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FROM THE EDITOR

The world's very first 8K high definition environmental documentary "Water with Life", sponsored by Delta Electronics Foundation and shot in collaboration with NHK Enterprises, has been screened in National Museum of Natural Science in Taichung, Akihabara in Japan, National Science and Technology Museum in Kaohsiung and National Museum of Marine Science and Technology in Keelung for charity. We hope the documentary will raise public awareness of water resource scarcity. As the weather gets cooler in autumn, Delta will be presenting the stunning image quality and magnificent views of the film using Delta's world-leading 8K projection technology with ultra-high brightness at the beautiful Sun Moon Lake. This is exactly the Thao ancestral residence featured in the film. We sincerely invite you to the visual feast in the picturesque site on October 10th and 11th.

In this issue of "Brand People", we interviewed, Mr. Wim Chang (A-Gan), the Chief Executive Officer of Delta Electronics Foundation. He is a well-known environmentalist in Taiwan and once managed a two-month water bill of NTD\$45 for a family of four. He shares with us ways to conserve energy as well as the planning and vision of Delta Electronics Foundation in climate change, energy saving, green building, low carbon emission and talent development.

In addition to the enormous energy savings delivered by Delta regional headquarters, Delta assists Shanghai Oriental Hospital to achieve energy savings and greater efficiency with building automation management recently. Through the adoption of LOYTEC integrated with building information modeling (BIM), energy usages are reduced and management efficiency is also improved. This has been detailed in "Special Report". With the connection of applications in the Internet of Things (IoT), the function of streetlights is no longer limited to purely lighting up streets at night. In "IoT Smart Solutions" in this issue, we will shed light on how Delta's Smart Streetlight Solution, which integrates energy-saving lighting, IoT device, information technology and innovative value-added service, help invigorate smart city.

Mr. Cheng, the founder of Delta Electronics Inc., has been sponsoring underprivileged students from Chiang Mai and Chiang Rai regions for nineteen years. He not only encourages students to study hard, but also welcomes them to join Delta after graduation. And after devoting significant efforts to automation for more than twenty years, Delta is applying the concept and practice of smart manufacturing in various industries. During the recent CIIF in Shanghai and New Industrial Automation Product Launch in Beijing, many new products that satisfy the requirements of high-level smart upgrading by industrial users are showcased. We invite you to read the "Brand Circle".

Have you visited Portland the city that was ranked the top sustainable city for two consecutive years? Portland has positioned itself as the "space for citizens" and all the mass transit is mainly one-way-street design. This allows light rails, buses, bicycles, and private cars to coexist on the boulevard without compromising sidewalk space, an excellent model for Taiwan. You will definitely enjoy the contents covered in "Delta Green Life".

Brand Management Office



Delta assists Shanghai Oriental Hospital to achieve greater efficiency with building automation management

Delta assists Shanghai Oriental Hospital to achieve greater efficiency with Building Automation management

Text by BABG

Shanghai Oriental Hospital (affiliated East Hospital of Tongji University) is a large Class 3 Grade A general hospital that combines medical care, teaching, scientific research, emergency medicine, preventive care, rehabilitation, and healthcare in one. The new general building includes two basement floors and 24 stories above ground. As part of a remodeling effort, it was required to introduce the monitoring and control systems of collaborating contractors for the expansion/remodeling of elevators and building automation to the Building Information Modeling (BIM) maintenance and management platform of the Shanghai Oriental Hospital. This would achieve integration of six management aspects for the hospital, namely building information, space, maintenance and service, smart facility monitoring, safety protection, and comprehensive decision-making.

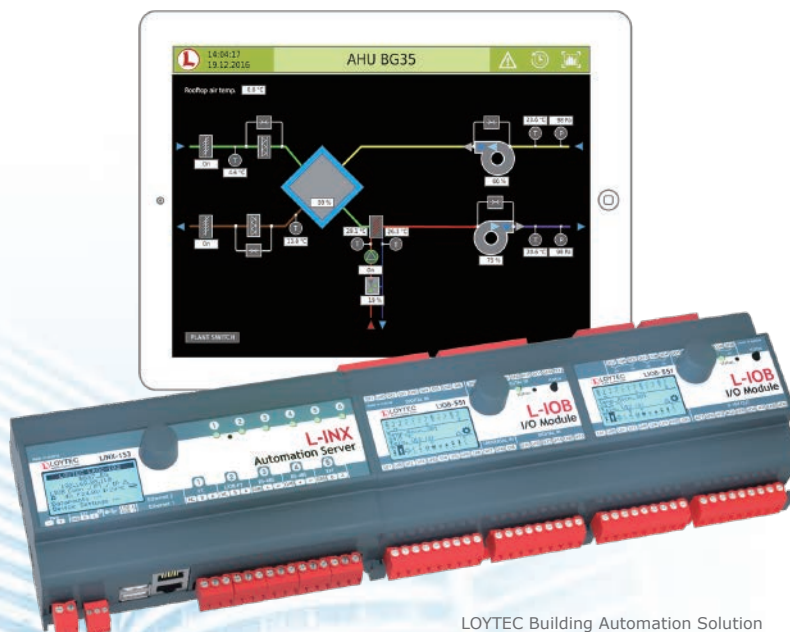


SPECIAL REPORT

A 3D visualized BIM is currently in the mainstream for building construction among engineering teams. It provides efficiency with enhanced software and hardware and updated construction criteria and regulations. Combining operating data and parameters for all mechanical/electrical systems and facilities within the building control system, the BIM system analyzes operating information to enhance the service and maintenance efficiency of equipment by monitoring energy consumption and conserving energy of mechanical/electrical equipment.

The LOYTEC Building Automation Solution supports OPC communication to integrate with the BIM maintenance and operation platform seamlessly and provide information on the maintenance and operation parameters of mechanical and electrical facilities so that it is more intuitive and accurate for related staff while troubleshooting or performing maintenance and care, significantly improving the operational efficiency of the hospital.

The Shanghai Oriental Hospital adopts the LOYTEC Automation Servers LINX-220 and LINX-212 and I/O Modules LIOB-150, LIOB-151, and LIOB-152, cooling/heating source communication gateways, sensors, and actuators. The IOT-based Automation Servers L-INX, in particular, collect information about external collaborating contractors while at the same time integrating internal corporate OA systems. Facility managers can review equipment maintenance, operation, and alarm status in the new building anytime from anywhere and plan preventive maintenance to reduce failure of equipment according to operating conditions, periodic maintenance requirements, and the workload of the maintenance group.



LOYTEC Building Automation Solution



To fulfill the strict environmental control demands and address high energy consumption at the hospital, Delta took advantage of the feature of LOYTEC to support various open interfaces and achieve integrated monitoring across cooling/heating source systems and equipment. Ventilation systems are deployed throughout various prioritized regions in the hospital for monitoring purposes. They control pressure according to each medical care feature and process flow. Isolated ventilation for the equipment room, the laboratory, and each department/office ensures reasonable and orderly air flows to prevent the spread of bacteria.

All air systems of large spaces such as the lobby are designed with low-speed airways and fixed air flows. Small spaces such as general wards and doctor's offices adopt primary air fan coil systems. These two sets of customized air-conditioning and monitoring systems optimize the energy-saving central air-conditioning system based on external climate changes while at the same time maintaining a comfortable temperature and humidity and effectively controlling bacterial growth.

The LOYTEC Building Automation Solution integrates smart management of mechanical/electrical equipment and links the BIM platform inside the hospital so that the service staff can quickly repair and resolve problems. It helps optimize the overall operational efficiency and reduce the management cost and provides the Shanghai Oriental Hospital with operational management featuring 24/7 high-quality environmental control and highly-efficient energy conservation.



Mr. Wim Chang, Chief Executive Officer of Delta Electronics Foundation

Sustainable development for a green future

Interview with Mr. Wim Chang, Chief Executive Officer of the Delta Electronics Foundation

Text by Brand Management Office

With the threat of global warming, the Delta Electronics Foundation (DEF) has focused over the years on issues such as energy efficiency improvement and climate change adaptation. In cooperation with relevant organizations at home and abroad, DEF endeavors to promote globally the mission established by founder Bruce Cheng, "To provide innovative, clean and efficient energy solutions for a better tomorrow." In this issue of Brand News, we interview Mr. Wim Chang, Chief Executive Officer of Delta Electronics Foundation, in which he shares with us the positioning and future development of the Foundation as well as his experience promoting water and energy conservation for more than a decade.



Following the vision and passion of the founder for the environment Practicing corporate social responsibility

Mr. Wim Chang, known as "A-Gan" to his colleagues, was promoted to Chief Executive Officer of DEF in February this year. When he joined the Foundation in 2007, his first job was to publish Delta Environmental E-News, which later became the Low-carbon Living Blog in line with digital trends. So far, the blog has received over 5 million clicks, and has been recognized by awards such as the Chinese Language Blog Award, Xue Xue Foundation Award, and the Environmental Hero Award by Global Views Monthly. The website contents were organized and published in the book 24 Lessons for a Low-carbon Life and the blog was transformed into the broadcast program Climate Campaign in Taiwan, which has won awards such as the China Times' Openbook Awards and Golden Bell Awards. In addition to providing digital information, A-Gan is one of the first colleagues from Delta to participate in the UN climate conference on behalf of the Foundation and has participated in side events of UN Climate Conferences on nine occasions, which subsequently prepared the DEF for speaking in international climate platforms.

