IEC/PAS 61162-101

Edition 1.0
2003-09

Maritime navigation and
radiocommunication equipment
and systems –
Digital interfaces –

Part 101:
Single talker and multiple listeners –
Modified sentences and requirements
for IEC 61162-1

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INTERNATIONAL
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A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC-PAS 61162-101 has been processed by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
80/363/PAS	80/376/RVD

Following publication of this PAS, the technical committee or subcommittee concerned will investigate the possibility of transforming the PAS into an International Standard.

This PAS document relates to International Standards of the IEC 61162 series. The document has been co-ordinated with the NMEA Standards Committee.

This PAS shall remain valid for an initial maximum period of 3 years starting from 2003-09. The validity may be extended for a single 3-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.

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INTRODUCTION

This document is issued as a IEC Publicly Available Specification according to the IEC/PAS approval process. This agreed process allows the latest information on modified sentences to be placed in the public domain in a shorter timescale than revising the appropriate international standards.

The publication of this PAS is intended to provide information on the interface standards which have been upgraded, modified or introduced in the light of experience with earlier editions of the IEC Standard 61162-1.

This publication IEC/PAS 61162-101 will be aligned with similar standards adopted by the NMEA in the latest version 3.12 of NMEA 0183.

A second IEC/PAS 61162-100 is available which deals solely with the interface standards required to implement the AIS. A future IEC/PAS 61162-102 will be made available concerning the additional requirements for the Voyage Data recorder (VDR).

This PAS will be replaced at a future date by, or be included within, a revision of the international standard IEC 61162-1.

MARITIME NAVIGATION AND RADIOCOMMUNICATION
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1   Scope

This PAS document for IEC 61162-1 contains additional requirements for existing sentences and details additions to the existing format which have been found desirable in the light of field experience.

This is the second PAS document to be developed for the IEC 61162-1, reference should be made to IEC/PAS 61162-100 which covers the requirements of the universal shipborne Automatic Identification System (AIS).

2   Normative references

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

Additions to this list are concerned solely with the new AIS and IEC/PAS 61162-100 should be referred to for details.

3   Definitions

3.1
Parametric sentences
(Reference IEC 61162-1 Section 5 : Data format protocol)

These sentences start with the "$" delimiter, and represent the majority of approved sentences defined by this standard. This sentence structure, with delimited and defined data fields, is the preferred method for conveying information.

The basic rules for parametric sentence structures are:

a) The sentence begins with the "$" delimiter.

b) Only approved sentence formatters are allowed. Formatters used by special-purpose encapsulation sentences cannot be reused. See Annex C, tables C.1 and C.2.

c) Only valid characters are allowed. See Annex B, tables B.1 and B.2.

d) Only approved field types are allowed. See Annex A, table A.1.

e) Data fields (parameters) are individually delimited, and their content is identified and often described in detail by this standard.

f) Encapsulated non-delimited data fields are NOT ALLOWED.

3.2
Encapsulation sentences
(Reference IEC 61162-1 these are new sentences : see note below)

There follows a brief description of the Encapsulation sentence. Note that a full description is to be found in the IEC/PAS 61162-100 for the universal shipborne Automatic Identification System (AIS).

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These sentences start with the "!" delimiter. The function of this special-purpose sentence structure is to provide a means to convey information, when the specific data content is unknown or greater information bandwidth is needed. This is similar to a modem that transfers information without knowing how the information is to be decoded or interpreted.

The basic rules for encapsulation sentence structures are:

a) The sentence begins with the "!" delimiter.

b) Only approved sentence formatters are allowed. Formatters used by conventional parametric sentences can not be reused.

c) Only valid characters are allowed.

d) Only approved field types are allowed)

e) Only Six bit coding may be used to create encapsulated data fields.

f) Encapsulated data fields may consist of any number of parameters, and their content is not identified or described by this standard.

g) The sentence must be defined with one encapsulated data field and any number of parametric data fields separated by the "," data field delimiter. The encapsulated data field shall always be the second to last data field in the sentence, not counting the checksum fieldh)

h) The sentence contains a "Total Number Of Sentences" field.

i) The sentence contains a "Sentence Number" field.

j) The sentence contains a "Sequential Message Identifier" field.

k) The sentence contains a "Fill Bits" field immediately following the encapsulated data field. The Fill Bits field shall always be the last data field in the sentence, not counting the checksum field.

