The Drive & Control Company

Rexroth
Bosch Group

ID 200, Function Blocks
IndraLogic PROFIBUS/PROFINET

3 842 358 772/2016-11
Replaces: 2014-06
EN

Issue 1.1

Programming Manual

The information contained herein is intended solely as a product description. It should not be understood as defining a particular characteristic or suitability for specific applications. The information does not release the user from the responsibility of performing his own assessments and tests.

This manual was originally written in German.

Contents

1 About this manual

This manual provides a brief guide to commissioning of the communication module ID 200 on an IndraLogic controller via PROFIBUS.

- Be sure to read this manual thoroughly. Familiarize yourself with the device before assembling, installing and starting to use it.
- Pay particular attention to the “Basic safety instructions” chapter when working with the device.

1.1 Other useful documentation

The device described here is a system component.

- Refer to the underlying user manuals
  “ID 200 PROFIBUS” 3 842 540 399 (ID 200/C-PDP) and
  “ID 200 Ethernet” 3 842 540 401 (ID 200/C-ETH).
- Please also note the instructions for the other system components.
- Furthermore, please adhere to all generally applicable, statutory and otherwise binding regulations under European or national law, as well as regulations pertaining to accident prevention and protection of the environment.

2 Declaration of Conformity

CE conformity: This product was developed and manufactured in accordance with applicable European standards and directives. A Declaration of Conformity can be requested from the manufacturer.

ISO9001

The manufacturer of this product has a quality assurance system that is certified to ISO 9001.

3 Basic safety information

The device was manufactured in accordance with generally recognized technical rules and standards. There is nevertheless a risk of personal injury or damage to property if you fail to observe the following basic safety instructions.
Read this manual thoroughly and completely before starting to use the device. Always pass on the manual together with the device when transferring it to third parties.

3.1 Proper use

The ID 200/C-... is a communication module for identification systems, and has PROFIBUS and Ethernet interfaces. You can use the device as a cabinet module or for field applications. You can connect suitable inductive antennas, microwave antennas or trigger sensors to the ID 200/C-.... When doing so, you must use cabling suitable to the system design.

The device is a component (sub-assembly) under the terms of the EU Machinery Directive 98/37/EC. It is not a ready-to-use complete machine under the terms of the EU Machinery Directive. The product/component is designed solely to be installed in a machine or system, or to be joined with other components to form a machine or system. The product may only be brought into operation after it has been installed in the machine/system for which it is intended, and this machine/system fully satisfies the requirements of the EU Machinery Directive.

Be sure to comply with the operating conditions and performance limits specified in the technical data.

The device is an item of technical equipment and not intended for private use.

Proper use also requires that you have fully read and understood this manual, particularly the section “Basic safety information”.

3.2 Improper use

Non-regulation use means that you are using the device for purposes other than those specified in the “Regulation use” chapter.

3.3 Qualification of personnel

Assembly, commissioning, operation, disassembly and maintenance (including service and care) require basic computer skills and knowledge of the relevant specialist terms. Therefore, in order to guarantee operational safety, the above activities may only be performed by a qualified specialist or an instructed person under the guidance of a specialist.

Specialist personnel in this context refers to personnel who, based on their professional training, knowledge and experience, as well as by virtue of their familiarity with the relevant rules and regulations, are able to assess the work assigned to them, identify potential dangers and take appropriate safety precautions. Specialist personnel must comply with the relevant technical rules and regulations.

3.4 Duties of the owner

The owner of products from Bosch Rexroth must regularly train his personnel in the following areas:

- Compliance with and use of the operating instructions and legal provisions
- Regulation use of the Bosch Rexroth product
- Compliance with health and safety instructions and the owner's work instructions
- What to do in an emergency

Bosch Rexroth offers supportive training measures in specific fields.
You can find an overview of available course contents on the internet at http://www.boschrexroth.de/didactic.

4 Interface via PROFIBUS DP

The ID 200 supports the basic functions of the Profibus DP Communication Profile in accordance with EN 50 170. The ID 200 identification system supports no extended DP functions as specified for the DPV1 or DPV2. Data exchange is executed by way of the cyclic data traffic of a DP Master class 1 (DPM1).

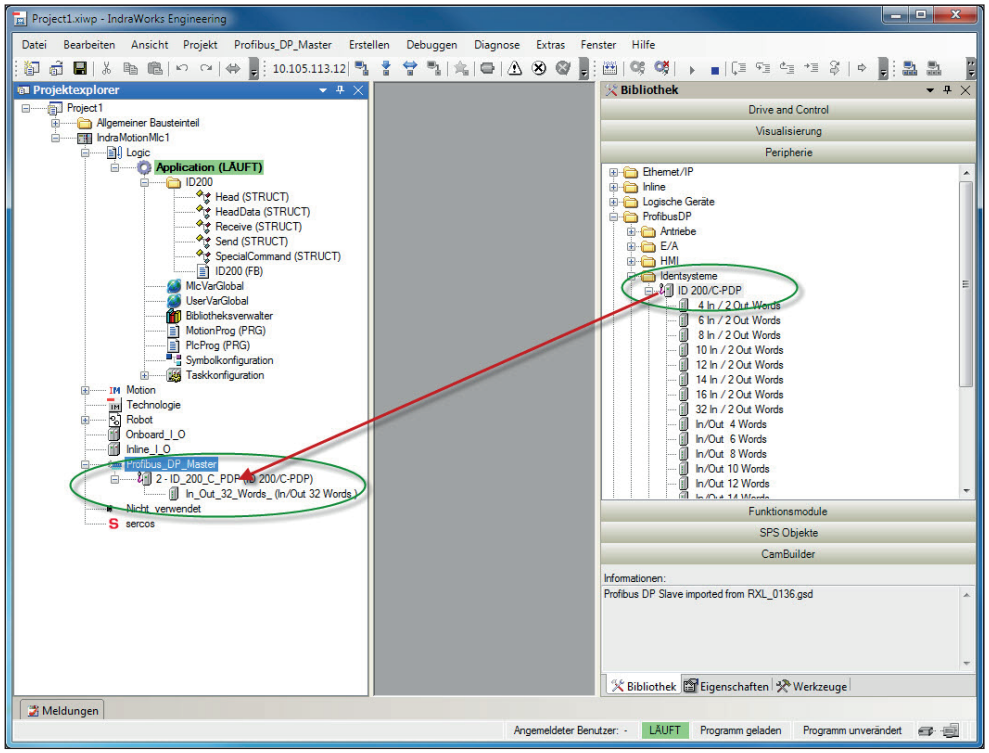
4.1 IndraWorks PROFIBUS hardware configuration

The hardware configuration specifies the following:

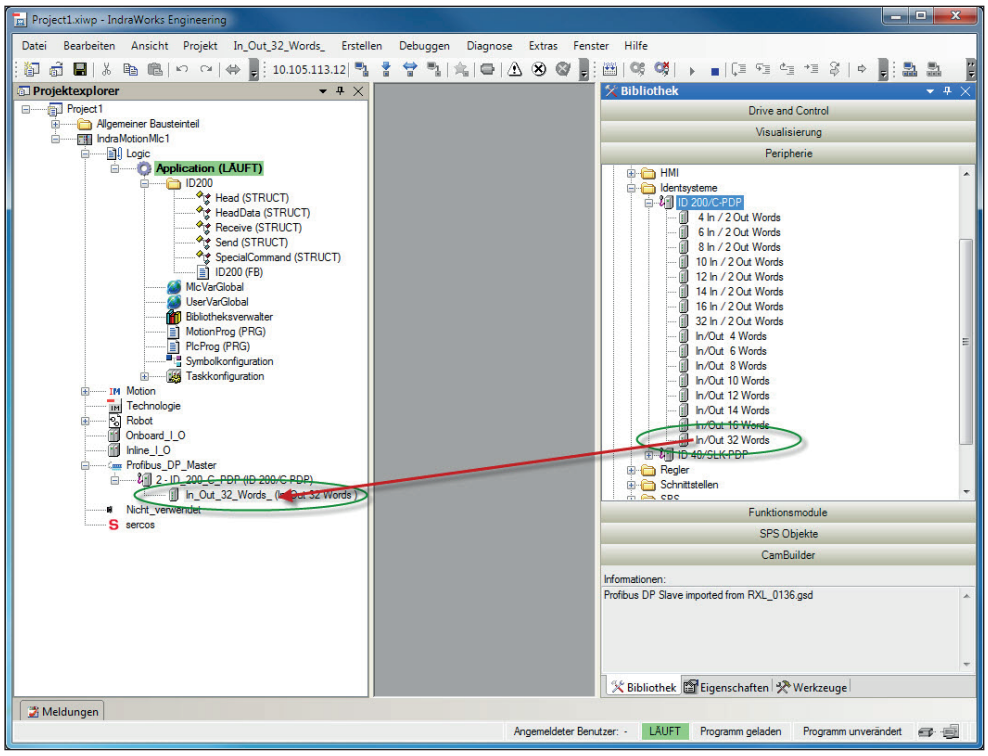
- Bus address of the ID 200
- Communication modules
- I/O ranges
- Manufacturer-specific data

▶ Linking ID 200 to the Profibus Master: Drag the ID 200 icon from the **Peripherals** library onto the Profibus Master in the Project Explorer.

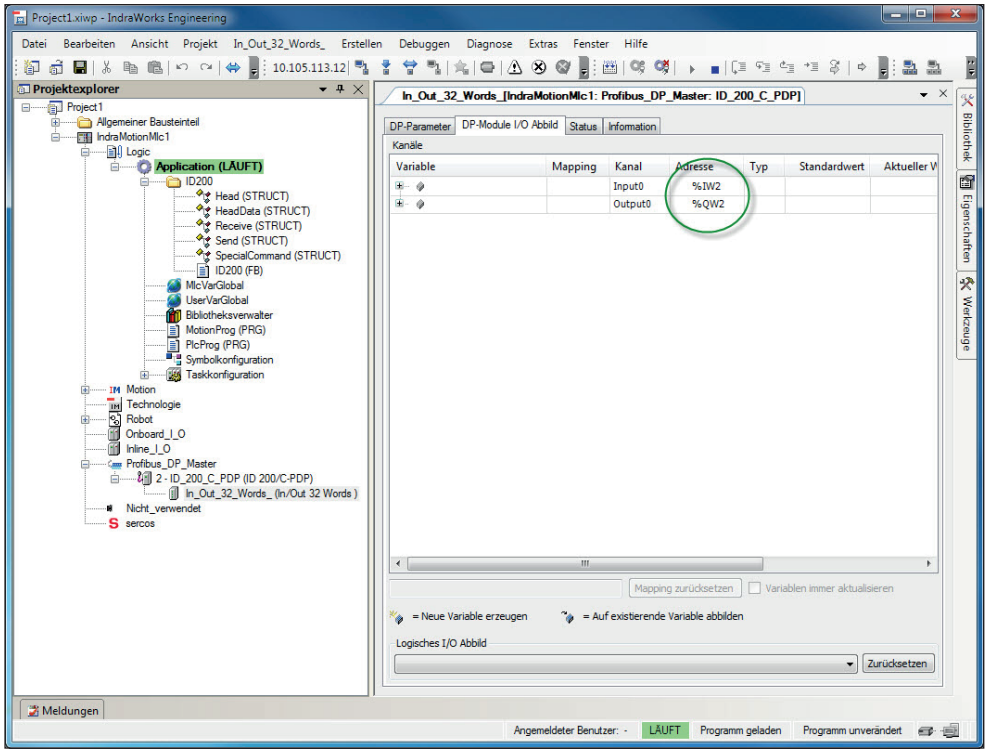
▶ Assign the bus address.



