

# NEWS

A roundup of the latest Everyday News from the world of electronics



## High noon for HDR showdown in Berlin – report by Barry Fox

To Berlin again in early September for another IFA – which this year had become a swamp of drones, fitness wearables, connected fridges, big and clumsy virtual reality headsets, smart toothbrushes and bigger 4K screens.

(US Patent 9 635 377 – <http://bit.ly/2yD9DO0>). Instead of upscaling or ‘stretching’ a conventional SDR (standard dynamic range) signal to simulate HDR, Samsung’s ‘High Dynamic Range Image Processing Device and Method’ relies on

The optional data includes histograms, showing the lowest, highest and most frequent pixel information, and sharpness information. The data is sent in packets stored inside a 10-bit base layer signal for backwards compatibility.

### HDR10+ vs Dolby Vision

The move into cloud-based voice control looks likely to be a lot more fruitful for the future (especially for audio streaming and in-car entertainment) as was the foundation of a new consortium of Samsung, Panasonic and 20th Century Fox, which is clearly intending to cut Dolby’s proprietary HDR (high dynamic range) system Dolby Vision off at the knees – and end the current, crippling HDR standards battle.

The consortium is promoting and licensing Samsung’s new HDR10+ system, which uses metadata to control all aspects of picture quality on a frame-by-frame basis (like Dolby Vision) but (unlike Dolby Vision) the HDR10+ metadata takes up very little extra bandwidth and (unlike Dolby Vision) the Samsung system is available to any hardware manufacturer or content producer under a royalty-free licence scheme.

Samsung, Panasonic and Fox have been secretive over how exactly HDR10+ works, but as is so often the case, their recently published patents tell all.

### Low-bandwidth solution

The lynch pin is a patent granted to Samsung Electronics in April 2017



SAMSUNG



Panasonic



additional information or metadata to describe each scene or frame.

The metadata is of two types, ‘compulsory’ and ‘optional’. Compulsory data includes information on the maximum and minimum brightness for each scene or frame, backlight peak brightness for each scene or frame, colour gamut and temperature, and gamma and contrast.

### Look-up table solution

A new HDR10+ capable TV will have look-up tables stored in its software, which hold details of the set’s display capabilities. So the metadata can squeeze the best results available from each individual set, regardless of the brightness of its display. HDR10+ uses Bezier transfer curves which smoothly convert digits to light – without having to switch between gamma and log transfer functions as is necessary for the BBC Hybrid Log Gamma broadcast HDR system to work without metadata.

To minimise the amount of metadata needed, and so use up as little transmission or storage space as possible, HDR10+ only codes changes in the picture parameters. So if there is no change between picture frames, or even between scenes, no data – even compulsory data – is needed.

In this way, claims Samsung’s patent, only around 20 bytes of data are required for each frame, and at 60Hz a bandwidth of only 10kbps is needed for the metadata. In practice, metadata will often only be needed for scene changes, so the data overhead may be as low as 1kbps. By contrast, the Dolby Vision metadata adds up to 20% of the normal TV signal.

## High noon for HDR showdown in Berlin – continued

Samsung also has several more recent applications which are still pending. These include United States Patent Application 20160381363 (<http://bit.ly/2gS4aJG>), for 'HDR Tone Mapping Methods with Scene Adaptive Paramaterized Tone Map Function'. This deals with the Bezier transfer curves on which HDR10+ relies.

Patent filings from Panasonic (such as US 20170251245 – <http://bit.ly/2znIfRd> and 20170251244 – <http://bit.ly/2inFT1G>) reveal what Panasonic has brought to the HDR10+ table – ways and means of decoding the signal and metadata, and managing the way it flows to the TV set. This is done by HDMI connection with HDCP (High-bandwidth Digital Content Protection) copy protection.

### Trademark resolution

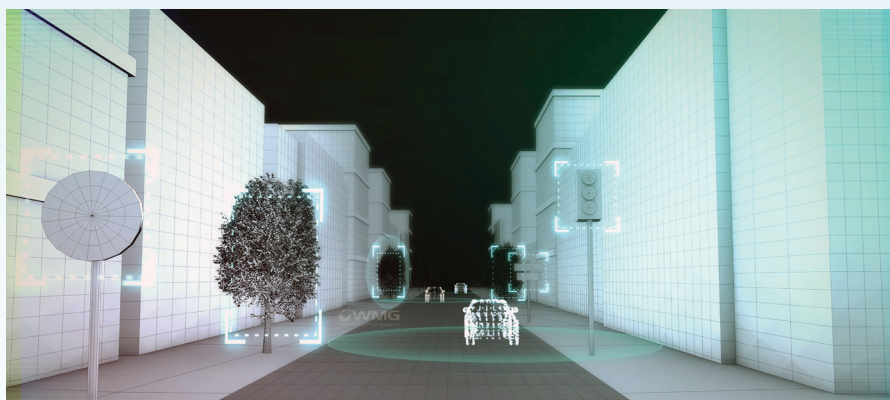
The HDR10+ consortium announcement explains why Samsung has