The origin of the Foundation began in 1990 when founder Bruce Cheng donated scholarships and grants to 16 colleges and vocational schools. The scholarships require a professional management team, which led to the establishment of the Foundation. In the beginning, the main business of the Foundation was to approve and manage scholarships. One unexpected benefit was many sponsored students would later go on to join Delta, and one by one they have ascended to executive positions at Delta. Around 2000, the Foundation's projects gradually expanded, such as how to improve society's overall energy use efficiency to fulfill Delta's continuous mission of "To provide innovative, clean and efficient energy solutions for a better tomorrow." As climate change has become the greatest challenge to human sustainability, the Foundation has since 2005 focused more on promoting green buildings, participating in international climate negotiations and translating and informing the public of the latest climate issues and energy saving solutions through exhibitions and large-scale projection activities. A-Gan explained, "At present, the main axes of the Foundation's projects are raising the awareness of energy conservation and climate change, promoting green buildings and low-carbon vehicles, and cultivating talent. These efforts are fundamentally aimed at improving mankind's energy use efficiency."



Using every penny wisely Valuing the effectiveness of resources invested

Many of the Foundation's projects have continued over a long period of time. For example volunteer training, managing blogs, and providing input to think tanks, have continued for more than 10 years. The Foundation attaches great importance to effective investment in resources. In 2018 it introduced the system of Social Return on Investment (SROI) to analyze the SROI benefits of green building promotion activities, as well as changes stakeholders may experience from related activities. The results show that an average input of NT\$1 can lead to the benefit of NT\$8.5, and even up to NT\$12 or NT\$13 for some large-scale activities. Compared with the social investment of corporate foundations at home and abroad, the SROI investment benefit of DEF is obviously quite high, and it shows outstanding results from its public welfare investment and promotion. The Board of Directors of the Foundation assesses whether projects should be undertaken by suitable units and whether resources should be moved to areas of greater need, even if some projects are progressing smoothly, or if external resources have already been invested. A-Gan says for assessing SROI it is hard to gauge the effectiveness of projects such as talent cultivation or those that are less likely to have immediate gains from investment. However, as long as the Board of Directors thinks the long-term investment in certain projects will contribute to society, the Foundation is willing to provide long term support.



Promoting Delta's energy-saving designs Building green cities

The Foundation often explains climate and energy related issues to the public by holding large-scale events and exhibitions, and A-Gan often faces the public directly as the representative of the Foundation. For example, for "Delta's Ring of Celestial Bliss" at the 2013 Lantern Festival, which was planned by the current Vice Chairman of the DEF Ms. Shan-Shan Guo, A-Gan stood in front of the projector while worrying about the safety of a large crowd of spectators inside the venue every evening. In 2014, at the "Run for Water, Water for Run" exhibition also planned by Ms. Guo, a duplicate of the bathroom from A-Gan's home was installed at the No.1 Warehouse of the Songshan Cultural and Creative Park, and was called "A-Gan's Bathroom." Later, the design of recovering laundry water for flushing toilets won the "Water-Saving Expert" award from the Water Resources Agency, Ministry of Economic Affairs, the following year. Since 2015, Delta's Green Building Exhibition has toured Paris, Beijing, Taipei and Kaohsiung and other cities, showing Delta's energy-saving designs and the electricity bill of A-Gan's home. Visitors to the exhibition not only see the latest energy-saving technologies of Delta, but they can also relate to these practical household solutions.

Delta constantly come up with new energy-saving technologies every year. These technologies are related to power conversion, heat dissipation, charging, energy storage, telecommunications, power recovery, intelligent buildings and more, which will make significant contributions to slowing down global greenhouse gas emissions, if popularized. A-Gan says, "The advantage we have over other corporate foundations is that we have opportunities to use the cutting-edge technologies of Delta to help promote science and technology education related to the climate. For example, by adopting 8K projection technology to promote environmental issues, we hope that the audience will see the beauty of the environment and the conditions of damage and destruction using the finest image quality, so that audiences are motivated to care about environmental issues." He stresses that these activities, combined with Delta products, are not meant for marketing, but are hoped to promote more advanced policies and support the popularization of new energy-saving technologies. Taking the elevator power recovery system as another example, he says that Taiwan did not formulate energy consumption standards for elevators in the past. However, after the Foundation entrusted a third party to conduct energy-saving research, it was found that elevator power recovery systems could have a yearly penetration rate of 7% in Taiwan, and would save 170 million KWH of electricity every year. He says, "The Foundation sincerely hopes that policymakers at the national and local government levels are aware of the development of new technologies and their contributions to energy conservation. This can bring long-term benefits to enterprises, consumers and future generations."



Stressing the importance of water to life Urging people to cherish water resources

Even though he is over 80 years old now, founder Bruce Cheng still shows his consistent modesty and thirst for knowledge in exploring energy-saving technologies daily. This includes his studying energy sources for new energy vehicles, riding nearly 500 kilometers to the grassland in Inner Mongolia from Beijing, or understanding the operating principle of radio astronomy in person. His devotion to promoting energy savings is truly impressive. One of A-Gan's jobs is to accompany Mr. Cheng to discussions with outstanding experts in various fields. At the end of 2016 with founder Cheng's passion for 8K UHD projection technology, the Foundation led by VP Shan-Shan Guo had the opportunity to co-produce Water with Life, the world's first 8K high-definition environmental documentary, with prestigious NHK Enterprises. The film examined the relationship between water and humanity under climate change. On March 31, 2019, Water with Life became the first environmental documentary to be shown on the NHK BS 8K channel. Beginning this year, the Foundation has held a series of well-received show tours with an 8K 36,000-lumen UHD laser projector for audiences at the National Museum of Natural Science in Taichung, the Museum of Drinking Water in Taipei, National Science and the Technology Museum in Kaohsiung, the National Museum of Marine Science & Technology in Keelung, Akihabara in Japan and more.



Founder Bruce Cheng (5th from left), Mrs. Cheng (3rd from left), Mr. Jin, Senior Vice Chairman of Delta (2nd from left) and A-Gan (1st from left) are in the group photo in front of the LAMOST telescope at the Xinglong Observatory of NAOC in Beijing



Ms. Shan-Shan Guo, Vice Chairman of DEF (middle), A-Gan and his colleague take part in the international climate event on behalf of Delta



Projecting Water with Life and Sun Moon Lake in the same frame Echoing the climate conference Blue COP

Sun Moon Lake is the background and main filming spot for the film *Water with Life*. The film originates from the relationship between indigenous people and the water. According to a legend told by the elderly, Thao ancestors chased white deer to Sun Moon Lake. In their dance, the interaction between people and water is expounded. Ecological fishing has been a sustainable way of life for the indigenous people for a long time. During National Day holidays this year, *Water with Life* will be shown to thousands of people outdoors at Sun Moon Lake as a public event, so that more people can experience the tremendous power of 8K. At present, the DEF, Brand Management Office, Corporate Communications, Human Resources Department, DSBU and Intelligent Lighting Department are working closely together to arrange the event. In addition, the Foundation has applied to show the 8K *Water with Life* at the exhibition area of the 25th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP25) in Santiago, Chile this year. Echoing the idea of "Blue COP" proposed by the host country, climate policymakers from various countries can focus on issues of ocean and water resources. At the end of September, the Foundation will be the first to translate the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC), so that the views of scientists can be known to Taiwan's greater public.



Living the low-carbon life Starting with yourself

After work, A-Gan does not free himself from his responsibility, and continues to apply everything he learned from work. Having participated in many projects related to green buildings, A-Gan uses his family of four as long-term energy-saving experiment subjects. He successfully achieved the goal of reducing his annual electricity bill to below NTD 5,000. A-Gan says that the thirty-year-old condo he bought with a loan last year is in its third version of energy-saving renovation that includes replacing the original owner's door glass with mesh screens and opening ventilation paths; removing rain awnings to improve natural lighting, and making good use of the white wall reflection of the opposite house so that it's not necessary to turn on the light when reading in the living room during the day. In terms of new energy-saving devices, A-Gan recommends the replacement of LED lights first. One of the LED lights in A-Gan's home is a Delta product he bought in 2009, which is still very good, even after ten years of use. The amount of electricity saved exceeded the expense of replacement long ago. As the price of new LED lights has greatly declined, it takes less than a year and a half to break even. A-Gan also suggests installing total heat exchangers, which are also products of Delta. As the autumn approaches, the night air can be cooler outdoors. Total heat exchangers can draw cooler outdoor air in to cool the interior and reduce the operation time of the variable frequency cool-air compressor. In winter, the situation is just the opposite; people can enjoy outdoor fresh air with windows remaining shut to keep warm. Delta's exhaust fan is one of the energy-saving highlights of A-Gan's home, which saves nearly 80% in electricity compared with conventional exhaust fans. A-Gan has even purchased Delta's batteries and installed them at his home. He has assembled a small peak and off-peak electricity regulating system with an inverter, so that he can use off-peak time to store cheaper and lower-carbon electricity to replace the more expensive electricity during the daytime peak period.

However, because Taiwan's electricity price has been long affected by policy, the cost of external pollution cannot be reflected and its inherent costs will be influenced by many considerations. As a result, A-Gan may not necessarily recover the costs of some of his energy-saving renovation projects, but he is still engrossed in them. He continues to carry out water- and electricity-saving experiments at home and believes that more people will join him in the effort to conserve energy.



