



# ISO/IEC JTC 1/SC 25 N 1527

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**TITLE:** Resolution of comments on SC 25 N 1437: ISO/IEC 2<sup>nd</sup> FCD15045-2: IT - Home electronic system (HES) gateway – Part 2: Modularity and protocol

**SOURCE:** SC 25 Secretary

**PROJECT:** 25.01.03.04

**STATUS:** The NWIP with distributed with JTC 1/SC 25 N 1021 and JTC 1 N 7676. The approval was reported with JTC 1/SC 25 N 1038. CDs were distributed with SC 25 N 1020 and N 1071. FCDs 15045-2 were distributed with SC 25 N 1259 and N 1437. The comments were resolved as recorded in SC 25 N 1436. The 2<sup>nd</sup> FCD did not receive substantial support as recorded in SC 25 N 1490. The comments have been resolved as recorded in this document. The text has been updated accordingly and is distributed as a 3<sup>rd</sup> FCD with SC 25 N 1528.

**ACTION ID:** FY.

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**Resolution of Comments on SC 25 N 1437 ISO/IEC 2<sup>nd</sup> FCD 15045-2: Information technology - Home electronic system (HES) gateway – Part 2: Modularity and protocol — agreed upon at Milan meeting (4 April 2008)**

E: editorial, G: general, T: technical

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Secretary's observations	Resolution
0			G, T	FR1	This draft is based on MODBUS RTPS (a PAS used as the one and only normative reference of the draft) and on a Abstract Intermediate Language that does not qualify for a normative reference but for Bibliography!	As Fieldbus is for industrial control systems, they may not be relevant for a multimedia home gateway	Although the referenced PAS has advanced two and IEC standard by now reference to publications from SC 25, ISO/IEC 14543-3-x, could be more appropriate.	ACCEPT. It was never intended that the PAS 62030 reference include the MODBUS client/server application layer messaging protocol, but only refer to the DDS/RTPS wire protocol. The reference to PAS 62030 will be removed and replaced with a reference limited to the OMG DDS/RTPS "Interop Wire Protocol Specification" properly prepared in accordance with JTC1 Directives ANNEX N on "The Normative Referencing of Specifications other than International Standards in JTC 1 International Standards - Guidelines for JTC 1 SCs" Note that OMG is an Approved Reference Originator (ARO).
0			G, T	FR2	There are several existing modern standards relevant for Home networking: - Cable Labs specifications are IUT standards like IP Cablecom; - DSL Forum has issued several documents, some of them are now Telecom standards; - UpnP and DLNA have been published as IEC 62481-1 and IEC 62481-2 and are to be used for in home networking. IEC 62457 Home Network Communication Protocol over TCP/IP for Multimedia Household Appliances IEC 62514 Requirements for home multimedia Gateway devices IEC 62480 is for Echonet adapters ETSI-TISPAN and 3GPP have issued several SIP /IMS convergence standards for all kinds of NGN (Next Generation Networks) in Telecommunications HGI (Home Gateway Initiative) is trying to assemble those standards into a consistent	Show what is the relevance of the FieldBus + Abstract Intermediate Language  or of  DDS / RTPS / UDP or TCP/ IP  or of MODBUS  for home-gateways, with respect to the standards and specifications that are today market-relevant for home gateways (like cable modems, xDSL modems etc.)	It appears that a number of useful specifications have been developed without being considered by this document.	ACCEPT. (see FR1)  The following criteria was applied in selection of the GL protocol. The OMG DDS/RTPS appears to best meet these requirements:  1. Only needs to support the 18012 series event asynchronous event bus (i.e., transparent to the applications that are communicating through the gateway)  2. Requirements for gateway link protocol: a. Minimal execution footprint b. Designed to run on UDP/IP (no requirement for TCP/IP between HES-Link modules) c. Manage multiple senders through a single UDP communication instance (efficient use of IP stack resources) d. One-to-many communication model (for efficient support of 18012 series asynchronous event bus) e. Support for both best-effort and reliable

