efficiently to all the screens in a home, using pre-existing networks in the building. SAT IP is currently a European standard compatible with satellite and ground networks.

The SAT IP Alliance, which will be constituted shortly in Luxembourg as a non-profit organization, will be in charge of setting forth SAT IP-related strategic developments and creating working groups through its executive committee. The main aims of the Alliance will be to promote the use of the SAT IP protocol throughout the industry, facilitate certification of new devices, and develop and improve the SAT IP standard.

Multiservice Broadcasting

Hans Massart, Broadcast Market Director of Newtec reviewed a couple of market trends in the broadcast industry. He said content remains to be the king but the difference is there is now multicamera events leading to higher bitrates. Capture content for any screen, he said, has led to more and more feeds tailored-fit for each device; next to transport streams. There is also the need for the traditional MPEG-2 TS and http adaptive streaming.

Multiservice network, or a single network that runs multiple services such as video or file exchanges. But next to that, there is also a need for an "always on" network for voice and other types of IP communications for social interaction, such as for tweeters accounts, e-mail, managed internet, etc. There is no such thing anymore as satellite-only or terrestrial-only network. All networks that we see these days are hybrid and workflows need to go flawlessly over the entire network.

Newtec revealed the findings of an industry survey it conducted in 2014, re-

sults of which are still valid, which found that over 90 percent of the industry considers the satellite segment OPEX to be a very high expense, yet more than a third (40%) say they have spare capacity. The total amount of space segment is therefore an expense area where OPEX can be reduced. The survey results also uncover many Occasional Use (OU) sessions in broadcast networks. These sessions often require a lot of manual operations, despite the cost of staff overall being considered even more important than the satellite space segment OPEX. This is another area where OPEX can be saved.

Obviously, Massart said, there is something that can be in the Opex by making effective use of the satellite resource.

Newtec also found the industry to be constantly searching for new growth. More than 80 percent of broadcasters and broadcast service providers plan to launch additional services in the near future. A single platform shared between multiple services, a "multiservice network", will help address rising costs while increasing network flexibility, enabling business cases for new service deployments.

The survey revealed that the industry wants a multiservice network is based on a single and future proof all-IP transport layer, independent of the underlying network layers. An all-IP multiservice network supports video, voice, data and broadband services on a single infrastructure and space segment.

Different broadcast linear and non-linear workflows can run simultaneously on multiservice networks. They share the same infrastructure, operating staff and space segment, instantly reducing the level of CAPEX and OPEX while increasing business flexibility.

So what do we believe the next generation should look like if we look at these trends and challenges. Massart said that by looking at all these trends, it is obvious what the next generation networks should look like. "We believe that it should all be IP...all IP transport layers, network should be flexible, scalable and efficient, multi service support, umbrella management system, workflow automation, hybrid connectivity, satellite capacity management, file exchange management," he said.

Digital Signage over Satellite

Another innovative change that has been sweeping the broadcast industry is digital signage. Today, through satellite connectivity solutions, big retail chains are able to entice customers to visit their stores and develop brand affinity through Eutelsat Broadband digital signage solutions that allow the management and monitoring of advertising content in remote locations.

Wide Area Networks (WAN) are available to transmit data and live content but for businesses and franchisees set up in rural locations, connectivity can be poor or non-existent. This is often the case for remote food retailers, fast food restaurant chains or service stations.

Herman Schulte Kellinghaus of Eutelsat Broadband stated that with Eutelsat's KA-Sat bird, they are able to provide broadband connectivity at a competitive price-point to any location across Europe, parts of North Africa and the Middle East. This is achieved through KA-Sat's futureproof technology, which provides high throughput bandwidth on the spot. Eutelsat Broadband also provides tariffs and terminal solutions that can connect digital signage, in-store radio and remote advertising systems.

Kellinghaus said the company's KA-SAT is a HTS satellite delivering high-bandwidth services to users beyond range of terrestrial networks. KA-SAT's revolutionary concept is based on a payload with 82 Ka-band spotbeams connected to a network of ten ground stations. This configuration enables frequencies to be re-used, taking total throughput to beyond 90 Gbps, and making it possible to deliver Internet connectivity for more than one million homes, at speeds comparable to ADSL. With the satellite's capability, his company has now become a sort of telco operator.

Their company, he said, has a lot of experience promoting B2B products, moving on to enterprise customers, and now to system integrators. Today, he admits, they are more of enablers, providing complete solutions for those in the digital signage business.

