HEDNO S.A. SPECIFICATION	ELECTRONIC MEDIUM VOLTAGE METERS	ND/389/22.11.2018

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Contents

TECHNICAL SPECIFICATION

ELECTRONIC MEDIUM VOLTAGE METERS

Scope

This technical specification determines the manufacturing, functional, physical and electrical requirements, tests, inspection tests and packing for transportation and delivery to HEDNO warehouses of electronic Medium Voltage (M.V.) meters for grid connection through current and voltage transformers.

Operating Conditions

1. The electronic meter shall operate or be stored under the following conditions:

Maximum altitude	2,000 m
Minimum ambient temperature	- 20° C
Average ambient temperature	20° C
Maximum ambient temperature	55° C
Minimum storage temperature	- 20° C
Maximum storage temperature	70° C
Maximum temperature at external surfaces due to solar radiation	70° C
Minimum relative humidity	5 %
Maximum relative humidity	95 %

Regulations - Specifications

REGULATION	TITLE
EN 50470-1	Electricity Metering equipment (a.c.) – Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C)
EN 50470-3	Electricity Metering equipment (a.c.) - Part 3: Particular requirements – Static meters for active energy (class indexes A, B and C)
EN/IEC 62052-11	Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 11: Metering equipment
EN/IEC 62053-23	Electricity metering equipment (a.c.) - Particular requirements - Part 23: Static meters for reactive energy (classes 2 and 3)
EN/IEC 62058-11	Electricity metering equipment (A.C.) - Acceptance inspection Part 11: General acceptance inspection methods

EN/IEC 62058-31	Electricity metering equipment (AC) - Acceptance inspection - Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)
EN/IEC 60529	Degrees of protection provided by enclosures (IP Code)
EN/IEC 62056-53	DLMS/COSEM Application Layer
EN/IEC 62056-72	DLMS/COSEM Data Link Layer
EN/IEC 62056-61	DLMS/COSEM OBIS Code
EN/IEC 62056-62	DLMS/COSEM Interface Classes
EN/IEC 62056-21	Data exchange for meter reading, tariff and load control
EN/IEC 62052-21	Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 21: Tariff and load control equipment
EN/IEC 62054-21	Electricity metering (a.c.) - Tariff and load control equipment - Part 21: Particular requirements for time switches
2014/32/EU	EU Directive – Measuring Instruments
2014/30/EU	EU Directive – Electromagnetic Compatibility

2. The electronic meter shall be industrial product manufactured according to this Technical Specification, the International EN/IEC regulations / standards and to HEDNO Technical Specifications as mentioned above, which are valid on the day of the bids submission.
3. Whenever the requirements of this Technical Specification contradict with the above editions of International Regulations / Standards or any other relevant Standards, the corresponding HEDNO specification shall prevail.
4. The electronic meter shall have markings according to the European Standards and they are particularly required to have the "CE" conformity mark.

Meter Description

Main Meter Characteristics

5. The electronic meter shall connect through two current transformers and two voltage transformers (two elements – three wires) to the AC power network.
6. The electronic meter shall be suitable for nominal voltage 3x57.7/100V, while it shall be suitable for voltage variation as required by EN/IEC 62052, EN/IEC 62053 and EN 50470.

7. The electronic meter shall have accuracy:
   i. Class C for active energy measurements, in compliance with directive 2014/32/EU (measuring instruments) and in accordance with the Joint Ministerial Decision Οικ. ΔΠΠ 1418/2016 - ΦΕΚ 1231/Β/27.4.2016.
   ii. Class 2 for reactive energy measurements, according to EN/IEC 62053-23.
8. The maximum current I_{max} of the electronic meter shall be at least 10A.
9. The electronic meter shall connect through MV current transformers, with secondary nominal current I_n = 5A.
10. The electronic meter shall operate at a network frequency of 50 Hz and a variation zone of ±2%.
11. The electronic meter shall be designed and manufactured according to the protection class IP51 as specified in EN/IEC 60529 for indoor installation (but with the meter covers closed).

Dimensions

For the proper installation of the electronic meter in HEDNO standardized M.V. meter boxes:

12. The electronic meter shall have screw slots suitable for mounting in a HEDNO meter box. It is acceptable that this requirement to be fulfilled by including a separate mounting adapter in the offer.
13. The electronic meter with all covers installed and the possible separate mounting adapter (point 12) shall have external dimensions: width up to 230 mm, length up to 360 mm, and depth up to 110 mm.