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					specification			communication (UDP/IP is not reliable) f. Optimized for time-sensitive applications (e.g., healthcare, distributed energy management) g. Fault tolerance to support networks without single points of failure (in support of multiple distributed HES-Link modules) h. Configurable to allow optimal balancing of reliability vs. time-sensitive requirements i. Does not introduce any blocking or time-outs that would cause unpredictable communication performance
0			G	FR12	<p>According to <a href="http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1a.pdf">http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1a.pdf</a></p> <p>MODBUS is an application layer messaging protocol, positioned at level 7 of the OSI model, that provides client/server communication between devices connected on different types of buses or networks.</p> <p>The industry's serial de facto standard since 1979, MODBUS continues to enable millions of automation devices to communicate. Today, support for the simple and elegant structure of MODBUS continues to grow. The Internet community can access MODBUS at a reserved system port 502 on the TCP/IP stack.</p> <p>MODBUS is a request/reply protocol and offers services specified by function codes. MODBUS function codes are elements of MODBUS request/reply PDUs. The objective of this document is to describe the function codes used within the framework of MODBUS transactions.</p> <p>MODBUS is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks.</p> <p>It is currently implemented using:</p>	<p>Clarify the relation between the MODBUS client server request /reply and the HES AIL ( Home Electronic System Abstract Intermediate Language ).</p> <p>Is it the same thing ?</p>	<p>This document references ISO/IEC 18012 for HES-AIL. Up to now only ISO/IEC 18012-1 is published that does not contain such a language.</p> <p>In case it intends to duplicate text of another standard such duplication shall be avoided by reference.</p>	ACCEPT. (see FR1 and FR2)

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					<p>- TCP/IP over Ethernet. See MODBUS Messaging Implementation Guide V1.0a.</p> <p>- Asynchronous serial transmission over a variety of media (wire : EIA/TIA-232-E, EIA422, EIA/TIA-485-A; fiber, radio, etc.)</p> <p>- MODBUS PLUS, a high speed token passing network</p>			
0	00		G	NL1	<p>Proposed protocol is not in line with the mentioned IP based major initiatives. Translation by a gateway into the RTPS (Real-Time Publish Subscribe) is not very realistic. Such protocols can be and are used for sensor based networks in real-time environments like automotive or industrial automation but the need for this to carry AV streams from the WAN in the home is doubtful if not absent.</p>		<p>HES also needs to support sensors and actors but definitely the reaction times requested for a much longer than in automotive or industrial automation.</p> <p>Specifications that are better suited for the home market should be found in the list of SC 25 publications, see ISO/IEC 14543-3-x and ISO/IEC 29431.</p>	<p>REJECT. The DDS/RTPS is not intended to transfer multimedia content (ie. AV streams) but only to provide messaging for setup and control of multimedia streams to transferred by other means. (MODBUS is not intended—see FR1)</p>
1		Whole Document	T	SE01 FI01	<p>ISO/IEC 29341 is already much used for home electronic systems.</p> <p>SC 25 should make use of this International Standard rather than referring to IEC/PAS 62030, since all functionalities required are already covered by ISO/IEC 29431</p>	<p>IEC/PAS 62030 should be replaced by references to ISO/IEC 29341 throughout the document. If details are needed they should be based on ISO/IEC 29431.</p>	<p>See NL1</p>	<p>REJECT. References to ISO/IEC 14543-3-x and to ISO/IEC 29431 may be useful in some cases, but the HES-gateway system is intended to provide interoperability between dissimilar new and legacy systems and equipment that do not employ any common (ie. standardized) protocol. The GL-link provides a different service than 14543 and 29431 (ie. lightweight DDS/RTPS limited to interconnecting GL-modules, rather than providing interoperable services in itself to end appliances).</p> <p>(See FR1 and FR2)</p>