- Specification of communication module: 32 IN/OUT words are selected here, corresponding to the assignment in the I/O range.



- Assign the I/O addresses.



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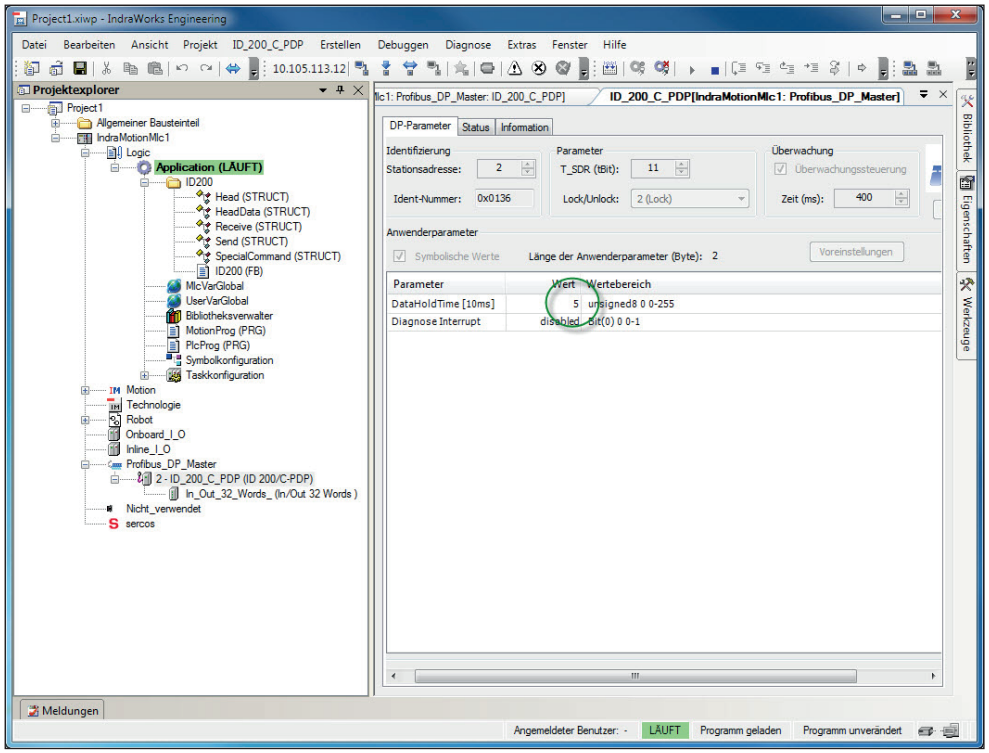
- Enter the manufacturer-specific data.

  A data hold time is parameterized. The parameter defines the data hold time in the output data field of the ID 200. The value should correspond to double the controller cycle time.



For more information on setup and programming refer to the **IndraLogic manual**.

5 Connection via PROFINET

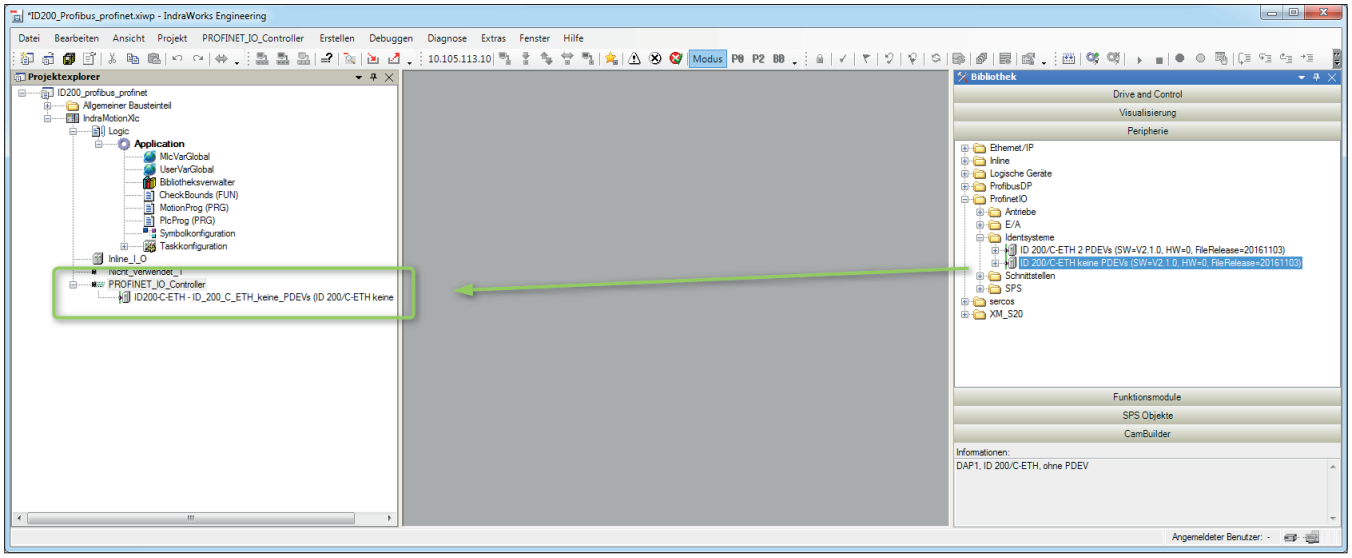
ID 200/C ETH supports PROFINET IO, the communication concept for setting up decentralized applications, i.e. decentralized field devices are connected via PROFINET IO. The familiar IO view from PROFIBUS DP is used here, with which the payload data from the field devices is cyclically transferred into the process map of the PLC. PROFINET IO describes a device model that is oriented on the main features of PROFIBUS DP and consists of slots and channels. The characteristic of the field devices are described in an XML-based general station description file (GSDML file). The engineering of the PROFINET IO is done as system integrators of PROFIBUS DP are used to. The decentral field devices are assigned an PLC in the project planning.
The ID 200/C ETH communication module is networked with a PROFINET IO device, which communicates cyclically with the PROFINET IO controller (PLC).

5.1 IndraWorks PROFINET hardware configuration

The following is defined within the hardware configuration:

- IP addresses of the ID 200
- Manufacturer-specific data
- I/O areas

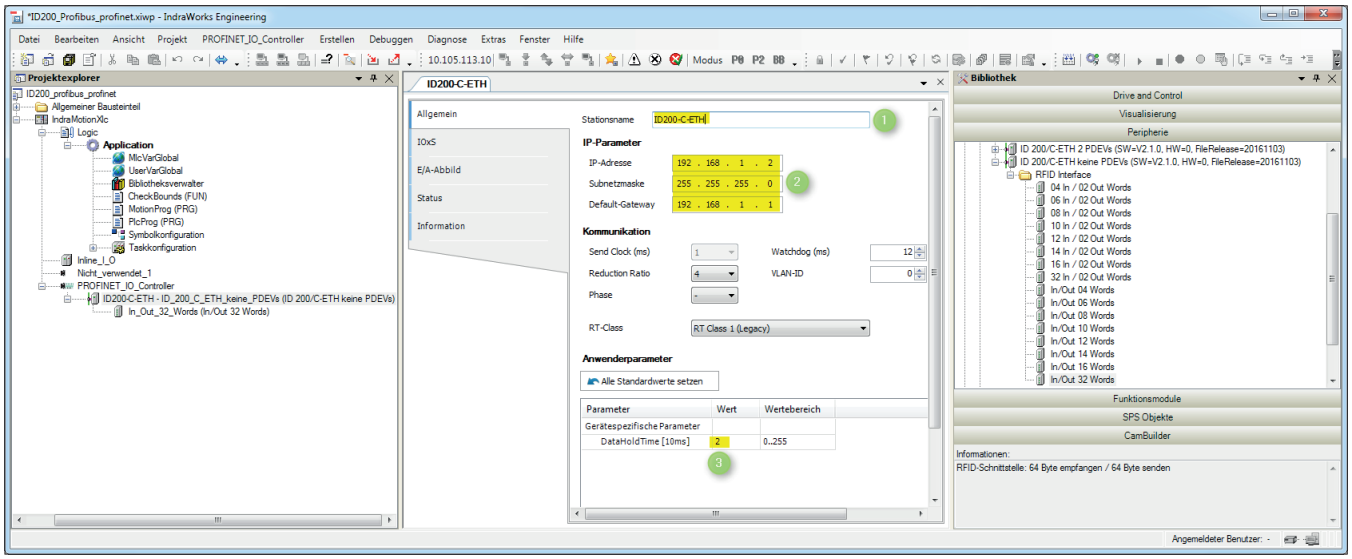
▶ To connect the ID 200 to the Profinet IO controller: Drag the symbol for the ID 200 from the library **peripherals/ProfinetIO/identification systems** in the project explorer to the **PROFINET_IO_Controller**.