Meter Cover

14. The window of the meter cover of the electronic meter shall be manufactured of a high purity transparent material with protection against solar radiation, enabling the meter's readings to be easily read.
15. The cover of the electronic meter shall include a communication port accessible through an optical head (§102-105).
16. The cover of the electronic meter shall feature slots for the installation of HEDNO seals (§97-98).
17. It shall be possible to perform the following tasks without unsealing the meter cover:
   i. Reading through the display and activation of functionalities using push buttons (§70-78).
   ii. Reading of the meter's characteristics (name table) (§27).

iii. Programming and reading of the electronic meter by a laptop computer or portable handheld unit, using the communication port through optical head (§102-105).

iv. Manual reset of the maximum demand register using push-button, installed on the front cover and sealed with a seal, independent of the meter cover seals and the terminal cover seal (§56.ii).

v. Measuring accuracy test for active and reactive energy through metering LEDS installed on the front cover (§32-34).

vi. Replacing of the auxiliary power (i.e. battery), the cover of which shall be sealed with a seal, independent of the meter cover seals and the terminal cover seal (§39-40).

Terminals and Terminal Cover

18. The size and position of terminals shall be according to EN/IEC Standards.

19. The terminals shall be of front connection type and shall have raised insulation separators in order to provide protection against accidental short-circuit between phases during the connection or disconnection works of the meter.

20. Each terminal for the current and voltage circuits must be designed in order to ensure proper electrical contact and no risk of temperature rise or conductor loosening under normal operating conditions. For this purpose, the terminals for the current or voltage shall, indicatively, follow EN/IEC 60947-7-1 (with corresponding type tests) or have at least two terminal screws to clamp the conductor.

21. The terminals of the meter for current circuits shall be suitable for conductors of at least 4 mm^2 cross-section and for voltage circuits shall be suitable for conductors of at least 2.5 mm^2 cross-section.

22. The stranded cable cross-section for the pulse outputs terminal shall be at least 1 mm^2.

23. The terminals for the pulse outputs shall be either screw terminals or spring terminals.

24. The terminal cover shall feature at least two sealing screws, in order that any intervention with the terminals should require breaking the terminal cover seals.

25. The terminal cover shall be delivered without seals installed.

26. In case that the communication medium is installed inside the terminal cover, the sealing screws position and the overall design shall ensure the appropriate fit of the terminal cover with the meter body with the communication medium installed.

Nameplate – Facade

27. The nameplate of the meter shall be in accordance with EN 50470, EN/IEC 62052-11, and EN/IEC 62053-23 standards.

28. The nameplate of the meter shall be designed and installed so that, without moving the meter cover, the following capabilities or information are provided, in addition to the requirements of §27:
    i. The PPC S.A. logo.
    ii. The PPC Material Code (K.Y.).
    iii. The accuracy class per case.
    iv. The test diodes (LED) with the corresponding meter constant (§34-35).
    v. The symbol for double insulation protection as required by standard EN/IEC 62052-11.
    vi. The CE mark for conformance with EU regulations/standards (§4).
    vii. Push buttons for navigating the display readings (§70-78).
    viii. Maximum demand indicator reset push button, with sealing capability (§56.ii).
    ix. Meter information (at least meter type, serial number, nominal and maximum voltage and current values, year of manufacture), as required also by EN/IEC 62052-11 standard.
    x. Essential measured values OBIS codes.
    xi. Pulse outputs information (§79-84).

Metering System

General

29. The electronic meter shall feature the following analog inputs:
    i. Voltage analog inputs U_{12} and U_{32} (polar voltages).
    ii. Current analog inputs I_1 and I_3.
30. The metering system using the above analog inputs must produce instantaneous digital measurements. Using those measurements, the meter shall calculate the following digitally measured readings (at most 1 sec average):
    i. Polar voltage per phase.
    ii. Current per element.
    iii. Phase shift between voltage and current vectors.
    iv. Phase shift between elements current vectors.
    v. Phase shift between voltage and current per element.
    vi. Voltage phase sequence.
    vii. Current phase sequence.
    viii. Frequency.

ix. Active energy per element and in total with sign (Q_1, Q_4 positive & Q_2, Q_3 negative).

x. Reactive energy per element and in total with sign (Q_1, Q_4 positive & Q_2, Q_3 negative).

xi. Power factor (cos φ).

