TAICS

社團法人台灣資通產業標準協會

Taiwan Association of Information and Communication Standards

2022 Annual Report

2022 Annual Event

Seminiar Workshop Lecture Activity

01 January

02 February

02/22
Beyond 5G (B5G) Technology Workshop – [Nokia] 3GPP RAN Release 18 themes and future of TSG RAN

03 March

03/15
The Latest International Standardation Sharing-NR NTN and Idle Mode

03/22
The 7th Meetings of the Second Board of Supervisors

04 April

04/14
3GPP 5G communication standard introduction

05 May

06 June

06/07
[On-line] The Latest International Standardation Sharing-3GPP (NR IIoT)

07 July

07/08.09
Webinar for 5G V2X and O-RAN Development Status

08 August

08/04
Webinar for 5G Open RAN Interworking and Information Security Certification and Verification

08/05
[On-line] ICT Standards Training

09 September

09/01
Webinar for EU Cybersecurity Act & Cybersecurity Certification Framework

09/06
The Latest International Standardation Sharing - 3GPP (5G Information Security Framework)

09/09
3rd TAICS-TTA Joint Workshop – 5G-Advanced and Beyond

09/23
2021 TAICS Standards Forum-Information Security Standards and Applications

09/27
The 1st Meetings of the Third Board of Supervisors
The 1st General Meeting of the Third General Assembly

10 October

10/13
MTSFB-TAICS 5G Forum Webinar-Exploration for 5G Implementation Challenges and Opportunities

10/14
Information and Communication International Standards Workshop

10/27
[2021 Global Standard Forum] Low Earth Orbit Satellite Communications

11 November

11/12
Webinar for 5G Open RAN Development Trend Sharing

12 December

12/09
The 2nd Meetings of the Third Board of Supervisors

A Message from the Chairman

We thank all sectors for supporting and caring for the Taiwan Association of Information and Communication Standards (TAICS). This year, after lockdowns gradually eased and the world opened up, TAICS' standards meetings are progressively returning to normal. In 2022, we completed nearly 50 technology standards meetings and formulated 10 industry standards and specifications, covering industrial automation cybersecurity for smart manufacturing, 5G O-RAN cybersecurity research, 5G base station cybersecurity, intelligent building facility management systems, and autonomous vehicle HD map data. The results of these standards, specifications, and studies will serve as a reference for domestic industry development, and relevant government agencies already utilized some as reference standards for installation grants and procurement.

Governments worldwide are currently concerned with cybersecurity. With the support of the Industrial Development Bureau and the Ministry of Digital Affairs, TAICS is in contact with EU ENISA and has signed MOUs with European labs. Moreover, tools and modules will be available this year to help companies compile preliminary test reports for products to lead the domestic industry in early deployment to comply with international cybersecurity specifications.

Regarding global exchanges, TAICS has resumed in-person exchanges with various countries' standards organizations. For example, we invited several representatives from South Korea to fly to Taiwan to exchange with us in person at the TAICS-TTA Joint Workshop we organized at the end of November. For promoting 5G standards, TAICS and MediaTek secured the organization of 3GPP TSGs#100, the 100th technical standards meeting, in Taiwan with the international standards development organization 3GPP. The meeting, to be held in June 2023, will help Taiwan companies stay up to date with international standards developments and broaden the influence of Taiwan companies over international standards.

Last, I want to express my gratitude to all the members who have provided TAICS with continuous support and care. We have combined the expertise of members from more than 100 companies to find a consensus on ICT industry standards. I aspire for TAICS to reach new heights, to be at the forefront of industry standards to become the professional platform that fosters connections between the industry and global standards organizations.

Chairman of TAICS

Jyuo Min Shyu

Contents

1 Overview

2 Achievements of the TAICS

1 Overview

1.1 Mission

Taiwan Association of Information and Communication Standards (TAICS) is an industry organization founded in June 2015, with the objectives of developing information and communication technology (ICT) standards among Taiwan's industries and engaging them with related international standards to enhance the competitiveness of Taiwan's industry. To achieve such goals, TAICS performs the following tasks.

1 Establish a platform:

Establish a platform to facilitate collaborative development of ICT standards among domestic vendors to meet Taiwan's industrial needs.

2 Connect International Standards Organizations:

Act as an intermediary for Taiwan in international standardization affairs and strengthen the connections between regional, international standards development organizations.

3 Promote industry standards:

Promote the adoption of Taiwan's ICT industry standards by local, regional or international standards bodies.

1.2 TAICS Organizational Structure

The Taiwan Association of Information and Communication Standards (TAICS) is organized and operated by key companies of Taiwan's information and communication industry. We have nearly 100 members from industry, academia, and research organizations.

