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Technical specification for OPC unified architecture and 5G integration - Part 1: General requirements

OPC统一架构与5G集成技术规范 第1部分：通用要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. This document is Part 1 of GB/T 45110 "OPC Unified Architecture and 5G Integration Technical

Specification". GB/T 45110 has been published The following parts.

1.General requirements. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Industrial Process Measurement, Control and Automation Standardization Technical Committee (SAC/TC124). This document was drafted by: Mechanical Industry Instrumentation Comprehensive Technical and Economic Research Institute, Shenyang Automation Research Institute of the Chinese Academy of Sciences, Huawei Technology Technology Co., Ltd., China Mobile Communications Group Co., Ltd., China Mobile Communications Co., Ltd. Research Institute, Schneider Electric (China) Co., Ltd., Xi'an Huayun Zhilian Information Technology Co., Ltd., Beijing Xiaomi Mobile Software Co., Ltd., Chongqing University of Posts and Telecommunications, Shanghai Jiaotong University, Dalian University of Technology University, Chongqing University, Tsinghua University, Peking University, Shenyang Siasun Robot Automation Co., Ltd., Beijing Yunzhi Soft Information Technology Co., Ltd. Ltd., Shenzhen Ai Ling Network Co., Ltd., Sichuan Ankong Technology Co., Ltd., Phoenix (China) Investment Co., Ltd., MCC SEDI Information Technology (Chongqing) Co., Ltd., Jilin Jida Communication Design Institute Co., Ltd., Anshan Iron and Steel Group Automation Co., Ltd., Tianjin Urban Construction University School, Tianjin Jiutian Industrial Control Systems Co., Ltd. The main drafters of this document are. Yu Haibin, Wang Zhen, Xu Chi, Liu Dan, Chen Xiaoguang, Pang Lingli, Gong Yanjie, Zhao Jun, Zhao Yanling, Wang Rui, Xing Yuanri, Ren Zhigang, Zeng Peng, Tan Bin, Zhang Yongjing, Li Dong, Kong Linghe, Yang Weiwei, Han Dantao, Zheng Qiuping, Hu Yongkang, Gao Xiaonong, Wei Min, Zhang Yaping, Wenqi Ge, Di Huang, Zhi Li, Xiaodong Sun, Xigang Xia, Wei Han, Long Zhang, Yifan Yu, Gao Feng, Kai Lin, Yueping Cai, Chenren Xu, Bangyu Li, Yanzhao Su, Wang Xu, Wang Changhai, Pan Xuelong, Liu Bin, Li Fangjian, Wang Licheng, and Song Yanfeng.

The fifth generation of mobile communication technology (abbreviated as 5G) has the characteristics of large bandwidth, wide connection and low latency. Industrial wireless communication based on 5G can Meet the communication needs of numerous flexible networks in industrial scenarios. For example, manufacturers use 5G to connect manufacturing equipment and other machines, tools, factories and warehouses, or connect information systems to various devices to provide stakeholders with richer operational, Traceable and locatable information helps the industry transform towards digitalization, informatization and intelligence. As an emerging technology, 5G lacks a unified description language for application layer semantic interaction. The integration of OPC unified architecture and 5G wireless communication technology is It provides 5G usage specifications at the application layer, improves the usability and interaction capabilities of 5G, and is the key to realizing the integration and interaction of 5G industrial equipment. It provides important support for key technologies such as interconnection, semantic

interoperability, and flexible reconfiguration, enabling more possibilities for industrial application scenarios. This document is a general technical standard to guide the integrated application of OPC unified architecture and industrial 5G network, aiming to propose OPC unified architecture The general architecture and basic requirements for integrated applications with industrial 5G networks provide industrial users, system integrators, system suppliers, operators, etc. Application guidance simplifies integration complexity. GB/T 45110 "OPC Unified Architecture and 5G Integration Technical Specification" is planned to consist of five parts.

1.General requirements. The purpose is to specify the overall requirements, connection requirements, and application of OPC unified architecture and industrial 5G network integration. Integration requirements for connection management, data transmission, network management, integrated application model, and integrated security Provide OPC unified architecture and industrial 5G network for industrial users, system integrators, system suppliers and network providers Guidance for integrated applications.

2.Application Specification. The purpose is to specify the OPC unified architecture and industrial 5G network integration application connection management, data It supports application models such as data transmission and network management, and supports the rapid integration of OPC unified architecture and industrial 5G networks.

3.Management Specification. The purpose is to specify the OPC unified architecture and industrial 5G network integration application operation and maintenance management, network It meets the requirements of network connection management and supports the integrated adaptation management of OPC unified architecture and industrial 5G network.

4.Test Specification. The purpose is to specify the connection management, data The consistency of application models such as data transmission and network management, and the compliance of various requirements of application specifications and management specifications.

5.Security Specification. The purpose is to specify the business operation and management of the integrated application of OPC unified architecture and industrial 5G network. Safety requirements of the company. OPC unified architecture and 5G integration technical specifications Part

1 Scope

GB/T 45110.1-2024 is Part 1 of the Chinese specification for integrating OPC UA with 5G. OPC UA is the information model industry uses to describe what a machine is and what it measures; 5G, in its industrial form, offers deterministic latency and network slicing. Joining them is not a matter of running one over the other but of mapping OPC UA's connection and data semantics onto 5G's quality of service mechanisms, so that a requested publishing interval becomes a network commitment rather than a hope. Part 1 sets the

general requirements: the physical and integration architecture and the integration process, the connection management requirements covering establishment, release and time synchronisation, and the data transfer requirements covering the transfer mapping and the acquisition of transfer status, together with the security and management requirements. It takes effect on 1 July 2025.

This document specifies the overall requirements for the integrated application of OPC unified architecture and industrial 5G networks, connection management integration requirements, data transmission Integration requirements, network management integration requirements, integrated application model requirements and integrated security requirements. This document is intended for industrial users, system integrators, system suppliers and network providers to provide OPC unified architecture and industrial Guidance for 5G network integration applications.

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Survival time How long an industrial application can continue to operate without receiving an expected message. [Source: GB/T 42126.1-2022, 3.11]

3.2 Industrial 5G networkindustrial5Gnetwork Industrial wireless communication network based on the fifth generation mobile communication technology (5G).

4 Abbreviations

The following abbreviations apply to this document. C/S. Client/Server