

INTERNATIONAL STANDARD

AMENDMENT 1

**Maritime navigation and radiocommunication equipment and systems – Digital
interfaces –
Part 450: Multiple talkers and multiple listeners – Ethernet interconnection**



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FOREWORD

This amendment has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The amendment corrects sundry issues which have been identified from the use of the standard and in particular corrects the checksums in many of the sentence examples.

The text of this amendment is based on the following documents:

FDIS	Report on voting
80/795/FDIS	80/796/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

2 Normative references

Insert, after publication reference IEC 61162-1, the following new reference:

IEC 61996-1, *Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorder (VDR) – Part 1: Performance requirements, methods of testing and required test results*

3 Terms and definitions

3.11

message type

Replace, in the definition and in the note, the acronym SMB by SBM, as follows:

classification of IEC 61162-1 sentence formatters into SBM, MSM and CRP types

NOTE 1 SBM, MSM and CRP types are defined in Annex A.

4.2.2 Additional requirements for network infrastructure equipment

Add, at the end of the existing notes, the following new note:

NOTE 3 Although multicast filtering techniques, such as IGMP snooping or CGMP, are not allowed to be activated, it is acceptable to manually configure individual ports of the switches to block unnecessary traffic flow (for example to isolate simple sensors from ECDIS and radar).

Table 4 – Destination multicast addresses and port numbers

Add, at the end of Table 4, the following new note:

NOTE The USR1 to USR8 transmission groups can be used, for example, for proprietary data in binary format.

Table 5 – Destination multicast addresses and port numbers for binary data transfer

Replace the existing Table 5 by the new Table 5, as follows:

Category	Multicast address	Destination port
Simple Binary image transfer ^a	239.192.0.21 to 239.192.0.25	60021 to 60025
Re-transmittable binary image transfer ^b	239.192.0.26 to 239.192.0.30	60026 to 60030
^a Address 239.192.0.25, port 60025 is the recommended default for ECDIS route transfer (see IEC 61174). ^b Address 239.192.0.26, port 60026 is the recommended default for VDR image transfer (see IEC 61996-1). Address 239.192.0.30, port 60030 is the recommended default for ECDIS re-transmittable data blocks for route transfer (see IEC 61174).		

7.2.3.3 Grouping control – g

Replace, in the fifth paragraph, the existing sentences by the following two sentences:

```
\g:1-2-34*59\!ABVDM,1,1,1,B,100000?0?wJm4:`GMUrf40g604:4,0*04
\g:2-2-34*5A\!ABVSI,r3669961,1,013536.96326433,1386,-98,,*14
\g:1-2-46*5C\!ABVDM,1,1,1,B,15N1u<PP1cJnFj:GV4>:MOw:0<02,0*2D
\g:2-2-46*5F\!ABVSI,r3669962,1,013538.05654921,1427,-101,,*20
```

7.2.3.7 Text string parameter – t (Proprietary data)

Replace, in the last paragraph, the existing sentences by the following sentences:

```
\g:1-2-34,s:TI0001,n:333*6B\!TIROT,123.45*67
\g:2-2-34,n:334,t:pmmma;MD5;0x12345678*74\
```

7.3.1 Application of this protocol

Delete, after the second paragraph, the existing note.

7.3.3.4 Source and destination identifier

Replace the existing title by the following new title:

7.3.3.4 Destination identifier

7.3.6 Sender process for binary image transfer

Add new subclause between title of 7.3.6 and title of 7.3.6.1:

7.3.6.3 General

Each single binary image transfer shall be identified by a unique combination of SrcID and BlockID (see Table 9). Within the same SrcID, the Device and Channel (see Table 10) shall be used to distinguish between different data sources of binary image transfers.

NOTE If a single SrcID has multiple needs to send binary images (e.g. ECDIS sending screen image, chart source information and Route exchange), then each single binary image transfer is identified, for example: ECDIS number 1 send screen image as Device = 1 and Channel = 1, and Chart source information as Device = 1 and Channel = 2.

