

ISO/IEC 14543-4-302:2023-04 (E)

Information technology - Home Electronic System (HES) architecture - Part 4-302: Application protocols for electrical storage systems and controllers

Contents	Page
FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviations.....	9
4 Conformance.....	10
5 Configuration.....	10
5.1 General.....	10
5.2 Configuration and components.....	10
5.3 Connection configuration	11
6 Application layer.....	12
6.1 General.....	12
6.2 NECD objects	12
6.3 NECD services.....	12
6.4 Object-specific NECD properties	12
6.5 Application operation	14
6.5.1 General	14
6.5.2 Continuous requests.....	14
6.5.3 Response wait time value for controllers.....	15
6.5.4 Resending a frame	15
6.5.5 Processing object property counter.....	15
6.5.6 Property values of write requests.....	15
7 Normal operation.....	16
7.1 General.....	16
7.2 Start-up operation	18
7.2.1 General	18
7.2.2 Start-up processing of NECD nodes	18
7.2.3 Search processing.....	18
7.2.4 Obtaining NECD attribute information	18
7.2.5 Obtaining electrical storage system attribute information	19
7.3 Occasional operation	22
7.3.1 General	22
7.3.2 Obtaining electrical storage system status.....	22
7.3.3 Setting and updating "AC charge amount target value" property (or "AC discharge amount target value" property).....	25
7.3.4 Setting and updating "Charging electric power setting" property (or "Discharging electric power setting" property) (optional)	28
7.3.5 Setting "Charging method" property (or "Discharging method" property) (optional).....	31
7.3.6 Setting "Operation mode setting" property	34

7.3.7	Terminating charging (or discharging) operation of the storage battery based on "AC charging amount target value" property (or "AC discharging amount target value" property).....	37
7.4	Fault status notification	41
8	Remote control	42
8.1	General.....	42
8.2	Setting and updating "AC charge amount target value" property (or "AC discharge amount target value" property) on remote control.....	42
8.3	Setting "Operation mode setting" property when remotely controlling	44
9	Considerations on controllers	46
9.1	General.....	46
9.2	Restrictions by electrical storage system implementations	47
Annex A (informative) Terms and NECD protocol frame format on ISO/IEC 14543-4-3 and IEC 62394.....		48
A.1	Terms correspondence between ISO/IEC 14543-4-3 and IEC 62394	48
A.2	NECD protocol frame format	48
Annex B (informative) Relationship between ISO/IEC 14543-4 series and the HES gateway, based on ISO/IEC 15045 series and ISO/IEC 18012 series.....		50
Bibliography.....		51
Figure 1 – Relationship between IEC 62394, ISO/IEC 14543-4-3 and ISO/IEC 14543-4-302.....		7
Figure 2 – Example of electrical storage system configuration and components.....		10
Figure 3 – Connection configurations.....		11
Figure 4 – Assumed network stack.....		11
Figure 5 – Summary of normal operation sequences.....		17
Figure 6 – Sequence for obtaining NECD attribute information.....		19
Figure 7 – Sequence of obtaining electrical storage system attribute information		21
Figure 8 – Sequence to obtain status of electrical storage systems.....		25
Figure 9 – Sequence for setting "AC charge amount target value" property (or "AC discharge amount target value" property).....		28
Figure 10 – Sequence for setting "Charging electric power setting" property (or "Discharging electric power setting" property)		31
Figure 11 – Sequence for setting "Charging method" property (or "Discharging method" property).....		33
Figure 12 – Sequence for setting "Charging method" property (or "Discharging method" property) when no response is received from the storage battery.....		34
Figure 13 – Sequence for setting "Operation mode setting" property.....		36
Figure 14 – Sequence for setting "Operation mode setting" property when no response is received from the storage battery		37
Figure 15 – Sequence of terminating charging (discharging) operation based on "AC charge amount target value" property ("AC discharge amount target value" property)		40
Figure 16 – Sequence of terminating charge (discharge) operation based on "AC charge amount target value" property ("AC discharge amount target value" property) when "Operation mode setting" property is changed		41
Figure 17 – Remote control.....		42
Figure 18 – Example of setting sequence for "AC charge amount target value" property ("AC discharge amount target value" property) when "Remote control setting" property is used.....		44

Figure 19 – Example of setting sequence for "Operation mode setting" property when "Remote control setting" property is used.....	45
Figure 20 – Example of setting sequence for "Operation mode setting" property when "Remote control setting" property is used, in case that no response is made by electrical storage system	46
Figure A.1 – NECD protocol frame format	49
Table 1 – NECD objects.....	12
Table 2 – NECD services	12
Table 3 – NECD properties of device object (super class).....	13
Table 4 – NECD properties of device object.....	13
Table 5 – Response wait time values for controllers.....	15
Table 6 – Re-set wait time for the AC charge (or discharge) amount target value.....	27
Table 7 – Wait time for re-setting charging and discharging electric power setting	30
Table 8 – Wait time for charging and discharging method for re-setting	32
Table 9 – Wait time for re-setting operation mode	35
Table A.1 – Terms correspondence table between ISO/IEC 14543-4-3 and IEC 62394	48
Table B.1 – Partial list of the translation between ISO/IEC 14543-4-302 and HES gateway lexicon (ISO/IEC 18012-3)	50