Cherishing the environment Building a green future for the next generation

Since the year when he attended the Climate Conference in Bali on behalf of Delta, A-Gan has observed that it is difficult to force countries to achieve goals of carbon reduction through international negotiations. Forward-looking politicians, enterprises and NGOs have to work together to continuously exert pressure on people and corporates at home, or all agreements may be reversed. However, the Foundation is still optimistic about the future. Many companies like Delta are trying to improve energy use efficiency through supply chain management, internal carbon pricing, setting carbon reduction targets, and sharing with investors measures to manage carbon risks. The rise of the green purchasing power of consumers is constantly changing corporate attitudes towards the environment.

Next year, the Foundation will celebrate its 30th anniversary. A-Gan believes that the successful operation of the Foundation lies in the ideals of founder Mr. Cheng, which have been recognized by the outside world. It is also closely related to the active participation of Delta's colleagues. "Most of Delta's employees have a common characteristic - the willingness to put effort into public welfare activities." He says many Delta volunteers are deeply involved in the Foundation's activities, and their enthusiasm is inspiring. Colleagues at the Foundation have also learned a lot from them. A-Gan believes that with the encouragement of like-minded Delta colleagues and partners, the Foundation will continue to spread its influence, making the concept of "To provide innovative, clean and efficient energy solutions for a better tomorrow" more popular and building a green future for the next generation.

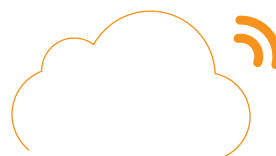


Delta's Smart Street Lighting Solution integrates energy-efficient lighting, IoT devices and ICT technologies, providing innovative value-added services help invigorate smart cities

Delta's smart street lighting serves the needs of the public, lighting up the vision of a smart city

Text by BABG

The connection of applications in the Internet of Things (IoT) has driven the layout and development of smart cities all over the world. Among them, the street lighting system, a city's essential infrastructure, has gradually transformed from purely lighting streets to taking the pulse of the smart city. Delta began the development of its LED Smart Street Lighting Solution in 2010, and has since installed more than 600,000 LED streetlights around the world, with more than half in Taiwan, of which 10% are smart streetlights. The success of its Smart Street Lighting Solutions spans from Taoyuan, to New Taipei City and Taipei, all the way to Penghu Island, as well as to overseas markets, such as Jakarta, Indonesia.





From being an underdog to winning the tender, Delta has built its street lighting brand value through “service”

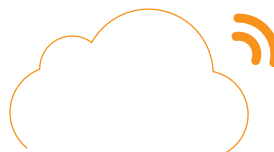
Senior manager Su Wen-Jie of Delta's Building Automation Business Unit recalled the initial stage when Delta entered the smart street lighting market. In spite of having won hundred million dollar tenders for Penghu, Kaohsiung, Tainan and Hsinchu projects since 2011, no one in the market could link the Delta brand to LED street lights. In 2014, during the tender for New Taipei City's low-carbon green city project, Taiwan's biggest LED street light project, Delta had yet to receive recognition from the industry. However, through its internal and external resource integration as well as the team's full support, Delta stood out and won LED energy-efficient street light tenders for 13 administrative districts in the northern region of New Taipei City. Altogether Delta installed more than 100,000 lights, for a total amount exceeding NTD900 million.

The New Taipei City project differed from the streetlight hardware upgrades of the past, since Delta would need to provide residents with streetlight maintenance services from the very beginning. Su Wen-Jie shared that during the tender, Delta needed to prove its ability to provide complete local maintenance services. So the team went into the streets, listened to the needs of the residents and village heads, visited local vendors, and conducted constant face-to-face communication to win the trust of the labor crew. Apart from a contract relationship, they also established a partner relationship to work together to provide services that meet the expectations of the village heads. This enabled Delta to win the tender among the leading vendors both locally and overseas.

The project manager, Cai Yong-Xiang, who is in charge of Delta's smart street light project, explained that they were always formally attired in suit and tie to present project reports to the relevant city government agencies that shared the benefits of smart street lighting. However, when on-site, suit and tie no longer worked. They would roll up their sleeves and change into T-shirt and jeans to humbly blend with the local vendors, and win the trust and be able to work together with the labor crew. Rain or shine and under pressure, they would try their best to meet project deadlines, and provide annual maintenance based on the warranty of the contract. The ups and downs of the project are difficult to describe in simple terms.



Rain or shine and under the pressure of contractual deadlines, Delta's team needed to win the trust and cooperate with local vendors to complete the job





IoT SMART SOLUTIONS

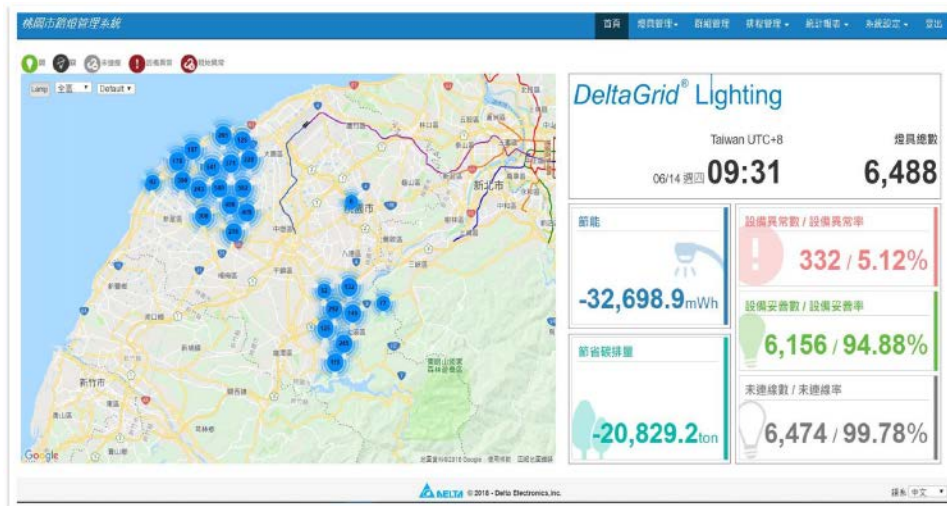
When the Delta team encountered natural environmental or local custom restrictions, it would provide services to suit the local conditions. For example, the team discovered that due to a strong northeast monsoon, Penghu's sea breezes contain a high salt concentration. Such environmental characteristics would easily cause damage to normal streetlights from salt erosion. When planning the location of smart streetlights, they would select places that were a certain distance away from the ocean to reduce damage due to sea breeze corrosion, ensuring the investment return of these infrastructures.

For Delta, providing customers with complete services through solutions is an innovative challenge. Su Wen-Jie said, "It is not possible to win a tender through the efforts of a single person. Instead, it requires the cooperation of product development, business correspondence, project execution and material scheduling of the business units. The team also needs to conduct constant and in-depth communication with the group's internal functional units, breaking away from past ODM/OEM business models, and providing services from the solution perspective." They conducted regular evaluations to satisfy the maintenance service and product quality of the contract, and to meet the "on-quality, on-time" requirements of the contract and customers.



Smart street lighting takes the city's pulse, supporting more convenient lifestyles for residents

Delta's Smart Street Lighting Solution integrates energy-efficient lighting, IoT devices, and information and communications technologies, to provide innovative value-added services on top of basic street lighting. These services include charging stations, micro weather stations, pole sharing with traffic lights, interactive touch screens, and more. It introduces new ideas for the development of smart cities, turning streetlights into important nodes for collecting big data on the urban environment.



A smart street lighting management platform facilitates remote monitoring and automatically reports breakdowns, which not only reduces the maintenance schedule for street light during downtime, but also provides residents with better lighting service

Delta's Smart Street Lighting Solution is recognized by customers due to Delta's integration technologies and the capabilities of its smart city management platform. Its Platform as a Service (PaaS) offers complete services ranging from data integration, big data database, user management, and more. On its extensible platform, it provides Software as a Service (SaaS) smart city applications, such as environment monitoring, equipment maintenance, and others. Delta provides customized services based on a customer's actual requirements, and continuously expands various applications based on the smart city's future plans.





IoT SMART SOLUTIONS



Delta's Smart Street Lighting Solution provides environmental sensing which gathers the city's day-to-day data such as temperature and humidity, wind direction, wind speed, and more, to be used as parameters for controlling smart lighting

Among its success stories, Delta's Smart Street Lighting Solution is comprised of the following IoT applications:

1. Environmental sensing: The management platform gathers the city's day-to-day data such as temperature and humidity, wind direction, wind speed, rainfall, optical radiation, ultraviolet rays, noise, PM2.5, PM10, and more, to be used as parameters for controlling smart lighting. During insufficient lighting on rainy days or due to thick fog as a result of PM2.5, it can automatically control and increase LED streetlight brightness, increasing the safety of pedestrians and drivers.
2. Human and traffic detection: Human and traffic detection cameras by VIVOTEK, a subsidiary of Delta, are installed at main road junctions, to compile statistics of vehicle categories, direction and volume, and human flow for the day. This makes use of big data to analyze results and conduct smart control. For example, during the early morning when the total volume of vehicles and pedestrians is reduced to 10% of the normal volume, the LED streetlight's brightness can be automatically reduced to 70%. This not only meets brightness regulations for urban roads, but also reduces light pollution during the night, saves electricity, and establishes traffic relief policies based on the data.
3. Smart street lighting management platform: This platform links up with the agencies' existing smart street lighting systems, and incorporates them into the platform for maintenance management, remote monitoring and automatic report on breakdowns. It not only reduces the maintenance schedule for streetlight during downtime, but also provides residents better lighting service.

