Information Note - Important changes coming to VDES1000

VDES1000 users are advised of significant changes coming to the PI sentences used for VDES-ASM, VDE-TER and VDE-SAT transfer on the VDES1000. These changes will remove the existing input and output sentences and replace them with binary structures that will use the Ethernet interface and will not be transmitted or accepted over serial ports such as RS232 or RS422. These changes reflect the upcoming changes in IEC 63514.

New AIS binary structures will also use the Ethernet interface, but legacy AIS sentences will still be supported on the RS422 and IEC61162-450 ports.

Applies to:

- VDES1000 Data Sheet revision 7 Data February 2025
- Firmware revision 7.5
- VDES Engineering Control Application revision 2.2
- All previous revisions are considered obsolete.

New documentation, firmware and a VDES Engineering Control Application are expected to be available early 2026. The following sentences from the VDES1000 Data Sheet will not function with the future firmware or in the future VDES Engineering Control Application.

- VDES-ASM sentences given in Table 7-11
- VDE-TER sentences given in Table 7-8
- VDE-SAT sentences given in table 7-10

New binary structures are being introduced that will simplify the handling of VDES-ASM, VDE-TER and VDE-SAT data transfers and reduce the load on the PI.

PI binary message structures are transferred using one or more datagrams as described in IEC63514 CD. Multiple datagrams are used when the length of the header plus PI binary message exceeds the maximum size of a datagram (1 472 bytes). The entire protocol and message format are described in IEC63514

4.3.8.1 General requirements for presentation interface

Table 3 defines talker IDs to be used by VDES mobile station when outputting data received from VDES.

Table 3 – VDES station talker IDs

Function	Talker ID
Data exchanged via ASM or VDE channels	VA
All other communications and output resulting reception of ASM Message 0	AI

The equipment shall respond to a standard query sentence with the TALKER Identifier for the device from which data is being requested set as AI.

4.3.8.1.1 PI functions

The equipment shall have a presentation interface (PI) for following functions:

a) input of information from other onboard equipment to be transmitted to other VDES stations by the equipment;
b) output of all received PI data payload broadcast or addressed to own station;
c) report equipment internal status and configuration information to other onboard equipment or system; and
d) accept configuration related commands from other onboard equipment or system.

This interface shall comply with requirements described in IEC 61162-450. The IEC 6162-450 parameters are given in Table 4, The interface shall additionally provide functionality as specified in 4.3.8.2.

NOTE AIS data input and output is combined into the -450 interface, but additionally, AIS information is provided through IEC 61162-1 and IEC 61162-2 for legacy purposes.

Table 4 – IEC 61162-450 parameters

Parameter name	Value to be used
IEC 61162-450 header for AIS data	UdPbC
Transmission group for AIS data	TGTD, multicast address: port: 239.192.0.2: 60002
IEC 61162-450 header for ASM and VDE data	UdPtD
Transmission group for ASM and VDE data	VDED, multicast address: port: 239.192.0.31: 60031

The equipment shall be capable of supporting multiple external equipment through PI by using IEC 61162-450 TAG block.

The timeout for input of a complete PI binary message structure is 1 s.

4.3.8.2 Additional PI functionality required for AIS component

In addition to requirements specified in IEC 61993-2, the equipment shall output AIS VHF data link message PI binary message structure as specified in Annex C.

4.3.8.3 Transfer of binary message structure using IEC 61162-450 interface

4.3.8.3.1 General

PI binary message structures are transferred over the IEC 61162-450 network using one or more datagrams. Multiple datagrams are needed when the length of a header and PI binary message structure exceeds the maximum size of a datagram (1 472 bytes).

The equipment shall be capable of assembling the complete binary message structure from input of multiple datagrams.

Binary message datagrams shall be transferred using non-re-transmittable IEC 61162-450 transfers in the network. The binary message datagram structure is illustrated in Table 5. It starts with an IEC 61162-450 header followed by the PI binary message structure. The header is needed for synchronisation and data integrity validation as specified in IEC 61162 -450.

