

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
ICCS Forum v1.0- Q&A forum accessible by all EPRI members	3002028804	2024/ICCS
Program 161, Information and Communication Technology (ICT) at a Glance	◀ 3002028985	2024/161
Infographic: Example EPRI Information, Communication and Cyber Security (ICCS) Resources	◀ 3002025520	161/183
Summary of Interoperability Tracking and Reporting by the Information Communication Technology Program in 2024	3002029788	2024/161A
2023-24 Information, Communication and Cyber Security Area Results Overview	◀ 3002028935	2024/161/183
Utility Digital Worker Collaborative Initiative	◀ 3002027556	2022
2021 Roadmap: Information and Communication Technology	◀ 3002020327	2021/161
Advanced Technologies		
Architectural Impacts of Disruptive Technologies, 5th Edition	3002029933	2024/161E
Distribution Digital Worker Case Study Overview: Electronic Job Aids	3002023205	2022/161
Digital Worker Maturity Model	3002023515	2022/161A
Transmission Digital Worker Case Study Overview – Autonomous Drone Substation Inspections Overview	3002023619	2022/161
Architectural Impacts of Disruptive Technology	3002020883	2021/161E
Building the Digital Thread for Distribution	◀ 3002022294	2021/161H
Integrating and Orchestrating WAN Services	3002020361	2021/161A
Leading the Digital Transformation in the Electric Utility Industry	3002021341	2021/161A
Mastering the Critical Role of GIS for Demand Energy Response (DER) Modeling	3002021345	2021/161A
Program on Technology Innovation: Utilizing AMI Data for Fault Anticipation	3002021414	2021/161F
Transmission Network Data Management: Best Practice for Meeting European Requirements	◀ 3002020537	2021/161A
Resilient Communications Selection and Design	3002018702	2020/161A
Standing Up the Real Digital Twin	3002018703	2020/161A
Utilizing a Framework for Measuring Application Data Quality	3002018699	2020/161A

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
AMI Applications		
Introduction to DC Metering for Utilities	3002029970	2024/161F
DLMS/COSEM for North American Utilities	3002029969	2024/161F
Guidebook for Advanced Metering Infrastructure (AMI) Data Analytics: Second Edition	3002024105	2023/161F
Survey of Currently Used AMI Radiofrequency Protocols	3002026728	2023/161F
Next Generation Metering – Distributed Intelligence Supplemental Opportunity	◀ 3002025322	2022/161F
Standard Meter Communications Protocols Primer	3002024105	2022/161F
ANSI Meter C12 Communications Compliance	3002021408	2021/161F
ANSI Meter C12 Communications Compliance Software (c12test) v1.0.4.6	3002021410	2021/161F
ANSI C12 Compliance Testing Software	◀ 3002023062	2021/161F
AMI Data Management		
Continuous Meter Replacement in Heterogenous Systems	3002029971	2024/161F
Analyzing and Categorizing Momentary Outages from Advanced Metering Infrastructure (AMI) Data	3002024107	2022/161F
Modeling Your Advanced Metering Infrastructure Network: How and Why You Should	3002024102	2022/161A
AMI Data Interoperability		
Business Cases for Replacement AMI Systems	3002026731	2023/161F
High-speed Experimental Meter Front-end	3002026735	2023/161F
Guidebook for Identifying and Mitigating AMI Communications Problems	3002024106	2022/161F
Guidebook for Integrating AMI into Outage Management	3002021413	2021/161F
Integrating Non-meter Sensors and Devices into AMI	3002021412	2021/161F