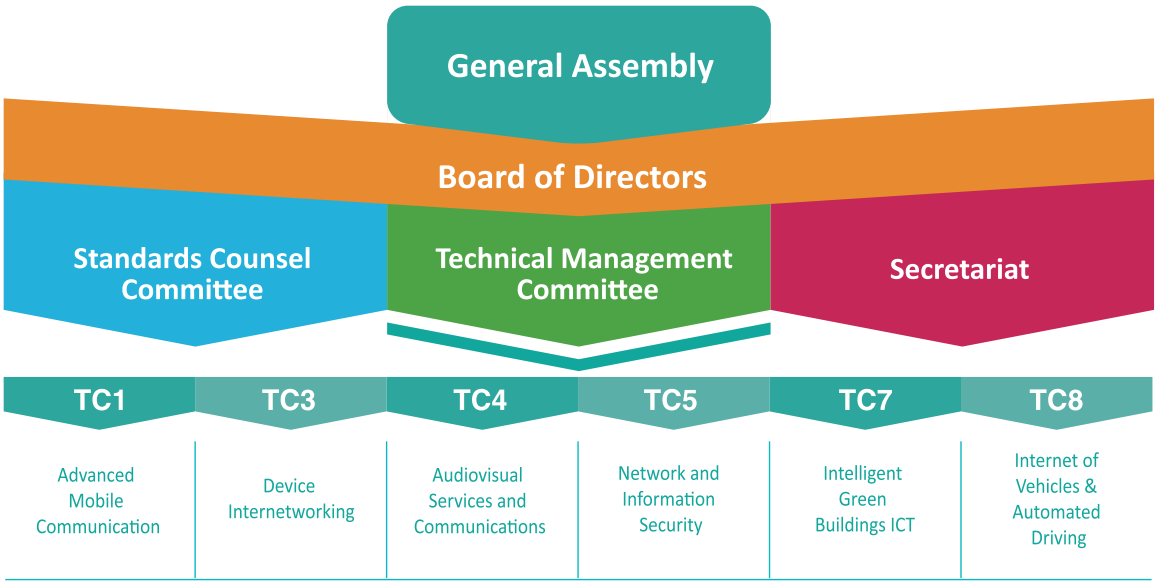


Fig 1. TAICS Organizational Structure

Representatives of various companies participated enthusiastically in the elections during the member conference and elected the Board of Directors for the current term (3rd term). Jyuo-Min Shyu, Research Fellow of the Industrial Technology Research Institute, will serve as the Chairman; Tsu-Chin Lee, Director of Inventec Corporation, and Pei-Zen Chang, Executive Vice President of the Industrial Technology Research Institute, will serve as the Vice Chairmen; and Shyue-Ching Lu, Honorary Professor of National Yan Ming Chiao Tung University, will serve as Executive Supervisor.

Chairman of TAICS
Jyuo Min Shyu

· Board of Directors

Position in TAICS	Name	Company	Position
Chairman & Managing Director	Jyuo Min Shyu	Industrial Technology Research Institute	Research Fellow
Vice Chairman & Managing Director	Richard Lee	Inventec Corporation	Board of Director
Vice Chairman & Managing Director	Pei-Zen Chang	Industrial Technology Research Institute	Executive Vice President
Director	Cheng-Te Chuang	Media Tek Inc.	Corporate Executive Vice President, Wireless Technology Group
Director	Shun-I Chu	Zyxel Communications Corp.	Chairman
Director	Jason Yi-Bing Lin	National Yang Ming Chiao Tung University	Chair Professor
Director	JK Chen	Chunghwa Telecom Laboratories	Vice President
Director	Henry Yeh	ASUSTek Computer Inc.	Corporate Vice President, Technology Innovation Office
Director	Wei-Bin Lee	Hon Hai research Institute	CEO
Director	James Hsu	AMPACS Corporation	Vice Chairman
Director	Karen Chang	Egis Technology Inc.	Vice Chairman
Director	Daniel Chang	Auden Techno Corp.	Chairman
Director	Gary Chen	HwaCom Systems Inc.	Chairman
Director	Steve Lai	ECOLUX Technology Co., Ltd.	Chairman
Director	Alice Chou	Taiwan Institute of Economic Research	Vice President
Alternate Director	Herman Rao	Far Eastone Telecommunications Co., Ltd.	Executive Vice President
Alternate Director	Morgan Hong	Onward Security Corporation	General Manager

· Board of Supervisors

Position in TAICS	Name	Company	Position
Executive Supervisor	Shyue Ching Lu	National Yang Ming Chiao Tung University	Emeritus Professor
Supervisor	Show-Ling Wen	Taiwan Intelligent Building Association	Honorary President
Supervisor	HT Lin	Telecom Technology Center	CEO
Alternate Supervisor	Albert Chen	Inventec Co.	Senior Vice President

Three units are established under the Board of Directors: the Technical Management Committee (TMC), the Standard Counsel Committee (SCC), and the Office of the Secretariat.

The Technical Management Committee (TMC), chaired by Albert Chen, Senior Vice President, Inventec Co., is to review the tasks, productivity, personnel appointments, and formation of the Technical Committees (TC). Also, the TMC coordinates the work among the TCs in the standardization process of the TAICS.

TMC Chair Albert Chen

SCC Chair Shyue Ching Lu

The Standard Counsel Committee (SCC) is to provide concrete recommendations for drafts of standards, standardization plans, and the promotion of standard counseling for TAICS. Dr.Shyue-Ching Lu, Honorary Professor of National Yang Ming Chiao Tung University, is the chair and Dr.Ming-Whei Feng, Vice President and Director General of Smart System Institute (SSI), at Institute for Information Industry (III), is the vice chair.

The Secretary General of the Office of the Secretariat is Sheng-Lin Chou, Chief of Venture Officer, Information and Communications Research Laboratories (ICRL) at Industrial Technology Research Institute (ITRI). The Office of the Secretariat deals with international affairs, partner relations, promotion of achievements, project management, and other administrative tasks. They also provide support for the operation of the TMC and SCC.

Secretary General Sheng-Lin Chou

In addition, 6 Technical Committees (TCs) have been established under the TMC in certain fields in Taiwan according to the urgency of the need to develop technical standards. TCs is where the industry come together to develop ICT industry standards in technical fields.

1.2.1 TC1 Advanced Mobile Communication Technical Committee

The primary focus of TC1 is the new generation of key industry technology in wireless communications, including access technology, network technology, the frequency spectrum of the future, and industry applications. The purpose of this Technical Committee is: The TC1 concentrates the research resources of the domestic industry, academia, and research institutes, and build a consensus, all for the purpose of developing of a new generation of wireless communication technologies. TC1 will become the single channel of communication for Taiwan in related international standard development organizations, e.g. 3GPP, and will thereby promote a connection to related international and regional standards as a precursor to establishing core intellectual properties in the future of international mobile communication standards.

TC1 defined the development vision and requirements of next-generation wireless communication technology based on the characteristics and demands of Taiwan's industries. Based on the applications and technology evolution of next-generation wireless communications, TC1 conducts applicable spectrum studies to provide a reference for policy formulation and for the development of key technologies and system specifications for next-generation wireless communications, in order to influence future B5G/6G standards and technologies. At the same time, TC1 serves as an intermediary of international partnerships for Taiwan's next-generation wireless communication technologies. TC1 facilitated international partnerships and business matching, drove international marketing, and strengthened the connection with international/regional standards.

In 2023, TC1 will continue to participate in exchanges related to 6G visions, needs, and technology trends, integrate the research and development capabilities of industry, government, academia, and research, and build consensus on the technology viewpoints of Taiwan's industries. TC1 plans to complete the White paper on potential 6G technologies in the third quarter of 2023, which will serve as a reference for Taiwan to develop 6G technological advantages. The white paper can also be used to exchange development information with regional standards organizations worldwide to ensure that Taiwan's limited and valuable research and development resources can focus on favorable opportunities and key technologies and allow Taiwan's industry, government, academia, and research to utilize global influence while progressing in 6G technologies and enhance the competitiveness of Taiwan's mobile communications industry.