Table 5 – IEC 61162-450 Binary message datagram structure

61162-450 header
PI binary message structure

4.3.8.3.2 Use of multicast addresses and port numbers

Port numbers and a multicast address shall be allocated for the binary message datagram according to Table 4.

4.3.8.3.3 IEC 61162-450 header

All datagrams shall include a IEC 61162-450 header for PI binary message structures as illustrated in Table 6. UDP multicast datagrams shall contain one of the tokens, followed by a null character (all bits set to zero) as the first six bytes of the datagram. Binary message datagrams shall use the token "UdPtD".

The purpose of the header is to identify a binary message structure and to provide the transfer status to receivers in an IEC 61162-450 network. This allows a receiver to identify if there is any data loss during binary message datagram transfers, and how much data loss occurs.

Table 6 – IEC 61162-450 header format

Data item	TYPE	Description
Token	STRING[6]	Identifier as ASCII string with a length of 5 bytes followed by a null character. For binary message structure, “UdPtD” shall be used.
Version	WORD	Defines the header version. The value is 1.
HeaderLength	WORD	Defines the length of the header in bytes. The header length is 38.
SrcID	STRING[6]	Define the source system identifier in format "ccxxxx". See IEC 61162-450 4.4.2.
DestID	STRING[6]	Defines the destination system identifier in format "ccxxxx". See IEC 61162-450 4.4.2.When Destid = "XXXXXX", then there is no assigned destination.
Type	WORD	Identifies the information in the Header.
SequentialMessageID	DWORD	Sequential message identifier. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 after a whole PI binary message structure is transmitted.
SequenceNum	DWORD	Defines the sequence number of the PI binary message structure fragment.
MaxSequence	DWORD	The number of datagrams needed for the transmission of this PI binary message structure. When SequenceNum is equal to MaxSequence, it means that this datagram is the last datagram of the binary message structure.
Device	BYTE	VDES data source (device) as binary value, 1 for VDES mobile station. The value can be between 1 and 255
Channel	BYTE	Subdivision according to data source (device), 1 for VDES mobile station. The value can be between 1 and 255.

The Device and Channel fields are defined by the application and may be used by receivers in the IEC 61162-450 network to determine how to process the binary message structure.

4.3.8.3.4 Type

Message type gives the information about which information is contained in the datagram. For VDES mobile station, the following applies.

- DATA (0x01) – This type is used for transmission of PI binary message including Message Identifier, Message Length and Message Contents.
- ACK (0x03) – Used as an acknowledgement from the receiver.

Non re-transmittable transfer makes use of only DATA message but re-transmittable transfer uses both message types.

4.3.8.3.5 PI binary message structure format

A PI binary message structure format is illustrated in Table 7.

Table 7 – PI binary message structure format

Data Items	Fields	Type	Description
PI binary message structure	Message Identifier	WORD	Identifier of the PI binary message structure.
	Message Length	DWORD	Length of the PI binary message structure.
	Message Contents	BYTE[message length]	Contents for the PI binary message structure.

The PI binary message structure identifiers are specified in Annex C.

4.3.8.4 Interface for alert information

Requirements as specified in IEC 61993-2 apply.

4.3.8.5 Equipment status

This interface shall comply with requirements described in 4.3.8.3. Table 8 defines binary message structures that shall be used for reporting equipment status to other equipment onboard. Table 9 lists the available status information.

Table 8 – PI binary message structures used to output equipment status and input equipment configuration

Binary Message structure	Direction	Note
Equipment Status	Output	Used to report equipment status
Equipment Status Request	Input	Used to request equipment status