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
AMI Operations & Maintenance		
Meter Socket Adapters for DER Devices	3002029794	2024/161A
Advanced Metering Infrastructure (AMI) System Simulation Software Manual	3002024109	2022/161F
PRE-SW: AMI System Simulation v1.0 Beta	3002024108	2022/161F
Application Portfolio Optimization		
Cloud Integration Guidebook, 6th Edition: A Guide for Enterprise Architects	3002024186	2022/161E
Architectural Impacts of Disruptive Technology	3002024191	2022/161E
A Reference Architecture for DER Gateways	3002024195	2022/161E&D
A Reference Architecture for the Control Center of the Future	3002021852	2022/161E
Library of Enterprise Architecture Patterns: LEAPworx 4th Edition	3002024189	2022/161E
Advanced Metering Infrastructure (AMI) Reference Architecture	3002021854	2021/161E&F
Augmented Reality		
The Future of XR in the Electric Power Industry	3002030561	2024/161A
Field Communicating AR/VR Technology Enablers	◀ 3002023218	2022/161G
Data Management		
Data Management Maturity Model	3002028913	2024/TI
Distributed Energy Resources (DER) Integration		
A DER Dilemma: Achieving Coexistence of Interoperability and Cyber Security	3002029791	2024/161A
Distributed Energy Resources Interoperability Guidebook – 2024 Edition: Information and Case Studies to Support Utilities in Achieving Interoperability with Distributed Energy Resources and Demand Response Technologies	3002029065	2024/161D
EPRI Protocol Reference Guidebook – 8th Edition	3002029064	2024/161D
Evaluation and Economic Feasibility Analysis of Commercial DER Gateways	3002025435	2024/161D
DER Interoperability Guidebook 2024	3002029062	2024/161D

2025 – 2020 Product Index

Information and Communication Technology



Topic	Product ID	Year/Project Set
Understanding the Difference in DER Gateways and Plant Controllers	3002028805	2024/161D
EPRI Protocol Reference Guidebook – 7th Edition: Assessment of Information and Protocol		
Standards for Distributed Energy Resources (DER), Electric Vehicles, and Demand Response Technologies	3002026697	2023/161D
Distributed Energy Resources Interoperability Guidebook – 2023 Edition: Information and Case Studies to Support Utilities in Achieving Interoperability with Distributed Energy Resources and Demand Response Technologies	3002026700	2023/161D
IoT Technologies for Distributed Energy Resources – 2023 Guidebook: Information, Case Studies, and Lab Evaluations of IoT-Based Connectivity, Distributed Messaging, and Integrated Platform-As-A-Service Solutions	3002026699	2023/161D
Interoperability-Oriented Test Cases to Embrace DER Integration: DER Data Needs for 2030 Energy System	3002026701	2023/161D
Interpreting the Interoperability Requirements in IEEE 1547-2018: A Deep Dive into Clause 10	3002026702	2023/161D
Protocols to Support Group Management of DERs: ADMS to DERMS and Utility to Aggregator	3002026698	2023/161D
Interfaces		
Distributed Energy Resources Utility Gateway Requirements: First Edition	3002025100	2022/161D/ P174
Distributed Energy Resources Interoperability Guidebook – 2022 Edition: Information and Case Studies to Support Utilities in Achieving Interoperability with Distributed Energy Resources and Demand Response Technologies	3002024910	2022/161D
Distributed Energy Resources (DER) Protocol Reference Guidebook—5th Edition: Public Version	◀ 3002023419	2022/161D
Developing ICT Networks to Integrate Distributed Energy Resource Technologies	3002024100	2022/161A
DER Protocol Reference Guidebook – 6th Edition: Assessment of Information and Protocol Standards for Distributed Energy Resources (DER), Electric Vehicles, and Demand Response Technologies	3002024179	2022/161D
Opportunities for IoT Protocols in DER Applications: Summary of IoT-Based Connectivity, Distributed Messaging, and Integrated Platform-As-A-Service Solutions	3002024001	2022/161D
DER Protocol Reference Guidebook – 5th Edition: Assessment of Information and Protocol Standards for Distributed Energy Resources (DER), Electric Vehicles, and Demand Response Technologies	3002021352	2021/161D
Distributed Energy Resources Interoperability Guidebook: Information and Case Studies to Support Utilities in Achieving Interoperability with Distributed Energy Resources and Demand Response Technologies	3002022065	2021/161D
Energy Storage Management Functions to Address Grid and Customer Services: Phase 2 – Information and Communication Capabilities	3002021863	2021/161D