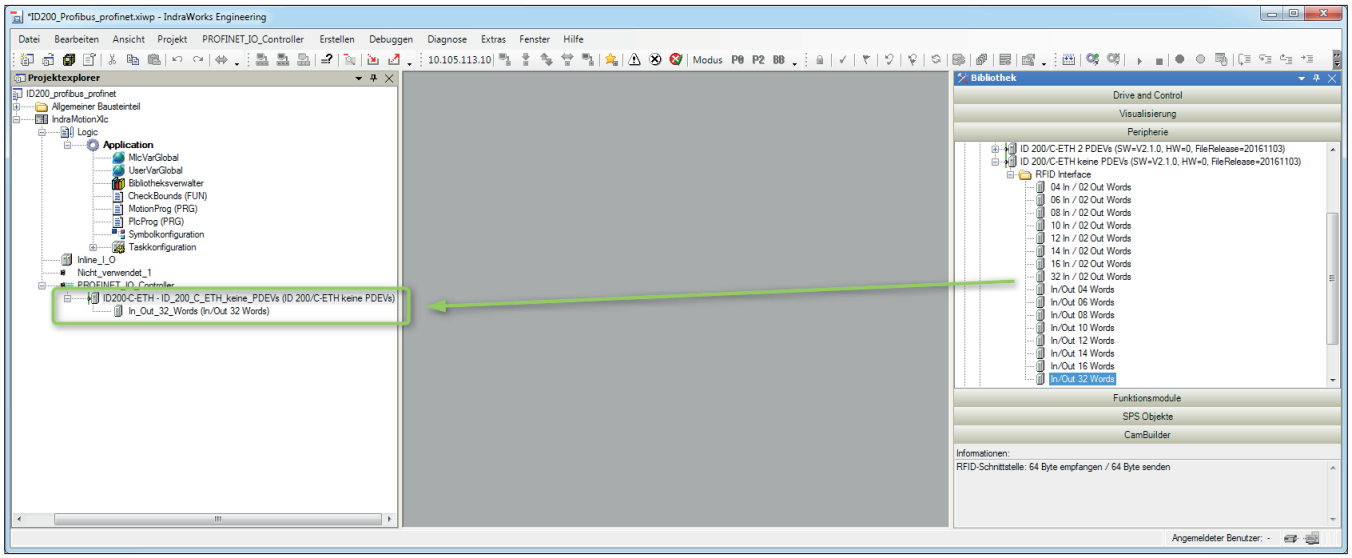
1. Specify the **station name**.
2. Specify the **IP addresses**.
3. Enter the **manufacturer-specific data**.

- A **data hold time** then occurs.

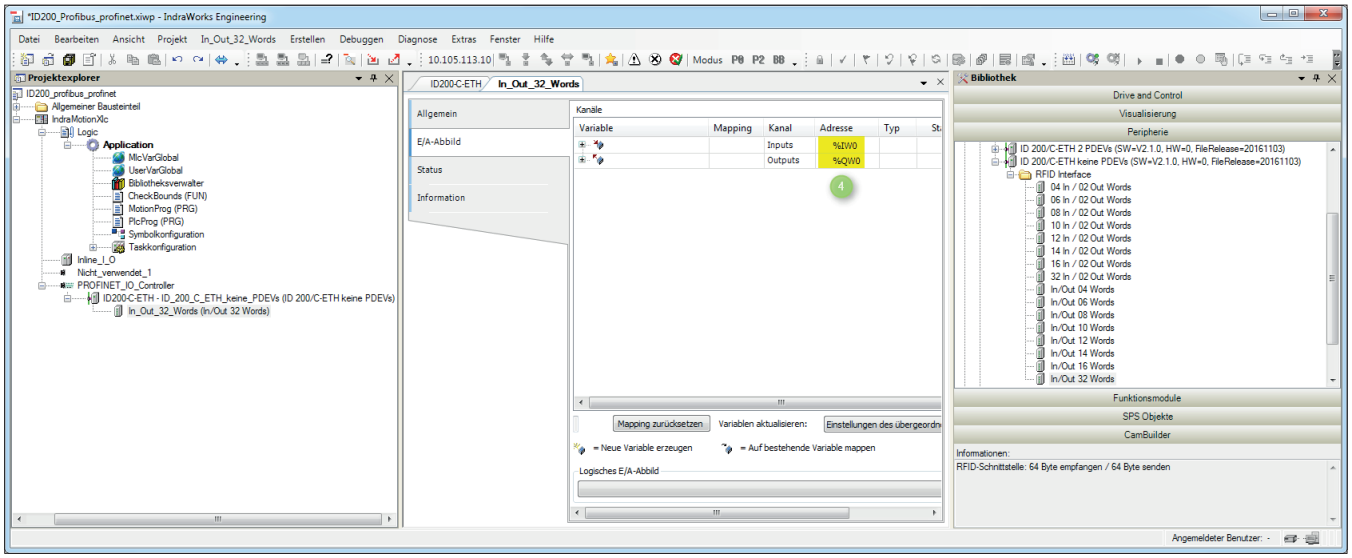
  The **data hold time** is defined by the parameter in the output data field of the ID 200. The value should correspond to the doubled cycle time of the control.



- To define the communication module: **IN/OUT 32 words** are selected here; this corresponds to the allocation in the I/O area.



- Specify the **I/O addresses**.



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6 Function block for interfacing of the ID 200

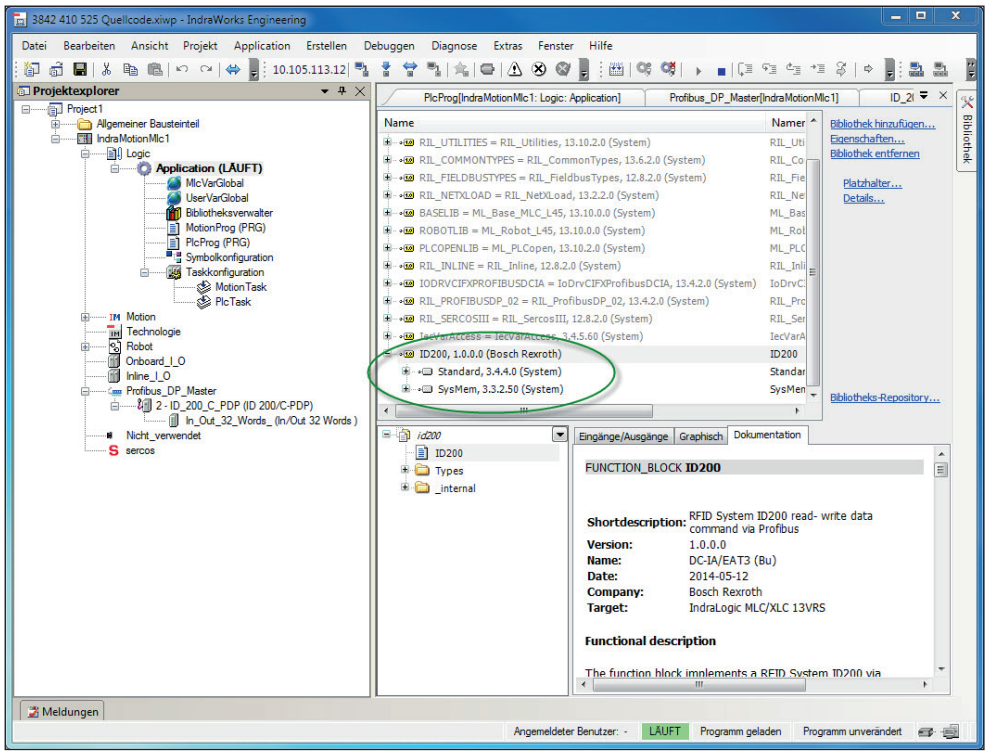
The **ID 200** function block aids interfacing of the ID 200 identification system to the controller. The ID 200 function block supports the following functions:

- Read and write max. 60 bytes of useful data with MDT../112-H and max. 56 bytes with MDT../2K-H per read operation
- Read the 8-byte UID with MDT../..-H
- Read and edit 5 bytes of fix code with MDT../28-L

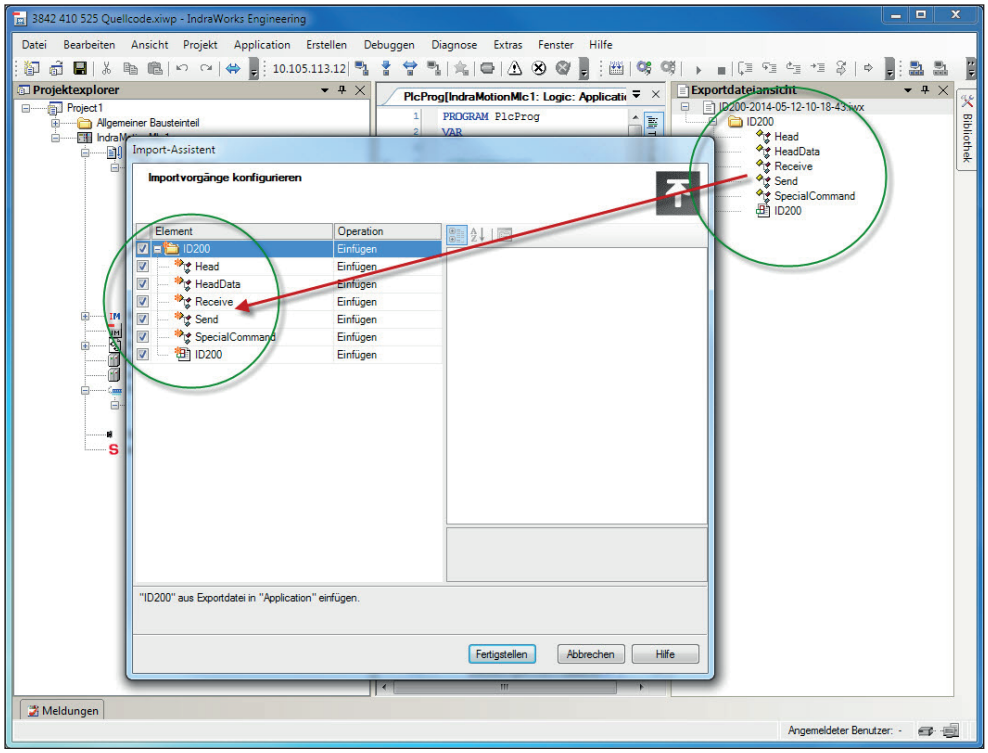
Implementation in a program

The function block is available as a library (ID200.lib) or as a import (ID200.iwx) and so can be easily included in the program.