7.3.6.1 Non re-transmittable sender process

Replace the text of item b) by the following new text:

- b) a block identifier is assigned for the image block (if this is the first image, then it is assigned randomly. Otherwise, the instance identifier of the previous image block + 1 is used). The BlockID shall be unique for each binary image transfer from the same SrcID;

Replace the text of item e) by the following new text:

- e) assign a sequence number, which is assigned to one initially;

7.3.6.2 Re-transmittable sender process

Replace the text of item b) by the following new text:

- b) a block identifier is assigned for the image block (if this is the first image, then it is assigned by randomly. Otherwise, the block identifier of the previous image block + 1 is used). The BlockID shall be unique for each binary image transfer from the same SrcID;

Replace the text of item e) by the following new text:

- e) assign a sequence number, which is assigned to one initially;

Replace, in item i), the text of the third bullet by the following new text:

- go to Step (g);

Replace, in item j), the text of the second bullet by the following new text:

- go to Step (g);

7.3.7 Receiver process for binary image transfer

Add new subclause between title of 7.3.7 and title of 7.3.7.1:

7.3.7.3 General

Each single binary image transfer shall be identified by a unique combination of SrcID and BlockID (see Table 9). Within the same SrcID, the Device and Channel (see Table 10) shall be used to distinguish between different data sources of binary image transfers.

NOTE If a single SrcID has multiple needs to send binary images (e.g. ECDIS sending screen image, chart source information and Route exchange), then each single binary image transfer is identified, for example: ECDIS number 1 send screen image as Device = 1 and Channel = 1, and Chart source information as Device = 1 and Channel = 2.

7.3.7.1 Non re-transmittable receiver process

Replace the text of item b) by the following new text:

- b) if the BlockID of the received datagram for same source identified by the combination of SrcID, Device and Channel is not equal to that of the previous datagram,
 - if there is any data in the receiver buffer, it is delivered to the SF
 - the receiver buffer is cleared.

7.3.7.2 Re-transmittable receiver process

Replace the text of item b) by the following new text:

- b) if the received datagram is QUERY message, then
 - compose a Header with the BlockID and sequence number of the previous datagram,
 - send a datagram to the sender,
 - go to Step (a);

Replace the text of item c) by the following new text:

- c) if the BlockID of the received datagram for same source identified by the combination of SrcID, Device and Channel is not equal to that of the previous datagram,
 - if there is any data in the receiver buffer, it is delivered to the SF,
 - the receiver buffer is cleared.

7.3.8.5 End of transmission

Replace, in the first paragraph, the first sentence by the following new sentence:

The receiver shall assume that a transmission has ended unsuccessfully when it gets a binary image block from same source identified by the combination of SrcID, Device and Channel (see Table 9 and Table 10) with a new BlockID.

7.3.8.6 Gaps between ACK messages

Add, at the end of the existing paragraph, the following new note:

NOTE ACK message is used both for positive and negative acknowledge. See 7.3.3.5 for the description of the ACK message.

7.3.8.9 UDP port and IP address

Delete the existing note.

Add, at the end of the existing first paragraph, the following new paragraph:

The receiver shall reply with ACK to the sender using the incoming datagram's multicast address and destination port. Optionally a reply with ACK to the sender may use any multicast address within the range from 239.192.0.21 to 239.192.0.30 and corresponding port number within the range from 60021 to 60030. This option requires that the system supports separate multicast address and port assignment for binary Image transfer sending and for ACK messages of binary Image transfer. For this option the default is 239.192.0.22 and 60022.

8.3.1 Maximum data rate

Replace in the existing first paragraph "datagram output rates" by "datagram input rates".

8.3.2 Error logging function

Delete, in the note, the existing reference to "8.8".

8.8 Transport layer

Delete the fourth paragraph.

8.9.4.1 Test of the transmitter

Replace the last bullet with the following:

- the device under test only feeds sentences preceded by a valid TAG block (for example "\s:II0001,n:23*31\$LCGLL,5420.123,N,01030.987,E,,A,A*58<CR><LF>") into the network.

8.11.1.1 Non re-transmittable image transfer

Replace the existing bulleted list by the following new text.

- header tokens are set correctly,
- header version is one (=1),
- srcID is correctly set,
- destID is set by "XXXXXX",
- unique BlockID is correctly set,
- BlockID, SequenceNum and MaxSequence are correctly set,
- Device is correctly set,
- Channel is correctly set,
- the IP address and port numbers are assigned by one of the addresses for non re-transmittable binary image transfer,
- there is no response when a receiver sends any ACK messages.

8.11.1.2 Re-transmittable image transfer

Replace the existing bulleted list by the following new text.