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Harmonized Communications and Information Exchanges for Distributed Energy Resources: Analyses and Implementation Guidelines	3002023106	2021/161D
Demand Response Interoperability Guidebook: A Repository of Information to Support Utilities in Achieving Interoperability in Demand Response Technologies	3002018543	2020/161D
Distributed Energy Resources (DER) Standards		
Federated Architecture for Distributed Energy Resources Integration	◀ 3002019424	2020/161D
DER Protocol Reference Guidebook – 4th Edition: Understanding the Characteristics of Communications with Distributed Energy Resource (DER) and Demand Response Technologies	3002018544	2020/161D
Enterprise Architecture		
Applied Grid Model Data Management (GMDM) for Distribution Project Opportunity	◀ 3002014739	2024/161E
Applied Grid Model Data Management (GMDM) for Transmission Project Opportunity	◀ 3002023866	2024/161E
Application Portfolio Management with Business Capabilities	3002029793	2024/161A
Business Capability-Based Investment Optimization (BCM Phase II)	◀ 3002025237	2024/161E
Cloud Integration Guidebook: A Guide for Enterprise Architects, 8th Edition	3002029921	2024/161E
Common Information Model (CIM) Primer, 10th Edition	◀ 3002029927	2024/161E
Data Management Collaborative: Surviving the Data Avalanche Project Opportunity	◀ 3002029355	2024/161E
Digital Transformation: Aligning Information Technology and Operations Technology, 6th Edition	3002029931	2024/161E
Enterprise Architecture Maturity Assessment Project Opportunity	◀ 3002025287	2024/161E
Grid Model Data Management (GMDM) Vendor Forum Phase II: An EPRI-Sponsored Vendor-Funded Collaborative Initiative	◀ 3002027444	2024/161E
Grid Model Manager (GMM) for Distribution Interest Group	◀ 3002027863	2024/161E
LEAPWorx 5th Edition	3002029906	2024/161E
Top Ten Indicators of EA Maturity: 2023 Survey Results	3002029901	2024/161E
Utility Business Capability Model 3rd Edition	3002029916	2024/161E
Utility Business Capability Model Guidebook 3rd Edition	3002029917	2024/161E

2025 — 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Utility Enterprise Architecture Guidebook, 9th Edition	3002029889	2024/161E
Architectural Impacts of Disruptive Technology: Fourth Edition	3002026854	2023/161E
Cloud Integration Guidebook, 7th Edition: A Guide for Enterprise Architects	3002026851	2023/161E
Common Information Model Primer: Ninth Edition	◀ 3002026852	2023/161E
Digital Transformation: Information Technology – Operational Technology Convergence Guidebook: Sixth Edition	3002026853	2023/161E
Enhanced Grid Model Validation: A SHACL Primer	3002026856	2023/161E
EPRI 2023 Utility Business Capability Model	3002028114	2023/161E
Grid Model Data Management (GMDM) Vendor Forum Phase II: An EPRI-Sponsored Vendor- Funded Collaborative Initiative	◀ 3002027444	2023/161E
Grid Model Manager (GMM) for Distribution Interest Group	◀ 3002027863	2023/161E
Library of Enterprise Architecture Patterns: LEAPworx, 5th Edition	3002026850	2023/161E
Maturity Model for Utilities: A Framework for Transformation and Sustainability	3002028128	2023/161E
Top Ten Indicators of Enterprise Architecture (EA) Maturity—2022 Results	3002026849	2023/161E
Utility Business Capability Guidebook, Second Edition	3002028279	2023/161E
Utility Enterprise Architecture Guidebook, 8th Edition	3002026848	2023/161E
Enterprise Architecture Maturity Assessment	◀ 3002025287	2022/161E
Grid Model Data Management (GMDM) Architecture in Archimate Supplemental Project	3002025385	2022/161E
Top Ten Indicators of Enterprise Architecture (EA) Maturity—2021 Results	3002024184	2022/161E
Utility Enterprise Architecture Guidebook, 7th Edition	3002024183	2022/161E
EPRI Business Capability Model - Funder Version	3002023123	2021/161E
Utility Business Capability Model	3002022007	2021/161E
Architectural Impacts of Disruptive Technology	3002020883	2021/161E