Table 9 – Equipment Status Identifiers

Function	Identifier	Sub identifier	Length [bytes]	Data
TBB in use	1	0	Variable	TBB as specified in R-REC M.2092-1 TABLE 41.
SBB in use		1	Variable	SBB specified in R-REC M.2092-1 TABLE 63 to TABLE 69.
VDES-ASM Network Status	2	0	1	BYTE containing Network Status: 0: Disabled by user 1: ASM Link ID 4 (satellite) disabled 2: Available 2-255: Reserved for future use.
VDE-TER Network Status		1		BYTE containing Network Status: 0: Disabled by user 1: Unavailable 2: Available 3: Ship-to-ship only 4-255: Reserved for future use.
VDE-SAT Network Status	3	0	1	BYTE containing Network Status: 0: Disabled by user 1: Unavailable 2: Available 3-255: Reserved for future use.
Satellite in use Network ID Type		1	1	Only valid when VDE-SAT Network Status is Available. BYTE containing Network Type: 0: Primary 1: Roaming 2: Not in Primary of Roaming list, but general use enabled

4.3.8.7 Presentation interface for ASM

4.3.8.7.1 General

The equipment shall be capable of assembling the entire received MITDMA chain and thereafter output the data using ASM Receive PI binary message structure. Information received from incomplete chains shall be discarded i.e. received partial information shall not be output through PI using ASM Receive PI binary message structure. In addition, the equipment may optionally be capable of outputting all received ASM VDL radio messages relevant to own station using VHF data-link message PI binary message structure.

4.3.8.7.2 Interface for input data to be transmitted to ASM VDL

This interface shall comply with requirements described in 4.3.8.3. Table 13 defines the PI binary message structures that shall be used when inputting data to be transmitted over ASM VDL. The details of binary message structures are described in Annex C.

Table 13 – Binary message structures used for input of data to equipment for transmission to ASM VDL

Binary message structure	Direction	Note
ASM Transmit	Input	ASM Transmit PI binary message structure
ASM geographical multicast	Input	ASM geographical multicast PI binary message structure
ASM Encapsulated AIS Transmit	Input	ASM Encapsulated AIS Transmit PI binary message structure
ASM acknowledgement	Output	ASM acknowledgement PI binary message structure

4.3.8.7.3 Interface to output received ASM VDL information

This interface shall comply with requirements described in IEC 61162-450. Table 14 defines the sentence formatter and Table 15 defines the binary message structures that shall be used for output of ASM VDL data from the equipment. These sentences shall be transported using an IEC 61162-450 header UdPtD. The details of the binary message structures are described in Annex C.

Table 14 – Sentence formatters used to output VDES-ASM VDL

Sentence formatter	Direction	Note
VDM[a]	Output	Used to output encapsulated AIS ASM messages that are received in ASM Message 0
[a] Talker ID used in combination shall be "AI" to ensure backwards compatibility		

Table 15 – PI binary message structure used for output VDES-ASM VDL

Binary message structure	Direction	Note
ASM Receive	Output	ASM Receive PI binary message structure

4.3.8.8 Presentation Interface for VDE-TER

4.3.8.8.1 Interface for input data to be transmitted to VDE-TER VDL

This interface shall comply with requirements described in 4.3.8.3. Table 16 defines the PI binary message structures that shall be used when inputting data to be transmitted over VDETER VDL. The details of binary message structures are described in Annex C.

Table 16 – PI Binary message structures used for input of data to equipment for transmission to VDE-TER VDL

Binary message structure	Direction	Note
VDE Data Transmit	Input	Binary message structure containing PI data payload to be transmitted to VDE-TER VDL
VDE Data Acknowledge	Output	VDE data transmit acknowledgement

4.3.8.8.2 Interface to output received VDE-TER VDL information

This interface shall comply with requirements described in IEC 61162-450 and 4.3.8.3. Table 17 defines the sentence formatter and Table 18 defines the binary message structure that shall be used for output of VDE-TER VDL data from the equipment. The details of the binary message structure is described in Annex C.

Table 17 – Sentence formatters used to output VDE-TER VDL

Sentence formatter	Direction	Note
VDM[a]	Output	Encapsulated AIS Message 21 derived from VDE-TER Virtual AtoN message (serving legacy equipment onboard). See 4.3.10.2.
[a] talker ID used in combination shall be "AI" to ensure backwards compatibility		

Table 18 – PI binary message structure used for output VDE-TER VDL

Binary message structure	Direction	Note
VDE Data Receive	Output	PI Message containing PI Data Payload received on VDE-TER VDL

The equipment shall be capable of assembling the entire received VDE -TER segment and thereafter output the data using the VDE Data Receive binary message structure (see Table 18). Information received from incomplete VDE-TER segments shall be discarded i.e. the received partial information shall not be output through PI.