For the Taoyuan City LED lighting system project, Delta Electronics replaced nearly 13,000 LED streetlights, including approximately 6,500 smart control-type LEDs. Delta's smart LED street lighting management platform offers functions such as remote monitoring, maintenance management, and streetlight control and saves more than 70% energy compared to traditional mercury lighting, plus an annual electricity savings of nearly NTD 18 million.



Integrating into local culture, reshaping the city's unique image

With its rich experience and reliable maintenance management capabilities, the Delta team goes one step further by incorporating smart street lighting into city development, making it a highlight for shaping the integration of local culture and technologies. For example, Delta optimized the pedestrian environment for residents in the western region of Taipei City, by upgrading street lights around Taipei Station at the road junctions of Yanping South Road, Gongyuan Road and Changde Street, to a smart lighting system. The street lights complement the imagery of North Gate, integrating with the cluster of historical buildings, and reshaping the nostalgic atmosphere of the western region.





IoT SMART SOLUTIONS



The smart streetlights of Taipei's western region complement the image of North Gate, integrating with the cluster of historical buildings, and reshaping the historical ambience

The smart lightings installed at the road junctions of Taipei Science and Art Park, which neighbors National Taiwan Science Education Center, possess educational values as they incorporate wind power generation and solar power generation, and are equipped with interactive screens



The smart street lighting project for the Taipei Science and Art Park has the National Taiwan Science Education Center as a neighbor with its rich educational value. The smart lighting installed at the road junctions incorporates wind power generation and solar power generation. It also provides charging stations, and is equipped with interactive screens for passersby to obtain direct environment information such as the current ultraviolet rays, wind direction, wind speed, and more.

Delta's smart street lighting applications have branched out from the scope of the city, taking it a step further with application to the smart management of traffic lighting between cities. In 2018, Delta undertook a national freeway smart control LED street lighting project and implemented a wireless and wired smart street lighting control system at the Guanxi Interchange and the Jiadong Interchange respectively. The system integrates two monitoring systems into one smart monitoring platform, increasing management efficiency.

With the rapid development of a new generation of communication technologies, success story experience, and continuous research and development, Delta's Smart Street Lighting Solution has become an indispensable infrastructure element for the smart city blueprint of various regions. It provides residents with a more convenient and safer lifestyle, and assists government agencies in integrating systems such as sewer monitoring, Wi-Fi hot spot, environmental sensing, and more. By gradually achieving its vision for a smart city, Delta continues to create a more humane urban living environment.





DEF hosts 8K charity film screenings on the eve of the 10th anniversary of Typhoon Morakot

Text by IABG

DEF has been committed to positive action on energy and climate-related issues. Before the 10th Anniversary of Typhoon Morakot in August, DEF held a charity screening featuring a series of environmental films at National Science and Technology Museum(NSTM). And To raise the environmental awareness about climate change, the films was displayed with the world's brightest laser 8K projector with 36000 lumens developed by Delta. The films displayed include: Behold Typhoon Morakot, a reproduction of the aerial documentary of the Morakot Disaster filmed by the late Director Po-Lin Chi; The Calling of Namaxia, a documentary on the reconstruction of Minchuan Primary School with the students and teachers as the cast;and Water with Life, the very first Taiwanese 8K environmental documentary that received domestic and international acclaim. Before the premiere of The Calling of Namaxia, the students from Minchuan Primary School were invited to perform two songs from the Bunun tribe and the moving performance was well received by the audience. Ms. Shan-Shan Guo, Vice Chairperson of DEF, Mr. Jesse Chou, Delta's CSO and Spokesperson, Mr. Rong-Fong Wu, the Director-general of Education Bureau, Kaohsiung City Government, Mr. Shiunn-Shyang Chen, the Director-general of NSTM, Mr. Ying Chao Kuo, the founder of Bio-architecture Formosana and Mr. Bruce Cheng, the founder of Delta, along with his wife, Ms Hsieh Yi-Yin attended the premiere.

In the hope that an overwhelming visual sensation from high quality image on large screen will raise the public's awareness on the effect of climate change on ocean environment and water resources in Taiwan, Water with Life was also screened at National Museum of Marine Science and Technology (NMMST) IMAX 3D Ocean Theatre in Keelung.

Both tours had full house with warm participation from more than a thousand citizens. After the afternoon screening on August 8 in Kaohsiung, a couple shared their reflection, the wife even shed tears and said that "humans are the ones who do not value water resources and they are also the ones destroying water resources. We need to protect our Mother Earth". To echo her words, we should reckon with what has happened and love and treasure Taiwan together.

Since the premiere at National Museum of Natural Science in March, colleagues from DEF and Video Department worked together to hold screenings to places including Taipei Water Park, NSTM and NMMST. To facilitate the public understanding over the importance of water resources and related issues, DEF will continue to organize inspiring and educational film tours displayed with Delta's 8K projector.



Colleagues from Delta Tainan Branch brought their families to enjoy 8K films at the National Science and Technology Museum



The public enjoying 8K films at the National Science and Technology Museum



The charity film screening 8K "Water with Life" on Oct. 10th and 11th at the Sun Moon Lake. Converging Greatness!

Text by DEF

Sponsored by Delta Electronics Foundation, the world's first 8K environmental documentary, "Water with Life" was produced by NHK Enterprises. The key feature of the film 'Sun Moon Lake' will be displayed at its actual scene Ita Thao Pier of Sun Moon Lake. The charity film screening event "8K Projection of the Sun Moon Lake. Converging Greatness" will be held in the evening on Oct. 10th and 11th. Apart from the film, internationally famous Vox Nativa Children's Choir and Ita Thao Dance Performers who performed in the documentary, are both invited to perform on the event. We expect a huge crowd and hope to raise public awareness of climate change and energy-related issues.



After the premiere on Japan's NHK BS 8K satellite channel on March 31st, "Water with Life" documentary has also been displayed at National Museum of Natural Science, Taipei Water Park, National Science and Technology Museum in Kaohsiung and National Museum of Marine Science and Technology in Keelung. This is the first time that the screening to be held at where it was filmed. It not only represented the beauty of Sun Moon Lake, but also reminds us the significance of water. Cherish water resource' is the lesson we can learn from the film, and it calls for our response from awareness to action.

The production team chose Sun Moon Lake as one of the filming locations. The reason behind the decision was because the lake is a world's famous tourist attraction. Besides, the lake was where the tribal legend of Ita Thao Community originated and thus water was considered highly significant in their culture and lives. During the filming, the team interviewed the local elders and invited the famous local dancer group, Ita Thao dancers, to perform by Sun Moon Lake. In film, the dancer poured water from bamboos with profound reverence in their traditional dance, which symbolizes passing down the culture. Much of the audience was impressed with their dancing in film. To show the pivotal role of water for life on earth, they will reintroduce their respect to water in Thau culture by their performance at this charity screening.

Aside from visual feast of 8K screening, the internationally famous Vox Nativa Children's Choir is also invited to perform at the event. In filmmaker Chi Po-Lin's environmental documentary "Beyond Beauty - Taiwan From Above", the choir climbed on top of the tallest mountain in Taiwan, Yushan, to sing in the first aerial environmental documentary in Taiwan. They will once again sing next to one of the most beautiful landmarks in Taiwan, Sun Moon Lake, and voice for the beauty of the lake.

"8K Projection of the Sun Moon Lake. Converging Greatness" charity film screening event will take place in the Ita Thao Pier, Sun Moon Lake on Oct. 10th and 11th, 2019 at 5 pm. For more information, please visit Delta Electronics Foundation website and the event page (<http://www.delta-foundation.org.tw/waterwithlife8K/>). The event is free to participate in. Please use public transportation or share your ride with others.



Delta's IoT framework solution shines as CIIF 2019

Text by DGC

The 2019 China International Industry Fair (CIIF) is held in Shanghai on September 17. Delta presents a full gigantic 200 square meters exhibition platform to display its IoT framework solution with three major themes: smart factory, smart buildings, and infrastructure. The highlights of the exhibition include the integrated monitoring and management of digital visual factory information control solutions for factory machinery equipment, operations, and power consumption information. This is also the efficient, power-efficient, and secure building management and control solution. It is a technological manifestation of Delta's future vision "IoT-Based Smart Green Solutions".

Delta CBO Guo Shan-Shan points out that Delta utilizes its own core technology in power electronics to offer power-efficient solutions in the traditional high-power consumption fields such as architecture, transportation, infrastructure, and industrial production for smart cities. The company also adopts IoT as a foundation to connect various power consumption big data in urban living for the synergy of power adaptation, helping cities forge an interconnected smart network.

In the smart factory theme exhibition area, professional solutions displayed include smart precision processing, smart production line control, high-speed smart driver, and power-saving efficiency. The exhibition also highlights "soft" technologies such as the all-in-one smart equipment installation software DIASudio, the robot analog integrated platform DRASimuCAD, and the manufacturing execution system (MES) to offer customers visual and highly integrated futuristic smart factory solutions.