Functional Requirements

Measured Quantities

31. The electronic meter shall be able to record and display at least the following quantities:

Measured quantity	**Unit**
Active Energy of Quandrant Q_i (i=1,..,4)	kWh, Wh
Reactive Energy of Quandrant Q_i (i=1,..,4)	Kvarh, varh
Apparent Energy of Quandrant Q_i (i=1,..,4)	kVAh
Active Instantaneous Power of Quandrant Q_i (i=1,..,4)	kW, W
Reactive Instantaneous Power of Quandrant Q_i (i=1,..,4)	Kvar, var
Active Energy Sum of all Quadrants QI+QIV+QII+QIII in total	kWh, Wh
Reactive Energy Sum of all Quadrants QI+QIV+QII+QIII in total	Kvarh, varh
Apparent Energy Sum of all Quadrants QI+QIV+QII+QIII in total	kVAh
Active Energy Incoming minus Outgoing QI+QIV-QII-QIII in total	kWh, Wh
Reactive Energy Incoming minus Outgoing QI+QII-QIII-QIV in total	Kvarh, varh
RMS polar voltage	V
RMS current per element	A
Phase shift voltages	Deg
Phase shift voltages – currents	Deg
Voltage phase sequence	
Frequency	Hz
Instantaneous power factor (cos φ)	

Metrological Test

32. The electronic meter shall feature two distinct metrological LEDs, one of active energy testing and one for reactive energy testing, with constant and identical number of pulses per measured quantity.

33. The pulses per Wh and Varh for the metrological LEDs shall be at least 5.

34. It should not be by any means possible to modify the meter constant (pulses/kWh and pulses/kVarh) for the metrological LEDs.

Starting Current

35. The electronic meter shall start to register active energy according to standard EN 50470 and reactive energy according to standard EN/IEC 62053-23, in accordance to each case accuracy class.

Meter Power Supply

36. O The electronic meter shall operate in case of a single phase outage.
37. The meter power supply shall operate during a three-phase blackout of at least 500 ms.

Meter self-consumption

38. Without the communications unit and the display backlighting, the electronic meter energy self-consumption shall be according to standards EN50470, EN/IEC 62052-11, and EN/IEC 62053-23, for multi-function metering devices.

Auxiliary Supply (Real-time Clock Autonomy)

39. The auxiliary supply shall provide power also to the real time clock (R.T.C).
40. The electronic meter shall be capable for operation of the internal clock (R.T.C) for three years at least without the electronic meter being connected to the network.

Registers (Registers)

41. The electronic meter shall store billing information (all the registers) in its memory for at least ten (10) years in case of continuous loss of power without any auxiliary power supply.

Energy Registers

42. The electronic meter shall feature at least ten (10) total energy registers.
43. The electronic meter shall feature at least twelve (12) historical registers for storing previous values of the total energy registers.
44. The storage of readings from the registers to the historical registers shall be performed with the maximum demand indicator reset (MDI-reset).
45. The maximum demand indicator reset shall be possible only through configuration, local or remote and in no case using the meter push-buttons. Except for the maximum demand registers which are reset by the MDI reset button (§56).
46. The calculation of the registered energy to the corresponding registers shall be defined via configuration, using one of the following methods:
    i. Only the time intervals that the algebraic sum of the measured energy quantity is positive for all three phases (One direction, Net value calculation).
    ii. Only the time intervals that the measured energy quantity is positive for all three phases (One direction, Sum of positive phases).

iii. At every moment, a simultaneous calculation is performed for both directions of the measured energy quantity and the three phases independent of quadrant (Simultaneous calculation in two directions).

iv. At every moment, the algebraic sum of the measured energy quantity for all three phases is calculated independent of quadrant (Absolute Sum of import and export energy).

Current Registers of Electrical Power

47. The electronic meter shall feature at least eight (8) current registers of electrical power. The registers of electrical power shall be reset at the start of every interval.

Maximum Demand Registers

48. The electronic meter shall feature at least eight (8) maximum demand registers. The maximum demand registers shall be reset at the end of each billing period.

Historical Data Registers

49. The electronic meter shall store in its memory at least the previous twelve (12) resets of the incoming and outgoing power with date and time.

