



# Smart Grid Standards Information

Version 1.6

Thursday, April 29, 2010

## Section I: Use and Application of the Standard

### A. Identification and Affiliation

1.	Number of the standard	C12.20
2.	Title of the standard	American National Standard For Electricity Meters—0.2 and 0.5 Accuracy Classes
3.	Name of owner organization	ANSI
4.	Latest versions, stages, dates	2002 (processing ballot comments for next revision now)
5.	URL(s) for the standard	<a href="http://webstore.ansi.org/FindStandards.aspx?SearchString=c12.20&amp;SearchOption=0&amp;PageNum=0&amp;SearchTermsArray=null%7cc12.20%7cnul">http://webstore.ansi.org/FindStandards.aspx?SearchString=c12.20&amp;SearchOption=0&amp;PageNum=0&amp;SearchTermsArray=null%7cc12.20%7cnul</a>
6.	Working group / committee	ANSI SC12.16
7.	Original source of the content (if applicable)	
8.	Brief description of scope	This standard establishes the physical aspects and acceptable performance criteria for 0.2 and 0.5 accuracy class electricity meters meeting Blondel's Theorem. Where differences exist between the requirements of this Standard and C12.1 and C12.10, the requirements of this Standard shall prevail.

### B. Level of Standardization

1.	Names of standards development organizations that recognize this standard and/or accredit the owner organization	ANSI, NEMA
2.	Has this standard been adopted in regulation or legislation, or is it under consideration for adoption?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
3.	Has it been endorsed or recommended by any level of government? If "Yes", please describe	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No PUC
4.	Level of Standard (check all that apply)	<input type="checkbox"/> International <input checked="" type="checkbox"/> National <input type="checkbox"/> Industry <input type="checkbox"/> de Facto <input type="checkbox"/> Single Company
5.	Type of document	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Report <input type="checkbox"/> Guide <input type="checkbox"/> Technical Specification
6.	Level of Release	<input checked="" type="checkbox"/> Released <input type="checkbox"/> In Development <input type="checkbox"/> Proposed

## Section I: Use and Application of the Standard

### C. Areas of Use

1.	Currently used in which domains? (check all that apply)	<input type="checkbox"/> Markets <input type="checkbox"/> Operations <input type="checkbox"/> Service Providers <input checked="" type="checkbox"/> Generation <input checked="" type="checkbox"/> Transmission <input checked="" type="checkbox"/> Distribution <input checked="" type="checkbox"/> Customer
2.	Planned for use in which domains? (check all that apply)	<input type="checkbox"/> Markets <input type="checkbox"/> Operations <input type="checkbox"/> Service Providers <input checked="" type="checkbox"/> Generation <input checked="" type="checkbox"/> Transmission <input checked="" type="checkbox"/> Distribution <input checked="" type="checkbox"/> Customer
3.	Please describe the Smart Grid systems and equipment to which this standard is applied	Electricity Meters

### D. Relationship to Other Standards or Specifications

1.	Which standards or specifications are referenced by this standard?	ANSI C12.10, American National Standard for Physical Aspects of Watthour Meters. ANSI C12.1, American National Standard for Electric Meters, Code for Electricity Metering.
2.	Which standards or specifications are related to this standard?	ANSI C12.1
3.	Which standards or specifications cover similar areas (may overlap)?	IEC 62052-11, IEC 62053-xx
4.	What activities are building on this work?	SC12.24

### E. Dept of Energy Smart Grid Characteristics

Please describe how this standard may encourage each of the following:

1.	Enables informed participation by customers	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
2.	Accommodates all generation and storage options	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
3.	Enables new products, services and markets	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
4.	Provides the power quality for a range of needs	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
5.	Optimizes asset utilization and operating efficiency	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No #####
6.	Operates resiliently to disturbances, attacks, and natural disasters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No #####

## F. Priority Areas Previously Mentioned by FERC and NIST

Please describe if and how this standard may be applied in each of the following areas. Note that there is space in section J to discuss any other significant areas where the standard may be applied.

1.	Cybersecurity and physical security	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
2.	Communicating and coordinating across inter-system interfaces	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
3.	Wide area situational awareness	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
4.	Smart grid-enabled response for energy demand	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
5.	Electric storage	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
6.	Electric vehicle transportation	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
7.	Advanced metering infrastructure	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.
8.	Distribution grid management	<input type="checkbox"/> Yes <input type="checkbox"/> No Not sure what is in FERC and NIST.