In the smart building theme exhibition area, Delta focused on the smart control of factory buildings. The smart IoT building solution includes smart building management and control, gate access control, online power monitoring solutions, Vivitek projectors, and the Mega Insight solution. It offers users power efficiency, safety, and comfort in a user-friendly office environment to facilitate an efficient smart factory operation.

In the infrastructure theme exhibition area, Delta solutions include the rooftop solar power solution, the data center solution, the street light control for the factory area, and the alternative energy EV charging pile solution.



Delta presents a full gigantic 200 square meters exhibition platform at the 2019 CIIF to display its diverse and efficient IoT framework solution with three major themes: smart factory, smart buildings and infrastructure



Delta cooperates with Oriental Pearl Group in establishing high-definition CINEX-D8K Imaging Lab in Shanghai

Text by DGC



Founder and cum Honorary Chairman, Mr. Bruce Cheng, hopes that through this cooperation, viewers can enjoy a brand new viewing experience, driving the entire industrial chain and ecosystem development of 8K image

On September 17, Delta, together with Oriental Pearl Group, set up CINEX-D8K Imaging Lab in Shanghai landmark building, Mercedes-Benz Arena. Viewers have the opportunity to enjoy stunning images of 25,000 lumen high brightness, 33 million pixels, high color saturation, and resolution 16 times of normal HD, presented by Delta's industrial leading 8K projector.

Delta's Founder cum Honorary Chairman, Mr. Bruce Cheng, expressed in his speech that he is very happy to be able to cooperate with Oriental Pearl Group, to present stunning 8K images to the public. With its technological advantages in heat dissipation and power management, Delta has since 2018, together with its associate company, Digital Projection, successfully developed DLP 8K projector, with ultra-high brightness of 25,000 lumen, making it one of the world's leading projectors. Through this cooperation, it enables the public to experience the vivid and immersive images from 8K projection at close distance, thereby promoting the maturity and development of 8K market.

Delta's Chief Brand Officer, Ms. Shan-Shan Guo, and Oriental Pearl's Editor-in-Chief, Dai Zhongwei, officially launched the 8K Imaging Lab. The highlights of the laboratory will be the projection of 8K content, immersive experience, etc., exploring the brand new cultural and entertainment consumption business model of 8K immersive experience. In addition, the documentary, "Water with Life", played during the closing ceremony, highlights that water resource is the concern for the whole world. Extreme climate is generating an increasing impact on Taiwan's water resource distribution. It is hoped that with Delta's 8K projection technologies, more people can learn about the Earth's crisis through the 8K environmental documentary.



Delta and Oriental Pearl set up 8K Imaging Lab, and the press conference was attended by: Founder cum Honorary Chairman, Bruce Cheng (5th from right); Chief Brand Officer, Ms. Shan-Shan Guo (4th from right); Chief Sustainability Officer cum Spokesman Jesse Chou (3rd from right); Display Solutions Business Unit General Manager, Jeff Fu (3rd from left); Display Solutions Business Unit's Marketing Director, Charlie Pai (leftmost); Oriental Pearl's Editor-in-Chief, Dai Zhongwei (5th from left); Oriental Pearl's Theater General Manager, Ling Rui-Qi (2nd from left); Shanghai Ultra-high HD Video Industrial Alliance's Secretary General, Zhu Jing-Lian (4th from left)



Students in North Thailand and overseas Chinese students studying in Taiwan are awarded with the scholarship by Mr. Cheng

Text by DEF

The Scholarship and Grant for Chinese Schools in North Thailand were formerly funded by Delta Electronics Foundation but is currently implemented by Delta Electronics Thailand (DET). This year, it has entered the 19th year since it was founded. The awards ceremonies in areas of Chiang Mai and Chiang Rai, Thailand were held separately on the 17th and 18th day of August. The Scholarship and Grant for Chinese Schools in North Thailand provides scholarship and grant to 100 elementary school students, each 1,000 Thai baht, and 100 high school students, each \$2,000 Thai baht, in Chiang Mai area and Chiang Rai area separately. The scholarships and grants provided in the past 20 years plus subsidies for software and hardware benefited more than 4,000 people and the total amount exceeds twenty million Thai baht.

The Principal of Khung Fu High School, Yan Xie-Qing, who brings the students down the mountain to receive the awards indicates that the students are looking forward to going to Yunnan Hall to participate in the awards ceremony every year, for this is a time of glory and gratitude. Li Quo-Qiang, a student of Khung Fu High School, has received the scholarship and grant from "Plum Blossom Program", Adopt-A-High-School-Student, for three consecutive years. He indicates that the scholarships and grants are a great encouragement to students. With the scholarships and grants, they can purchase stationery and extra-curricular reading materials, or even pay for the accommodation fee. For students who come from the family of low income, it may slightly reduce the burden of their parents. The Vice President of Operations of DET, Xu Wei-Min, who had once studied in Mae Salong Xinghua School in Chiang Rai, always takes time to attend the awards ceremony and visit Xinhua School every year. Xu Wei-Min encourages the students not to fear difficulties and hardship and welcome them to work for DET. It is also a feedback to the contributions of overseas Chinese students in North Thailand in building up the factory of DET 30 years ago.

Under the arrangement of the Foundation, five overseas Chinese students who received this year's scholarship and grant for overseas Chinese student coming from North Thailand to Taiwan attended another awards ceremony held on the 30th day of August in Neihsu district of Taipei City, while the team of DET attended via video. Through this opportunity, they communicated with each other, and especially, learned about the living and learning experiences from other overseas Chinese students that have already studied in Taiwan. For students who just came to Taiwan for study, this was a precious experience. During the ceremony, the CEO of the Foundation, Zhang Yang-Qian, took the experience of Mr. Cheng, the founder of the Scholarship, who came to Taiwan for study and started a business in his early age, as an example to encourage the students. It is not easy to come alone to Taiwan. He hopes the scholarship and grant can reduce their financial burden so they can concentrate on learning and hopes that they will not forget to give feedback to their hometowns when going back to their country after graduation, for this is the important purpose of studying abroad.



The managers of DET participate in the awards ceremony via video and encourage students to study hard

Delta's dynamic MDC solution assists to build the university infrastructure

Text by DGC

A university in the northwest region has planned to build an information building on its new campus, including the campus internet server room, security server room, data center, command center and others. The data center has a total surface area of about 1500 m², and is built with an infrastructure that includes seven of Delta's dynamic series micro-modular data center (MDC) solution.

In compliance with the university's demands and future trends, Delta offers users the dynamic MDC solution along with the DCIM data center's basic infrastructure management system, which has advantages such as a system structure, high reliability, low cost equipment, and a good storage expandability. The design was made in consideration of three aspects: high usability, rapid deployment, and excellent storage expandability. The data center adopts the dynamic micromodule to construct an independent and comprehensive space that includes: the DPH series modular UPS, precision air conditioning, high density server cabinets, and pre-engineered server cabinet-top cable modules, PDU, airflow control systems, and others. It also provides smart management through the DCIM system.

The DPH series modular UPS has a high reliability, excellent performance and efficiency like the Delta UPS, as well as the (N+X) fault tolerance achieving automatic redundancy for the power supply module through built-in control mechanisms.



Delta dynamic series MDC solution assists to build the data center infrastructure on campus



Delta MDC solution has been applied to the e-governance joint visit reception center

Text by DEF



Delta Micro Modular Data Center (MDC) solution

Recently, Delta's Micro Data Center (MDC) solution has been successfully applied to the e-governance joint visit reception center of a certain region. The highly integrated and scalable solution safeguards the data security of the e-governance platform improving the government's information technology infrastructure.

Traditionally, small and medium sized e-governance data centers adopt a distributed procurement approach to buy what is needed, which causes numerous issues. In order to improve it, the e-governance data center at the said governmental user's joint visit reception center has selected Delta's 20kVA MDC, which demonstrates the rapid deployment of a stable and reliable small data center by enterprise users. For small data centers of less than 10 IT rack cabinets and 50 m2, a three-in-one system including a power supply and monitoring integrated system, a cabinet system, a cooling system will be provided. It is easy and flexible for installation, smart and simple to manage, and offers small data center users a great value for cost, a highly applicable solution. In consideration of the demand by administrative departments for operations to be as simple as possible, the rapid installation of MDC only requires a power cable and data cables to begin its operation. As for the government agency e-governance's potential demand to expand storage in the future, MDC also supports the expansions at any time. Its three main software functions — power management, user management, and environment monitoring — also shows the demands of many enterprise users for reliable monitoring and smart management.

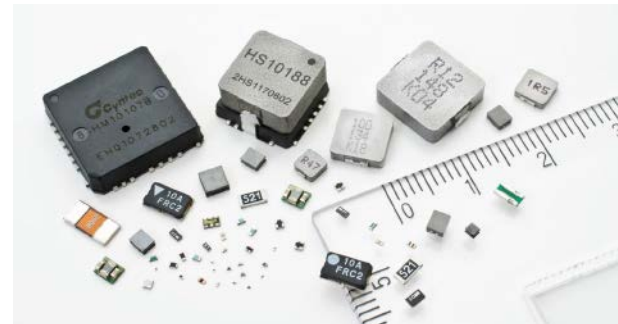
DRC assists Cyntec in AI process tuning for parameter optimization

Text by DRC

The improvement of quality management has always been one of the main KPIs of manufacturers. Cyntec Co., Ltd. realizes that the quality related research as well as the collection and tracking of production history are inseparable from AI technology. Data collection with in-depth data analysis can improve quality rapidly. In light of this knowledge, Cyntec has invested in a team of experts in manufacturing and has invited DRC to conduct data analysis and diagnostics for a joint development in verification solutions.