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Cloud Integration Guidebook, 6th Edition: A Guide for Enterprise Architects	3002021856	2021/161E
Common Information Model Primer: Seventh Edition	◀ 3002021840	2021/161E
Common Information Model Primer: Seventh Edition (Spanish Translation)	◀ 3002022981	2021/161E
Top Ten Indicators of Enterprise Architecture (EA) Maturity—2020 Results	3002021837	2021/161E
Utility Enterprise Architecture Guidebook, 6th Edition	3002021832	2021/161E
Geospatial Informatics (GIS)		
Evaluation of Automated GIS Data Cleanup Methods Project Opportunity	3002027888	2024/161H
Elevating Geospatial Insights: A Case Study on the Strategic Implementation of 3D Geospatial Design	3002029799	2024/161A
Field Asset Unique Identification System Project Opportunity	3002025238	2024/161H
Geospatial Guidebook Training	3002029156	2024/161H
Geospatial Informatics Guidebook: Fifth Edition	3002029155	2024/161H
Geospatial Innovations	3002029157	2024/161H
GIS Capabilities Roadmap	3002029158	2024/161H
Digital Twin Study - Phase I	3002026789	2023/161H
Digital Unique Identification of Specialized Equipment	3002026788	2023/161H
Evaluation of Automated GIS Data Cleanup Methods Supplemental Opportunity	◀ 3002027888	2023/161H
Geospatial Applications and Management	3002026787	2023/161H
Geospatial Informatics Guidebook: Fourth Edition	3002026827	2023/161H
Geospatial XR Demonstration	3002026839	2023/161H
The Utility of the Future Story Map Demonstration	3002026841	2023/161H
Utility Hazard Zones for Distribution Resilience Story Map Demonstration	3002026846	2022/161H
Dynamic Geospatial Informatics Can Model Grid Operating Conditions	3002024818	2022/161H

2025 — 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Enhancing GIS Data Quality Using Artificial Intelligence Tools	3002024798	2022/161H
Field Asset Unique Identification System	3002025238	2022/161H
Geospatial Analysis for Site Selection and Grid Management of Distributed Energy Resources	3002024104	2022/161A
Geospatial Informatics Guidebook: Third Edition	3002024796	2022/161H
Geospatial Requirements for XR Applications - 2022 Update	3002024797	2022/161H
Building the Digital Thread for Distribution	◀ 3002022294	2021/161H
Geospatial Informatics Guidebook: Second Edition	3002021995	2021/161H
Geospatial Requirements for XR Applications	3002021996	2021/161H

Information Availability

Exploring a Data Centric Approach for Digital Utilities	3002021349	2021/161E
---	----------------------------	-----------

Information Availability: Common Information Model

Common Information Model (CIM) Primer: Eighth Edition	◀ 3002024188	2022/161E
Common Information Model (CIM) Overview: Training video and companion resource deck	3002023690	2022/161E
Common Information Model (CIM) Support for Distribution Grid Model Data Management	◀ 3002025386	2022/161E
Common Information Model Primer: Seventh Edition (Spanish Translation)	◀ 3002022981	2021/161E

Information Availability: Grid Model Data Management

Applying the Grid Model Data Management (GMDM) Information Architecture at the Distribution Utility	◀ 3002025387	2022/161E
Grid Model Data Management (GMDM) Information Architecture	3002025786	2022/161E
Grid Model Data Management (GMDM) Architecture in Archimate	3002025385	2022/161E/P39
Grid Model Data Management (GMDM) Functional Application Architecture	3002025383	2022/161E
A Functional Application Architecture for Grid Model Data Management: Model Files	3002025428	2022/161E
Grid Model Data Management (GMDM): A Best Practice Approach to Managing Distribution Grid Model	◀ 3002025384	2022/161E

