TIC4.0
Newsletter December 2022

TIC4.0 Continues the Standardisation

TIC4.0 Review Year 2022

TIC4.0 Reinforces its Position as Global Association Driving Standardization and Innovation

2022 has been a hectic year for the cargo handling industry, a year that has deepen in a scenario without precedents in the last decades. **Besides the post-pandemic economic framework, other factors such as the conflict in Ukraine, the energy crisis and climate urgency, together with the rise on consumer goods prices and the threat of economic recession, are configuring a new world paradigm**. This situation is pushing the port and maritime industry to re-evaluate its value proposition to its clients and final users.

The continued transformation of the sector is entering into an accelerated trend, where innovation and Industry4.0 technologies are starting to play a relevant role in the operational and business models of the cargo handling industry.

Standardisation of operations through harmonised digital languages has also been a key topic in 2022, as the sector is acknowledging a clear perception of added value that the industry can get from the use and exploitation of logistics data streams.

During 2022, TIC4.0 has positioned itself as one of the reference actors in this innovation ecosystem, developing useful technical contributions to the industry following the principles of openness and technology neutrality. TIC4.0 represents the will of the industry so that advancing towards a more connected, interoperable and united sector following a *coopetition* model (collaboration among industry competitors) as the way forward for offering added value to cargo owners.

In this end of year's Newsletter, we would like an overview of the main TIC4.0 highlights of 2022:

- 2022 Technical Releases

- TIC4.0 General Assemblies

- Participation in Conferences and Congresses

- 'WeTalkTIC' Logo

- Industry CEO Interviews

- Participation of TIC4.0 in Innovation EU Funded Projects

- New Members in 2022

2022 TIC4.0 Technical Releases

TIC4.0 has published in 2022 four technical releases, a summary of which is following provided:

- **2022.003 Release**. This document provided the Semantics and Data Model of the following concepts:

  - Cycle: extension of the 2021.002 release with regards to terminal, berth, yard, train and horizontal transport cycle.

  - Carrier Visit: included the "Data Model" and the fundamental definitions to digitalize any carrier visit process.

  - Cargo Visit: included the Data Model and the fundamental definitions to describe what status of cargo, being part of the TOS Data Model.

  - Health: included the initial definitions and the Data Model to describe the "vitality" of CHE and systems.

  - Drive and Movement: included extensive definitions addressing the direction and possible movements of CHE and their subsystems.

- **2022.004 Release**. This document provided the Semantics and Data Model of the following concepts:

  - Cycle: Included the 'terminal.gate.cycle'. With this definition, the most important cycles within a terminal were completed: terminal.cycle, terminal.berth.cycle, terminal.yard.cycle, terminals.gate.cycle, terminal.train.cycle, terminal.horizontaltransport.cycle and at the equipment level: CHE.cycle.

  - Carrier Visit: included important definitions for processes from the perspective of a carrier visit: Arrival, TerminalOperations and Departure.

  - Cargo Visit: included important definitions to follow the process of the cargo on a terminal, such as Inbound and Outbound as well as unambiguous definitions related to the weight of cargo. With these definitions, the most important definitions for the "Cargo Visit" were defined.

  - Schema JSON to FLAT: an important work was done to implement TIC4.0. The JSON Schema was defined and clear instructions for a human to convert a JSON format dataset into a FLAT format were included. TIC4.0 developed and published an open-source software tool to automatically convert datasets from JSON to FLAT. The source code can be included in any program and is available via GitHub.

- **2022.005 Release**. This document provided the Semantics and Data Model of the following concepts:

  o Job Instruction: the most important process related to the TOS data model. It included any order sent to any subject to execute any action over any object.

  o Order: belongs to Job Instructions and defined the specific coordinate action (with other orders) to be done by the subject over the object.

  o Job Instruction List: this is a collection of job instructions, but very relevant to organising the sequences.

  o Preparation at Arrival: belongs to terminal operations related to any carrier visit process. It included all the activities of the terminal in preparation for the start of carrier visit cargo operations.

  o Cargo Operations: this is the process that moves the cargo itself.

  o Lashing: this includes all related to the lashing/unlashing activities to securitize the cargo in the carrier.

  o Closing at Departure: belongs to terminal operations related to any carrier visit process. It included all the activities of the terminal in preparation for the departure of the carrier visit.