## G. Openness

1.	Amount of fee (if any) for the documentation	\$67
2.	Amount of fee (if any) for implementing the standard	None
3.	Amount of fee (if any) to participate in updating the standard	None
4.	Is the standard documentation available online?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <a href="http://webstore.ansi.org/FindStandards.aspx?SearchString=c12.20&amp;SearchOption=0&amp;PageNum=0&amp;SearchTermsArray=null%7cc12.20%7cnull">http://webstore.ansi.org/FindStandards.aspx?SearchString=c12.20&amp;SearchOption=0&amp;PageNum=0&amp;SearchTermsArray=null%7cc12.20%7cnull</a>
5.	Are there open-source or reference implementations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6.	Are there open-source test tools?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7.	Would open-source implementations be permitted?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8.	Approximately how many implementers are there?	10's
9.	Approximately how many users are there?	100's
10.	Where is the standard used outside of the USA?	ANSI meter market in the America's
11.	Is the standard free of references to patented technology?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12.	If patented technology is used, does the holder provide a royalty-free license to users of the standard?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Patented
13.	Can an implementer use the standard without signing a license agreement?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14.	Are draft documents available to the public at no cost?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
15.	How does one join the working group or committee that controls the standard?	Attend a meeting of the Subcommittee
16.	Is voting used to decide whether to modify the standard? If Yes, explain who is permitted to vote.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Subcommittee Members at the SC level, standard balloted by C12 Main
17.	Is an ANSI-accredited process used to develop the standard?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
18.	What countries are represented in the working group or committee that controls the standard?	USA, Canada (observer)

## H. Support, Conformance, Certification and Testing

1.	Is there a users group or manufacturers group to support this standard?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2.	What is the name of the users group or manufacturers group (if any)?	#####
3.	What type of test procedures are used to test this standard? (please check all that apply)	<input checked="" type="checkbox"/> Internal to the lab <input type="checkbox"/> Published by standards organization <input type="checkbox"/> Published by users group <input type="checkbox"/> No procedures, informal testing
4.	Are there test vectors (pre-prepared data) used in testing? (please check all that apply)	<input checked="" type="checkbox"/> Internal to the lab <input type="checkbox"/> Published by standards organization <input type="checkbox"/> Published by users group <input type="checkbox"/> No procedures, informal testing

5.	What types of testing programs exist? (check all that apply)	<input type="checkbox"/> Interoperability Testing <input checked="" type="checkbox"/> Conformance Testing <input type="checkbox"/> Security Testing <input type="checkbox"/> No Testing
6.	What types of certificates are issued? (check all that apply)	<input type="checkbox"/> Interoperability Certificate <input type="checkbox"/> Conformance Certificate <input type="checkbox"/> Security Certificate (text document) <input checked="" type="checkbox"/> No Certificates
7.	Are there rules controlling how and when to use the logo?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Standard has no logo
8.	Is there a program to approve test labs?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9.	Approximately how many test labs are approved (if any)?	Unknown
10.	Is there a defined process for users to make technical comments on the standard or propose changes to the standard and have these issues resolved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11.	Is there a published conformance checklist or table?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
12.	Are there defined conformance blocks or subsets?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13.	Approximately how many vendors provide test tools?	Unknown
14.	Are there tools for pre-certification prior to testing?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15.	Can vendors self-certify their implementations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
16.	Is there application testing for specific uses?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
17.	Is there a "golden" or "reference" implementation to test against?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
18.	Who typically funds the testing? (check all that apply)	<input type="checkbox"/> User <input type="checkbox"/> Users Group <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Confidential
19.	Is there a method for users and implementers to ask questions about the standard and have them answered? (check all that apply)	<input checked="" type="checkbox"/> Yes, official interpretations <input checked="" type="checkbox"/> Yes, informal opinions <input type="checkbox"/> No
20.	Does the users' group (or some other group) fund specific tasks in the evolution of the standard?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
21.	Is the users' group working on integration, harmonization or unification with other similar standards?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
22.	What other standards is this standard being integrated, harmonized, or unified with (if any)?	N/A
23.	Are there application notes, implementation agreements, or guidelines available describing specific uses of the standard?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not applicable

## J. Notes

Please present here any additional information about the standard that might be useful:

1.

## Section II: Functional Description of the Standard

### K. GridWise Architecture: Layers

Please identify which layers this standard specifies, as described in

[http://www.gridwiseac.org/pdfs/interopframework\\_v1\\_1.pdf](http://www.gridwiseac.org/pdfs/interopframework_v1_1.pdf), and the applicable section of the standard. Note the mapping to the Open Systems Interconnect (OSI) model is approximate.

1.	<b>Layer 8: Policy</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
2.	<b>Layer 7: Business Objectives</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
3.	<b>Layer 6: Business Procedures</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
4.	<b>Layer 5: Business Context</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
5.	<b>Layer 4: Semantic Understanding (object model)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
6.	<b>Layer 3: Syntactic Interoperability (OSI layers 5-7)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
7.	<b>Layer 2: Network Interoperability (OSI layers 3-4)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20
8.	<b>Layer 1: Basic Connectivity (OSI layers 1-2)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No No layers in C12.20

### L. GridWise Architecture: Cross-Cutting Issues

Please provide an explanation in the box beside the heading for any questions answered "Not applicable". If the question is not applicable because the function is provided in another layer or standard, please suggest any likely candidates. Note that "the standard" refers to the technology specified by the standard, not the documents themselves.