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Secretary's observations	Resolution
1		Title	G	DE01	<p>The document title is "Modularity and protocol".</p> <p>This document does not define a new protocol but rather references IEC/PAS 62030, which is an industrial protocol, as the upper layer of the "gateway link" protocol.</p> <p>Residential systems, especially AV products and control systems already use ISO/IEC 29341 as intermediary protocol. An international standard for HES shall refer to standards that are being used by millions of devices in operation for HES applications.</p>	Replace IEC/PAS 62030 and other protocol elements by references to ISO/IEC 29341.	Check the suitability of ISO/IEC/JTC 1/SC 25 and IEC TC 100 publications for suitability before considering specifications that have been developed for a very different kind of application.	ACCOMODATED. Requirements which were assumed in DDS/RTPS will be clarified.(couple of paragraphs – see FR2). It was requested at the Milan meeting (4 April 2008) that DE provide a detailed explanation of exactly what portion of UPnP they recommend as an alternative to RTPS. None of the alternatives to DDS/RTPS suggested appear to better meet the needs of the GL-link protocol. (see FR1, FR2)
4	20 – 25	Fore word	G	DE02	<p>Parts 3 to 8 were proposed at the last meeting in Jeju. A consensus on the necessity or scope of these parts was not reached in the working group.</p> <p>Reference to future parts should be added when these have been approved.</p>	Remove references to future parts that have not been approved as work items yet.	Development of part 1 took nine years. The NWIP for part 2 gates next to 2004. Reference to part that is not covered by a proposal for a new work even would be counter-productive.	ACCEPTED. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.
4	20 – 25	Fore word	G	DE05	<p>When ISO/IEC 29341 is referenced in this Part 2 as the "gateway link" protocol parts 3 to 8 can be removed as all issues mentioned in the titles of parts 3 to 8 are covered by ISO/IEC 29341.</p>	Remove parts 3 to 8. Reference ISO/IEC 29341.	Reference to existing standards would improve smarted acceptance	ACCOMODATED. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.
4	20 – 25	Fore word	G	SE02	<p>At the last WG 1 meeting there were some suggestions of several new parts but there was no consensus on this.</p> <p>Furthermore, making use of ISO/IEC 29431 make them unnecessary.</p>	Remove references to parts 3-8 and make use of ISO/IEC 29431.	See DE05	ACCOMODATED. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2. See DE05
4	20, 23	Fore word	G	DE03	<p>This document (Part 2) describes the modular nature of the HES gateway. This model incorporates the vision that the HES gateway is distributed and linked by a common "gateway link" protocol. Hence, the network is the gateway and vice versa. Either one of the proposed parts 3 and 6 is not needed.</p>	Remove either Part 3 or Part 6.	Taking into account the long-time development of ISO/IEC 15045-1 needed NWIPs for the envisaged parts should be agreed.	ACCEPT. Agree with comment except for last sentence which does not follow. (see SE1, F11). It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.

Page	Line	Clause	E/G/T	ID	Comment	Proposed change	Secretary's observations	Resolution
4	25	Fore word	G	DE04	A part for which the name has not even been determined appears to be superfluous.	Remove Part 8.	See DE05 and DE02	ACCEPT.
5	39 – 41	Introduction	G	DE06	<p>“This part 2 defines a common framework for implementing gateway platforms to achieve interconnection and interoperability of home system products and applications from any manufacturer or provider in a manner that is safe, reliable, predictable and consistent.”</p> <p>The introduction should reflect the scope of the document, which is directed at distributed gateway architectures.</p>	Change text to: “This part 2 defines a common framework for implementing <u>distributed</u> gateway platforms to achieve interconnection and interoperability of home system products and applications from any manufacturer or provider in a manner that is safe, reliable, predictable and consistent.”	This proposed change is supported by line 56	ACCEPT.
7	109	1.2	G T	FR3	<p>About the assertion that this standard is relevant for many commercial gateway configurations. Examples in annex A".</p> <p>Annex A is displaying obsolete ATM-SAR interfaces; ATM is now dead and buried ! Hence albeit there is some lip service to IP in clause 7-2 lines 619 to 622 the relevance of this draft is questionable.</p>	Delete or update Annex A with up-to-date network technologies.	Could it be possible that this text has developed slower than the reality?	REJECT. Annex A is only provided as an informative example of how a legacy WAN network might be implemented.
10	224-227	2	T	DE07	<p>IEC/PAS 62030:2004 is referenced.</p> <p>IEC/PAS 62030:2004 is titled “Digital data communications for measurement and control – Fieldbus for use in industrial control systems - Section 1: MODBUS® Application Protocol Specification V1.1a - Section 2: Real-Time Publish-Subscribe (RTPS) Wire Protocol Specification Version 1.0.”</p> <p>This protocol is used in industrial applications. The document does not contain detailed information on how this protocol shall be utilized for HES.</p>	Describe in detail how the protocol shall be used.	In order to be accepted by users standards need to give practical guidance that is up-to-date.	ACCEPT. (see FR1) Reference to IEC/PAS 62030:2004 is deleted