- header tokens are set correctly,
- header version is one (=1),
- SrcID and DestID is correctly set by "ccxxxx",
- Unique BlockID is correctly set,
- BlockID, SequenceNum and MaxSequence are correctly set,
- Device is correctly set,
- Channel is correctly set,
- the IP address and port numbers are assigned by one of the addresses for re-transmittable binary image transfer,
- A new data transmission is started after an ACK message, whose SequenceNum is equal to the MaxSequence, after all data are transmitted,
- a QUERY message is sent when there is no ACK message after all data are transmitted,
- a QUERY message is sent when there is no ACK message after a QUERY message is transmitted,
- image data is retransmitted when ACK message, whose SequenceNum is less than the MaxSequence, is received,
- the number of re-transmission including the number of QUERY message is always less than or equal to three,
- new data transmission is started when the number of re-transmission including the number of QUERY message is more than three,
- log messages are correct.

8.11.2.1 Non re-transmittable image transfer

Replace the existing bulleted list by the following new text.

- messages are received correctly on given IP and port address,
- each separate image transfer is identified by the combination of SrcID, BlockID, Device and Channel,

- a new receiving process starts when a message with new BlockID is received for the combination of SrcID, Device and Channel,
- the received messages are the same as that of the transmitted data when there is no loss,
- any log information is provided if there is any loss,
- log messages are correct.

8.11.2.2 Re-transmittable image transfer

Replace the existing bulleted list by the following new text.

- messages are received correctly on given IP and port address,
- each separate image transfer is identified by the combination of SrcID, BlockID, Device and Channel,
- an ACK message is transmitted when the received SequenceNum is equal to the MaxSequence with the same instance identifier,
- an ACK message is transmitted when a receiver detects that there is a gap in the SequenceNum between two consecutive messages,
- a new receiving process starts when a message with new BlockID is received for the combination of SrcID, Device and Channel,
- the received messages are the same as that of the transmitted data,
- the receiver does not send any control message when a sender sends image block with different DestID,
- log messages are correct.

B.3 TAG block parameter-code dictionary

Add, after the first paragraph, the following new note:

NOTE Table B.1 is a subset of TAG Block parameters defined in NMEA 0183, section 7. NMEA 0183 defines for example additional TAG Blocks for UNIX time (c), Relative time (r), etc.

C.5.1 Heartbeat message

Replace, after the first paragraph, the two existing sentences by the following sentences:

```

...
\s:YX0001,n:123*01\YXHBT,60,A,3*07<CR><LF>
...
\s:YX0001,n:231*01\YXHBT,60,A,4*00<CR><LF>

```

C.5.2 Command response pair

Replace the entire subclause by the following:

This example is for command-response to set NAVTEX receiver mask from an INS.

```
\s:IN0001,d:NR0001,n:123*68\INNRM,2,1,00001E1F,00000023,C*38<CR><LF>
```

The response within timeout from the NAVTEX receiver is if operation is successful

\s:NR0001,d:IN0001,n:234*6D\ \$NRNRM,2,1,00001E1F,00000023,R*32<CR><LF>

or if unsuccessful operation

\s:NR0001,d:IN0001,n:234*6D\ \$NRNAK,IN,NRM,NR0001,2,Unvalid setting*16<CR><LF>

or if a bad checksum in the TAG block or any TAG block in a grouped TAG block

\s:NR0001,d:IN0001,n:234*6D\ \$NRNAK,IN,NRM,NR0001,6,Checksum failure in TAG Block*58<CR><LF>

or if a bad checksum in the sentence or any sentence in a TAG block group of sentences

\s:NR0001,d:IN0001,n:234*6D\ \$NRNAK,IN,NRM,NR0001,6,Checksum failure in sentence*62<CR><LF>

C.5.4 No-alerts message

Replace, after the second paragraph, the existing sentence by the following sentence:

\s:YX0001,d:BN0001,n:456*79\ \$YXALR,, ,V,V,*72

C.5.5 Alerts-list message

Replace, after the third paragraph, the two existing sentences by the following sentences:

\s:YX0001,d:BN0001,n:567*7A\ \$YXALR,123456,123,A,A,Battery power in use*33<CR><LF>
\s:YX0001,d:BN0001,n:568*75\ \$YXALR,130507,456,A,V,Self test failure*18<CR><LF>

C.6.2 Alert acknowledgement

Replace, after the first paragraph, the existing sentence by the following sentence:

\s:BN0001,d:YX0001,n:123*7E\ \$BNACK,234*5C<CR><LF>

C.6.3 Alarm acknowledgement capability

Replace, after the second paragraph, the existing sentence by the following sentence:

\s:BN0001,d:YX0001,n:123*7E\ \$BNACK,*69<CR><LF>

Bibliography

Insert, after the reference IEC 61162-3, the following new reference:

IEC 61174, *Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results*

Delete the reference IEC 61996-1.