TC1 will continue to share the latest information obtained from meetings about international standards and liaise with 3GPP in a timely manner to provide the opinions of Taiwan's industry to influence the development of international standards and even integrate Taiwan's capabilities with the 3GPP standards organization. TC1 will also strive to be re-elected as the RAN2 chairman to increase the exposure and acceptance of Taiwan's proposals and improve B5G standards in the future to continue to exert Taiwan's influence in the development of international standards for 5G.

1.2.2 TC3 Device Internetworking Technical Committee

Develop universal industry standards for device internetworking applications such as smart environment protection monitoring, smart grid, smart lighting, and other fields to improve competitiveness across the industry in Taiwan.

TC3 will formulate the Data format standard for smart agricultural IoT from 2022 to 2023. The Council of Agriculture supports the formulation of the standard, which will combine the opinions of industry experts. With agricultural IoT data exchange as the objective, TC3 will formulate standards for the data exchange format of the different agricultural management systems of related agricultural units in Taiwan, including the names and definitions of the agricultural IoT fields and the application programming interface (API) for exchanging data to facilitate data connections between different units to accelerate the development of smart agriculture. TC3 expects to produce the Data format standard for smart agricultural IoT in the second quarter of 2023.

TC3 plans to publish a report on the global development status of cooperative and connected unmanned vehicles in 2023. TC3 will collect the needs of the domestic industry to prepare for the formulation of the standard for cooperative and connected unmanned vehicles and expects to produce the Cooperative and connected unmanned vehicles standard in 2024.

1.2.3 TC4 Audiovisual Services and Communications Technical Committee

The goal of TC4 is to consolidate audiovisual services and communications technologies, establish a content-service integration platform, enrich specialty audiovisual channels and content, facilitate development of innovative value-added audiovisual operating and service modes, and drive the development of Taiwan's digital audiovisual software and hardware industry chain.

To establish 5G broadcast industry technical standards that are in line with Taiwan's situation, TC4 started developing the Study on the development of Taiwan's 5G broadcasting industry in 2022. The goal of the study is to promote the experimental program for the next-generation digital wireless TV and 5G broadcasting to accelerate the development of Taiwan's 5G broadcast industry.

In terms of international connections, TC4 will continue to participate in events related to MPEG video standards, such as H.266 and Point Cloud Compression (PCC), regularly update the status of the development of MPEG-related video standards, and obtain and share firsthand video standards information and technology trends as a reference for the technology development blueprint of Taiwan's video industry . TC4 will continue to reference and attend conferences of the relevant standards of the ECI collaboration platform to accelerate the formulation of industry standards for content protection and copyright management of emerging media in Taiwan.

1.2.4 TC5 Network and Information Security Technical Committee

TC5 promotes the development of industry standards according to the security needs of Taiwan's information communication industry. TC5 keeps track of the latest trends in the region and in the world to promote the development of safe and trustworthy products and services, bolster the influence of Taiwan in international organizations, and facilitate the industry' s global market strategy.

- The IoT cybersecurity work group (WG1) researches specifications and standards for interface security, vulnerability testing, and security compliance of IoT devices and systems. In 2022, WG1 published the Cybersecurity guidelines for smart manufacturing IACS - Part 1: Asset owner, the Cybersecurity standard and test specification for set-top boxes, the Cybersecurity standard and test specification for modems, and the Cybersecurity guidelines for smart manufacturing IACS - Part 2: Integration and maintenance service provider.
- The identify verification and identification work group (WG2): researches biometric identification with FIDO technology. WG2 discusses the technical specifications of cybersecurity technology combined with the PKI framework and connects with foreign countries.
- The mobile cybersecurity work group (WG3) researches and analyzes future development trends and cybersecurity requirements of the new generation of mobile communication technologies and builds consensus on mobile cybersecurity through cybersecurity analysis and studies and formulating cybersecurity test specifications. In 2022, WG3 published the Cybersecurity study report for 5G Open RAN and the Cybersecurity test specification for gNodeBs v2.

Looking forward to 2023, the team will develop the Cybersecurity test specification for 5G Open RAN to solve the cybersecurity issues of 5G Open RAN. The specification will be based on the Cybersecurity study report for 5G Open RAN published in 2022 to provide 5G Open RAN manufacturers with an understanding of the threats they will face and the countermeasures they can adopt when using the technology. As 5G technology gradually matures, the high degree of flexibility that comes with its characteristics allows private enterprises and government units to build private networks for specific applications. The lack of a private 5G network cybersecurity management structure for the field, personnel, and processes could easily lead to the problem of responsibility attribution, potentially posing a huge threat to deploying the private network in the field and the audit and control process of cybersecurity. TAICS will propose suggestions for cybersecurity guidelines for the operations and maintenance stage of the 5G base station/core network equipment system layer after the 5G field is built and connected for the operations and maintenance considerations of private 5G network builders, integrators, and operators. TAICS will also propose the Cybersecurity guidelines for private 5G network equipment and service management systems.

Once the smart manufacturing industrial IoT's Industrial Automation and Control System (IACS) was connected and after the Industry 4.0 process internet was catalyzed, cybersecurity issues started impacting industrial production. With the role of applying the CNS/IEC 62443 standard, TC5 completed Part 1: Asset owner and Part 2: Integration and maintenance service provider of the Cybersecurity guidelines for smart manufacturing IACS in 2022. In 2023, to improve the cybersecurity capabilities of industrial automation and control systems and provide a stable and secure industry environment, TAICS will continue to develop the Cybersecurity guidelines for smart manufacturing IACS - Part 3-1: Industrial control and cybersecurity management of manufacturing systems.

Moreover, the Security assessment guidelines of system-level IoT-enabled applications part 1: General requirements published in 2021 have been utilized in the field for over a year. TAICS will revise the test items that do not apply to the actual tests and make the terms and definitions more practical for use in more fields. Domain name system attacks occurred ceaselessly in recent years. As an essential service for internet connections, common cybersecurity issues for domain name system services include hijacking, amplification/reflection attacks, and denial-of-service attacks. Thus, TC5 will formulate the Cybersecurity guidelines for domain name systems in 2023 to conduct assessments according to relevant international guidelines and known domain name system threats. TC5 will evaluate related risks through the operating processes and system mechanisms and suggest implementation items to provide guidelines for checking cybersecurity configurations to ensure secure domain name system operations and data integrity.