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10	22 4- 22 7	2	G	DE08	IEC/PAS 62030:2004 is referenced. This protocol is used in industrial applications. ISO/IEC 29341 has been approved as an International Standard. It is designed for interconnection of all home applications and is already being used for this purpose.	Replace the reference to IEC/PAS 62030:2004 by a reference to ISO/IEC 29341 to reflect the true market situation.	See DE1	ACCOMODATED. (see DE1)
11	26 5	3.8	E	DE09	"A gateway may provide services up to layer seven and above." Insert OSI.	"A gateway may provide services up to OSI layer seven and above."	Accept	ACCEPT
13		3-20	E	FR4	Abbreviations	Add DG = distributed Gateways CIF = common interoperability framework based on ISO 18012	The list of abbreviations should be complete	ACCEPTED in principle.
13	33 6	5.1	G	DE10	"This translation is accomplished by the Common Interoperability Framework (HES-CIF) (described in ISO/IEC 18012 Interoperability guidelines) and specified in ISO/IEC 15045 Part 4, and Part 5." ISO/IEC Parts 4 and 5 have not even been approved as NWIP. Additionally, the Common Interoperability Framework should be described in ISO/IEC 18012, Interoperability Guidelines.	Remove "and specified in ISO/IEC 15045 Part 4, and Part 5".	Relationship and status of the different parts of ISO/IEC 15045 and ISO/IEC 18012 seem to raise a number of open questions.	ACCEPT. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.  See 5.1 line 336, delete text after "(guidelines)"
13	33 6	5.1	G	SE03	Referencing parts 4 and 5 implies that this document cannot be published until those parts are completed. It would be better to describe this in 18012	Remove the references of parts 4 and 5 and describe these in 18012.	See DE02 & DE05	ACCOMODATED. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.
13	33 6	5.1	G	FI02	Referencing parts 4 and 5 implies that these documents are being developed	New work needs to be approved before it is quoted	See DE02	ACCOMODATED. It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.

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14		5		FR5	Modularity requirements are Each Message should be translated into a common intermediate language the HES-AIL (Home Electronic System Abstract Intermediate Language).  No such translation is known to occur in known commercial market led devices conforming to the above mentioned standards xx/IP with UPnP & DLNA in the home.	Delete the requirement.	In order to be accepted by users standards need to give practical guidance that is up-to-date.	REJECT. Message translation is the most basic function of the gateway and the modular architecture and HES-AIL is intended as a way to make this process practical and interchangeable between different manufacturers and between new and legacy systems that do not employ a common protocol.
15	38 9- 40 1	6.1.2	T	DE1 1	The Generic Interworking Function (GIWF) represents the idea of a generic transformation of information encoded on one protocol into another (common) protocol.  Such a generic translator does not exist.  In practical terms, such a translation is a specific implementation that requires knowledge of both protocols. Defining a GIWF does not provide any benefit.	Remove this clause.	In order to be accepted by users standards need to give practical guidance that is up-to-date.	ACCOMODATED. The text will be clarified to explain that the Generic Interworking Function (GIWF) refers to modules that will be designed and implemented by mfgs to perform translation between specific HES system implementations of device classes to the Generic interoperability application model device classes.  It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.
18		468- 471	G T	FR6	Existing home gateway standards e.g. for cable are mandating detailed MIBs to enable remote management (help line of the WAN provider) and secure software update  SNMPv3 is one of the ways to go (for cable, xDSL is using other ways).		While standards May guide the market in new directions we also have to consider market status at the time of the publication and the readiness of the market to accept a new direction.	ACCEPT  This comment offers an observation and does not propose a change. The use of the MIB or SNMP suggested by FR6 is not restricted or required in this standard and does not in conflict with it. However The Secretary's observation does suggest that the following clarifying sentence be added at the end of the first paragraph of 1.4.3.5 Minimalist approach: "It is anticipated that many different commercial gateways will be implemented as subsets of this standard."
18 & 19		figure 6 and 7		FR7	Gateways as they exist are simply not made according to such block diagrams ; the full seven layer protocol stack of the GL does not exist in modern TCP & UDP/IP environments for multimedia home networks.	Delete considerations on layer 7.	See FR6	ACCEPT. Considerations on layer 7 are not intended and wording will be modified in the text of . References to layer 7 are merely formalistic. OSI Layer 7 (the Application Layer) is the interface to user applications residing above it. The block diagram shows layer 7 for formal completeness, even though in this case layer 7 is moot. Section 6.1.2 has been modified to remove confusing reference to "above layer 7".