The early stages of this project also faced challenges such as "new equipment parameter tunings for weeks", "highly complex and mutually interfering parameters obscures the correlation between the parameters", and "traditional experiment designs are time-consuming and makes it difficult to produce a good yield at the same time". Thus, the two teams find the key problem through data quality diagnostics, root cause analysis on quality, and then tune the parameters to improve the product quality for first-of-a-kind (FOAK) parameter optimization.

In contrast to the prior methods of trial and error or the comprehensive planning of Taguchi Methods in which the levels of various factors are laid out, the popular algorithm Bayesian Optimization was adopted this time, combined with expert production process knowledge, to design methods through human-machine interaction mechanisms in sequential experiments. In the past, a production line would require a full-time R&D staff to tune parameters for one week. Now that period has been reduced to 1.5 hours for tuning 11 parameters in winding station line changes. The parameters recommended by the algorithm can result in 96% yield for 100 products. It is a testament to the infinite potential of AI in smart manufacturing.



Cyntec and the DRC team find the key problem through data quality diagnostics, root cause analysis on quality, and then tune the parameters to improve the product quality for project parameter optimization



Driving the smart future: new industrial automation product release in Beijing

Text by DEF

"Driving the smart future: 2019 Delta's new industrial automation product release" was held in Beijing on August 22. According to General Manager Chen Minren of DGC's Industrial Automation Business Unit (IABU), "Delta has been in automation for more than twenty years and has accumulated rich experience in the industry. With its strong research and development capability and production process, it provides customers with new general industrial automation products with breadth and depth, satisfying users' high-end requirements of industrial intelligentization upgrade." According to General Manager David Tsai of IABG's Industrial Motion System Business Unit (IMSBU), "Delta adheres to the philosophy of decentralized control in the development of motion control products and solutions. While increasing productivity, it also optimizes the overall control network in smart manufacturing. PC-Based motion controller AX864E series and high-performance servo drive system ASDA-B3 series are proof of Delta's development of intelligentization."

The new industrial automation products launched include:

PC-Based motion controller AX864E series: Delta's new generation PC-Based motion control product is developed to meet the high-precision processing requirements of intelligentization. It uses CODESYS motion control software platform, currently widely used by machinery and equipment manufacturers, significantly reducing the time and cost incurred by machinery and equipment manufacturers in building the equipment.

High performance servo drive system ASDA-B3 series: small and compact, equipped with powerful loading capacity, uses 3.1 kHz bandwidth +24 bit resolution, and has lowered 40% high response setting time.

Compact vector control drive ME300 series: It is easy to install and user-friendly, and has low maintenance cost, significantly increases equipment production quality and efficiency, and saves manpower and cost.

High-performance universal vector control drive C2000 Plus series: 460V model has a maximum power range of 560kW, significantly increasing loading capacity from 120% to 150%, providing good speed control, torque control, position control and system stability for drive series.

High-speed inverter C2000-HS series: A rated output frequency of up to 1500Hz efficiently enhances inverter's output current; the size of inverter reduces by 60%, suitable for high-speed requirements in fluid machinery.

Synchronous reluctance motor: IE5 efficiency, energy saving from 5% to 10%, 2 frame size lesser compared to traditional electric motor.



(left to right) DGC's IABU Inverter Product Director Shi Wenyang, IABU GM Chen Minren, IMSBU GM David Tsai and IABU Product Director Li Wenjian of IABG



Delta Data Center Infrastructure Solutions, UPS and VIVOTEK showcase at Security Exhibition & Conference 2019

Text by BA

Delta showcased Data Center Infrastructure Total Solutions, Uninterruptible Power Supplies (UPS) products and solutions and VIVOTEK Intelligent IP Surveillance Solution at Security Exhibition & Conference 2019 at Sydney.

VIVOTEK Intelligent IP Surveillance Solution includes:

- The professional 180-degree day and night network cameras support different IR distances and vertical field of views, which reduce not only the installation time but also total number of cameras needed.
- 360-degree Deep Learning Fisheye Camera enables user to obtain intelligent video content analysis and utmost security.
- Cybersecurity management solution can display a live cyberattack targeted on network cameras.

With Delta's modular and scalable data center, UPS solutions and VIVOTEK surveillance solutions portfolio, customers can be confident in power security while achieving excellent Total Cost of Ownership (TCO) optimization. Delta leverages its core competencies in power management and conversion to deliver reliable and energy-efficient solutions that tailor to the specific needs of customers across Australia.



Security Exhibition & Conference 2019

Delta Future Industry Summit 2019 drives ideas to power ASEAN smart city transformation

Text by DET

DET hosted the second Delta Future Industry Summit to offer its stakeholders opportunities to connect and share ideas for industry development in ASEAN under the theme-Powering ASEAN's Urban Transformation. This event brought together key decision-makers to discuss and explore smart city solutions including: E-mobility, Solar Energy, Industrial Automation, Industrial Power, Data Center Power, Smart Ventilation and Energy Storage.

"We believe in bringing people together around our shared values and that's why we decided that this event will be an open platform. Delta believes that everyone's success is important because in today's connected world we can do so much more together," Mr. Jackie Chang, Delta Thailand Vice President, said. "At Delta we always embrace changes as opportunities for new and more sustainable growth. From early on, we leveraged our core competencies in power and thermal management to develop solutions that address global mega-trends. This makes us the perfect partner to transform businesses in the Industry 4.0 era."

With Thailand taking the role of 2019 ASEAN chairman, the government presents its Thailand 4.0 policy as way to harness technology and drive local innovation. Mr. Panuwat Triyangkoon, Inspector General at the Ministry of Industry, said, "Our Big Brother Project connects Thai SMEs with large innovative companies to enhance their competitiveness. This year, we signed an MOU with Delta to join to offer SMEs with the latest automation technology and business advice. We believe Delta and other companies with a proven track record of sustainable development will play a key role in our aim to have world-class local businesses."



Unique open platform empowers regional leaders moving the needle in digital industrial and green solutions



Delta promotes Indoor Air Quality Solutions at ACAT Seminar 2019

Text by IAQ

The non-profit organization Air Conditioning Engineering Association of Thailand (ACAT) is renowned among developers and contractors in Thailand and the main supporter for RHVAC industry event. DET promoted its innovative Indoor Air Quality Solution, to protect Bangkok residents from air pollution and improve customer quality of life, at the ACAT Academic Seminar. As an association member, Delta joined the seminar in Bangkok to display its Indoor Air Quality (IAQ) solutions and speak under the seminar topic-Tackling PM2.5.

In his presentation, Mr. Pasakorn Thamwittayakorn, Delta Senior Business Development Manager Fan and Thermal Management Business, highlighted how Delta's Indoor Air Quality Solution leverages High-efficiency particulate air (HEPA) filters in its Energy Recovery Ventilation (ERV) to supply PM2.5-free fresh air for family members in every room of the home. HEPA filters in Delta's ERV use interception, impact and diffusion methods to filter out PM2.5 at a rate of 97%. The ERV features Delta's heat-exchanger core technology which pre-cools air while keeping moisture in to reduce air temperature and humidity by up to 6°C and 16% respectively.

This technology can help save up to 30% of the energy used for air conditioning. Seminar participants visited Delta's booth to explore Delta's IAQ products including the Wall-mount type ERV and Fresh Air Supply Fan. These products combine with Delta's energy-efficient DC brushless ventilation fans to create Indoor Air Quality solutions for the home or office.



Delta joined the ACAT seminar in Bangkok to display its Indoor Air Quality (IAQ) solutions

Delta Electronics Thailand in FTSE4Good Index Series 2019

Text by DET

Delta Electronics Thailand is in the FTSE4Good Emerging Index for the third consecutive year. Delta remains a constituent of the FTSE4Good Index Series following the June 2019 index review by global index provider FTSE Russell.

Launched in 2001, the FTSE4Good Index Series measures performance in companies demonstrating strong Environmental, Social and Governance (ESG) practices. In 2016, the FTSE4Good Emerging Indexes began for companies in over 20 emerging countries. Delta's Sustainable Development Committee strives to ensure a resilient business model that encompasses all necessary Corporate Social Responsibility (CSR) aspects.

As part of the London Stock Exchange Group (LSEG), FTSE Russell's ESG Ratings provide a multi-dimensional measure of environmental, social and governance exposure and practice. Investors can leverage the FTSE4Good Index as a tool for sustainable investment and as a framework for corporate engagement and stewardship. Delta commits to the UN Sustainable Development Goals (UNSDG) as it works to create a sustainable business that adds value to all stakeholders.