been so keen to register a trademark for the word 'HDR10+'; it will strengthen licence control. But it does not explain why Samsung tried also to land grab rights on the word 'HDR10', which is already widely used in the industry to describe the basic HDR system, which is part of the Blu-ray standard. Most likely, Samsung's lawyers were briefed to protect the word 'HDR10+', ahead of the new system announcement, and got carried away trying to collar all words similar to 'HDR10+'.

The good news, though, is that shortly before IFA, Samsung finally dropped all claims to the industry word 'HDR10'.

So, hopefully, the world of TV can now move forward into a new age of improved pictures with future-proof sets that automatically self-adjust to all the royalty-free HDR systems, HDR10, HDR10+ and HLG.

## Midlands roads to be UK autonomous vehicle testbed



Roads in Coventry and Birmingham are set to become a world-class UK testbed for developing the next generation connected and autonomous (CAV) of vehicles, thanks to a new £25m programme of investment being led by the Warwick Manufacturing Group (WMG) at the University of Warwick.

The pioneering venture, undertaken by a consortium of research and industry partners, will make UK roads ready for CAVs by developing wireless networks, analysing how vehicles behave in real urban environments and involving the public in their evaluations.

The UK Central CAV Testbed will be based on 80km of urban roads in Coventry and Birmingham, creating a world-leading connected infrastructure and eco-system, and positioning the Midlands as a centre for cutting-edge automotive and communication technologies.

Professor Paul Jennings, an expert in CAV technology from WMG, is leading the project. He commented: "The Midlands has a proud heritage of pioneering vehicle development, and I am delighted to be part of the next era – bringing CAVs onto the road and allowing all of us to reap the benefits as soon as possible."

The control room for the testbed will be located within the National Automotive Innovation Centre (NAIC) – a unique centre which will provide a critical mass of research capability, combining automotive expertise nationally and internationally.

The development and deployment of CAVs is driven by the need to reduce traffic congestion and accidents on our roads, and will provide significant societal benefits, as well as business opportunities for the automotive, communications, infrastructure and transport sectors in the UK.

## Arduino boards support IoT connectivity

Arduino has unveiled the new Arduino MKR WAN 1300 (LoRa) and the Arduino MKR GSM 1400, two new boards that are designed to offer a practical and cost-effective solution for developers, makers and enterprises, enabling them to quickly add connectivity to their projects and ease the development of battery-powered IoT edge applications.

The MKR WAN 1300 delivers LoRa low-power WAN connectivity, and the MKR GSM 1400 adds global 2G/3G communications capability.

Offering 32-bit computational power, the MKR WAN 1300 is based around the Murata LoRa low-power connectivity module and the Atmel SAM D21 microcontroller, which integrates the 32-bit low-power ARM Cortex-M0+ processor, 256KB Flash memory and 32KB SRAM.

Like the MKR WAN 1300, the Arduino MKR GSM 1400 is based on the ARM Cortex-M0+ based SAM D21, but integrates the u-blox module to deliver global 3G communications.

## New PV cell technology

A recent report from the Society of Chemical Industry in London has highlighted the potential of a new kind of solar PV (photovoltaic) cell based on non-silicon materials.

Silicon solar cells have long been the standard for the solar renewable energy sector, with almost 90% of PV cells globally containing silicon. However, research in the last decade has produced an alternative to silicon-based PV cells that could challenge their position on the market. Made from readily available materials such as ammonia and iron, perovskite solar cells are highly efficient and inexpensive. As silicon solar cells struggle to reach 20% in power conversion efficiency, the National Renewable Energy Laboratory, US, has revealed data predicting 50% efficiency for perovskites.

Occurring naturally, perovskites are inherently light absorbing, making them the ideal candidate for PV cells, as well as being light-weight, flexible, and semi-transparent. Perovskites are popular with solar power researchers and engineers as they can absorb a wider range of wavelengths of light, increasing their capacity to convert sunlight into electricity.

Researchers still have obstacles to overcome, including toxicity and UV-based degradation, but the future is starting to look bright for these new PV materials.