4.3.8.9 Presentation Interface for VDE-SAT

4.3.8.9.1 Interface for input data to be transmitted to VDE-SAT VDL

This interface shall comply with requirements described in 4.3.8.3. Table 19 defines the PI binary message structures that shall be used when inputting data to be transmitted over VDE - SAT VDL. The details of binary message structures are described in Annex C.

Table 19 – PI Binary message structures used for input of data to equipment for transmission to VDE-SAT VDL

Binary message structure	Direction	Note
VDE-SAT Data Uplink	Input	Binary message structure containing PI data payload to be transmitted to VDE-SAT VDL
VDE-SAT Data Acknowledge	Output	VDE-SAT data transmit acknowledgement

From the length of the PI data payload, the equipment determines which VDE-SAT link layer methods to use for transmission. The following cases exist:

a) in case of 8 bits of data is provided, an Uplink short message shall be sent on the RAC;
b) in case of 40 bits of data, no acknowledgement is requested and no destination ID are provided, an Uplink short message (without acknowledgement) is used. The message type value can be 24 to 28;
c) in all other cases, an Uplink data session is used.

4.3.8.9.2 Interface to output received VDE-SAT VDL information

This interface shall comply with requirements described in 4.3.8.3. Table 20 defines the PI binary message structures that shall be used when inputting data to be transmitted over VDE - SAT VDL. The details of binary message structures are described in Annex C.

Table 20 – PI binary message structure used for output VDE-SAT VDL

Binary message structure	Direction	Note
VDE-SAT Data Downlink	Output	Binary message structure containing PI data payload to be received on VDE-SAT VDL

Annex C
PI binary message structures

C.1 General

The PI binary message structure identifiers are specified in Table C.1

Table C.1 – VDES PI binary message structure identifiers

Value	Description
1	NAK
2	Equipment Configuration Value
3	Equipment Configuration Information Request
4	Equipment Status Request
5	Equipment Status Report
6	VHF data-link message
7	ASM Transmit
8	ASM Receive
9	ASM geographical multicast
10	ASM Encapsulated AIS Transmit
11	ASM acknowledgement
12	VDE-TER Data Transmit
13	VDE-TER Data Receive
14	VDE-TER Data Acknowledge
15	VDE-SAT Data Uplink

Value	Description
16	VDE-SAT Data Downlink
17	VDE-SAT Data Acknowledge

C.2 PI binary message structure authentication

PI binary message structures can be authenticated by means of a SHA-256.

PI binary message structures that may require authentication have an optional Authentication field. The SHA-256 hash is calculated over the password and the entire PI binary message structure up to the Authentication field, including the Message Identifier and Message Length.

The equipment shall respond with a NAK PI binary message structure with reason code set to:

2: Message Authentication failed

when a non-authenticated PI binary message structure is received but authentication is expected.

C.3 PI binary message structure identifier descriptions

C.3.1 General C.3.1.1 NAK

Negative acknowledgement, see Table C.2. This PI binary message structure is used to indicate an error in a received PI binary message structure.

Table C.2 – NAK data structure

Field	Type	Description
Message Identifier	WORD	Message Identifier of the PI binary message structure that contained an error.
Reason code	BYTE	1: Message Identifier not supported. 2: Message Authentication failed. 3: Message Error. Data Item error, unit in incorrect state, etc.

C.3.1.6 VHF data-link message

Used to transfer the entire content of a received VDL message packet, as defined in ITU-R M.1371 or ITU-R M.2092 and as received on the VHF Data Link (VDL) with the received slot information, see Table C.7.