1.2.5 TC7 Intelligent Buildings ICT Technical Committee

The mission of TC7 is to develop and promote information communication standards for intelligent buildings. The purpose of TC7 is to act as a platform for communication among industry, government, academia, and research institutions, and for developing and promoting standards with consideration of intelligent buildings information communication standards; to represent Taiwan in activities hosted by the international intelligent building standards alliance and facilitate the development of the intelligent building industry in Taiwan.

TC7 published the Data format standard and test specification for intelligent building facility management systems in 2022 to accelerate data exchange interoperability of intelligent building facility management systems and enhance industry competitiveness.

In the future, TC7 will continue to build a dialogue platform for the intelligent buildings industry to provide a foundation for cross-industry dialogue. In 2023, TC7 will formulate the Data exchange interoperability standard and test specification for intelligent buildings to establish the data exchange interface (API) between the surveillance systems, energy management systems, and facility management systems of intelligent buildings, the intelligent building management systems, and the intelligent building cloud platforms and test specification. For global connections, TC7 will continue to participate in APIGBA events and help with the participation of Taiwan's excellent intelligent green buildings and system products to promote Taiwan as Asia's bellwether of intelligent green buildings.

1.2.6 TC8 Internet of Vehicles (IoV) & Automated Driving Technical Committee

TC8 was established with the purpose to improve industry competitiveness by developing a common industry standard that follows the global trend in next generation intelligent transportation and the development of automated driving and V2X initiated by the IoV. By creating specifications that is on par with international standards, TC8 can provide Taiwanese companies a reference specification when manufacturing and marketing products. The committee will also serve to introduce foreign technologies that can serve as a reference for the industry, government, academia, and research sectors as they formulate their strategy for the future.

In terms of developing standards, TC8 focused on high-precision maps (WG3) and completed the Content and format standard for autonomous vehicle HD Maps auxiliary and events data in 2022. TC8 gathered real-time information released by different units to provide autonomous vehicles with real-time road information. By formulating the Standard for autonomous vehicle HD Maps auxiliary and events data, TC8 provided autonomous vehicles access to traffic services and warning information already established in Taiwan, including real-time traffic, parking, traffic incident, warning, road construction and closure, and weather information, driving the development of related industries with national standards.

For IoV technology in 2023, TC8 will further explore developments related to two-wheeler vehicles and formulate the Safety warning application standards for connected two-wheeler vehicles v2 and the Guidelines for accuracy requirements and verification process of smart vehicle navigation systems to integrate the latest information on international standards development, providing reference for domestic industry development.

For participating in the development of international standards, TC8 will continue to attend international standards conferences, including those organized by SAE (U.S.), ETSI (Europe), ARIB (Japan), and the ITS Forum. TC8 will share the information obtained from the conferences in the working meetings to provide Taiwan's industry a plan for future product output to help Taiwan's manufacturers develop products that are globally connected.

2 Achievements of the TAICS

2.1 Standards Development

TAICS hosted nearly 50 technology standards meetings in 2022, which more than 1,000 member experts attended. With members' eager participation, we reached consensuses in various sectors through Technical Committees, establishing industry standards and specifications, completing a total of 10 formulations and publications, namely 4 standards, 3 specifications, 1 study, and 2 guidelines. The results of these standards and specifications serve as a reference for industry development, and were also utilized by related government agencies as reference standards for installation grants and procurement.

In terms of device internetworking, the Automatic clean water monitoring system field deployment Guidelines were completed. The guidelines consider the location, power, and communication restrictions of different sites for installing water-quality monitoring equipment, and propose solutions and cases based on systematic and scientific analyses, and inventories. We hope that these guidelines will serve as a reference for deployment by monitoring companies and system integrators in Taiwan, thereby effectively reducing operations and maintenance costs and enhancing competitiveness.

In network and cybersecurity, the following research reports, standards, and test specifications were completed. A summary is as follows: In network and cybersecurity, we completed the Cybersecurity guidelines for smart manufacturing IACS - Part 1: Asset owner, the Cybersecurity study report for 5G Open RAN, the Cybersecurity standard and test specification for set-top boxes, the Cybersecurity standard and test specification for modems, the Cybersecurity test specification for gNodeBs v2, and the Cybersecurity guidelines for smart manufacturing IACS - Part 2: Integration and maintenance service provider.

The Cybersecurity guidelines for smart manufacturing IACS - Part 1: Asset owner is based on the IEC 62443 series of standards and provides cybersecurity guidelines for Industrial Automation and Control Systems (IACS) of production plants. The guidelines apply to asset owners responsible for planning policies and procedures and operating and maintaining control systems. The guidelines cover cybersecurity requirements of the systems and the defense boundaries of connected interfaces, namely the needs of each stage from risk analysis, evaluation, cybersecurity countermeasures, requirements, design, implementation, verification and confirmation, operations, and maintenance to decommissioning. The Cybersecurity study report for 5G Open RAN builds on the standards, specifications, and study reports of the O-RAN Alliance and The 3rd Generation Partnership Project (3GPP). It analyzes the implementation methods of Open RAN's security mechanisms and test cases to help 5G system integrators and manufacturers understand the threats they will face when deploying Open RAN and response methods. The report also serves as a reference for formulating the future domestic test specification for 5G Open RAN cybersecurity.

The Cybersecurity standard and test specification for set-top boxes stipulates the cybersecurity requirements for set-top boxes according to four security aspects: (1) availability, (2) identification, (3) encryption, and (4) security functions and categorizes the security requirements into three levels. It is a reference blueprint for set-top box testing technologies of product manufacturers, system integrators, and IoT cybersecurity testing laboratories. The Cybersecurity standard and test specification for modems establishes cybersecurity requirements for modems according to seven security aspects: (1) physical security, (2) firmware security and updates, (3) system security, (4) communication security, (5) identity authentication security, (6) webpage service security, and (7) log data security and categorizes the requirements into three levels, providing product manufacturers, system operators, and IoT cybersecurity testing laboratories a reference for modem product testing technologies.