Integration Interval

50. The control of the integration interval shall be performed by the internal time switch of the meter.

51. The duration of the integration interval shall be configurable to at least values 1, 5, 10, 15, 30 and 60 minutes.

52. The defined duration of the integration interval shall be common both for all registers.

53. The current integration period should be continued in any of the following cases:

    i. Maximum demand indicator reset.

    ii. Time change of the real-time clock (RTC).

    iii. Power outage for a duration longer than of §37.

    The incomplete integration interval measurements should be registered always.

End of Billing Period

54. With the end of the billing period, the total energy registers and the maximum demand indicator registers are copied to the historical registers.

55. The billing period is defined as the time interval between two successful maximum demand indicator resets.

56. The maximum demand indicator reset shall be performed with the following ways:

    i. Automatically at predefined date and time.

    ii. Through the telemetering center or software command, locally or remotely.

iii. Using the maximum demand indicator reset button (with sealing capability) that only authorized personnel is allowed to use.

57. To protect against mistakes it shouldn't be possible for maximum demand indicator reset in a time configurable from 1 to 10 minutes after the last reset.

Self-diagnostic

58. The electronic meter shall perform a self-diagnostic check for its circuits each time it is powered on, after a power outage and in regular intervals.
59. The user must be able to set the meter in self-check, so that all the meter functionality shall be checked.
60. Any fault determined during self-check shall result in the appearance of a message fault on the meter display with fault identification capability.
61. When the sum check on historic registers is wrong, the error shall be recorded in the log file but the computation on the active registers shall continue.
62. The message format on the display shall be configurable (i.e. display or fault code message) or they shall be selectable through configuration from a predetermined list.
63. Erasing a non-fatal fault shall not be possible through the meter push-buttons, but only using software, locally and remotely.
64. Every event shall be recorded in the Log File.

Time Switch / Calendars / Real-Time Clock (RTC)

65. The electronic meter shall feature a calendar time switch, which automatically generates signals to reset automatically the maximum demand register and determine the end of the billing period for the maximum demand registers according to EN/IEC 62054-21 and EN/IEC 62052-21.
66. The clock mechanism shall be high precision Quartz.
67. The clock shall provide all required timings for the proper operation of the electronic meter.
68. The calendar shall support leap years and daylight saving time according to the European standard.
69. The electronic meter shall be capable for time synchronization with telemetering system.

Display

70. The electronic meter shall be capable to display, as configured, everything available in its object list (OBIS object list).
71. The information display shall be according to DLMS/COSEM – OBIS Identification System.

72. The decimal places, the units, the content and the order of appearance shall be determined through configuration. For the indications, at least 8 digits are required, with capability to set at least 3 decimal places.
73. The content of the list and the order of appearance shall be determined through configuration.
74. The following active readings shall be available for display:
    i. The quantities of §31.
    ii. The fault code for the conditions of §124.
    iii. Phase status and sequence.
    iv. Indication of direction of flow of active and reactive energy.
    v. Indication of active event (§125).
    vi. Indication of active communication session.
75. The meter display must be visible from a distance of 1m below and 0.75m horizontally from the front side of the meter (observation angle 30°).
76. The display shall be backlit and the backlighting shall be active when the push-buttons are pressed.
77. The date display format shall be dd/mm/yy.
78. The offered electronic meter shall be capable to support the following display operating modes:
    i. Automatic cyclic scrolling of displayed information.
    ii. Manual cyclic scrolling of displayed information, at least two (2) sets of indications.
    iii. Technical Check (Set mode).

Outputs

Pulse Outputs

79. The contacts of the pulse outputs shall be at least five (5).
80. It shall be possible to program pulse outputs to be sent based on every kind of measured or calculated quantity.
81. The weight of the pulse outputs of the offered electronic meter shall be determined via configuration such that the relation between pulse outputs per kWh should be in the interval 5000-20.000 Imp/kWh.
82. The maximum frequency of switch-off of the contact of the pulse outputs must be at least 25 Hz.
83. The technical specifications of the pulse output contact are the following:
    i. Solid state relay,
    ii. Voltage 12 – 27 V ac/dc,

iii. Minimum current 100mA.

84. For the contacts of the pulse outputs, it should be possible to choose from four (4) internally measured quantities, in which the incoming and outgoing active and reactive energy should be included.

85. The signal output shall have capability for at least 10^6 open/close actions for resistive load at nominal power.

Communication Protocol

86. The electronic meter shall be compatible with the DLMS/COSEM (Application Protocol) EN / IEC 62056 communication protocol.