But the expectations and requirements of the retail industry is ever increasing, he explains. "Now it is not good enough to



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Modems for the Next Generation Satellite Networks

Work Microwave, a leading European manufacturer of advanced satellite communications equipment, will introduce its A-Series FPGA-based modem platform at the IBC Sept. 9-13 in Amsterdam. WORK Microwave will provide demonstrations of the AX-60 IP modem, showing attendees how the new platform provides the high performance necessary for IP trunking and IP network infrastructure applications.

"One of the biggest challenges that operators in the satellite communications environment face today is the rapid rate of technology innovation. When it comes to modem equipment, they need more flexibility and faster deployment times," said Jörg Rockstroh, director of digital technologies at Work Microwave. "We designed the A-Series to specifically address these issues. Through a flexible, future-proof, IP-based architecture, the new platform enables our customers to adapt to future requirements, including the next-generation DVB-S2X standard, with ease and affordability."

Using the AX-60 IP modem, operators can transmit and receive DVB-S2X signals with utmost efficiency and simplify operations. The platform is completely customizable and scalable, adapting to any throughput (i.e., analysis method, and other wave-S2X, it is an ideal solution for telecommunications companies, internet service providers, government and intelligence agencies, and operators of low orbit (LEO) satellite constellations. Optimal use cases include high-speed network links (i.e., 100, 200, or 300 Mbps) over satellite, IP-based satellite newsgathering, IP-based contribution links, connection to and from LEO for earth observation, and reception and analysis of satellite communication. By providing a future-proof and flexible platform for both standardized DVB-S2X and customized satellite communication, the AX-60 IP modem simplifies the transition toward an all-IP environment.



Work Microwave's AX-60 IP modem

Some of the advanced features and benefits that will be on display at IBC2016 include higher modulation schemes up to 256APSK, a finer granularity of ModCods, and advanced filtering. Work Microwave will also show the platforms' enhanced access from monitoring and control to the transmission parameters, allowing direct real-time monitoring as well as a quick adaptation to specific operator requirements.

The A-Series platform includes modem, modulator, and demodulator options, all of which are now shipping.

More information about Work Microwave is available at www.work-microwave.com, or visit their booth at the IBC at Hall 5, booth # 5.A77.

have text on the screen. It is not enough to have HD pictures. People also expect some interactivity possibilities." He said customers also want to give feedback on the screen and want to get information as quickly from the advertisers. These allow the retail chains the ability to profile their customers and gather other vital information such as measure the effectiveness of the content played, receive a breakdown of the viewing audience for each ad played, know who looks at the digital signage displays and for how long, and determine the monetary value of an ad per targeted shopper, making digital signage an ideal form of targeted advertising.

In addition, Kellinghaus said, they are also employing Cross Media for their customers by providing WiFi, which attracts customers who eventually get hooked to

buying their products.

Deployment of digital signage has become more complex, he said, because of the variety of possible connections (DSL, fiber), networks, telcos, and needs of the customers required. But he said their "HTS satellite is some kind of tool box which does it all" because it also offers broadband IP connectivity.

"The good thing is that the satellite issue itself can be completely kept independent from the rest of the infrastructure. So digital signature can come on the side of retail market they don't need to touch IT infrastructure and usually the IT managers of those companies like that because they don't like to be disturbed by digital signage people. It is always 'on' solution, so we can always touch the system. The ideal is never go on one side let's

just say manage the system from remote and finally and that is the biggest advantage of the satellite is you can place it everywhere you want."

Next Generation Satellite Broadcast Services

Examining the different changes in the broadcast industry, Hub Urlings of General Manager of M2sat, observes that production cost had been going down. Equipment, editing suites, and connections are all going down, there is no more need to invest because even the broadcast workflow systems can be rented out. He said newcomers in the industry prefer to rent equipment and services rather than invest because of the complexities involved. While operational costs to clients may be

higher, there is less worry involved in the production. The satellite industry, he says, must respond to the challenge with lower cost, more flexible solutions, easier to use systems, and higher throughput for the connections. While operational costs

Today, he said, satellites are competing with terrestrial broadband networks with 3G or 4G connections. But Urlings said this is not necessarily a threat to satellites but in fact poses an enormous opportunity because today it is not only the broadcast industry now that uses video. So now, there is a lot of cooperation among different industry players.

Urlings said we now see multi-network SNGs; they are no longer the SNGs of old where their only function was to send videos. SNGs, he said, are now multifunction communications van that can send videos, radio signals, and can communicate with the studio. They send files, they check background for the reporters who do interview. And so SNGs have to have good satellite and even terrestrial connections. "The market is seeking for flexible solutions that are more cost-effective. And that has nothing to do anymore with the traditional SNGs," he added.