Example with imported library



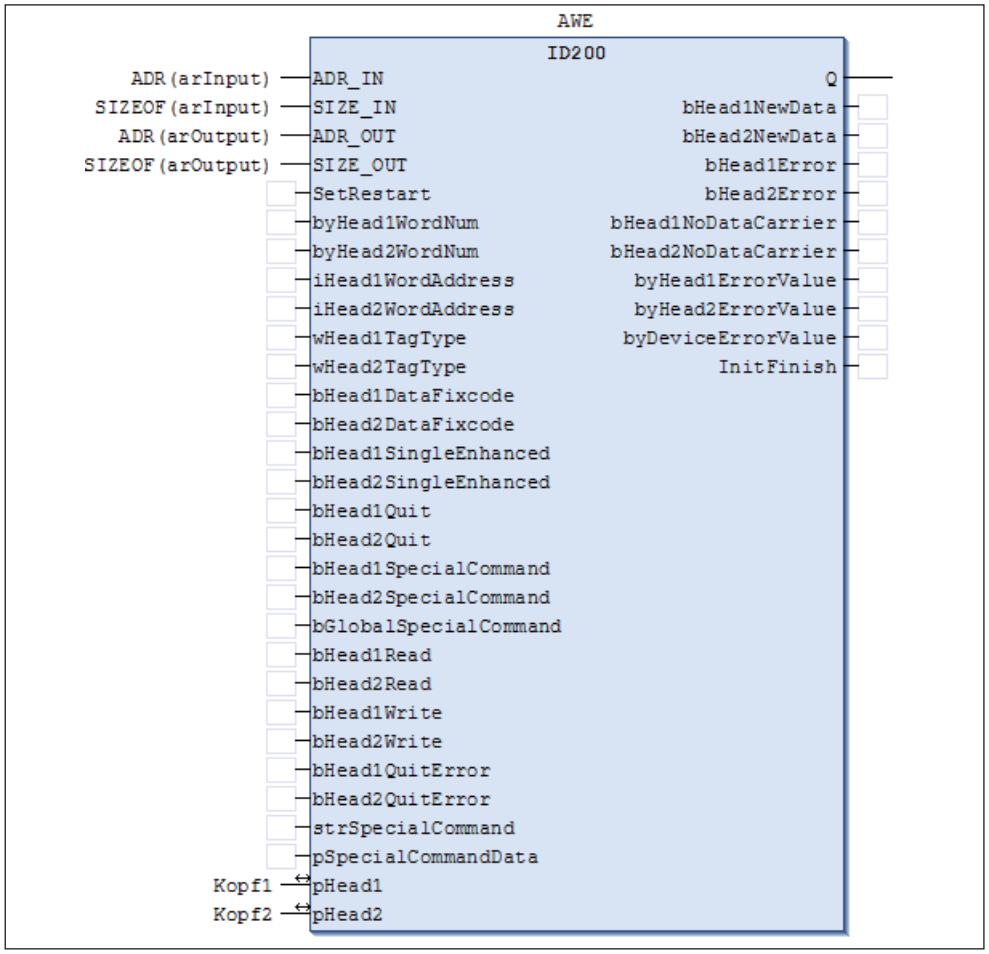
Example with imported source



- You then also have to implement (assign) the inputs and outputs in your program.

The following example uses a 64-byte I/O module. The I/O range begins at %IB2 and %QB2 respectively.

Hardware configuration



The FB shown by way of example is set on antenna 1 to a MDT../2K-H (type 33), and on antenna 2 to a MDT../28-L (type 15). A maximum of 56 bytes can be read at antenna 1 and 28 bytes at antenna 2 in Enhanced mode.

Description for function block application

Declaration section

```
 (*Peripherie*)
       arInput AT%IB0:     ARRAY[0..63] OF BYTE;
       arOutput AT%QB0:    ARRAY[0..63] OF BYTE;
(*Function block*)
       AWE:                ID200;
(*Head Data*)
       Kopf1:        HeadData;
       Kopf2:        HeadData;
```

Implementation section

```
 (*Function block*)
AWE(
       ADR_IN:= ADR(arInput),
       SIZE_IN:= SIZEOF(arInput),
       ADR_OUT:= ADR(arOutput),
       SIZE_OUT:= SIZEOF(arOutput),
       SetRestart:= ,
       byHead1WordNum:= 16#02,
       byHead2WordNum:= 16#02,
       iHead1WordAddress:= 16#0000,
       iHead2WordAddress:= 16#0000,
       wHead1TagType:= 16#3333,
       wHead2TagType:= 16#3333,
       bHead1DataFixcode:= ,
       bHead2DataFixcode:= ,
       bHead1SingleEnhanced:= ,
       bHead2SingleEnhanced:= ,
       bHead1Quit:= ,
       bHead2Quit:= ,
       bHead1SpecialCommand:= ,
       bHead2SpecialCommand:= ,
       bGlobalSpecialCommand:= ,
       bHead1Read:= ,
       bHead2Read:= ,
       bHead1Write:= ,
       bHead2Write:= ,
       bHead1QuitError:= ,
       bHead2QuitError:= ,
       strSpecialCommand:= ,
       pSpecialCommandData:= ,
       pHead1:= Kopf1,
       pHead2:= Kopf2,
       Q=> ,
       bHead1NewData=> ,
       bHead2NewData=> ,
       bHead1Error=> ,
       bHead2Error=> ,
       bHead1NoDataCarrier=> ,
       bHead2NoDataCarrier=> ,
       byHead1ErrorValue=> ,
       byHead2ErrorValue=> ,
       byDeviceErrorValue=> ,
       InitFinish=> );
```

Inputs

Name	Model	Function
ADR_IN	DWORD	Address of input data field
SIZE_IN	INT	Size of input data field
ADR_OUT	DWORD	Address of output data field
SIZE_OUT	INT	Size of output data field
SetRestart	BOOL	Start of initialization (FP)
Head1/2WordNum	BYTE	Number of data blocks to read or write
Head1/2WordAddress	WORD	Block start address in data tag
Head1/2TagType	WORD	Data tag type
Head1/2DataFixcode	BOOL	0 = Access to data area 1 = Access to fix code
Head1/2SingleEnhanced	BOOL	0 = Single command 1 = Enhanced command
Head1/2Quit	BOOL	Start command execution Quit command (FP)
Head1/2SpecialCommand	BOOL	Start command execution SpecialCommand (FP)
GlobalSpecialCommand	BOOL	Start command execution SpecialCommand evaluation unit (FP)
Head1/2Read	BOOL	Start command execution Read command (FP)
Head1/2Write	BOOL	Start command execution Write command (FP)
Head1/2QuitError	BOOL	Start command execution Quit error antenna (FP)
SpecialCommand	STRING[2]	Command for Special Command (see legend B)
SpecialCommandData	STRUCT	"Special Command" structure (see legend B)

Inputs and outputs

Name	Model	Function
Head1/2	STRUCT	"HeadData" structure for useful data, (see legend A)

Outputs

Name	Model	Function
Head1/2NewData	BOOL	New data in the input data field. Data has been successfully read or written
Head1/2Error	BOOL	Error executing a command
Head1/2NoDataCarrier	BOOL	No data tag in field range at time of command execution
Head1/2ErrorValue	BYTE	> 0x00 Error message status
DeviceErrorValue	BYTE	> 0x00 Error value evaluation unit status
InitFinish	BOOL	Initialization finished

Legend A: “HeadData” structure

```
TYPE HeadData :
STRUCT
       arWriteData          : ARRAY [1..60] OF BYTE;
       arReadData           : ARRAY [1..60] OF BYTE;
END_STRUCT
END_TYPE
```

The **HeadData** structure comprises the useful data of the write/read commands. It is divided into two arrays with a length of 60. The data read from the data tag is in the **arReadData** field. Data to be written to the data tag must be imported into the **arWriteData** field prior to command execution.

Legend B: “SpecialCommandData” structure

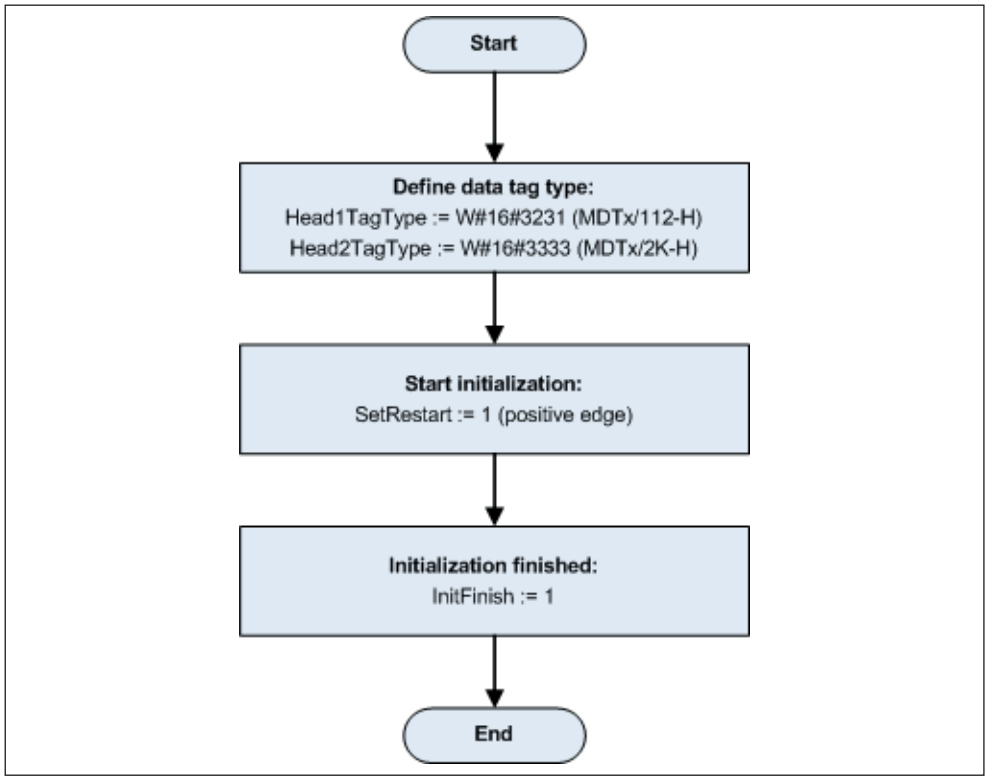
```
TYPE SpecialCommand :
STRUCT
       arSpecialCommandData       : ARRAY [1..60] OF BYTE;
END_STRUCT
END_TYPE
```

The **SpecialCommandData** structure comprises the useful data for execution of the special commands. The structure consists of one array with a length of 60 bytes.

For more details on communications and control of the ID 200 refer to the **System Manual 3 842 540 399**.

