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TECHNICAL REPORT



**Communication networks and systems for power utility automation –
Part 90-7: Object models for power converters in distributed energy resources
(DER) systems**

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CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references	9
3 Terms, definitions and acronyms	10
3.1 Terms and definitions	10
3.2 Acronyms	13
4 Abbreviated terms	14
5 Overview of power converter-based DER functions	15
5.1 General.....	15
5.2 Power converter configurations and interactions.....	16
5.3 Power converter methods.....	18
5.4 Power converter functions	19
5.5 Differing DER architectures	20
5.5.1 Conceptual architecture: electrical coupling point (ECP).....	20
5.5.2 Conceptual architecture: point of common coupling (PCC).....	20
5.5.3 Utility interactions directly with power converters or indirectly via a customer EMS	21
5.5.4 Communication profiles	21
5.6 General Sequence of information exchange interactions	22
6 Concepts and constructs for managing power converter functions	23
6.1 Basic settings of power converters	23
6.1.1 Nameplate values versus basic settings	23
6.1.2 Power factor and power converter quadrants	23
6.1.3 Maximum watts, vars, and volt-amp settings	25
6.1.4 Active power ramp rate settings.....	27
6.1.5 Voltage phase and correction settings	27
6.1.6 Charging settings	28
6.1.7 Example of basic settings	28
6.1.8 Basic setting process.....	29
6.2 Modes for managing autonomous behaviour.....	29
6.2.1 Benefits of modes to manage DER at ECPs.....	29
6.2.2 Modes using curves to describe behaviour	30
6.2.3 Paired arrays to describe mode curves	31
6.2.4 Percentages as size-neutral parameters: voltage and var calculations.....	32
6.2.5 Hysteresis as values cycle within mode curves	32
6.2.6 Low pass exponential time rate.....	33
6.2.7 Ramp rates.....	34
6.2.8 Randomized response times.....	34
6.2.9 Timeout period	35
6.2.10 Multiple curves for a mode.....	35
6.2.11 Multiple modes	35
6.2.12 Use of modes for loosely coupled, autonomous actions	35
6.3 Schedules for establishing time-based behaviour	35
6.3.1 Purpose of schedules	35
6.3.2 Schedule components	36
7 DER management functions for power converters.....	37

7.1	Immediate control functions for power converters	37
7.1.1	General	37
7.1.2	Function INV1: connect / disconnect from grid	38
7.1.3	Function INV2: adjust maximum generation level up/down.....	38
7.1.4	Function INV3: adjust power factor	39
7.1.5	Function INV4: request active power (charge or discharge storage).....	39
7.1.6	Function INV5: pricing signal for charge/discharge action	40
7.2	Modes for volt-var management	41
7.2.1	VAr management modes using volt-var arrays	41
7.2.2	Example setting volt-var mode VV11: available var support mode with no impact on watts	42
7.2.3	Example setting volt-var mode VV12: maximum var support mode based on <i>WMax</i>	44
7.2.4	Example setting volt-var mode VV13: static power converter mode based on settings	45
7.2.5	Example setting volt-var mode VV14: passive mode with no var support	46
7.3	Modes for frequency-related behaviours	47
7.3.1	Frequency management modes	47
7.3.2	Frequency-watt mode FW21: high frequency reduces active power	48
7.3.3	Frequency-watt mode FW22: constraining generating/charging by frequency	50
7.4	Dynamic reactive current support during abnormally high or low voltage levels	53
7.4.1	Purpose of dynamic reactive current support	53
7.4.2	Dynamic reactive current support mode TV31: support during abnormally high or low voltage levels	54
7.5	Low/high voltage ride-through curves for “must disconnect” and “must remain connected” zones	57
7.5.1	Purpose of L/HVRT.....	57
7.5.2	“Must disconnect” (MD) and “must remain connected” (MRC) curves	57
7.6	Modes for watt-triggered behaviours.....	59
7.6.1	Watt-power factor mode WP41: feed-in power controls power factor.....	59
7.6.2	Alternative watt-power factor mode WP42: feed-in power controls power factor	59
7.7	Modes for voltage-watt management	60
7.7.1	Voltage-watt mode VW51: voltage-watt management: generating by voltage	60
7.7.2	Voltage-watt mode VW52: voltage-watt management: charging by voltage	60
7.8	Modes for behaviours triggered by non-power parameters.....	61
7.8.1	Temperature mode TMP	61
7.8.2	Pricing signal mode PS.....	61
7.9	Setting and reporting functions	62
7.9.1	Purpose of setting and reporting functions	62
7.9.2	Establishing settings DS91: modify power converter-based DER settings	62
7.9.3	Event logging DS92: log alarms and events, retrieve logs.....	62
7.9.4	Reporting status DS93: selecting status points, establishing reporting mechanisms	66
7.9.5	Time synchronization DS94: time synchronization requirements	68
8	IEC 61850 information models for power converter-based functions	68