The Cybersecurity test specification for gNodeBs v2 is a correction and revision based on 3GPP's TS 33.117 and TS 33.511 documents. Its implementation details and testing aspects covers mobile communication security and systems and applications security. The Cybersecurity guidelines for smart manufacturing IACS - Part 2: Integration and maintenance service provider references the recommendations and practices of the Cybersecurity guidelines for smart manufacturing IACS - Part 1: Asset owner and refers to IEC 62443-2-2 ED1, the Cyber Security Agency of Singapore's Security-by-Design Framework, CNS 62443-2-4, and the NISTIR 8183 Cybersecurity Framework Manufacturing Profile to provide implementation principles and methods for those who offer smart manufacturing integration and maintenance services. The guidelines apply to the field functions, automation functions, and manufacturing operations management (MOM) functions covering the International Society of Automation's ISA-95 or the NISTIR 8107 manufacturing pyramid model and connections to enterprise information systems in a Demilitarized Zone (DMZ) of the Purdue Reference Model, IACS solutions within the scope of the IEC 62264-1 Hierarchy Model.

For intelligent buildings, we completed the Data format standard and test specification for intelligent building facility management systems to define the data format standard and test specification for the application scenarios and requirements of the lifecycle facility management systems of intelligent buildings to help vendors test and verify that the systems they develop conform to the data format standard. Integrated monitoring platforms of intelligent building facility management systems can use the standard and test specification to utilize the benefits of integrated intelligent building facility management systems, improve the standard of integrating systems and maintaining the quality, and improve the technical standard of domestic equipment and systems integration companies to boost industry competitiveness.

For IoV and autonomous driving, we completed the Standard for autonomous vehicle HD Maps auxiliary and events data, where auxiliary data includes information related to real-time traffic and parking, while events data covers events that impact road accessibility or lead to a lower level of services, which includes seven categories: accidents, construction, congestion, hazards, activities, preventative traffic control, and other. The data gives autonomous vehicles more real-time information to avoid dangerous road segments or traffic jams and make better decisions when planning routes and parking. The standard applies to units that release auxiliary and events data for autonomous vehicle HD Maps, data services platforms, and the autonomous vehicle industry.

2.2 TAICS Standards Adoption

▶ Cumulative results of the IoT cybersecurity mark system

Since the promotion of the IoT cybersecurity mark system from 2018 to the end of 2022, a total of 6 laboratories have been approved and 165 products (or series of products) were certified, including 112 video surveillance systems, 21 digital set-top boxes (San Da Cable TV, Cable Giant, Chunghwa Telecom, Homeplus Digital, Shih-Hsin, TAIPEINET, TFN Media, Taiwan Infrastructure, TBC, PINGNAN, and Kbro), 10 mobile signal boosters (Coiler, Universal Mobile Technical Services, and Remotek), 12 intelligent street-lights (3jiot, Delta Electronics, Semisils, LEOTEK, Lite-On, ORing, InSynerger, Far EasTone Telecommunications, and ITE TECH), 3 on board units (Baoruh, Vacron, and Telenet), 2 intelligent bus stops (MaxWin Technology and New Light Opto), and 5 wireless routers (Atop, Tecom, ORing, Billion Electric, and Arcadyan).

Table: Cumulative number of certificates issued (2018 to December 31, 2022)

Types of Boiler	Accredited Laboratory	Qualified Product
Video monitoring systems	5	111
Wireless/hybrid IP cameras	2	0
Digital set-top boxes	2	21
Mobile signal boosters	2	10
Smart street lights	2	12
Intelligent bus telematics systems	0	5
Wireless access points	1	0
Wireless routers	1	5

Many products were tested and passed by the 8 TAICS-approved laboratories. Interested members are welcome to contact them directly. Please check the TAICS' website for the contact information.

Table: Statistics of cumulative number of items (2018-2022)

Cardinal	1	2	3	4	5	6	7	8
Name of the laboratory / Product category	Telecom Laboratories/ Chunghwa Telecom Co., Ltd./Testing Center	TUV Rheinland Taiwan Ltd./Taipei Testing Laboratories	Onward Security Corporation/Security Assessment Laboratory	Gapertise Mobile Vetting Service Co., Ltd/Smart IoT Security Vetting Laboratory	Taiwan Testing and Certification Center/Information and Communications Testing Laboratory	Telecom Technology Center/Info-Com Security Testing Laboratory	PricewaterhouseCoopers Taiwan/Information Security and Forensic Science and Technology Laboratory	Information Security Service Digital United Inc./Information and Communication Security Detection Laboratory.
Wired IP CAM	V	V		V	V	V	V	V
Wireless IP Camera	V					V		
Wireless Local Area Network Access Point						V		
Wireless Router						V		
Digital Set Top Box	V					V		
Intelligent Bus Telematics System-Intelligent Bus Stop			V					
Intelligent Streetlight System-Intelligent Lighting		V	V					
Mobile Communication Repeater	V					V		
Smart Speakers								

▶ 2022 Verification and certification results

In 2022, a total of 26 products (including a series of products) were approved and listed on TAICS website. Interested members may visit the website.

Product Category	Main Product	Series of Products	Total
Wired IP CAM	8	5	13
Intelligent Streetlight System-Intelligent Lighting	1		1
Digital Set Top Box	5	2	7
Wireless Router	1		1
Mobile Communication Repeater	4		4
Total	19	7	26

There were a total of 14 IoT devices, 13 wired IP cameras and 1 smart streetlights. The statistics of each device are described below:

Item			Main Product	Series of Products	Total
IoT devices (total in 14 items)	Wired IP Camera		8	5	13
	1	Geovision, Inc.	1	1	2
	2	Hi Sharp Electronics Co., Ltd.	2	3	5
	3	COP Security System Corp.	2	1	2
	4	Acti Corporation	1	0	1
	5	Cammax Optronics Co., Ltd	1	0	1
	6	Vital Resources Co., Ltd.	1	0	1
	Intelligent Streetlight System-Intelligent Lighting		1	0	1
	1	LEOTEK Corporation	1	0	1

There were a total of 14 Netcom devices, 7 digital set top box, 1 wireless router and 4 mobile communication repeater. The statistics of each device are described below:

Item			Main Product	Series of Products	Total
Netcom devices (total in 12 items)	Digital Set Top Box		5	2	7
	1	Cable-Giant CATV Co., Ltd.	1	0	1
	2	TFN Media	1	0	1
	3	Ping Nan CATV Co., Ltd.	1	0	1
	4	KBRO	1	0	1
	5	Shih Sin CATV Co., Ltd.	1	0	1
	6	Taiwan Infrastructure Technology	0	2	2
	Wireless Router		1	0	1
	1	ATOP Technologies, Inc.	1	0	1
	Mobile Communication Repeater		4	0	4
	1	Universal Mobile Technical Services Inc.	1	0	1
	2	Remotek Corporation	3	0	3

2.3 TAICS Events

▶ 2.3.1 [2022 TAICS Standards Forum]

B5G/6G Technology Development and Applications (2022/05/26)

TAICS held the 2022 TAICS Standards Forum online on May 26, 2022, focusing on B5G/6G technology development and applications. 5G technology and industry representatives from Taiwan, Japan, and South Korea were invited to share the latest 5G policy plans, technology developments, and applications. TAICS Chairman Jyuo Min Shyu and Secretary General Sheng-Lin Chou expressed their gratitude for the friendship and support from the Ministry of Internal Affairs and Communications of Japan, ARIB of Japan, and TTA of South Korea during their opening remarks. They said that new 5G forces can be created by learning from each other through frequent interactions and forming alliances in the 3GPP organization. They also thanked ITRI, MediaTek, Keysight, Rohde & Schwarz Taiwan, and Communication Components for their help and sponsorship of this event and hoped that all participants could benefit from it.

Pang-An Ting, General Director of Information and Communications Research Laboratories of ITRI, started the presentations by introducing Taiwan's low earth orbit satellite and 6G communication plans. Shinji Ide, Director of Japan's Ministry of Internal Affairs and Communication, indicated that Japan faced significant challenges due to the declining population and changes in social structure. Thus, Japan's government proposed Society 5.0, a blueprint for a super-smart society where humans live in a world where cyberspace and physical space are tightly integrated, and a blueprint and policy plans for realizing B5G that connects AI, robotic, and IoT technologies to realize the super-smart society that can connect with the world.

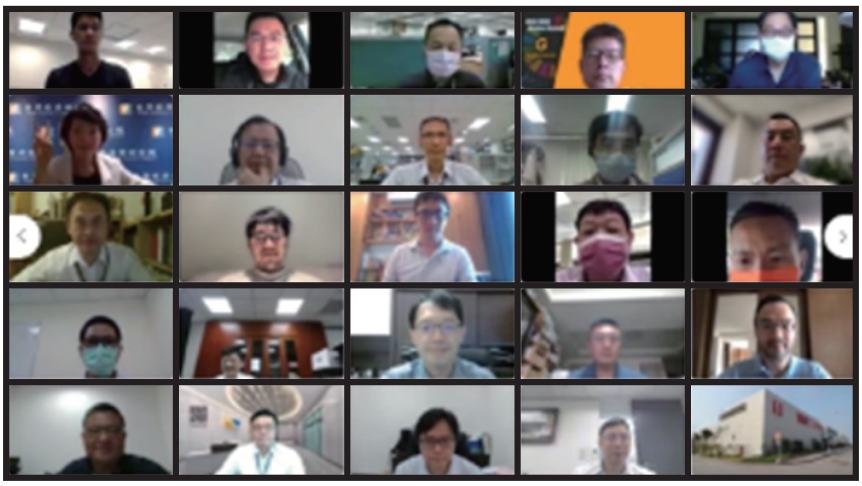
Dr. Lee of South Korea's TTA mentioned the South Korean government's commitment to improving the 6G core infrastructure in the next ten years and achieving a B5G global cooperative ecosystem. TTA has also set up multiple 5G/B5G work groups within their organization for this purpose. Moreover, NTT DOCOMO and Samsung Electronics shared Japan and South Korea's visions and blueprints for 5G/6G, and Taiwan's speakers (representatives from MediaTek, Far EasTone, and ITRI) shared exciting information about 5G developments, low earth orbit satellite tests, and global 5G O-RAN tests. Many members attended this event; 110 to 120 participated on average.

Caption: An online group photo of the event's guest speakers, representatives, and participants.

▶ 2.3.2 2nd member conference of term 3 (2022/06/23)

The 2nd member conference of term 3 was held online on June 23, 2022 due to the pandemic. However, many members still attended. Chairman Jyuo-Min Shyu served as the chairperson while Secretary General Sheng-Lin Chou of the secretariat presented the outcomes of 2021 and the 2022 work plan to the members. The work plan was reviewed and approved online by the members.

Chairman Jyuo-Min Shyu said he is grateful for everyone's support and care for the association. With the support of various government agencies, we have completed many projects for formulating industry standards and specifications throughout this year, making substantial contributions to the industry. We continue to move forward with B5G and 6G standards and continue to internationalize. At the end of May, we organized the TAICS Standards Forum, inviting representatives from Japan's Ministry of Internal Affairs and Communication, Japan's telecom operator NTT Docomo, South Korea's TTA, Samsung, and Taiwan's industry, academia, and research units (MediaTek, Far EasTone, ITRI, NTU, Auray, Keysight, and R&S) to present the latest technical standards and applications for B5G and 6G, which participants received with great enthusiasm. Looking to the future, we will continue our commitment to promoting international standards like 3GPP and work with member companies so that information and communication standards can exert an essential impact.



Caption: An online group photo

▶ 2.3.3 4th TAICS-TTA Joint Workshop 5G-Advanced and Beyond (2022/11/23)

The Taiwan Association of Information and Communication Standards (TAICS) and the Telecommunications Technology Association (TTA) hosted the 4th TAICS-TTA Joint Workshop on November 23, 2022, to welcome the next-generation 5G/6G standards. The workshop focused on 5G-Advanced and Beyond. Dr. Daekyum Kim, Chairman of the Mobile Communication Technical Committee, TTA, and Dr. Hyeon Woo LEE, Vice Chairman of the Mobile Communication Technical Committee, TTA, from Korea, led the in-person exchanges in Taiwan. Speakers included representatives from LGE, Samsung, and SKT. Chunghwa Telecom, MediaTek, Spectacular, Pegatron, and National Taiwan University represented Taiwan. Participants shared and exchanged views on the latest progress of current 5G/6G standards.