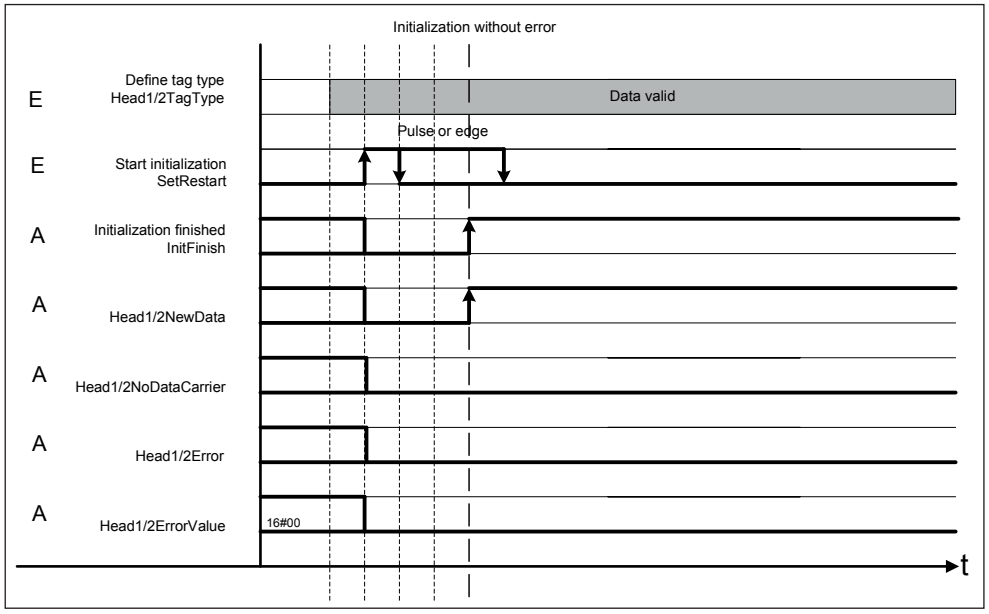
7 Command execution and flowcharts

7.1 Initialization

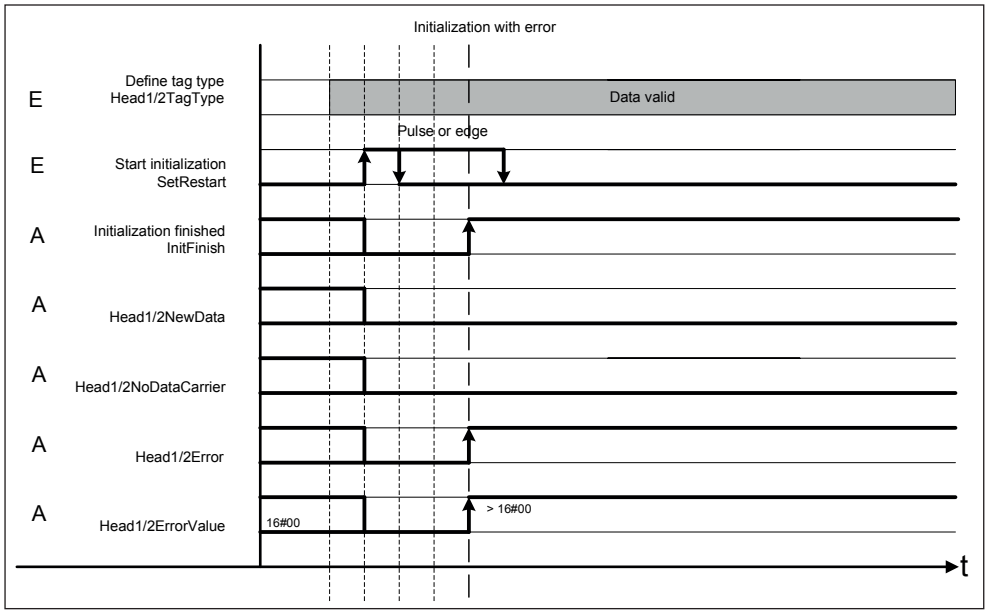


Flowcharts

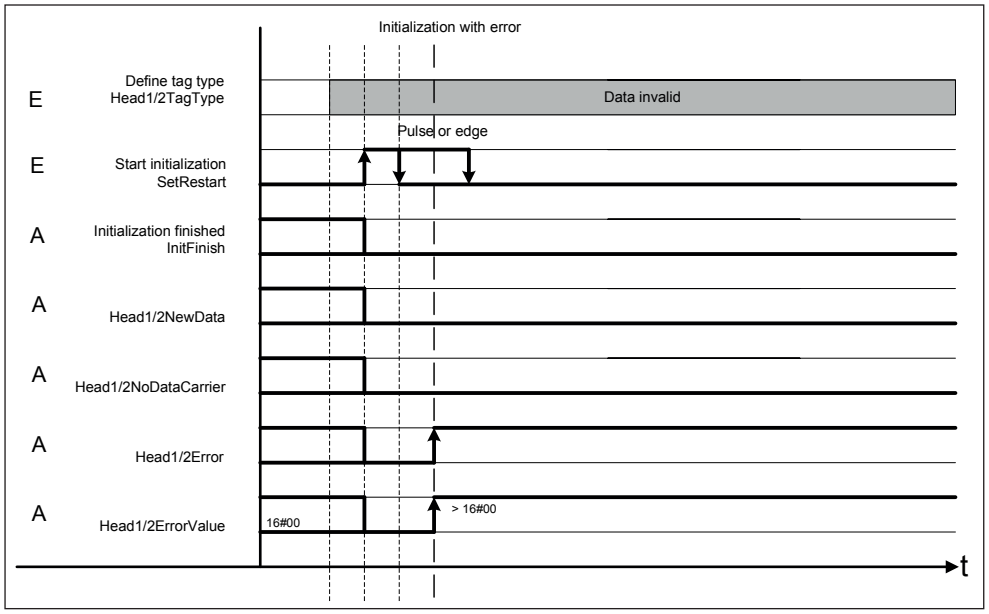
Initialization without error



Initialization with error, return InitFinish = TRUE

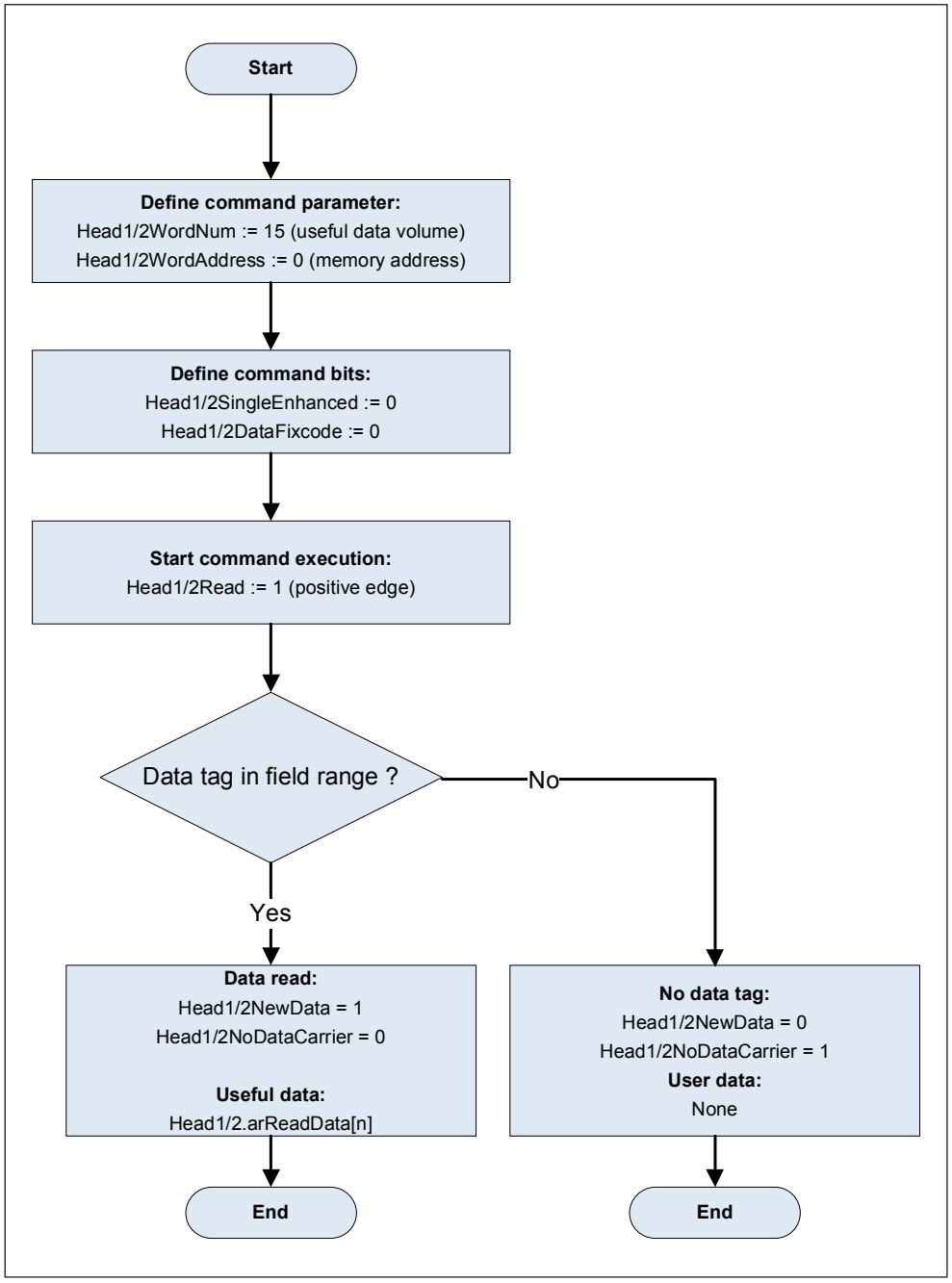


Initialization with error, return InitFinish = FALSE
(WordNum or TagType wrong)