- **2022.006 Release**. This document provides the Semantics and Data Model of the following concepts:

  o 'CHE talks TIC' - Guideline on how the include TIC in technical specifications: aims to support the technical clarification process between terminal operator and solution provider by providing a framework on how to structure and classify the available data points.

  o Carrier Visit: an extensive overview of the main events and processes along the carrier visit process, including a direct mapping to the timestamps defined by DCSA (Digital Shipping Association).

  o Job Instruction: In this publication, the 'Job Instruction Subject' and the 'Job Instruction Object' were defined.

  o Spreader: this is the first set of definitions directly targeting the Spreader. It is an important set of definitions as the spreader is an important component in the whole process across all CHE.

  o FLAT to JSON: in addition to the 'JSON to FLAT' converter published in Release R2022.004 the principles of how to translate the dataset from the FLAT format into the JSON format is now being published. TIC4.0 developed and published an open-source software tool to automatically convert datasets from FLAT to JSON. The source code can be included in any program and is available via GitHub.

2022 TIC4.0 General Assemblies

On May 3rd, TIC4.0 celebrated the first General Assembly of the association in 2022 in the **Port of Valencia** (Spain). The meeting took place following a hybrid format, being an important milestone since the beginning of the COVID19 pandemic two years ago. Some of the Terminal Industry Committee members were able to meet physically at the Fundación Valenciaport premises.

The General Assembly validated the technical progress developed during the first quarter of the year. Moreover, the meeting confirmed the positive growth of the association with the incorporation of Siemens, Nokia and Prodevelop as new members of TIC4.0.

The General Assembly finished with a visit to MSC Terminal Valencia.

On the 15th of September, following a hybrid format, TIC4.0 hosted its second General Assembly of the year in Tampere (Finland), at **Kalmar's Headquarters**. It was a great opportunity to meet face-to-face with some of our members and to discuss the progress situation of the initiatives promoted and developed by TIC4.0.

Important strategic topics for TIC4.0 were reviewed and planned: from the technical progress of the TIC4.0 Semantics and Grammar (TIC4.0 Language) to the ongoing and upcoming technical task-force groups and the cooperation and alliance building with sector-related associations, among others, were thoroughly discussed by the TIC4.0 members.

Moreover, it was a pleasure to welcome new members of TIC4.0: **Stinis Lifting Equipment, ARMS - Automated Reefer Management Systems, Bromma, Wilson Sons and TGI Maritime Software** were officially presented at the General Assembly.