2025 – 2020 Product Index Information and Communication Technology



Topic		Product ID	Year/Project Set
Distribution Grid Model Manager (GMM) Functional Requirements	◀	3002025388	2022/161E
Why Does Distribution Grid Model Management Matter?	◀	3002022737	2021/161E
Transmission Network Data Management: Best Practice for Meeting European Requirements	◀	3002020537	2021/161E
Success Story: Successful Integrated Network Model Management	◀	3002020734	2021/161E
Interoperability			
Decomposing FERC O2222: Architectures and Protocols to Support DER Aggregation		3002024002	2022/161D
Evaluation and Economic Feasibility Analysis of Commercial DER Gateways	◀	3002025435	2022/161D
Simplifying and Streamlining Interoperability of Distributed Energy Resources: Application-Specific Profiles for DER Information and Protocol Standards		3002024196	2022/161D
Training Materials – Information and Communication Technologies for Monitoring, Management, and Configuration of DER/DR		3002024909	2022/161D
Summary of Interoperability Tracking and Reporting by the Information and Communication Technology Program in 2020		3002019404	2020/161A
Network Model Management			
Success Story: Successful Integrated Network Model Management	◀	3002020734	2021/161E
Organizational Alignment			
Business Capability: Motivations and Meta-Models		3002021938	2022/161E
Grid Modernization Playbook A Framework for Developing Your Plan		3002024809	2022/161E
Information Technology–Operational Technology Convergence Guidebook: Fifth Edition		3002024190	2022/161E
Utility Business Capability Model Guidebook		3002025136	2022/161E
A Framework for Relating the Elements of Strategy Development through Implementation		3002021853	2021/161E
Business Capability Model: Capability Progressions and Maturity		3002023081	2021/161E
EPRI Business Capability Model - Public Version	◀	3002023122	2021/161E
Public Utility Business Capability Model (Model Files)	◀	3002022006	2021/161E
Business Capability Assessment: Assessing the Maturity of a Business Capability		3002024101	2022/161A

2025 – 2020 Product Index

Information and Communication Technology



Topic		Product ID	Year/Project Set
EPRI Utility Business Capability Model Demonstration Video		3002022918	2021/161E
Telecommunications			
Enhanced Surveillance Over Wireless Project Opportunity	◀	3002027808	2024/161G
Emergency/Black Sky Communications Resilience and Planning		3002029965	2024/161G
Empowering Tomorrow's Grid: The Vital Role of Telecommunications in Enabling Decarbonization, Electrification, and Resilience	◀	3002029141	2024/161A
Evaluation of Interference to 6- GHz Microwave		3002029950	2024/161G
Evaluation of Low Latency Wireless technologies for Direct Transfer Trip		3002029962	2024/161G
Network Management Systems		3002029963	2024/161G
Next Generation Wireless Local Area Network (WLAN) Project Opportunity		3002022297	2024/161G
Power System Telecommunications Reliability – An Analytical Deconstruction		3002029796	2024/161A
Private LTE Guidebook – 2024 Edition		3002029961	2024/161G
Resilient Networks with Islanded Operation Capability		3002029964	2024/161G
Smart Grid Communications Intelligencer 1H 2024		3002029966	2024/161G
Smart Grid Communications Intelligencer 2H 2024		3002029968	2024/161G
Strategic Fiber Guidebook 2024 Edition		3002029958	2024/161G
Telecom Standards Guidebook Vol 6		3002029967	2024/161G
WAN Modernization Guidebook 2024 Edition		3002029953	2024/161G
6 GHz AFC Public Trial Preliminary Results		3002027046	2023/161G
Applicability of Low Earth Orbit Satellite for Utility WAN and Emergency Communication		3002027112	2023/161G
Communication Requirements For DER: Update On Testbed Requirements and Configuration		3002028191	2023/161G
Enhanced Surveillance Over Wireless Supplemental Opportunity	◀	3002027808	2023/161G
FirstEnergy 6 GHz Additive Interference Study: Phase 2 - Winter	◀	3002027536	2023/161G