Table C.7 – VHF data-link message data structure

Field	Type	Description
TOA Year	WORD	Time of arrival year.
TOA Month	BYTE	Time of arrival month.
TOA Day	BYTE	Time of arrival day.
TOA Hour	BYTE	Time of arrival hours.
TOA Minute	BYTE	Time of arrival minutes.
TOA Second	BYTE	Time of arrival seconds.
TOA Nanoseconds	DWORD	Time of arrival nanoseconds.
Slot	WORD	First slot number of VDL message.
Channel	WORD	Four-digit channel identifier of channel on which packet was received as described in ITU-R M.1084-5. Example: 2087 is AIS1.
Radio Message Length	WORD	Number of bytes to follow in Radio Message field.
Radio Message	BYTE[]	Byte array with number of bytes specified by Radio Message Length. Contains the complete VDL message as received on the VDL.

C.3.2 PI binary messages structures applicable to ASM function

C.3.2.1 ASM Transmit

This sentence supports the generation of ASM message as defined by ITU -R M.2092 and provides an external application with a means to exchange data via an ASM station see Table C.8. Data is defined by the application only, not the ASM station. This sentence offers flexibility for implementing system functions that use the transponder like a communications device. The success or failure of reception of this transmission by the addressed ASM station for addressed messages is confirmed through the use of the ASM acknowledgement PI binary message structure. The ASM station determines the appropriate communication state for transmission of message types that use communication state over the VHF data Link.

NOTE: ASM can chain up to 15 blocks which will result in a maximum payload size of approximately 2259 bytes broadcast / 2199 bytes addressed / 157 bytes geographical multicast (numbers including DAC/FI)

Table C.8 – ASM Transmit data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each ASM Data Transmit Message.
Source ID	DWORD	The MMSI of the ASM station that is the source of the message.0000000000 to 4294967295. Set to 0 to use MMSI of the transmitting station.
Destination ID	DWORD	The MMSI of the ASM station that is the destination of the message.0000000000 to 4294967295. Set to 0 for broadcast.
Retransmit flag	BYTE	Reserved for future use. Set to zero.
ASM Channel	BYTE	The ASM channel that shall be used for the transmission. 0: No preference 1: ASM 1 2: ASM 2 3: Transmit on both channels
Error Encoding	BYTE	Determine if the message will be transmitted with error encoding. 0: No FEC encoding 1: ¾ FEC 2: ASM SAT uplink message 3: FEC encoding determined by the equipment.
Data Length	WORD	Number of Data Payload bytes to follow.
Data Payload	BYTE[]	Byte array that is the content of the “binary data” for the payload of the ASM message with length equal to Data Length field.

C.3.2.2 ASM Receive

The ASM message receive is output after the completion of a complete ASM message reception, see Table C.9 .

NOTE ASM can chain up to 15 blocks which will result in a maximum binary payload size of approximately 19 000 bits (2 380 bytes).

Table C.9 – ASM Receive data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each ASM reception.
TOA Year	WORD	Time of arrival year.
TOA Month	BYTE	Time of arrival month.
TOA Day	BYTE	Time of arrival day.
TOA Hour	BYTE	Time of arrival hours.
TOA Minute	BYTE	Time of arrival minutes.
TOA Second	BYTE	Time of arrival seconds.
TOA Nanoseconds	DWORD	Time of arrival nanoseconds.
Source ID	DWORD	The MMSI of the ASM station that is the source of the message. 0000000000 to 4294967295

Field	Type	Description
Destination ID	DWORD	The MMSI of the ASM station that is the destination of the message. 0000000000 to 4294967295. Set to 0 for broadcast.
Retransmit flag	BYTE	Retransmit flag from received message.
Repeat indicator	BYTE	Repeat indicator from received message.
ASM Channel	BYTE	The ASM channel on which message was received. 1: ASM 1 2: ASM 2 3: ASM 1 and intended destination is satellite 4: ASM 2 and intended destination is satellite
Data Length	WORD	Number of Data Payload bytes to follow.
Data Payload	BYTE[]	Byte array that is the content of the "binary data" for the payload of the ASM message with length equal to Data Length field.