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21		7-1-1		FR8	Seven layer OSI reference model is hardly relevant in the IP/Ethernet world today .		See FR6	REJECT. The OSI Reference Model is useful tool for clarity of explanation. OSI layer terminology is well-established and generally considered essential for descriptions of this nature.
23		7-2		FR9	As the Gateway Link must support IP the rest of the draft looks irrelevant, particularly the DDS data distribution service of FieldBus RTPS .		See FR6	REJECT. The GL relies on DDS/RTPS on top of UDP/IP for message exchange. The HES-gateway modular architecture is a fundamentally important element for exchange of messaging between dissimilar new and legacy systems that do not employ a common protocol.
23	63 2- 63 3	7.2	G	DE1 2	<p>"HES-AIL is an HES abstract intermediate application language that supports HES product interoperability, specified in ISO/IEC 15045-4."</p> <p>ISO/IEC Part 4 has not even been approved as NWIP.</p> <p>Additionally, any aspect of interoperability should be described in ISO/IEC 18012, Interoperability Guidelines.</p>	Reference ISO/IEC 18012.	The reference should go to be applicable part of ISO/IEC 18012. In addition see DE01	ACCEPTED. The reference to 18012-2 should be substituted. (see DE2)  It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2.
23	632 f	7.2	G	SE04	See SE03	See SE03	See DE02 & DE05	REJECT (see SE3)
23	63 2f	7.2	G	FI03	See FI02	See FI02	See DE02 & DE05	REJECT. (see SE3)
24			G, T	FR11	<p>The main specification appear in the last page 24 :</p> <ol style="list-style-type: none"> <li>1) use an IP interface to the Gateway Link</li> <li>2) use DDS (data distribution service) rather than UDP or TCP, for transport layer functions</li> </ol> <p>The RTPS protocol is designed to run over an unreliable transport such as UDP/IP.</p> <p>RTPS is a message exchange protocol, whereas the DDS defines an application level interface; that is RTPS is the underlying layer allowing DDS implementations from multiple vendors to interoperate as stated in <a href="http://www2.modbus-ida.org/idagroup/service/download/IDA_RTPS_WireProtocol.pdf">http://www2.modbus-ida.org/idagroup/service/download/IDA_RTPS_WireProtocol.pdf</a></p> <p>In addition a MODBUS communication requires the establishment of a TCP connection between client and server according to</p>	<p>Clarify whether RTPS is to be used.</p> <p>Clarify how DDS can replace UDP or TCP.</p> <p>Clarify the relevance of those real time protocols for the domestic environment.</p>	These comments indicate that the reader would not know what to do while standard should be written to tell him so.	ACCEPT. The reference will be clarified. (see FR1)  All references to Modbus and reference to IEC/PAS 62030:2004 is deleted. A normative reference to OMG DDS/RTPS has been added to Section 2.

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					<a href="http://www.chipkin.com/files/resources/modbus/Modbus_Messaging_Implementation_Guide_V1_0a.pdf">http://www.chipkin.com/files/resources/modbus/Modbus_Messaging_Implementation_Guide_V1_0a.pdf</a>			
24		7-2-2		FR10	If DDS is a replacement for TCP or UDP (it is indeed not at the same layer !), will multimedia content be converted to MODBUS (e.g. streaming audio video)?		See NL1	ACCEPT. The DDS/RTPS is not intended to transfer multimedia content but only to provide messaging for setup and control of multimedia streams to transferred by other means. DDS/RTPS does not replace UDP/IP but sits on top of it. (MODBUS is not intended—see FR1)
24	65 4- 65 5	7.2.3	G	DE1 3	“IEC/PAS 62030, v. 1.0 meets these criteria and is specified for the GL upper layers.” IEC/PAS 62030:2004 was defined for industrial applications. ISO/IEC 29341 has been approved as an International Standard. It is designed for interconnection of all home applications and is already being used for this purpose.	Replace the reference to IEC/PAS 62030:2004 by a reference to ISO/IEC 29341 to reflect the true market situation.	See NL1	ACCOMODATED. (see DE1)
	20	Fwd	T	PE1	Project editor's general comment./explanation	Eliminate reference to non-existing parts 3-8.		Delete Parts 3-8 from text bullet list on lines 20-25.  It was agreed at the Milan meeting (4 April 2008) that project subdivision (parts 3-8) will be avoided for now by moving the Interworking Functions into the interoperability project 18012-2. Future parts may be added, if needed, by NWIP or other appropriate mechanism.