87. It shall be possible to use the DLMS/COSEM for every possible channel, including the communication port through optical head or the communication port.

88. The offered meter manufacturer shall submit the codes of the objects used (according to DLMS/COSEM), together with the meter technical data.

89. The above must be documented by compliance certification according to DLMS User Association procedure:

    (http://www.dlms.com/conformance/certificationprocess/index.html).

Meter and Data Security

90. Reading and configuration of the meters shall be possible using discrete passwords for various users.

91. Access for meter reading and configuration, locally and remotely, through the meter communication ports, shall be determined according to at least four access layers with discrete username and password for each.

92. The modification of the access passwords shall be possible only with the provided software locally and remotely.

93. The list of users and passwords and the corresponding access rights (read-write) shall be communicated in writing and electronic format and will be determined before the series production.

94. The communication with the meter, either with the offerered software or with the telemetering center(s), besides the user/password system, shall require the usage of the serial number and the physical address of the meter.

95. The Physical Address shall be the 4 last digits of the serial number, adding number 1000.

96. High Level Security.

    i. Client-server authentication via GMAC.

    ii. Message encryption AES-GCM-128.

    iii. At least 3 security access levels available.

    iv. Highly configurable object oriented security system based on DLMS/COSEM.

Security Seals and Meter Cover Security

97. The security seals of the meter cover of the offered electronic meter shall be approved in writing by HEDNO.
98. The electronic meter shall be delivered with the meter cover sealed with conventional sealing screws, in order to allow for the physical access to the inner part of the meter for password modification.
99. The electronic meter shall be accompanied by a set of special screws, same in number as the sealing positions of the meter cover, that their head shall be detached when the screw tightening is completed. The remaining Το παραμένων screw stub shall not allow to be removed following the detachment of the screw head.
100. The cover or covers of the meter as well as the terminal cover shall have a resettable mechanism, which in case of opening shall create an entry in the log file of tampering events, as described in chapter Log File.
101. The communication unit shall not be accessible from the outside without cutting the seal for anti-tampering purposes.

Meter Communications

Communication Port through Optical Head (IR- Port)

102. The electronic meter shall feature a communication port through optical head. The communication port shall be of infra-red type (IR-port).
103. The communication protocol for the communication port through optical head shall be according to EN/IEC 62056-21 for reading and EN/IEC 62056 DLMS/COSEM for bi-directional communication. The communication speed shall be configurable to 9600 baud.
104. The communication port through optical head shall ensure a connection with a hand-held unit and computer.
105. The optical head shall be supported by itself in position in a way that does not affect the correct operation of the meter (i.e. magnetic).

Ports for communication unit (MODEM)

106. The electronic meter shall be capable to connect to a communication unit (MODEM) for telemetering and remote parametrization.
107. The communication unit shall be modular. It may be plugin/modular on the front side of the offered electronic meter or adaptable inside the termal cover of the offered electronic meter with the SIM card protected, such as to be replaced only b authorized personnel.
108. The port for the connection of the communication unit should be able to supply the communication unit offered with the required voltage and power.

109. Following the installation of a communication unit, it is required that there is at least one free RS-485 port with RJ12 or RJ45 or terminals, in which another communication unit could be connected.

110. The communication protocol of the ports for the connection of the communication unit shall be according to DLMS/COSEM for bidirectional communication. The communication speed shall be configurable at 9600 baud at least.

Energy Profiles Recoding

111. The offered electronic meter shall feature the capability to create profiles for every measured quantity. It must be able to register the real power or energy for every element, depending on the direction of energy flow, on two separate profiles. If during the same integration interval, there is both incoming and outgoing energy, those should be registered separately.

112. The memory capacity must be sufficient for the creation of at least 16 profiles, split into two groups, with integration interval of at least every 15 minutes. The memory capacity shall be sufficient for at least 120 days for one group and at least 30 days for the second. The memory management of the offered electronic meter shall allow the increase of the duration of storage of various profiles, in case that it is chosen to record less profiles. When the available memory space is exhausted due to new recordings, the older 15-minute interval shall be removed and the new one shall be recorded.

113. Among the possible to be chosen quantities, all energy registers (internal quantities or pulses) are included, such as voltage, current and power factor. In this case, the electronic meter shall record the average value of the recording period.