FTSE4Good

DET in the FTSE4Good Emerging Markets Index 2019



Delta has been included in the DJSI World Index for the 9th consecutive year

Text by Corporate Communications

MEMBER OF

Dow Jones Sustainability Indices

In collaboration with



a RobecoSAM brand



**Dow Jones
Sustainability
Indices
20th Anniversary**

In collaboration with SAM

Delta is included in the 2019 DJSI World Index

Delta has just been recognized by the Dow Jones Sustainability Indices (DJSI) 2019 assessment as the industry leader within the Electronic Equipment, Instruments & Components sector for the fourth time. With the global challenge of climate change and strong competition among peers, Delta has now been included in the DJSI World Index for the 9th consecutive year and in the DJSI Emerging Markets Index for the 7th consecutive year. The 2019 DJSI survey not only underscores Delta's continuous dedication towards climate change action and superior performance in economic and social dimensions, but also rewards the Company with the highest score in 8 criteria, outperforming the previous years. The DJSI assessment recognizes Delta's efforts in the three dimensions of ESG (Environment, Social, and Governance). With its focus on climate change action, in 2018, Delta reduced its carbon intensity by 16.8% in efforts to achieve the Science Based Target (SBT) set in 2017 of reducing its carbon intensity 56.6% by 2025.

Mr. Jesse Chou, Delta's chief sustainability officer, highlighted, " In 2019, our cooperation with the Delta Electronics Foundation in the promotion of environmental education and green buildings and transportation concepts helped us achieve full credits in "Innovation Management", "Environmental Reporting", and Social Reporting". Delta also led the electronics industry in 5 major criteria for the 2019 DJSI corporate sustainability assessment: "Materiality", "Risk and Crisis Management", "Codes of Business Conduct", "Product Stewardship", and "Corporate Citizenship and Philanthropy". Delta's dedication to innovative development, enhancing eco-efficiency, increasing its percentage of renewable energy, and balancing the development on ESG, have supported us in achieving this year's industry leadership position.

Delta has recently issued its 2018 Corporate Social Responsibility Report. Delta's high energy-efficient products have helped its clients save 28.1 billion kWh of electricity from 2010 to 2018, reducing 15.06 million tons of carbon emissions. From 2011 to 2018, a total of 1,846 energy-saving solutions were implemented at its major plants, saving 230 million kWh of electricity and reducing about 186,000 tons of carbon emissions. As for energy conservation through green buildings, the 15 certified factories and 5 academic buildings that Delta has sponsored to build have saved 17.83 million kWh of electricity and reduced about 11,200 tons of carbon emissions.



DRC Tech Centers are located in Ruey Kuang Building in Taipei

PEOPLE

Forward-looking technology for innovative upgrading - Tech Centers of Delta Research Center

Text by Tech Centers of Delta Research Center

The Tech Centers of Delta Research Center consist of four units. In the previous issue, we introduced the Artificial Intelligence Center of Excellence (AICoE) and Advanced Green Photonics Center (AGPC). In this issue, we will introduce the Video & Image Analytics Center and Healthcare Data Analytics Center.



Video & Image Analytics Center (VIA Center)



Liu Yixin / Image Application Analysis Engineer of VIA Center

Industrial automation is a good opportunity for transforming and upgrading the industry, but it is also a battle for survival. The goal of industrial automation is to combine the existing production technology with the information from all aspects through technologies such as Internet of Things, real-time data collection and analysis, and artificial intelligence, and achieve maximum benefits through analysis and prediction.

In response to the impact of industrial automation, Delta established its research center in 2013 to develop intelligent solutions. In addition to intelligent manufacturing that Delta itself is good at, its research fields include information security, life sciences, green energy, etc. These fields are interrelated, and many related technologies and issues also emerge successively from research efforts, some of which are related to machine vision. How can we make the machine see what should be seen and make correct analysis and judgment? How can we solve the related issues by applying these technologies to the actual fields in the most painless manner? To find answers to these questions is the top priority of the VIA Center.

After completing my study in the graduate school in 2017, I joined the VIA Center of the Delta Research Center as an image application analysis engineer. Prior to this, in addition to the multimedia systems and image processing projects with which I involved myself in the school, my only practical experience was analyzing nuclear medicine images when I was the research assistant was in the hospital. Therefore, the image processing application of the manufacturing industry when I first joined was a whole new challenge.

Unlike my past experience, in recent years, the product life cycle is getting shorter with greater user expectations and faster demand, and the production model gradually becomes that of large variety in small quantity, or even customization, which has made the experimental data insufficient in quantity and led to inconsistency in quality. Moreover, the short life cycle means limited development time, making it essential to master the subject of using time, cost, and resources effectively. And the biggest difference from the academic or medical fields that I have been exposed to in the past is that the manufacturing industry involves a wide range of fields. In addition to the generally-recognized areas such as mechanical, electronic, optical, and even chemical and information technologies, humanity disciplines such as design, psychology and management are also important components. Many of my colleagues coming from different backgrounds also play a pivotal role in manufacturing.

The differences in background, viewpoints of seeing a problem and the influence of different values have led to considerable inconsistency in standards, which is the most important problem we have to overcome in project coordination. For example, the colleagues of different fields may have completely different views concerning what amount of information of the production line should be collected in order to establish an automation model - the production line staff think that a well-defined copy is enough, while the engineers that work with computers all day long think that only a large number of reference pictures and a large amount of numeric data will suffice them. The line staff are often troubled by collection of the information, which is when the hidden costs of the project are starting to be examined, including the necessity of implementing the project, as well as realism in collecting such a huge information system every time. All these kinds of problems often came one after another and occurred repeatedly in the project.



PEOPLE & PRODUCT

Of course, before solving the problem, we must get to the root of the problem: the cause and the existing solution. At this stage, the operational experience and habits of the first-line operators are valuable information, but they are also the most difficult part of the whole study. In addition to differences in technical backgrounds that need to be overcome, sorting and clarifying the issues, converging information, and solving problems with the smallest amount of information is one of the major obstacles at this stage. After understanding the issue, we will employ the "Proof of Concept (PoC)" to test the feasibility of the current technology and applicability of the problem in order to reduce the cost of actually implementing the project in the future and reduce the risk of failure. Through project cooperation, we can try to uncover together with the production line any potential problems that have been missed and develop corresponding technologies. Finally, through cooperation with the team for the Cyber-Physical Systems (CPS), we can link existing resources to achieve "translational research" that strives to find the solution of the greatest benefit with the minimum change.

Under cross-team cooperation, in addition to solutions such as automatic defect classification and license plate recognition, the current research results of the VIA Center include the applications in image analysis - technologies such as synchronous positioning and map construction, virtual gate, facial recognition and cross-camera tracking. Through Delta smart image analysis platform developed by the VIA Center that integrated image processing algorithms of various teams, the technology can be easily applied across fields and departments, so that technicians can be wholeheartedly devoted to development efforts.

Having worked with DRC for more than two years, in addition to applying the technology I learned in the past to different fields, I have also continuously accumulated practical experiences from the projects. I met professionals from various fields and have gained a certain extent of understanding about the overall ecology of the manufacturing industry. In the future, we will continue to work with the VIA Center team and devote our efforts to the development of AI chips and automated optical inspection machines, aiming to expand our solutions to the field of edge computing. Through R&D of new technology and innovative applications, we strive to expand and optimize the ecosystem so as to facilitate upgrading of the industry.



Team members of DRC VIA Center (the author of this article is the sixth from the left)



Healthcare Data Analytics Center (HDAC)



Dr. Eric Chou / HDAC Center for Research in Applied Life Sciences

In 2014, because of an opportunity of summer internship, I joined the Center for Research in Applied Life Sciences from Delta Research Institute to identify symptoms from customers and the point for intervention of suitable technology, thereby identifying feasible opportunities and proposing potential business models. By further combining field medical knowledge with information technology learned in the past, it will explore and build the most practical AI-based medical applications, have deep learning be introduced into the clinic, reduce the burden on physicians, improve the quality of medical care, and reduce costs. Traditionally, though assistance from instruments was available for discovery of diseases, a large amount of clinical data generated through data collection, including test data, medical images, genetic sequencing, etc., still requires manual confirmation. Disease diagnosis and treatment are based on the understanding on the field of medicine from the past. It is hoped that the root cause will be discovered through collection, sorting, and analysis of a large number of clinical data, which will lead to reforms in medical sector.



HDAC team colleagues took a group photo, with the author of this article on the right



PEOPLE & PRODUCT

With the aging society and the environmental change, WHO statistics shows a significant increase in the number of new cases of cancer diagnosis by 2030. Nevertheless, as cancer is diagnosed by pathologists, the problem with a shortage of professionals resulting from senior doctors retiring and insufficient number of new doctors is prevalent. According to research and surveys, pathology is a profession with high amount of accumulation in knowledge, with interpretation of data always facing bottlenecks. Relying solely on manpower, with an increasing amount of data and the longer training time for pathologists or the continued decrease in the number of professionals, these problems will place a heavy burden on the existing medical system.

The Healthcare Data Analytics Center (HDAC) is dedicated to providing solutions in AI-assisted digital pathology diagnosis that combine medical knowledge and information technology to form a team with an ability of cross-disciplinary communication and integration that can further enhance the ability to match technology with clinical needs. In addition to the system for managing and labeling digital pathological images, it also integrates the inference function from deep learning to meet the needs for the application and development of AI modules on quantitative clinical indicators.