Participation in Conferences and Congresses

After two years of absence due to the COVID19 pandemic, **TOC Europe 2022** restarted its exhibition and conference in Rotterdam at the city's Ahoy Centre the 14th, 15th and 16th of June. TIC4.0 had the opportunity to participate in this special edition with an exhibition booth and with dedicated speaking slots in the conference programme. There were three exciting days where we got in touch with other TIC4.0 members and **confirmed the strong interest of port-industry companies in standardisation of operations and its technological adoption**. TOC Europe allowed TIC4.0 to appear as the industry association driving this process from a collaborative perspective.
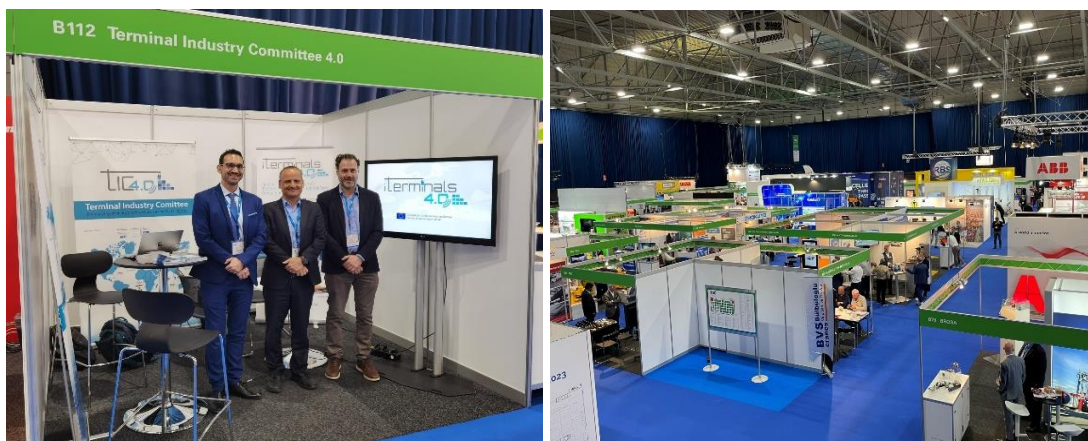
During the first walks across the exhibition arena, we proudly discovered that some **TIC4.0 members already had included in their marketing and display materials our association's logo**, and that they were doing active promotion of TIC4.0 activities also at their stands with visitors and clients. The TIC4.0 booth was also busy during all the event, receiving numerous visits from companies which already had good knowledge about TIC4.0 and others that wanted to learn more about TIC4.0 initiatives.

Our participation at TOC Europe was also a relevant commercial action to gain more new members in situ. TIC4.0 gained the commitment of some companies to join the association, being ELME and TGI Maritime Software companies that confirmed their willingness to join TIC4.0 during the event.

We also had the opportunity to spend time with some of our TIC4.0 members and visit them at their booths. We met our member **ICT Group**, where **Bart Overgaauw**, Business Unit Manager at ICT and **Boris Wenzel**, TIC4.0 President, exchanged views and ideas about the role of standardisation in the sector. Main messages were aligned with the need of advancing toward a common digital language which makes easier integration of solutions and decrease project costs. TIC4.0 also visited **Konecranes'** booth and recorded an interview with **Antoine Bosquet**, Vice-President Sales of Port Solutions. Antoine confirmed that Konecranes had started offering to its clients "TIC Ready" straddle carriers. To encourage more members to promote the adoptions of the standards that are being developed, TIC4.0 decided to create a "*WE TALK TIC*" logo that can be used by members but also by non-members as a physical or digital sticker on products and on marketing materials to indicate their adoption of TIC4.0 standards.

On December 1ˢᵗ, the **VII Annual Stakeholders Conference organised by FEPORT** took place under the title "**How to Preserve EU's Transport Sector's Competitiveness in a World of Perma-Crises?**".

The conference was attended by representatives from EU institutions, port-logistics and maritime transport companies, think tanks and foundations who shared their views, expressed their expectations and clarified how their efforts contribute to the overall objective of the energy transition, climate resilience and competitiveness of the transport sector.

The event, organised by FEPORT in partnership with WaterborneTP and Terminal Industry Committee 4.0 was dedicated to discussing the competitiveness and resilience of logistic chains in the current uncertain scenario of post-pandemic, the war in Ukraine and the energy crisis.

TIC4.0 participated with a Keynote speech offered by TIC4.0's President Boris Wenzel, followed by a panel composed of TIC4.0's Chair of the Operations Council **Francisco Blanquer Jaraiz** (Senior Innovation Manager in CMA CGM-CGM) and TIC4.0 Executive Council Member **Jari Hämäläinen** (Director of Terminal Automation in Kalmar) together with **Theo Notteboom** (Professor of Port and Maritime Economics), **Marco Campomenosi** (member of the European Parliament), **Szymon Oscislowski** (Deputy Head of Unit for Maritime Transport and Logistics in DG Move), and **Olivier Silla** (Head of CEF Department in CINEA - European Climate, Infrastructure and Environment Executive Agency).