The two parties met at the workshop in person for the first time after the pandemic. In his speech, TAICS Chairman Jyuo-Min Shyu said that TAICS is eager to welcome representatives from international standards organizations to resume regular exchanges and visits after the country reopens. Doing so will strengthen friendships, spark more ideas, and generate more opportunities for partnerships for technical standard exchanges. In his online speech, TTA Vice President Kyoung Cheol Koo mentioned that digital development is ever-changing. From 3G to 5G or even the next generation, TTA is happy to share the progress of the latest 3GPP standards with Taiwanese companies. TTA will continue to play an important role by sharing the insights of Samsung, ETRI, LGE, and SKT on new technologies and work with Taiwanese companies to exchange the latest developments of current telecommunications standards.

The signing of an MOU between TAICS and TTA in 2017 launched regular communications between the parties. In addition to continuing the discussion of the previous year's topics and presenting the 3GPP Rel-18 standard, this event also invited representatives from telecom operators of Taiwan and South Korea Telecom to introduce and share information about 5G/6G technologies (5G O-RAN, 5G Smart Pole, and NR Sidelink). In addition to continuing to support the development of 5G/6G technologies and cooperation-related topics in the future, TAICS and TTA also look forward to cooperating to create better industry results and contributions through learning from and discussing with each other. This event was co-organized by ITRI and the Cloud Computing and IoT Association in Taiwan and sponsored by Chunghwa Telecom and MediaTek. A total of 80 representatives from companies in Taiwan and South Korea participated in person and online.

Caption: group photo

▶ 2.3.4 Other technical standards sharing sessions

EU ENISA Cybersecurity Standards and System Sharing Session (2022/06/10 and 2022/10/14)

The European Union (EU) has been paying more attention to cybersecurity recently. In addition to the Cybersecurity Act they already passed, they published the EUCC V1.1.1 certification scheme for ICT products in May 2021 to increase trust in ICT products and services to promote the development of EU's digital economy. TAICS organized two EU ENISA Cybersecurity Standards and System Sharing Sessions in 2022. The first session invited overseas representatives from SGS Brightsight, a network of labs in Europe, Red Alert Labs, and Winbond Technology to share information about EU ENISA cybersecurity standards, EUCC solutions, and the Common Criteria-based European Cybersecurity Certification Scheme for certifying information technology products.

The second session invited Philippe Blot, the representative for EU cybersecurity certification, Professor Jiann-Liang Chen of National Taiwan University of Science and Technology, and Chien-Chang Hsu, Executive Secretary of TAICS, to share information about EUCC. The topics included the EU Cybersecurity Act and EUCC Scheme developments and updates, study reports about the EU ENISA cybersecurity standards and system, reports about industry response strategies, and plans and technologies for product development.

Through these sharing sessions, TAICS hopes to help our country's industries seize opportunities and understand relevant regulations to form countermeasures. When designing and manufacturing products, companies should adopt the applicable EU certification framework to boost the competitiveness of Taiwan's products and services in the EU market.

5G O-RAN Private Network Interoperability Test Industry Opinion Solicitation Conference (2022/07/28)

5G development and applications are progressing rapidly worldwide. For 5G private networks, companies have invested more in IoT applications and the utilization of AI for remote control and zero-touch management to maintain factory operations, driving increasing demand for 5G private networks. The deployment of 5G private networks in Taiwan will rise in the future. Therefore, TAICS invited ITRI, Chunghwa Telecom, and the National Penghu University of Science & Technology to deliver keynote presentations on worldwide O-RAN market developments, 5G private network applications and deployment experience, and 5G O-RAN private network testing frameworks. TAICS also invited many ICT representatives to participate in industry discussions. Representatives from Pegatron, Compal, TransNet, Lite-On, Alpha Networks, Far EasTone, Chunghwa Telecom, and Auray Technology discussed testing frameworks and recommendations that cater to the requirements of domestic 5G private networks based on their respective industry perspective. 76 people attended this event and more than 30 companies participated.

International ICT Standards Workshop (2022/10/20)

The number of non-standalone (NSA) 5G telecommunication networks is increasing, while the deployment of standalone (SA) ones has just entered the initial commercialization stage. 3GPP has launched the formulation of the standard for 5G-Advanced (R-18) in early 2022. This declares that the formulation of international standards has officially entered the post-5G era, following the 5G era. The organizer, the Bureau of Standards, Metrology, and Inspection, commissioned ITRI to hold the International ICT Standards Workshop in the afternoon of 2022/10/20. The Taiwan Association of Information and Communication Standards (TAICS) and the Cloud Computing and IoT Association in Taiwan were co-organizers. The workshop was held both online and offline, inviting 5G industry analysts and numerous international standards experts to share information about international standards applicable to the post-5G era, opportunities for applications and services, and future 6G developments.