System for management, labeling and analysis: With scalability of the AI model, the system provides development and deployment for AI-based digital pathology, seamlessly integrating training. Utilizing artificial intelligence in coordinated work with physicians, it enhances productivity and consistency in interpretations. It also provides a scalable basic storage architecture and supports both local and data centers as a solution for long-term storage expansion.

In the future, when this solution is introduced to a partner hospital, from the perspective of ICT, we can see some opportunities, in addition to building a data center to collect four types of real world data, including free, continuously observed, accurate, multi-dimensional and unlimited dimensional data. If it can help hospitals generate data in the process of equipment operation and find new business potential, it can create a new value chain while the product is in operation, and communication between the platform and data center requires network communication equipment to ensure a stable and safe data transmission. Combining Delta's strengths and capabilities along with this solution for digital pathology, it will not only expand Delta's existing business horizontally, but also provide a full lifecycle of smart medical services to our partners to achieve the goal of building an ecosystem for a smart healthcare industry.



New 600W LED driver

PRODUCT

New 600W LED driver with 10kV high surge immunity

Text by DET

Delta Electronics' latest range of 600W LED drivers comes rigorously tested for both indoor and outdoor lighting requirement. As part of the LNE series, the 600W design can withstand high surge immunity single pulse of 10kV for both common and differential mode. The 600W LED driver meets IEC 61000-4-2 Level 4 Criteria A, and IEC 61000-4-5 (common 6kV, differential 4kV). It comes in 36V (LNE-36V600WBGA) and 48V (LNE-48V600WBGA) output voltages. The products offer a wide operating temperature from -40°C to +70°C with convection cooling. The efficiency levels up to 96% and IP67 design makes the Delta LNE series an essential part of an energy efficient LED lighting power solution for sports arena lighting and agricultural lighting.

In addition, the products come with major international safety certifications include UL 8750, IEC/EN 61347-2-13, EN 62384 and compliant with EN 55015 Immunity/ Emissions/ Harmonic requirements.

Highlights & Features:

- ▶ International AC input voltage with worldwide certified cable use
- ▶ Up to 96.0% efficiency
- ▶ 10kV common mode & 10kV differential mode surge immunity
- ▶ IEC/EN 61000-4-2, Level 4 Criteria A, 15kV air discharge, 8kV contact discharge
- ▶ IP67 mechanical design for indoor and outdoor applications



Light rails connecting urban and suburban areas can be seen everywhere in the city

The champion of U.S sustainable city! Explore the proper livability and mobility of Portland

Text by Yvonne Chan / Senior Program Coordinator at DEF



If you list the current sustainable cities in the United States, many people may think of New York and Seattle, which are extremely strict with building codes, or San Francisco, which strives to strengthen mass transit. Among possible candidates in U.S., Portland, the most populated city in Oregon with less popular tourism, seems to be the least-likely to be on the list. But its sustainable performance turned out to be even better!

In August this year, the famous international think tank "American Council for an Energy-Efficient Economy, ACEEE" chose to hold its annual conference '2019 summer study on energy efficiency in industry' in Portland. I gained significant insight into industrial energy efficiency at the conference. Meanwhile, I also took time out to explore the city's "sustainable livability and mobility".

Portland Mall Revitalization: enhanced urban accessibility

Portland's sustainable performance has actually stood out in several ratings a decade ago. At that time, a sustainable life company in the United States conducted a study to review the urban sustainability. The study consisted of 16 aspects, including economic, environmental, green and clean technology etc. And Portland was ranked the top for two consecutive years!

There is a reason for such an excellent performance. As early as the 1970s, Portland positioned itself as a "space for citizens", allowing light rails, buses, bicycles and private cars to coexist on the Portland Mall without compromising sidewalk space. The government planned bus patron on the sidewalk, and to separate the shared transit way for both buses and the light rails from roadways for cars.

You must be curious! Where did so much road space come from? To deal with road space shortage, most of Portland's mass transit is mainly "one-way street", which means that when passengers get on vehicles heading to the right, they must go to adjacent street where vehicles traveling to the left when returning to the same place. Such planning has reduced traffic, ensured the right of way for pedestrians, and even left space for public art. The permeable pavement was able to be constructed and there were still spaces to accommodate plants on the sidewalks, which revitalized the city's connectivity and also achieved flood control effects.

Large-scale afforestation and acclaimed as the livable city

In addition to the convenient public transportation system, there are many green parks scattered in the city, including an internationally renowned case for water treatment: Tanner Spring Park. In fact, this area was originally a wetland lake, and was then filled and developed into a commercial area because of economic development. However, by the end of the 20th century, the government decided to make a major renovation, restoring nearly 0.9 acres of the wetland among its surrounding residential areas.

Under careful design, the park became the first case in Portland using local natural ecology to treat rainwater and to regulate the local ecosystem. The rainwater collection system installed around the wetland can transport water into the park, and then treated and purified by the soil layer and the ecological pool, which formed a healthy water circulation system. Natural-based solutions (NBS) were used in many places in the park to achieve a win-win effect of ecological and social well-being, and these solutions also provide strong environmental education significance. When I visited the wetland, many children were observing creatures in the pool here while many adults were resting aside. It is true that this kind of quietness and peace will make people stay a little longer.



Tanner Spring Park is an oasis in urban Portland



Unexpectedly found the world's first neighborhood certified as LEED v.4 Platinum for Neighborhood Development (ND)

In addition, I found the first neighborhood to be certified as LEED v.4 Platinum for Neighborhood Development (ND). In the neighborhood, green spaces and ecological pools scattered between the buildings. The entire community adopts NORM (Natural Organic Recycling Machine) water recycling system, and the system decentralizes water treatment and treats sewage on-site. During the process, sewage and rainwater will pass through the anaerobic digestion device, the filtration device, and then filtrated by three layers of green space and wetland. And after that, the water will be transported to deoxidation devices. In the end, the community will be directly supplied with the water after the disinfection. Therefore, 100% of the water used by the residents is recycled form sewage. Comparing to wastewater treatment systems in large metropolitan areas, electricity consumption of the decentralized wastewater treatment is significantly reduced.

Last year, the Delta Foundation and ACEEE collaborated to compose a policy report on low-carbon housing and traveling in the United States. It was mentioned that it's mandatory to disclose energy consumption of a building for house transactions in Portland. It is obvious that the city government attaches great importance to energy efficiency of buildings. During the stay in Portland, I visited Portland's unique and sustainable attractions, which made me thought that the building codes and transportation planning in Portland could be an excellent model for Taiwan.



來自台灣各廠區、美國、泰國和大陸廠區志工們共聚一堂

Volunteers from the US, Taiwan, China and Thailand cooperate to promote DEEP teaching materials and bring wireless charging technology into elementary schools

Text by Delta Electronics Foundation

As the opening day for elementary schools in Taiwan approached, the 12th Delta Energy Education Program has cheerfully begun on 31st and 30th August. After the successful teaching of electric cars and motors' basic engine principle with the triangular electromagnetism teaching aids, the wireless charging technology is the next topic to be introduced to the schools. Senior volunteering staffs from energy education sites in the U.S., Thailand, Shanghai, Hunjiang, Chengdu and Beijing all came and learned how the wireless car charging module developed by Cyntec can be used as teaching aids for electromagnetism in schools.



The program was in itself a exemplifier of energy savings in daily lives. Despite the distance of the venue and an increase in the number of participants, public transportation was arranged by the training provider to minimize the carbon emissions from transport. The concept of 'Food Miles' was promoted to reduce the environmental impact of food. As learned from this year's topic, a substantial cut in vehicle emission could be achieved by electric public transportation, a green trip was organized for the participants. Volunteers traveled with Tamsui light rail to visit the Chi Po-lin Museum and learn about the passion and selfless dedication to the environment of the documentary filmmaker and environmentalist Chi Po-lin. Finally, group discussions and teaching demonstrations are held in the diamond-level green building in Xinshi Elementary School at Tamsui. This was the first time for volunteers to bring their school-age children to learn together, and the parents also drew great encouragement from the participation of those young assistants.



The teaching demonstration for operation of teaching aids was opened to the children of volunteers for the first time



Energy education volunteers traveled with light rail to visit the Chi Po-lin Museum

Apart from acquiring energy literacy in the training, overseas volunteers were also here to exchange their experience at different energy education sites. Arthur, who works at Delta Americas and is responsible for promoting Corporate Social Responsibility, applied wireless teaching aids to volunteer events at junior high schools and senior high schools in DPC after participating last year's Delta Energy Education Program in Taiwan. The implementation of energy education for Deltas in China covers the widest area. Heng Lin from Delta Electronics Shanghai reported that the collaboration between local elementary schools and every subsidiary was rewarded for the contribution to energy education. Solar energy was introduced to children by Delta Electronics Thailand. The Thailand representative Teresa shared their lesson plan of combining green building with solar cooker. And we couldn't stop watering during her report. In addition, overseas members also brought inspiring stories about green buildings in their climate region, from net zero energy building (NET ZEB) in north America to Delta Electronics Thailand's renovation of its plant from old buildings and to Yangguang elementary school in Chengdu, Sichuan. Instead of merely statistics on the paper which the volunteers in Taiwan were very familiar with, these stories added human touches to green buildings.

The Program 'Low-Carbo Transport' will open for applications from October 2019 to June 2020. Schools near Delta Taipei, Taoyuan, Zhongli and Taichung are first considered. For more news and information, please visit Delta Electronics Foundation official website.