	<b>Shared Meaning of Content</b>	Not applicable
1.	Do all implementations share a common information model?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
2.	Can data be arranged and accessed in groups or structures?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
3.	Can implementers extend the information model?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
4.	Can implementers use a subset of the information model?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable
	<b>Resource Identification</b>	Not applicable
5.	Can data be located using human-readable names?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
6.	Can names and addresses be centrally managed without human intervention?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	<b>Time Synchronization and Sequencing</b>	Not applicable
7.	Can the standard remotely synchronize time?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Provided in another layer
8.	Can the standard indicate the quality of timestamps?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Provided in another layer
	<b>Security and Privacy</b>	Not applicable
9.	Where is security provided for this standard?	<input type="checkbox"/> Within this standard <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> By other standards
10.	Does the standard provide authentication?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11.	Does the standard permit role-based access control?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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12.	Does the standard provide encryption?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13.	Does the standard detect intrusions or attacks?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
14.	Does the standard facilitate logging and auditing of security events?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15.	Can the security credentials be upgraded remotely?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No Credentials
16.	Can the security credentials be managed centrally?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No Credentials
17.	Please list any security algorithms and standards used	Not applicable
18.	Please provide additional information on how the standard addresses any "Yes" answers above	Not applicable
19.	Please provide additional information about why any of the questions listed above do not apply to this standard	C12.20 is a metrology standard and does not cover communication
	<b>Logging and Auditing</b>	Not applicable
20.	Does the standard facilitate logging and auditing of critical operations and events?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
21.	Can the standard gather statistics on its operation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
22.	Can the standard report alerts and warnings?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	<b>Transaction State Management</b>	Not applicable
23.	Can the standard remotely enable or disable devices or functions?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	<b>System Preservation</b>	Not applicable
24.	Can the standard automatically recover from failed devices or links?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Provided in another layer
25.	Can the standard automatically re-route messages?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Provided in another layer
26.	Can the standard remotely determine the health (as opposed to just connectivity) of devices or software?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	<b>Other Management Capabilities</b>	
27.	Please describe any other system or network management capabilities the standard provides.	Not applicable
	<b>Quality of Service</b>	Not applicable
28.	Is data transfer bi-directional?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
29.	Can data be prioritized?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
30.	What types of reliability are provided?	<input type="checkbox"/> Reliable <input type="checkbox"/> Non-guaranteed <input type="checkbox"/> Both <input type="checkbox"/> Either <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Provided in another layer
31.	Can information be broadcast to many locations with a single transmission?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
32.	Please describe any other methods the standard uses to manage quality of service.	Not applicable
	<b>Discovery and Configuration</b>	Not applicable
33.	Can the software or firmware be upgraded remotely?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable



## Section II: Functional Description of the Standard

34.	Can configuration or settings be upgraded remotely?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
35.	Can implementations announce when they have joined the system?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
36.	Can implementations electronically describe the data they provide?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	<b>System Evolution and Scalability</b>	Not applicable
37.	What factors could limit the number of places the standard could be applied?	Not applicable
38.	What steps are required to increase the size of a system deploying this standard?	Not applicable
39.	Is the information model separate from the transport method?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable
40.	Does the standard support alternate choices in the layers(s) below it?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No layers below
41.	List the most common technology choices for layers implemented below this standard	Not applicable
42.	Does the standard support multiple technology choices in the layers above it?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No layers above
43.	List the technologies or entities that would most commonly use this standard in the layer above	Not applicable
44.	Please describe any mechanism or plan to ensure the standard is as backward-compatible as possible with previous versions	Covers products currently being manufactured.
45.	Please describe how the design of this standard permits it to be used together with older or legacy technologies	Definition of Kilowatt hours has not changed.
46.	Please describe how the design of this standard permits it to co-exist on the same network or in the same geographic area with similar technologies, and give examples	Not applicable
47.	<b>Electromechanical</b>	Electromechanical meters are included.

## M. Architectural Principles

Please describe how this standard may apply any of these principles:

1.	Symmetry – facilitates bi-directional flow of energy and information	Not applicable
2.	Transparency – supports a transparent and auditable chain of transactions	Not applicable
3.	Composition – facilitates the building of complex interfaces from simpler ones	Not applicable
4.	Loose coupling – can support bilateral and multilateral transactions without elaborate pre-arrangement	Not applicable
5.	Shallow integration – does not require detailed mutual information to interact with other components	Not applicable

## Section II: Functional Description of the Standard

6.	Please list any other architectural models, reference architectures or frameworks this standard was designed to be compliant with, e.g. W3C, IEC TC57, OSI and how it fits those models	Not applicable
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