NOTE This method of conveying information is to be used only when absolutely necessary, and will only be considered when one or both of two conditions are true, and when there is no alternative.

Condition 1: The data parameters are unknown by devices having to convey the information. For example, the ABM and BBM sentences meet this condition, because the content is not known to the Universal Automatic Identification System (AIS) transponder.

Condition 2: When information requires a significantly higher data rate than can be achieved by the IEC 61162-1 (4 800 baud) and IEC 61162-2 (38 400 baud) standards utilising parametric sentences.

By encapsulating a large amount of information, the number of overhead characters, such as "," field delimiters can be reduced, resulting in higher data transfer rates. It is very unusual for this second condition to be fulfilled. As an example, a UAIS transponder has a data rate capability of 4 500 messages per minute, and satisfies this condition, resulting in the VDM and VDO sentences.

4 Data format protocol

Reference IEC 61162-1 Section 5: New section 5.3.7 multi-sentence messages, see also 4.1 and 4.2 below.

Multi-sentence messages may be transmitted where a data message exceeds the available character space in a single sentence. The key fields supporting the multi-sentence message capability shall always be included, without exception. The required fields are: total number of sentences, sentence number, and sequential message identifier fields. Only sentence definitions containing these fields may be used to form messages. The TUT sentence is a good example of how a sentence is defined to provide these capabilities.

The Listener should be aware that a multi-sentence message may be interrupted by a higher priority message such as an alarm sentence, and thus the original message should be discarded as incomplete and has to await re-transmission. The Listener has to check that multi-sentences are contiguous.

Should an error occur in any sentence of a multi-sentence message, the Listener shall discard the whole message and be prepared to receive the message again upon the next transmission.

4.1   A new definition for Message is added to Annex B of 61162-1

Message – A message consists of 2 or more sentences with the same sentence formatter. Messages are used when 2 or more sentences are needed to convey related data that exceeds the maximum sentence length. This only applies to those sentence formatters that are defined with the key fields supporting multi-sentence messages.

4.2   Editorial correction

Previously, the words 'Sentence' and 'Message' had been interchangeable in their use within the standard. The word 'Message' has now been given a specific meaning – see 4.1 above. The words 'Sentence' and 'Message' are no longer interchangeable and have two different meanings. Accordingly, a number of sentence descriptions, field labels, and notes have been edited to use the words 'Sentence' and 'Message' in a consistent and proper manner. The sentences affected are:

ALM	GPS Almanac Data
ABM	UAIS Addressed binary and safety related message.
BBM	UAIS Broadcast Binary Message.
DSE	Expanded Digital Selective Calling
DSI	DSC Transponder Initialise
DSR	DSC Transponder Response
GBS	GNSS Satellite Fault Detection
GMP	GNSS Map Projection Fix Data
GNS	GNSS Fix Data
GRS	GNSS Range Residuals
GSA	GNSS DOP and Active Satellites
GST	GNSS Pseudorange Error Statistics
GSV	GNSS Satellites in View
MLA	GLONASS Almanac Data
MSK	MSK Receiver Interface
RTE	Routes RTE - Routes
SFI	Scanning Frequency Information
TLB	Target Label

5   Changes to existing parametric sentences

Reference IEC 61162-1 Section 6.3:

5.1   ABM and BBM are covered in IEC/PAS 61162-100

5.2   ACK – Acknowledge Alarm

Updated the text label for the data field.

$--ACK,xxx*hh<CR><LF>

                    Unique alarm number (identifier) at alarm source