TIC4.0 presented its contribution to the digitalisation and standardisation of process and communication technologies in the port-logistic industry and the potential of the TIC4.0 language to be extended along other legs of the logistics environment.

On December 13th, the European consortium that integrates the **iTerminals4.0 project** held its **Final Conference** in which the results achieved by the project were presented. iTerminals4.0 is an innovation action co-financed by the **Connecting Europe Facility Programme (CEF) of the European Commission**. The main objective of the project has been to **develop and test in real operations a standard digital language that facilitates bidirectional communication between port equipment and the operations management systems of the container terminals participating in the project**. This communication language has been successfully implemented in the container terminals operated by the CMA CGM-Terminal Link group in Malta, Thessaloniki, Dunkirk and Montoir, as well as in PSA Antwerp Container Terminal.

The conference was structured in three blocks, the first of which was dedicated to the impact that the application of digital standards has on the improvement of port operations. In this session, three application cases were presented in which IoT devices were installed on port machinery to record and send operational information from this equipment to Big Data management platforms.

The second part of the conference consisted of a round table discussion in which the experiences and lessons learned during the project were shared. Issues such as cybersecurity and quality of available data were some of the aspects discussed.

The last session of the conference focused on the applications of the digital standard in areas such as predictive maintenance, energy efficiency and operational safety in port terminals.

The iTerminals4.0 consortium has been coordinated by the Valenciaport Foundation and regroups the following companies: Terminal Link - CMA CGM, Prodevelop, Hyster-Yale, RBS, PSA Group, Konecranes, TBA, Cargotec, ZPMC, Kho Management and Bolloré Ports.
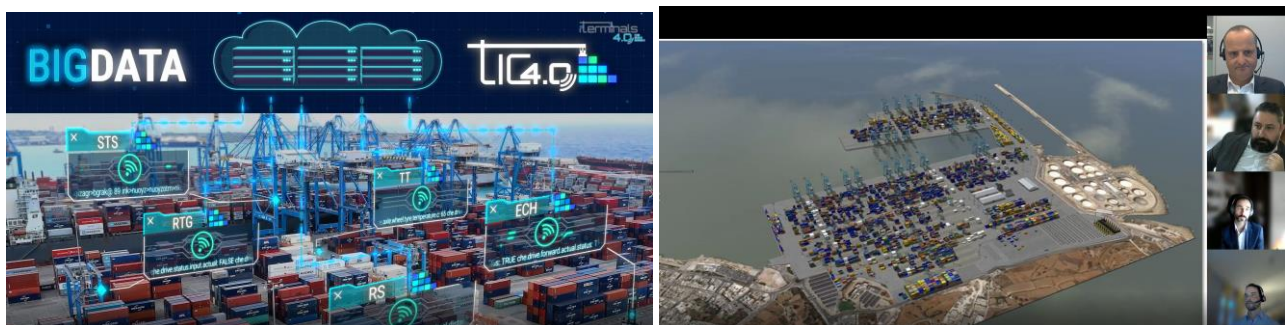
WeTalkTIC Logo

In November 2022, TIC4.0 presented to the port-logistics community the "**We Talk TIC**" logo. This logo symbolizes an important step forward by the industry showing its commitment and support to progress in the standardisation of processes, technology and in the digital transformation of port operations.

The "**We Talk TIC**" logo should become a sign of rallying of port terminal operators, port equipment manufacturers and digital solution providers for the future of the sector, which will be driven by the intensive use of data and the application of Industry4.0 technologies such as Big Data Management, Artificial Intelligence, Predictive Analytics, Digital Twins, IoT and other related solutions.

The "We Talk TIC" logo is more than a marketing instrument, as it means for companies displaying it: "We are (or we aim to) integrating the TIC4.0 Standard Language and definitions in our port operations / in the equipment or solutions we supply to the port operators". The "We Talk TIC" logo can be used by TIC4.0 members as well as by non-members active in the port terminal industry, meaning it is available for its use to the whole port-logistics community.