Appendix: Membership

NO.	Company Name	Website
1	MEDIATEK INC.	http://www.mediatek.com/zh-TW/
2	WISTRON NEWEB CORPORATION	http://www.wnc.com.tw/index.php?lang=tw
3	ACER INCORPORATED	http://www.acer.com.tw/ac/zh/TW/content/home/
4	HON HAI PRECISION IND. CO., LTD.	https://www.honhai.com/zh-tw/
5	ARCADYAN TECHNOLOGY CORPORATION	http://www.arcadyan.com/home.aspx
6	ASUSTEK COMPUTER INC.	https://www.asus.com/tw/
7	CHUNGHWA TELECOM CO., LTD.	http://www.cht.com.tw/
8	KEYSIGHT TECHNOLOGIES INC.	https://www.keysight.com.cn/cn/zh/home.html
9	BUREAU VERITAS CONSUMER PRODUCTS SERVICES (HONG KONG) LIMITED, TAOYUAN BRANCH	https://ee.bureauveritas.com.tw/BVInternet/Default
12	AUDEN TECHNO CORP.	http://www.auden.com.tw/
13	INVENTEC CORPORATION	http://www.inventec.com/
14	NATIONAL CHUNG-SHAN INSTITUTE OF SCIENCE AND TECHNOLOGY	http://www.ncsist.org.tw/csistdup/main/Default.aspx
18	ACCTON TECHNOLOGY CORP.	http://www.accton.com.tw/
21	GEMTEK TECHNOLOGY CO., LTD.	http://www.gemtek.com.tw/
22	ROHDE & SCHWARZ	http://www.rohde-schwarz.com.tw
24	TATUNG CO.	http://www.tatung.com.tw/b5/index.asp
25	ACBEL POLYTECH INC.	https://www.acbel.com.tw/
27	UNITECH ELECTRONICS CO., LTD.	https://www.ute.com/tw/?rbu=2
29	HWACOM SYSTEMS INC.	http://www.hwacom.com/
33	SATELLITE TELEVISION BROADACSTING ASSOCIATION R.O.C	http://www.stba.org.tw/
36	TAIWAN DIGITAL TELEVISION COMMITTEE	http://www.dtvc.org.tw/index.aspx
37	TREND MICRO INC.	http://www.trendmicro.tw/tw/index.html
39	ONWARD SECURITY CORPORATION	http://www.onwardsecurity.com/
43	SPORTON INTERNATION INC.	http://www.sporton.com.tw/
44	DEKRA TESTING AND CERTIFICATION CO., LTD.	https://www.dekra.com.tw/tc/home/
48	INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE	https://www.itri.org.tw/
49	INSTITUTE FOR INFORMATION INDUSTRY	http://www.iii.org.tw/Default.aspx
53	TAIWAN MOBILE CO., LTD.	https://www.taiwanmobile.com/index.html
62	TAIWAN INTELLIGENT BUILDIN G ASSOCIATION	http://www.tiba.org.tw/
68	PEGATRON CORP.	http://cht.pegatroncorp.com/
70	ZYXEL COMMUNICATIONS CORP.	http://www.zyxel.com/tw/zh/homepage.shtml
74	SERCOMM CORPORATION	http://www.sercomm.com/home.aspx
75	NATIONAL CHIAO TUNG UNIVERSITY	http://www.nctu.edu.tw/
76	TAIWAN SECOM CO. , LTD.	http://www.secom.com.tw/
78	NATIONAL CHUNG CHENG UNIVERSITY	http://www.ccu.edu.tw/
79	INFORMATION SERVICE INDUSTRY ASSOCIATION OF R.O.C	http://www.cisanet.org.tw/
81	ELECTRONICS TESTING CENTER, TAIWAN	http://www.etc.org.tw/default.aspx

Appendix: Membership

NO.	Company Name	Website
84	NRITSU COMPANY INC.	http://www.anritsu.com/zh-TW/Home.aspx
90	TAIWAN INSTITUTE OF ECONOMIC RESEARCH	http://www.tier.org.tw/
93	FAR EAS TONE TELECOMMUNICATIONS CO., LTD.	http://www.fetnet.net/cs/Satellite/Corporate/coHome
94	TELECOM TECHNOLOGY CENTER	https://www.ttc.org.tw/
97	NATIONAL TAIWAN UNIVERSITY	https://www.ntu.edu.tw/
98	NATIONAL CHENG KUNG UNIVERSITY	http://web.ncku.edu.tw/bin/home.php
100	ASIA PACIFIC TELECOM CO., LTD.	http://www.aptg.com.tw/my/index.htm
101	TAIWAN TELEMATICS INDUSTRY ASSOCIATION	http://www.ttia-tw.org/
103	TAIWAN ELECTRICAL AND ELECTRONIC MANUFACTURERS' ASSOCIATION	http://www.teema.org.tw/index.aspx
104	SENAO NETWORKS, INC.	http://www.senao.com/Taiwan/
110	NATIONAL CENTRAL UNIVERSITY	http://www.ncu.edu.tw/
113	NAN YA PLASTICS CO.	http://www.npc.com.tw
114	EGIS TECHNOLOGY INC.	https://www.egistec.com/
116	TAIWAN-CA. INC.	https://www.twca.com.tw/Portal/Portal.aspx
117	SYNOLOGY INC.	https://www.synology.com/zh-tw
118	GAPERTISE INC.	http://www.gapertise.com/
119	TAIWAN TELECOM INDUSTRY DEVELOPMENT ASSOCIATION	http://www.ttida.org.tw/
120	ICP DAS CO., LTD.	http://www.icpdas.com.tw/index_tc.php
123	NATIONAL TAIPEI UNIVERSITY	https://new.ntpu.edu.tw/
125	NATIONAL DONG HWA UNIVERSITY	https://www.ndhu.edu.tw/
126	SGS TAIWAN LTD.	https://campaigns.sgs.com/zh-tw/taiwan/sgs-in-taiwan
127	TÜV RHEINLAND TAIWAN LTD.	https://www.tuv.com/taiwan/tw/
128	CHICONY POWER TECHNOLOGY CO., LTD.	https://www.chiconypower.com/zh-tw/
129	AUTOMOTIVE RESEARCH TESTING CENTER	https://www.artc.org.tw/
132	DELOITTE TOUCHE TOHMATSU LTD.	https://www2.deloitte.com/tw/tc.html
134	ASKEY COMPUTER CO.	http://www.askey.com.tw/
136	ESSEN PATENT AND TRADEMARK OFFICE	http://www.essenptl.com/
138	WISTRON CORPORATION	https://www.wistron.com/
140	SPECTACULAR CO., LTD.	https://www.linkedin.com/company/spectacular/?originalSubdomain=tw
142	EZ TRANSCEND INNOVATION TECHNOLOGY COMPANY LIMITED	https://www.ezplus.com.tw/
143	HP TAIWAN INFORMATION TECHNOLOGY LTD.	https://www8.hp.com/tw/zh/home.html
144	NEMKO AS, TAIWAN BRANCH (NORWAY)	http://www.nemko.com
145	AEONMOTOR CO., LTD.	https://www.aeonmotor.com.tw/
146	CHT SECURITY CO., LTD.	https://www.chtsecurity.com/
147	AESOPOWER, INC.	http://www.aesopower.com/
148	ECOLUX TECHNOLOGY	https://ecolux.tech/
149	AU OPTRONICS CORPORATION	https://www.auo.com/zh-TW
150	AMPACS CORPORATION	http://www.ampacscorp.com/zh-tw/
151	TRON FUTURE TECH	https://tronfuture.com/product/t-radar-overview/
152	AUTHME	https://authme.com/

TAICS

Taiwan Association of Information and Communication Standards

6F., No.30-2, Beiping E. Rd.,
Zhongzheng Dist., Taipei City 100, Taiwan
+886-2-2356-7698
http://www.taics.org.tw