C.3.2.3 ASM geographical multicast

This PI binary message structure supports the generation of ASM message as defined by ITU-R M.2092 and provides an external application with a means to exchange data via an ASM station, see Table C.10. Data is defined by the application only, not the ASM station. This sentence offers flexibility for implementing system functions that use the transponder link communications device. After receiving this sentence via the command interface, transponder initiates a VDL geographical broadcast.

Table C.10 – ASM geographical multicast data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each ASM transmission.
Source ID	DWORD	The MMSI of the ASM station that is the source of the message. 0000000000 to 4294967295 Set to 0 to use MMSI of the transmitting station.
Retransmit flag	BYTE	Retransmit flag from received message.
ASM Channel	BYTE	The ASM channel that shall be used for the transmission. 0: No preference 1: ASM 1 2: ASM 2 3: Transmit on both channels
Error Encoding	BYTE	Determine if the message will be transmitted with error encoding. 0: No FEC encoding 1: ¾ FEC 2: ASM SAT uplink message 3: FEC encoding determined by the equipment.
Region southwest corner Longitude	DWORD	Longitude in 1/10 min of region southwest corner. ±180° (East = Positive; West = Negative).
Region southwest corner Latitude	DWORD	Latitude in 1/10 min of region southwest corner. ±90° (North = Positive; South = Negative).
Region northeast corner Longitude	DWORD	Longitude in 1/10 min of region northeast corner. ±180° (East = Positive; West = Negative).
Region northeast corner Latitude	DWORD	Latitude in 1/10 min of region northeast corner. ±90° (North = Positive; South = Negative).
Data Length	WORD	Number of Data Payload bytes to follow.
Data Payload	BYTE[]	Byte array that is the content of the "binary data" for the payload of the ASM message with length equal to Data Length field.

C.3.2.4 ASM Encapsulated AIS Transmit

This sentence supports the generation of ASM message 0 as defined by ITU-R M.2092 and provides an external application with a means to exchange data via an ASM station, see Table C.11. Data is defined by the application only, not the ASM station.

Table C.11 – ASM Transmit data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (2^232 – 1 = 4294967295) and is incremented by 1 for each ASM Data Transmit Message.
Source ID	DWORD	The MMSI of the ASM station that is the source of the message. 0000000000 to 4294967295 Set to 0 to use MMSI of the transmitting station.
Retransmit flag	BYTE	Reserved for future use. Set to zero.
ASM Channel	BYTE	The ASM channel that shall be used for the transmission. 0: No preference 1: ASM 1 2: ASM 2 3: Transmit on both channels
Error Encoding	BYTE	Determine if the message will be transmitted with error encoding. 0: No FEC encoding 1: ¾ FEC2: ASM SAT uplink message 3: FEC encoding determined by the equipment.
Data Length	WORD	Number of Data Payload bytes to follow.
Data Payload	BYTE[]	Byte array that is the content of the "binary data" for the payload of the ASM message with length equal to Data Length field.

C.3.2.5 ASM acknowledgement

This PI binary message structure is generated when a transaction, initiated by reception of an ASM selective addressed, ASM broadcast or ASM geographical multicast, is completed or terminated see Table C.12. This PI binary message structure also provides information about the success or failure of a requested delivery. This is done by utilizing the information received in ASM acknowledgement (#5) message. Upon reception of the ASM acknowledgement message (#5), or the failure of addressed ASM message, the own ASM station delivers this PI binary message structure to the external application. This PI binary message structure is also used to report to the external application the own ASM station's handling of the ASM broadcast and ASM geographical multicast PI binary messages. The external application initiates a broadcast through the use of the ASM broadcast and ASM geographical multicast PI binary messages. The own ASM station generates an ASM acknowledgement sentence to report the outcome of the ASM selective addressed, ASM broadcast or ASM geographical multicast broadcast process.