8.1	Overall structure of IEC 61850	68
8.2	IEC 61850 system logical nodes	69
8.3	Key components of IEC 61850 information modelling of power converter-based functions	71
8.3.1	Subsets of 61850 models for power converter-based DER functions	71
8.3.2	Types of interactions for settings, functions, and modes	72
8.3.3	Key common data classes (CDCs)	73
8.3.4	Messaging services	77
8.3.5	Message errors	78
8.4	Basic settings in IEC 61850	78
8.4.1	Logical nodes for basic settings	78
8.4.2	IEC 61850 models for basic settings	79
8.5	Mode settings in IEC 61850	80
8.5.1	Logical nodes for establishing and managing modes	80
8.5.2	IEC 61850 models for modes	81
8.6	Schedules in IEC 61850	83
8.6.1	Scheduling structures	83
8.6.2	IEC 61850 models for schedules	84
8.7	Immediate control functions in IEC 61850	84
8.7.1	IEC 61850 models for INV1: connect/disconnect	84
8.7.2	IEC 61850 models for INV2: adjust maximum generation level up/down	85
8.7.3	IEC 61850 models for INV3: adjust power factor	86
8.7.4	IEC 61850 models for INV4: charge/discharge storage	86
8.7.5	IEC 61850 models for INV5: pricing signal for charge/discharge of storage	87
8.8	Volt-var management modes in IEC 61850	88
8.8.1	IEC 61850 models for VV11 – VV12: volt-var curve settings	88
8.8.2	IEC 61850 models for VV13 – VV14: volt-var parameter settings	88
8.9	Frequency-related modes in IEC 61850	89
8.9.1	IEC 61850 for FW21: frequency-driven active power modification	89
8.9.2	IEC 61850 for FW22: Frequency-watt mode FW22: generating/charging by frequency	90
8.10	Voltage management modes in IEC 61850	91
8.10.1	IEC 61850 for TV31: dynamic reactive current support	91
8.10.2	IEC 61850 for “must disconnect”	92
8.10.3	IEC 61850 for “must remain connected”	92
8.11	Watt-triggered behaviour modes in IEC 61850	93
8.11.1	IEC 61850 for WP41 and WP42: feed-in watts control of power factor	93
8.12	Voltage-watt management modes in IEC 61850	94
8.12.1	IEC 61850 for VW51: voltage-watt management in generation and charging	94
8.13	Non-power mode behaviours in IEC 61850	95
8.13.1	IEC 61850 models for temperature mode TMP	95
8.13.2	IEC 61850 models for pricing signal mode PS	95
8.14	IEC 61850 reporting commands	96
8.14.1	IEC 61850 models for DS91: modify DER settings	96
8.14.2	IEC 61850 models for DS92: event/history logging	96
8.14.3	IEC 61850 models for DS93: status reporting	97
	Bibliography	102

Figure 1 – DER management hierarchical interactions: autonomous, loosely-coupled, broadcast/multicast.....	18
Figure 2 – Electrical Connection Points (ECP) and Point of Common Coupling (PCC)	21
Figure 3 – Producer and Consumer Reference Frame conventions	24
Figure 4 – EEI Power Factor sign convention.....	25
Figure 5 – Working areas for different modes.....	26
Figure 6 – Example of voltage offsets (V_{RefOfs}) with respect to the reference voltage (V_{Ref}).....	28
Figure 7 – Example of modes associated with different ECPs	30
Figure 8 – Example of a volt-var mode curve	31
Figure 9 – Example of hysteresis in volt-var curves.....	33
Figure 10 – Example of deadband in volt-var curves	33
Figure 11 – Local function block diagram	34
Figure 12 – Time domain response of first order low pass filter.....	34
Figure 13 – Interrelationships of schedule controllers, schedules, and schedule references	37
Figure 14 – Volt-var mode VV11 – available vars mode	43
Figure 15 – Power converter mode VV12 – Maximum var support mode based on W_{Max}	44
Figure 16 – Power converter mode VV13 – Example: static var support mode based on V_{ArMax}	46
Figure 17 – Frequency-watt mode curves.....	48
Figure 18 – Frequency-based active power reduction	49
Figure 19 – Frequency-based active power modification with the use of an array.....	50
Figure 20 – Example of a basic frequency-watt mode configuration	51
Figure 21 – Example array settings with hysteresis.....	52
Figure 22 – Example of an asymmetrical hysteresis configuration.....	52
Figure 23 – Example array configuration for absorbed watts vs. frequency	53
Figure 24 – Basic concepts of the dynamic reactive current support function	54
Figure 25 – Calculation of delta voltage over the filter time window.....	55
Figure 26 – Activation zones for dynamic reactive current support.....	55
Figure 27 – Alternative gradient behaviour, selected by ArGraMod	56
Figure 28 – Settings to define a blocking zone.....	57
Figure 29 – Must disconnect and must remain connected zones	58
Figure 30 – Examples of “must remain connected” requirements for different regions	58
Figure 31 – Power factor controlled by feed-in power.....	59
Figure 32 – Example configuration curve for maximum watts vs. voltage	60
Figure 33 – Example configuration curve for maximum watts absorbed vs. voltage	61
Figure 34 – Structure of the IEC 61850 Parts.....	69
Figure 35 – Interrelationships of schedule controllers, schedules, and schedule references	84
Table 1 – Producer Reference Frame (PRF) conventions.....	24
Table 2 – Example basic settings for a storage DER unit	28