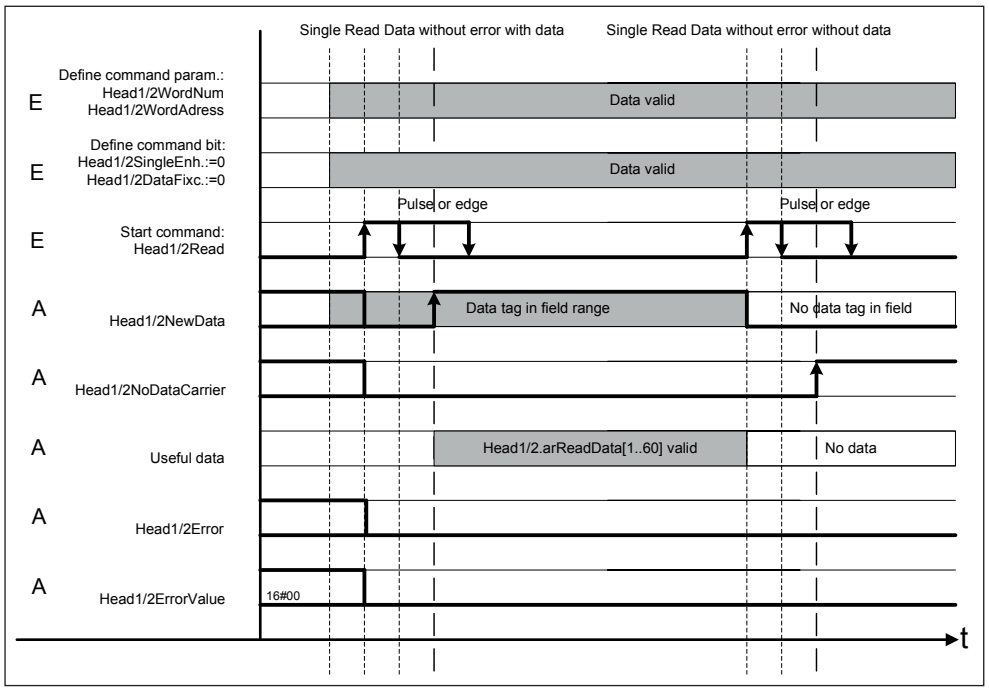
Note: The initialization programs the antennas of the ID 200 to the MDT (mobile data tag) being used. It is necessary in order to optimize the command execution times. If no antenna is connected to a channel, or if the antenna has a fault, the status (Head1/2ErrorValue) := 0x06 is returned. If the parameterized data tag type (Head1/2TagType) does not match the connected antenna, the status (Head1/2ErrorValue) := 0x09 is returned.

7.2 Single Read Data

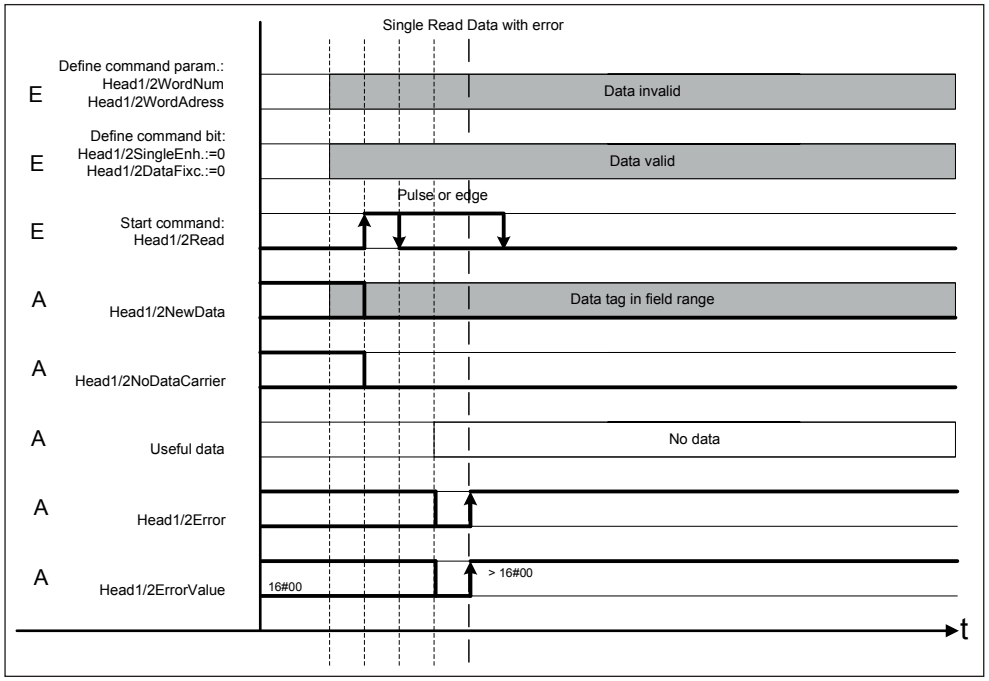


Flowcharts

Single Read Data without error



Single Read Data with error

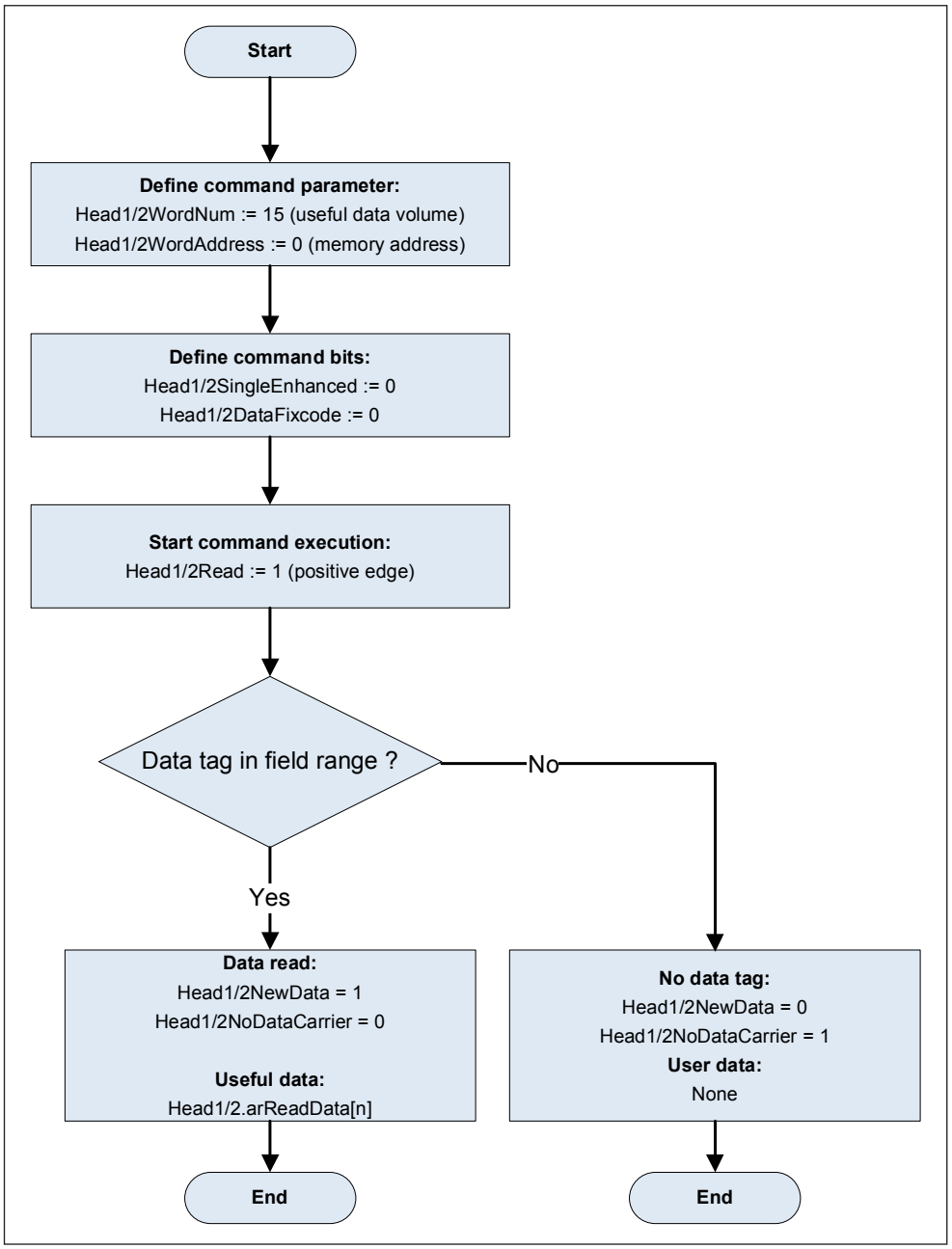


Note: The **Single Read Data** command attempts precisely once to read-in Head1/2WordNum data blocks as from the address Head1/2WordAddress. The command is terminated as soon as the data has been successfully read-in (Head1/2NewData := TRUE), if no mobile data tag was positioned in front of the antennas (Head1/2NoDataCarrier := TRUE), or if an error has occurred (Head1/2Error := TRUE). If the status (Head1/2ErrorValue) := 0x04 is returned, the

start address on the data tag (Head1/2WordAddress) and the data set to be read-in (Head1/2WordNum) must be checked. The data area to be read-in must be fully within the valid data area on the mobile data tag. Following successful execution of the command, the read-in useful data (Head1/2.arRead.Data) can be processed further.

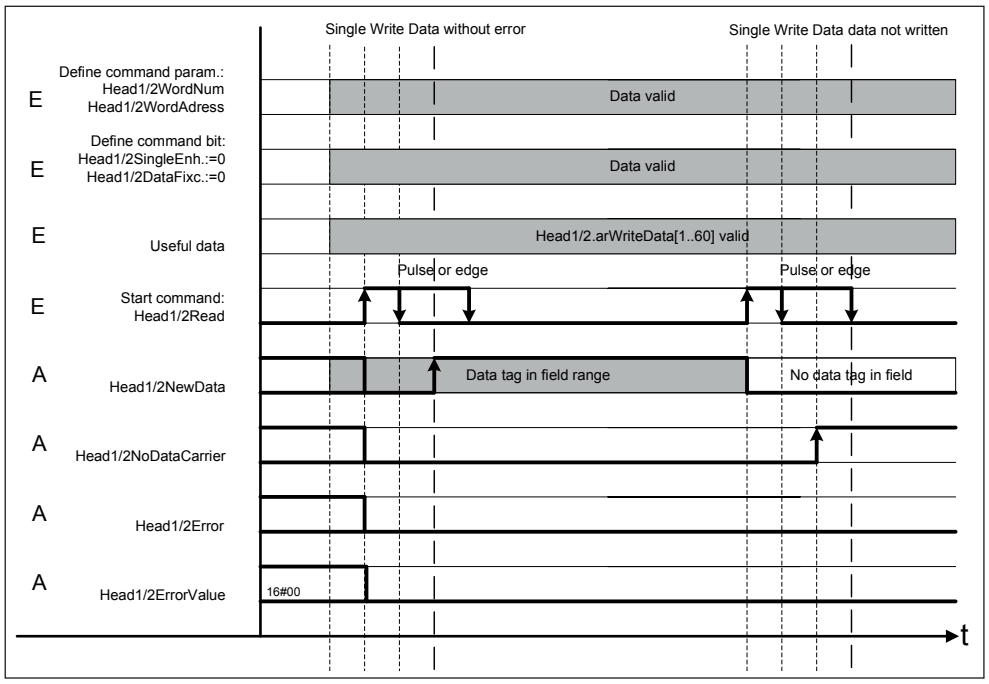
For more status returns refer to **System Manual 3 842 540 399**.