Table C.12 – ASM acknowledgement data structure

Field	Type	Description
Sequential message ID	DWORD	The sequential message identifier shall match the initiating ASM Transmit, ASM geographical multicast or ASM Encapsulated AIS transmit PI binary message structure.
Type	BYTE	Type of acknowledgement: 0: Message successfully received by the addressed ASM station 1: Message was sent, but no acknowledgement by the addressed ASM station 2: Message could not be sent or broadcast: link temporarily unavailable 3: Requested broadcast of Message has been successfully completed 4: Late reception of Addressed message acknowledgement that was to own ASM station and referenced as valid transaction 5: Reserved for future use. 6: Link disabled 7: Message sent to satellite, no link layer acknowledgement expected 8: Transmission queue full, retry later

C.3.3 PI binary messages structures applicable to VDE-TER function

C.3.3.1 VDE-TER Data Transmit

Used to input binary data to be transmitted over VDE data links to a specified destination, see Table C.13. See also the VDE-TER Data Acknowledge for acknowledgement of this message.

Table C.13 – VDE data transmit data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each VDE-TER Data Transmit Message.
Source ID	DWORD	The MMSI of the VDE station that is the source of the message. 0000000000 to 4294967295 Set to 0 to use MMSI of the transmitting station.
Destination ID	DWORD	The MMSI of the VDE station that is the destination of the message. 0000000000 to 4294967295. Set to 0 for broadcast.
Priority	BYTE	Priority of transmission in TX queue.Used to prioritize on input TX queues when scheduling data for transmission. 0: Low Priority 1: Medium Priority 2: High Priority All other values reserved.
Data Type	BYTE	Data type classification. Reserved for future use. Intended to be used to set value on Resource request (#90) field 7 (Priority). In ITU-R M.2092-1 implementations, this is set to 0 in VDES equipment VDL transmission. Any value is ignored by the VDES equipment.
Signature Request	BYTE	Requests that PI Data Payload is signed for authentication using the stored private key. 0: PI Data Payload is not signed. 1: PI Data Payload must be signed.
Validity Duration	WORD	Number of seconds that PI Data Payload should be considered valid from time when message is input. Set to zero to indicate that data is valid indefinitely.
Acknowledgement	BYTE	Specifies if acknowledgment of proper reception of complete message is requested. 0: Acknowledgement is not required. 1: Acknowledgement is required.
Data Length	WORD	Number of PI Data Payload bytes to follow.
PI Data Payload	BYTE[]	Byte array of PI Data Payload to transmit with length equal to Data Length field.

C.3.3.2 VDE-TER Data Receive

Used to output data received over VDE data links on PI port, see Table C.14.

Table C.14 – VDE-TER Data Receive data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each VDE-TER Data Receive Message.
Source ID	DWORD	Source ID for VDE data received. 0000000000 to 4294967295
Destination ID	DWORD	Destination ID for VDE data received. 0000000000 to 4294967295. Set to 0 for broadcast.
Data Type	BYTE	Data type classification. Set to the value of Resource request / transmission announcement (#90) field 7 (Priority). In ITU-R M.2092-1 implementations, this is set to 0 in VDES equipment VDL transmission. Any other value is ignored by the VDES equipment.
Authentication Status	BYTE	Reports the authenticity status when receiving this PI Data Payload. 0: PI Data Payload was not signed. 1: PI Data Payload was signed and authenticated using sender's public certificate. 2: PI Data Payload was signed and authenticated using sender's public

Field	Type	Description
		certificate but validity period has expired. 3: PI Data Payload was signed but could not be authenticated.
Data Length	WORD	Number of PI Data Payload bytes to follow.
PI Data Payload	BYTE[]	Byte array of PI Data Payload received with length equal to Data Length field

C.3.3.3 VDE-TER Data Acknowledge

This PI binary message structure is generated by the VDES mobile station when a VDL transaction, initiated by input of a VDE Data Transmit PI binary message structure, is completed or terminated, see Table C.15. This PI binary message structure provides information about the success or failure of a requested data transfer over a radio datalink, identified using the Sequential Message Identifier used in the corresponding VDE Data Transmit PI binary message structure.