Table 3 – Events.....	64
Table 4 – Examples of status points.....	66
Table 5 – Interpretation of logical node tables.....	70
Table 6 – LPHD class	70
Table 7 – Common LN class	71
Table 8 – LLN0 class	71
Table 9 – CDC SPS	73
Table 10 – CDC SPC	73
Table 11 – CDC DPC.....	74
Table 12 – CDC INC	74
Table 13 – CDC ING	75
Table 14 – CDC ASG.....	75
Table 15 – CDC ORG	76
Table 16 – CDC CSG.....	76
Table 17 – Schedule (SCR) common data class specification	77
Table 18 – Service error type definitions	78
Table 19 – LN DRCT – DER controller characteristics.....	79
Table 20 – LN FMAR – set mode array	81
Table 21 – LN DGSM – issue mode command	83
Table 22 – LN DOPM – operations.....	85
Table 23 – INV1 – LN CSWI – issue and respond to control.....	85
Table 24 – LN FWHZ – set power levels by frequency for FW21	90
Table 25 – LN RDGS – dynamic reactive current support for TV31	92
Table 26 – LN PPFW – set power factor by feed-in power for WP41	94
Table 27 – DS92 – IEC 61850 log structure	97
Table 28 – LN DRCS – DER state for DS93.....	99
Table 29 – DS93 – Status, settings, and measurement points.....	99

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 90-7: Object models for power converters in distributed energy resources (DER) systems

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IEC 61850-90-7, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1239/DTR	57/1281/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61850 series, under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

Only the new data objects and CDCs which are represented in ***bold-italic*** will be tagged with the namespace name of this document. The others should still refer to the namespace where they are primarily defined.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 90-7: Object models for power converters in distributed energy resources (DER) systems

1 Scope

This part of IEC 61850 describes the functions for power converter-based distributed energy resources (DER) systems, focused on DC-to-AC and AC-to-AC conversions and including photovoltaic systems (PV), battery storage systems, electric vehicle (EV) charging systems, and any other DER systems with a controllable power converter. It defines the IEC 61850 information models to be used in the exchange of information between these power converter-based DER systems and the utilities, energy service providers (ESPs), or other entities which are tasked with managing the volt, var, and watt capabilities of these power converter-based systems.

These power converter-based DER systems can range from very small grid-connected systems at residential customer sites, to medium-sized systems configured as microgrids on campuses or communities, to very large systems in utility-operated power plants, and to many other configurations and ownership models. They may or may not combine different types of DER systems behind the power converter, such as an power converter-based DER system and a battery that are connected at the DC level.

The namespace of this document is:

“(Tr) IEC 61850-90-7:2012”

The namespace "IEC 61850-90-7" is considered as "transitional" since the models are expected to be included in IEC 61850-7-420. Potential extensions/modifications may happen if/when the models are moved to International Standard status.

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NOTE The term power converter is being used in place of “inverter” since it covers more types of conversion from input to output power:

- AC to DC (rectifier)
- DC to AC (inverter)
- DC to DC (DC-to-DC converter)
- AC to AC (AC-to-AC converter)

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61850-7-2, *Communication networks and systems for power utility automation – Part 7-2: Basic communication structure – Abstract communication service interface (ACSI)*

IEC 61850-7-3, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

IEC 61850-7-4, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 61850-7-410, *Communication networks and systems for power utility automation – Part 7-410: Hydroelectric power plants – Communication for monitoring and control*

IEC 61850-7-420, *Communication networks and systems for power utility automation – Part 7-420: Basic communication structure – Distributed energy resources logical nodes*

IEC 61850-8-1, *Communication networks and systems for power utility automation – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3*

ISO 4217, *Codes for the representation of currencies and funds*

EI Handbook for Electricity Metering, 10th Edition (2002), Edison Electric Institute, Washington, D.C.