7.3 Single Write Data

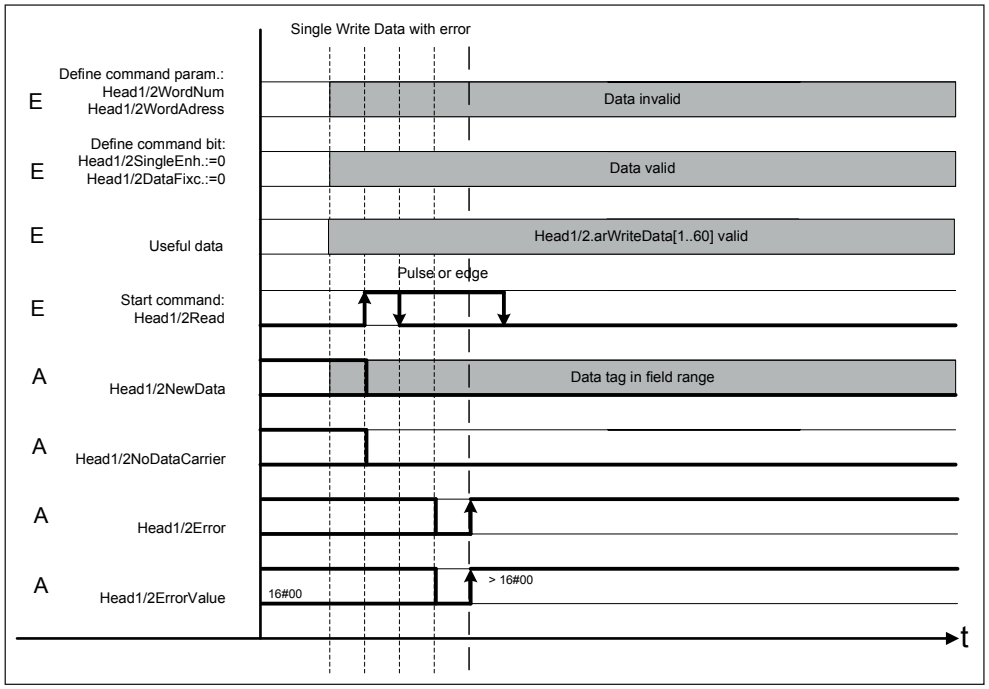


Flowcharts

Single Write Data without error



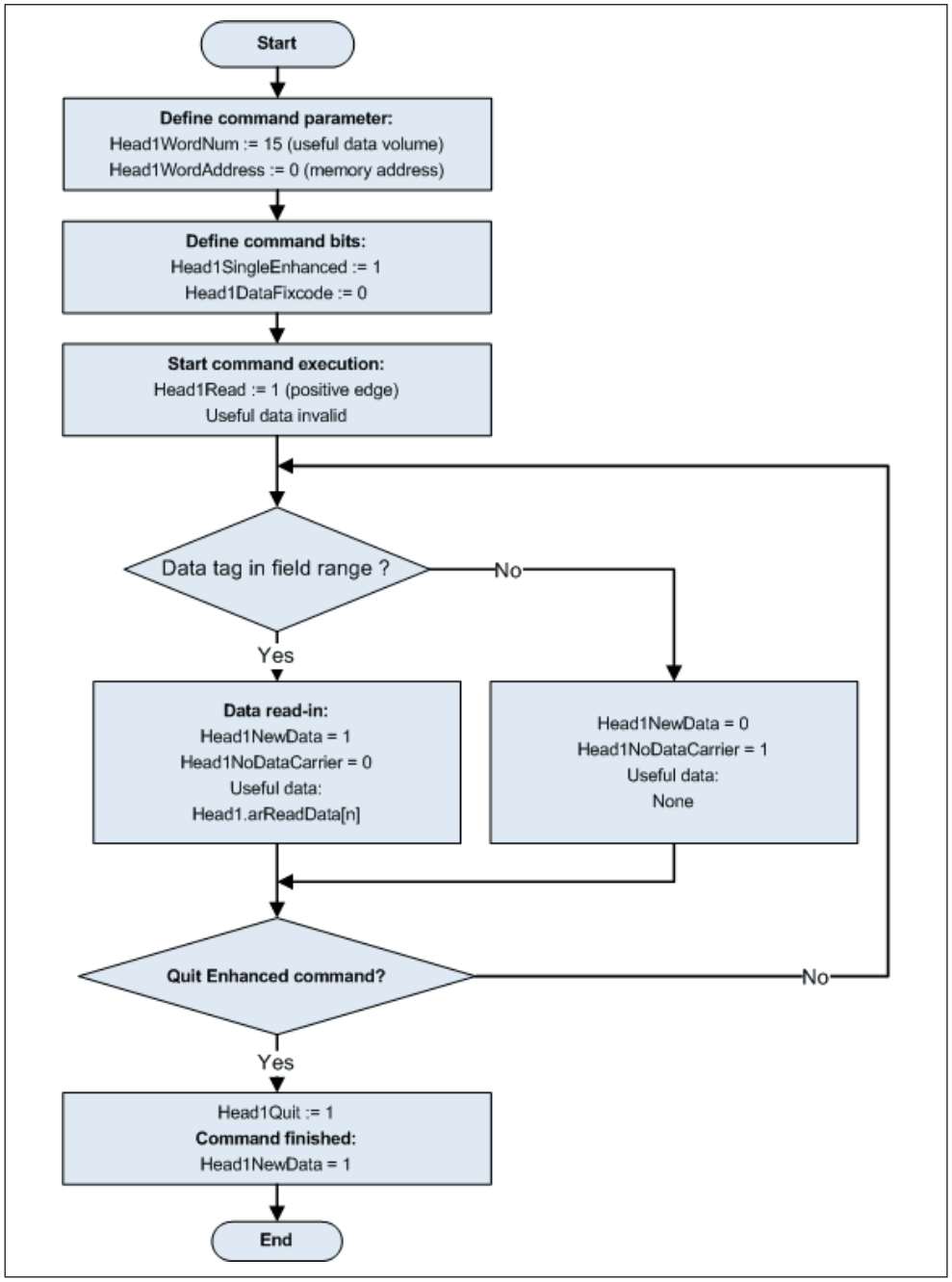
Single Write Data with error



Note: The **Single Write Data** command attempts precisely once to write Head1/2WordNum data blocks as from the address Head1/2WordAddress to the mobile data tag. Before command execution (Head1/2Write) is started the useful data (Head1/2.arWrite.Data) to be written must be parameterized.
The command is terminated as soon as the data has been successfully written (Head1/2NewData := TRUE), if no mobile data tag was positioned in front of the

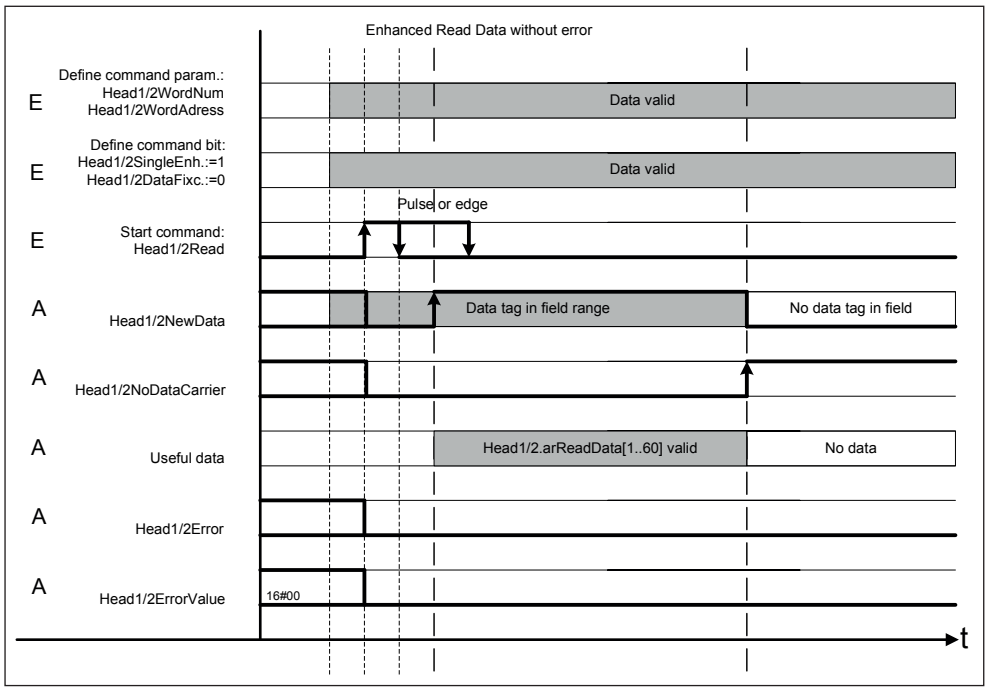
antenna (Head1/2NoDataCarrier := TRUE), or if an error has occurred (Head1/2Error := TRUE).
If the status (Head1/2ErrorValue) := 0x04 is returned, the start address on the data tag (Head1/2WordAddress) and the data set to be written (Head1/2WordNum) must be checked. The data area to be written must be fully within the valid data area on the MDT.