114. The integration interval shall be defined through configuration and is common for all energy profiles.

115. Time synchronization with the real-time clock shall occur every hour.

116. The electronic meter shall retain the energy profiles in its memory for at least ten (10) years in case of a continuous power loss and without auxiliary power.

Event Status

117. Clear non-fatal alarms and clear fatal alarms shall be performed exclusively with the offered software that are described in the relevant paragraph at the highest level of security or by a central system with an equivalent level of security.

118. The current status of the active tamper alarms and the power quality data shall be displayed on the meter display with a distinct indication for each one. In any case, the supplier is required to deliver the relevant list (electronic file) with detailed explanations.

Log File

General

119. Any event that the meter can detect and does not constitute a normal operation must be logged in a Log File. Each entry in the log file must provide information about the type, date and start and end time.
120. In the case of events with an extended duration, only one record for the start and one for the end will be recorded in the log file, in order to avoid unnecessary filling.
121. The log file must have a capacity for at least 500 records. Records in excess of the above will be recorded in the place of the older ones.
122. Clearing all or part of the log file shall not be possible in any way.
123. The meter shall retain the log file in its memory for at least ten (10) years in case of a continuous power loss and without auxiliary power.
124. The following malfunctions will be checked and recorded in the log file with separate codes:
    i. Voltage outage per element (or undervoltage), with recording of the missing voltage.
    ii. Current flow reversal per element.
    iii. Voltage phases sequence.
    iv. Current phases sequence per element.

Tampering Events Logging

125. The meter shall have the capability, of detecting and logging at least the following events, of potential attempt for tampering the meter (each event individually:
    i. strong DC magnetic field influence.
    ii. meter cover opening or removal.
    iii. terminal cover opening or removal.
    iv. Removal of auxiliary power (i.e. battery).

Power Quality Monitoring

126. The meter shall have the capability, via appropriate parameterization for the definition of the measured quantities thresholds, of logging at least the following events (each event type individually):
    i. under-voltage for every element.
    ii. over-voltage for every element.
    iii. over-current.
    iv. power-down.

v. power-up.

vi. Total Harmonic Distortion measurement and monitoring.

vii. 5 Voltage and Current Harmonics measurement and monitoring.

127. For each of the above cases, the threshold and duration for recording will be set during configuration.

Meter Health Monitoring

128. The electronic meter shall be capable, through appropriate configuration, to record at least the following events (each event type individually), by logging the time (date and time) of appearance and disappearance of each event:

i. Memory fault.

ii. Clock fault.

iii. Battery fault or Battery Low.

iv. Self-check error.

v. Configuration error

vi. Time synchronization, remote and local

vii. Status/update of meter reconfiguration.

Communication Logging

129. The electronic meter shall be able to record all communications time stamped (date and time).

Meter Reading/Configuration and Mass Remote Meter Configuration Software

130. The electronic meter shall be accompanied by software for the following operations, locally and remotely:

i. Reading and full configuration.

ii. Automated mass full configuration and meters firmware upgrade.

131. The electronic meter shall be configurable using the provided software without any manual local operation or removal from the installation point.

132. During configuration, the registers data shall not be inconsistent of false.

133. Reset of all meter data shall be possible only in a laboratory environment in a way to ensure protection of accidental action.

134. The measured quantities of §30 shall be displayed on the reading and full configuration software and shall be automatically updated with maximum update time 15 sec.

135. The reading and full configuration software shall display graphically the voltage and currents vectors.

136. The automated mass full configuration and meters firmware upgrade software shall be capable to massively import the meters communication data to be processed from a file of type Excel, TXT, CSV, and following the configuration to export an Excel compatible results file.

137. The software must be capable to connect to the meters either locally through optical head and RS-485 port or remotely, through all Greek phone and mobile networks. Especially for mobile communications, the meter shall connect using a CSD call and join HEDNO VPN (GPRS).

138. The required time for a full or partial configuration or firmware update for each meter shall not require more than 30 minutes, either locally or remotely.

Tests

Definition of Tests

- **Type Tests**

  All tests intended to identify the type characteristics of the meter in order to prove the compliance with the requirements of the relevant standards/regulations that these characteristics are required to comply with.

- **Series tests**

  Tests performed on new meters to ensure that they comply with the results of the above tests or to prove that the batch meets the specialized general and specific requirements of the relevant specification.