2025 – 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Low-Latency Cellular Network Field Study	3002028524	2023/161G
Moveable Base Stations: Coverage Planning	3002027158	2023/161G
Network Management Guidebook: First Edition 2023	3002027107	2023/161G
Private Long-Term Evolution Guidebook: Fifth Edition 2023	3002027090	2023/161G
Smart Grid Communications Intelligencer, 1H 2023	3002027122	2023/161G
Smart Grid Communications Intelligencer, 2H 2023	3002027150	2023/161G
Strategic Fiber Guidebook 2023 Edition	3002027080	2023/161G
Telecommunication Standards Guidebook V5 2023	3002027156	2023/161G
Wide Area Network (WAN) Modernization Guidebook: 2023 Edition	3002027068	2023/161G
Smart Grid Communications Intelligencer Newsletter List 2023— List of all published newsletters to date	◀ 3002020175	2023/161G
5G Architecture - Evolution and Roadmap for the Utility Industry	◀ 3002023219	2022/161G
6 GHz Microwave – An Executive Perspective on Managing Business Risk	3002024103	2022/161A
Analysis of Automatic Frequency Control System Protection of 6 GHz Microwave: Review, Research, and Simulations	3002023621	2022/161G
Approaches for Autonomous Peer to Peer Communication: For Resilient Community Microgrids	◀ 3002023630	2022/161G
Communication Requirements for DER: Initial Steps in Evaluating Wi-SUN for DER Communications	3002023627	2022/161G
Field Communicating AR/VR Technology Enablers	◀ 3002023218	2022/161G
FirstEnergy 6 GHz Additive Interference Study – Public	◀ 3002025484	2022/161G
FirstEnergy Internal 6 GHz Additive Interference Study	3002025346	2022/161G
Integration of Device Provisioning into the Network Management System	3002023628	2022/161G
Private Long-Term Evolution Guidebook: Fourth Edition 2022	3002023624	2022/161G
Reference Implementation of OpenAFC: AFC Assessment Tool Project Research	3002024799	2022/161G
Smart Grid Communications Intelligencer, 1H 2022	3002023632	2022/161G

2025 — 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Smart Grid Communications Intelligencer, 2H 2022	3002023633	2022/161G
Strategic Fiber Guidebook 2022 Edition	3002023623	2022/161G
Telecom Site Planning and Practices for Resilience and Backup Power	3002023629	2022/161G
Telecommunication Standards Guidebook V4 2022	3002023631	2022/161G
Wide Area Network (WAN) Modernization Guidebook: First Edition 2022	3002023622	2022/161G
Success Story: 6 GHz Interference: Field Testing	◀ 3002020732	2022/161G
Integration of the Telecom NMS with GIS data	3002020376	2022/161G
Design and Planning of a Scalable IT Network	3002020375	2021/161G
Persistent Wi-Fi Demonstration Final Update Presentation	3002022896	2021/161G
Private Long-Term Evolution Guidebook: Second Edition 2021	3002020373	2021/161G
Smart Grid Communications Intelligencer, 2H 2021	3002020380	2021/161G
Strategic Fiber Guidebook	3002020359	2021/161G
Reliable Operation of 6 GHz Microwave Links: Indoor Unlicensed Devices Field Test Report (Peoria, IL)	3002020360	2021/161G
Telecommunication Standards Guidebook V2 2021	3002020378	2021/161G
Unlicensed Use in the 6 GHz Band: Columbus, Georgia Field Interference Test Results	◀ 3002022241	2021/161G
Unlicensed Use of the 6 GHz Band: Analysis of Wi-Fi 6E interactions with 6 GHz FS Radios – Lab Test Results	3002022243	2021/161G
6 GHz Interference: Field Test Report	3002018508	2020/161G
Evaluation of NB-IoT for FAN Use Cases	3002018511	2020/161G
FAN Capacity Offload: Selective Use of Higher-band Spectrum	3002018510	2020/161G
IP Architecture and Planning for IPv4 and IPv6	3002018515	2020/161G
Optimizing Provisioning and Device Management, Phase 2	3002018512	2020/161G

2025 — 2020 Product Index Information and Communication Technology



Topic	Product ID	Year/Project Set
Telecom Network Management and Manager of Manager Systems: Metrics and Opportunities for Interconnections	3002018513	2020/161G
Teleprotection Over Packet Guidebook: 2020 Edition	◀ 3002018509	2020/161G
Unlicensed Use in the 6 GHz Band: Field Interference Test Results	◀ 3002019712	2020/161G
Unlicensed Use of the 6 GHz Band – Fixed Service Incumbent Protection: Excerpts and Analysis of FCC Report & Order	3002019705	2020/161G

2025 — 2020 Product Index
Information and Communication Technology



Topic	Product ID	Year/Project Set
-------	------------	------------------

2025 — 2020 Product Index
Information and Communication Technology



Topic	Product ID	Year/Project Set
-------	------------	------------------