7.4 Enhanced Read Data

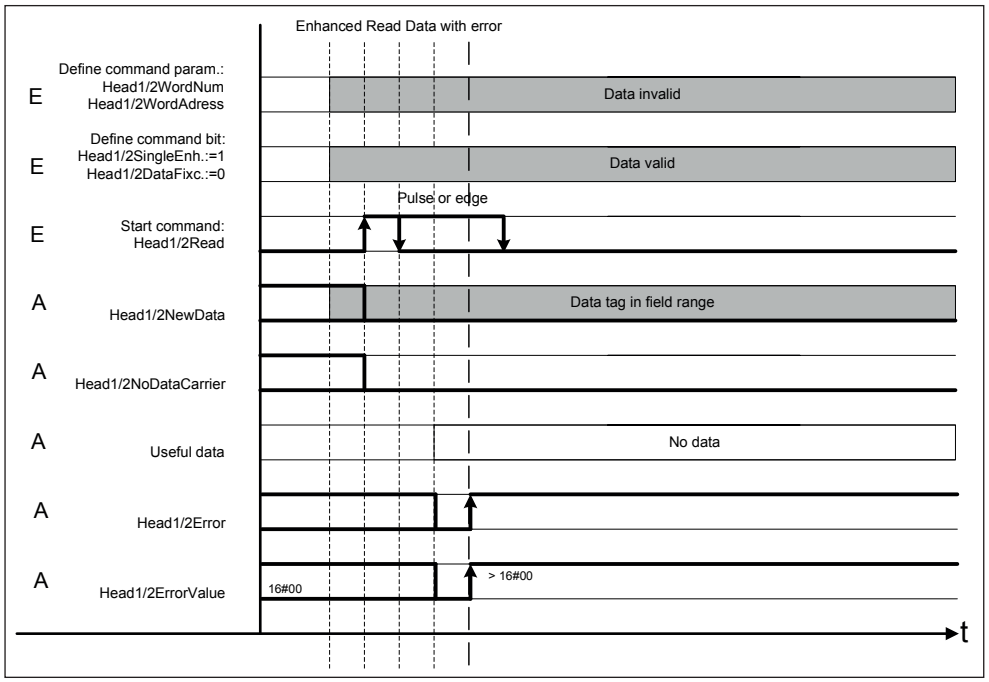


Flowcharts

Enhanced Read Data without error



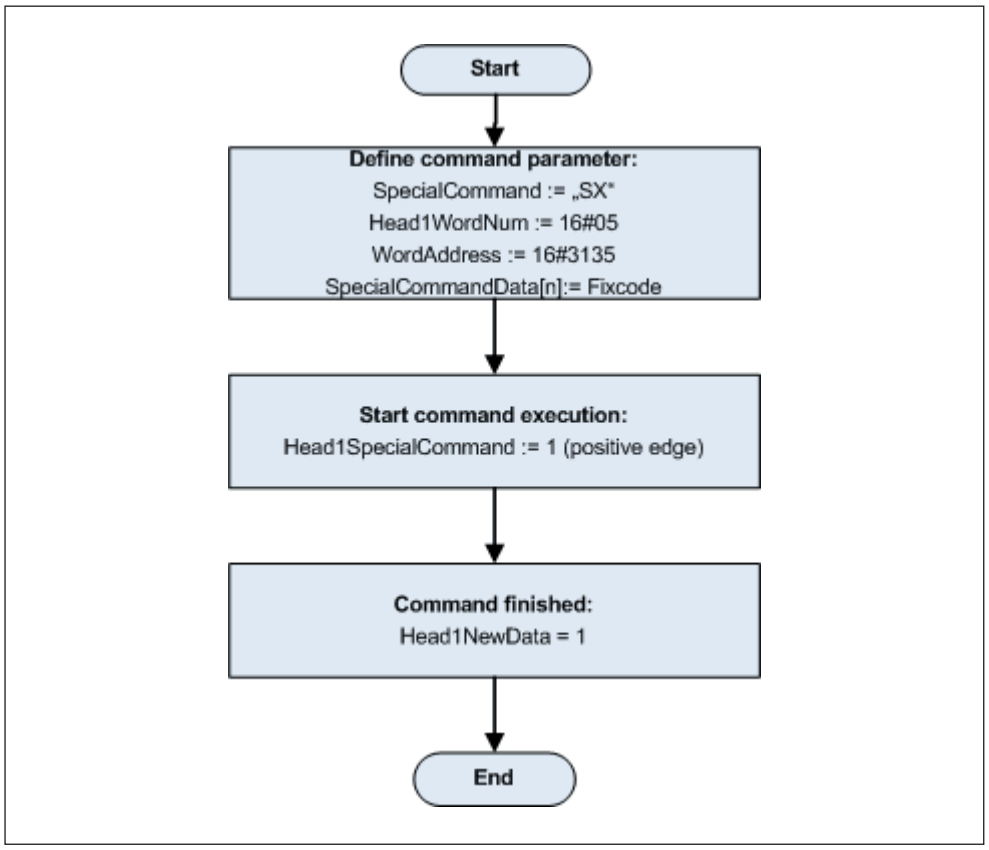
Enhanced Read Data with error



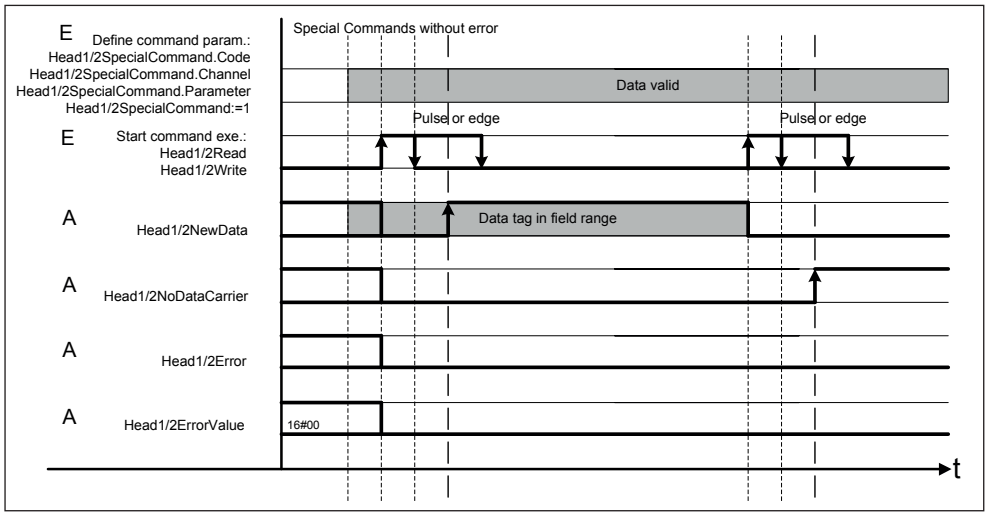
Note: The **Enhanced Read Data** command attempts continuously to read-in Head1/2WordNum data blocks as from the address Head1/2WordAddress. The command remains active until it is aborted by a Quit command (Head1/2Quit). The data has been read-in when a positive edge change has occurred at Head1/2NewData. The read-in useful data (Head1/2d.arRead.Data) can be processed further; the data is deleted only by being subsequently overwritten.

The data tag has moved out of the detection range if there is a positive edge change at Head1/2NoDataCarrier. The data tag cannot be read a second time; it must first be removed from the field and then re-entered.

7.5 Special commands



Flowchart



Command to write fix code Single: SX

Note: The error feedback is identical to the **Read Data** or **Enhanced Read Data** command.

For more details on the individual commands refer to **System Manual 3 842 540 399**.

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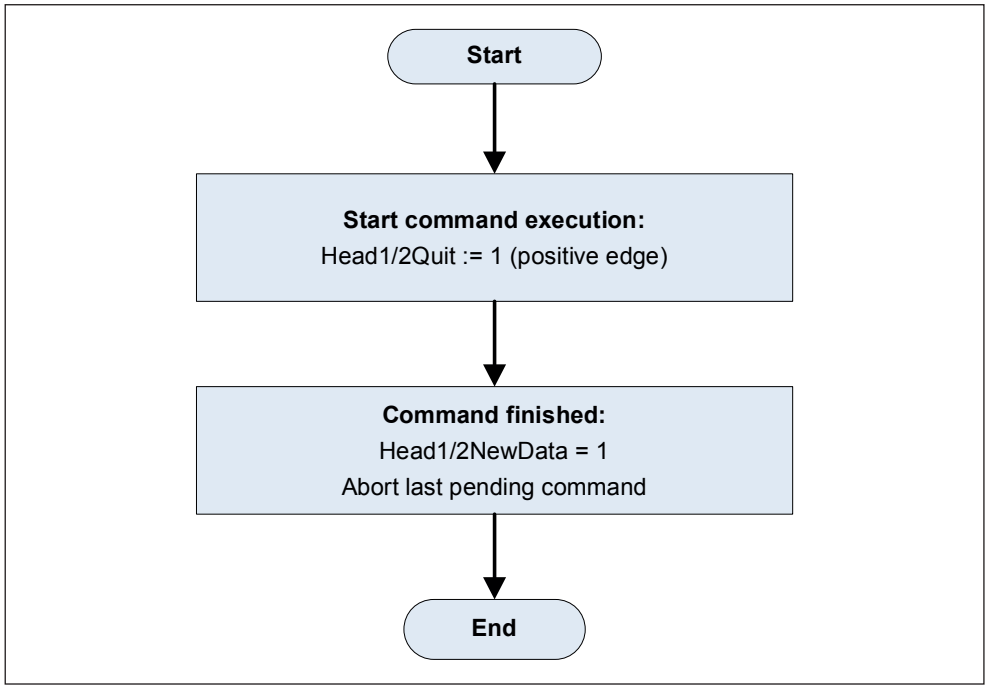
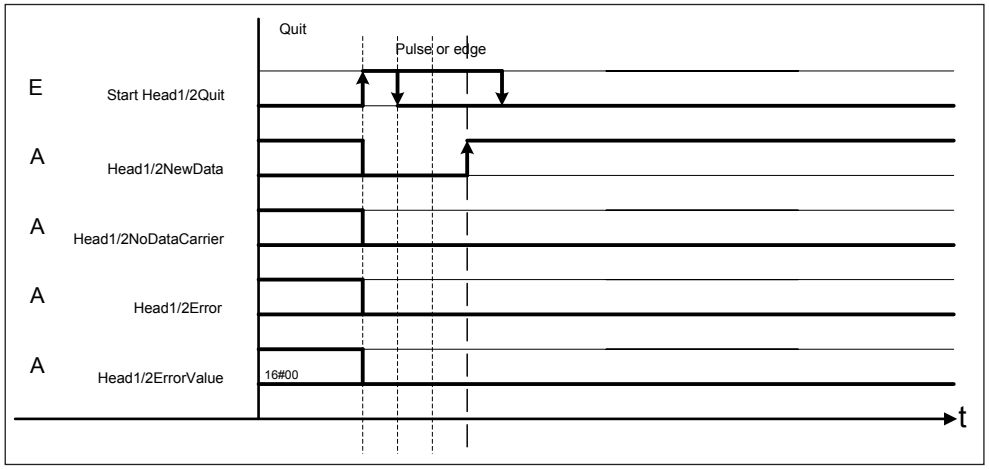
7.6 Quit



Flowchart



Note: The last outstanding command is aborted (e.g. Enhanced).

The Drive & Control Company

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Änderungen vorbehalten
3 842 358 772/2016-11