He also recommends the use of IP for targeted groups of audience, unlike when you have a big audience. "There is a lot of broadband infrastructure around the world and to reach customers around the world that is very much cheaper than a satellite. You go mpegs for a big audience then you need a satellite but when you have a special diving channel to diving enthusiasts also over the world you might as well go over IP."

He also lamented the fact that while IPTV is now growing worldwide, the technical know-how and expertise to put into IPTV channel or a streaming remains very scarce. So there is difficulty for broadcasters to put the whole chain of video contribution and distribution from beginning to the end.

One company that is committed to providing innovative products for thenext generation satellite broadcast networks is Holzkirchen, Germany-based Work Microwave. Work Microwave's Satcom Technologies division offers a wide range of high-performance, advanced satellite communications equipment for telecommunications companies, broadcasters,

integrators, and government organizations operating satellite earth stations, satellite newsgathering vehicles, flyaways, and other mobile or portable Satcom solutions.

"Our comprehensive portfolio — which includes satellite up/down converters, DVB-S/S2/S2X modulators and demodulators, modems, and redundancy switch systems — is renowned for helping operators get the most out of expensive satellite bandwidth, optimizing data transport, and dramatically improving satellite signal quality," said Work Microwave's CEO Thomas Frölich.

"All of WORK Microwave's Satcom solutions feature optional customized bands, superior spectral purity, an intuitive user interface, compact and robust mechanical design, extremely low power consumption, high MTBF, and state-of-the-art technologies such as predistortion, carrier ID, OptiACM and the latest features from the DVB-S2X standard extension like low roll-off and super-frames... They come with a three-year standard warranty and adherence to all European export control regulations for guaranteed customer satisfaction." Frölich added.

Second Generation DTH Services

Mark Lambert, VP and Managing Director of EMEA from Advantech Wireless, said Advantech is achieving lots of innovations and advances in certain areas of the broadcast industry, such as in the delivery of DTH TV. He said they're already in the second generation of DTH TV by pushing forward various encoding technologies. He said they've been delivering television signals via DVB2 for 11 years. He foresees more progress in the DBS owing to the introduction of successive various encoding technologies.

He said their usual challenge is how to deliver their services more cost-effectively. In DTH, there are still clients who want to deliver the signals the traditional way, via satellite. But now, he said,

you can employ IPTV using new technologies.

Lambert cited the development of gallium nitride (GaN) amplifiers which Advantech introduced about five years ago. In partnership with key technology providers, he said Advantech engineers have focused on technology transition to high frequency, high efficiency, and high performance, as demanded by the growing Satcom on the Move, Mobile, man pack, broadcast and teleport markets.

"They've got a lot of benefits in terms of size and weight, reducing the equipment that you need in terms of size and weight. It is also super linear, so it is fantastic for putting high order modulation schemes through." Now you can put all the carriers through the same amplifiers, he said, which is much more efficient. It is now possible for the first time since the introduction of the Solid State Microwave Technology to design and manufacture Power Amplifiers that exceed by several orders of magnitude the reliability, linearity, power density and energy efficiency of all existing technologies, being GaAs, LDMOS, or TWT.

Today GaN is a mature, robust technology with extraordinary reliability and is now used by both the military and commercial satellite markets. GaN high power density also allows for smaller devices, reducing the capacitance, enabling high impedances, wider bandwidths, and reduced size and cost. Additional benefits include industry-leading efficiency of operation, reduced cooling requirements, and lighter weight.

Conclusion

A better understanding of the next generation broadcast technologies, Simon Pryor said, will further push the industry forward. "As always the broadcast market is changing even changing and people have to adapt because if you don't you would die."



Virgil Labrador is the Editor-in-Chief of *Satellite Markets and Research* based in Los Angeles, California. He is the author of two books on the satellite industry and has been covering the industry for various publications since 1998. Before that he worked in various capacities in the industry, including a stint as marketing director for the Asia Broadcast Center, a full-service teleport based in Singapore. He can be reached at: virgil@satellitemarkets.com



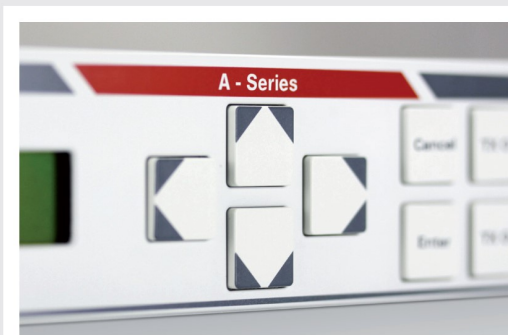
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