From the terminal operator perspective, by using the "We Talk TIC Logo" the company expresses that is has already implemented or has an interest in implementing parts of the TIC4.0 Language and will require services, tools and pilots for testing, validating and implementing it.

From the equipment manufacturer and digital solution provider perspective, using the "We Talk TIC" logo expresses that the company's products already integrate the first versions of the TIC4.0 Language, or that the company is willing to integrate TIC4.0 Language in their products to address their customer's needs.

Industry CEO Interviews

In 2022 TIC4.0 started a new initiative in collaboration with TOC Worldwide, dedicated to sharing the vision of innovation, standardisation and the future of our sector by C-level decision-makers.

In the first release of this CEO Interview Series, **Mika Vehvilainen - CEO of Cargotec was interviewed by Holger Schuett – Managing Director at AKQUINET.**

These interviews will provide interesting reflections about the role of digitalisation and innovation at port terminals by CEOs of strategic organisations of the cargo handling industry.

Participation of TIC4.0 in Innovation EU funded projects

During 2022, TIC4.0 has increased its presence in the **European innovation ecosystem**, participating in joint consortiums with relevant technological and industry organisations. As a result of this strategy, TIC4.0 is participant in two main innovation projects co-funded by the European Commission's innovation programme, Horizon Europe.

The projects awarded by the European Commission in which TIC4.0 participates as partner are the following:

The **FOR-FREIGHT project** aims to maximise the utilisation of multimodal freight transport capacity and reduce the average cost of freight transport through the development of novel solutions and their integration with legacy logistics systems. This will enable more effective and sustainable management of goods and freight flows in airports, ports, inland terminals and various logistics nodes, taking into account the requirements of all involved stakeholders, and accounting for economic, environmental and social aspects. Through the FOR-FREIGHT solutions the following functionalities will be delivered: i) real-time door-to-door tracking and status monitoring & control of cargo, ii) Decision Support Systems for the optimization of resource utilization based on Digital Twin concept, iii) Increased resilience against large scale disruptive events and increased security of information based on Blockchain technology, iv) Increased sustainability through the implementation of a carbon footprint assessment framework and use of alternative modes of transportation (subway).

The **SEAMLESS project** aims at developing and adapting missing building blocks and enablers into a fully automated, economically viable, cost-effective, and resilient waterborne freight feeder loop service for Short Sea Shipping (SSS) and/or Inland Waterways Transport (IWT). Autonomous systems will be integrated to ensure safe, resilient, efficient, and environmentally friendly operation to shift road freight movements to hinterland waterways, while enhancing the performance of the TEN-T network. The service will be delivered 24/7 by a fleet of autonomous cargo shuttles, with humans in-the-loop located in Remote Operation Centres (ROCs), which efficiently cooperate with automated and autonomous shore-side infrastructure and safely interact with conventional systems. The services will rely on a redesigned logistics system enabling seamless freight flows by minimising delays at intermodal nodes. A digital bird's eye view of the supply chain allows the exploitation of real-time information for planning optimisation and reconfiguration to support resilient logistics, incl. digitalised administrative procedures.

TIC4.0 New Members in 2022

During 2022, twelve companies joined TIC4.0, showing the growing interest of the sector in advancing towards the development and adoption of common digital standards. TIC4.0 wants to recognise and thank the new and current members for their support and commitment to the association!

TIC4.0 New Full Members in 2022

TIC4.0 New Affiliated Members in 2022

TIC4.0 is an international association headquartered in Brussels which is open to any organisation active in the cargo handling industry wishing to participate in the elaboration of common industry standards for the cargo handling industry. If you are a terminal operator or a supplier of equipment, technology, or solutions to the port terminal industry, maybe you should be a member of TIC4.0 and contribute some time from your engineers to join the leading technical experts of our industry collaborating on the development of common industry standards.