Table C.15 – VDE-TER data acknowledge data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID of the VDE-TER Data Transmit PI binary message structure being acknowledged.
Status	BYTE	0 - Accepted in queue 1 - Transmission success, and successfully received by node destination (if addressed) 2 - Transmission failure 3 - Transmission queue full, retry later 4 – Radio link related time-out 5 – PI Data Payload size exceeds equipment limit 6 – Service denied

C.3.4 PI binary messages structures applicable to VDE-SAT function

C.3.4.1 VDE-SAT Data Uplink

Used to input binary data to be transmitted over VDE-SAT data link to a specified destination, see Table C.16. See also the VDE-SAT Data Acknowledge for acknowledgement of this message.

Table C.16 – VDE-SAT data uplink data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each VDE-SAT Data Uplink Message.
Destination ID	DWORD	The MMSI of the VDES station that is the destination of the message. 0000000000 to 4294967295. Set to 0 for broadcast.
Priority	BYTE	VDL priority associated with that transmitted to indicate priority of the message to the satellite according to ITU-R M.2092-1, table 72, field 4. 0 to 15.
Acknowledgement	BYTE	Specifies if acknowledgment of proper reception of complete message by satellite is requested. 0: Acknowledgement is not required. 1: Acknowledgement is required.
Network ID Type	BYTE	Limits the satellite network ID allowed for transport, combined with Network ID Number field: 0: No network preference, network will be selected automatically 1: Primary 2: Roaming
Network ID Number	BYTE	Limits the satellite network ID allowed for transport, combined with Network ID Type field. Set to 0 if Network ID Type is 0.
Signature Request	BYTE	Requests that PI Data Payload is signed for authentication using the stored private key. 0: PI Data Payload is not signed. 1: PI Data Payload must be signed.

Field	Type	Description
Validity Duration	WORD	Number of seconds that PI Data Payload should be considered valid from time when message is received. Set to zero to indicate that data is valid indefinitely.
Data Length	WORD	Number of PI Data Payload bytes to follow.
PI Data Payload	BYTE[]	Byte array of PI Data Payload to transmit with length equal to Data Length field.

C.3.4.2 VDE-SAT Data Downlink

Used to output binary data received over VDE-SAT data link, see Table C.17.

Table C.17 – VDE-SAT Data downlink data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each VDE-SAT Data Uplink Message.
Source ID	DWORD	Source ID for VDE data received: 0000000000 to 4294967295
Destination ID	DWORD	The MMSI of the VDES station that is the destination of the message: 0000000000 to 4294967295. Set to 0 for broadcast.
Network ID Type	BYTE	Satellite network ID that the downlink data originated from, combined with Network ID Number field: 1: Primary 2: Roaming
Network ID Number	BYTE	Satellite network ID that the downlink data originated from, combined with Network ID Type field.
Authentication Status	BYTE	Reports the authenticity status when receiving this PI Data Payload. 0: PI Data Payload was not signed. 1: PI Data Payload was signed and authenticated using sender's public certificate. 2: PI Data Payload was signed and authenticated using sender's public certificate but validity period has expired. 3: PI Data Payload was signed but could not be authenticated.
Data Length	WORD	Number of PI Data Payload bytes to follow.
PI Data Payload	BYTE[]	Byte array of PI Data Payload received with length equal to Data Length field.

C.3.4.3 VDE-SAT Data Acknowledge

This PI binary message structure is generated by the VDES mobile station when a VDL transaction, initiated by input of a VDE-SAT Data Transmit PI binary message structure, is completed or terminated, see Table C.18. This PI binary message structure provides information about the success or failure of a requested data transfer over a radio datalink, identified using the Sequential Message Identifier used in the corresponding VDE-SAT Data Uplink PI binary message structure.

Table C.18 – VDE-SAT Data acknowledge data structure

Field	Type	Description
Sequential message ID	DWORD	Sequential message ID used to identify this message. The initial value is randomly generated within a range 0 to (232 – 1 = 4294967295) and is incremented by 1 for each VDE-SAT Data Uplink Message.
Status	BYTE	0: Message accepted in transmission queue. 1: VDL Transmission success. 2: VDL Transmission failed. 3: VDL Transmission queue full. Retry later. 4: VDL Time out. 5: Reserved for future use. 6: Requested VDL network not allowed.