

PUBLICLY
AVAILABLE
SPECIFICATION

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PAS 61162-102

Pre-Standard

First edition
2003-12

**Maritime navigation and
radiocommunication equipment
and systems –
Digital interfaces –**

**Part 102:
Single talker and multiple listeners –
Extra requirements to IEC 61162-1
for the Voyage Data Recorder**

IEC PAS 61162-102:2003

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT
AND SYSTEMS – DIGITAL INTERFACES –****Part 102: Single talker and multiple listeners –
Extra requirements to IEC 61162-1 for the Voyage Data Recorder**

FOREWORD

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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 61162-102 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
80/364/PAS	80/384/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a single 3-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.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 an IEC Publicly Available Specification according to the IEC/PAS approval process. This agreed process allows the new information needed to implement the Voyage Data Recorder (VDR) to be placed in the public domain in a shorter time-scale than revising the appropriate international standards.

This document provides information on sentences necessary to interface shipborne alarm systems with the VDR. The introduction of the VDR has highlighted the limitations of the existing alarm sentences in the IEC Standards 61162-1 and 2. The VDR is required to acquire data on engine, cargo and deck monitoring status in addition to the navigation and radiocommunications.

In particular, the data sources have to be identified, in a system possibly comprising several thousand sensors.

This PAS has been developed in conjunction with the NMEA.

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

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IEC PAS 61162-102:2003

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 102: Single talker and multiple listeners – Extra requirements to IEC 61162-1 for the Voyage Data Recorder

1 Scope

The IEC 61162-1 standard includes 4 sentence formatters for handling alarm and transducer status data. These were originally developed to handle the data required by navigation and radiocommunications equipment and multiple alarm systems were not envisaged.

The introduction of the Voyage Data Recorder (VDR) has necessitated the interfacing to engine, cargo and deck monitoring systems. In particular the interface to multi-point fire alarm systems presents problems due to the large number of sensors and the need to identify specific sources of incoming messages.

The IEC 61162-102 is the specified interface to the VDR and to permit identification of data a series of specific sentences has been developed.

Whilst the facilities included in the IEC 61162-4 series may be utilised to handle the most complex systems, these are not in general use, and probably unlikely on smaller vessels. The VDR has to be applied with immediate effect to a range of vessels and there does not appear to be any alternative standard available to meet the requirement.

NOTE This document defines sentences and parameters useful for the VDR and associated systems. The sentences and parameters extend in some cases beyond the minimum requirement for the VDR.

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.

The references contained in IEC 61162-1 apply to this PAS. In addition the following apply :

IEC 61996:2000(E) *Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorders (VDR) – Performance requirements – Methods of testing and required test results*

IMO A.830(19) *Code on Alarms and Indicators*, 1995

IMO SOLAS Convention, Chapter V, (2002)

IMO HSC Code, Chapter 13.

IMO A.861 (20):1997, *Performance standards for shipborne voyage data recorders (VDRs)*

3 Definitions

3.1

alarm

denotes a condition that has to be recognised, or acted upon immediately, e.g. depth minimum limit exceeded, anchor deep

3.2

diagnostic

usually denotes a failure, or warning of deterioration in a system, e.g. engine sensor malfunction

3.3

event

is used to log a condition that has occurred and /or [track the operation of some condition]. Events are [normally] defined, e.g. transfer of control to the bridge

3.4

fault

is a technical problem in one of the system components that will reduce the availability, or future availability, of some or all functions

3.5

warning

is similar to ALARM but need not be acted upon immediately

4 Data requirements of the VDR (from IMO A.861)

Date and time

Ship's position

Speed

Heading

Bridge Audio

Communications audio

Radar data, post-display selection

Echo-sounder

Main alarms

Rudder order and response

Engine order and response

Hull openings status

Watertight and fire door status

Accelerations and hull stresses

Wind speed and direction

5 Existing sentence formatters in IEC 61162-1 for handling alarm data

ALR – Set alarm status –possibly relevant to the VDR but not for machinery, fire or related alarms.

AAM – Waypoint arrival alarm –possibly relevant to the VDR but not for machinery, fire or related alarms.

ACK – Acknowledge alarm – developed for single items of equipment and has limitations for the VDR. Lacks definition of source.

XDR – Transducer measurements – has limited use where multiple devices are in use e.g. cabin fire alarm status.

6 Limitations of existing sentences

The data source is not readily identified in a multi-sensor system.

No differentiation between two or more devices transmitting the same sentence.

The definition of the alarm is inadequate, i.e. no distinction between a malfunction and abnormal condition.

The VDR requires additional talker identifiers not presently covered by IEC 61162-1.

7 Additional talker identifiers

FD	Fire door controller / monitoring panel
FR	Fire detection system
HD	Hull door controller / monitoring panel
HS	Hull stress monitoring system
RC	Propulsion machinery including remote control system
SG	Steering gear / steering engine
WD	Watertight door controller / monitoring panel
WL	Water level detection system

NOTE Talker identifiers FE (Fire extinguisher system – halon, CO2 or similar), FS (Sprinkler, watermist or similar system) and BI (Bilge system) may be added in a later edition.

8 New sentence formatters

NOTE An additional dedicated sentence for rudder order and response will be considered in a later edition of 61162.

8.1 AKD – Acknowledge detail alarm condition

This sentence provides for acknowledgement of the detail alarm condition received from the alarm source. The sentence is designed to clarify the source of the response.

8.2 ALA – Set detail alarm condition

This sentence permits the alarm condition of a system to be set. The data source is identified and the alarm category is defined and avoids any conflict between alarms and devices.

8.3 EVE – Detailed event message to VDR

This is a voluntary sentence that is used to inform the VDR about details in system status that are not contained in the mandatory sentences.

8.4 DOR – Door status detection

This sentence indicates the status of watertight doors, fire doors and other hull openings / doors. Malfunction alarms of the watertight door, fire door and hull opening/door controller should be included in the “ALA” sentence.

8.5 ETL – Engine telegraph operation status

This sentence indicates engine telegraph position including operating location and sub-telegraph indicator.

8.6 FIR – Fire detection

This sentence indicates fire detection status with data on the specific location. Malfunction alarm of the fire detection system should be included in the “ALA” sentence.

8.7 GEN – Generic status information

This sentence provides a means of transmitting multi-sensor information from any source, in a format that can be stored by the VDR.

8.8 HSS – Hull surveillance system

This sentence indicates the hull surveillance system (HSS) measurement data required to be logged by the VDR, if a HSS is fitted on the ship.

8.9 PRC – Propulsion remote control status

This sentence indicates the engine control status (engine order) on a M/E remote control system. This provides the detail data not available from the engine telegraph.

8.10 TRC/TRD – Thruster control data / Thruster response data

This sentence provides the control and response data for thruster devices.

8.11 WAT – Water level detection

This sentence provides detection status of water leakage and bilge water level, with monitoring location data. Malfunction alarm of the water level detector should be included in the “ALA” sentences.

9 New sentence structure

The sentence format is presented in tabular form in this PAS to facilitate understanding and discussion.

9.1 AKD – Acknowledge detail alarm condition

This sentence provides for acknowledgement of the detail alarm condition received from the alarm source. The sentence is designed to clarify the source of the response. AKD is used to acknowledge an alarm reported through ALA.

\$--AKD, hhmss.ss, aa, aa, xx, xxx, aa, aa, xx *hh<CR><LF>

0 1 2 3 4 5 6 7 8 9

Field No	Data form	Field name	Definition
0	\$--AKD	Header	
1	hhmss.ss	Event time (optional)	Event time of alarm condition change or acknowledgement – if required or available.