- **Acceptance Tests**

  Sampling tests performed on a batch of meters prior to delivery for the purpose of making a decision regarding the acceptance or rejection of the batch.

139. All tests shall be performed as described in each relevant and most recent issue of the IEC/EN 62058-31 standard.

Test Certificates Submission

140. Tenderers shall submit with their offer type tests and samples of series tests, defining the series tests that are performed at their factory.

141. Offers that do not include the above test reports will be rejected during the technical evaluation stage.

142. Acceptable test reports are only those issued by an independent, internationally accredited and certified by EN ISO / IEC 17025 test laboratory.

Sample Tests (Acceptance Tests)

143. Sampling tests for acceptance during the acceptance check are all the tests specified in IEC/EN 62058-31 and IEC/EN 62058-11.

144. The sampling procedure for the tests shall be according to IEC/EN 62058-11 and IEC/EN 62058-31 using the following criteria:

   i. Test level II.

   ii. Simple or double sampling.

   iii. Acceptable Quality Limit A.Q.L = 1,0 for each separate test.

Operating Instructions

145. Tenderers shall submit with their offers, the operating instructions manual of the meters.

Meters Parameterization

146. The electronic meter shall be delivered programmed with the parameterization and passwords that will be proposed and agreed by HEDNO, during the sample approval procedure, before the series production of the meters.

147. The electronic meter shall be delivered with the security seals installed on the meter cover.

148. The electronic meter shall be delivered with the external and the possible internal battery disabled such that they can be stored for three years without connection to the grid.

149. The real-time clock (RTC) shall be configured for Greek local time.

Warranty

150. The meters shall have a five (5) year warranty from the date of delivery.

Submission of Information

151. With their offer, tenderers are required to submit:

   i. Construction designs showing the dimensions of the meters.

   ii. Detailed description of the meter.

   iii. Electronic meter operating instructions in Greek or English(§145). In case that English language instructions are submitted with the offer, a declaration is required that during sample approval the Electronic meter operating instructions will be submitted in Greek.

   iv. Full versions of the software required by this specification, with the corresponding user licenses.

   v. Integrated quality management system certificate according to the latest version of the standard EN/ISO 9001 for the production plant of the electronic meters, covering the design, development and production of electronic electricity meters.

   vi. Environmental Management Certificate according to the latest version of the standard EN/ISO 14001 for the production facility of the electronic meter.

vii. Certificate of Conformity according to the latest version of the standard EN/ISO/IEC 17025 for factory production test laboratories and the place of inspection of the electronic meters, if different from the production plant of the offered electronic meters.

viii. Full type test certificates for the electronic meter from an independent, internationally recognized laboratory (accredited according to the latest version of the standard EN/ISO/IEC 17025) according to EN 50470-1, EN 50470-3, EN/IEC 62052-11, EN/IEC 62053-23. The type test certificate must be for to the same meter type as the meter offered, with a definition of the meter type in accordance with §3.1.12 of EN 50470-1 and §3.1.8.2 of EN/IEC 62052-11.

ix. Full type test certificates for the electronic meter from an independent, internationally recognized laboratory (accredited according to the latest version of the standard EN/ISO/IEC 17025) according to EN/IEC 62054-21 and EN/IEC 62052-21 (for the time switch functionality).

x. Type test certificates for the voltage and current circuits terminals of the meter, if required – see §20.

xi. Samples of series test certificates, as described in §140.

xii. List of series tests that are performed at the electronic meters factory, as described in §140.

xiii. Certificate of compliance with DLMS/COSEM (EN/IEC 62056) for the offered electronic meter, with respect to the communication protocol, issued by the DLMS User Association or by an test laboratory listed on the website: http://dlms.com/conformance/listofcompliantequipment

xiv. CE Declaration of Conformity for the offered electronic meter in accordance with EMC Directive 2014/30/EU.

xv. Objects codes used by the electronic meter according to DLMS/COSEM (§88).

Packaging

152. The meters shall be carefully packaged in cardboard boxes individually, and these boxes in a larger box of 5-6 meters, with consecutive serial numbers.

153. The cardboard boxes shall be placed on EU palettes to facilitate transport.

154. These boxes shall be externally and indelibly marked with the contract number, the configuration, the material code and the vendor data.

155. With the above-mentioned package, the boxes shall be able to be stored outdoors without further protection against weather conditions (rain or humidity).